Draft Preliminary Engineering Report (PER)

Florida Department of Transportation

District Four

SR 9/I-95

Limits of Project: FROM SOUTH OF SR 870/COMMERCIAL BOULEVARD TO NORTH OF CYPRESS CREEK ROAD

Broward County, Florida

Financial Management Number: 435808-1-22-02

ETDM Number: 14222

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The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by FDOT pursuant to 23 U.S.C. § 327 and a Memorandum of Understanding dated December 14, 2016 and executed by FHWA and FDOT.

This action has been determined to be a Draft Preliminary Engineering Report (PER) which meets the definition contained in 40 CFR 1508.4, and, based on past experience with similar actions and this analysis, does not involve significant environmental impacts. Signature below constitutes Location and Design Concept Acceptance:

Director of the Office of Environmental Management
Florida Department of Transportation

Date

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1 Project Summary

The Florida Department of Transportation (FDOT) District Four is conducting a Project Development and Environment (PD&E) Study for improvements to SR 9/I-95 from south of SR 870/Commercial Boulevard to north of Cypress Creek Road in Broward County, Florida (Milepost 14.5 to Milepost 17.0).

This Preliminary Engineering Report (PER) contains detailed information that fulfills the purpose and need for the project.

1.1 Project Background

I-95 is one of the most important surface transportation facilities along the east coast of Florida. As part of the state's Strategic Intermodal System (SIS), it is a critical asset for moving people and goods within the 12 coastal counties, including Miami-Dade, Broward, and Palm Beach Counties.

FDOT is conducting a comprehensive systematic analysis of the I-95 interchanges in Broward and Palm Beach Counties for the first time since the initial construction of the interstate in the 1970s. Per the I-95 Interchange Master Plan, FDOT has developed preliminary design concepts to address traffic spillback onto I-95, improve traffic operations at the interchanges, reduce congestion which has reached unacceptable levels during peak hours, and to enhance overall safety at each interchange, including those at Commercial Boulevard and Cypress Creek Road. These preliminary design concepts were developed in separate Interchange Concept Development Reports (ICDR) for each interchange completed in February 2016 (Commercial Boulevard) and June 2015 (Cypress Creek Road).

The intent of the I-95 PD&E Study from south of Commercial Boulevard to north of Cypress Creek Road is to study in further detail the preliminary design concepts from the I-95 Interchange Master Plan ICDRs in addition to other alternatives. This PD&E Study will also include a No-Action alternative which assumes no proposed improvement and serves as a baseline for comparison against other alternatives.

1.2 Project Description

This project is proposing improvements to the Commercial Boulevard and Cypress Creek Road interchanges and along I-95 from south of Commercial Boulevard to north of Cypress Creek Road, a distance of approximately two miles in Broward County, Florida. A project location map is depicted in Figure 1-1.

I-95 is the primary north-south interstate facility that links all major cities along the Atlantic Seaboard and is one of the most important transportation systems in southeast Florida. I-95 is one of the two major expressways, Florida's Turnpike being the other, that connect the major employment centers and residential areas within the South Florida tri-county area. I-95 is part of the state's SIS and the National Highway System (NHS). In addition, I-95 is designated as an evacuation route along the east coast of Florida.

I-95, within the majority of the project limits, has six general purpose lanes (three in each direction) and two High Occupancy Vehicle (HOV) lanes (one in each direction). This segment of I-95 is functionally classified as a Divided Urban Principal Arterial Interstate and has a posted speed limit of 65 miles per hour. The access management classification for this corridor is Class 1.2, Freeway in an existing urbanized area with limited access. There are two full interchanges within the project limits located at Commercial Boulevard and Cypress Creek Road, as well as entry ramps from N. Andrews Avenue and from the Cypress Creek Park and Ride Lot to I-95 southbound.



Figure 1-1 Project Location Map

The proposed improvements will be compatible with the proposed I-95 Express Lanes Phase 3 Project, which will introduce two tolled, express lanes in place of the existing HOV lanes from Broward Boulevard in Broward County to Linton Boulevard in Palm Beach County. Phase 3A, which extends from Broward Boulevard to south of SW 10 Street and includes the limits of the proposed interchange improvements, began construction in early 2016.

1.3 Purpose and Need

The primary need for this project is to increase capacity and improve traffic operations on I-95 and at the Commercial Boulevard and Cypress Creek Road interchanges. The project is also intended to improve safety within the vicinity, including access to I-95 and the arterial intersections. Secondary considerations for the purpose and need of this project include system linkage, modal interrelationships, transportation demand, social demands and economic development, and evacuation.

I-95 within the project limits currently operates at Level of Service (LOS) F. Additionally, Commercial Boulevard operates at LOS E east of I-95 and LOS F west of I-95, while Cypress Creek Road operates at LOS E on both sides of I-95. Without improvements, the driving conditions will continue to deteriorate well below acceptable LOS standards. The 95 Express Phase 3 improvements will help maintain or slightly improve the I-95 corridor LOS by adding one travel lane in each direction in the form of an Express Lane. The improvements proposed as part of this project will complement the I-95 Express Lanes improvements.

The existing Cypress Creek Park and Ride southbound on ramp and Commercial Boulevard southbound on ramp provide less than 500 feet of weave distance before the acceleration lane drops and merges with the general-purpose traffic. This forces commuters to merge with the general-purpose traffic while accelerating which is an unsafe maneuver.

The proposed modifications will improve the safety of the project corridor. The buses travelling onto I-95 from the Cypress Creek Park and Ride will be provided greater distance prior to merging with I-95 southbound traffic. Additionally, the existing substandard vertical clearance of the North Andrews Avenue bridge over I-95 will be resolved with the bridge replacement.

The project is anticipated to improve emergency evacuation capabilities by enhancing connectivity and accessibility to major arterials designated on the state evacuation route. I-95, Commercial Boulevard, and Cypress Creek Road serve as part of the emergency evacuation route network designated by the Florida Division of Emergency Management and by Broward County. Commercial Boulevard and Cypress Creek Road move traffic from the east to I-95. I-95 is critical in facilitating traffic during emergency evacuation periods as it connects to other major arterials and highways of the state evacuation route network (i.e., I-595 and the Florida's Turnpike).

The Cypress Creek Road Interchange Project is included in the Broward Metropolitan Planning Organization (MPO) Transportation Improvement Program (TIP) for Fiscal Years (FY) 2016-2020, FDOT Work Program FY 2017- 2021, FDOT State TIP FY 2016-2020, and FDOT SIS Five Year Plan FY 2016-2020 for PD&E Phase in FY 2016.

The Broward MPO 2035 Long Range Transportation Plan (LRTP) included improvements to all I-95 interchanges in Broward County under Illustrative Roadway Projects. Illustrative projects are those that cannot be included in the cost feasible plan due to financial constraints but would be included in a future approved TIP.

1.4 Commitments

1. FDOT is committed to the construction of feasible and reasonable noise abatement measures at the noise- impacted locations contingent upon the following conditions:
    a. Final recommendations on the construction of abatement measures is determined during the project's final design and through the public involvement process;

b. Detailed noise analyses during the final design process support the need, feasibility, and reasonableness of providing abatement;

c. Cost analysis indicates that the cost of the noise barrier(s) will not exceed the cost reasonable criterion;

d. Community input supporting types, heights, and locations of the noise barrier(s) is provided to the District Four Office; and,

e. Safety and engineering aspects as related to the roadway user and the adjacent property owner have been reviewed and any conflicts or issues resolved.

2. As committed to the City of Oakland Park, the Design Phase shall further analyze the proposed bridge across N. Andrews Avenue to address design questions posed by the public and to conduct additional outreach during design related to this concept.

3. FDOT will implement the most current versions of the following protection measures which will be included in the construction documents and implemented during construction: US Fish and Wildlife Service (USFWS) Standard Protection Measures of the Eastern Indigo Snake.

1.5 Description of Recommended Alternative

A recommended alternative was selected following the June 29, 2017 Alternative Public Workshop based on results from the alternative analysis process, public, local and state officials input, and coordination with FDOT. Alternative 1A-6 was selected as the recommended Build Alternative. This alternative meets the purpose and need of the project. The proposed improvements under this alternative achieve the objectives of the Department to improve traffic operations and enhance overall safety within the project study area while minimizing environmental and socio-economic impacts, and construction cost.

The following are the proposed improvements associated with Alternative 1A-6:

<u>I-95 Mainline Improvements</u>

- Maintain the proposed I-95 Express Lanes Phase 3 project improvements, which will introduce two tolled, express lanes in place of the existing HOV lanes from Broward Boulevard in Broward County to Linton Boulevard in Palm Beach County.
- Provide a Collector-Distributor (CD) road system to carry a large volume of the Cypress Creek Road traffic desiring to go southbound onto I-95. The CD road system starts at the Cypress Creek Park & Ride on-ramp and merges with the existing I-95 southbound on-ramp from North Andrews Avenue. The CD road system continues southbound over Commercial Boulevard and merges with the I-95 mainline just north of Powerline Road.
- Reconstruct the North Andrews Bridge over the I-95 mainline.

<u>Commercial Boulevard Interchange Improvements</u>

I-95 Northbound Off-Ramp:

- Provide two additional eastbound right turn lanes to have a triple right turn movement to Commercial Boulevard east.

I-95 Southbound Off-Ramp:

- Provide one additional westbound right turn lane to have a dual right turn movement to Commercial Boulevard west.

Commercial Boulevard and Powerline Road Intersection:

- Provide one additional Powerline Road southbound left turn lane by removing one of the three thru lanes to have a triple left turn movement to Commercial Boulevard east.
- Provide one additional Commercial Boulevard westbound thru lane by removing one of the two westbound to southbound left turn lanes to have four thru westbound lanes.
- Provide one additional Commercial Boulevard eastbound thru lane east of Powerline Road.

Commercial Boulevard and N. Andrews Avenue Intersection:

- Provide one additional North Andrews Avenue southbound left turn lane to have dual left turn lanes to Commercial Boulevard east.
- Provide one additional Commercial Boulevard eastbound thru lane to have four eastbound thru lanes.
- Reduce existing westbound thru lanes from three to two lanes.
- Provide a one lane bridge across North Andrews Avenue to accommodate Commercial Boulevard westbound traffic to the existing I-95 westbound to southbound flyover on-ramp. The proposed one lane bridge merges with the existing I-95 westbound to southbound at-grade ramp which accommodates the North Andrews Avenue southbound and northbound traffic heading to southbound I-95. This reconfigured I-95 westbound to southbound flyover on-ramp will have two lanes at the entrance and will drop to one lane after the third span of the flyover bridge. The first three spans of the flyover bridge will be reconstructed.
- Convert existing two-lane frontage road located at the northeast quadrant of the intersection to a one lane frontage road in the westbound direction. The west end of the proposed one lane frontage road turns northward before approaching North Andrews Avenue and terminates at the intersection of NE 1 Avenue and NE 51 Street.

<u>Cypress Creek Road Interchange Improvements</u>

I-95 Northbound Off-Ramps:

- Replace the existing I-95 northbound to westbound off-ramp loop at the northwest quadrant of the interchange with a bridge parallel to the existing I-95 mainline northbound bridge over Cypress Creek Road. The bridge accommodates the I-95 northbound to Cypress Creek westbound traffic to a stop condition at Cypress Creek Road. This movement will require signalization.
- Widen the northbound to eastbound off-ramp with an additional eastbound right turn lane to have a dual right turn movement to Cypress Creek Road eastbound. This movement will require signalization.

I-95 Northbound On-Ramp:

- Remove the Cypress Creek Road westbound free flow right on-ramp onto I-95 northbound. Provide one additional Cypress Creek Road westbound right turn lane to have a dual right turn lane I-95 on-ramp which will drop to one lane before merging with the I-95 mainline.

I-95 Southbound On-Ramp from N. Andrews Avenue:

- Reconstruct and widen to provide an additional lane; tie in to the proposed CD road system which starts from the Cypress Creek Park and Ride.

Cypress Creek Road and N. Andrews Avenue Intersection:

- Maintain existing number of lanes at the north and south legs of the intersection.

- Remove one Cypress Creek Road eastbound thru lane between NW 6 Way and North Andrews Avenue and provide one additional right turn lane to have dual right turn lanes from Cypress Creek Road eastbound to North Andrews Avenue southbound.

N. Andrews Avenue and N. Andrews Way Intersection:

- Maintain existing number of lanes at all legs of the intersection.

Cypress Creek Road and NE 7 Avenue Intersection:

- Provide one additional left turn lane to have dual left turn lanes from Cypress Creek Road eastbound to NE 7 Avenue northbound.

2 Existing Conditions

2.1 Functional Classification

I-95 from south of the Commercial Boulevard interchange to north of the Cypress Creek Road interchange is functionally classified as a divided Principal Arterial Interstate and is part of the SIS as well as the NHS. Commercial Boulevard and Powerline Road are both classified as a divided State Principal Arterial, while N. Andrews Avenue is classified as a County Minor Arterial. Cypress Creek Road is classified as a County Principal Arterial west of the I-95 interchange and as a County Minor Arterial east of the I-95 interchange.

2.1.1 DESIGN SPEED & POSTED SPEED

Design speed is a principal design control for establishing the project design standards. The design speed is generally based on the roadway physical setting and on the character of traffic service to be provided such as functional classification. Based on coordination with FDOT District Four, the study will evaluate the I-95 corridor using a Design Speed of 65 mph which is similar to the posted speed of 65 mph (see Appendix A). The posted speed limit will be maintained. I-95 is a SIS facility in an urbanized area so the minimum required design speed is 60 mph. Therefore, the design speed of 65 mph will be used for this PD&E Study.

Table 2-1 summarizes the functional classification and design/posted speeds of all the corridors involved in this project.

Table 2-1
Functional Classification with Design Speed & Posted Speed

Location	Functional Classification within Project Limits	Design Speed (mph)	Posted Speed (mph)
I-95	Divided Principal Arterial Interstate	65	65
Commercial Boulevard	Divided State Principal Arterial	45	45
Powerline Road	Divided State Principal Arterial	45	45
N. Andrews Avenue	County Minor Arterial	40	35 (South of Cypress Creek Road)
			40 (North of Cypress Creek Road)
Cypress Creek Road	County Principal Arterial West of I-95 Interchange County Minor Arterial East of I-95 Interchange	45	45 (West of NE 7 Avenue)
			35 (East of NE 7 Avenue)

2.2 Typical Sections

The typical sections for each roadway within the study area are described in the following paragraphs.

2.2.1 I-95

Existing typical section conditions along I-95 (northbound and southbound) as they are today are described below; however, with the I-95 Express Lanes Phase 3 project anticipated for completion in 2019, the existing typical section will differ as also described below.

Typical Sections today:

- From just south of NW 44 Street/West Prospect Road to approximately 1000 ft. south of Commercial Boulevard, I-95 consists of a ten-lane (12 ft. each) divided section providing four general purpose lanes and one HOV lane in each direction. Both sides of the interstate have outside shoulders varying between eight and 13 ft. and inside shoulders varying between 10 and 12 ft. The northbound and southbound directions are divided by a raised concrete barrier wall with existing luminaire structures placed approximately every 300 feet. This section also contains bridges: 860199 (northbound) and 860129 (southbound), and both span approximately 180 ft. in length over Prospect Road.
- From approximately 1000 ft. south of Commercial Boulevard to just north of Cypress Creek Road, I-95 consists of a ten-lane (12 ft. each) divided section providing three general purpose lanes, one auxiliary lane, and one HOV lane in each direction. Both sides of the interstate have paved 12 ft. outside shoulders and an inside shoulder varying between 10 and 12 ft. The northbound and southbound directions are divided by a raised concrete barrier wall with existing luminaire structures placed approximately every 300 ft.

  This section contains five bridges: 860196 (northbound) and 860130 (southbound), which span approximately 180 ft. in length over Commercial Boulevard; 860240 (northbound) and 860239 (southbound), which span approximately 320 ft. in length over Cypress Creek Road; and 860131 [Commercial Boulevard (westbound) to I-95 (southbound)], which is a flyover bridge spanning approximately 550 ft. over Commercial Boulevard and the I-95 Mainline. Characteristics for all bridges can be seen in Section 2.18 Existing Structural Characteristics.

Typical Section after the completion of the I-95 Express Lanes Phase 3 Project:

- From south of Commercial Boulevard to north of Cypress Creek Road, I-95 consists of a 12-lane (12 ft. each, except two southbound express lanes measuring 11 to 12 ft.) divided section providing three general purpose lanes, two express lanes, and one auxiliary lane in each direction. The northbound direction has an outside shoulder varying between 8 and 12 ft. and inside shoulder varying between 6 and 12 feet. The southbound direction has an outside shoulder varying between 5 and 12 ft. and an inside shoulder varying between 8 and 12 ft. Both directions are divided by a raised concrete barrier wall with existing luminaire structures placed approximately every 300 ft. Tubular markers are also present in both directions, separating the express lanes from the general-purpose lanes.

The existing typical section as described above is depicted in Figure 2-1.

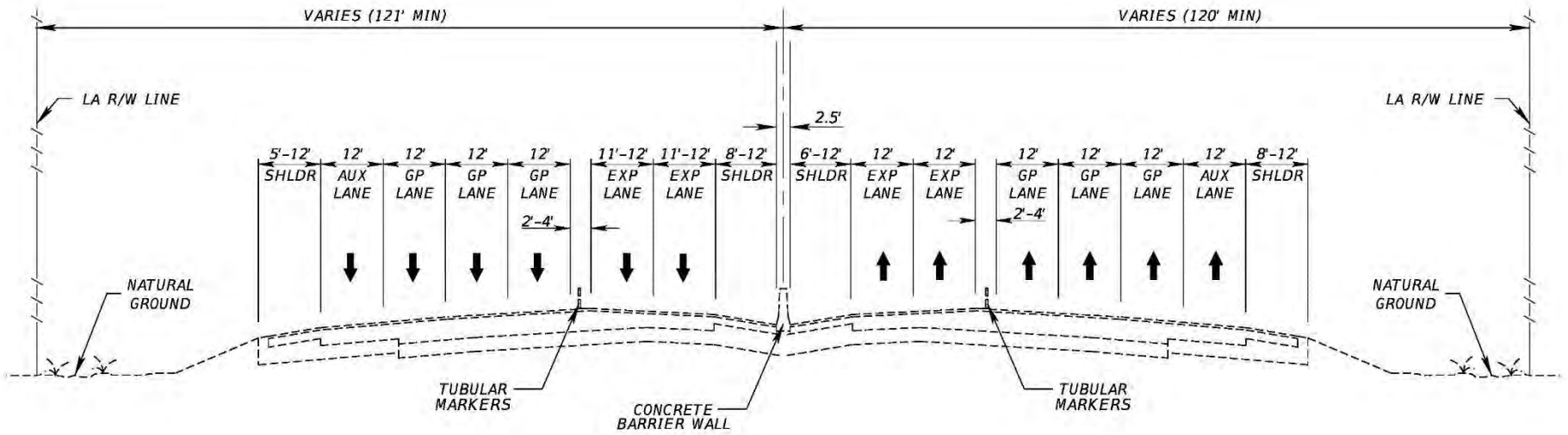


Figure 2-1 Existing Typical Section for I-95 from south of Commercial Boulevard to north of Cypress Creek Road

2.2.2 COMMERCIAL BOULEVARD

The existing typical sections along Commercial Boulevard (eastbound and westbound) vary and are described in the following two segments:

- From NW 12 Avenue to N. Andrews Avenue, Commercial Boulevard consists of a six-lane (12 ft. each, three in each direction) urban divided roadway with a raised landscaped median of varying widths up to 24 ft. Both directions consist of type "F" curb and gutter as well as a concrete sidewalk, varying between 5 and 6 ft. Underneath the I-95 overpass, the eastbound and westbound lanes are separated by a median containing a raised concrete barrier wall as well as support piers for the I-95 overpass.
- From N. Andrews Avenue to NE 6 Avenue, Commercial Boulevard consists of a six-lane (12 ft. each, three in each direction) urban divided roadway with a raised landscaped median of varying widths up to 20 ft., and a 30 ft. frontage road on the north side separated by a 12-foot raised landscaped median. This frontage road provides access to existing properties along the north side of the roadway. This section also contains a 3 ft. undesignated bike lane in both directions. The roadway consists of type "F" curb and gutter and a type "E" curb on the north side of the frontage road. In addition, there is a concrete sidewalk varying between 5 and 6 feet.

The existing typical sections for Commercial Boulevard as described above are depicted in Figure 2-2 and Figure 2-3.

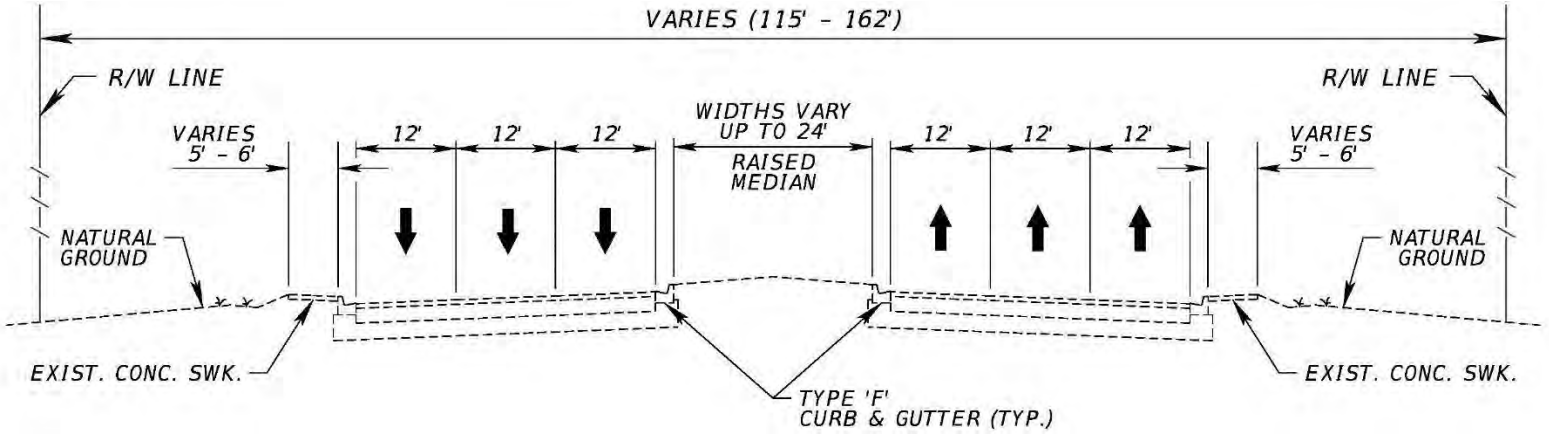


Figure 2-2 Existing Typical Section for Commercial Boulevard from NW 12 Avenue to N. Andrews Avenue

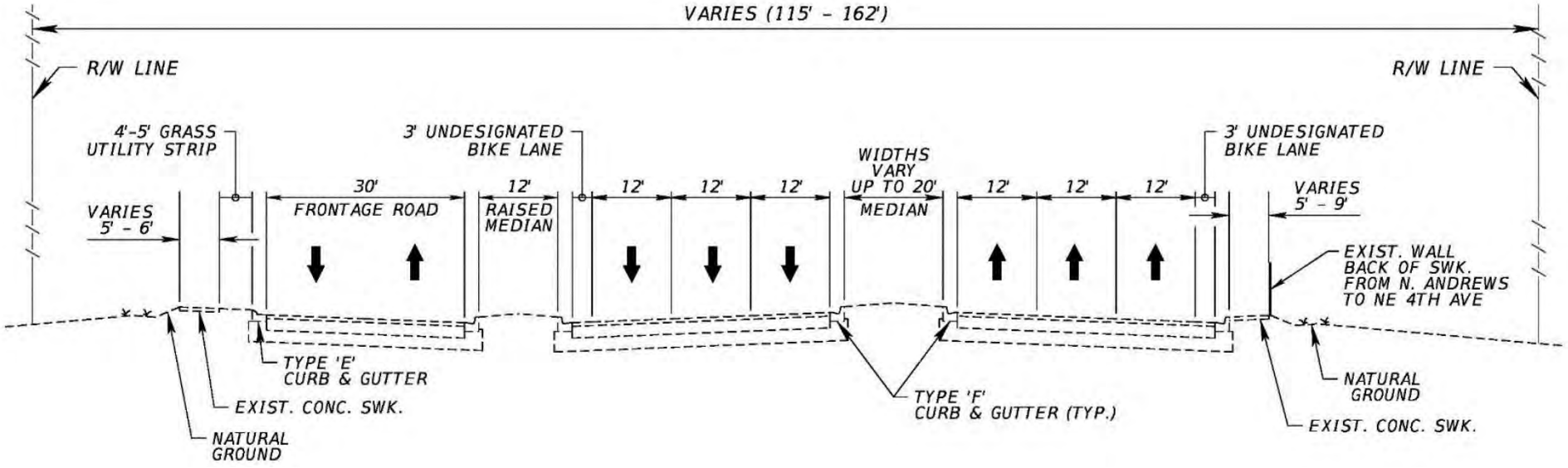


Figure 2-3 Existing Typical Section for Commercial Boulevard from N. Andrews Avenue to NE 6 Avenue

2.2.3 CYPRESS CREEK ROAD

The existing typical sections along Cypress Creek Road vary and are described in the following two segments:

- From NW 6 Way to the I-95 southbound off-ramp, Cypress Creek Road consists of an eight-lane (12 ft. each, four in each direction) urban divided roadway with a raised landscaped median of varying widths up to 25 ft. Both directions consist of type "F" curb and gutter as well as a concrete sidewalk, varying between 5 and 8 ft.
- From the I-95 southbound off-ramp to just east of NE 9 Avenue, Cypress Creek Road consists of a six-lane (12 ft. each, three in each direction) urban divided roadway with a raised landscaped median of varying widths up to 22 ft. Both directions consist of type "F" curb and gutter as well as a concrete sidewalk, varying between 4 and 7 ft. From the I-95 southbound off-ramp to NW 7 Avenue, there is a 4 ft. grass utility strip on both sides of the roadway between the sidewalk and type "F" curb and gutter.

The existing typical sections for Cypress Creek Road as described above are depicted in Figure 2-4 and Figure 2-5

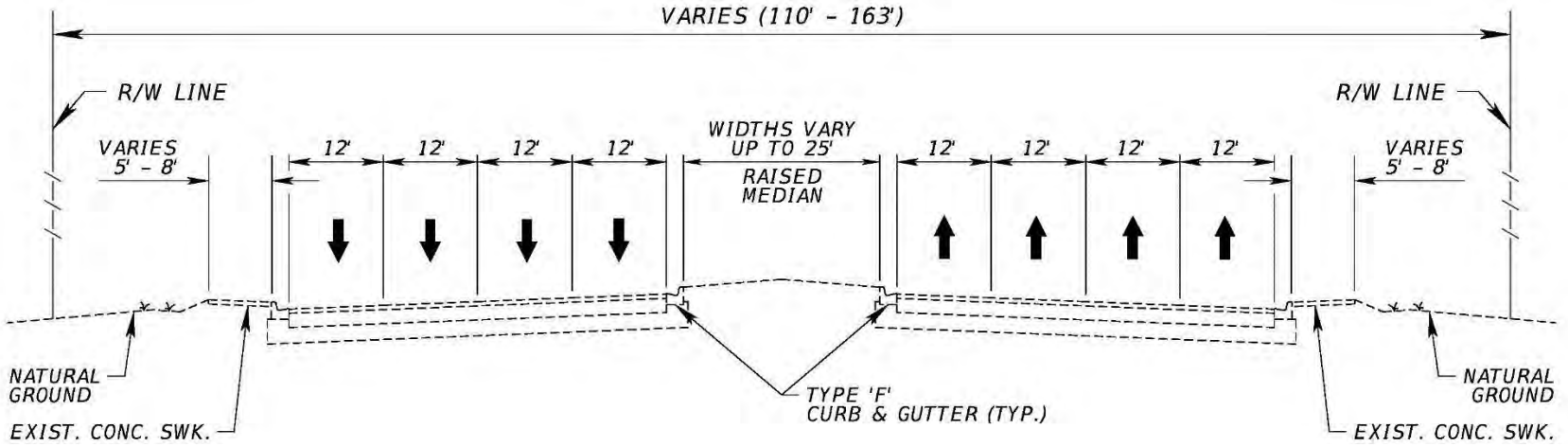


Figure 2-4 Existing Typical Section for Cypress Creek Road from NW 6 Way to the I-95 Southbound Off-Ramp

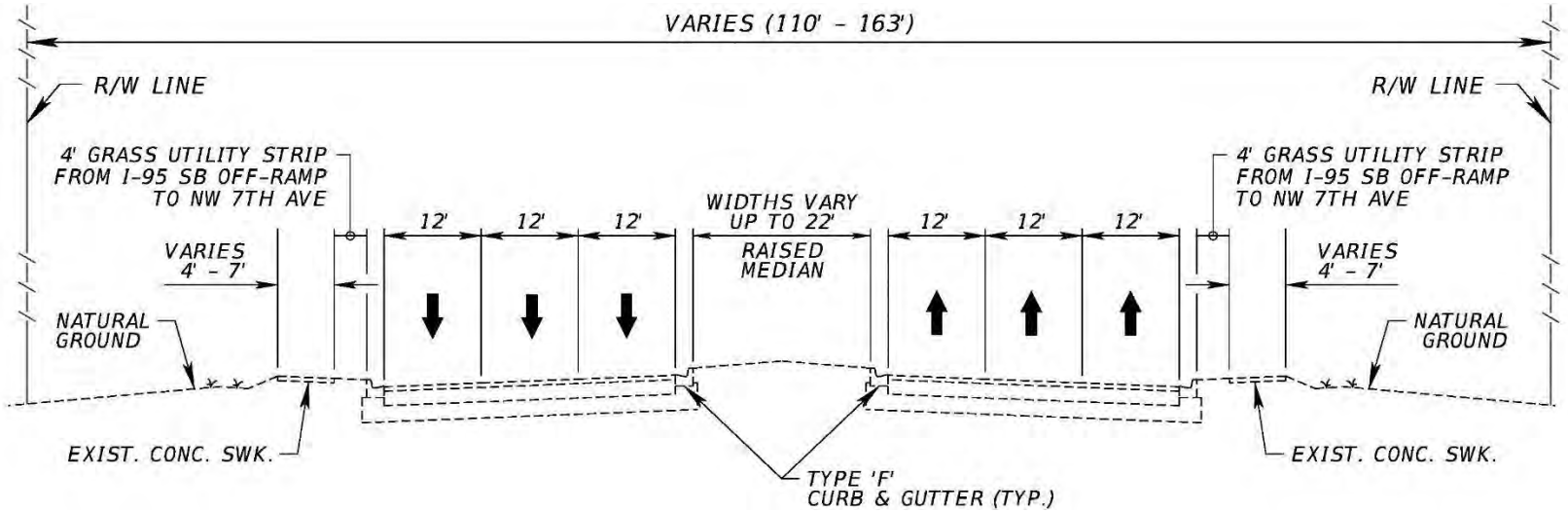


Figure 2-5 Existing Typical Section for Cypress Creek Road from the I-95 Southbound Off-Ramp to NE 9 Avenue

2.2.4 POWERLINE ROAD

The existing typical section along Powerline Road is described as follows:

- From north of Prospect Road, just past the CSX Railroad crossing, to NW 57 Street, Powerline Road consists of a six-lane (11 ft. each, three in each direction) urban divided roadway with a raised landscaped median of varying widths up to 15 ft. Both directions consist of type "F" curb and gutter as well as concrete sidewalks, varying between 5 and 8 ft.

The existing typical section for Powerline Road as described above is depicted in Figure 2-6.

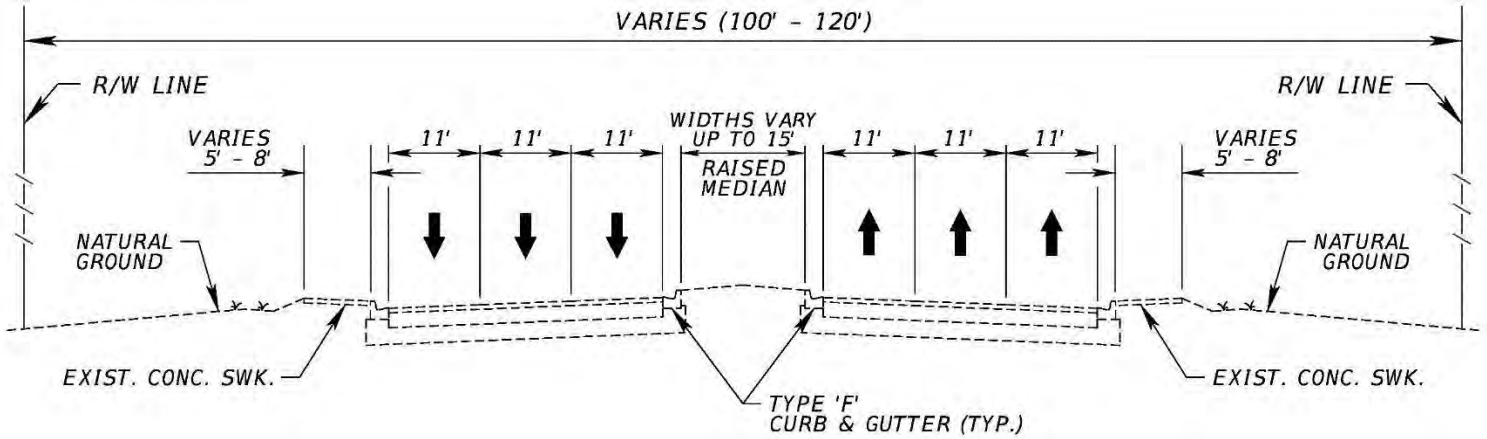


Figure 2-6 Existing Typical Section for Powerline Road from Prospect Road to NW 56 Street

2.2.5 N. ANDREWS AVENUE

The existing typical sections along N. Andrews Avenue vary and are described in the following four segments:

- From 500 ft. south of Commercial Boulevard to 500 ft. north of Commercial Boulevard, N. Andrews Avenue consists of a four-lane (11 ft. each, two in each direction) urban divided roadway with a 10 ft. raised landscaped median. Both directions consist of type "F" curb and gutter as well as a 6 ft. concrete sidewalk.
- From NW 57 Street to N. Andrews Way, N. Andrews Avenue consists of a four-lane (11 ft. each, two in each direction) urban divided roadway with a 16 ft. raised landscaped median and two 10 ft. paved shoulders (one in each direction). Both directions consist of type "F" curb and gutter towards the outside as well existing guardrail behind a 6 ft. concrete sidewalk.

  This section also contains bridge No. 860237 which spans approximately 280 ft. over the I-95 mainline. Characteristics for this bridge can be seen in Section 2.18 Existing Structural Characteristics.
- From N. Andrews Way to NW 67 Street, N. Andrews Avenue consists of a six-lane (11 ft. each, three in each direction) urban divided roadway with a raised landscaped median varying in widths up to 24 ft. This section also contains a 4 ft. undesignated lane on both sides of the roadway, north of the Cypress Creek Road intersection. Both directions consist of type "F" curb and gutter as well as a concrete sidewalk varying between 6 and 8 feet.

The existing typical sections for N. Andrews Avenue, as described above are depicted in Figure 2-7, Figure 2-8, and Figure 2-9.

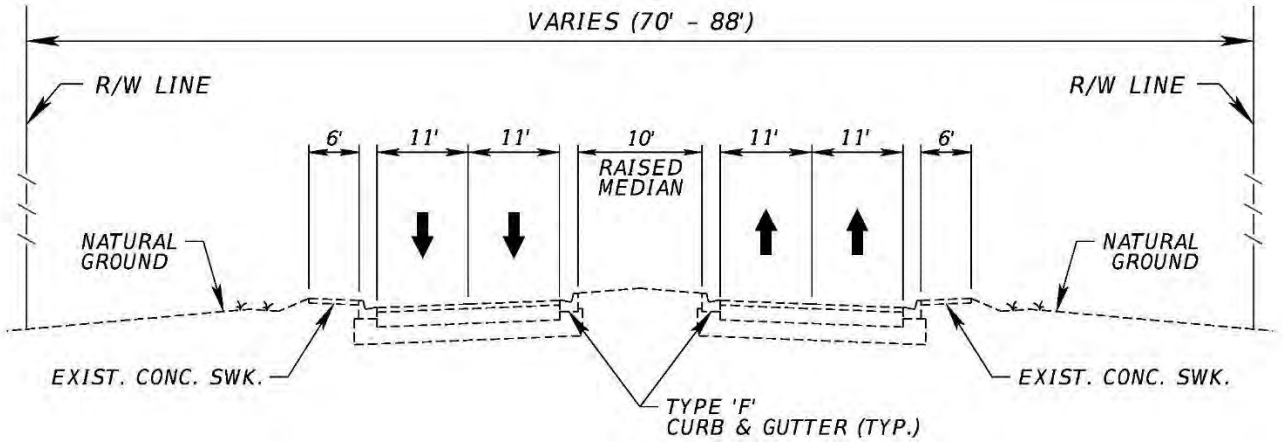


Figure 2-7 Existing Typical Section for N. Andrews Avenue from NW 47 Court to NW 51 Court

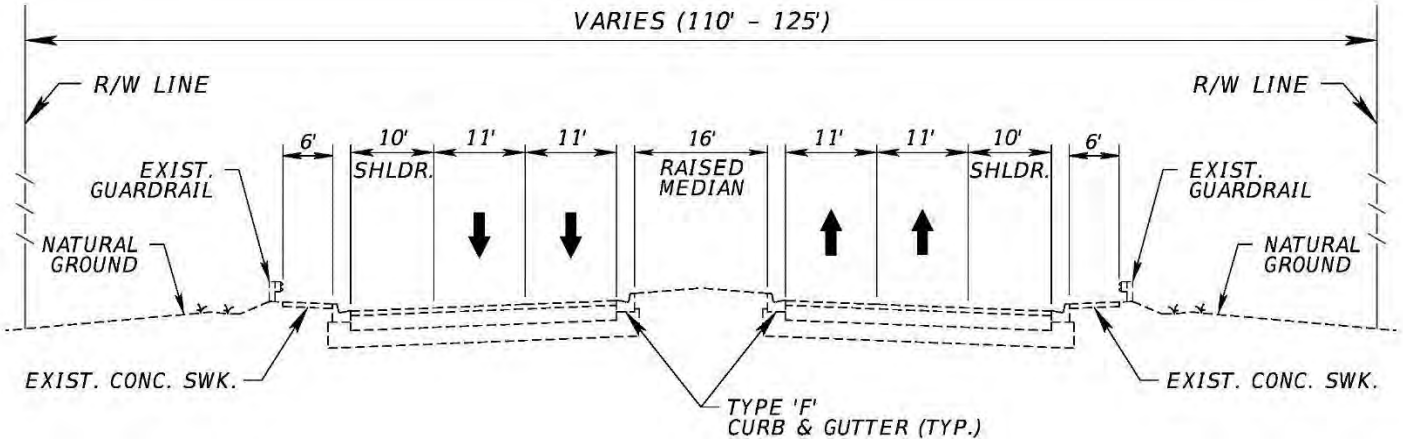


Figure 2-8 Existing Typical Section for N. Andrews Avenue from NW 57 Street to N. Andrews Way

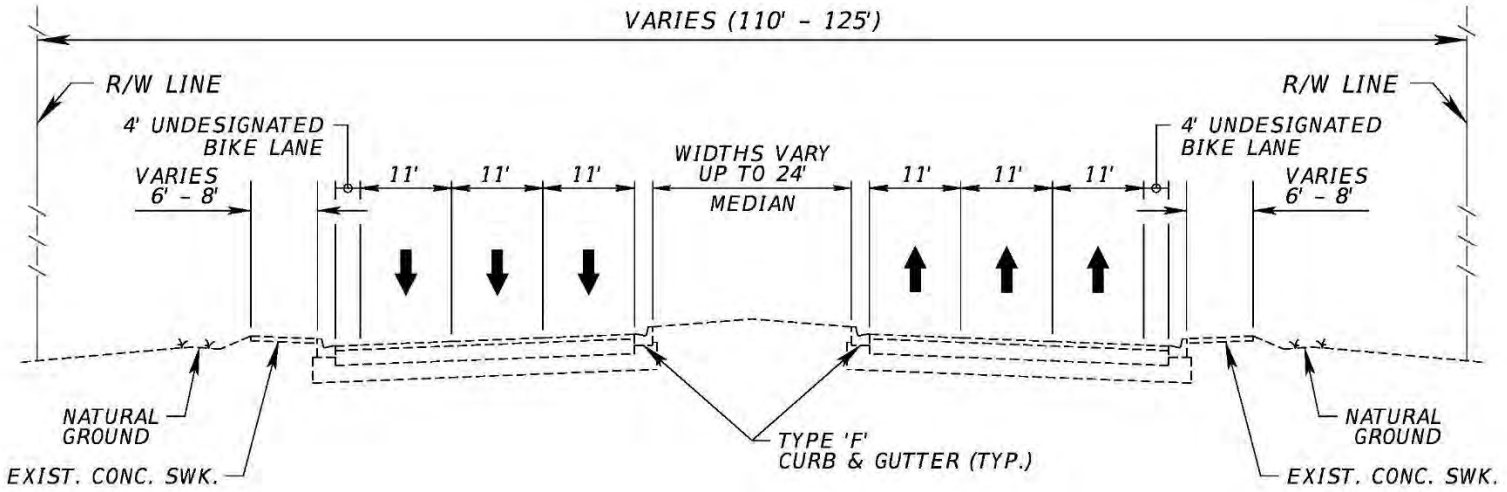


Figure 2-9 Existing Typical Section for N. Andrews Avenue from N. Andrews Way to NW 67 Street

2.3 Right of Way

The right of way for each roadway facility within the project limits vary and are summarized in Table 2-2.

Table 2-2
Existing Right of Way

Location/Limits	Minimum Right of Way Width (ft.)	Maximum Right of Way Width (ft.)
I-95 from south of the Commercial Boulevard Interchange to north of the Cypress Creek Road Interchange	335	500
Commercial Boulevard from NW 12 Avenue to NE 6 Avenue	115	162
Powerline Road from Prospect Road to NW 56 Street	100	120
N. Andrews Avenue from NW 47 Court to NW 51 Court	70	88
N. Andrews Avenue from NW 57 Street to NW 67 Street	110	125
Cypress Creek Road from NW 6 Way to NE 9 Avenue	110	163

2.4 Access Management

An access management review was conducted as a part of the PD&E Study. This involved evaluating the spacing between median openings, signalized intersections, and connections along each arterial within the project area. Table 2-3 summarizes the access class and functional classifications for each corridor.

Table 2-3
Access Management Summary

Location	Functional Classification within Project Limits	Roadway ID	Access Class	Begin Mile Post / Limits	End Mile Post / Limits
I-95	Divided Principal Arterial Interstate	86070000	1	0	25.334
Commercial Boulevard	Divided State Principal Arterial	86014000	3 5	0 6.248	6.248 9.893
Powerline Road	Divided State Principal Arterial	86065000	5	0	13.314
N. Andrews Avenue	County Minor Arterial	86033503	*	NW 47 Court	NW 51 Court
				NW 57 Street	NW 67 Street
Cypress Creek Road	County Principal Arterial West of I-95 Interchange County Minor Arterial East of I-95 Interchange	86530500	*	NW 6 Way	NE 9 Avenue

*Note: N. Andrews Avenue and Cypress Creek Road are both County roads and do not have a state road access classification.

2.4.1 I-95

I-95 is a limited access facility with an Access Class 1, Area Type 1, under FDOT's Access Management Classification System. The minimum interchange spacing allowed is 1 mile. This study covers two interchanges: I-95 at Commercial Boulevard and at Cypress Creek Road. However, the area of influence along I-95 is from the north oriented ramps of the I-95/Oakland Park Boulevard interchange to the south oriented ramps of the I-95/Atlantic Boulevard interchange. The south oriented ramps at the Atlantic Boulevard interchange and the north oriented ramps at the Oakland Park Boulevard interchange are included in the traffic analysis to ensure that the ramps are not adversely impacted by the proposed improvements at the Commercial Boulevard and Cypress Creek Road interchanges. The existing spacing between these interchanges is summarized in Table 2-4.

Table 2-4
Access Management – Interchange Spacing - I-95

Interchange	Mile Post	Existing Spacing (Mile)	Deviation from Standard (%)
Oakland Park Boulevard	13.45	0	-
Commercial Boulevard	15.10	1.65	0
Cypress Creek Road	16.30	1.20	0
Atlantic Boulevard	18.42	2.12	0

2.4.2 COMMERCIAL BOULEVARD

Commercial Boulevard has a posted speed of 45 mph and falls under two different Access Classifications within the project limits:

- The segment west of Powerline Road has a Class 3 Restrictive classification which requires minimum spacings of 2640 ft. for full median openings and signalized intersections, 1320 ft. for directional openings, and 440 ft. for connection spacings.
- The segment east of Powerline Road has a Class 5 Restrictive classification which requires minimum spacings of 1320 ft. for full median openings and signalized intersections, 660 ft. for directional openings, and 245 ft. for connection spacings.

Table 2-5 summarizes the spacing of median openings and signalized intersections and Table 2-6 summarizes spacing of the connections along the Commercial Boulevard segment included in the study area.

Table 2-5
Access Management – Median Openings/Signal Spacing - Commercial Boulevard

Location	Opening Type	Spacing (ft.)	Deviation from Standard (%)*
NW 12 Avenue	EB and WB Directional	0	0
Powerline Road	Full (Signal)	1320	50
I-95 SB Off-Ramp	Full (Signal)	860	35
I-95 NB On-Ramp	Full (Signal)	415	69
N. Andrews Avenue	Full (Signal)	1415	0
NE 1 Terrace	EB & WB Directional	660	50
NE 3 Avenue	EB & WB Directional	660	0
NE 4 Avenue	EB & WB Directional	580	12

*Note: Percent deviation is based on Access Class 3 for Commercial Boulevard west of Powerline Road and Access Class 5 for Commercial Boulevard east of Powerline Road.

Table 2-6 Access Management – Driveway Connection Spacing - Commercial Boulevard			
Direction	Location (Center of Nearest Road to Center of Driveway)	Distance (ft.) to nearest connection	Deviation from Standard (%)*
Westbound (WB)	170' E of NW 12 Avenue	121	72
WB	275' E of NW 12 Avenue	64	85
WB	200' W of NW 10 Terrace	130	70
WB	70' W of NW 10 Terrace	100	77
WB	NW 10 Terrace	36	92
WB	125' E of NW 10 Terrace	98	78
WB	370' E of NW 10 Terrace	21	95
WB	210' W of Powerline Road	93	79
WB	125' W of Powerline Road	39	91
WB	Powerline Road	51	88
WB	185' E of Powerline Road	125	72
WB	270' E of Powerline Road	63	86
Eastbound (EB)	70' E of NW 11 Avenue	40	91
EB	160' E of NW 11 Avenue	76	83
EB	255' E of NW 11 Avenue	78	82
EB	90' W of NW 10 Avenue	125	72
EB	NW 10 Avenue	66	85
EB	85' E of NW 10 Avenue	52	88
EB	150' E of NW 10 Avenue	45	90
EB	150' E of NW 10 Avenue	36	92
EB	210' E of NW 10 Avenue	75	83
EB	175' W of Powerline Road	105	76
EB	Powerline Road	40	91
EB	185' E of Powerline Road	115	53
EB	150' E of N. Andrews Avenue	108	56

*Note: Percent deviation is based on Access Class 3 for Commercial Boulevard west of Powerline Road and Access Class 5 for Commercial Boulevard east of Powerline Road.

2.4.3 POWERLINE ROAD

Powerline Road is Access Class 5 Restrictive within the study area with a speed limit of 45 mph. This requires a minimum spacing of 1320 ft. for full median openings and signalized intersections, 660 ft. for directional openings, and 245 ft. for connection spacings.

Table 2-7 summarizes the spacing of median openings and signalized intersections and Table 2-8 summarizes spacing of the connections along the Powerline Road corridor within the study area.

Table 2-7 Access Management - Median Opening and Signal Spacing – Powerline Road			
Location	Opening Type	Spacing (ft.)	Deviation from Standard (%)*
NW 47 Court	NB Directional	0	0
Approx. 150' North of NW 47 Court	Full (Emergency Signal)	150	89
Approx. 550' North of NW 47 Court	SB Directional	400	70
Commercial Boulevard	Full (Signal)	530	60
NW 51 Place	NB & SB Directional	850	0
NW 53 Street	NB Directional	460	30
Approx. 200' North of NW 53 Court	NB & SB Directional	420	36

*Note: Percent deviation based on Access Class 5 Restrictive

Table 2-8 Access Management – Connection Spacing – Powerline Road			
Direction	Location (Center of Nearest Road to Center of Driveway)	Distance (ft.) to nearest connection	Deviation from Standard (%)*
Southbound (SB)	140' N of NW 45 Court	113	54
SB	60' S of NW 46 Street	15	94
SB	70' N of NW 46 Street	35	86
SB	135' N of NW 46 Street	30	88
SB	90' S of NW 47 Street	85	65
SB	NW 47 Street	57	77
SB	125' N of NW 47 Court	66	73
SB	300' N of NW 47 Court	100	59
SB	270' S of NW 49 Street	70	71
SB	125' S of NW 49 Street	48	80
SB	85' N of NW 49 Street	68	72
SB	145' N of NW 49 Street	32	87
SB	115' S of Powerline Road	50	80
SB	Powerline Road	40	84
SB	170' N of Powerline Road	110	55
SB	350' N of Powerline Road	125	49
SB	275' S of NW 51 Place	203	17
SB	135' S of NW 51 Place	110	55
SB	NW 51 Place	102	58
SB	180' N of NW 51 Place	145	41
SB	180' S of NW 53 Street	105	57

Table 2-8 Access Management – Connection Spacing – Powerline Road			
Direction	Location (Center of Nearest Road to Center of Driveway)	Distance (ft.) to nearest connection	Deviation from Standard (%)*
SB	NW 53 Street	160	35
SB	120' N of NW 53 Court	100	59
Northbound (NB)	Opposite NW 46 Street	194	21
NB	125' N of NW 47 Street	430	0
NB	Opposite NW 47 Court	78	68
NB	215' N of NW 47 Court	208	15
NB	560' S of Powerline Road	238	3
NB	515' S of Powerline Road	40	84
NB	330' S of Powerline Road	145	41
NB	175' S of Powerline Road	115	53
NB	Powerline Road	110	55
NB	95' N of Powerline Road	40	84
NB	165' N of Powerline Road	50	80
NB	525' N of Powerline Road	334	0
NB	Opposite NW 51 Place	345	0
NB	Opposite NW 53 Street	405	0
NB	160' N of NW 53 Court	310	0

*Note: Percent deviation based on Access Class 5 Restrictive

2.4.4 N. ANDREWS AVENUE AND CYPRESS CREEK ROAD

N. Andrews Avenue and Cypress Creek Road are both County roads and are not part of the State Highway System, thus they do not have a designated Access Class by FDOT.

2.5 Roadway Geometric Elements

The existing geometric elements for the corridor were evaluated via topographic survey, field reviews, and final design/as-built plans from Broward County and FDOT District Four. The design team conducted this review based on the existing geometry of I-95. This PD&E Study does not propose improvements to the mainline of I-95 (except for a CD road system). As such, design variations and exceptions required based on the analysis detailed in subsequent sections may be under evaluation as part of the I-95 Express Phase 3 project. This should be confirmed during the final design phase and appropriate actions taken as required.

The following geometric elements were evaluated:

2.5.1 HORIZONTAL ALIGNMENT

Horizontal alignment defines the geometry of the roadway by the horizontal curvature (radius) and curve length controls as well as the bearings of the tangent segments of a roadway facility. For freeways and expressways, FDOT Florida Design Manual (FDM) requires a maximum curvature of 2°30'00" (minimum radius of 1,910 ft.), limiting values for superelevation (e_{max}=10%) and a

desirable horizontal curve length of 1950 ft. (30V) with a minimum horizontal curve length of 975 ft. (15V).

The American Association of State Highway and Transportation Officials (AASHTO) requires a minimum radius of 1340 ft. for a 65 mph design speed when using the limiting values of superelevation (e=10%) and side friction (f=0.11) and a minimum length of 975 ft. (15V) when the desirable horizontal curve of 1950 ft. (30V) is not attainable.

2.5.1.1 I-95

The horizontal alignment along I-95 consists of four horizontal curves with interspersed tangent segments. All tangent segments along the corridor are connected by horizontal curves, i.e. there are no deflections without a horizontal curve. Table 2-9 through Table 2-11 summarize the existing horizontal geometric characteristics of these curves, which can also be seen in Figure 2-10 through Figure 2-14. As seen from these tables, several design elements along the corridor do not meet the governing standards set by the 2018 FDOT FDM and the 2011 AASHTO.

Table 2-9
I-95 Existing Radius of Curvature and Superelevation

Curve No.	Existing Curve Parameters				Superelevation Criteria		Variation & Exception
	Alignment	Design Speed (mph)	Radius (ft.)	Superelevation	FDM	AASHTO	
H1	Northbound & Southbound	65	2864.76	0.074	0.062	0.062	OK
H2	Northbound & Southbound	65	7639.40	0.029	0.025	0.025	OK
H3	Northbound & Southbound	65	4297.15	0.049	0.048	0.044	OK
H4	Northbound & Southbound	65	3819.72	N/A	0.048	0.048	N/A

Table 2-10
I-95 Existing Horizontal Curve Length

Curve No.	Existing Curve Parameters			FDM/AASHTO Criteria		Variation
	Alignment	Design Speed (mph)	Length (ft.)	Desirable (ft.)	Minimum (ft.)	
H1	Northbound & Southbound	65	882.49	1950	975	Variation*
H2	Northbound & Southbound	65	937.74	1950	975	Variation*
H3	Northbound & Southbound	65	2466.02	1950	975	OK
H4	Northbound & Southbound	65	2967.71	1950	975	OK

*Note: Variations will be completed during the design phase based on the input from the District Design Engineer.

Table 2-11 I-95 Existing Horizontal Sight Distance							
Curve No.	Existing Curve Parameters				Criteria		Variation & Exception
	Alignment	Design Speed (mph)	Radius (ft.)	Sight Distance (ft.)	FDM (ft.)	AASHTO (ft.)	
H1	Northbound & Southbound	65	2864.76	466 NB 421 SB	730	645	Exception
H2	Northbound & Southbound	65	7639.40	691 NB 694 SB	730	645	Variation
H3	Northbound & Southbound	65	4297.15	571 NB 526 SB	730	645	Exception
H4	Northbound & Southbound	65	3819.72	492 NB 487 SB	730	645	Exception

2.5.1.2 Commercial Boulevard

The horizontal alignment along Commercial Boulevard consists of two horizontal curves with interspersed tangent segments. All tangent segments along the corridor are connected by horizontal curves, i.e. there are no deflections without a horizontal curve. Table 2-12 through Table 2-14 summarize the existing horizontal geometric characteristics of these curves, which can also be seen in Figure 2-15. As seen from these tables, the horizontal alignment features along the corridor do not meet the governing standards set by the 2018 FDOT FDM and the 2011 AASHTO. As a result, the following design exceptions and variations will be completed during the design phase should the final design not meet the minimum allowable criteria:

- Horizontal Curve Length – design variation at two locations
- Horizontal Sight Distance – design exceptions at two locations

Table 2-12 Commercial Boulevard Existing Horizontal Curve Length						
Curve No.	Existing Curve Parameters			FDM/AASHTO Criteria		Variation
	Alignment	Design Speed (mph)	Length (ft.)	Desirable (ft.)	Minimum (ft.)	
H1	Eastbound & Westbound	45	293.97	675	400	Variation*
H2	Eastbound & Westbound	45	293.97	675	400	Variation*

*Note: Variations will be completed during the design phase based on the input from the District Design Engineer.

Table 2-13 Commercial Boulevard Existing Radius of Curvature and Superelevation							
Curve No.	Existing Curve Parameters				Superelevation Criteria		Variation & Exception
	Alignment	Design Speed (mph)	Radius (ft.)	Superelevation	FDM	AASHTO	
H1	Northbound & Southbound	45	1145.92	N/A	NC*	NC*	N/A
H2	Northbound & Southbound	45	1145.92	N/A	NC*	NC*	N/A

*NC = Normal Crown

Table 2-14 Commercial Boulevard Existing Horizontal Stopping Sight Distance								
Curve No.	Existing Curve Parameters					Criteria		Variation & Exception
	Alignment	Design Speed (mph)	Radius (ft.)	Horizontal Sightline Offset (ft.)	Sight Distance (ft.)	FDM	AASHTO	
H1	Northbound & Southbound	45	1145.92	13.5	352	360	360	Exception*
H2	Northbound & Southbound	45	1145.92	7.5	262	360	360	Exception*

*Note: Exceptions will be completed during the design phase based on the input from the District Design Engineer.

2.5.2 HORIZONTAL CLEARANCE

The horizontal clearance design element for freeways is the lateral distance from the roadway edge of travel lane to a roadside feature or object. The horizontal clearance requirements for roadside features and objects are based on providing the required clear zone unless shielded by a crash worthy barrier. Per FDOT FDM, Table 215.2.1 Clear Zone Width Requirements, recoverable terrain from the edge of travel way will range from 18 ft. to 36 ft., depending on design speed. For auxiliary lanes and single lane ramps, the recoverable terrain will vary from 10 ft. to 24 feet.



Figure 2-10 Evaluation of Geometric Elements



Figure 2-11 Evaluation of Geometric Elements



Figure 2-12 Evaluation of Geometric Elements

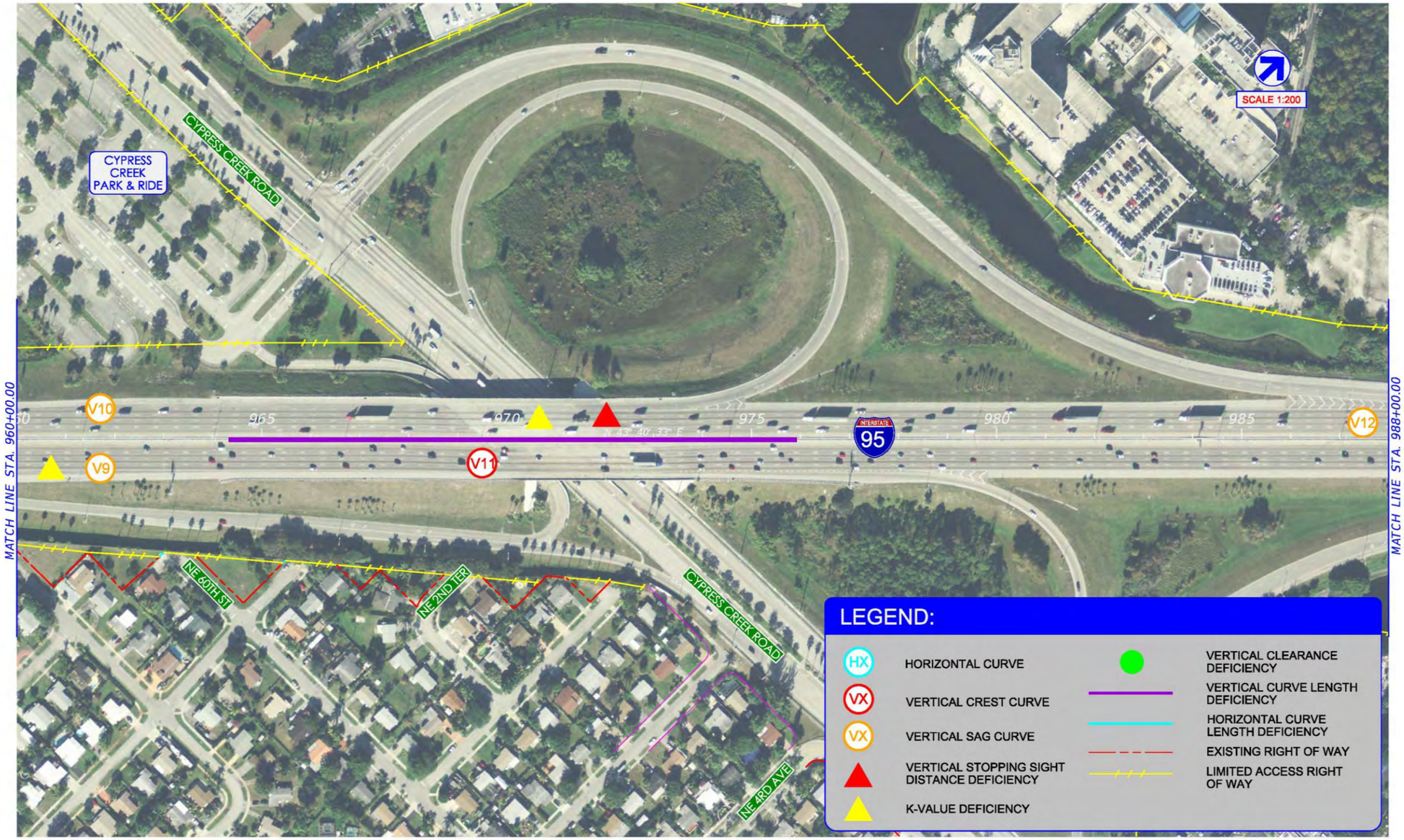


Figure 2-13 Evaluation of Geometric Elements



Figure 2-14 Evaluation of Geometric Elements



Figure 2-15 Evaluation of Geometric Elements

2.5.3 VERTICAL ALIGNMENT

Vertical alignment refers to both vertical curvature and grade. This section focuses on vertical curve lengths and K-Values. Generally, the length of a vertical curve is specified in terms of the algebraic difference in grades (A) and the rate of vertical curvature (K), i.e. L = KA. The K-Values are based on the stopping sight distance criteria for the specified design speed.

For interstate highways, FDOT FDM specifies a minimum K-Value of 313 for crest vertical curves and 157 for sag vertical curves using a design speed of 65 mph. The FDM also has supplementary criteria which requires the use of a minimum crest vertical curve length of 1800 ft. within interchanges and 1000 ft. for open highways. For sag vertical curves along an interstate mainline, a curve length of 800 ft. is recommended. AASHTO requires minimum K-Values of 193 for crest vertical curves, and 157 for sag vertical curves with a design speed of 65 mph.

Table 2-15 and Table 2-16 summarize the existing vertical geometric characteristics of these curves along I-95 and they can be seen in Figure 2-10 through Figure 2-15. As seen from these tables, several design elements such as vertical curve length, K-value, and vertical sight distance along the corridor do not meet the governing standards set by the 2018 FDOT FDM and the 2011 AASHTO. However, design variations for these design elements are anticipated to be processed under the I-95 Express Phase 3 project.

Table 2-15
Existing Vertical Alignment – Grades and K Values

Curve No.	Baseline	Design Speed (mph)	Vertical Curve Type	Grade		Δ G	Existing Curve Length (ft.)	Existing K-Value	Criteria- K Value		Variation or Exception
				Back	Ahead				FDM	AASHTO	
V1	Northbound (NB)	65	Crest	0.208	-1.315	1.523	1000	657	313	193	OK
V2	Southbound (SB)	65	Crest	+0.170	-2.100	2.270	915	403	313	193	OK
V3	NB	65	Sag	-0.622	0.539	1.161	866	745	157	157	OK
V4	SB	65	Sag	-1.207	1.080	2.287	600	262	157	157	OK
V5	NB	65	Crest	0.975	-2.480	3.455	995	288	313	193	Variation*
V6	SB	65	Crest	1.118	-2.120	3.238	930	287	313	193	Variation*
V7	NB	65	Sag	-2.710	0.356	3.066	659	215	157	157	OK
V8	SB	65	Sag	-2.610	0.139	2.749	621	226	157	157	OK
V9	NB	65	Sag	0.207	2.699	2.492	800	321	157	157	OK
V10	SB	65	Sag	-0.100	2.656	2.756	800	290	157	157	OK
V11	NB & SB	65	Crest	2.800	-1.800	4.600	1200	261	313	193	Variation*
V12	NB & SB	65	Sag	-1.800	3.00	4.800	1200	250	157	157	OK
V13	NB & SB	65	Crest	0.300	-2.820	5.820	1600	275	313	193	Variation*
V14	NB & SB	65	Sag	0.200	3.000	2.800	800	286	157	157	OK

*Note: Variations to be processed under the I-95 Express Phase 3.

Table 2-16
Existing Vertical Alignment – Vertical Stopping Sight Distance

Curve No.	Baseline	Vertical Curve Type	Grade		ΔG	Existing Curve Length (ft.)	Existing SSD		Criteria - SSD		Variation or Exception
			Back	Ahead			FDM	AASHTO	FDM	AASHTO	
V1	Northbound (NB)	Crest	0.208	-1.315	1.523	1000	934	1190	730.00	645.00	OK
V2	Southbound (SB)	Crest	+0.170	-2.100	2.270	915	732	933	730.00	645.00	OK
V5	NB	Crest	0.975	-2.480	3.455	995	649	788	730.00	645.00	Variation*
V6	SB	Crest	1.118	-2.120	3.238	930	618	787	730.00	645.00	Variation*
V11	NB & SB	Crest	2.800	-1.800	4.600	1200	589	750	730.00	645.00	Variation*
V13	NB & SB	Crest	0.300	-2.820	5.820	1600	604	770	730.00	645.00	Variation*

*Note: Variations to be processed under the I-95 Express Phase 3.

2.5.4 VERTICAL CLEARANCE

Refer to Section 2.18.2 Minimum Vertical Clearance.

2.6 Pedestrian and Bicycle Facilities

I-95 is a limited access facility; bicycles and pedestrians are not allowed along the corridor. However, bicycle and pedestrian facilities are present along the overpasses and underpasses of the interchange cross streets. The following is a description of the existing bicycle and pedestrian facilities near the project. The existing bicycle and pedestrian facilities can be seen in Figure 2-16:

- Designated Bike Lane
    - Cypress Creek Road from NE 7 Avenue to Dixie Highway
    - Commercial Boulevard from State Road 441 to Powerline Road
- Undesignated Bike Lane
    - N. Andrews Avenue from Oakland Park Boulevard to Prospect Road
    - Commercial Boulevard from Powerline Road to NE 6 Avenue
    - N. Andrews Avenue from N. Andrews Way to Race Track Road / Pompano Park Place
    - Cypress Creek Road from South Pompano Parkway to Powerline Road
    - Cypress Creek Road from I-95 southbound off-ramp to NE 7 Avenue
    - McNab Road from SW 36 Avenue to Dixie Highway
- Sidewalks
    - Commercial Boulevard has 6 ft. sidewalks on both sides along the entire project area
    - Cypress Creek road currently has 6 ft. sidewalks along both sides from N. Andrews Avenue to North Dixie Highway

Complete Streets principles have been incorporated into the design and evaluations conducted as part of this study. The Broward MPO has prioritized and funded several bicycle and pedestrian mobility projects in Broward County that seek to complement the goals and vision of the Broward MPO's Complete Streets Initiative. Currently, bike lanes are under construction on NW 31 Avenue from Broward Boulevard to Commercial Boulevard and two more bike projects are programmed for 2020 that will connect the bike network on Commercial Boulevard.

The City of Fort Lauderdale has identified several bicycle and pedestrian facilities in the study area as part of their Connecting the Blocks (CTB) Plan. The CTB Plan addresses the city's goal to become more multimodal and connected as part of a larger vision that seeks to enhance the livability of the city while continuing to foster economic growth. This is a vision that looks beyond change and points towards transformation. All programed bicycle and pedestrian projects have been identified in Table 2-17 and can be seen in Figure 2-17.

Table 2-17 Bicycle and Pedestrian Projects					
Project	Lead Agency	Location	From	To	Program Year
Bike Lanes	Broward MPO	NW 31 Avenue	Broward Boulevard	Commercial Boulevard	Under Construction
Bike Lanes	Broward MPO	Prospect Road	Commercial Boulevard	Dixie Highway	2020
Complete Streets Project – Bike lanes with 2 ft. buffer	Broward MPO	NW 21 Avenue	Oakland Park Boulevard	Commercial Boulevard	Construction 2019
Complete Streets Project	Broward MPO	Mc Nab Road	NW 31 Avenue	Dixie Highway	Proposed Complete Streets Master Plan
Pedestrian- Implement Lane/Road diet to create sidewalk buffers. Add pedestrian-oriented lighting and shade.	City of Fort Lauderdale	Cypress Creek Road	N. Andrews Avenue	Powerline Road	Proposed
Bicycle- Add bike lanes as park of the lane/road diet.	City of Fort Lauderdale	Cypress Creek Road	N. Andrews Avenue	Powerline Road	Proposed
Pedestrian- Implement Lane/Road diet to create sidewalk buffers. Add pedestrian-oriented lighting and shade. Enhance pedestrian crossing	City of Fort Lauderdale	Cypress Creek Road	Powerline Road	NW 21 Avenue	Proposed
Bicycle-Add bike lanes as part of the lane/road diet	City of Fort Lauderdale	Cypress Creek Road	Powerline Road	NW 21 Avenue	Proposed
Pedestrian- reconstructs sidewalks with sidewalk buffers. Add pedestrian oriented lighting. Add shade. Enhance pedestrian crossing.	City of Fort Lauderdale	Commercial Boulevard	I-95	SR 7	Proposed

Table 2-17 Bicycle and Pedestrian Projects					
Project	Lead Agency	Location	From	To	Program Year
Bicycle- Narrow Median (eliminating one left turn lane where dual lefts exist) and auto lanes to create buffered bike lanes where bike lanes do not exist. Narrow auto lanes to create buffers for existing bike lanes.	City of Fort Lauderdale	Commercial Boulevard	I-95	SR 7	Proposed
Pedestrian- Complete sidewalks on 2 sides. Add pedestrian-oriented lighting. Add shade.	City of Fort Lauderdale	NW 21 Avenue	Cypress Creek Road	McNab Road	Proposed
Bicycle- Narrow auto lanes and widen paved area to create bike lanes or two-way bike path.	City of Fort Lauderdale	NW 21 Avenue	Cypress Creek Road	McNab Road	Proposed
Pedestrian- Complete sidewalks on 2 sides. Add pedestrian-oriented lighting. Add shade.	City of Fort Lauderdale	NW 21 Avenue	Prospect Road	Commercial Boulevard	Proposed
Bicycle- Narrow auto lanes and widen paved area to create bike lanes. Coordinate with county regarding opportunity to create multi-use trail between Oakland Park Boulevard and Commercial Boulevard.	City of Fort Lauderdale	NW 21 Avenue	Prospect Road	Commercial Boulevard	Proposed



Figure 2-16 Existing Bicycle and Pedestrian Facilities

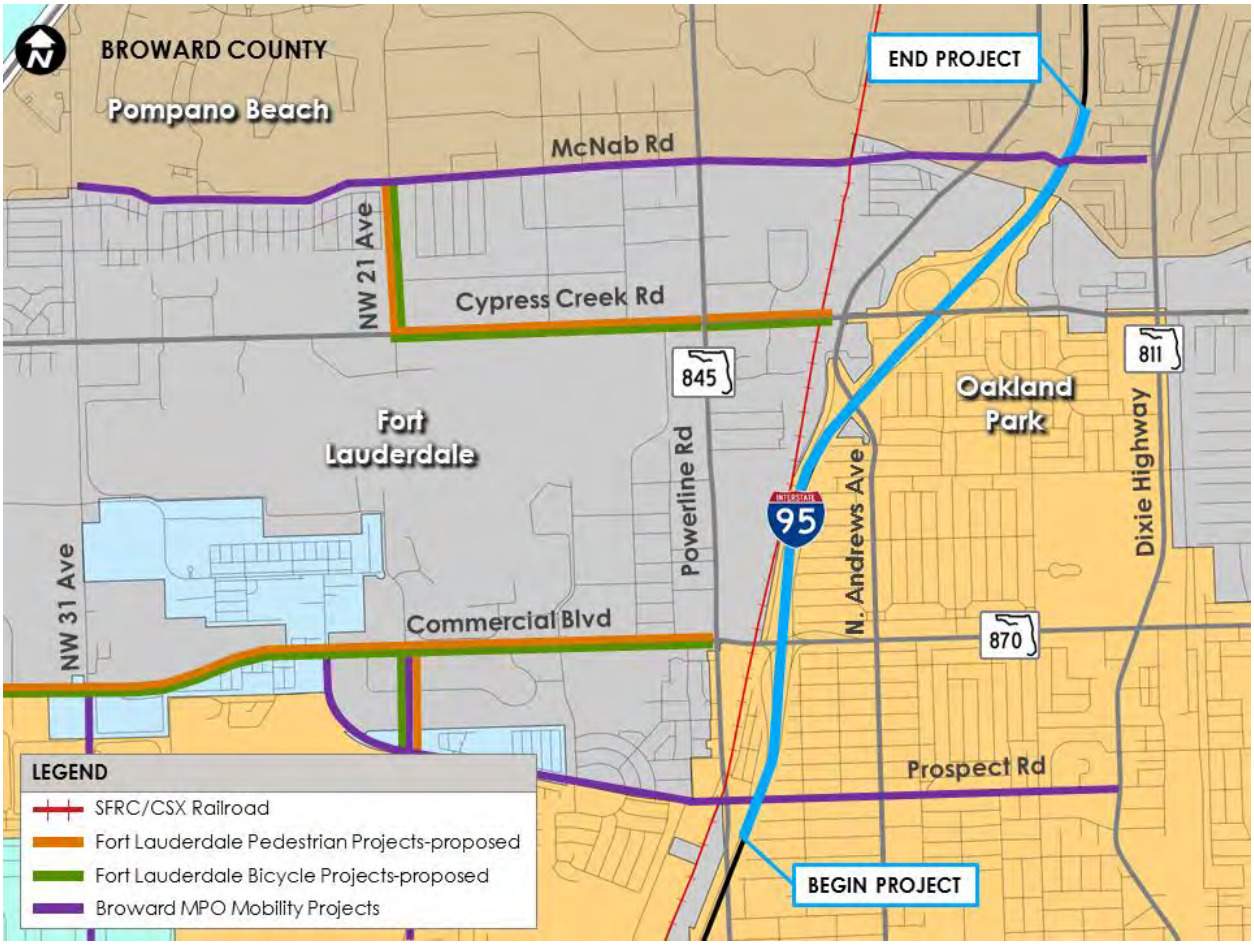


Figure 2-17 Programmed Pedestrian and Bicycle Facilities

2.6.1 CYPRESS CREEK GREENWAY

Along the study area Broward County has completed a Greenways Trail called Cypress Creek Greenway. As stated in the master plan the trail offers a multi-purpose trail from the western conservation area to the eastern beach areas. The trail connects to the project area from Atlantic Boulevard just east of the Florida Turnpike to the Cypress Creek Canal. The Cypress Creek Canal Trail continues through the Cypress Bend community to wider sidewalks paralleling McNab Road and ending at N. Andrews Avenue just north of a Tri-Rail station. East of N. Andrews Avenue, the trail would resume along Cypress Creek Road, terminating just east of I-95.

2.7 Lighting

The I-95 lighting system consists of dual arm poles with conventional cobra head luminaires installed on the median barrier wall, and single arm pole luminaires along the outside shoulder at the northbound and southbound exit and entrance ramps. The lighting along Commercial Boulevard consists of single arm poles with cobra head luminaires on the south side of the road west of the interchange and on the north side of the road east of the interchange. The lighting within the Cypress Creek Road interchange consist of single arm poles with cobra head luminaires on the south side of the road, and of cobra head joint used Florida Power and Light (FP&L) transmission poles on the north side of the road.

2.8 Intersection Layout & Signalization

2.8.1 COMMERCIAL BOULEVARD

The Commercial Boulevard and Powerline Road intersection as seen below in Figure 2-18 is a four-leg, actuated-coordinated signalized intersection. The intersection utilizes four mast arms, one in each corner.



Figure 2-18 Intersection of Commercial Boulevard and Powerline Road

The Commercial Boulevard interchange as seen in Figure 2-19 is a tight-diamond interchange with signalized ramp terminals which operate as actuated-coordinated signals. The interchange utilizes four mast arms. One single mast arm for the westbound traffic and one double mast arm for the eastbound and southbound off-ramp traffic which are located on the east side of the interchange. One single mast arm for the westbound traffic and one double mast arm for the eastbound and northbound off-ramp traffic are located on the west side of the interchange. The traffic controller also operates a preemption plan for the adjacent railroad on the west side of the interchange.



Figure 2-19 Commercial Boulevard and I-95 Interchange

The Commercial Boulevard and N. Andrews Avenue intersection as shown in Figure 2-20 is a four-leg, actuated-coordinated signalized intersection. The intersection utilizes three mast arms, a single mast arm in the northwest corner for the westbound traffic, a single mast arm in the northeast corner for the northbound traffic and a double mast arm in the southeast corner for the eastbound and southbound traffic. In addition, a supplemental signal head is mounted on an aluminum pedestal in the southwest corner for the southbound traffic.

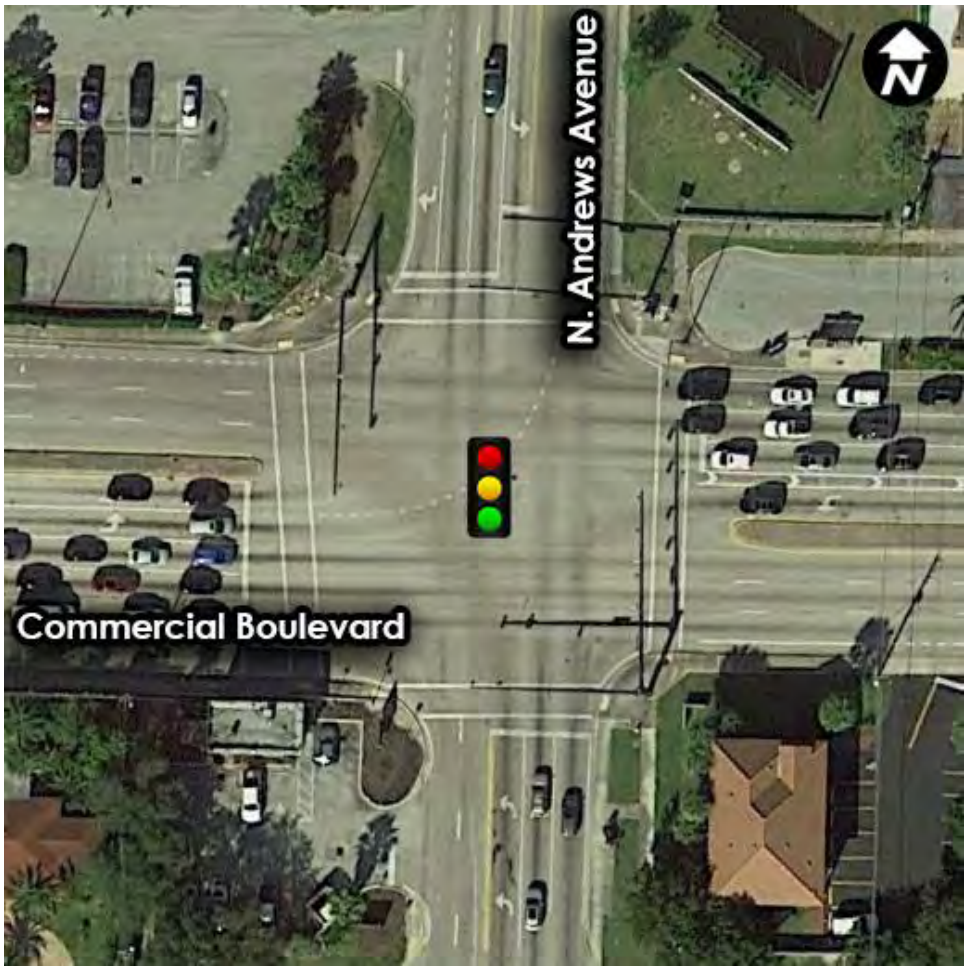


Figure 2-20 Intersection of Commercial Boulevard and N. Andrews Avenue

2.8.2 CYPRESS CREEK ROAD

The Cypress Creek Road and N. Andrews Avenue intersection as shown in Figure 2-21 is a four-leg, actuated coordinated signalized intersection. The intersection currently utilizes six single mast arm poles to support the signal heads. One single mast arm on the northeast quadrant of the intersection serves the northbound and westbound traffic, one single mast arm on the northwest quadrant of the intersection serves the westbound and southbound traffic, one single mast arm for a secondary signal on the northwest quadrant of the intersection serves the southbound traffic, one single mast arm on the southwest quadrant of the intersection serves the eastbound and southbound traffic, one single mast arm on the southeast quadrant of the intersection serves the northbound and eastbound traffic, and one single mast arm for a secondary signal on the southeast quadrant of the intersection serves the northbound traffic.



Figure 2-21 Intersection of Cypress Creek Road and N. Andrews Avenue

The Cypress Creek Road interchange is a modified partial cloverleaf interchange with signalized ramp terminals which operate as actuated-coordinated signals. The interchange utilizes six mast arms. The I-95 southbound ramp terminal on the west side of the interchange as shown in Figure 2-22 has one single mast arm on the northeast quadrant that serves the northbound traffic, one single mast arm on the northwest quadrant that serves the westbound traffic, one single mast arm on the southeast quadrant that serves the eastbound traffic, and one single mast arm on the SW quadrant that serves the southbound traffic. On the east side of the interchange, a single mast arm serves the eastbound traffic, and a single mast arm serves the westbound traffic as shown in Figure 2-23.

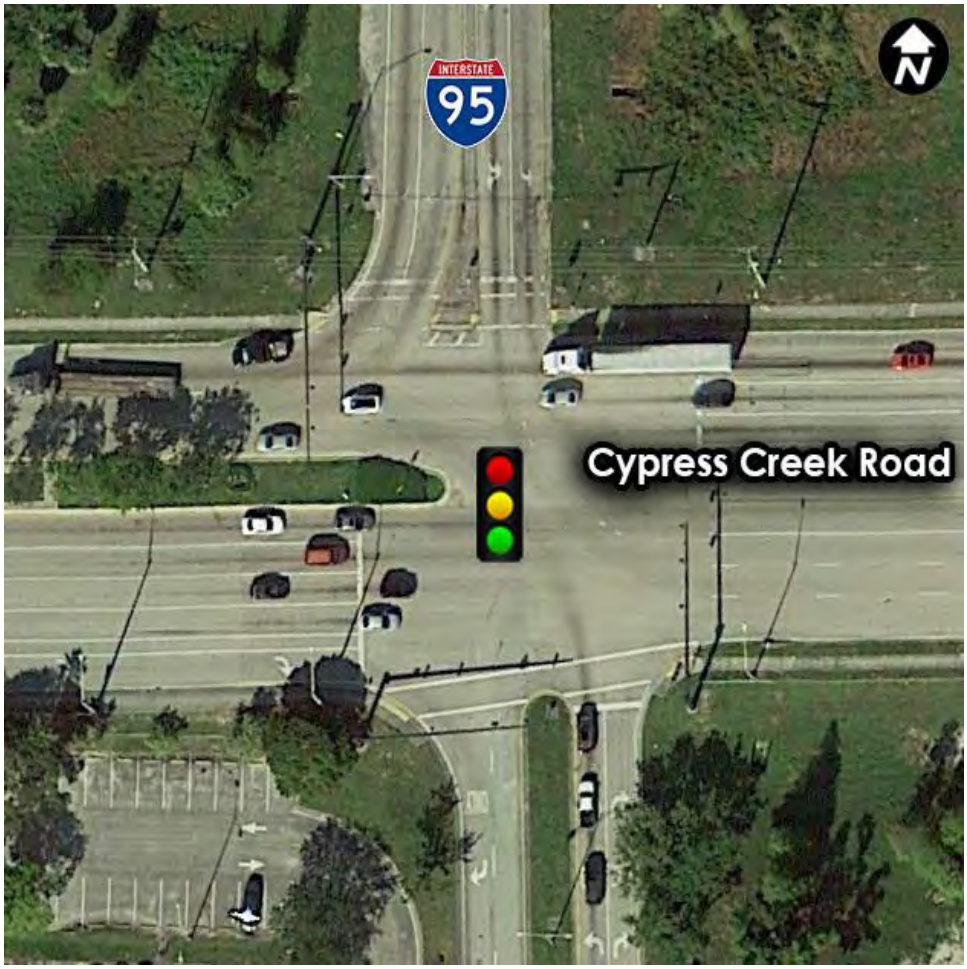


Figure 2-22 I-95 Southbound Ramp Terminal at Cypress Creek Road



Figure 2-23 I-95 Northbound Ramp Terminal at Cypress Creek Road

The Cypress Creek Road and NE 7 Avenue intersection as seen in Figure 2-24 is a four-leg, actuated coordinated signalized intersection. The intersection has one double mast arm in the SE quadrant that serves the eastbound and southbound traffic, one single mast arm in the NE quadrant that serves the northbound traffic, and one single mast arm that serves the westbound traffic.



Figure 2-24 Intersection of Cypress Creek Road and NE 7 Avenue

2.9 Railroad Facility

There are two main rail facilities: The South Florida Rail Corridor (SFRC) and the Florida East Coast (FEC) Railway. The SFRC is a freight and passenger line. The FEC is currently a freight only rail line that has plans in the future to implement passenger service. The railroad facilities are shown in Figure 2-25.

2.9.1 SOUTH FLORIDA RAIL CORRIDOR

The project study area is adjacent to the east of the SFRC. This railroad is owned by FDOT and is a segment of the most extensive rail network in Florida: CSX Transportation (CSXT). This segment was acquired by FDOT from CSXT in 1988 and spans from Miami-Dade County to Palm Beach County. As part of the purchase agreement, CSXT has an exclusive perpetual freight easement. The SFRC is used for transporting freight such as nonmetallic minerals, chemicals, coal, and miscellaneous shipments. The SFRC is also used for passenger travel. There are two passenger rail services utilized along the SFRC: Tri-Rail and Amtrak. The following is a brief description of each:

- Tri-Rail is operated by South Florida Regional Transportation Authority (SFRTA) and provides passenger commuter rail services between Miami-Dade County and Palm Beach County.
- Amtrak operates over 21,000 route miles in 46 states, the District of Columbia and three Canadian provinces with more than 300 trains each day at speeds up to 150 mph to more than 500 destinations. The Amtrak system utilizes the South Florida Rail Corridor and has one Amtrak station to the south of the project corridor at the Broward Boulevard Park and Ride lot.

2.9.2 FLORIDA EAST COAST RAILWAY

The FEC rail line is east of the project study area. The FEC is a regional railroad operating between Miami and Jacksonville. FEC maintains the second largest railroad network in the State after CSXT and provides the only north south mainline along the Atlantic Coast between West Palm Beach and Jacksonville. FEC provides exclusive rail service to the Ports of Palm Beach, Everglades (Fort Lauderdale), Miami, and the Kennedy Space Center. The FEC railroad corridor is used for transporting aggregates, automobiles, lumber, cement, food products, and other commodities.

Currently, the All Aboard Florida initiative is underway with plans to complete installation of a passenger rail service on the FEC railway. All Aboard Florida is developing a train route called Brightline that is intended to connect Miami and South Florida to Orlando. The first phase connects Miami to West Palm Beach through express intercity service, with a stop in Fort Lauderdale. Passenger service between Fort Lauderdale and West Palm Beach began on January 13, 2018, followed by an extension south to Miami on May 19, 2018. It is the only privately owned and operated passenger railroad in the United States.

In addition to the All Aboard Florida initiative, SFRTA is planning to link Tri-Rail services to the FEC corridor. This new service will be call Tri-Rail Coastal link. SFRTA has been working with FDOT, Miami-Dade, Broward and Palm Beach MPOs, the Southeast Florida Transportation Council (SEFTC), and the South Florida and Treasure Coast Regional Planning Councils in order to make the Tri-Rail coastal link a reality.

The Tri-Rail Coastal link will be a commuter rail serving 85 miles of the FEC corridor from Miami to Jupiter in conjunction with existing Tri-Rail service. Per the Tri-Rail Coastal Link Station Area Opportunities Report, nine stations were identified in Broward County. The station nearest to the study area is the 38 Street Oakland Park Station.

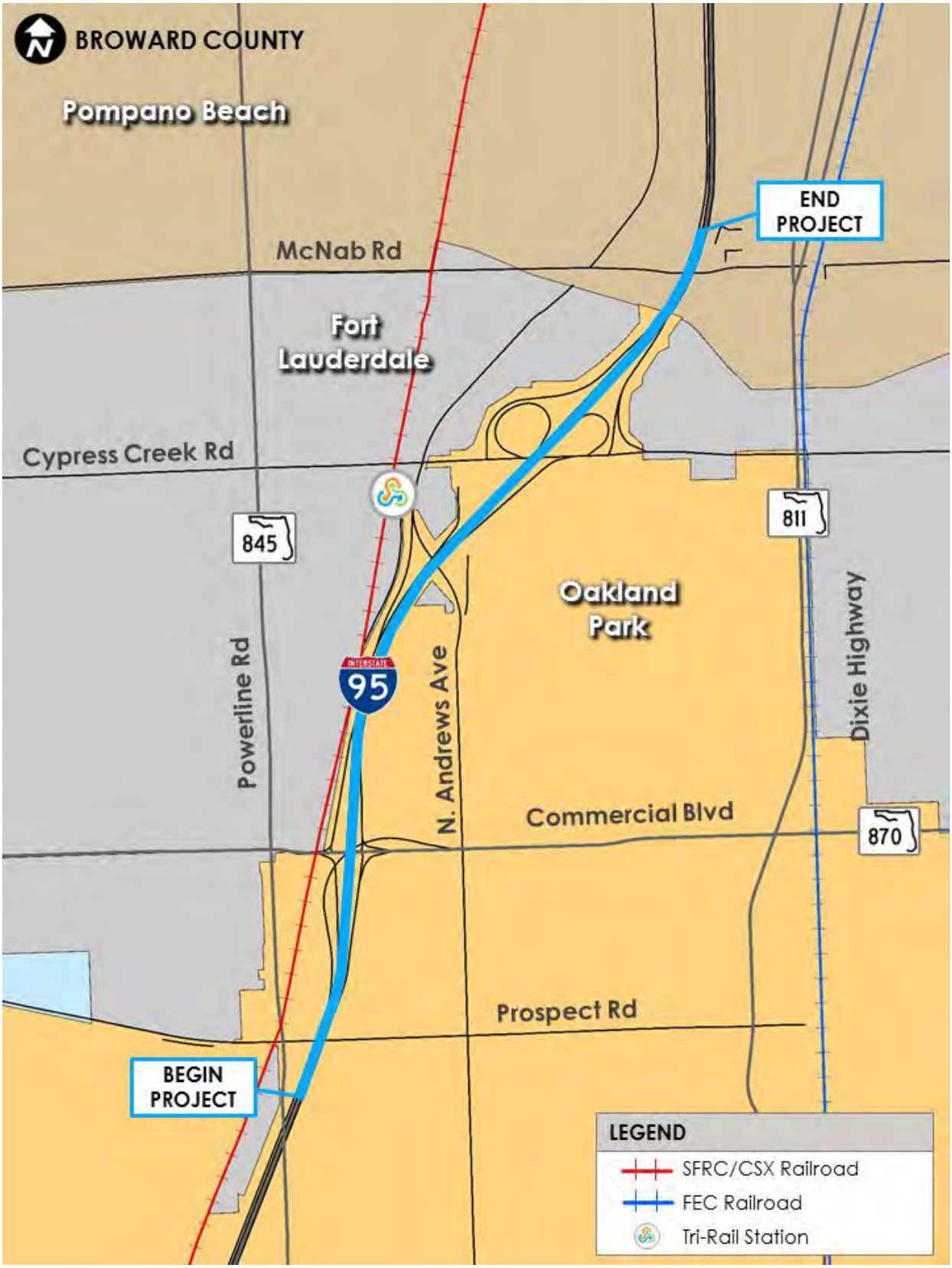


Figure 2-25 Railroad Facilities

2.10 Public Transportation

Public transportation near the project vicinity and in Broward County was reviewed using information gathered from the website of all the available modes and providers, which are described in the following sections.

SFRTA also plays a significant role in Broward County public transportation through the operation of the Tri-Rail commuter rail service and the Tri-Rail shuttle busses. The Sun Trolley also offers shuttle services from the Cypress Creek Tri-Rail station to the business center in the Uptown link. Figure 2-26 presents the transit services provided by BCT and Tri-Rail. Figure 2-27 presents the Tri-Rail Shuttle routes and Sun Trolley routes near the project vicinity.

2.10.1 BROWARD COUNTY TRANSIT

Broward County Transit is the public transit authority in Broward County and it currently runs four routes in the project area; Route 14 (runs north-south on Powerline Road and east on Cypress Creek Road), Route 55 (runs east-west on Commercial Boulevard), Route 60 (runs north-south on N. Andrews Avenue), and Route 62 (runs east-west on Cypress Creek Road and McNab Road). Routes 14, 60, and 62 make stops at the Cypress Creek Tri-Rail Station.

Route 60 and 62 use the current Cypress Creek Park and Ride lot which is just east of N. Andrews Avenue and east of the Tri-Rail Cypress Creek Station. In the 2016–2025 Transit Development Plan (TDP) Annual Update for BCT, known as BCT Connected, the plan has identified capital plan improvements and realignments for these routes. The capital plan improvements are to improve access to the Cypress Creek Tri-Rail station by adding a new turn signal on Powerline Road for route 14 southbound. Realignments of route 60 and 62 are planned into the Cypress Creek Tri-Rail Station once the access to the station is completed.

No transit services are currently provided along SR 9/I-95 throughout the project limits. It is anticipated that implementation of the potential SR 9/I-95 Express Lanes project will facilitate operation of new express bus services along SR 9/I-95 similar to the current SR 9/I-95 Express bus services in Miami-Dade and Broward Counties.

2.10.2 AIRPORTS

The Fort Lauderdale Executive (FXE) Airport is a general aviation airport located west of the project area at 6000 NW 21 Avenue, Fort Lauderdale, FL 33309, and it is owned and ran by the City of Fort Lauderdale. FXE has flight paths directly over the project area. FXE's most recent Airport Layout Plan (ALP) from 2009 generated a Part 77 Departure Surface that stretches 2 nautical miles (12,521.2 ft) from the departure end of the runways and slopes upward at a 40:1 slope. There can be no structures, temporary or permanent (including construction cranes), built over this surface area as they interfere with the direct flight paths for airplanes in and out of the airport. The surface ranges from about 1,500 ft to 3,600 feet above the ground along I-95 in the project area. Within the Cypress Creek Road Interchange, the surface ranges from about 1,900 feet to 4,200 feet o elevation above the ground. Within the Commercial Boulevard Interchange, the surface ranges from about 400 feet to 1,800 feet in elevation above the ground.

Although there may not be any structures that break the surface, the Federal Aviation Administration (FAA) through Federal Regulation Title 14 Part 77 may require the notification of such structures and construction through the submittal of Form 7460-1. FAA provides the following guidelines to who must submit Form 7460-1:

- Any construction or alteration exceeding 200 ft above ground level
- Any construction or alteration:
    - Within 20,000 ft of a public use or military airport which exceeds a 100:1 surface from any point on the runway of each airport with at least one runway more than 3,200 ft.
    - Within 10,000 ft of a public use or military airport which exceeds a 50:1 surface from any point on the runway of each airport with its longest runway no more than 3,200 ft.
    - Within 5,000 ft of a public use heliport which exceeds a 25:1 surface
- Any highway, railroad, or other traverse way whose prescribed adjusted height would exceed that above noted standards
- When requested by the FAA
- Any construction or alteration located on a public use airport or heliport regardless of height or location

Proposals that are subject to the above must file whether the proposed modification is located on or off airport property. The form can be filed at oeaaa.faa.gov.

2.10.3 COMMUTING

South Florida Commuter Services (SFCS) is an assistance program ran by the Florida Department of Transportation and is dedicated to improving traffic conditions by promoting alternatives to drive-alone commuting. With the use of Park and Ride lots, SFCS and FDOT provide locations for commuters to meet their carpool, vanpool, bus, and/or other transit/ride sharing mode of transportation.

There are two Park and Ride facilities in the project area that are part of the SFCS program. The Cypress Creek Tri-Rail Station/Park and Ride is located at 6151 N Andrews Avenue, Ft. Lauderdale, FL 33309. The lot accommodates for BCT and Tri-Rail passengers that use the Cypress Creek Tri-Rail Station and serves as an FDOT Park and Ride Lot for commuters and carpools. There are 403 parking spaces available and has bike lockers for bicyclists. The lot is serviced by Tri-Rail's Commuter Connector shuttles that are accessible from the west side of the station and BCT's routes 60 and 62 that are accessible from the east side of the station.

The Commercial Boulevard Park and Ride lot is located at 55 West Commercial Boulevard, Ft. Lauderdale, FL 33309. This lot only serves as an FDOT Park and Ride lot and is also free of charge.

These Park and Ride facilities are not anticipated to have any impacts and their operation will be maintained during future construction.

2.10.4 SOUTH FLORIDA REGIONAL TRANSPORTATION AUTHORITY

SFRTA is a public transportation agency similar to BCT that operates both Tri-Rail and shuttle bus services within Miami-Dade, Broward, and Palm Beach Counties.

The SFRTA shuttle buses operate a fixed-route transit services providing a circulator-like system that connects nearby communities with a Tri-Rail station. There are three shuttle busses that operate out of the Cypress Creek Station CC-1, CC-2, and CC-3. The shuttles serve the business community, nearby hospitals, FDOT, and shopping centers.

The City of Fort Lauderdale Downtown Fort Lauderdale Transportation Management Association (TMA) administers the Sun Trolley. The Sun Trolley operates a free shuttle from the Cypress Creek Station called the Uptown Link. The route runs east on Cypress Creek Road to the Uptown Centre, north on N. Andrews Avenue to Microsoft/Marriot, then back south on N. Andrews Avenue to the Cypress Creek Station, and west on Cypress Creek Road to the Citrix Loop.

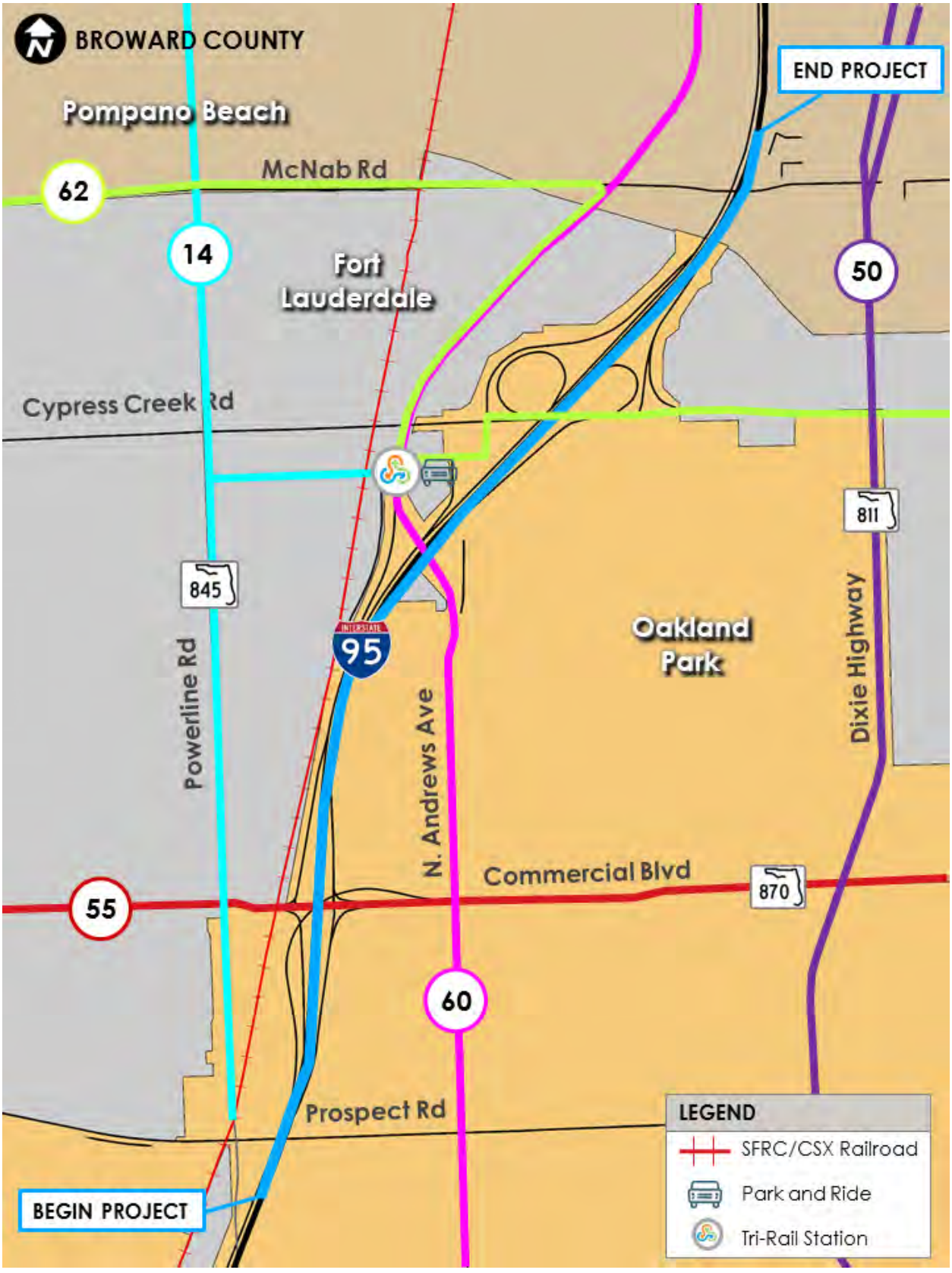


Figure 2-26 BCT Routes and Tri-Rail Station Location

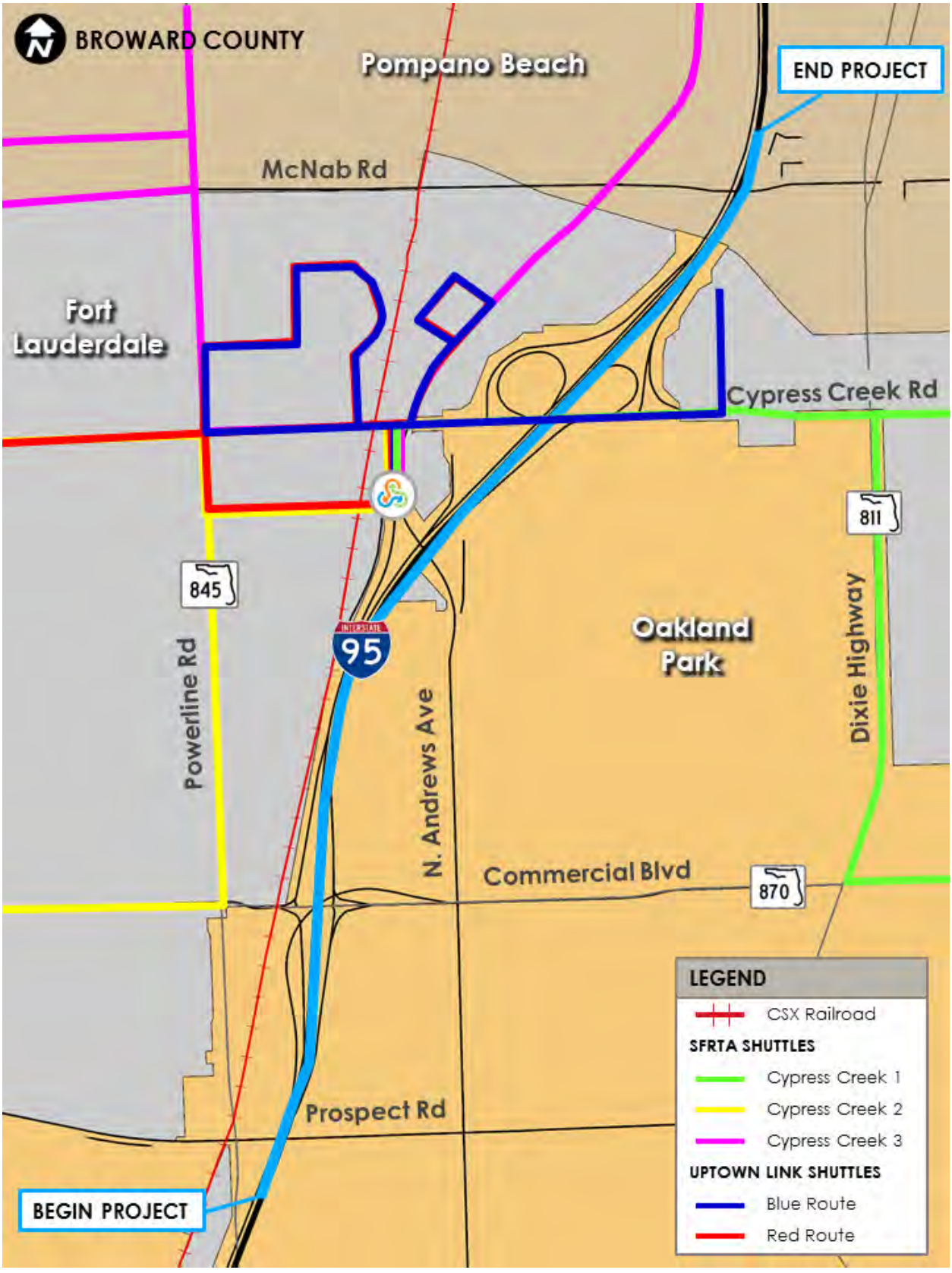


Figure 2-27 Shuttle Bus Routes

2.11 Pavement Structural & Operational Conditions

The Pavement Systems Evaluation Section of FDOT's State Materials Office collects pavement data on all the roadways under FDOT jurisdiction. This data is then analyzed to assess the pavement physical conditions. Each section of pavement is rated for cracking and ride on a 0-10 scale, with 0 being the worst and 10 being the best. Any rating of 6 or less is considered deficient pavement and is flagged. Ride rating of 6 or less is not considered deficient when speed limit is less than 50 mph. The following ratings shown in Table 2-18 were assigned for the I-95 from south of Commercial Boulevard to north of Cypress Creek Road on Pavement Condition Surveys (PCS) conducted on 2016 along specific lanes.

Table 2-18
Pavement Conditions

Roadway	Begin Milepost	End Milepost	Existing Pavement Conditions (2018)		Future Pavement Conditions (2023)	
			Cracking	Ride	Cracking	Ride
			R3 or R4	R3 or R4	R3 or R4	R3 or R4
I-95	14	17	6.5	7.8	6.5	7.7
Commercial Boulevard (Section 1)	4	6	8.5	7.4	8.1	7.1
Commercial Boulevard (Section 2)	6	8	8.0	5.6	6.8	5.2
Powerline Road	3	5	7.0	6.8	6.4	5.9

Based on these ratings, the roadway pavement within the project limits is currently not exhibiting any signs of pavement distress since the speed limit for Commercial Blvd and Powerline Road are less than 50 mph.

2.12 Geotechnical

A Geotechnical Report prepared for the I-95 Design Build Phase 3A-1, which includes the study location covered in this PD&E, documented the presence of 13 mapping units within this area. The soil units encountered are summarized in Table 2-19.

Table 2-19
Existing Geotechnical Characteristics

Map Unit Symbol	Soil Name	Typical Profile
2	Arents-Urban land complex	0 to 9 in.: cobbly sand; 9 to 60 in.: sand
3	Arents, organic substratum-Urban-land complex	0 to 12 in.: gravelly sand; 12 to 38 in.: sand; 38 to 52 in.: muck; 52 to 72 in.: sand
4	Basinger fine sand	0 to 60 in.: fine sand
10	Duette-Urban land complex	0 to 80 in.: sand

Table 2-19 Existing Geotechnical Characteristics		
Map Unit Symbol	Soil Name	Typical Profile
15	Immokalee fine sand	0 to 54 in.: fine sand; 54 to 80 in.: loamy fine sand
16	Immokalee, limestone substratum-Urban land complex	0 to 58 in.: fine sand; 58 to 62 in.: weathered bedrock
17	Immokalee-Urban land complex	0 to 72 in.: fine sand
19	Margate fine sand	0 to 28 in.: fine sand; 28 to 32 in.: gravelly fine sand; 32 to 36 in.: unweathered bedrock
21	Okeelanta muck	0 to 31 in.: muck; 31 to 65 in.: fine sand
27	Plantation muck	0 to 10 in.: muck; 10 to 28 in.: fine sand; 28 to 35 in.: fine sandy loam; 35 to 39 in.: unweathered bedrock
38	Udorthents, shaped	0 to 30 in.: gravelly sand; 30 to 50 in.: sand; 50 to 54 in.: weathered bedrock
40	Urban land	N/A
99	Water	N/A

A total of eight different layers of materials were observed during the drilling of the roadway borings and percolation tests. Stratum 1a is asphaltic concrete. Stratum 1b is topsoil. Stratum 2 consists of organic silty fine sand. Stratum 3 consists of silty fine sand with some limerock. Stratum 4 consists of silty fine sand with traces of limerock. Stratum 5 consists of sandy silt. Stratum 6 consists of organic stained to slightly organic fine sand or fine sand with traces of limerock/limestone lenses. Stratum 7 consists of the natural limestone.

Based on the Water Table Map, Average Wet Season dated February 17, 2000 by Broward County Office of Environmental Services, Water Management Division, the average wet season groundwater along the project is at 1.5 ft., NAVD 88. A Seasonal High Ground Water Table (SHGWT) of 2.5 ft. NAVD 88 may be used for design. The SHGWT was estimated by adding 12 in. over the average wet season. Fluctuation in the groundwater levels should be expected due to seasonal climatic changes, construction activity, rainfall variations, surface water runoff and other site-specific factors such as water elevation variations at the canals. Since groundwater level variations are anticipated, design drawing and specifications should accommodate such possibilities and construction planning should assume that variations will occur. For additional geotechnical data, refer to the Geotechnical Exploration Report on file with FDOT District Four.

2.13 Existing Drainage

This project is located in Broward County, Florida, near the City of Fort Lauderdale. The study area lies within the jurisdiction of South Florida Water Management District (SFWMD), specifically within the C-13 and C-14 drainage basins. Surface runoff south of NW 54 Court ultimately discharges into the C-13 Canal and surface runoff north of NW 54 Court ultimately discharges into the C-14 Canal. Refer to Figure 2-28 below for map of the regional watershed in the project area.

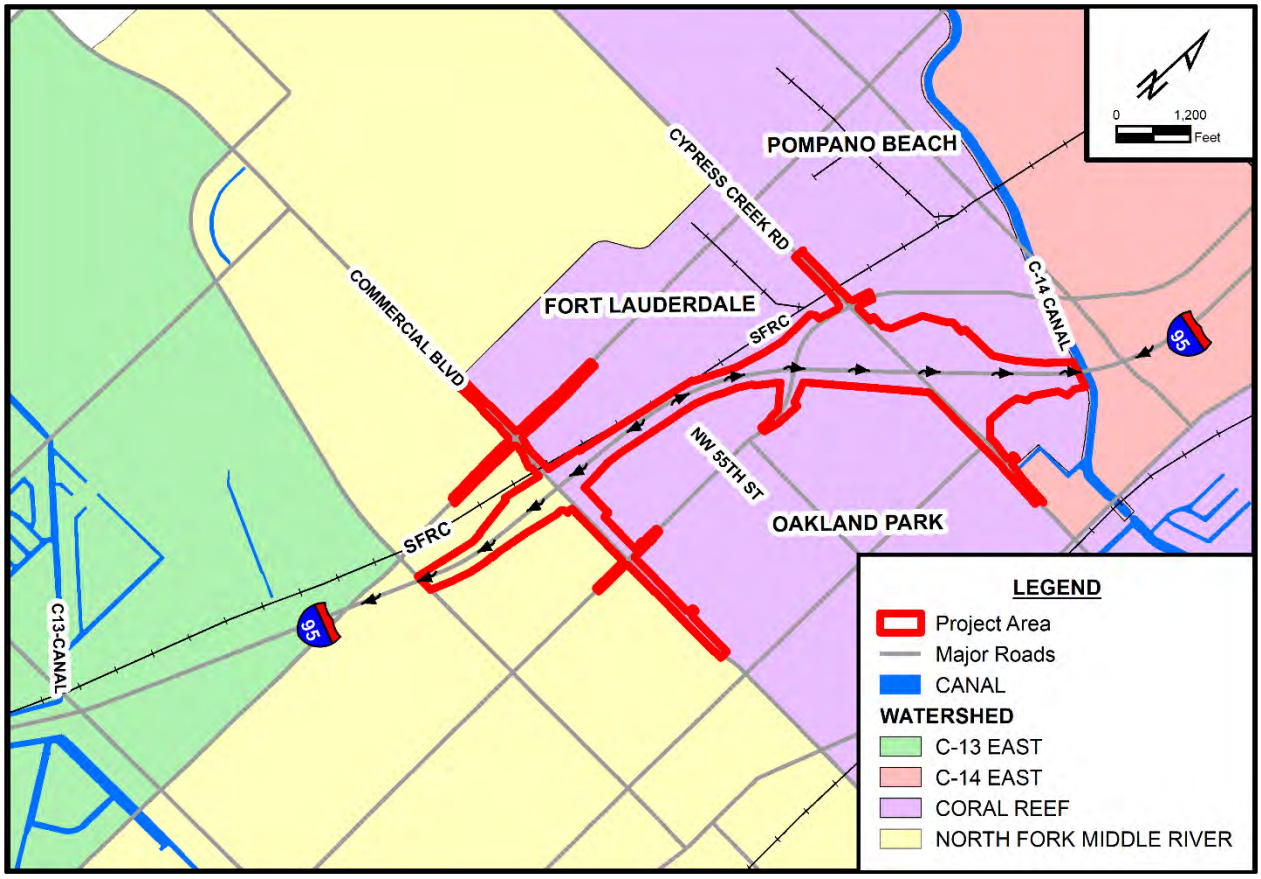


Figure 2-28 Regional Watersheds

The project area was divided into four main drainage systems as shown in Figure 2-29 and listed below:

- C13-South Commercial (C13-SCOM)
- C13-North Commercial (C13-NCOM)
- C14-South Cypress (C14-SCYP)
- C14-North Cypress (C14-NCYP)

The naming convention was chosen so that the first three characters represent the name of the receiving waterbody, followed by the fourth character which represents the location of the system with respect to the intersecting roadway at the interchange (i.e. Commercial Boulevard & Cypress Creek Road), and then by the last three characters which represent the name of the intersecting roadway at the interchange. These systems have a combined total area of 236 acres. The approach to meeting water quality requirements is to provide treatment for the increase in impervious area and restore or replace existing treatment facilities impacted by this project.

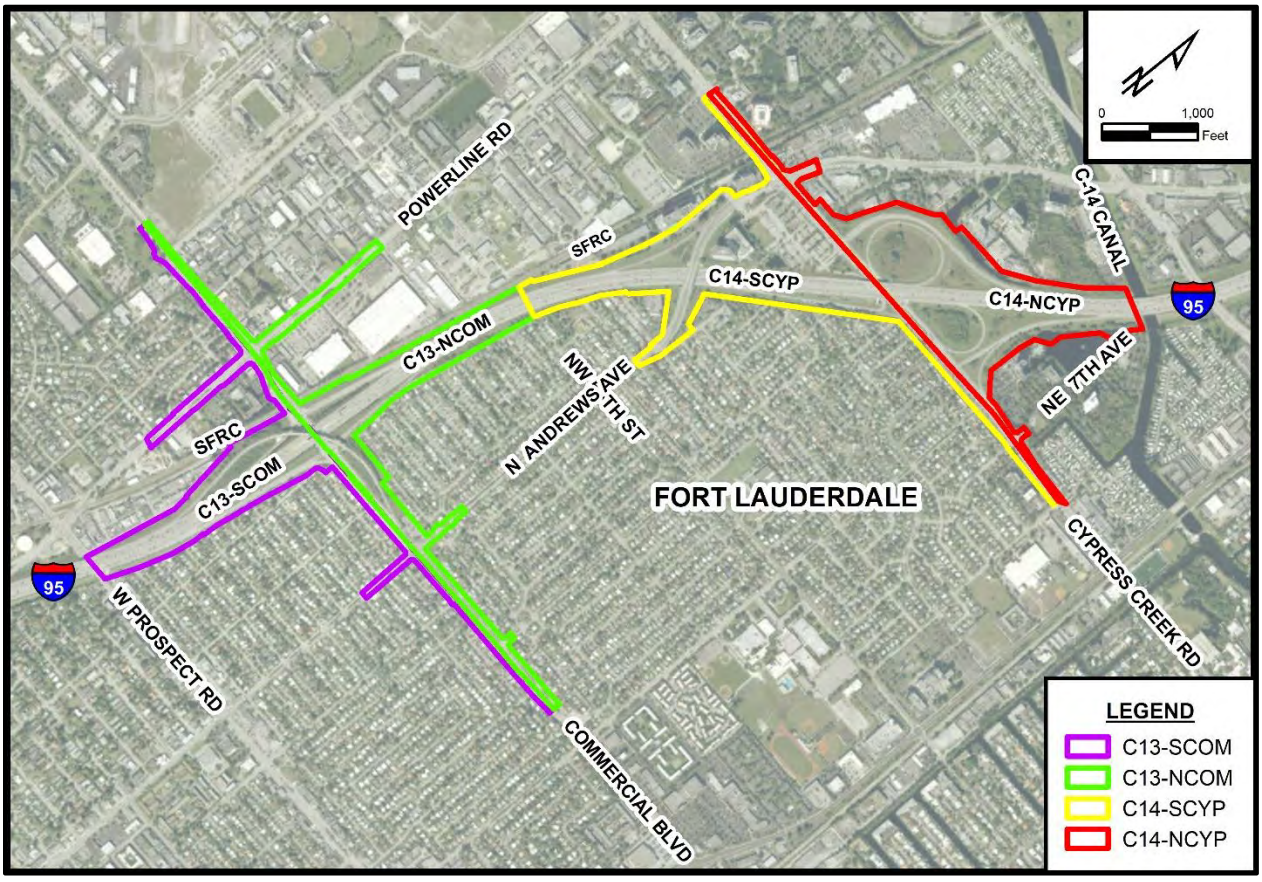


Figure 2-29 Drainage Systems

2.13.1 SYSTEM C13-SCOM

System C13-SCOM covers I-95 from Prospect Road to Commercial Boulevard; Commercial Boulevard eastbound lanes from 400 ft. west of NW 12 Avenue to 300 ft. east of NE 4 Avenue; Powerline Road from just south of NW 47 Street to Commercial Boulevard; and N. Andrews Avenue from NW 48 Street to Commercial Boulevard. Refer to Figure 2-30 for a map of the system. The drainage area is approximately 46 acres in size. A review of previous drainage plans and existing permit information shows that runoff is being collected and treated by various dry retention ponds. Generally, excess runoff from System C13-SCOM is being conveyed towards the south via roadside swales, pipes and culverts, and ultimately discharges into the C-13 Canal.

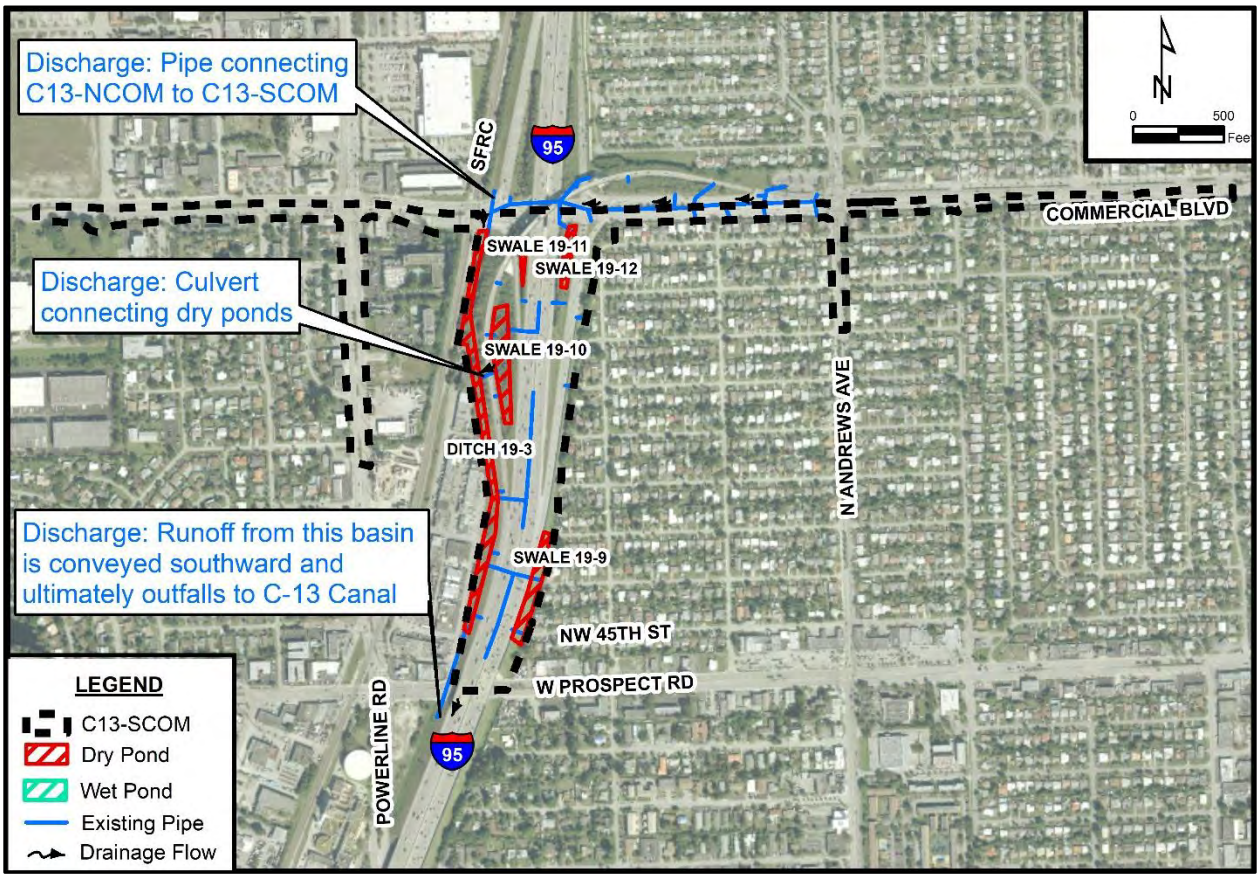


Figure 2-30 C13-SCOM Drainage System

2.13.2 SYSTEM C13-NCOM

System C13-NCOM covers I-95 from Commercial Boulevard to NW 55 Street; Commercial Boulevard westbound lanes from 400 ft. west of NW 12 Avenue to 300 ft. east of NE 4 Avenue; and Powerline Road from Commercial Boulevard to just north of NW 53 Street. Refer to Figure 2-31 for a map of the system. The drainage area is approximately 47 acres in size. A review of previous drainage plans and existing permit information shows that runoff is being collected and treated by various dry retention ponds. Generally, excess runoff from System C13-NCOM is being conveyed towards the south via roadside swales, pipes and culverts, and ultimately discharges into the C-13 Canal.

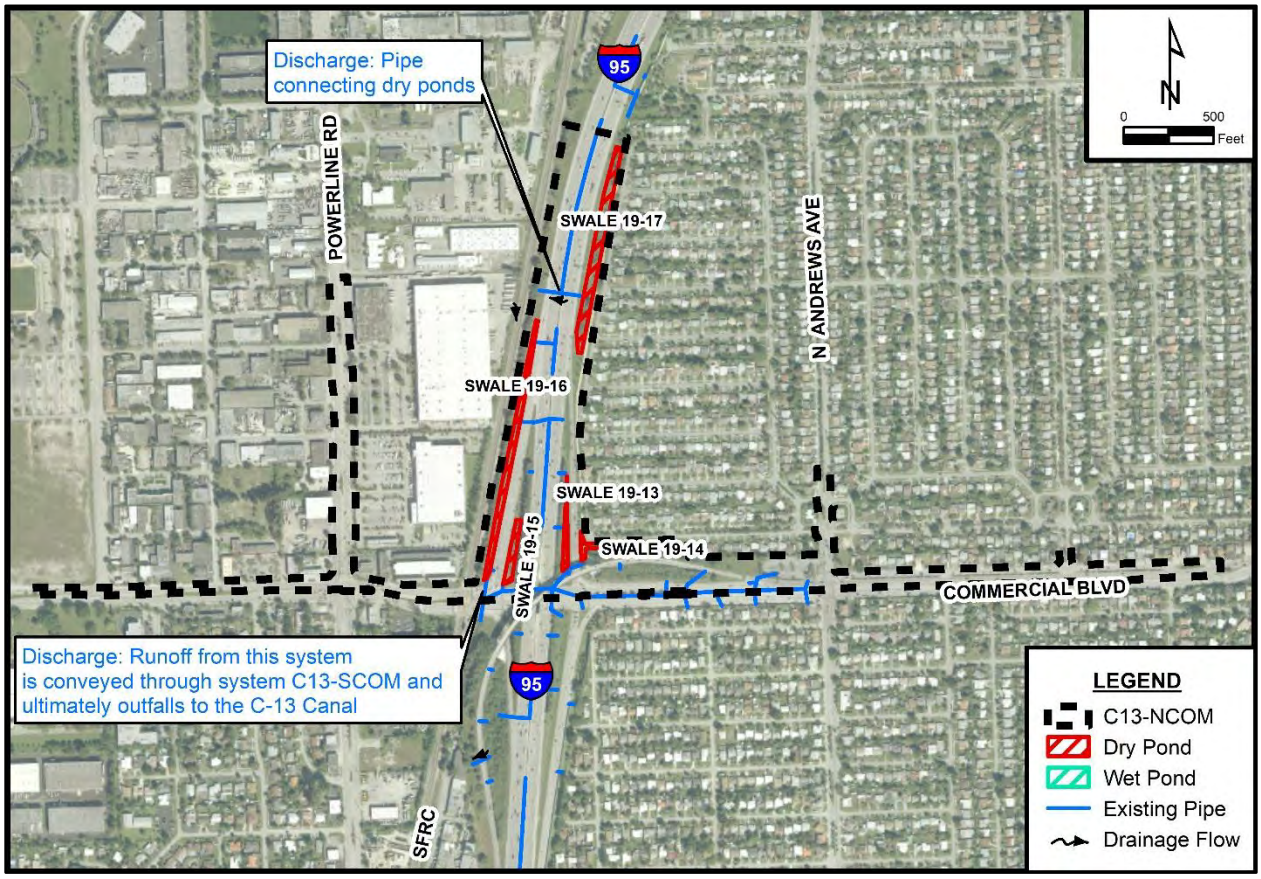


Figure 2-31 C13-NCOM Drainage System

2.13.3 SYSTEM C14-SCYP

System C14-SCYP covers I-95 from NW 55 Street to Cypress Creek Road; Cypress Creek Road eastbound lanes from NW 6 Way to NE 9 Avenue; and N. Andrews Avenue from NE 57 Court to Cypress Creek Road. Refer to Figure 2-32 for a map of the basin. The drainage area is approximately 74 acres in size. A review of previous drainage plans and existing permit information shows that runoff is being collected and treated by various dry and wet detention ponds. Generally, excess runoff from System C14-SCYP is being conveyed towards the north via roadside swales, pipes and culverts, and ultimately discharges into the C-14 Canal.

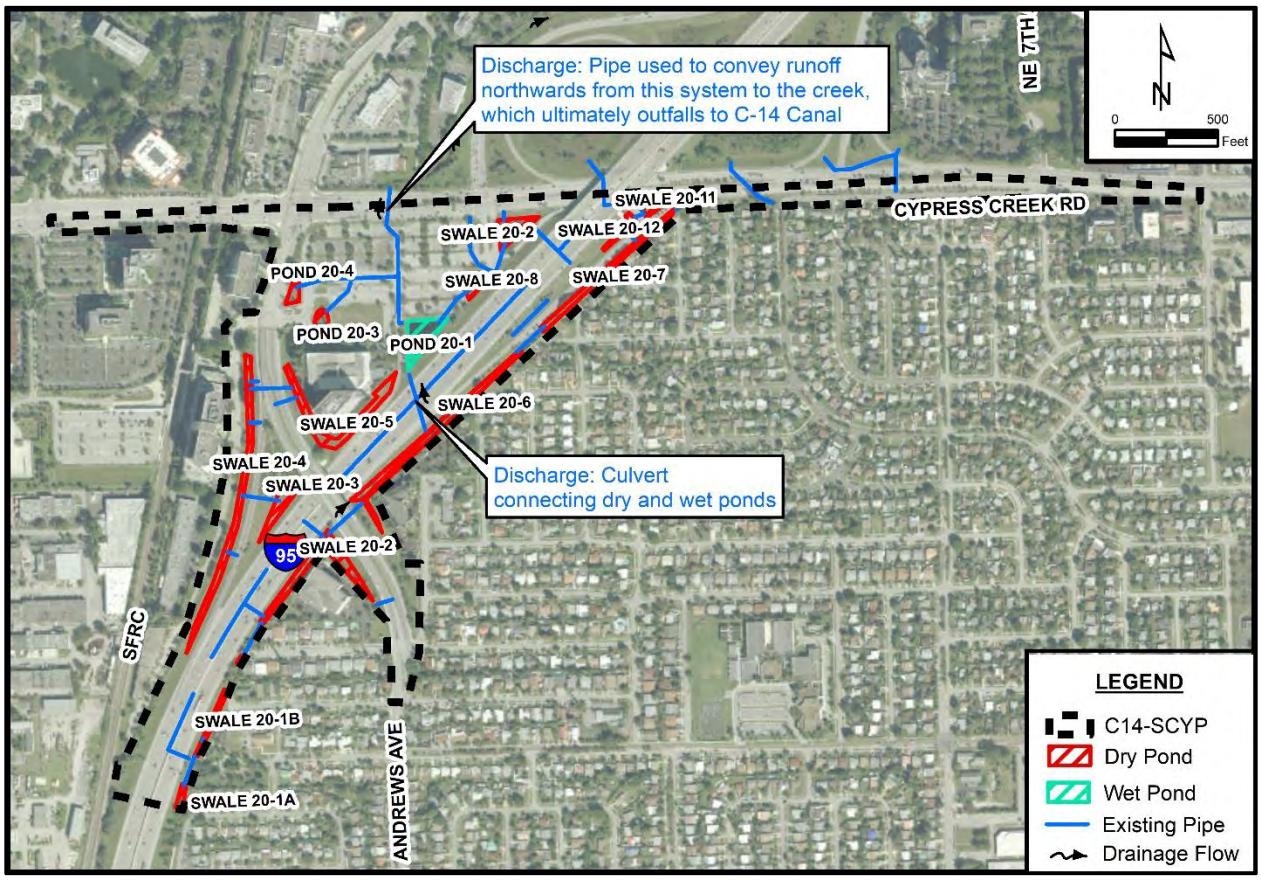


Figure 2-32 C14-SCYP Drainage System

2.13.4 SYSTEM C14-NCYP

System C14-NCYP covers I-95 from Cypress Creek Road to the C14-Canal; Cypress Creek Road westbound lanes from NW 6 Way to NE 9 Avenue; and N. Andrews Avenue from NE 57 Court to Cypress Creek Road. Refer to Figure 2-33 for a map of the basin. The drainage area is approximately 69 acres in size. A review of previous drainage plans and existing permit information shows that runoff is being collected and treated by various dry detention ponds. Generally, excess runoff from System C14-NCYP is being conveyed towards the north via roadside swales, pipes and culverts, and ultimately discharges into the C-14 Canal.

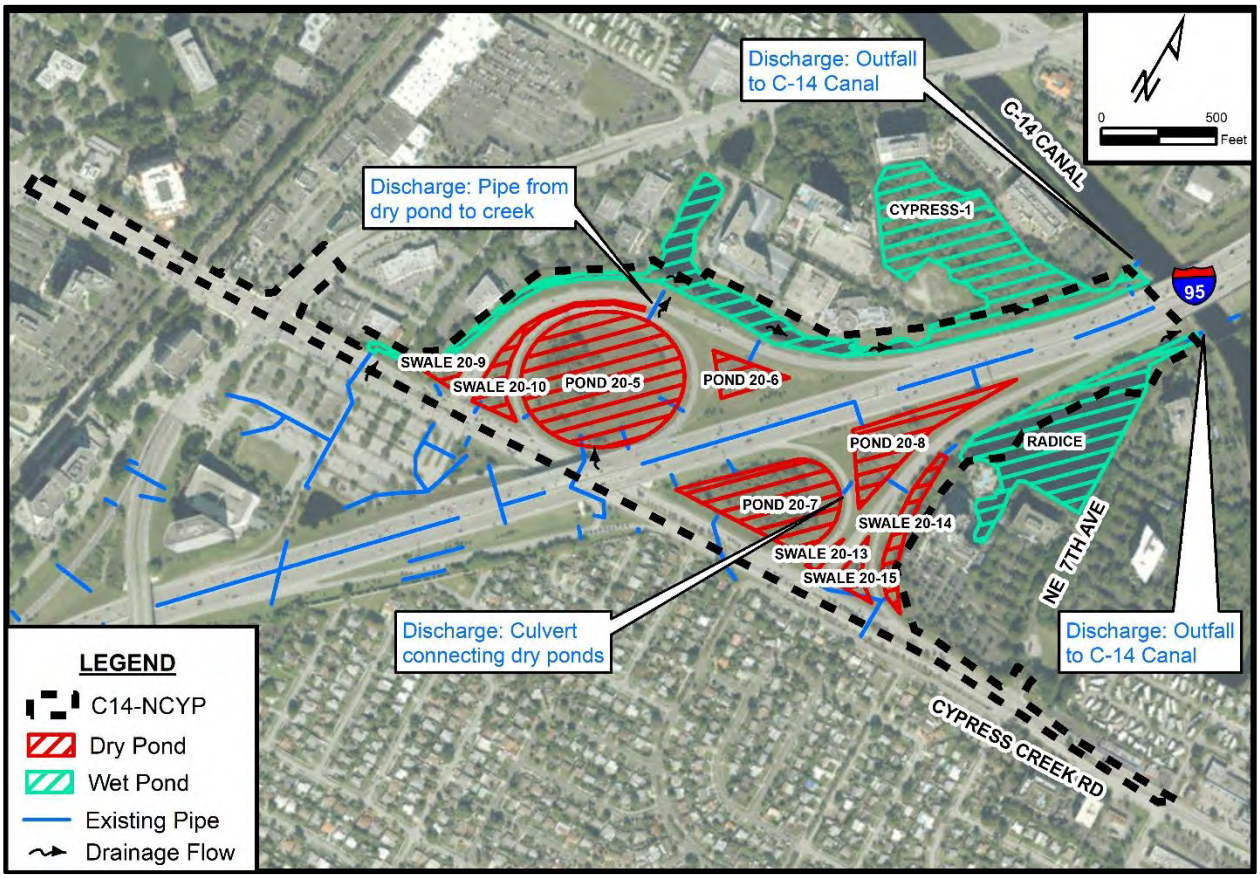


Figure 2-33 C14-NCYP Drainage System

For additional details, refer to the Preliminary Drainage Report on file at FDOT District Four.

2.14 Traffic Data

A Systems Interchange Modification Report (SIMR) was prepared for this study which documents the analysis methodology, traffic forecasting, and operational analysis for existing and future conditions for the study. The SIMR is on file at FDOT District Four.

2.14.1 TRAFFIC DATA COLLECTION

Traffic data was collected in May 2015 to evaluate the existing conditions and provide a basis for future traffic analysis. Seventy-two-hour classification counts were collected at all on and off-ramps at both the I-95/Commercial Boulevard and I-95/Cypress Creek Road interchanges, as well as the I-95/Oakland Park Boulevard and I-95/Atlantic Boulevard interchange ramps, as part of the pre-PD&E Study traffic data collection. Seventy two-hour approach counts were also collected at the approaches of the study intersections from the pre-PD&E traffic data collection as well as the Cypress Creek Park and Ride on-ramp. The traffic count data also included six-hour turning movement counts for the following intersections:

- Commercial Boulevard/Powerline Road
- Commercial Boulevard/Southbound I-95 Ramp Terminal
- Commercial Boulevard/Northbound I-95 Ramp Terminal
- Commercial Boulevard/N. Andrews Avenue
- Cypress Creek Road/N. Andrews Avenue
- Cypress Creek Road/Southbound I-95 Ramp Terminal
- Cypress Creek Road/Northbound I-95 Ramp Terminal
- Cypress Creek Road/NE 7 Avenue
- Cypress Creek Road/NE 9 Avenue
- Cypress Creek Road/Dixie Highway

In March 2016, an additional six-hour turning movement counts were collected to supplement the pre-PD&E turning movement counts that were provided. The additional intersections that were counted are listed below:

- Commercial Boulevard/NW 15 Avenue
- Commercial Boulevard/NW 12 Avenue
- Commercial Boulevard/NE 3 Avenue
- Commercial Boulevard/NE 6 Avenue
- Powerline Boulevard/NW 46 Street
- Powerline Boulevard/NW 51 Place
- Powerline Boulevard/NW 53 Court
- Powerline Boulevard/NW 56 Street
- N. Andrews Avenue/NE 48 Street
- N. Andrews Avenue/NE 51 Court
- Cypress Creek Road/NW 6 Way
- N. Andrews Avenue/N. Andrews Way
- N. Andrews Avenue/NE 1 Avenue (northern connection)
- N. Andrews Avenue/NW 66 Street

2.14.2 EXISTING TRAFFIC OPERATIONS

The existing I-95/Commercial Boulevard interchange is a diamond interchange with a westbound to southbound flyover ramp. The existing I-95/Cypress Creek Road interchange is a modified partial cloverleaf interchange with loop ramps for the northbound to westbound and westbound to northbound movements. Slip ramps are located on all but the southwest quadrant. The eastbound to southbound movement is not handled at the main interchange, but via an on-ramp that accesses southbound I-95 from southbound N. Andrews Avenue. The South Florida Rail Corridor (SFRC)/CSX railroad is adjacent to and runs parallel along the west side of I-95 within the project area.

Traffic operational analysis was conducted for Existing Year (2015) conditions using Vissim to document the deficiencies of the existing configuration and to provide a calibrated base model for future year analysis. The results of the intersection analyses indicate that all the intersections are operating at Level of Service (LOS) D or better during the AM peak hour except for the Commercial Boulevard and I-95 northbound ramp terminal intersection, which is operating at LOS E. During the PM peak, all intersections are operating at LOS D or better except for the following intersections that are operating at LOS E:

- Cypress Creek Road and N. Andrews Avenue
- Commercial Boulevard and Powerline Road
- Commercial Boulevard and N. Andrews Avenue
- Commercial Boulevard and NE 6 Avenue

The Vissim models were used to produce volume and speed profiles along the I-95 general purpose lanes for the AM and PM peak periods. The results of the mainline analysis indicate the following:

- I-95 northbound experiences moderate congestion between Oakland Park Boulevard and Commercial Boulevard due to the heavy off-ramp volumes at Commercial Boulevard. Speeds between 30 and 45 mph were observed during both the AM and PM peak periods, with the lowest speeds occurring during the AM peak when the off-ramp volumes are the highest (approaching 2,000 vehicles per hour).
- I-95 northbound also experiences minor congestion between Commercial Boulevard and Cypress Creek Road during the PM peak hour due to the weaving segment between interchanges. Speeds as low as 45 mph were observed in this area before returning to free flow conditions north of the interchange.
- I-95 southbound experiences significant congestion near Cypress Creek Road and Commercial Boulevard during the PM peak period due to the short weaving segment between the N. Andrews Avenue on-ramp and the Commercial Boulevard off-ramp. Speeds as low as 15 mph were observed between the interchanges, with slow operating speeds of 30 mph or less extending to Atlantic Boulevard. This congestion is less severe during the AM peak period, but speeds as low as 30 to 35 mph were still observed in the immediate vicinity of the weaving segment.
- I-95 southbound also experiences congestion south of Commercial Boulevard where the Commercial Boulevard westbound to southbound flyover ramp merges onto I-95. Speeds as low as 25 mph were observed during both the AM and PM peak periods.

2.15 Safety Analysis

A Crash Data Review was conducted as part of this study to identify crash patterns, probable contributing cases, countermeasures and to provide recommendations for further studies, if needed. Crash analysis was performed for the mainline and ramps of the project corridor. The following section summarizes the safety analysis performed as part of this study.

2.15.1 CRASH DATA

Crash data for the I-95 project corridor was obtained using FDOT's Crash Analysis Reporting System (CAR) database for the five-year period from 2011 to 2015 for the Commercial Boulevard corridor, I-95 mainline, and I-95 ramps at the interchanges of Commercial Boulevard and Cypress Creek Road. Crash data was also obtained from the Broward County Safety Office and Fort Lauderdale Police Department through Signal Four Analytics for the Cypress Creek Road corridor from west of NW 6 Way to east of NE 7 Avenue.

2.15.2 SUMMARY OF CRASH FREQUENCY & SEVERITY

The following tables present a summary of the crash frequency, severity, and historical trend for the mainline and interchange ramps within the project corridor and the main arterials within the project limits.

Table 2-20
Crash Summary for I-95 Mainline and Ramps

Crash Type	Number of Crashes					5 Year Total Crashes	Mean Crashes Per Year	%
	Year							
	2010	2011	2012	2013	2014			
Rear End	114	125	167	213	226	845	169	51%
Head On	2	1	1	1	3	8	2	0%
Angle	23	1	2	8	3	37	7	2%
Left Turn	1	1	2	4	1	9	2	1%
Right Turn	0	1	5	3	3	12	2	1%
Sideswipe	36	49	56	57	64	262	52	16%
Backed Into	2	0	0	0	0	2	0	0%
Pedestrian	0	4	1	0	1	6	1	0%
Bicycle	1	3	0	3	3	10	2	1%
Fixed Object	26	45	40	54	31	196	39	12%
Other Non-Fixed Object Collisions	8	5	10	6	14	43	9	3%
Non-Collisions	0	10	17	15	16	58	12	3%
Others	48	30	35	30	38	181	36	11%
Total Crashes	261	275	336	394	403	1669	334	100%

As indicated in Table 2-20, a total of 1,669 crashes occurred along the mainline and interchange ramps of the project corridor over the five-year analysis period. Out of the 1,669 crashes reported, four crashes resulted in fatalities. The majority of the crashes were rear-ending (51%) and sideswipes (16%). This is indicative of traffic congestion and a need for improvement of capacity and traffic operations on I-95 and at the Cypress Creek Road/I-95 and Commercial Boulevard / I-95 interchanges to improve safety within the vicinity, including access to I-95 and the arterial intersections.

Table 2-21
Crash Summary along Commercial Boulevard

Crash Type	Number of Crashes					5 Year Total Crashes	Mean Crashes Per Year	%
	Year							
	2010	2011	2012	2013	2014			
Rear End	47	41	48	67	77	280	56	49%
Head On	3	0	1	0	2	6	1	1%
Angle	15	2	5	7	8	37	7	6%
Left Turn	4	2	2	5	4	17	3	3%
Right Turn	0	5	5	3	3	16	3	3%
Sideswipe	9	7	17	25	36	94	19	16%
Backed Into	1	0	0	0	0	1	0	0%
Pedestrian	1	2	1	0	0	4	1	1%
Bicycle	1	2	1	1	2	7	1	1%
Fixed Object	3	1	6	8	4	22	4	4%
Other Non-Fixed Object Collisions	3	1	0	1	1	6	1	1%
Non-Collisions	0	2	1	1	2	6	2	1%
Others	14	9	16	24	15	78	16	14%
Total Crashes	101	74	103	142	154	574	115	100%

As indicated in Table 2-21, a total of 574 crashes occurred along Commercial Boulevard over the five-year analysis period. Out of the 574 crashes reported, three crashes concluded in fatalities. The majority of the crashes were rear-ending (49%) and sideswipes (16%). This is indicative of traffic congestion and a need for improvement of capacity and traffic operations on Commercial Boulevard to improve safety within the vicinity, including access to I-95 and the arterial intersections.

Table 2-22
Crash Summary along Cypress Creek Road

Crash Type	Number of Crashes					5 Year Total Crashes	Mean Crashes Per Year	%
	Year							
	2010	2011	2012	2013	2014			
Rear End	17	14	30	43	50	154	31	62%
Head On	1	0	1	1	0	3	1	1%
Angle	1	0	1	2	1	5	1	2%
Left Turn	1	4	1	2	3	11	2	4%
Right Turn	1	1	1	2	0	5	1	2%
Sideswipe	4	3	2	6	7	22	4	9%
Backed Into	0	0	0	0	0	0	0	0%
Pedestrian	0	2	0	0	0	2	0	1%
Bicycle	1	0	0	1	0	2	0	1%
Fixed Object	1	2	0	1	3	7	1	3%
Other Non-Fixed Object Collisions	0	0	0	0	0	0	0	0%
Non-Collisions	5	1	6	8	7	27	5	11%
Others	0	0	2	5	4	11	2	4%
Total Crashes	32	27	44	71	75	249	50	100 %

As indicated in Table 2-22, a total of 249 crashes occurred along the county road limits over the five-year analysis period. Out of the 249 crashes reported, one fatal crash was reported in 2014. The majority of the collisions were rear-ending (62%) and sideswipes (9%). This is indicative of traffic congestion and a need for improvement of capacity and traffic operations on Cypress Creek Road to improve safety within the vicinity.

2.16 Utilities

There are 21 Utility Agency Owners (UAO) with facilities within the study area. Table 2-23 presents the list of UAOs and utility contact data obtained from Sunshine State One Call of Florida (SSOCOF). All utility companies contacted have responded and provided as-builts, marked plans or a letter indicating they have no facilities in the area.

Table 2-23
Existing Utility Agencies/Owners

	Utility Agency Owner	Facilities	Contact Person	Phone	Master Agreement
1	Allied Fiber LLC	Fiber	Kristin Zaky	212-920-8305	N/A
2	American Traffic Solutions	Telecommunications	Santiago Martinez	480-596-4595	N/A
3	AT&T Distribution Florida	Telecommunications	Otis Keeve	954-723-2540	Yes
4	Broward County Water & Sewer	Water & Wastewater	Halita Pluta	954-831-0917	Yes
5	Century Link (QWEST)	Fiber Optic	Mike Fitzgerald	813-630-2605	Yes
6	City of Fort Lauderdale	Water & Sewer	John Stahl	954-828-7830	Yes
7	City of Pompano Beach	Water & Sewer	Alessandra Delfico	954-786-4144	No
8	City of Oakland Park	Water & Sewer	Harris Hamid	954-561-6100	No
9	Comcast	Cable TV	Leonard Maxwell-Newbold	954-447-8405	Yes
10	Crown Castle	Fiber	Bryan Lowe	724-416-2193	Yes
11	Fiberlight LLC	Telecommunications	Troy Gaeta	54-422-5618	Yes
12	Fibernet Direct	Telecommunications	Danny Haskett	305-552-2931	Yes
13	Florida Power & Light - Distribution	Electric	Byron Sample	954-321-2052	Yes
14	Florida Power & Light - Transmission	Electric	George Beck	561-904-3604	Yes
15	Hotwire Communications	Telecommunications	Water Sancho Davila	954-417-3606	No
16	Level 3 Communications, LLC	Telecommunications	Michael Nunez	720-888-0916	Yes
17	MCI (Verizon)	Telecommunications	Dean Boyers	972-729-6322	Yes
18	Sice Inc	Telecommunications	Cesar Escolar Saval	305-951-4533	N/A
19	Sprint (Nextel)	Fiber Optic	Mark Caldwell	321-287-9942	Yes
20	TECO Peoples Gas	Gas	Max Chamorro	954-453-0812	Yes
21	XO Communications	Telecommunications	Tony Kowaleski	305-356-3160	Yes

2.17 Intelligent Transportation Systems (ITS)

Existing Intelligent Transportation Systems (ITS) and Signing infrastructure and devices for I-95 are documented in the "Existing ITS and Signing Conditions Memo" in Appendix B.

2.18 Existing Structural Characteristics

There are 12 bridges within the project limits, ten of which are mainline freeway bridges, one a flyover ramp (westbound Commercial Boulevard over I-95 to I-95 southbound), and one an arterial crossover bridge (N. Andrews Avenue over I-95). Most of the existing bridge superstructures (except three) consist of prestressed concrete (AASHTO) girders. There are two steel girder bridges (I-95 over Powerline Road) and one combination steel girder (main spans) and prestressed concrete (AASHTO) girder (approach spans) (flyover bridge, westbound Commercial Boulevard over I-95 to I-95 southbound). The bridge decks all consist of cast-in-place concrete. All bridges were built between 1974 to 1976 and all the mainline bridges were widened in 1990. Most of the bridges substructure consists of multi-column piers, supported on pile footings and pile end bents, with the exception of the flyover bridge (westbound Commercial Boulevard over I-95 to I-95 southbound) which consists of hammer head piers and the bridges crossing over Canal C-14 which consist of intermediate pile bents. Bridge railings meet current standards and therefore no bridge railing upgrades will be required as part of this project. See Table 2-24 for additional information about the existing bridges including bridge and span lengths, number of spans, bridge width and existing railing type and deficiencies identified by FDOT maintenance that will be addressed as part of this project.

Table 2-24
Summary of Existing Bridge Characteristics

Bridge Crossing	Bridge Number	Year Built/ Widened	Approx. Begin MP	Approx. End MP	Bridge Length	Max. Span Length	Superstructure Type	No. of Spans	Bridge Width	Shoulder Width Outside/Inside	Width Variation/ Exception	Joint Type	Traffic Railing Type	Railing Disposition	Comments
I-95 over Prospect Road	860129 (SB)	1974/1990	14.6	14.6	181'-0"	91'-0"	AASHTO Beams	3	Varies, 91'-2 3/16" - 92'-11 7/8"	10'-0"/11'-10.5"	None	Poured Joint	32" F-Shape	OK	BIR - States several failure points along the Joints, recommend replacement
	860199 (NB)	1974/1990	14.6	14.6	181'-0"	91'-0"	AASHTO Beams	3	86'-8"	10'-0"/11'-10.5"	None	Poured Joint	32" F-Shape	OK	BIR - States several failure points along the Joints, recommend replacement
WB Commercial Boulevard over I-95 to I-95 SB	860131	1974	15.0	15.1	769'-1 1/2"	134'-0"	Main: Steel Girder Continuous, Appr: AASHTO Beams	8	29'-3"	6'-0"/6'-0"	None	Poured Joint	Vertical Face Retrofit	OK	BIR - States minimal deterioration of Joints.
I-95 over Commercial Boulevard	860130 (SB)	1974/1990	15.1	15.1	176'-9"	92'-3"	AASHTO Beams	2	70'-6 1/2"	9'-8.5"/8'-0"	Exception[3]	Poured Joint	32" F-Shape	OK	BIR - States minimal deterioration of Joints.
	860196 (NB)	1974/1990	15.1	15.1	176'-9"	92'-3"	AASHTO Beams	2	70'-6 1/2"	9'-8.5"/8'-0"	Exception[3]	Poured Joint	32" F-Shape	OK	BIR - States minimal deterioration of Joints.
N. Andrews Avenue over I-95	860237 (EB & WB)	1975	15.9	15.9	284'-0"	103'-7"	AASHTO Beams	4	99'-9"	10'-0"/19'-6" median	None	Poured Joint	Vertical Face/Bullet Railing Retrofit	OK	BIR - States minimal deterioration of Joints.
I-95 over Cypress Creek Road	860239 (SB)	1976/1990	16.2	16.3	319'-0"	99'-9"	AASHTO Beams	4	87'-2 1/2"	10'-9"/11'-10.5"	None	Poured Joint	32" F-Shape	OK	BIR - States minimal deterioration of Joints. Dirt and debris to be cleaned
	860240 (NB)	1975/1990	16.3	16.3	319'-0"	99'-9"	AASHTO Beams	4	79'-2 1/2"	14'-9"/11'-10.5"	None	Poured Joint	32" F-Shape	OK	BIR - States minimal deterioration of Joints.
I-95 over Canal C-14	860243 (SB)	1975/1990	16.8	16.8	252'-0"	84'-0"	AASHTO Beams	3	86'-5 1/2"	10'-0"/11'-10.5"	None	Poured Joint	32" F-Shape	OK	BIR - States minimal deterioration of Joints.

Table 2-24
Summary of Existing Bridge Characteristics

Bridge Crossing	Bridge Number	Year Built/ Widened	Approx. Begin MP	Approx. End MP	Bridge Length	Max. Span Length	Superstructure Type	No. of Spans	Bridge Width	Shoulder Width Outside/Inside	Width Variation/ Exception	Joint Type	Traffic Railing Type	Railing Disposition	Comments
	860244 (NB)	1975/1990	16.8	16.8	252'-0"	84'-0"	AASHTO Beams	3	Varies from 97'-107'	10'-0"/11'-10.5"	None	Poured Joint	32" F-Shape	OK	BIR - States major adhesion joint failures at end bent 4, recommend replacement

Notes:

[1] Bridge characteristics collected from existing bridge plans and bridge inspection reports

[2] Railing disposition criteria is based on January 2016 SDG Section 6.7.1.C superseded FDOT barriers that are structurally and functionally adequate for resisting vehicular impact loads

[3] Violates Minimum AASHTO shoulder widths FDOT FDM Table 122.5.3

[4] 32" F-Shape Barrier appears consistent with superseded FDOT Index 14286

[5] SB – Southbound

EB – Eastbound

WB – Westbound

NB – Northbound

BIR – Bridge Inspection Report

2.18.1 STRUCTURAL CAPACITY

The bridge load rating indicates the capacity of a bridge to carry live loads. Bridges are rated at three different levels: Inventory Rating, Operating Rating and Permit Rating. Existing load rating calculations were provided by the Department for all bridges along the project. The controlling load rating factor, load rating year and methodology used in calculations are summarized in Table 2-25. All the bridges in the project have a load rating greater than or equal to 1.0. Table 2-25 also summarizes the sufficiency rating and health index that were reported in the latest inspection report.

Table 2-25
Load Rating and Inspection Information

Bridge Crossing	Bridge Number	Design Load Description	Design Load (tons)	Rating (tons)	Load Rating	Load Rating Year	Method	Suffic. Rating	Health Index	Inspection Date
I-95 over Powerline Road	860128 [Southbound (SB)]	HS-20	36	39.4	1.09	2013	LRFD*	85	71.52	5/26/2016
	860198 [Northbound (NB)]	HS-20	36	43.2	1.20	1991	LFR*	85	73.92	7/6/2016
I-95 over Prospect Road	860129 (SB)	HS-20	36	36	1.00	1991	LFR	81	98.95	3/9/2016
	860199 (NB)	HS-20	36	36	1.00	1991	LFR	81	99.2	4/21/2016
Westbound (WB) Commercial Boulevard over I-95 to I-95 SB	860131	HS-20	36	56.2	1.56	1989	LFR	91.7	90.47	6/14/2016
I-95 over Commercial Boulevard	860130 (SB)	HS-20	36	49.3	1.37	1991	LFR	92	86.73	6/10/2016
	860196 (NB)	HS-20	36	39.2	1.09	2013	LRFD	92	99.99	4/29/2016
N. Andrews Avenue over I-95	860237 [Eastbound (EB) & WB]	HS-20	36	50.05	1.39	1989	LFR	93.8	99.41	8/10/2016
I-95 over Cypress Creek Road	860239 (SB)	HS-20	36	39.3	1.09	1991	LFR	96	99.81	6/13/2016
	860240 (NB)	HS-20	36	38	1.06	1991	LFR	96	99.88	6/13/2016
I-95 over Canal C-14	860243 (SB)	HS-20	36	45.9	1.28	1991	LFR	86.9	94.77	2/29/2016
	860244 (NB)	HS-20	36	45.1	1.25	1991	LFR	86.9	95.02	2/29/2016

*Note: LRFD – Load and Resistance Factor Design
LFR – Load Factor Rating

2.18.2 MINIMUM VERTICAL CLEARANCE

FDOT FDM, Section 260.6 Vertical Clearance, provides criteria tables and figures for determining minimum vertical clearance requirements for bridges. For new bridges, the minimum vertical clearance required over limited access roadways, arterials and collector roadways is 16'-6". For any construction affecting existing bridges (e.g., bridge widenings or resurfacing), minimum vertical clearance is 16'-0".

As shown in Table 2-26, there are six existing bridges within the project limits that have existing vertical clearance less than 16'-0", and therefore Design Exceptions for vertical clearance are required for those bridges.

With respect to the vertical clearance above water for bridges over waterways, FDM requires a minimum 6 ft. clearance above the optimal water elevation to accommodate small boat traffic. The minimum vertical clearance between the design flood stage and the low member of bridges shall be two feet. This clearance is necessary to allow the majority of debris to pass under the bridge without causing damage to the structure. The existing vertical clearance at the canal C-14 crossing is 13.77 ft. and both criteria (6 ft. over Optimum Water Elevation, 2 ft. over Design Water Elevation) are met.

Table 2-26
Minimum Vertical Clearance Evaluation

Bridge Crossing	Bridge Number	Min. Vert. Cl.[1] (ft.)	Vert. Cl. Disposition
I-95 over Powerline Road	860128 [Southbound (SB)]	17.2	OK
	860198 [Northbound (NB)]	17.2	OK
I-95 over Prospect Road	860129 (SB)	15.91	Exception*
	860199 (NB)	15.91	Exception*
Westbound (WB) Commercial Boulevard over I-95 to I-95 SB	860131	15.6	Exception*
I-95 over Commercial Boulevard	860130 (SB)	15	Exception*
	860196 (NB)	15	Exception*
N. Andrews Avenue over I-95	860237 [Eastbound (EB) & WB]	15.6	Exception*
I-95 over Cypress Creek Road	860239 (SB)	16.8	OK
	860240 (NB)	17	OK
I-95 over Canal C-14	860243 (SB)	13.77	OK
	860244 (NB)	13.77	OK

Note:

[1] Based on Bridge Inspection Reports, with the exception of I-95 over Canal C-14 which is based on existing bridge plans.

* Exceptions to be processed as part of the I-95 Express Phase 3 project. Bridge over N. Andrews Avenue bridge is being proposed for replacement under this PD&E Study.

2.18.3 PIER PROTECTION

For roadway work beneath or adjacent to an existing structure and for which new construction criteria applies, FDOT Structures Design Guidelines (SDG) Section 2.6.4 states that for existing piers located within the setback distance that are not theoretically capable of resisting the LRFD equivalent static force and that are unshielded or shielded by guardrail or non-crash tested barrier wall, shall be protected using standard index 411 pier protection barrier. In lieu of pier protection barriers, strengthening of the piers can be considered. If the existing pier is capable of resisting the equivalent static force, roadside barrier in accordance with FDOT FDM, Chapter 215 Roadside Safety, as applicable, shall be provided. None of the exiting columns supporting the existing bridges are capable of resisting the equivalent static force except for possibly ramp westbound Commercial Boulevard over I-95 to I-95 southbound columns. New pier columns lengthened for bridge widening, located within the setback distance, shall be designed for the LRFD equivalent design force (See Table 2-27).

Table 2-27
Horizontal Clearance/Pier Protection

Bridge Crossing	Bridge Number	Column Width (Original)	Column Width (Widening)	Offset (Feet) @ Middle Piers	Existing Protection	Horizontal Cl. Disposition	Offset[1] (Feet) @ End Piers	Existing Protection	Horizontal Cl. Disposition
I-95 over Powerline Road	860128 [Southbound (SB)]	3'-0"	3'-0"	8'-0"	Concrete Barrier [1]	OK	14'-0"	None	Pier Protection Barrier (index 411), recommended
	860198 [Northbound (NB)]	3'-0"	3'-0"	8'-0"	Concrete Barrier [1]	OK	14'-0"	None	Pier Protection Barrier (index 411), recommended
I-95 over Prospect Road	860129 (SB)	2'-8"	2'-8"	N/A	N/A	N/A	1'-3"	Vertical Concrete Wall [2]	Pier Protection Barrier (index 411), recommended
	860199 (NB)	2'-8"	2'-8"	N/A	N/A	N/A	1'-3"	Vertical Concrete Wall [2]	Pier Protection Barrier (index 411), recommended
Westbound (WB) Commercial Boulevard over I-95 to I-95 SB	860131	4'-6" x 6'-0" [3]	N/A	Varies	Concrete Barrier, Retaining wall & Abutment	OK	Varies	Most are unprotected	Roadway Barriers, recommended
I-95 over Commercial Boulevard	860130 (SB)	2'-8"	2'-8"	Unknown [4]	Concrete Barrier [1]	OK	N/A	N/A	N/A
	860196 (NB)	2'-8"	2'-8"	Unknown [4]	Concrete Barrier [1]	OK	N/A	N/A	N/A
N. Andrews Avenue over I-95	860237 [Eastbound (EB) & WB]	3'-0"	N/A	Unknown [5]	Concrete Barrier [1]	OK	30'-0" [5]	None	Offset should be field verified during design phase, if less that 30'-0'', Pier Protection Barrier (index 411) is recommended
I-95 over Cypress Creek Road	860239 (SB)	3'-6"	3'-6"	Unknown [5]	Concrete Barrier [1]	OK	7'-0"	None	Pier Protection Barrier (index 411), recommended
	860240 (NB)	3'-6"	3'-6"	Unknown [5]	Concrete Barrier [1]	OK	7'-0"	None	Pier Protection Barrier (index 411), recommended
I-95 over Canal C-14	860243 (SB)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	860244 (NB)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Note:

All bridge information is based on existing bridge plans

[1] Similar to Index 410, Concrete Barrier

[2] None standard

[3] To be analyzed however more than likely crash test worthy

[4] Dimensions in existing plans unreadable

[5] Existing bridge plans do not reflect present conditions

2.19 Transportation Plans

The Broward MPO transportation plans and FDOT, District Four Five-Year Work Program transportation plans were reviewed to identify any programmed/planned projects along the project corridor and the major cross streets. Annually, the Broward MPO develops the Transportation Improvement Program (TIP) which is a comprehensive list of federal, state, and locally funded transportation projects within Broward County. The Broward MPO also develops the Long Range Transportation Plan (LRTP) which sets the framework for future transportation improvements for the next 26 years.

The Broward MPO Commitment 2040 LRTP builds on the 2035 Broward Transformation LRTP plan. The 2035 LRTP identified the SR 9/I-95 project as a SIS facility. The project is identified as the I-95 Managed Lanes from I-595 to the Palm Beach County Line for the implementation of four managed or express lanes, two in each direction, for year 2021-2025.

Figure 2-34 shows the various transportation related projects along or adjacent to the project corridor that have been identified in the TIP.

Current projects in the FY 2016-2017 TIP within the study area:

- Cypress Creek Joint Use Development (FM# 2331912)
- Cypress Creek Mobility Hub (FM# 4334271)
- SR 9/I-95 from south of SR 870/Commercial Boulevard to north of Cypress Creek Road (FM# 4358081)
- Powerline Road Lane Reduction Study

2.19.1 CYPRESS CREEK MOBILITY HUB MASTER PLAN

The 2035 LRTP identified a Mobility Hub located at the Cypress Creek Tri Rail Station, the Mobility Hub was identified as a Gateway Hub. A Gateway Hub is an active area with connections to high capacity transit surrounded by higher density mixed use developments including downtown areas and transit-oriented developments (TOD). The Broward MPO completed a Cypress Creek Mobility Hub Master Plan Study and partnered with SFRTA who operates Tri-Rail, FDOT, Broward County, City of Fort Lauderdale, and City of Oakland Park to complete the study.

The Cypress Creek Mobility Hub Master Plan outlined several findings and recommendations for the Cypress Creek Tri-Rail station area. The MPO board approved the motion to accept the Cypress Creek Mobility Hub master plan and to direct staff to work with partners to implement the plan recommendations. As part of the findings and recommendations the following considerations were developed to form the foundation for the concept plans: community vision, market study, height restrictions, zoning and Land Use implications/regulations, parking, site drainage, utility improvements, and streetscape concepts. The recommendations form the Cypress Creek Mobility Hub Master plan resulted in streetscape improvements.

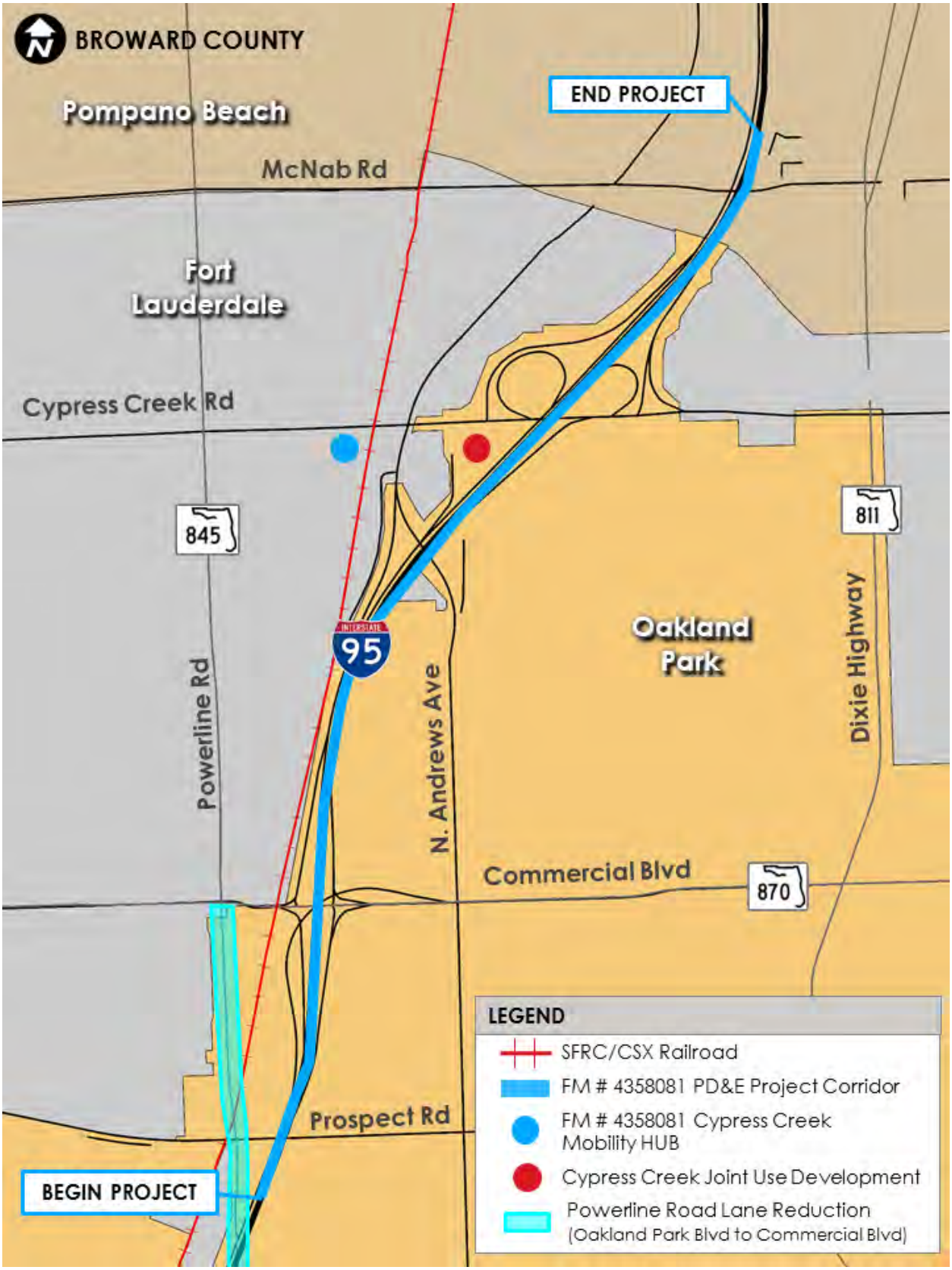


Figure 2-34 On-going Projects within the Study Area

2.20 Other Considerations

2.20.1 FORT LAUDERDALE EXECUTIVE AIRPORT (FXE)

The Fort Lauderdale Executive (FXE) Airport is located in the Uptown Business District and located west of Powerline Road between Commercial Boulevard and Cypress Creek Road. The Airport is owned and operated by the City of Fort Lauderdale and serves primarily general aviation operations.

2.20.2 PREMIER PARKS – WET'N'WILD

The Wet'N'Wild water park site is located a half-mile west of I-95, in the NW quadrant of the intersection of Commercial Boulevard with NW 12 Avenue. The site covers about 64 acres of land and includes the old Fort Lauderdale Stadium and Lockhart Stadium. The land is owned by Fort Lauderdale Executive Airport and it will be leased to Premier Parks LLC.

2.20.3 THE UPTOWN URBAN VILLAGE

The Uptown Urban Village is located in and around the FXE Airport and N. Andrews Avenue and Cypress Creek Road intersection. The area is bounded by the C-14 Canal and McNab Road to the north, 57 Street to the south, one block west of Powerline Road to the west, and I-95 to the east. The report "Developing Long-Term Strategies for Resiliency in the Face of Climate Change: The Uptown Urban Village", outlines several recommendations for the area. This report included a technical assistance panel (TAC) for the City of Fort Lauderdale partnering with Urban Land Institute (ULI). Some of the recommendation in the report includes a walkable street network, a multiway boulevard, shading, energy conservation, and transportation choices.

2.20.4 ENVISION UPTOWN

Envision Uptown is non-profit organization established in early 2014 to collaborate with landowners, business and civic leaders, and officials and staffs of local, regional, state, and federal agencies to develop a specific physical vision plan for the transformation of the Uptown area described in the previous section. Their goal is to take the necessary steps that will turn the current car dependent Uptown area into a walkable, transit-ready urban neighborhood of offices, residences, retail, hospitality, civic buildings, large and small civic spaces and parks, and public plazas.

2.20.5 CYPRESS CREEK PARK AND RIDE

The Cypress Creek Park and Ride is located in the southwest quadrant of the Cypress Creek Road interchange. The Cypress Creek Park and Ride property is maintained by lesses who are in a 99 year lease. The leaseholder have visions to develop this Park and Ride area into a Transit Oriented Development area, in particular to the close proximity of the Cypress Creek Tri-rail station to the west and direct access from I-95.

FDOT has reserved an area along the east side of the Cypress Creek Park and Creek parcel for potential use of 95 express bus service in the future.

2.20.6 PERMITTED BILLBOARD VIEW ZONES

There is an existing billboard located at the northeast quadrant of the Commercial Boulevard and N. Andrews Avenue intersection. The billboard is located on an empty parcel (Folio #4942-15-04-0030) at the corner of N. Andrews Avenue and the frontage road. The following Florida Administrative Code shall be reviewed with any proposed improvement in close proximity with the billboard:

Florida Administrative Code Rule 14-40.003(3)(b) No planting or installation of vegetation or other landscape material for landscape projects, or issuance of permits for such planting or installation, including construction and beautification projects, is allowed on Department right of way which screens or which, when mature, will screen an outdoor advertising sign permitted under Chapter 479, Florida Statutes.

3 Planning Phase

As a SIS facility, I-95's mobility plays a critical role in maintaining the economic vitality of the state. I-95 is not only a vital transportation link but a critical evacuation route as well. Preserving mobility within the corridor is of prime concern to Florida.

In 2003, FDOT finalized a master planning study for the I-95/I-595 corridors and the SFRC, which evaluated the existing deficiencies and recommended possible future improvements along these corridors. The Locally Preferred Alternative (LPA) consisted of widening I-95 to eight general purpose lanes with two HOV lanes and some interchange improvements.

In 2007, FDOT completed the Managed Lanes Comprehensive Traffic and Revenue Study, which evaluated the potential operations of the corridor with the implementation of two tolled express lanes in each direction. The study determined that the improvements would offer time savings during peak travel periods by providing continuous express lanes along I-95 throughout Miami-Dade, Broward, and Palm Beach Counties.

In 2009, FDOT began the I-95 Corridor Planning Study, between Stirling Road (SR 848) in Broward County and Indiantown Road (SR 706) in Palm Beach County, to evaluate the feasibility of adding tolled express lanes in the median of I-95. The study was completed in January 2012 and determined that express lanes along this portion of I-95 was feasible and could be studied further during the PD&E Phase to evaluate the concept as a viable alternative along the corridor. Since then, several PD&E Studies were performed and recommended the implementation of express lanes along the I-95 within the Tri-counties

Subsequently, in 2013-2015, FDOT developed an Interchanges Master Plan (IMP) to address traffic spillback onto I-95, improve interchange operations, reduce congestion, and increase safety at the 18 interchanges within Broward County. This PD&E Study addresses two of the 18 interchnages. Proposed improvements are intended to be compatible with the express lanes implementation along the I-95 corridor.

4 Project Design Standards

4.1 Design Criteria

This PD&E Study will evaluate and design alternatives in accordance with criteria and standards based on design parameters outlined in several manuals; some of which are listed below:

- A Policy on Geometric Design of Highways and Streets, AASHTO
- Best Management Practices for South Florida Urban Stormwater Management Systems, SFWMD
- Computer-Aided Design and Drafting (CADD) Structures Standards and Guidelines, FDOT
- Computer-Aided Design and Drafting Roadway Standards and Guidelines, FDOT
- Design Standards, FDOT
- Drainage Manual, FDOT
- Drainage Design Guide, FDOT
- Environmental Resource Permit Applicant's Handbook Volume II, SFWMD
- Flexible Pavement Design Manual for New Construction and Pavement Rehabilitation, FDOT
- FDOT Design Manual (FDM)
- Pavement Type Selection Manual, FDOT
- Guide for Selecting, Locating and Designing Traffic Barriers, AASHTO
- Highway Capacity Manual, Transportation Research Board
- Highway Safety Manual, Transportation Research Board
- Manual of Uniform Minimum Standards for Design, Construction and Maintenance of Streets and Highways, FDOT
- Manual of Uniform Traffic Control Devices (MUTCD), FHWA
- Project Development and Environment Manual, FDOT
- Project Traffic Forecasting Handbook, FDOT
- Roadside Design Guide, AASHTO
- Standard Drawings, Structures Design Office, FDOT
- Standard Specifications for Road and Bridge Construction, FDOT
- Structures Manual Volumes 1-9, FDOT
- The Interchange Handbook, FDOT
- Utility Accommodation Manual, FDOT

4.1.1 FREEWAY DESIGN CRITERIA

Table 4-1
Design Criteria for Freeways/Expressways

Design Elements	FDOT		AASHTO	
	Criteria	Source	Criteria	Source
Functional Classification	Urban Principal Arterial/ Interstate	FDOT Straight Line Diagram	Urban Principal Arterial	AASHTO 2011, Section 1-3
Access Classification / Interchange Spacing	Class 1 (Area Type 2) / 1 miles	Table 201.3.1, Chp 201, FDM 2018	-	-
Design Vehicle	WB-62 FL	Section 201.5, Chp 201, FDM 2018	WB-62	AASHTO 2011, Table 2-1b
10 Design Controlling Elements				
Design Speed	65 mph	Table 201.4.1, Chp 201, FDM 2018	65 mph	AASHTO 2011, Section 8.2.1
Lane Widths				
Thru Lane	12-ft	Section 211.2, Chp 211, FDM 2018	12-ft	AASHTO 2011, Section 8.2.4
Auxiliary / Speed Change Ln.				
Shoulder Width				
Mainline	4-lane freeway - Inside and outside - 12-ft (10-ft paved) (min.)	Table 211.4.1, Chp 211, FDM 2018	4-lane freeway - inside 4 to 8-ft (4-ft paved); outside 10-ft paved (min.) 6-lane or more freeway - 10-ft paved inside and outside	AASHTO 2011, Section 8.2.4
Aux Lanes	12-ft (10-ft)		8-ft	
Horizontal Curve Radius				
Radius	Varies (based on superelevation)	Table 210.8.2, Chp 210, FDM 2018	Varies (based on superelevation and friction)	AASHTO 2011, Section 3.3.5
Min. Length of Horizontal Curves	15V min	Table 210.8.1, Chp 210, FDM 2018	15V min	AASHTO 2011, Section 3.3.13
Max. Length of Horizontal Curves	30V preferred		30V preferred	
Maximum deflection without curve	0° 45' 00"	Section 210.8.1, Chp 210, FDM 2018	-	-
Maximum curvature	2° 30' 00"	Table 210.9.1, Chp 210, FDM 2018	-	-
Superelevation Rate (e)				
Maximum Superelevation Rate	emax = 10%	Table 210.9.1, Chp 210, FDM 2018	emax = 12%	AASHTO 2011, Section 8.2.6
Superelevation Transition Rate	1:250 for 2-4 lanes and 1:200 for 6 lanes	Table 210.9.3, Chp 210, FDM 2018	0.203472222	AASHTO 2011, Table 3-15
Stopping Sight Distance	820-ft	Table 211.10.1, Chp 211, FDM 2018	645-ft + adjustments	AASHTO 2011, Table 3.1

Table 4-1
Design Criteria for Freeways/Expressways

Design Elements	FDOT		AASHTO	
	Criteria	Source	Criteria	Source
Maximum Grade				
Mainline	3%	Table 211.9.1, Chp 211, FDM 2018	3% (1% steeper if right of way constraints)	AASHTO 2011, Table 8-1
Cross Slope				
Travel Lanes	2 Lanes @ 0.02 3rd & 4th Lane @ 0.03 and 6th lane @ 0.03	Figure 211.2.1 , Chp 211, FDM 2018	Min=0.015 - Max.=0.03	AASHTO 2011, Sections 3.3.3 & 4.2.2
Median - left shoulder / Outside - Right Shoulder	0.06	Table 211.2.3, Chp 211, FDM 2018	Min=0.02 - Max.=0.06	AASHTO 2011, Section 4.4.3
Bridge Deck	0.02 in each direction with no break in slope	Section 211.2.2, Chp 211, FDM 2018	-	-
Max algebraic difference between adjacent through lanes	4%		4 to 5%	AASHTO Section 4.4.3
Max algebraic difference at Turning Road Terminals	5%	Table 211.2.2, Chp 211, FDM 2018	4 to 5%	AASHTO Table 9-20
Vertical Clearance				
Roadway over Roadway	16-ft - 6-inch	Table 260.6.1, Chp 260, FDM 2018	16-ft; Min. clearance of 14-ft may be provided if alternate route with 16-ft clearance	AASHTO 2011, Section 8.2.9
Roadway over Railroad	23-ft - 6-inch		-	-
Pedestrian over Railroad	23-ft - 6-inch		-	-
Pedestrian over Roadway	17-ft - 6-inch		17-ft	AASHTO 2011 Section 8.2.9
Roadway over Canal	2-ft min from Design Flood Stage and Bridge low Member Elev. & 6-ft above Normal High Water Elevation or Control Elevation	Section 260.8.1, Chp 260, FDM 2018	-	-
Overhead Sign Structures	17-ft - 6-inch	Section 210.10.3, Chp 210, FDM 2018	17-ft	AASHTO 2011, Section 8.2.9
Overhead Dynamic Message Sign Structures	19-ft - 6-inch		-	-

Table 4-1 Design Criteria for Freeways/Expressways				
Design Elements	FDOT		AASHTO	
	Criteria	Source	Criteria	Source
Signals on Span Wires, Mast Arms, or Other Structures	17-ft - 6-inch			
Design Loading Structural Capacity	HL 93 & FL-120 Trucks	Bridge Load Rating Manual 2017	HL 93	AASHTO 2011, Section 8.2.8 (AASHTO Manual for Bridge Evaluation with 2011-2016 Interim Revisions)
Other Design Elements				
Median Width	64-ft Min. (Interstate Without Barrier) 26-ft Min. (With Barrier)	Table 211.3.1, Chp 211, FDM 2018	22-ft Min.	AASHTO 2011, Section 8.4.2
Bridge Width	Travel Lanes + 10-ft inside and outside shoulders	Section 260.5, Chp 260, FDM 2018	Roadway Width	AASHTO 2011, Section 8.2.8 (AASHTO Manual for Bridge Evaluation with 2011-2016 Interim Revisions)
Vertical Alignment				
Max Change in Grade w/o Curve	0.2	Table 211.9.2, Chp 211, FDM 2018	-	-
Min. Length of Crest Curve (Open Highway)	L=KA		L=KA	AASHTO 2011, Section 3.4.6
Min. Length of Crest Curve (Interchange)	L=KA		L=KA	
Minimum Length of Sag Curve	L=KA	Table 211.9.2, Chp 211, FDM 2018	L=KA	AASHTO 2011, Section 3.4.6
Minimum Crest K-Value	506		193	AASHTO 2011, Table 3-34
Minimum Sag K-Value	206		157	AASHTO 2011, Table 3-36
Horizontal Clearance				
Clear Zone Width Requirements	Outside Clear Zone	Table 215.2.1, Chp 215, FDM 2018	Outside Clear Zone	AASHTO 2011, Section 8.2.10 & AASHTO Roadside Design Guide Section, Chapter 4

Table 4-1 Design Criteria for Freeways/Expressways				
Design Elements	FDOT		AASHTO	
	Criteria	Source	Criteria	Source
Bridge Piers	Outside Clear Zone	Section 210.10.3, Chp 210, FDM 2018		
Fixed Objects	Outside Clear Zone			
Light Poles	20-ft from travel lanes			
	14-ft from auxiliary lanes			
	4-ft minimum behind guardrail			
ITS Poles and Related Items	Outside Clear Zone			
Aboveground Fixed Utilities (AFU)	Outside Clear Zone and as close to R/W as practical			
Canal Hazards	60-ft from travel lanes (≥50 mph)	Section 215.3.2, Chp 215, FDM 2018	-	-
Drop-off Hazards	6-ft or more with slope more than 1:3			
Border Width	94-ft (Edge of traffic Lane to L/A ROW Line including interchange ramps)	Table 210.7.1, Chpt 210, FDM 2018	-	-
Roadway Base Clearance*				
Mainline	3.0-ft above Seasonal High Ground Water Table Elevation (SHGWT)	Section 215.3.2, Chp 215, FDM 2018	-	-
Roadside Slopes				
Front Slope	1:6 for fills less than 5-ft 1:6 to Edge of CZ then '1:4 for fills 5-ft to 10-ft 1:6 to Edge of CZ then '1:3 for fills 10-ft to 20-ft 1:2 (with guardrail for fills more than 20-ft)	Table 215.2.3, Chp 215, FDM 2018	-	-
Back Slope	1:3 or 1:4			
Transverse	1:10 or Flatter			

4.1.2 FREEWAY RAMP DESIGN CRITERIA

Table 4-2
Design Criteria for Freeway/Expressway Ramps

Design Elements	FDOT		AASHTO	
	Criteria	Source	Criteria	Source
Design Vehicle	WB-62FL	Section 201.5, Chp 201, FDM 2018	WB 62	AASHTO 2011 Table 2-1b
10 Design Controlling Elements				
Design Speed				
Connector / Flyover Ramps	45-50 mph	Section 201.4.1.1, Chp 201, FDM 2018	50 mph	AASHTO 2011, Section 10.9.6
Loop and Other Ramps	30 mph		30 mph	
Lane Widths				
One-Lane Ramp	15-ft	Section 211.2.1, Chp 211, FDM 2018	15-ft	AASHTO 2011, Table 3-29
Two-Lane Ramp	24-ft (12-ft each)		24-ft	
Shoulder Width				
Outside/Right Shoulder Width	6-ft (4-ft paved) – One-Lane Ramps	Section 211.4, Chp 211, FDM 2018	10-ft combined min. (left 2'-paved) (right 8'-paved)	AASHTO 2011, Section 10.9.6
	10-ft (8-ft paved) – Two-Lane Ramps			
Inside/Left Shoulder Width	6-ft (2-ft paved) – One-Lane Ramps			
	8-ft (4-ft paved) – Two-Lane Ramps			
Horizontal Curve Radius				
Radius	Varies (based on superelevation)	Table 210.9.2, Chp 210, FDM 2018	Varies (based on superelevation and friction)	AASHTO 2011, Section 3.3.5
Min. Length of Horizontal Curves	15V min	Section 211.7.2, Chp 211, FDM 2018	15V min	AASHTO 2011 Section 3.3.13
Maximum deflection without curve	00°45'00"		-	-
Maximum curvature (Min. Radius)	8°15'00" – Connector Ramps	Table 211.2.1 and Table 210.9.2, Chp 210 and Chp 211, FDM 2018		
	24°45'00" – Loop and other Ramps			
Exit Ramp Taper Angle	4°	Standard Index 525	-	-
Superelevation Rate (e)				
Maximum Superelevation Rate	emax = 10%	Table 210.9.1, Chp 210, FDM 2018	emax = 12%	AASHTO 2011 Section 8.2.6

Table 4-2
Design Criteria for Freeway/Expressway Ramps

Design Elements	FDOT		AASHTO	
	Criteria	Source	Criteria	Source
Superelevation Transition Rate	1:200 for 45-50 mph	Table 210.9.3, Chp 210, FDM 2018	1:200 for 50 mph; 1:185 for 45 mph; 1:172 for 40 mph; 1:161 for 35 mph; 1:152 for 30 mph	AASHTO 2011 Table 3-15
	1:175 for 35-40 mph			
	1:100 for 30 mph			
Maximum Grade	8% for D.S. = < 20 mph	Table 211.10.2, Chp 211, FDM 2018	3% to 5% for 45 to 50 mph	AASHTO 2011 Section 10.9.6
	7% for D.S. = 25 to 30 mph		4% to 6% for 40 mph	
	6% for D.S. = 35 to 40 mph		5% to 7% for 25 to 30 mph	
	5% for D.S. = 45 to 50 mph		6% to 8% for 15 to 25 mph	
Cross Slopes				
Travel Lanes	2% Min, varies for superelevated segments	Figure 211.2.1, Chp 211, FDM 2018	1.5% -2%	AASHTO 2011, Section 10.9.6
Outside/Right Shoulder	6%	Table 211.2.3, Chp 211, FDM 2018	Max=0.06, Min= 0.02	
Inside/Left Shoulder	5%			
Maximum Shoulder Cross Slope Break	7%		-	-
Vertical Clearance				
Ramp over Roadway	16-ft - 6-inch	Table 260.6.1, Chp 260, FDM 2018	16-ft	AASHTO 2011, Section 8.2.9
Ramp over Railroad	23-ft - 6-inch			
Roadway over Roadway	16-ft - 6-inch		16-ft	
Roadway over Railroad	23-ft - 6-inch		-	-
Pedestrian over Railroad	23-ft - 6-inch		-	-
Pedestrian over Roadway	17-ft - 6-inch		17-ft	AASHTO 2011 Section 8.2.9
Roadway over Canal	2-ft Min from Design Flood Stage and Bridge Low Member Elev. & 6-ft above Normal High Elevation or control elevation	Section 260.8.1, Chp 260, FDM 2018	-	-
Overhead Sign Structures	18-ft	Section 210.10.3, Chp 210, FDM 2018	17-ft	AASHTO 2011

Table 4-2
Design Criteria for Freeway/Expressway Ramps

Design Elements	FDOT		AASHTO	
	Criteria	Source	Criteria	Source
				Section 8.2.9
Overhead Dynamic Message Sign Structures	19-ft - 6-inch		-	-
Signals on Span Wires, Mast Arms, or Other Structures	17-ft - 6-inch			
Design Loading Structural Capacity	HL 93 & FL-120 Trucks	Bridge Load Rating Manual 2017	HL 93	AASHTO 2011, Section 8.2.8 (AASHTO Manual for Bridge Evaluation with 2011-2016 Interim Revisions)
Other Design Elements				
Ramp Terminal Spacing				
Entrance-Entrance/Exit-Exit	-	-	Full Freeway: 1000-ft Collector Distributor Road or Freeway Distributor Road: 800-ft	AASHTO 2011 Figure 10-68
Exit-Entrance			Full Freeway: 500-ft Collector Distributor Road or Freeway Distributor Road: 400-ft	
Entrance- Exit (Weaving)			System to Service Interchange: Full Freeway: 2000-ft Collector Distributor Road or Freeway Distributor Road: 1600-ft	

Table 4-2
Design Criteria for Freeway/Expressway Ramps

Design Elements	FDOT		AASHTO	
	Criteria	Source	Criteria	Source
			Service to Service Interchange: Full Freeway: 1600-ft Collector Distributor Road or Freeway Distributor Road: 1000-ft	
Bridge Width				
One-Lane Ramps	Travel Lanes + 6-ft Shoulders	Section 260.9.1.1, Chp 260, FDM 2018	Roadway width	AASHTO 2011, Section 8.2.8 (AASHTO Manual for Bridge Evaluation with 2011-2016 Interim Revisions)
Two-Lane Ramps	Travel Lanes + 6-ft inside and 10-ft Outside Shoulders			
Vertical Alignment				
Max Change in Grade w/o Curve	0.6% - Straight Ramps	Tables 211.9.2 and 211.9.3, Chp 211, FDM 2018	0.30%	AASHTO 2011 Section 3.4
	1.0% - Loop Ramps			
Min. Length of Crest Curve	Varies, L=KA, but not less than 300-ft	Tables 211.9.2 and 211.9.3, Chp 211, FDM 2018	L=KA	
Minimum Length of Sag Curve	Varies, L=KA, but not less than 200-ft			
Minimum Crest K-Value	98 -136-ft Connector Ramps		84-ft Connector Ramps 19-ft Loop Ramps	AASHTO 2011, Table 3-34
	31-ft Loop Ramps			
Minimum Sag K-Value	79 – 96-ft Connector Ramps		96-ft Connector Ramps 37-ft Loop Ramps	AASHTO 2011, Table 3-36
	37-ft Loop and other Ramps			
Stopping Sight Distance	360 – 425-ft Connector Ramps	Tables 211.10.1 and 211.10.2, Chp 211, FDM 2018	425-ft - Connector Ramps 200-ft - Loop Ramps	AASHTO 2011, Table 3-1
	200-ft - Loop Ramps			
Horizontal Clearance				
Clear Zone Width Requirements	Outside Clear Zone	Table 215.2.1, Chp 215, FDM 2018	Outside Clear Zone	AASHTO 2011, Section

Table 4-2 Design Criteria for Freeway/Expressway Ramps				
Design Elements	FDOT		AASHTO	
	Criteria	Source	Criteria	Source
Bridge Piers	Outside Clear Zone	Section 210.10.3, Chp 210, FDM 2018		8.2.10 & AASHTO Roadside Design Guide Section, Chapter 4
Fixed Objects	Outside Clear Zone			
Light Poles	20-ft from travel lanes			
	14-ft from auxiliary lanes			
	4-ft minimum behind guardrail			
ITS Poles and Related Items	Outside Clear Zone			
Aboveground Fixed Utilities (AFU)	Outside Clear Zone and as close to R/W as practical			
Canal Hazards	60-ft from travel lanes (≥50 mph)	Section 215.3.2, Chp 215, FDM 2018	-	-
	50-ft from travel lanes (< 50 mph)			
Drop-off Hazards	6-ft or more with slope more than 1:3			
Roadway Base Clearance*				
Ramp Proper	2.0-ft above Seasonal High Ground Water Table Elevation (SHGWT)	Section 215.3.2, Chp 215, FDM 2018	-	-
Low Point on-ramps at Cross Roads	1.0-ft above SHGW Elev.			

4.1.3 ARTERIAL STREET DESIGN CRITERIA

Table 4-3
Design Criteria for Arterials

Design Elements	FDOT		AASHTO		Florida Greenbook 2016	
	Criteria	Source	Criteria	Source	Criteria	Source
*Context Classification	C4- Urban General	Page 3, FDOT Context Classification, August 2017	-	-	-	-
Functional Classification	Varies (Urban Minor / Principal Arterial)	SLD	Varies (Urban Minor / Principal Arterial)	AASHTO 2011, Section 1-3	Varies (Urban Minor / Principal Arterial)	Florida Greenbook, Chap. 1
Design Vehicle	WB-62FL	Section 201.5, Chp 201, FDM 2018	WB-62	AASHTO 2011, Table 2-1b	WB-62	Florida Greenbook Chap. 3, Table 3.2
10 Design Controlling Elements						
Design Speed	35-45 mph	Table 201.4.1, Chp 201, FDM 2018	30-60 mph	AASHTO 2011, Section 7.3.2 and 2.3.6	35-50 mph	Florida Greenbook, Chap. 3, Table 3-1
Lane Widths						
Through Lane	10-ft (11-ft for design speed > or = to 40 mph)	Table 210.2.1, Chp 210, FDM 2018	10-ft to 12-ft	AASHTO 2011, Section 7.3.3	10 &11-ft	Florida Greenbook, Chap. 3, Table 3-10
Turn Lane	11-ft (12-ft for design speed > or = to 40 mph)					
Shoulder Width	8-ft - 12-ft	Table 210.4.1, Chp 210, FDM 2018	4-ft to 8-ft	AASHTO 2011, Section 7.2.3	6-ft - 10-ft	Florida Greenbook, Chap. 3, Table 3-11
Horizontal Curve Radius						
Minimum Radius	Varies (based on superelevation)	Table 210.8.2, Chp 210, FDM 2018	Varies (based on superelevation and friction)	AASHTO 2011, Section 3.3.5	245-ft to 880-ft	Florida Greenbook, Chap. 3, Table 3-5
Min. Length of Horizontal Curves	15V min but not < 400-ft	Section 211.7.2 and Table 210.8.1, Chp 210, FDM 2018	15V min	AASHTO 2011, Section 3.3.13	900-ft long for a central angle of 1 degree or 500-ft long for a central angle of 5 degrees	Florida Greenbook, Chap. 3, Section C.4.a
Maximum Deflection Without a Curve	1°00'00" with C&G and 45'00'' without C&G for 45 mph or greater 2°00'00" for 40 mph or less	Section 210.8.1, Chp 210, FDM 2018	-	-	-	-
Deflection Through Intersections	8°00' for 30 mph	Table 212.7.1, Chp 212, FDM 2018	-	-	-	-
	6°00' for 35 mph					
	5°00' for 40 mph					
	3°00' for 45 mph					

Table 4-3
Design Criteria for Arterials

Design Elements	FDOT		AASHTO		Florida Greenbook 2016	
	Criteria	Source	Criteria	Source	Criteria	Source
Superelevation	emax = 10%	Section 210.9 and Table 210.9.2, Chp 210, FDM 2018	emax = 12%	AASHTO 2011 Section 8.2.6	5% max	Florida Greenbook, Chap. 3, Section C.4
Stopping Sight Distance	250-ft for 35 mph 305-ft for 40 mph 360-ft for 45 mph	Table 210.11.1, Chp 210, FDM 2018	250-ft for 35 mph 305-ft for 40 mph 360-ft for 45 mph 425-ft for 50 mph	AASHTO 2011, Table 7-1	250-ft for 35 mph 305-ft for 40 mph 360-ft for 45 mph 425-ft for 50 mph	Florida Greenbook, Chap. 3, Table 3-15
Maximum Grade	7% for 30 mph 7% for 40 mph 6% for 45 mph	Table 210.10.1, Chp 210, FDM 2018	8% for 30 mph 7% for 35 to 40 mph 6% for 45 to 50 mph 5% for 55 to 60 mph	AASHTO 2011 Section 7.3.2 Table 7-4	8% for 30 mph 7% for 35 to 40 mph 6% for 45 to 50 mph	Florida Greenbook, Chap. 3, Table 3-7
Cross Slopes	2% to 4%	Figure 211.2.1, Chp 211, FDM 2018	1.5% to 3%	AASHTO 2011, Sections 7.3.2 & 4.2.2	1.5% to 3%	Florida Greenbook, Chap. 3, Section C.7
Vertical Clearance						
Roadway over Roadway	16-ft - 6-inch	Table 260.6.1, Chp 260, FDM 2018	16 ft.; min. clearance of 14 ft. may be provided if alternate route with 16 ft. clearance	AASHTO 2011, Section 7.3.5	16.5 ft. (major arterials); 16 ft. (other streets and highways) and 14 ft. allowed in specific conditions	Florida Greenbook, Chap. 3, C.7
Roadway over Railroad	23-ft - 6-inch		-	-	23 ft.	
Pedestrian over Railroad	23-ft - 6-inch					
Pedestrian over Roadway	17-ft - 6-inch		17 ft.	AASHTO 2011 Section 8.2.9	17 ft.	
Roadway over Canal	2-ft min from Design Flood Stage and bridge low Member Elev. & 6-ft above Normal High Water Elevation or Control Elevation	Section 260.8.1, Chp 260, FDM 2018	-	-	2-ft min from Design Flood Stage and bridge low Member Elevation	Florida Greenbook, Chap. 17, C.3
Overhead Sign Structures	17-ft - 6-inch	Section 210.10.3, Chp	17-ft	AASHTO 2011 Section 7.3.5	-	-

Table 4-3
Design Criteria for Arterials

Design Elements	FDOT		AASHTO		Florida Greenbook 2016	
	Criteria	Source	Criteria	Source	Criteria	Source
Overhead Dynamic Message Sign Structures	19-ft - 6-inch	210, FDM 2018	-	-	-	-
Signals on Span Wires, Mast Arms, or Other Structures	17-ft - 6-inch		HL 93	AASHTO 2011, Section 8.2.8 (AASHTO Manual for Bridge Evaluation with 2011-2016 Interim Revisions)	-	-
Design Loading Structural Capacity	HL 93 & FL-120 Trucks	Bridge Load Rating Manual 2017	-	-	-	-
Other Design Elements						
Bike Lane Width	7-ft Buffered Bike Lanes	Section 223.2.1.1, Chp 210, FDM 2018	HL 93	AASHTO 2011, Section 8.2.8 (AASHTO Manual for Bridge Evaluation with 2011-2016 Interim Revisions)	-	-
Median Width	40-ft for D.S. > 45 mph 19.5 - 22-ft for D.S. < or = 45 mph and 15.5-ft for D.S. < 40 mph	Table 210.3.1, Chp 210, FDM 2018	-	-	4-ft Bike lanes (5-ft min. when adjacent to curb and gutter or other barrier) Bike Lanes	Florida Greenbook, Chap. 3, Section C.10 & Chap. 9, Section B.1
Vertical Alignment						
Minimum Crest K-Value (RRR Criteria)	35 mph - L=KA (K=25) 40 mph - L=KA (K=44)	Table 210.10.3, Chp 210, FDM 2018	30-ft to 60-ft	AASHTO 2011 Sections 7.3.3	19.5-ft for 50 mph 15.5-ft for 45 mph or less	Florida Greenbook, Chap. 3, Table 3-14
	45 mph - L=KA (K=61)		29 for 35 mph	AASHTO 2011 Table 3-34	29 - D.S. = 35 mph	Florida Greenbook, Chap. 3, Table 3-9
Minimum Sag K-Value	35 mph - L=KA (K=49)		44 for 40 mph		44- D.S. = 40 mph	
	40 mph - L=KA (K=64)		61 for 45 mph		61 - D.S. = 45 mph	
	45 mph - L=KA (K=79)		84 for 50 mph		84 - D.S. = 50 mph	
Minimum Curve Lengths	35 mph= 105	Table 210.10.4, Chp 210, FDM 2018	49 for 35 mph	AASHTO 2011 Table 3-36	49 - D.S. = 35 mph	Florida Greenbook, Chap. 3, Table 3-9
	40 mph= 120		64 for 40 mph		64 - D.S. = 40 mph	
	45 mph =135		79 for 45 mph		79 - D.S. = 45 mph	
			96 for 50 mph		96 - D.S. = 50 mph	

Table 4-3
Design Criteria for Arterials

Design Elements	FDOT		AASHTO		Florida Greenbook 2016	
	Criteria	Source	Criteria	Source	Criteria	Source
Horizontal Clearance						
Fixed Objects	Outside Clear Zone	Table 215.2.2, Chp 215, FDM 2018	L=KA	AASHTO 2011, Section 3.4.6	L=KA (200-300-ft minimum)	Florida Greenbook, Chap. 3, Table 3-9
Light Poles	20-ft from travel lanes					
	14-ft from auxiliary lanes					
	4-ft from curb					
ITS Poles and Related Items	Outside Clear Zone					
Aboveground Fixed Utilities (AFU)	Outside Clear Zone and as close to R/W as practical		Outside Clear Zone and as close to R/W as practical	AASHTO Roadside Design Guide 2011, Section 4.2	Outside Clear Zone	Florida Greenbook, Chap. 3, C.7
Drop-off Hazards	For DS ≤ 45 mph a slope steeper that 1:3 with a depth of 6-ft or more with 22-ft of traveled way	Section 215.3.1, Chp 215, FDM 2018	Outside Clear Zone	AASHTO Roadside Design Guide 2011, Section 4.5.2		
Canal Hazards	Clearances requirements: Flush Shoulder DS ≥ 50 mph - 60-ft; Flush Shoulder DS ≤ 45 mph- 50-ft; Curb & Gutter Roadway- 40-ft	Section 215.3.2, Chp 215, FDM 2018				
Conventional Lighting	Urban C & G (D.S. < or= 45 mph) 4-ft behind face of Curb	Table 215.2.2, Chp 215, FDM 2018				
Bridge Piers	Urban C & G (D.S. < or= 45 mph)					
	16-ft from Edge of Travel Lane			AASHTO Roadside Design Guide 2011, Section 4.8		
	4-ft from Face of Outside Curbs		-	-	Shield if within clear zone	Florida Greenbook, Chap. 4, D.4
	6-ft from the Edge of Inside Traffic Lane					
Border Width	D.S. = 45 mph	Table 210.7.1, Chp 210, FDM 2018	Outside the clear zone	AASHTO 2011 Section 4.6.1and AASHTO Roadside Design	Outside of clear zone, but shield if within clear zone	Florida Greenbook, Chap. 6

Table 4-3
Design Criteria for Arterials

Design Elements	FDOT		AASHTO		Florida Greenbook 2016	
	Criteria	Source	Criteria	Source	Criteria	Source
				Guide 2011 Section 4.5.2		
	14-ft Travel Lanes at Curb		Urban C & G - 1.5-ft from Face of Curb, w/ 3-ft at intersections; No C & G - 4-ft from edge of traveled way for shoulder < 4-ft	AASHTO 2011, Section 7.3.4	Placed outside of clear zone if possible / Placed at or beyond the required shoulder	Florida Greenbook, Chapters 7 &. 17
	12-ft with Bike or Aux. Lanes					
	D.S. < or = 40 mph					
	12-ft Travel Lanes at Curb					
	10-ft with Bike or Aux. Lanes		8-ft to 12-ft	AASHTO 2011, Section 7.3.3	Wide enough to provide pedestrian activity including space to walk, provide places for street furniture and landscaping, etc.	Florida Greenbook, Chap. 19, Section E.5
Sidewalk	5-ft Standard	Table 222.1.1, Chp 222, FDM 2018	Varies 4 to 8-ft; Less than 5-ft requires passing section every 200-ft; Adjacent to curb add 2-ft to min. required width	AASHTO 2011 Section 4.17.1	5-ft Standard, may be reduced to 4-ft when physical constraints exist	Florida Greenbook, Chap. 3, Section C.7
	6-ft Adjacent to curb				6-ft Adjacent to curb	

*A context classification was not assigned for this project, so 'C4 – Urban General' was assumed as it best fits the general description for all arterials within the vicinity of this project.

4.1.4 DRAINAGE DESIGN CRITERIA

Table 4-4
Design Criteria for Drainage

Design Elements	Criteria	Source
Cross Drains	50-Year design frequency	D.M. Section 4.3.1
Design Tailwater		
All Conditions	Conditions vary with outfall	D.M. Section 3.4
Time of Concentration (TOC)	Minimum T.O.C. of 10 Minutes	D.M. Section 3.5.1
	Other T.O.C calculations to follow NRCS TR-55	
Pipe Slopes		
Minimum	Min. slope to produce v=2.5 ft./sec flowing full	D.M. Section 3.6.1
Manning's "n" Coefficient		
Pipes	0.012 (smooth pipes) 0.024 (corrugated pipe)	D.M. Section 3.6.4
Asphalt (rough texture)	0.016 Asphalt Pavement	D.D.G. Table B-2
Grades		
Longitudinal Gutter Grade	minimum gutter grade is 0.3%	D.M. Section 3.8.1
Spread Standards		
Design Speed ≤ 45	Keep ½ lane clear	D.M. Section 3.9
45 < Design Speed ≤55	Keep 8 ft. of lane clear	
Design Speed >55	No encroachment	
Pipe Size and Length		
Trunk Line	18-in Minimum Diameter.	D.M. Section 3.10.1
Length Between Structure	18 in. Pipe=300 ft., 24 in. – 36 in.=400 ft., >42 in.=500 ft.	D.M. Section 3.10.1
Ground Water Clearance		
Dry-retention	Pond bottom minimum 1 ft. above SHGWT	B.M.P. Section VIII
Freeboard		
Storm Drain	Minimum 1 ft. Below Theoretical Gutter Elevation	D.D.G. Section 6.5
Ponds	Minimum 1 ft. above peak design stage	D.M. Section 5.4.4.2
Roadside Swale	Minimum of 0.5 ft. freeboard	D.M. Section 5.4.4.2
Stormwater Management System		
Water Quality	Water quality standards, as set forth in Chapter 62-302, Florida Administrative Code.	ERP II 4.1.1
Discharge Limitations	Historic Discharges, Post <= Pre	ERP II 3.2

5 Alternative Alignment Analysis

Developing alternatives that meet the purpose and need for the project was undertaken in a collaborative process utilizing input from the Department, stakeholders, and the study team. A two-phase alternative development, evaluation and section process was followed to develop, evaluate, and eliminate potential project alternatives based on the purpose and need for the project. A detailed discussion of each of the phases is summarized in Section 5.3 and Section 5.4.

5.1 No-Action (No-Build) Alternative

The No-Action alternative is an alternative solution that assumes the retainment of existing conditions within the projects limits. As part of the PD&E process, an analysis of the existing conditions with respect to the transportation needs of the area was performed to determine if operating conditions would significantly deteriorate should no improvements be implemented. This alternative is also utilized as a benchmark for comparison against the Transportation System Management & Operations (TSM&O) and the Build Alternatives. Thus, the No-Action Alternative will remain under consideration throughout the PD&E Study, including the Public Hearing.

5.2 Transportation Systems Management and Operations

TSM&O alternatives generally provide short-term improvements that extend the service life of the facility. TSM&O alternatives also seek to maximize the performance and utilization of the existing infrastructure through implementation of systems, services, and projects. This may include milling and resurfacing of the roadway surface to extend pavement life, improvements to roadway signing and pavement markings, traffic incident management, traveler information services, traffic control and repairs/enhancements to pedestrian facilities aimed at enhancing safety and meeting Americans with Disabilities Act (ADA) requirements.

TSM&O improvements will only alleviate some operational, geometric and safety deficiencies along some portions of the study area. Their implementation alone does not meet the purpose and need for this project. Therefore, it was concluded that in addition to TSM&O solutions, major reconstruction alternatives would be evaluated to meet the Purpose and Need for this project.

5.3 Phase 1 – High Level Subarea Alternative Evaluation

Phase 1 consisted of a high level screening (fatal flaw analysis) of individual subareas composed of individual interchange and intersection alternatives. The following locations were screened as subareas:

- I-95 Mainline
- I-95 and Commercial Boulevard Interchange
- Commercial Boulevard and Powerline Road Intersection
- Commercial Boulevard and N. Andrews Avenue Intersection
- Cypress Creek Road and N. Andrews Avenue Intersection
- I-95 and Cypress Creek Road Interchange

The subarea alternatives were geometrically developed to assess potential fatal flaws using a qualitative approach. Two criteria were used to evaluate the I-95 mainline subarea alternatives; ramp connection spacing and safety concerns. The following criteria was used to evaluate the interchanges and intersections subarea alternatives: right of way impacts and safety concerns.

A preliminary traffic operational analysis and an environmental desktop review were performed for the subarea alternatives; however, they did not establish a clear differentiation between subarea alternatives. Therefore, the Study Team has elected to use the variables mentioned above to

eliminate unreasonable or nonviable subarea alternatives and help identify viable improvements to be further refined and analyzed in greater detail in Phase 2. The recommendations of the Phase 1 high level subarea alternatives analysis are summarized in Table 5-1 and Section 5.3.7.

The following alternatives were evaluated for each of the subareas.

5.3.1 I-95 MAINLINE SUBAREA ALTERNATIVES

FDOT is currently implementing Phase 3 of the 95 Express Lanes project continuing 29 miles north from Stirling Road in Broward County to Linton Boulevard in Palm Beach County. The 95 Express Phase 3A project will convert the existing HOV lane in each direction to an express lane and add one additional express lane in each direction. The resulting typical section becomes a 10-lane facility comprised of three general purpose lanes and two express lanes in each direction.

Auxiliary lanes were not evaluated as part of the alternative analysis since the 95 Express Phase 3 construction project expanded the typical section within the project limits to three general purpose lanes, two express lanes, and one auxiliary lane in each direction between the study interchanges. This geometry was considered as the base condition for the subarea alternatives.

The existing I-95 mainline has two safety concern between the Cypress Creek Road and Commercial Boulevard interchanges that should be addressed by the recommended alternative. There are three closely spaced southbound on-ramps from the Cypress Creek interchange (westbound to southbound loop, Cypress Creek Park and Ride on-ramp and the southbound on-ramp from N. Andrews Avenue) with substandard acceleration lanes which merge with the general-purpose traffic. This forces commuters to merge with the general-purpose traffic while accelerating which is an unsafe maneuver. Additionally, there is a substandard weaving distance between the southbound on-ramp from N. Andrews Avenue and the Commercial Boulevard off -ramp.

Collector-Distributor (CD) Road Systems were evaluated for the I-95 mainline. A southbound CD road system between the Cypress Creek Road and Commercial Boulevard interchanges would reduce the number of closely spaced southbound on-ramp merges and short weaving segments between interchanges. Two southbound CD road systems options were evaluated. Both options combine the Cypress Creek Park and Ride on-ramp and the southbound on-ramp from N. Andrews Avenue to begin the CD road system.

Option 1 includes braiding the CD road system between the Cypress Creek Road and Commercial Boulevard with the Commercial Boulevard southbound off-ramp. The merge point of the CD road system is just north of Commercial Boulevard which is a safety concern with traffic from the CD road system merging with I-95 general purpose lanes within the constraint cross section of I-95 underneath the Commercial Boulevard westbound to southbound flyover ramp. Due to safety concerns with merging of the CD road system with the I-95 general purpose lanes, this subarea alternative was eliminated from further analysis.

Option 2 continues the southbound CD road system over Commercial Boulevard and merges with the existing westbound to southbound flyover ramp from Commercial Boulevard before tieing into the I-95 mainline. This subarea alternative was advanced for further refinement and analysis in Phase 2.

A northbound CD road system was also evaluated to improve the weaving condition of the northbound on-ramp from Commercial Boulevard with the northbound off-ramp to Cypress Creek Road. However, this option would result in significant impacts to adjacent residential properties to accommodate the required braided ramp system. As a result, a northbound CD road system was eliminated from further consideration.

5.3.2 I-95 AND COMMERCIAL BOULEVARD INTERCHANGE SUBAREA ALTERNATIVES

The Commercial Boulevard Interchange subarea evaluation consisted of two types of interchanges; a Tight Urban Diamond Interchange (TUDI) and a Diverging Diamond Interchange (DDI). The interchange subarea alternatives provide full access to and from I-95.

The following is a description of the two subarea alternatives analyzed for the Commercial Boulevard interchange:

- TUDI - Maintains the existing tight urban diamond interchange configuration including the existing westbound to southbound flyover and modifies the I-95 off-ramps and ramp terminal intersections. The locations of the existing ramp terminal intersections are maintained with this alternative and provide approximately 300 ft. between the two intersections measured from centerline to centerline.

  As part of the 95 Express Phase 3 project, improvements to the northbound off-ramp include modifying the existing single lane exit to a two-lane exit with a shared choice lane and an exit only lane located just north of the Prospect Road bridge. The two-lane off-ramp opens to four lanes approximately 1000 ft. prior to the Commercial Boulevard intersection. The off-ramp widens to the outside to accommodate an additional two lanes approximately 400 ft. prior to the Commercial Boulevard Intersection. This subarea alternative eliminates the existing free-flow right turn lane to eastbound Commercial Boulevard and provides three left turn lanes and three right turn lanes at the signalized ramp terminal intersection.

  As part of the 95 Express Phase 3 project, improvements to the southbound off-ramp include modifying the existing single lane exit to a two-lane exit with a shared choice lane and an exit only lane located approximately 1,500 ft. from the Commercial Boulevard intersection. The two lanes open to five lanes approximately 800 ft. prior to the Commercial Boulevard intersection which accommodates three left turn lanes and two right turn lanes. This subarea alternative eliminates the existing free-flow right turn lane to westbound Commercial Boulevard and provides three left turn lanes and two right turn lanes at the signalized ramp terminal intersection.

  This subarea alternative was advanced for further refinement and analysis in Phase 2.

- DDI - The I-95 northbound and southbound exit ramps for the DDI are unchanged from the TUDI subarea alternative with approximately 300 feet of distance between the northbound and southbound left turn lanes. This distance allows for approximately 600 feet between the two crossover intersections. This interchange configuration consists of two two-phase signals at the ramp terminal intersections.

  The existing interchange at Commercial Boulevard performs rather well and is not considered a high crash location. When evaluated from a traffic perspective, the improvements needed are dual right turn lanes at the southbound off-ramp and triple right turn lanes at the northbound off-ramp. The traffic issue at this interchange stems from the intersection of Commercial Boulevard and N. Andrews Avenue. There is a large volume of traffic traveling westbound along Commercial Boulevard with approximately half of it wanting to continue west and/or north and half of it wanting to access the existing southbound flyover ramp. The intersection is metering the traffic getting to the flyover. A DDI does not address this issue. In addition, there is a concern related to the safety of a DDI in close proximity to an active railroad facility.

  Due to the proximity of the railroad tracks to the west of the interchange and the residential neighborhood located in the southeast quadrant of the northbound I-95 off-ramp, the maximum design speed achieved while maintaining the critical geometric elements of a DDI was 35 miles per hour. This design speed reduces the existing posted speed by 10 miles per hour, which was identified as a potential safety concern, especially at night during non-congested travel times. Revising the geometry of the DDI to maintain a higher design speed

was considered but the right of way impact was significant without addressing the traffic metering concern associated with the adjacent intersection of Commercial Boulevard and N. Andrews Avenue.

After careful consideration of the mentioned issues, it was determined that this interchange is not an ideal location for a DDI. For these reasons, this subarea alternative was eliminated from further consideration.

5.3.3 COMMERCIAL BOULEVARD AND POWERLINE ROAD INTERSECTION SUBAREA ALTERNATIVES

The intersection of Commercial Boulevard and Powerline Road is located approximately 800 ft. west of the I-95 southbound off-ramp. The four quadrants of the intersection are developed. Four subarea alternatives were developed and evaluated; an echelon with a Median U-turn (MUT), MUTs along Powerline Road, a north-south grade separation of Powerline Road over Commercial Boulevard, and a traditional intersection widening alternative. Several other alternatives were considered but dismissed due to associated impacts related to: right of way, out-of-direction travel, and impacts to the local roadway network. These other alternatives included quadrant roads located in either or both of the western quadrants of the intersection.

The following is a description of the four subarea alternatives analyzed for the Commercial Boulevard and Powerline Road intersection:

- T-Bridge (Echelon) with a MUT – An echelon is a T-shaped bridge above the existing intersection of Commercial Boulevard and Powerline Road. The echelon intersection essentially splits the existing at-grade four-phase signalized intersection into two two-phase signalized intersections on two different levels. By splitting a single intersection into two, congestion and delay are reduced, and throughput is increased by increasing the effective green time for every movement. As previously described, a MUT intersection eliminates the left turn at the main intersection and either forces the traffic to make a right turn followed by a U-turn or go through the intersection, U-turn, and then execute a right turn.

  Typically, an echelon provides four legs of an intersection for both the at-grade and elevated intersections. However, due to the location of the existing railroad tracks geometrically constraining the vertical profile, the eastern leg of the intersection was required to remain at grade. The at-grade intersection provides movements for the eastbound and westbound thru movements and right turns. Additionally, the at-grade intersection provides movements for the westbound left turn. The elevated intersection provides movements for the northbound and southbound thru and left turns.

  Due to the railroad constraints previously mentioned, the southbound left is forced to turn right from the elevated intersection and utilize a MUT located at-grade approximately 1,300 ft. to the west of the main intersection. To accommodate the design vehicle and a dual U-turn, a bulb-out is required at the MUT intersection. To meet design standards, this alternative requires widening along Commercial Boulevard and Powerline Road. This alternative requires a significant amount of right of way, retaining walls and structures, however it also provides acceptable operations.

  This subarea alternative was advanced for further refinement and analysis in Phase 2.

- Median U-Turns along Powerline Road - This subarea alternative proposed MUTs approximately 800 ft. north and south of Commercial Boulevard. The north MUT would serve the westbound and northbound left turn movements while the south MUT would serve the eastbound and southbound left turn movements. Bulb outs would be required at the MUT to allow for off-tracking of design vehicles. This alternative requires dual right turn lanes for all approaches except the eastbound right turn which can be handled by a single lane.

  Due to the significant out-of-direction travel for the left turn movements and right of way impacts at the bulb outs, this subarea alternative was eliminated from further consideration.

- Northbound-southbound Grade Separation – This subarea alternative proposes grade separation of the north-south thru movements along Powerline Road over Commercial Boulevard. Access to developed parcels located in the four quadrants are maintained with a frontage road along Powerline Road. The touchdown points for the grade separation are approximately 1,000 ft. from the Commercial Boulevard and Powerline Road intersection. The at-grade intersection operates under a four-phase signal and provides movements to all directions. This maintains access to the parcels in the four quadrants. To meet design standards, this subarea alternative requires widening along Commercial Boulevard and Powerline Road.

  This subarea alternative was advanced for further refinement and analysis in Phase 2.

- Traditional Intersection Widening – This alternative proposes minor widening and restriping along Commercial Boulevard and Powerline Road. Along Commercial Boulevard, the westbound approach to Powerline Road is restriped to provide a fourth thru lane and one left turn lane. Along Powerline Road, the southbound approach to Commercial Boulevard is restriped to provide a third left turn lane and two thru lanes. Right of way impacts to the four quadrants are anticipated.

  This subarea alternative was advanced for further refinement and analysis in Phase 2.

5.3.4 COMMERCIAL BOULEVARD AND N. ANDREWS AVENUE INTERSECTION SUBAREA ALTERNATIVES

The intersection of Commercial Boulevard and N. Andrews Avenue is located approximately 1,350 ft. to the east of the I-95 northbound off-ramp. The southeast and southwest quadrants consist mostly of residential homes. The northeast consists of a frontage road with mostly businesses and a few residential homes. The northwest quadrant has a small Park and Ride. Five alternatives were developed for subarea analysis: a quadrant road, grade separation, two variations of traditional intersection widening, and a traditional intersection widening with a flyover.

As previously mentioned, the traffic issue at this intersection stems from the large volume of traffic traveling westbound along Commercial Boulevard with approximately half of it wanting to continue west and/or north and half of it wanting to access the existing I-95 southbound flyover ramp. The intersection is in essence metering the traffic getting to the flyover.

The following is a description of the five subarea alternatives analyzed for the Commercial Boulevard and N. Andrews Avenue intersection:

- Quadrant Road – This subarea alternative utilizes a quadrant road to remove left turns from the Commercial Boulevard and N. Andrews Avenue intersection. A quadrant road consists of a connector road that intersects both arterials and is used to reroute left turns from the main intersection. Rather than left turns being executed at the main intersection, left turning traffic uses a series of left or right turns at adjacent signalized intersections to complete the desired movement. This allows the main intersection to be controlled by fewer signal phases, increasing the throughput, and reducing the lost time and delay of the intersection.

  The quadrant road for this subarea alternative was placed in the northwest quadrant of the main intersection, where the existing Park and Ride is located. The other three quadrants were not considered for a quadrant road due to right of way impacts to businesses and residential homes. The quadrant road serves the eastbound and westbound left turns from Commercial Boulevard.

  The left turns from N. Andrews Avenue are still executed at the main intersection. Both movements are displaced approximately 200 ft. prior to the Commercial Boulevard and N. Andrews Avenue intersection. By displacing the left turns, the left turns no longer conflict with the thru movements and the northbound and southbound approaches operate as a continuous flow intersection.

This subarea alternative would require removing the westbound to southbound single-lane flyover ramp to I-95 due to the proximity of the proposed quadrant road. Additionally, displacing the northbound and southbound left turns impacts right of way on the northeast and southwest quadrants. Operationally, the locations of the quadrant road intersections are too close to the main intersection and are not ideal for adequate signal coordination and progression. For these reasons, this subarea alternative was eliminated from further consideration.

- Westbound-Eastbound Grade Separation – This subarea alternative proposes grade separating the east-west thru traffic along Commercial Boulevard from N. Andrews Avenue. Traffic to and from N. Andrews Avenue would be maintained by a frontage road adjacent to the elevated Commercial Boulevard thru lanes. The touchdown points for the grade separation are approximately 700 ft. from the N. Andrews Avenue intersection.

  To meet design standards, this subarea alternative requires widening along Commercial Boulevard. By grade separating the heavy east-west thru movements, the at-grade N. Andrews Avenue/Frontage Road intersection provides acceptable operations. As previously mentioned, the traffic issue at this intersection stems from the large volume of traffic traveling westbound along Commercial Boulevard with approximately half of it wanting to continue west and/or north and half of it wanting to access the existing I-95 southbound flyover ramp. Although removing the thru movement from the intersection of Commercial Boulevard and N. Andrews Avenue results in additional time for the at-grade thru movement to access the I-95 southbound flyover ramp, there is still a significant westbound queue. Due to minor traffic operational benefits, coupled with the associated impacts of implementing this concept, this subarea alternative was eliminated from further consideration.

- Traditional Intersection Widening, North & West Legs – This subarea alternative proposes widening along Commercial Boulevard and N. Andrews Avenue. An additional left turn is added to the north leg of N. Andrews Avenue while the approach on the south leg remains unchanged, creating an acceptable deflection thru the intersection. The east and west leg of Commercial Boulevard is widened to accommodate an additional eastbound thru lane, which merges back down to the existing cross-section approximately 1,200 ft. east of the intersection.

  To minimize right of way impacts, the south curb line along Commercial Boulevard was maintained, and widening was achieved to the north, impacting the small Park and Ride and FDOT owned frontage road. Additionally, the west curb line along the southbound approach of N. Andrews Avenue was maintained and widening was achieved to the east. The northbound approach along N. Andrews Avenue maintained both the east and west curb line and required an acceptable offset of the thru lanes within the intersection to eliminate right of way impacts to adjacent parcels.

  This subarea alternative was advanced for further refinement and analysis in Phase 2.

- Traditional Intersection Widening with Westbound Flyover - In addition to the widening proposed in the Traditional Intersection Widening, North & West legs, this subarea alternative proposes a westbound flyover to serve the westbound traffic on Commercial Boulevard bound for southbound I-95. The flyover starts approximately 1,550 ft. east of the N. Andrews Avenue intersection and runs along the north curb line of Commercial Boulevard. After crossing over N. Andrews Avenue, the flyover ties into the existing westbound to southbound flyover ramp as a second lane and is carried approximately 500 ft. before merging to match the existing single lane cross-section of the existing westbound to southbound flyover ramp.

  The proposed flyover eliminates access to eastbound Commercial Boulevard from NE 3 Avenue and requires reconfiguration of the existing frontage road that runs parallel to Commercial Boulevard. The frontage road will be reduced to a single westbound lane and traffic from the frontage road and NE 3 Avenue will be rerouted to NW 51 Street to maintain connectivity to Commercial Boulevard.

This subarea alternative was advanced for further refinement and analysis in Phase 2.

- Traditional Intersection Widening, North, East & West Legs – This subarea alternative proposes widening along Commercial Boulevard and N. Andrews Avenue. In addition to the proposed improvements to the south and eastbound approaches described in the Traditional Intersection Widening, North & West Legs, this subarea alternative also widens the westbound approach to include an additional thru lane. This subarea alternative also retrofits the existing westbound single lane flyover on-ramp to southbound I-95 to accommodate a two-lane on-ramp. The second lane is carried approximately 500 ft. before merging to match the existing single lane cross-section of the existing westbound to southbound flyover ramp.

  Reconfiguration of the existing frontage road that runs parallel to Commercial Boulevard is required as described in the Traditional Intersection Widening with Westbound Flyover. To minimize right of way impacts, the south curb line along Commercial Boulevard was maintained, and widening was achieved to the north.

  This subarea alternative was advanced for further refinement and analysis in Phase 2.

5.3.5 I-95 AND CYPRESS CREEK ROAD INTERCHANGE SUBAREA ALTERNATIVES

The existing I-95 interchange has two safety-related design deficiencies that should be addressed by the recommended alternative. The existing northbound to westbound off-ramp has substandard geometry leading to accidents involving vehicles leaving the roadway. Additionally, the substandard weaving length between the northbound to westbound I-95 off-ramp and the westbound to southbound I-95 on-ramp contributes to sideswipes and rear end accidents.

Four types of interchanges were analyzed for the Cypress Creek Road interchange subarea, a DDI, a Tight Diamond With Displaced Left (TDDL) turn interchange, a braid system at the northwest quadrant, and modification of the existing partial cloverleaf interchange. The interchange subarea alternatives provide access to and from I-95 for all movements except for eastbound Cypress Creek Road to I-95 southbound. Due to the Cypress Creek Park and Ride located in the southwest quadrant of the interchange, direct access from eastbound Cypress Creek Road to southbound I-95 is provided by the existing N. Andrews Avenue On-ramp.

Several alternatives were developed that removed or relocated the existing southbound on-ramp from N. Andrews Avenue to reduce the traffic volumes at the Cypress Creek Road and N. Andrews Avenue intersection. These alternatives included a new I-95 southbound on-ramp from NW 66 Street which will be described as the Canal On-ramp.

The proposed Canal On-ramp repurposes the east leg of the N. Andrews Avenue and NW 66 Street intersection and runs the new on- ramp overtop an existing canal. The Canal On-ramp reduces traffic at the N. Andrews Avenue intersection by providing an additional entrance ramp to southbound I-95. This Canal On-ramp meets limited right of way access control requirements but impacts access to local businesses. The existing driveway at NW 66 Street would have to be relocated to the north to accommodate the proposed Canal On-ramp. The four subarea alternatives for the Cypress Creek Road interchange are compatible with the Canal On-ramp. The Canal On-ramp was advanced for further refinement and analysis in Phase 2.

The following is a description of the four subarea alternatives analyzed for the Cypress Creek Road interchange:

- DDI – The DDI subarea alternative removes the existing I-95 on-ramp from N. Andrews Avenue. The I-95 northbound and southbound off-ramps are located similar to a tight diamond configuration, placing the east (northbound off-ramp) and west (southbound off-ramp) two-phase signalized crossover intersections approximately 600 ft. apart.

  As previously mentioned, due to the Cypress Creek Park and Ride located in the southwest quadrant of the interchange, the southbound I-95 on-ramp (which would be typically be

located on the west side of a DDI) is located on the east side of the interchange. This entails combining the on-ramp to northbound and southbound I-95 east of the northbound off-ramp at a two-phase signalized intersection. Downstream from the signal, approximately 300 ft. from the gore, the northbound and southbound on-ramps diverge, and the southbound on-ramp goes over the I-95 mainline before tying into any of the two proposed southbound CD road system options.

This interchange configuration consists of two two-phase signals; the I-95 northbound and southbound off-ramp and the I-95 northbound and southbound on-ramp. The existing location of the Cypress Creek Park and Ride driveway from Cypress Creek Road would have significant impacts to the operations of the DDI due to the proximity of the west crossover intersection. The Cypress Creek Park and Ride driveway location would have to be relocated and reconfigured to provide full access to and from Cypress Creek Road.

Due to impacts to the Cypress Creek Park and Ride driveway, the DDI was eliminated from further consideration.

- Tight Diamond with Displaced Left (TDDL) Turns – This subarea alternative removes the existing I-95 on-ramp from N. Andrews Avenue. A displaced left turn intersection eliminates the left turn conflict at the main intersection by executing a left turn movement at a signalized intersection prior to the main intersection and running the left turn traffic on the left side of opposing traffic to the main intersection where it completes the intended left turn movement without conflicting with the opposing thru movement.

  The TDDL alternative displaces two left turn movements; the left turn from the northbound I-95 off- ramp and the westbound left turn destined for the Cypress Creek Park and Ride. Both movements are then channelized to the signalized southbound I-95 off-ramp terminal intersection. The northbound left turn to westbound Cypress Creek Road runs on the same phase as the southbound left turn while the northbound left turn to the Cypress Creek Park and Ride is provided via a free-flow slip lane.

  By displacing the left turn from the northbound exit terminal and channelizing the traffic to the southbound exit terminal, this allows the left turns from I-95 to operate similarly to a single point urban interchange, allowing the intersection to be controlled by a three-phase signal. In addition to displacing the northbound left turn, this alternative combines the on-ramp to northbound and southbound I-95 east of the northbound off-ramp at a signalized intersection. Downstream from the signal, approximately 350 ft. from the gore, the northbound and southbound on-ramp diverge, and the southbound on-ramp goes over I-95 before tying into any of the two proposed southbound CD road system options.

  This interchange configuration consists of a three-phase signal at the I-95 southbound off-ramp, a two-phase signal at the I-95 northbound off-ramp, and a two-phase signal at the I-95 northbound and southbound on-ramp.

  Due to impacts to the Cypress Creek Park and Ride driveway, this alternative was eliminated from further consideration.

- Braid System at Northwest Quadrant – This subarea alternative removes the existing I-95 on-ramp from N. Andrews Avenue and provides a new on-ramp at the intersection of Cypress Creek Road with the Cypress Creek Park and Ride entrance/exit. The new on-ramp would braid over the existing off-ramp at this location. This requires the addition of a signal phase to this intersection for the left turn movement. Removing the existing N. Andrews Avenue southbound on-ramp results in heavy volumes at this intersection, which when combined with the added signal phase resulted in a failing level of service at this intersection and operational impacts to I-95.

  Due to impacts to the Cypress Creek Park and Ride, this alternative was eliminated from further consideration.

- Modification of Existing Partial Cloverleaf – The existing northbound I-95 has two separate off-ramps to Cypress Creek Road; one for eastbound Cypress Creek Road and the Cypress Creek Park and Ride, and one for westbound Cypress Creek Road. This subarea alternative modifies the northbound I-95 off-ramp to increase capacity and improve safety by eliminating the existing weave between the northbound to westbound and westbound to southbound movements located between the I-95 off-ramp terminals. Additionally, the northbound to eastbound off-ramp is modified to eliminate the existing free-flow movement. The ramp is widened to three lanes approximately 1,000 ft. from the intersection with Cypress Creek Road to accommodate two right turn lanes controlled by a signal. The existing on-ramp into the Cypress Creek Park and Ride is maintained.

  The northbound to westbound exit gore is moved approximately 1,000 ft. south of the existing exit gore, requiring a new single-lane bridge over Cypress Creek Road. This modification addresses the existing loop ramp geometry safety concern by allowing for adequate deceleration length prior to the entrance curve into the loop ramp. After crossing over Cypress Creek Road and prior to entering the loop ramp, the westbound off-ramp widens to two lanes. The two-lane loop ramp then terminates at the existing Cypress Creek Road and I-95 northbound on-ramp intersection, eliminating the existing free-flow movement from the loop ramp. By eliminating the free-flow movement, the weave between this movement and the I-95 westbound to southbound on-ramp is also eliminated, addressing the existing safety issue previously described.

  The existing westbound to northbound on-ramp free-flow movement is also eliminated. The right-turn lane is widened to two-lanes and extended to the signalized Cypress Creek Road and I-95 northbound on-ramp intersection.

  A variation of this subarea alternative was also evaluated which replaces the two-lane loop ramp for the northbound to westbound movement with a flyover. The proposed flyover diverges from the existing I-95 northbound to eastbound off-ramp, crosses over Cypress Creek Road and I-95 mainline and ties into the I-95 southbound off-ramp. This variation alternative was eliminated from further consideration due to safety concerns of traffic weaving between the I-95 southbound off-ramp and the proposed flyover.

  This subarea alternative was advanced for further refinement and analysis in Phase 2.

5.3.6 CYPRESS CREEK ROAD AND N. ANDREWS AVENUE INTERSECTION SUBAREA ALTERNATIVES

The intersection of Cypress Creek Road and N. Andrews Avenue is located approximately 550 ft. to the west of the I-95 southbound off-ramp. Located in the southeast quadrant of this intersection is the Cypress Creek Park and Ride. The Cypress Creek Park and Ride has full access to and from Cypress Creek Road, N. Andrews Avenue, and I-95 southbound and northbound off-ramps. The Cypress Creek Park and Ride also has an on-ramp to southbound I-95 located at the south of the parcel. As per direction from FDOT District Four, all existing access to the Cypress Creek Park and Ride are to be maintained with any Cypress Creek Road interchange improvement. Two subarea alternatives were evaluated for the Cypress Creek Road and N. Andrews intersection:

- Median U-Turn (MUT) - A Median U-Turn (MUT) intersection removes either all the left turns or just a left turn pair from the main intersection. Rather than turning left at the main intersection, vehicles make a right turn followed by a U-Turn at the adjacent signalized or unsignalized intersection, or MUT. The left turn movement can also be provided by sending the left turn volume through the main intersection followed by a U-Turn at the adjacent signalized intersection, or MUT, and then a right turn at the main intersection. The benefit of a MUT intersection is the reduction in signal phases at the main intersection, thus providing more green time to the critical movements and reducing loss time.

  The existing railroad to the west and the proximity of the I-95 interchange to the east, precluded using MUTs on the east and west legs of the intersection. This alternative placed

a MUT along N. Andrews Avenue, approximately 1,100 ft. north of the Cypress Creek Road intersection, at NE 1 Avenue. NE 1 Avenue would need to be signalized. This MUT serves what would be the westbound and northbound left turns at the main intersection. Due to the topography and the existing bridge on N. Andrews Avenue over I-95, rather than use a MUT, a grade separated hook turn located approximately 1,100 ft. south of the main intersection was proposed. The grade separated hook turn would allow the eastbound and southbound left turns to run free-flow to complete the U-Turn movement.

The horizontal and vertical alignment of the MUT would diverge from N. Andrews Avenue, allowing for adequate longitudinal distance to gain the vertical clearance required to go under the existing N. Andrews Avenue bridge. Although operationally this is beneficial for the free-flowing vehicles completing the U-Turn movement, weaving issues may occur where the hook turn merges back with northbound N. Andrews Avenue. Additionally, the grade separated hook turn was developed with the original assumption that the existing southbound I-95 on-ramp from N. Andrews Avenue would be removed. The horizontal and vertical diverge for the grade separated hook turn and N. Andrews Avenue would be located approximately where the existing I-95 on-ramp gore is located, making this alternative incompatible with the existing I-95 on-ramp. Iterations were considered to maintain the existing I-95 on-ramp while still providing the grade separated hook turn. These iterations included three eastbound right turn lanes, one bound for the I-95 on-ramp, one bound for either the grade separated hook turn or N. Andrews Avenue, and one bound for N. Andrews Avenue.

Due to the significant out-of-direction travel for the left turn movements, right of way impacts at the MUTs, and weaving at the merge and diverge of the hook turn, the MUT alternative was eliminated from further consideration.

- Traditional Intersection Widening - Widening along Cypress Creek Road only includes additional width for bicycle lanes in each direction. Additionally, modifications were made to the east and west legs of Cypress Creek Road. The west leg was modified from four thru lanes and a single right turn lane to three thru lanes and two right turn lanes. The east leg reduced the number of receiving lanes from four lanes to three lanes and widened the center median to meet current standards. To minimize impacts to the parking lot in the southwest quadrant and eliminate impacts to the Cypress Creek Park and Ride, the south curb line along the east and west leg was maintained.

  The traditional intersection widening was advanced for further refinement and analysis in Phase 2.

5.3.7 SUBAREA ALTERNATIVES ADVANCED TO PHASE 2

The following summarizes the subarea alternatives advanced for further refinement and analysis in Phase 2 –Detailed Alternatives Analysis:

I-95 Mainline:

- Southbound C-D Road (Option 2)

Commercial Boulevard Interchange

- Modification of Existing Tight Urban Diamond Interchange

Commercial Boulevard & Powerline Road Intersection

- Echelon with Median U-Turn
- Northbound-southbound Grade Separation
- Traditional Intersection Widening

Commercial Boulevard & N. Andrews Avenue Intersection

- Traditional Intersection Widening, North and West Legs
- Traditional Intersection Widening with Westbound Flyover
- Traditional Intersection Widening, North, East & West Legs

Cypress Creek Road Interchange

- Modification of Existing Partial Cloverleaf

Cypress Creek Road & N. Andrews Avenue Intersection

- Traditional Intersection Widening

Table 5-1
Phase 1 – High Level Alternative Analysis Summary

Subarea Alternatives	Proposed Ramp Connection Spacing	Safety Concerns	Recommendations
I-95 Mainline			
Southbound CD Road System (Option 1)	The on to on on-ramp connection spacing is from the existing Cypress Creek Road westbound to southbound loop to the CD road system which merges with the I-95 mainline just north of Commercial Boulevard.	Merge point of the CD road system just north of Commercial Boulevard is a safety concern with traffic from the CD road system merging with I-95 general purpose lanes within the constraint cross section of I-95 underneath the Commercial Boulevard westbound to southbound flyover ramp.	Eliminated from further analysis
Southbound CD Road System (Option 2)	The on to on on-ramp connection spacing is from the existing Cypress Creek Road westbound to southbound loop to the CD road system which merges with the I-95 mainline south of Commercial Boulevard, just north of Powerline Road.	Safety concern from Option 1 is eliminated by merging the CD road system south of Commercial Boulevard.	Advanced for further refinement and analysis in Phase 2
Commercial Boulevard Interchange			
Subarea Alternatives	**Right of Way Impacts**	**Safety/Traffic Operations/Community Concerns**	**Recommendations**
Modification of Existing Tight Urban Diamond Interchange	No right of way acquisition anticipated.	Eliminates the existing southbound and northbound off-ramps free-flow right turn lanes. Elimination of free-flow right turn lanes removes the conflict point with thru lanes.	Advanced for further refinement and analysis in Phase 2
Diverging Diamond Interchange	No right of way acquisition anticipated with 10 miles per hour speed reduction from the approaches. Revising the geometry of the DDI to maintain a higher design speed was considered but was significant.	Concerns associated with the proximity of the railroad tracks and the reduction of the approaching posted speed by 10 miles per hour.	Eliminated from further analysis
Commercial Boulevard & Powerline Road Intersection			
Echelon with Median U-Turn	31 Parcels impacted - 9 Parcels south of intersection, 10 parcels north of intersection, 10 parcels west of intersection and 2 parcels east of intersection.	Access impacts to adjacent businesses and out-of-direction travel for all left turn movements.	Advanced for further refinement and analysis in Phase 2
Median U-Turns along Powerline Road	35 Parcels impacted - 13 Parcels south of intersection, 15 parcels north of intersection, 5 parcels west of intersection and 2 parcels east of intersection.	Out-of-direction travel for all left turn movements.	Eliminated from further analysis
Northbound-southbound Grade Separation	31 Parcels impacted - 9 Parcels south of intersection, 12 parcels north of intersection, 8 parcels west of intersection and 2 parcels east of intersection.	Access impacts to adjacent businesses and out-of-direction travel for all left turn movements.	Advanced for further refinement and analysis in Phase 2
Traditional Intersection Widening	28 Parcels impacted - 7 Parcels south of intersection, 11 parcels north of intersection, 8 parcels west of intersection and 2 parcels east of intersection.	No major safety or community concerns.	Advanced for further refinement and analysis in Phase 2
Commercial Boulevard & N. Andrews Avenue Intersection			
Quadrant Road	The quadrant road was placed in the northwest quadrant of the main intersection, where the existing Park and Ride is located. This subarea alternative would require removing the westbound to southbound flyover ramp to I-95 due to the proximity of the proposed quadrant road. Additionally, displacing the northbound and southbound left turns impacts right of way on the northeast and southwest quadrants.	Operationally, the locations of the quadrant road intersections are too close to the main intersection and are not ideal for adequate signal coordination and progression.	Eliminated from further analysis
Westbound-eastbound Grade Separation	6 Parcels impacted east of intersection, north side.	Access impacts to adjacent businesses and aesthetic concerns with retaining walls in the middle of Commercial Boulevard. Minor traffic operations benefits.	Eliminated from further analysis
Traditional Intersection Widening, North & West Legs	9 Parcels impacted: 6 Parcels impacted north of intersection, 2 parcels south of intersection, and 1 parcel east of the intersection. To minimize right of way impacts, the south curb line along Commercial Boulevard was maintained, and widening was achieved to the north, impacting the Park and Ride and FDOT owned frontage road.	This alternative does not fix the failing level of service of the westbound traffic. Approximately half of the traffic travels west and/or north and the other half is trying to access the existing westbound to southbound flyover ramp. However, this alternative provides the least impact to adjacent properties.	Advanced for further refinement and analysis in Phase 2

Table 5-1
Phase 1 – High Level Alternative Analysis Summary

Subarea Alternatives	Right of Way Impacts	Safety/Traffic Operations/Community Concerns	Recommendations
Commercial Boulevard & N. Andrews Avenue Intersection			
Traditional Intersection Widening with Westbound Flyover	11 Parcels impacted: 8 parcels north of intersection, 2 parcels south of the intersection, and 1 parcel east of the intersection.	The proposed flyover eliminates access to eastbound Commercial Boulevard from NE 3 Avenue and requires reconfiguration of the existing frontage road that runs parallel to Commercial Boulevard. There are access impacts to adjacent businesses and aesthetic concerns.	Advanced for further refinement and analysis in Phase 2
Traditional Intersection Widening, North, East & West Legs	11 Parcels impacted: 8 parcels north of intersection, 2 parcels south of the intersection, and 1 parcel east of the intersection.	There are access impacts to adjacent businesses and aesthetic concerns.	Advanced for further refinement and analysis in Phase 2
Cypress Creek Road Interchange			
Diverging Diamond Interchange (with removal of I-95 on-ramp from N. Andrews Avenue)	Reconfiguration of the interchange would occur within the existing limited access right of way.	The existing location of the Cypress Creek Park and Ride driveway along Cypress Creek Road impact the operation of the DDI due to the proximity of the west crossover intersection. The Cypress Creek Park and Ride driveway location would have to be relocated and reconfigured to provide full access to and from Cypress Creek Road.	Eliminated from further analysis
Tight Diamond with Displaced Left Turns (with removal of I-95 on-ramp from N. Andrews Avenue)	Partial reconfiguration of the interchange would occur within the existing limited access right of way.	This concept focuses all I-95 southbound movements onto the existing intersection west of the interchange and as a result causes the intersection of Cypress Creek Road and N. Andrews Avenue to fail. Additionally, the storage required for the eastbound left turn extends underneath the I-95 mainline bridges and would require reconstruction of the I-95 mainline bridges over Cypress Creek Road.	Eliminated from further analysis
Braid System at Northwest Quadrant (with removal of I-95 on-ramp from N. Andrews Avenue)	Reconfiguration of the northwest quadrant of the interchange within the limited access right of way.	This concept focuses all I-95 southbound movements onto the existing intersection of Cypress Creek Road with the Cypress Creek Park and Ride entrance/exit. The additional signal phase at this intersection results in a failing level of service at this intersection and operational impacts to I-95. Attempts to address these traffic impacts results in access impacts to the Cypress Creek Park and Ride entrance/exit. Additionally, the storage required for the eastbound left turn extends underneath the I-95 mainline bridges and would require reconstruction of the I-95 mainline bridges over Cypress Creek Road.	Eliminated from further analysis
Modification of Existing Partial Cloverleaf (keeping I-95 on-ramp from N. Andrews Avenue)	Reconfiguration of the northbound to westbound off-ramp loop and elimination of the northbound to eastbound off-ramp free-flow movement to two right turn lanes controlled by a signal. Reconfiguration would occur within the limited access right of way.	This subarea alternative modifies the northbound I-95 off-ramp to increase capacity and improve safety by eliminating the existing weave between the northbound to westbound and westbound to southbound movements located between the I-95 off-ramp terminals. Additionally, this modification addresses the existing northbound to westbound loop ramp geometry safety concern by allowing for adequate deceleration length prior to the entrance curve into the loop ramp.	Advanced for further refinement and analysis in Phase 2
Cypress Creek Road & N. Andrews Avenue Intersection			
Median U-Turns	4 Parcels impacted north of intersection.	Out-of-direction travel for all left turn movements and weaving concerns where the Texas U-turn movement under the N. Andrews Avenue bridge merges back with northbound N. Andrews Avenue.	Eliminated from further analysis
Traditional Intersection Widening	3 Parcels impacted: 1 on the northeast corner (corner clip), 1 on northwest corner (corner clip) and 1 on southwest corner (corner clip).	No major safety or community concerns.	Advanced for further refinement and analysis in Phase 2

5.4 Phase 2 – Detailed Alternatives Analysis

Phase 2 consisted of developing Corridor Alternatives for each interchange area by combining the subareas alternatives identified in Phase 1 to aid in the selection of a recommended Build Alternative for the study area. Six Corridor Alternatives were selected for the Commercial Boulevard interchange and three Corridor Alternatives were selected for the Cypress Creek Road interchange in addition to the No-Action alternative. The Corridor Alternatives did not include the I-95 mainline. The intent of the Corridor Alternatives was not only to further refine the subarea alternatives from Phase 1 but to analyze how the subareas along a corridor interact with one another. The corridor models helped to verify compatibility of each subarea as part of the larger system and to determine if additional modifications to the subarea alternatives were required.

The resulting recommended Corridor Alternatives for each interchange were then combined with the recommended I-95 mainline improvement of the southbound CD road system to develop and analyze the recommended Build Alternative.

5.4.1 COMMERCIAL BOULEVARD INTERCHANGE CORRIDOR ALTERNATIVES

A total of six Commercial Boulevard subarea alternatives were advanced from Phase 1; three for Powerline Road, one for the interchange, and three for N. Andrews Avenue. Using the seven subarea alternatives, six Corridor Alternatives were developed. The six Corridor Alternatives provide modifications to the existing Tight Urban Diamond interchange consisting of triple right turn lanes for the northbound off-ramp and dual right turn lanes for the southbound off-ramp. Additionally, the six Corridor Alternatives provide seven-foot bicycle lanes along Commercial Boulevard and Powerline Road in both directions. Refer to Table 5-2 for the subareas that are included in each Corridor Alternative.

Table 5-2
Commercial Boulevard Subarea Alternatives

Corridor Alternative	Powerline Road	Interchange	N. Andrews Avenue	Detail Figure
1	Traditional Intersection Widening	Modification of Existing Tight Urban Diamond Interchange	Traditional Intersection Widening North & West Legs	5-1 & 5-2
2	Echelon with Median U-Turn		Traditional Intersection Widening with Westbound Flyover	5-3 & 5-4
3	Northbound-southbound Grade Separation		Traditional Intersection Widening North, East & West Legs	5-5 & 5-6
4	Northbound-southbound Grade Separation		Traditional Intersection Widening with Westbound Flyover	5-7 & 5-8
5	Traditional Intersection Widening		Traditional Intersection Widening North, East & West Legs	5-9 & 5-10
6	Traditional Intersection Widening		Traditional Intersection Widening with Westbound Flyover	5-11 & 5-12

5.4.1.1 Commercial Boulevard Corridor Alternative 1

Commercial Boulevard Corridor Alternative 1 consists of the following improvements:

Commercial Boulevard and Powerline Road Intersection – Traditional Intersection Widening:

- Provide one additional Powerline Road southbound left turn lane by removing one of the three thru lanes to have a triple left turn movement to Commercial Boulevard east.
- Provide one additional Commercial Boulevard westbound thru lane by removing one of the two westbound to southbound left turn lanes to have four thru westbound lanes.
- Provide one additional Commercial Boulevard eastbound thru lane east of Powerline Road.

Commercial Boulevard and N. Andrews Avenue Intersection – Traditional Intersection Widening, North & West Legs:

- Provide one additional N. Andrews Avenue southbound left turn lane to have dual left turn lanes to Commercial Boulevard east.
- Provide one additional Commercial Boulevard eastbound thru lane to have four eastbound thru lanes.

Refer to Figure 5-1 and Figure 5-2 for a graphic depiction of Corridor Alternative 1 for the Commercial Boulevard Interchange.

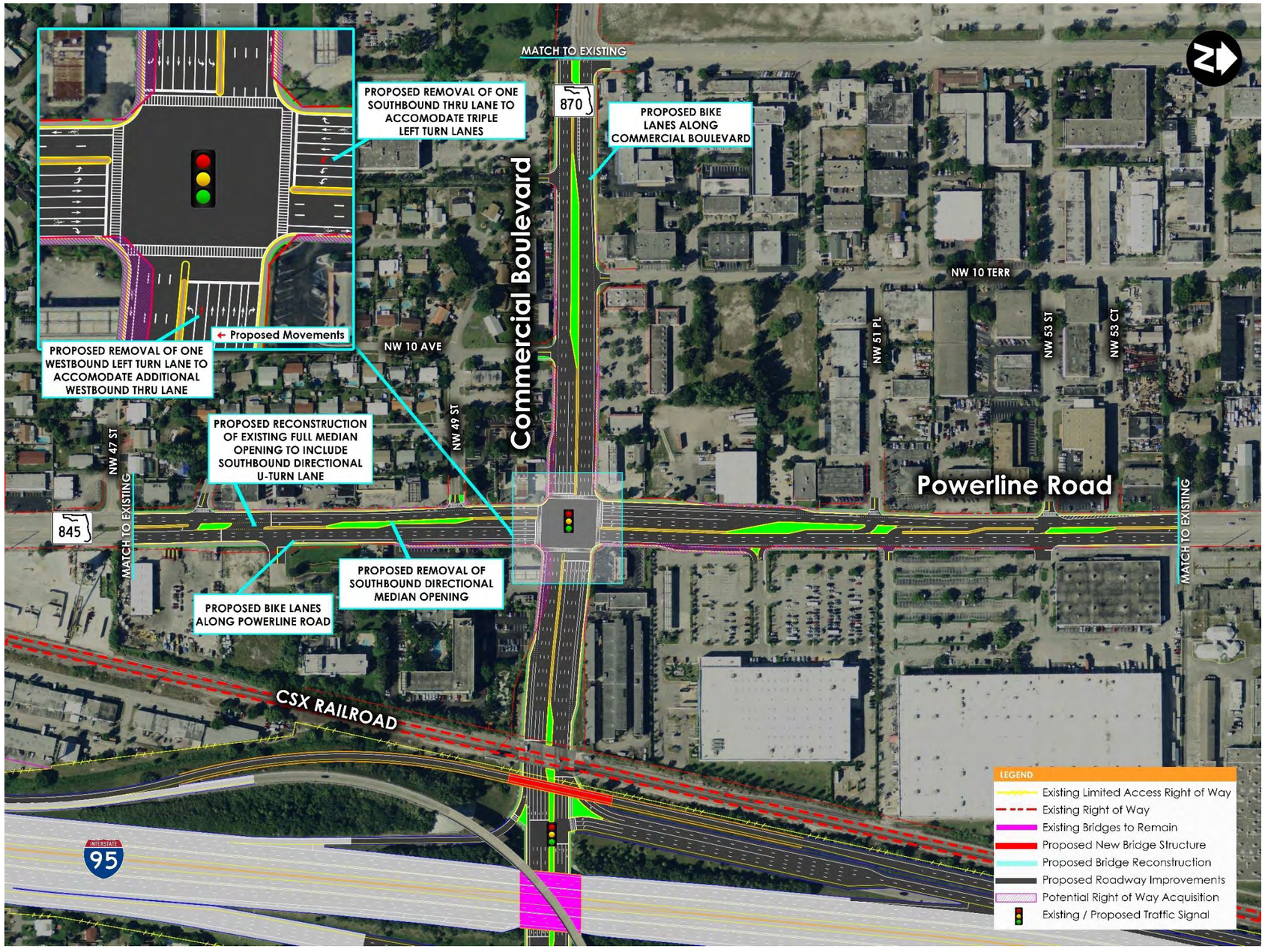


Figure 5-1 Commercial Boulevard Corridor Alternative 1 – Powerline Road Improvements

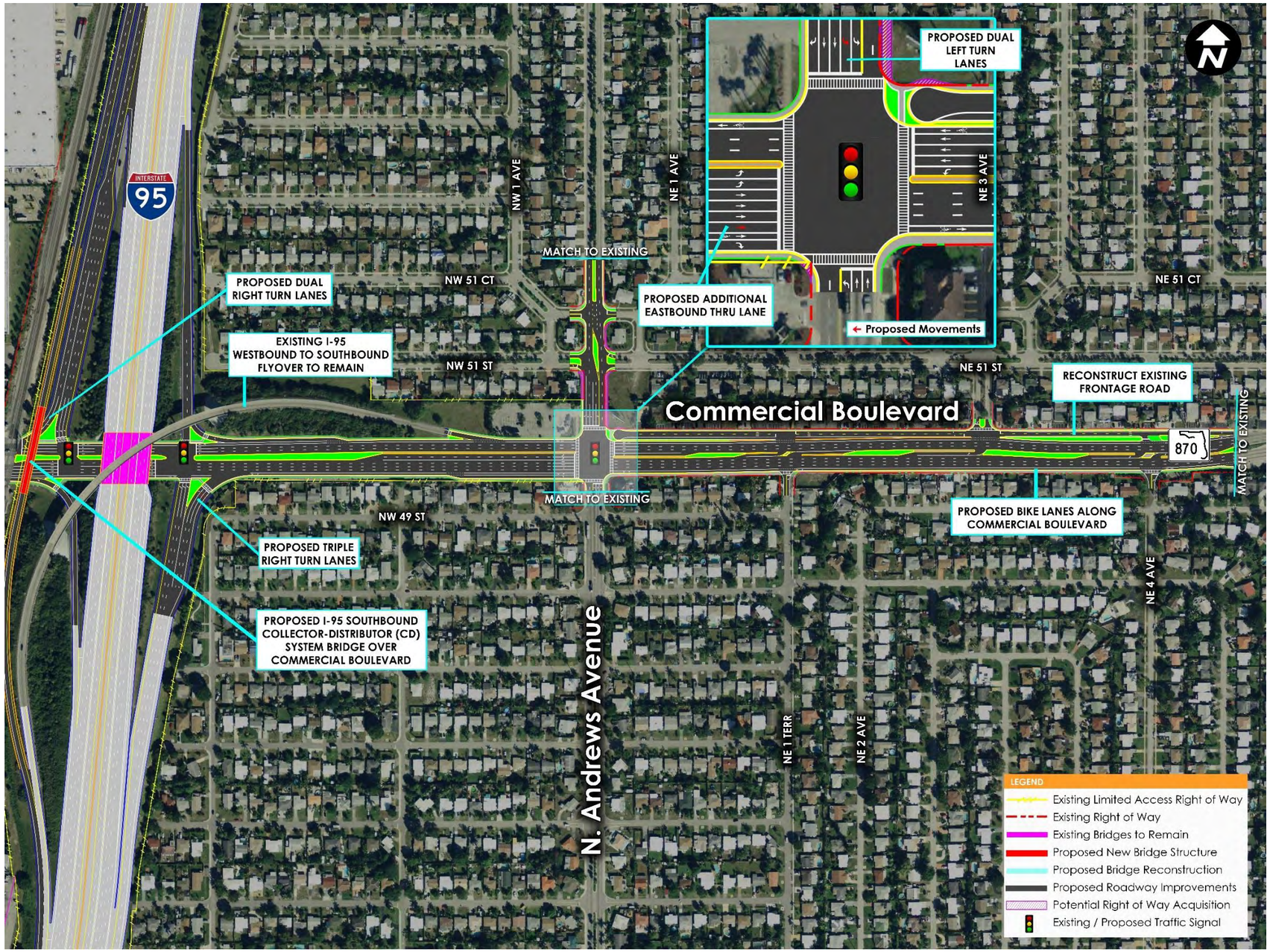


Figure 5-2 Commercial Boulevard Corridor Alternative 1 – N. Andrews Avenue Improvements

5.4.1.2 Commercial Boulevard Corridor Alternative 2

Commercial Boulevard Corridor Alternative 2 consists of the following improvements:

Commercial Boulevard and Powerline Road Intersection - Echelon with MUT:

- Provide a T-shape elevated structure at the intersection to accommodate Powerline Road northbound and southbound thru traffic, northbound to westbound left traffic and southbound to westbound right traffic. This bridge has three lanes along Powerline Road and one lane along Commercial Boulevard. This option requires the construction of approximately 800 ft. and 2,200 ft. (1100 ft. on each side of the intersection) of Mechanically Stabilized Earth (MSE) walls along Powerline Road and Commercial Boulevard respectively. In addition, one lane frontage roads will be provided on each side of the elevated section along Powerline Road. The thru lanes along Commercial remain at-grade. Note that the eastbound and westbound existing dual left turn lanes have been reduced to just one left turn in each direction.
- Provide a U-turn bay to allow dual U-turn lanes along Commercial Boulevard close to NW 12 Avenue to accommodate the Powerline Road southbound left turns going east on Commercial Boulevard.

Commercial Boulevard and N. Andrews Avenue Intersection – Traditional Intersection Widening with Westbound Flyover:

- Provide one additional N. Andrews Avenue southbound left turn lane to have dual left turn lanes to Commercial Boulevard east.
- Provide one additional Commercial Boulevard eastbound thru lane to have four eastbound thru lanes.
- Reduce existing westbound though lanes from three to two lanes.
- Provide a one lane bridge across N. Andrews Avenue to accommodate Commercial Boulevard westbound traffic to the existing I-95 westbound to southbound flyover on-ramp. The proposed one lane bridge merges with the existing I-95 westbound to southbound at-grade ramp which accommodates the N. Andrews Avenue southbound and northbound traffic heading to southbound I-95. This reconfigured I-95 westbound to southbound flyover on-ramp will have two lanes at the entrance and will drop to one lane after the third span of the flyover bridge. The first three spans of the flyover bridge will be reconstructed.
- Convert existing two-lane frontage road located at the northeast quadrant of the intersection to a one lane frontage road in the westbound direction. The west end of the proposed one lane frontage road turns northward before approaching N. Andrews Avenue and terminates at the intersection of NE 1 Avenue and NE 51 Street.

Refer to Figure 5-3 and Figure 5-4 for a graphic depiction of Corridor Alternative 2 for the Commercial Boulevard Interchange.

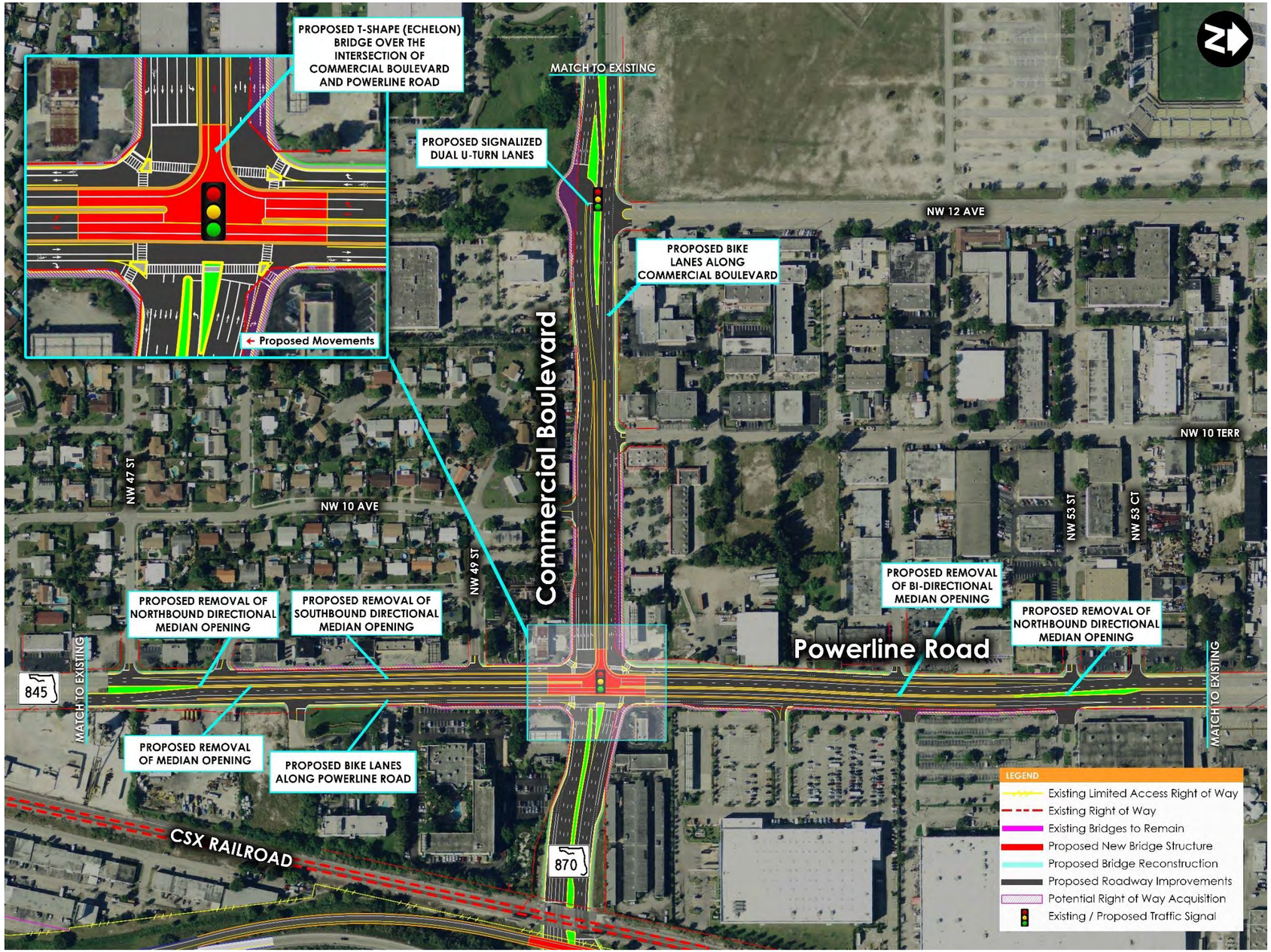


Figure 5-3 Commercial Boulevard Corridor Alternative 2 - Powerline Road Improvements

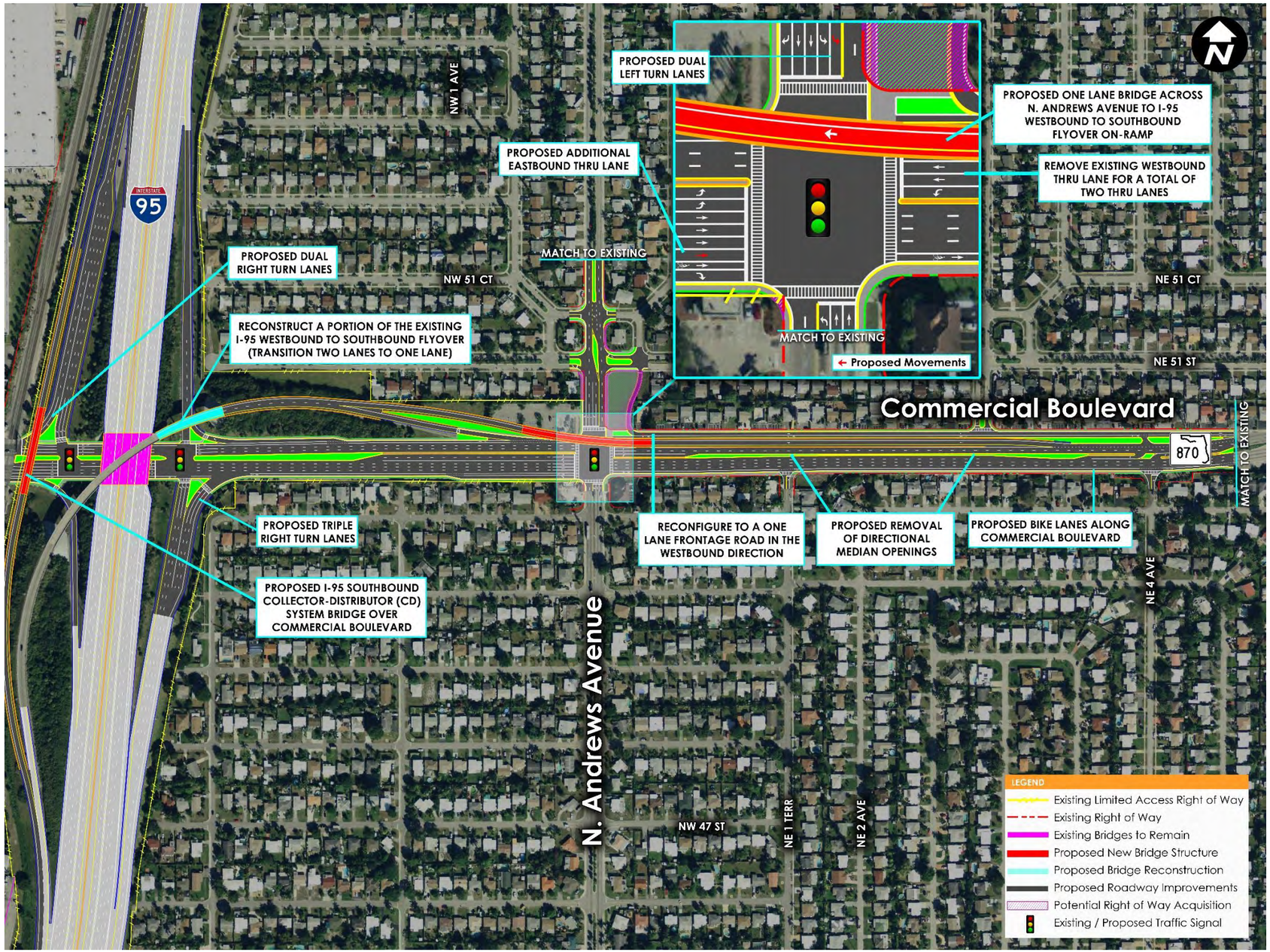


Figure 5-4 Commercial Boulevard Corridor Alternative 2 - N. Andrews Avenue Improvements

5.4.1.3 Commercial Boulevard Corridor Alternative 3

Commercial Boulevard Corridor Alternative 3 consists of the following improvements:

Commercial Boulevard and Powerline Road Intersection – Northbound-Southbound Grade Separation:

- Provide a northbound-southbound bridge along Powerline Road (one lane in each direction) over Commercial Boulevard. This option requires the construction of approximately 2,000 ft. of MSE walls along Powerline Road. The at-grade north leg of the intersection has two northbound thru lanes, two southbound to eastbound left turn lanes, one southbound to westbound right turn lane and one southbound thru lane. The at-grade south leg of the intersection has one southbound and northbound thru lane, one northbound to westbound left turn lane and one northbound to eastbound right turn lane. In addition, a Texas U-turn is provided at both north and south approaches to facilitate local circulation. The east and west approaches have at-grade lane configuration similar to the existing except the conversion of one of the two westbound to southbound left turn lanes into the fourth westbound thru lane.

Commercial Boulevard and N. Andrews Avenue Intersection – Traditional Intersection Widening, North, East & West Legs:

- Provide one additional N. Andrews Avenue southbound left turn lane to have dual left turn lanes to Commercial Boulevard east.
- Provide one additional Commercial Boulevard eastbound and westbound thru lanes to have four eastbound and westbound thru lanes.
- Convert existing two-lane frontage road located at the northeast quadrant of the intersection to a one lane frontage road in the westbound direction. The west end of the proposed one lane frontage road turns northward before approaching N. Andrews Avenue and terminates at the intersection of NE 1 Avenue and NE 51 Street.
- Reconfigure the existing I-95 westbound to southbound one lane flyover on-ramp to two lanes at the entrance and drop to one lane after the third span of the flyover bridge. The first three spans of the flyover bridge will be reconstructed.

Refer to Figure 5-5 and Figure 5-6 for a graphic depiction of Corridor Alternative 3 for the Commercial Boulevard Interchange.

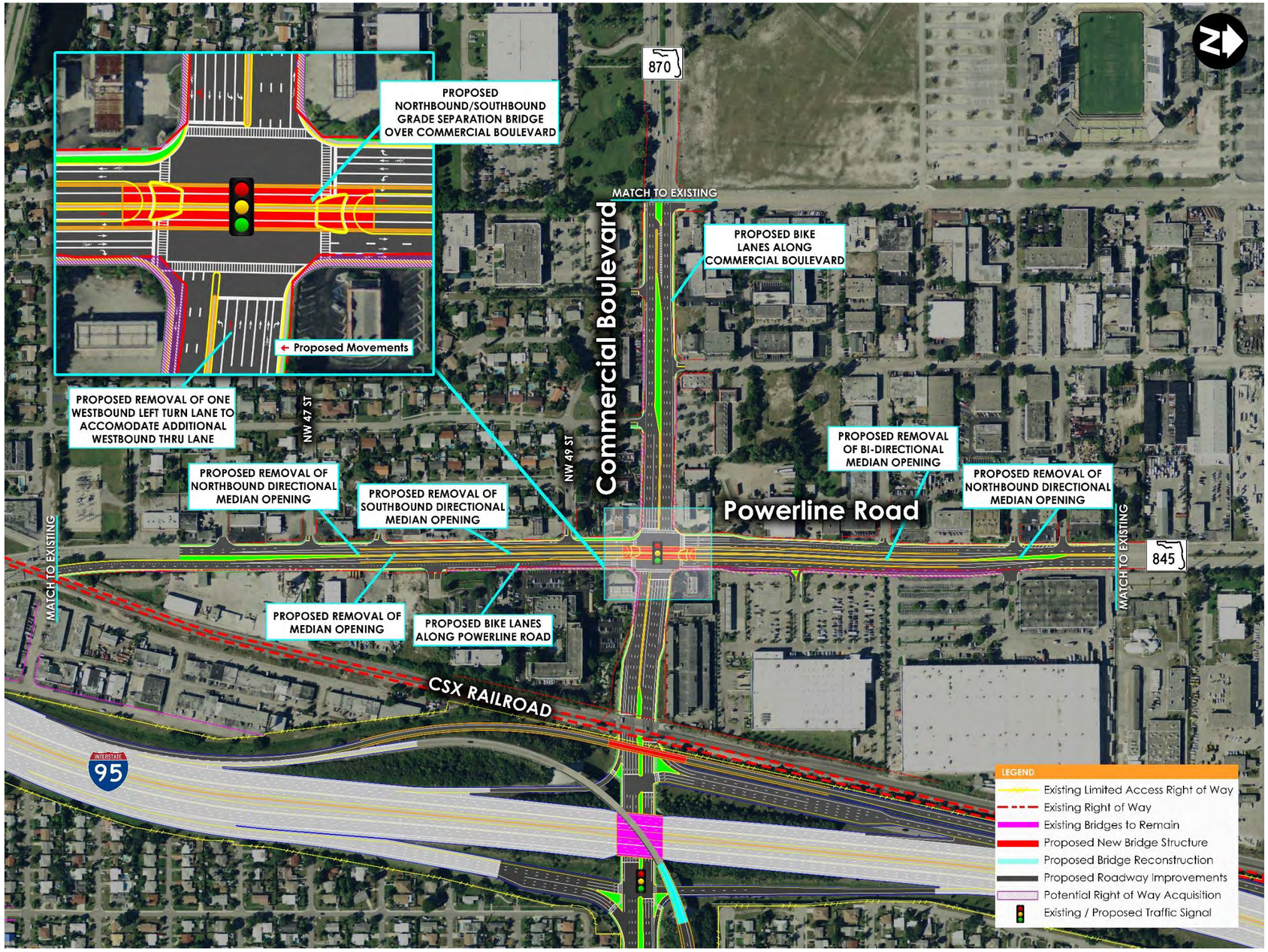


Figure 5-5 Commercial Boulevard Corridor Alternative 3 - Powerline Road Improvements

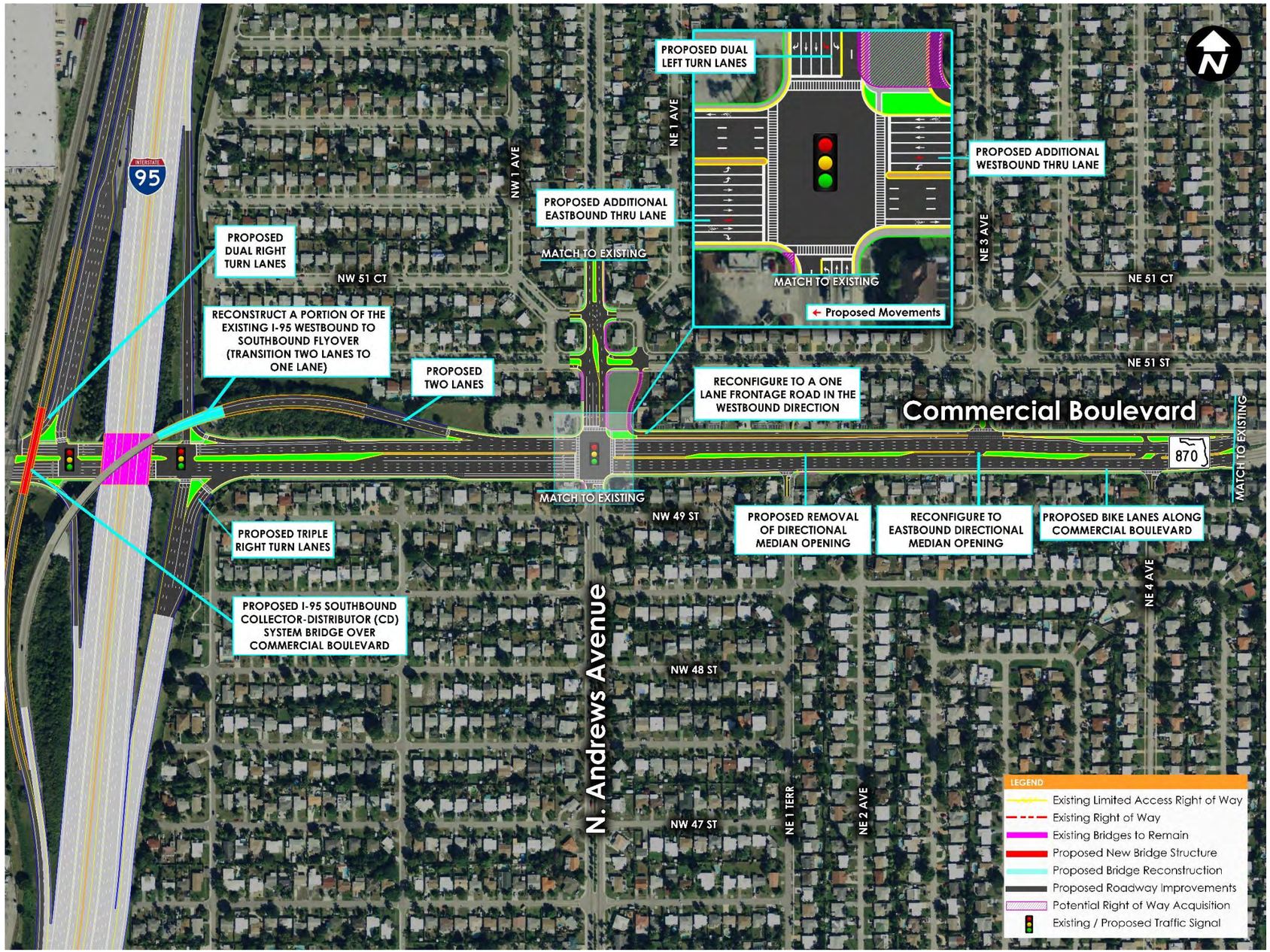


Figure 5-6 Commercial Boulevard Corridor Alternative 3 - N. Andrews Avenue Improvements

5.4.1.4 Commercial Boulevard Corridor Alternative 4

Commercial Boulevard Corridor Alternative 4 consists of the following improvements:

Commercial Boulevard and Powerline Road Intersection – Northbound-Southbound Grade Separation:

- Provide a northbound-southbound bridge along Powerline Road (one lane in each direction) over Commercial Boulevard. This option requires the construction of approximately 2,000 ft. of MSE walls along Powerline Road. The at-grade north leg of the intersection has two northbound thru lanes, two southbound to eastbound left turn lanes, one southbound to westbound right turn lane and one southbound thru lane. The at-grade south leg of the intersection has one southbound and northbound thru lane, one northbound to westbound left turn lane and one northbound to eastbound right turn lane. In addition, a Texas U-turn is provided at both north and south approaches to facilitate local circulation. The east and west approaches have at-grade lane configuration similar to the existing except the conversion of one of the two westbound to southbound left turn lanes into the fourth westbound thru lane.

Commercial Boulevard and N. Andrews Avenue Intersection – Traditional Intersection Widening with Westbound Flyover:

- Provide one additional N. Andrews Avenue southbound left turn lane to have dual left turn lanes to Commercial Boulevard east.
- Provide one additional Commercial Boulevard eastbound thru lane to have four eastbound thru lanes.
- Reduce existing westbound though lanes from three to two lanes.
- Provide a one lane bridge across N. Andrews Avenue to accommodate Commercial Boulevard westbound traffic to the existing I-95 westbound to southbound flyover on-ramp. The proposed one lane bridge merges with the existing I-95 westbound to southbound at-grade ramp which accommodates the N. Andrews Avenue southbound and northbound traffic heading to southbound I-95. This reconfigured I-95 westbound to southbound flyover on-ramp will have two lanes at the entrance and will drop to one lane after the third span of the flyover bridge. The first three spans of the flyover bridge will be reconstructed.
- Convert existing two-lane frontage road located at the northeast quadrant of the intersection to a one lane frontage road in the westbound direction. The west end of the proposed one lane frontage road turns northward before approaching N. Andrews Avenue and terminates at the intersection of NE 1 Avenue and NE 51 Street.

Refer to Figure 5-7 and Figure 5-8 for a graphic depiction of Corridor Alternative 4 for the Commercial Boulevard Interchange.

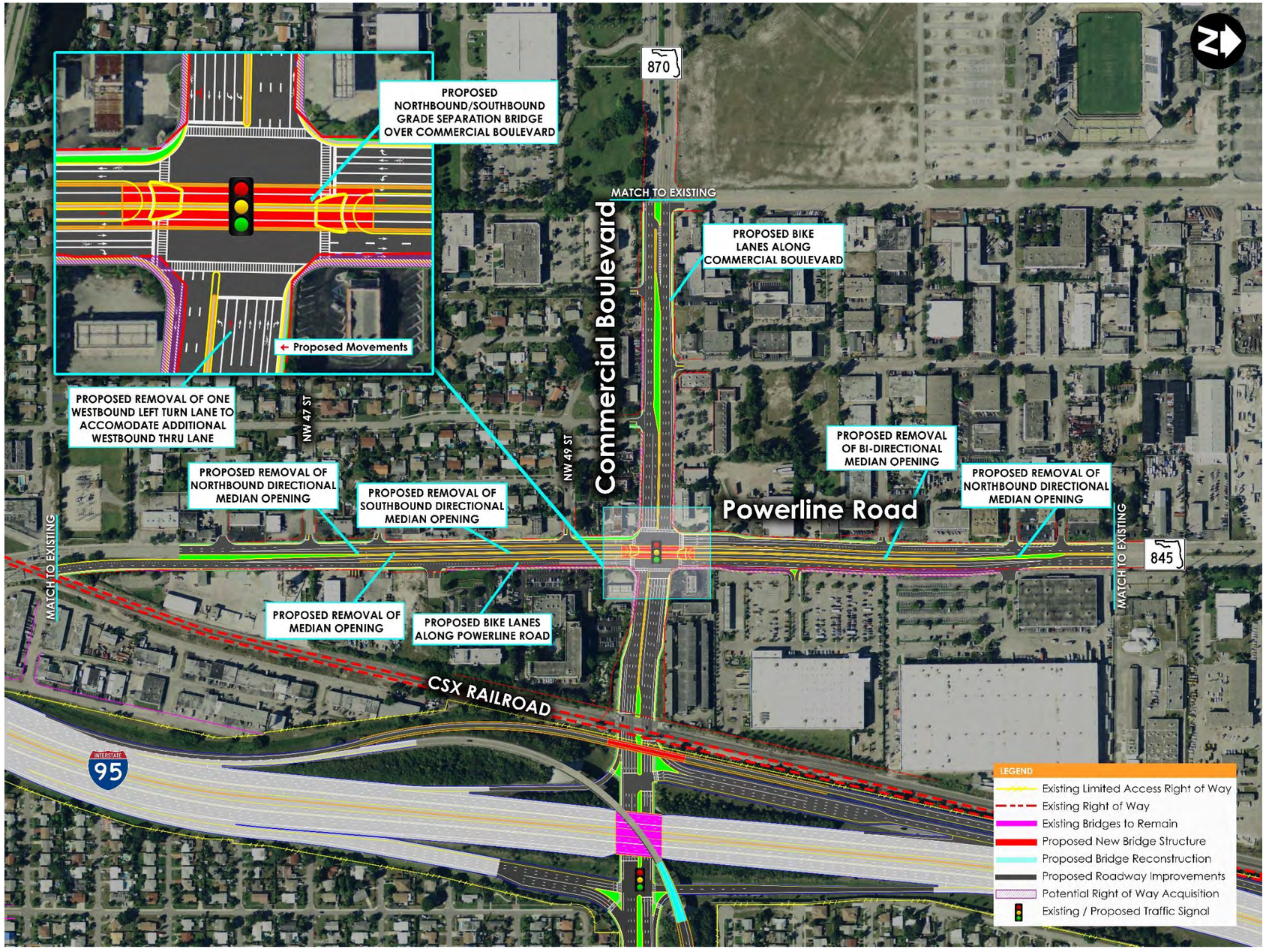


Figure 5-7 Commercial Boulevard Corridor Alternative 4 - Powerline Road Improvements

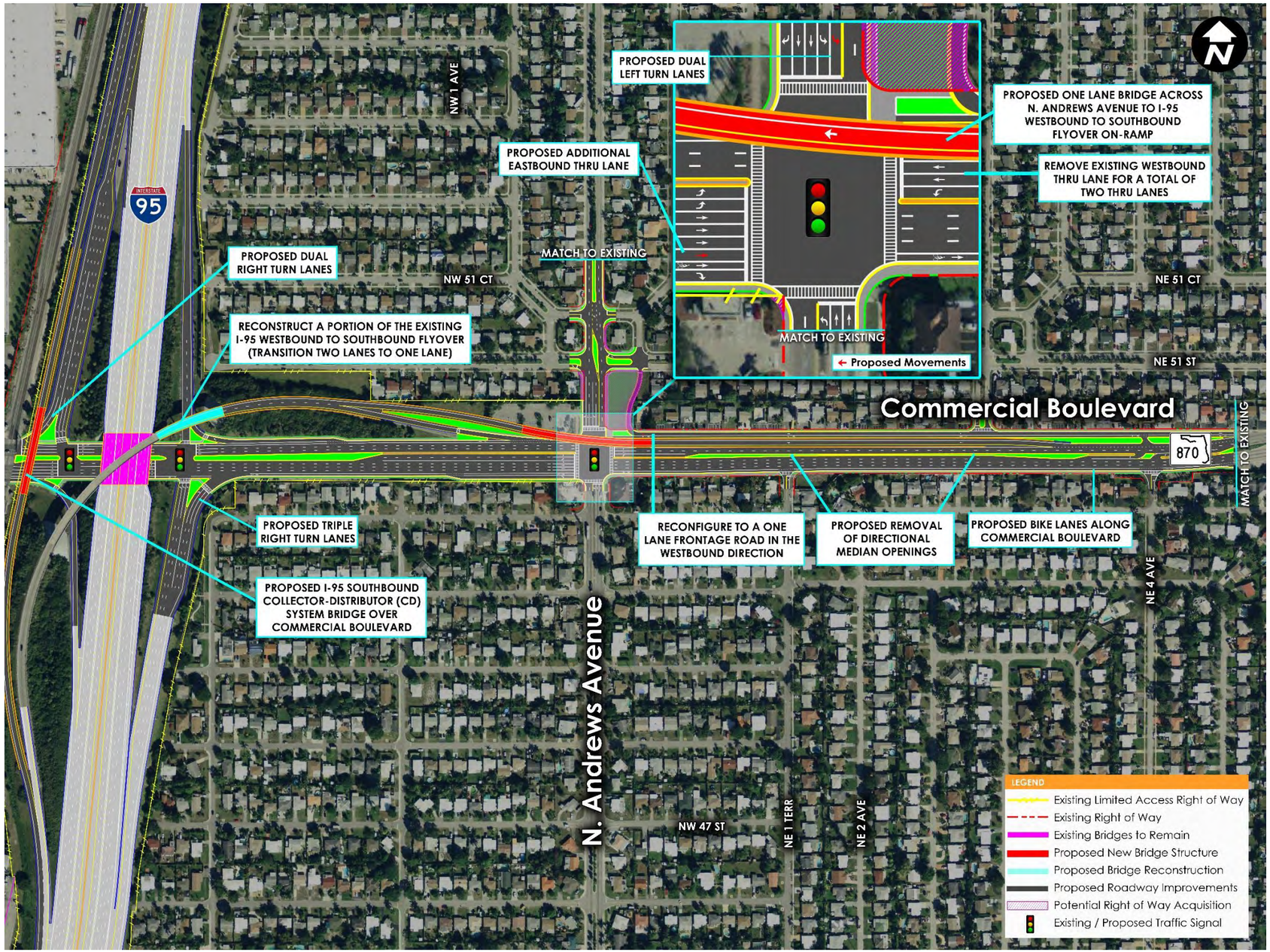


Figure 5-8 Commercial Boulevard Corridor Alternative 4 - N. Andrews Avenue Improvements

5.4.1.5 Commercial Boulevard Corridor Alternative 5

Commercial Boulevard Corridor Alternative 5 consists of the following improvements:

Commercial Boulevard and Powerline Road Intersection – Traditional Intersection Widening:

- Provide one additional Powerline Road southbound left turn lane by removing one of the three thru lanes to have a triple left turn movement to Commercial Boulevard east.
- Provide one additional Commercial Boulevard westbound thru lane by removing one of the two westbound to southbound left turn lanes to have four thru westbound lanes.
- Provide one additional Commercial Boulevard eastbound thru lane east of Powerline Road.

Commercial Boulevard and N. Andrews Avenue Intersection – Traditional Intersection Widening, North, East & West Legs:

- Provide one additional N. Andrews Avenue southbound left turn lane to have dual left turn lanes to Commercial Boulevard east.
- Provide one additional Commercial Boulevard eastbound and westbound thru lanes to have four eastbound and westbound thru lanes.
- Convert existing two-lane frontage road located at the northeast quadrant of the intersection to a one lane frontage road in the westbound direction. The west end of the proposed one lane frontage road turns northward before approaching N. Andrews Avenue and terminates at the intersection of NE 1 Avenue and NE 51 Street.
- Reconfigure the existing I-95 westbound to southbound one lane flyover on-ramp to two lanes at the entrance and drop to one lane after the third span of the flyover bridge. The first three spans of the flyover bridge will be reconstructed.

Refer to Figure 5-9 and Figure 5-10 for a graphic depiction of Corridor Alternative 5 for the Commercial Boulevard Interchange.

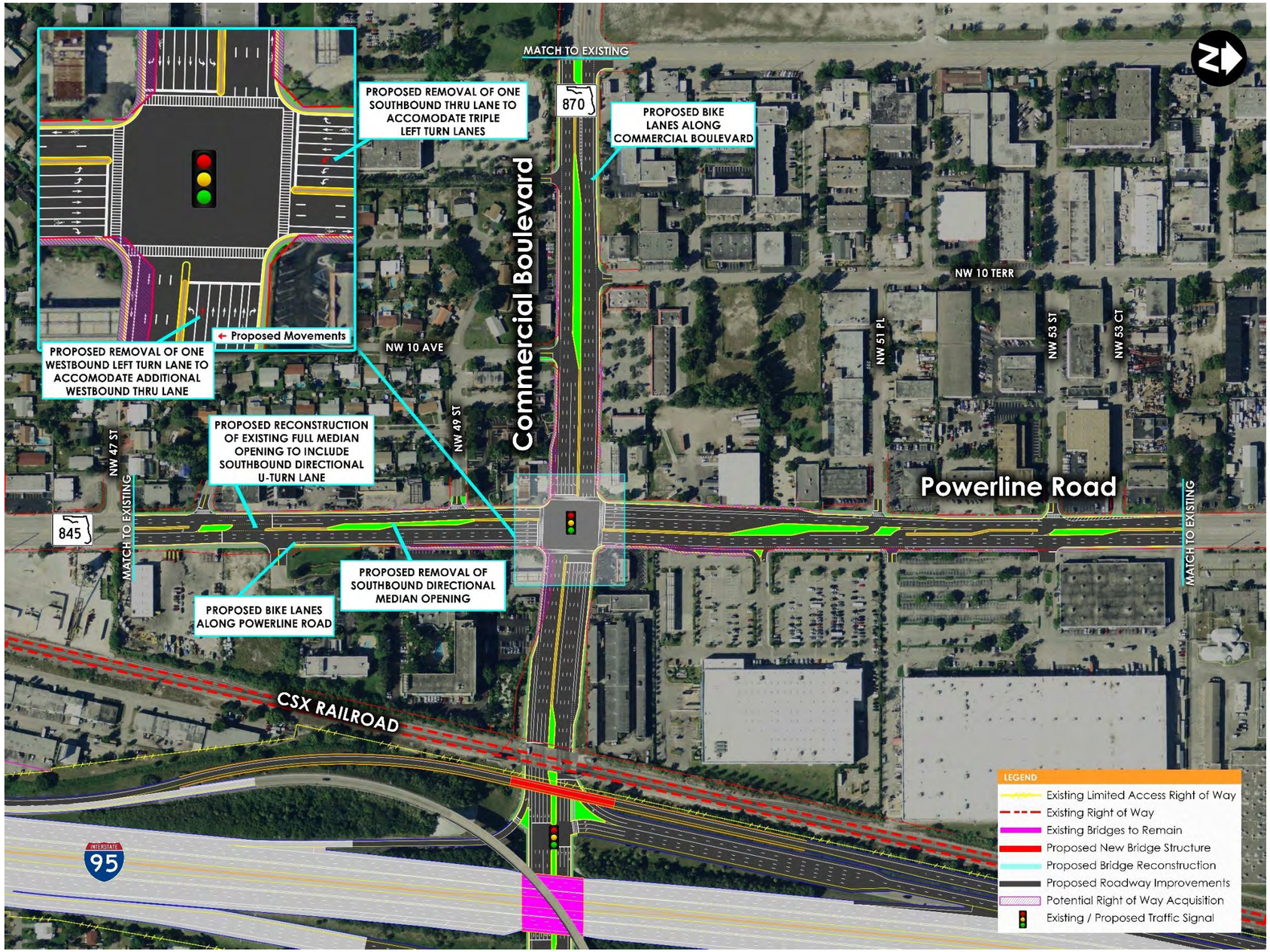


Figure 5-9 Commercial Boulevard Corridor Alternative 5 - Powerline Road Improvements

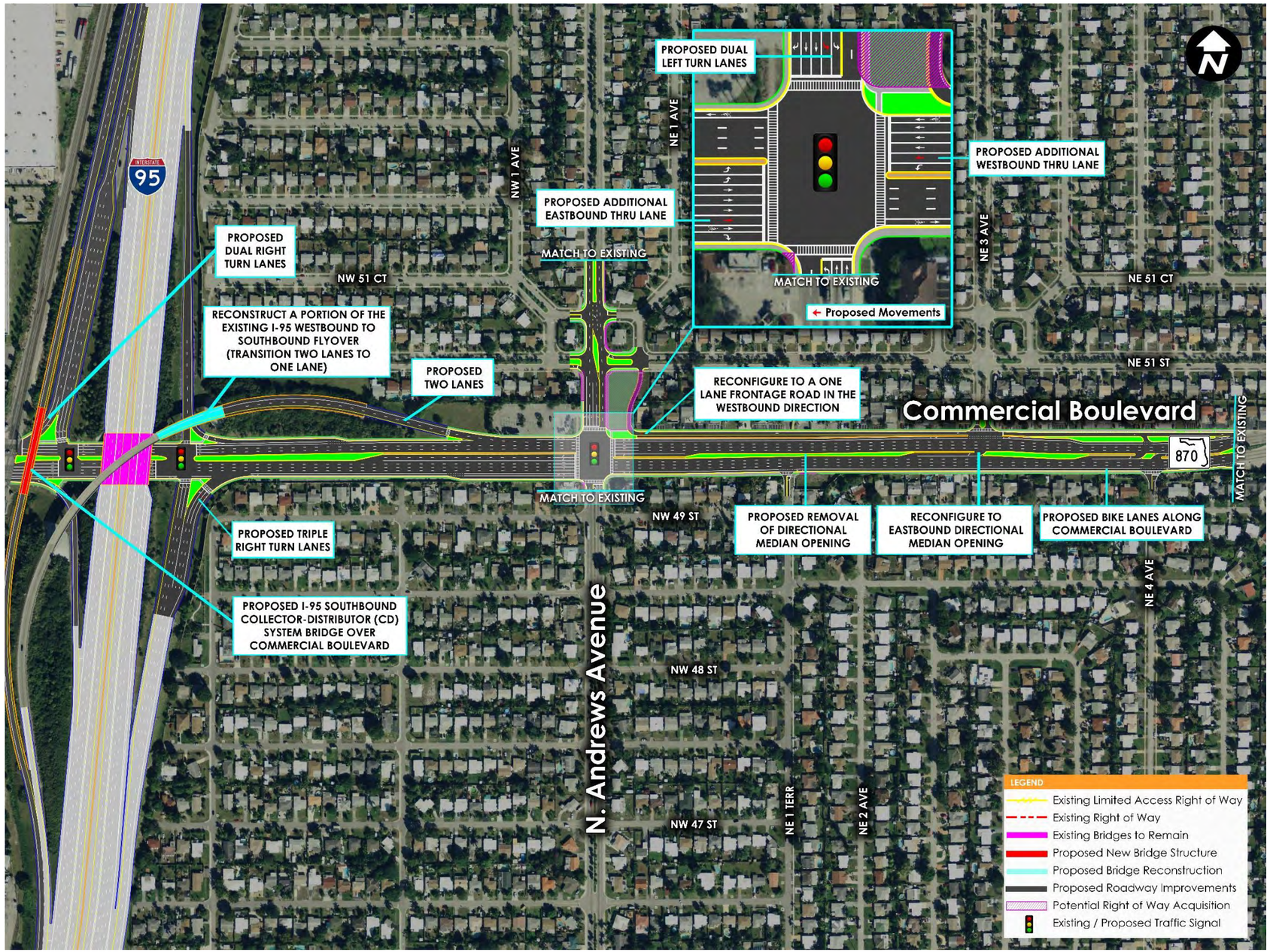


Figure 5-10 Commercial Boulevard Corridor Alternative 5 - N. Andrews Avenue Improvements

5.4.1.6 Commercial Boulevard Corridor Alternative 6

Commercial Boulevard Corridor Alternative 6 consists of the following improvements:

Commercial Boulevard and Powerline Road Intersection – Traditional Intersection Widening:

- Provide one additional Powerline Road southbound left turn lane by removing one of the three thru lanes to have a triple left turn movement to Commercial Boulevard east.
- Provide one additional Commercial Boulevard westbound thru lane by removing one of the two westbound to southbound left turn lanes to have four thru westbound lanes.
- Provide one additional Commercial Boulevard eastbound thru lane east of Powerline Road.

Commercial Boulevard and N. Andrews Avenue Intersection – Traditional Intersection Widening with Westbound Flyover:

- Provide one additional N. Andrews Avenue southbound left turn lane to have dual left turn lanes to Commercial Boulevard east.
- Provide one additional Commercial Boulevard eastbound thru lane to have four eastbound thru lanes.
- Reduce existing westbound thru lanes from three to two lanes.
- Provide a one lane bridge across N. Andrews Avenue to accommodate Commercial Boulevard westbound traffic to the existing I-95 westbound to southbound flyover on-ramp. The proposed one lane bridge merges with the existing I-95 westbound to southbound at-grade ramp which accommodates the N. Andrews Avenue southbound and northbound traffic heading to southbound I-95. This reconfigured I-95 westbound to southbound flyover on-ramp will have two lanes at the entrance and will drop to one lane after the third span of the flyover bridge. The first three spans of the flyover bridge will be reconstructed.
- Convert existing two-lane frontage road located at the northeast quadrant of the intersection to a one lane frontage road in the westbound direction. The west end of the proposed one lane frontage road turns northward before approaching N. Andrews Avenue and terminates at the intersection of NE 1 Avenue and NE 51 Street.

Refer to Figure 5-11 and Figure 5-12 for a graphic depiction of Corridor Alternative 6 for the Commercial Boulevard Interchange.

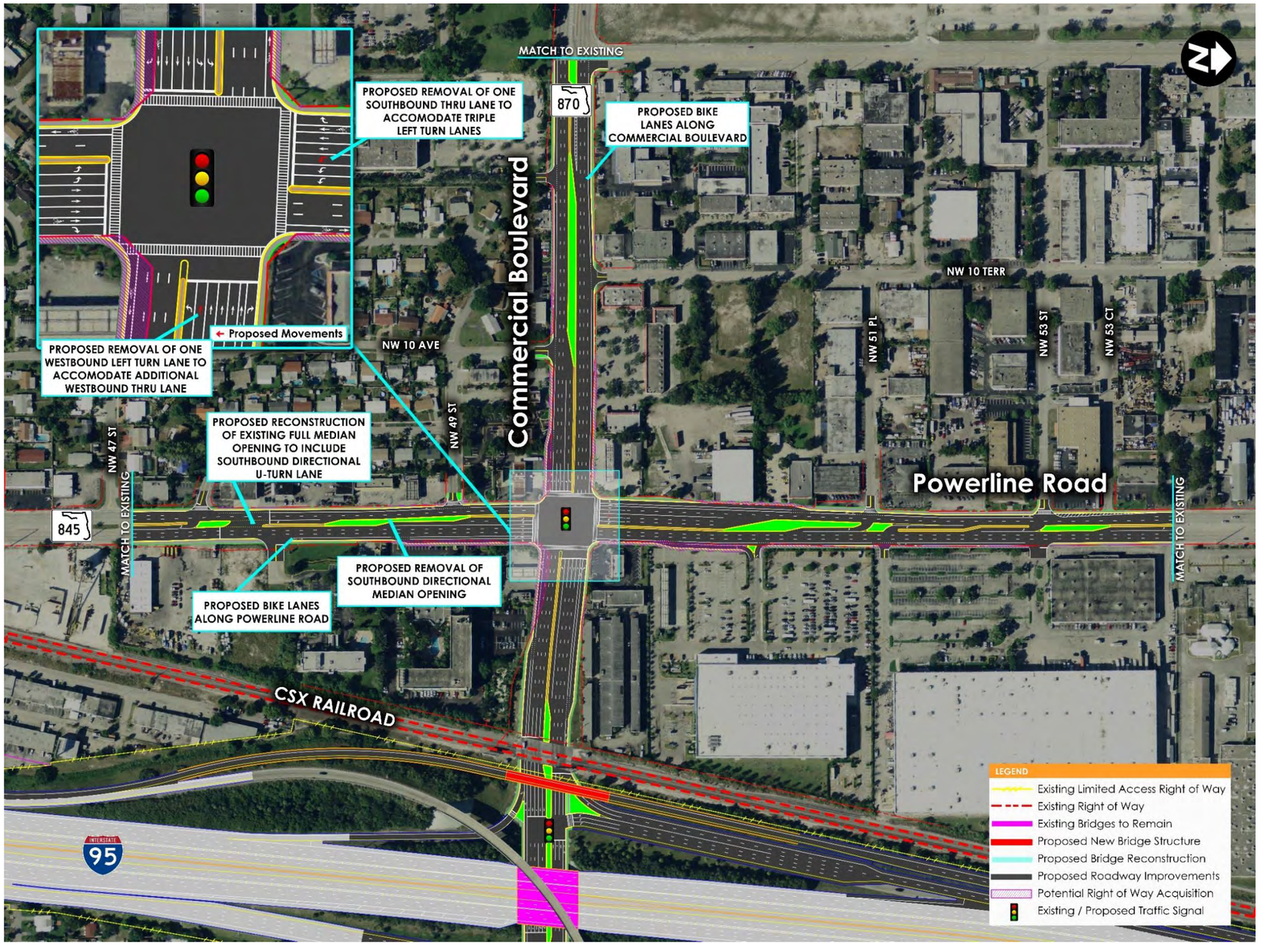


Figure 5-11 Commercial Boulevard Corridor Alternative 6 - Powerline Road Improvements

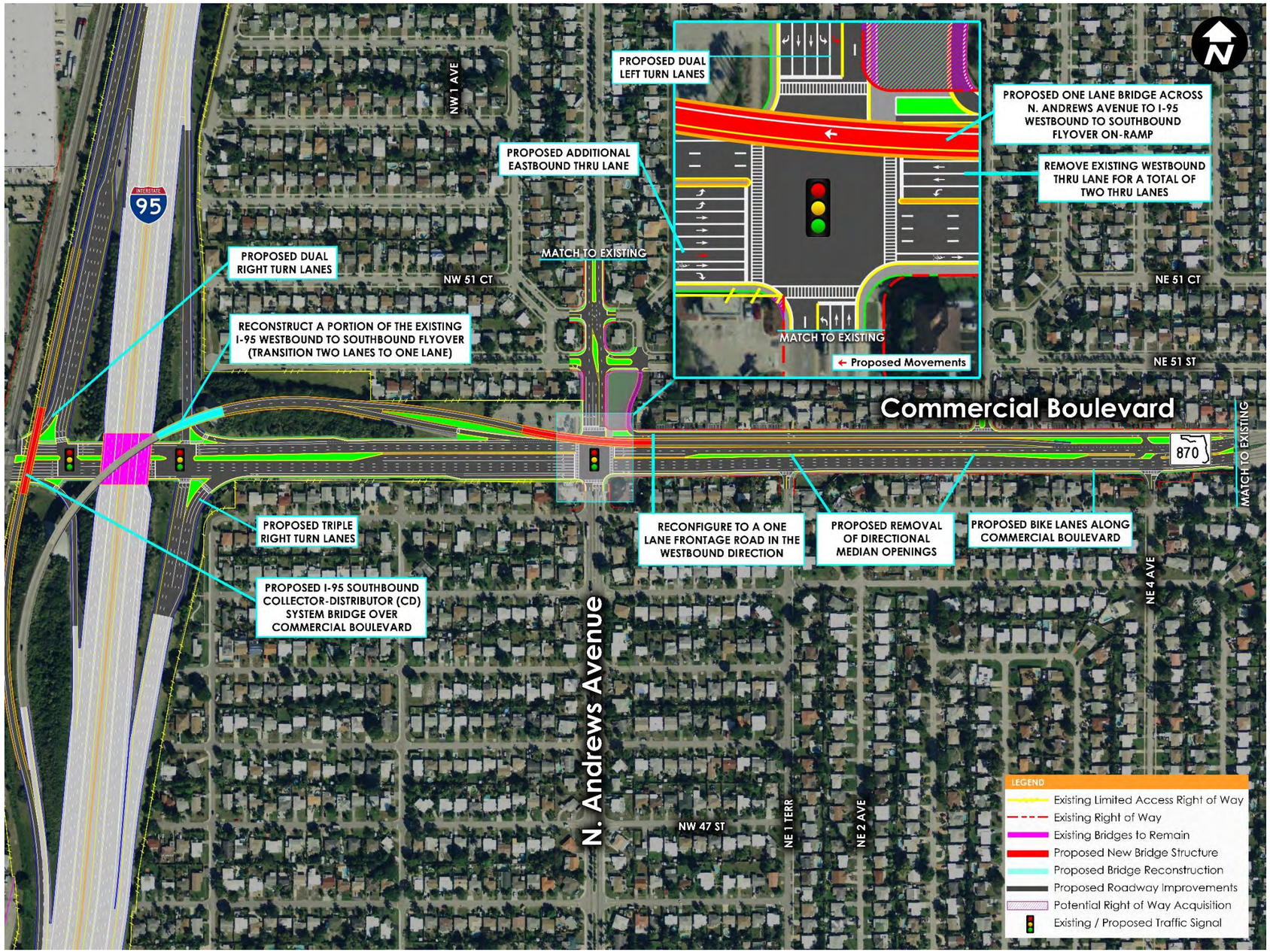


Figure 5-12 Commercial Boulevard Corridor Alternative 6 - N. Andrews Avenue Improvements

5.4.2 CYPRESS CREEK ROAD INTERCHANGE CORRIDOR ALTERNATIVES

A total of three Cypress Creek subarea alternatives were advanced from Phase 1; one for N. Andrews Avenue and three for the interchange. Three Corridor Alternatives were developed and analyzed for the Cypress Creek Road corridor. The three Corridor Alternatives provide the Traditional Intersection Widening subarea alternative for the intersection of Cypress Creek Road and N. Andrews Avenue. Additionally, the three Corridor Alternative provide seven-foot bicycle lanes along Cypress Creek Road in both directions. Refer to Table 5-3 for the subareas that are included in each Corridor Alternative.

Table 5-3
Cypress Creek Road Subarea Alternatives

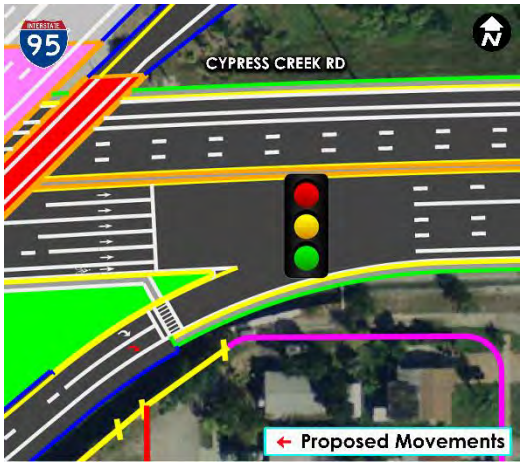
Corridor Alternative	Interchange	N. Andrews Avenue	Canal On-Ramp	Detail Figure
1	Modification of Existing Partial Cloverleaf	Traditional Intersection Widening	Yes	5-13
1A	Modification of Existing Partial Cloverleaf (without the proposed Canal On-Ramp)		No	5-14
2	Modification of Existing Partial Cloverleaf with Northbound to Westbound Flyover		Yes	5-15

5.4.2.1 Cypress Creek Road Corridor Alternative 1

Cypress Creek Road Corridor Alternative 1 consists of the following improvements summarized below.

I-95 Northbound Off-Ramps:

- Replace the existing I-95 northbound to westbound off-ramp loop at the northwest quadrant of the interchange with a two-lane bridge parallel to the existing I-95 mainline northbound bridge over Cypress Creek Road. The two-lane bridge accommodates the I-95 northbound to Cypress Creek westbound traffic to a stop condition at Cypress Creek Road. This movement will require signalization.
- Widen the northbound to eastbound off-ramp with an additional eastbound right turn lane to have a dual right turn movement to Cypress Creek Road eastbound. This movement will require signalization.



I-95 Northbound Off-Ramps

I-95 Northbound On-Ramp:

- Remove the Cypress Creek Road westbound free flow right on-ramp onto I-95 northbound. Provide one additional Cypress Creek Road westbound right turn lane to have a dual I-95 on-ramp which will drop to one lane before merging with the I-95 mainline.

I-95 Southbound On-Ramp (Canal On-Ramp):

- Provide a new I-95 Southbound on-ramp from N. Andrews Avenue at NW 66 Street (Canal On-ramp).
- Provide a bridge parallel to the I-95 southbound mainline bridges over Cypress Creek Road to carry the proposed Canal On-ramp. This new bridge would begin the southbound CD road system. In addition, the Cypress Creek Park and Ride on-ramp and the existing on-ramp from N. Andrews Avenue would merge with the CD road system.

N. Andrews Avenue and NW 66 Street Intersection:

- Provide a second southbound left turn lane to have dual left turn lanes accessing the new Canal On-ramp.
- Provide exclusive right turn lane from N. Andrews Avenue northbound to NW 66 Street eastbound onto the new Canal on-ramp.

Existing I-95 Southbound On-Ramp from N. Andrews Avenue:

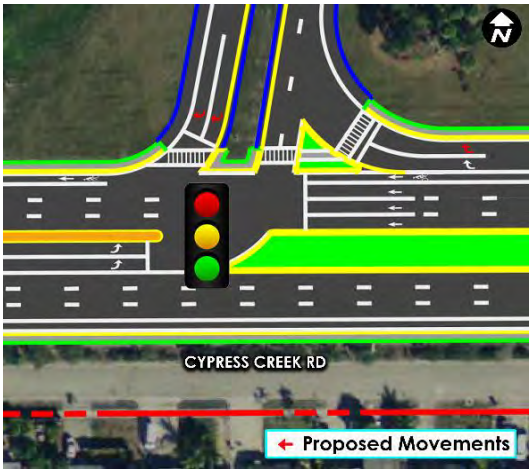
- Reconstruct and widen to provide an additional lane; tie in to the proposed CD road system which starts from the Cypress Creek Park and Ride.

N. Andrews Avenue and Cypress Creek Road Intersection:

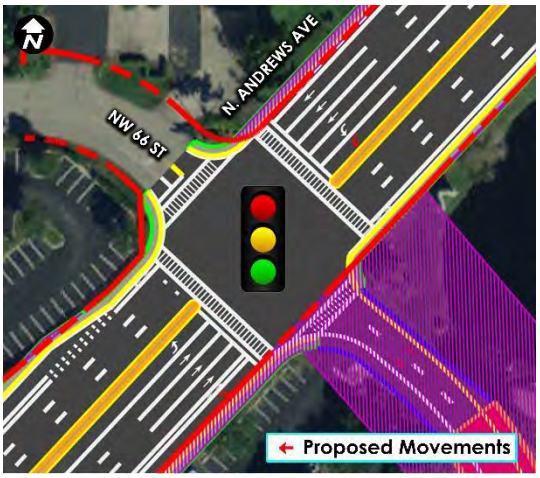
- Maintain existing number of lanes at the north and south legs of the intersection.
- Remove one Cypress Creek Road eastbound thru lane between NW 6 Way and N. Andrews Avenue and provide one additional right lane to have dual right turn lanes from Cypress Creek Road eastbound to N. Andrews Avenue southbound.

N. Andrews Avenue and N. Andrew Way Intersection:

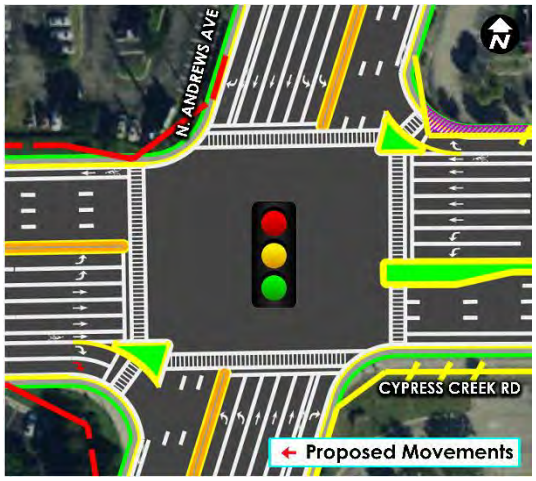
- Maintain existing number of lanes at the legs of the intersection.



I-95 Northbound On-Ramp



N. Andrews Avenue and
NW 66 Street Intersection

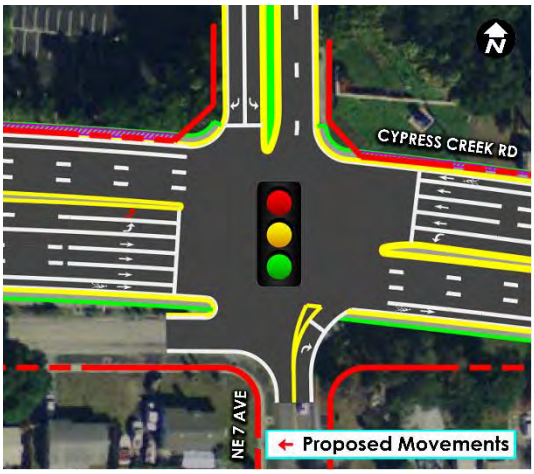


N. Andrews Avenue and
Cypress Creek Road Intersection

Cypress Creek Road and NE 7 Avenue Intersection:

- Provide one additional left turn lane to have dual left turn lanes from Cypress Creek Road eastbound to NE 7 Avenue northbound.

Refer to Figure 5-13 for a graphic depiction of Corridor Alternative 1 for the Cypress Creek Road Interchange.



Cypress Creek Road and
NE 7 Avenue Intersection

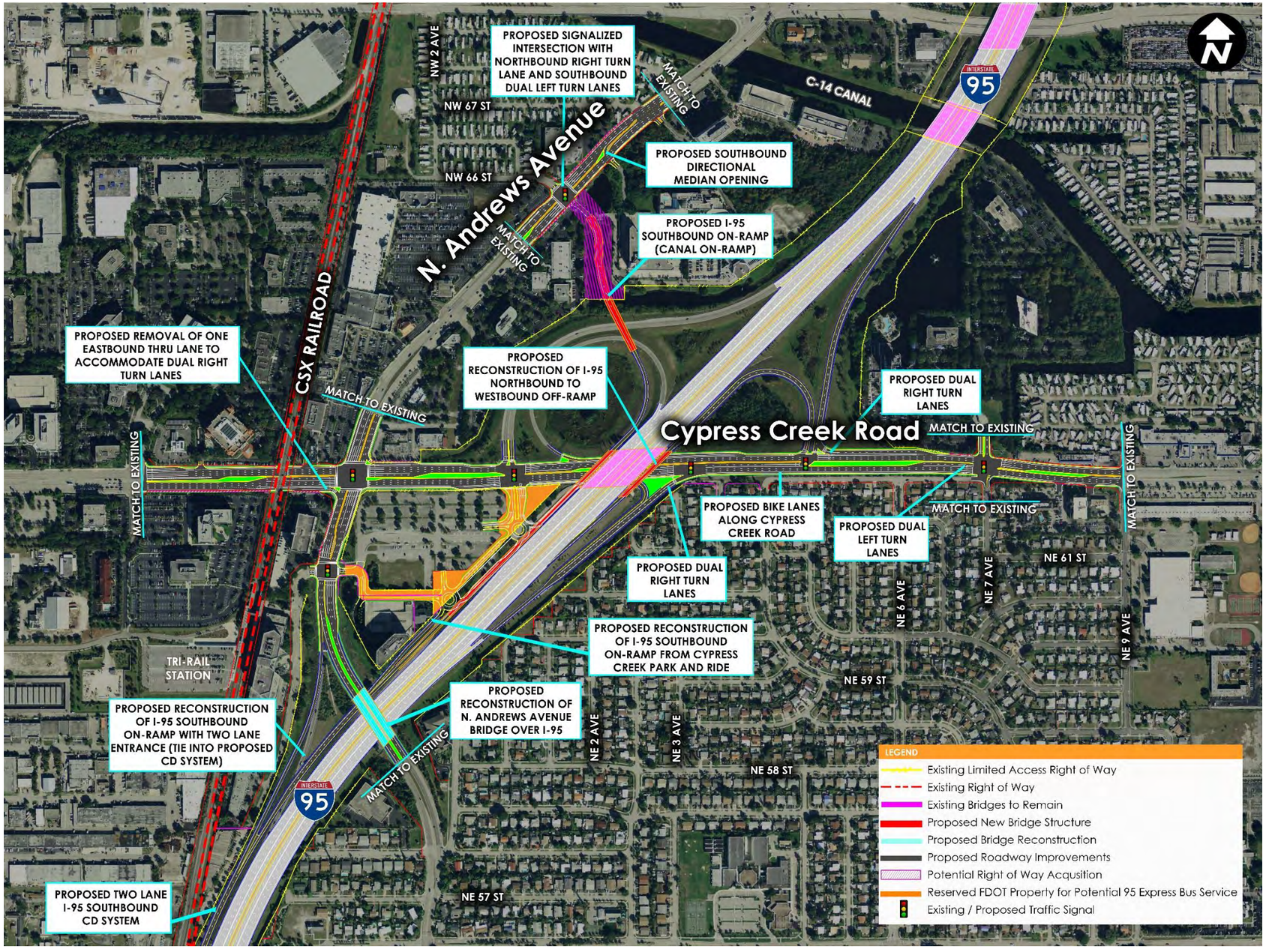


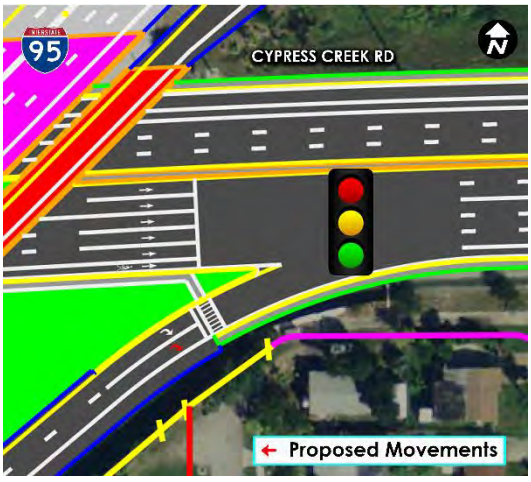
Figure 5-13 Cypress Creek Road Corridor Alternative 1 Improvements

5.4.2.2 Cypress Creek Road Corridor Alternative 1A

Cypress Creek Road Corridor Alternative 1A consists of the following improvements:

I-95 Northbound Off-Ramps:

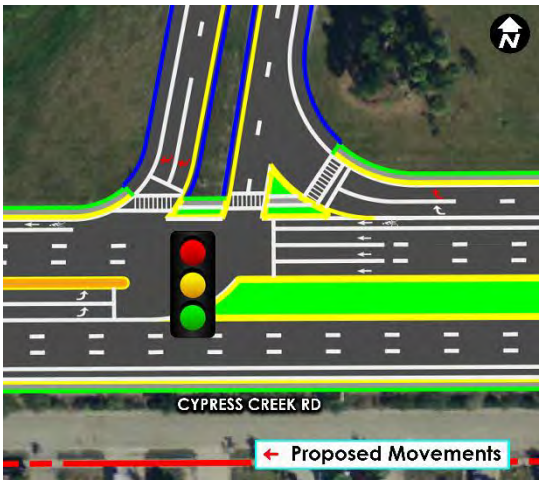
- Replace the existing I-95 northbound to westbound off-ramp loop at the northwest quadrant of the interchange with a two-lane bridge parallel to the existing I-95 mainline northbound bridge over Cypress Creek Road. The two-lane bridge accommodates the I-95 northbound to Cypress Creek westbound traffic to a stop condition at Cypress Creek Road. This movement will require signalization.
- Widen the northbound to eastbound off-ramp with an additional eastbound right turn lane to have a dual right turn movement to Cypress Creek Road eastbound. This movement will require signalization.



I-95 Northbound Off-Ramps

I-95 Northbound On-Ramp:

- Remove the Cypress Creek Road westbound free flow right on-ramp onto I-95 northbound. Provide one additional Cypress Creek Road westbound right turn lane to have a dual I-95 on-ramp which will drop to one lane before merging with the I-95 mainline.



I-95 Northbound On-Ramp

Existing I-95 Southbound On-Ramp from N. Andrews Avenue:

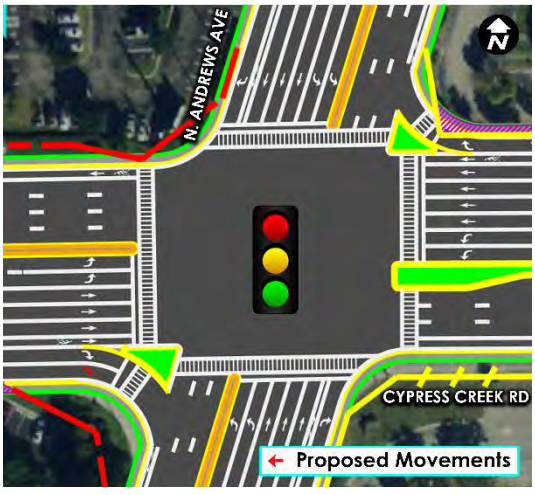
- Reconstruct and widen to provide an additional lane; tie in to the proposed CD road system which starts from the Cypress Creek Park and Ride.

N. Andrews Avenue and Cypress Creek Road Intersection:

- Maintain existing number of lanes at the north and south legs of the intersection.
- Remove one Cypress Creek Road eastbound thru lane between NW 6 Way and N. Andrews Avenue and provide one additional right lane to have dual right turn lanes from Cypress Creek Road eastbound to N. Andrews Avenue southbound.

N. Andrews Avenue and N. Andrews Way Intersection:

- Maintain existing number of lanes at the legs of the intersection.

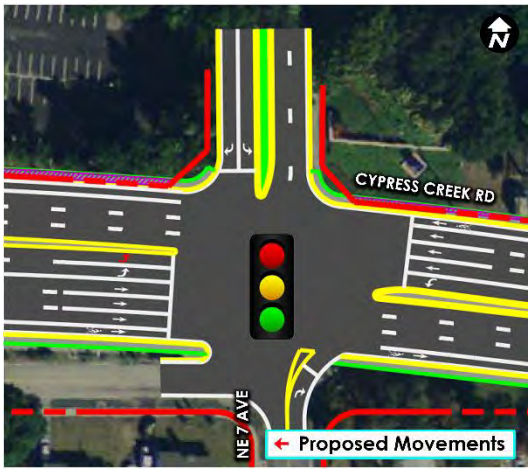


N. Andrews Avenue and
Cypress Creek Road Intersection

Cypress Creek Road and NE 7 Avenue Intersection:

- Provide one additional left turn lane to have dual left turn lanes from Cypress Creek Road eastbound to NE 7 Avenue northbound.

Refer to Figure 5-14 for a graphic depiction of Corridor Alternative 1A for the Cypress Creek Road Interchange.



Cypress Creek Road and
NE 7 Avenue Intersection

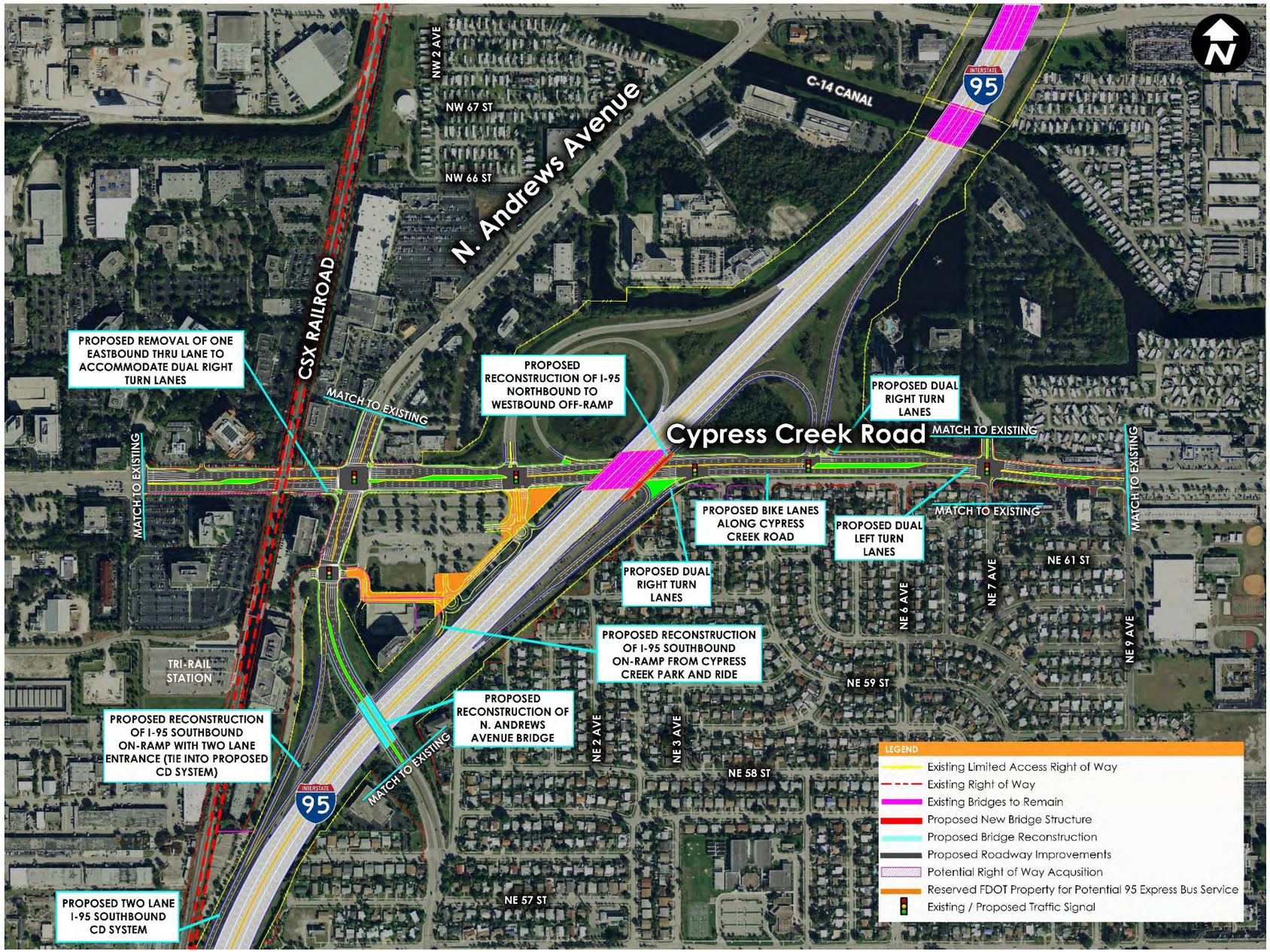


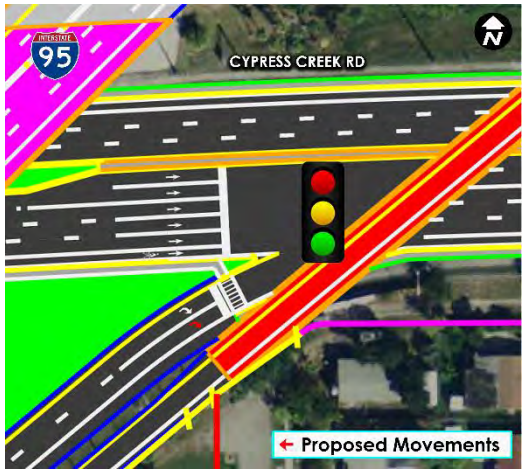
Figure 5-14 Cypress Creek Road Interchange – Option 1A Improvements

5.4.2.3 Cypress Creek Road Corridor Alternative 2

Cypress Creek Road Corridor Alternative 2 consists of the following improvements:

I-95 Northbound Off-Ramp:

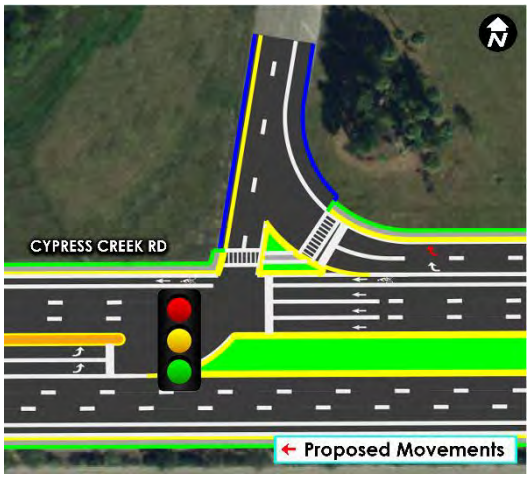
- Remove the existing I-95 northbound to westbound loop off-ramp. Provide a new parallel bridge to the I-95 mainline bridges over Cypress Creek Road. This new bridge departs from the existing northbound I-95 off-ramp, crosses Cypress Creek Road (second level) and crosses the I-95 mainline (third level) to the southbound off-ramp terminal.
- Widen the northbound to eastbound off-ramp with an additional eastbound right turn lane to have a dual right turn movement to Cypress Creek Road eastbound. This movement will require signalization.



I-95 Northbound Off-Ramp

I-95 Northbound On-Ramp:

- Remove the Cypress Creek Road westbound free flow right on-ramp onto I-95 northbound. Provide one additional Cypress Creek Road westbound right turn lane to have a dual I-95 on-ramp which will drop to one lane before merging with the I-95 mainline.



I-95 Northbound On-Ramp

I-95 Southbound Off-Ramp:

- Maintain the existing two-lane off-ramp at the exit point and convert it to four lanes at the terminal. An additional lane from the new I-95 northbound to Cypress Creek Road westbound is also provided resulting in triple right turn lanes to westbound Cypress Creek. The dual left turn lanes to eastbound Cypress Creek are maintained.

I-95 Southbound On-Ramp (Canal On-Ramp):

- Provide a new I-95 Southbound on-ramp from N. Andrews Avenue at NW 66 Street (Canal On-ramp).
- Provide a bridge parallel to the I-95 southbound mainline bridges over Cypress Creek Road to carry the proposed Canal On-ramp. This new bridge would begin the southbound CD road system. In addition, the Cypress Creek Park and Ride on-ramp and the existing on-ramp from N. Andrews Avenue would merge with the CD road system.

N. Andrews Avenue and NW 66th Street Intersection:

- Provide a second southbound left turn lane to have dual left turn lanes accessing the new Canal on-ramp.
- Provide exclusive right turn lane from N. Andrews Avenue northbound to NW 66 Street eastbound onto the new Canal On-ramp.

Existing I-95 Southbound On-Ramp from N. Andrews Avenue:

- Reconstruct and widen to provide an additional lane; tie in to the proposed CD road system which starts from the Cypress Creek Park and Ride.

N. Andrews Avenue and Cypress Creek Road Intersection:

- Maintain existing number of lanes at the north and south legs of the intersection.
- Remove one Cypress Creek Road eastbound thru lane between NW 6 Way and N. Andrews Avenue and provide one additional right lane to have dual right turn lanes from Cypress Creek Road eastbound to N. Andrews Avenue southbound.

N. Andrews Avenue and N. Andrew Way Intersection:

- Maintain existing number of lanes at the legs of the intersection.

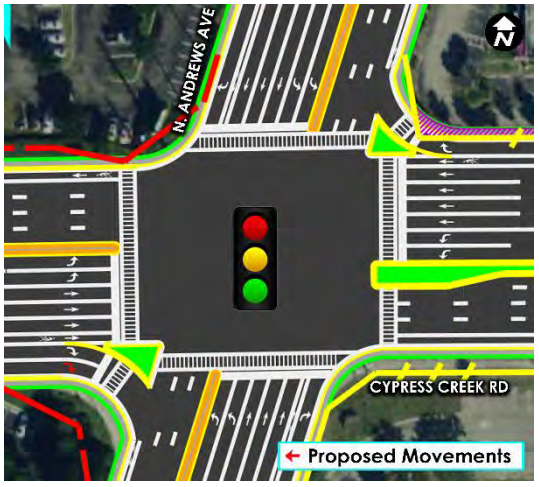
Cypress Creek Road and NE 7 Avenue Intersection:

- Provide one additional left turn lane to have dual left turn lanes from Cypress Creek Road eastbound to NE 7 Avenue northbound.

Refer to Figure 5-15 for a graphic depiction of Corridor Alternative 2 for the Cypress Creek Road Interchange.



N. Andrews Avenue and
NW 66 Street Intersection



N. Andrews Avenue and
Cypress Creek Road Intersection



Cypress Creek Road and
NE 7 Avenue Intersection

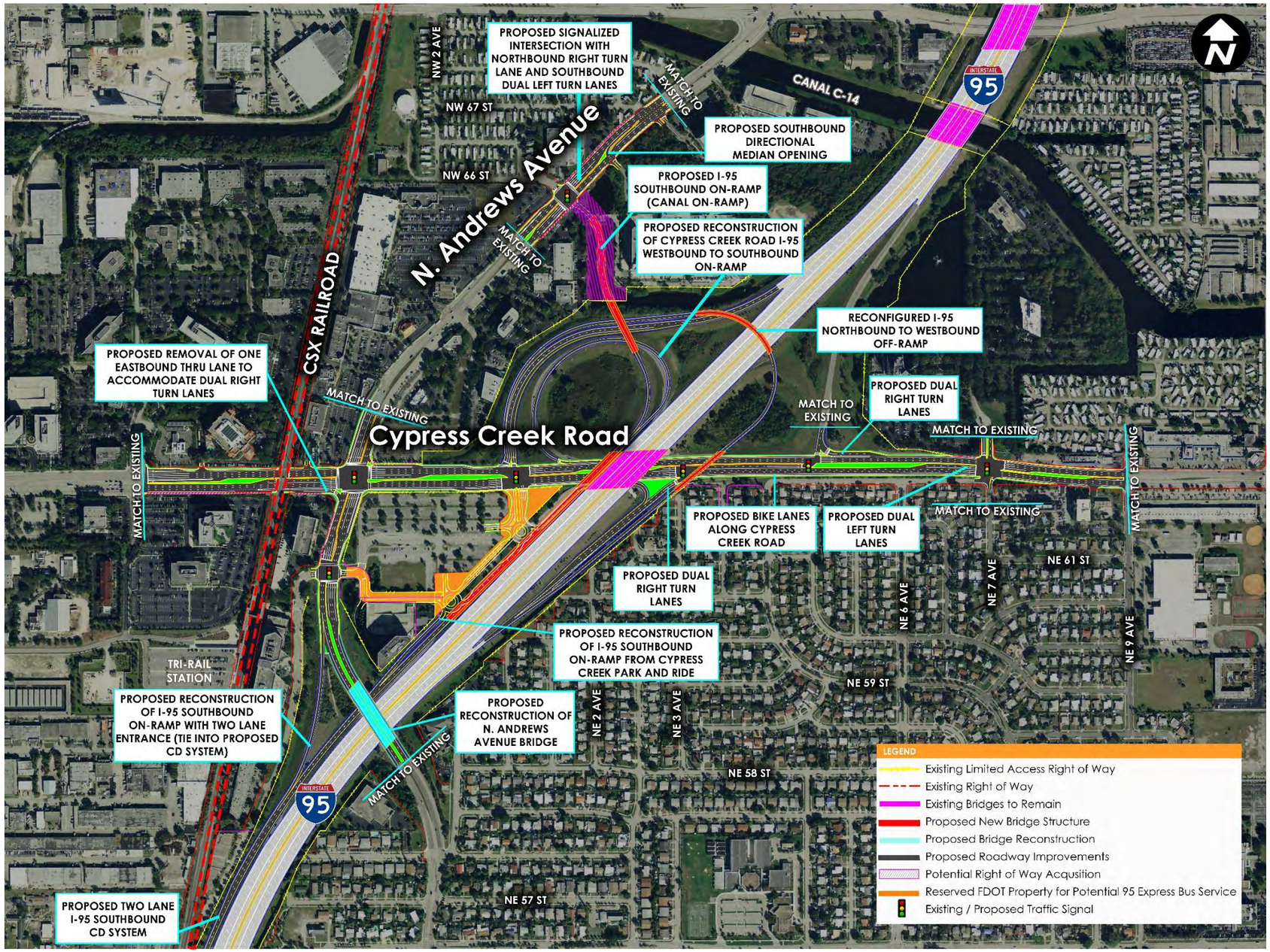


Figure 5-15 Cypress Creek Road Corridor Alternative 2 Improvements

5.4.3 COMPLETE STREETS

Complete streets serve the transportation needs of users of different ages and abilities, including cyclists, pedestrians, motorists, transit riders, emergency responders, and freight handlers. Incorporation of complete streets into the project development process requires coordination with local governments, MPO's, transportation agencies, and the public. Several meetings were held throughout the process with key stakeholders to understand the needs of the community and help develop build alternatives that are complete street oriented. See Public Involvement Summary Report on file with FDOT District Four for complete information of the meetings and coordination held with key stakeholders.

5.4.4 PEDESTRIANS AND BICYCLE ACCOMMODATION

Arterial street segments within the study area have sidewalks on both sides. These existing sidewalks will either remain or be replaced to standard width where widening is proposed. Seven-foot bike lanes are proposed on both sides of Commercial Boulevard and Cypress Creek Road. Four-foot bike lanes are proposed along N. Andrews Avenue between Cypress Creek Road and N. Andrews Way to minimize right of way impacts and to provide continuity with the existing four-foot bike lanes along N. Andrews Avenue, north of Cypress Creek Road.

5.4.5 TRAFFIC OPERATIONS

The Commercial Boulevard Corridor Alternative Vissim models were used to evaluate intersection operations using node evaluation. Average intersection delay and an estimated Level of Service (LOS) based on the Highway Capacity Manual (HCM) metrics for both the AM and PM peak hours are summarized in Table 5-4 and Table 5-5 for the Design Year (2040). The results of the intersection analyses indicate that the I-95 ramp terminal intersections are operating similarly (LOS D or better) for the corridor alternatives during the AM and PM peak hours.

At the Commercial Boulevard and Powerline Road intersection, Corridor Alternatives 2, 3, and 4 outperform the other alternatives because of the grade separation of critical movements that improve overall intersection operations. While the Commercial Boulevard and Powerline Road intersection is operating at a LOS E/F in the design year with traditional widening in Corridor Alternatives 1, 5, and 6, the analysis demonstrated that the alternatives would improve overall interchange operations compared to the No-Action Alternative.

At the Commercial Boulevard and N. Andrews Avenue intersection, Corridor Alternatives 2 through 6 improve intersection operations compared to Corridor Alternative 1. The alternatives include a second southbound left turn lane on N. Andrews Avenue and an additional eastbound thru lane on Commercial Boulevard to minimize queueing that can impact the interchange. The primary difference is that Corridor Alternative 1 does not provide any improvements for westbound Commercial Boulevard. Of the remaining Corridor Alternatives, both Corridor Alternative 5 and 6 improve overall intersection operations by either widening westbound Commercial Boulevard to add a fourth thru lane, or by constructing a westbound flyover over N. Andrews Avenue.

The results of the intersection analyses show that the Commercial Boulevard and N. Andrews intersection is operating at LOS F in the PM peak hour, compared to LOS D in Corridor Alternative 5 and LOS E in Corridor Alternative 6. While the overall average intersection delay increased by 11 seconds (due in part to the reduction in westbound thru lanes), the delays for the critical westbound Commercial Boulevard to southbound I-95 movement are significantly reduced.

Table 5-4
2040 AM Commercial Boulevard Corridor Alternatives Intersection Results

Intersection	No-Action		Corridor Alternative 1		Corridor Alternative 2		Corridor Alternative 3		Corridor Alternative 4		Corridor Alternative 5		Corridor Alternative 6	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Powerline Road	83.7	F	72.2	E	34.3	C	50.2	D	49.9	D	75.0	E	77.0	E
I-95 SB Ramps	38.8	D	25.2	C	23.5	C	24.4	C	25.4	C	35.1	D	35.2	D
I-95 NB Ramps	55.9	E	31.1	C	29.0	C	26.6	C	30.7	C	31.6	C	31.8	C
N. Andrews Avenue	72.5	E	72.2	E	36.6	D	35.5	D	37.7	D	42.8	D	34.4	C

Table 5-5
2040 PM Commercial Boulevard Corridor Alternatives Intersection Results

Intersection	No-Action		Corridor Alternative 1		Corridor Alternative 2		Corridor Alternative 3		Corridor Alternative 4		Corridor Alternative 5		Corridor Alternative 6	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Powerline Road	79.2	E	82.1	F	15.2	B	50.2	D	37.7	D	81.3	F	80.3	F
I-95 SB Ramps	34.0	C	16.6	B	16.1	B	17.0	B	17.3	B	14.0	B	16.9	B
I-95 NB Ramps	34.9	C	29.5	C	26.6	C	23.6	C	27.8	C	22.2	C	29.5	C
N. Andrews Avenue	133.9	F	96.7	F	61.2	E	57.8	E	62.6	E	50.9	D	62.3	E

The Cypress Creek Road Corridor Alternative Vissim models were used to evaluate intersection operations using node evaluation. Average intersection delay and an estimated LOS based on HCM metrics for both the AM and PM peak hours are summarized in Table 5-6 and Table 5-7 for the Design Year (2040). The results of the intersection analyses indicate that the intersections are operating at LOS D or better for the Corridor Alternatives during the AM peak hour. During the PM peak hour, the intersections are operating at LOS D or better except for Cypress Creek Road and N. Andrews Avenue in Alternative 3, which is operating at LOS E.

Table 5-6
2040 AM Cypress Creek Road Corridor Alternatives Intersection Results

Intersection	No-Action		Corridor Alternative 1		Corridor Alternative 1A		Corridor Alternative 2	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Cypress Creek Road & N. Andrews Avenue	47.8	D	33.2	C	35.4	D	37.0	D
Cypress Creek Road & I-95 SB Exit Ramp	35.5	D	28.7	C	29.0	C	39.8	C
Cypress Creek Road & I-95 NB Exit Ramp	5.6	A	18.3	B	18.4	B	19.6	B
Cypress Creek Road & I-95 NB On Ramp	20.9	C	37.9	D	38.7	D	16.9	D
Cypress Creek Road & NW 7 Avenue	32.5	C	36.5	D	36.9	D	37.2	D

Table 5-7
2040 PM Cypress Creek Road Corridor Alternatives Intersection Results

Intersection	No-Action		Corridor Alternative 1		Corridor Alternative 1A		Corridor Alternative 2	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Cypress Creek Road & N. Andrews Avenue	94.4	F	41.2	D	66.7	E	43.4	D
Cypress Creek Road & I-95 SB Exit Ramp	107.9	F	28.0	C	42.5	D	33.6	C
Cypress Creek Road & I-95 NB Exit Ramp	40.5	D	18.5	B	18.2	B	19.0	B
Cypress Creek Road & I-95 NB On Ramp	44.4	D	25.4	C	26.2	C	12.4	B
Cypress Creek Road & NW 7 Avenue	81.4	F	36.2	D	35.5	D	35.1	D

5.4.6 SAFETY

A Crash Data Review was conducted for this project in June 2016. The review summarized crash data for the five most recent years from 2010 to 2014 for the I-95 mainline and interchange ramps, Commercial Boulevard, and Cypress Creek Road within the study area. Based on the review, the predominant crash types in the study area was overwhelmingly rear-ends followed by sideswipes. These crash patterns are indicative of traffic congestion and a need for improvement of capacity. A summary of the Crash Data Review is provided in Section 2.15 of this report.

The Corridor Alternatives propose to add capacity and improve traffic operations at the I-95 interchanges and arterial streets which will ultimately improve safety. Below is a summary of the key improvements from each Corridor Alternative that will improve safety:

- Cypress Creek Road Corridor Alternatives 1, 1A and 2
    - The I-95 CD road system will reduce sideswipe crashes from weaving vehicles and rear-end crashes with improved traffic operations on the mainline.
    - Ramp terminal capacity improvements will reduce rear-end collisions. Operational improvements with the addition of a traffic signal control the conflict points between the ramps and Cypress Creek Road and effectively reduce sideswipe crashes.
    - Designated bicycle lanes contribute to improve bicycle safety
- Commercial Boulevard Corridor Alternative 1, 2, 3, 4, 5 and 6
    - Capacity improvements along Commercial Boulevard and at the interchange ramps will reduce rear-end crashes.
    - Designated bicycle lanes contribute to improve bicycle safety
- Commercial Boulevard Corridor Alternative 2, 3, and 4
    - Commercial Boulevard and Powerline Road grade separations will reduce rear-end crashes, left-turn and right-turn-related crashes, and sideswipes with the improved traffic operations, increased capacity, and reduction of conflict points.
- Commercial Boulevard Corridor Alternative 2, 4 and 6
    - Commercial Boulevard and N. Andrews Avenue grade separation will reduce rear-end crashes, left-turn and right-turn-related crashes, and sideswipes with the improved traffic operations, increased capacity, and reduction of conflict points.
    - Traffic operations, increased capacity, and reduction of conflict points.

5.4.7 ACCESS MANAGEMENT

5.4.7.1 I-95

I-95 is a limited access facility with an Access Class 1, Area Type 2. The minimum interchange spacing allowed is 2 miles under this class. The current spacing between Commercial Boulevard and Cypress Creek interchanges will remain inadequate at 1.2 miles under the Corridor Alternatives being considered.

5.4.7.2 Commercial Boulevard

Commercial Boulevard is an urban principal arterial with access classes 3 and 5. The segment west of Powerline Road falls under access class 3, whereas the eastern portion has an access class 5. The proposed access changes associated with each Corridor Alternative for Commercial Boulevard are based on the intersection improvements associated with each intersection. Commercial Boulevard, west of Powerline Road has proposed access changes associated with the Echelon with Median U-Turn alternative as shown in Table 5-8 and Figure 5-16.

Existing driveways and the following side streets (NW 12 Avenue, NW 10 Avenue and NW 10 Terrace) within the construction limits will continue to operate as right-in and right-out facilities.

Table 5-8 Proposed Access Changes Along Commercial Boulevard – West of Powerline Road			
Corridor Alternative	Powerline Road Intersection Improvement	Access Changes	Figure
1	Traditional Intersection Widening	None	N/A
2	Echelon with Median U-Turn	Proposed signalized dual U-turn lanes	5-16
3	Northbound-southbound Grade Separation	None	N/A
4	Northbound-southbound Grade Separation	None	N/A
5	Traditional Intersection Widening	None	N/A
6	Traditional Intersection Widening	None	N/A

There are no access changes proposed along Commercial Boulevard, from east of Powerline Road to West of N. Andrews Avenue.

There are access changes proposed along Commercial Boulevard, east of N. Andrews Avenue as shown in Table 5-9 and Figure 5-17 through Figure 5-20.

Table 5-9 Proposed Access Changes Along Commercial Boulevard – East N. Andrews Avenue			
Corridor Alternative	N. Andrews Avenue Intersection Improvement	Access Changes East of N. Andrews Avenue	Figure
1	Traditional Intersection Widening North & West Legs	Proposed removal of westbound directional median opening at NE 3 Avenue	5-17
2, 4 & 6	Traditional Intersection Widening with Westbound Flyover	Proposed removal of directional median openings NE 1 Terrace and NE 3 Avenue; Reconfigure to a one lane frontage road in the westbound direction	5-18 & 5-19
3 & 5	Traditional Intersection Widening North, East & West Legs	Proposed removal o directional median opening NE 1 Terrace; Proposed removal of westbound directional median opening at NE 3 Avenue; Reconfigure to a one lane frontage road in the westbound direction	5-20

Corridor Alternative 1 proposes removing the westbound directional median opening to avoid conflict with the merging of the eastbound thru movement from four to three lanes at this location.

Eastbound U-turns can be made at the adjacent directional median opening on NE 1 Terrace. Proposed access change to Corridor Alternative 1 is shown in Figure 5-17.

Corridor Alternatives 2, 3, 4, 5 and 6 propose reconfiguring the frontage road located on the northeast quadrant of the Commercial Boulevard and N. Andrews Avenue intersection to a one lane frontage road in the westbound direction. Traffic form the frontage road and NE 3 Avenue will be rerouted to NW 51 Street to maintain connectivity to Commercial Boulevard. Corridor Alternative 2, 4 and 6 removes the directional median openings at NE 1 Terrace and NE 3 Avenue and requires eastbound traffic to use the directional median opening at NE 4 Avenue to access the frontage road. Proposed access changes to Corridor Alternatives 2, 4, and 6 are shown in Figure 5-18 and Figure 5-19.

Corridor Alternative 3 and 5 propose access changes similar to Corridor Alternatives 2, 4 and 6 with the exception that the existing eastbound directional median opening at NE 3 Avenue is maintained and the westbound directional median opening is removed. Proposed access changes to Corridor Alternatives 3 and 5 are shown in Figure 5-20.



Figure 5-16 Commercial Boulevard Proposed Access Changes
Commercial Boulevard Corridor Alternative 2 – West of Powerline Road

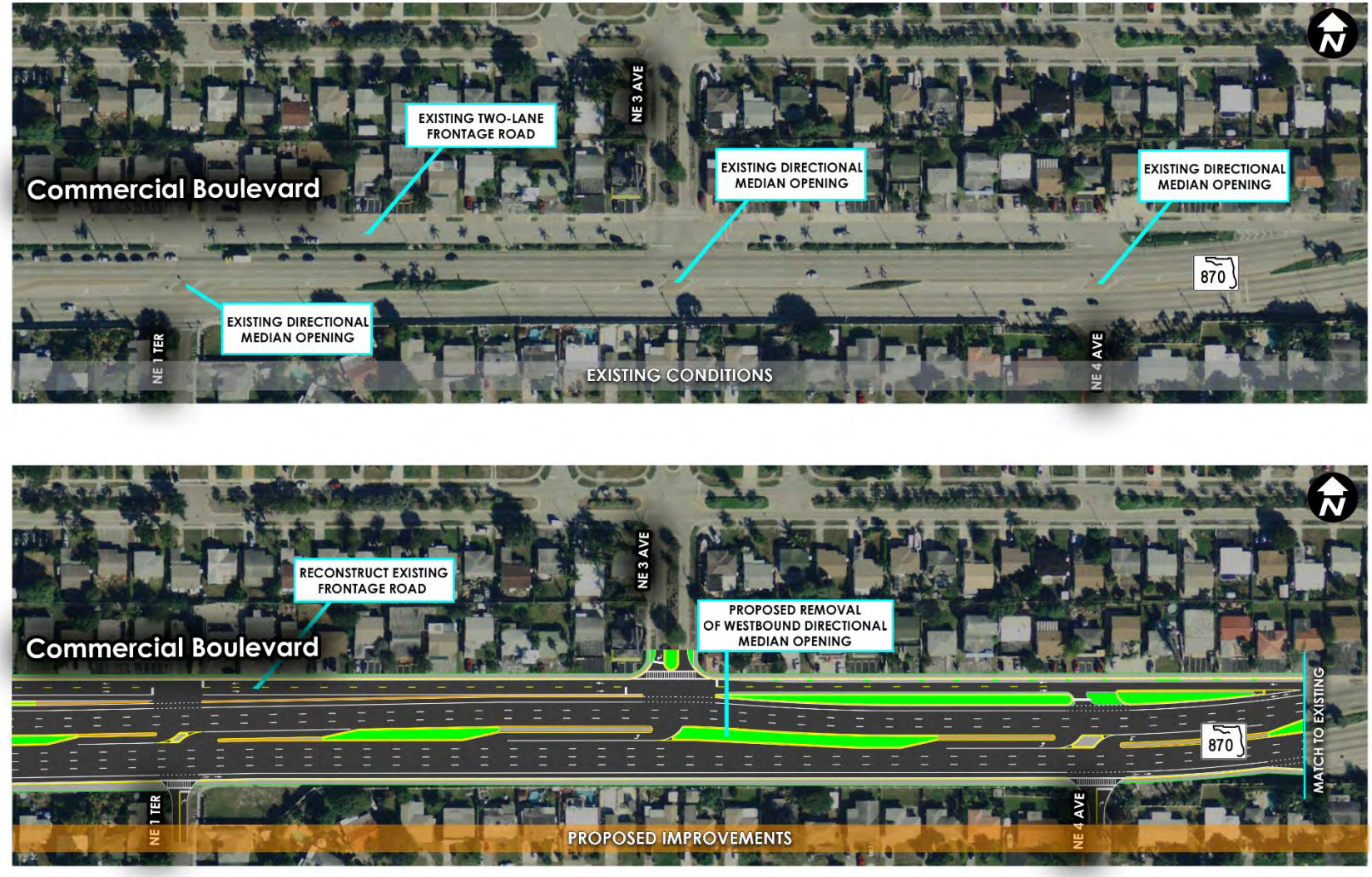


Figure 5-17 Commercial Boulevard Proposed Access Changes
Commercial Boulevard Corridor Alternative 1 – East of N. Andrews Avenue



Figure 5-18 Commercial Boulevard Proposed Access Changes
Commercial Boulevard Corridor Alternative 2, 4, and 6 – East of N. Andrews Avenue



Figure 5-19 Commercial Boulevard Proposed Access Changes
Commercial Boulevard Corridor Alternative 2, 4, and 6 – East of N. Andrews Avenue



Figure 5-20 Comercial Boulevard Proposed Access Changes
Commercial Boulevard Corridor Alternative 3 and 5 – East of N. Andrews Avenue

5.4.7.3 Powerline Road

Powerline Road is a principal arterial with an access management class 5.

South of Commercial Boulevard, Corridor Alternatives 1, 5 and 6 proposed the removal of the southbound directional median opening just south of Commercial Boulevard to avoid conflicts with the storage of the northbound dual left turns. As a result of this access change, a southbound directional U-turn lane is proposed at the south median opening just north of NW 47 Court. Proposed access changes to Corridor Alternatives 1, 5, and 6 are shown in Table 5-10 and Figure 5-21.

South of the Commercial Boulevard, Corridor Alternatives 2, 3 and 4 proposed the same access changes as a result of the grade separations along Powerline Road. Southbound traffic will be able to perform U-turns at NW 46 Street and northbound traffic at the proposed Texas U-turn underneath the proposed grade separation. Frontage roads are proposed on both sides of the grade separation to allow traffic circulation. Proposed access changes to Corridor Alternatives 2, 3 and 4 are shown in Table 5-10 and Figure 5-22.

Table 5-10
Proposed Access Changes Along Powerline Road – South of Commercial Boulevard

Corridor Alternative	Powerline Road Intersection Improvement	Access Changes	Figure
1, 5 and 6	Traditional Intersection Widening	Proposed reconstruction of existing full median opening to include southbound directional U-turn lane just norh of NW 47 Court; Proposed removal of southbound directional median opening	5-21
2	Echelon with Median U-Turn	Proposed removal of southbound directional median opening just south of Commercial Boulevard, full median opening north of NW 47 Court and northbound directional median at NW 47 Court	5-22
3 and 4	Northbound-southbound Grade Separation *	Same access changes as Corridor Alternative 2	5-22

*Note: Figure 5-22 shows the Echelon concept of Corridor Alternative 2, however the Grade Separation proposed under Corridor Alternatives 3 and 4 maintain the same access changes

To the north of Commercial Boulevard, Corridor Alternatives 2, 3 and 4 propose removal of the directional median opening at NW 51 Place as a result of the proposed grade separation along Powerline Road. Northbound traffic will be able to perform a U-turn just north of NW 53 Court and southbound traffic at the proposed Texas U-turn underneath the proposed grade separation. Frontage roads are proposed on both sides of the grade separation to allow traffic circulation. Proposed access changes to Corridor Alternatives 2, 3 and 4 are shown in Table 5-11 and Figure 5-23.

Table 5-11 Propose Access Changes Along Powerline Road – North of Commercial Boulevard			
Corridor Alternative	Powerline Road Intersection Improvement	Access Changes	Figure
1, 5 and 6	Traditional Intersection Widening	None	N/A
2	Echelon with Median U-Turn	Proposed removal of directional median opening	5-23
3 and 4	Northbound-southbound Grade Separation *	Proposed removal of directional median opening	5-23

*Note: Figure 5-23 shows the Echelon concept of Corridor Alternative 2, however the Grade Separation proposed under Corridor Alternatives 3 and 4 maintain the same access changes

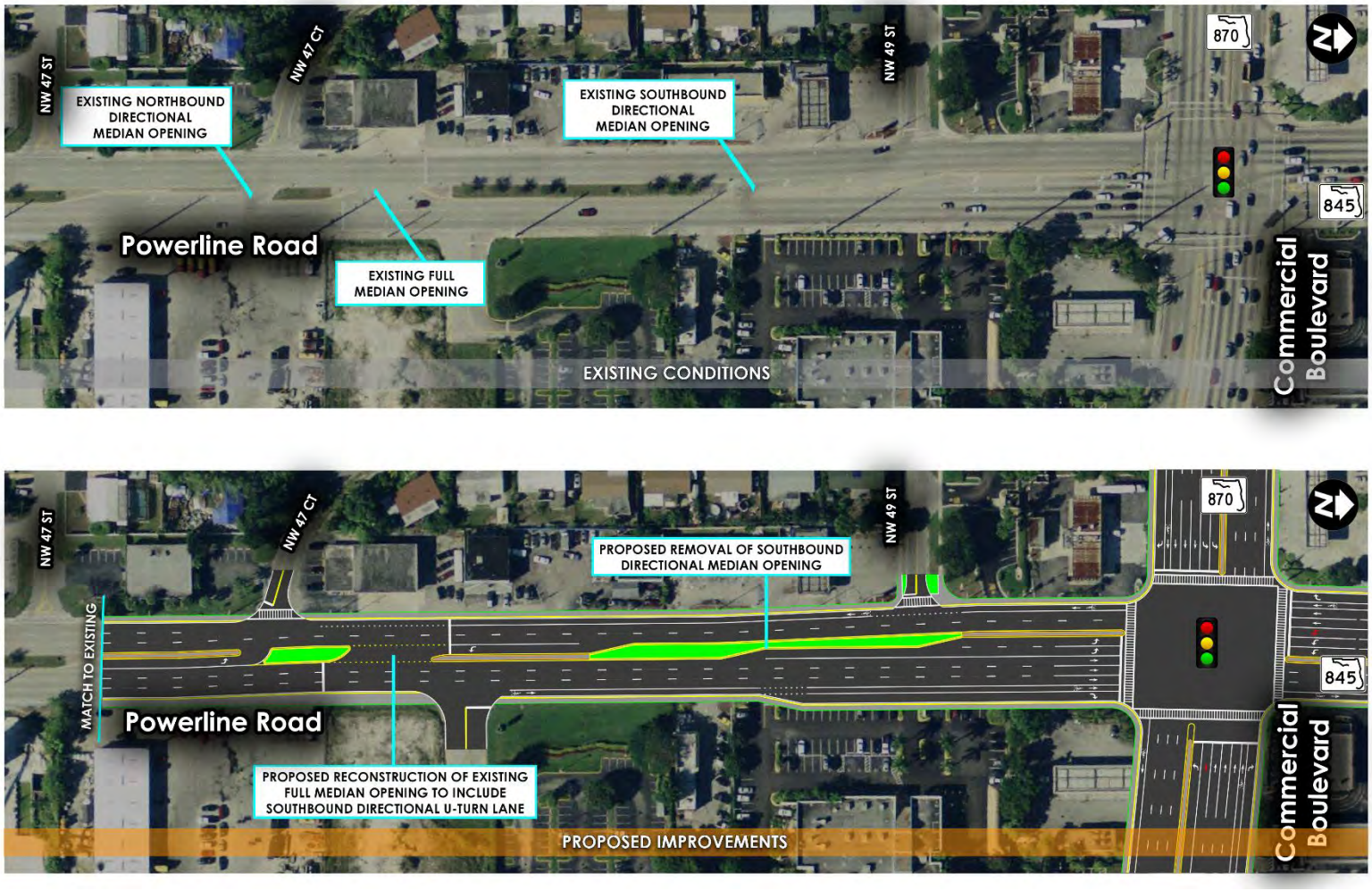


Figure 5-21 Powerline Road Proposed Access Changes
Commercial Boulevard Corridor Alternative 1, 5, and 6 – South of Commercial Boulevard

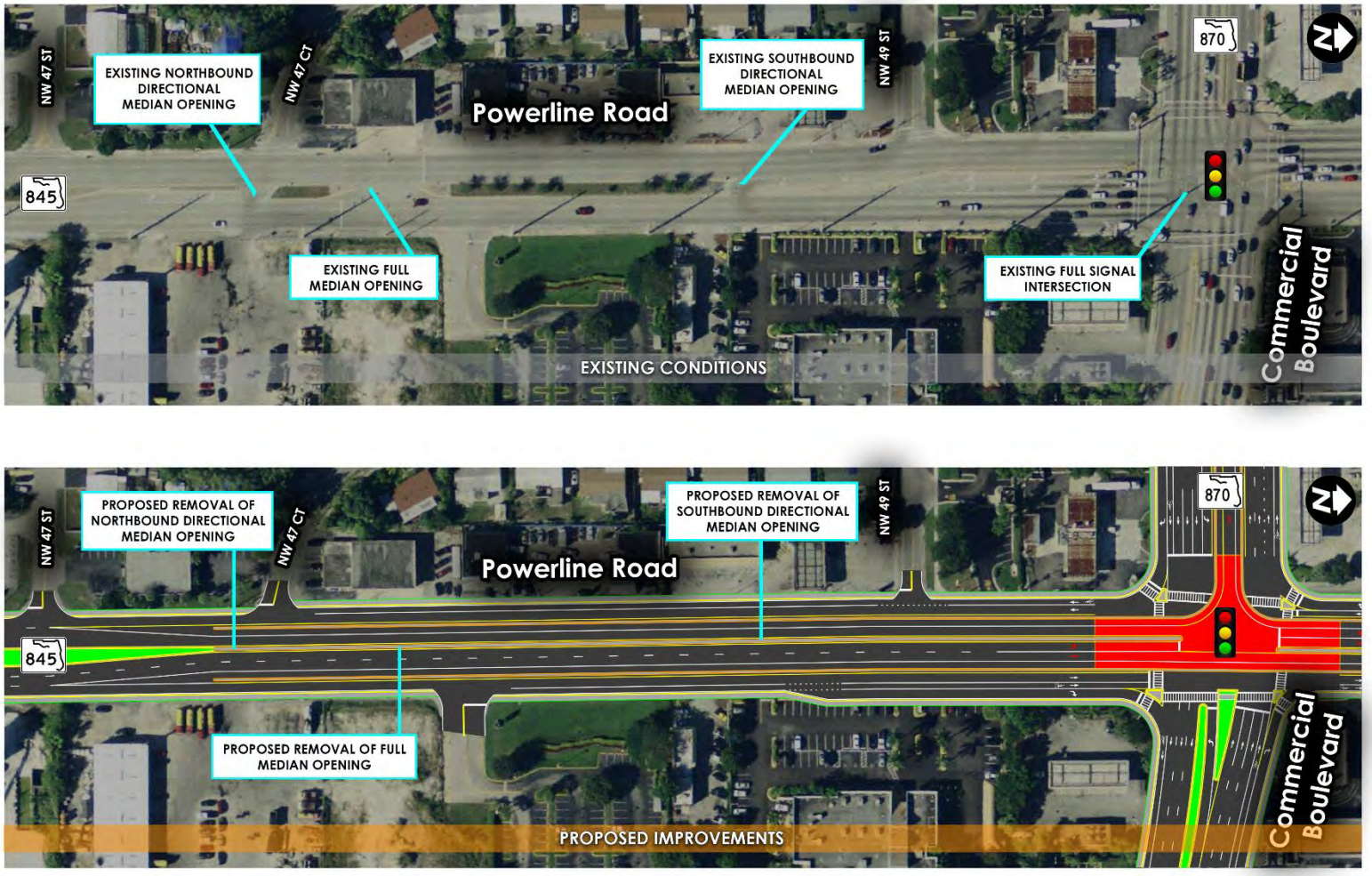


Figure 5-22 Powerline Road Proposed Access Changes
Commercial Boulevard Corridor Alternative 2, 3, and 4 – South of Commercial Boulevard

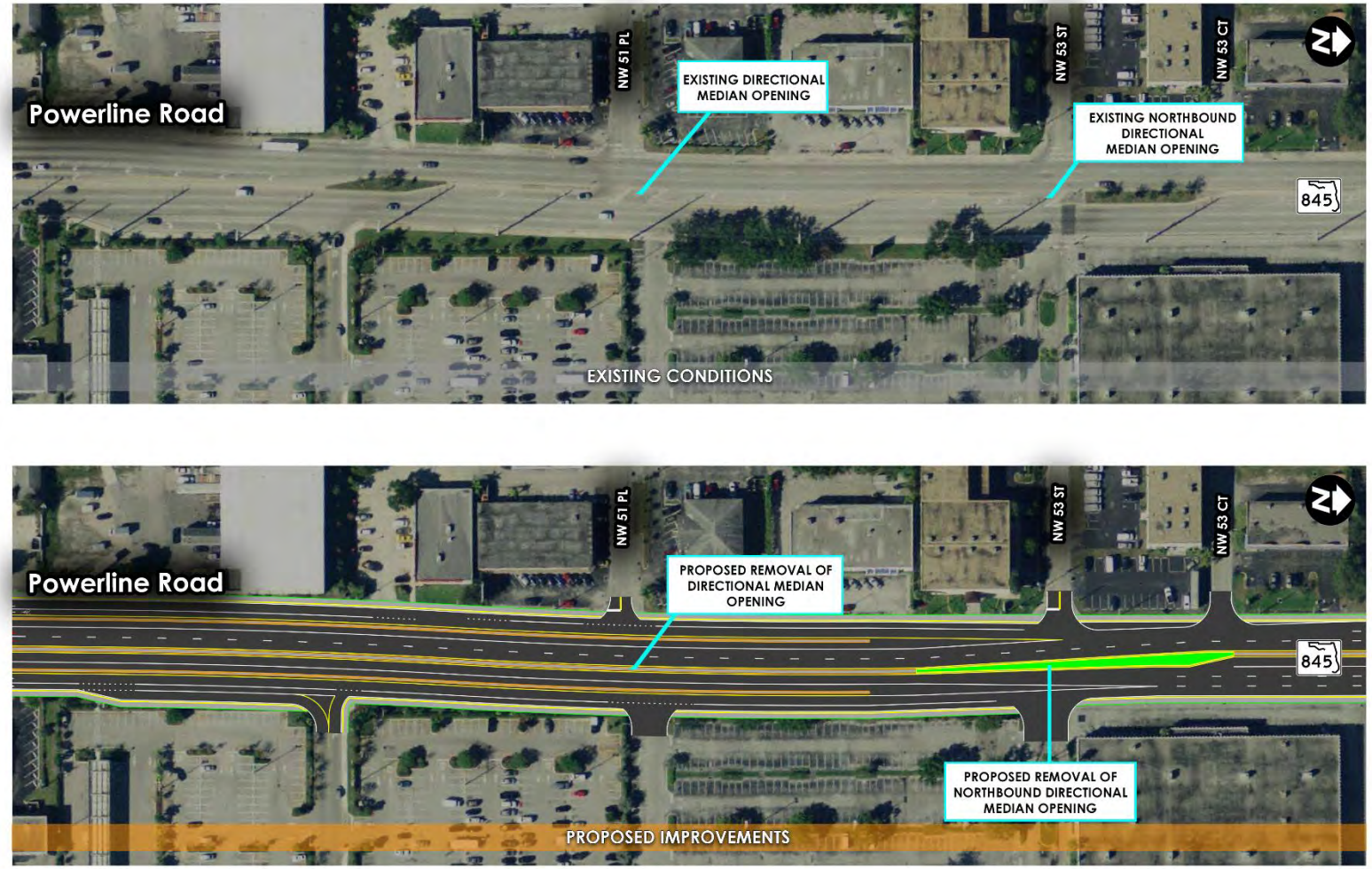


Figure 5-23 Powerline Road Proposed Access Changes
Commercial Boulevard Corridor Alternative 2, 3, and 4 – North of Commercial Boulevard

5.4.7.4 Cypress Creek

Cypress Creek Road is a County road and does not have a state road access classification. No access management changes are proposed for Cypress Creek Road within the project limits.

5.4.7.5 N. Andrews Avenue

N. Andrews Avenue is a County road and does not have a state road access classification.

All the Commercial Boulevard Interchange Corridor Alternatives propose one additional N. Andrews Avenue southbound left turn lane to provide dual left turn lanes to Commercial Boulevard east. Corridor Alternatives 2, 3, 4, 5 and 6 propose reconfiguring the frontage road located on the northeast quadrant of the Commercial Boulevard and N. Andrews Avenue intersection to a one lane frontage road in the westbound direction. Traffic form the frontage road and NE 3 Avenue will be rerouted to NW 51 Street to maintain connectivity to Commercial Boulevard. As a result of these proposed improvements, a raised median is proposed at the intersection of N. Andrews Avenue and NE 51 Street. The proposed median closing will eliminate the safety conflict of left turn movements from westbound NE 51 Street traffic with the proposed southbound dual left turns along N. Andrews Avenue. The access change along N. Andrews Avenue just north of Commercial Boulevard is shown in Figure 5-24.

There are proposed access changes associated with the Cypress Creek Road Interchange Corridor Alternatives along N. Andrews Avenue, north of Cypress Creek Road. In order to provide access to the proposed Canal On-ramp, the median opening at the intersection of N. Andrews Avenue and NW 66 Street is proposed to be signalized and provide a new southbound directional median opening just north of NW 66 Street to mediate local access being impacted by the Canal On-ramp. The access changes along N. Andrews Avenue, north of Cypress Creek Road are shown in Table 5-12 and Figure 5-24.

Table 5-12
Proposed Access Changes Along N. Andrews Avenue – North of Cypress Creek Road

Corridor Alternative	Interchange Improvements	Access Changes	Figure
1	Modification of Existing Partial Cloverleaf	Proposed southbound directional median opening; Proposed full signal intersection	5-24
2	Modification of Existing Partial Cloverleaf with Northbound to Westbound Flyover	Proposed southbound directional median opening; Proposed full signal intersection	5-24
1A	Modification of Existing Partial Cloverleaf (without the proposed Canal On-Ramp)	None	N/A

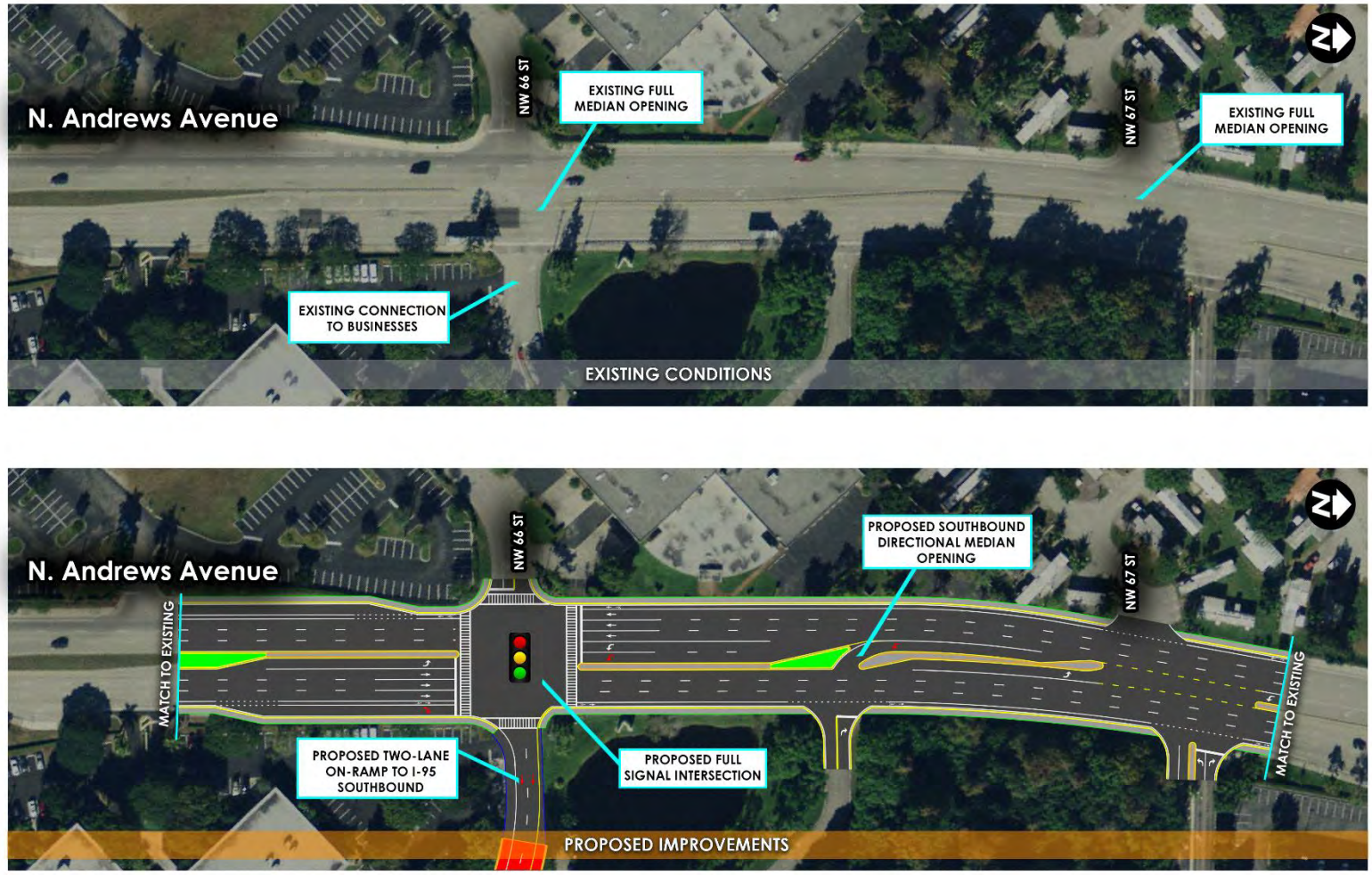


Figure 5-24 N. Andrews Avenue Proposed Access Change
Cypress Creek Road Corridor Alternatives 1 and 2 – North of Cypress Creek Road

5.4.8 STRUCTURES AND BRIDGES

Preliminary structural concepts were evaluated for each alternative analyzed as part of the Phase 2 – Detailed Alternatives Analysis. Superstructure and substructure considerations should be confirmed during the Final Design phase for the recommended alternative.

5.4.8.1 I-95 Existing Mainline Bridges

There are 12 bridges within the project limits, ten of which are mainline freeway bridges. The ten existing mainline freeway bridges shown below will remain as is; no improvements are required:

- I-95 over Powerline Road – Bridges 860128 (Southbound) and 860198 (Northbound)
- I-95 over Prospect Road – Bridges 860129 (Southbound) and 860199 (Northbound)
- I-95 over Commercial Boulevard – Bridges 86030 (Southbound) and 860196 (Northbound)
- I-95 over Cypress Creek Road – Bridges 860239 (Southbound) and 860240 (Northbound)
- I-95 over Canal C-14 – Bridges 860243 (Southbound) and 860244 (Northbound)

The remaining two mainline bridges: the I-95 Westbound to Southbound flyover on-ramp bridge and the N. Andrews Avenue over I-95 bridge will be addressed in the alternatives sections below.

5.4.8.2 I-95 Proposed Collector-Distributor (CD) System Bridge over Commercial Boulevard

The proposed CD system extends from Cypress Creek to south of Commercial Boulevard. Southbound traffic from N. Andrews Avenue and Cypress Creek access I-95 southbound via this proposed CD system. A new bridge over Commercial Boulevard is required as part of this concept as shown on Figure 5-25 below.

There is another bridge associated with the proposed CD system located within the Cypress Creek Road interchange area. This bridge will be discussed in Section 5.4.8.8 as part of the Cypress Creek Subarea Alternatives (See Figure 5-39).

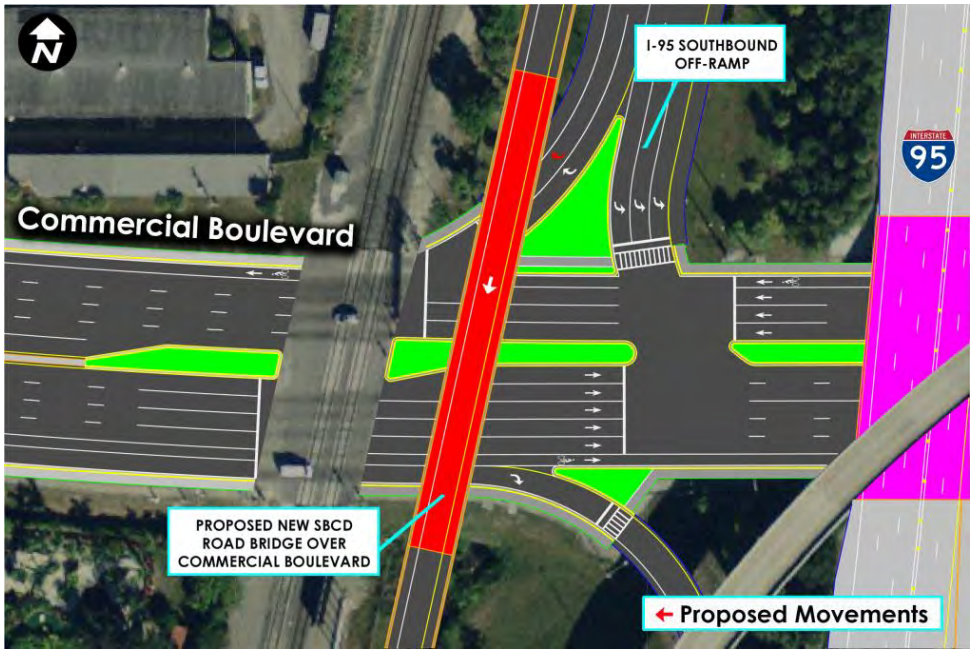


Figure 5-25 CD System Bridge over Commercial Boulevard

Superstructure Considerations

The proposed typical section for this new bridge consists of a single 15 ft. lane with 6 ft. shoulders, as required by standards set forth in FDOT's FDM, Section 260.1.1 Partial Bridge Sections. The overall bridge length will be approximately 295 ft. with MSE walls. The bridge at this location is a anticipated to be a two span structure with the first span crossing over westbound Commercial Boulevard (178 ft long) and the second span crossing over eastbound Commercial Boulevard (117-ft long). Based on the maximum span length (178 ft) a FIB 84 is recommended.

Substructure Considerations

The proposed bridge can be supported by a hammer head pier type substructure between Commercial Boulevard eastbound and westbound traffic. The pier foundation would consist of footings and prestressed piles. The end bents would also be supported on prestressed piles and protected with MSE Walls.

5.4.8.3 I-95 Commercial Boulevard Subarea Alternatives

There are six Corridor Alternatives for the Commercial Boulevard Subarea Alternatives. These alternatives consider new bridges or improvements to existing bridges at the following locations:

- New bridges at the intersection of Commercial Boulevard and Powerline Road
- Modification of existing I-95 Westbound to Southbound flyover on-ramp
- New bridge at the intersection of Commercial Boulevard and N. Andrews Avenue.

The bridges associated with each alternative are described in Table 5-13 and Figure 5-26 through Figure 5-28.

Table 5-13
Commercial Boulevard Subarea Alternatives

Corridor Alternative	Powerline Road	N. Andrews Avenue	Bridge Improvements	Figure No.	Bridge Detail
1	Traditional Intersection Widening	Traditional Intersection Widening North & West Legs	None	N/A	N/A
2	Echelon with Median U-Turn	Traditional Intersection Widening with Westbound Flyover	New Echelon bridge structure at Commercial Boulevard / Powerline Road;	5-26	A
			Reconstruct portion of Existing I-95 Westbound to Southbound Flyover On-ramp		B
			New Bridge – one lane bridge across N. Andrews Avenue to tie into I-95 Westbound to Southbound Flyover On-ramp		C
3	Northbound-southbound	Traditional Intersection	New Northbound / Southbound Grade Separation at	5-27	A

Table 5-13 Commercial Boulevard Subarea Alternatives					
Corridor Alternative	Powerline Road	N. Andrews Avenue	Bridge Improvements	Figure No.	Bridge Detail
	Grade Separation	Widening North, East & West Legs	Commercial Boulevard / Powerline Road		
			Reconstruct portion of Existing I-95 Westbound to Southbound Flyover On-ramp		B
4	Northbound-southbound Grade Separation	Traditional Intersection Widening with Westbound Flyover	New Northbound / Southbound Grade Separation at Commercial Boulevard / Powerline Road	5-28	A
			Reconstruct portion of Existing I-95 Westbound to Southbound Flyover On-ramp		B
			New Bridge – one lane bridge across N. Andrews Avenue to tie into I-95 Westbound to Southbound Flyover On-ramp		C
5	Traditional Intersection Widening	Traditional Intersection Widening North, East & West Legs	Reconstruct portion of Existing I-95 Westbound to Southbound Flyover On-ramp	5-26	B
6	Traditional Intersection Widening	Traditional Intersection Widening with Westbound Flyover	Reconstruct portion of Existing I-95 Westbound to Southbound Flyover On-ramp	5-26	B
			New Bridge – one lane bridge across N. Andrews Avenue to tie into I-95 Westbound to Southbound Flyover On-ramp	5-26	C

* Note: Bridge Detail B of Corridor Alternative 5 and 6 and Detail C of Corridor Alternative 6 can be seen on Figure 5-26 for Corridor Alternative 2.



Figure 5-26 Commercial Boulevard Corridor Alternative 2

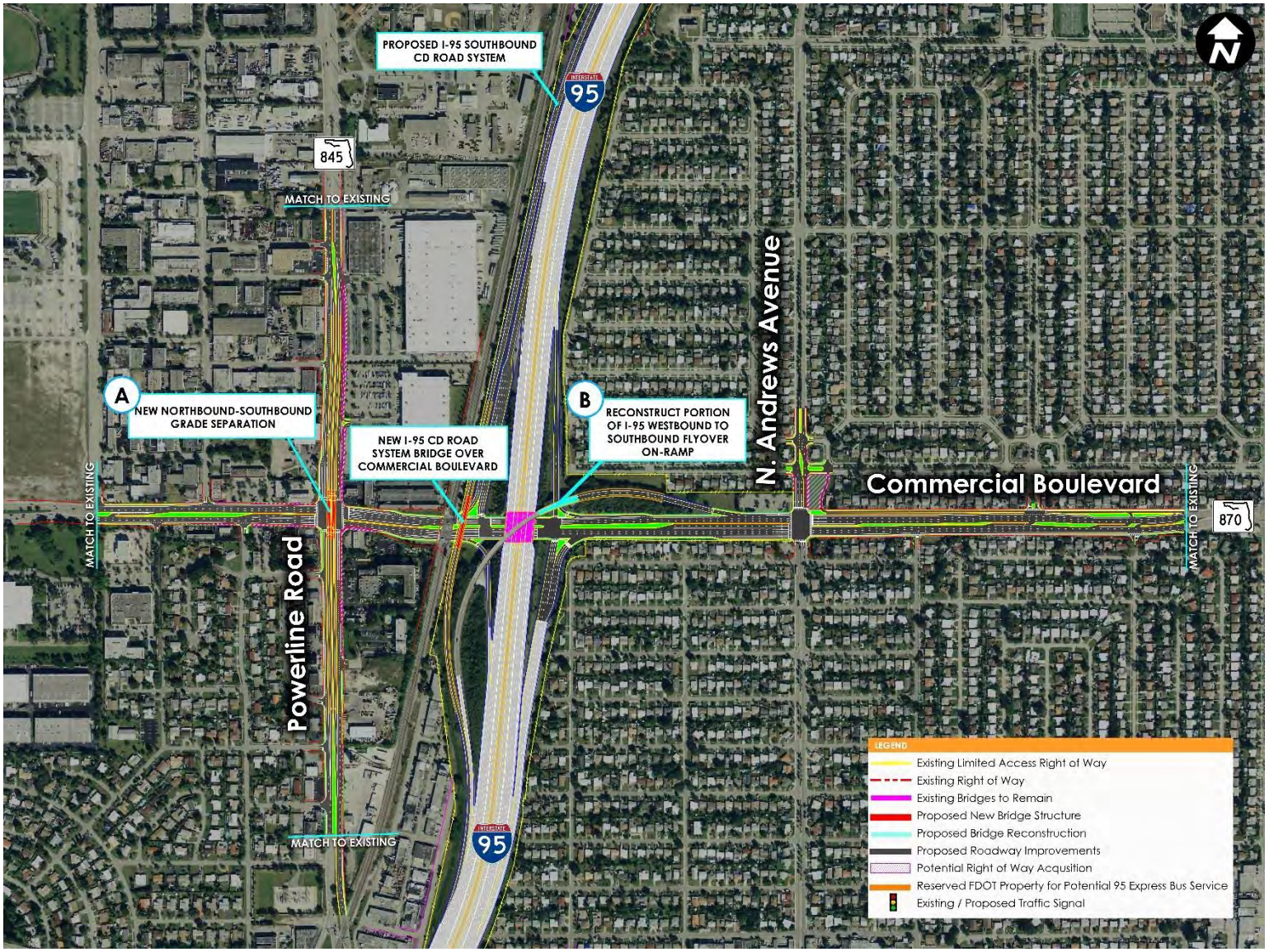


Figure 5-27 Commercial Boulevard Corridor Alternative 3

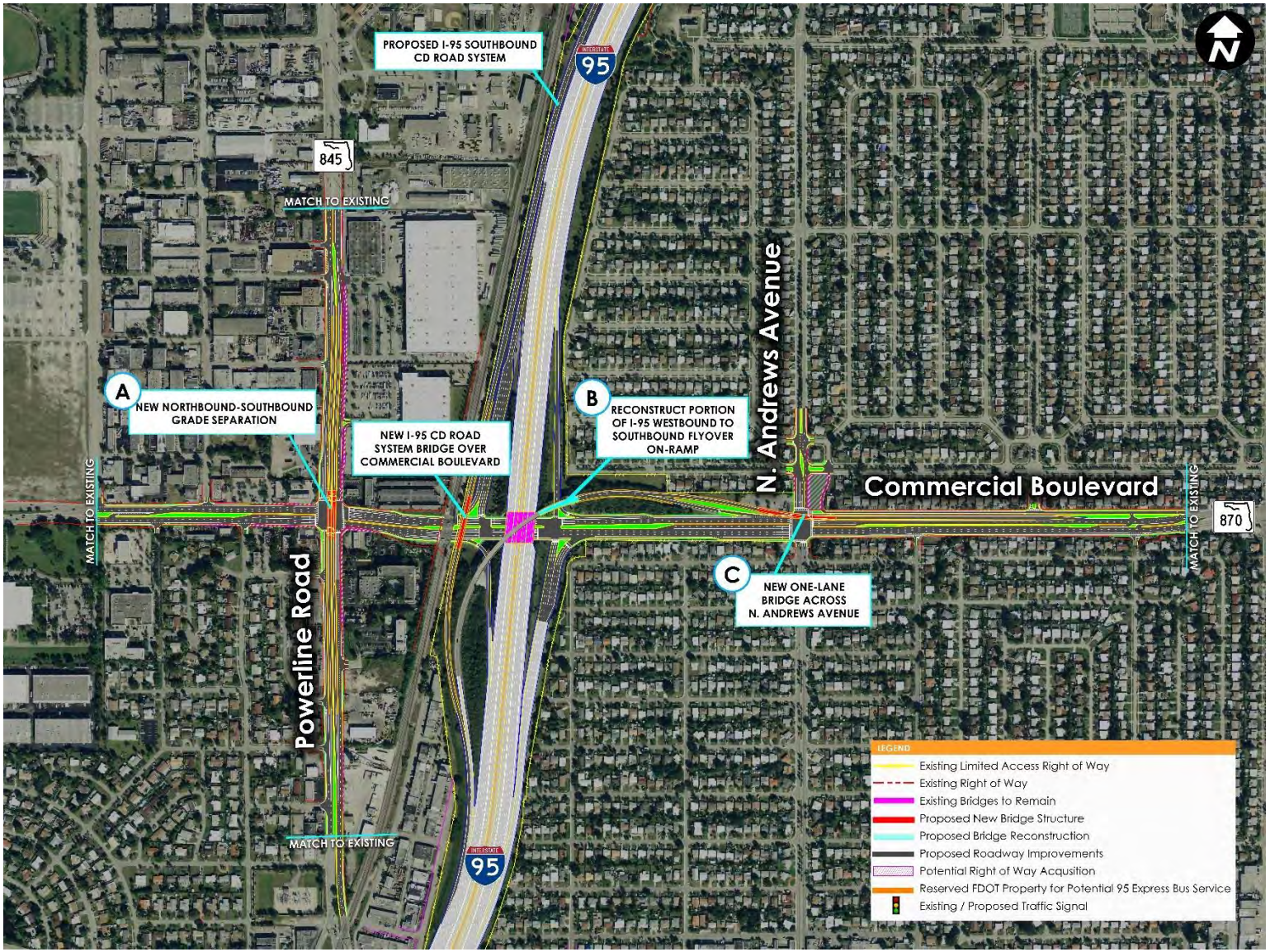


Figure 5-28 Commercial Boulevard Corridor Alternative 4

5.4.8.4 Commercial Boulevard Corridor Alternative 2

Commercial Boulevard Corridor Alternative 2 requires two new bridges and reconfigures the existing I-95 Westbound to Southbound fly over on-ramp.

Echelon Bridge at Commercial Boulevard / Powerline Road Intersection

This echelon bridge is proposed to facilitate Powerline Road unsignalized northbound and southbound flow, in addition to westbound turn lanes to Commercial Boulevard. This is basically an elevated T-junction. The typical section consists of one northbound, one southbound through lane, and westbound turn lanes originating from either direction of travel as shown on Figure 5-29.

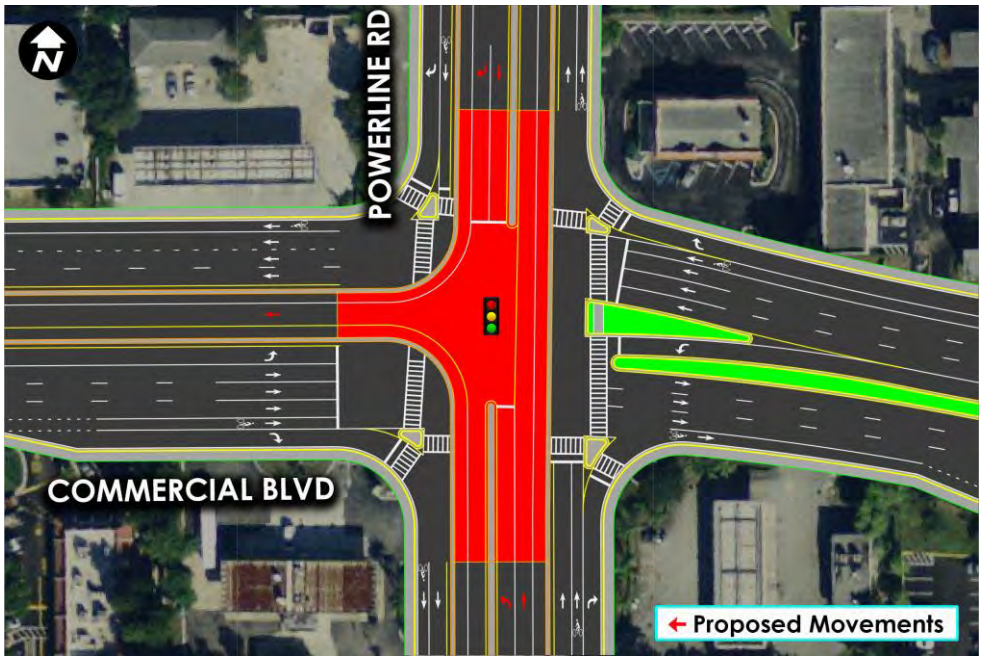


Figure 5-29 Echelon Bridge at Commercial Boulevard and Powerline Road Intersection

Superstructure Considerations

Overall bridge length in the north/south direction will be approximately 280 ft. with MSE walls, and of single span, the westbound T component of the bridge will span 75 ft from the end bent to the coping of the north/south component of the bridge.

Its superstructure, based on the anticipated maximum span length (280 ft.), will be a steel girder structure, and the westbound portion will frame into the north/south direction of the bridge with diagonal cross bracings in the flared portions.

Substructure Considerations

Its substructure will consist of end bents supported on piles and protected by MSE walls. The traffic flow under the bridge does not accommodate for placement of pier supports.

Reconfiguration of Existing I-95 Westbound to Southbound Flyover On-Ramp

Ramp E flyover (Bridge #860131), connects Commercial Boulevard westbound with I-95 southbound traffic as shown on Figure 5-30. Its typical section meets FDM criteria and consists of one 15 ft. lane with six ft. shoulders on either side. The existing bridge is comprised of eight spans. The superstructure of the two center spans over I-95 consist of steel plate girders while the three end spans on either side consist of AASHTO Type IV beams. The substructure consists of hammer head piers and cast in place end bents supported by 18" prestressed piles. Wingwalls are supported with 12HP53 steel piles. The end bends are protected with 2:1 slope pavements.

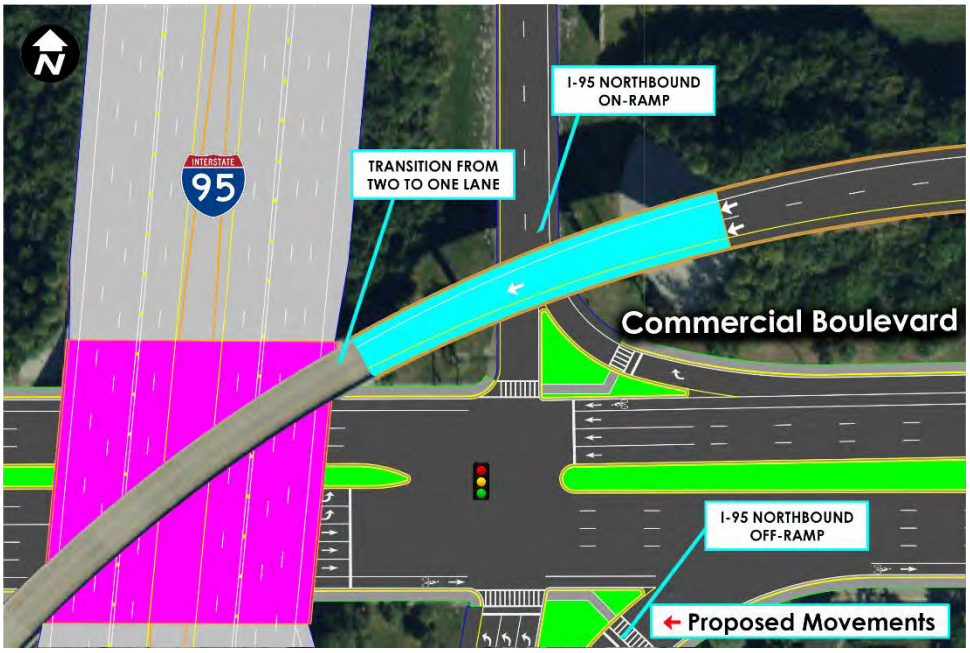


Figure 5-30 Proposed Ramp E Widening

Reconfiguration of the three eastern most end spans are required to accommodate the proposed improvements which includes accommodating two movements on the on-ramp. The first movement is the existing at grade on-ramp from westbound Commercial Boulevard just west of the N. Andrews Avenue intersection. The second movement comes from the new Westbound to Southbound bridge over N. Andrews Avenue. These two movements merge and transition from two lanes at the entrance to one lane along the existing flyover on-ramp.

This transition occurs within the last three end spans. As such the proposed modification of Ramp E occurs in the last three end spans (Spans 6, 7 and 8) and the remaining five spans stay unchanged.

Superstructure Considerations

Spans 6, 7 and 8 will need to be widened. The required width will taper from a 9-ft. max at the end bent down to 0-ft. at Pier 5. Widening towards one side of the bridge is recommended for ease in construction. Widening towards the inside is preferable since it is the shorter side of the vertical curve radius. This minimizes the additional superstructure weight.

Span 6 will require replacing the existing exterior beam line with FIB 36" beams. Based on the existing load rating results, it is possible that the existing exterior beam has adequate capacity for the additional overhang weight. However aesthetically it is preferable for all exterior beams to be the same type where possible.

Span 7 will require a new beam line or replacement of the existing exterior beam line with FIB 36" beams.

Span 8 will require a new beam line, based on the span length 85 ft., a FIB 36" would be adequate.

Since the widened portion of Spans 6 through 8, will be brought up to standard with a 36" single-slope traffic railing, it is recommended that the existing railing on the inner side of Spans 1 through 5 be also replaced with the same 36" single-slope traffic railing.

Substructure Considerations

The existing end bent will be widening to support the proposed superstructure. Its properties will be similar to the existing and the slope embankment will be extended accordingly.

Pier 5, should be evaluated during the Final Design phase to determine if there is adequate capacity to handle the additional loads created by the replacement of the existing beam and additional overhang width. Alternatively, a retrofit will be required.

Pier 6 will be retrofitted to accommodate the adjusted beam lines of spans 7 and 8.

Pier 7 can potentially utilize a new pie, isolated from the existing to support the proposed additional beam line of Span 8.

The governing vertical clearance is located at spans 4 and 5 over I-95, which is 16.48 ft. as per the 2016 Bridge Inspection Report and require a design variation as the minimum vertical clearance allowed as per FDM is 16.5 ft. and AASHTO is 16 ft.

However, the area of the bridge where the proposed widening is located is over I-95 northbound on ramp which has an existing vertical clearance of approximately 34.82 ft. (per existing bridge plans) which is far more than the minimum required of 16.5 ft. Additionally the existing beams on Spans 6, 7 and 8 are AASHTO Type IV beams which are 4.5 ft in height. The proposed widening, although on the low end of the bridge (0.94 ft/ft cross slope), will not reduce the existing vertical clearance as the proposed beams are FIB 36" which are 3 ft. in height.

<u>New Bridge – Provide One Lane Commercial Boulevard Bridge Across N. Andrews Avenue</u>

Corridor Alternative 2 requires a new one lane bridge to provide direct flyover access from westbound Commercial Boulevard to I-95 southbound. See Figure 5-31.

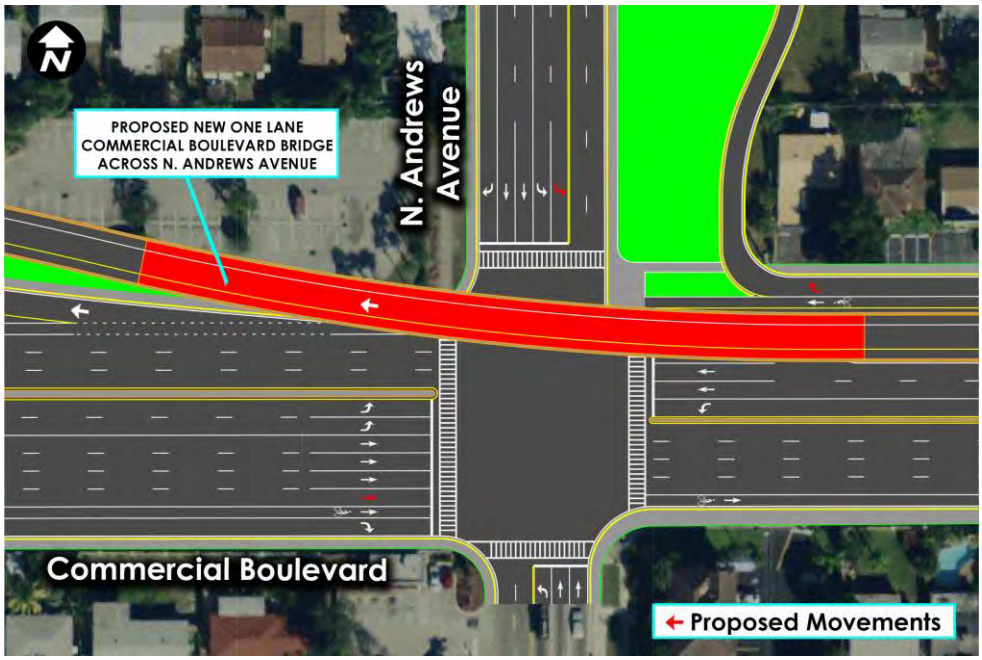


Figure 5-31 Commercial Boulevard Westbound Flyover

The proposed typical section for this new bridge consists of a single 15 ft. lane with 6 ft. shoulders, as required by standards set forth in FDOT's FDM, Section 260.1.1 Partial Bridge Sections.

Superstructure Considerations

The overall bridge length will be approximately 465 ft. with MSE walls. This bridge could be constructed as a three span structure with a center span of 200-ft to accommodate N. Andrews Avenue at grade traffic underneath.

Based on the anticipated mid span length (200 ft). and horizontal curvature, a continuous steel girder superstructure is recommended. Based on AASHTO criteria, the superstructure depth has been estimated at 6.5 feet.

Substructure Considerations

Cantilevered hammer head piers can be utilized to facilitate the geometry required along Commercial Boulevard. During the Design phase, final placement of the piers should be determined to optimize the design taking into consideration the geometric constraints. Travel lane lateral offsets, barrier requirements and setbacks should be evaluated further during the Final Design phase. Pier foundations may be supported by drilled shafts or piles. End bents may be supported on piles and protected by MSE walls.

Portions of the proposed piers will extend over Commercial Boulevard and consequently the vertical profile will be elevated high enough so that the pier cap clears the vertical clearance.

5.4.8.5 Commercial Boulevard Corridor Alternative 3

Reconfiguration of Existing I-95 Westbound to Southbound Flyover On-Ramp

This required reconfiguration is the same as that described in Section 5.4.8.4 above for Commercial Boulevard Corridor Alternative 2.

Powerline northbound-southbound grade separation over Commercial Boulevard

A northbound-southbound grade separation is proposed at the intersection of Commercial Boulevard with Powerline Road as shown on Figure 5-32. The elevated bridge structure provides a single lane in each direction with 8 ft. outside shoulders and a 7 ft. median. The proposed bridge will span over Commercial Boulevard and accommodate Texas U-turns on either side that will wrap around both end bents to provide greater accessibility.

Superstructure Considerations

The approximate proposed bridge length is 300 feet. The bridge could be constructed as a three span structure with a center span of 200 ft. to accommodate Commercial Boulevard at grade traffic underneath and end spans of 50 ft. in width. Based on the maximum span length (200-ft) span, the superstructure could be designed as a continuous girder system with an estimated 6.5 ft. overall superstructure depth.

Substructure Considerations

The length of the center span is estimated based on placement of the piers (within the median), located between the Texas U-turn and Commercial Boulevard. Conventional pier caps will hang over the travel lanes but would need to be elevated to meet the required 16'-6" vertical clearance under the cap. Alternatively, an integral steel box girder system with V-shaped piers can be investigated during the Final Design phase to avoid this condition.

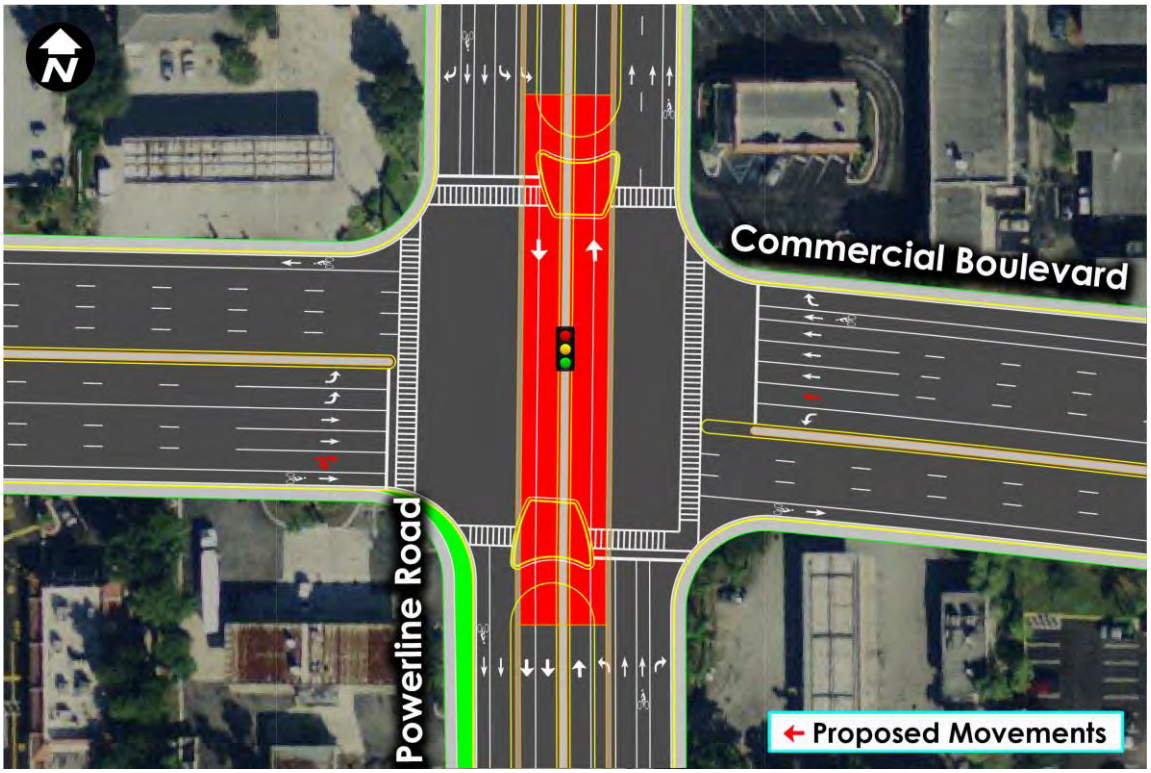


Figure 5-32 Powerline Road Proposed Northbound-Southbound Grade Separation

The design of the grade separation was streamlined to minimize right of way impacts to adjacent property owners. In order to do this, the MSE wall is reset 12-ft behind the coping line, for a length of 350-ft to allow for placement of left turn lanes at the intersection with Commercial Boulevard. From a structural perspective, a concrete approach slab is recommended to counter balance the overhang. Piles should be installed along the length for the overhang, behind the MSE wall, to reduce the earth pressure behind the wall.



Sample Bridge with Turn Lanes Underneath Overhang

5.4.8.6 Commercial Boulevard Corridor Alternative 4

This alternative encompasses all the structural improvements described in the previous alternatives.

Powerline northbound-southbound grade separation over Commercial Boulevard

The structural discussion associated with the proposed northbound-southbound grade separation for the intersection of Commercial Boulevard with Powerline Road is the same as that described in Section 5.4.8.5 for the Commercial Boulevard Corridor Alternative 3.

Reconfiguration of Existing I-95 Westbound to Southbound Flyover On-Ramp

This required reconfiguration is the same as that described in Section 5.4.8.4 above for Commercial Boulevard Corridor Alternative 2.

New Bridge – Provide One Lane Commercial Boulevard Bridge Across N. Andrews Avenue

The structural discussion associated with the proposed one lane Commercial Boulevard Bridge Across N. Andrews Avenue is the same as that described in Section 5.4.8.4 for the Commercial Boulevard Corridor Alternative 2.

5.4.8.7 Commercial Boulevard Corridor Alternative 5 and 6

This alternative encompasses all the structural improvements described in the previous three alternatives.

Reconfiguration of Existing I-95 Westbound to Southbound Flyover On-Ramp

This required reconfiguration is the same as that described in Section 5.4.8.4 above for Commercial Boulevard Corridor Alternative 2.

New Bridge – Provide One Lane Commercial Boulevard Bridge Across N. Andrews Avenue

The structural discussion associated with the proposed one lane Commercial Boulevard Bridge Across N. Andrews Avenue is the same as that described in Section 5.4.8.4 for the Commercial Boulevard Corridor Alternative 2.

5.4.8.8 Cypress Creek Road Subarea Alternatives

There are three Corridor Alternatives for the Cypress Creek Road Subarea Alternatives. These alternatives consider new bridges or improvements to existing bridges at the following locations:

- New bridges evaluated as part of interchange concepts
- New bridges evaluated as part of the proposed CD system
- Replacement of the existing N. Andrews Avenue bridge over I-95

The bridges associated with each alternative are described in Table 5-14 and Figure 5-33 through Figure 5-35.

Table 5-14
Cypress Creek Road Subarea Alternatives

Corridor Alternative	Interchange	Bridge Improvements	Figure No.	Bridge Detail
1	Modification of Existing Partial Cloverleaf	New I-95 parallel ramp bridge carrying I-95 Northbound to Commercial Boulevard Westbound Off-ramp	5-33	A
		Replace N. Andrews Avenue bridge over I-95		B
		New I-95 Southbound On-ramp (Canal On-ramp)		C
		New I-95 Southbound CD Road Bridge over the 95 Express Bus Service (w/in Park and Ride)		D
1A	Modification of Existing Partial	New I-95 parallel ramp bridge carrying I-95 Northbound to Commercial Boulevard Westbound Off-Ramp	5-34	A

Table 5-14 Cypress Creek Road Subarea Alternatives				
Corridor Alternative	Interchange	Bridge Improvements	Figure No.	Bridge Detail
	Cloverleaf (without the proposed Canal On-Ramp)	Replace N. Andrews Avenue bridge over I-95		B
2	Modification of Existing Partial Cloverleaf with Northbound to Westbound Flyover	New bridge from the I-95 Northbound Off-ramp over Commercial Boulevard	5-35	A
		Replace N. Andrews Avenue bridge over I-95		B
		New I-95 Southbound On-ramp (Canal On-ramp)		C
		New I-95 Southbound CD Road Bridge over the 95 Express Bus Service (w/in Park and Ride)		D
		New bridge over the I-95 mainline; part of re-aligned I-95 Northbound to Commercial Boulevard Westbound Off-ramp		E

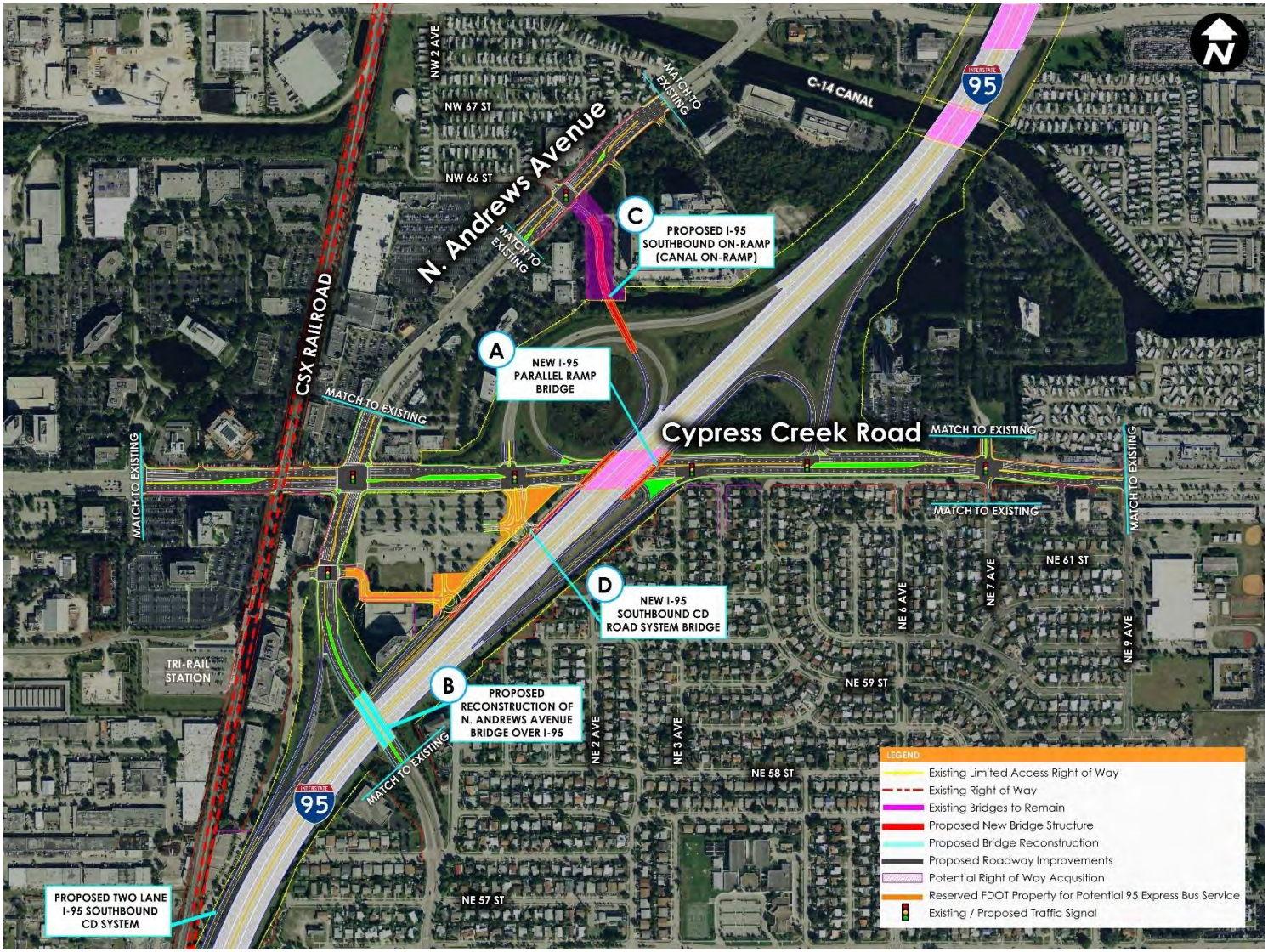


Figure 5-33 Cypress Creek Road Corridor Alternative 1

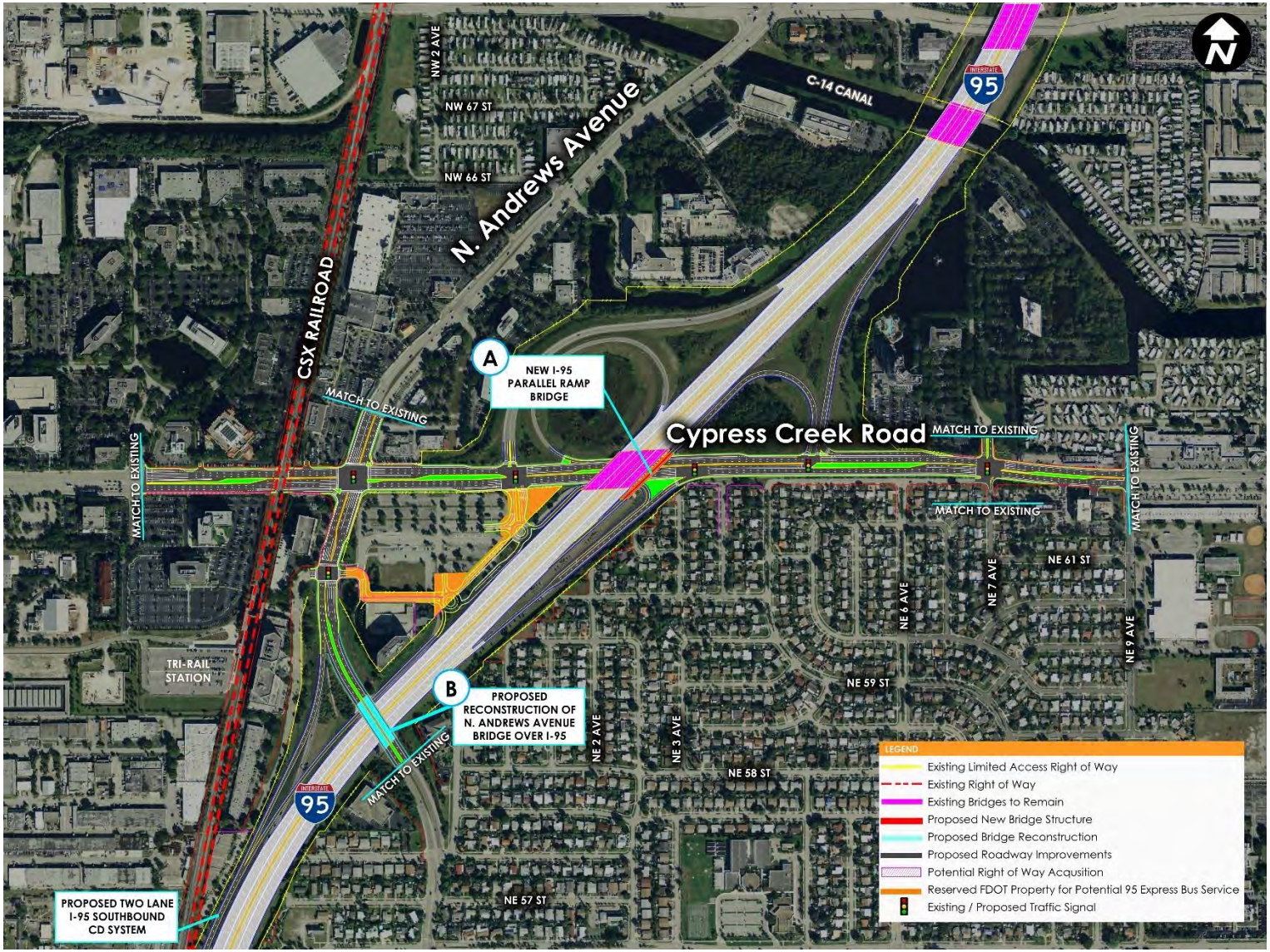


Figure 5-34 Cypress Creek Road Corridor Alternative 1A



Figure 5-35 Cypress Creek Road Corridor Alternative 2

5.4.8.8.1 Cypress Creek Road Corridor Alternative 1

New I-95 parallel ramp bridge carrying I-95 Northbound to Commercial Boulevard Westbound Off-Ramp

This bridge is proposed to facilitate the exit of I-95 northbound crossing over Cypress Creek Road and directed to Cypress Creek Road westbound travel. Its positioned parallel to the existing I-95 Northbound bridge over Cypress Creek Road (Br #860240). See Figure 5-36.

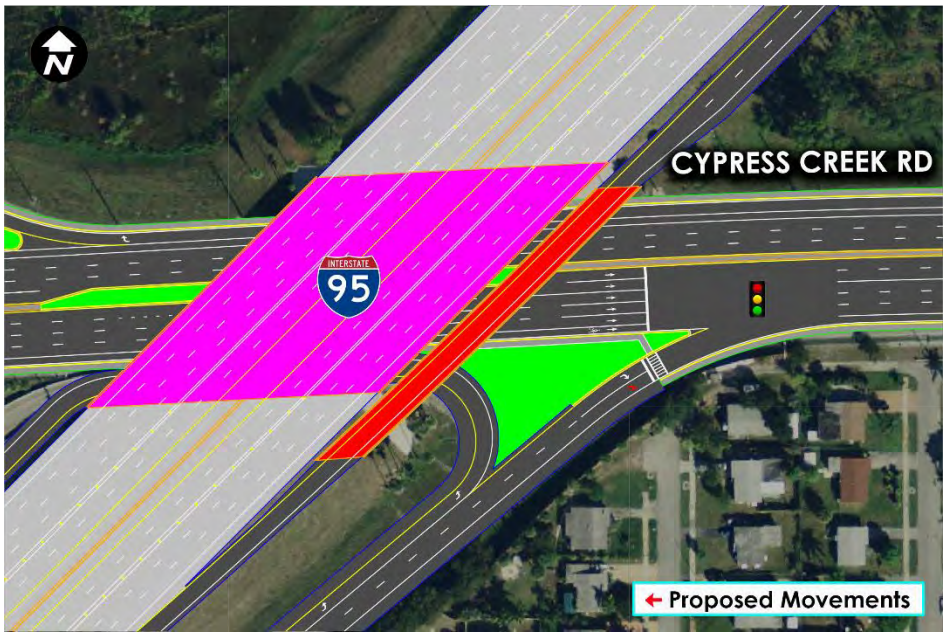


Figure 5-36 I-95 Parallel Ramp Bridge

The existing bridge is a 3 span structure with an overall length of 319 ft. Its superstructure consists of prestressed concrete AASHTO beams and its substructure consists of multi column piers supported on prestressed concrete pile foundations. The end bents are supported on prestressed concrete piles and originally protected with sloped embankments. Later, the south embankment was cut back with retaining wall to make room for a Texas U-turn wrapping the first span.

The typical section of the proposed ramp bridge consists of a single 15-ft lane with 6-ft shoulders, as required by FDOT FDM, Section 260.1.1, Partial Bridge Sections.

Superstructure Considerations

The proposed bridge span lengths may match the adjacent existing I-95 Northbound bridge (Br #860240) except for Span 1. The comparison of the proposed vs. adjacent existing span lengths are shown below.

	Proposed Bridge	Adjacent Existing Bridge
Span 1	77'-9"	60'-9"
Span 2	99'-9"	99'-9"
Span 3	99'-9"	99'-9"
Span 4	58'-9"	58'-9"
Overall Length	336'-0"	319'-0"

Based on the proposed span lengths the superstructure will consist of Florida I Beams (FIB 45).

Substructure Considerations

The proposed bridge pier locations shall be in line with existing pier locations, as well as, the end bridge, which will also be protected by a slope embankment. The begin bridge however will have to start before the existing bridge and be protected by MSE wall, to accommodate for the curvature of the Texas U-turn, which falls under the proposed bridge. This will result in the 4 span arrangement shown above.

The proposed bridge substructure shall be supported on multi column piers with concrete prestressed pile foundations and end bents also supported on prestressed piles. Also, the existing concrete barrier walls surrounding the existing median pier will be extending to surround the proposed median pier.

Replace N. Andrews Avenue bridge over I-95 (Bridge #860237)

The proposed CD system traverses underneath the existing N. Andrews Avenue bridge over I-95 within Span 4 of the existing bridge. Span 4 does not provide sufficient room to accommodate the new bridge. As a result, this existing bridge must either be replaced or retrofitted. See Figure 5-37.

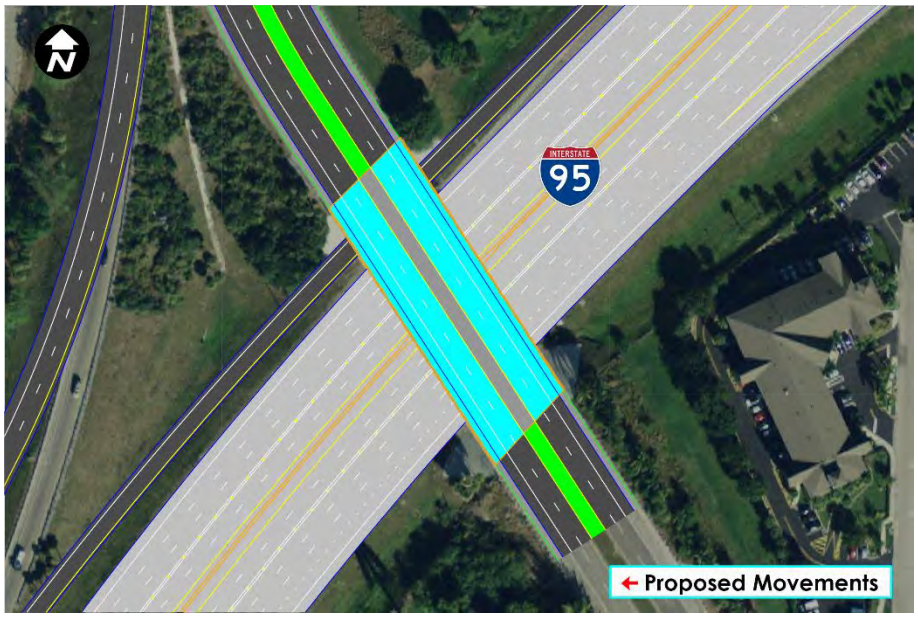


Figure 5-37 N. Andrews Avenue over I-95

The vertical clearance of the existing bridge is severely substandard (15.6-ft) as per the BIR. Retrofitting the bridge by lengthening Span 4 will increase loads on Pier 4 which may require replacement. This in turn would require a replacement of Span 3 as well. Under this situation, a potential retrofit could require replacement of approximately half of the bridge while maintaining a sub-standard vertical clearance. As a result, bridge replacement is recommended which addresses the vertical clearance deficiency.

Superstructure Considerations

The proposed typical section shall consist of two 12 ft. lanes, a 10 ft. outside shoulder, and a 6 ft. raised sidewalk in either direction of travel and separated with a 16 ft. raised median.

Overall bridge length will be approximately 306 ft. with MSE walls. A two span structure is proposed with Span 1 (171 ft. long) crossing over the CD system and I-95 Southbound and Span 2 (135 ft. long) crossing over I-95 Northbound.

Based on the maximum span length (171 ft.) FIB 78'' beams are recommended for this superstructure.

Substructure Considerations

The proposed bridge substructure shall be supported on a multi column pier between I-95 Southbound and I-95 Northbound and surrounded on either side with concrete barrier walls. The pier foundations would consist of footings and prestressed piles. The end bents will also be supported on prestressed piles and protected with MSE Walls.

Horizontal Clearance at the begin bridge, shall provide 24 ft. clear zone from edge of travel lane (CD system) to the face of the MSE wall, which is based on a design speed of 50 mph. At the end bridge, a 36 ft. clear zone shall be provided from edge of travel lane (I-95 southbound) to the face of the MSE wall, which is based on a design speed of 70 mph.

New I-95 Southbound On-ramp (Canal On-ramp)

This new ramp bridge is proposed to provide a new I-95 Southbound On-ramp from N. Andrews Avenue. Most of the ramp crosses over a pond/containment area and at the end will cross over I-95 off-ramps and cypress westbound to I-95 southbound loop. See Figure 5-38.



Figure 5-38 I-95 Southbound CD Access Ramp

Superstructure Considerations

The typical section at the beginning of the proposed bridge is based on a two lane ramp configuration (two 12 ft. lanes, with 10 ft. shoulders on either side, as required by FDOT FDM). This ramp ultimately merges to a single 15 ft. lane prior to merging with the upstream CD system. It is recommended to keep the bridge at constant width and increase the shoulders as the ramp merges to a single lane. The level of complexity associated with the design of a tapered bridge would significantly increase without necessarily decreasing potential bridge costs. Additionally, a tapered bridge would also complicate future widening,

The overall bridge length will be approximately 880 ft. with a combination of MSE walls and sloped embankments. The horizontal geometry is of a reverse curvature. Due to the reversed curvature geometry, a continuous steel girder superstructure would be the most appropriate. Preliminary calculations estimate the governing span (approximately 240 ft.) as the one that crosses over the existing I-95 on and off-ramps at this location. A span of that length could be supported with a continuous steel girder superstructure of approximately 7.67 ft. in depth.

Substructure Considerations

The substructure design will consist of hammer head piers on pile foundations, or a combination if pile bents can be utilized. End bents would most likely be supported on piles and protected by combination of MSE walls and sloped embankments.

Horizontal clearance at the end bridge, shall provide 24 ft. clear zone from edge of travel lane (cypress westbound / I-95 southbound loop) to the face of the MSE wall, which is based on a 45 mph design speed.

New I-95 Southbound CD Road Bridge over the 95 Express Bus Service (within Park and Ride)

This CD Road Bridge is proposed to facilitate N. Andrews Ave traffic, north of Cypress Creek Road, to enter I-95 southbound. The typical section consists of a single 15 ft. lane with 6 ft. shoulders is proposed, as required by FDOT's FDM. See Figure 5-39.

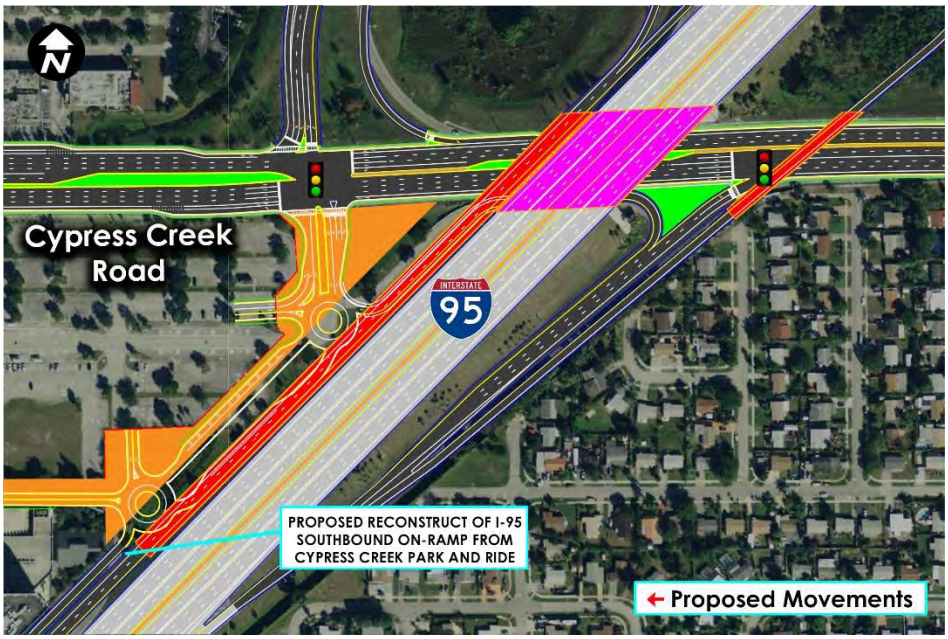


Figure 5-39 I-95 CD System over Cypress Creek Park and Ride

Superstructure Considerations

The overall bridge length will be approximately 1350 ft. with MSE walls. The proposed bridge will be comprised of multiple spans with a maximum span length of approximately 265 ft., which crosses over the northern most round-a-bout within the Park and Ride facility.

Based on the maximum span length (265 ft.), a continuous steel girder superstructure is recommended. The approximate superstructure depth would be 8.5 feet.

Substructure Consideration

The substructure will consist of a hammer head pier between Cypress Creek Road eastbound and westbound traffic, and straddle bent piers over the proposed park and ride travel lane. Pier foundations may be drilled shafts or piles which will be further analyses during the design phase. End bents would most likely be supported on piles and protected by MSE walls.

5.4.8.8.2 Cypress Creek Road Corridor Alternative 1A

This alternative encompasses the structural improvements described in the Cypress Creek Road Corridor Alternative 1.

New I-95 parallel ramp bridge carrying I-95 Northbound to Commercial Boulevard Westbound Off-ramp

This required reconfiguration is the same as that described in Section 5.4.8.8.1 above for Cypress Creek Road Corridor Alternative 1.

Replace N. Andrews Avenue bridge over I-95

This required reconfiguration is the same as that described in Section 5.4.8.8.1 above for Cypress Creek Road Corridor Alternative 1.

5.4.8.8.3 Cypress Creek Road Corridor Alternative 2

This alternative encompasses the structural improvements described in the Cypress Creek Road Corridor Alternative 1.

New bridge from the I-95 Northbound Off-ramp over Commercial Boulevard

This ramp precedes the flyover described above and similarly is proposed to facilitate northbound I-95 exiting traffic to westbound Cypress creek road, with the same typical section consisting of a single 15 ft. lane and 6 ft. shoulders, as required by FDOT's FDM. See Figure 5-40.

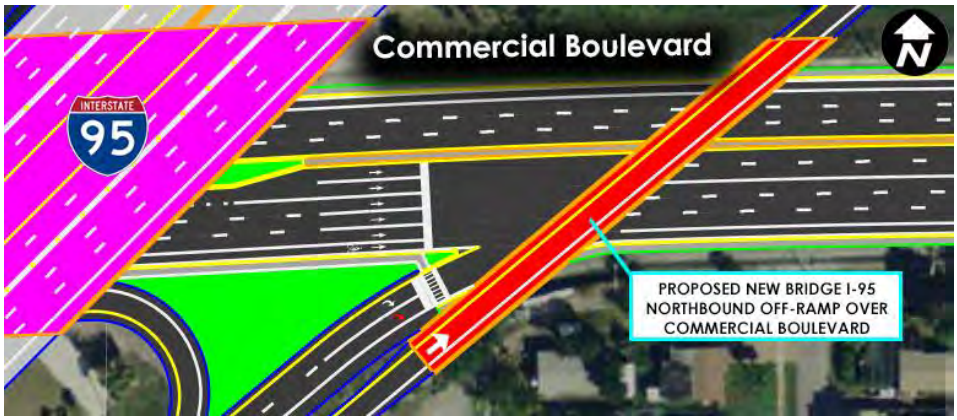


Figure 5-40 I-95 Northbound Off-ramp over Commercial Boulevard

Superstructure Considerations

The overall bridge length will be approximately 330 ft. with MSE walls. The proposed bridge consists of two spans with the first span crossing over Commercial Boulevard eastbound (212 ft. long) and the second span crossing over Commercial Boulevard westbound (118 ft.).

Based on the maximum span length (212 ft). a continuous steel girder superstructure is recommended. With the aid of AASHTO criteria, the superstructure depth is estimated at 6.833 feet.

Substructure Consideration

The proposed bridge substructure shall be supported on a multi column pier between Commercial Boulevard eastbound and Commercial Boulevard westbound are surrounded on either side with concrete barrier walls. The pier foundations would consist of footings and prestressed piles. The end bents will also be supported on prestressed piles and protected with MSE Walls.

Replace N. Andrews Avenue bridge over I-95

This required reconfiguration is the same as that described in Section 5.4.8.8.1 above for Cypress Creek Road Corridor Alternative 1.

New I-95 Southbound On-ramp (Canal On-ramp)

This required reconfiguration is the same as that described in Section 5.4.8.8.1 above for Cypress Creek Road Corridor Alternative 1.

New I-95 Southbound CD Road Bridge over the 95 Express Bus Service (within Park and Ride)

This required reconfiguration is the same as that described in Section 5.4.8.8.1 above for Cypress Creek Road Corridor Alternative 1.

New bridge over the I-95 mainline; part of re-aligned I-95 Northbound to Commercial Boulevard Westbound Off-ramp

This flyover is proposed to facilitate northbound I-95 exiting traffic to westbound Cypress creek road. The typical section consists of a single 15 ft. lane with 6 ft. shoulders is proposed, as required by FDOT's FDM. See Figure 5-41.



Figure 5-41 I-95 Northbound to Commercial Boulevard Westbound Off-ramp

Superstructure Considerations

The overall bridge length will be approximately 546 ft. with MSE walls. The proposed bridge will consiste of a two spans with equal span lengths of approximately 273 feet.

Based on the anticipated span lengths (273 ft.) and horizontal curvature, a continuous steel girder superstructure is recommended. Based on AASHTO, approximate superstructure depth would be 8.75 feet.

Substructure Consideration

Its substructure will consist of a hammer head pier can be utilized positioned west of I-95 southbound. Pier foundations may be drilled shafts or piles which will be further analyses during the design phase. End bents would most likely be supported on piles and protected by MSE walls. At the end bridge a bulkhead wall maybe required along the edge of the canal. This will be further analyzed at a BDR level.

Horizontal Clearance at the begin bridge, shall provide 36 ft. clear zone from edge of travel lane (I-95 northbound) to face of MSE wall, which is based on a 70 mph design speed. At the end bridge, concrete barrier protection will be required.

5.4.9 RIGHT OF WAY

Additional right of way will be required in order to implement the proposed improvements for all six Corridor alternatives at the Commercial Boulevard Interchange as well as the three Corridor alternatives at the Cypress Creek Road Interchange.

Table 5-15 below summarizes the preliminary number of parcels impacted for each Corridor alternative as well as the area of anticipated right of way impacts.

Table 5-15
Right of Way Acquisition Summary

Corridor Alternative	Number of Parcels	Right of Way Impact (AC)
Cypress Creek Road Corridor Alternative 1	26	3.22
Cypress Creek Road Corridor Alternative 2	26	3.22
Cypress Creek Road Corridor Alternative 1A	11	0.33
Commercial Boulevard Corridor Alternative 1	32	1.01
Commercial Boulevard Corridor Alternative 2	37	2.10
Commercial Boulevard Corridor Alternative 3	39	2.11
Commercial Boulevard Corridor Alternative 4	39	2.11
Commercial Boulevard Corridor Alternative 5	36	1.57
Commercial Boulevard Corridor Alternative 6	36	1.57

5.4.10 COST ESTIMATES

The preliminary cost estimates for the Corridor Alternatives are presented in Table 5-16. Using FDOT's Long Range Estimate System (LRE), each Corridor alternative was created with several sequences that are organized by the location of the improvements – for instance, Commercial Boulevard Interchange Area Alternative 1 includes separate sequences for the ramp improvements, Commercial Boulevard, N. Andrews Avenue, and Powerline Road. Each sequence includes numerous components to establish a cost per sequence. These sequences were subsequently summed up for each alternative and a total was derived after factoring in maintenance of traffic, mobilization, project unknowns, and project non-bid items.

Table 5-16
Preliminary Cost Estimate

Road	Corridor Alternative #	Estimated Construction Cost
I-95 and Commercial Boulevard Interchange	1	$23,723,800
	2	$49,459,500

Table 5-16
Preliminary Cost Estimate

Road	Corridor Alternative #	Estimated Construction Cost
	3	$39,178,600
	4	$42,877,100
	5	$24,882,500
	6	$30,317,700
I-95 and Cypress Creek Road Interchange	1	$25,807,000
	2	$30,994,900
	1A	$10,480,300
I-95 Southbound Collector-Distributor (CD) Road System	1	$30,391,500
	2	$20,003,700

5.4.11 VALUE ENGINEERING

A Cost Risk Assessment and Value Engineering (CRAVE) report was performed for this PD&E study. The CRAVE report was prepared and facilitated by HDR Engineering, Inc.

The study was conducted from October 9 to 13, 2017 and the primary objectives of the CRAVE study was to:

- Verify or improve upon the various concepts for the project.
- Identify high-risk areas in delivering the project.
- Improve the value of the project through innovative measures aimed at improving the
- Performance while reducing costs of the project.
- Perform a cost risk assessment on both the baseline design and the VE recommendations.

The Value Engineering (VE) team generated 51 ideas during the creative ideas phase of the VE and concluded with seven VE recommendations. The following are the seven VE recommendation:

VE Recommendation Number No. 1: Assign Lanes with Signs and Pavement Markings

VE Recommended Change: Use guide signs to place traffic in the correct turning lanes at I-95 southbound off-ramp going onto Commercial Boulevard. Use painted pavement markings to place traffic in the correct turning lanes.

PD&E Proposed: The baseline condition at the I-95 southbound off-ramp includes dual right turn lanes to westbound Commercial Boulevard and maintains triple left turns onto eastbound Commercial Boulevard. No guide signs or painted pavement markings were proposed at this location.

PD&E Recommendation Response: Accepted

A conceptual signing and marking design will be included as part of the recommended build alternative preliminary concept plans. Guide signs and pavement markings will be included in the recommened build alternative preliminary conceptual plans at the I-95 southbound off-ramp.

VE Recommendation Number No. 2: Extend Storage of Eastbound to Northbound Turning Lanes on Commercial Bouleavard and Powerline Road

VE Recommended Change: Extend queueing length on eastbound to northbound turning lanes on Commercial Boulevard and Powerline Road to maintain storage.

PD&E Proposed: The existing condition has two left turn lanes going northbound on Powerline Road from eastbound Commercial Boulevard with 350 feet of storage. The proposed concept plans to retain the two turn lanes while reducing the storage by 70 to 280 feet.

PD&E Recommendation Response: Accepted

The storage for the eastbound to northbound dual left turn lanes will be extended to existing conditions of approximately 350 feet. The proposed 280 feet for the dual left turn lane storage in the concept plans was based on projected 2040 traffic volumes.

VE Recommendation Number No. 3: Channelize I-95 Southbound Off-ramp to Eastbound Traffic at Commercial Boulevard

VE Recommended Change: Channelize the three southbound I-95 onto eastbound Commercial Boulevard exit ramp lanes.

PD&E Proposed: The baseline concept has three southbound I-95 onto eastbound Commercial Boulevard lanes, which are not channelized to the east. The two southbound I-95 onto westbound Commercial Boulevard lanes angle to the west, channelizing traffic that crosses over the railroad tracks. A raised island separates the westbound and eastbound Commercial Boulevard turn lanes.

PD&E Recommendation Response: Accepted

The I-95 southbound off-ramp to eastbound left turn lanes to Commercial Boulevard will be channelized to the east to improve traffic flow for vehicles traveling eastbound to Commercial Boulevard.

VE Recommendation Number No. 4: Cypress Eastbound to Southbound Entrance Loop

VE Recommended Change: Use existing westbound to southbound loop on Cypress Creek Road to provide an eastbound to southbound loop and remove southbound N. Andrews Avenue to I-95 on-ramp (option: maintain southbound N. Andrews Avenue to I-95 on-ramp).

PD&E Proposed: The baseline proposes an additional eastbound right turn lane at the intersection of Cypress Creek Road and N. Andrews Avenue to provide additional capacity for those drivers wishing to go south on N. Andrews Avenue to access the I-95 southbound on-ramp. The baseline also keeps the existing westbound to southbound loop on Cypress Creek Road.

PD&E Recommendation Response: Not Accepted

A similar concept was analyzed during the early phases of the alternative analysis process. The concept consisted of removing the existing I-95 southbound on-ramp from N. Andrews Avenue and shifting this traffic to the northwest quadrant of the interchange utilizing the existing westbound to southbound loop. This concept entailed adding an additional signal phase (eastbound to southbound I-95 traffic) to the intersection of Cypress Creek Road and the Cypress Creek Park and Ride entrance/exit. The addition of the signal phase caused the intersection to fail. The option of maintaining the existing I-95 southbound on-ramp from N. Andrews Avenue also causes the intersection to fail since an additional signal phase is still required at the intersection of Cypress Creek Road and the Cypress Creek Park and Ride entrance/exit. The recommended eastbound to southbound on-ramp loop (with and without the existing I-95 southbound on-ramp from N. Andrews Avenue) causes the intersection of Cypress Creek Road and the Cypress Creek Park and Ride entrance/exit to fail. The concept was removed from further analysis due to a failing level of service and traffic operational impacts to the interchange.

VE Recommendation Number No. 5: Use 35mph Divergent Diamond Interchange on Commercial Boulevard

VE Recommended Change: Lower the design speed on Commercial Boulevard to accommodate a Diverging Diamond Interchange (DDI).

PD&E Proposed: The baseline concept for the Commercial Boulevard interchange is an additional right turn lane for the I-95 southbound off-ramp and two additional lanes for the I-95 northbound off-ramp. Both off-ramps are proposed as stop conditions with a traffic signal, the existing condition is free flow right turn for both off-ramps.

PD&E Recommendation Response: Not Accepted

A DDI was considered during the early phases of the alternatives analysis process. FDOT District Four expressed concerns relating to the approaching speeds at the DDI. The existing design speed along Commercial Boulevard is 45 mph. The DDI was designed at a 35 mph. FDOT District Four was concerned with a speed reduction of 10 mph approaching a DDI. A preliminary analysis was performed for a DDI with a speed reduction of 5 mph as recommended by FDOT District Four. The roadway geometry associated with a 5mph speed reduction resulted in significant construction impacts to the Commercial Boulevard interchange, including removal of the existing westbound to southbound flyover from Commercial Boulevard and reconstruction of the I-95 mainline bridges over Commercial Boulevard. FDOT District Four was also concerned with the proximity to the railroad west of the interchange. After further discussion with FDOT District Four, a DDI concept at this location was removed from further consideration.

VE Recommendation Number No. 6: Powerline Road Modifications

VE Recommended Change: Remove the northbound third lane on Powerline Road north of Commercial Boulevard, add southbound thru lane.

PD&E Proposed: The baseline concept is a northbound/southbound overpass over Commercial Boulevard shifting all of the impacts on right of way to the east side of Powerline Road. The baseline proposes three northbound thru lanes on Powerline Road north of Commercial Boulevard.

PD&E Recommendation Response: Accepted

The intent of the PD&E proposed concept of three northbound thru lanes on Powerline Road was to improve traffic operations to the eastbound to northbound right turn lane from Commercial Boulevard by making it a free flow right. Traffic operations were reviewed with the recommendations of removing one northbound at-grade thru lane on Powerline Road north of Commercial Boulevard and adding one southbound at-grade thru lane on Powerline Road. The analysis resulted in an acceptable level of service for the intersection of Commercial Boulevard and Powerline Road. One northbound thru lane on Powerline Road north of Commercial Boulevard will be removed and one southbound thru lane on Powerline Road will be added south of Commercial Boulevard.

This recommendation does not impact the lane elimination project along Powerline Road, south of Commercial Boulevard. The alternative can transition to existing conditions along Powerline Road to the north of the CSX railroad tracks.

VE Recommendation Number No. 7: Implement TSM&O Solutions

VE Recommended Change: Implement TSM&O Solutions

PD&E Proposed: Baseline conditions established for this project do not currently consider any TSM&O (Transportation Systems Management & Operations) applications. The only funds allocated to TSM&O/ ITS (Intelligent Transportation Systems) are to address any impacts to the systems located on I-95 (ITS devices, tolling devices, etc.)

PD&E Recommendation Response: Accepted

The VE recommended TSM&O/ITS solutions are for the arterial system. The VE recommended TSM&O/ITS solutions for the arterial system will be included in the engineering and environmental documents as a recommendation to be considered during the design phase and will be included in the construction cost estimate of the recommended alternative.

Summary

The VE recommendations that are accepted are VE Recommendations 1, 2, 3, 6 and 7. These five recommendations created a potential additional cost of approximately $1,192,658.

5.5 Evaluation Matrix

The evaluation methodology used to determine the recommended alternative for this I-95 PD&E Study involves a two-step process consisting of a comparative multi-criteria qualitative and quantitative analysis based on a wide range of performance criteria.

Responsible professionals and several team members with extensive knowledge of the alternatives development provided commentaries and numerical entries for the qualitative and quantitative evaluation matrices. Each alternative was given a score ranging from 1 to 5 for each performance measure. The scores define the effect of each alternative as follows:

- 5- Substantially positive effect or best alternative
- 4 – Generally positive effect or good alternative
- 3 – Generally no effect or moderate alternative
- 2 – Generally negative effect or inferior alternative
- 1 – Substantially negative effect or worst alternative

Table 5-17 through Table 5-19 summarize the results of these evaluations.

Table 5-17
Qualitative Evaluation Matrix

EVALUATION CRITERIA		COMMERCIAL BOULEVARD CORRIDOR ALTERNATIVES						
		NO-ACTION	CORRIDOR ALTERNATIVE 1	CORRIDOR ALTERNATIVE 2	CORRIDOR ALTERNATIVE 3	CORRIDOR ALTERNATIVE 4	CORRIDOR ALTERNATIVE 5	CORRIDOR ALTERNATIVE 6
ENGINEERING	Bicycles and Pedestrians	No bicycle and pedestrian improvements	Minor improvements to traditional intersection widening due to wider crossing distances for pedestrians	Substantial improvements due to grade separation at both intersections. Grade separations introduce shorter crossing distances for pedestrians	Generally positive improvement due to grade separations at Powerline Road	Similar improvements to Corridor Alternative 2	Minor improvements to traditional intersection widening due to wider crossing distances for pedestrians	Generally positive improvement due to grade separations at Powerline Road
	Traffic Operations	Increased congestion	Minor improvement to traffic operations due to traditional intersection widening at both Powerline Road and N. Andrews Avenue. Operates slighly better than the No-Action	Substantial trafic operational improvements due to grade separation at both intersections	Enhanced traffic operations due to grade separation at Powerline Road and additional westbound thru lane at N. Andrews Avenue	Similar in traffic operations to Corridor Alternative 3	Traffic operations are better than Corridor Alternative 1 but not better than Corridors Alternative 3 and 4	Similar traffic operations to Corridor Alternative 5
	Access Management	No impact	Minor access modification proposed	Substantial access modifications proposed along Powerline Road, Commercial Boulevard and N. Andrews Avenue due to grade separations	Substantial access modifications proposed along Powerline Road and Commercial Boulevard frontage road	Substantial access modifications proposed along Powerline Road and Commercial Boulevard frontage road	Generally negative effect associated with access modifications proposed along Commercial Boulevard frontage road	Generally negative effect associated with access modifications proposed along Commercial Boulevard frontage road
	Safety Impacts	Safety concerns associated with mainline weaving not addressed	Moderate safety improvement associated with intersection widening	Best alternative for safety because grade separation reduces conflict points	Generally positive safety improvement associated with grade separaton at Powerline Road	Best alternative for safety because grade separation reduces conflict points	Moderate safety improvement associated with intersection widening	Best alternative for safety because grade separation reduces conflict points
ENVIRONMENTAL	Aesthetics	No impacts but no potential for improvement either (landscaping)	Moderate impacts	Substantial impact due to north-south grade separation of Powerline Road and Commercial westbound flyover	Moderate impacts	Substantial impact due to north-south grade separation at Powerline Road and Commercial westbound flyover	Moderate impacts	Less noise impacts than Corridor Alternative 2 and 4
	Stakeholder Input	Public generally understands the need for improvements within this interchange area and without a project there is no improvement	Generally in favor but understand degree of improvements are limited	Generally opposed due to out-of-direction travel	Generally in favor	Generally in favor	Generally in favor	Generally in favor

Table 5-17
Qualitative Evaluation Matrix

EVALUATION CRITERIA		COMMERCIAL BOULEVARD CORRIDOR ALTERNATIVES						
		NO-ACTION	CORRIDOR ALTERNATIVE 1	CORRIDOR ALTERNATIVE 2	CORRIDOR ALTERNATIVE 3	CORRIDOR ALTERNATIVE 4	CORRIDOR ALTERNATIVE 5	CORRIDOR ALTERNATIVE 6
	Noise & Air Quality	No Effect, but no ability to add noise abatement	Least impact	Greatest noise impact due to elevated segment of Powerline and Commercial westbound flyover	Moderate noise impact	Greatest noise impact due to elevated segment of Powerline Road and Commercial westbound flyover	Moderate noise impact	Moderate noise impact
	Contamination	No Impacts	3 potential relocations	Greatest potential impacts due to the amount of right of way required for improvements	Similar to Corridor Alternative 1	Similar to Corridor Alternative 1	Similar to Corridor Alternative 1	Similar to Corridor Alternative 1
COST	Construction Cost	No construction, no cost involved ($ 0)	Approximately $24M	Approximately $49.5M	Approximately $39.5M	Approximately $43M	Approximately $25M	Approximately $30.5M
	Right of Way/Relocation Potential	No R/W acquisition or business damages , no cost involved ($0)	1.01 Acres	2.10 Acres	2.11 Acres	2.11 Acres	1.57 Acres	1.57 Acres

Table 5-18
Qualitative Evaluation Matrix

Evaluation Criteria		CYPRESS CREEK ROAD CORRIDOR ALTERNATIVES			
		NO-ACTION	CORRIDOR ALTERNATIVE 1	CORRIDOR ALTERNATIVE 2	CORRIDOR ALTERNATIVE 1A
ENGINEERING	Bicycles and Pedestrians	No bicycle and pedestrian improvements	Generally positive improvements	Generally positive improvements	Generally positive improvements
	Traffic Operations	Increased congestion	Substantial trafic operational improvements due to Canal On-ramp	Enhanced traffic operations due to northbound to westbound flyover and Canal On-ramp	The least operational improvements
	Access Management	No impacts	No impacts	No impacts	No impacts
	Safety Impacts	No safety improvements	Additional capacity in the form new ramps and thru & turning lanes on arterials improve safety	Greater safety improvements due to additional improvements	Similat to Corridor Alternative 1
ENVIRONMENTAL	Aesthetics	No impacts	Moderate aesthetic impacts with the proposed Canal On-ramp between businessess	Substantial aesthetic concerns with northbound to westbound flyover	Least impacts
	Stakeholder Input	Public generally understands the need for improvements within this interchange area	Generally opposed due Canal On-ramp impacts to businesses	Generally opposed due Canal On-ramp impacts to businesses	Generally in favor
	Noise Impacts	No Effect, but no ability to add noise abatement	Moderate noise impact due to Canal On-ramp between businessess	Moderate noise impact due to Canal On-ramp between businessess	Generally no effect
	Contamination	Generally no effect	Similar potential contamination impacts to all Cypress Creek Road Corridor Alternatives	Similar potential contamination impacts to all Cypress Creek Road Corridor Alternatives	Similar potential contamination impacts to all Cypress Creek Road Corridor Alternatives
COST	Construction Cost	No construction, no cost involved ($0)	Approximately $29M	Approximately $31M	Approximately $10.5M
	Right of Way/Potential Relocation	No R/W acquisition or business damages , no cost involved ($0)	3.22 Acres	3.22 Acres	0.33 Acres

Table 5-19
Quantitative Evaluation Matrix

LEGEND		ENGINEERING				ENVIRONMENTAL				COST		SCORE	RANK
5	Substantial Positive Effect or Best Alternative	Bicycles and Pedestrians	Traffic Operations	Access Management	Safety Impacts	Aesthetics	Stakeholder Input	Noise Impacts	Contamination	Construction Cost	Right of Way/Relocation Potential		
4	Generally Positive Effect or Good Alternative												
3	Generally No Effect or Moderate Alternative												
2	Generally Negative Effect or Inferior Alternative												
1	Substantial Negative Effect or Worst Alternative												
Commercial Boulevard Interchange Subarea Alternatives													
No-Action		1	1	3	1	3	1	1	3	5	5	24	6
Corridor Alternative 1		3	2	3	2	3	3	4	2	3	3	28	3
Corridor Alternative 2		5	5	1	5	1	1	2	1	1	1	23	7
Corridor Alternative 3		4	4	1	4	3	4	3	2	2	2	29	2
Corridor Alternative 4		5	4	1	5	1	4	2	2	2	2	28	3
Corridor Alternative 5		3	3	2	2	3	4	3	2	3	3	28	3
Corridor Alternative 6		4	3	2	5	2	4	3	2	3	3	31	1
Cypress Creek Road Interchange Subarea Alternatives													
No-Action		1	1	3	1	3	1	1	3	5	3	22	4
Corridor Alternative 1		4	4	3	2	2	2	2	3	2	1	25	2
Corridor Alternative 2		4	5	3	3	1	2	2	3	1	1	25	2
Corridor Alternative 1A		4	3	3	2	3	4	3	3	3	3	31	1

5.6 Recommended Build Alternative

Based on Alternative Alignment Analysis, public input from the Alternatives Public Workshop, held on June 29, 2017, local stakeholder coordination meetings, FDOT District Four, Design Interchange Review Committee (DIRC) coordination meetings, and the evaluation results summarized in the Evaluation Matrix, Corridor Alternative 6 for the Commercial Boulevard Interchange and Corridor Alternative 1A for the Cypress Creek Interchange have been combined to be selected as the Recommended Build Alternative for this PD&E Study.

This alternative meets the purpose and need of the project, and the proposed improvements under this alternative achieve the objectives of the department to increase mobility, capacity and enhance overall safety within the project study area while minimizing cost and environmental and socio-economic impacts.

6 Public Involvement/Project Coordination

A Public Involvement Plan (PIP) was initiated as part of this PD&E Study. This plan is in compliance with FDOT's PD&E Manual, Section 339.155, Florida Statutes (F.S.); Council of Environmental Quality (CEQ) Regulations for implementing the procedural provisions of NEPA and 23 Code of Federal Regulations (CFR) 771. The purpose of the PIP is to assist in providing information to and obtaining input from concerned citizens, agencies, private groups (residential/business), and governmental entities. The overall goal of this plan is to help ensure that the study reflects the values and needs of the communities it is designed to benefit. The outreach activities and public involvement efforts are summarized below. Additional details are provided in the Public Involvement Summary Report on file at FDOT District Four.

6.1 Outreach Activities

Several measures were taken to ensure that the public was informed of the project issues and had a way to communicate their concerns to the department. These measures included:

- Newspaper Ads
- Invitational/Information Letters
- Newsletters/Factsheets
- Press Releases
- Public Notices
- Project Website (www.95commercialtocypress.com)
- Agency/Stakeholder Coordination (See Section 6.3)

6.2 Identification of Agencies, Elected Officials and Affected Public

FDOT has identified federal, state, regional and local agencies having a concern in this project due to jurisdictional review or expressed interest. These agencies were contacted directly by FDOT through the Advance Notification (AN) process during the Programming Screening event of the ETDM process in accordance with the PD&E Manual, Part 1, Chapter 3, Preliminary Environmental Discussion and Advanced Notification. A contact list was developed including the Environmental Technical Advisory Team (ETAT) Members and federally recognized Native American Tribes.

Local, state, and national interest groups or organizations having a direct or expressed interest in the project study were also identified and contacted by FDOT. As other concerned public interest organizations were identified throughout the study process, they also were listed and contacted.

6.3 Agency/Stakeholder Coordination

During the study, the project team met and discussed the project and issues with the following agencies, cities, committees, and stakeholders:

- Envision Uptown
- Broward County Traffic Engineering Division
- Broward Metropolitan Planning Organization (MPO)
- Broward MPO Bicycle and Pedestrian Advisory Committee (BPAC)
- South Florida Water Management District (SFWMD)

- City of Oakland Park
- City of Fort Lauderdale
- N. Andrews Neighborhood Association
- Cypress Creek Mobility Hub
- Cypress Creek Park and Ride Developer
- Uptown Land Use Plan Amendment (LUPA)
- Zimmerman Advertising / AutoNation
- Keith & Schnars, Inc.

6.4 Project Kick-Off Meetings

An Elected / Agency Officials Kick-off Meeting and Public Kick-off Meeting were held on Tuesday, May 24, 2016. The meetings consisted of a presentation and overview of the project followed by a question and answer session. The following is a summary of the public involvement efforts conducted in preparation for the kick-off meetings and subsequent coordination and responses to comments made.

Invitational Letters:

A letter and a copy of the Public Notice for the Kick-off Meeting were mailed to Native American Tribes on April 26, 2016. Elected and Agency Officials and ETAT representatives were also sent a letter and a copy of the Public Notice via e-mail on April 26, 2016. Property Owners and Interested Stakeholders were notified by letter enclosed with the Meeting Location Map via US Mail on April 29, 2016.

Public Advertisement:

The Kick- off meeting was advertised in the following:

- Sun Sentinel on May 10, 2016
- Noticed on FDOT's official website
- FDOT District Four Press Release May 17, 2016
- Project website: www.95commercialtocypress.com
- Florida Administrative Register (FAR) May 13, 2016
- Broward MPO Currents May 5, 2016

Presentation and Displays:

The following was on display and presented at the meeting:

- Welcome Board
- Title VI Board
- Location Map Board
- PD&E Study Process Board
- Purpose and Need Board

The following informational brochures were available:

- Project Fact Sheet

Elected / Agency Officials Kick-off Attendance:

- Elected Officials: 0
- Appointed Officials: 20
- Project Kick-off: 30 attendees total (including FDOT and Consultant Staff)

Public Kick-off Attendance:

- Elected Officials: 0
- Appointed Officials: 13
- Project Kick-off: 54 attendees total (including FDOT and Consultant Staff)

Available Comment Forms:

The following forms were available for the public to provide comments:

- Public Comment Form
- Online Comment Form

Questions and Comments Received:

During the Kick-off meetings a total of sixteen (16) questions were asked. The questions were regarding several issues such as: project completion date, environmental concerns, Complete Streets design, 95 Express Phase 3 project, I-95 congestion, and weaving issues on the interchanges. At the Kick-off meeting one written comment was received and following the meeting six online comments were received.

6.5 Alternative Public Workshop

An Alternatives Public Workshop was held on Thursday, June 29, 2017 in accordance with the PIP. The following provides a summary of the public involvement efforts conducted in preparation for the Alternatives Public Workshop and subsequent coordination and responses to comments made. The meeting was conducted as an informal open house. The project website was updated to reflect all documentation shown at the Alternative Public Workshop.

Invitational Letters:

A letter and a copy of the Public Notice for the Alternatives Public Workshop was mailed to Native American Tribes on June 02, 2017. Elected and Agency Officials and ETAT representatives were also sent a letter and a copy of the Public Notice via e-mail on June 02, 2017. Property Owners and Interested Stakeholders were notified by letter enclosed with the Meeting Location Map via US Mail on June 06, 2017.

Public Advertisement:

The Alternatives Public Workshop was advertised in the following:

- Sun Sentinel on June 22, 2017
- Noticed on FDOT's official website
- FDOT District Four Public Notice June 19, 2017
- Press Release June 19, 2017
- Project website: www.95commercialtocypress.com
- Florida Administrative Register (FAR) June 19, 2017

Presentation and Displays:

The following was on display and presented at the meeting:

- Welcome Board
- Title VI Board
- Project Location Board
- Station 1: Project Background and History Boards
    - About the Study
    - Project Development & Environment (PD&E) Study
- Station 2: I-95 Mainline Improvements Board
- Station 3: Commercial Boulevard and Powerline Road Intersection Boards
    - Commercial Boulevard and Powerline Road Intersection Board Alternative 1 (Traditional Intersection Widening)
    - Commercial Boulevard and Powerline Road Intersection Board Alternative 2 (Echelon with MUT)
    - Commercial Boulevard and Powerline Road Intersection Board Alternative 3 (Northbound-southbound Grade Separation)
- Station 4: Commercial Boulevard and N. Andrews Avenue Intersection Boards
    - Commercial Boulevard and N. Andrews Avenue Intersection Board Alternative 1 (Traditional Intersection Widening, North & West Legs)
    - Commercial Boulevard and N. Andrews Avenue Intersection Board Alternative 2 (Traditional Intersection Widening, North, East, West Legs)
    - Commercial Boulevard and N. Andrews Avenue Intersection Board Alternative 3 (Traditional Intersection Widening with Westbound Flyover)
- Station 5: Cypress Creek Road Interchange Boards
    - Cypress Creek Road Interchange Alternative 1 (Modification of Existing Partial Cloverleaf)
    - Cypress Creek Road Interchange Alternative 2 (Modification of Existing Partial Cloverleaf, Variation)

Alternatives Public Workshop Attendance:

- Elected Officials: 0
- Appointed Officials: 3
- Public: 70 attendees total (including FDOT and Consultant Staff)

Available Comment Forms:

The following forms were available for the public to provide comments:

- Public Comment Form
- Online Comment Form

Comments Received:

During the Alternatives Public Workshop a total of ten (10) written comments were received. The questions were regarding several issues such as: concern about homes during construction, concerns about proximity to homes and the effects that vibration may have on them, traffic congestion, barriers for safety, and noise cocerns.

6.6 Public Hearing

A Public Hearing is scheduled for August 23, 2018 in accordance with the PIP. The meeting will begin as an open house followed by a formal presentation and a comment period. Notices will be sent out to all property owners and tenants located within at least 300 feet on either side of the study area and to public officials, regulatory agencies, organizations, and individuals interested in the project.

6.7 Public Involvement Summary

A Public Involvement Summary will be produced at the conclusion of the study, containing, at a minimum, all documentation regarding public participation performed throughout the study period. This summary will include all comments and responses received from the public and coordination with local officials and agencies. Other items the summary will include are a proof of advertisements, meeting notes and sign-in sheets, verbatim transcript from the public hearing, public hearing certification by the Project Manager, and all public correspondence. The Public Involvement Summary will be kept on file at District Four.

7 Design Details of Recommended Alternative

The recommended Build Alternative consists of the Commercial Boulevard Corridor Alternative 6, the Cypress Creek Road Corridor Alternative 1A, and the I-95 southbound CD road system. The recommended Build Alternatives will also provide seven-foot bicycle lanes along Commercial Boulevard, Cypress Creek Road and Powerline Road in both directions.

The recommended Build Alternative will be described as Build Alternative 1A-6 for the remainder of this report. The Conceptual Design Plans are shown in Appendix C. The Build Alternative 1A-6 improvements are as follows:

I-95 Mainline Improvements (See Figure 7-1 and Figure 7-2)

- Maintain the proposed 95 Express Phase 3 project improvements, which will introduce two tolled, express lanes in place of the existing HOV lanes from Broward Boulevard in Broward County to Linton Boulevard in Palm Beach County.
- Provide a Collector-Distributor (CD) road system to carry a large volume of the Cypress Creek Road traffic desiring to go southbound onto I-95. The CD road system starts at the Cypress Creek Park & Ride on-ramp and merges with the existing I-95 southbound on-ramp from N. Andrews Avenue. The CD road system continues southbound over Commercial Boulevard and merges with the I-95 mainline just north of Powerline Road.
- Reconstruct the North Andrews Bridge over the I-95 mainline.

Commercial Boulevard Interchange Improvements (See Figure 7-3 and Figure 7-4)

I-95 Northbound Off-Ramp:

- Provide two additional eastbound right turn lanes to have a triple right turn movement to Commercial Boulevard east.

I-95 Southbound Off-Ramp:

- Provide one additional westbound right turn lane to have a dual right turn movement to Commercial Boulevard west.

Commercial Boulevard and Powerline Road Intersection:

- Provide one additional Powerline Road southbound left turn lane by removing one of the three thru lanes to have a triple left turn movement to Commercial Boulevard east.
- Provide one additional Commercial Boulevard westbound thru lane by removing one of the two westbound to southbound left turn lanes to have four thru westbound lanes.
- Provide one additional Commercial Boulevard eastbound thru lane east of Powerline Road.

Commercial Boulevard and N. Andrews Avenue Intersection:

- Provide one additional N. Andrews Avenue southbound left turn lane to have dual left turn lanes to Commercial Boulevard east.
- Provide one additional Commercial Boulevard eastbound thru lane to have four eastbound thru lanes.
- Reduce existing westbound thru lanes from three to two lanes.
- Provide a one lane bridge across N. Andrews Avenue to accommodate Commercial Boulevard westbound traffic to the existing I-95 westbound to southbound flyover on-ramp. The proposed one lane bridge merges with the existing I-95 westbound to

southbound at-grade ramp which accommodates the N. Andrews Avenue southbound and northbound traffic heading to southbound I-95. This reconfigured I-95 westbound to southbound flyover on-ramp will have two lanes at the entrance and will drop to one lane after the third span of the flyover bridge. The first three spans of the flyover bridge will be reconstructed.

- Convert existing two-lane frontage road located at the northeast quadrant of the intersection to a one lane frontage road in the westbound direction. The west end of the proposed one lane frontage road turns northward before approaching N. Andrews Avenue and terminates at the intersection of NE 1 Avenue and NE 51 Street.

Cypress Creek Road Interchange Improvements (See Figure 7-5)

I-95 Northbound Off-Ramps:

- Replace the existing I-95 northbound to westbound off-ramp loop at the northwest quadrant of the interchange with a bridge parallel to the existing I-95 mainline northbound bridge over Cypress Creek Road. The new bridge accommodates the I-95 northbound to Cypress Creek westbound traffic to a stop condition at Cypress Creek Road. This movement will require signalization.
- Widen the northbound to eastbound off-ramp with an additional eastbound right turn lane to have a dual right turn movement to Cypress Creek Road eastbound. This movement will require signalization.

I-95 Northbound On-Ramp:

- Remove the Cypress Creek Road westbound free flow right on-ramp onto I-95 northbound. Provide one additional Cypress Creek Road westbound right turn lane to have a dual I-95 on-ramp which will drop to one lane before merging with the I-95 mainline.

I-95 Southbound On-Ramp from N. Andrews Avenue:

- Reconstruct and widen to provide an additional lane; tie in to the proposed CD road system which starts from the Cypress Creek Park and Ride.

Cypress Creek Road and N. Andrews Avenue Intersection:

- Maintain existing number of lanes at the north and south legs of the intersection.
- Remove one Cypress Creek Road eastbound thru lane between NW 6 Way and N. Andrews Avenue and provide one additional right lane to have dual right turn lanes from Cypress Creek Road eastbound to N. Andrews Avenue southbound.

N. Andrews Avenue and N. Andrew Way Intersection:

- Maintain existing number of lanes at the legs of the intersection.

Cypress Creek Road and NE 7 Avenue Intersection:

- Provide one additional left turn lane to have dual left turn lanes from Cypress Creek Road eastbound to NE 7 Avenue northbound.

Refer to Figure 7-1 through Figure 7-5 for graphical depictions of the recommend Build Alternative 1A-6.

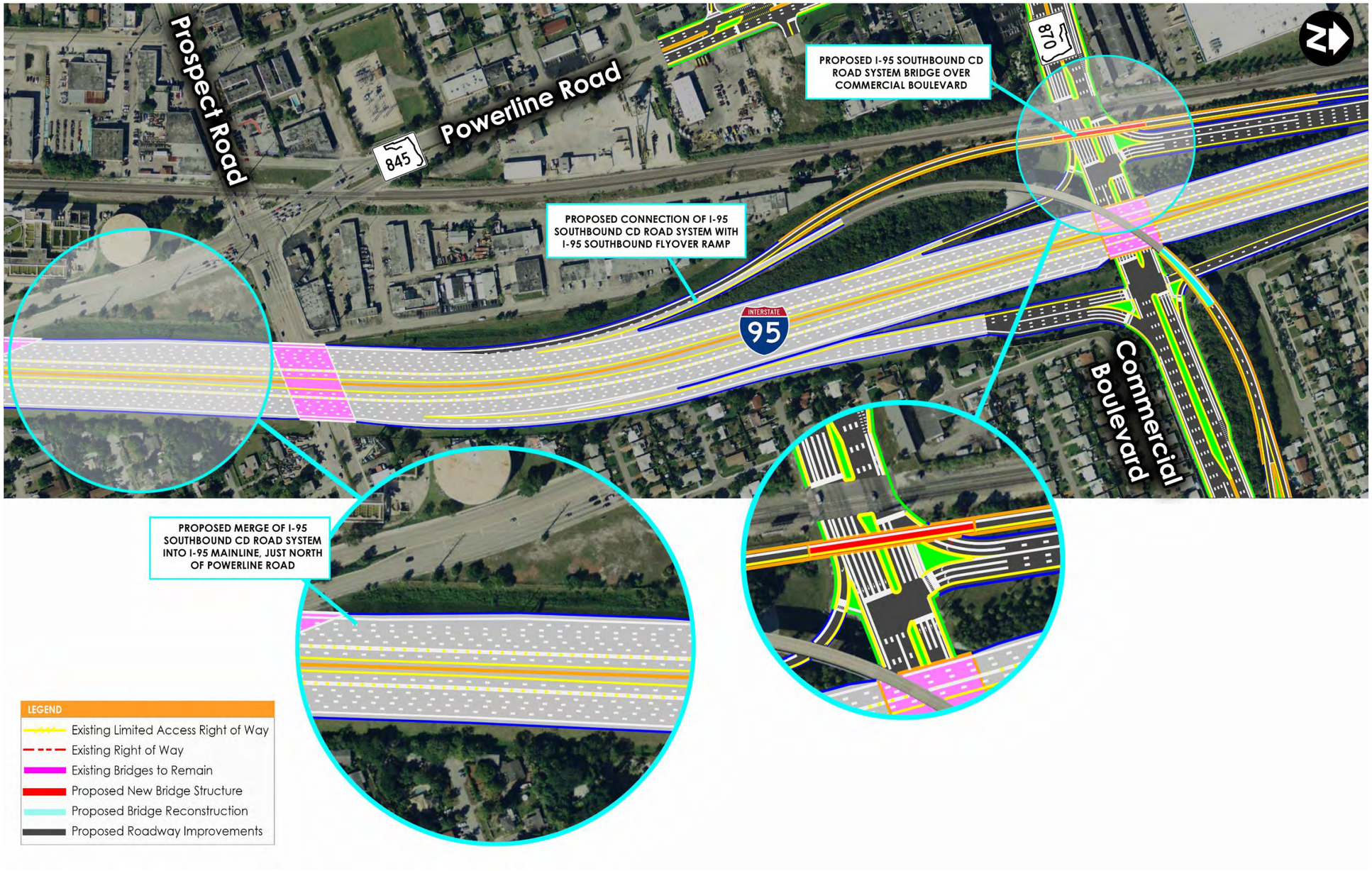


Figure 7-1 I-95 Mainline Improvements

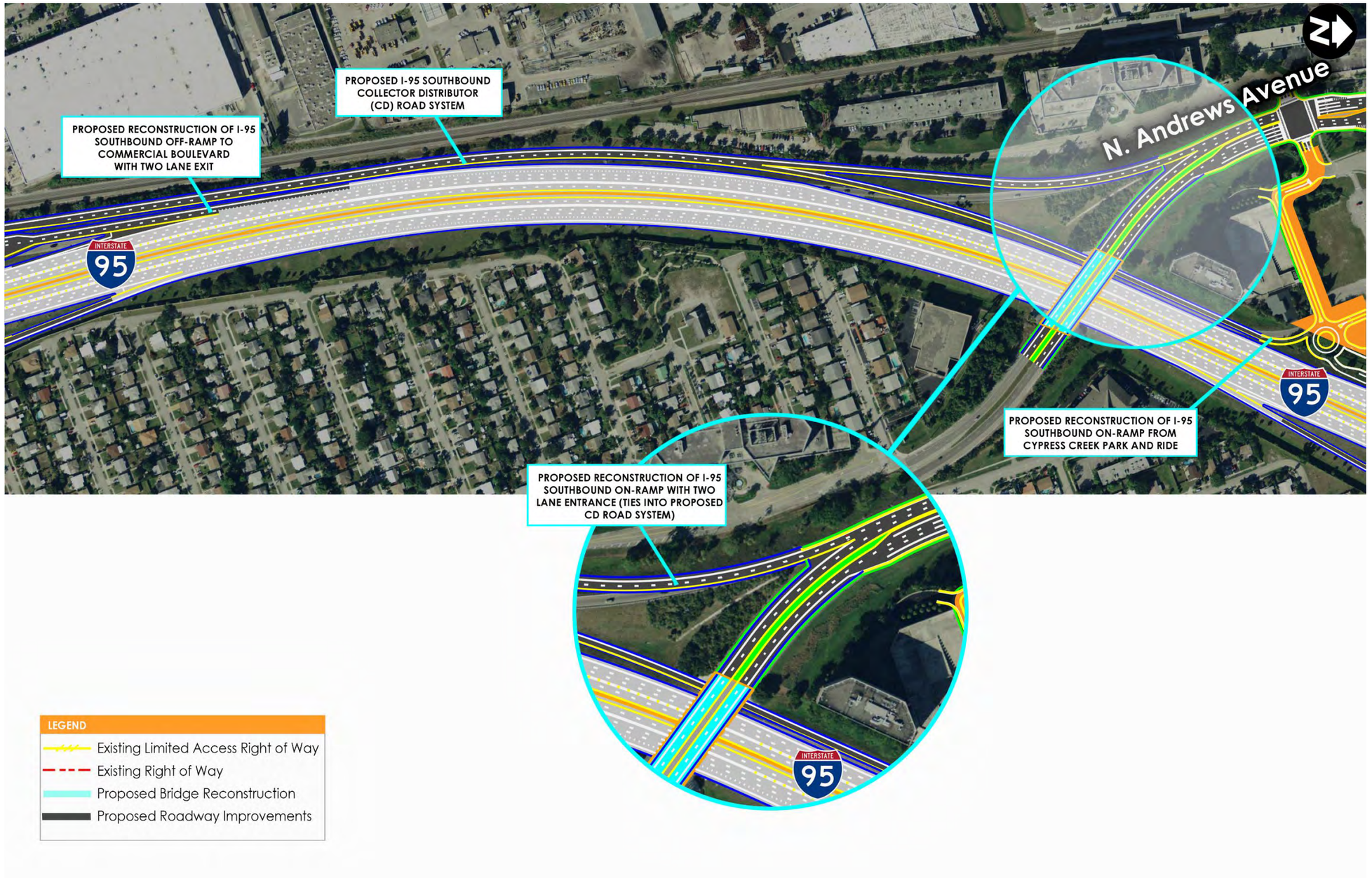


Figure 7-2 I-95 Mainline Improvements

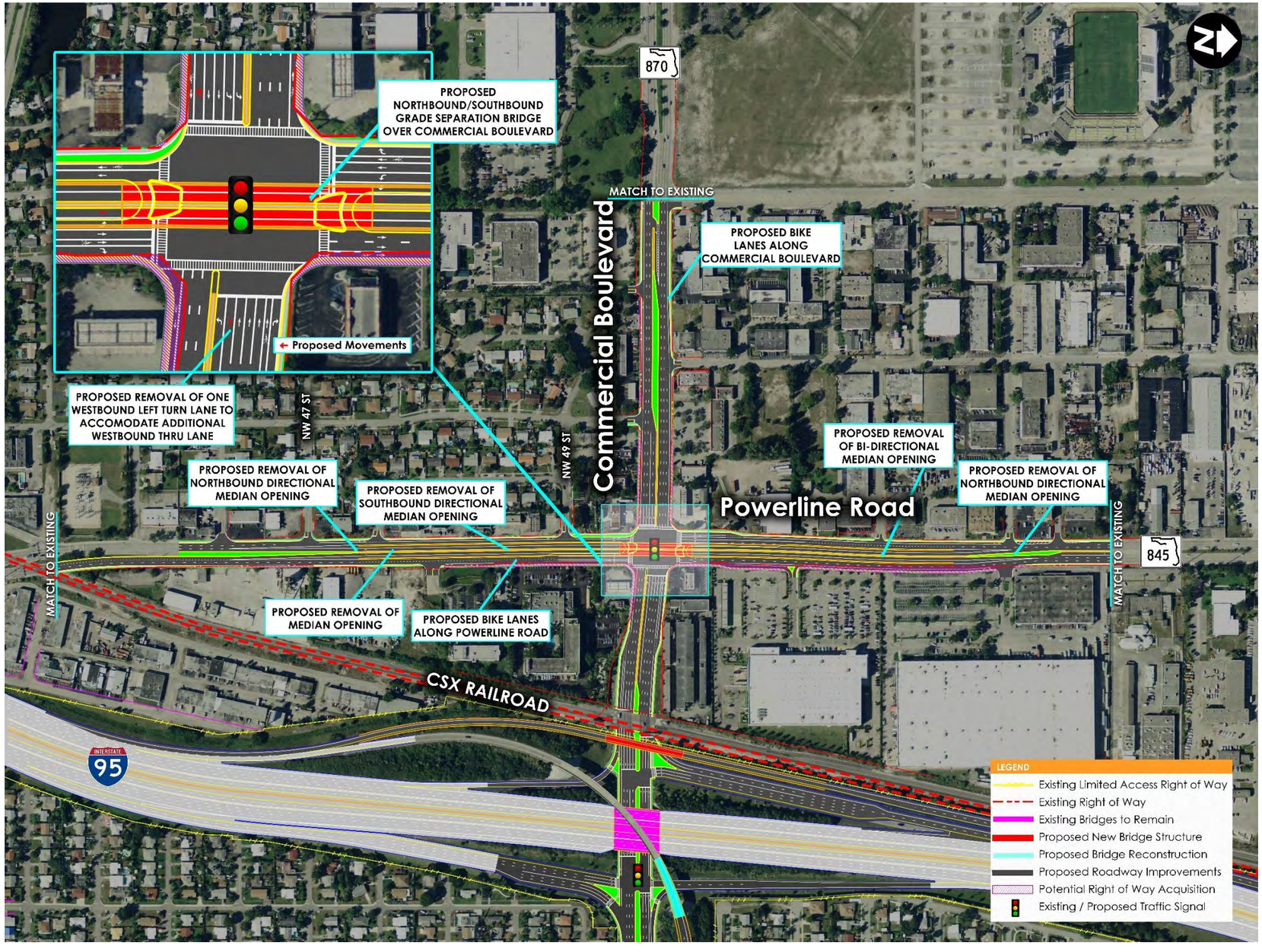


Figure 7-3 Build Alternative 1A-6

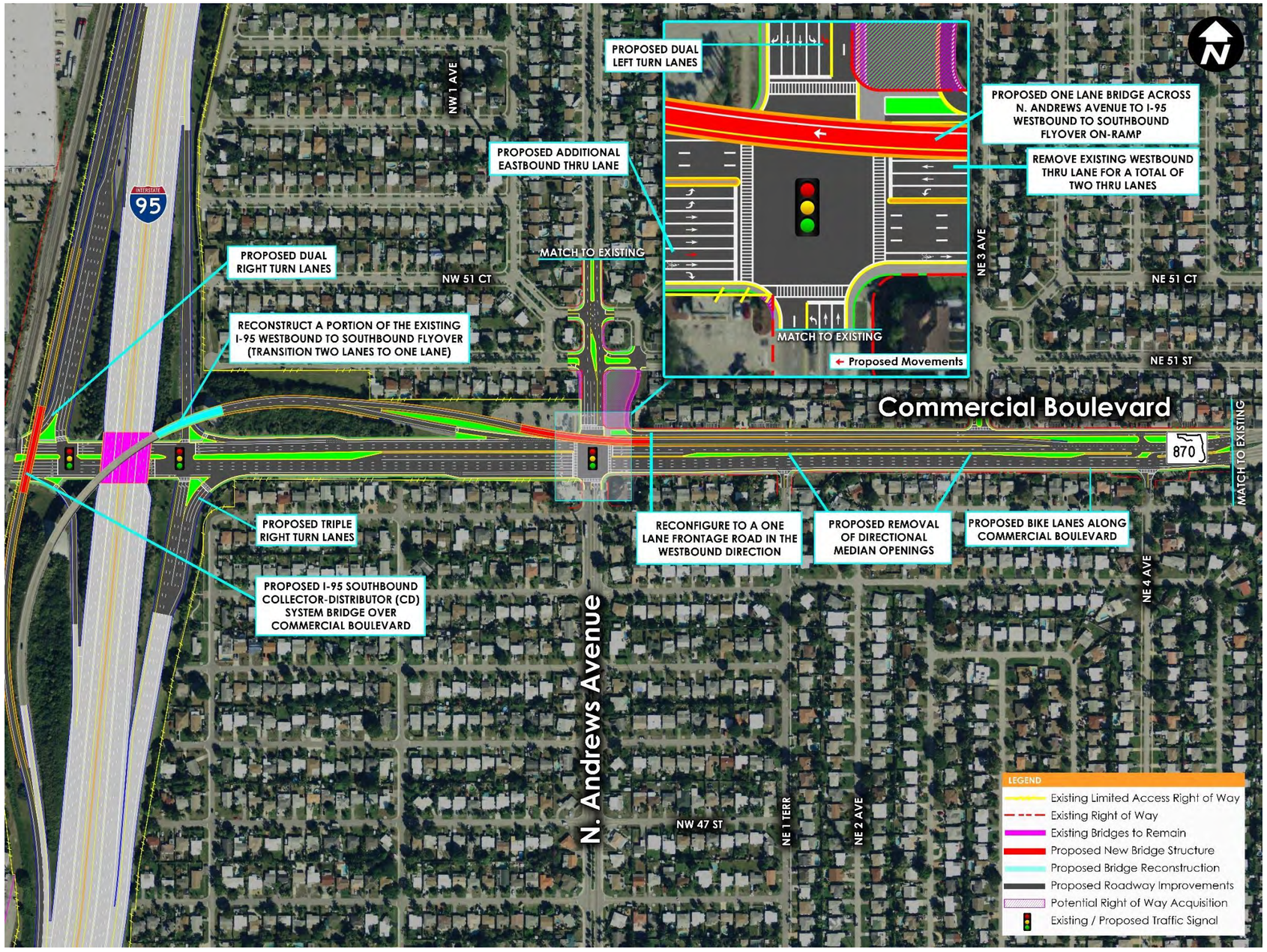


Figure 7-4 Build Alterantive 1A-6

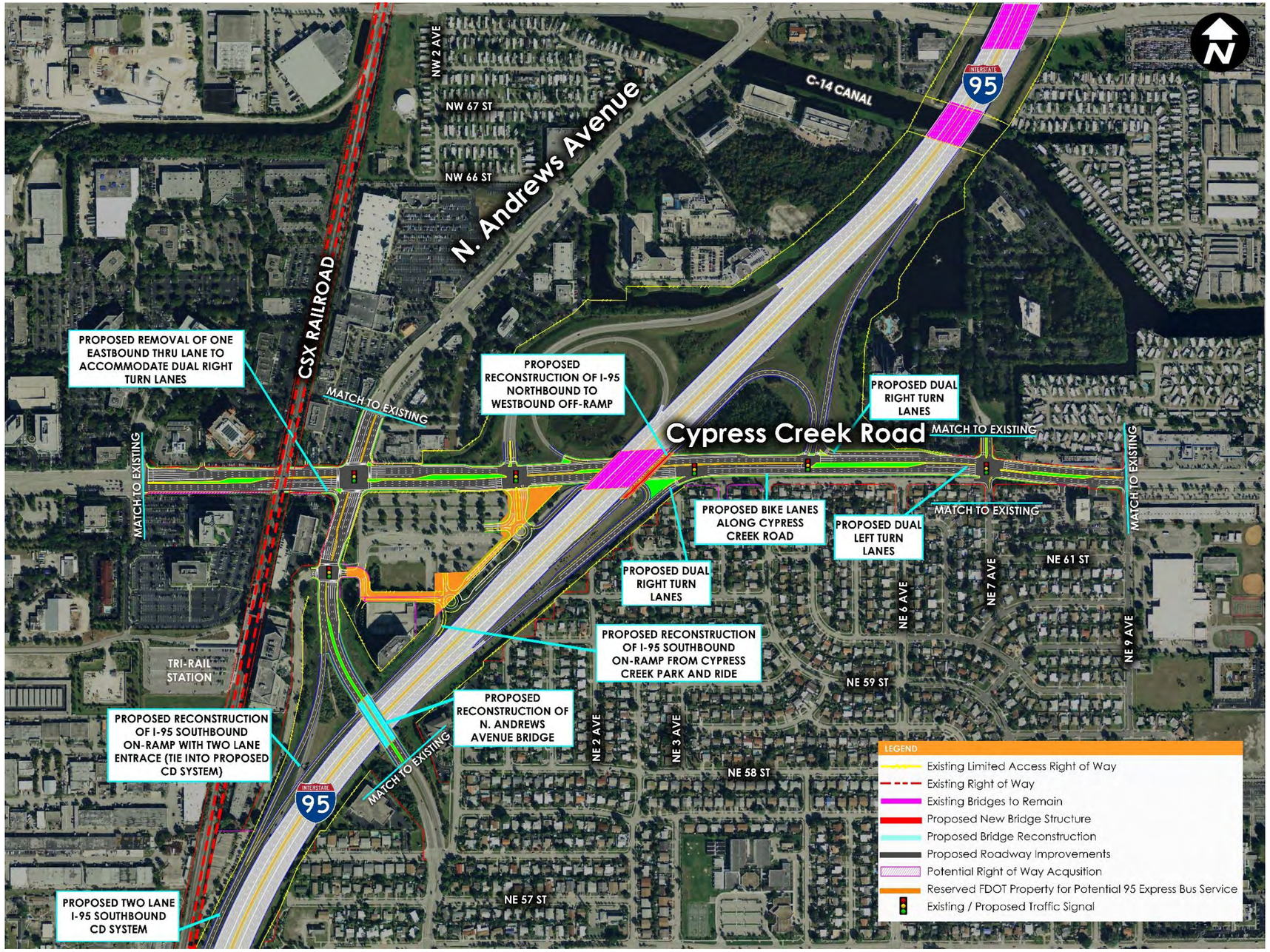


Figure 7-5 Build Alternative 1A-6

7.1 Traffic Operations

An alternatives analysis was performed to compare traffic operations of the No-Action alternative and recommended Build Alternative 1A-6 for the opening year (2020) and design year (2040). The calibrated existing models were used to develop the opening year (2020) and the design year (2040) Vissim models and the calibration parameters from the existing conditions models were carried forward to the future conditions models. Assumed express lane volumes were obtained from the 95 Express Phase 3 Corridor Traffic Analysis Report (CTAR) completed in 2014 and ranged from 3,000 to 4,000 vehicles per hour for two lanes. The CTAR also noted that the 2040 travel demand forecasts exceeded the capacity of the I-95 mainline and reduced the I-95 mainline volumes by 10 percent for the AM peak period and 20 percent for the PM peak period in order to produce meaningful results. Similar to the 95 Express Phase 3 study, the travel demand forecasts for this study also exceed the capacity of the I-95 mainline. Consistent with the approved CTAR, and agreed upon by FDOT District Four, the I-95 mainline volumes for the SIMR were reduced by 10 percent for the AM peak period and by 20 percent for the PM peak period.

A network performance evaluation was performed to assess total network delay, the relative number of vehicles that are being served, and extent of the latent demand of the study area. The network performance analysis for the design year (2040) indicates that there are significant capacity constraints on I-95 for both the No-Action and Build alternatives, despite the reduction in demand volumes. The mainline and interchange improvements in the Build Alternative improve the latent demand at the end of the peak period by 17 and 29 percent during the AM and PM peak periods, respectively. In terms of total network delay, the Build Alternative shows up to a 33 percent reduction compared to the No-Action Alternative for the AM peak period and up to a 51 percent reduction for the PM peak period. The total travel time for vehicles in the network is also reduced by up to 21 percent in the AM peak period and up to 24 percent in the PM peak period.

7.1.1 MAINLINE OPERATIONS

The Vissim models were used to produce volume and speed profiles along the I-95 general purpose lanes and express lanes for the AM and PM peak periods. The results of the mainline analysis for the design year (2040) indicate the following:

- I-95 northbound in the No-Action alternative experiences significant congestion in the AM peak period between Oakland Park Boulevard and Commercial Boulevard due to queuing from the off-ramp to Commercial Boulevard. Speeds as low as 15 mph were observed, with slow operating speeds extending beyond Oakland Park Boulevard. In the Build Alternative 1A-6, improvements at the Commercial Boulevard interchange eliminate the queue spillback from the northbound off-ramp and significantly improve operations on I-95.
- I-95 northbound also experiences minor congestion between Commercial Boulevard and Cypress Creek Road during the AM peak period in both the No-Action and Build Alternative 1A-6 due to the weaving segment between interchanges. Speeds as low as 45 mph were observed in this area before returning to free flow conditions north of the interchange.
- I-95 northbound experiences moderate congestion between Commercial Boulevard and Cypress Creek Road during the PM peak period in both the No-Action and Build Alternative 1A-6 due to the weaving segment between interchanges. Speeds between 30 and 40 mph were observed in this area before returning to free flow conditions north of the interchange. Slower speeds were observed in the Build Alternative 1A-6 compared to the No-Action alternative due to the improvements on Commercial Boulevard delivering more traffic to I-95.

- I-95 southbound in the No-Action alternative experiences significant congestion near Cypress Creek Road and Commercial Boulevard during the AM peak period due to the short weaving segment between the N. Andrews Avenue on-ramp and the Commercial Boulevard off-ramp, as well as an over-capacity condition on I-95. Speeds between 10 and 20 mph were observed between the interchanges, with congestion extending north of Atlantic Boulevard. This congestion is less severe during the PM peak period, but speeds as low as 15 mph were still observed between the interchanges.
- I-95 southbound in the Build Alternative 1A-6 still experiences significant congestion during the AM peak period due to an over-capacity condition, but with the addition of the CD road system that eliminates the short weaving segment between the N. Andrews Avenue on-ramp and the Commercial Boulevard off-ramp, the bottleneck is shifted farther north to Cypress Creek Road. Speeds between 10 and 20 mph were observed near the Cypress Creek Road interchange, with congestion extending north of Atlantic Boulevard.
- I-95 southbound in the Build Alternative 1A-6 is operating at or near free flow speed during the PM peak period.

The results of the link evaluation for the opening year (2020) indicate the following:

- I-95 northbound is operating at or near free flow speed during the AM peak period and experiences minor congestion between Commercial Boulevard and Cypress Creek Road due to the weaving segment between interchanges. Speeds as low as 45 mph were observed in this area before returning to free flow conditions north of the interchange.
- I-95 southbound experiences moderate congestion near Cypress Creek Road during the AM peak period due to the traffic demand south of the Cypress Creek Road westbound to I-95 southbound on-ramp. With traffic demand in the general-purpose lanes at 1900 to 2000 vehicles per hour per lane, speeds as low as 20 mph were observed at the merge before returning to free flow speeds. Slow operating speeds extend north of Cypress Creek Road, but the congestion remains south of Atlantic Avenue.
- I-95 southbound is operating at or near free flow speed during the PM peak period.

7.1.2 INTERSECTION OPERATIONS

The results of the intersection analyses indicate that the intersections in the design year (2040) are operating at LOS D or better during the AM peak hour in the Build Alternative 1A-6 except for the Commercial Boulevard and Powerline Road intersection, which is operating at LOS E. In the No-Action alternative, this intersection is operating at LOS F. During the PM peak hour, the intersections in the project limits are operating at LOS D or better in the Build Alternative 1A-6 except for the following intersections that are operating at LOS E:

- Cypress Creek Road and N. Andrews Avenue
- Commercial Boulevard and Powerline Road
- Commercial Boulevard and N. Andrews Avenue

In the No-Action alternative, these intersections are operating at LOS F. Several intersections in the area of influence are operating at LOS F in the PM peak hour in both the No-Action and Build Alternative 1A-6, but no improvements are proposed at these intersections as part of the PD&E project. While they are operating at LOS F, the delays have been reduced at the majority of the intersections in the Build Alternative 1A-6 due to improvements at nearby intersections within the project limits. The design year (2040) results are shown on Table 7-1.

Table 7-1 Design Year (2040) Build Alternative 1A-6 vs. No-Action Intersection Results									
Corridor	Intersection	AM Peak No-Action 2040		AM Peak Build 2040		PM Peak No-Action 2040		PM Peak Build 2040	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Cypress Creek Rd	NW 6th Way	37.0	D	28.7	C	239.8	F	163.3	F
	N Andrews	51.5	D	45.3	D	101.3	F	74.3	E
	I-95 SB Ramps	52.6	D	19.8	B	56.2	E	28.8	C
	I-95 NB Ramp	-	-	16.6	B	-	-	17.4	B
	I-95 NB Ramp	13.9	B	27.7	C	50.5	D	23.8	C
	NW 7th	30.1	C	34.9	C	23.8	C	33.7	C
	NW 9th	2.2	A	2.7	A	7.7	A	12.4	B
	N Dixie Hwy	49.3	D	49.9	D	93.3	F	95.2	F
N. Andrews Ave	NW 66th	6.1	A	6.1	A	6.1	A	6.1	A
	NE 1st	8.3	A	11.6	B	17.7	B	13.3	B
	N Andrews	24.4	C	22.3	C	21.8	C	13.0	B
	NW 51st	9.8	A	3.7	A	72.5	E	28.2	C
	NW 48th	6.0	A	1.0	A	222.8	F	16.2	B
Commercial Blvd	NW 15th	21.6	C	20.5	C	13.6	B	18.2	B
	NW 12th	21.1	C	6.6	A	11.9	B	12.5	B
	Powerline	86.2	F	61.1	E	84.6	F	70.1	E
	I-95 SB Ramps	41.4	D	18.5	B	39.8	D	15.0	B
	I-95 NB	92.0	F	31.8	C	40.4	D	27.8	C
	N Andrews	64.8	E	32.0	C	80.1	F	59.3	E
	NE 3rd	38.3	D	8.8	A	58.7	E	11.9	B
	NE 6th	61.9	E	47.2	D	157.6	F	95.5	F
Powerline Rd	NW 56th	1.4	A	1.0	A	30.0	C	1.0	A
	NW 53rd	0.7	A	0.6	A	66.1	E	9.8	A
	NW 51st Pl	3.9	A	1.1	A	28.8	C	10.4	B
	NW 46th	0.5	A	0.6	A	0.6	A	0.8	A

The results of the intersection analyses indicate that the intersections are operating at LOS D or better during the AM peak hour in the opening year (2020) Build condition. During the PM peak hour, the intersections are operating at LOS D or better except for the Cypress Creek Road and N. Andrews Avenue intersection, which is operating at LOS E. The opening year (2020) results are shown on Table 7-2.

Table 7-2
Opening Year (2020) Build Alternative 1A-6 Intersection Results

Corridor	Intersection	AM Peak Build 2020		PM Peak Build 2020	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Cypress Creek Rd	NW 6 Way	17.6	B	37.7	D
	N. Andrews Avenue	37.8	D	56.2	E
	I-95 SB Ramps	17.1	B	21.1	C
	I-95 NB Ramp Off	13.8	B	14.8	B
	I-95 NB Ramp On	22.1	C	19.5	B
	NW 7 Avenue	27.6	C	26.5	C
	NW 9th Avenue	1.6	A	2.8	A
	N. Dixie Hwy	32.6	C	52.7	D
N. Andrews Ave	NW 66 Street	4.3	A	5.2	A
	NE 1 Avenue	7.3	A	9.7	A
	N. Andrews Way	20.0	B	12.4	B
	NW 51 Street	2.3	A	5.5	A
	NW 48 Street	0.8	A	1.1	A
Commercial Blvd	NW 15 Avenue	11.3	B	14.6	B
	NW 12 Avenue	3.3	A	4.4	A
	Powerline Road	46.3	D	46.5	D
	I-95 SB Ramps	17.2	B	14.1	B
	I-95 NB Ramps	29.9	C	27.5	C
	N. Andrews Avenue	28.1	C	41.0	D
	NE 3 Avenue	6.7	A	7.3	A
	NE 6 Avenue	33.7	C	54.2	D
Powerline Rd	NW 56 Street	0.8	A	0.7	A
	NW 53 Street	0.4	A	0.6	A
	NW 51 Pl	0.5	A	1.0	A
	NW 46 Street	0.5	A	0.7	A

7.2 Bridge Analysis

A comprehensive analysis of the existing bridges can be found in Section 2.18 of this PD&E Study.

COMMERCIAL BOULEVARD INTERCHANGE AREA

The Commercial Boulevard Westbound Flyover is proposed to facilitate westbound Commercial Boulevard traffic over N. Andrews Avenue to the existing southbound I-95 flyover ramp. Its intention is to bypass the Commercial Boulevard/N. Andrews Avenue intersection to improve traffic flow as can be seen in Figure 7-6.

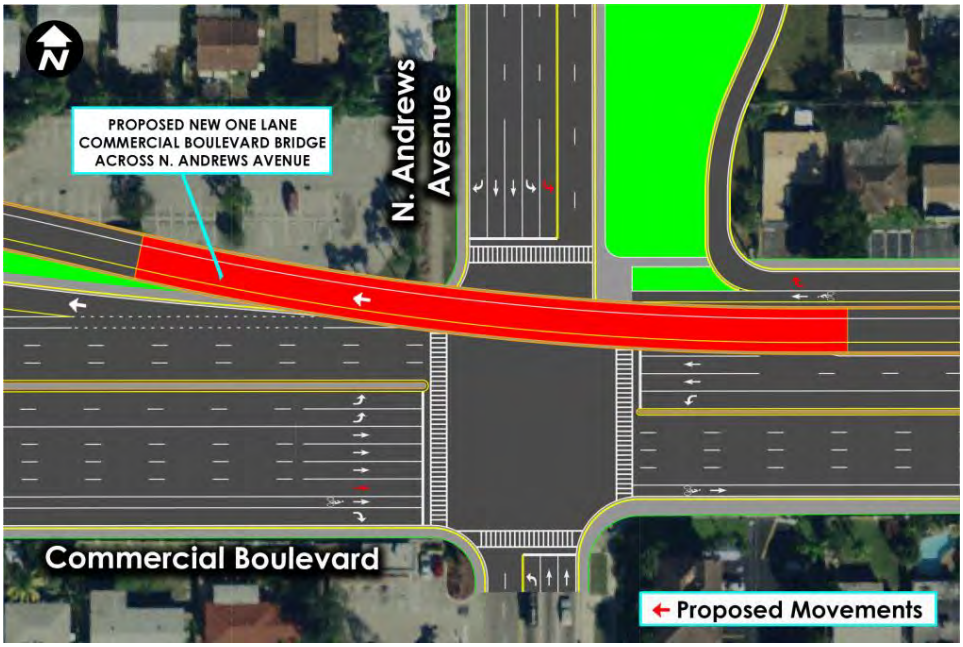


Figure 7-6 Commercial Boulevard Westbound Flyover

The proposed typical section as seen in Figure 7-7 consists of a single 15 ft. lane with 6 ft. shoulders, as required by standards set forth in FDOT's FDM, Section 260.1.1 Partial Bridge Sections.

The overall bridge length will be approximately 465 ft. with MSE walls. The bridge can be designed as a potential three span structure with a mid span approximately 200 ft. long. Based on the anticipated mid span length (200 ft.) and horizontal curvature, a continuous steel girder structure will be recommended. Based on AASHTO LRFD Bridge Design Specifications, Table 2.5.2.6.3-1, approximate superstructure depth would be 6.5 feet.

Cantilevered hammer head piers can be utilized to facilitate the geometry of Commercial Boulevard. During the final design phase, final placement of the piers will be determined to optimize design and geometric constraints. Travel lane lateral offsets, barrier requirements and setbacks will also be determined. The substructure will consist of pier foundations with drilled shafts or piles. End bents will be supported on piles and protected by MSE walls.

Based on the anticipated mid span length (200 ft.) and horizontal curvature, a continuous steel girder structure will be recommended. Based on AASHTO LRFD Bridge Design Specifications, Table 2.5.2.6.3-1, approximate superstructure depth would be 6.5 feet.

Portions of the proposed piers will extend over Commercial Boulevard and consequently the vertical profile will be elevated high enough so that the pier cap clears the vertical clearance.

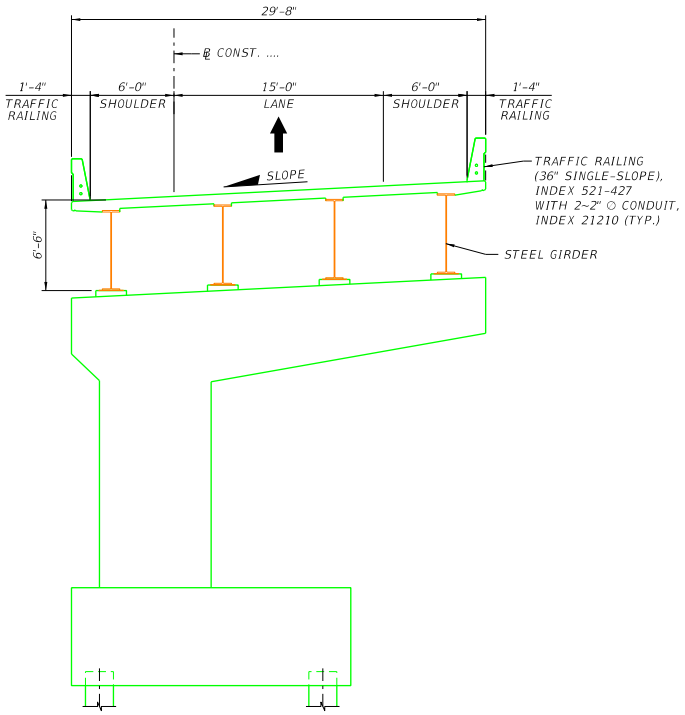


Figure 7-7 Proposed Westbound Flyover Typical Section

I-95 Westbound to Southbound Flyover On-ramp (existing Ramp E flyover, Bridge #860131), connects Commercial Boulevard westbound with I-95 southbound traffic. Its typical section consists of one 15 ft. lane with 6 ft. shoulders on both sides which meets FDOT FDM criteria.

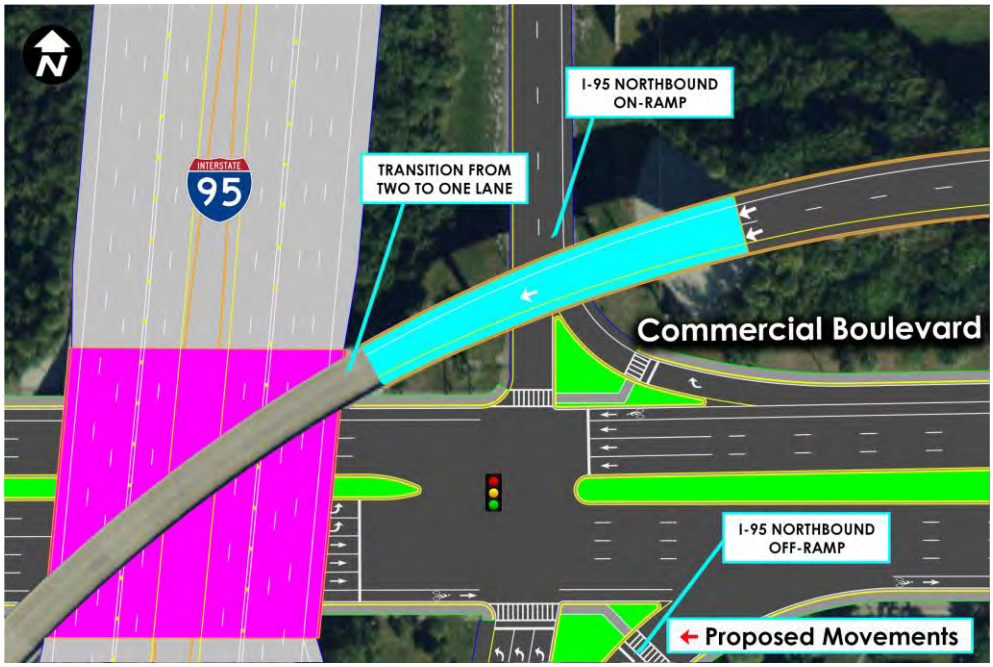


Figure 7-8 I-95 Westbound to Southbound Flyover On-ramp (Existing Ramp E)

Its superstructure consists of a total of eight spans with the two mid spans over I-95 constructed with steel girders and three end spans on either side constructed with AASHTO Type IV beams.

Its substructure consists of hammer head piers and cast in place end bents supported on 18" prestressed piles. Wingwalls are supported with 12-HP53 steel piles. The end bents are protected with 2:1 slope pavements.

2016 Bridge Inspection Report states a sufficiency rating of 91.7 and Health Index of 90.47, superstructure in good condition and substructure in very good condition. A load rating was also outlined with results for HS 20 Design Truck Inventory of 56.2 Tons (1.56 RF) and Operating of 65.4 (1.82 RF) governed by spans 1 and 3.

Proposed widening of the Ramp E Flyover as seen in Error! Reference source not found. takes two l anes of Commercial Blvd. westbound traffic, one lane prior to N. Andrews Avenue and the other lane after N. Andrews Avenue. The two lanes begin to merge into one lane as they enter Ramp E. The transition occurs within the last three spans. As such the proposed modification of Ramp E occurs in the last three spans, the remaining five spans will stay unchanged.

The proposed typical section as seen in Figure 7-9 remains unchanged as described in the existing conditions above, with the exception of the merge in the last three spans.

The last three spans will require a widening from 9 ft. at the end bent and tapers to 0 ft. at Pier 5. It will be recommended that the widening occurs on one side of the bridge to facilitate constructability, preferably on the inside as it's the shorter side of the horizontal curve radius and will minimize the additional superstructure weight.

Span 8 (last span) will require a new beam line, based on the span length of 85 ft. which can be accommodated with a FIB 36".

Span 7 will require a new beam line or replacement of the existing exterior beam line with FIB 36".

Span 6 will require a replacement of the existing exterior beam line with FIB 36". It is possible that the existing exterior beam has adequate capacity for the additional overhang weight, based on the existing load rating, however aesthetically it is preferred that all exterior beams should be of the same type where possible.

Since the widened portion of Spans 6 through 8, will be brought up to standard with a 36" single-slope traffic railing, it is recommended that the existing railing on the inner side of Spans 1 through 5 also be replaced with the same 36" single-slope traffic railing.

The above options will be determined during final design.

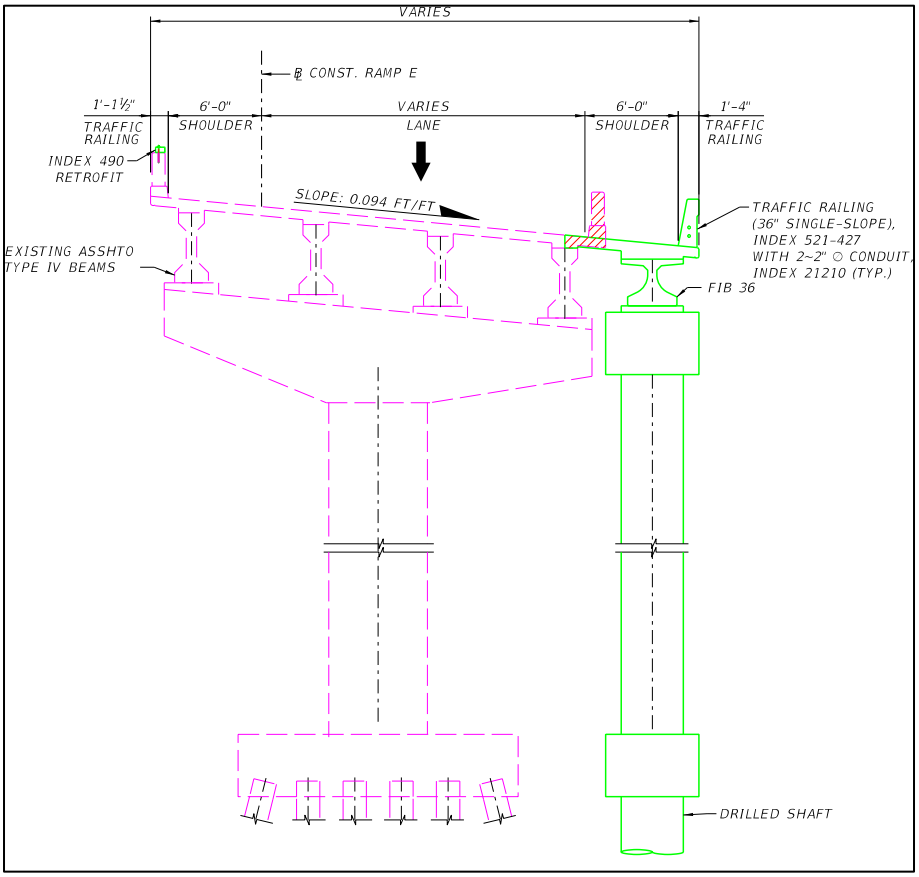


Figure 7-9 Proposed Ramp E Widening Typical Section

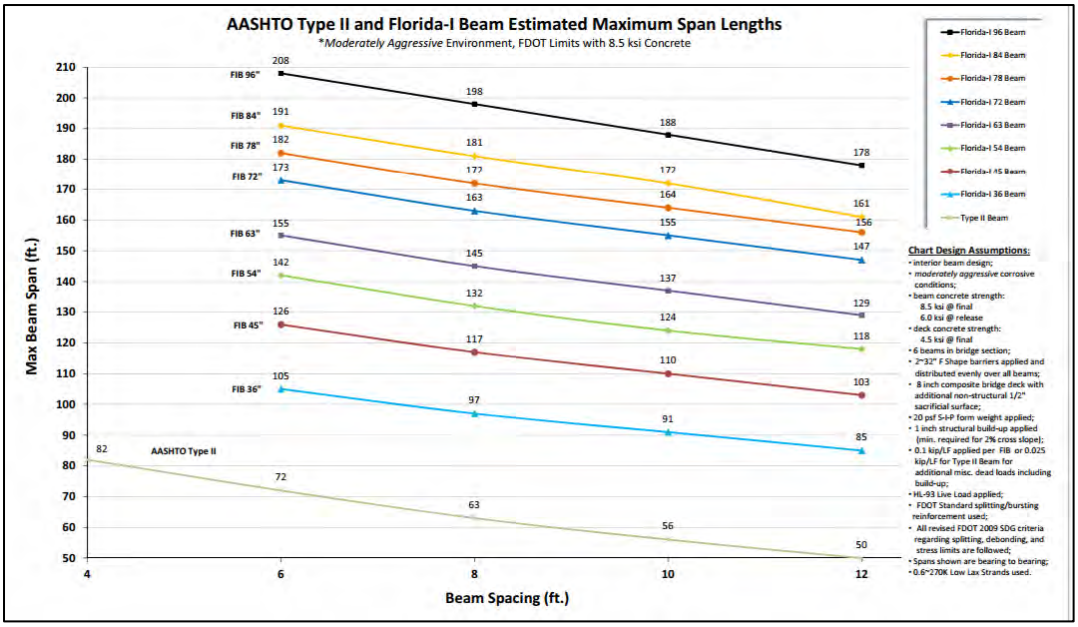


Figure 7-10 Excerpt from FDOT Structures Design Guidelines

The existing end bent will be widening to support the proposed superstructure. Its properties will be similar to the existing and the slope embankment will be extended accordingly.

Pier 7, can potentially utilize a new pier, isolated from the existing, to support the proposed additional beam line of Span 8.

Pier 6, will consit of retrofitting the existing pier to accommodate the adjusted beam lines of spans 7 and 8.

Pier 5, should be evaluated further in final design to determine if there is adequate capacity to take the additional loads created by the replacement of the existing beam and additional overhang width. Alternatively, a retrofit will be required.

The governing vertical clearance is located at spans 4 and 5 over I-95, which is 15.6 ft. as per 2016 Bridge Inspection Report and would require a design exception as the minimum vertical clearance allowed per FDOT's FDM is 16.5 ft. and AASHTO is 16 feet. However, the area of the bridge with the proposed widening is over Ramp C1 and Return 2 currently having an existing vertical clearance of approximately 34.82 ft. as per existing bridge plans, which is far more than the minimum required 16.5 feet. Although the proposed beam is on the low end of the 0.94 ft./ft. bridge cross slope, the existing AASHTO Type IV and proposed FIB 36 beams have a height of 4.5 ft. and 3 ft. respectively and therefore will not reduce the existing vertical clearance.

I-95 Southbound Collector-Distributor (CD) Road System bridge over Commercial Boulevard: is proposed to facilitate southbound traffic from N. Andrews Avenue and the Cypress Creek Park and Ride to I-95 southbound by crossing over Commercial Boulevard as seen in Figure 7-11.

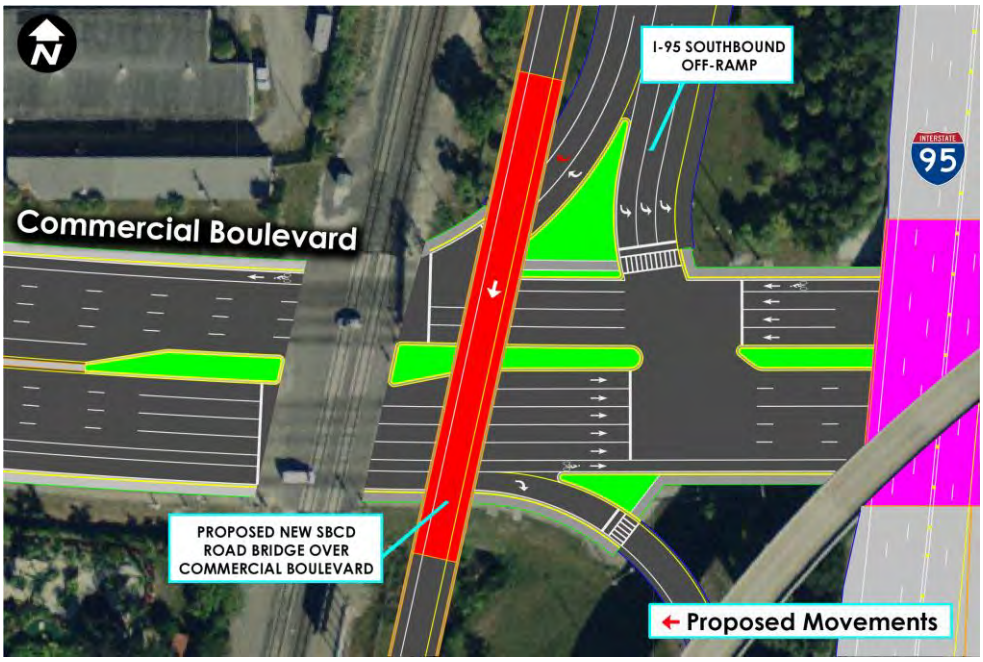


Figure 7-11 I-95 SB CD Road System Bridge over Commercial Boulevard

The proposed typical section as seen in Figure 7-12 consists of a single 15 ft. lane with 6 ft. shoulders, as required by standards set forth in FDOT's FDM, Section 260.1.1 Partial Bridge Sections.

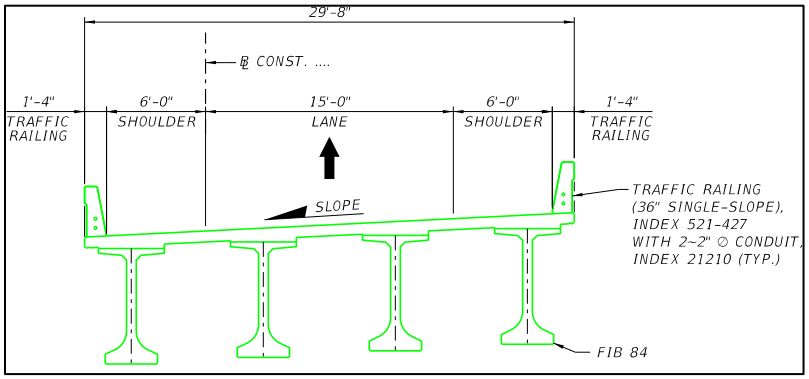


Figure 7-12 Proposed I-95 SB CD Road System Bridge over Commercial Boulevard Typical Section

Overall bridge length will be approximately 295 ft. with MSE walls. A potential two span structure with the first and longest span being approximately 178 feet. Based on that span length, a FIB 84" beam would be appropriate. With the second span being significantly shorter, a smaller FIB may be used as interior beams in combination with FIB 84" exterior beams.

A typical multi column or hammer head pier would be positioned between the median of Commercial Boulevard. Pier foundations and end bents would be supported on piles, and end bents protected by MSE walls.

CYPRESS CREEK INTERCHANGE AREA

The proposed CD system traverses underneath the existing N. Andrews Avenue bridge over I-95 within Span 4 of the existing bridge. Span 4 does not provide sufficient room to accommodate the new bridge. As a result, this existing bridge must either be replaced or retrofitted. See Figure 7-13.

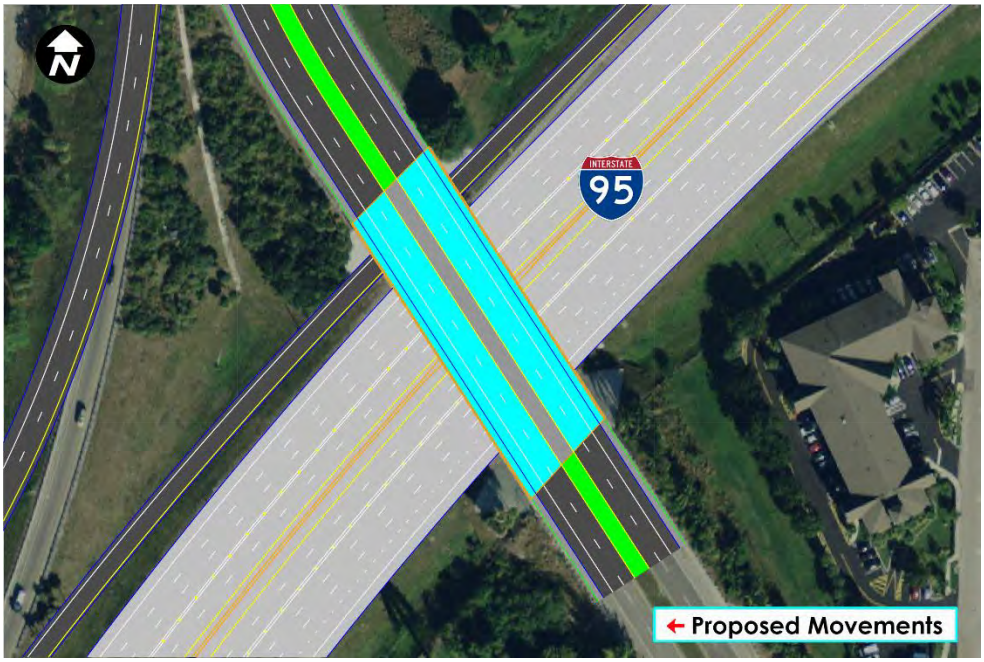


Figure 7-13 Proposed N. Andrews Avenue over I-95

The vertical clearance of the existing bridge is severely substandard (15.6-ft) as per the BIR. Retrofitting the bridge by lengthening Span 4 will increase loads on Pier 4 which may require replacement. This in turn would require a replacement of Span 3 as well. Under this situation, a potential retrofit could require replacement of approximately half of the bridge while maintaining a sub-standard vertical clearance. As a result, bridge replacement is recommended which addresses the vertical clearance deficiency.

Overall bridge length will be approximately 306 ft. with MSE walls. A two span structure is proposed with Span 1 (171 ft. long) crossing over the CD system and I-95 Southbound and Span 2 (135 ft. long) crossing over I-95 Northbound.

Based on the maximum span length (171 ft.) FIB 78" beams are recommended for this superstructure.

The proposed bridge substructure shall be supported on a multi column pier between I-95 Southbound and I-95 Northbound and surrounded on either side with concrete barrier walls. The pier foundations would consist of footings and prestressed piles. The end bents will also be supported on prestressed piles and protected with MSE Walls.

Horizontal Clearance at the begin bridge, shall provide 24 ft. clear zone from edge of travel lane (CD system) to the face of the MSE wall, which is based on a design speed of 50 mph. At the end bridge, a 36 ft. clear zone shall be provided from edge of travel lane (I-95 southbound) to the face of the MSE wall, which is based on a design speed of 70 mph.

The proposed typical section of the N. Andrews Avenue bridge as seen in Figure 7-14 consists of two 12 ft. lanes, 10 ft. outer shoulders and 6 ft. sidewalks in each direction of traffic, separated by a 16-ft raised median.

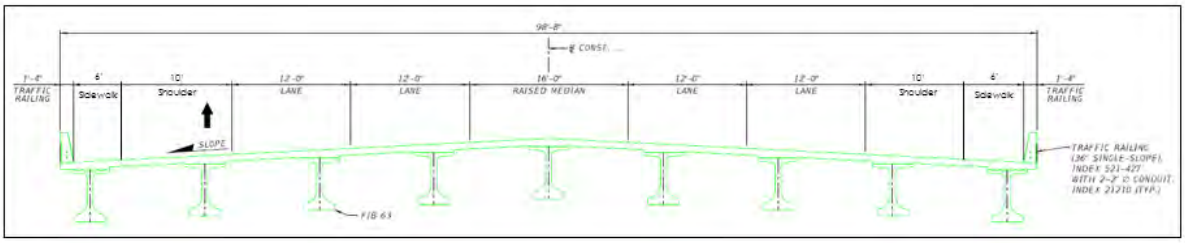


Figure 7-14 Proposed N. Andrews Avenue over I-95 Typical Section

The Proposed 1-95 Northbound Off-Ramp Bridge over Cypress Creek is proposed to facilitate the northbound exit off I-95 crossing over Cypress Creek Road and directed to Cypress Creek Road westbound travel as seen in Figure 7-15. Its positioned parallel to the existing I-95 Northbound bridge over Cypress Creek (Bridge #860240). The existing bridge is a 3-span structure with an overall length of 319 ft. Its superstructure consists of prestressed concrete AASHTO beams and substructure consists of multi column piers supported on prestressed concrete pile foundations. The end bents are supported on prestressed concrete piles and originally protected with sloped embankments. Later, the south embankment was cut back with retaining wall to make room for a Texas U-turn under the first span.

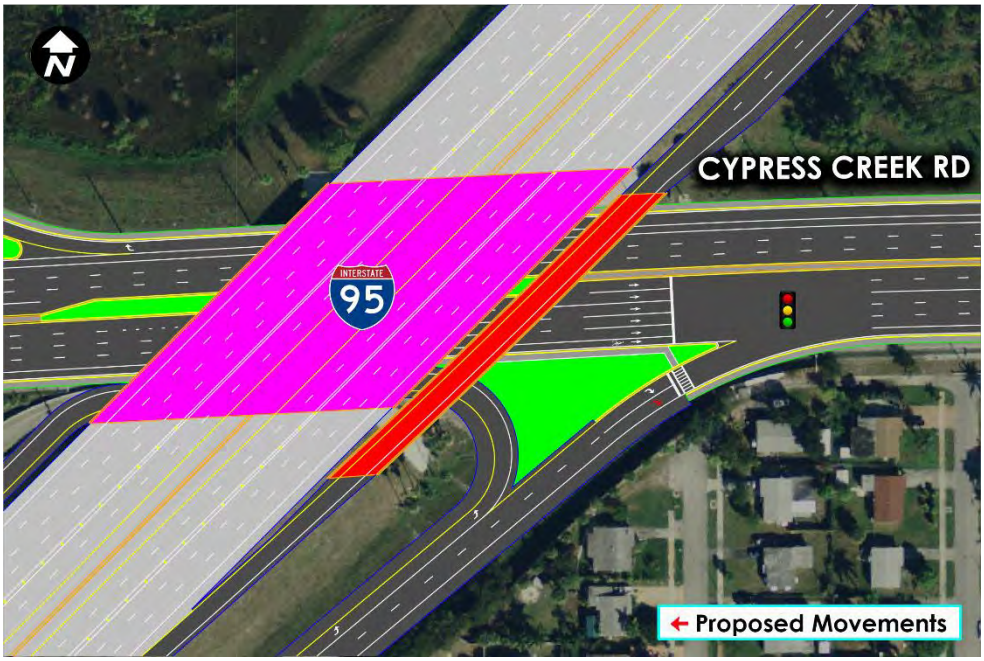


Figure 7-15 Proposed I-95 Northbound Off-Ramp over Cypress Creek Road

The proposed typical section as seen in Figure 7-16 consists of a single 15 ft. lane with 6 ft. shoulders, as required by standards set forth in FDOT's FDM, Section 260.1.1 Partial Bridge Sections.

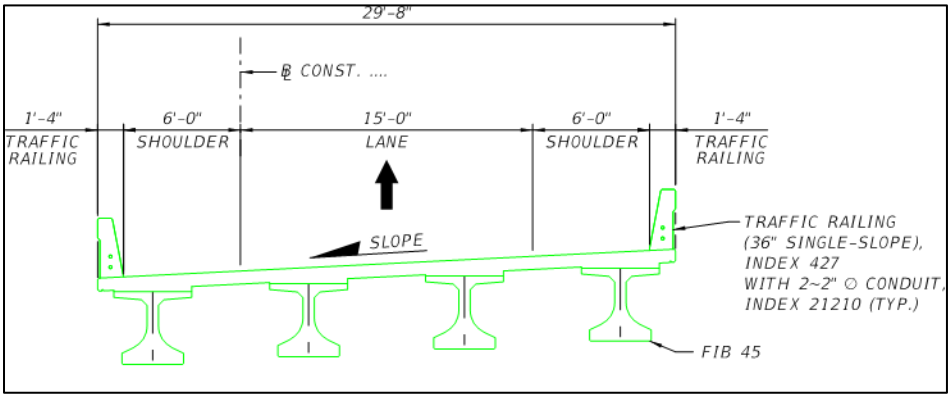


Figure 7-16 Proposed I-95 Northbound Off-Ramp over Cypress Creek Road Typical Section

The proposed bridge may match the adjacent existing I-95 Northbound bridge (Bridge #860240) with pier locations in line with each other as well as the end bridge, which will also be protected by a slope embankment. The begin bridge however will have to start before the existing bridge and protected be an MSE wall, to accommodate for the curvature of the Texas U-turn, which falls under the proposed bridge. This will result in the following 4 span arrangement:

	Proposed Bridge	Adjacent Existing Bridge
Span 1	77'-9"	60'-9"
Span 2	99'-9"	99'-9"
Span 3	99'-9"	99'-9"
Span 4	58'-9"	58'-9"
Overall Length	336'-0"	319'-0"

Based on the proposed span lengths the superstructure will consist of FIB 45", its substructure supported on multi column piers with concrete prestressed pile foundations and end bents also supported on prestressed piles. There may be underground utilities in the vicinity of the proposed foundations which will have to be investigate for potential relocation. Also, the existing concrete barrier walls surrounding the existing median pier will be extended to surround the proposed median pier. See Figure 7-17 below.



Figure 7-17 Existing I-95 Northbound over Cypress Creek

7.3 Access Management

A comprehensive analysis of the existing access management summary for I-95 and all respective arterials, related to this project, can be found in Section 2.4 of this PD&E Study.

COMMERCIAL BOULEVARD

Commercial Boulevard is an urban principal arterial with access class 3 west of Powerline Road and access class 5 east of Powerline Road. Neither class will change despite a couple of changes in existing median openings under the Recommended Build Alternative. Said changes include the closures of two bi-directional (EB & WB) median openings, located at NE 1 Terrace and NE 3 Avenue (See Figure 7-18). The directional opening at NE 1 Terrace allows U-turn movements as well as access to the frontage road businesses along the north side of Commercial Boulevard and the residential properties on the south side of Commercial Boulevard. The directional opening at

NE 3 Avenue allows U-turn movements as well as access to the frontage road businesses along the north side of Commercial Boulevard. Vehicles can have to use the existing bi-directional opening located at NE 4 Avenue or the full-signal opening at NE 6 Avenue to access the respective properties.

POWERLINE ROAD

Powerline Road is a principal arterial with an access management class 5. The existing southbound directional opening just south of NW 49 Street, which serves U-turn traffic as well as traffic entering the Waffle House and the Universal Palms Hotel on the east side of Powerline Road will be closed (See Figure 7-19). To compensate for the closure of this SB directional, the recommended Build Alternative proposes relocating this movement to an existing full median opening just north of NW 47 Court, along Powerline Road. At this location, all vehicles trying to access the Waffle House and Universal Palms Hotel will have to complete a U-turn and a right-turn in to either property.



Figure 7-18 Commercial Boulevard Access Management Plan Proposed Improvements



Figure 7-19 Powerline Road Access Management Plan Proposed Improvements

7.4 Variations and Exceptions

The existing geometric elements for the corridor were evaluated via topographic survey, field reviews, and final design/as-built plans from Broward County and FDOT District Four. The design team conducted this review based on the existing geometry of I-95. This PD&E Study does not propose improvements to the mainline of I-95 (except for a CD road system).

The design team will be responsible for the development of any design variations and exceptions anticipated during the design phase due to inadequate existing conditions or right of way constraints requiring less than required standard criteria. Table 7-3 summarizes the potential design variations and exceptions. Several of the identified variations and exceptions are anticipated to be processed under separate projects such as the I-95 Express Phase 3 project. The table includes a current status of these design variations and exceptions. The processing of other design variations for non-critical design elements will require the decision from the District Design Engineer.

Table 7-3
Summary of Design Variations and Exceptions

Design Element	Location	Details of design	Variation or Exception	Current Status
Horizontal Curve Length Horizontal Curve Length	I-95 – H1	Table 2-10	Variation	Non-critical element so the processing of this design variation will be decided by District Design Engineer
	I-95 – H2	Table 2-10	Variation	
	Commercial Blvd – H1	Table 2-12	Variation	
	Commercial Blvd – H1	Table 2-12	Variation	
Horizontal Stopping Sight Distance	I-95 – H1	Table 2-11	Exception	This will be completed during the design phase
	I-95 – H2	Table 2-11	Variation	
	I-95 – H3	Table 2-11	Exception	
	I-95 – H4	Table 2-11	Exception	
	Commercial Blvd – H1	Table 2-14	Exception	
	Commercial Blvd – H2	Table 2-14	Exception	
Vertical Alignment – K-value deficiency	I-95 – V5	Table 2-15	Variation	To be processed under the I-95 Express Phase 3 project
	I-95 – V6	Table 2-15	Variation	
	I-95 – V11	Table 2-15	Variation	
	I-95 – V13	Table 2-15	Variation	

Table 7-3 Summary of Design Variations and Exceptions				
Design Element	Location	Details of design	Variation or Exception	Current Status
Vertical Stopping Sight Distance	I-95 – V5	Table 2-16	Variation	To be processed under the I-95 Express Phase 3 project
	I-95 – V6	Table 2-16	Variation	
	I-95 – V11	Table 2-16	Variation	
	I-95 – V13	Table 2-16	Variation	
Vertical Clearance	I-95 over Prospect Road	Table 2-26	Exception	This will be completed during the design phase
	WB Commercial Boulevard over I-95 to I-95 SB	Table 2-26	Exception	
	I-95 over Commercial Boulevard	Table 2-26	Exception	
	N. Andrews Avenue over I-95	Table 2-26	Exception	
Bridge Width	I-95 over Commercial Boulevard	Table 2-24	Variation	This will be completed during the design phase

7.5 Utilities

This is a preliminary evaluation of potential utility conflicts within the project corridor based on proposed improvements under the recommended Build Alternative (See Table 7-4). Additional conflicts may be identified during final design due to proposed drainage, lighting, sound walls, signals, structural foundation (bridge, signs, gantries etc.), MOT, etc. Subsurface Utility Engineering (SUE) for verified vertical and horizontal (vvh) information on existing utilities is required to advance the utility coordination efforts. Obtaining vvh information will also help to guide the design phase to ensure that informed and intelligent decisions are made where practical to reduce potential utility relocations.

The interchange improvements along the side streets will have varying limits and the impact on the type of facility must be carefully considered. Impacts to underground facilities such as water, waste water and gas mains will typically lie within the project limits. However, telecommunication facilities (underground and aerial) may have an existing splice point required for relocation and or adjustment, beyond the project limits. Overhead electric facilities may have to extend relocation beyond the project limits as well due to sudden change in alignment or impact to an existing pole that is relied on for structural support.

Table 7-4
Utility Conflicts

Utility Agency Owner (UAO)	Utility Type	Location	Conflicts
Allied Fiber	Buried Fiber Optic Cables (BFO)	Cypress Creek Road	No impacts anticipated
American Traffic Solutions	2" and 3" Conduits	Commercial Boulevard	Conduits serving the red-light cameras at station 24+00 and 25+00 on Commercial Boulevard may be impacted by the new drainage system as part of the proposed widening along Commercial Boulevard. The existing red-light cameras may be impacted by the proposed sidewalk along Commercial Boulevard due to American Disability Act (ADA) requirements.
AT&T Distribution Florida	BT in 12-4" HDPE ducts, BT in 1-4" HDPE ducts, 1-2" copper cable, 2-1" buried fiber, 1-1" aerial fibers, 1-2" BT, BT in 5-4" duct, 1-1" BT and 1-1" fiber, 4-4" HDPE duct, BT in 10-4", 1-3" and 1-2" BT, BT in 9-4" duct	Commercial Boulevard	Manhole located on NW corner of Commercial Boulevard and Andrews Avenue may need to be raised to accommodate the final design elevation on the new side walk
	1-1" Buried cable, buried telephone (BT) in 2-3" ducts, 1-1" aerial cable, BT in 4-4" duct ,1-1" BT line, BT in 11-4" HDPE duct	Powerline Road	No impacts anticipated
	BT in 9-4" duct, aerial fiber, 3-4" HDPE duct, 9-4" HDPE duct, BT in 2-4" HDPE duct, BT in 1-1.5" HDPE Duct, BT in 2-4" HDPE duct, poles	Cypress Creek Road	A pole at approximate station 214+00 may have to be relocated due to the new sidewalk and a pole at approximate station 216+00 due to the new right turn lane to north of Andrews Avenue. The overhead telephone line may have to be relocated to new pole location. Two manholes at approximate station 242+50 and 249+80 may have to be raised to finished design elevation of new lane and edge of pavement.
	1-1" BT, 1-1" aerial, 2-4" HDPE duct, 1-2" BT, 4-4" HDPE duct, 1-1" fiber, 3-4" HDPE duct, 1-3" BT, BT in 6-4" duct, 1-4" HDPE crossing, 1-4" HDPE, 1-1" BT	N Andrews Avenue	No impacts anticipated
	AT&T buried fiber, 1-1" buried cable, BT in 9-4" HDPE ducts, BT in 12-4" HDPE ducts, BT in 9-4" HDPE ducts, BT in 1-4" HDPE ducts and 1-1" BFO, 40-4" PVC BT,	I-95	No impacts anticipated
Broward County- Water and Sewer Department	8" and 16" DI WM pipes, 12" DIP WM, 8" DIP WM, 20" DIP WM, 16" DIP WM, 12" CI Sanitary Sewer, 8" sanitary sewer, 12" CI FM	Cypress Creek Road	No impacts anticipated
	8" Ductile iron pipe (DIP) WM, 8" DIP WM, 12" DIP WM, 12" DIP WM, 8" WM, 12" DIP WM, 14" HDD pipe, 6" WM, 12" WM, 8" DIP WM, 12" DIP WM, 12" WM, 8" PVC, 8" Sanitary Sewer systems, 8" FM, 6" FM , 6" DIP FM, 8" PVC sanitary sewer system, 20" DIP FM, 12" DIP FM	N. Andrews Avenue	No impacts anticipated
	12" FM, 20" FM	I-95	No impacts anticipated
City of Fort Lauderdale	24" FM, 12" WM, 12" WM, 8" WM, 12" WM, 6" WM, 12" WM, 42" Raw WM, 16" FM, 30" WM, 8" Sanitary Sewer	Commercial Boulevard	The first twos manhole at approximate station 13+50 and 15+50 may be relocated due to the proposed curb and gutter. All the remaining manholes may need to be raised to the finished elevation of the new shoulder.
	12" WM, 6" WM, 8" WM, 6" FM, 10" Sanitary Sewer system, 8" Sanitary Sewer	Powerline Road	No impacts anticipated

Table 7-4
Utility Conflicts

Utility Agency Owner (UAO)	Utility Type	Location	Conflicts
	12" WM, 30" WM, 6" FM	Cypress Creek Road	No impacts anticipated
	30" WM, 20" WM, 16" WM	N. Andrews Avenue	No impacts anticipated
	A 54" WM, 36" WM, 30" WM, 14" HDPE WM with 16" steel casing	I-95	The 14" HDPE WM with 16" steel casing crossing may represent a potential conflict with I-95 new southbound ramp lanes.
City of Oakland Park	8" WM and 8" Sanitary Sewer system	Commercial Boulevard	The fire hydrant located at 57+50 and 61+50 may have to be relocated due to the new curb and gutter. The manholes located at approximate station 53+50 and 57+50 may need to be relocated due to the new curb and gutter. The 8" Sanitary Sewer line may be in potential conflict with the proposed traffic separator added to Frontage Street. All water and sewer valves, and water meters may have to be raised to finished design elevation of new sidewalk along Frontage Street.
	12" FM	Powerline Road	No impacts anticipated
	12" WM	Andrews Avenue	No impacts anticipated
	A 12" WM, 6" FM and an 8" Sanitary Sewer line, 2" WM, Two 8" WMs and a 4" FM, 12" WM	I-95	No impacts anticipated
City of Pompano Beach	Two 12" WM and 20" Sanitary crosses	I-95	No impacts anticipated
Comcast	Underground CATV cable	Prospect Road	No impacts anticipated
	Comcast	Commercial Boulevard	No impacts anticipated
	Aerial CATV and underground CATV	Powerline Road	No impacts anticipated
	Aerial CATV and underground CATV	Cypress Creek Road	A pole at approximate station 214+00 may have to be relocated due to the new sidewalk and a pole at approximate station 216+00 due to the new right turn lane to north of Andrews Avenue. The overhead CATV may have to be relocated to the new pole location. A pole at approximate station 241+80 may have to be relocated due to the new right turn lane to I-95 north bound. Four poles at approximate station 245+50, 247+50, 249+00 and 250+50 may have to be relocated due to the new sidewalk location. The overhead CATV line at these poles locations may have to be relocated.
	Aerial CATV and underground CATV	Andrews Avenue	No impacts anticipated
	Aerial CATV and underground CATV	I-95	No impacts anticipated
Fibernet Direct	Buried Fiber Optic Cables (BFO)	Commercial Boulevard	No impacts anticipated
	Overhead Fiber (OFO) and Buried Fiber Optic Cable (BFO)	Powerline Road	No impacts anticipated

Table 7-4
Utility Conflicts

Utility Agency Owner (UAO)	Utility Type	Location	Conflicts
	Overhead Fiber (OFO) and Buried Fiber Optic Cable (BFO)	Cypress Creek Road	No impacts anticipated
	Buried Fiber Optic Cables (BFO)	Andrews Avenue	No impacts anticipated
	Overhead Fiber (OFO) and Buried Fiber Optic Cable (BFO)	I-95	No impacts anticipated
Florida Power & Light – Distribution	13kV OE and 13kV BE	Commercial Boulevard	The pole located on the north side of Commercial Boulevard at approximate station 54+00 may need to be relocated due to the new Frontage Road.
	13kV OE	Powerline Road	These facilities will require relocation due to widening improvements along Powerline Road.
	13kV OE and 13kV BE	Cypress Creek Road	A pole at approximate station 214+00 may have to be relocated due to the new sidewalk and a pole at approximate station 216+00 due to the new right turn lane to north of Andrews Avenue. A pole at approximate station 241+80 may have to be relocated due to the new right turn lane to I-95 north bound. Four poles at approximate station 245+50, 247+50, 249+00 and 250+50 may have to be relocated due to the new sidewalk location.
	13kV OE and 13kV BE	Andrews Avenue	At the northeast and northwest corners of the intersection of Andrews Avenue and Cypress Creek Road, four guy wires may have to be relocated due to the new sidewalk.
	13kV OE and 13kV BE	I-95	No impacts anticipated
Florida Power & Light – Transmission	138kV OE	Powerline Road	These facilities will require relocation due to widening improvements along Powerline Road.
	230kV OE, 138kV OE,	I-95	No impacts anticipated
Florida Department of Transportation District 4 ITS	Fiber Optic Facilities	Near the beginning of the project	Fiber Optic Facilities may be impacted
Hotwire Communications	Buried Fiber Optic Cables (BFO)	Commercial Boulevard	No impacts anticipated
	Buried Fiber Optic Cables (BFO)	Power Road	No impacts anticipated
Level 3 Communications LLC	Buried Fiber Optic Cables (BFO)	Commercial Boulevard	No impacts anticipated
	Overhead Fiber (OFO) and Buried Fiber Optic Cable (BFO)	Cypress Creek Road	A pole at approximate station 216+00 due to the new right turn lane to north of Andrews Avenue. The overhead fiber may have to be relocated to the new pole location. A pole at approximate station 241+80 may have to be relocated due to the new right turn lane to I-95 north bound. Four poles at approximate station 245+50, 247+50, 249+00 and 250+50 may have to be relocated due to the new sidewalk location. The overhead fiber at these pole locations may have to be relocated.
	Underground Fiber and Aerial Fiber Optic Cable	Andrews Avenue	No impacts anticipated

Table 7-4
Utility Conflicts

Utility Agency Owner (UAO)	Utility Type	Location	Conflicts
	3-1.25" HDPE Conduits and an Overhead Fiber Optic	I-95	No impacts anticipated
MCI (Verizon)	Fiber Optic Cables	Commercial Boulevard	No impacts anticipated
	Fiber Optic Cables	Cypress Creek Road	No impacts anticipated
	Fiber Optic Cables	Andrews Avenue	No impacts anticipated
Teco Peoples Gas	8" Gas Main and 6" Gas Main	Commercial Boulevard	No impacts anticipated
	8" Gas Main	Powerline Road	No impacts anticipated
	4" Gas Main	Cypress Creek Road	No impacts anticipated
	4" Gas Main	Andrews Avenue	No impacts anticipated
	10" Casting with 6" Gas Main	I-95	No impacts anticipated

7.6 Transportation Management Plan (MOT)

Proper traffic control will be critical in order to minimize impacts to the community and construction cost. Care should be taken to ensure the safety and mobility of both vehicular and pedestrian traffic and impacts to transit, and businesses should be minimized. As part of this PD&E Study, a preliminary traffic control plan was developed for the construction of the proposed improvements under the Recommended Build Alternative. Due to the high traffic volume along Commercial Boulevard, Powerline Road, Cypress Creek Road, Andrews Avenue, and I-95 and interchange ramps, the existing number of travel lanes should be maintained during each construction phase. However, temporary lane closures along with potential detour routes may be required in some locations such as overhead construction over existing roadways and should be limited to off-peak hours. The preliminary temporary traffic control plan can be accomplished in the four phases as follows and can be seen in Figure 7-30 and Figure 7-31.

PHASE 1

Cypress Creek Boulevard Interchange Area – Phase 1 of the construction sequence would include the widening of Cypress Creek Boulevard to provide 7 ft. bike lanes, the addition of a second right turn lane for eastbound to southbound traffic, and intersection improvements at Andrews Avenue. This widening can be accommodated by reducing the existing travel lanes from 12-ft to 10-ft in both directions. This will enable the use of a staked Type K Temporary Concrete Barrier System with the minimum travel lane offset (1 ft.) and minimum deflection space (1 ft.) needed to meet the drop-off protection requirements for the outside work zone per FDOT's Standard Index 600 and 414.

This sequence also includes the addition of bike lanes along N. Andrews Avenue (south leg of the intersection) and the reconstruction of the roadway approach to accommodate replacement of the N. Andrews Avenue bridge over I-95 which is also included in this phase. To accommodate this widening and reconstruction, N. Andrews Avenue will be reduced to two lanes in each direction to provide work zones that meets the required barrier, offset and barrier deflection widths as defined in Standard Index 600 and 414. A lane closure analysis will need to be performed to determine the feasibility of a lane reduction. The construction sequence for the replacement of the N. Andrews Avenue bridge is illustrated in the following figures and is as follows:

- Sequence 1A (Figure 7-20) – Shift the existing lanes of traffic to the outside of the bridge and place Type "K" Temporary Barrier walls to create a work zone to construct the center section of the bridge.

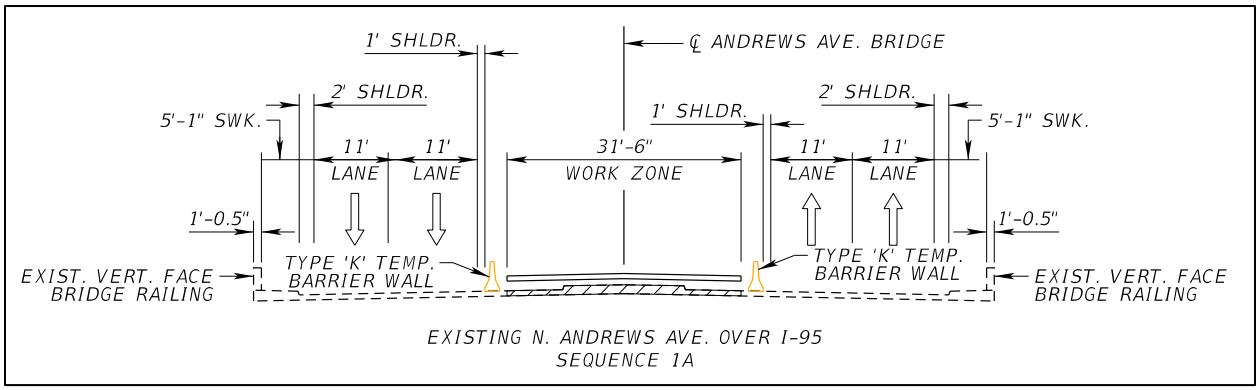


Figure 7-20 Traffic Control Plan at N. Andrews Avenue Bridge – Sequence 1A

- Sequence 1B (Figure 7-21) – Shift the two northbound lanes to the completed center portion of the bridge and maintain the two temporary southbound lanes to construct the outside section (north side) of the bridge.

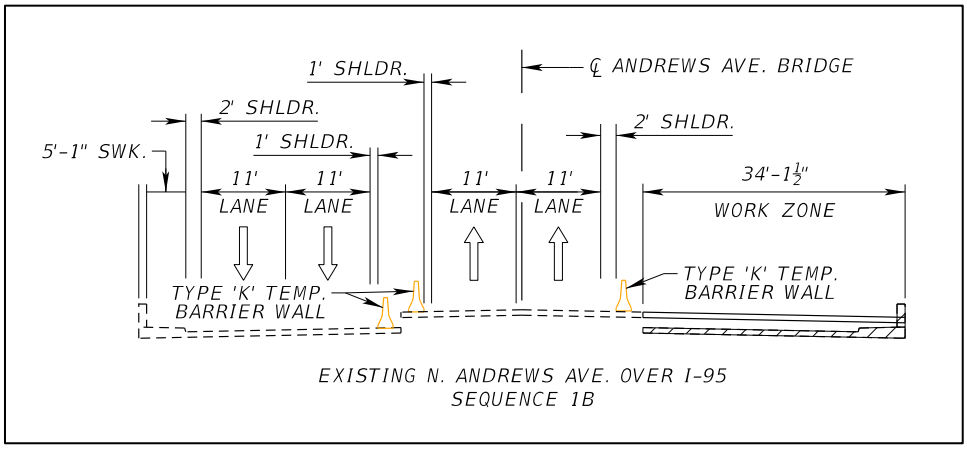


Figure 7-21 Traffic Control Plan at N. Andrews Avenue Bridge – Sequence 1B

- Sequence 1C (Figure 7-22) – Shift both the northbound and southbound lanes to the newly constructed sections of the bridge to create a work zone to complete the remainder of the bridge construction on the south side.

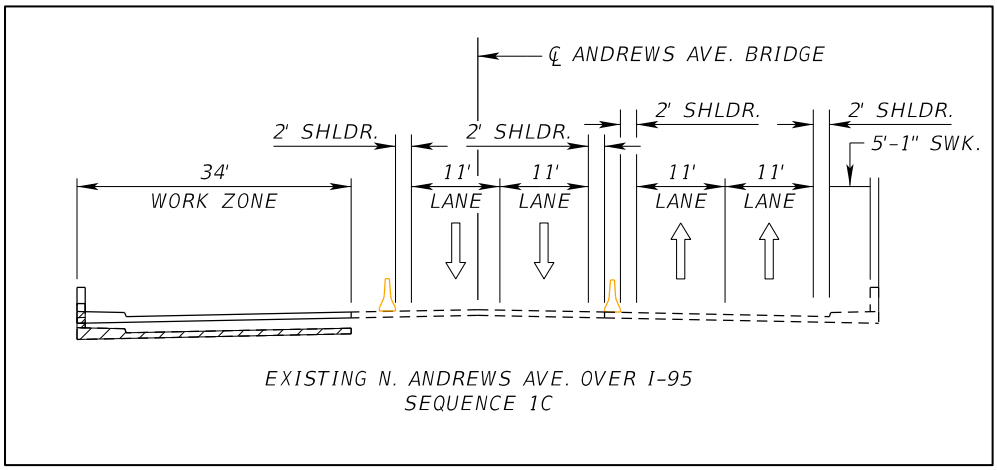


Figure 7-22 Traffic Control Plan at N. Andrews Avenue Bridge – Sequence 1C

Commercial Boulevard Interchange Area – Phase 1 of the construction sequence for this area would include the improvements to Commercial Boulevard including widening to provide bike lanes from NW 12th Avenue to Andrews Avenue, an additional westbound lane from the I-95 southbound off-ramp terminal to NW 10th Terrace, and intersection improvements (turn lanes) at Powerline Road and at Andrews Avenue. Similar to Cypress Creek Road, the outside widening for bike lanes and turn lane improvements can be accommodated by narrowing the existing travel lanes from 12-ft to 10-ft in both directions. This will enable the use of a staked Type K Temporary Concrete Barrier System with the minimum travel lane offset (1-ft) and minimum deflection space (1-ft) needed to meet the drop-off protection requirements for the outside work zone. Improvements along Powerline Road and Andrews Avenue, including addition of bike lanes, will

also be included as part of phase 1 and will require reducing the number of travel lanes along Powerline Road to two lanes in each direction and reducing Andrews Avenue to one lane in each direction to meet the work zone standard requirements. A lane closure analysis will need to be performed to determine whether a lane reduction can be used to accommodate the construction improvements.

PHASE 2

Phase 2 will consist of the construction of the southbound CD road including the on-ramps from the Park and Ride facility and Andrews Avenue. The CD road construction will also include the overpass bridge at Commercial Boulevard and the reconstruction of the two-lane on-ramp to I-95 that merges with the westbound to southbound flyover from Commercial Boulevard. The existing I-95 on-ramp from Andrews Avenue will be maintained and then traffic will be shifted to the new CD road configuration upon completion of the construction.

PHASE 3

Cypress Creek Boulevard Interchange Area – Phase 3 of the construction sequence will include the Cypress Creek Boulevard northbound on-ramp and off-ramps to and from I-95. The existing eastbound and westbound NB on-ramp movements will be maintained during construction and shifted over to the final configuration upon completion. For the northbound off-ramps from I-95 to Cypress Creek Road, the ramp for the eastbound traffic will be constructed first, maintaining the existing movement, and provide a temporary loop ramp on the northeast quadrant of the interchange from the existing off-ramp for westbound traffic to Cypress Creek Road. This temporary loop ramp will be provided for the westbound traffic during the construction of the new northbound to westbound loop ramp to Cypress Creek Road. Additionally, new traffic signals will be constructed at the ramp terminals.

Commercial Boulevard Interchange Area – Phase 3 for the Commercial Boulevard Interchange Area will include the construction of the two additional right turn lanes on the northbound off-ramp and one additional righ turn at the southbound off-ramps from I-95 to Commercial Boulevard, including the new traffic signals at the ramp terminals. Traffic will be maintained for the existing movements during the widening of these ramps.

PHASE 4

Phase 4 of construction will consist of the reconstruction of Commercial Boulevard, including the frontage road, from N. Andrews Avenue to just east of NE 4 Avenue. The connection of the west end of the frontage road north to NW 51 Street will be constructed first. This is necessary since the frontage road is being converted from a two-way street to one-way westbound and will provide egress from the frontage road to NW 51st Street. Once this connection is complete the reconstruction of Commercial Boulevard can proceed and be accommodated in 6 sequences while maintaining the existing traffic as shown in Figure 7-23 through Figure 7-28. The construction of the new bridge over N. Andrews Avenue will need to be completed during sequence 4B before westbound traffic can be shifted to the grade separation as depicted in Sequence 4C. Also, temporary closures of Andrews Avenue will be required to accommodate this overhead construction, such as placement of beams, and should be limited to off-peak hours.

In sequence 4A (Figure 7-23), relocation of the curb and gutter will take place as well as reconstruction of the driveways to the adjacent properties.

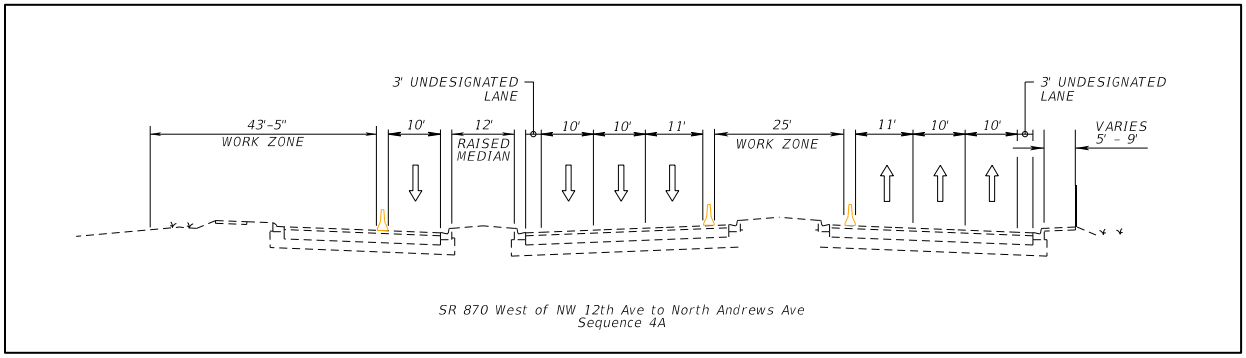


Figure 7-23 Traffic Control Plan for Commercial Boulevard – Sequence 4A

Sequence 4B (Figure 7-24) will be comprised of the construction of the grade separation, including the new bridge over Andrews Avenue, for the westbound to southbound I-95 traffic and the placement of temporary pavement to accommodate lane shifts to maintain existing traffic in the following sequences.

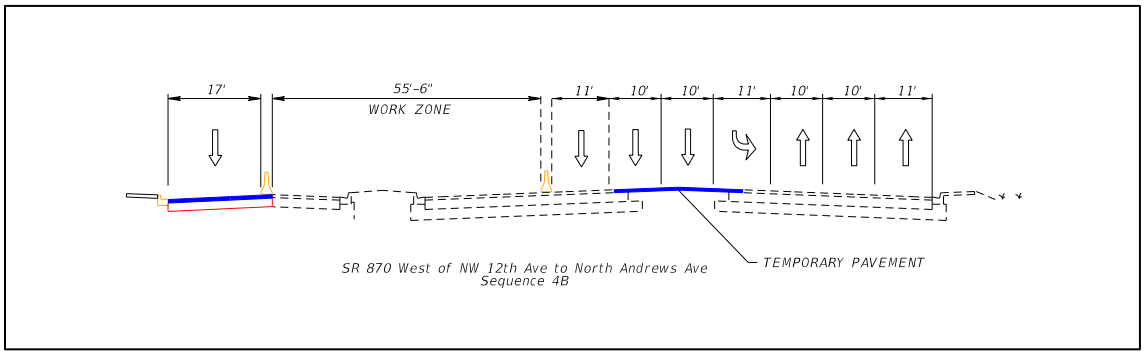


Figure 7-24 Traffic Control Plan for Commercial Boulevard – Sequence 4B

Sequences 4C through 4F will consist of work zones to complete the remainder of the at-grade section along Commercial Boulevard and can be seen in the Figure 7-25 through Figure 7-28.

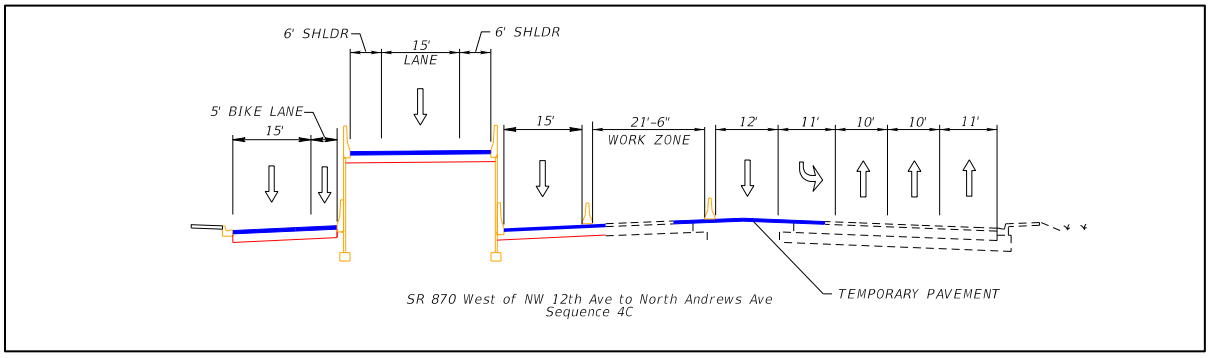


Figure 7-25 Traffic Control Plan for Commercial Boulevard – Sequence 4C

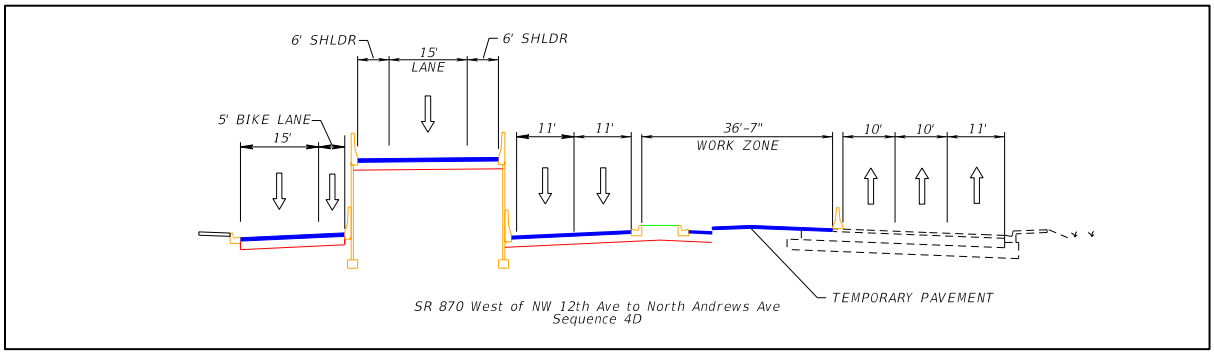


Figure 7-26 Traffic Control Plan for Commercial Boulevard – Sequence 4D

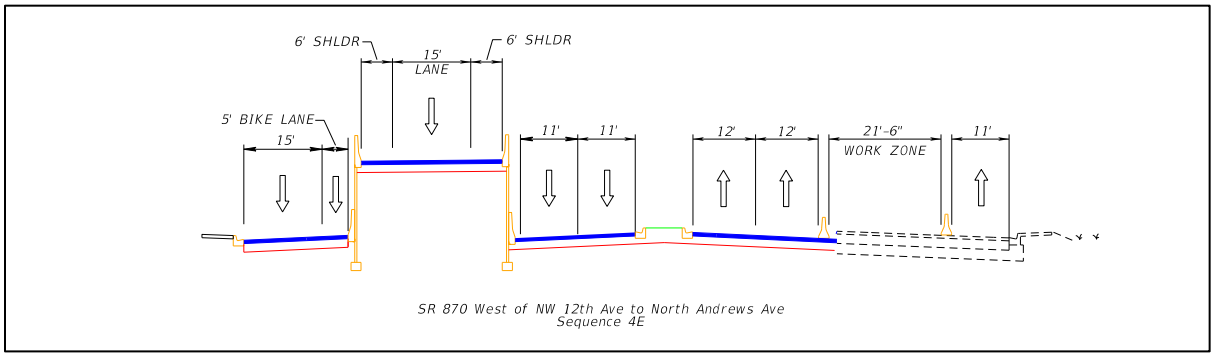


Figure 7-27 Traffic Control Plan for Commercial Boulevard – Sequence 4E

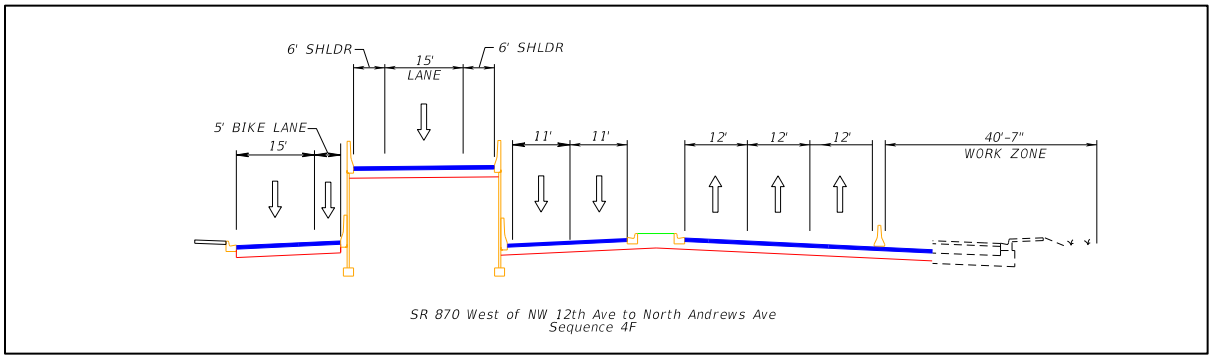


Figure 7-28 Traffic Control Plan for Commercial Boulevard – Sequence 4F

The new on-ramps to the existing westbound to southbound I-95 flyover from the grade separation and from the at-grade connection west of Andrews Avenue will also be constructed during this phase. Widening of the first three spans of the existing WB-SB flyover structure will also need to be accomplished during this phase to accommodate the two new lane connections. Traffic on the flyover can be maintained during construction as depicted in Figure 7-29.

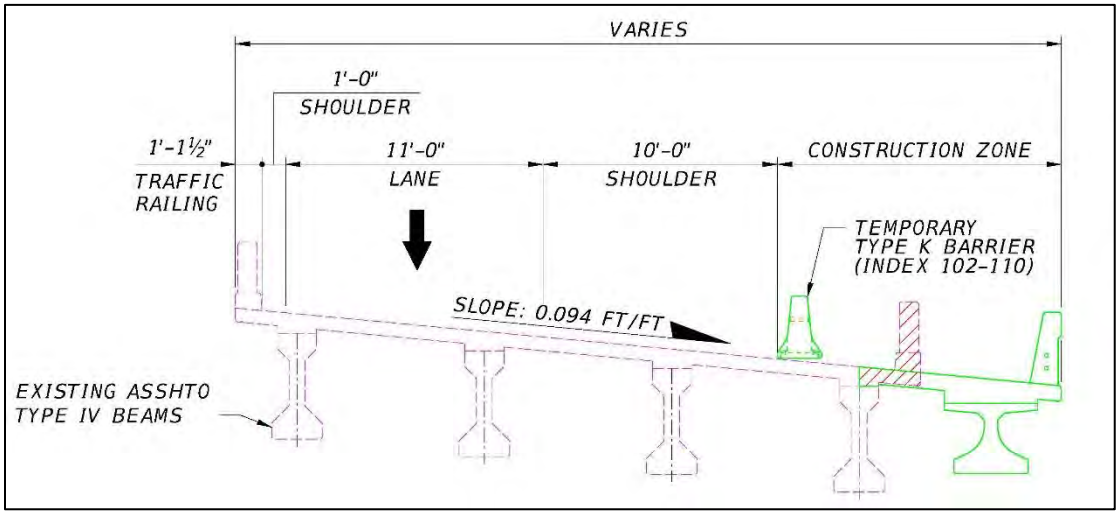


Figure 7-29 Traffic Control Plan for WB Commercial Boulevard to SB I-95 Flyover Ramp

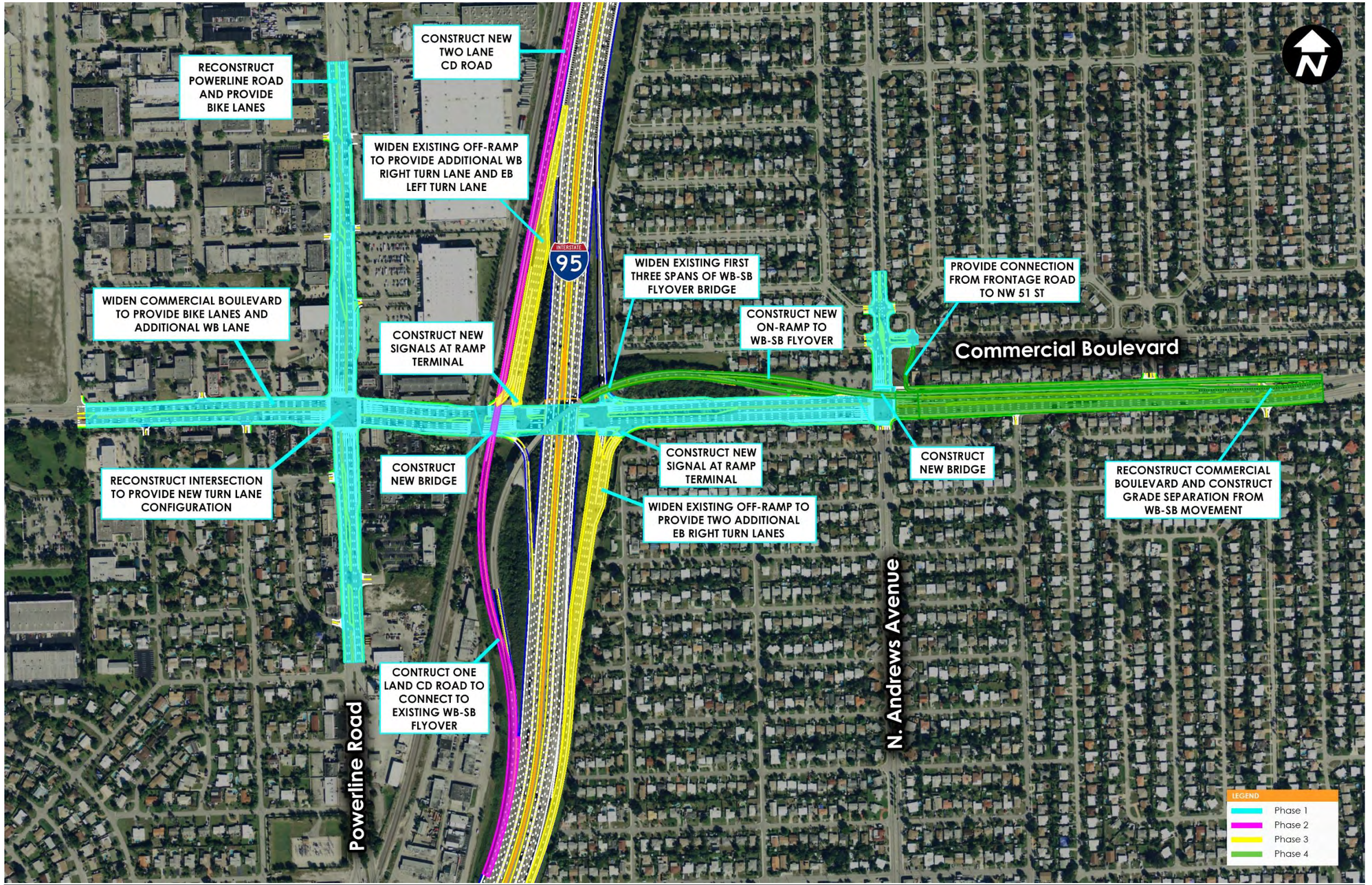


Figure 7-30 Traffic Control Plan for Commercial Boulevard Interchange Area



Figure 7-31 Traffic Control Plan for Cypress Creek Road Interchange Area

7.7 Preliminary Drainage Analysis

The project area was divided into four drainage systems. These systems include C13-SCOM, C13-NCOM, C14-SCYP and C14-NCYP. Runoff from Systems C13-SCOM and C13-NCOM moves southwardly and ultimately discharges into the C13 Canal. Runoff from Systems C14-SCYP and C14-NCYP moves towards the north and ultimately discharges into the C14 Canal. The approach that was used to meet water quality requirements is to provide treatment for the increase in impervious area and to restore or replace existing permitted treatment facilities that will be impacted by this project.

Water quality requirements for Systems C13-SCOM and C13-NCOM were met by accounting for the existing surplus capacity (2.43 ac-ft.) that is available in the interconnected treatment areas (swales and ponds) just south of the project area. Runoff from Systems C13-SCOM and C13-NCOM will enter these treatment areas before discharging into the C13-Canal.

The approach to meet water quality requirements for System C14-SCYP is to account for the existing surplus capacity that is available in System C14-NCYP. In addition, the control structures for various interconnected dry detention ponds in System C14-NCYP will be raised 2 inches. Using this approach, 6.23 ac-ft. of treatment volume will be provided and will be sufficient to accommodate the proposed roadway improvements within System C14-SCYP. Water quality requirements for System C14-NCYP will be met by treating the additional runoff using treatment areas in this system with existing surplus capacity. Based on information obtained from SFWMD Permit 06-01465-S, it was determined that the treatments areas in System C14-NCYP have an existing surplus capacity of 3.60 ac-ft. which is sufficient to accommodate the proposed roadway improvements, under the preferred alternative.

Based on preliminary calculations, the stormwater management systems proposed by this study meet existing water quality standards as set forth in Chapter 62-302 of the Florida Administrative Code. Additionally, the total treatment provided exceeds the total treatment required. No offsite ponds or right of way acquisition are needed to meet current permitting requirements. See Table 7-5 for the water treatment summary. For additional information, the Drainage Report is on file at FDOT District Four.

Table 7-5
Water Treatment Summary

Receiving Waterbody	Recommended Build Alternative 1A-6		
	RT[1] (ac-ft.)	PT[2] (ac-ft.)	TB[3] (ac-ft.)
C13 Canal	1.36	2.05	0.69
C14 Canal	1.81	2.73	0.92

[1]RT = Required treatment, total treatment required to accommodate the proposed improvements. It includes the sum of the treatment volume needed for the increase in imperious area and encroachment volume into permitted treatment areas.

[2]PT = Provided Treatment, treatment volume to be provided including both existing surplus and proposed new treatment volumes.

[3]TB = Treatment Balance = PT (Provided Treatment) – RT (Required treatment)

7.8 Environmental Analysis

Summarized below are the results of the environmental analysis conducted as part of this PD&E Study and documented in detail in the Type 2 Categorical Exclusion (CE) Report. The purpose of this analysis was to determine the effects associated with the recommended Build Alternative 1A-6 being considered for this project. This analysis was conducted using the information obtained from detailed studies of the Social & Economic, Cultural, Natural and Physical environments conducted for this project; as well as comments made by the various Environmental Technical Advisory Team (ETAT) members through the Efficient Transportation Decision Making (ETDM) Environmental Screening Tool (EST). The ETDM Programming Screen Summary Report (#14222) was published on February 4, 2016. The Type 2 CE Report is on file at the District Four Planning and Environmental Management Office (PLEMO).

7.8.1 SOCIAL AND ECONOMIC

7.8.1.1 Social

This project was reviewed by the ETAT through the ETDM EST, and the Federal Highway Administration (FHWA) and FDOT District Four assigned a Degree of Effect (DOE) of Minimal for Social impacts, as access to residences and businesses may be temporarily affected during construction, and some right of way acquisition (ROW) is required for improvements. The U.S. Environmental Protection Agency (USEPA) assigned a Degree of Effect of None. A review of the potential impacts to demographics, community cohesion, safety and community goals, and quality of life issues was conducted.

Overall, there are no major social issues associated with the recommended Build Alternative 1A-6. The proposed project will improve safety, improve connectivity to communities, and provide enhanced mobility of goods and improve access to businesses in the area. This project is expected to have a positive effect on the area by improving traffic operations and enhance connectivity and accessibility to major arterials.

No minority or low-income populations have been identified that would be adversely impacted by the proposed project, as determined above. Therefore, in accordance with the provisions of Executive Order 12898 and FHWA Order 6640.23a, no further Environmental Justice analysis is required.

7.8.1.2 Economic

This project has been reviewed by the appropriate agencies in the ETDM Tool and has been assigned a Summary Degree of Effect of Substantial. The project was assigned a Substantial Degree of Effect by the Florida Department of Economic Opportunity, Minimal by FHWA, and Enhanced by FDOT District Four. The project supports the land use vision according to the Broward County Comprehensive Plan. The recommended Build Alternative does not eliminate existing pedestrian features along the arterial roadway and enhances connectivity concerns by providing bicycle lanes and operational improvements. The population of Broward County is expected to grow from 1,935,878 in 2017 to approximately 2,000,000 in 2025 (US Census Bureau and Greater Fort Lauderdale Alliance). Population growth will result in more concentrations and new housing developments thereby demanding increased surface transportation. Based on the 2014 data from Broward County, median household income in the project area is estimated to be $50,664 with approximately 22 percent of the population below the poverty level compared to the Broward County median income of $52,954.

The project area's character is not anticipated to have major impacts as a result of this project. The proposed improvements to I-95 and the addition of the CD road system will enhance the mobility of goods by alleviating current and future congestion at the SR 870/Commercial Boulevard and Cypress Creek Road interchanges and on the surrounding freight network. Reduced congestion will serve to maintain and improve access to the major transportation

facilities and businesses in the area (including connectors to freight activity centers/local distribution facilities or between the regional freight corridors). The proposed project is compatible with local growth management policies and adopted land use plans. The proposed construction of the CD road system, the flyover and frontage road improvements at Commercial Boulevard will not impact existing or future land use. This project will not have any adverse effects on the tax base of Broward County and the other adjacent municipalities. The enhanced mobility has the potential to support increased vehicular traffic for the Uptown Urban Village Project and other future development areas west of I-95.

7.8.1.3 Land Use Changes

This project has been reviewed by the appropriate agencies in the ETDM EST and has been assigned a Summary Degree of Effect (DOE) of Substantial. A DOE of Minimal was assigned by the Federal Highway Administration (FHWA), and a DOE of Substantial was assigned by the Florida Department of Economic Opportunity (FDEO). FDEO listed concerns regarding elimination of pedestrian access to the Park and Ride Lot across N. Andrews Avenue and severing of vehicle access to N. Andrews Way, due to a braided ramp proposed on N. Andrews Avenue. Based on the recommended Build Alternative 1A-6, the braided ramp alternative has been eliminated, and current access will remain.

The proposed improvements aim to achieve an acceptable level of service by accommodating future travel demands. The Recommended Alternative is anticipated to have minimal effect on the land use within the area, as it is located in the Fort Lauderdale Uptown District, the second largest commercial district in Broward County. The character of the area will remain unchanged and will continue to support the existing and future land uses.

7.8.1.4 Mobility

This project has been reviewed by the appropriate agencies in the ETDM Tool and has been assigned a DOE of Enhance by FHWA. I-95 is an existing limited access facility and Commercial Boulevard and Cypress Creek Road are existing full interchanges. The proposed interchange improvements will reduce congestion and improve local and regional mobility. Physical barriers are not proposed for the project. The project is not anticipated to have effects on community cohesion, create isolated areas, disrupt social relationships and patterns, or affect connectivity to community activity centers.

Overall, the improvements proposed as part of this project will complement the I-95 Express Lanes improvements with the addition of auxiliary lanes in both the northbound and southbound directions. The auxiliary lanes will improve traffic operations and will help commuters weave safely between the general-purpose lanes and ramps. Capacity improvements along the I-95 project corridor will enhance the mobility of goods by alleviating current and future congestion along the corridor and on the surrounding freight and transit networks. Reduced congestion will serve to maintain and improve viable access to the major transportation facilities and businesses of the area.

Cypress Creek Road also serves as an important intermodal route providing access to the Cypress Creek Park and Ride which includes a Tri-Rail Station, Tri-Rail shuttles, and bus service. In addition, bicyclists will benefit from the proposed project due to the addition of bicycle lanes along Powerline Road, Commercial Boulevard and Cypress Creek Road.

I-95, Commercial Boulevard, and Cypress Creek Road all serve as part of the emergency evacuation routes and play an important role in facilitating traffic during an evacuation. The proposed project is anticipated to enhance capacity and traffic circulation, thereby enhancing mobility.

7.8.1.5 Aesthetics

This project has been reviewed by the appropriate agencies using the ETDM EST and has been assigned a summary degree effect of minimal by FDOT District Four. Due to the urbanized nature of the corridor, improvements are unlikely to impact the aesthetics of the environment. During project development, public outreach was conducted by FDOT District Four in coordination with the Broward MPO and local municipalities to solicit opinions on preferences related to design elements.

It is not expected that improvements to the facility could result in major aesthetic impacts. Minor aesthetic impacts are a concern to the City of Oakland Park with the proposed bridge across N. Andrews Avenue to accommodate Commercial Boulevard westbound traffic to the existing I-95 westbound to southbound flyover on-ramp. As a result of this concern, a commitment has been included for the Design Phase to further analyze the proposed bridge across N. Andrews Avenue to address design questions posed by the public and to conduct additional outreach during design related to this concept. The Design Phase will continue public outreach with the City of Oakland Park pertaining to this concern.

Noise and vibration related effects may be of concern to residents since the project traverses residential areas. However, due to existing noise barriers and consistency with future land use plans, impacts are anticipated to be minor. Highway landscaping is viewed by both motorists and citizens along the corridor. Landscaping will be impacted on Commercial Boulevard and on Cypress Creek Road. During final design, coordination with the Cities of Oakland Park and Fort Lauderdale should occur to determine if they desire landscaping relocations.

Additionally, this project has no involvement with scenic highways.

7.8.1.6 Relocation Potential

Through the ETDM Environmental Screening EST, the summary DOE assigned to relocation was moderate. FHWA made the following summary comment: no relocations are expected, but right of way acquisitions from some commercial and residential properties.

A Conceptual Stage Relocation Plan (CSRP) was prepared for the project and is on file with FDOT District Four PLEMO. There are no residential household displacements, however the recommended Build Alternative proposes three business relocations (Shell Gas Station, 890 West Commercial Boulevard; Chevron Gas Station, 4999 NW 9 Avenue; Dunkin Donuts 1070 West Commercial Boulevard) and 11 sign relocations. As a result of the business displacements, the greatest effect to the community will likely be the acquisitions of the Shell and Chevron gas stations. Since there are at least four gas stations in the general area, the community will not greatly be affected. Substantial controversy was not identified during the public outreach activities conducted during the study.

In order to minimize the unavoidable effects of right of way acquisition and displacement of people, FDOT will carry out a Right of Way and Relocation Program in accordance with Florida Statute 339.09 and the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646 as amended by Public Law 100-17). FDOT provides advance notification of impending right of way acquisition. Before acquiring right of way, all properties are appraised on the basis of comparable sales and land use values in the area. Owners of property to be acquired will be offered and paid fair market value for their property rights. Relocation advisory services and resources are available to the resident and business to be relocated without discrimination.

7.8.1.7 Farmlands

Natural Resources Conservation Service (NRCS) and FHWA assigned a DOE of none for Farmlands through the ETDM EST. The project is within the Miami Urbanized Area. According to Part 2, Chapter 6, Farmland, Section 6.2.1 of FDOT's PD&E Manual (June 14, 2017), transportation projects within urbanized areas with no adjacent present or future agricultural lands are excluded from coordination with the NRCS.

This project has no involvement with Farmlands and is not subject to the provisions of the Farmland Protection Policy Act of 1981.

7.8.2 CULTURAL

7.8.2.1 Section 4(f)

An evaluation was conducted pursuant to 23 CFR 774, Parks, Recreation Areas, Wildlife and Waterfowl Refuges and Historic Sites.

Through the ETDM EST, a summary DOE of minimal was assigned for Section 4(f). Two Section 4(f) resources were identified in proximity to the project area. Table 7-6 lists the identified potential resources.

Table 7-6
List of Potential Section 4(f) Resources I-95

Parcel Number	Resource Name	Location	Distance to Project Area	Owner/ Official with Jurisdiction	Size (Acres)	Access Change	Facility	Approval Option
494215054870	North Andrews Gardens Neighborhood Park	500 NW 56 Street	60 Feet east of I-95	City of Oakland Park	1.80	No	Neighborhood Park/Play-ground	No Use
494215022212	North Andrews Gardens Volunteer Park	518 NW 48 Court	75 Feet east of I-95	City of Oakland Park	0.33	No	Neighborhood Park/Walking Path	No Use

A Section 4(f) Determination of Applicability (DOA) for the project area was completed in accordance with FDOT PD&E Manual Part 2, Chapter 7, Section 4(f) Resources (June 14, 2017), and is on file at FDOT District Four PLEMO. The purpose of this Section 4(f) DOA is to apply Section 4(f) criteria to determine the applicability of the two identified resources located in proximity to the I-95 project area and proposed improvements. Although Section 4(f) is applicable to both parks, the project will not entail a "use" of either property. In concurrence with this finding, No Use Determination forms were signed by FDOT OEM on January 8, 2018.

7.8.2.2 Historic Districts/Sites

Through ETDM EST, a moderate DOE was assigned by the Florida Department of State (FDOS), and a minimal DOE was assigned by FHWA for Historic Sites. FDOS commented that the area around Cypress Creek adjacent to I-95 has a high potential for unrecorded archaeological sites. The potential for direct impacts to resources within I-95 right of way is minimal. Potential impact risks are higher in areas where new right of way is being acquired. FHWA commented that a Cultural Resource Assessment Survey (CRAS) is necessary in accordance with Part 2, Chapter 8, Archaeological and Historical Resources (June 14, 2017) of FDOT's PD&E Manual.

In accordance with the procedures contained in 36 CFR Part 800, a CRAS, including background research and a field survey coordinated with the State Historic Preservation Officer (SHPO), was performed for the project, and is on file at FDOT District Four PLEMO. The CRAS was conducted in support of the recommended Build alternative. The objective was to locate, identify, and bound any historic and archaeological structures and potential districts within the project's Area of Potential Effect (APE) and assess their potential for listing in the NRHP. The CRAS identified 173 total historic resources within the APE, including one historic railway and 172 historic buildings. The Seaboard Air Line (CSX) Railroad (8BD4649) was previously documented in several previous surveys throughout Broward County, but it had not been documented within the current APE at the intersections of Cypress Creek Road, Commercial Boulevard, and Powerline Road. The 172 historic buildings document are all newly recorded. Of all 173 sites, only the Seaboard Air Line (CSX) Railroad (8BD4649) is considered eligible for listing in the NRHP, while the other sites are considered individually ineligible for inclusion in the NRHP.

On April 25, 2018 FDOT submitted a letter to the SHPO to address project related effects relative to resource 8BD4649, Seaboard Air Line (CSX) Railroad, which is eligible for inclusion in the NRHP. The improvements recommended within Commercial Boulevard and Cypress Creek Road will only impact the westbound rail signals and will require additional pavement across the tracks. The rail signals are modern features, and the tracks ties and bed will not be touched. These improvements are common improvements at rail crossings and will not compromise any characteristics or features that contribute to the Railroad's significance. No further work is recommended. Therefore, these improvements will not adversely affect the significant historic linear resource, and no physical changes will be made to the historic materials that make up the Railroad. The SHPO reviewed the CRAS, and provided concurrence with the findings of the CRAS, on May 18, 2018.

7.8.2.3 Archeological Sites

Through the ETDM EST review process, FDOS noted that a previous CRAS was prepared for the 2013 I-95 express project, but an additional study may be required for areas not adequately addressed and where new right of way would be required. FDOS also noted the area around Cypress Creek as high potential for unrecorded archaeological sites. The potential for direct impacts to resources within the right of way on I-95 is minimal; areas where new right of way is being required have a high potential for impacts.

No previously recorded or newly recorded archaeological sites were identified within the archaeological APE. Background research and a pedestrian survey indicated that there is a low probability of finding intact archaeological sites within the archaeological APE. Subsurface archaeological testing was not feasible within most of the archaeological APE due to the existence of pavement, sidewalks, berms, buried utilities, landscaping, and residential and commercial frontage.

7.8.2.4 Recreation Sites

Through the ETDM EST, a minimal DOA was assigned by FHWA and SFWMD. A DOE of none was assigned by the United State Environmental Protection Agency (EPA) and the Florida Department of Environmental Protection (FDEP), and no involvement was assigned by the National Park Service.

Two recreational resources were identified within the study area, North Andrews Gardens Volunteer Park and North Andrews Gardens Neighborhood Park. No impacts to either park property is proposed. These sites have been evaluated through a Section 4(f) DOA and these resources are not anticipated to be directly impacted by the project. A determination of No Use was issued by FDOT OEM on January 8, 2018.

7.8.3 NATURAL

7.8.3.1 Wetland and Other Surface Waters

Through the ETDM EST, a DOE of none was assigned by the National Marine Fisheries Service (NMFS), and a minimal DOE was assigned by EPA, FDEP, United States Army Corps of Engineers (USACE), United States Fish and Wildlife Service (USFWS), SFWMD, FHWA. The EST review process identified wetlands and surface waters, including natural wetlands and stormwater management/drainage features, within a 200-foot buffer. Because the project area is largely developed, paved and landscaped, impacts will be minimal.

The wetland evaluation, included in the Natural Resources Evaluation (NRE), was completed in accordance with FDOT's PD&E Manual, Part 2, Chapter 9, Wetlands and Other Surface Waters (June 14, 2017) and conducted pursuant to the Presidential Executive Order (EO) 11990 of 1997 as amended, Protection of Wetlands and the USDOT order 5660.1A, Preservation of the Nation's Wetlands. The evaluation identifies and describes existing wetlands and surface waters within and adjacent to the project limits, assesses potential impacts and evaluates avoidance, minimization, and potential mitigation options. The NRE, is on file at FDOT District Four PLEMO.

In accordance with EO 11990, the project has been evaluated to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. The recommended Build Alternative meets the purpose and need of the project while minimizing environmental impacts. Additional measures including staging restrictions, proper erosion control measures and Best Management Practices (BMPs) will be evaluated during the design phase and implemented during construction to further minimize wetland impacts. Based on the recommended Build Alternative the proposed project will have no significant short-term or long-term adverse impacts to wetlands.

7.8.3.2 Aquatic Preserves and Outstanding Florida Waters

This project has no involvement with Aquatic Preserves or Outstanding Florida Waters.

7.8.3.3 Water Quality and Quantity

During the ETDM EST review process, FHWA, EPA, SFWMD and FDEP assigned a DOE of minimal. FHWA and EPA stated that the project will increase impervious surfaces which will increase runoff with contamination. FDEP also commented on the increase in impervious surfaces, as well as a potential alteration of existing surface water hydrology and natural drainage patterns, and a reduction in flood attenuation capacity of area canals, ditches, and sloughs. They stated that every effort should be made to maximize the treatment of stormwater runoff from the proposed improvements to prevent ground and surface water contamination. The SFWMD stated that the project will require an Environmental Resource Permit (ERP), and there is potential to modify one or more of the following existing permits: I-95 (06-1465-S) and Cypress Creek Park and Ride Area (06-00257-S/88-00050-S).

The project area lies within the jurisdiction of SFWMD, specifically within the Coral Reef and North Fork Middle River watersheds. SFWMD requires that all projects meet State water quality and quantity criteria as set forth in Chapter 62-302, Florida Administrative Code (FAC). A review of previous drainage plans, and existing permit information, shows that runoff is being collected and treated by various dry and wet retention ponds. Excess runoff is conveyed to nearby canals via roadside swales, pipes, and culverts. Surface runoff discharges into either the C-13 or C-14 Canal. The approach to meet water quality requirements is to provide treatment for the increase in impervious area and restore or replace existing permitted treatment facilities impacted by the project. A preliminary analysis of drainage requirements indicates that existing surplus capacities are sufficient enough to accommodate proposed roadway improvements under the recommended Build Alternative.

Project limits lie within the boundaries of the Biscayne Sole Source Aquifer, the principal drinking water source for the area. In accordance with the Sole Source Aquifer Program, authorized by Section 1424(e) of the Safe Drinking Water Act of 1974, FDOT requested concurrence from the EPA regarding potential impacts to the Biscayne Aquifer. On March 6, 2018, the EPA concurred that the project is not expected to cause significant impacts to the aquifer system as long as proper protection measures were followed.

In accordance with Section 403.0885, F.S., a National Pollutant Discharge Elimination System (NPDES) stormwater permit will be acquired prior to constuction. Water quality impacts resulting from erosion and sedimentation during construction activities will be controlled in accordance with the NPDES permit, including the preparation of a Stormwater Pollution Prevention Plan; the latest edition of FDOT's Standard Specification for Road and Bridge Construction; and the Best BMPs including temporary erosion features during construction. FDOT will continue to coordinate water quality and quantity impacts and stormwater management with the appropriate regulatory agencies as required throughout the design and permitting phases of the project, as well as during and after construction.

A Water Quality Impact Evaluation (WQIE) was completed for the project in accordance with FDOT PD&E Manual Part 2, Chapter 11, Water Quality and Quantity (June 14, 2017). Results confirmed that the proposed stormwater facility design will include, at a minimum, the requirements for water quality impacts required by SFWMD. It is therefore anticipated that no adverse effects will occur to the water quality within the project area.

7.8.3.4 Wild and Scenic Rivers

This project has no involvement with Wild and Scenic Rivers.

7.8.3.5 Floodplains

Floodplain impacts resulting from the project were evaluated pursuant to Executive Order 11988 of 1977, Floodplain Management.

During the ETDM EST review process, FHWA and SFWMD assigned a DOE of minimal to Floodplains while the EPA assigned a DOE of none. I-95 is designated as an evacuation route along the east coast of Florida. A review of the Flood Insurance Rate Map published by Federal Emergency Management Agency (FEMA), indicates that a portion of the study area is located in Special Flood Zones AE, AH and X. Areas identified in zone AE and AH have a 1% annual chance of flooding during the Base Flood (100-year flood). Areas identified in zone X are estimated to have less than 1 foot or no flooding at all during the Base Flood. Additional details are available in the Preliminary Drainage Report, on file at the District Four PLEMO.

No adverse impacts are anticipated to the floodplain, as required by the SFWMD permitting requirements. Encroachments due to the proposed roadway improvements are being compensated within the proposed stormwater management system, mostly through the use of dry and wet-detention, and dry-retention ponds.

There is no change in flood "Risk" or adverse floodplain impacts associated with this project. The following floodplain statement is a slightly modified version of statement number 3, in Chapter 13 of the PD&E Manual, tailored for this project.

Modifications to existing drainage structures included in this project will result in an insignificant change in their capacity to carry floodwater. This change will cause minimal increases in flood heights and flood limits. These minimal increases will not result in any significant adverse impacts on the natural and beneficial floodplain values or any significant change in flood risks or damage. In addition, this project will not result in any new or increased adverse environmental impacts. There will not be a significant change in the potential for interruption or termination of emergency service or emergency evacuation routes. Therefore, it has been determined that this encroachment is not significant.

7.8.3.6 Coastal Zone Consistency

FDEP is responsible for the review of federal activities for consistency with the Coastal Zone Management Act (CZMA) and its implementing regulations, 15 CFR Part 930. FDEP facilitates coordination between the participating agencies of the Florida Coastal Management Program (FCMP). Based on comments provided by FCMP agencies, FDEP makes a determination on behalf of the State of Florida regarding the consistency of a proposed federal action. On May 21, 2015, as part of the ETDM EST review process, this project was determined to be consistent with the Coastal Zone Management Program. Therefore, as per FDOT's PD&E Manual, Part 2, Chapter 14, Coastal Zone Consistency (June 14, 2017), the State of Florida has determined that this project is consistent with the Florida Coastal Zone Management Plan.

7.8.3.7 Coastal Barrier Resources

This project is located more than three miles west of the Atlantic Ocean and Intracoastal Waterway, and is therefore not located within a Coast Barrier Resource Area.

7.8.3.8 Protected Species and Habitat

Through the ETDM EST, a DOE of minimal was assigned by FHWA, Florida Fish and Wildlife Commission (FWC) and USFWS. FWC stated no significant wildlife resources were identified in the project area. FHWA and USFWS identified Consultation Area for the Everglade snail kite and designated Rare and Imperiled Fish habitat for the mangrove rivulus within 200 feet of the project limits. However, the project is within a highly urbanized area that lacks suitable habitat for either species. USFWS and FHWA also determined that the project falls within the core foraging area (CFA) for three wood stork colonies. USFWS identified the potential for the federally listed Eastern indigo snake and federally listed plant species to occur near the project limits. As previously noted, suitable habitat in the area is lacking, and maintenance and mowing of the area significantly reduces the potential for plant species to be present.

A Protected Species and Habitat Evaluation was completed, as part of the NRE, to identify potential occurrence of any federal or state listed protected species, and habitat impacts within the proposed improvements associated with the recommended Build Alternative. The evaluation was completed in accordance with Section 7(c) of the Endangered Species Act (ESA) of 1973, as amended, FDOT's PD&E Manual, Part 2, Chapter 16, Protected Species and Habitat (June 14, 2017), and satisfies the requirement for a Biological Assessment. The Protected Species and Habitat Evaluation identified 15 federally and/or state listed species that could potentially occur within the project area.

The four federally listed and one candidate species (T = Threatened, E = Endangered, CS = Candidate) under the purview of the USFWS are: wood stork (T), Everglade snail kite (E), West Indian manatee (T), Eastern indigo snake (T) and gopher tortoise (CS). The 11 state listed species under the purview of FWC are: least tern, little blue heron, tricolored heron, snowy egret, reddish egret, white ibis, black skimmer, burrowing owl, roseate spoonbill, gopher tortoise and mangrove rivulus. Table 7-7 summarizes the names, protected status and occurrence potential of the 15-listed species.

Table 7-7
Limited Species and the Potential to Occur within the Project Area/Vicinity

Common Name	Common Name	Federal Status	State Status	Occurrence Potential
Birds				
Wood Stork	*Mycteria Americana*	T	T	Low
Everglade Snail Kite	*Rostrhamus sociabilis plumbeus*	E	E	Low

Table 7-7 Limited Species and the Potential to Occur within the Project Area/Vicinity				
Common Name	Common Name	Federal Status	State Status	Occurrence Potential
Least Tern	*Sterna antillarum*	NL	T	Low
Little Blue Heron	*Egretta caerulea*	NL	SSC	Low
Tricolored Heron	*Egretta tricolor*	NL	SSC	Low
Snowy Egret	*Egretta thula*	NL	SSC	Moderate
Reddish Egret	*Egretta rufescens*	NL	SSC	Low
White Ibis	*Eudocimus albus*	NL	SSC	Low
Black Skimmer	*Rynchops niger*	NL	SSC	Low
Burrowing Owl	*Athene cunicularia*	NL	SSC	Low
Roseate Spoonbill	*Platalea ajaja*	NL	SSC	Low
Mammals				
West Indian Manatee	*Trichechus manatus latirostris*	T	T	Low
Reptiles				
Eastern Indigo Snake	*Drymarchon corais couperi*	T	T	Low
Gopher Tortoise	*Gopherus polyphemus*	CS	T	Low
Fish				
Mangrove Rivulus	*Rivulus marmoratus*	NL	SSC	Low

Legend: E = Endangered; T = Threatened; SSC = Species of Special Concern; CS = Candidate Species; NL = Not Listed

Field surveys conducted on November 8, 2016 and September 5, 2017, found no evidence of the occurrence of any of the listed species. Due to the limited suitable habitat within the highly developed project area, no direct, indirect, or cumulative impacts are anticipated as a result of the project. Although the project is within the CFA of three wood stork colonies, there are no proposed impacts to the one natural wetland, and proposed impacts to roadside swales is limited to 0.07 acres. Therefore, the effect determination for the wood stork is "May Affect, Not Likely to Adversely Affect". An effect determination of "May Affect, Not Likely to Adversely Affect" for the Eastern indigo snake was applied per the programmatic effect determination key. The project is not located in open water or salt marsh, and all required permits for this project will be conditioned for use of the USFWS's most current guidance for Standard Protection Measures for the Eastern Indigo Snake during site preparation and project construction (included in USACE permit No. SAJ-2014-01584). Although no manatees were observed during wildlife surveys for this study, a section of the Cypress Creek (C-14) Canal crosses under I-95 within the study area. However, no work is proposed within or above this canal or any other surface waters for project. Therefore, the effect determination for the West Indian manatee is "No Effect". No active tortoise burrows were

observed within the project limits; therefore, the gopher tortoise determination is "No Effect". "No Effect" is the effect determination for all state listed species. A summary of effect determinations can be found in Table 7-8.

Table 7-8
Federal and State-Listed Species Effect Determination

Common Name	Scientific Name	Federal Status	State Status	Effect Determination
Mammals				
West Indian Manatee	*Trichechus manatus*	T	T	No Effect
Birds				
Wood Stork	*Mycteria americana*	T	T	May Affect, Not Likely to Adversely Affect
Everglade Snail Kite	*Rostrhamus sociabilis plumbeus*	E	E	No Effect
Least Tern	*Sterna antillarum*	NL	T	No Effect
Little Blue Heron	*Egretta caerulea*	NL	SSC	No Effect
Tricolored Heron	*Egretta tricolor*	NL	SSC	No Effect
Snowy Egret	*Egretta thula*	NL	SSC	No Effect
Reddish Egret	*Egretta rufescens*	NL	SSC	No Effect
White Ibis	*Eudocimus albus*	NL	SSC	No Effect
Black Skimmer	*Rynchops niger*	NL	SSC	No Effect
Burrowing Owl	*Athene cunicularia*	NL	SSC	No Effect
Roseate Spoonbill	*Platalea ajaja*	NL	SSC	No Effect
Reptiles				
Eastern Indigo Snake	*Drymarchon corais couperi*	T	T	May Affect, Not Likely to Adversely Affect
Gopher Tortoise	*Gopherus polyphemus*	CS	T	No Effect
Fish				
Mangrove Rivulus	*Rivulus marmoratus*	NL	SSC	No Effect

Legend: E = Endangered; T = Threatened; SSC = Species of Special Concern; CS = Candidate Species; NL = Not Listed

On April 30, 2018 a Concurrence Request letter was sent to USFWS regarding federally listed species with the potential to occur in the project area. Three species had an effect determination of "No Effect" (West Indian manatee, Everglade snail kite and gopher tortoise), and two had an effect determination of "May Affect, Not Likely to Affect" (Eastern indigo snake and wood stork). USFWS responded on May 2, 2018 and concurred that the proposed project is not likely to adversely affect any federally listed species or designated habitat protected by the Endangered Species Act of 1973, as amended (16 U.S.C. 1521 et. Seq.). No further actions are required unless project modifications are made, additional information involving potential effects becomes available, or new species are listed, in which case reinitiation of consultation may be necessary.

7.8.3.9 Essential Fish Habitat

Through the ETDM EST review process, the NMFS indicated the project area does not contain areas that support Essential Fish Habitat (EFH) or National Oceanic and Atmospheric Administration (NOAA) trust fishery resources. Therefore, there is no involvement with or adverse effect on EFH. NMFS had no comments pursuant to the EFH requirements of the Magnuson-Stevens Fishery Conservation and Management Act (P.L. 104-927). NMFS concluded that this project will not require an EFH assessment, and further consultation with the NMFS is not necessary unless future modifications to the project could result in adverse impacts to EFH.

7.8.4 PHYSICAL

7.8.4.1 Noise

A DOE of minimal was assigned during the ETDM EST review process by FHWA. FHWA identified residential, commercial, retail, and industrial properties in the immediate vicinity of the project corridor. Currently there are noise barriers adjacent to the residential properties. Areas sensitive to noise and vibration were identified, and while construction noise may have short-term effects, overall noise-related impacts are anticipated to be minimal.

A traffic noise study was completed in accordance with FDOT's PD&E Manual, Part 2, Chapter 18, Highway Traffic Noise (June 14, 2017) and Title 23 Code of Federal Regulations (CFR) Part 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise. The prediction of existing and future traffic noise levels with and without the recommended Build Alternative was performed using the FHWA Traffic Noise Model 2.5 (TNM 2.5). A Noise Study Report (NSR) was prepared for the project and is on file at FDOT District Four PLEMO.

FHWA has established Noise Abatement Criteria (NAC) for seven land use activity categories. These criteria determine when an impact occurs and when consideration of noise abatement is required. Maximum noise level thresholds have been established for five of these activity categories. These maximum thresholds, or criteria levels, represent acceptable traffic noise level conditions. Noise abatement measures must be considered when predicted noise levels approach or exceed the NAC levels or when a substantial noise increase occurs. FDOT defines "approach" as within one dB(A) of the FHWA criteria. A substantial noise increase is defined as when the existing noise level is predicted to be exceeded by 15 dB(A) or more as a result of the transportation improvement project.

Within the project study limits, there are 521 noise sensitive sites consisting of 507 residences and 14 special land use sites: three recreational areas, one school playground, one outdoor dining area, two churches, two chiropractic clinics and five hotel pools. Exterior traffic noise levels were predicted for the residential and recreational sites as well as the school playground, outdoor dining area and hotel pools. Interior traffic noise levels were predicted for the churches and chiropractic clinics.

Results of the noise monitoring analysis for the recommended Build Alternative indicate traffic noise levels at the residences are predicted to range from 55.4 to 71.7 dB(A), and from 36.9 to 72.0 dB(A) at non-residential/special use sites. Design year traffic noise levels are predicted to approach, meet, or exceed the respective FHWA NAC, 67 dB(A), at 47 residences and equal the NAC for Activity Class E sites, 72.0 dB(A), at only one special land use site, the outdoor dining area. Since, noise impacts at noise sensitive sites are predicted based on the recommended Build Alternative, consideration of noise abatement measures is required to mitigate these impacts.

Noise abatement measures were evaluated for the 47 residences and 1 special land use site predicted to be impacted by the proposed project. The results of the evaluation indicate that the construction of a noise barrier appears to be a potentially feasible and cost reasonable method of reducing traffic noise impacts for all 12 impacted residences located on the east side of I-95 between NW 57 Street to N. Andrews Avenue.

The likelihood of providing the noise barrier mentioned above as a potential abatement measure varies. FDOT is committed to the construction of the noise barriers contingent upon the following conditions:

- Final recommendations on the construction of abatement measures is determined during the project's final design and through the public involvement process;
- Detailed noise analyses during the final design process support the need, feasibility, and reasonableness of providing abatement;
- Cost analysis indicates that the cost of the noise barrier(s) will not exceed the cost reasonable criterion;
- Community input supporting types, heights, and locations of the noise barrier(s) is provided to the District Four Office; and,
- Safety and engineering aspects as related to the roadway user and the adjacent property owner have been reviewed and any conflicts or issues resolved.

As described above, noise abatement measures were found to be feasible for 12 of the 47 residences analyzed. Noise barriers were not feasible and cost reasonable for the remaining 35 impacted residences or the outdoor seating area, the one (1) special land use site. This was due to the inability of the evaluated noise barriers to meet the minimum requirements for feasibility and reasonableness because of site specific geometry, conflicts with utilities, or failing to provide a 5.0 dB(A) reduction for at least two impacted receptors.

7.8.4.2 Air Quality

Through the ETDM EST review process, the EPA and FHWA assigned a DOE of minimal to Air Quality. FHWA noted that the project is not located within a EPA-designated Air Quality Maintenance or Non-Attainment area, therefore the Clean Air Act conformity requirements do not apply. Long-term impacts on air quality should be minimal or negligible and no permanent effects to air quality are anticipated. Short-term impacts due to dust and emissions should be minimized using BMPs. As support to the PD&E Study, an Air Quality Technical Memorandum (AQTM) was prepared in accordance with Part 2, Chapter 19, Air Quality (June 14, 2017) of FDOT's PD&E Manual. The AQTM is on file and the District Four PLEMO.

The recommended Build Alternative was subjected to a carbon monoxide (CO) screening model that makes various conservative worst-case assumptions related to site conditions, meteorology, and traffic. FDOT's screening model for CO uses the latest EPA-approved software to produce estimates of one-hour and eight-hour CO at default air quality receptor locations. The one-hour and eight-hour estimates can be directly compared to the current one-hour and eight-hour National Ambient Air Quality Standards (NAAQS) for CO.

The traffic data input used in the model was from the roadway intersection forecast to have the highest total approach traffic volume. This location was at the I-95/Commercial Boulevard interchange. The No-Build and recommended Build Alternatives for both the opening year (2020) and the design year (2040) were evaluated.

Estimates of CO were predicted for the default receptors which are located 10 feet to 150 feet from the edge of the roadway. Based on the results from the screening model, the highest project-related CO one-hour and eight-hour levels are not predicted to meet or exceed the one-hour or eight-hour NAAQS for this pollutant with either the No-Action or recommended Build Alternative. As such, the project "passes" the screening model. The results of the screening model are attached to the AQTM.

The project is expected to improve traffic flow by improving the operation of the I-95 Interchanges and arterial roadways. The planned improvements are expected to improve overall traffic operations, thereby relieving congestion, within the project study area, which should reduce operational greenhouse gas emissions.

7.8.4.3 Contamination

Through the ETDM EST, FDEP, SFWMD and FHWA assigned a moderate DOE, while the EPA assigned a substantial DOE, reporting several potential contamination sites within a 500-foot project buffer. A Contamination Screening Evaluation Report (CSER) was completed in accordance with FDOT PD&E Manual Part 2, Chapter 20, Contamination. This report evaluated potential and existing contamination sources within the project area buffer. The CSER is on file at FDOT District Four PLEMO.

Available state, local and federal records were reviewed to identify all contamination sites within 500 ft., solid waste sites within one-quarter mile, and superfund sites within one mile. Sites were evaluated independently.

Each site identified within the defined buffers from the proposed improvements was evaluated for its potential impact and assigned a rating of High, Medium, Low, or No potential risk. A total of 54 potential contamination sites were identified. Sites were rated based on their characteristics and distance from the proposed improvements. Risk ratings were assigned in accordance with Part 2, Chapter 20, Section 2.2.4 of FDOT's PD&E Manual (June 14, 2017). The risk rating distribution for these identified sites/facilities is presented in .

Table 7-9
Summary of Potential Contamination Sources by Risk Rating

Risk Rating	Number of Sites SR 9/I-95
High	7
Medium	7
Low	40
No	0
Total	54

No: No potential contamination impact to subject site/corridor
Low: Subject site/corridor have ongoing contamination issues, however, not likely to impact the project
Medium: Potential to impact the subject site/corridor from petroleum or hazardous substance contamination
High: Contamination will substantially impact construction activities, have right of way acquisition implications, or other liability to FDOT

A Level II contamination assessment will be conducted during the design phase for high and medium sites that have the potential to impact construction. The high and medium sites are presented in Table 7-10.

Table 7-10 Summary of High and Medium Contamination Source Sites	
Site Name and Location	Risk Rating
Site No. 8 Florida Department of Transportation Carmen Siding, Ft. Lauderdale, FL	Medium
Site No. 10 Marathon-Cypress Creek #581 850 East Cypress Creek Road, Ft. Lauderdale, FL	High
Site No. 13 Executive Cleaners/Nu-Look 1 Hour Cleaners #47 900 NE 62 Street, Ft. Lauderdale, FL	Medium
Site No. 14 Cypress Creek Cleaners 821 NE 62 Street/899 NE 62 Street, Oakland Park, FL	Medium
Site No. 18 Powertrain Rebuilders, Inc. 897 ½ East Cypress Creek Road, Suite 100, Oakland Park, Florida, FL	Medium
Site No. 20 FDOT Operations Center (DOT Dump Site 1) 5548 NW 9 Avenue, Ft. Lauderdale, FL	High
Site No. 29 Circle K #4865 1177 West Commercial Boulevard, Ft. Lauderdale, FL	Medium
Site No. 30 7-Eleven Food Store #34825 901 West Commercial Boulevard, Ft. Lauderdale, FL	High
Site No. 33 Adventure Petroleum 4999 NW 9 Avenue, Ft. Lauderdale FL	High
Site No. 34 Shell – First Coast Energy #1818 890 NW 50 Street, Ft. Lauderdale, FL	High
Site No. 37 Sunoco Twin Oil Company 4891 Powerline Road, Oakland Park, FL	High
Site No. 45 Hollingsworth Solderless Terminal 700 NW 57 Place, Ft. Lauderdale, FL	High
Site No. 48 Graphic Products, Inc. 1140 NW 55 Street, Ft. Lauderdale, FL	Medium
Site No. 49 D&B Paint Manufacturing Company 1100 NW 55 Street, Ft. Lauderdale, FL	Medium

Site references and additional information: *Contamination Screening Evaluation Report, PD& Study, SR 9/I 95 from south of Commercial Boulevard to north of Cypress Creek Road (MP 14.5 to 17.0 May 2018*

7.8.4.4 Construction

Short-term impacts associated with construction of the proposed improvements are anticipated including potential erosion of areas cleared for construction, temporary increases in noise levels, and fugitive dust from use of heavy construction equipment. Temporary impacts to traffic flow and travel patterns are anticipated during construction activities and would occur along existing roads and at intersections during construction activities.

FDOT's Standard Specifications for Road and Bridge Construction, latest edition, has standard construction practices which take into consideration many of the direct construction impacts and provides measures to minimize effects. BMPs will be employed during construction to ensure minimization of impacts.

7.8.4.5 Bicycles and Pedestrians

As I-95 is a limited access facility, bicycles and pedestrians are not allowed along the corridor. Therefore, no accommodations for pedestrians or bicycles are provided along I-95. However, bicycle and pedestrian facilities are present along the overpasses and underpasses of the interchange cross streets. There will be no impact to these facilities based on the recommended Build Alternative.

All arterial street segments within the study area have sidewalks on both sides. These existing sidewalks will either remain or be replaced to standard width where arterial streets widenings are proposed. Seven-foot bike lanes are proposed on both sides of Commercial Boulevard and Cypress Creek Road. Four-foot bike lanes are proposed along N. Andrews Avenue between Cypress Creek Road and N. Andrews Way to minimize right of way impacts and to provide continuity with the existing four-foot bike lanes along N. Andrews Avenue, north of Cypress Creek Road.

7.8.4.6 Utilities and Railroads

FHWA provided a DOE or minimal during the ETDM EST review process. While infrastructure-related features were identified within the vicinity, the proposed improvements within the I-95 mainline and the interchanges will primarily be within the existing limited access right of way. Therefore, minimal utilities impacts are expected to the I-95 mainline and the interchanges. The proposed improvements to the adjacent arterial intersection of Commercial Boulevard/Powerline Road and Commercial Boulevard/N. Andrews Avenue will require right of way acquisition and therefore, moderate utilities impacts are anticipated. In particular to the FPL transmission lines along the east side of Powerline Road.

There are 21 existing Utility Agency Owners (UAO) with facilities within the study area. The existing utilities are described in Table 7-11 and include overhead power lines, underground fiber optic, cable, water distribution, sanitary and storm sewer, and gas distribution. All utility companies contacted have responded and provided as-builts, marked plans or no facilities in the area, letters.

The interchange improvements along the side streets will have varying limits, and the impact on the type of facility has to be carefully considered. Impacts to underground facilities such as water, waste water and gas mains will typically lie within the project limits. However, telecommunication facilities (underground and aerial) may have an existing splice point required for relocation and or adjustment, beyond the project limits. Overhead electric facilities may have to extend relocation beyond the project limits as well due to sudden change in alignment or impact to an existing pole that is relied on for structural support.

Table 7-11 Summary of Utilities	
Utility Agency Owner	Facility Type
Allied Fiber LLC	Fiber
American Traffic Solutions	Telecommunications
AT&T Distribution Florida	Telecommunications
Broward County Water & Sewer	Water & Wastewater
Century Link (QWEST)	Fiber Optic
City of Fort Lauderdale	Water & Sewer
City of Pompano Beach	Water & Sewer
City of Oakland Park	Water & Sewer
Comcast	Cable TV
Crown Castle	Fiber
Fiberlight LLC	Telecommunications
Fibernet Direct	Telecommunications
Florida Power & Light – Distribution	Electric
Florida Power & Light - Transmission	Electric
Hotwire Communications	Telecommunications
Level 3 Communications, LLC	Telecommunications
MCI (Verizon)	Telecommunications
Sice Inc	Telecommunications
Sprint (Nextel)	Fiber Optic
TECO Peoples Gas	Gas
XO Communications	Telecommunications

The CSX railroad runs south to north, parallel to the west of I-95 in the project area, and crosses Cypress Creek Road at grade between NW 6 Way and N. Andrews Avenue and it crosses Commercial Boulevard at grade between Powerline Road and I-95. The length of the railroad extends to the north and south beyond the project area and the right of way is approximately 100 feet in width.

The CSX railroad runs south to north, parallel to the west of I-95 in the project area, and crosses Cypress Creek Road at grade between NW 6 Way and N. Andrews Avenue and it crosses Commercial Boulevard at grade between Powerline Road and I-95. The length of the railroad extends to the north and south beyond the project area and the right of way is approximately 100 feet in width.

This CSX railroad runs a commuter rail line managed by the SFRTA. This commuter rail line has a Tri-Rail stop in the study area, the Cypress Creek Tri-Rail Station, located at 5910 NW 9 Avenue, Fort Lauderdale FL 33309. The first stop at the Cypress Creek Tri-Rail Station is at 4:54 AM and the last stop is at 10:34 PM on weekdays. Weekends and holidays have a first stop time of 6:12 AM and a last stop of 10:37 PM.

Tri-Rail, railroad operations, and Commuter Connector operations have no anticipated impacts due to the project and will be maintained during future construction.

7.8.4.7 Navigation

During the ETDM EST review process, FHWA assigned a DOE of none as no navigable waterways are present within the project area. Therefore, this project will not involve impacts to navigable waterways.

7.9 Right of Way

Right of way acquisition will be required in order to implement the proposed improvements under the recommended Build Alternative 1A-6.

For the Cypress Creek Road Interchange, a total of 11 parcels will be impacted, requiring approximately 0.34 acres of right of way acquisition.

For the Commercial Boulevard Interchange, a total of 36 parcels will be impacted, requiring approximately 1.57 acres of right of way acquisition.

No limited access right of way acquisition is anticipated to accommodate the I-95 mainline proposed improvements such as the southbound CD road system, replacement of the North Andrews Avenue bridge and ramp improvements.

Table 7-12 below summarizes the preliminary right of way acquisition cost estimates prepared by FDOT District Four for the recommended Build Alternative 1A-6. Additional data, detailing parcel information as well as graphical representations of the impacted parcels are depicted in the Conceptual Stage Relocation Plan on file at FDOT District Four.

Table 7-12
Recommended Build Alternative 1A-6 – Preliminary Right of Way Estimate

Intersection	Corridor Subarea Alternative	Right of Way Estimate (millions)
Commercial Boulevard and Powerline Road	Traditional Intersection Widening	$32,005,705
Commercial Boulevard and N. Andrews Avenue	Traditional Intersection Widening with Westbound Flyover	$3,809,096
Cypress Creek Interchange	Modification of Existing Partial Cloverleaf (without the proposed Canal On-Ramp)	$7,475,361
Total		$43,290,162

7.10 Preliminary Cost Estimates

Preliminary construction cost estimates were established using FDOT's Long Range Estimate (LRE) program. Table 7-13 summarizes the preliminary cost for the recommended Build Alternative 1A-6. The details of the LRE are included in Appendix D.

Table 7-13
Recommended Build Alternative 1A-6 – Preliminary Cost Estimate

Description	Costs (millions)
Project Sequences Subtotal	$51,074,008
Maintenance of Traffic (10%)	$5,107,401
Mobilization (8%)	$4,494,513

Table 7-13 Recommended Build Alternative 1A-6 – Preliminary Cost Estimate	
Description	Costs (millions)
Initial Contingency Amount	$150,000
Total	$60,825,922

8 List of Technical Reports

The following is a list of technical reports and documents that were completed for the study and are on file at FDOT District Four.

Table 8-1 Technical Reports and Documents	
Type	Technical Report
Engineering	• Methodology Letter of Understanding (MLOU) for System Interchange Modification Report (SIMR) • Safety Analysis Memorandum • VISSIM Model Development and Calibration Report • Future Traffic Volume Development Memorandum • SIMR • Location Hydraulics Memorandum • Drainage Report • Existing ITS and Signing Conditions Memorandum • Value Engineering Report
Environmental	• Type 2 Categorical Exclusion Report • Noise Study Report • Air Quality Technical Memorandum • Contamination Screening Evaluation Report • Natural Resource Evaluation • Cultural Resource Assessment Report (CRAS) • Conceptual Stage Relocation Plan • Sociocultural Effects Evaluation

APPENDIX A

I-95 Design Speed Documentation

Silvia Beltre

From: Holzweiss, Ray [Ray.Holzweiss@dot.myflorida.com]
Sent: Tuesday, April 03, 2012 5:24 PM
To: Oaikhena, Henry
Cc: Mike Ciscar; 'Ryan Solis-Rios'; Webb, Howard; Olson, John; Plass, Mark; Silvia Beltre; Desir Jacques
Subject: RE: I-95 PD&E Study from Stirling road in Broward to south of Glades road in Palm Beach County, Posted Speed

Thanks Henry, I will pass along to our team too.

Ray Holzweiss, P.E.
Project Manager, FDOT District 4
3400 West Commercial Blvd
Fort Lauderdale, Fl 33309
954-777-4425 (office), 954-777-4482 (fax)
ray.holzweiss@dot.state.fl.us

From: Oaikhena, Henry
Sent: Tuesday, April 03, 2012 5:07 PM
To: Webb, Howard; Olson, John; Holzweiss, Ray; Plass, Mark
Cc: Mike Ciscar; 'Ryan Solis-Rios'
Subject: I-95 PD&E Study from Stirling road in Broward to south of Glades road in Palm Beach County, Posted Speed

Howard,

As a follow up on our yesterday 4/2/12 meeting to discuss project progress and possible design variations and exceptions, I went to discuss with Mark Plass this afternoon 4/3/12 the Posted Speed for this corridor. He agreed we should keep the current posted speed which today is 65 mph.

As suggested and agreed on yesterday, both the Design and Posted speed could be the same to help minimized the number of variations and exception since all improvement will be within the existing ROW and the main focus is to get the Manage Lanes to function without a fatal flaw.

With this email and concurrence from everyone, the Project Team will continue their analysis and evaluation of the corridor based on a 65 mph Design and Posted Speed.

Thanks.

Henry A. Oaikhena

Henry Oaikhena, PE.

Project Manager

FDOT D-4 Consultant Management / Design

3400 West Commercial Blvd.

Ft. Lauderdale, Fl 33309

Phone: 954 777-4445

Fax: 954 777-4482

email: henry.oaikhena@dot.myflorida.com

Note: My email address has changed.

Please note: Florida has a very broad public records law. Most written communications to or from state officials regarding state business are public records available to the public and media upon request. Your e-mail communications may be subject to public disclosure. (Chapter 119, Florida Statutes)

APPENDIX B

Existing ITS and Signing Conditions Memorandum

Memo

Date:	Monday, November 13, 2017
Project:	I-95 at Commercial Boulevard and Cypress Creek Road PD&E Study
To:	Robert Gutierrez, P.E., Stantec Inc.
From:	Joshua Salazar, P.E., Cory Beard E.I., HDR Inc.
Subject:	Existing ITS and Signing Conditions

This memorandum documents the existing Intelligent Transportation Systems (ITS) and Signing infrastructure and devices within the scope of the I-95 at Commercial Boulevard and Cypress Creek Road PD&E Study. The purpose is to understand the potential impacts on the existing ITS and Signing from the proposed improvements. The limits of influence are along I-95 from the north-oriented ramps of the Oakland Park Boulevard interchange to the south-oriented ramps of the Atlantic Boulevard interchange. The limits of influence along Commercial Boulevard are from NW 15th Avenue to NE 6th Avenue and along Powerline Road from NW 47th Street to NW 51st Plaza. The limits of influence along Cypress Creek Road are from NW 6th Way to Dixie Highway and along N Andrews Avenue from N Andrews Way to NW 66th Street

To fully examine the existing conditions, a field review was conducted along the arterials and the I-95 Express Phase 3A-1 (FPID: 433108-4-52-01) and I-95 Express Phase 3A-2 (FPID 433108-5-52-01) ITS and Signing and Pavement Marking (S&PM) RFC plans were reviewed (See Appendices A through E). The I-95 Express Phase 3A-1 project limits are from Davie Boulevard to just north of Commercial Boulevard and I-95 Express Phase 3A-2 project limits are from just north of Commercial Boulevard to south of SW 10th Street. The scope of these projects include widening of I-95 and the construction of two Express Lanes in each direction. In addition, a Ramp Metering System (RSS) is being installed at each interchange. These projects are currently under design construction with a scheduled completion date of mid-2019. The plans are still under design and as a result may vary from what is described in this Memo.

Overall ITS and Signing installed along Commercial Boulevard and Cypress Creek Road

- Single Post Mounted Signs
- Multi-Post Mounted Signs
- Overhead Cantilever Mounted Signs
- Signal Mast Arm Mounted Signs
- Arterial Dynamic Message Signs (ADMS)
- Closed Circuit Television (CCTV) Cameras
- Fiber Optic Cable (FOC) Communication
- Power Distribution System

There are Arterial Dynamic Message Signs (ADMS) and Closed Circuit Television (CCTV) cameras along the Commercial Boulevard corridor. Broward County Traffic Engineering Division (BCTED), Florida Power & Light (FPL) FiberNet, and XO Communications have fiber optic cable (FOC) installed along the outside of the sidewalk along the north side of Commercial Blvd from NE 6th Ave to the start of the westbound frontage road. The FOC then transitions to the grass area between the frontage road and Commercial Blvd. It then transitions back to the outside of the sidewalk at N Andrews Avenue and continues to NW 15th Ave. Typically the FiberNet and XO Communications pull boxes are installed in the grass area behind the sidewalk and the BCTED pull boxes are installed in the sidewalk.

In addition, BCTED has FOC along the south side of Commercial Blvd for the entire project limits from NW 15th Ave to NE 6th Ave. The pull boxes are installed in the sidewalk.

BCTED has additional FOC along Powerline Rd on the west side that extends from NW 47th St to NW 51st Plaza with pull boxes located in the sidewalk. FPL FiberNet FOC is installed along the west side of Powerline Rd from Commercial Blvd to NW 47th St.

There are CCTV cameras along the Cypress Creek Road corridor. FPL FiberNet and XO Communications have FOC along the south side of Cypress Creek Rd from NW 6th Way to Dixie Highway. The FOC and pull boxes are installed behind the sidewalk from NW 6th Way to the western I-95 signalized intersection. From the western I-95 intersection to NE 7th Avenue the pull boxes and FOC transition to the grass area between eastbound Cypress Creek Rd and the sidewalk. The FOC then transitions to the back of the sidewalk from NE 7th Ave to Dixie Hwy. Additionally there is FPL FiberNet FOC along the east side of N Andrews Ave from Cypress Creek Rd to NW 66th Street.

BCTED FOC is installed along the north side of Cypress Creek Rd from the eastern I-95 signalized intersection to NW 6th Way, with the pull boxes installed in the sidewalk.

The existing signing consists of a combination of single-post, multi-post, mast-arm mounted, and overhead mounted signs throughout the areas of influence.

The Existing Signing and ITS Inventory Exhibit in Appendix E shows the locations of the Signs and ITS devices.

The existing Signing and ITS devices along both Commercial Blvd and Cypress Creek Rd may be impacted by this project and may need to be relocated depending on the roadway design. Appendix F includes a summary matrix that shows the potential cost of relocating the ITS devices along the corridors.

ITS and Signing Infrastructure and Devices within the Commercial Boulevard and Cypress Creek Road Project Limits

There is one (1) Arterial Dynamic Message Sign (ADMS) along westbound Commercial Boulevard between NE 6th Avenue and N Andrews Avenue and one (1) ADMS along eastbound Commercial Blvd between NW 15th Avenue and Powerline Road. One (1) CCTV camera is installed on the north side of Commercial Blvd just east of the western I-95 signalized

intersection. There are two (2) CCTV cameras installed on the south side of Cypress Creek Road just west of the Railroad Tracks near N Andrews Avenue. Table 1 lists these ITS devices. See Appendix E for the exhibit showing the ITS device locations.

Table 1 List of Commercial Boulevard and Cypress Creek Road ITS Devices

Device Type	Roadway	Location	Direction	Reference
ADMS	Commercial Blvd	Between NE 6th Ave and N Andrews Ave	WB	Appendix E
ADMS	Commercial Blvd	Between NW 15th Ave and Powerline Rd	EB	Appendix E
CCTV	Commercial Blvd	East of the western I-95 intersection	WB	Appendix E
CCTV (2)	Cypress Creek Rd	West of the railroad tracks near N Andrews Ave	EB	Appendix E

Signing Infrastructure within the I-95 Project Limits

Overall there are six (6) overhead sign structures along Commercial Boulevard and five (5) along Cypress Creek Road. All of the sign structures are installed along the outside of the roadway on cantilever structures. Additionally there is one (1) bridge mounted sign panel on Commercial Blvd. Table 2 below lists these sign structures. See Appendix E for the exhibit showing the sign structure locations. Additionally, the locations of the Single-Post, Multi-Post, and mast arm mounted signs can be found in Appendix E.

Table 2 List of Commercial Boulevard and Cypress Creek Road Overhead Signing

Structure Type	Roadway	Location	Direction	Reference
Cantilever	Commercial Blvd	East of Powerline Rd	EB	Appendix E
Cantilever	Commercial Blvd	East of Powerline Rd	WB	Appendix E
Cantilever	Commercial Blvd	West of I-95 overpass	EB	Appendix E
Bridge Mounted	Commercial Blvd	I-95 overpass	EB	Appendix E
Cantilever	Commercial Blvd	East of I-95 overpass	WB	Appendix E
Cantilever	Commercial Blvd	West of N Andrews Ave	WB	Appendix E
Cantilever	Cypress Creek Rd	West of N Andrews Ave	EB	Appendix E
Cantilever	Cypress Creek Rd	West of N Andrews Ave	EB	Appendix E
Cantilever	Cypress Creek Rd	East of I-95 overpass	WB	Appendix E
Cantilever	Cypress Creek Rd	East of I-95 overpass	EB	Appendix E
Cantilever	Cypress Creek Rd	West of NE 7th Ave	WB	Appendix E

Overall ITS and Signing installed by I-95 Express Phase 3A-1 and Phase 3A-2

- Single Post Mounted Signs
- Multi-Post Mounted Signs
- Overhead Cantilever Mounted Signs
- Overhead Span Mounted Signs

- Overhead Bridge Mounted Signs
- Closed Circuit Television (CCTV) Cameras
- Microwave Vehicle Detection Systems (MVDS)
- Dynamic Message Signs (DMS)
- Voice Over IP (VoIP)
- Wireless Access Point (WAP)
- Ramp Metering System (RSS)
- Express Lanes Toll Gantry
- ITS Master HUB
- Fiber Optic Cable (FOC) Communication
- Power Distribution System

CCTVs are typically spaced at one-half mile intervals on alternating sides of the corridor. Additional Dedicated CCTVs (D-CCTV) are installed to monitor Toll Amount DMS (T-DMS), Lane Status DMS (S-DMS), and Toll Gantries. MVDSs are typically installed every one-quarter mile on both sides of the corridor. General Purpose DMS, Express Lanes DMS, T-DMS, and S-DMS exist within the I-95 limits on overhead structures in both the northbound and southbound travel directions of I-95. There are two existing WAP and one existing VoIP devices along the I-95 limits. Ramp Metering is installed at each entrance ramp for the interchanges within the project limits. There is one ITS Master HUB in the Southwest quadrant of the I-95 and Commercial Blvd interchange. There are three ITS power distribution load centers and two Express Lanes Toll Gantries within the I-95 limits.

These devices are connected to District Four's SMART SunGuide Transportation Management Center (TMC) via the Fiber Optic Cable (FOC) based Ethernet communication network along I-95.

The existing underground infrastructure consists of one 144-count single mode fiber optic cable for District 4 (D4) in one 2-inch High Density Polyethylene (HDPE) conduit, one 144-count single mode FOC for shared use of FDOT D4 Transportation Systems Management and Operations (TSM&O) Arterial Management System (AMS) and Broward County Traffic Engineering Division (BCTED), and 72-count FOC for Broward County Enterprise Technology Services (ETS) in one 2 inch HDPE conduit, one for the power conductors in one 2" HDPE conduit, and three spare 2 inch HDPE FOC conduits. Additionally along each interchange ramp there is a FOC conduit containing one 144-count single mode FOC for potential future use.

The existing signing consists of a combination of single-post, multi-post, and overhead mounted signs throughout the areas of influence.

ITS and Signing Infrastructure and Devices within the I-95 Project Limits

There are forty-one (41) MVDS, twenty-eight (28) CCTV, two (2) WAP, seven (7) RSS, three (3) DMS, four (4) S-DMS, one (1) Express Lanes DMS, two (2) T-DMS, one (1) ITS Master HUB, and two (2) toll gantries located along I-95 from the north-oriented ramps of the Oakland Park Boulevard interchange to the south-oriented ramps of the Atlantic Boulevard interchange. Table

3 lists these ITS devices. See Appendix A for the I-95 Phase 3A-1 ITS RFC plans and Appendix B for the I-95 Phase 3A-2 ITS RFC plans showing the device locations and cross sections

Table 3 List of I-95 ITS Devices

Device Type	Device Name	Station #	Direction	Reference
Lane Status DMS	S-DMS 95-30.9 NB	2224+10	NB	Appendix A
MVDS	MVDS 95-31.08 NB	2233+40	NB	Appendix A
MVDS	MVDS 95-31.08 SB	2234+00	SB	Appendix A
CCTV	CCTV 95-31.08 SB	2234+00	SB	Appendix A
MVDS	MVDS 95-31.28 SB	2243+75	SB	Appendix A
MVDS	MVDS 95-31.28 NB	2243+95	NB	Appendix A
MVDS	MVDS 95-31.54 SB	2257+70	SB	Appendix A
MVDS	MVDS 95-31.54 NB	2258+00	NB	Appendix A
CCTV	CCTV 95-31.54 NB	2258+00	NB	Appendix A
MVDS	MVDS 95-31.76 NB	2269+20	NB	Appendix A
MVDS	MVDS 95-31.76 SB	2269+50	SB	Appendix A
Dedicated CCTV	CCTV 95-31.76 SB	2269+50	SB	Appendix A
VoIP	VOIP 95-31.76 SB	2269+50	SB	Appendix A
WAP	WAP 95-31.76 SB	2269+50	SB	Appendix A
CCTV	CCTV 95-31.95 SB	2279+50	SB	Appendix A
MVDS	MVDS 95-31.95 SB	2279+50	SB	Appendix A
MVDS	MVDS 95-31.95 NB (2)	2279+50	NB	Appendix A
Ramp Signal	NA	2284+10	WB to SB ramp	Appendix A
Express Lane DMS	EL-DMS 95-32.06 SB	2285+00	SB	Appendix A
Dedicated CCTV	CCTV 95-32.08 SB	2286+00	SB	Appendix A
Dedicated CCTV	CCTV 95-32.14 NB	2289+00	NB	Appendix A
MVDS	MVDS 95-32.14 NB	2289+00	NB	Appendix A
Dedicated CCTV	CCTV 95-32.14 SB	2289+20	SB	Appendix A
MVDS	MVDS 95-32.14 SB	2289+20	SB	Appendix A
Ramp Signal	NA	2992+07	EB to SB ramp	Appendix A
Toll Gantry	Toll Site 3	2294+00	NB	Appendix A
ITS HUB	MHUB 95-32.26	2295+50	SB	Appendix A
ITS Service Point	GEN 95-32.26 SB	2295+50	SB	Appendix A
Dedicated CCTV	CCTV 95-32.27 SB	2296+30	SB	Appendix A
WAP	WAP 95-32.32 SB	2298+95	SB	Appendix A
Dedicated CCTV	CCTV 95-32.27 SB	2269+30	SB	Appendix A
Dedicated CCTV	CCTV 95-32.35 NB	2300+75	NB	Appendix A
Dedicated CCTV	CCTV 95-32.39 SB	2302+40	SB	Appendix A
MVDS	MVDS 95-32.39 SB	2302+40	SB	Appendix A
CCTV	CCTV 95-32.39 NB	2302+80	NB	Appendix A
Dedicated CCTV	CCTV 95-32.39 NB	2302+80	NB	Appendix A
MVDS	MVDS 95-32.39 NB	2302+80	NB	Appendix A
Ramp Signal	NA	2307+95	EB/WB to NB ramp	Appendix A
DMS	DMS 95-32.58 NB	2312+95	NB	Appendix A
MVDS	MVDS 95-32.64 NB	2315+85	NB	Appendix A
MVDS	MVDS 95-32.64 SB	2315+90	SB	Appendix A

Dedicated CCTV	CCTV 95-32.64 SB	2315+90	SB	Appendix A
MVDS	FL D4 095 015.6 NB NS DS EL-GP 6	2322+85	SB	Appendix B
MVDS	FL D4 095 015.6 SB SS DS EL-GP 6	2323+02	NB	Appendix B
CCTV	015.6 CCTV EL-GP 1	2323+02	NB	Appendix B
MVDS	FL D4 095 015.7 SB SS DS EL-GP-ON 6	2331+20	SB	Appendix B
Ramp Signal	NA	2334+20	Andrews ramp	Appendix B
MVDS	FL D4 095 015.8 NB NS DS EL-GP 6	23335+21	NB	Appendix B
Dedicated CCTV	015.8 CCTV GP 1	2336+09	SB	Appendix B
MVDS	FL D4 095 016.0 SB SS DS EL-GP-ON 6	2344+47	SB	Appendix B
CCTV	016.0 CCTV EL-GP 1	2344+47	SB	Appendix B
MVDS	FL D4 095 016.0 NB NS DS EL-GP-OF6	2346+00	NB	Appendix B
MVDS	FL D4 095 0.16.2SB SS DS EL-GP 6	2357+74	SB	Appendix B
MVDS	FL D4 095 016.2 NB NS DS EL-GP 6	2357+93	NB	Appendix B
ITS Service Point	Power Station A	2361+82	SB	Appendix B
MVDS	FL D4 095 016.4 SB SS DS EL-GP-ON 6	2364+20	SB	Appendix B
Ramp Signal	NA	2365+80	WB to SB ramp	Appendix B
Lane Status DMS	FL D4 DOT 095 016.4 NB LS 1	2366+26	NB	Appendix B
Dedicated RSS	016.4 CCTV GP 1	2366+94	SB	Appendix B
MVDS	FL D4 095 016.4 NB NS DS EL-GP-OF 6	2369+05	NB	Appendix B
CCTV	016.4 CCTV EL-GP 1	2369+05	NB	Appendix B
Dedicated CCTV	016.5 CCTV Toll 1	2371+32	SB	Appendix B
Toll Gantry	Toll Site 4	2371+85	SB	Appendix B
Dedicated CCTV	016.5 CCTV GP 1	2372+80	NB	Appendix B
MVDS	FL D4 095 016.6 SB SS DS EL-GP-OF 7	2378+05	SB	Appendix B
DMS	NA	2379+40	NB	Appendix B
Ramp Signal	NA	2382+95	EB/WB to NB	Appendix B
MVDS	FL D4 095 016.7 NB NS DS EL-GP-ON 6	2383+15	NB	Appendix B
CCTV	016.7 CCTV EL 1	2383+15	NB	Appendix B
MVDS	FL D4 095 016.8 NB NS DS EL-GP 6	2387+00	NB	Appendix B
MVDS	FL D4 095 016.9 SB SS DS EL-GP 6	2390+65	SB	Appendix B
CCTV	016.9 CCTV GP 1	2390+65	SB	Appendix B
Toll Amount DMS	FL D4 DOT 095 016.9 NB TR 1	2393+00	NB	Appendix B
CCTV	016.9 CCTV EL 1	2393+00	NB	Appendix B

Lane Status DMS	FL D4 DOT 095 017.1 NB LS 1	2401+00	NB	Appendix B
MVDS	FL D4 095 017.1 SB SS DS EL-GP 6	2404+00	SB	Appendix B
MVDS	FL D4 095 017.2 NB NS DS EL-GP 6	2409+00	NB	Appendix B
CCTV	017.2 CCTV EL 1	2409+00	NB	Appendix B
Toll Amount DMS	FL D4 DOT 095 017.3 NB TR 1	2416+00	NB	Appendix B
MVDS	FL D4 095 017.4 SB SS DS EL-GP 6	2417+00	SB	Appendix B
MVDS	FL D4 095 017.4 NB NS DS EL-GP 6	2417+04	NB	Appendix B
CCTV	017.4 CCTV EL-GP 1	2417+04	NB	Appendix B
DMS	NA	2417+20	SB	Appendix B
Lane Status DMS	FL D4 DOT 095 017.5 NB LS 1	2424+00	NB	Appendix B
ITS Service Point	Power Station B	2425+01	NB	Appendix B
MVDS	FL D4 095 017.6 NB NS DS EL-GP 6	2430+06	NB	Appendix B
MVDS	FL D4 095 017.6 SB SS DS EL-GP 7	2430+10	SB	Appendix B
MVDS	FL D4 095 017.9 NB NS DS EL-GP 6	2443+22	NB	Appendix B
MVDS	FL D4 095 017.9 SB SS DS EL-GP 6	2443+54	SB	Appendix B
CCTV	017.9 CCTV EL-GP 1	2443+54	SB	Appendix B
MVDS	FL D4 095 018.1 NB NS DS EL-GP-OF 7	2454+91	NB	Appendix B
CCTV	018.1 CCTV EL-GP 1	2454+91	NB	Appendix B
MVDS	FL D4 018.1 SB SS DS EL-GP-ON 6	2454+95	SB	Appendix B
Ramp Signal	NA	2457+30	EB/WB to SB	Appendix B

The FOC backbone and power distribution conduit typically runs along the east side of I-95 as shown in Appendices A and B. There are multiple lateral drops for devices along the west side of I-95. The conduit is a combination of underground open trench and directional bore within the project limits.

A combination of Ground-Mounted Type 334 cabinets and pole-mounted Type 336 cabinets are used for the ITS devices throughout the corridor. Refer to Appendices A and B for cabinet locations.

Signing Infrastructure within the I-95 Project Limits

There are fifteen (15) overhead span structures, sixteen (16) overhead cantilever structures, and two (2) Bridge Mounted locations installed along I-95 in the area of influence. Table 4 below lists these sign structures. See Appendix C for the I-95 Phase 3A-1 S&PM RFC plans

and Appendix D for the I-95 Phase 3A-2 S&PM RFC plans showing the sign locations and cross sections. Additionally, the locations of the Single-Post and Multi-Post mounted signs can be found in Appendices C and D.

Table 4 List of I-95 Overhead Signing

Structure Name	Structure Type	Station #	Direction	Reference
OH1B-19	Span	2224+05	NB	Appendix C
OH1B-20	Span	2230+10	SB	Appendix C
OH1B-21	Cantilever	2240+30	NB	Appendix C
OH1B-22	Cantilever	2254+20	SB	Appendix C
OH1B-23	Cantilever	2266+00	NB	Appendix C
OH1B-24	Span	2267+00	SB	Appendix C
OH1B-25	Cantilever	2273+95	NB	Appendix C
OH1B-26	Cantilever	2275+40	SB	Appendix C
EL-DMS 95-32.06 SB	Cantilever	2285+00	SB	Appendix C
OH1B-27	Span	2300+70	SB	Appendix C
OH1B-28	Cantilever	2302+00	NB	Appendix C
OH1B-29	Span	2312+75	SB	Appendix C
DMS 95-32.58 NB	Span	2312+95	NB	Appendix C
OH1B-30	Span	2321+00	NB	Appendix C
NA	Cantilever	2323+00	SB	Appendix D
NA	Span	2331+00	SB	Appendix D
NA	Cantilever	2331+18	NB	Appendix D
NA	Bridge Mounted	2340+58	NB	Appendix D
NA	Bridge Mounted	2342+00	SB	Appendix D
NA	Cantilever	2353+49	NB	Appendix D
NA	Span	2366+26	NB	Appendix D
NA	Cantilever	2374+00	SB	Appendix D
NA	Cantilever	2378+87	SB	Appendix D
NA	Span	2379+40	NB	Appendix D
NA	Span	2393+00	NB	Appendix D
NA	Cantilever	2398+00	SB	Appendix D
NA	Span	2401+00	NB	Appendix D
NA	Span	2416+00	NB	Appendix D
NA	Span	2417+23	SB	Appendix D
NA	Span	2424+00	NB	Appendix D
NA	Cantilever	2434+52	SB	Appendix D
NA	Cantilever	2442+00	SB	Appendix D
NA	Cantilever	2452+54	NB	Appendix D

Overall, the existing Signing and ITS devices along I-95 may be impacted by this project and may need to be relocated or modified depending on the roadway design. Appendix F includes a summary matrix that shows the potential cost of relocating the ITS devices and Toll Gantries along the corridors.

Appendix A:

I-95 Express Phase 3A-1 ITS RFC

Note:
95 Express Phase 3A- ITS RFC
is on file at FDOT District Four

APPENDIX C

Concept Plans and Conceptual Signing Plan

CONSTRUCTION CONTRACT NO.

COMPONENTS OF CONTRACT PLANS SET

CONCEPT PLANS

A DETAILED INDEX APPEARS ON THE KEY SHEET OF EACH COMPONENT

INDEX OF ROADWAY PLANS

SHEET NO.	SHEET DESCRIPTION
1	KEY SHEET
2-26	PRELIMINARY CONCEPT PLANS
27-37	PRELIMINARY ROADWAY PROFILES
S1-S24	SIGNING CONCEPTUAL PLANS

STATE OF FLORIDA

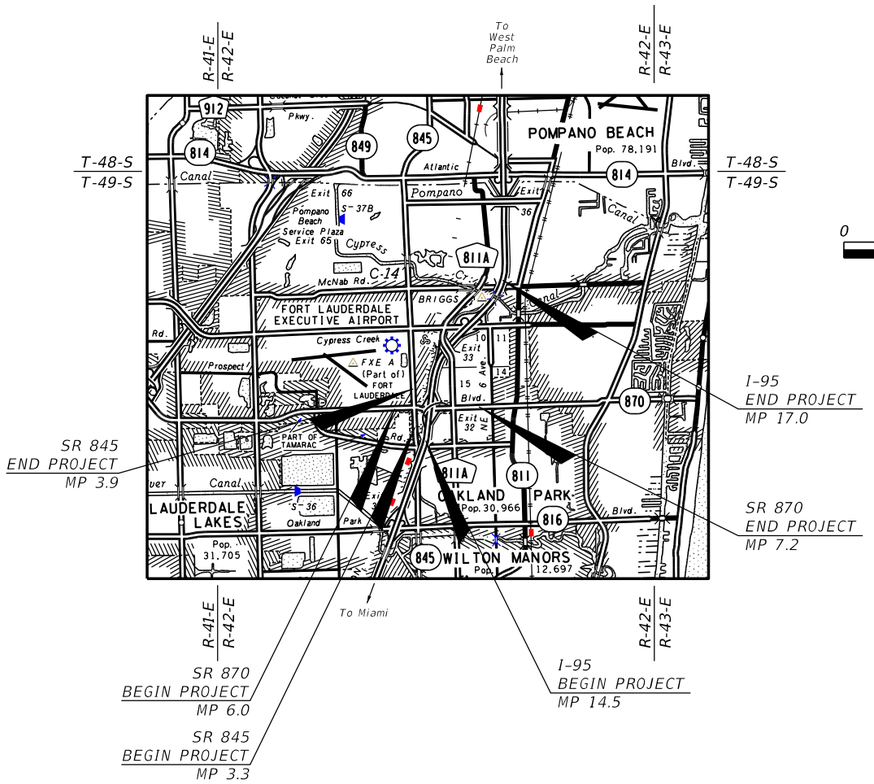
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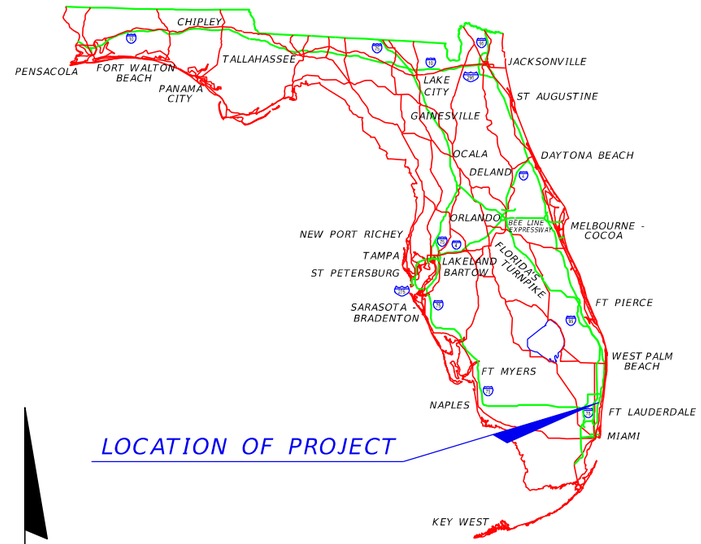
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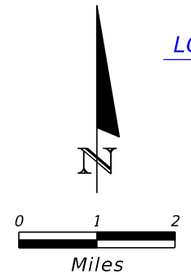
FINANCIAL PROJECT ID 435808-1

BROWARD COUNTY (86070)
STATE ROAD No. 9

FROM SOUTH OF SR 870/COMMERCIAL BOULEVARD
TO NORTH OF CYPRESS CREEK ROAD







ROADWAY SHOP DRAWINGS
TO BE SUBMITTED TO:

PLANS PREPARED BY:
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD., SUITE 900
CORAL GABLES, FLORIDA 33134
MIAMI (305)-445-2900 FLORIDA (800)-448-0227
CERTIFICATION OF AUTHORIZATION NO. 00027013
VENDOR ID NO. 650039493001
CONSULTANT CONTRACT NO. C-8F17

GOVERNING STANDARDS AND SPECIFICATIONS:

Florida Department of Transportation, Design Standards and revised Index Drawings as appended herein, and Standard Specifications for Road and Bridge Construction, as amended by Contract Documents.

For Design Standards click on the "Design Standards" link at the following web site:
http://www.dot.state.fl.us/rddesign/

For the Standard Specifications for Road and Bridge Construction click on the "Specifications" link at the following web site:
http://www.dot.state.fl.us/specificationsoffice/

NOTE: THE SCALE OF THESE PLANS MAY HAVE CHANGED DUE TO REPRODUCTION.

PROJECT LENGTH IS BASED ON ℄ OF CONSTRUCTION

LENGTH OF PROJECT		
	LINEAR FEET	MILES
ROADWAY		
BRIDGES		
NET LENGTH OF PROJECT		
EXCEPTIONS		
GROSS LENGTH OF PROJECT		

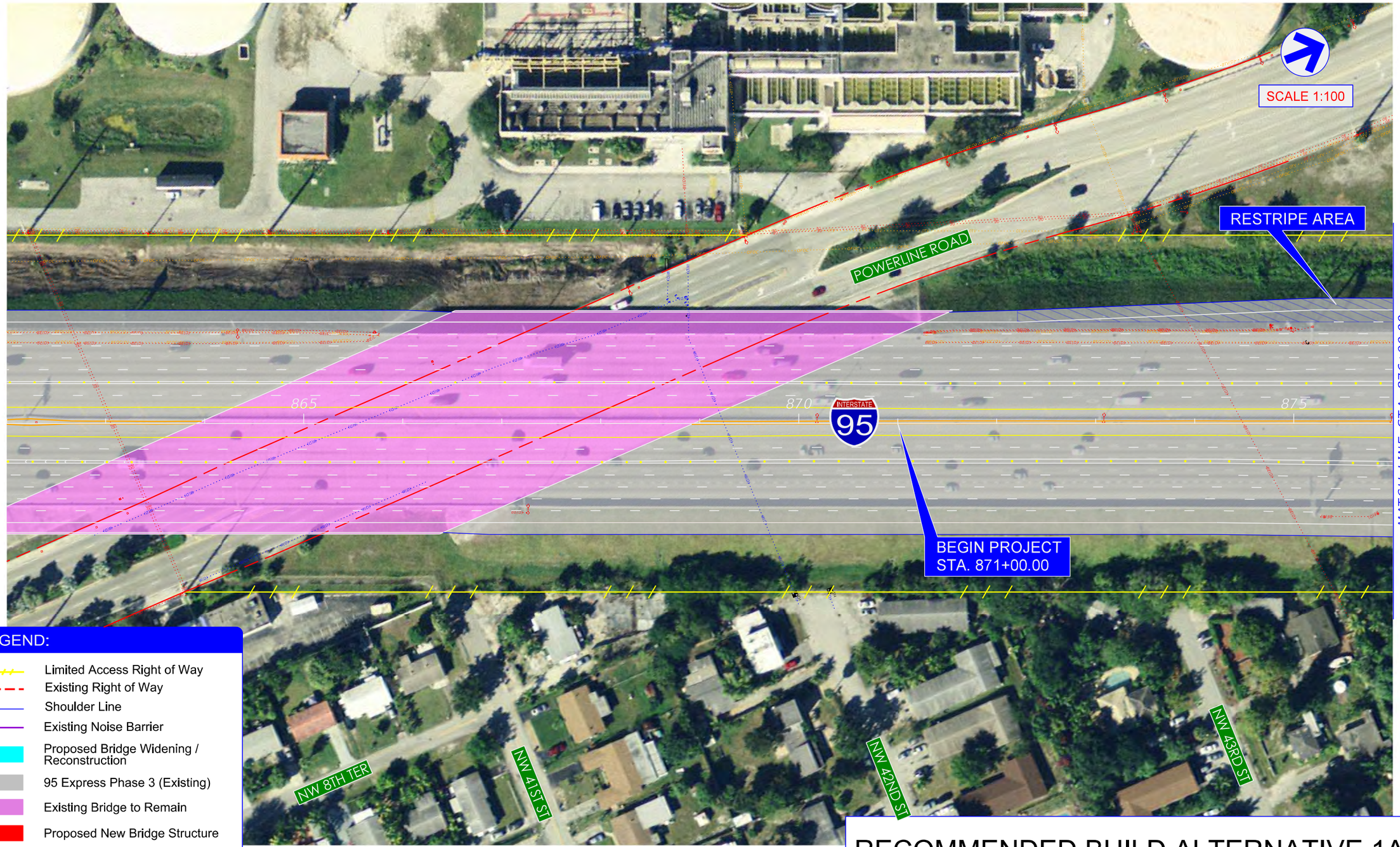
FDOT PROJECT MANAGER: NADIR RODRIGUES, P.E.

ROADWAY PLANS
ENGINEER OF RECORD: SILVIA BELTRE, P.E.

P.E. NO.: 51295

FISCAL YEAR	SHEET NO.
	1

$USERS $DATE$ $TIME$ $FILE$



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Shoulder Line
- Existing Noise Barrier
- Proposed Bridge Widening / Reconstruction
- 95 Express Phase 3 (Existing)
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED BUILD ALTERNATIVE 1A-6

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

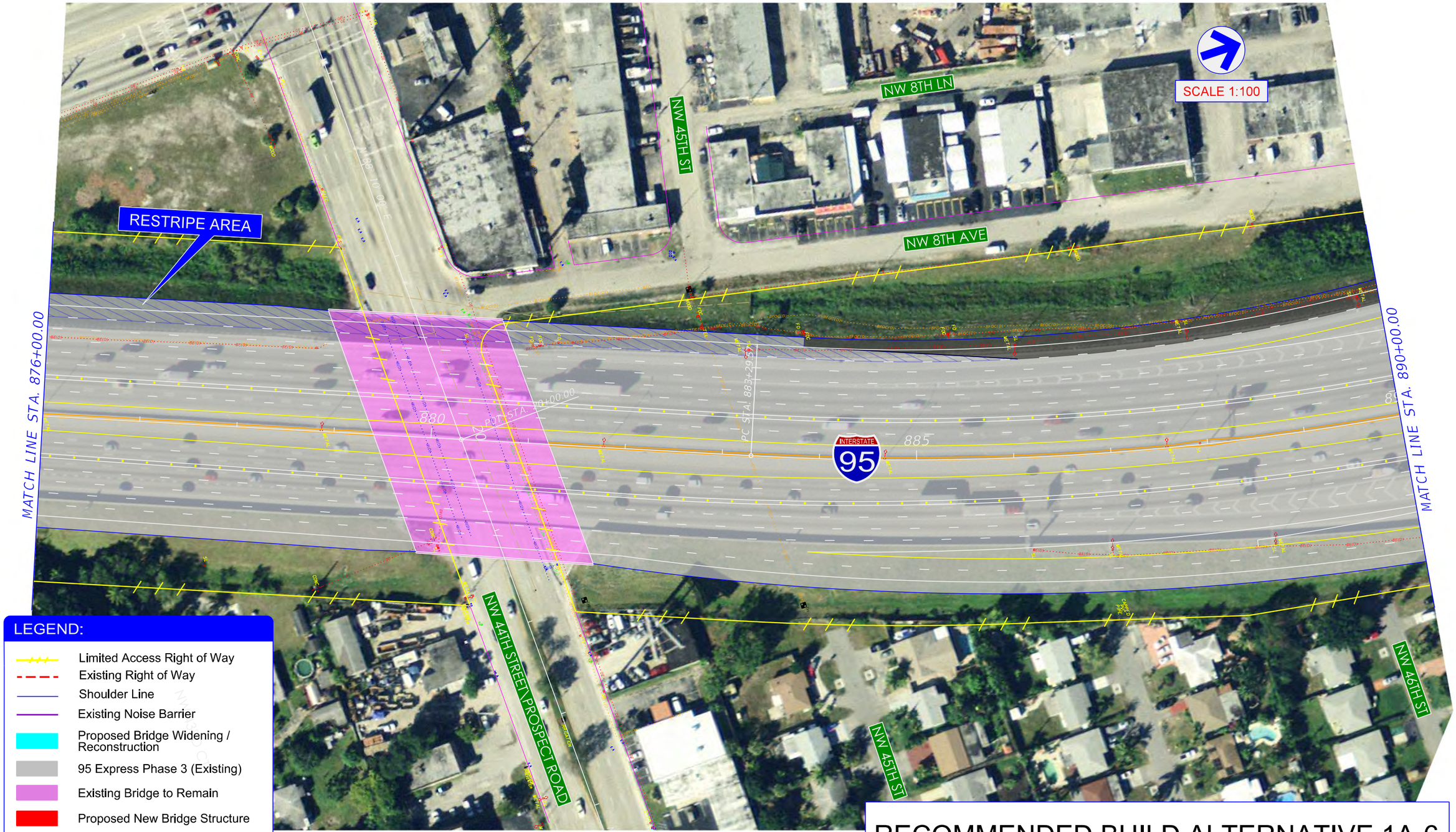
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY
CONCEPT PLANS

SHEET NO. 2



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Shoulder Line
- Existing Noise Barrier
- Proposed Bridge Widening / Reconstruction
- 95 Express Phase 3 (Existing)
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED BUILD ALTERNATIVE 1A-6

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

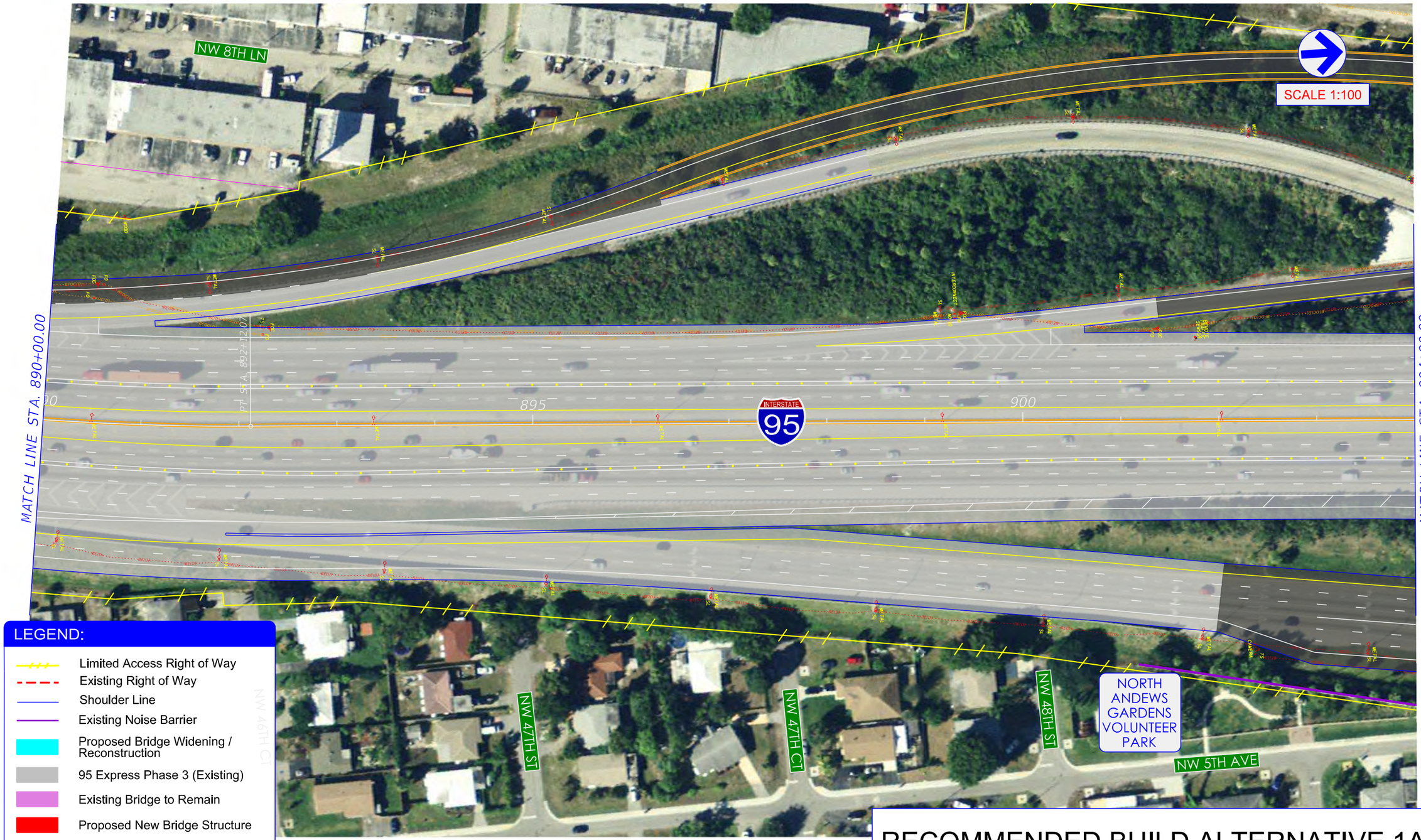
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY
CONCEPT PLANS

SHEET NO.
3

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LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Shoulder Line
- Existing Noise Barrier
- Proposed Bridge Widening / Reconstruction
- 95 Express Phase 3 (Existing)
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED BUILD ALTERNATIVE 1A-6

REVISIONS			
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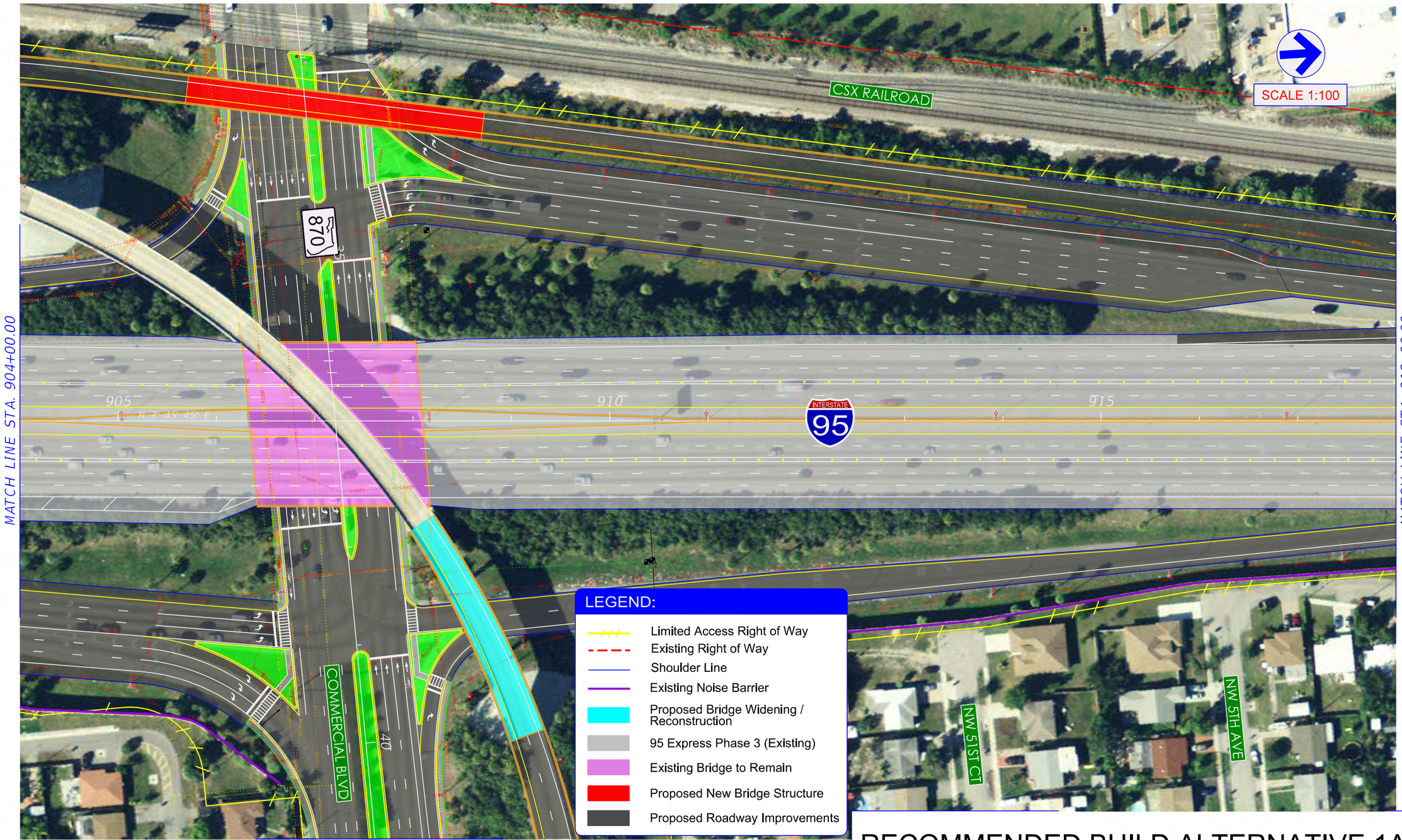
SILVIA M. BELTRE, P.E.
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY CONCEPT PLANS

SHEET NO. 4



RECOMMENDED BUILD ALTERNATIVE 1A-6

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

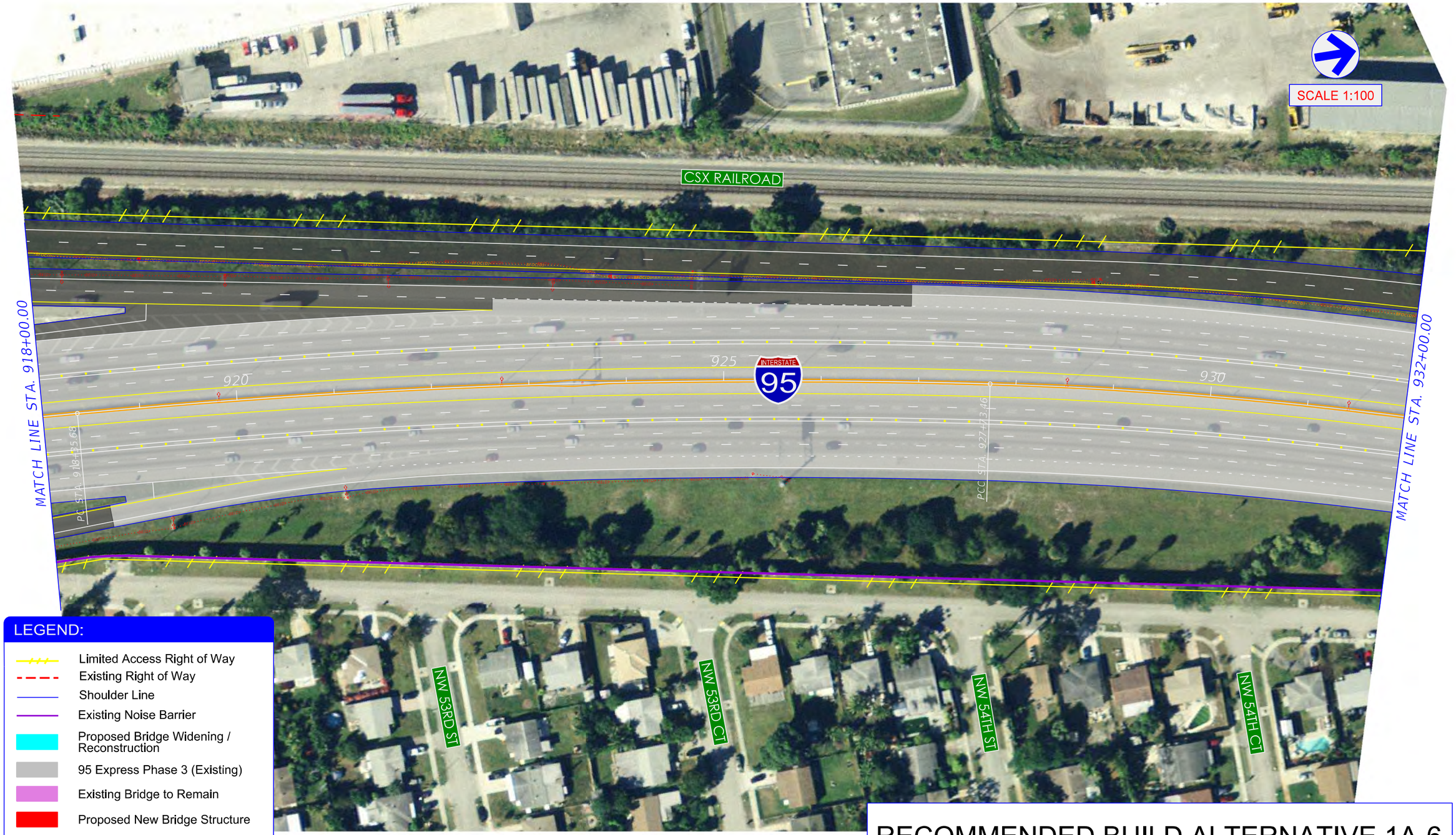
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY CONCEPT PLANS

SHEET NO. 5



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Shoulder Line
- Existing Noise Barrier
- Proposed Bridge Widening / Reconstruction
- 95 Express Phase 3 (Existing)
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED BUILD ALTERNATIVE 1A-6

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY CONCEPT PLANS

SHEET NO. 6



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Shoulder Line
- Existing Noise Barrier
- Proposed Bridge Widening / Reconstruction
- 95 Express Phase 3 (Existing)
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED BUILD ALTERNATIVE 1A-6

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY CONCEPT PLANS

SHEET NO. 7

MATCH LINE STA. 25+64.50

MATCH LINE STA. 946+00.00

MATCH LINE STA. 960+00.00

EXISTING PAVEMENT TO BE REMOVED

PROPOSED NOISE BARRIER EXTENSION

RESERVED FDOT PROPERTY FOR POTENTIAL 95 EXPRESS BUS SERVICE

SCALE 1:100

PC STA. 23+90.44

PT STA. 24+50.62

PT STA. 952+99.46

PT STA. 18+00.13

N. ANDREWS AVE

NW 59TH CT

INTERSTATE 95

950

955

LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Shoulder Line
- Existing Noise Barrier
- Proposed Bridge Widening / Reconstruction
- 95 Express Phase 3 (Existing)
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED BUILD ALTERNATIVE 1A-6

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

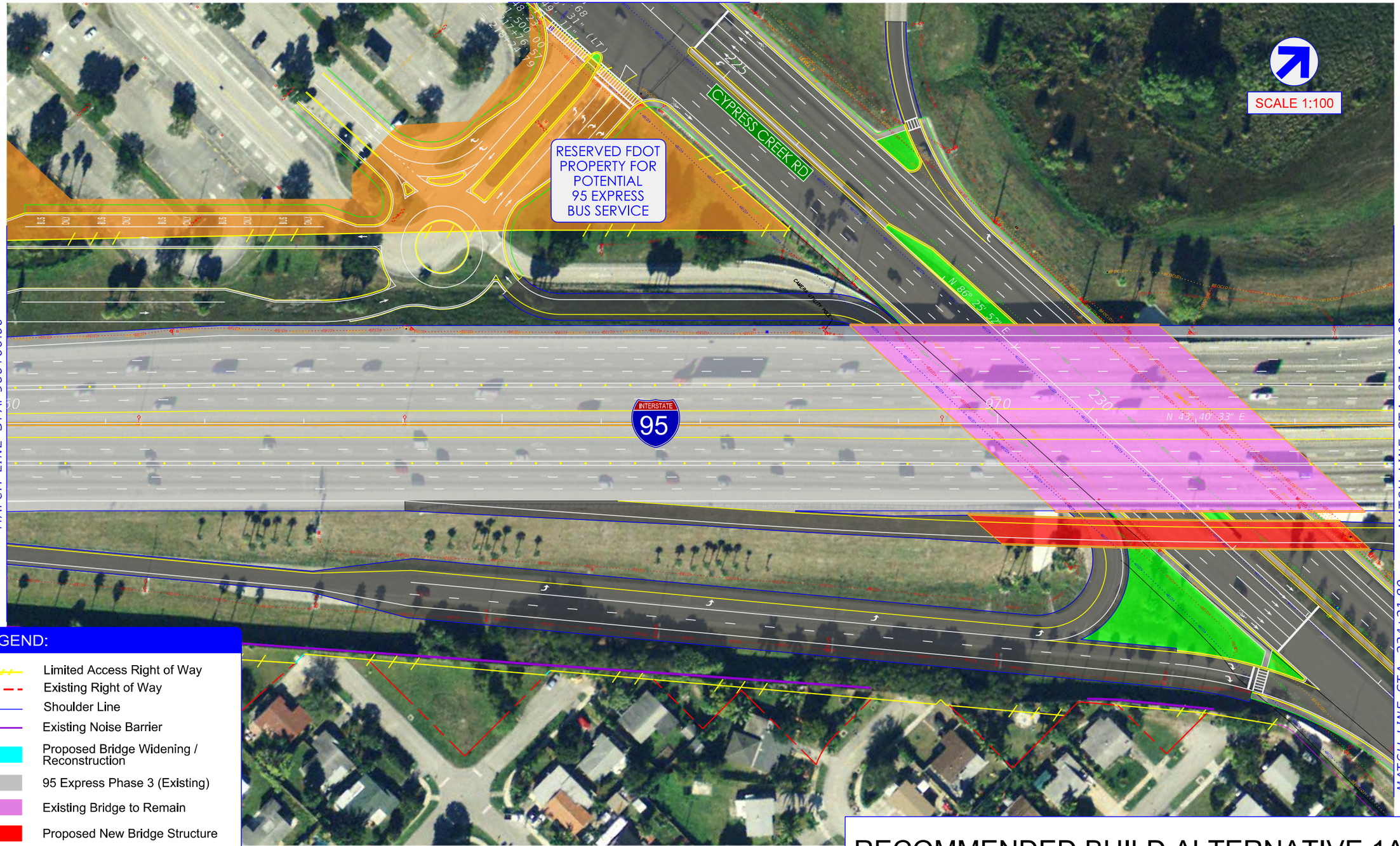
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY CONCEPT PLANS

SHEET NO. 8

MATCH LINE STA. 223+87.49



MATCH LINE STA. 960+00.00

MATCH LINE STA. 974+00.00

MATCH LINE STA. 234+21.80
SEE SHT 19

LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Shoulder Line
- Existing Noise Barrier
- Proposed Bridge Widening / Reconstruction
- 95 Express Phase 3 (Existing)
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED BUILD ALTERNATIVE 1A-6

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY CONCEPT PLANS

SHEET NO. 9



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Shoulder Line
- Existing Noise Barrier
- Proposed Bridge Widening / Reconstruction
- 95 Express Phase 3 (Existing)
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED BUILD ALTERNATIVE 1A-6

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

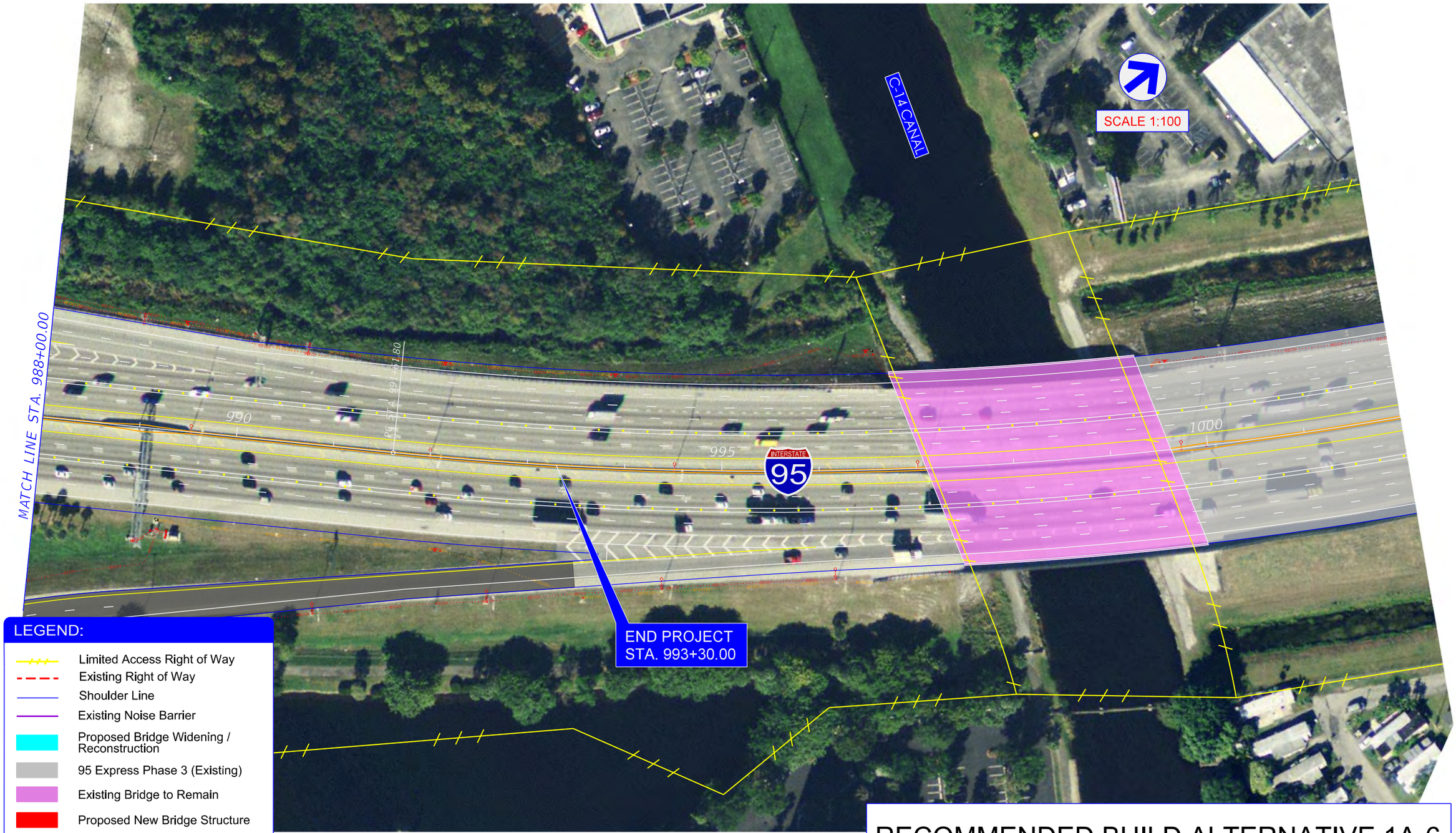
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY
CONCEPT PLANS

SHEET NO.
10



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Shoulder Line
- Existing Noise Barrier
- Proposed Bridge Widening / Reconstruction
- 95 Express Phase 3 (Existing)
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED BUILD ALTERNATIVE 1A-6

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

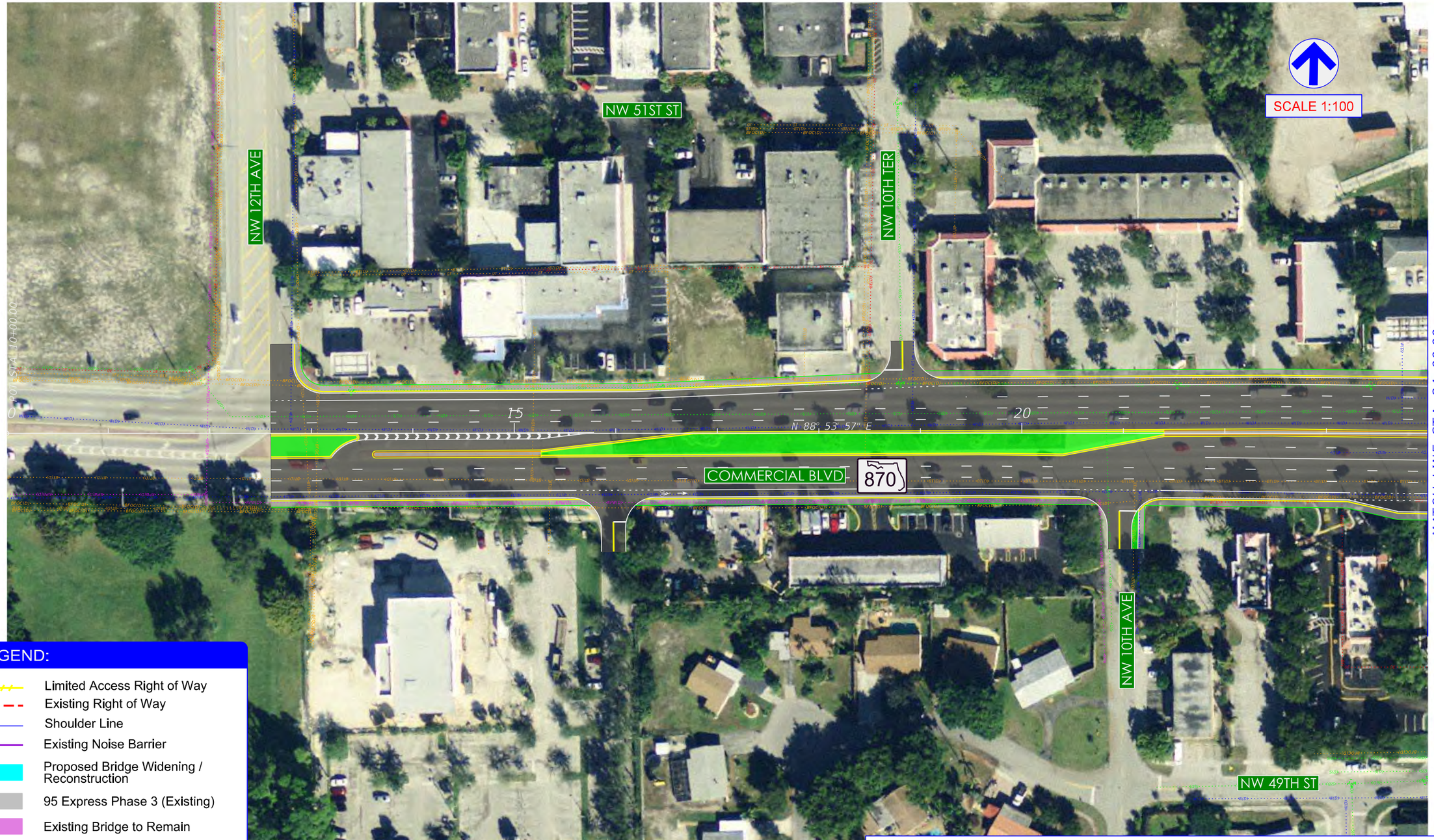
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY
CONCEPT PLANS

SHEET NO. 11



RECOMMENDED BUILD ALTERNATIVE 1A-6

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

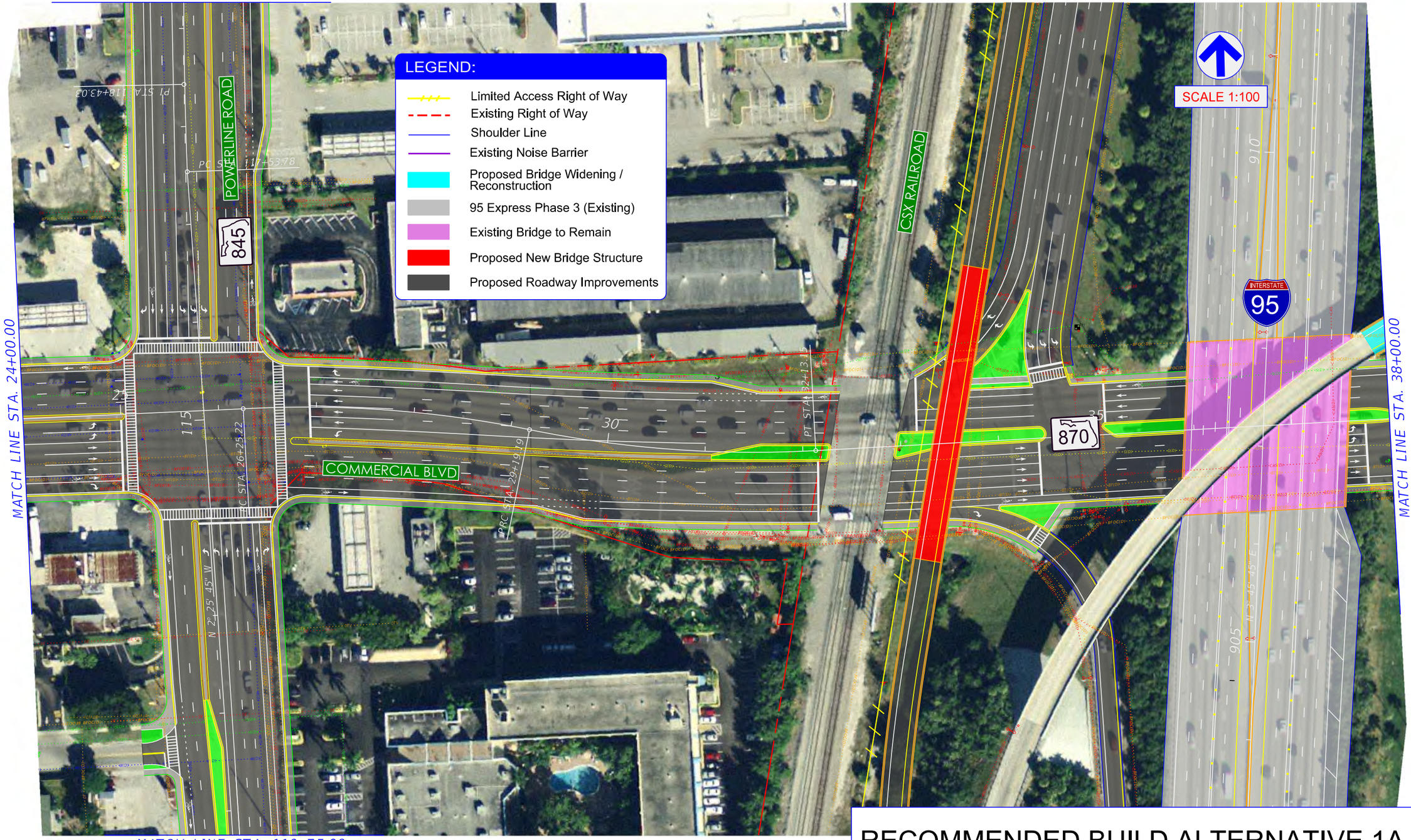
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 870	BROWARD	435808-1

PRELIMINARY CONCEPT PLANS

SHEET NO. 12

MATCH LINE STA. 119+26.70



MATCH LINE STA. 110+75.00

RECOMMENDED BUILD ALTERNATIVE 1A-6

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

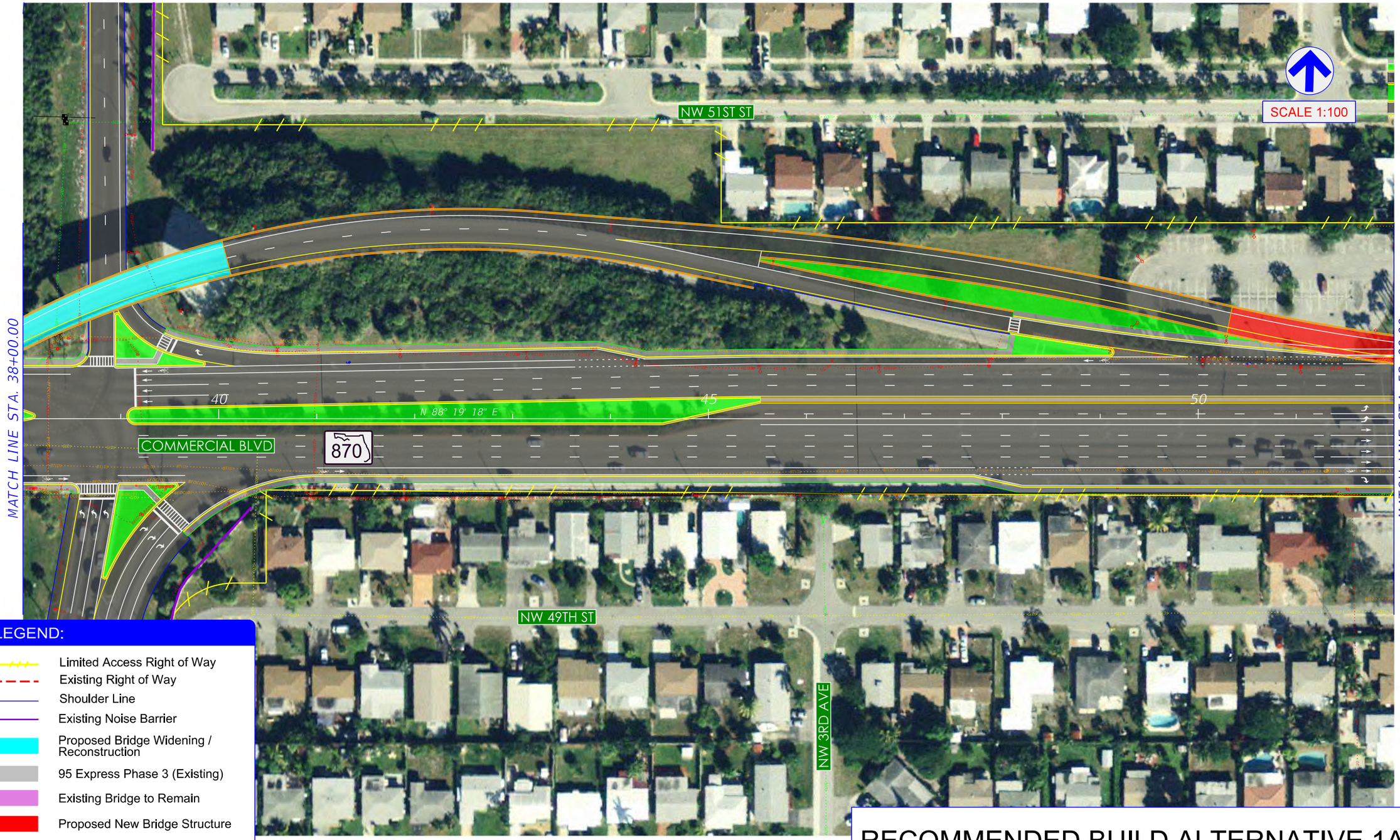
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 870	BROWARD	435808-1

PRELIMINARY CONCEPT PLANS

SHEET NO. 13



RECOMMENDED BUILD ALTERNATIVE 1A-6

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

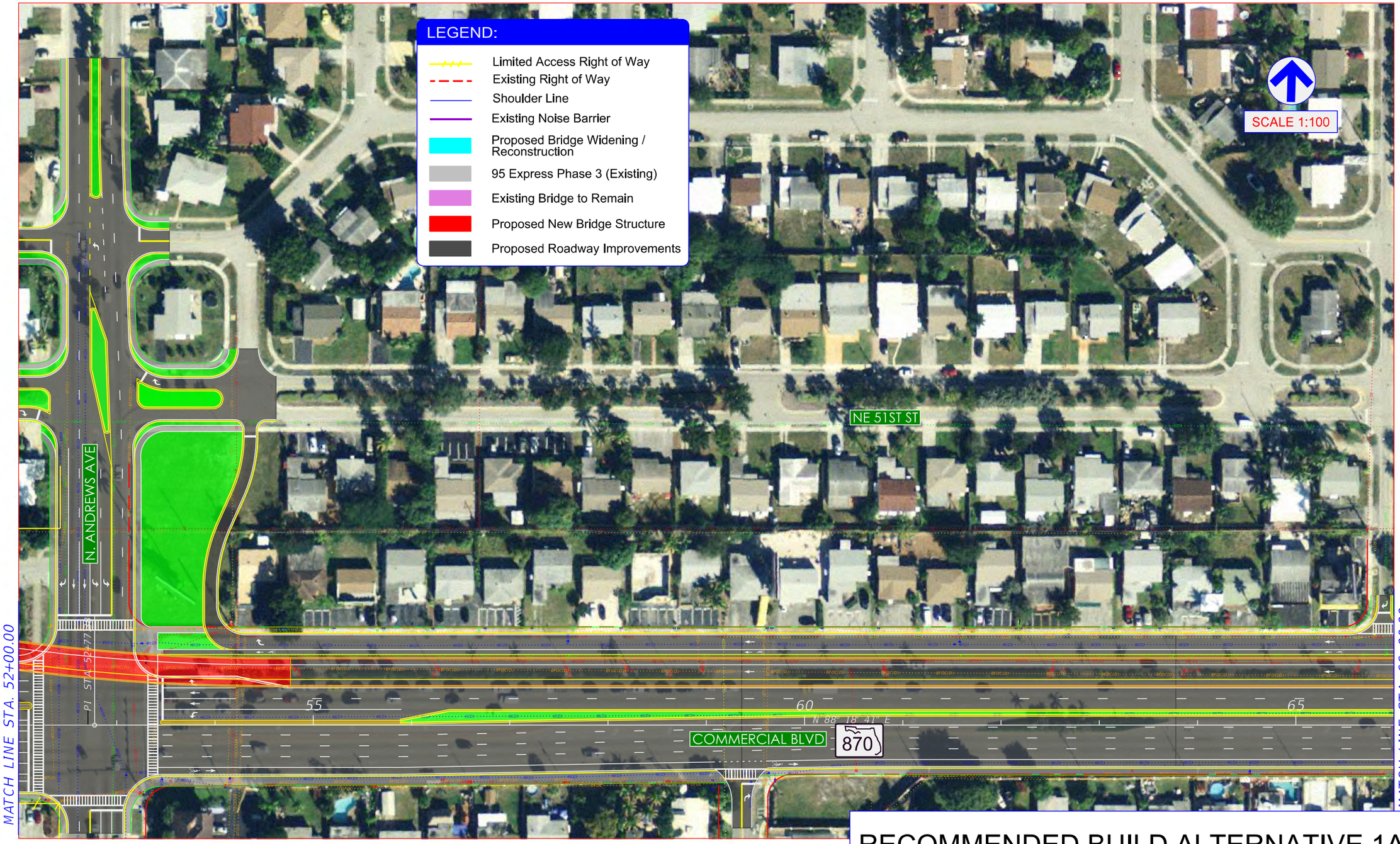
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 870	BROWARD	435808-1

PRELIMINARY CONCEPT PLANS

SHEET NO. 14



RECOMMENDED BUILD ALTERNATIVE 1A-6

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

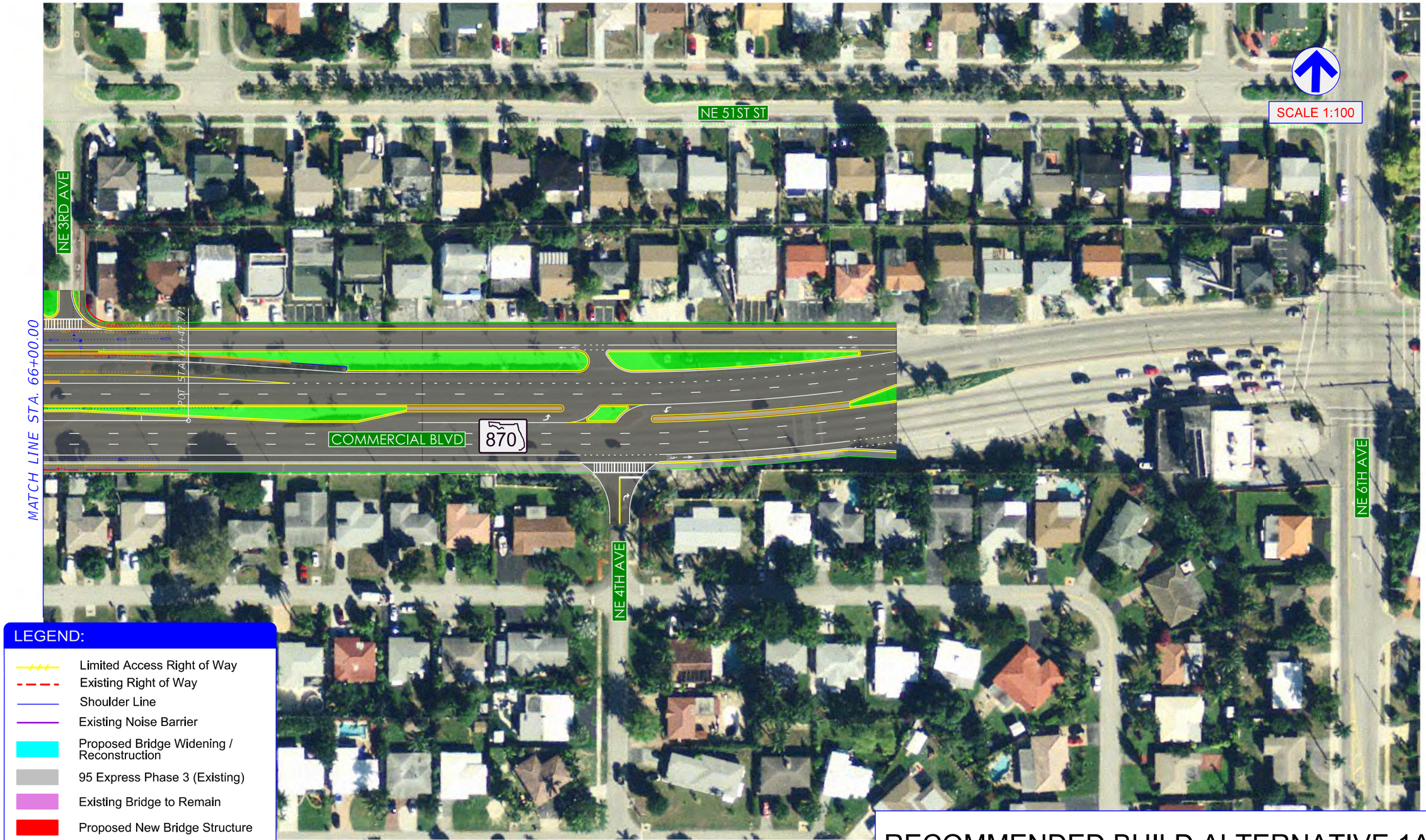
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 870	BROWARD	435808-1

PRELIMINARY CONCEPT PLANS

SHEET NO. 15



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Shoulder Line
- Existing Noise Barrier
- Proposed Bridge Widening / Reconstruction
- 95 Express Phase 3 (Existing)
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED BUILD ALTERNATIVE 1A-6

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

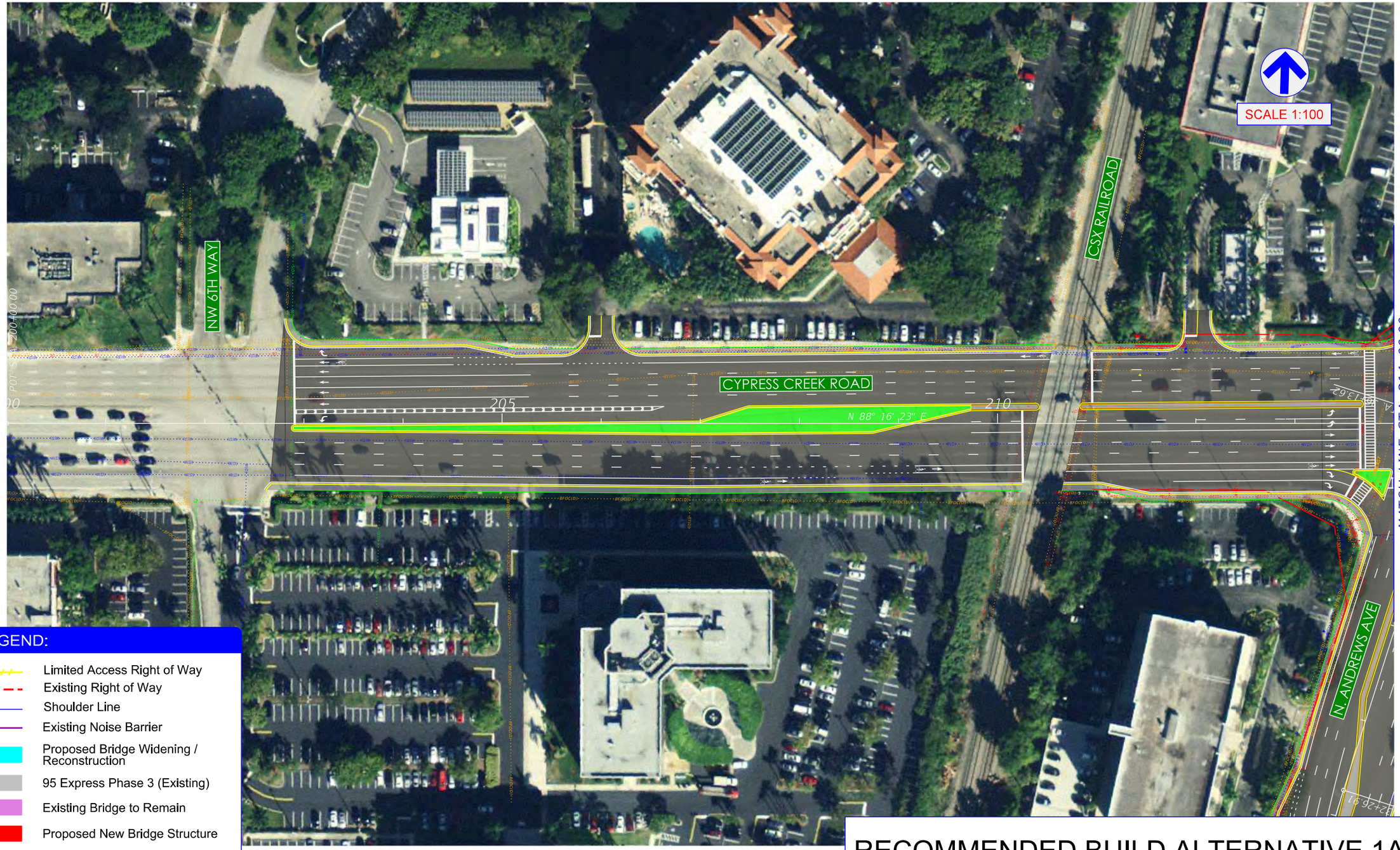
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 870	BROWARD	435808-1

PRELIMINARY CONCEPT PLANS

SHEET NO. 16



RECOMMENDED BUILD ALTERNATIVE 1A-6

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

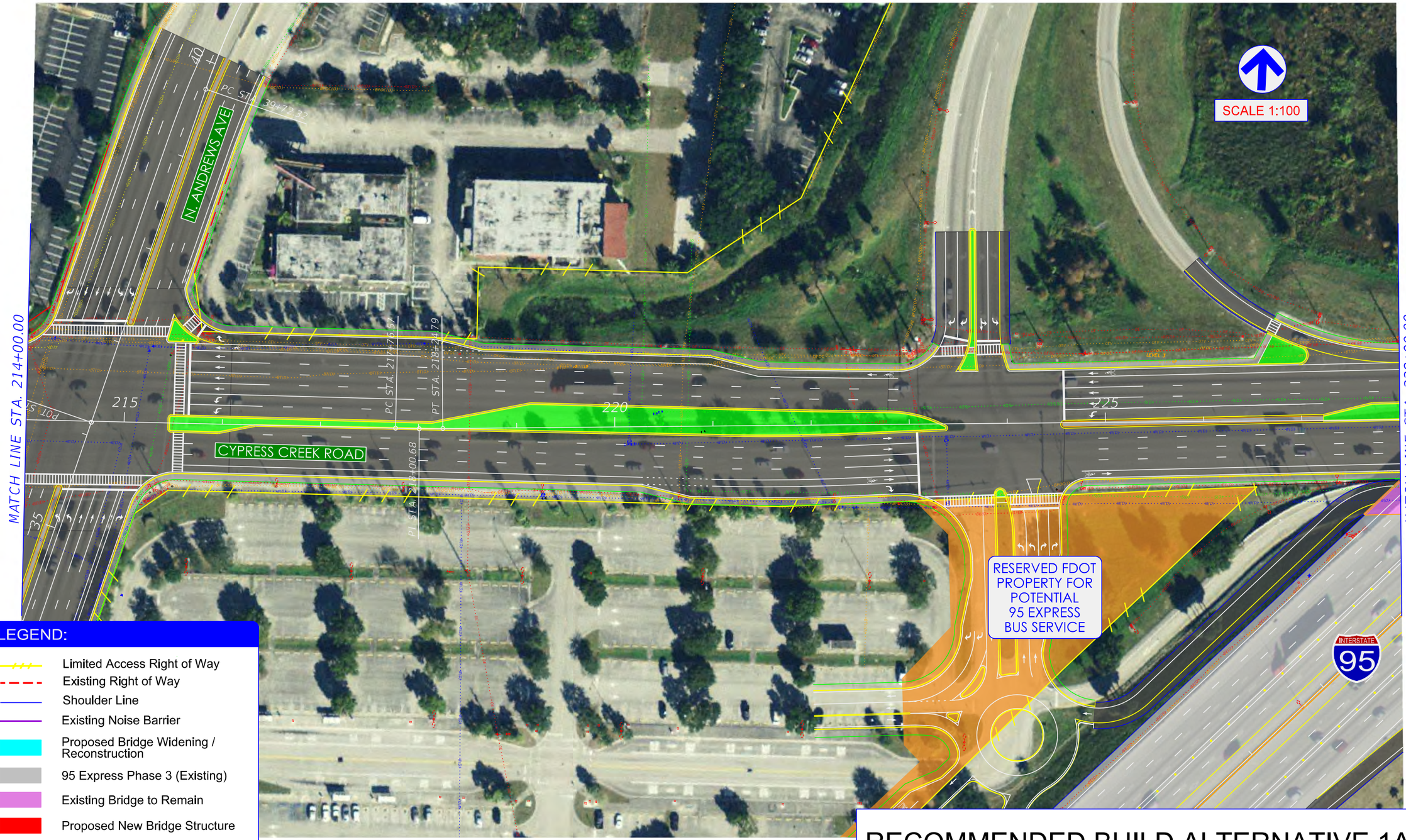
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BROWARD	435808-1

PRELIMINARY
CONCEPT PLANS

SHEET NO.
17



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Shoulder Line
- Existing Noise Barrier
- Proposed Bridge Widening / Reconstruction
- 95 Express Phase 3 (Existing)
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED BUILD ALTERNATIVE 1A-6

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

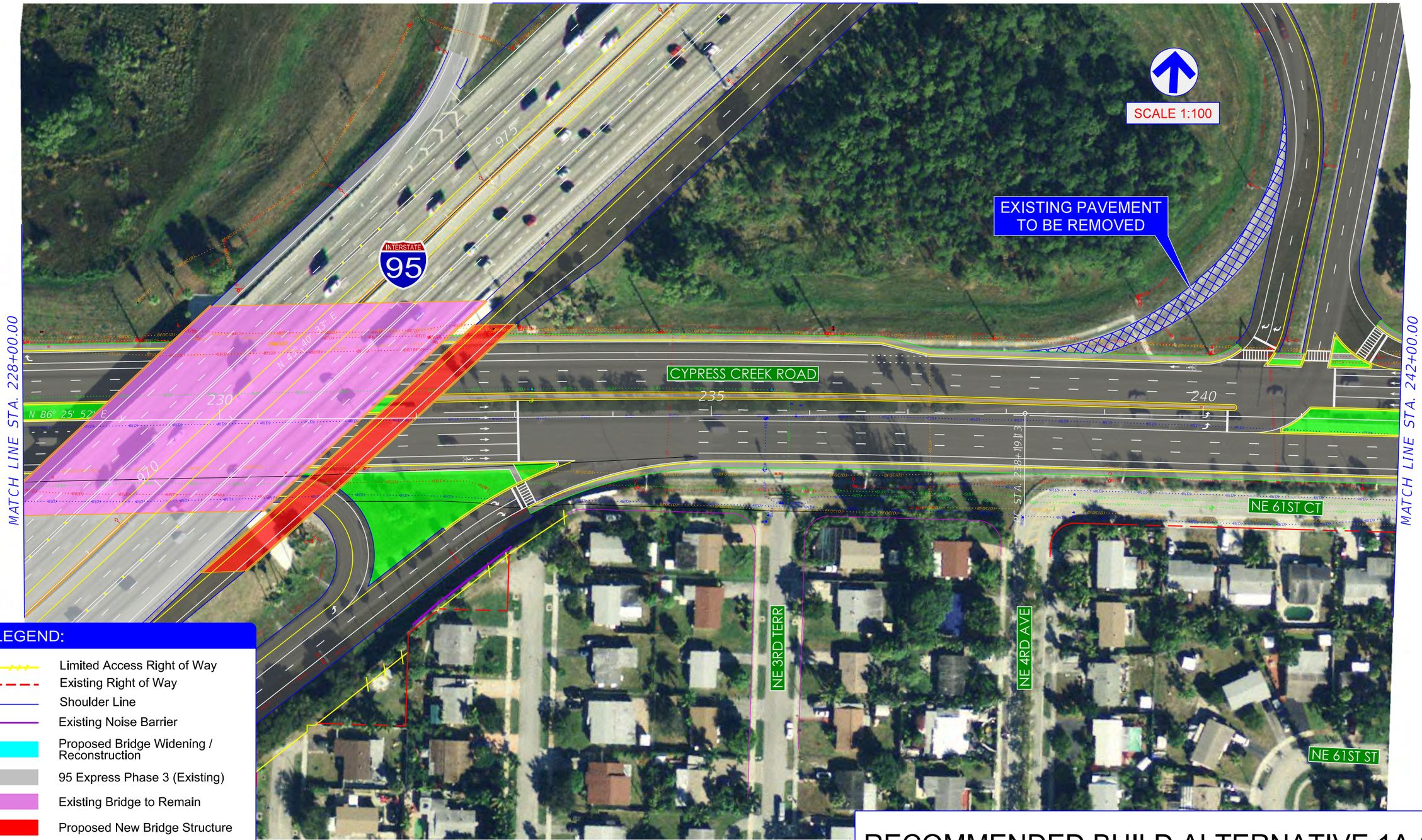
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BROWARD	435808-1

PRELIMINARY CONCEPT PLANS

SHEET NO. 18

MATCH LINE STA. 977+18.88



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Shoulder Line
- Existing Noise Barrier
- Proposed Bridge Widening / Reconstruction
- 95 Express Phase 3 (Existing)
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED BUILD ALTERNATIVE 1A-6

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

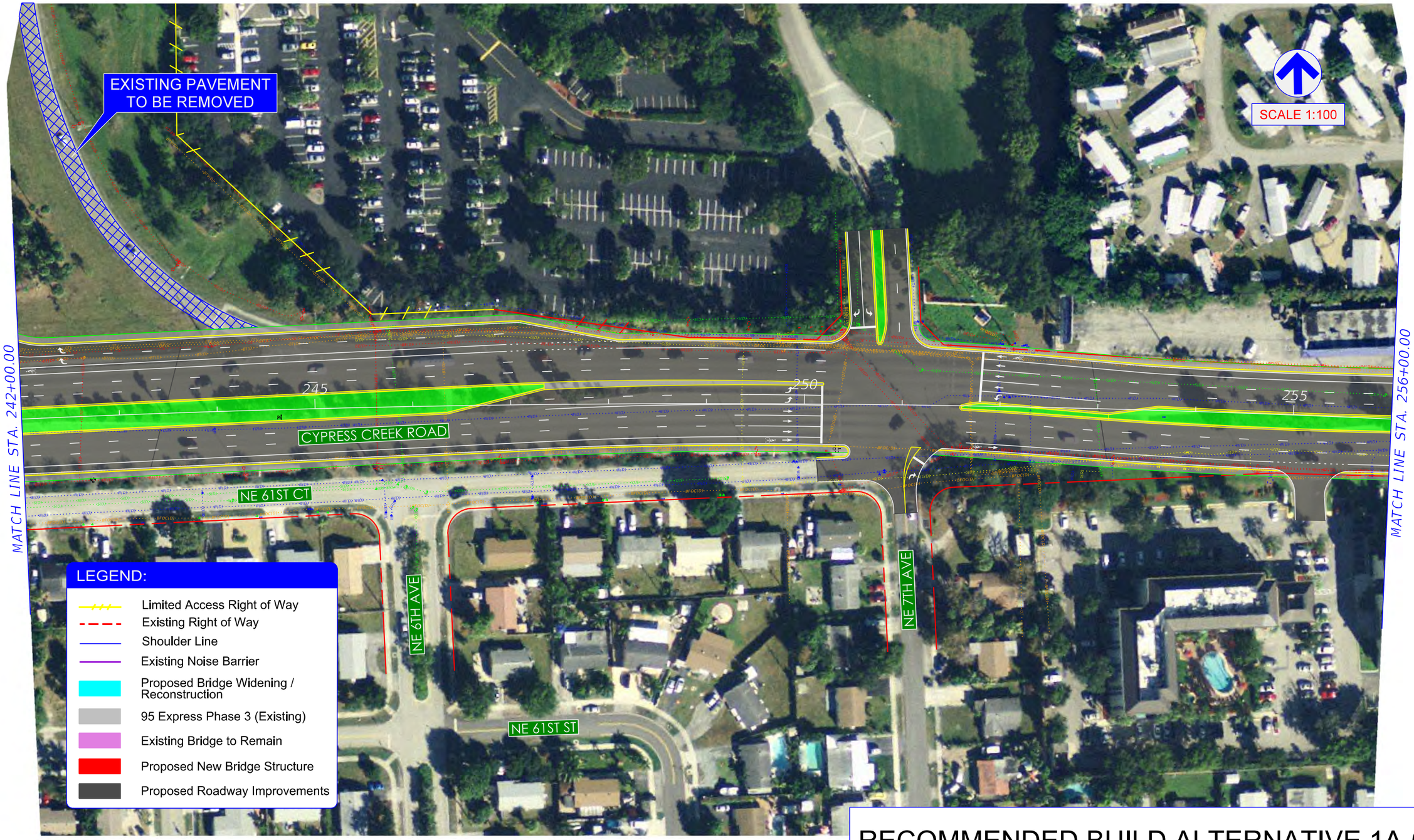
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BROWARD	435808-1

PRELIMINARY CONCEPT PLANS

SHEET NO. 19



RECOMMENDED BUILD ALTERNATIVE 1A-6

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

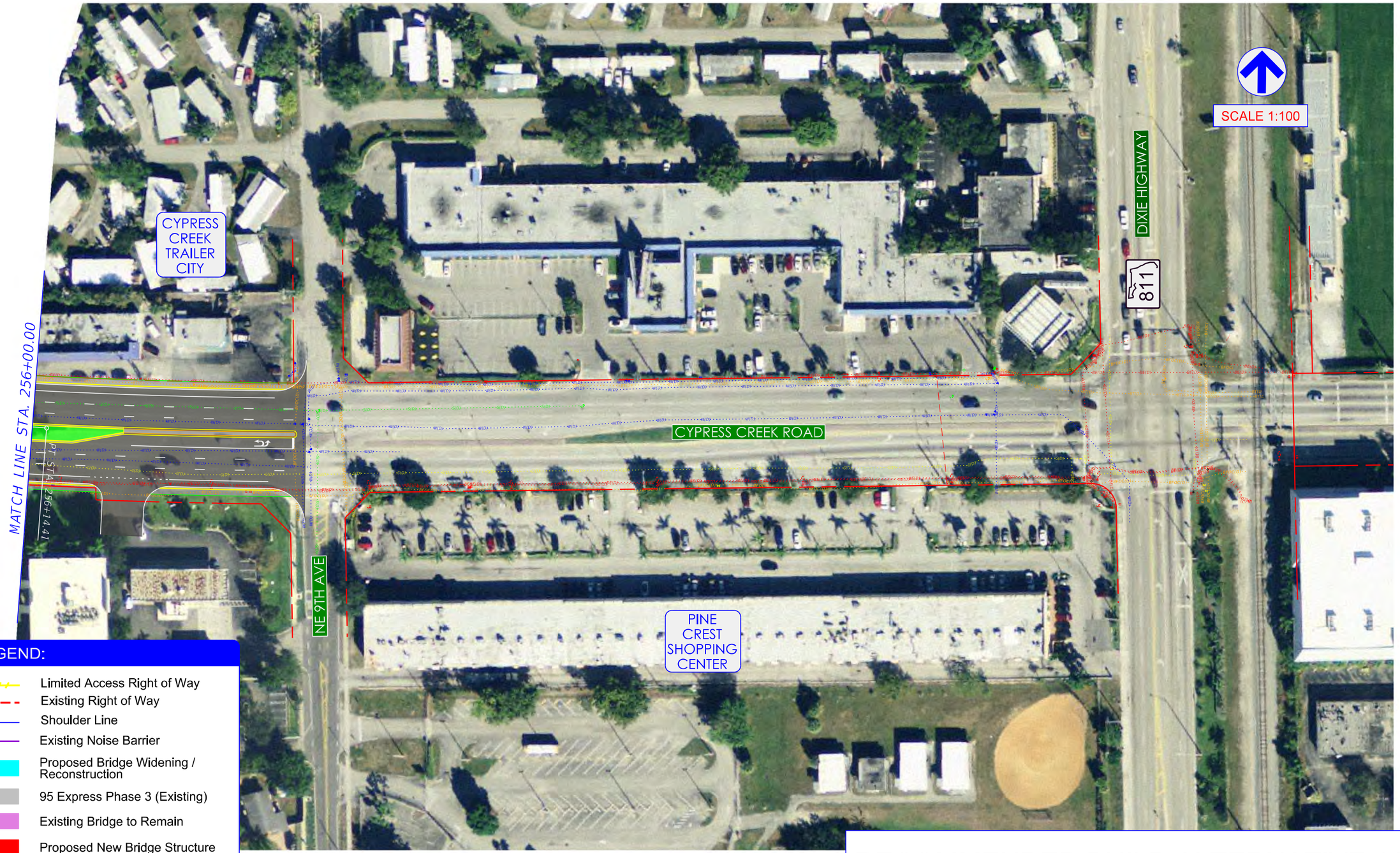
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BROWARD	435808-1

PRELIMINARY CONCEPT PLANS

SHEET NO. 20



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Shoulder Line
- Existing Noise Barrier
- Proposed Bridge Widening / Reconstruction
- 95 Express Phase 3 (Existing)
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED BUILD ALTERNATIVE 1A-6

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

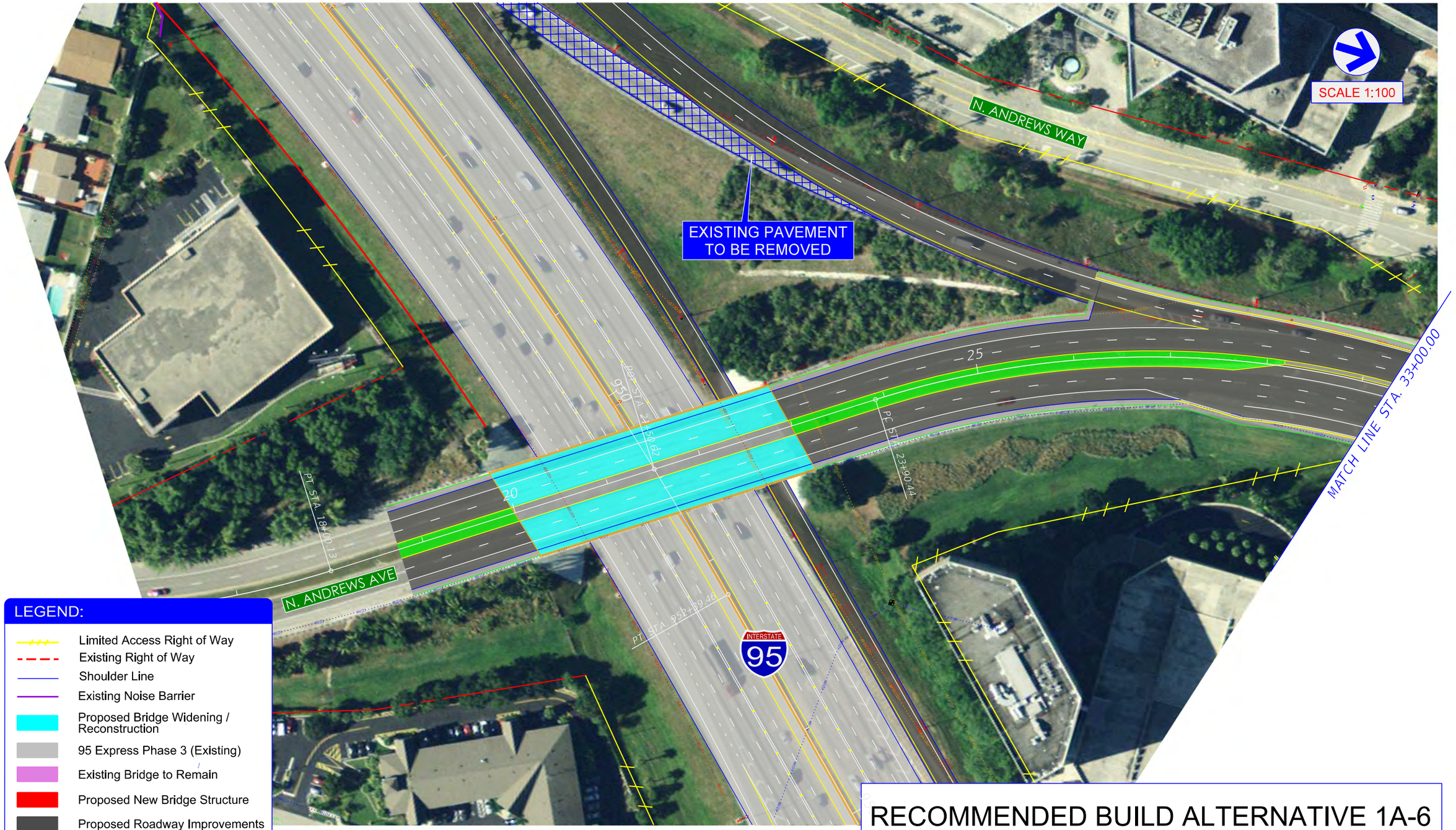
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY CONCEPT PLANS

SHEET NO. 21



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Shoulder Line
- Existing Noise Barrier
- Proposed Bridge Widening / Reconstruction
- 95 Express Phase 3 (Existing)
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED BUILD ALTERNATIVE 1A-6

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

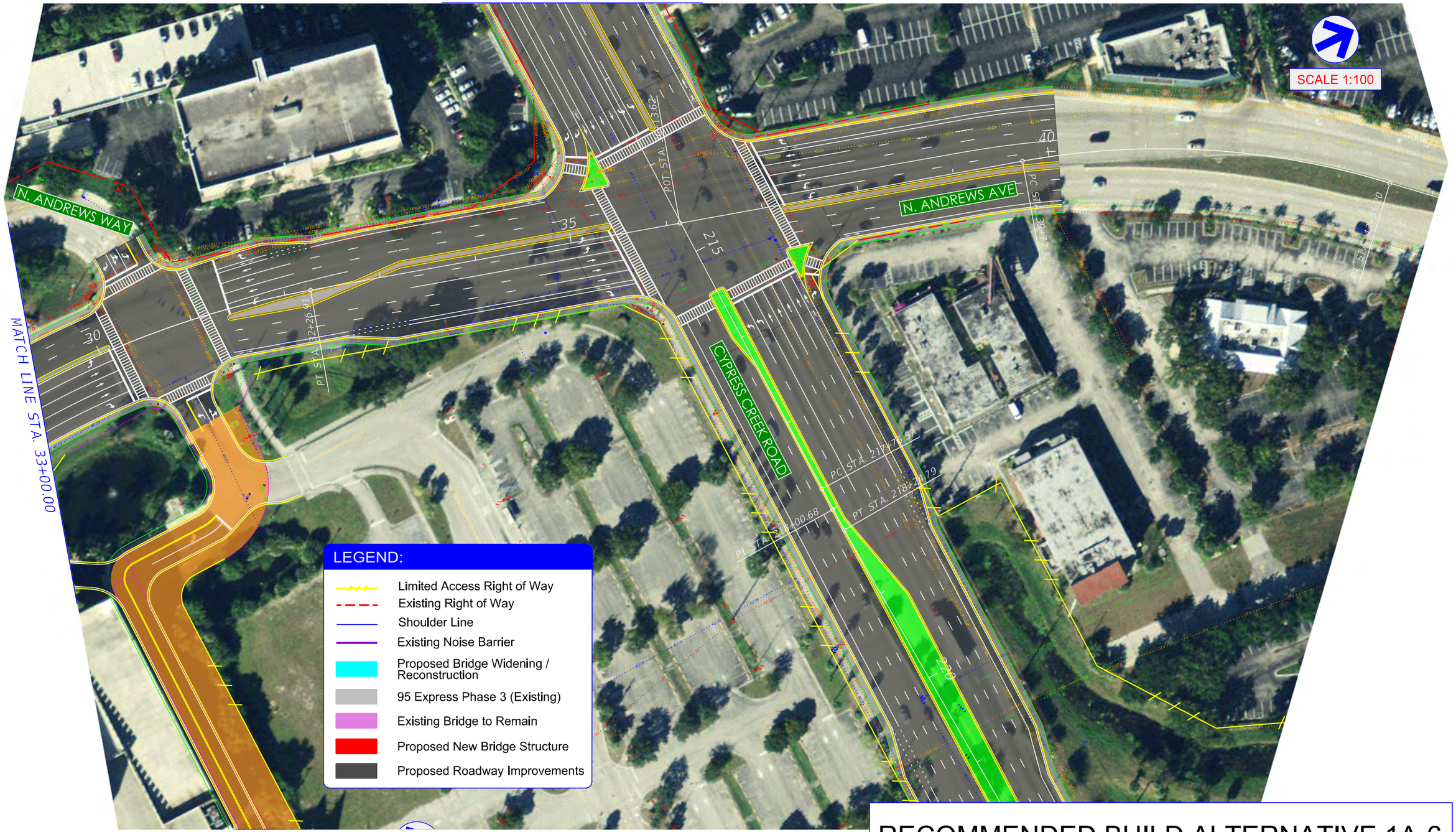
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BROWARD	435808-1

PRELIMINARY
CONCEPT PLANS

SHEET NO. 22

MATCH LINE STA. 212+10.50



RECOMMENDED BUILD ALTERNATIVE 1A-6

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BROWARD	435808-1

PRELIMINARY CONCEPT PLANS

SHEET NO. 23

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LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Shoulder Line
- Existing Noise Barrier
- Proposed Bridge Widening / Reconstruction
- 95 Express Phase 3 (Existing)
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED BUILD ALTERNATIVE 1A-6

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

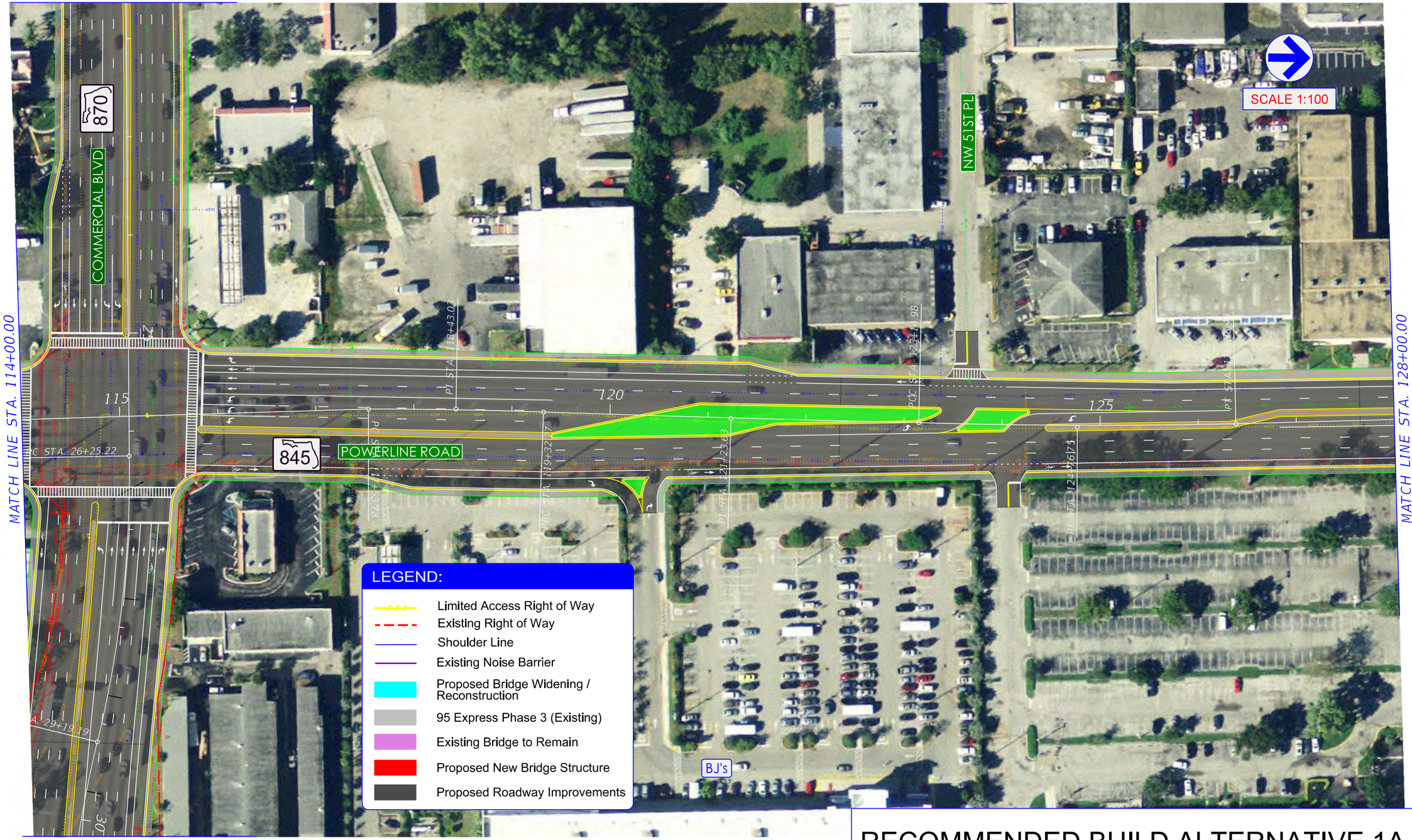
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 845	BROWARD	435808-1

PRELIMINARY
CONCEPT PLANS

SHEET NO. 24

MATCH LINE STA. 21+63.12



MATCH LINE STA. 114+00.00

MATCH LINE STA. 128+00.00

MATCH LINE STA. 30+17.48

RECOMMENDED BUILD ALTERNATIVE 1A-6

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 845	BROWARD	435808-1

PRELIMINARY CONCEPT PLANS

SHEET NO. 25



RECOMMENDED BUILD ALTERNATIVE 1A-6

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

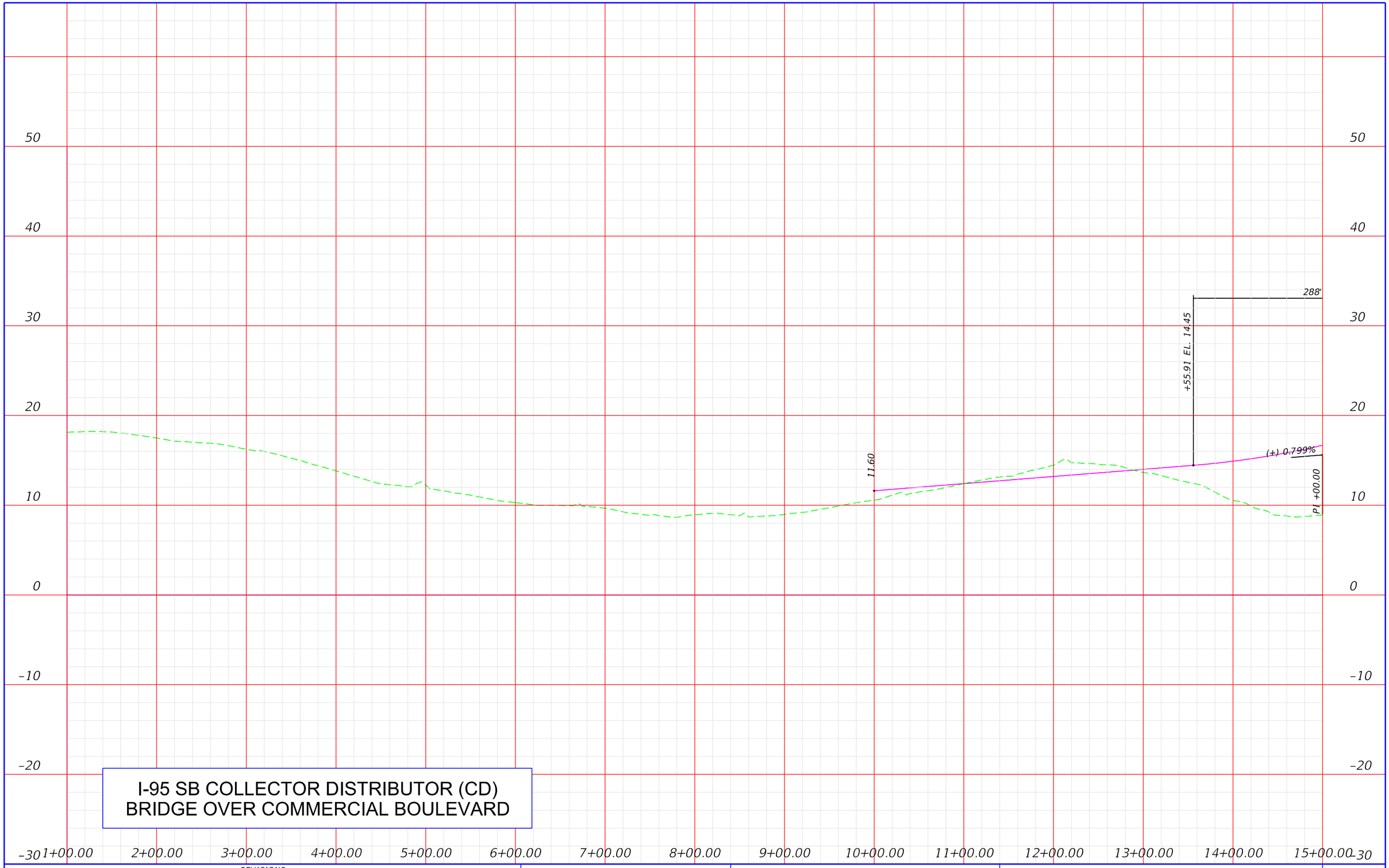
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 845	BROWARD	435808-1

PRELIMINARY CONCEPT PLANS

SHEET NO. 26



I-95 SB COLLECTOR DISTRIBUTOR (CD) BRIDGE OVER COMMERCIAL BOULEVARD

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY ROADWAY PROFILES

SHEET NO. 27

50
40
30
20
10
0
-10
-20
-30

PI +00.00
EL. 49.81
(+) 3.801%
(-) 5.004%

V.C.
+44.09
EL. 21.08
(+) 3.801%
EL. 15.60
+01.29
EL. 27.05

1,197' V.C.

COMMERCIAL BOULEVARD

15+00.00 16+00.00 17+00.00 18+00.00 19+00.00 20+00.00 21+00.00 22+00.00 23+00.00 24+00.00 25+00.00 26+00.00 27+00.00 28+00.00 29+00.00

I-95 SB COLLECTOR DISTRIBUTOR (CD)
BRIDGE OVER COMMERCIAL BOULEVARD

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

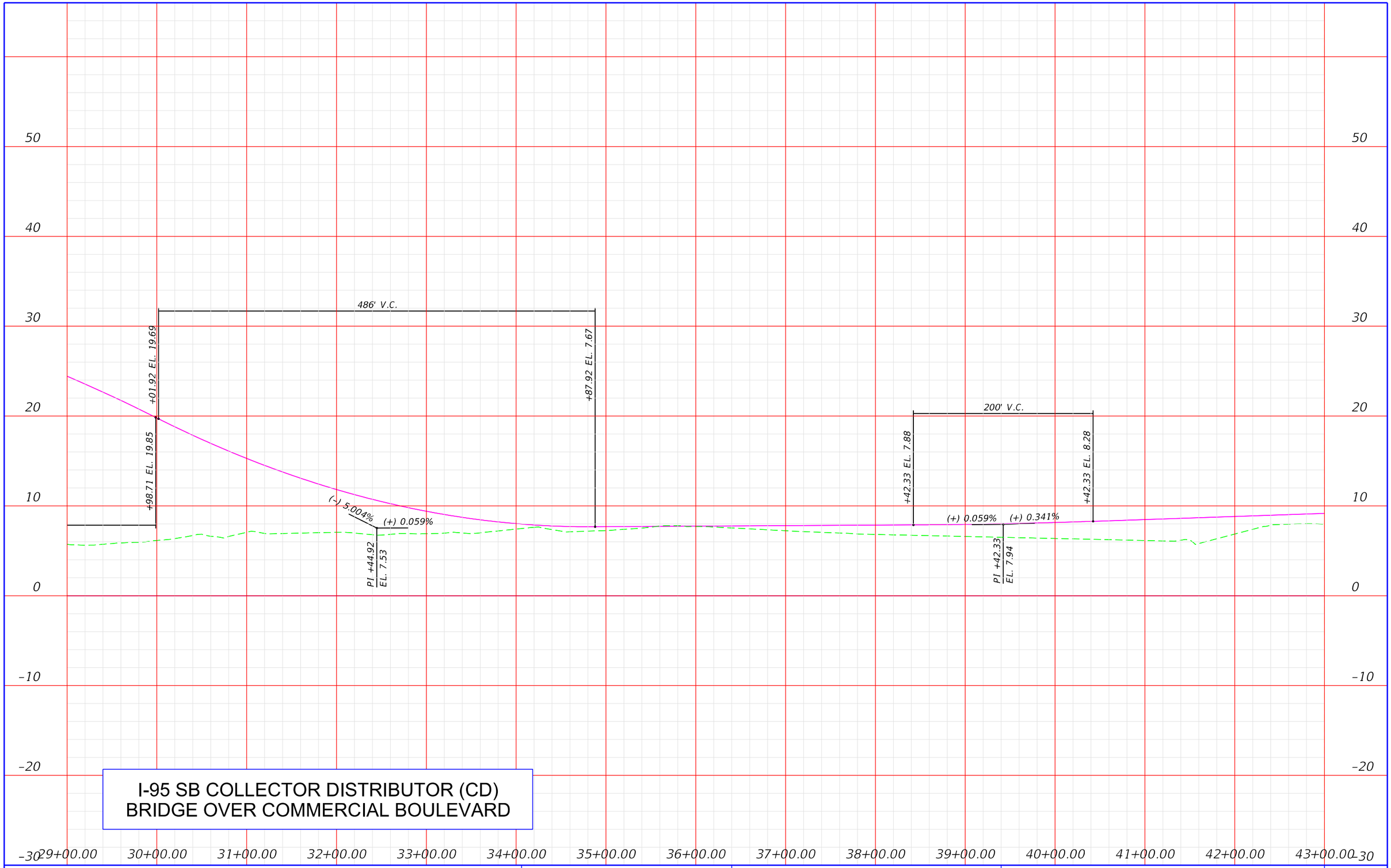
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY ROADWAY PROFILES

SHEET NO. 28

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I-95 SB COLLECTOR DISTRIBUTOR (CD)
BRIDGE OVER COMMERCIAL BOULEVARD

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY ROADWAY PROFILES

SHEET NO. 29

50
40
30
20
10
0
-10
-20
-30

11.25

43+00.00 44+00.00 45+00.00 46+00.00 47+00.00 48+00.00 49+00.00 50+00.00 51+00.00 52+00.00 53+00.00 54+00.00 55+00.00 56+00.00 57+00.00

I-95 SB COLLECTOR DISTRIBUTOR (CD) BRIDGE OVER COMMERCIAL BOULEVARD

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

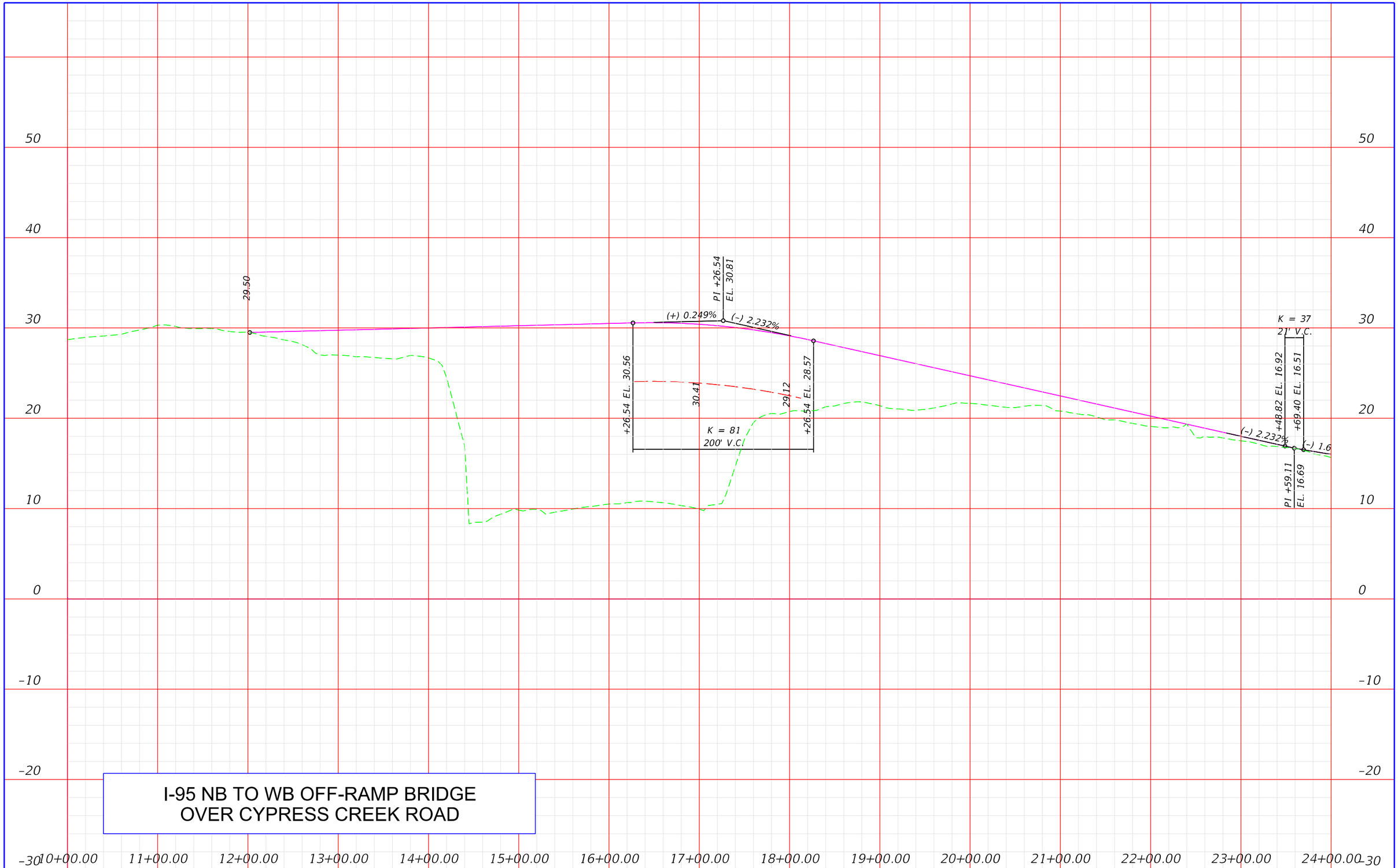
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
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CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY ROADWAY PROFILES

SHEET NO. 30



I-95 NB TO WB OFF-RAMP BRIDGE OVER CYPRESS CREEK ROAD

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

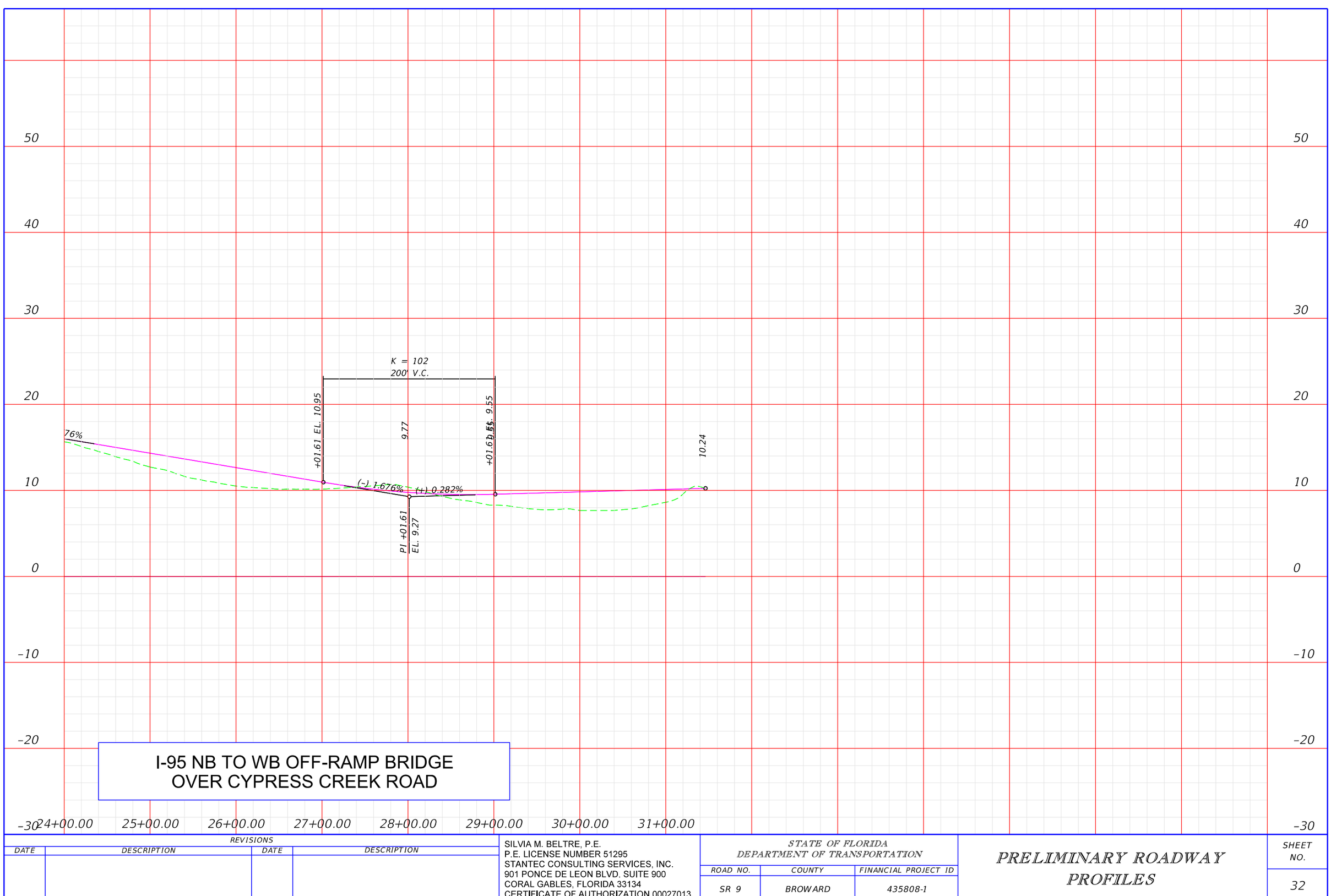
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY ROADWAY PROFILES

SHEET NO. 31



I-95 NB TO WB OFF-RAMP BRIDGE OVER CYPRESS CREEK ROAD

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

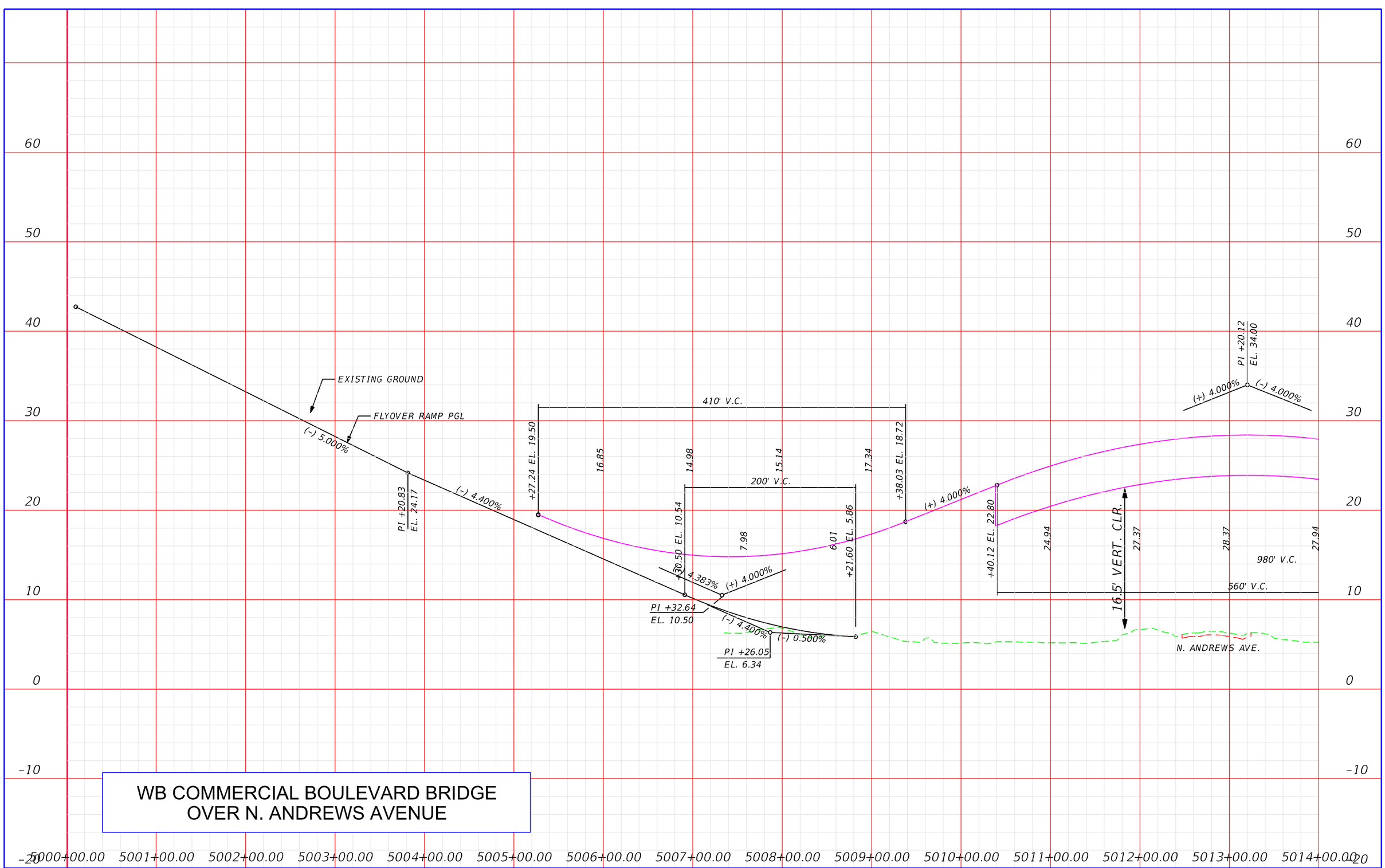
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY ROADWAY PROFILES

SHEET NO. 32

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WB COMMERCIAL BOULEVARD BRIDGE OVER N. ANDREWS AVENUE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

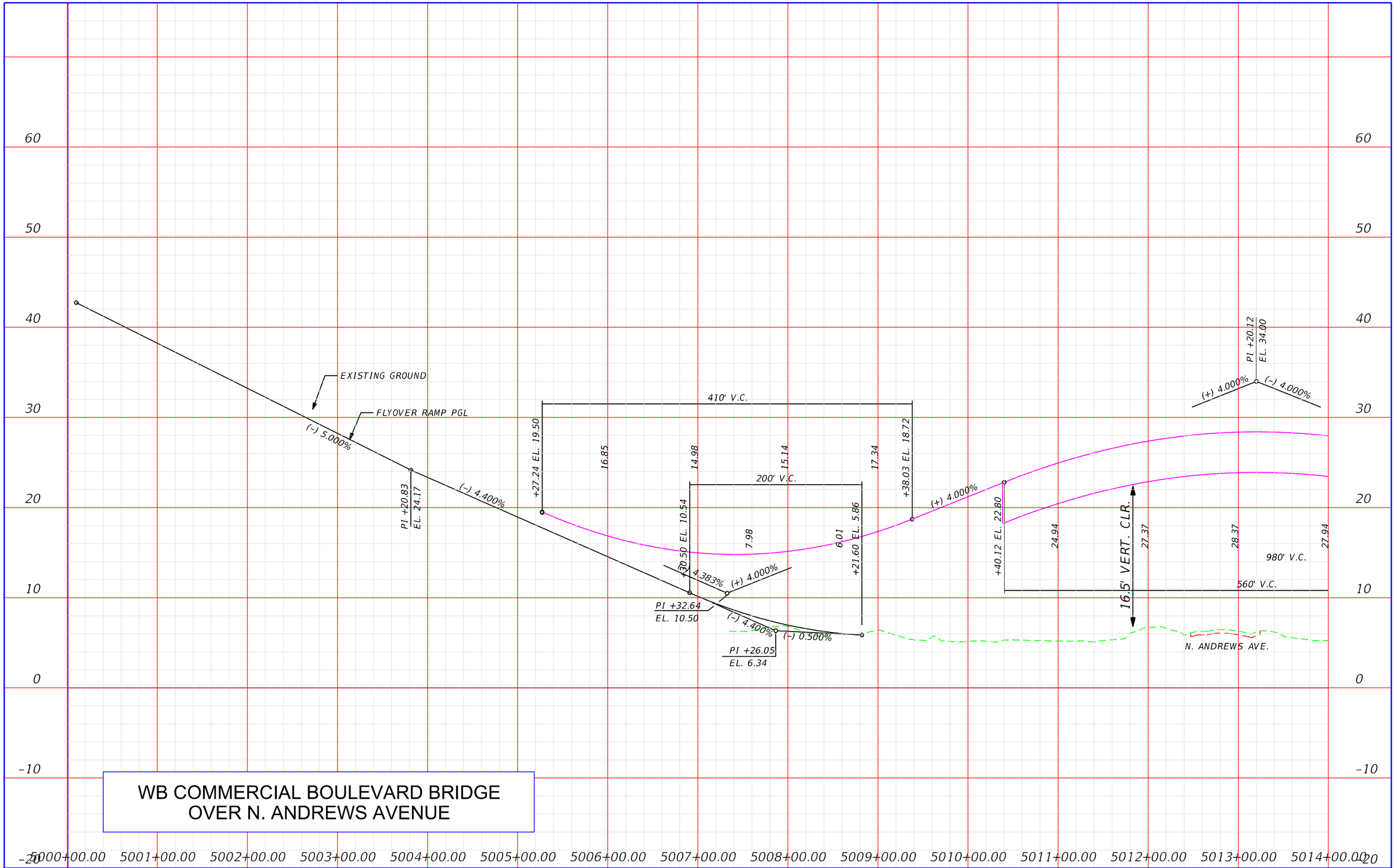
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 870	BROWARD	435808-1

PRELIMINARY ROADWAY PROFILES

SHEET NO. 33



WB COMMERCIAL BOULEVARD BRIDGE OVER N. ANDREWS AVENUE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

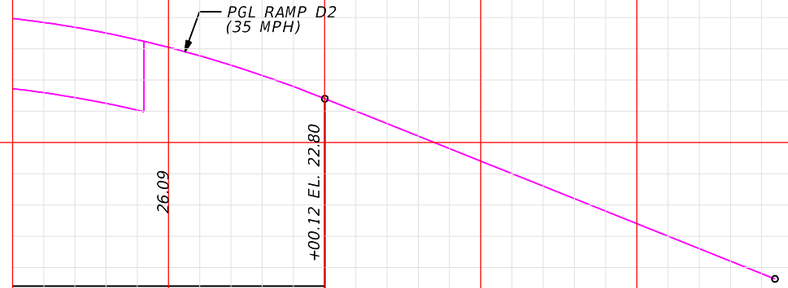
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 870	BROWARD	435808-1

PRELIMINARY ROADWAY PROFILES

SHEET NO. 34



60 50 40 30 20 10 0 -10 -20

5014+00.00 5015+00.00 5016+00.00 5017+00.00 5018+00.00 5019+00.00 5020+00.00 5021+00.00 5022+00.00 5023+00.00 5024+00.00 5025+00.00 5026+00.00 5027+00.00 5028+00.00

WB COMMERCIAL BOULEVARD BRIDGE OVER N. ANDREWS AVENUE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 870	BROWARD	435808-1

PRELIMINARY ROADWAY PROFILES

SHEET NO. 35

70
60
50
40
30
20
10
0
-10

10+00.00 11+00.00 12+00.00 13+00.00 14+00.00 15+00.00 16+00.00 17+00.00 18+00.00 19+00.00 20+00.00 21+00.00 22+00.00 23+00.00

+90.00 EL. 38.50
38.64
39.16

I-95

I-95 SB CD SYSTEM

N. ANDREWS AVENUE BRIDGE OVER I-95

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BROWARD	435808-1

PRELIMINARY ROADWAY PROFILES

SHEET NO.
36

70

60

50

40

30

20

10

0

-10

24+00.00 25+00.00 26+00.00 27+00.00 28+00.00 29+00.00 30+00.00 31+00.00 32+00.00 33+00.00 34+00.00 35+00.00 36+00.00 37+00.00

PI +10.00
EL. 41.80

(+) 1.500%

(-) 5.500%

38.04

35.29

30.90

+30.00 EL. 29.26

440' V.C.

235' V.C.

+10.75 EL. 18.96

14.48

10.91

9.79

(-) 5.100%

(-) 2.106%

PI +28.25
EL. 12.26

N. ANDREWS AVENUE BRIDGE OVER I-95

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

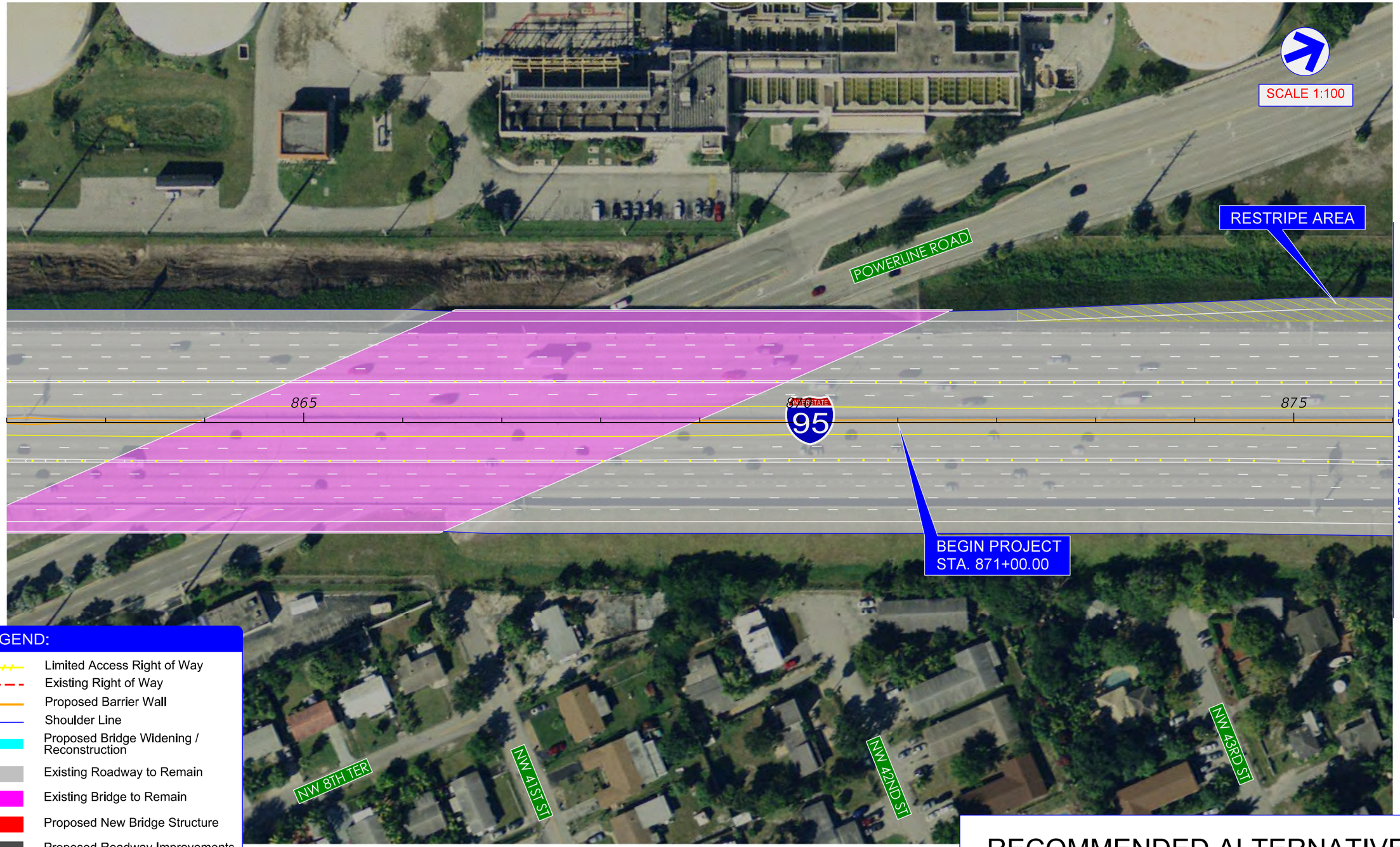
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BROWARD	435808-1

PRELIMINARY ROADWAY PROFILES

SHEET NO. 37



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Proposed Barrier Wall
- Shoulder Line
- Proposed Bridge Widening / Reconstruction
- Existing Roadway to Remain
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

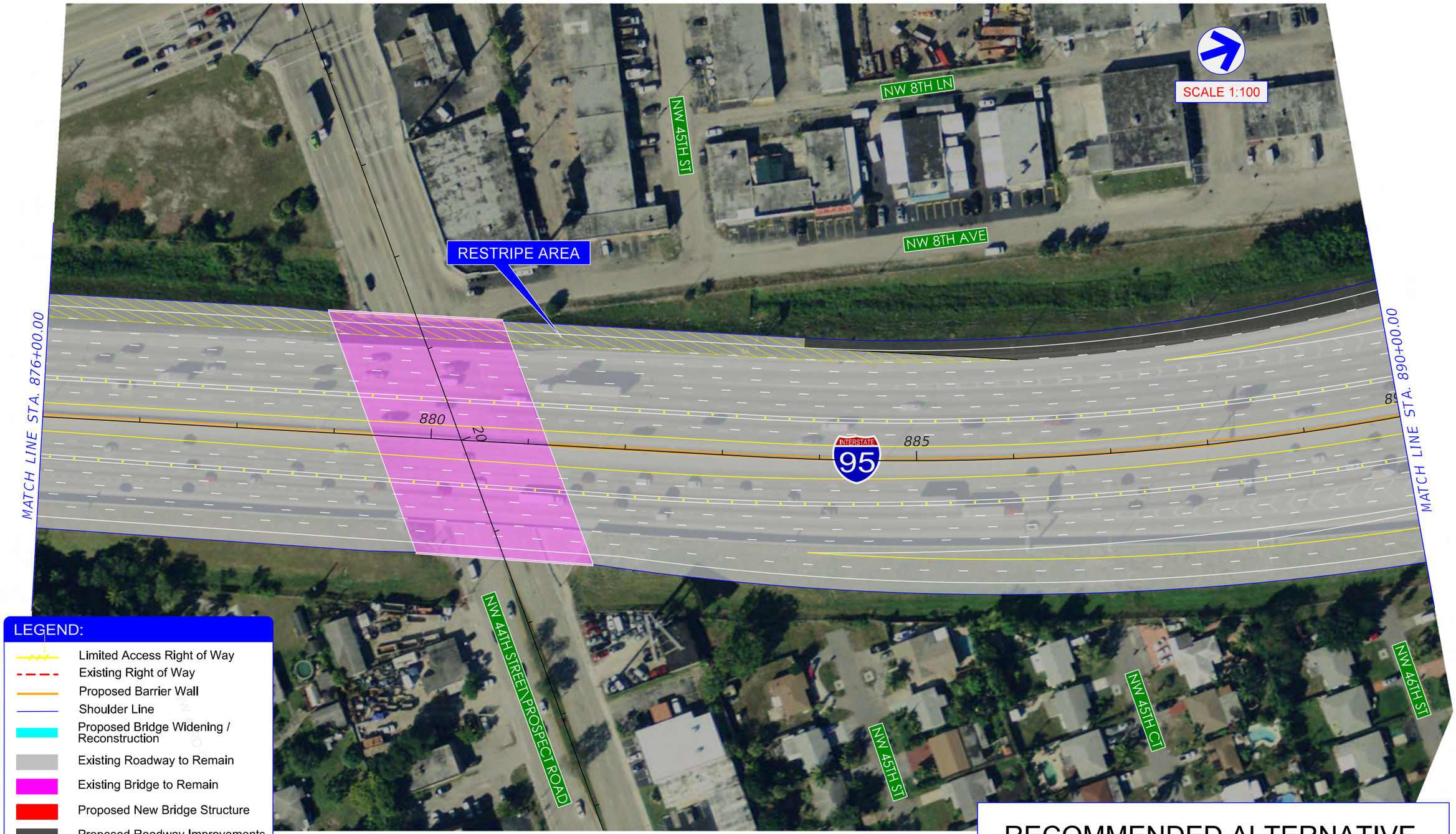
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-1



RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

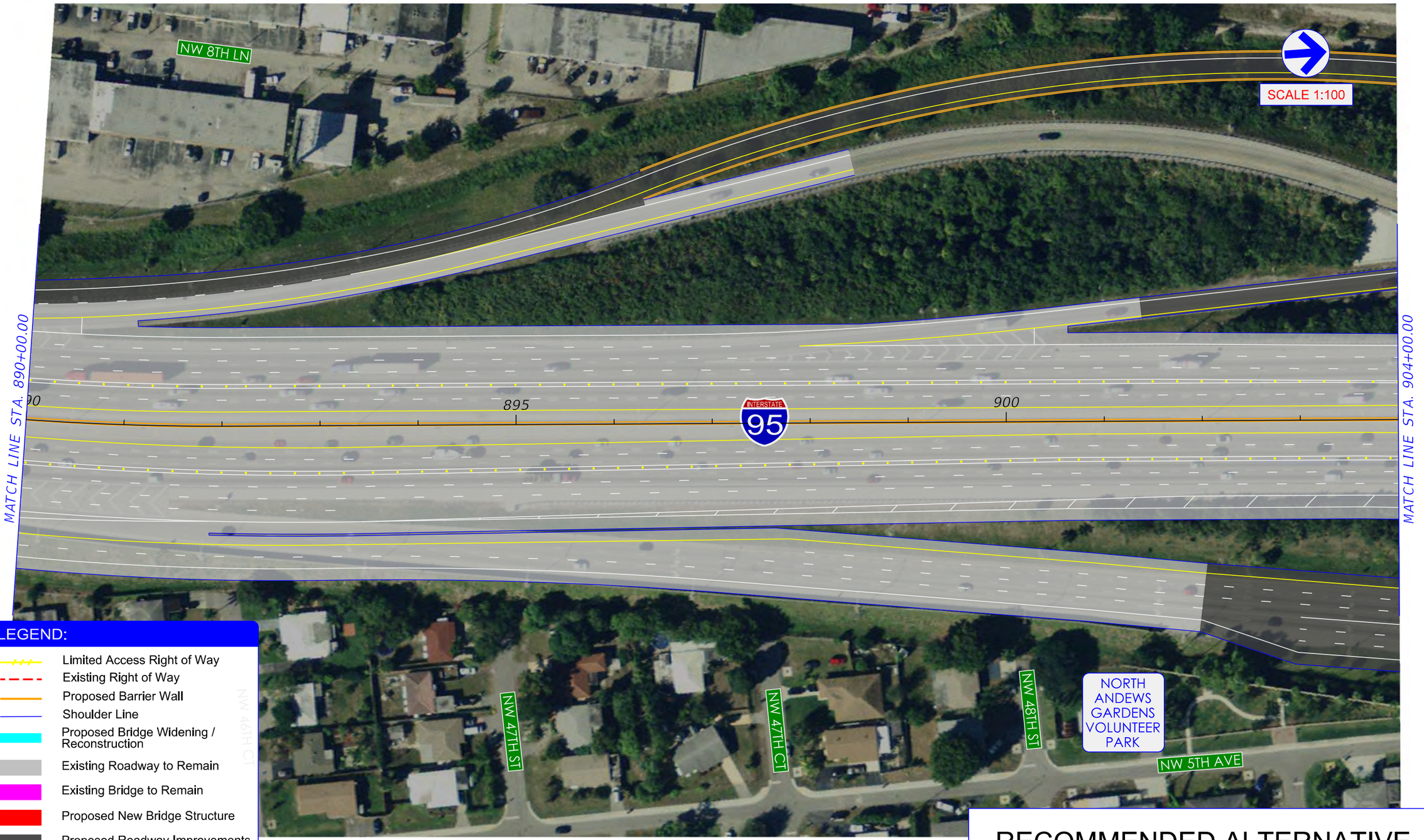
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-2



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Proposed Barrier Wall
- Shoulder Line
- Proposed Bridge Widening / Reconstruction
- Existing Roadway to Remain
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

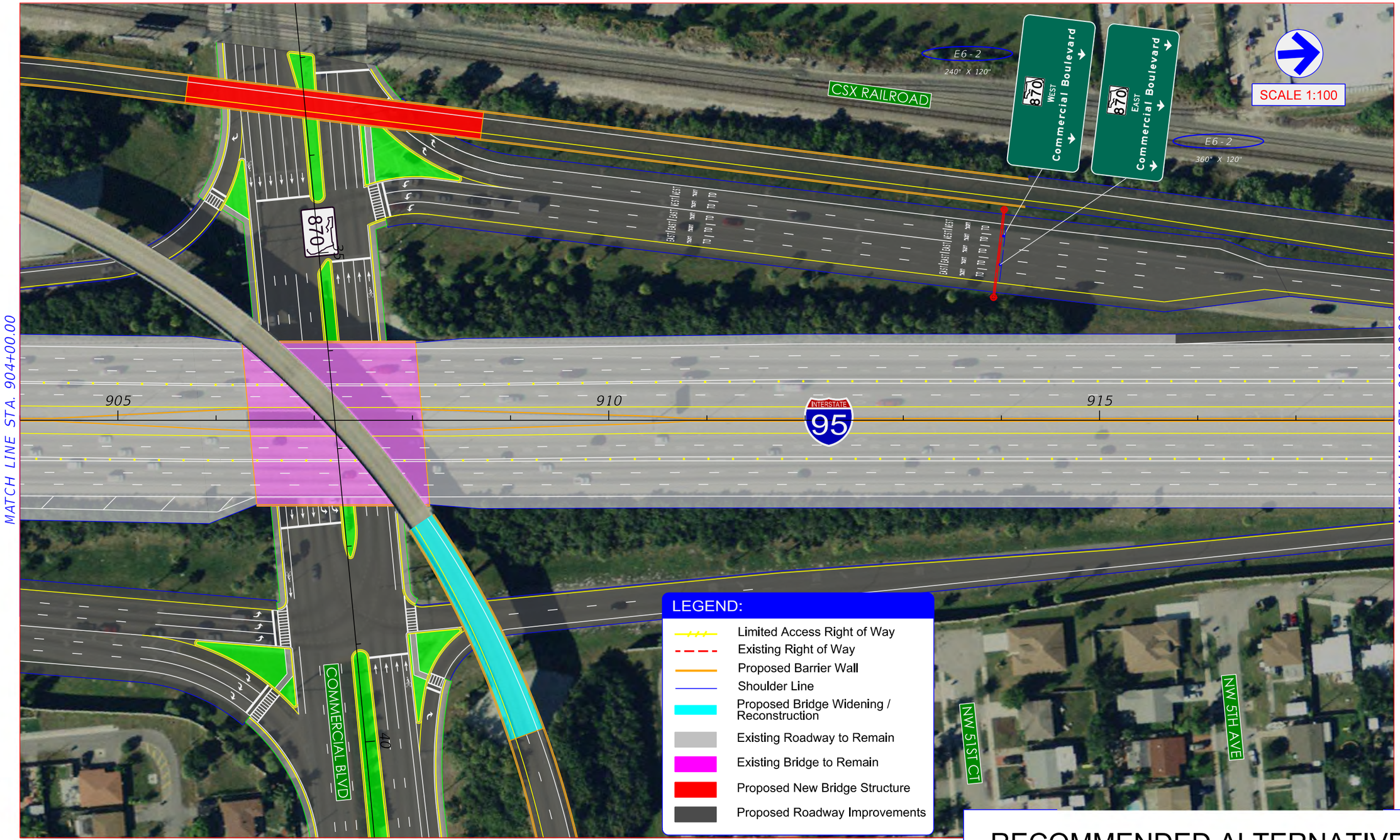
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-3



RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

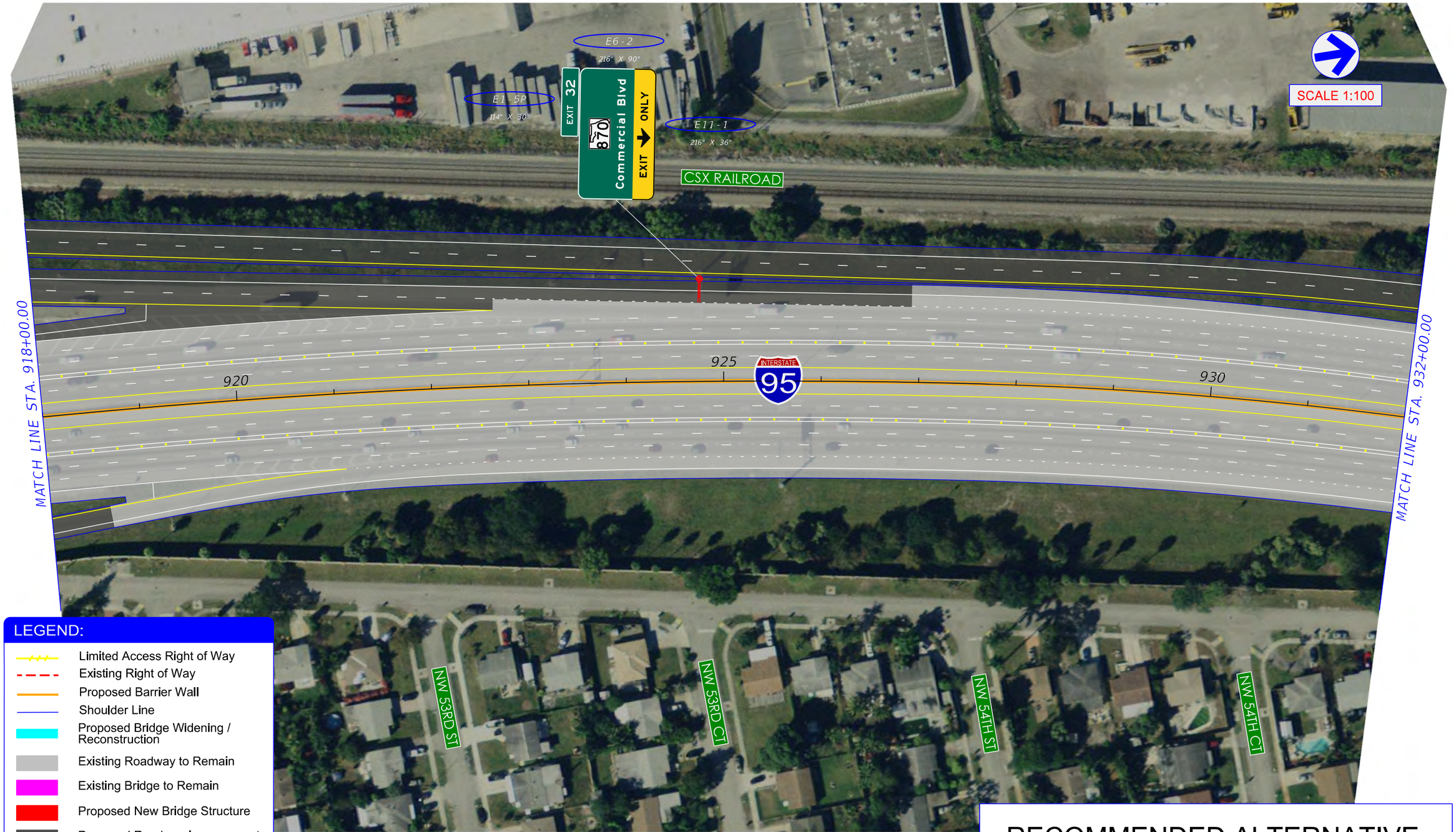
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-4



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Proposed Barrier Wall
- Shoulder Line
- Proposed Bridge Widening / Reconstruction
- Existing Roadway to Remain
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

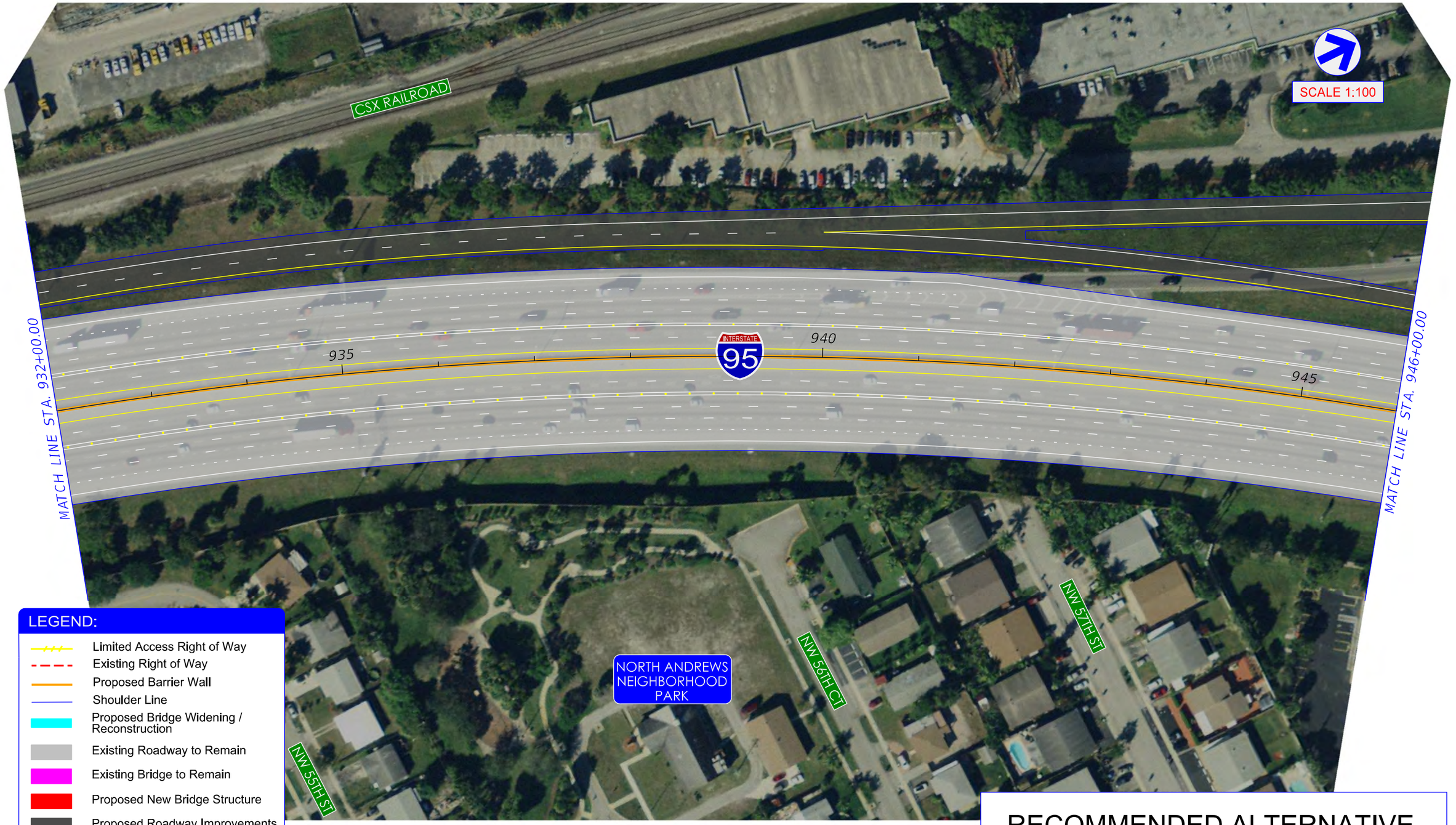
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-5



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Proposed Barrier Wall
- Shoulder Line
- Proposed Bridge Widening / Reconstruction
- Existing Roadway to Remain
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

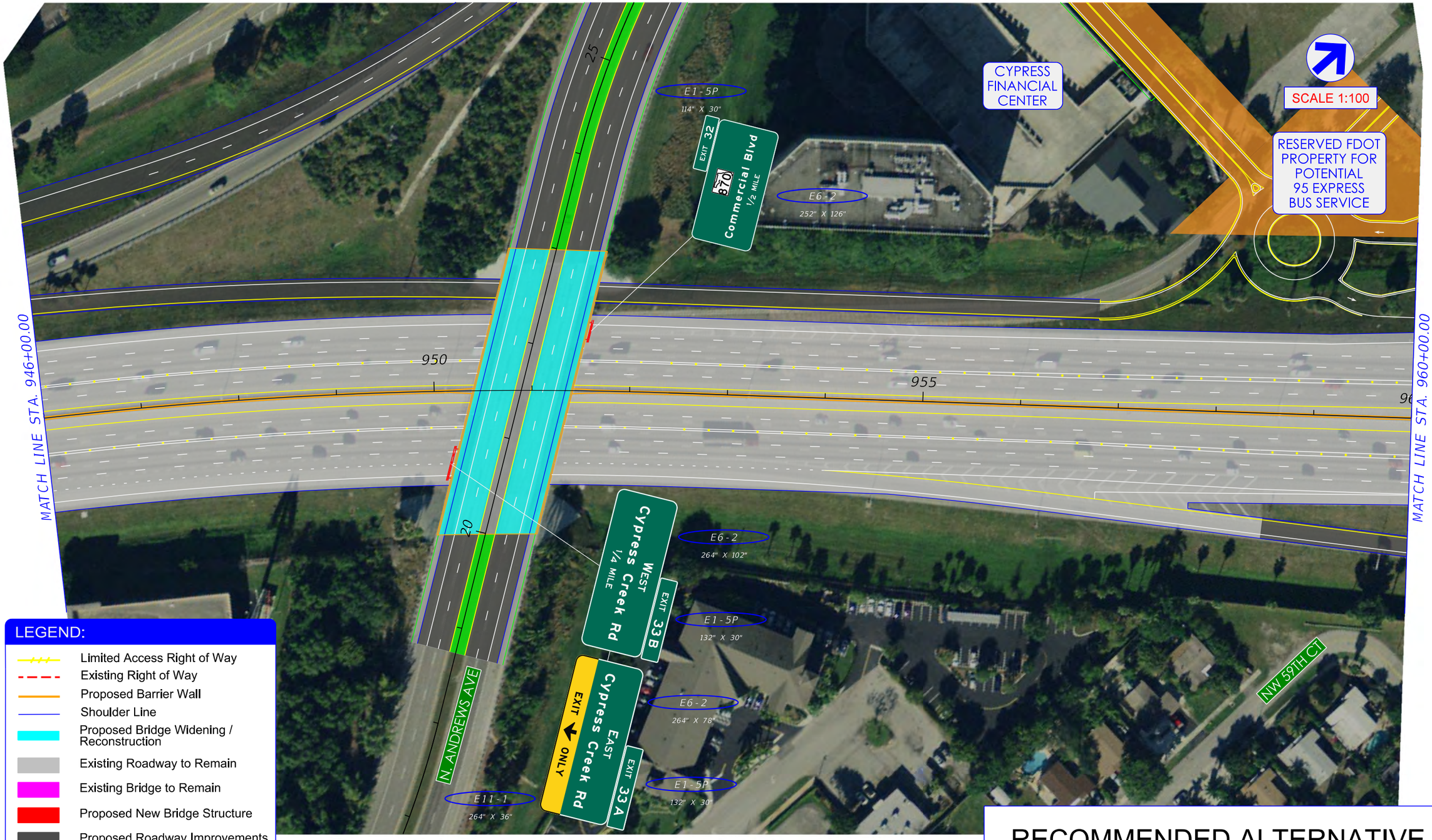
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-6



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Proposed Barrier Wall
- Shoulder Line
- Proposed Bridge Widening / Reconstruction
- Existing Roadway to Remain
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

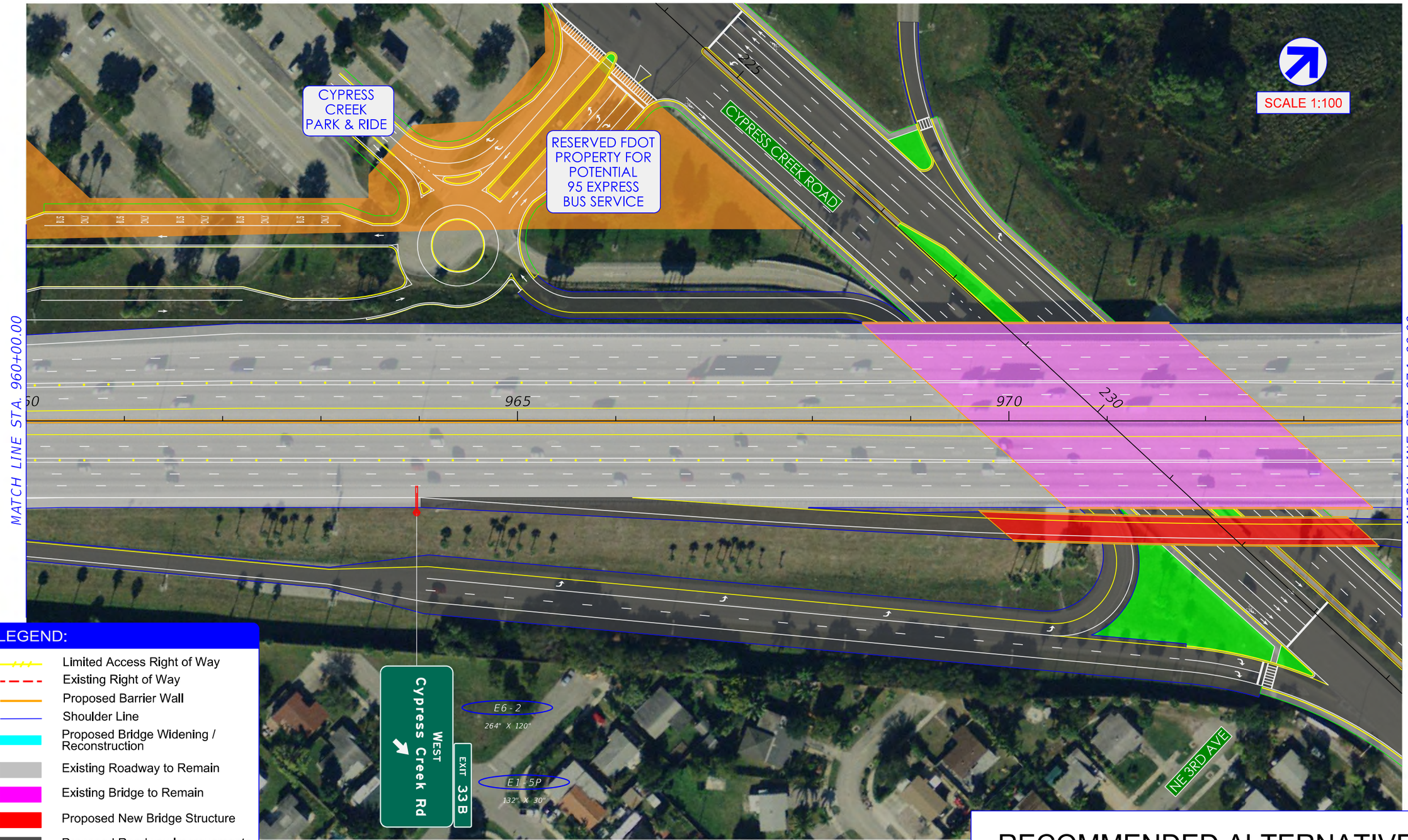
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-7



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Proposed Barrier Wall
- Shoulder Line
- Proposed Bridge Widening / Reconstruction
- Existing Roadway to Remain
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

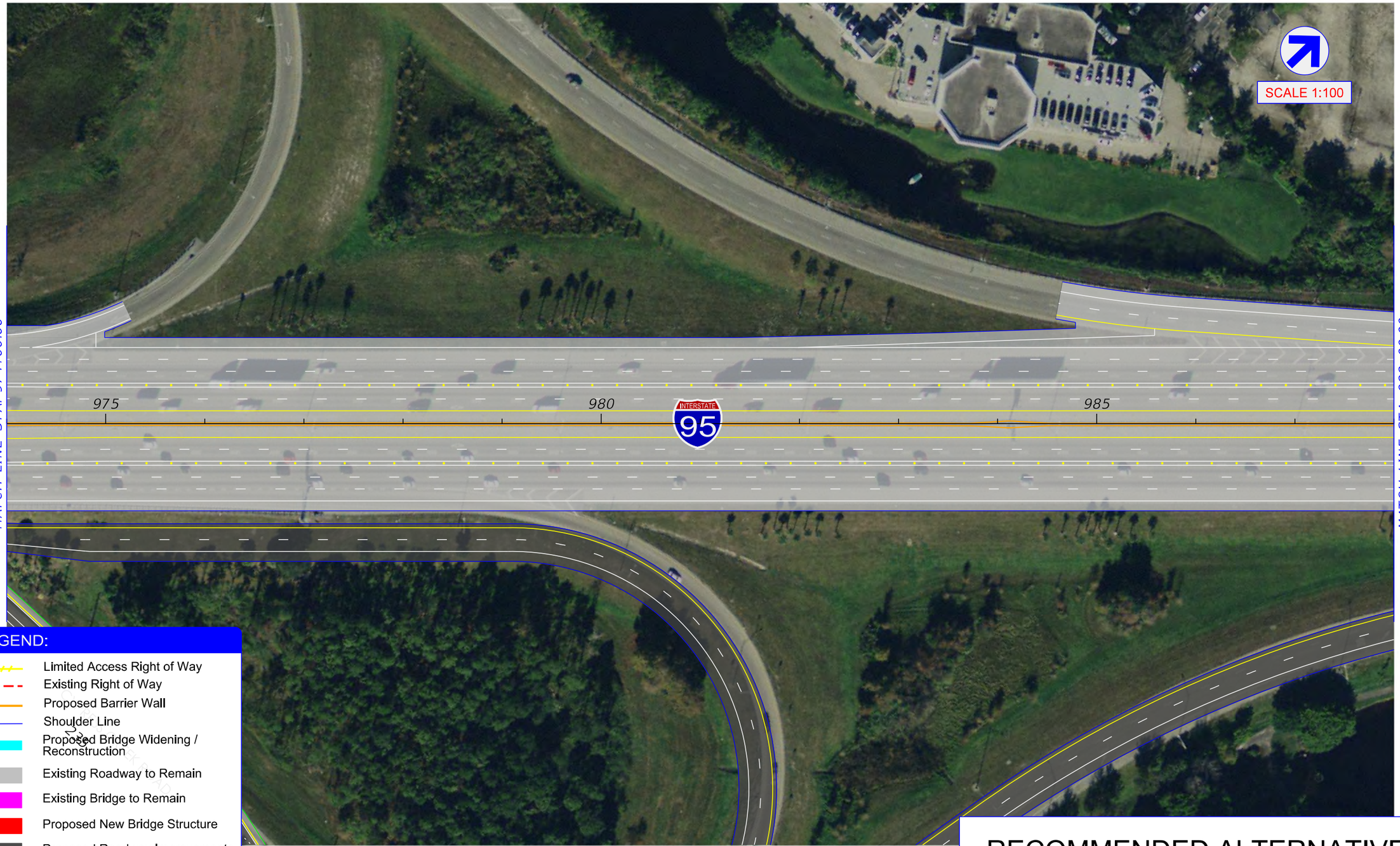
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO. S-8



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Proposed Barrier Wall
- Shoulder Line
- Proposed Bridge Widening / Reconstruction
- Existing Roadway to Remain
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

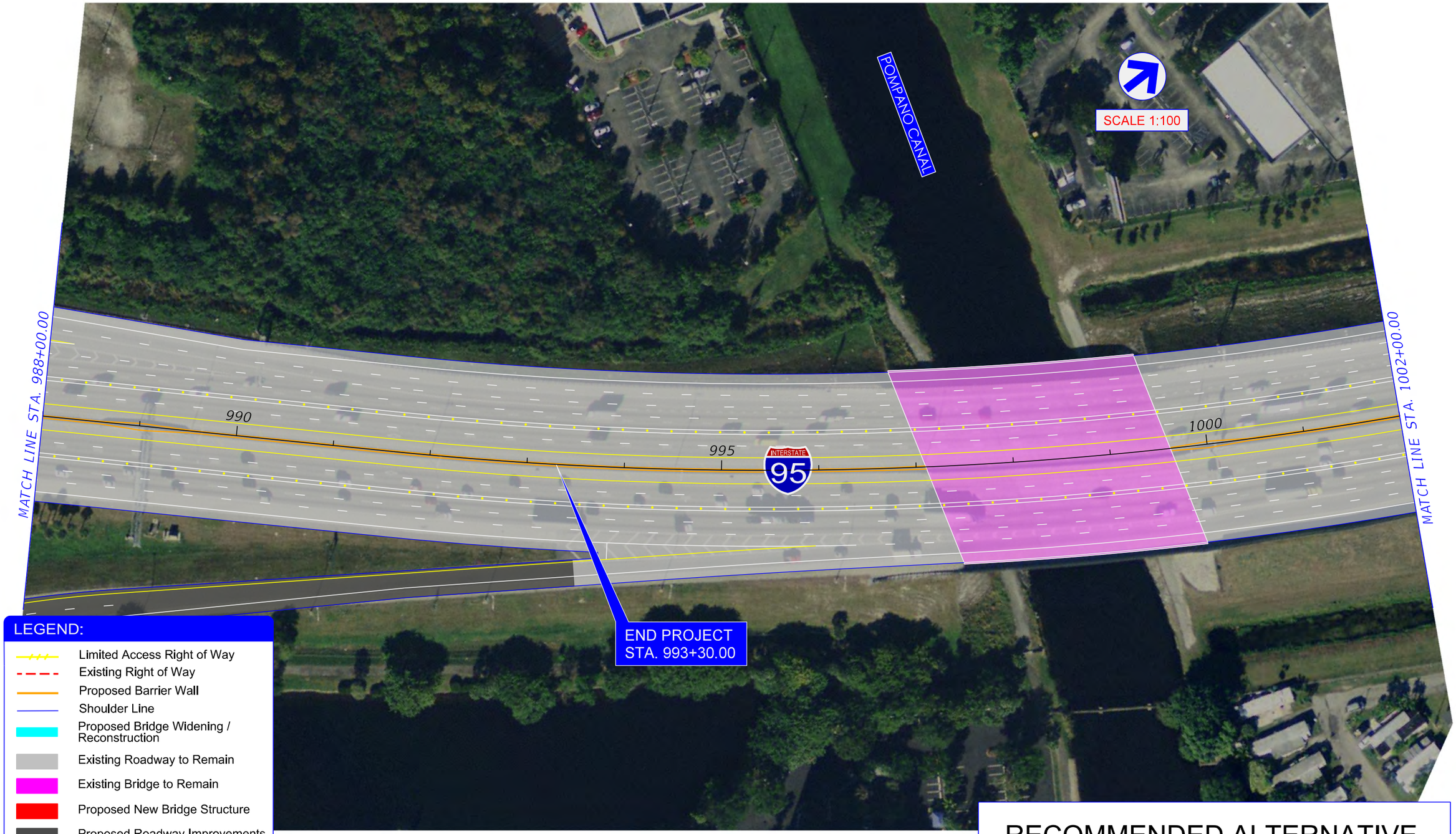
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO. S-9



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Proposed Barrier Wall
- Shoulder Line
- Proposed Bridge Widening / Reconstruction
- Existing Roadway to Remain
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

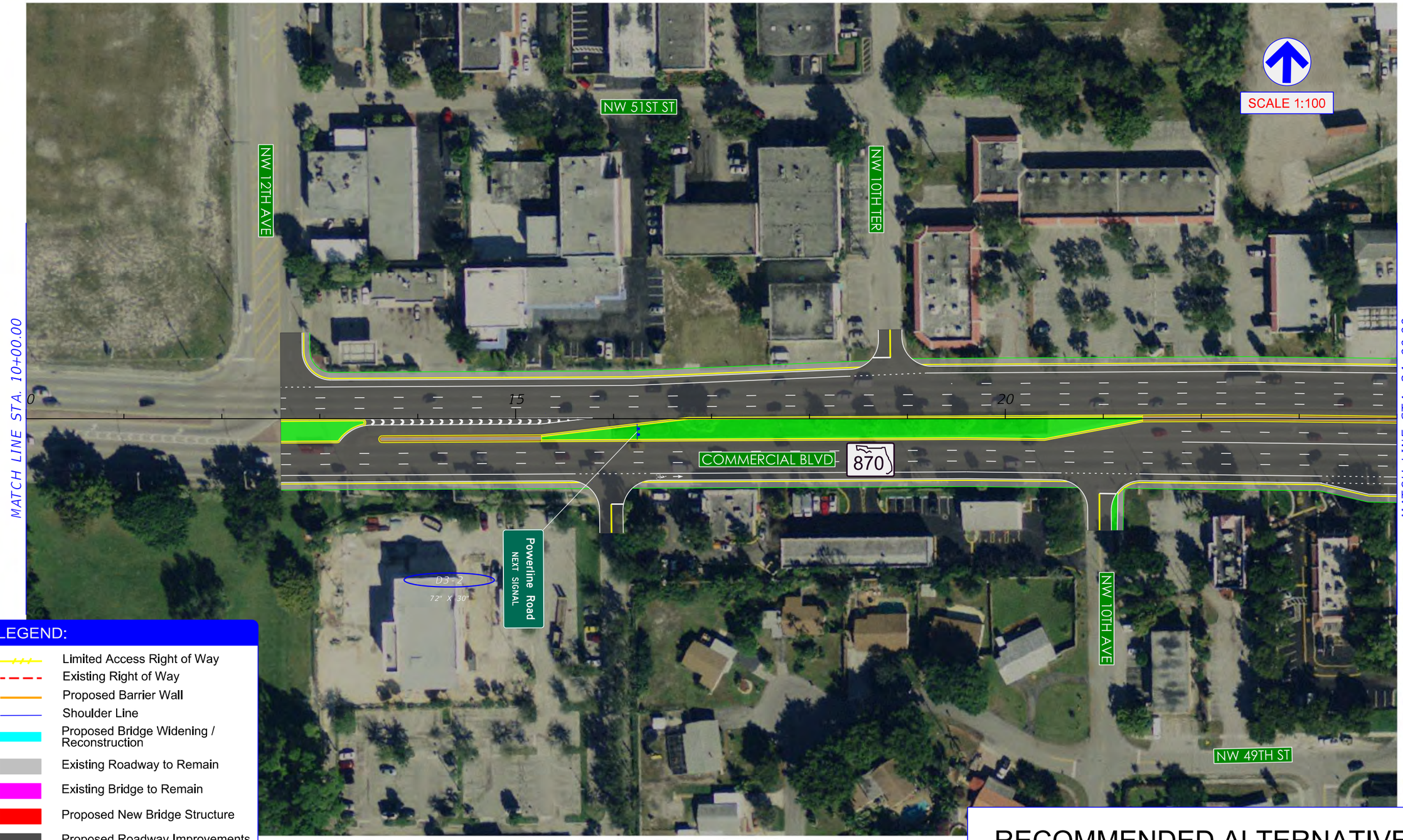
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-10



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Proposed Barrier Wall
- Shoulder Line
- Proposed Bridge Widening / Reconstruction
- Existing Roadway to Remain
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

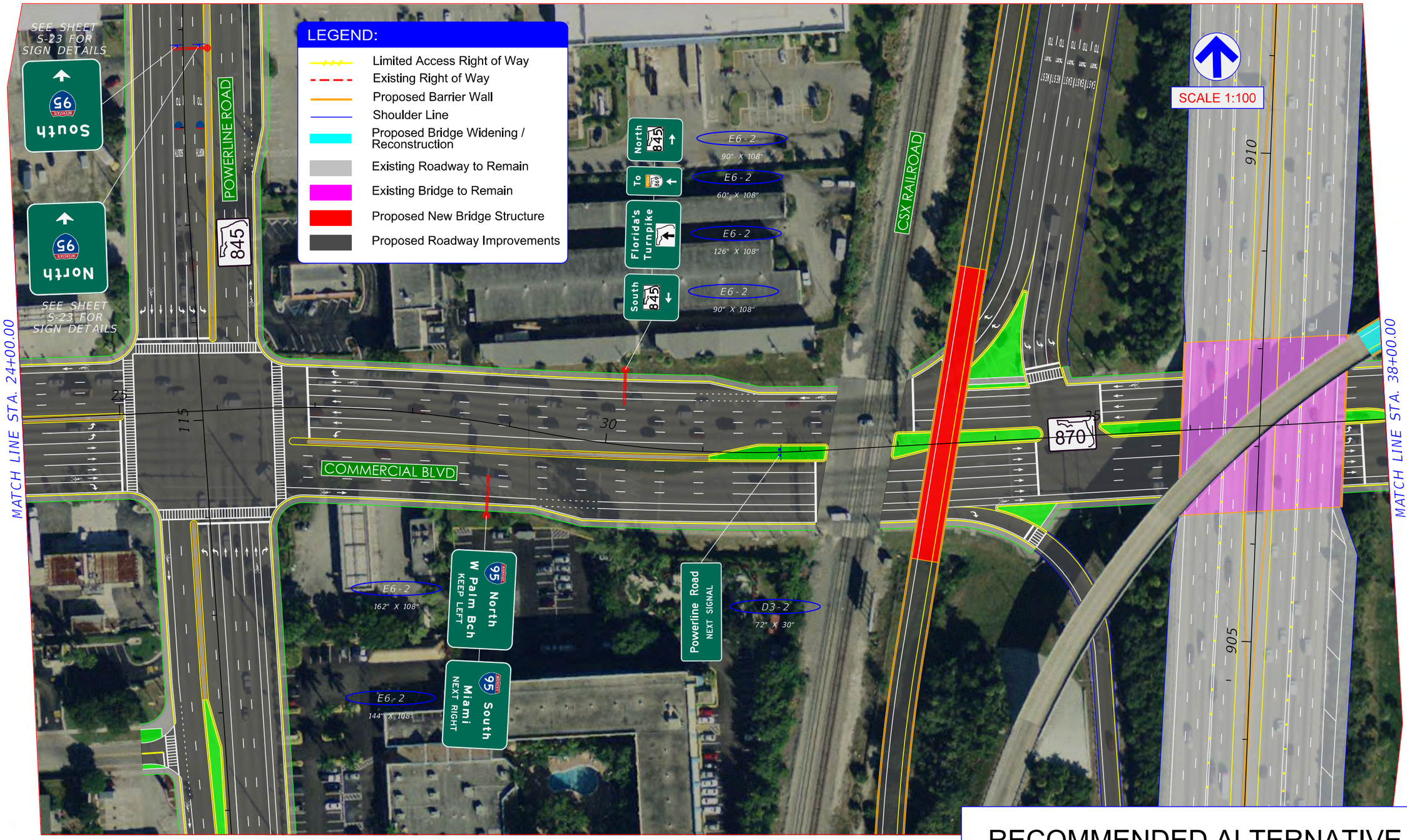
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 870	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-11



RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

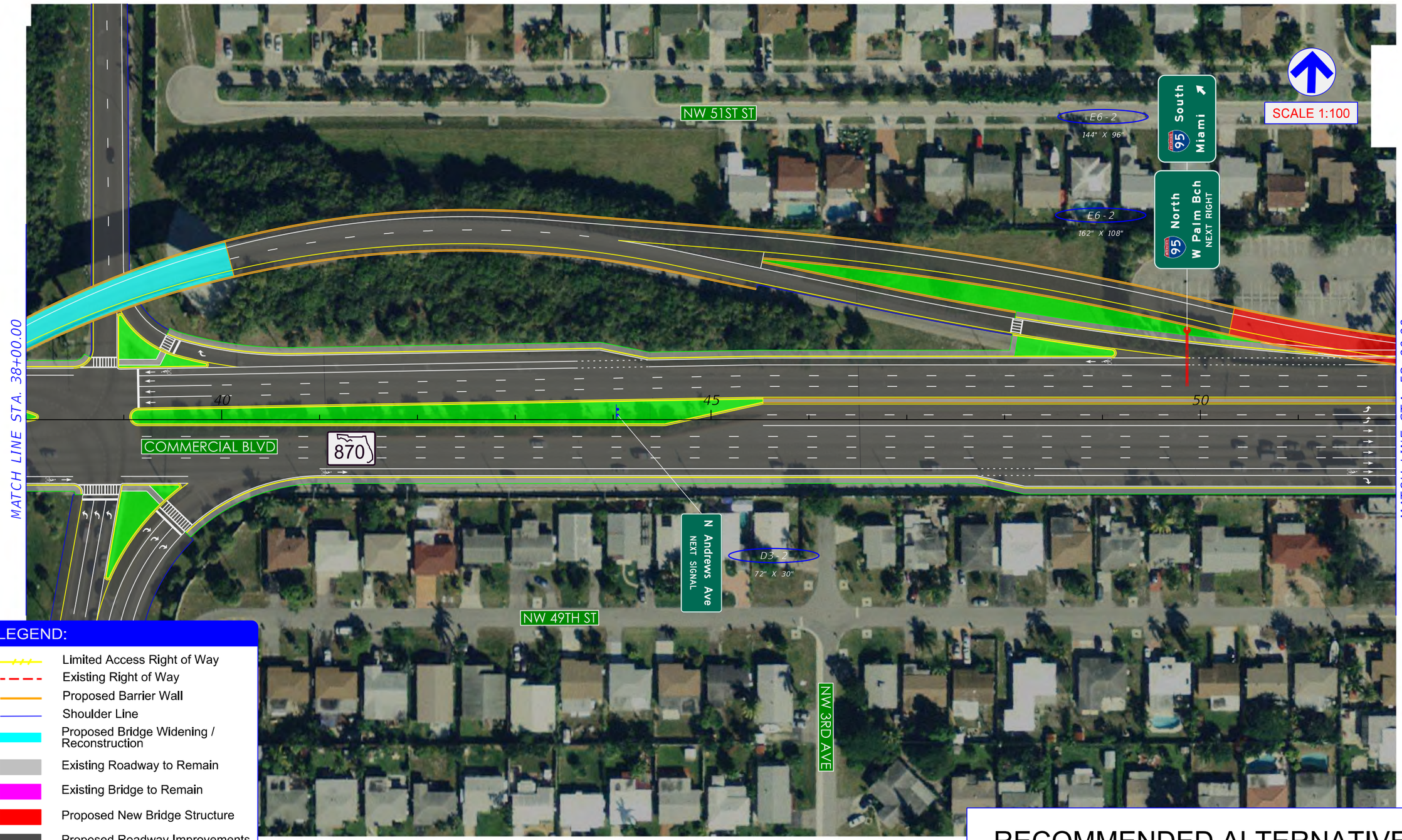
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 870	BROWARD	435808-1

PRELIMINARY CONCEPT SIGNING PLANS

SHEET NO. S-12



RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 870	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-13



RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

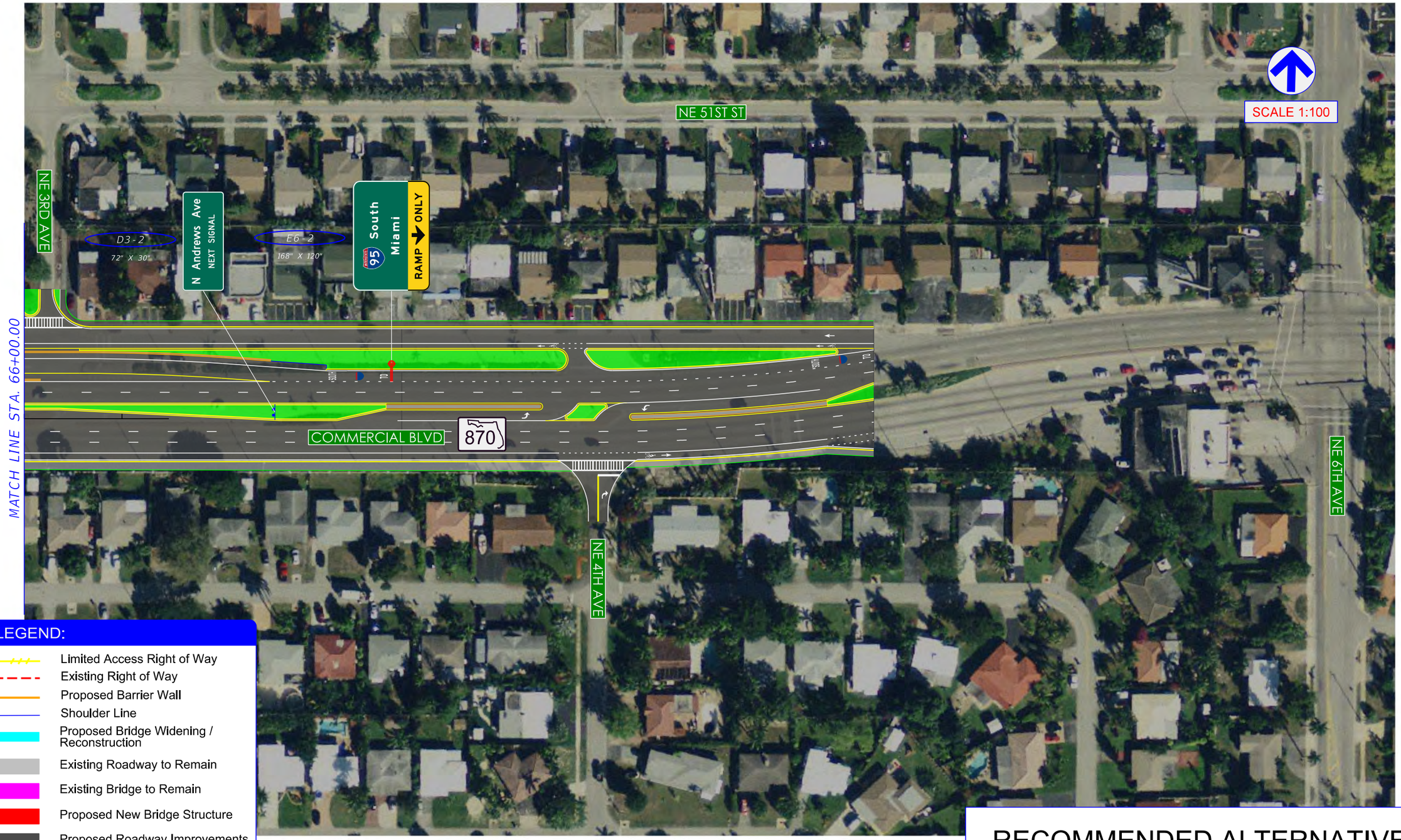
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 870	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-14



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Proposed Barrier Wall
- Shoulder Line
- Proposed Bridge Widening / Reconstruction
- Existing Roadway to Remain
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

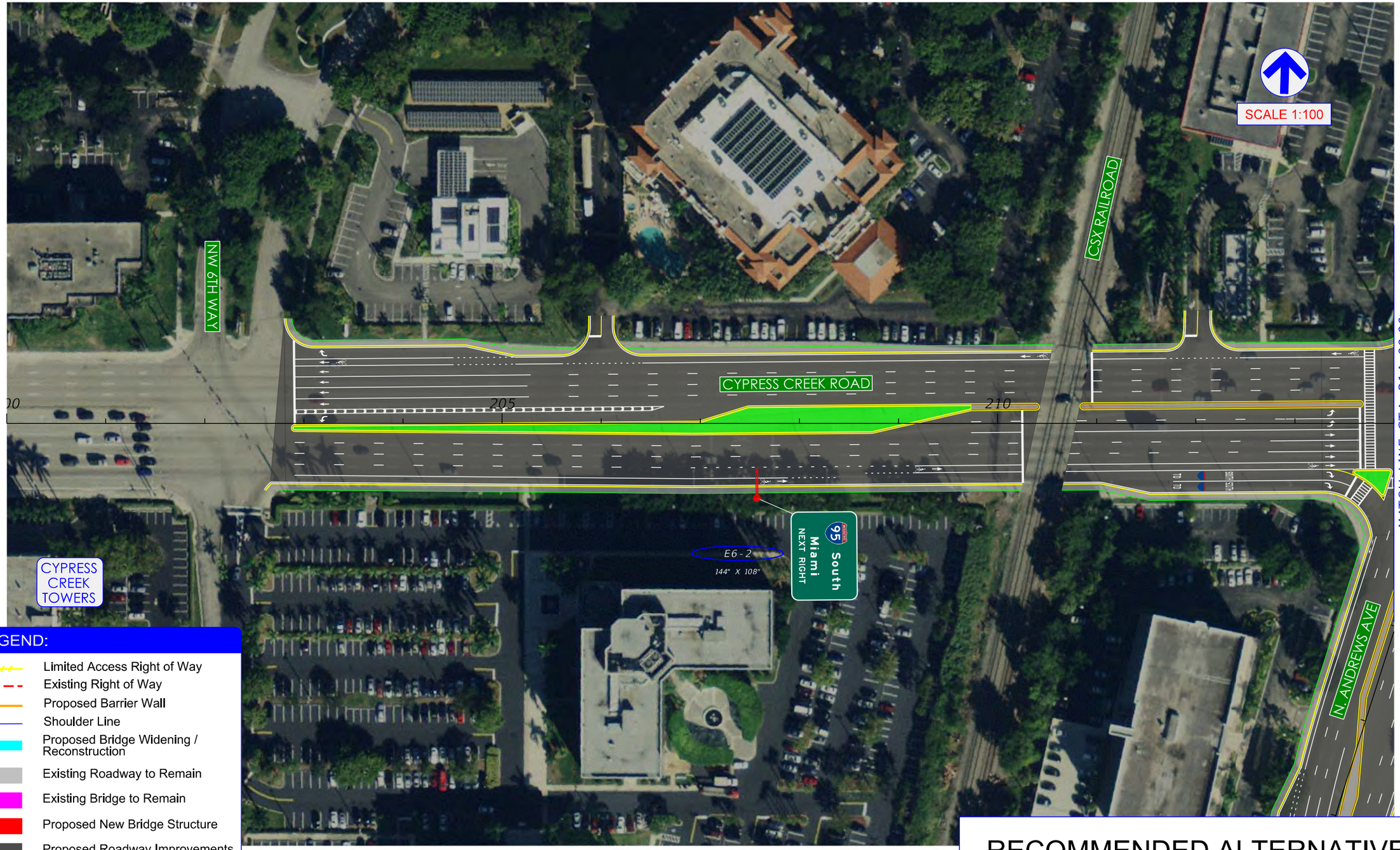
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 870	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-15



RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

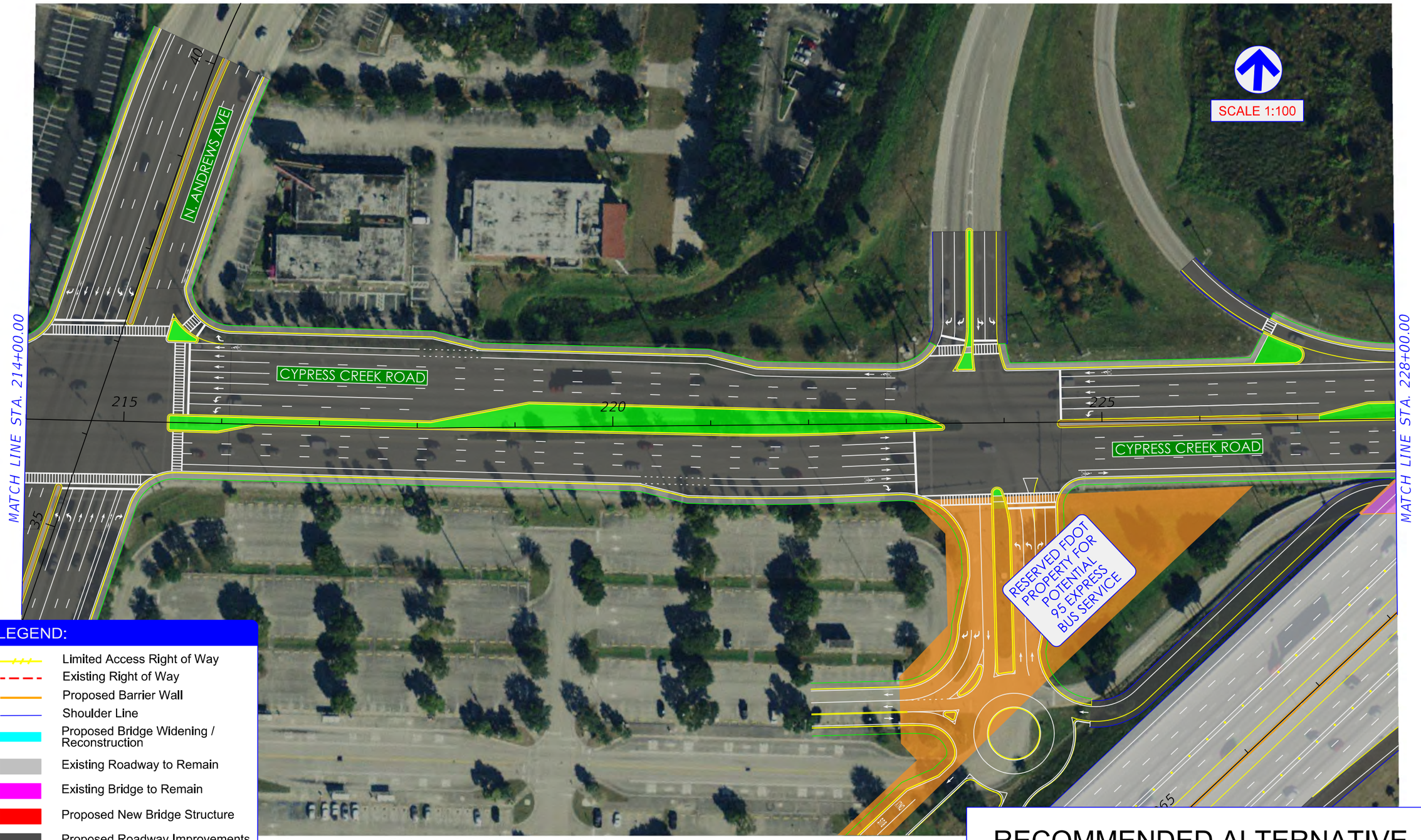
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-16



RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

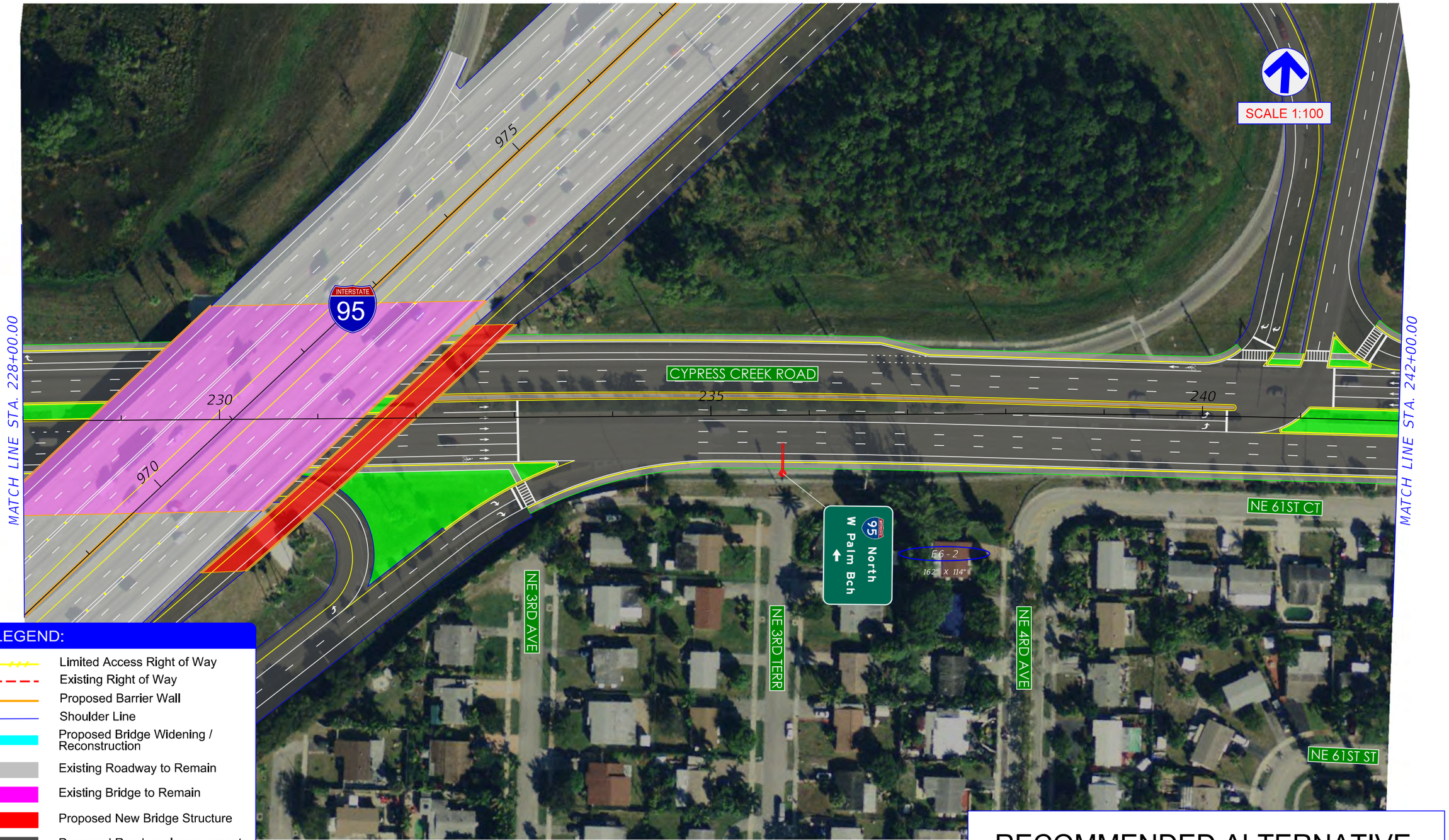
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-17



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Proposed Barrier Wall
- Shoulder Line
- Proposed Bridge Widening / Reconstruction
- Existing Roadway to Remain
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

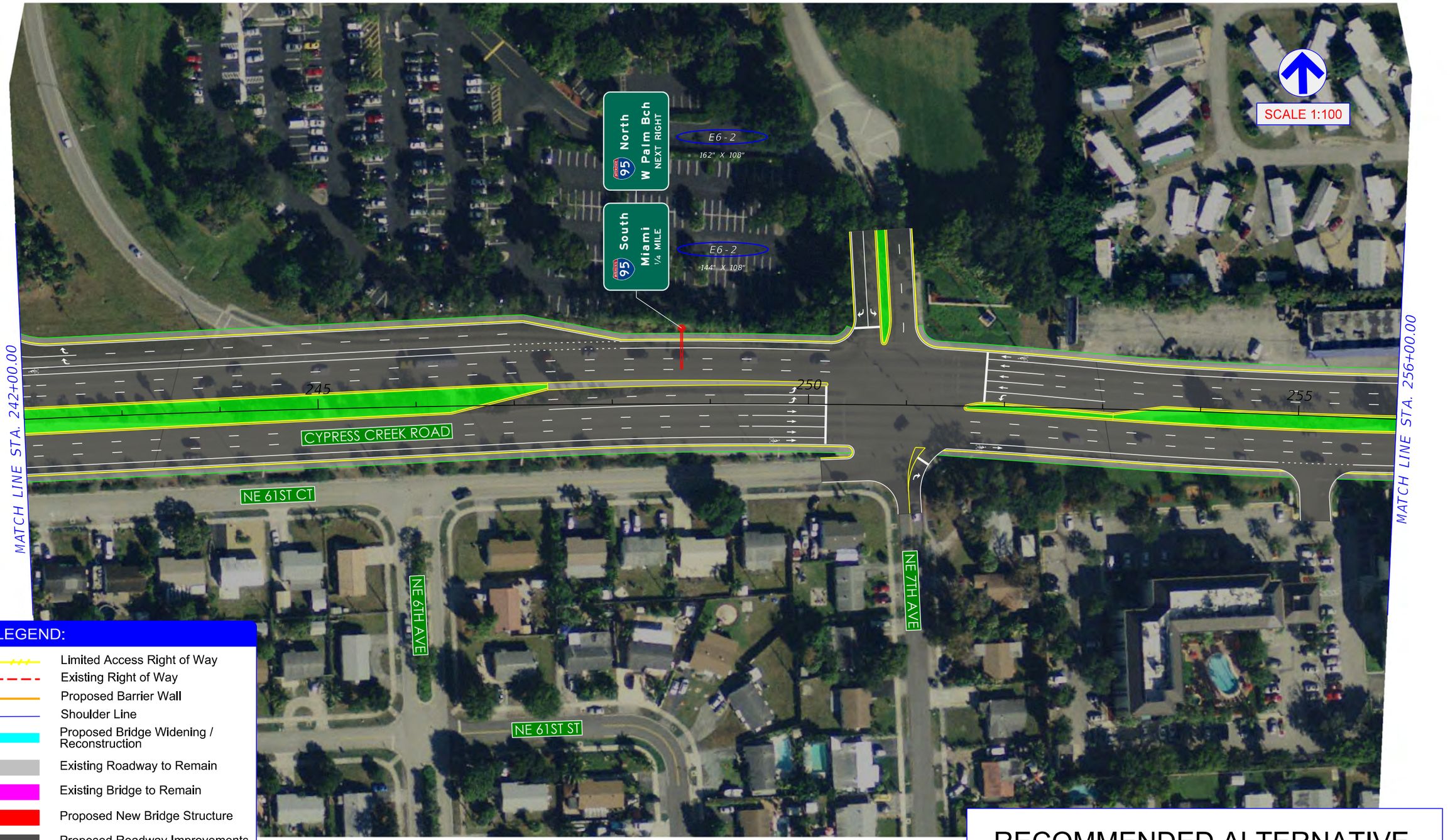
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-18



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Proposed Barrier Wall
- Shoulder Line
- Proposed Bridge Widening / Reconstruction
- Existing Roadway to Remain
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

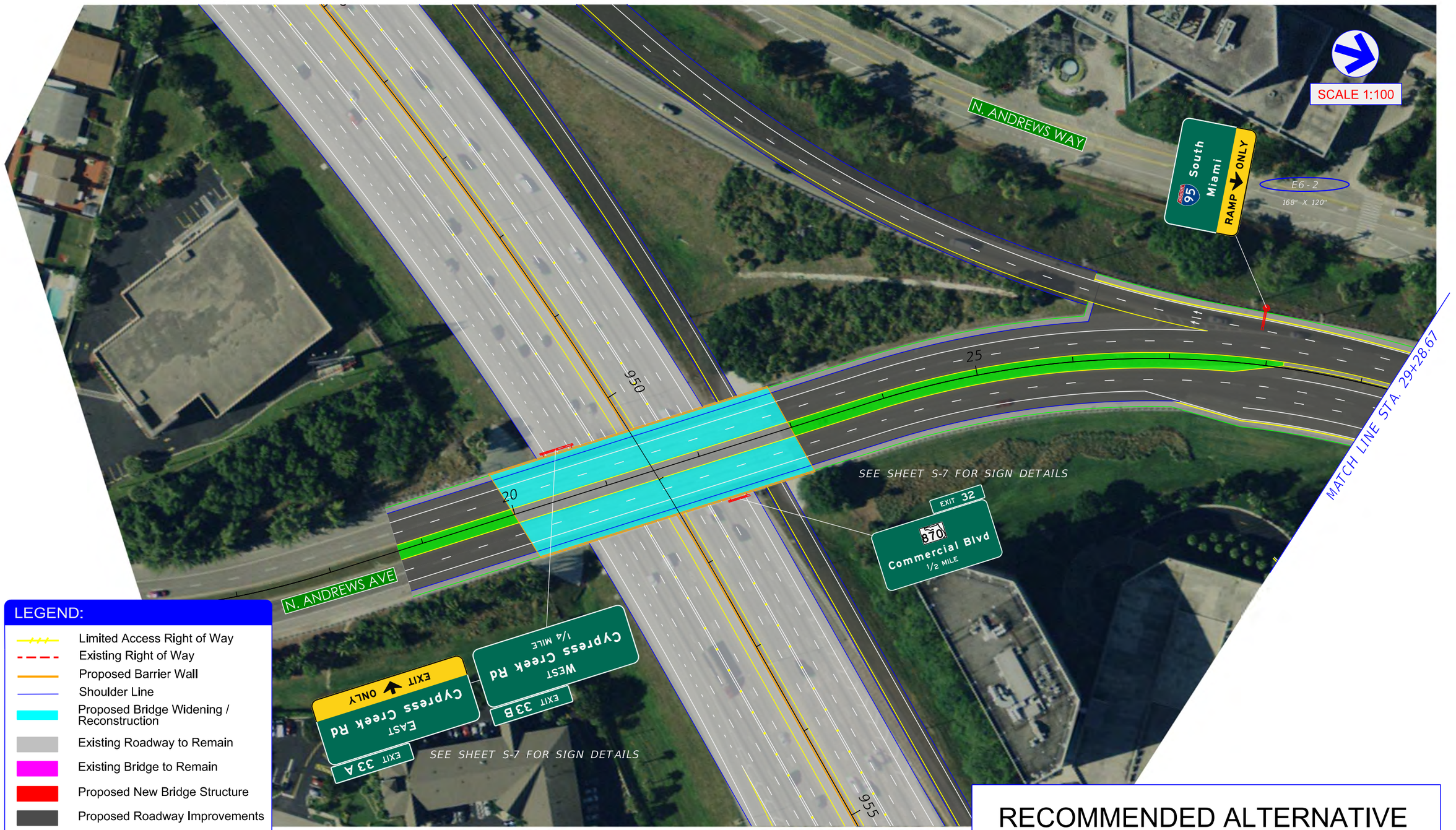
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-19



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Proposed Barrier Wall
- Shoulder Line
- Proposed Bridge Widening / Reconstruction
- Existing Roadway to Remain
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

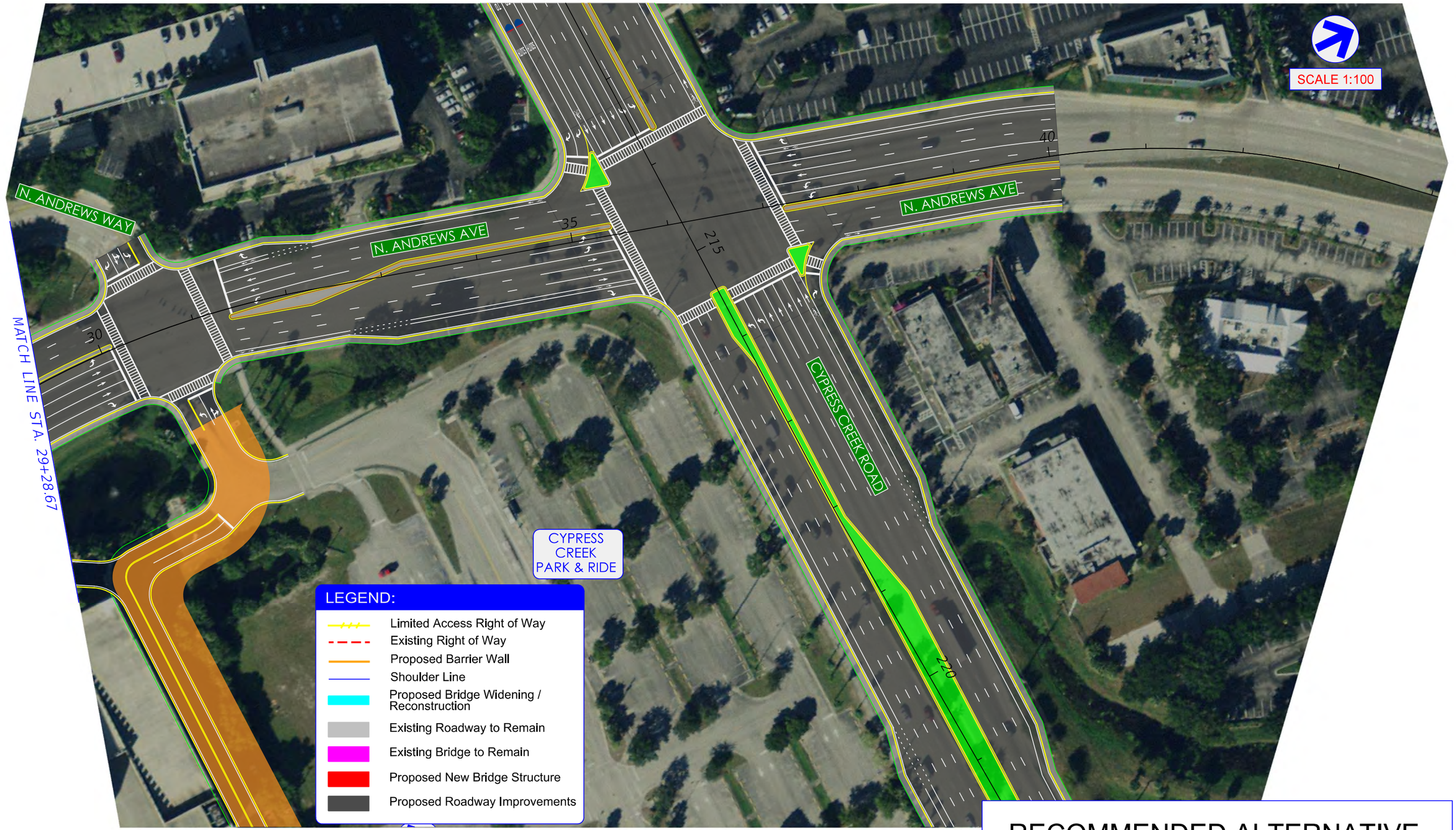
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-20



RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

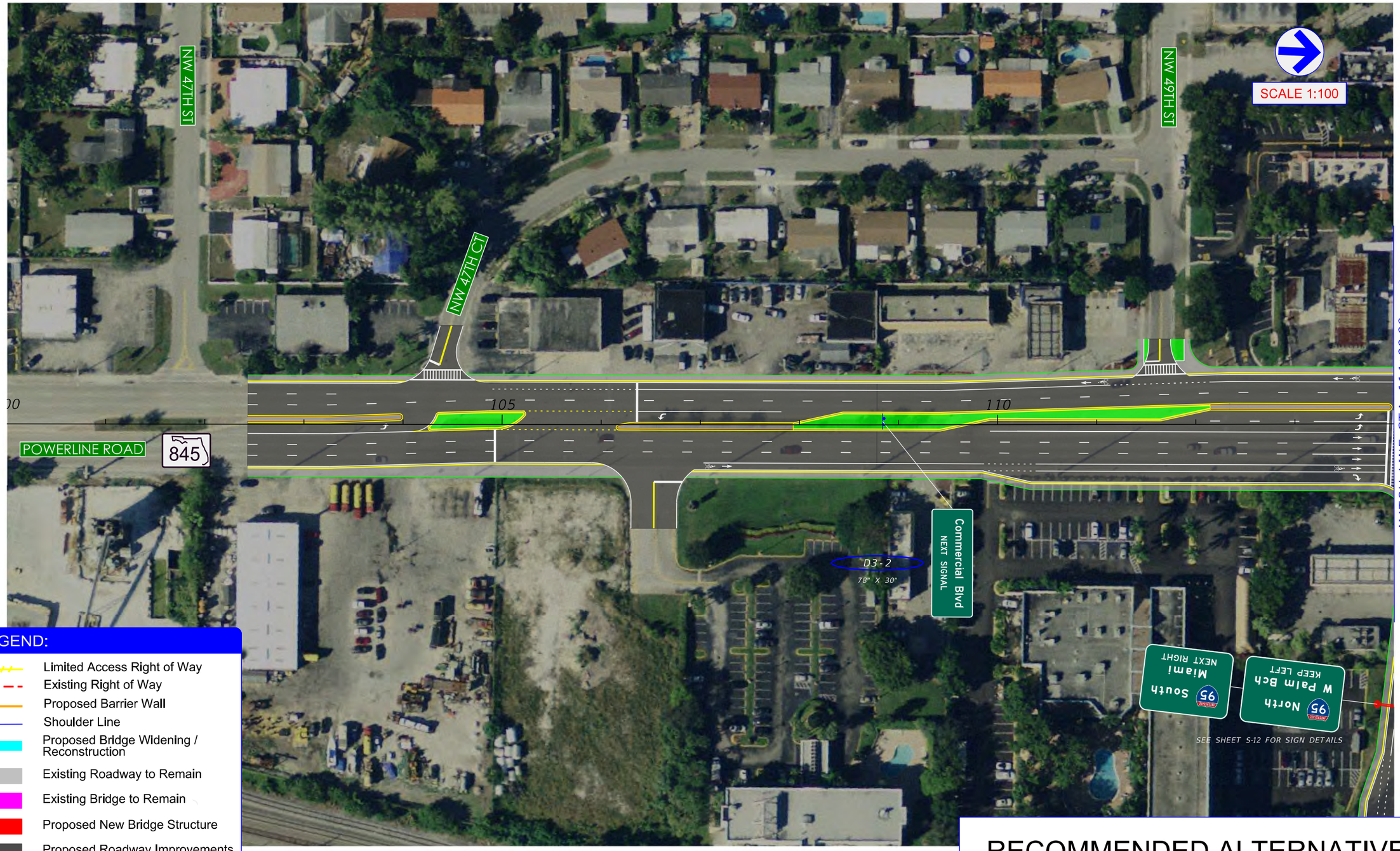
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-21



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Proposed Barrier Wall
- Shoulder Line
- Proposed Bridge Widening / Reconstruction
- Existing Roadway to Remain
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 845	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-22



RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 845	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-23



RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

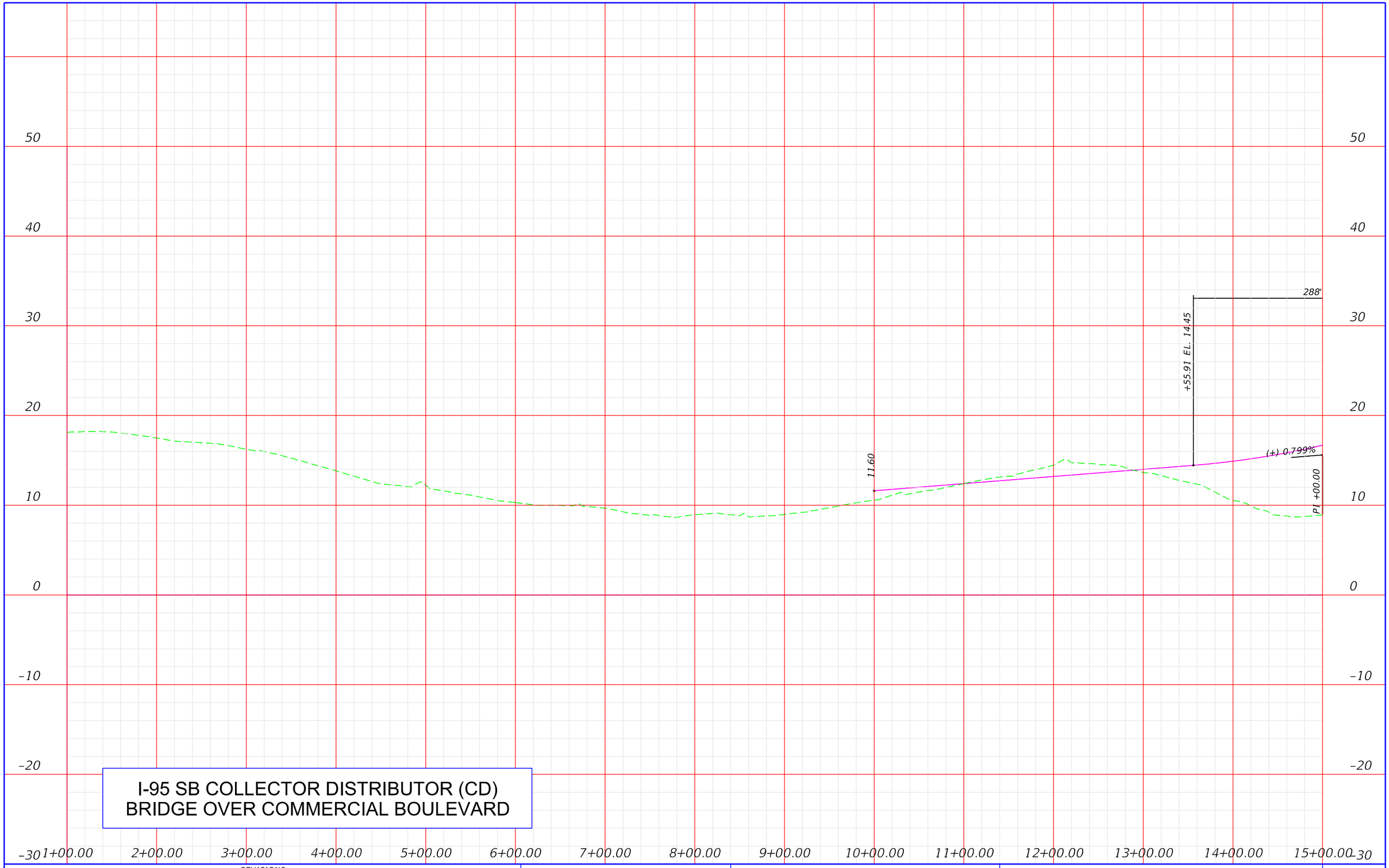
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 845	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-24



I-95 SB COLLECTOR DISTRIBUTOR (CD) BRIDGE OVER COMMERCIAL BOULEVARD

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY ROADWAY PROFILES

SHEET NO. 27

50
40
30
20
10
0
-10
-20
-30

PI +00.00
EL. 49.81
(+) 3.801%
(-) 5.004%

V.C.
+44.09
EL. 21.08
(+) 3.801%
EL. 15.60
+01.29
EL. 27.05

1,197' V.C.

COMMERCIAL BOULEVARD

15+00.00 16+00.00 17+00.00 18+00.00 19+00.00 20+00.00 21+00.00 22+00.00 23+00.00 24+00.00 25+00.00 26+00.00 27+00.00 28+00.00 29+00.00

I-95 SB COLLECTOR DISTRIBUTOR (CD)
BRIDGE OVER COMMERCIAL BOULEVARD

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

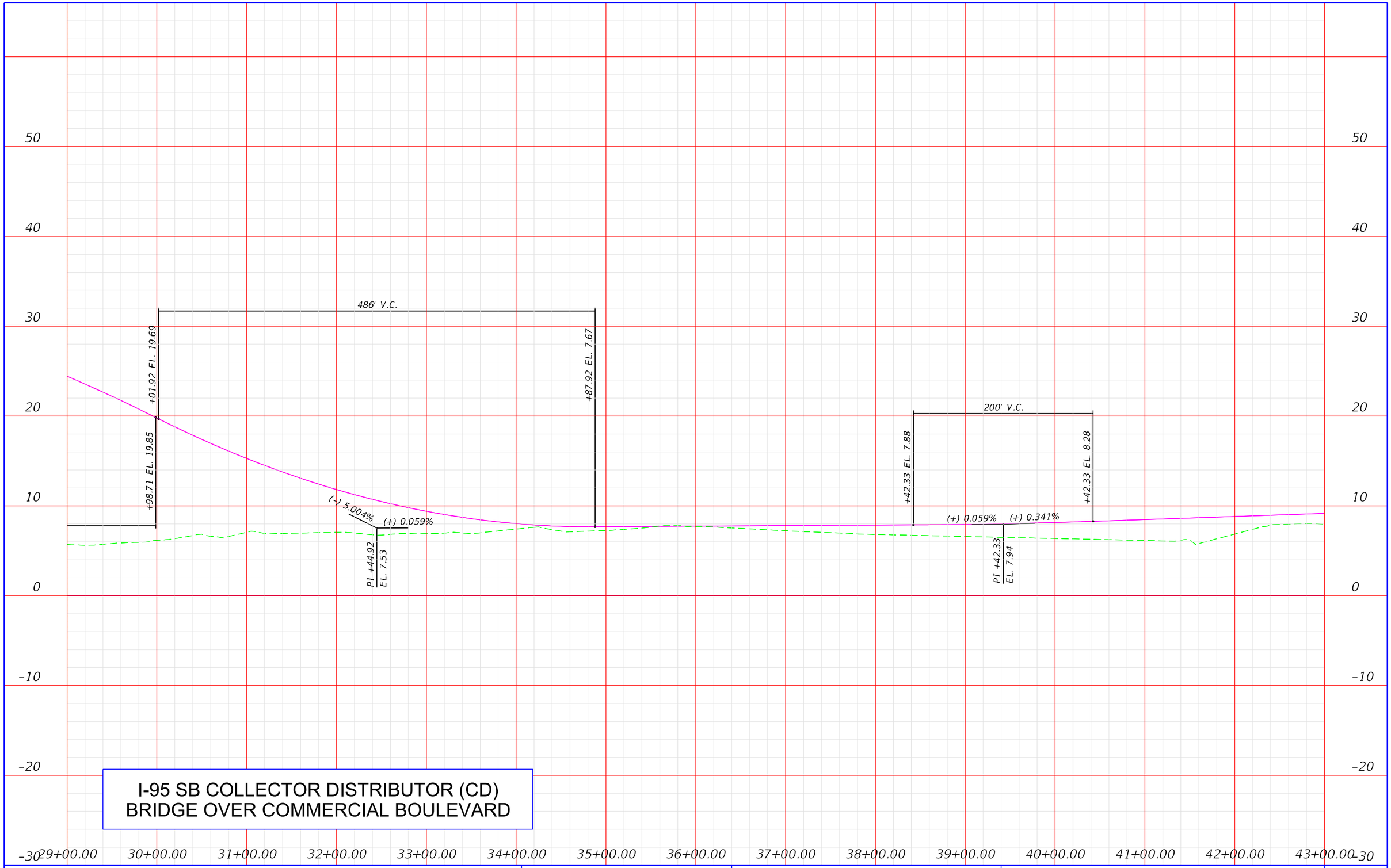
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY ROADWAY PROFILES

SHEET NO. 28

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I-95 SB COLLECTOR DISTRIBUTOR (CD)
BRIDGE OVER COMMERCIAL BOULEVARD

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY ROADWAY PROFILES

SHEET NO. 29

50
40
30
20
10
0
-10
-20
-30

11.25

43+00.00 44+00.00 45+00.00 46+00.00 47+00.00 48+00.00 49+00.00 50+00.00 51+00.00 52+00.00 53+00.00 54+00.00 55+00.00 56+00.00 57+00.00

I-95 SB COLLECTOR DISTRIBUTOR (CD) BRIDGE OVER COMMERCIAL BOULEVARD

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

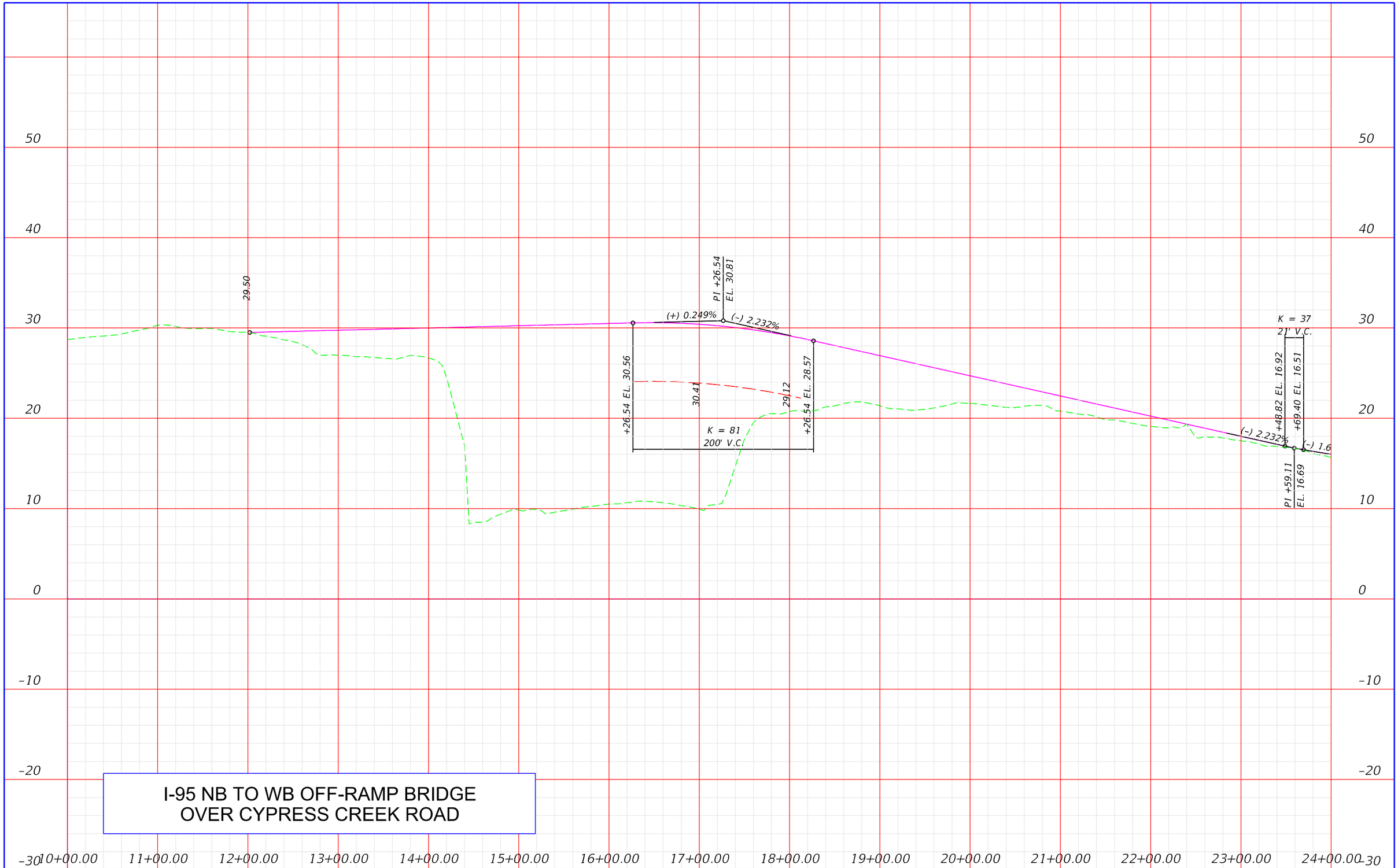
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY ROADWAY PROFILES

SHEET NO. 30



I-95 NB TO WB OFF-RAMP BRIDGE OVER CYPRESS CREEK ROAD

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

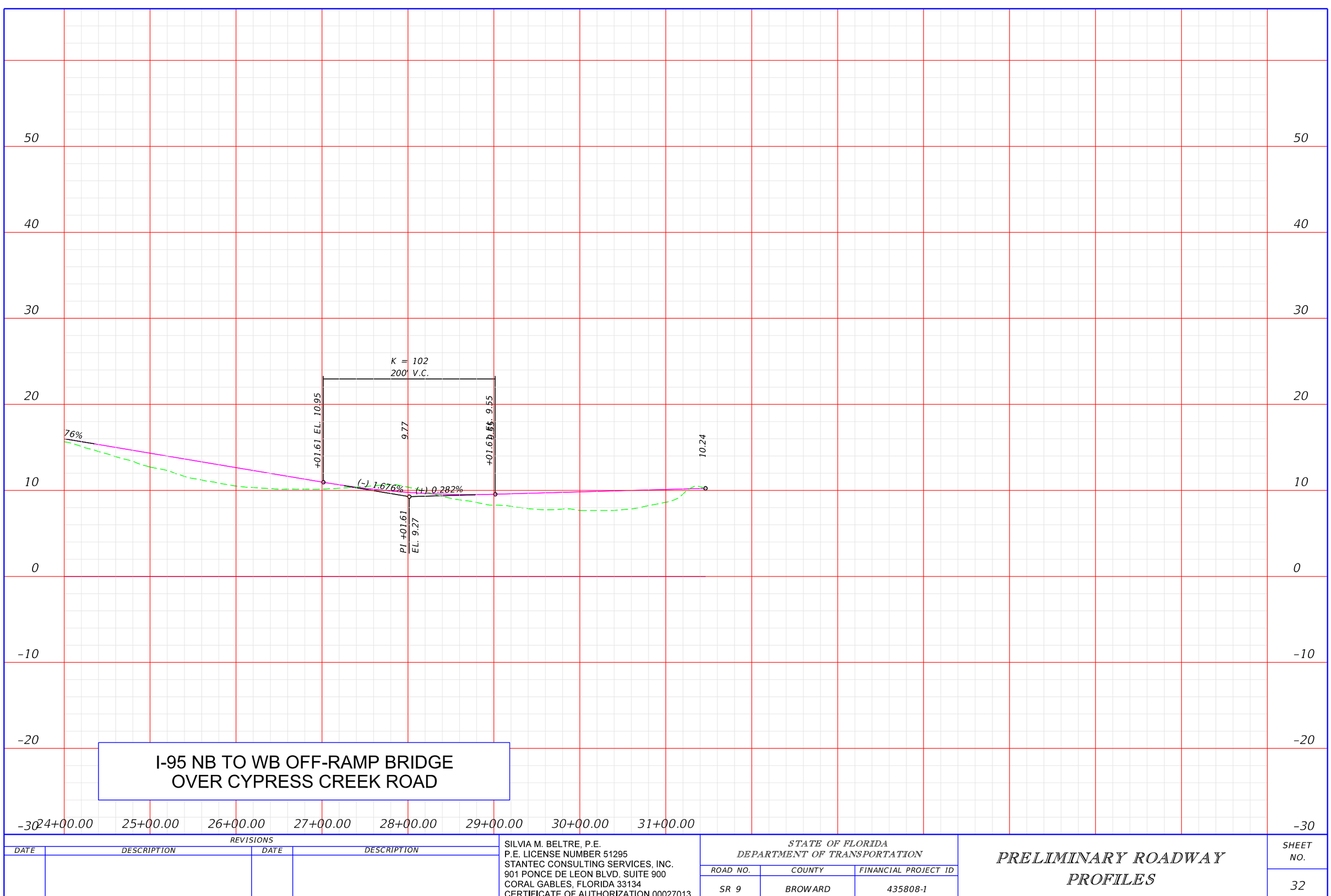
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY ROADWAY PROFILES

SHEET NO. 31



I-95 NB TO WB OFF-RAMP BRIDGE OVER CYPRESS CREEK ROAD

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

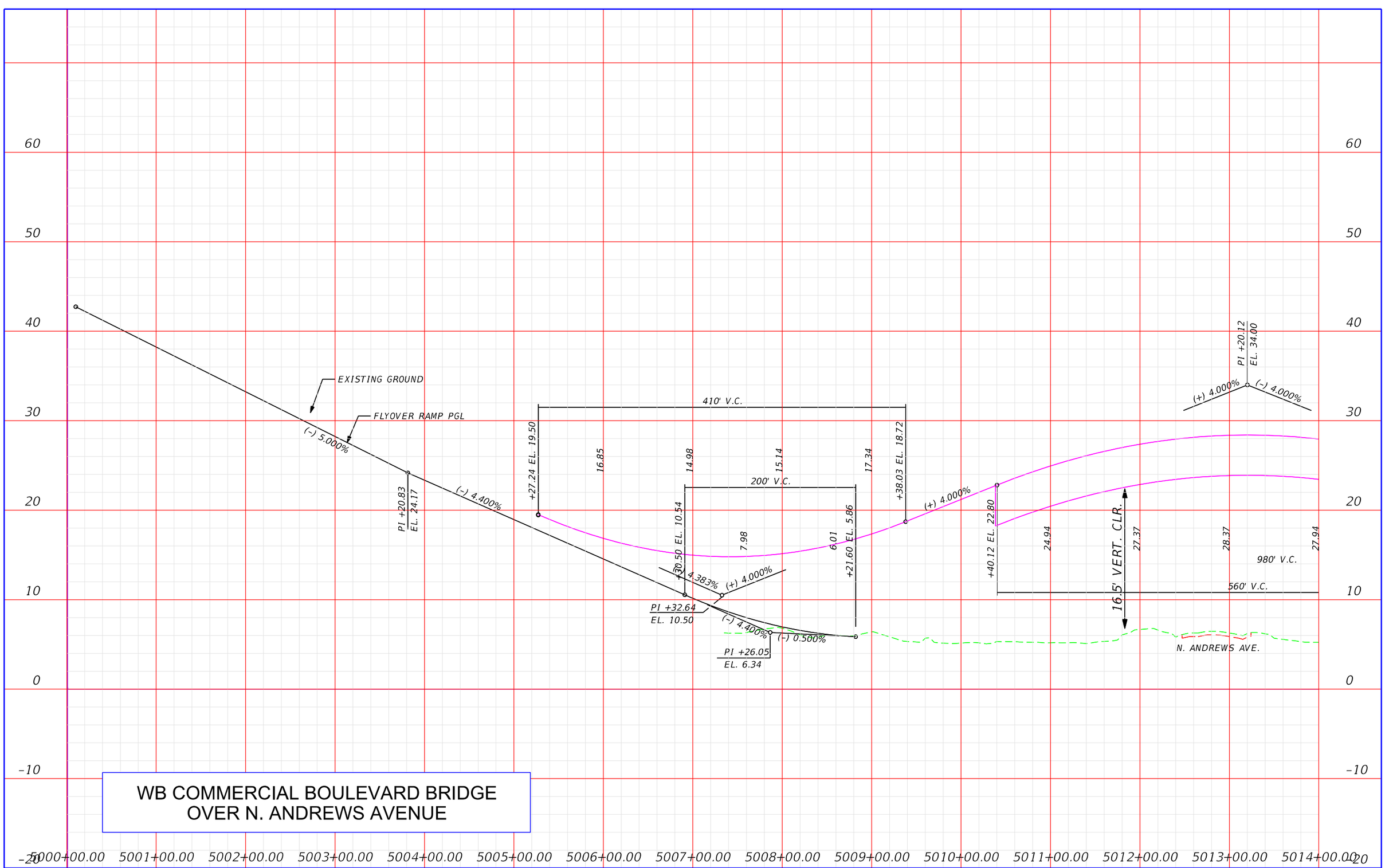
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY ROADWAY PROFILES

SHEET NO. 32

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WB COMMERCIAL BOULEVARD BRIDGE OVER N. ANDREWS AVENUE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

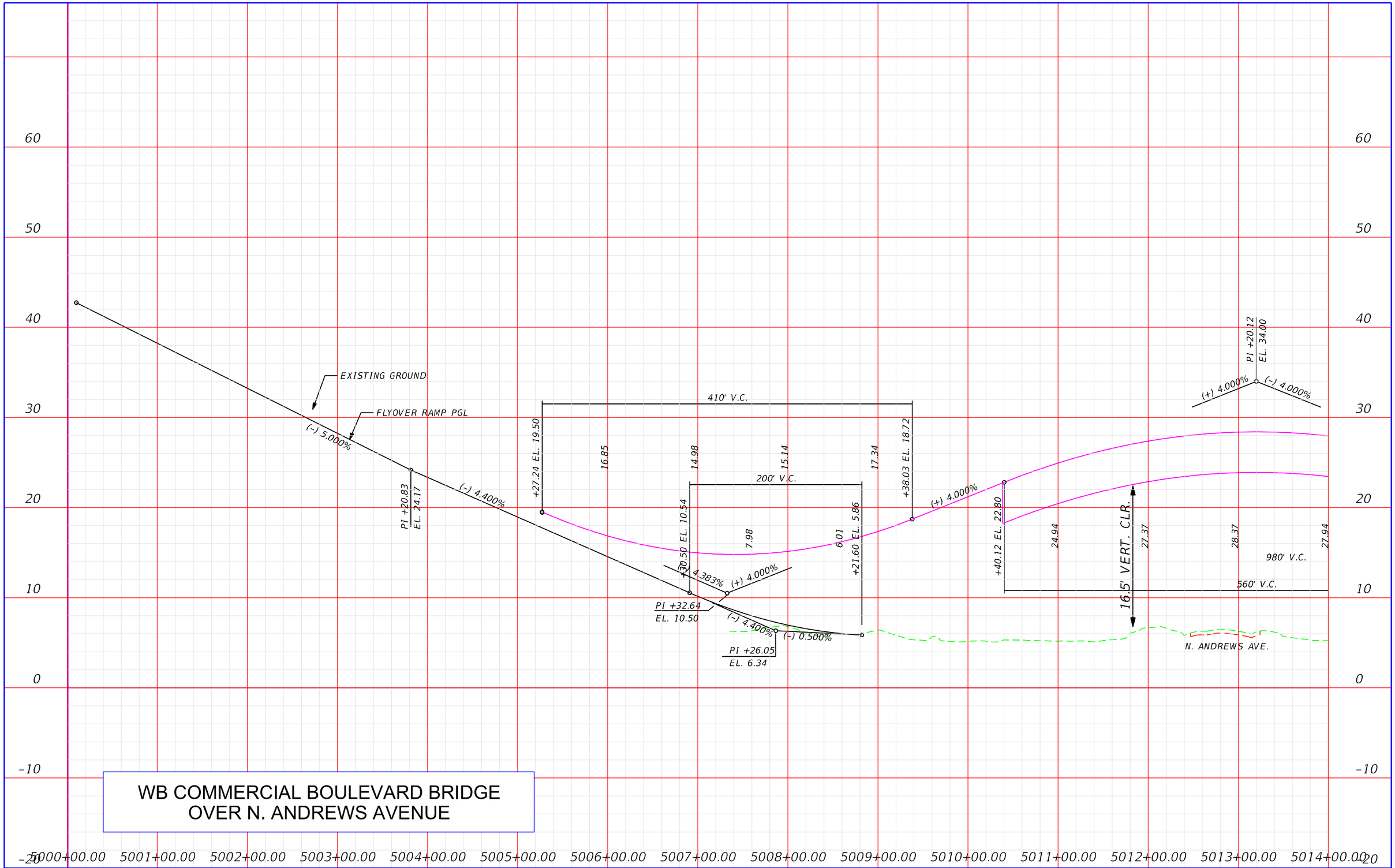
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 870	BROWARD	435808-1

PRELIMINARY ROADWAY PROFILES

SHEET NO. 33



WB COMMERCIAL BOULEVARD BRIDGE OVER N. ANDREWS AVENUE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

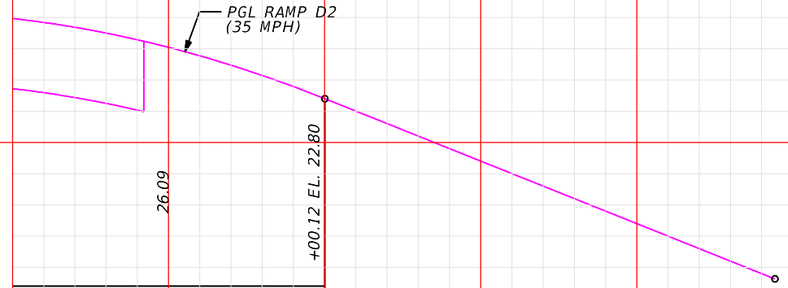
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 870	BROWARD	435808-1

PRELIMINARY ROADWAY PROFILES

SHEET NO. 34



60 50 40 30 20 10 0 -10 -20

5014+00.00 5015+00.00 5016+00.00 5017+00.00 5018+00.00 5019+00.00 5020+00.00 5021+00.00 5022+00.00 5023+00.00 5024+00.00 5025+00.00 5026+00.00 5027+00.00 5028+00.00

WB COMMERCIAL BOULEVARD BRIDGE OVER N. ANDREWS AVENUE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 870	BROWARD	435808-1

PRELIMINARY ROADWAY PROFILES

SHEET NO. 35

70
60
50
40
30
20
10
0
-10

10+00.00 11+00.00 12+00.00 13+00.00 14+00.00 15+00.00 16+00.00 17+00.00 18+00.00 19+00.00 20+00.00 21+00.00 22+00.00 23+00.00

+90.00 EL. 38.50
38.64
39.16

I-95

I-95 SB CD SYSTEM

N. ANDREWS AVENUE BRIDGE OVER I-95

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BROWARD	435808-1

PRELIMINARY ROADWAY PROFILES

SHEET NO.
36

70

60

50

40

30

20

10

0

-10

24+00.00 25+00.00 26+00.00 27+00.00 28+00.00 29+00.00 30+00.00 31+00.00 32+00.00 33+00.00 34+00.00 35+00.00 36+00.00 37+00.00

PI +10.00
EL. 41.80

(+) 1.500%

(-) 5.500%

38.04

35.29

30.90

+30.00 EL. 29.26

440' V.C.

235' V.C.

+10.75 EL. 18.96

14.48

10.91

9.79

(-) 5.100%

(-) 2.106%

PI +28.25
EL. 12.26

N. ANDREWS AVENUE BRIDGE OVER I-95

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

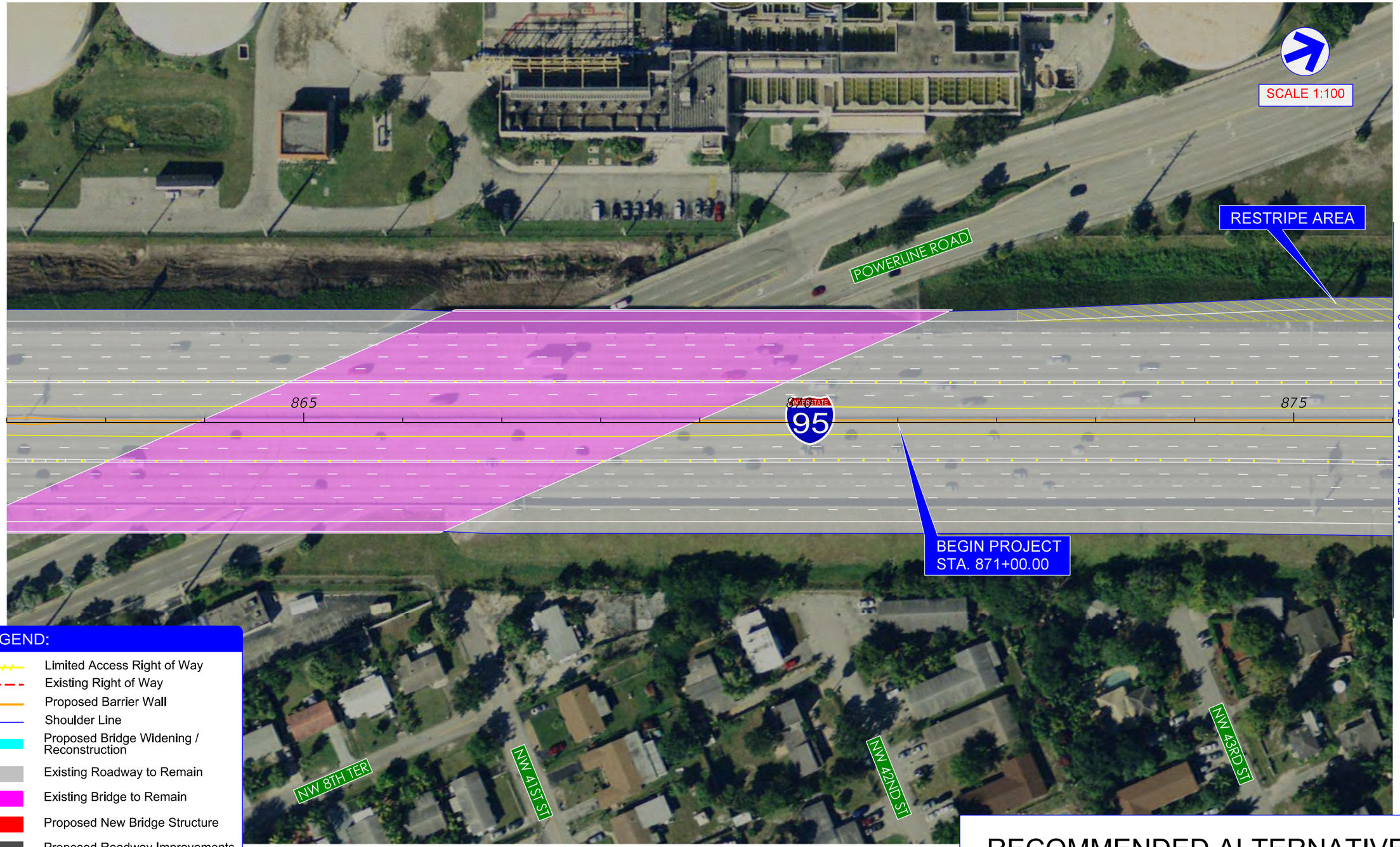
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BROWARD	435808-1

PRELIMINARY ROADWAY PROFILES

SHEET NO. 37



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Proposed Barrier Wall
- Shoulder Line
- Proposed Bridge Widening / Reconstruction
- Existing Roadway to Remain
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

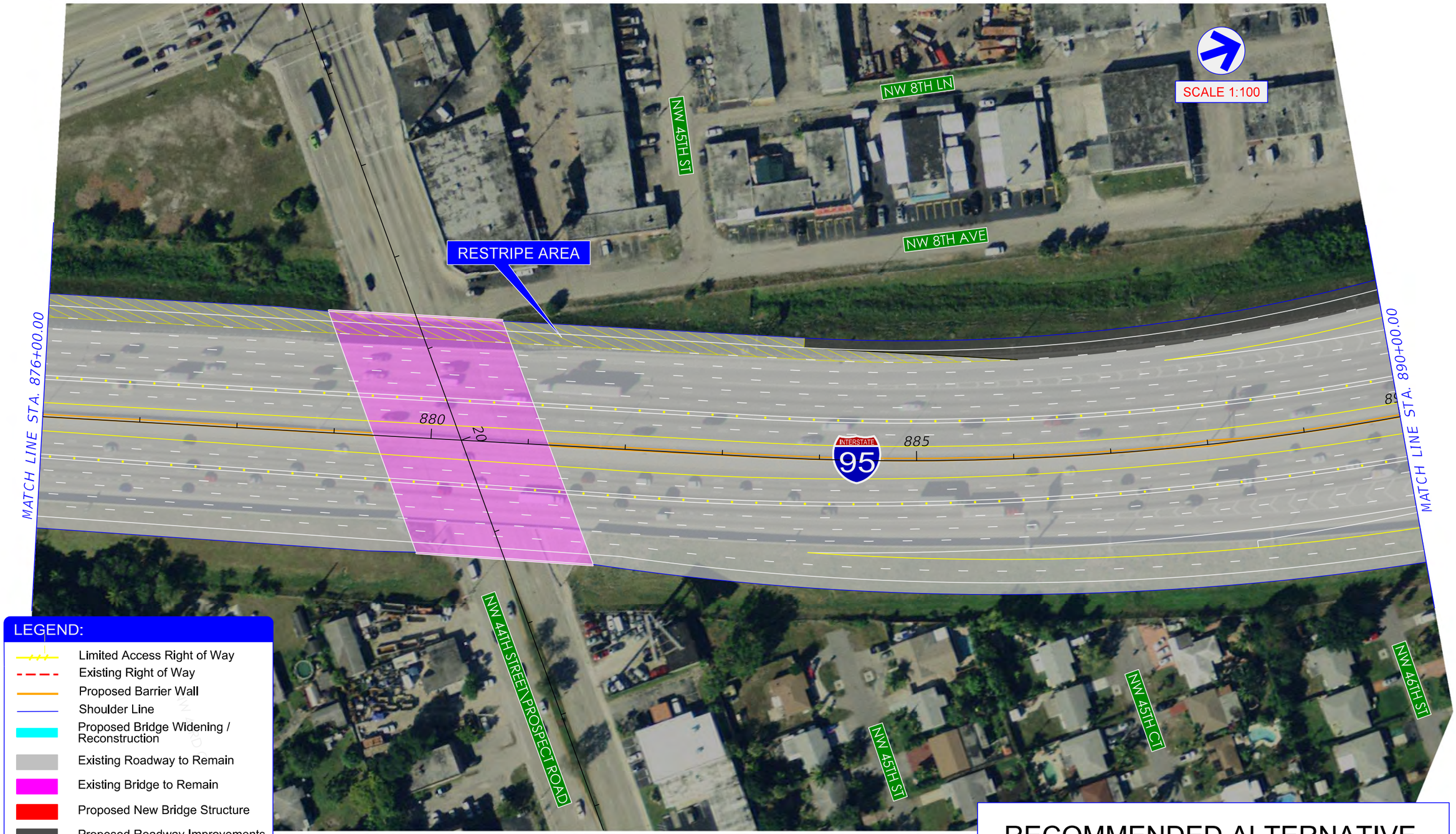
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-1



RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

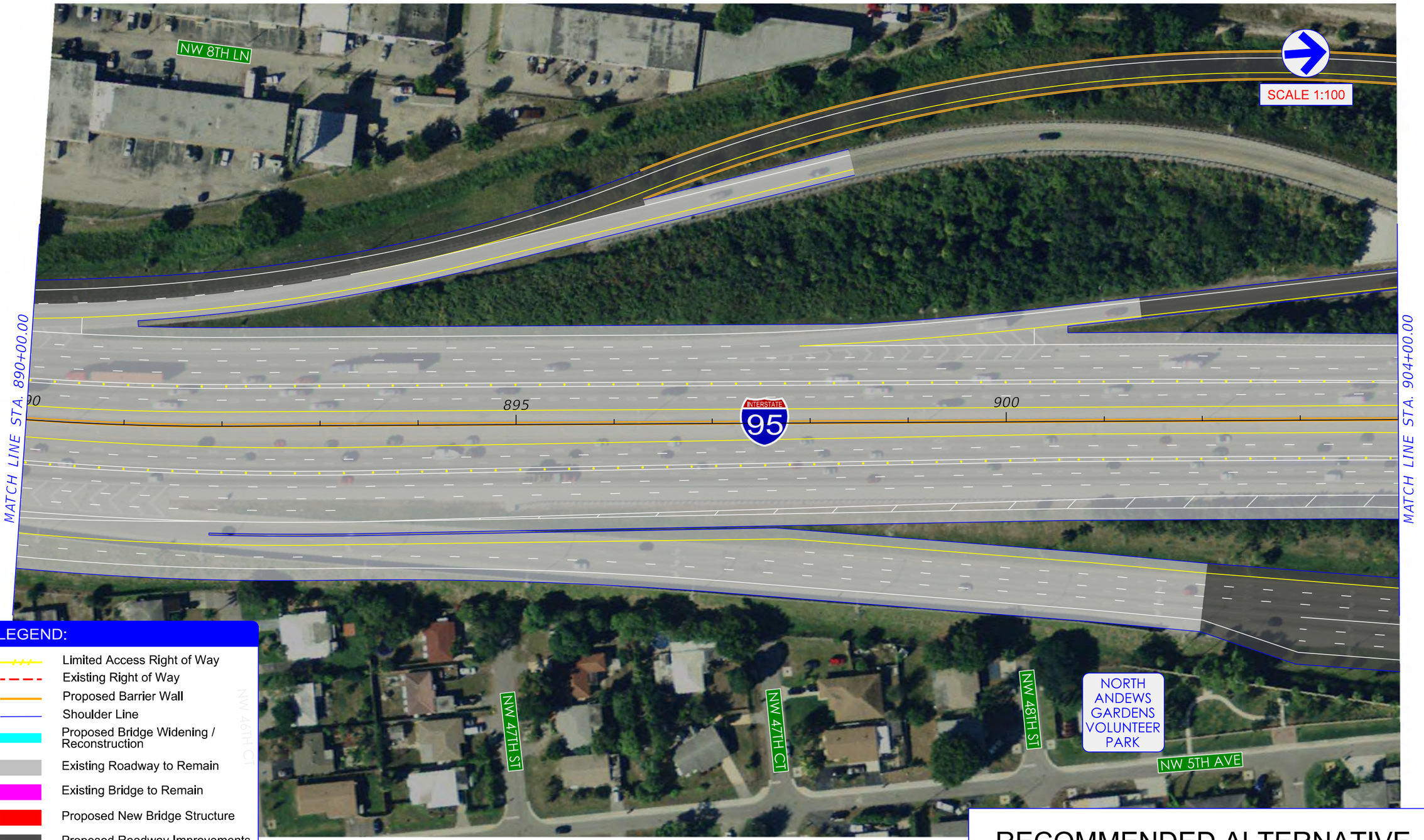
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-2



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Proposed Barrier Wall
- Shoulder Line
- Proposed Bridge Widening / Reconstruction
- Existing Roadway to Remain
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

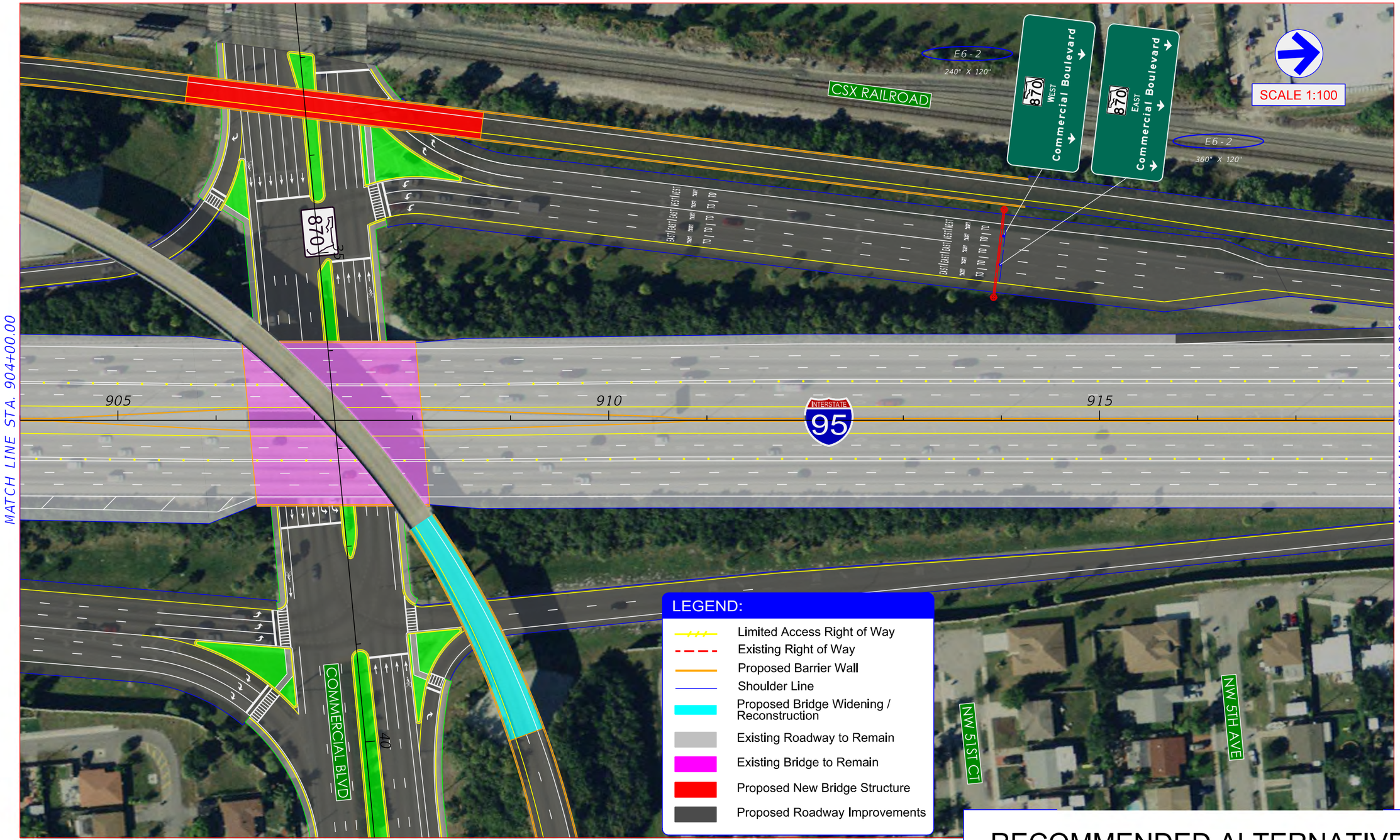
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-3



RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

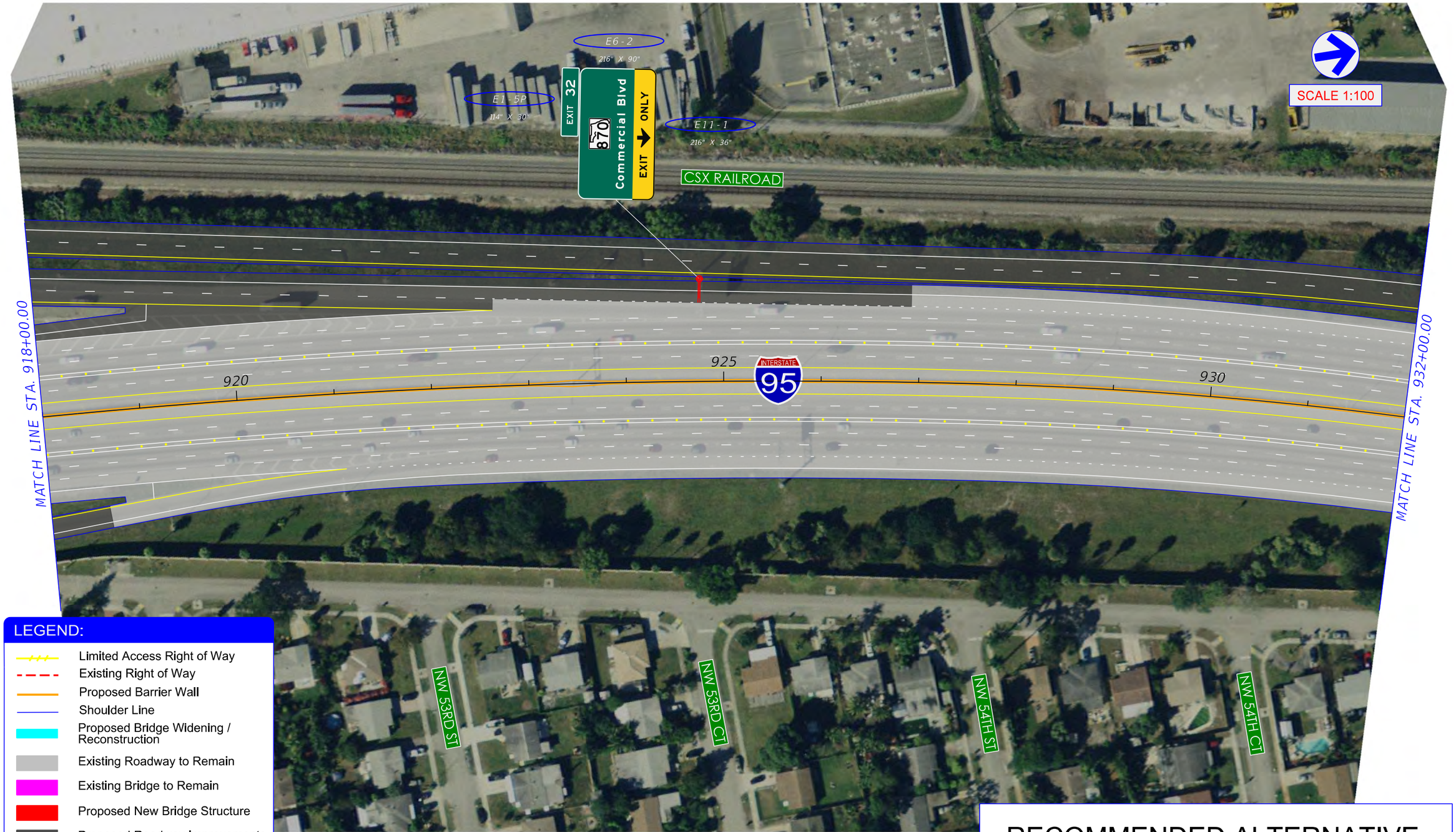
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-4



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Proposed Barrier Wall
- Shoulder Line
- Proposed Bridge Widening / Reconstruction
- Existing Roadway to Remain
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

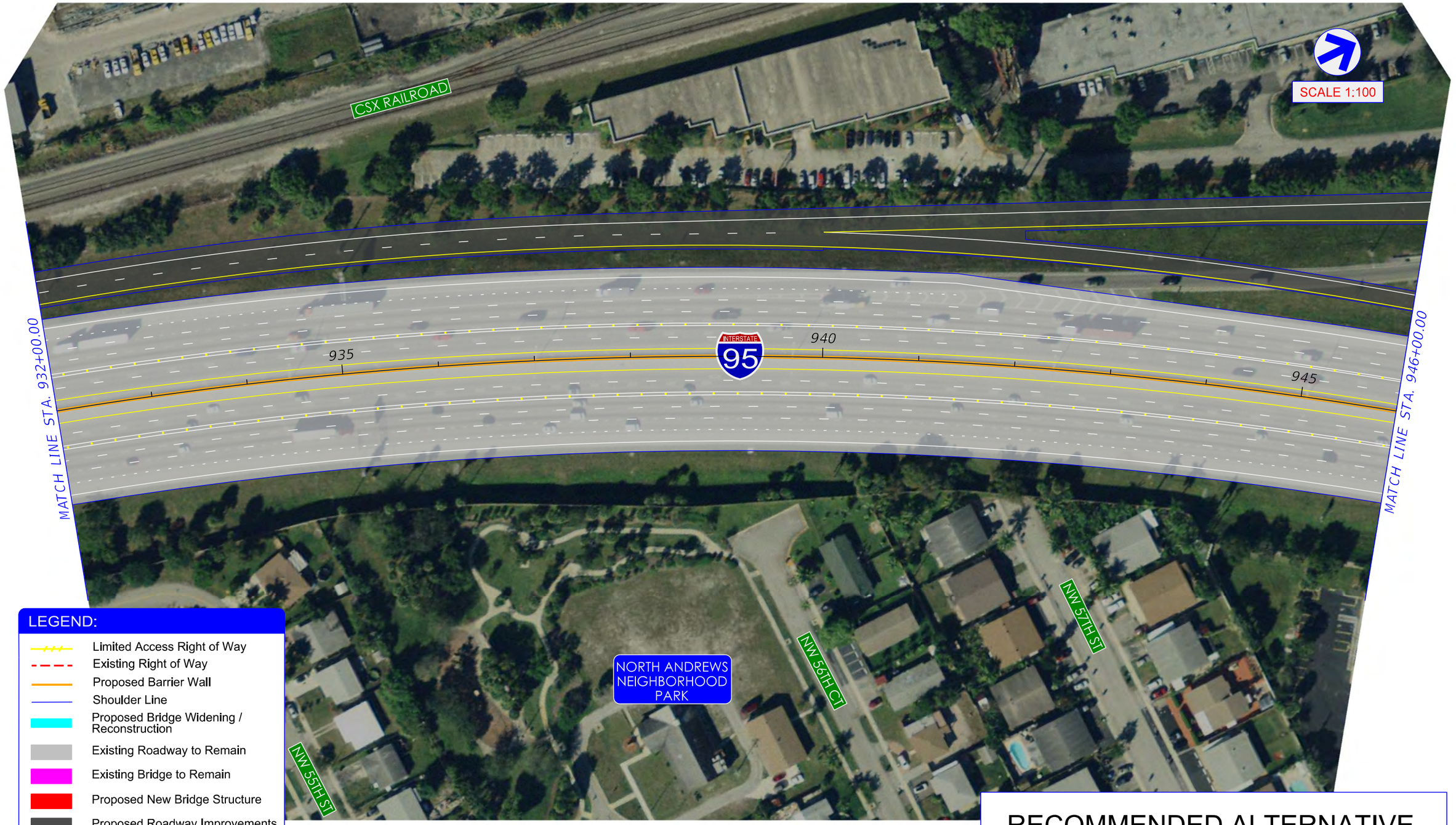
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-5



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Proposed Barrier Wall
- Shoulder Line
- Proposed Bridge Widening / Reconstruction
- Existing Roadway to Remain
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

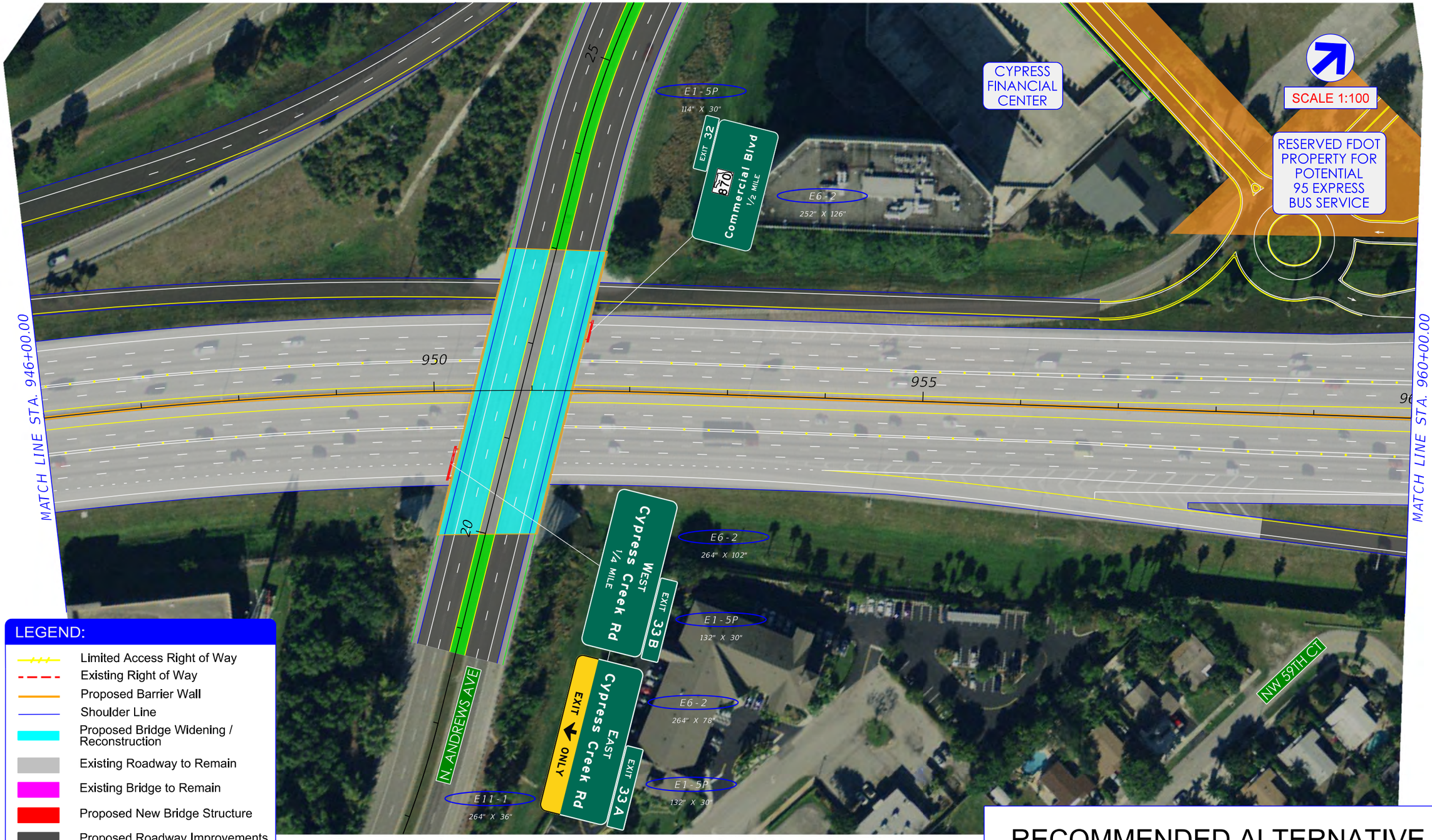
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-6



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Proposed Barrier Wall
- Shoulder Line
- Proposed Bridge Widening / Reconstruction
- Existing Roadway to Remain
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

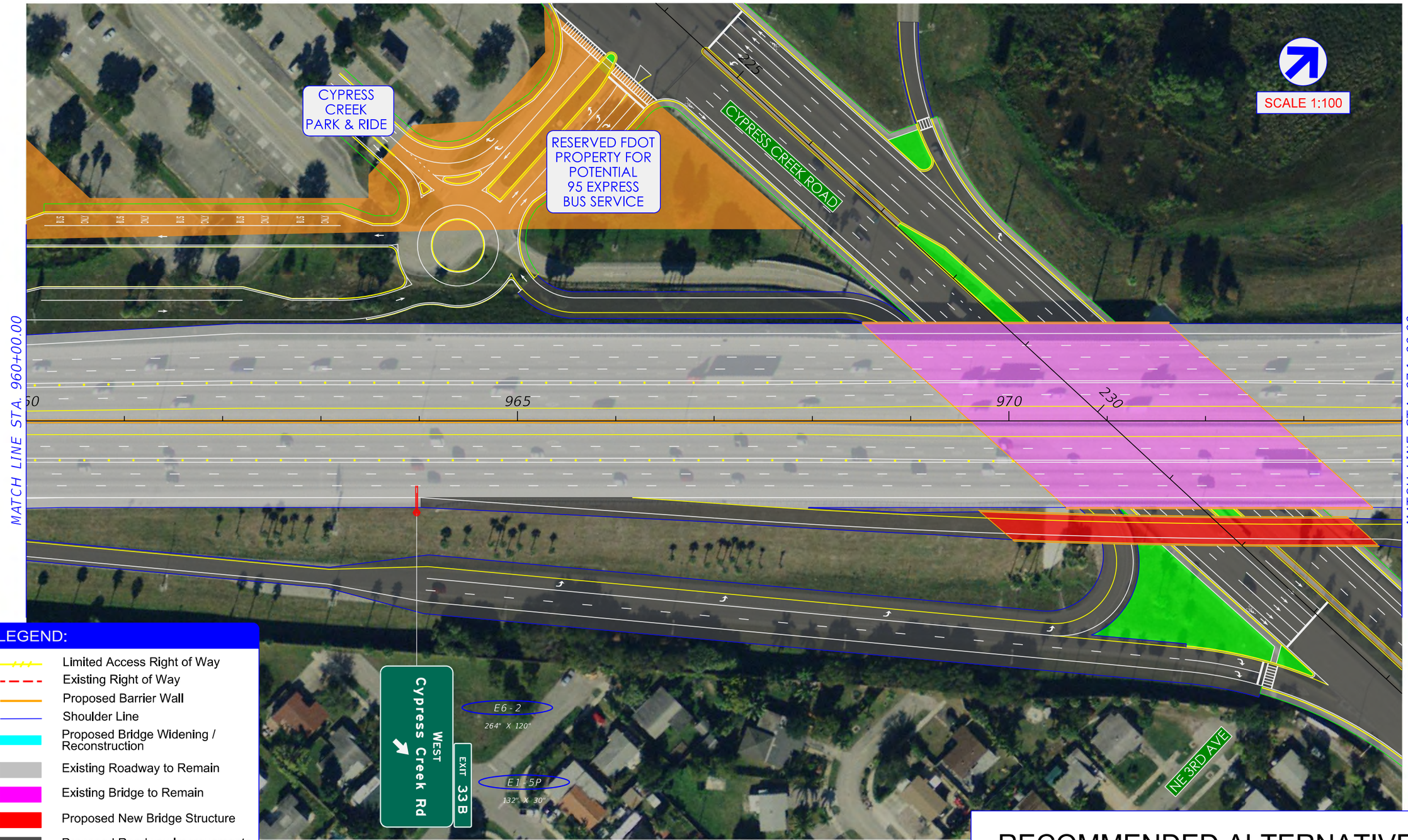
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-7



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Proposed Barrier Wall
- Shoulder Line
- Proposed Bridge Widening / Reconstruction
- Existing Roadway to Remain
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

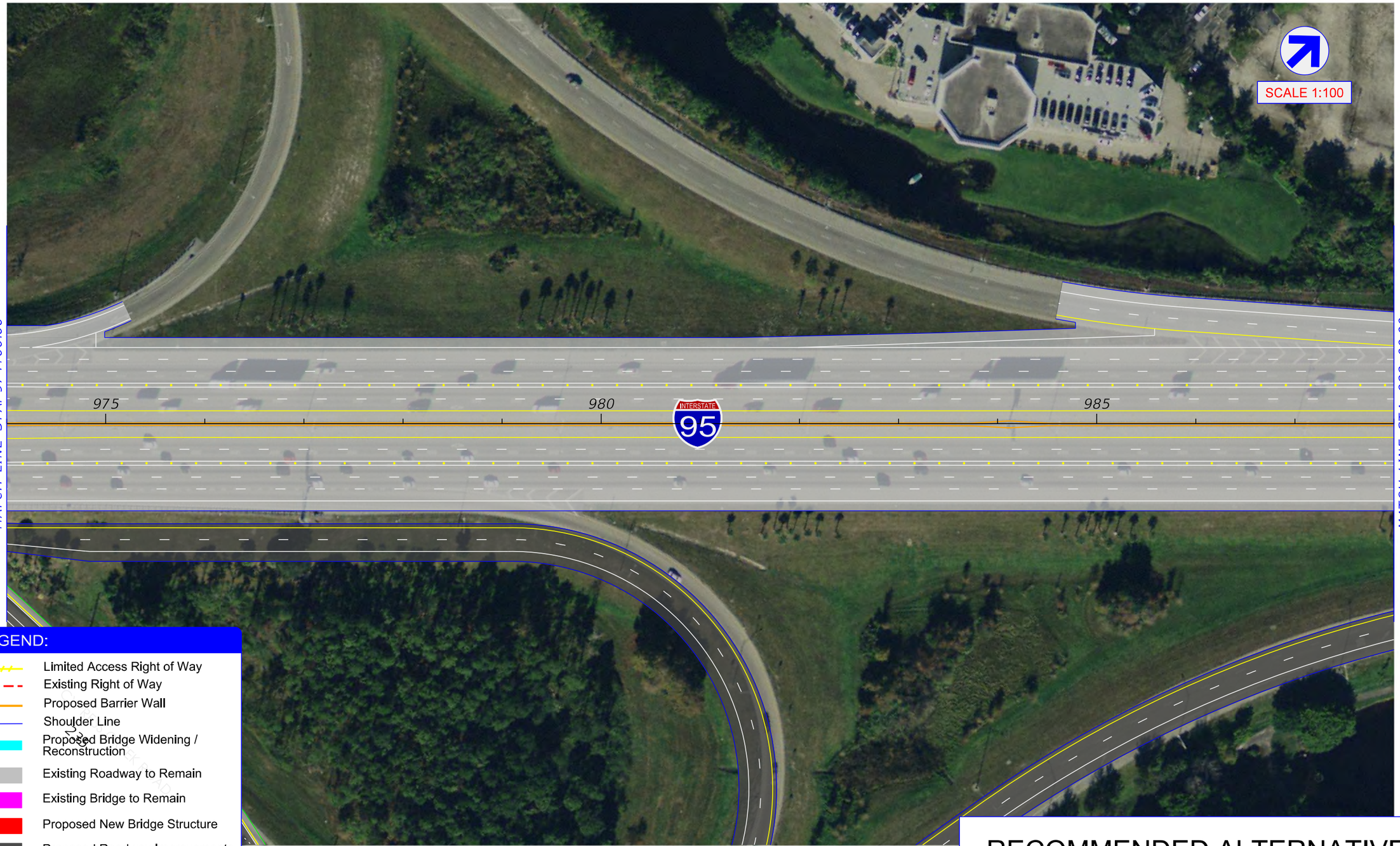
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO. S-8



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Proposed Barrier Wall
- Shoulder Line
- Proposed Bridge Widening / Reconstruction
- Existing Roadway to Remain
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

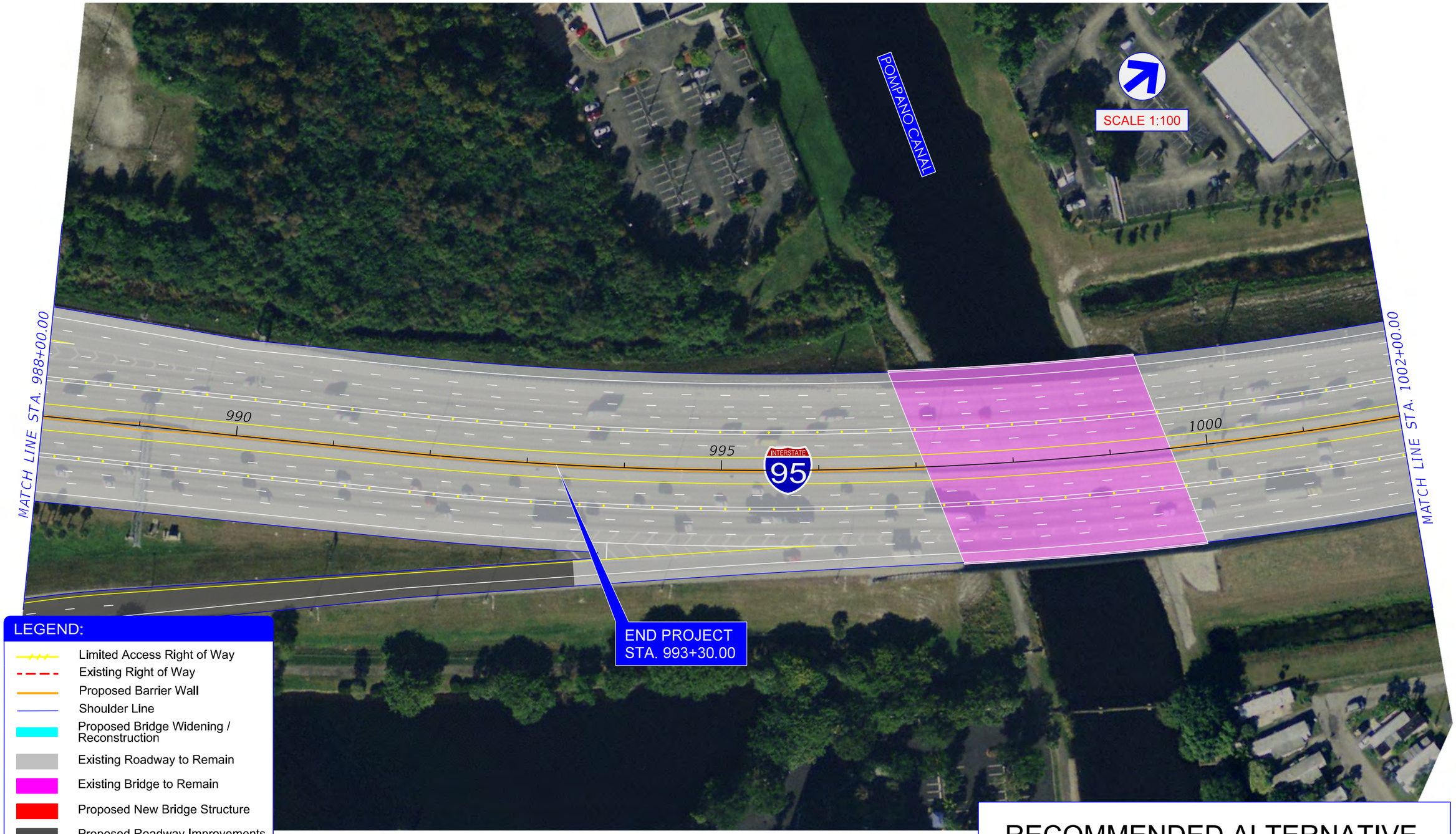
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO. S-9



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Proposed Barrier Wall
- Shoulder Line
- Proposed Bridge Widening / Reconstruction
- Existing Roadway to Remain
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

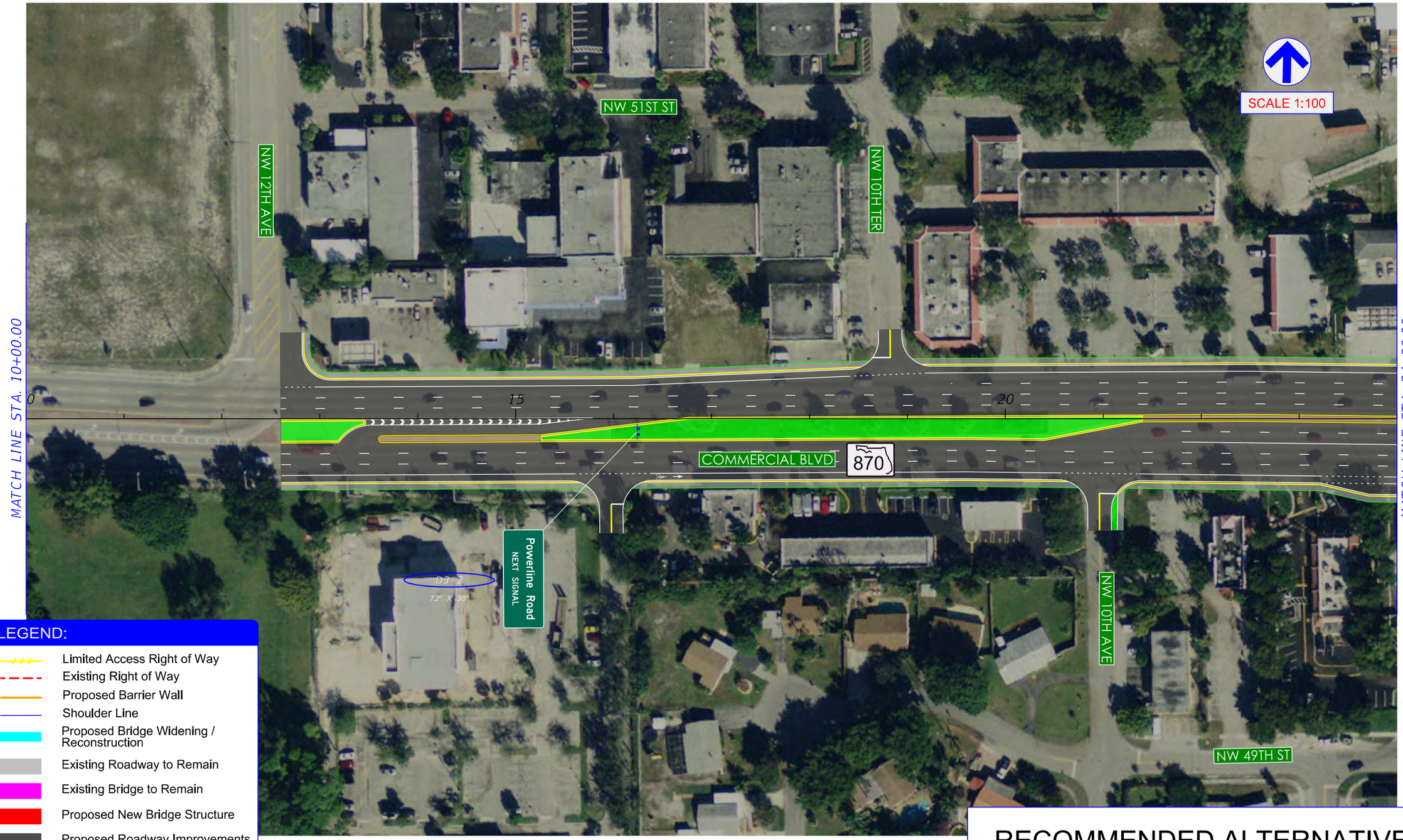
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CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-10



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Proposed Barrier Wall
- Shoulder Line
- Proposed Bridge Widening / Reconstruction
- Existing Roadway to Remain
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

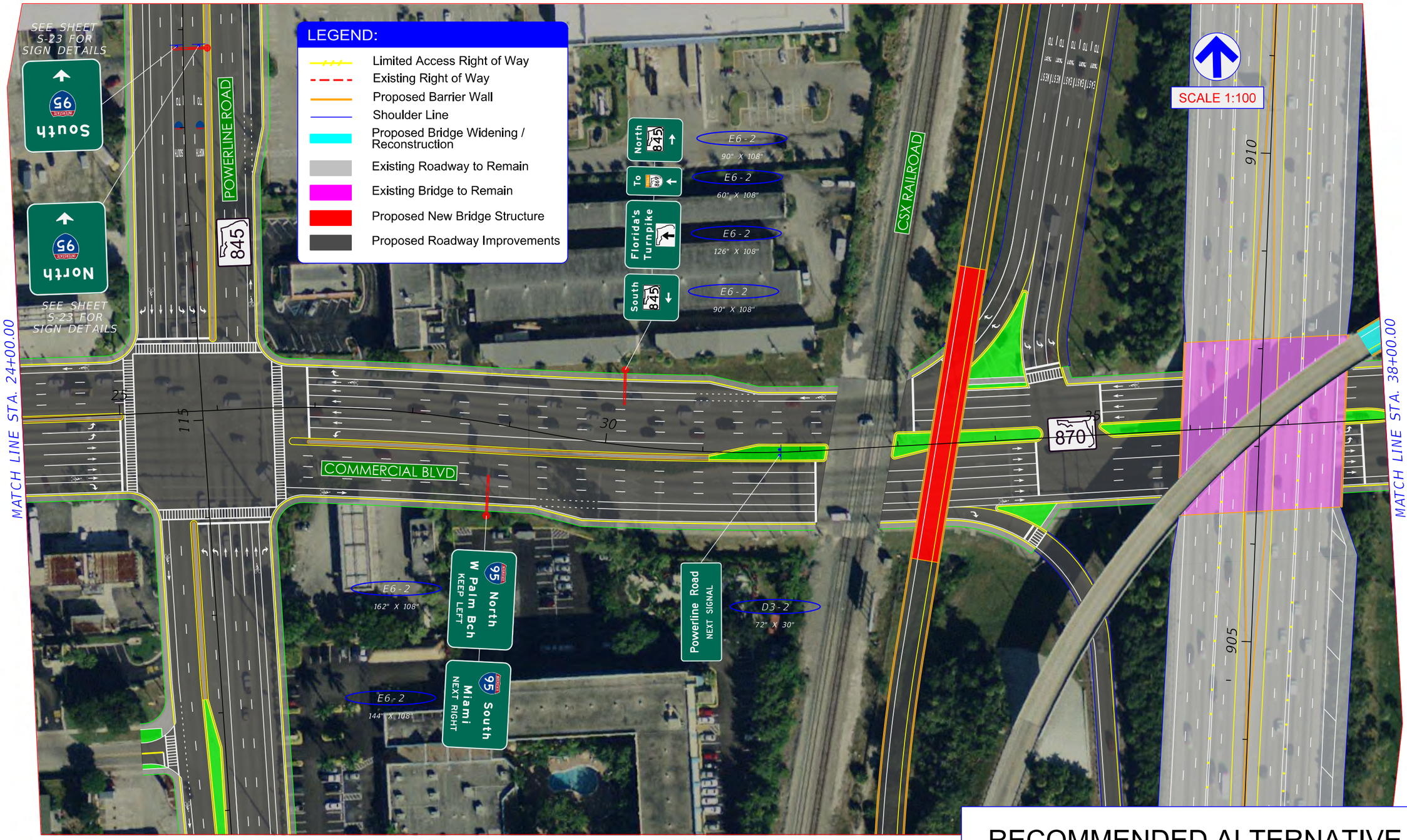
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 870	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-11



RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

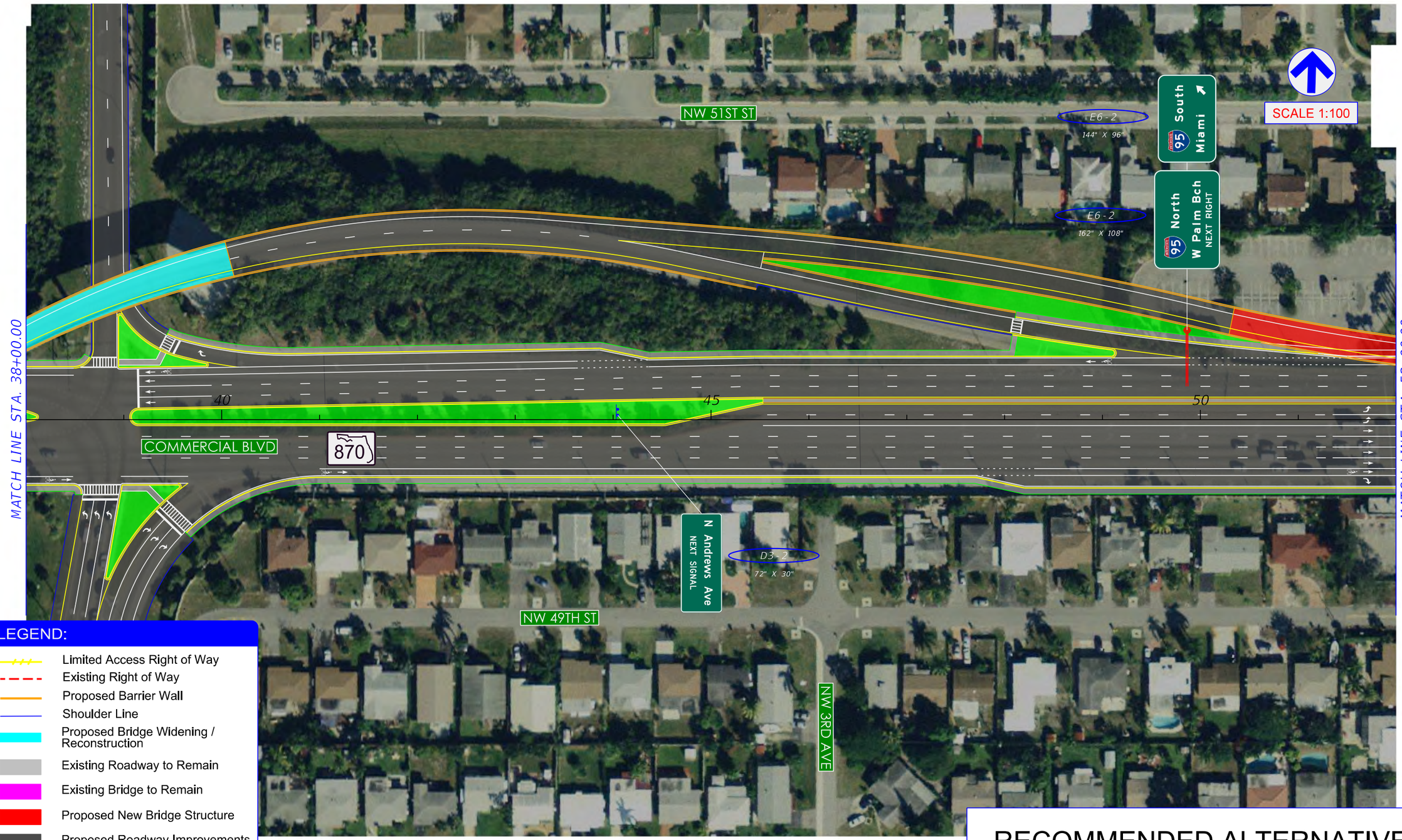
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901 PONCE DE LEON BLVD. SUITE 900
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CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 870	BROWARD	435808-1

PRELIMINARY CONCEPT SIGNING PLANS

SHEET NO. S-12



RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 870	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-13



RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

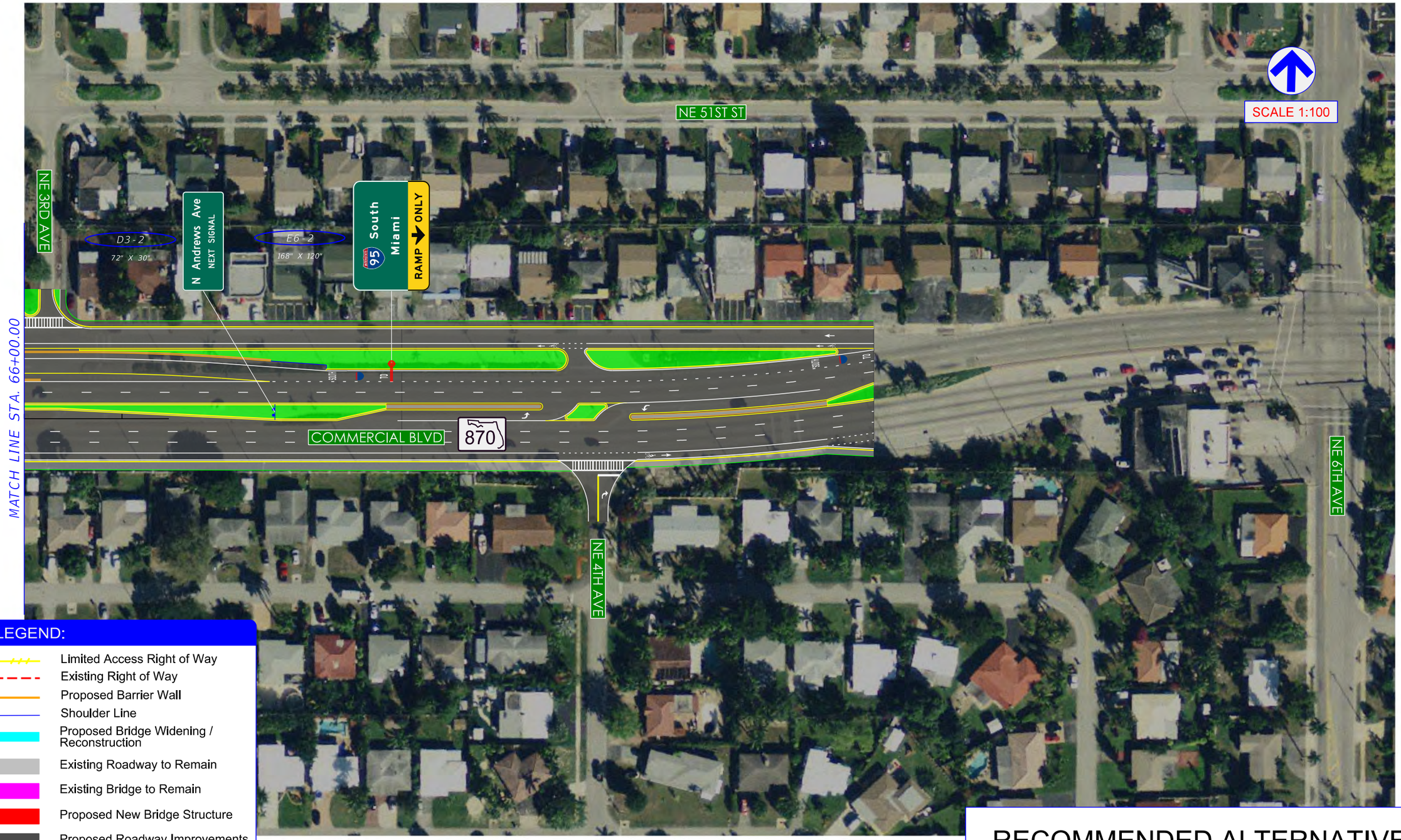
SILVIA M. BELTRE, P.E.
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CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 870	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-14



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Proposed Barrier Wall
- Shoulder Line
- Proposed Bridge Widening / Reconstruction
- Existing Roadway to Remain
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

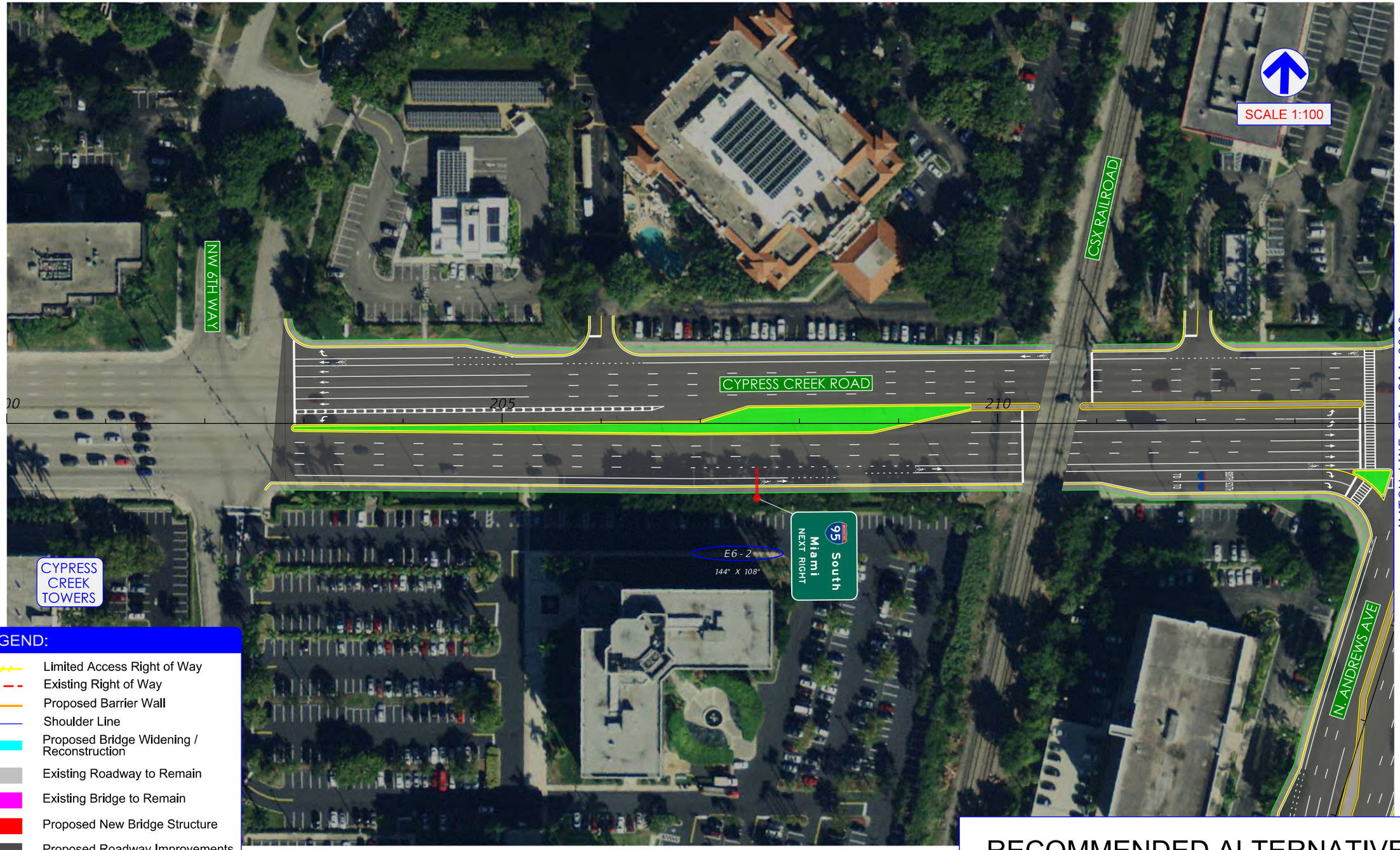
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 870	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-15



RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

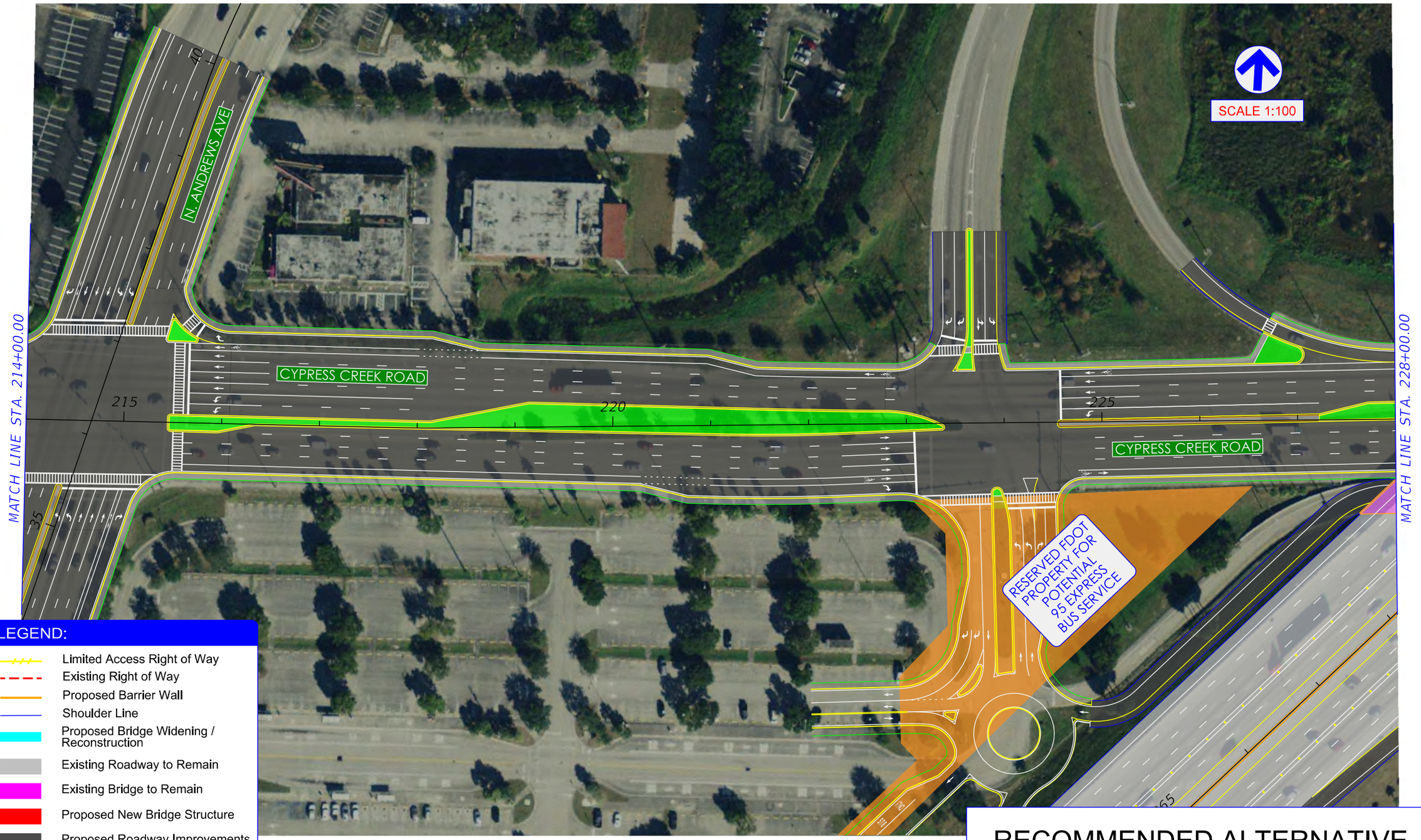
SILVIA M. BELTRE, P.E.
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-16



RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

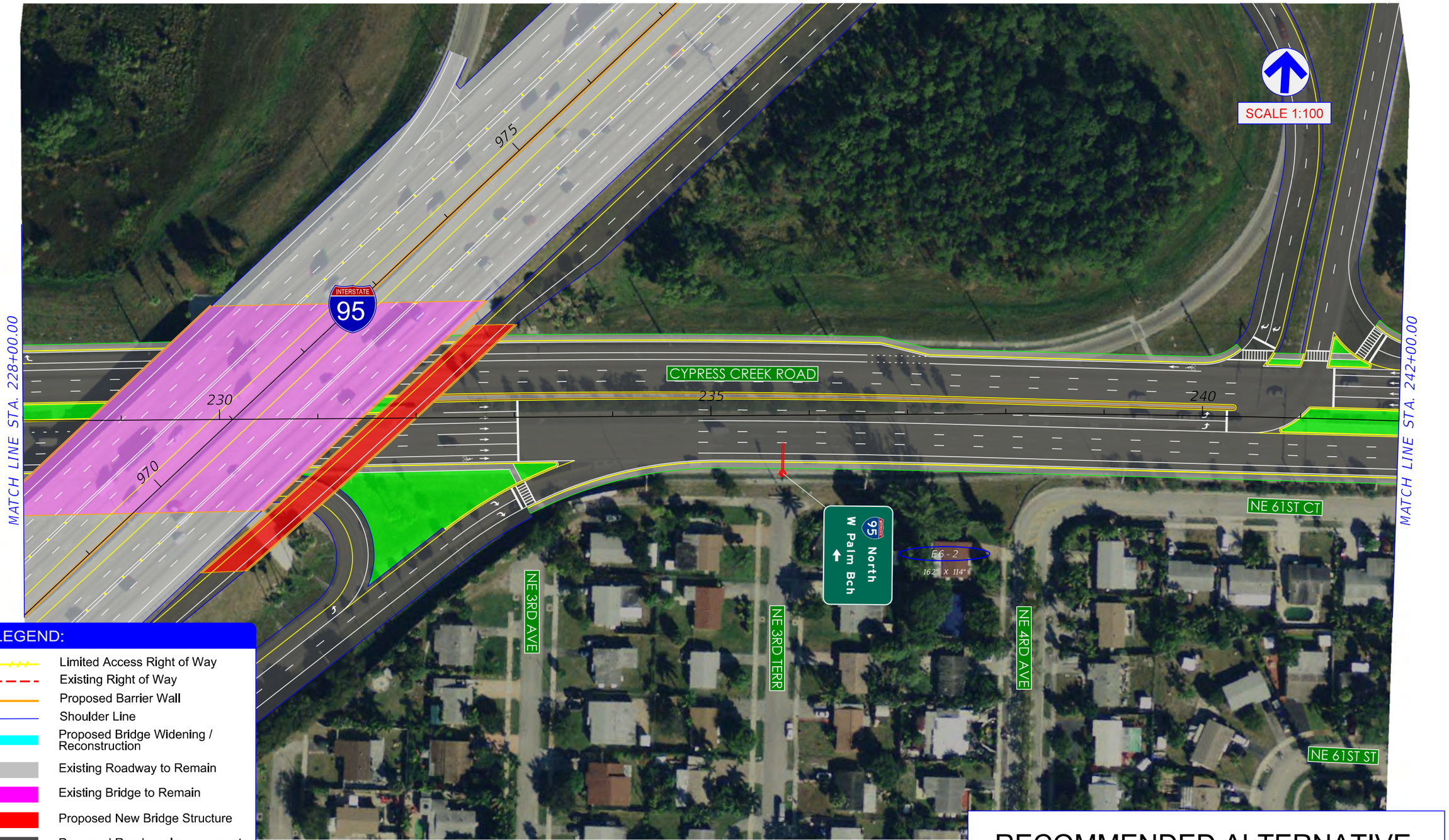
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-17



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Proposed Barrier Wall
- Shoulder Line
- Proposed Bridge Widening / Reconstruction
- Existing Roadway to Remain
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED ALTERNATIVE

REVISIONS			
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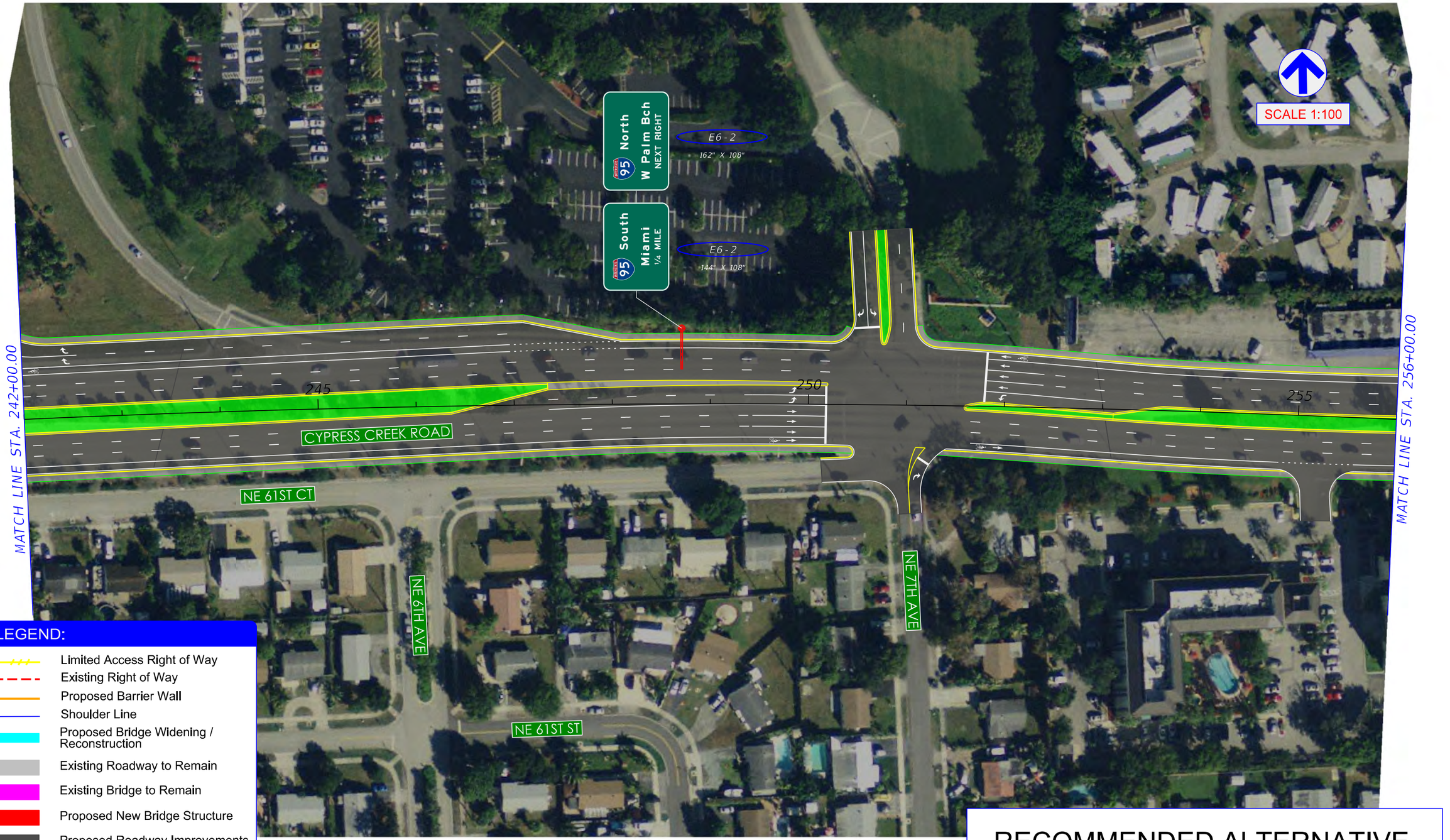
SILVIA M. BELTRE, P.E.
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CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-18



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Proposed Barrier Wall
- Shoulder Line
- Proposed Bridge Widening / Reconstruction
- Existing Roadway to Remain
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

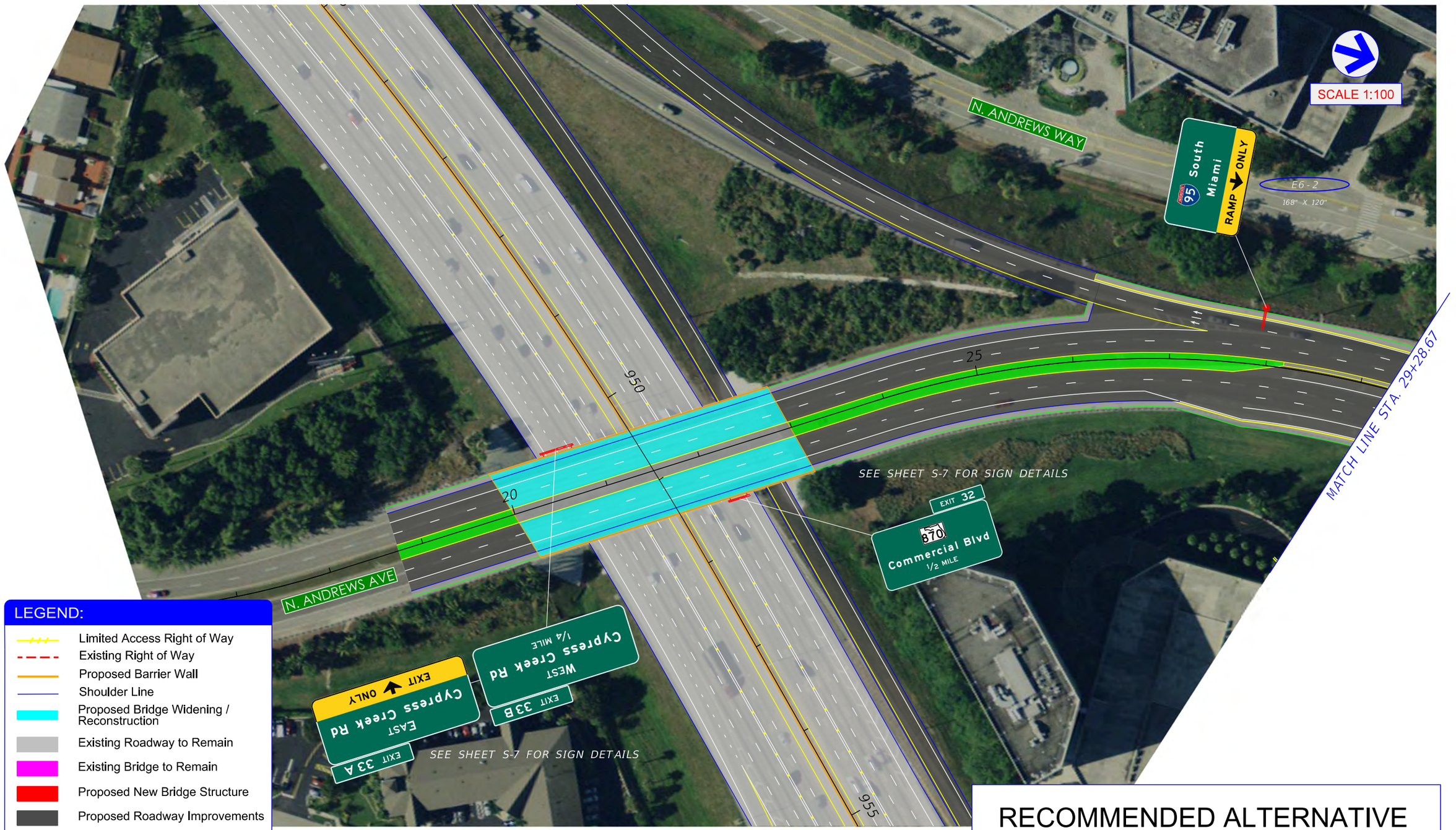
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-19



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Proposed Barrier Wall
- Shoulder Line
- Proposed Bridge Widening / Reconstruction
- Existing Roadway to Remain
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

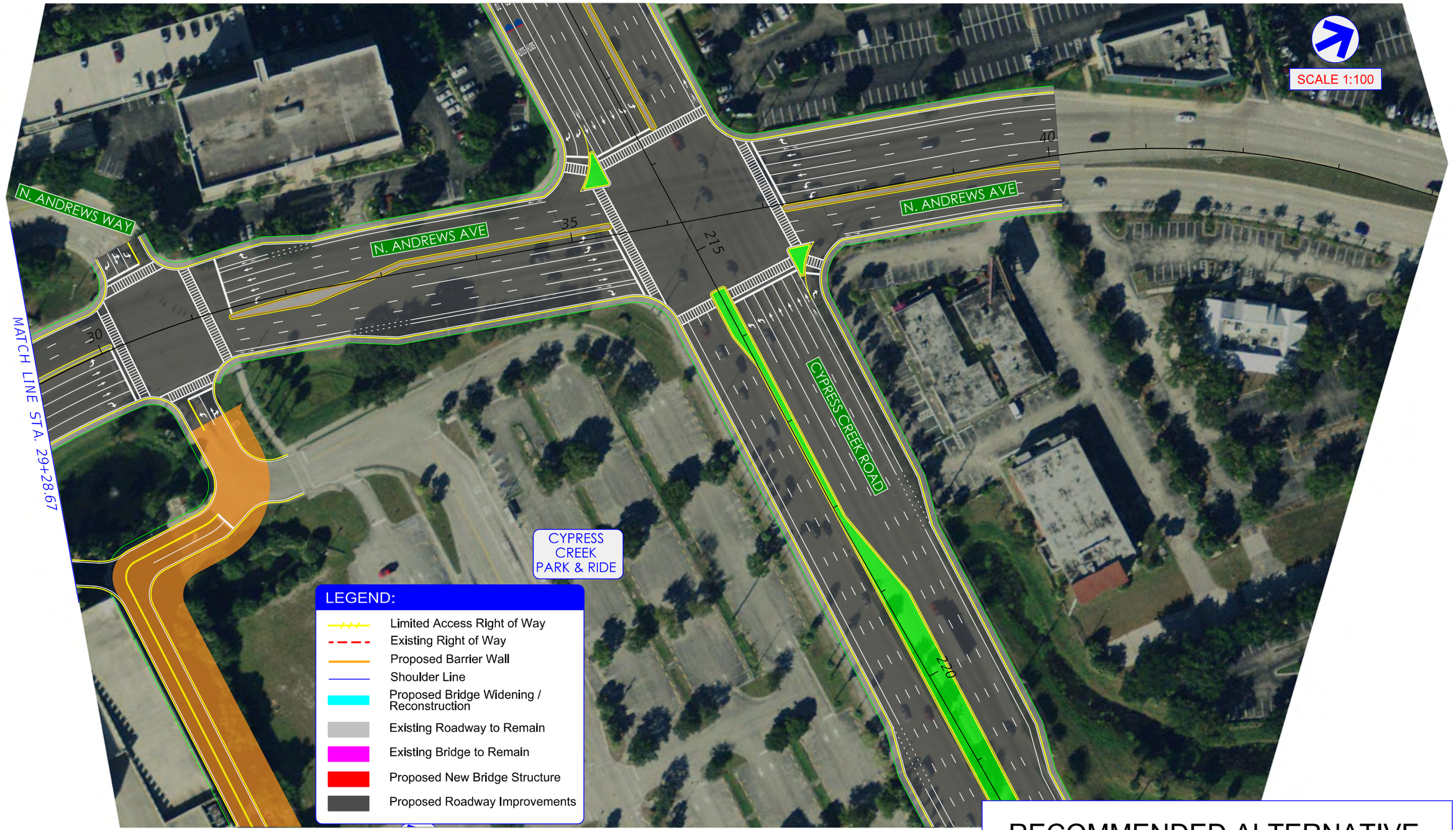
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-20



RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

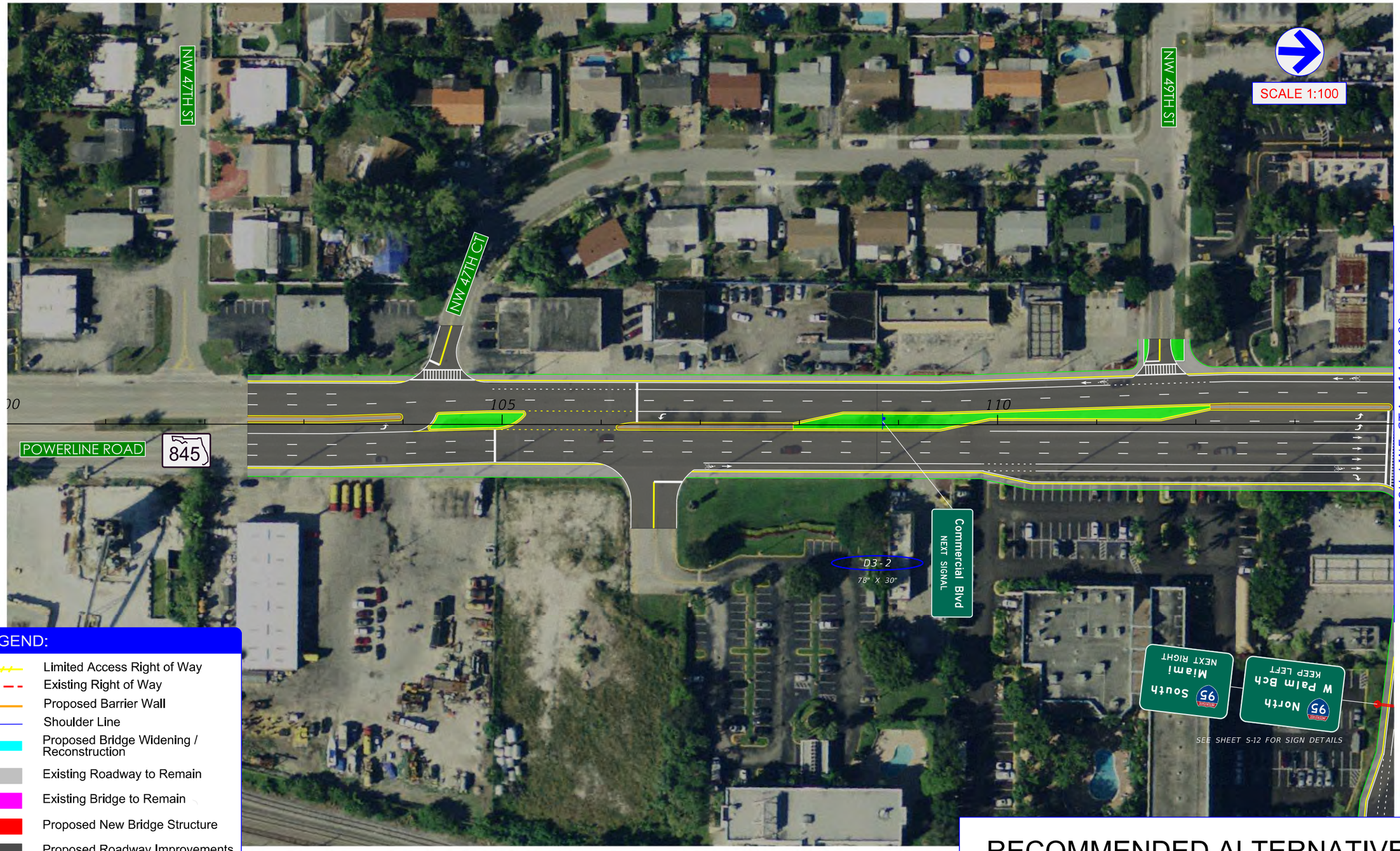
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-21



LEGEND:

- Limited Access Right of Way
- Existing Right of Way
- Proposed Barrier Wall
- Shoulder Line
- Proposed Bridge Widening / Reconstruction
- Existing Roadway to Remain
- Existing Bridge to Remain
- Proposed New Bridge Structure
- Proposed Roadway Improvements

RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 845	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-22



RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD. SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 845	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-23



RECOMMENDED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
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CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 845	BROWARD	435808-1

PRELIMINARY
CONCEPT SIGNING PLANS

SHEET NO.
S-24

APPENDIX D

Long Range Estimates

Date: 5/9/2018 1:17:39 PM

FDOT Long Range Estimating System - Production

R3: Project Details by Sequence Report

Project: 435808-1-52-01 Letting Date: 01/2099

Description: SR-9/I-95 FROM S. OF SR-870/COMMERCIAL BLVD. TO N. OF CYPRESS CREEK RD

District: 04 County: 86 BROWARD Market Area: 12 Units: English

Contract Class: 1 Lump Sum Project: N Design/Build: N Project Length: 6.755 MI

Project Manager: RODRIGUES

Version 15 Project Grand T otal $60,825,922.12

Description: Recommended Alternative -Commercial Blvd Interchange Area - Option 6 and Cypress Creek Rd - Option 1A with CD Road - Option 1

Sequence: 24 WUR - Widen/Resurface, Undivided, Rural Net Length: 0.100 MI 528 LF

Description: I-95 NB off-ramp - Option 6 - Commercial

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	0.00 / 40.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.100
Top of Structural Course For Begin Section	102.00
Top of Structural Course For End Section	102.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Existing Front Slope L/R	6 to 1 / 6 to 1
Existing Outside Shoulder Cross Slope L/R	6.00 % / 6.00 %
Front Slope L/R	6 to 1 / 6 to 1
Outside Shoulder Cross Slope L/R	6.00 % / 6.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	0.48	AC	$39,220.64	$18,825.91
120-2-2	BORROW EXCAVATION, TRUCK MEASURE	286.49	CY	$30.24	$8,663.46
	Earthwork Component T otal				$27,489.37

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	6
Existing Roadway Pavement Width L/R	44.00 / 0.00
Structural Spread Rate	165
Friction Course Spread Rate	80
Widened Outside Pavement Width L/R	0.00 / 22.00
Widened Structural Spread Rate	275
Widened Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	1,877.33	SY	$5.23	$9,818.44
285-709	OPTIONAL BASE,BASE GROUP 09	1,310.03	SY	$22.00	$28,820.66
327-70-5	MILLING EXIST ASPH PAVT, 2" AVG DEPTH	2,581.33	SY	$2.97	$7,666.55
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	212.96	TN	$129.60	$27,599.62
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	177.47	TN	$129.60	$23,000.11
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	103.25	TN	$139.83	$14,437.45
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	106.48	TN	$139.83	$14,889.10

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	N
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	2
Solid Stripe No. of Stripes	2
Skip Stripe No. of Paint Applications	2
Skip Stripe No. of Stripes	5

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
706-3	RETRO-REFLECTIVE PAVEMENT MARKERS	94.00	EA	$4.80	$451.20
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	0.40	GM	$869.98	$347.99
710-11-231	PAINTED PAVT MARK,STD,YELLOW,SKIP,6"	1.00	GM	$390.33	$390.33
	Roadway Component T otal				$127,421.45

SHOULDER COMPONENT

User Input Data

Description	Value
Existing Total Outside Shoulder Width L/R	10.00 / 0.00
New Total Outside Shoulder Width L/R	0.00 / 10.00
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 0.00
Existing Paved Outside Shoulder Width L/R	10.00 / 0.00
New Paved Outside Shoulder Width L/R	0.00 / 10.00
Structural Spread Rate	110
Friction Course Spread Rate	80
Total Width (T) / 8" Overlap (O)	T
Rumble Strips ï¿½No. of Sides	0

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
285-704	OPTIONAL BASE,BASE GROUP 04	606.03	SY	$25.70	$15,574.97
327-70-1	MILLING EXIST ASPH PAVT, 1" AVG DEPTH	586.67	SY	$3.52	$2,065.08
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	32.27	TN	$129.60	$4,182.19

337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	23.47	TN	$139.83	$3,281.81

Erosion Control

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	1,214.40	LF	$1.86	$2,258.78
104-11	FLOATING TURBIDITY BARRIER	10.00	LF	$11.41	$114.10
104-12	STAKED TURBIDITY BARRIER-NYL REINF PVC	10.00	LF	$5.90	$59.00
104-15	SOIL TRACKING PREVENTION DEVICE	1.00	EA	$2,013.84	$2,013.84
104-18	INLET PROTECTION SYSTEM	1.00	EA	$97.92	$97.92
107-1	LITTER REMOVAL	0.24	AC	$47.56	$11.41
107-2	MOWING	0.24	AC	$66.75	$16.02
	Shoulder Component T otal				$29,675.12

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-2	CONC CLASS II, ENDWALLS	1.80	CY	$2,160.00	$3,888.00
430-174-124	PIPE CULV, OPT MATL, ROUND,24"SD	16.00	LF	$191.28	$3,060.48
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	8.00	LF	$144.65	$1,157.20
430-984-129	MITERED END SECT, OPTIONAL RD, 24" SD	1.00	EA	$1,579.93	$1,579.93
570-1-1	PERFORMANCE TURF	40.40	SY	$2.66	$107.46
	Drainage Component T otal				$9,793.07

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	1.00	AS	$346.35	$346.35
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	2.00	AS	$1,045.67	$2,091.34
700-1-50	SINGLE POST SIGN, RELOCATE	1.00	AS	$279.29	$279.29
700-1-60	SINGLE POST SIGN, REMOVE	2.00	AS	$20.90	$41.80
700-2-13	MULTI- POST SIGN, F&I GM, 21-30 SF	1.00	AS	$3,177.63	$3,177.63
700-2-60	MULTI- POST SIGN, REMOVE	1.00	AS	$483.73	$483.73
	Signing Component T otal				$6,420.14

SIGNALIZATIONS COMPONENT

Signalization 1

Description	Value
Type	2 Lane Mast Arm
Multiplier	1
Description	Mast arm for new triple right from NB off-ramp

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	800.00	LF	$8.24	$6,592.00
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	200.00	LF	$18.50	$3,700.00
632-7-1	SIGNAL CABLE- NEW OR RECO, FUR & INSTALL	1.00	PI	$5,084.78	$5,084.78
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	12.00	EA	$618.19	$7,418.28
639-1-112	ELECTRICAL POWER SRV,F&I,OH,M,PUR BY CON	1.00	AS	$1,795.00	$1,795.00
639-2-1	ELECTRICAL SERVICE WIRE, F&I	60.00	LF	$4.12	$247.20
649-21-4	STEEL MAST ARM ASSEMBLY, F&I, 40'- 30'	4.00	EA	$30,000.00	$120,000.00
650-1-14	VEH TRAF SIGNAL,F&I ALUMINUM, 3 S 1 W	8.00	AS	$971.18	$7,769.44
653-1-11	PEDESTRIAN SIGNAL, F&I LED COUNT, 1 WAY	8.00	AS	$703.42	$5,627.36
660-1-102	LOOP DETECTOR INDUCTIVE, F&I, TYPE 2	8.00	EA	$184.94	$1,479.52
660-2-106	LOOP ASSEMBLY, F&I, TYPE F	8.00	AS	$1,009.61	$8,076.88
665-1-11	PEDESTRIAN DETECTOR, F&I, STANDARD	8.00	EA	$221.97	$1,775.76
670-5-111	TRAF CNTL ASSEM, F&I, NEMA, 1 PREEMPT	1.00	AS	$29,375.31	$29,375.31
700-3-101	SIGN PANEL, F&I GM, UP TO 12 SF	4.00	EA	$288.05	$1,152.20
	Signalizations Component T otal				$200,093.73

LIGHTING COMPONENT

Rural Lighting Subcomponent

Description	Value
Multiplier (Number of Poles)	4

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	800.00	LF	$8.24	$6,592.00
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	4.00	EA	$618.19	$2,472.76
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	2,400.00	LF	$2.20	$5,280.00
715-4-14	LIGHT POLE COMPLETE, F&I-STD, 45'	4.00	EA	$5,937.91	$23,751.64
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	4.00	EA	$590.10	$2,360.40
	Subcomponent T otal				$40,456.80
	Lighting Component T otal				$40,456.80

Sequence 24 T otal $441,349.68

Sequence: 25 WUR - Widen/Resurface, Undivided, Rural

Net Length: 0.208 MI 1,100 LF

Description: I-95 SB off-ramp - Option 6 - Commercial

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	0.00 / 30.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.100
Top of Structural Course For Begin Section	102.00
Top of Structural Course For End Section	102.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Existing Front Slope L/R	6 to 1 / 6 to 1
Existing Outside Shoulder Cross Slope L/R	6.00 % / 6.00 %
Front Slope L/R	6 to 1 / 6 to 1
Outside Shoulder Cross Slope L/R	6.00 % / 6.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	0.76	AC	$39,220.64	$29,807.69
120-2-2	BORROW EXCAVATION, TRUCK MEASURE	227.24	CY	$30.24	$6,871.74
	Earthwork Component T otal				$36,679.43

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	6
Existing Roadway Pavement Width L/R	44.00 / 0.00
Structural Spread Rate	165
Friction Course Spread Rate	80
Widened Outside Pavement Width L/R	0.00 / 11.00
Widened Structural Spread Rate	275
Widened Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	2,566.26	SY	$5.23	$13,421.54
285-709	OPTIONAL BASE,BASE GROUP 09	1,384.56	SY	$22.00	$30,460.32
327-70-5	MILLING EXIST ASPH PAVT, 2" AVG DEPTH	5,376.92	SY	$2.97	$15,969.45
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	443.60	TN	$129.60	$57,490.56
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	184.83	TN	$129.60	$23,953.97
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	215.08	TN	$139.83	$30,074.64
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	110.90	TN	$139.83	$15,507.15

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	N
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	2
Solid Stripe No. of Stripes	2
Skip Stripe No. of Paint Applications	2

Skip Stripe No. of Stripes 5

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
706-3	RETRO-REFLECTIVE PAVEMENT MARKERS	197.00	EA	$4.80	$945.60
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	0.83	GM	$869.98	$722.08
710-11-231	PAINTED PAVT MARK,STD,YELLOW,SKIP,6"	2.08	GM	$390.33	$811.89
	Roadway Component T otal				$189,357.20

SHOULDER COMPONENT

User Input Data

Description	Value
Existing Total Outside Shoulder Width L/R	10.00 / 0.00
New Total Outside Shoulder Width L/R	0.00 / 10.00
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 0.00
Existing Paved Outside Shoulder Width L/R	10.00 / 0.00
New Paved Outside Shoulder Width L/R	0.00 / 10.00
Structural Spread Rate	110
Friction Course Spread Rate	80
Total Width (T) / 8" Overlap (O)	T
Rumble Strips ï¿½No. of Sides	0

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
285-704	OPTIONAL BASE,BASE GROUP 04	1,262.35	SY	$25.70	$32,442.40
327-70-1	MILLING EXIST ASPH PAVT, 1" AVG DEPTH	1,222.03	SY	$3.52	$4,301.55
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	67.21	TN	$129.60	$8,710.42
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	48.88	TN	$139.83	$6,834.89

Erosion Control

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	2,529.60	LF	$1.86	$4,705.06
104-11	FLOATING TURBIDITY BARRIER	20.83	LF	$11.41	$237.67
104-12	STAKED TURBIDITY BARRIER-NYL REINF PVC	20.83	LF	$5.90	$122.90
104-15	SOIL TRACKING PREVENTION DEVICE	1.00	EA	$2,013.84	$2,013.84
104-18	INLET PROTECTION SYSTEM	1.00	EA	$97.92	$97.92
107-1	LITTER REMOVAL	0.50	AC	$47.56	$23.78
107-2	MOWING	0.50	AC	$66.75	$33.38
	Shoulder Component T otal				$59,523.81

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-2	CONC CLASS II, ENDWALLS	3.75	CY	$2,160.00	$8,100.00

430-174-124	PIPE CULV, OPT MATL, ROUND,24"SD	32.00 LF	$191.28	$6,120.96
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	16.00 LF	$144.65	$2,314.40
430-984-129	MITERED END SECT, OPTIONAL RD, 24" SD	3.00 EA	$1,579.93	$4,739.79
570-1-1	PERFORMANCE TURF	84.15 SY	$2.66	$223.84
	Drainage Component T otal			$21,498.99

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	1.00	AS	$346.35	$346.35
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	5.00	AS	$1,045.67	$5,228.35
700-1-50	SINGLE POST SIGN, RELOCATE	1.00	AS	$279.29	$279.29
700-1-60	SINGLE POST SIGN, REMOVE	5.00	AS	$20.90	$104.50
700-2-13	MULTI- POST SIGN, F&I GM, 21-30 SF	1.00	AS	$3,177.63	$3,177.63
700-2-60	MULTI- POST SIGN, REMOVE	1.00	AS	$483.73	$483.73
	Signing Component T otal				$9,619.85

SIGNALIZATIONS COMPONENT

Signalization 1

Description	Value
Type	2 Lane Mast Arm
Multiplier	1
Description	Mast arm for new triple right from NB off-ramp

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	800.00	LF	$8.24	$6,592.00
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	200.00	LF	$18.50	$3,700.00
632-7-1	SIGNAL CABLE- NEW OR RECO, FUR & INSTALL	1.00	PI	$5,084.78	$5,084.78
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	12.00	EA	$618.19	$7,418.28
639-1-112	ELECTRICAL POWER SRV,F&I,OH,M,PUR BY CON	1.00	AS	$1,795.00	$1,795.00
639-2-1	ELECTRICAL SERVICE WIRE, F&I	60.00	LF	$4.12	$247.20
649-21-4	STEEL MAST ARM ASSEMBLY, F&I, 40'- 30'	4.00	EA	$30,000.00	$120,000.00
650-1-14	VEH TRAF SIGNAL,F&I ALUMINUM, 3 S 1 W	8.00	AS	$971.18	$7,769.44
653-1-11	PEDESTRIAN SIGNAL, F&I LED COUNT, 1 WAY	8.00	AS	$703.42	$5,627.36
660-1-102	LOOP DETECTOR INDUCTIVE, F&I, TYPE 2	8.00	EA	$184.94	$1,479.52
660-2-106	LOOP ASSEMBLY, F&I, TYPE F	8.00	AS	$1,009.61	$8,076.88
665-1-11	PEDESTRIAN DETECTOR, F&I, STANDARD	8.00	EA	$221.97	$1,775.76
670-5-111	TRAF CNTL ASSEM, F&I, NEMA, 1	1.00	AS	$29,375.31	$29,375.31

	PREEMPT			
700-3-101	SIGN PANEL, F&I GM, UP TO 12 SF	4.00 EA	$288.05	$1,152.20
	Signalizations Component T otal			$200,093.73

LIGHTING COMPONENT

Rural Lighting Subcomponent

Description	Value
Multiplier (Number of Poles)	7

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	1,400.00	LF	$8.24	$11,536.00
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	7.00	EA	$618.19	$4,327.33
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	4,200.00	LF	$2.20	$9,240.00
715-4-14	LIGHT POLE COMPLETE, F&I-STD, 45'	7.00	EA	$5,937.91	$41,565.37
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	7.00	EA	$590.10	$4,130.70
	Subcomponent T otal				$70,799.40
	Lighting Component T otal				$70,799.40

Sequence 25 T otal $587,572.41

Sequence: 28 WDU - Widen/Resurface, Divided, Urban Net Length: 0.492 MI 2,600 LF

Description: Option 6 - Widen Commercial Blvd. from NW 12th Ave to I-95 NB ramp terminals to provide bike lanes and additional WB through lane.

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	25.00 / 25.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.492
Top of Structural Course For Begin Section	102.00
Top of Structural Course For End Section	102.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Existing Front Slope L/R	6 to 1 / 6 to 1
Existing Median Shoulder Cross Slope L/R	4.00 % / 4.00 %
Existing Outside Shoulder Cross Slope L/R	2.00 % / 2.00 %
Front Slope L/R	6 to 1 / 6 to 1
Median Shoulder Cross Slope L/R	4.00 % / 4.00 %
Outside Shoulder Cross Slope L/R	2.00 % / 2.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	2.98	AC	$39,220.64	$116,877.51
120-2-2	BORROW EXCAVATION, TRUCK MEASURE	2,932.58	CY	$30.24	$88,681.22

	Earthwork Component T otal	$205,558.73

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	6
Existing Roadway Pavement Width L/R	33.00 / 33.00
Structural Spread Rate	165
Friction Course Spread Rate	80
Widened Outside Pavement Width L/R	18.00 / 7.00
Widened Inside Pavement Width L/R	0.00 / 0.00
Widened Structural Spread Rate	275
Widened Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	8,712.46	SY	$5.23	$45,566.17
285-709	OPTIONAL BASE,BASE GROUP 09	7,412.52	SY	$22.00	$163,075.44
327-70-5	MILLING EXIST ASPH PAVT, 2" AVG DEPTH	19,065.73	SY	$2.97	$56,625.22
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	1,572.92	TN	$129.60	$203,850.43
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	993.01	TN	$129.60	$128,694.10
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	762.63	TN	$139.83	$106,638.55
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	595.80	TN	$139.83	$83,310.71

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	N
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	2
Solid Stripe No. of Stripes	4
Skip Stripe No. of Paint Applications	2
Skip Stripe No. of Stripes	4

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
706-3	RETRO-REFLECTIVE PAVEMENT MARKERS	332.00	EA	$4.80	$1,593.60
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	3.94	GM	$869.98	$3,427.72
710-11-131	PAINTED PAVT MARK,STD,WHITE,SKIP, 6"	3.94	GM	$384.56	$1,515.17

	Roadway Component T otal	$794,297.11

SHOULDER COMPONENT

User Input Data

Description	Value
Existing Total Outside Shoulder Width L/R	7.00 / 7.00
New Total Outside Shoulder Width L/R	8.25 / 8.25

Total Outside Shoulder Perf. Turf Width L/R	0.00 / 0.00
Sidewalk Width L/R	6.00 / 6.00

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
520-1-10	CONCRETE CURB & GUTTER, TYPE F	2,599.87	LF	$26.01	$67,622.62
520-1-10	CONCRETE CURB & GUTTER, TYPE F	2,599.87	LF	$26.01	$67,622.62
522-1	CONCRETE SIDEWALK AND DRIVEWAYS, 4"	3,466.50	SY	$42.68	$147,950.22

Erosion Control

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	5,199.74	LF	$1.86	$9,671.52
104-11	FLOATING TURBIDITY BARRIER	49.24	LF	$11.41	$561.83
104-12	STAKED TURBIDITY BARRIER-NYL REINF PVC	49.24	LF	$5.90	$290.52
104-15	SOIL TRACKING PREVENTION DEVICE	1.00	EA	$2,013.84	$2,013.84
104-18	INLET PROTECTION SYSTEM	23.00	EA	$97.92	$2,252.16
107-1	LITTER REMOVAL	4.29	AC	$47.56	$204.03
107-2	MOWING	4.29	AC	$66.75	$286.36
	Shoulder Component T otal				$298,475.72

MEDIAN COMPONENT

User Input Data

Description	Value
Total Median Width	22.00
Performance Turf Width	5.34

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
520-5-11	TRAF SEP CONC-TYPE I, 4' WIDE	880.00	LF	$43.11	$37,936.80
570-1-1	PERFORMANCE TURF	1,542.59	SY	$2.66	$4,103.29
	Median Component T otal				$42,040.09

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-2	CONC CLASS II, ENDWALLS	8.86	CY	$2,160.00	$19,137.60
425-1-351	INLETS, CURB, TYPE P-5, <10'	18.00	EA	$5,339.35	$96,108.30
425-1-451	INLETS, CURB, TYPE J-5, <10'	5.00	EA	$8,552.96	$42,764.80
430-175-124	PIPE CULV, OPT MATL, ROUND, 24"S/CD	272.00	LF	$105.93	$28,812.96
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	80.00	LF	$144.65	$11,572.00
570-1-1	PERFORMANCE TURF	149.69	SY	$2.66	$398.18
	Drainage Component T otal				$198,793.84

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	11.00	AS	$346.35	$3,809.85
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	1.00	AS	$1,045.67	$1,045.67
700-1-50	SINGLE POST SIGN, RELOCATE	1.00	AS	$279.29	$279.29
700-1-60	SINGLE POST SIGN, REMOVE	11.00	AS	$20.90	$229.90
700-2-14	MULTI- POST SIGN, F&I GM, 31-50 SF	1.00	AS	$4,669.54	$4,669.54
700-2-60	MULTI- POST SIGN, REMOVE	1.00	AS	$483.73	$483.73
	Signing Component T otal				$10,517.98

SIGNALIZATIONS COMPONENT

Signalization 1

Description	Value
Type	6 Lane Mast Arm
Multiplier	2
Description	Signal at Powerline Road east and west leg

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	1,400.00	LF	$8.24	$11,536.00
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	600.00	LF	$18.50	$11,100.00
632-7-1	SIGNAL CABLE- NEW OR RECO, FUR & INSTALL	2.00	PI	$5,084.78	$10,169.56
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	44.00	EA	$618.19	$27,200.36
639-1-112	ELECTRICAL POWER SRV,F&I,OH,M,PUR BY CON	2.00	AS	$1,795.00	$3,590.00
639-2-1	ELECTRICAL SERVICE WIRE, F&I	120.00	LF	$4.12	$494.40
641-2-11	PREST CNC POLE,F&I,TYP P-II,PEDESTAL	2.00	EA	$1,167.92	$2,335.84
649-1-10	STEEL STRAIN POLE, F&I, PEDESTAL	2.00	EA	$1,505.77	$3,011.54
649-21-21	STEEL MAST ARM ASSEMBLY, F&I, 78'	12.00	EA	$43,505.68	$522,068.16
650-1-14	VEH TRAF SIGNAL,F&I ALUMINUM, 3 S 1 W	40.00	AS	$971.18	$38,847.20
653-1-11	PEDESTRIAN SIGNAL, F&I LED COUNT, 1 WAY	16.00	AS	$703.42	$11,254.72
660-1-102	LOOP DETECTOR INDUCTIVE, F&I, TYPE 2	40.00	EA	$184.94	$7,397.60
660-2-106	LOOP ASSEMBLY, F&I, TYPE F	40.00	AS	$1,009.61	$40,384.40
665-1-11	PEDESTRIAN DETECTOR, F&I, STANDARD	16.00	EA	$221.97	$3,551.52
670-5-111	TRAF CNTL ASSEM, F&I, NEMA, 1 PREEMPT	2.00	AS	$29,375.31	$58,750.62
700-3-101	SIGN PANEL, F&I GM, UP TO 12 SF	8.00	EA	$288.05	$2,304.40

Signalization 2

Description	Value
Type	4 Lane Mast Arm

Multiplier	3
Description	Signalization at I-95 SB terminals

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	2,250.00	LF	$8.24	$18,540.00
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	750.00	LF	$18.50	$13,875.00
632-7-1	SIGNAL CABLE- NEW OR RECO, FUR & INSTALL	3.00	PI	$5,084.78	$15,254.34
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	48.00	EA	$618.19	$29,673.12
639-1-112	ELECTRICAL POWER SRV,F&I,OH,M,PUR BY CON	3.00	AS	$1,795.00	$5,385.00
639-2-1	ELECTRICAL SERVICE WIRE, F&I	180.00	LF	$4.12	$741.60
649-21-10	STEEL MAST ARM ASSEMBLY, F&I, 60'	12.00	EA	$40,041.33	$480,495.96
650-1-14	VEH TRAF SIGNAL,F&I ALUMINUM, 3 S 1 W	36.00	AS	$971.18	$34,962.48
653-1-11	PEDESTRIAN SIGNAL, F&I LED COUNT, 1 WAY	24.00	AS	$703.42	$16,882.08
660-1-102	LOOP DETECTOR INDUCTIVE, F&I, TYPE 2	36.00	EA	$184.94	$6,657.84
660-2-106	LOOP ASSEMBLY, F&I, TYPE F	36.00	AS	$1,009.61	$36,345.96
665-1-11	PEDESTRIAN DETECTOR, F&I, STANDARD	24.00	EA	$221.97	$5,327.28
670-5-111	TRAF CNTL ASSEM, F&I, NEMA, 1 PREEMPT	3.00	AS	$29,375.31	$88,125.93
700-3-101	SIGN PANEL, F&I GM, UP TO 12 SF	12.00	EA	$288.05	$3,456.60

Signalization 3

Description	Value
Type	4 Lane Mast Arm
Multiplier	3
Description	Signalization at I-95 NB terminals

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	2,250.00	LF	$8.24	$18,540.00
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	750.00	LF	$18.50	$13,875.00
632-7-1	SIGNAL CABLE- NEW OR RECO, FUR & INSTALL	3.00	PI	$5,084.78	$15,254.34
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	48.00	EA	$618.19	$29,673.12
639-1-112	ELECTRICAL POWER SRV,F&I,OH,M,PUR BY CON	3.00	AS	$1,795.00	$5,385.00
639-2-1	ELECTRICAL SERVICE WIRE, F&I	180.00	LF	$4.12	$741.60
649-21-10	STEEL MAST ARM ASSEMBLY, F&I, 60'	12.00	EA	$40,041.33	$480,495.96
650-1-14	VEH TRAF SIGNAL,F&I ALUMINUM, 3 S 1 W	36.00	AS	$971.18	$34,962.48
653-1-11	PEDESTRIAN SIGNAL, F&I LED COUNT, 1 WAY	24.00	AS	$703.42	$16,882.08
660-1-102	LOOP DETECTOR INDUCTIVE, F&I, TYPE 2	36.00	EA	$184.94	$6,657.84
660-2-106	LOOP ASSEMBLY, F&I, TYPE F	36.00	AS	$1,009.61	$36,345.96
665-1-11	PEDESTRIAN DETECTOR, F&I, STANDARD	24.00	EA	$221.97	$5,327.28

670-5-111	TRAF CNTL ASSEM, F&I, NEMA, 1 PREEMPT	3.00	AS	$29,375.31	$88,125.93
700-3-101	SIGN PANEL, F&I GM, UP TO 12 SF	12.00	EA	$288.05	$3,456.60
	Signalizations Component T otal				$2,265,442.70

Sequence 28 T otal $3,815,126.17

Sequence: 29 NDU - New Construction, Divided, Urban Net Length: 0.682 MI 3,600 LF

Description: Option 6 - Commercial Blvd. from NB terminals to beginning of frontage road

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	30.00 / 0.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.682
Top of Structural Course For Begin Section	105.00
Top of Structural Course For End Section	105.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	6 to 1 / 6 to 1
Median Shoulder Cross Slope L/R	4.00 % / 4.00 %
Outside Shoulder Cross Slope L/R	2.00 % / 2.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	2.48	AC	$39,220.64	$97,267.19
120-6	EMBANKMENT	84,969.32	CY	$22.58	$1,918,607.25
	Earthwork Component T otal				$2,015,874.44

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	6
Roadway Pavement Width L/R	40.00 / 51.00
Structural Spread Rate	330
Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	40,526.92	SY	$5.23	$211,955.79
285-709	OPTIONAL BASE,BASE GROUP 09	36,399.03	SY	$22.00	$800,778.66
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	6,005.84	TN	$129.60	$778,356.86
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	3,002.92	TN	$139.83	$419,898.30

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	N
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	2
Solid Stripe No. of Stripes	4
Skip Stripe No. of Paint Applications	2
Skip Stripe No. of Stripes	4

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
706-3	RETRO-REFLECTIVE PAVEMENT MARKERS	460.00	EA	$4.80	$2,208.00
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	5.45	GM	$869.98	$4,741.39
710-11-131	PAINTED PAVT MARK,STD,WHITE,SKIP, 6"	5.45	GM	$384.56	$2,095.85
	Roadway Component T otal				$2,220,034.85

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	8.25 / 8.25
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 0.00
Sidewalk Width L/R	6.00 / 6.00

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
520-1-10	CONCRETE CURB & GUTTER, TYPE F	3,599.90	LF	$26.01	$93,633.40
520-1-10	CONCRETE CURB & GUTTER, TYPE F	3,599.90	LF	$26.01	$93,633.40
522-1	CONCRETE SIDEWALK AND DRIVEWAYS, 4"	4,799.87	SY	$42.68	$204,858.45

Erosion Control

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	7,199.81	LF	$1.86	$13,391.65
104-11	FLOATING TURBIDITY BARRIER	170.45	LF	$11.41	$1,944.83
104-12	STAKED TURBIDITY BARRIER-NYL REINF PVC	170.45	LF	$5.90	$1,005.66
104-15	SOIL TRACKING PREVENTION DEVICE	1.00	EA	$2,013.84	$2,013.84
104-18	INLET PROTECTION SYSTEM	35.00	EA	$97.92	$3,427.20
107-1	LITTER REMOVAL	17.35	AC	$47.56	$825.17
107-2	MOWING	17.35	AC	$66.75	$1,158.11
	Shoulder Component T otal				$415,891.71

MEDIAN COMPONENT

User Input Data

Description	Value
Total Median Width	22.00
Performance Turf Width	4.00

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
520-1-7	CONCRETE CURB & GUTTER, TYPE E	7,199.81	LF	$24.86	$178,987.28
520-5-11	TRAF SEP CONC-TYPE I, 4' WIDE	1,260.00	LF	$43.11	$54,318.60
521-1	MEDIAN CONC BARRIER WALL	5,190.00	LF	$151.75	$787,582.50
570-1-1	PERFORMANCE TURF	1,599.96	SY	$2.66	$4,255.89
	Median Component T otal				$1,025,144.27

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-2	CONC CLASS II, ENDWALLS	12.27	CY	$2,160.00	$26,503.20
425-1-351	INLETS, CURB, TYPE P-5, <10'	25.00	EA	$5,339.35	$133,483.75
425-1-451	INLETS, CURB, TYPE J-5, <10'	7.00	EA	$8,552.96	$59,870.72
425-1-521	INLETS, DT BOT, TYPE C, <10'	4.00	EA	$2,905.39	$11,621.56
425-2-41	MANHOLES, P-7, <10'	4.00	EA	$4,468.81	$17,875.24
430-175-124	PIPE CULV, OPT MATL, ROUND, 24"S/CD	1,808.00	LF	$105.93	$191,521.44
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	160.00	LF	$144.65	$23,144.00
430-175-148	PIPE CULV, OPT MATL, ROUND, 48"S/CD	3,416.00	LF	$347.62	$1,187,469.92
570-1-1	PERFORMANCE TURF	207.27	SY	$2.66	$551.34
	Drainage Component T otal				$1,652,041.17

INTERSECTIONS COMPONENT

Intersection 1

Description	Value
Mainline No. of Left Turn Lanes	2
Mainline No. of Right Turn Lanes	1
Mainline Design Speed	45
Cross Street Thru Lanes	4
Cross Street No. of Left Turn Lanes	3
Cross Street No. of Right Turn Lanes	3
Cross Street Design Speed	35
T-Intersection?	N
Multiplier	1
Description	Intersection at I-95 NB terminal

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	2.36	AC	$39,220.64	$92,560.71
120-1	REGULAR EXCAVATION	2,120.09	CY	$16.08	$34,091.05
160-4	TYPE B STABILIZATION	1,718.56	SY	$5.23	$8,988.07
160-4	TYPE B STABILIZATION	5,118.92	SY	$5.23	$26,771.95
285-709	OPTIONAL BASE,BASE GROUP 09	1,718.56	SY	$22.00	$37,808.32
285-709	OPTIONAL BASE,BASE GROUP 09	5,118.92	SY	$22.00	$112,616.24
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	283.56	TN	$129.60	$36,749.38

334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	844.62	TN	$129.60	$109,462.75
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	422.31	TN	$139.83	$59,051.61
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	141.78	TN	$139.83	$19,825.10
520-1-7	CONCRETE CURB & GUTTER, TYPE E	405.68	LF	$24.86	$10,085.20
520-1-10	CONCRETE CURB & GUTTER, TYPE F	898.00	LF	$26.01	$23,356.98
520-5-11	TRAF SEP CONC-TYPE I, 4' WIDE	670.00	LF	$43.11	$28,883.70
520-5-11	TRAF SEP CONC-TYPE I, 4' WIDE	340.00	LF	$43.11	$14,657.40
522-1	CONCRETE SIDEWALK AND DRIVEWAYS, 4"	498.89	SY	$42.68	$21,292.63
522-2	CONCRETE SIDEWALK AND DRIVEWAYS, 6"	173.89	SY	$52.88	$9,195.30
570-1-1	PERFORMANCE TURF	498.89	SY	$2.66	$1,327.05

Intersection 2

Description	Value
Mainline No. of Left Turn Lanes	3
Mainline No. of Right Turn Lanes	1
Mainline Design Speed	45
Cross Street Thru Lanes	4
Cross Street No. of Left Turn Lanes	3
Cross Street No. of Right Turn Lanes	1
Cross Street Design Speed	35
T-Intersection?	N
Multiplier	1
Description	Intersection at Andrews Ave.

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	2.36	AC	$39,220.64	$92,560.71
120-1	REGULAR EXCAVATION	1,872.14	CY	$16.08	$30,104.01
160-4	TYPE B STABILIZATION	2,272.31	SY	$5.23	$11,884.18
160-4	TYPE B STABILIZATION	4,520.25	SY	$5.23	$23,640.91
285-709	OPTIONAL BASE,BASE GROUP 09	2,272.31	SY	$22.00	$49,990.82
285-709	OPTIONAL BASE,BASE GROUP 09	4,520.25	SY	$22.00	$99,445.50
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	374.93	TN	$129.60	$48,590.93
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	745.84	TN	$129.60	$96,660.86
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	187.47	TN	$139.83	$26,213.93
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	372.92	TN	$139.83	$52,145.40
520-1-7	CONCRETE CURB & GUTTER, TYPE E	405.68	LF	$24.86	$10,085.20
520-1-10	CONCRETE CURB & GUTTER, TYPE F	898.00	LF	$26.01	$23,356.98
520-5-11	TRAF SEP CONC-TYPE I, 4' WIDE	620.00	LF	$43.11	$26,728.20
520-5-11	TRAF SEP CONC-TYPE I, 4' WIDE	340.00	LF	$43.11	$14,657.40
522-1	CONCRETE SIDEWALK AND DRIVEWAYS, 4"	498.89	SY	$42.68	$21,292.63
522-2	CONCRETE SIDEWALK AND DRIVEWAYS, 6"	173.89	SY	$52.88	$9,195.30
570-1-1	PERFORMANCE TURF	498.89	SY	$2.66	$1,327.05

	Intersections Component T otal	$1,284,603.45

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	17.00	AS	$346.35	$5,887.95
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	2.00	AS	$1,045.67	$2,091.34
700-2-15	MULTI- POST SIGN, F&I GM, 51-100 SF	2.00	AS	$7,627.27	$15,254.54
700-2-16	MULTI- POST SIGN, F&I GM, 101-200 SF	2.00	AS	$9,241.53	$18,483.06
	Signing Component T otal				$41,716.89

SIGNALIZATIONS COMPONENT

Signalization 1

Description	Value
Type	6 Lane Mast Arm
Multiplier	4
Description	Signalization at Andrews Ave.

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	2,800.00	LF	$8.24	$23,072.00
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	1,200.00	LF	$18.50	$22,200.00
632-7-1	SIGNAL CABLE- NEW OR RECO, FUR & INSTALL	4.00	PI	$5,084.78	$20,339.12
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	88.00	EA	$618.19	$54,400.72
639-1-112	ELECTRICAL POWER SRV,F&I,OH,M,PUR BY CON	4.00	AS	$1,795.00	$7,180.00
639-2-1	ELECTRICAL SERVICE WIRE, F&I	240.00	LF	$4.12	$988.80
641-2-11	PREST CNC POLE,F&I,TYP P-II,PEDESTAL	4.00	EA	$1,167.92	$4,671.68
649-1-10	STEEL STRAIN POLE, F&I, PEDESTAL	4.00	EA	$1,505.77	$6,023.08
649-21-21	STEEL MAST ARM ASSEMBLY, F&I, 78'	24.00	EA	$43,505.68	$1,044,136.32
650-1-14	VEH TRAF SIGNAL,F&I ALUMINUM, 3 S 1 W	80.00	AS	$971.18	$77,694.40
653-1-11	PEDESTRIAN SIGNAL, F&I LED COUNT, 1 WAY	32.00	AS	$703.42	$22,509.44
660-1-102	LOOP DETECTOR INDUCTIVE, F&I, TYPE 2	80.00	EA	$184.94	$14,795.20
660-2-106	LOOP ASSEMBLY, F&I, TYPE F	80.00	AS	$1,009.61	$80,768.80
665-1-11	PEDESTRIAN DETECTOR, F&I, STANDARD	32.00	EA	$221.97	$7,103.04
670-5-111	TRAF CNTL ASSEM, F&I, NEMA, 1 PREEMPT	4.00	AS	$29,375.31	$117,501.24
700-3-101	SIGN PANEL, F&I GM, UP TO 12 SF	16.00	EA	$288.05	$4,608.80
	Signalizations Component T otal				$1,507,992.64

LIGHTING COMPONENT

Conventional Lighting Subcomponent

Description	Value
Spacing	MIN

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	3,599.90	LF	$8.24	$29,663.18
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	714.53	LF	$18.50	$13,218.80
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	24.00	EA	$618.19	$14,836.56
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	13,147.83	LF	$2.20	$28,925.23
715-4-13	LIGHT POLE COMPLETE, F&I-STD, 40'	24.00	EA	$5,627.26	$135,054.24
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	24.00	EA	$590.10	$14,162.40
	Subcomponent T otal				$235,860.41
	Lighting Component T otal				$235,860.42

BRIDGES COMPONENT

Bridge WB/SB

Description	Value
Estimate Type	SF Estimate
Primary Estimate	YES
Length (LF)	240.00
Width (LF)	5.00
Type	Low Level
Cost Factor	1.34
Structure No.	
Removal of Existing Structures area	0.00
Default Cost per SF	$120.00
Factored Cost per SF	$160.80
Final Cost per SF	$165.49
Basic Bridge Cost	$192,960.00
Description	WIDEN WB TO SB FLYOVER TO ACCOMMODATE TAPER

Bridge Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-10	CONC CLASS II, APPROACH SLABS	11.11	CY	$351.19	$3,901.72
415-1-9	REINF STEEL- APPROACH SLABS	1,944.25	LB	$0.89	$1,730.38
	Bridge WB/SB Total				$198,592.10

Bridge ANDREW

Description	Value
Estimate Type	SF Estimate
Primary Estimate	YES
Length (LF)	450.00
Width (LF)	30.00
Type	Low Level
Cost Factor	1.34
Structure No.	
Removal of Existing Structures area	0.00
Default Cost per SF	$120.00

Factored Cost per SF	$160.80
Final Cost per SF	$163.30
Basic Bridge Cost	$2,170,800.00
Description	

Bridge Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-10	CONC CLASS II, APPROACH SLABS	66.67	CY	$351.19	$23,413.84
415-1-9	REINF STEEL- APPROACH SLABS	11,667.25	LB	$0.89	$10,383.85
	Bridge ANDREW T otal				$2,204,597.69
	Bridges Component T otal				$2,403,189.79

RETAINING WALLS COMPONENT

Retaining W all 1

Description	Value
Length	1,100.00
Begin height	1.00
End Height	25.00
Multiplier	2

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
548-12	RET WALL SYSTEM, PERM, EX BARRIER	28,600.00	SF	$23.14	$661,804.00

Retaining W all 2

Description	Value
Length	1,000.00
Begin height	25.00
End Height	25.00
Multiplier	2

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
548-12	RET WALL SYSTEM, PERM, EX BARRIER	50,000.00	SF	$23.14	$1,157,000.00
	Retaining W alls Component T otal				$1,818,804.00

Sequence 29 T otal $14,621,153.63

Sequence: 30 WUU - Widen/Resurface, Undivided, Urban Net Length: 0.085 MI 450 LF

Description: Widen North Andrews Intersection to provide additional southbound left turn - Option 6

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	7.00 / 7.00
Incidental Clearing and Grubbing Area	0.00

Alignment Number	1
Distance	0.085
Top of Structural Course For Begin Section	102.00
Top of Structural Course For End Section	102.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Existing Front Slope L/R	6 to 1 / 6 to 1
Existing Outside Shoulder Cross Slope L/R	2.00 % / 2.00 %
Front Slope L/R	6 to 1 / 6 to 1
Outside Shoulder Cross Slope L/R	2.00 % / 2.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	0.14	AC	$39,220.64	$5,490.89
120-2-2	BORROW EXCAVATION, TRUCK MEASURE	197.14	CY	$30.24	$5,961.51
	Earthwork Component T otal				$11,452.40

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	5
Existing Roadway Pavement Width L/R	28.00 / 28.00
Structural Spread Rate	165
Friction Course Spread Rate	80
Widened Outside Pavement Width L/R	6.00 / 6.00
Widened Structural Spread Rate	275
Widened Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	857.73	SY	$5.23	$4,485.93
285-709	OPTIONAL BASE,BASE GROUP 09	632.80	SY	$22.00	$13,921.60
327-70-5	MILLING EXIST ASPH PAVT, 2" AVG DEPTH	2,799.10	SY	$2.97	$8,313.33
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	230.93	TN	$129.60	$29,928.53
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	82.47	TN	$129.60	$10,688.11
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	111.96	TN	$139.83	$15,655.37
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	49.48	TN	$139.83	$6,918.79

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	N
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	2
Solid Stripe No. of Stripes	4
Skip Stripe No. of Paint Applications	2
Skip Stripe No. of Stripes	4

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
706-3	RETRO-REFLECTIVE PAVEMENT MARKERS	69.00	EA	$4.80	$331.20
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	0.68	GM	$869.98	$591.59
710-11-131	PAINTED PAVT MARK,STD,WHITE,SKIP, 6"	0.68	GM	$384.56	$261.50
	Roadway Component T otal				$91,095.95

SHOULDER COMPONENT

User Input Data

Description	Value
Existing Total Outside Shoulder Width L/R	7.00 / 7.00
New Total Outside Shoulder Width L/R	8.25 / 8.25
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 0.00
Sidewalk Width L/R	6.00 / 6.00

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
520-1-10	CONCRETE CURB & GUTTER, TYPE F	449.86	LF	$26.01	$11,700.86
520-1-10	CONCRETE CURB & GUTTER, TYPE F	449.86	LF	$26.01	$11,700.86
522-1	CONCRETE SIDEWALK AND DRIVEWAYS, 4"	599.81	SY	$42.68	$25,599.89

Erosion Control

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	899.71	LF	$1.86	$1,673.46
104-11	FLOATING TURBIDITY BARRIER	8.52	LF	$11.41	$97.21
104-12	STAKED TURBIDITY BARRIER-NYL REINF PVC	8.52	LF	$5.90	$50.27
104-15	SOIL TRACKING PREVENTION DEVICE	1.00	EA	$2,013.84	$2,013.84
104-18	INLET PROTECTION SYSTEM	5.00	EA	$97.92	$489.60
107-1	LITTER REMOVAL	0.39	AC	$47.56	$18.55
107-2	MOWING	0.39	AC	$66.75	$26.03
	Shoulder Component T otal				$53,370.57

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
425-1-351	INLETS, CURB, TYPE P-5, <10'	4.00	EA	$5,339.35	$21,357.40
425-1-451	INLETS, CURB, TYPE J-5, <10'	1.00	EA	$8,552.96	$8,552.96
425-1-521	INLETS, DT BOT, TYPE C, <10'	1.00	EA	$2,905.39	$2,905.39
425-2-41	MANHOLES, P-7, <10'	1.00	EA	$4,468.81	$4,468.81
430-175-124	PIPE CULV, OPT MATL, ROUND, 24"S/CD	168.00	LF	$105.93	$17,796.24
430-175-148	PIPE CULV, OPT MATL, ROUND, 48"S/CD	432.00	LF	$347.62	$150,171.84
570-1-1	PERFORMANCE TURF	25.90	SY	$2.66	$68.89

Drainage Component T otal $205,321.53

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	2.00	AS	$346.35	$692.70
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	1.00	AS	$1,045.67	$1,045.67
700-1-50	SINGLE POST SIGN, RELOCATE	1.00	AS	$279.29	$279.29
700-1-60	SINGLE POST SIGN, REMOVE	2.00	AS	$20.90	$41.80
700-2-14	MULTI- POST SIGN, F&I GM, 31-50 SF	1.00	AS	$4,669.54	$4,669.54
700-2-60	MULTI- POST SIGN, REMOVE	1.00	AS	$483.73	$483.73

Signing Component T otal $7,212.73

LIGHTING COMPONENT

Conventional Lighting Subcomponent

Description	Value
Spacing	MAX

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	449.86	LF	$8.24	$3,706.85
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	58.70	LF	$18.50	$1,085.95
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	2.00	EA	$618.19	$1,236.38
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	1,525.68	LF	$2.20	$3,356.50
715-4-13	LIGHT POLE COMPLETE, F&I-STD, 40'	2.00	EA	$5,627.26	$11,254.52
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	2.00	EA	$590.10	$1,180.20
	Subcomponent T otal				$21,820.39

Lighting Component T otal $21,820.40

Sequence 30 T otal $390,273.58

Sequence: 31 NUR - New Construction, Undivided, Rural Net Length: 0.549 MI 2,900 LF

Description: Option 6 - Lane pavement for WB Commercial to SB I-95 from NE 3rd Ave. to flyover bridge over NB on-ramp.

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	0.00 / 0.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.549
Top of Structural Course For Begin Section	105.00
Top of Structural Course For End Section	105.00

Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	6 to 1 / 6 to 1
Outside Shoulder Cross Slope L/R	6.00 % / 6.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
120-6	EMBANKMENT	14,763.07	CY	$22.58	$333,350.12
	Earthwork Component T otal				$333,350.12

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	1
Roadway Pavement Width L/R	0.00 / 15.00
Structural Spread Rate	275
Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	28,031.17	SY	$5.23	$146,603.02
285-709	OPTIONAL BASE,BASE GROUP 09	4,939.29	SY	$22.00	$108,664.38
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	664.53	TN	$129.60	$86,123.09
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	398.72	TN	$139.83	$55,753.02

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	N
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	2
Solid Stripe No. of Stripes	2
Skip Stripe No. of Paint Applications	2
Skip Stripe No. of Stripes	0

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	2.20	GM	$869.98	$1,913.96
	Roadway Component T otal				$399,057.47

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	66.00 / 6.00
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 0.00
Paved Outside Shoulder Width L/R	6.00 / 6.00
Structural Spread Rate	110

Friction Course Spread Rate	165
Total Width (T) / 8" Overlap (O)	T
Rumble Strips ï¿½No. of Sides	0

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
285-704	OPTIONAL BASE,BASE GROUP 04	4,079.02	SY	$25.70	$104,830.81
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	212.65	TN	$129.60	$27,559.44
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	318.98	TN	$139.83	$44,602.97

Erosion Control

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	7,539.42	LF	$1.86	$14,023.32
104-11	FLOATING TURBIDITY BARRIER	137.30	LF	$11.41	$1,566.59
104-12	STAKED TURBIDITY BARRIER-NYL REINF PVC	137.30	LF	$5.90	$810.07
104-15	SOIL TRACKING PREVENTION DEVICE	1.00	EA	$2,013.84	$2,013.84
107-1	LITTER REMOVAL	6.66	AC	$47.56	$316.75
107-2	MOWING	6.66	AC	$66.75	$444.56
	Shoulder Component T otal				$196,168.35

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-2	CONC CLASS II, ENDWALLS	9.89	CY	$2,160.00	$21,362.40
430-174-124	PIPE CULV, OPT MATL, ROUND,24"SD	440.00	LF	$191.28	$84,163.20
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	96.00	LF	$144.65	$13,886.40
430-984-129	MITERED END SECT, OPTIONAL RD, 24" SD	22.00	EA	$1,579.93	$34,758.46
570-1-1	PERFORMANCE TURF	386.64	SY	$2.66	$1,028.46
	Drainage Component T otal				$155,198.92

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	2.00	AS	$346.35	$692.70
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	11.00	AS	$1,045.67	$11,502.37
700-2-14	MULTI- POST SIGN, F&I GM, 31-50 SF	2.00	AS	$4,669.54	$9,339.08
	Signing Component T otal				$21,534.15

Sequence 31 Total $1,105,309.01

Sequence: 32 WDU - Widen/Resurface, Divided, Urban Net Length: 0.568 MI 3,000 LF

Description: Widen Powerline Road. from NW 47th St. to NW 53rd St. to provide 7 bike lanes, new median and median openings - Option 6

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	10.00 / 10.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.568
Top of Structural Course For Begin Section	102.00
Top of Structural Course For End Section	102.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Existing Front Slope L/R	6 to 1 / 6 to 1
Existing Median Shoulder Cross Slope L/R	4.00 % / 4.00 %
Existing Outside Shoulder Cross Slope L/R	2.00 % / 2.00 %
Front Slope L/R	6 to 1 / 6 to 1
Median Shoulder Cross Slope L/R	4.00 % / 4.00 %
Outside Shoulder Cross Slope L/R	2.00 % / 2.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	1.38	AC	$39,220.64	$54,124.48
120-2-2	BORROW EXCAVATION, TRUCK MEASURE	2,790.22	CY	$30.24	$84,376.25
	Earthwork Component Total				$138,500.73

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	6
Existing Roadway Pavement Width L/R	33.00 / 33.00
Structural Spread Rate	165
Friction Course Spread Rate	80
Widened Outside Pavement Width L/R	7.00 / 7.00
Widened Inside Pavement Width L/R	0.00 / 0.00
Widened Structural Spread Rate	275
Widened Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	6,386.87	SY	$5.23	$33,403.33
285-709	OPTIONAL BASE,BASE GROUP 09	4,886.82	SY	$22.00	$107,510.04
327-70-5	MILLING EXIST ASPH PAVT, 2" AVG DEPTH	22,000.70	SY	$2.97	$65,342.08
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	1,815.06	TN	$129.60	$235,231.78

334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	641.69	TN	$129.60	$83,163.02
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	880.03	TN	$139.83	$123,054.59
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	385.01	TN	$139.83	$53,835.95

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	N
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	2
Solid Stripe No. of Stripes	4
Skip Stripe No. of Paint Applications	2
Skip Stripe No. of Stripes	4

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
706-3	RETRO-REFLECTIVE PAVEMENT MARKERS	384.00	EA	$4.80	$1,843.20
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	4.55	GM	$869.98	$3,958.41
710-11-131	PAINTED PAVT MARK,STD,WHITE,SKIP, 6"	4.55	GM	$384.56	$1,749.75
	Roadway Component T otal				$709,092.15

SHOULDER COMPONENT

User Input Data

Description	Value
Existing Total Outside Shoulder Width L/R	7.00 / 7.00
New Total Outside Shoulder Width L/R	8.25 / 8.25
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 0.00
Sidewalk Width L/R	6.00 / 6.00

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
520-1-10	CONCRETE CURB & GUTTER, TYPE F	3,000.10	LF	$26.01	$78,032.60
520-1-10	CONCRETE CURB & GUTTER, TYPE F	3,000.10	LF	$26.01	$78,032.60
522-1	CONCRETE SIDEWALK AND DRIVEWAYS, 4"	4,000.13	SY	$42.68	$170,725.55

Erosion Control

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	6,000.19	LF	$1.86	$11,160.35
104-11	FLOATING TURBIDITY BARRIER	56.82	LF	$11.41	$648.32
104-12	STAKED TURBIDITY BARRIER-NYL REINF PVC	56.82	LF	$5.90	$335.24
104-15	SOIL TRACKING PREVENTION DEVICE	1.00	EA	$2,013.84	$2,013.84
104-18	INLET PROTECTION SYSTEM	27.00	EA	$97.92	$2,643.84
107-1	LITTER REMOVAL	4.95	AC	$47.56	$235.42
107-2	MOWING	4.95	AC	$66.75	$330.41

	Shoulder Component T otal	$344,158.17

MEDIAN COMPONENT

User Input Data

Description	Value
Total Median Width	14.00
Performance Turf Width	7.00

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
520-1-10	CONCRETE CURB & GUTTER, TYPE F	6,000.19	LF	$26.01	$156,064.94
520-5-11	TRAF SEP CONC-TYPE I, 4' WIDE	900.00	LF	$43.11	$38,799.00
570-1-1	PERFORMANCE TURF	2,333.41	SY	$2.66	$6,206.87
	Median Component T otal				$201,070.81

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-2	CONC CLASS II, ENDWALLS	10.23	CY	$2,160.00	$22,096.80
425-1-351	INLETS, CURB, TYPE P-5, <10'	21.00	EA	$5,339.35	$112,126.35
425-1-451	INLETS, CURB, TYPE J-5, <10'	6.00	EA	$8,552.96	$51,317.76
430-175-124	PIPE CULV, OPT MATL, ROUND, 24"S/CD	320.00	LF	$105.93	$33,897.60
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	96.00	LF	$144.65	$13,886.40
570-1-1	PERFORMANCE TURF	172.73	SY	$2.66	$459.46
	Drainage Component T otal				$233,784.37

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	13.00	AS	$346.35	$4,502.55
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	2.00	AS	$1,045.67	$2,091.34
700-1-50	SINGLE POST SIGN, RELOCATE	2.00	AS	$279.29	$558.58
700-1-60	SINGLE POST SIGN, REMOVE	13.00	AS	$20.90	$271.70
700-2-14	MULTI- POST SIGN, F&I GM, 31-50 SF	2.00	AS	$4,669.54	$9,339.08
700-2-60	MULTI- POST SIGN, REMOVE	2.00	AS	$483.73	$967.46
	Signing Component T otal				$17,730.71

Sequence 32 T otal	$1,644,336.94

Sequence: 33 NUU - New Construction, Undivided, Urban Net Length: 0.260 MI 1,370 LF

Description: New turn lanes at Commercial and Powerline - WB right, SB left, and median openings along

Powerline - Option 6

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	0.00 / 0.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.260
Top of Structural Course For Begin Section	105.00
Top of Structural Course For End Section	105.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	6 to 1 / 6 to 1
Outside Shoulder Cross Slope L/R	2.00 % / 2.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
120-6	EMBANKMENT	6,200.99	CY	$22.58	$140,018.35
	Earthwork Component T otal				$140,018.35

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	1
Roadway Pavement Width L/R	0.00 / 11.00
Structural Spread Rate	275
Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	2,067.42	SY	$5.23	$10,812.61
285-709	OPTIONAL BASE,BASE GROUP 09	1,674.64	SY	$22.00	$36,842.08
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	230.26	TN	$129.60	$29,841.70
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	138.16	TN	$139.83	$19,318.91

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	N
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	2
Solid Stripe No. of Stripes	4
Skip Stripe No. of Paint Applications	2
Skip Stripe No. of Stripes	0

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
710-11-101	PAINTED PAVT	2.08	GM	$869.98	$1,809.56

	MARK,STD,WHITE,SOLID,6"	
	Roadway Component T otal	$98,624.86

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	0.00 / 0.00
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 0.00
Sidewalk Width L/R	0.00 / 0.00

Erosion Control

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	2,740.32	LF	$1.86	$5,097.00
104-11	FLOATING TURBIDITY BARRIER	64.88	LF	$11.41	$740.28
104-12	STAKED TURBIDITY BARRIER-NYL REINF PVC	64.88	LF	$5.90	$382.79
104-15	SOIL TRACKING PREVENTION DEVICE	1.00	EA	$2,013.84	$2,013.84
104-18	INLET PROTECTION SYSTEM	14.00	EA	$97.92	$1,370.88
107-1	LITTER REMOVAL	3.15	AC	$47.56	$149.81
107-2	MOWING	3.15	AC	$66.75	$210.26
	Shoulder Component T otal				$9,964.86

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-2	CONC CLASS II, ENDWALLS	4.67	CY	$2,160.00	$10,087.20
425-1-351	INLETS, CURB, TYPE P-5, <10'	10.00	EA	$5,339.35	$53,393.50
425-1-451	INLETS, CURB, TYPE J-5, <10'	3.00	EA	$8,552.96	$25,658.88
425-1-521	INLETS, DT BOT, TYPE C, <10'	2.00	EA	$2,905.39	$5,810.78
425-2-41	MANHOLES, P-7, <10'	2.00	EA	$4,468.81	$8,937.62
430-175-124	PIPE CULV, OPT MATL, ROUND, 24"S/CD	608.00	LF	$105.93	$64,405.44
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	56.00	LF	$144.65	$8,100.40
430-175-148	PIPE CULV, OPT MATL, ROUND, 48"S/CD	1,304.00	LF	$347.62	$453,296.48
570-1-1	PERFORMANCE TURF	78.89	SY	$2.66	$209.85
	Drainage Component T otal				$629,900.15

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	6.00	AS	$346.35	$2,078.10
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	1.00	AS	$1,045.67	$1,045.67

700-2-15	MULTI- POST SIGN, F&I GM, 51-100 SF	1.00 AS	$7,627.27	$7,627.27
	Signing Component T otal			$10,751.04

Sequence 33 T otal $889,259.26

Sequence: 34 NUU - New Construction, Undivided, Urban Net Length: 0.642 MI 3,390 LF

Description: Turn lanes and median openings along Commercial Blvd. - Option 6

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	0.00 / 0.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.642
Top of Structural Course For Begin Section	105.00
Top of Structural Course For End Section	105.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	6 to 1 / 6 to 1
Outside Shoulder Cross Slope L/R	2.00 % / 2.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
120-6	EMBANKMENT	15,311.67	CY	$22.58	$345,737.51
	Earthwork Component T otal				$345,737.51

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	1
Roadway Pavement Width L/R	0.00 / 11.00
Structural Spread Rate	275
Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	5,114.77	SY	$5.23	$26,750.25
285-709	OPTIONAL BASE,BASE GROUP 09	4,143.04	SY	$22.00	$91,146.88
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	569.67	TN	$129.60	$73,829.23
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	341.80	TN	$139.83	$47,793.89

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	N

Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	2
Solid Stripe No. of Stripes	4
Skip Stripe No. of Paint Applications	2
Skip Stripe No. of Stripes	0

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	5.14	GM	$869.98	$4,471.70
	Roadway Component T otal				$243,991.95

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	0.00 / 0.00
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 0.00
Sidewalk Width L/R	0.00 / 0.00

Erosion Control

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	6,779.52	LF	$1.86	$12,609.91
104-11	FLOATING TURBIDITY BARRIER	160.50	LF	$11.41	$1,831.30
104-12	STAKED TURBIDITY BARRIER-NYL REINF PVC	160.50	LF	$5.90	$946.95
104-15	SOIL TRACKING PREVENTION DEVICE	1.00	EA	$2,013.84	$2,013.84
104-18	INLET PROTECTION SYSTEM	33.00	EA	$97.92	$3,231.36
107-1	LITTER REMOVAL	7.78	AC	$47.56	$370.02
107-2	MOWING	7.78	AC	$66.75	$519.32
	Shoulder Component T otal				$21,522.71

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-2	CONC CLASS II, ENDWALLS	11.56	CY	$2,160.00	$24,969.60
425-1-351	INLETS, CURB, TYPE P-5, <10'	24.00	EA	$5,339.35	$128,144.40
425-1-451	INLETS, CURB, TYPE J-5, <10'	7.00	EA	$8,552.96	$59,870.72
425-1-521	INLETS, DT BOT, TYPE C, <10'	4.00	EA	$2,905.39	$11,621.56
425-2-41	MANHOLES, P-7, <10'	4.00	EA	$4,468.81	$17,875.24
430-175-124	PIPE CULV, OPT MATL, ROUND, 24"S/CD	1,496.00	LF	$105.93	$158,471.28
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	136.00	LF	$144.65	$19,672.40
430-175-148	PIPE CULV, OPT MATL, ROUND, 48"S/CD	3,216.00	LF	$347.62	$1,117,945.92
570-1-1	PERFORMANCE TURF	195.17	SY	$2.66	$519.15
	Drainage Component T otal				$1,539,090.27

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	13.00	AS	$346.35	$4,502.55
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	2.00	AS	$1,045.67	$2,091.34
700-2-15	MULTI- POST SIGN, F&I GM, 51-100 SF	2.00	AS	$7,627.27	$15,254.54
	Signing Component T otal				$21,848.43

Sequence 34 T otal $2,172,190.87

Sequence: 35 NUR - New Construction, Undivided, Rural Net Length: 0.112 MI 590 LF

Description: Option 1 - I-95 NB to WB Off-ramp

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	0.00 / 50.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.435
Top of Structural Course For Begin Section	105.00
Top of Structural Course For End Section	105.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	6 to 1 / 6 to 1
Outside Shoulder Cross Slope L/R	6.00 % / 6.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	0.68	AC	$39,220.64	$26,670.04
120-6	EMBANKMENT	11,697.52	CY	$22.58	$264,130.00
	Earthwork Component T otal				$290,800.04

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	1
Roadway Pavement Width L/R	0.00 / 15.00
Structural Spread Rate	275
Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	1,769.33	SY	$5.23	$9,253.60

285-709	OPTIONAL BASE,BASE GROUP 09	1,004.59	SY	$22.00	$22,100.98
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	135.16	TN	$129.60	$17,516.74
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	81.09	TN	$139.83	$11,338.81

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	N
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	2
Solid Stripe No. of Stripes	2
Skip Stripe No. of Paint Applications	2
Skip Stripe No. of Stripes	0

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	0.45	GM	$869.98	$391.49
	Roadway Component T otal				$60,601.62

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	6.00 / 6.00
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 0.00
Paved Outside Shoulder Width L/R	6.00 / 6.00
Structural Spread Rate	110
Friction Course Spread Rate	165
Total Width (T) / 8" Overlap (O)	T
Rumble Strips ï¿½No. of Sides	0

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
285-704	OPTIONAL BASE,BASE GROUP 04	829.62	SY	$25.70	$21,321.23
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	43.25	TN	$129.60	$5,605.20
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	64.88	TN	$139.83	$9,072.17

Erosion Control

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	1,533.42	LF	$1.86	$2,852.16
104-11	FLOATING TURBIDITY BARRIER	27.92	LF	$11.41	$318.57
104-12	STAKED TURBIDITY BARRIER-NYL REINF PVC	27.92	LF	$5.90	$164.73
104-15	SOIL TRACKING PREVENTION DEVICE	1.00	EA	$2,013.84	$2,013.84
107-1	LITTER REMOVAL	1.35	AC	$47.56	$64.21
107-2	MOWING	1.35	AC	$66.75	$90.11
	Shoulder Component T otal				$41,502.22

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-2	CONC CLASS II, ENDWALLS	2.01	CY	$2,160.00	$4,341.60
430-174-124	PIPE CULV, OPT MATL, ROUND,24"SD	96.00	LF	$191.28	$18,362.88
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	24.00	LF	$144.65	$3,471.60
430-984-129	MITERED END SECT, OPTIONAL RD, 24" SD	5.00	EA	$1,579.93	$7,899.65
570-1-1	PERFORMANCE TURF	78.64	SY	$2.66	$209.18
	Drainage Component T otal				$34,284.91

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	1.00	AS	$346.35	$346.35
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	3.00	AS	$1,045.67	$3,137.01
700-2-14	MULTI- POST SIGN, F&I GM, 31-50 SF	1.00	AS	$4,669.54	$4,669.54
	Signing Component T otal				$8,152.90

LIGHTING COMPONENT

Rural Lighting Subcomponent

Description	Value
Multiplier (Number of Poles)	7

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	1,400.00	LF	$8.24	$11,536.00
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	7.00	EA	$618.19	$4,327.33
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	4,200.00	LF	$2.20	$9,240.00
715-4-14	LIGHT POLE COMPLETE, F&I-STD, 45'	7.00	EA	$5,937.91	$41,565.37
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	7.00	EA	$590.10	$4,130.70
	Subcomponent T otal				$70,799.40
	Lighting Component T otal				$70,799.40

BRIDGES COMPONENT

Bridge NB/WB

Description	Value
Estimate Type	SF Estimate
Primary Estimate	YES
Length (LF)	375.00
Width (LF)	45.00
Type	Low Level
Cost Factor	1.00
Structure No.	

Removal of Existing Structures area	0.00
Default Cost per SF	$120.00
Factored Cost per SF	$120.00
Final Cost per SF	$123.00
Basic Bridge Cost	$2,025,000.00
Description	

Bridge Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-10	CONC CLASS II, APPROACH SLABS	100.00	CY	$351.19	$35,119.00
415-1-9	REINF STEEL- APPROACH SLABS	17,500.00	LB	$0.89	$15,575.00
	Bridge NB/WB Total				$2,075,694.00
	Bridges Component T otal				$2,075,694.00

RETAINING WALLS COMPONENT

Retaining W all 1

Description	Value
Length	600.00
Begin height	1.00
End Height	25.00
Multiplier	2

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
548-12	RET WALL SYSTEM, PERM, EX BARRIER	15,600.00	SF	$23.14	$360,984.00
	Retaining W alls Component T otal				$360,984.00

Sequence 35 T otal $2,942,819.09

Sequence: 36 NUR - New Construction, Undivided, Rural Net Length: 0.265 MI 1,400 LF

Description: Option 1 - I-95 NB to WB Off-ramp (2 lane loop)

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	0.00 / 50.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.435
Top of Structural Course For Begin Section	105.00
Top of Structural Course For End Section	105.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	6 to 1 / 6 to 1
Outside Shoulder Cross Slope L/R	6.00 % / 6.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	1.61	AC	$39,220.64	$63,145.23
120-6	EMBANKMENT	14,188.27	CY	$22.58	$320,371.14
	Earthwork Component T otal				$383,516.37

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	2
Roadway Pavement Width L/R	0.00 / 22.00
Structural Spread Rate	275
Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	5,601.02	SY	$5.23	$29,293.33
285-709	OPTIONAL BASE,BASE GROUP 09	3,474.19	SY	$22.00	$76,432.18
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	470.64	TN	$129.60	$60,994.94
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	282.38	TN	$139.83	$39,485.20

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	N
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	2
Solid Stripe No. of Stripes	2
Skip Stripe No. of Paint Applications	2
Skip Stripe No. of Stripes	1

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
706-3	RETRO-REFLECTIVE PAVEMENT MARKERS	36.00	EA	$4.80	$172.80
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	1.06	GM	$869.98	$922.18
710-11-231	PAINTED PAVT MARK,STD,YELLOW,SKIP,6"	0.53	GM	$390.33	$206.87
	Roadway Component T otal				$207,507.50

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	4.00 / 10.00
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 0.00
Paved Outside Shoulder Width L/R	4.00 / 10.00
Structural Spread Rate	110
Friction Course Spread Rate	165
Total Width (T) / 8" Overlap (O)	T
Rumble Strips ï¿½No. of Sides	0

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
285-704	OPTIONAL BASE,BASE GROUP 04	2,280.86	SY	$25.70	$58,618.10
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	119.80	TN	$129.60	$15,526.08
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	179.70	TN	$139.83	$25,127.45

Erosion Control

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	3,640.67	LF	$1.86	$6,771.65
104-11	FLOATING TURBIDITY BARRIER	66.30	LF	$11.41	$756.48
104-12	STAKED TURBIDITY BARRIER-NYL REINF PVC	66.30	LF	$5.90	$391.17
104-15	SOIL TRACKING PREVENTION DEVICE	1.00	EA	$2,013.84	$2,013.84
107-1	LITTER REMOVAL	3.21	AC	$47.56	$152.67
107-2	MOWING	3.21	AC	$66.75	$214.27
	Shoulder Component T otal				$109,571.71

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-2	CONC CLASS II, ENDWALLS	4.77	CY	$2,160.00	$10,303.20
430-174-124	PIPE CULV, OPT MATL, ROUND,24"SD	216.00	LF	$191.28	$41,316.48
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	48.00	LF	$144.65	$6,943.20
430-984-129	MITERED END SECT, OPTIONAL RD, 24" SD	11.00	EA	$1,579.93	$17,379.23
570-1-1	PERFORMANCE TURF	186.70	SY	$2.66	$496.62
	Drainage Component T otal				$76,438.73

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	1.00	AS	$346.35	$346.35
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	6.00	AS	$1,045.67	$6,274.02
700-2-14	MULTI- POST SIGN, F&I GM, 31-50 SF	1.00	AS	$4,669.54	$4,669.54
	Signing Component T otal				$11,289.91

SIGNALIZATIONS COMPONENT

Signalization 1

Description	Value
Type	2 Lane Mast Arm
Multiplier	1
Description	Signal for NB to WB right turns

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	800.00	LF	$8.24	$6,592.00
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	200.00	LF	$18.50	$3,700.00
632-7-1	SIGNAL CABLE- NEW OR RECO, FUR & INSTALL	1.00	PI	$5,084.78	$5,084.78
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	12.00	EA	$618.19	$7,418.28
639-1-112	ELECTRICAL POWER SRV,F&I,OH,M,PUR BY CON	1.00	AS	$1,795.00	$1,795.00
639-2-1	ELECTRICAL SERVICE WIRE, F&I	60.00	LF	$4.12	$247.20
649-21-4	STEEL MAST ARM ASSEMBLY, F&I, 40'- 30'	4.00	EA	$30,000.00	$120,000.00
650-1-14	VEH TRAF SIGNAL,F&I ALUMINUM, 3 S 1 W	8.00	AS	$971.18	$7,769.44
653-1-11	PEDESTRIAN SIGNAL, F&I LED COUNT, 1 WAY	8.00	AS	$703.42	$5,627.36
660-1-102	LOOP DETECTOR INDUCTIVE, F&I, TYPE 2	8.00	EA	$184.94	$1,479.52
660-2-106	LOOP ASSEMBLY, F&I, TYPE F	8.00	AS	$1,009.61	$8,076.88
665-1-11	PEDESTRIAN DETECTOR, F&I, STANDARD	8.00	EA	$221.97	$1,775.76
670-5-111	TRAF CNTL ASSEM, F&I, NEMA, 1 PREEMPT	1.00	AS	$29,375.31	$29,375.31
700-3-101	SIGN PANEL, F&I GM, UP TO 12 SF	4.00	EA	$288.05	$1,152.20
	Signalizations Component T otal				$200,093.73

LIGHTING COMPONENT

Rural Lighting Subcomponent

Description	Value
Multiplier (Number of Poles)	7

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	1,400.00	LF	$8.24	$11,536.00
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	7.00	EA	$618.19	$4,327.33
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	4,200.00	LF	$2.20	$9,240.00
715-4-14	LIGHT POLE COMPLETE, F&I-STD, 45'	7.00	EA	$5,937.91	$41,565.37
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	7.00	EA	$590.10	$4,130.70
	Subcomponent T otal				$70,799.40
	Lighting Component T otal				$70,799.40

RETAINING WALLS COMPONENT

Retaining W all 1

Description	Value
Length	600.00
Begin height	25.00
End Height	1.00
Multiplier	2

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
548-12	RET WALL SYSTEM, PERM, EX BARRIER	15,600.00	SF	$23.14	$360,984.00
	Retaining W alls Component T otal				$360,984.00

Sequence 36 T otal $1,420,201.35

Sequence: 37 WUR - Widen/Resurface, Undivided, Rural Net Length: 0.189 MI 1,000 LF

Description: Option 1 - Widen NB to EB offramp for additional right turn lane

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	0.00 / 30.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.189
Top of Structural Course For Begin Section	102.00
Top of Structural Course For End Section	102.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Existing Front Slope L/R	6 to 1 / 6 to 1
Existing Outside Shoulder Cross Slope L/R	6.00 % / 6.00 %
Front Slope L/R	6 to 1 / 6 to 1
Outside Shoulder Cross Slope L/R	6.00 % / 6.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	0.69	AC	$39,220.64	$27,062.24
120-2-2	BORROW EXCAVATION, TRUCK MEASURE	437.24	CY	$30.24	$13,222.14
	Earthwork Component T otal				$40,284.38

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	3
Existing Roadway Pavement Width L/R	22.00 / 0.00
Structural Spread Rate	165
Friction Course Spread Rate	80
Widened Outside Pavement Width L/R	0.00 / 11.00
Widened Structural Spread Rate	275
Widened Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	3,444.55	SY	$5.23	$18,015.00
285-709	OPTIONAL BASE,BASE GROUP 09	1,258.93	SY	$22.00	$27,696.46

327-70-5	MILLING EXIST ASPH PAVT, 2" AVG DEPTH	2,444.52	SY	$2.97	$7,260.22
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	201.67	TN	$129.60	$26,136.43
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	168.06	TN	$129.60	$21,780.58
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	97.78	TN	$139.83	$13,672.58
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	100.84	TN	$139.83	$14,100.46

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	N
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	2
Solid Stripe No. of Stripes	2
Skip Stripe No. of Paint Applications	2
Skip Stripe No. of Stripes	2

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
706-3	RETRO-REFLECTIVE PAVEMENT MARKERS	102.00	EA	$4.80	$489.60
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	0.76	GM	$869.98	$661.18
710-11-231	PAINTED PAVT MARK,STD,YELLOW,SKIP,6"	0.76	GM	$390.33	$296.65
	Roadway Component T otal				$130,109.16

SHOULDER COMPONENT

User Input Data

Description	Value
Existing Total Outside Shoulder Width L/R	4.00 / 4.00
New Total Outside Shoulder Width L/R	10.00 / 10.00
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 0.00
Existing Paved Outside Shoulder Width L/R	4.00 / 4.00
New Paved Outside Shoulder Width L/R	10.00 / 10.00
Structural Spread Rate	110
Friction Course Spread Rate	80
Total Width (T) / 8" Overlap (O)	T
Rumble Strips ï¿½No. of Sides	0

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
285-704	OPTIONAL BASE,BASE GROUP 04	2,295.63	SY	$25.70	$58,997.69
327-70-1	MILLING EXIST ASPH PAVT, 1" AVG DEPTH	888.92	SY	$3.52	$3,129.00
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	122.23	TN	$129.60	$15,841.01
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	88.89	TN	$139.83	$12,429.49

Erosion Control

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount

104-10-3	SEDIMENT BARRIER	2,300.07 LF	$1.86	$4,278.13
104-11	FLOATING TURBIDITY BARRIER	18.94 LF	$11.41	$216.11
104-12	STAKED TURBIDITY BARRIER-NYL REINF PVC	18.94 LF	$5.90	$111.75
104-15	SOIL TRACKING PREVENTION DEVICE	1.00 EA	$2,013.84	$2,013.84
104-18	INLET PROTECTION SYSTEM	1.00 EA	$97.92	$97.92
107-1	LITTER REMOVAL	0.46 AC	$47.56	$21.88
107-2	MOWING	0.46 AC	$66.75	$30.70
	Shoulder Component T otal			$97,167.53

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-2	CONC CLASS II, ENDWALLS	3.41	CY	$2,160.00	$7,365.60
430-174-124	PIPE CULV, OPT MATL, ROUND,24"SD	32.00	LF	$191.28	$6,120.96
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	16.00	LF	$144.65	$2,314.40
430-984-129	MITERED END SECT, OPTIONAL RD, 24" SD	2.00	EA	$1,579.93	$3,159.86
570-1-1	PERFORMANCE TURF	76.52	SY	$2.66	$203.54
	Drainage Component T otal				$19,164.36

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	1.00	AS	$346.35	$346.35
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	4.00	AS	$1,045.67	$4,182.68
700-1-50	SINGLE POST SIGN, RELOCATE	1.00	AS	$279.29	$279.29
700-1-60	SINGLE POST SIGN, REMOVE	4.00	AS	$20.90	$83.60
700-2-13	MULTI- POST SIGN, F&I GM, 21-30 SF	1.00	AS	$3,177.63	$3,177.63
700-2-60	MULTI- POST SIGN, REMOVE	1.00	AS	$483.73	$483.73
	Signing Component T otal				$8,553.28

SIGNALIZATIONS COMPONENT

Signalization 1

Description	Value
Type	2 Lane Mast Arm
Multiplier	1
Description	Signal for NB to EB right turns

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	800.00	LF	$8.24	$6,592.00
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	200.00	LF	$18.50	$3,700.00

632-7-1	SIGNAL CABLE- NEW OR RECO, FUR & INSTALL	1.00 PI	$5,084.78	$5,084.78
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	12.00 EA	$618.19	$7,418.28
639-1-112	ELECTRICAL POWER SRV,F&I,OH,M,PUR BY CON	1.00 AS	$1,795.00	$1,795.00
639-2-1	ELECTRICAL SERVICE WIRE, F&I	60.00 LF	$4.12	$247.20
649-21-4	STEEL MAST ARM ASSEMBLY, F&I, 40'- 30'	4.00 EA	$30,000.00	$120,000.00
650-1-14	VEH TRAF SIGNAL,F&I ALUMINUM, 3 S 1 W	8.00 AS	$971.18	$7,769.44
653-1-11	PEDESTRIAN SIGNAL, F&I LED COUNT, 1 WAY	8.00 AS	$703.42	$5,627.36
660-1-102	LOOP DETECTOR INDUCTIVE, F&I, TYPE 2	8.00 EA	$184.94	$1,479.52
660-2-106	LOOP ASSEMBLY, F&I, TYPE F	8.00 AS	$1,009.61	$8,076.88
665-1-11	PEDESTRIAN DETECTOR, F&I, STANDARD	8.00 EA	$221.97	$1,775.76
670-5-111	TRAF CNTL ASSEM, F&I, NEMA, 1 PREEMPT	1.00 AS	$29,375.31	$29,375.31
700-3-101	SIGN PANEL, F&I GM, UP TO 12 SF	4.00 EA	$288.05	$1,152.20
	Signalizations Component T otal			$200,093.73

Sequence 37 T otal $495,372.44

Sequence: 38 NUU - New Construction, Undivided, Urban Net Length: 0.131 MI 690 LF

Description: Option 1 - WB to NB I-95 right turn lanes

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	0.00 / 30.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.131
Top of Structural Course For Begin Section	105.00
Top of Structural Course For End Section	105.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	6 to 1 / 6 to 1
Outside Shoulder Cross Slope L/R	2.00 % / 2.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	0.48	AC	$39,220.64	$18,825.91
120-6	EMBANKMENT	5,175.05	CY	$22.58	$116,852.63
	Earthwork Component T otal				$135,678.54

ROADWAY COMPONENT

User Input Data

Description	Value

Number of Lanes	2
Roadway Pavement Width L/R	0.00 / 22.00
Structural Spread Rate	275
Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	1,884.73	SY	$5.23	$9,857.14
285-709	OPTIONAL BASE,BASE GROUP 09	1,686.90	SY	$22.00	$37,111.80
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	231.95	TN	$129.60	$30,060.72
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	139.17	TN	$139.83	$19,460.14

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	N
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	2
Solid Stripe No. of Stripes	4
Skip Stripe No. of Paint Applications	2
Skip Stripe No. of Stripes	1

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
706-3	RETRO-REFLECTIVE PAVEMENT MARKERS	18.00	EA	$4.80	$86.40
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	1.05	GM	$869.98	$913.48
710-11-131	PAINTED PAVT MARK,STD,WHITE,SKIP, 6"	0.26	GM	$384.56	$99.99
	Roadway Component T otal				$97,589.67

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	0.00 / 8.25
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 0.00
Sidewalk Width L/R	0.00 / 6.00

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
520-1-10	CONCRETE CURB & GUTTER, TYPE F	690.10	LF	$26.01	$17,949.50
522-1	CONCRETE SIDEWALK AND DRIVEWAYS, 4"	460.06	SY	$42.68	$19,635.36

Erosion Control

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	1,380.19	LF	$1.86	$2,567.15
104-11	FLOATING TURBIDITY BARRIER	32.68	LF	$11.41	$372.88
104-12	STAKED TURBIDITY BARRIER-NYL REINF PVC	32.68	LF	$5.90	$192.81
104-15	SOIL TRACKING PREVENTION	1.00	EA	$2,013.84	$2,013.84

	DEVICE			
104-18	INLET PROTECTION SYSTEM	7.00 EA	$97.92	$685.44
107-1	LITTER REMOVAL	1.58 AC	$47.56	$75.14
107-2	MOWING	1.58 AC	$66.75	$105.46
	Shoulder Component T otal			$43,597.59

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-2	CONC CLASS II, ENDWALLS	2.35	CY	$2,160.00	$5,076.00
425-1-351	INLETS, CURB, TYPE P-5, <10'	5.00	EA	$5,339.35	$26,696.75
425-1-451	INLETS, CURB, TYPE J-5, <10'	2.00	EA	$8,552.96	$17,105.92
425-1-521	INLETS, DT BOT, TYPE C, <10'	1.00	EA	$2,905.39	$2,905.39
425-2-41	MANHOLES, P-7, <10'	1.00	EA	$4,468.81	$4,468.81
430-175-124	PIPE CULV, OPT MATL, ROUND, 24"S/CD	304.00	LF	$105.93	$32,202.72
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	32.00	LF	$144.65	$4,628.80
430-175-148	PIPE CULV, OPT MATL, ROUND, 48"S/CD	656.00	LF	$347.62	$228,038.72
570-1-1	PERFORMANCE TURF	39.73	SY	$2.66	$105.68
	Drainage Component T otal				$321,228.79

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	3.00	AS	$346.35	$1,039.05
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	1.00	AS	$1,045.67	$1,045.67
700-2-15	MULTI- POST SIGN, F&I GM, 51-100 SF	1.00	AS	$7,627.27	$7,627.27
	Signing Component T otal				$9,711.99

SIGNALIZATIONS COMPONENT

Signalization 1

Description	Value
Type	2 Lane Mast Arm
Multiplier	1
Description	Signal for 2 right turn lanes WB to NB I-95

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	800.00	LF	$8.24	$6,592.00
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	200.00	LF	$18.50	$3,700.00
632-7-1	SIGNAL CABLE- NEW OR RECO, FUR & INSTALL	1.00	PI	$5,084.78	$5,084.78
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	12.00	EA	$618.19	$7,418.28

639-1-112	ELECTRICAL POWER SRV,F&I,OH,M,PUR BY CON	1.00 AS	$1,795.00	$1,795.00
639-2-1	ELECTRICAL SERVICE WIRE, F&I	60.00 LF	$4.12	$247.20
649-21-4	STEEL MAST ARM ASSEMBLY, F&I, 40'- 30'	4.00 EA	$30,000.00	$120,000.00
650-1-14	VEH TRAF SIGNAL,F&I ALUMINUM, 3 S 1 W	8.00 AS	$971.18	$7,769.44
653-1-11	PEDESTRIAN SIGNAL, F&I LED COUNT, 1 WAY	8.00 AS	$703.42	$5,627.36
660-1-102	LOOP DETECTOR INDUCTIVE, F&I, TYPE 2	8.00 EA	$184.94	$1,479.52
660-2-106	LOOP ASSEMBLY, F&I, TYPE F	8.00 AS	$1,009.61	$8,076.88
665-1-11	PEDESTRIAN DETECTOR, F&I, STANDARD	8.00 EA	$221.97	$1,775.76
670-5-111	TRAF CNTL ASSEM, F&I, NEMA, 1 PREEMPT	1.00 AS	$29,375.31	$29,375.31
700-3-101	SIGN PANEL, F&I GM, UP TO 12 SF	4.00 EA	$288.05	$1,152.20
	Signalizations Component T otal			$200,093.73

LIGHTING COMPONENT

Conventional Lighting Subcomponent

Description	Value
Spacing	MAX

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	690.10	LF	$8.24	$5,686.42
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	90.05	LF	$18.50	$1,665.93
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	3.00	EA	$618.19	$1,854.57
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	2,340.44	LF	$2.20	$5,148.97
715-4-13	LIGHT POLE COMPLETE, F&I-STD, 40'	3.00	EA	$5,627.26	$16,881.78
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	3.00	EA	$590.10	$1,770.30
	Subcomponent T otal				$33,007.97
	Lighting Component T otal				$33,007.97

Sequence 38 T otal $840,908.28

Sequence: 39 WDU - Widen/Resurface, Divided, Urban Net Length: 1.061 MI 5,600 LF

Description: Option 1 - Widen Cypress Creek for 7' bike lanes.

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	10.00 / 10.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	1.061
Top of Structural Course For Begin Section	102.00

Top of Structural Course For End Section	102.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Existing Front Slope L/R	6 to 1 / 6 to 1
Existing Median Shoulder Cross Slope L/R	4.00 % / 4.00 %
Existing Outside Shoulder Cross Slope L/R	2.00 % / 2.00 %
Front Slope L/R	6 to 1 / 6 to 1
Median Shoulder Cross Slope L/R	4.00 % / 4.00 %
Outside Shoulder Cross Slope L/R	2.00 % / 2.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	2.57	AC	$39,220.64	$100,797.04
120-2-2	BORROW EXCAVATION, TRUCK MEASURE	5,212.01	CY	$30.24	$157,611.18
	Earthwork Component T otal				$258,408.22

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	6
Existing Roadway Pavement Width L/R	33.00 / 33.00
Structural Spread Rate	165
Friction Course Spread Rate	80
Widened Outside Pavement Width L/R	7.00 / 7.00
Widened Inside Pavement Width L/R	0.00 / 0.00
Widened Structural Spread Rate	275
Widened Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	11,921.71	SY	$5.23	$62,350.54
285-709	OPTIONAL BASE,BASE GROUP 09	9,121.73	SY	$22.00	$200,678.06
327-70-5	MILLING EXIST ASPH PAVT, 2" AVG DEPTH	41,066.43	SY	$2.97	$121,967.30
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	3,387.98	TN	$129.60	$439,082.21
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	1,197.77	TN	$129.60	$155,230.99
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	1,642.66	TN	$139.83	$229,693.15
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	718.66	TN	$139.83	$100,490.23

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	N
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	2
Solid Stripe No. of Stripes	4
Skip Stripe No. of Paint Applications	2
Skip Stripe No. of Stripes	4

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount

706-3	RETRO-REFLECTIVE PAVEMENT MARKERS	716.00	EA	$4.80	$3,436.80
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	8.48	GM	$869.98	$7,377.43
710-11-131	PAINTED PAVT MARK,STD,WHITE,SKIP, 6"	8.48	GM	$384.56	$3,261.07
	Roadway Component T otal				$1,323,567.78

SHOULDER COMPONENT

User Input Data

Description	Value
Existing Total Outside Shoulder Width L/R	7.00 / 7.00
New Total Outside Shoulder Width L/R	8.25 / 8.25
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 0.00
Sidewalk Width L/R	6.00 / 6.00

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
520-1-10	CONCRETE CURB & GUTTER, TYPE F	5,599.97	LF	$26.01	$145,655.22
520-1-10	CONCRETE CURB & GUTTER, TYPE F	5,599.97	LF	$26.01	$145,655.22
522-1	CONCRETE SIDEWALK AND DRIVEWAYS, 4"	7,466.62	SY	$42.68	$318,675.34

Erosion Control

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	11,199.94	LF	$1.86	$20,831.89
104-11	FLOATING TURBIDITY BARRIER	106.06	LF	$11.41	$1,210.14
104-12	STAKED TURBIDITY BARRIER-NYL REINF PVC	106.06	LF	$5.90	$625.75
104-15	SOIL TRACKING PREVENTION DEVICE	2.00	EA	$2,013.84	$4,027.68
104-18	INLET PROTECTION SYSTEM	49.00	EA	$97.92	$4,798.08
107-1	LITTER REMOVAL	9.25	AC	$47.56	$439.93
107-2	MOWING	9.25	AC	$66.75	$617.44
	Shoulder Component T otal				$642,536.69

MEDIAN COMPONENT

User Input Data

Description	Value
Total Median Width	30.00
Performance Turf Width	8.25

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
520-5-11	TRAF SEP CONC-TYPE I, 4' WIDE	1,200.00	LF	$43.11	$51,732.00
570-1-1	PERFORMANCE TURF	5,133.30	SY	$2.66	$13,654.58
	Median Component T otal				$65,386.58

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-2	CONC CLASS II, ENDWALLS	19.09	CY	$2,160.00	$41,234.40
425-1-351	INLETS, CURB, TYPE P-5, <10'	39.00	EA	$5,339.35	$208,234.65
425-1-451	INLETS, CURB, TYPE J-5, <10'	11.00	EA	$8,552.96	$94,082.56
430-175-124	PIPE CULV, OPT MATL, ROUND, 24"S/CD	592.00	LF	$105.93	$62,710.56
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	176.00	LF	$144.65	$25,458.40
570-1-1	PERFORMANCE TURF	322.42	SY	$2.66	$857.64
	Drainage Component T otal				$432,578.21

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	24.00	AS	$346.35	$8,312.40
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	3.00	AS	$1,045.67	$3,137.01
700-1-50	SINGLE POST SIGN, RELOCATE	3.00	AS	$279.29	$837.87
700-1-60	SINGLE POST SIGN, REMOVE	24.00	AS	$20.90	$501.60
700-2-14	MULTI- POST SIGN, F&I GM, 31-50 SF	3.00	AS	$4,669.54	$14,008.62
700-2-60	MULTI- POST SIGN, REMOVE	3.00	AS	$483.73	$1,451.19
	Signing Component T otal				$28,248.69

Sequence 39 T otal $2,750,726.17

Sequence: 40 NUU - New Construction, Undivided, Urban Net Length: 0.072 MI 380 LF

Description: Option 1 - Additional EB left turn lane from Cypress Creek to NB NE 7th Ave.

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	11.00 / 0.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.072
Top of Structural Course For Begin Section	105.00
Top of Structural Course For End Section	105.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	6 to 1 / 6 to 1
Outside Shoulder Cross Slope L/R	2.00 % / 2.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount

110-1-1	CLEARING & GRUBBING	0.10 AC	$39,220.64	$3,922.06
	Earthwork Component T otal			$3,922.06

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	1
Roadway Pavement Width L/R	11.00 / 0.00
Structural Spread Rate	275
Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	573.62	SY	$5.23	$3,000.03
285-709	OPTIONAL BASE,BASE GROUP 09	464.64	SY	$22.00	$10,222.08
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	63.89	TN	$129.60	$8,280.14
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	38.33	TN	$139.83	$5,359.68

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	N
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	2
Solid Stripe No. of Stripes	4
Skip Stripe No. of Paint Applications	2
Skip Stripe No. of Stripes	0

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	0.58	GM	$869.98	$504.59
	Roadway Component T otal				$27,366.52

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	0.00 / 0.00
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 0.00
Sidewalk Width L/R	0.00 / 0.00

Erosion Control

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	760.32	LF	$1.86	$1,414.20
104-11	FLOATING TURBIDITY BARRIER	18.00	LF	$11.41	$205.38
104-12	STAKED TURBIDITY BARRIER-NYL REINF PVC	18.00	LF	$5.90	$106.20
104-15	SOIL TRACKING PREVENTION DEVICE	1.00	EA	$2,013.84	$2,013.84
104-18	INLET PROTECTION SYSTEM	4.00	EA	$97.92	$391.68

107-1	LITTER REMOVAL	0.87	AC	$47.56	$41.38
107-2	MOWING	0.87	AC	$66.75	$58.07
	Shoulder Component T otal				$4,230.75

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-2	CONC CLASS II, ENDWALLS	1.30	CY	$2,160.00	$2,808.00
425-1-351	INLETS, CURB, TYPE P-5, <10'	3.00	EA	$5,339.35	$16,018.05
425-1-451	INLETS, CURB, TYPE J-5, <10'	1.00	EA	$8,552.96	$8,552.96
425-1-521	INLETS, DT BOT, TYPE C, <10'	1.00	EA	$2,905.39	$2,905.39
425-2-41	MANHOLES, P-7, <10'	1.00	EA	$4,468.81	$4,468.81
430-175-124	PIPE CULV, OPT MATL, ROUND, 24"S/CD	168.00	LF	$105.93	$17,796.24
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	16.00	LF	$144.65	$2,314.40
430-175-148	PIPE CULV, OPT MATL, ROUND, 48"S/CD	360.00	LF	$347.62	$125,143.20
570-1-1	PERFORMANCE TURF	21.89	SY	$2.66	$58.23
	Drainage Component T otal				$180,065.28

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	2.00	AS	$346.35	$692.70
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	1.00	AS	$1,045.67	$1,045.67
700-2-15	MULTI- POST SIGN, F&I GM, 51-100 SF	1.00	AS	$7,627.27	$7,627.27
	Signing Component T otal				$9,365.64

LIGHTING COMPONENT

Conventional Lighting Subcomponent

Description Value

Spacing MAX

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	380.16	LF	$8.24	$3,132.52
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	49.61	LF	$18.50	$917.79
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	2.00	EA	$618.19	$1,236.38
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	1,289.30	LF	$2.20	$2,836.46
715-4-13	LIGHT POLE COMPLETE, F&I-STD, 40'	2.00	EA	$5,627.26	$11,254.52
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	2.00	EA	$590.10	$1,180.20
	Subcomponent T otal				$20,557.86
	Lighting Component T otal				$20,557.87

Sequence 40 Total $245,508.12

Sequence: 41 NUR - New Construction, Undivided, Rural Net Length: 0.176 MI 930 LF

Description: 1 lane SB CD Road from Andrews on-ramp merge to bridge over Commercial Blvd.

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	25.00 / 25.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.682
Top of Structural Course For Begin Section	105.00
Top of Structural Course For End Section	105.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	6 to 1 / 6 to 1
Outside Shoulder Cross Slope L/R	6.00 % / 6.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	1.07	AC	$39,220.64	$41,966.08
120-6	EMBANKMENT	17,700.72	CY	$22.58	$399,682.26
	Earthwork Component Total				$441,648.34

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	1
Roadway Pavement Width L/R	0.00 / 15.00
Structural Spread Rate	275
Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	2,169.55	SY	$5.23	$11,346.75
285-709	OPTIONAL BASE,BASE GROUP 09	1,583.77	SY	$22.00	$34,842.94
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	213.08	TN	$129.60	$27,615.17
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	127.85	TN	$139.83	$17,877.27

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	N
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	2
Solid Stripe No. of Stripes	2
Skip Stripe No. of Paint Applications	2
Skip Stripe No. of Stripes	0

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	0.70	GM	$869.98	$608.99
	Roadway Component T otal				$92,291.12

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	2.00 / 4.00
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 0.00
Paved Outside Shoulder Width L/R	2.00 / 4.00
Structural Spread Rate	110
Friction Course Spread Rate	165
Total Width (T) / 8" Overlap (O)	T
Rumble Strips ï¿½No. of Sides	0

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
285-704	OPTIONAL BASE,BASE GROUP 04	688.06	SY	$25.70	$17,683.14
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	34.09	TN	$129.60	$4,418.06
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	51.14	TN	$139.83	$7,150.91

Erosion Control

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	2,417.50	LF	$1.86	$4,496.55
104-11	FLOATING TURBIDITY BARRIER	44.02	LF	$11.41	$502.27
104-12	STAKED TURBIDITY BARRIER-NYL REINF PVC	44.02	LF	$5.90	$259.72
104-15	SOIL TRACKING PREVENTION DEVICE	1.00	EA	$2,013.84	$2,013.84
107-1	LITTER REMOVAL	2.13	AC	$47.56	$101.30
107-2	MOWING	2.13	AC	$66.75	$142.18
	Shoulder Component T otal				$36,767.97

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-2	CONC CLASS II, ENDWALLS	3.17	CY	$2,160.00	$6,847.20
430-174-124	PIPE CULV, OPT MATL, ROUND,24"SD	144.00	LF	$191.28	$27,544.32
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	32.00	LF	$144.65	$4,628.80
430-984-129	MITERED END SECT, OPTIONAL RD, 24" SD	8.00	EA	$1,579.93	$12,639.44
570-1-1	PERFORMANCE TURF	123.97	SY	$2.66	$329.76
	Drainage Component T otal				$51,989.52

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	1.00	AS	$346.35	$346.35
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	4.00	AS	$1,045.67	$4,182.68
700-2-14	MULTI- POST SIGN, F&I GM, 31-50 SF	1.00	AS	$4,669.54	$4,669.54
	Signing Component T otal				$9,198.57

LIGHTING COMPONENT

Rural Lighting Subcomponent

Description	Value
Multiplier (Number of Poles)	12

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	2,400.00	LF	$8.24	$19,776.00
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	12.00	EA	$618.19	$7,418.28
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	7,200.00	LF	$2.20	$15,840.00
715-4-14	LIGHT POLE COMPLETE, F&I-STD, 45'	12.00	EA	$5,937.91	$71,254.92
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	12.00	EA	$590.10	$7,081.20
	Subcomponent T otal				$121,370.40
	Lighting Component T otal				$121,370.40

RETAINING WALLS COMPONENT

Retaining W all 1

Description	Value
Length	600.00
Begin height	25.00
End Height	1.00
Multiplier	2

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
548-12	RET WALL SYSTEM, PERM, EX BARRIER	15,600.00	SF	$23.14	$360,984.00
	Retaining W alls Component T otal				$360,984.00

Sequence 41 T otal $1,114,249.92

Sequence: 42 NUR - New Construction, Undivided, Rural Net Length: 0.061 MI 320 LF

Description: 1 lane CD Road bridge over Commercial Blvd.

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	20.00 / 20.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.682
Top of Structural Course For Begin Section	105.00
Top of Structural Course For End Section	105.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	6 to 1 / 6 to 1
Outside Shoulder Cross Slope L/R	6.00 % / 6.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	0.30	AC	$39,220.64	$11,766.19
	Earthwork Component T otal				$11,766.19

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	1
Roadway Pavement Width L/R	0.00 / 15.00
Structural Spread Rate	275
Friction Course Spread Rate	165

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	Y
Pavement Type	Concrete
Solid Stripe No. of Paint Applications	0
Solid Stripe No. of Stripes	2
Skip Stripe No. of Paint Applications	0
Skip Stripe No. of Stripes	0

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
711-16-101	THERMOPLASTIC, STD-OTH, WHITE, SOLID, 6"	0.12	GM	$3,814.69	$457.76
	Roadway Component T otal				$457.76

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	6.00 / 6.00
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 0.00
Paved Outside Shoulder Width L/R	6.00 / 6.00
Structural Spread Rate	110
Friction Course Spread Rate	165
Total Width (T) / 8" Overlap (O)	T

Rumble Strips ï¿½No. of Sides 0

Erosion Control

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	831.92	LF	$1.86	$1,547.37
104-11	FLOATING TURBIDITY BARRIER	15.15	LF	$11.41	$172.86
104-12	STAKED TURBIDITY BARRIER-NYL REINF PVC	15.15	LF	$5.90	$89.38
104-15	SOIL TRACKING PREVENTION DEVICE	1.00	EA	$2,013.84	$2,013.84
107-1	LITTER REMOVAL	0.73	AC	$47.56	$34.72
107-2	MOWING	0.73	AC	$66.75	$48.73
	Shoulder Component T otal				$3,906.91

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-2	CONC CLASS II, ENDWALLS	1.09	CY	$2,160.00	$2,354.40
430-174-124	PIPE CULV, OPT MATL, ROUND,24"SD	56.00	LF	$191.28	$10,711.68
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	16.00	LF	$144.65	$2,314.40
430-984-129	MITERED END SECT, OPTIONAL RD, 24" SD	3.00	EA	$1,579.93	$4,739.79
570-1-1	PERFORMANCE TURF	42.66	SY	$2.66	$113.48
	Drainage Component T otal				$20,233.75

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	1.00	AS	$346.35	$346.35
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	2.00	AS	$1,045.67	$2,091.34
700-2-14	MULTI- POST SIGN, F&I GM, 31-50 SF	1.00	AS	$4,669.54	$4,669.54
	Signing Component T otal				$7,107.23

LIGHTING COMPONENT

Rural Lighting Subcomponent

Description	Value
Multiplier (Number of Poles)	2

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	400.00	LF	$8.24	$3,296.00
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	2.00	EA	$618.19	$1,236.38
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	1,200.00	LF	$2.20	$2,640.00
715-4-14	LIGHT POLE COMPLETE, F&I-	2.00	EA	$5,937.91	$11,875.82

	STD, 45'			
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	2.00 EA	$590.10	$1,180.20
	Subcomponent T otal			$20,228.40
	Lighting Component T otal			$20,228.40

BRIDGES COMPONENT

Bridge CD/COM

Description	Value
Estimate Type	SF Estimate
Primary Estimate	YES
Length (LF)	320.00
Width (LF)	30.00
Type	Low Level
Cost Factor	1.25
Structure No.	
Removal of Existing Structures area	0.00
Default Cost per SF	$120.00
Factored Cost per SF	$150.00
Final Cost per SF	$153.52
Basic Bridge Cost	$1,440,000.00
Description	1 LANE CD ROAD BRIDGE OVER COMMERCIAL BLVD.

Bridge Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-10	CONC CLASS II, APPROACH SLABS	66.67	CY	$351.19	$23,413.84
415-1-9	REINF STEEL- APPROACH SLABS	11,667.25	LB	$0.89	$10,383.85
	Bridge CD/COM T otal				$1,473,797.69
	Bridges Component T otal				$1,473,797.69

Sequence 42 T otal $1,537,497.93

Sequence: 43 NUR - New Construction, Undivided, Rural Net Length: 0.189 MI 1,000 LF

Description: 4 lane terminal at I-95 SB exit to Commercial Blvd.

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	40.00 / 40.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.682
Top of Structural Course For Begin Section	105.00
Top of Structural Course For End Section	105.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	6 to 1 / 6 to 1
Outside Shoulder Cross Slope L/R	6.00 % / 6.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	1.83	AC	$39,220.64	$71,773.77
120-6	EMBANKMENT	45,982.93	CY	$22.58	$1,038,294.56
	Earthwork Component T otal				$1,110,068.33

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	4
Roadway Pavement Width L/R	24.00 / 24.00
Structural Spread Rate	275
Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	7,555.80	SY	$5.23	$39,516.83
285-709	OPTIONAL BASE,BASE GROUP 09	5,406.84	SY	$22.00	$118,950.48
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	733.36	TN	$129.60	$95,043.46
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	440.01	TN	$139.83	$61,526.60

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	N
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	2
Solid Stripe No. of Stripes	2
Skip Stripe No. of Paint Applications	2
Skip Stripe No. of Stripes	3

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
706-3	RETRO-REFLECTIVE PAVEMENT MARKERS	128.00	EA	$4.80	$614.40
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	0.76	GM	$869.98	$661.18
710-11-231	PAINTED PAVT MARK,STD,YELLOW,SKIP,6"	1.14	GM	$390.33	$444.98
	Roadway Component T otal				$316,757.93

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	10.00 / 10.00
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 0.00
Paved Outside Shoulder Width L/R	10.00 / 10.00
Structural Spread Rate	110
Friction Course Spread Rate	165
Total Width (T) / 8" Overlap (O)	T
Rumble Strips ï¿½No. of Sides	0

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
285-704	OPTIONAL BASE,BASE GROUP 04	2,295.63	SY	$25.70	$58,997.69
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	122.23	TN	$129.60	$15,841.01
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	183.34	TN	$139.83	$25,636.43

Erosion Control

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	2,600.08	LF	$1.86	$4,836.15
104-11	FLOATING TURBIDITY BARRIER	47.35	LF	$11.41	$540.26
104-12	STAKED TURBIDITY BARRIER-NYL REINF PVC	47.35	LF	$5.90	$279.36
104-15	SOIL TRACKING PREVENTION DEVICE	1.00	EA	$2,013.84	$2,013.84
107-1	LITTER REMOVAL	2.30	AC	$47.56	$109.39
107-2	MOWING	2.30	AC	$66.75	$153.52
	Shoulder Component T otal				$108,407.67

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-2	CONC CLASS II, ENDWALLS	3.41	CY	$2,160.00	$7,365.60
430-174-124	PIPE CULV, OPT MATL, ROUND,24"SD	152.00	LF	$191.28	$29,074.56
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	32.00	LF	$144.65	$4,628.80
430-984-129	MITERED END SECT, OPTIONAL RD, 24" SD	8.00	EA	$1,579.93	$12,639.44
570-1-1	PERFORMANCE TURF	133.34	SY	$2.66	$354.68
	Drainage Component T otal				$54,063.08

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	1.00	AS	$346.35	$346.35
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	4.00	AS	$1,045.67	$4,182.68
700-2-14	MULTI- POST SIGN, F&I GM, 31-50 SF	1.00	AS	$4,669.54	$4,669.54
	Signing Component T otal				$9,198.57

SIGNALIZATIONS COMPONENT

Signalization 1

Description	Value
Type	4 Lane Mast Arm
Multiplier	1

Description	Left turn signal for CD road terminal at Commercial Blvd.

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	750.00	LF	$8.24	$6,180.00
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	250.00	LF	$18.50	$4,625.00
632-7-1	SIGNAL CABLE- NEW OR RECO, FUR & INSTALL	1.00	PI	$5,084.78	$5,084.78
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	16.00	EA	$618.19	$9,891.04
639-1-112	ELECTRICAL POWER SRV,F&I,OH,M,PUR BY CON	1.00	AS	$1,795.00	$1,795.00
639-2-1	ELECTRICAL SERVICE WIRE, F&I	60.00	LF	$4.12	$247.20
649-21-10	STEEL MAST ARM ASSEMBLY, F&I, 60'	4.00	EA	$40,041.33	$160,165.32
650-1-14	VEH TRAF SIGNAL,F&I ALUMINUM, 3 S 1 W	12.00	AS	$971.18	$11,654.16
653-1-11	PEDESTRIAN SIGNAL, F&I LED COUNT, 1 WAY	8.00	AS	$703.42	$5,627.36
660-1-102	LOOP DETECTOR INDUCTIVE, F&I, TYPE 2	12.00	EA	$184.94	$2,219.28
660-2-106	LOOP ASSEMBLY, F&I, TYPE F	12.00	AS	$1,009.61	$12,115.32
665-1-11	PEDESTRIAN DETECTOR, F&I, STANDARD	8.00	EA	$221.97	$1,775.76
670-5-111	TRAF CNTL ASSEM, F&I, NEMA, 1 PREEMPT	1.00	AS	$29,375.31	$29,375.31
700-3-101	SIGN PANEL, F&I GM, UP TO 12 SF	4.00	EA	$288.05	$1,152.20

Signalization 2

Description	Value
Type	2 Lane Mast Arm
Multiplier	1
Description	Right turn signal for CD road terminal at Commercial Blvd.

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	800.00	LF	$8.24	$6,592.00
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	200.00	LF	$18.50	$3,700.00
632-7-1	SIGNAL CABLE- NEW OR RECO, FUR & INSTALL	1.00	PI	$5,084.78	$5,084.78
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	12.00	EA	$618.19	$7,418.28
639-1-112	ELECTRICAL POWER SRV,F&I,OH,M,PUR BY CON	1.00	AS	$1,795.00	$1,795.00
639-2-1	ELECTRICAL SERVICE WIRE, F&I	60.00	LF	$4.12	$247.20
649-21-4	STEEL MAST ARM ASSEMBLY, F&I, 40'- 30'	4.00	EA	$30,000.00	$120,000.00
650-1-14	VEH TRAF SIGNAL,F&I ALUMINUM, 3 S 1 W	8.00	AS	$971.18	$7,769.44
653-1-11	PEDESTRIAN SIGNAL, F&I LED COUNT, 1 WAY	8.00	AS	$703.42	$5,627.36
660-1-102	LOOP DETECTOR INDUCTIVE, F&I, TYPE 2	8.00	EA	$184.94	$1,479.52
660-2-106	LOOP ASSEMBLY, F&I, TYPE F	8.00	AS	$1,009.61	$8,076.88
665-1-11	PEDESTRIAN DETECTOR, F&I, STANDARD	8.00	EA	$221.97	$1,775.76
670-5-111	TRAF CNTL ASSEM, F&I, NEMA, 1	1.00	AS	$29,375.31	$29,375.31

	PREEMPT			
700-3-101	SIGN PANEL, F&I GM, UP TO 12 SF	4.00 EA	$288.05	$1,152.20
	Signalizations Component T otal			$452,001.46

LIGHTING COMPONENT

Rural Lighting Subcomponent

Description	Value
Multiplier (Number of Poles)	6

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	1,200.00	LF	$8.24	$9,888.00
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	6.00	EA	$618.19	$3,709.14
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	3,600.00	LF	$2.20	$7,920.00
715-4-14	LIGHT POLE COMPLETE, F&I-STD, 45'	6.00	EA	$5,937.91	$35,627.46
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	6.00	EA	$590.10	$3,540.60
	Subcomponent T otal				$60,685.20
	Lighting Component T otal				$60,685.20

Sequence 43 T otal $2,111,182.24

Sequence: 44 NUR - New Construction, Undivided, Rural Net Length: 0.407 MI 2,150 LF

Description: 2 lane SB CD Road from Andrews on-ramp merge to Park and Ride on-ramp

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	30.00 / 30.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.682
Top of Structural Course For Begin Section	105.00
Top of Structural Course For End Section	105.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	6 to 1 / 6 to 1
Outside Shoulder Cross Slope L/R	6.00 % / 6.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	2.96	AC	$39,220.64	$116,093.09
120-6	EMBANKMENT	34,038.41	CY	$22.58	$768,587.30
	Earthwork Component T otal				$884,680.39

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	2
Roadway Pavement Width L/R	11.00 / 11.00
Structural Spread Rate	275
Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	8,600.06	SY	$5.23	$44,978.31
285-709	OPTIONAL BASE,BASE GROUP 09	5,413.26	SY	$22.00	$119,091.72
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	722.64	TN	$129.60	$93,654.14
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	433.59	TN	$139.83	$60,628.89

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	N
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	2
Solid Stripe No. of Stripes	2
Skip Stripe No. of Paint Applications	2
Skip Stripe No. of Stripes	1

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
706-3	RETRO-REFLECTIVE PAVEMENT MARKERS	55.00	EA	$4.80	$264.00
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	1.63	GM	$869.98	$1,418.07
710-11-231	PAINTED PAVT MARK,STD,YELLOW,SKIP,6"	0.81	GM	$390.33	$316.17
	Roadway Component T otal				$320,351.30

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	4.00 / 10.00
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 0.00
Paved Outside Shoulder Width L/R	4.00 / 10.00
Structural Spread Rate	110
Friction Course Spread Rate	165
Total Width (T) / 8" Overlap (O)	T
Rumble Strips ï¿½No. of Sides	0

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
285-704	OPTIONAL BASE,BASE GROUP 04	3,502.14	SY	$25.70	$90,005.00
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	183.95	TN	$129.60	$23,839.92
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	275.92	TN	$139.83	$38,581.89

Erosion Control

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	5,590.04	LF	$1.86	$10,397.47
104-11	FLOATING TURBIDITY BARRIER	101.80	LF	$11.41	$1,161.54
104-12	STAKED TURBIDITY BARRIER-NYL REINF PVC	101.80	LF	$5.90	$600.62
104-15	SOIL TRACKING PREVENTION DEVICE	1.00	EA	$2,013.84	$2,013.84
107-1	LITTER REMOVAL	4.94	AC	$47.56	$234.95
107-2	MOWING	4.94	AC	$66.75	$329.74
	Shoulder Component T otal				$167,164.98

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-2	CONC CLASS II, ENDWALLS	7.33	CY	$2,160.00	$15,832.80
430-174-124	PIPE CULV, OPT MATL, ROUND,24"SD	328.00	LF	$191.28	$62,739.84
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	72.00	LF	$144.65	$10,414.80
430-984-129	MITERED END SECT, OPTIONAL RD, 24" SD	17.00	EA	$1,579.93	$26,858.81
570-1-1	PERFORMANCE TURF	286.67	SY	$2.66	$762.54
	Drainage Component T otal				$116,608.79

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	1.00	AS	$346.35	$346.35
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	9.00	AS	$1,045.67	$9,411.03
700-2-14	MULTI- POST SIGN, F&I GM, 31-50 SF	1.00	AS	$4,669.54	$4,669.54
	Signing Component T otal				$14,426.92

LIGHTING COMPONENT

Rural Lighting Subcomponent

Description	Value
Multiplier (Number of Poles)	13

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	2,600.00	LF	$8.24	$21,424.00
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	13.00	EA	$618.19	$8,036.47
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	7,800.00	LF	$2.20	$17,160.00
715-4-14	LIGHT POLE COMPLETE, F&I-STD, 45'	13.00	EA	$5,937.91	$77,192.83
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	13.00	EA	$590.10	$7,671.30
	Subcomponent T otal				$131,484.60

Lighting Component T otal	$131,484.60

Sequence 44 T otal	$1,634,716.98

Sequence: 45 NUR - New Construction, Undivided, Rural — Net Length: 0.331 MI / 1,750 LF

Description: 1 lane SB on-ramp from park and ride to CD road

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	20.00 / 20.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.360
Top of Structural Course For Begin Section	105.00
Top of Structural Course For End Section	105.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	6 to 1 / 6 to 1
Outside Shoulder Cross Slope L/R	6.00 % / 6.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	1.60	AC	$39,220.64	$62,753.02
120-6	EMBANKMENT	9,680.70	CY	$22.58	$218,590.21
	Earthwork Component T otal				$281,343.23

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	1
Roadway Pavement Width L/R	0.00 / 15.00
Structural Spread Rate	275
Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	5,249.38	SY	$5.23	$27,454.26
285-709	OPTIONAL BASE,BASE GROUP 09	2,980.48	SY	$22.00	$65,570.56
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	400.99	TN	$129.60	$51,968.30
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	240.60	TN	$139.83	$33,643.10

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	N
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	2

Solid Stripe No. of Stripes	2
Skip Stripe No. of Paint Applications	2
Skip Stripe No. of Stripes	0

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	1.33	GM	$869.98	$1,157.07
	Roadway Component T otal				$179,793.29

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	6.00 / 6.00
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 0.00
Paved Outside Shoulder Width L/R	6.00 / 6.00
Structural Spread Rate	110
Friction Course Spread Rate	165
Total Width (T) / 8" Overlap (O)	T
Rumble Strips ï¿½No. of Sides	0

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
285-704	OPTIONAL BASE,BASE GROUP 04	2,461.37	SY	$25.70	$63,257.21
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	128.32	TN	$129.60	$16,630.27
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	192.48	TN	$139.83	$26,914.48

Erosion Control

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	4,549.46	LF	$1.86	$8,462.00
104-11	FLOATING TURBIDITY BARRIER	82.85	LF	$11.41	$945.32
104-12	STAKED TURBIDITY BARRIER-NYL REINF PVC	82.85	LF	$5.90	$488.82
104-15	SOIL TRACKING PREVENTION DEVICE	1.00	EA	$2,013.84	$2,013.84
107-1	LITTER REMOVAL	4.02	AC	$47.56	$191.19
107-2	MOWING	4.02	AC	$66.75	$268.34
	Shoulder Component T otal				$119,171.47

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-2	CONC CLASS II, ENDWALLS	5.97	CY	$2,160.00	$12,895.20
430-174-124	PIPE CULV, OPT MATL, ROUND,24"SD	272.00	LF	$191.28	$52,028.16
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	56.00	LF	$144.65	$8,100.40
430-984-129	MITERED END SECT, OPTIONAL RD, 24" SD	14.00	EA	$1,579.93	$22,119.02
570-1-1	PERFORMANCE TURF	233.31	SY	$2.66	$620.60

	Drainage Component T otal	$95,763.38

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	1.00	AS	$346.35	$346.35
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	7.00	AS	$1,045.67	$7,319.69
700-2-14	MULTI- POST SIGN, F&I GM, 31-50 SF	1.00	AS	$4,669.54	$4,669.54
	Signing Component T otal				$12,335.58

LIGHTING COMPONENT

Rural Lighting Subcomponent

Description	Value
Multiplier (Number of Poles)	12

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	2,400.00	LF	$8.24	$19,776.00
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	12.00	EA	$618.19	$7,418.28
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	7,200.00	LF	$2.20	$15,840.00
715-4-14	LIGHT POLE COMPLETE, F&I-STD, 45'	12.00	EA	$5,937.91	$71,254.92
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	12.00	EA	$590.10	$7,081.20
	Subcomponent T otal				$121,370.40
	Lighting Component T otal				$121,370.40

RETAINING WALLS COMPONENT

Retaining W all 1

Description	Value
Length	600.00
Begin height	25.00
End Height	1.00
Multiplier	2

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
548-12	RET WALL SYSTEM, PERM, EX BARRIER	15,600.00	SF	$23.14	$360,984.00
	Retaining W alls Component T otal				$360,984.00

Sequence 45 T otal	$1,170,761.35

Sequence: 46 NUR - New Construction, Undivided, Rural Net Length: 0.633 MI

3,340 LF

Description: 1 lane SB CD Road from bridge over Commercial Blvd. to I-95 mainline.

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	20.00 / 20.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.682
Top of Structural Course For Begin Section	105.00
Top of Structural Course For End Section	105.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	6 to 1 / 6 to 1
Outside Shoulder Cross Slope L/R	6.00 % / 6.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	3.07	AC	$39,220.64	$120,407.36
120-6	EMBANKMENT	19,555.88	CY	$22.58	$441,571.77
	Earthwork Component T otal				$561,979.13

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	1
Roadway Pavement Width L/R	0.00 / 15.00
Structural Spread Rate	275
Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	9,278.13	SY	$5.23	$48,524.62
285-709	OPTIONAL BASE,BASE GROUP 09	5,689.35	SY	$22.00	$125,165.70
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	765.45	TN	$129.60	$99,202.32
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	459.27	TN	$139.83	$64,219.72

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	N
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	2
Solid Stripe No. of Stripes	2
Skip Stripe No. of Paint Applications	2
Skip Stripe No. of Stripes	0

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	2.53	GM	$869.98	$2,201.05

	Roadway Component T otal	$339,313.41

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	0.00 / 10.00
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 0.00
Paved Outside Shoulder Width L/R	0.00 / 10.00
Structural Spread Rate	110
Friction Course Spread Rate	165
Total Width (T) / 8" Overlap (O)	T
Rumble Strips ï¿½No. of Sides	0

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
285-704	OPTIONAL BASE,BASE GROUP 04	3,833.72	SY	$25.70	$98,526.60
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	204.12	TN	$129.60	$26,453.95
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	306.18	TN	$139.83	$42,813.15

Erosion Control

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	8,684.33	LF	$1.86	$16,152.85
104-11	FLOATING TURBIDITY BARRIER	158.15	LF	$11.41	$1,804.49
104-12	STAKED TURBIDITY BARRIER-NYL REINF PVC	158.15	LF	$5.90	$933.08
104-15	SOIL TRACKING PREVENTION DEVICE	1.00	EA	$2,013.84	$2,013.84
107-1	LITTER REMOVAL	7.67	AC	$47.56	$364.79
107-2	MOWING	7.67	AC	$66.75	$511.97
	Shoulder Component T otal				$189,574.73

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-2	CONC CLASS II, ENDWALLS	11.39	CY	$2,160.00	$24,602.40
430-174-124	PIPE CULV, OPT MATL, ROUND,24"SD	512.00	LF	$191.28	$97,935.36
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	112.00	LF	$144.65	$16,200.80
430-984-129	MITERED END SECT, OPTIONAL RD, 24" SD	26.00	EA	$1,579.93	$41,078.18
570-1-1	PERFORMANCE TURF	445.35	SY	$2.66	$1,184.63
	Drainage Component T otal				$181,001.37

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount

700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	2.00	AS	$346.35	$692.70
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	13.00	AS	$1,045.67	$13,593.71
700-2-14	MULTI- POST SIGN, F&I GM, 31-50 SF	2.00	AS	$4,669.54	$9,339.08
	Signing Component T otal				$23,625.49

LIGHTING COMPONENT

Rural Lighting Subcomponent

Description	Value
Multiplier (Number of Poles)	19

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	3,800.00	LF	$8.24	$31,312.00
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	19.00	EA	$618.19	$11,745.61
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	11,400.00	LF	$2.20	$25,080.00
715-4-14	LIGHT POLE COMPLETE, F&I-STD, 45'	19.00	EA	$5,937.91	$112,820.29
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	19.00	EA	$590.10	$11,211.90
	Subcomponent T otal				$192,169.80
	Lighting Component T otal				$192,169.80

RETAINING WALLS COMPONENT

Retaining W all 1

Description	Value
Length	950.00
Begin height	25.00
End Height	1.00
Multiplier	2

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
548-12	RET WALL SYSTEM, PERM, EX BARRIER	24,700.00	SF	$23.14	$571,558.00
	Retaining W alls Component T otal				$571,558.00

Sequence 46 T otal $2,059,221.93

Sequence: 47 NUR - New Construction, Undivided, Rural Net Length: 0.263 MI 1,390 LF

Description: 2 lane Andrews on-ramp to CD Road

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	30.00 / 30.00

Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.682
Top of Structural Course For Begin Section	105.00
Top of Structural Course For End Section	105.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	6 to 1 / 6 to 1
Outside Shoulder Cross Slope L/R	6.00 % / 6.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	1.91	AC	$39,220.64	$74,911.42
120-6	EMBANKMENT	34,038.41	CY	$22.58	$768,587.30
	Earthwork Component T otal				$843,498.72

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	2
Roadway Pavement Width L/R	11.00 / 11.00
Structural Spread Rate	275
Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	5,560.90	SY	$5.23	$29,083.51
285-709	OPTIONAL BASE,BASE GROUP 09	3,500.28	SY	$22.00	$77,006.16
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	467.27	TN	$129.60	$60,558.19
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	280.36	TN	$139.83	$39,202.74

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	N
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	2
Solid Stripe No. of Stripes	2
Skip Stripe No. of Paint Applications	2
Skip Stripe No. of Stripes	1

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
706-3	RETRO-REFLECTIVE PAVEMENT MARKERS	36.00	EA	$4.80	$172.80
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	1.05	GM	$869.98	$913.48
710-11-231	PAINTED PAVT MARK,STD,YELLOW,SKIP,6"	0.53	GM	$390.33	$206.87
	Roadway Component T otal				$207,143.75

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	4.00 / 10.00
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 0.00
Paved Outside Shoulder Width L/R	4.00 / 10.00
Structural Spread Rate	110
Friction Course Spread Rate	165
Total Width (T) / 8" Overlap (O)	T
Rumble Strips ï¿½No. of Sides	0

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
285-704	OPTIONAL BASE,BASE GROUP 04	2,264.52	SY	$25.70	$58,198.16
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	118.94	TN	$129.60	$15,414.62
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	178.41	TN	$139.83	$24,947.07

Erosion Control

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	3,614.58	LF	$1.86	$6,723.12
104-11	FLOATING TURBIDITY BARRIER	65.82	LF	$11.41	$751.01
104-12	STAKED TURBIDITY BARRIER-NYL REINF PVC	65.82	LF	$5.90	$388.34
104-15	SOIL TRACKING PREVENTION DEVICE	1.00	EA	$2,013.84	$2,013.84
107-1	LITTER REMOVAL	3.19	AC	$47.56	$151.72
107-2	MOWING	3.19	AC	$66.75	$212.93
	Shoulder Component T otal				$108,800.81

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-2	CONC CLASS II, ENDWALLS	4.74	CY	$2,160.00	$10,238.40
430-174-124	PIPE CULV, OPT MATL, ROUND,24"SD	216.00	LF	$191.28	$41,316.48
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	48.00	LF	$144.65	$6,943.20
430-984-129	MITERED END SECT, OPTIONAL RD, 24" SD	11.00	EA	$1,579.93	$17,379.23
570-1-1	PERFORMANCE TURF	185.36	SY	$2.66	$493.06
	Drainage Component T otal				$76,370.37

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	1.00	AS	$346.35	$346.35
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	6.00	AS	$1,045.67	$6,274.02

700-2-14	MULTI- POST SIGN, F&I GM, 31-50 SF	1.00	AS	$4,669.54	$4,669.54
	Signing Component T otal				$11,289.91

LIGHTING COMPONENT

Rural Lighting Subcomponent

Description	Value
Multiplier (Number of Poles)	8

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	1,600.00	LF	$8.24	$13,184.00
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	8.00	EA	$618.19	$4,945.52
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	4,800.00	LF	$2.20	$10,560.00
715-4-14	LIGHT POLE COMPLETE, F&I-STD, 45'	8.00	EA	$5,937.91	$47,503.28
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	8.00	EA	$590.10	$4,720.80
	Subcomponent T otal				$80,913.60
	Lighting Component T otal				$80,913.60

Sequence 47 T otal $1,328,017.16

Sequence: 48 NDU - New Construction, Divided, Urban Net Length: 0.114 MI 600 LF

Description: Reconstruct Andrews Ave from N Andrews Way to bridge over I-95

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	60.00 / 60.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.114
Top of Structural Course For Begin Section	105.00
Top of Structural Course For End Section	105.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	6 to 1 / 6 to 1
Median Shoulder Cross Slope L/R	4.00 % / 4.00 %
Outside Shoulder Cross Slope L/R	2.00 % / 2.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	1.66	AC	$39,220.64	$65,106.26
120-6	EMBANKMENT	12,228.34	CY	$22.58	$276,115.92
	Earthwork Component T otal				$341,222.18

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	6
Roadway Pavement Width L/R	34.00 / 34.00
Structural Spread Rate	330
Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	5,219.66	SY	$5.23	$27,298.82
285-709	OPTIONAL BASE,BASE GROUP 09	4,531.88	SY	$22.00	$99,701.36
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	747.76	TN	$129.60	$96,909.70
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	373.88	TN	$139.83	$52,279.64

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	N
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	2
Solid Stripe No. of Stripes	4
Skip Stripe No. of Paint Applications	2
Skip Stripe No. of Stripes	4

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
706-3	RETRO-REFLECTIVE PAVEMENT MARKERS	77.00	EA	$4.80	$369.60
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	0.91	GM	$869.98	$791.68
710-11-131	PAINTED PAVT MARK,STD,WHITE,SKIP, 6"	0.91	GM	$384.56	$349.95
	Roadway Component T otal				$277,700.75

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	8.25 / 8.25
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 0.00
Sidewalk Width L/R	6.00 / 6.00

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
520-1-10	CONCRETE CURB & GUTTER, TYPE F	599.81	LF	$26.01	$15,601.06
520-1-10	CONCRETE CURB & GUTTER, TYPE F	599.81	LF	$26.01	$15,601.06
522-1	CONCRETE SIDEWALK AND DRIVEWAYS, 4"	799.74	SY	$42.68	$34,132.90

Erosion Control

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount

104-10-3	SEDIMENT BARRIER	1,199.62	LF	$1.86	$2,231.29
104-11	FLOATING TURBIDITY BARRIER	28.40	LF	$11.41	$324.04
104-12	STAKED TURBIDITY BARRIER-NYL REINF PVC	28.40	LF	$5.90	$167.56
104-15	SOIL TRACKING PREVENTION DEVICE	1.00	EA	$2,013.84	$2,013.84
104-18	INLET PROTECTION SYSTEM	6.00	EA	$97.92	$587.52
107-1	LITTER REMOVAL	2.89	AC	$47.56	$137.45
107-2	MOWING	2.89	AC	$66.75	$192.91
	Shoulder Component T otal				$70,989.63

MEDIAN COMPONENT

User Input Data

Description	Value
Total Median Width	16.00
Performance Turf Width	11.00

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
520-1-10	CONCRETE CURB & GUTTER, TYPE F	1,199.62	LF	$26.01	$31,202.12
520-5-11	TRAF SEP CONC-TYPE I, 4' WIDE	200.00	LF	$43.11	$8,622.00
570-1-1	PERFORMANCE TURF	733.10	SY	$2.66	$1,950.05
	Median Component T otal				$41,774.17

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-2	CONC CLASS II, ENDWALLS	2.04	CY	$2,160.00	$4,406.40
425-1-351	INLETS, CURB, TYPE P-5, <10'	5.00	EA	$5,339.35	$26,696.75
425-1-451	INLETS, CURB, TYPE J-5, <10'	2.00	EA	$8,552.96	$17,105.92
425-1-521	INLETS, DT BOT, TYPE C, <10'	1.00	EA	$2,905.39	$2,905.39
425-2-41	MANHOLES, P-7, <10'	1.00	EA	$4,468.81	$4,468.81
430-175-124	PIPE CULV, OPT MATL, ROUND, 24"S/CD	304.00	LF	$105.93	$32,202.72
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	32.00	LF	$144.65	$4,628.80
430-175-148	PIPE CULV, OPT MATL, ROUND, 48"S/CD	568.00	LF	$347.62	$197,448.16
570-1-1	PERFORMANCE TURF	34.53	SY	$2.66	$91.85
	Drainage Component T otal				$289,954.80

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	3.00	AS	$346.35	$1,039.05
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	1.00	AS	$1,045.67	$1,045.67
700-2-15	MULTI- POST SIGN, F&I GM, 51-	1.00	AS	$7,627.27	$7,627.27

	100 SF				
700-2-16	MULTI- POST SIGN, F&I GM, 101-200 SF	1.00	AS	$9,241.53	$9,241.53
	Signing Component T otal				$18,953.52

LIGHTING COMPONENT

Conventional Lighting Subcomponent

Description	Value
Spacing	MIN

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	599.81	LF	$8.24	$4,942.43
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	119.05	LF	$18.50	$2,202.43
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	4.00	EA	$618.19	$2,472.76
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	2,190.66	LF	$2.20	$4,819.45
715-4-13	LIGHT POLE COMPLETE, F&I-STD, 40'	4.00	EA	$5,627.26	$22,509.04
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	4.00	EA	$590.10	$2,360.40
	Subcomponent T otal				$39,306.51
	Lighting Component T otal				$39,306.51

Sequence 48 T otal $1,079,901.56

Sequence: 49 NUR - New Construction, Undivided, Rural Net Length: 0.061 MI 320 LF

Description: New Andrews Bridge over I-95

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	20.00 / 20.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.682
Top of Structural Course For Begin Section	105.00
Top of Structural Course For End Section	105.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	6 to 1 / 6 to 1
Outside Shoulder Cross Slope L/R	6.00 % / 6.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	0.30	AC	$39,220.64	$11,766.19
	Earthwork Component T otal				$11,766.19

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	1
Roadway Pavement Width L/R	0.00 / 15.00
Structural Spread Rate	275
Friction Course Spread Rate	165

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	Y
Pavement Type	Concrete
Solid Stripe No. of Paint Applications	0
Solid Stripe No. of Stripes	2
Skip Stripe No. of Paint Applications	0
Skip Stripe No. of Stripes	0

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
711-16-101	THERMOPLASTIC, STD-OTH, WHITE, SOLID, 6"	0.12	GM	$3,814.69	$457.76
	Roadway Component T otal				$457.76

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	6.00 / 6.00
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 0.00
Paved Outside Shoulder Width L/R	6.00 / 6.00
Structural Spread Rate	110
Friction Course Spread Rate	165
Total Width (T) / 8" Overlap (O)	T
Rumble Strips ï¿½No. of Sides	0

Erosion Control

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	831.92	LF	$1.86	$1,547.37
104-11	FLOATING TURBIDITY BARRIER	15.15	LF	$11.41	$172.86
104-12	STAKED TURBIDITY BARRIER-NYL REINF PVC	15.15	LF	$5.90	$89.38
104-15	SOIL TRACKING PREVENTION DEVICE	1.00	EA	$2,013.84	$2,013.84
107-1	LITTER REMOVAL	0.73	AC	$47.56	$34.72
107-2	MOWING	0.73	AC	$66.75	$48.73
	Shoulder Component T otal				$3,906.91

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-2	CONC CLASS II, ENDWALLS	1.09	CY	$2,160.00	$2,354.40
430-174-124	PIPE CULV, OPT MATL, ROUND,24"SD	56.00	LF	$191.28	$10,711.68

430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	16.00	LF	$144.65	$2,314.40
430-984-129	MITERED END SECT, OPTIONAL RD, 24" SD	3.00	EA	$1,579.93	$4,739.79
570-1-1	PERFORMANCE TURF	42.66	SY	$2.66	$113.48
	Drainage Component T otal				$20,233.75

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	1.00	AS	$346.35	$346.35
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	2.00	AS	$1,045.67	$2,091.34
700-2-14	MULTI- POST SIGN, F&I GM, 31-50 SF	1.00	AS	$4,669.54	$4,669.54
	Signing Component T otal				$7,107.23

LIGHTING COMPONENT

Rural Lighting Subcomponent

Description	Value
Multiplier (Number of Poles)	2

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	400.00	LF	$8.24	$3,296.00
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	2.00	EA	$618.19	$1,236.38
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	1,200.00	LF	$2.20	$2,640.00
715-4-14	LIGHT POLE COMPLETE, F&I-STD, 45'	2.00	EA	$5,937.91	$11,875.82
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	2.00	EA	$590.10	$1,180.20
	Subcomponent T otal				$20,228.40
	Lighting Component T otal				$20,228.40

BRIDGES COMPONENT

Bridge ANDR95

Description	Value
Estimate Type	SF Estimate
Primary Estimate	YES
Length (LF)	300.00
Width (LF)	100.00
Type	Low Level
Cost Factor	1.25
Structure No.	
Removal of Existing Structures area	0.00
Default Cost per SF	$120.00
Factored Cost per SF	$150.00
Final Cost per SF	$153.76
Basic Bridge Cost	$4,500,000.00
Description	NEW ANDREWS BRIDGE OVER I-95

Bridge Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-10	CONC CLASS II, APPROACH SLABS	222.22	CY	$351.19	$78,041.44
415-1-9	REINF STEEL- APPROACH SLABS	38,888.50	LB	$0.89	$34,610.76
	Bridge ANDR95 T otal				$4,612,652.21
	Bridges Component T otal				$4,612,652.21

Sequence 49 T otal $4,676,352.45

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FDOT Long Range Estimating System - Production

R3: Project Details by Sequence Report

Project: 435808-1-52-01 Letting Date: 01/2099

Description: SR-9/I-95 FROM S. OF SR-870/COMMERCIAL BLVD. TO N. OF CYPRESS CREEK RD

District: 04 County: 86 BROWARD Market Area: 12 Units: English

Contract Class: 1 Lump Sum Project: N Design/Build: N Project Length: 6.755 MI

Project Manager: RODRIGUES

Version 15 Project Grand T otal $60,825,922.12

Description: Recommended Alternative -Commercial Blvd Interchange Area - Option 6 and Cypress Creek Rd - Option 1A with CD Road - Option 1

Project Sequences Subtotal			$51,074,008.52
102-1	Maintenance of Traffic	10.00 %	$5,107,400.85
101-1	Mobilization	8.00 %	$4,494,512.75
Project Sequences T otal			$60,675,922.12
Project Unknowns		0.00 %	$0.00
Design/Build		0.00 %	$0.00

Non-Bid Components:

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
999-25	INITIAL CONTINGENCY AMOUNT (DO NOT BID)		LS	$150,000.00	$150,000.00
Project Non-Bid Subtotal					$150,000.00
Version 15 Project Grand T otal					$60,825,922.12