PRELIMINARY ENGINEERING REPORT

Northeast Connector Expressway – Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Central Florida Expressway Authority

CENTRAL
FLORIDA
EXPRESSWAY
AUTHORITY

CFX Project No.: 599-228
Contract No.: 001546

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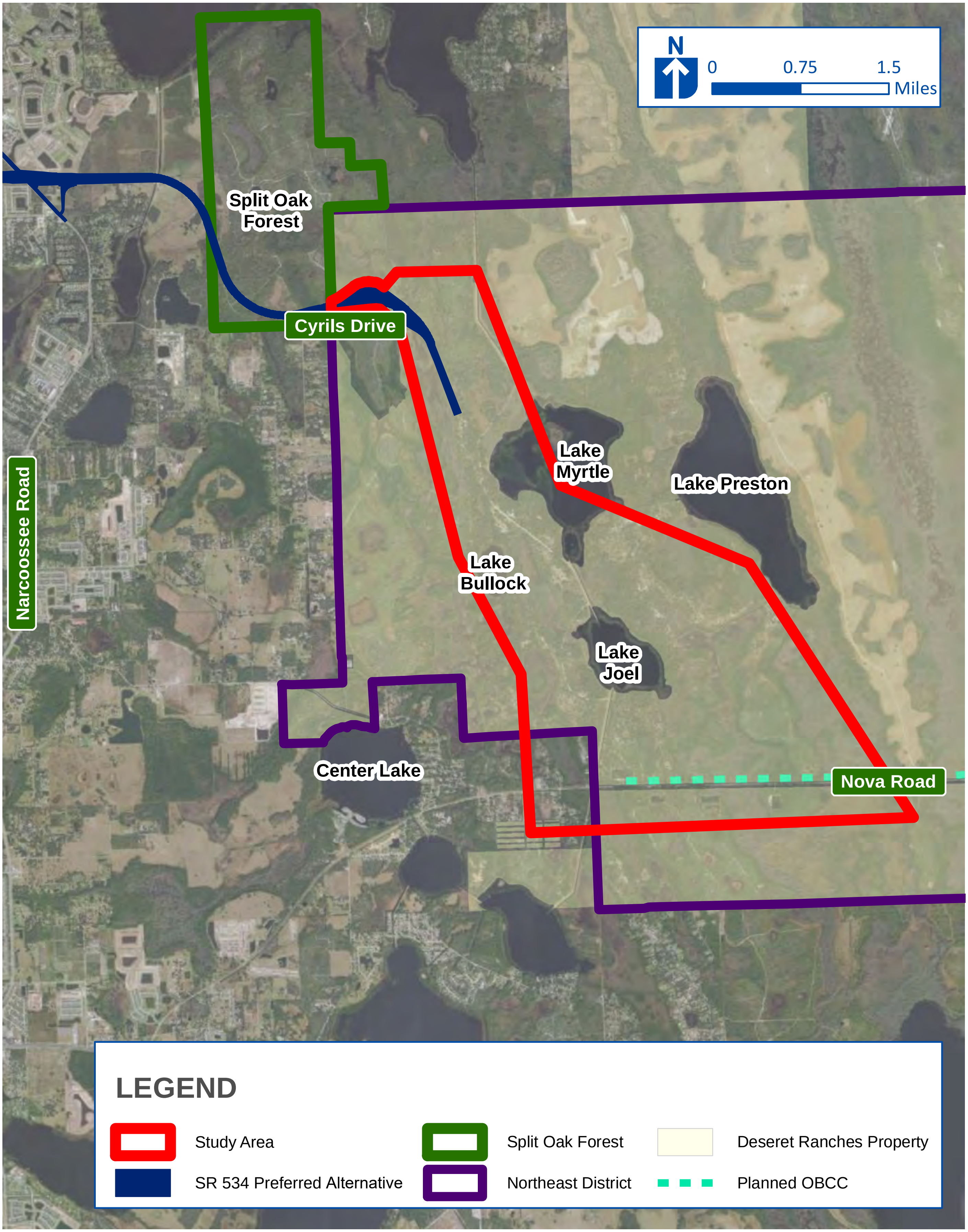
1.0 Project Summary

1.1 Project Description

The Central Florida Expressway Authority (CFX) is studying a new expressway connection between Cyrils Drive and Nova Road in Osceola County. The study area begins at the terminus of the planned Osceola Parkway Extension (SR 534) near Cyrils Drive and extends to Nova Road, a distance of approximately 4.3 miles. The study area is located primarily on Deseret Ranches property. Figure 1.1.1 shows the Northeast Connector Expressway – Phase 1 (hereafter referred to as Northeast Connector) study area.

The goal of the Northeast Connector is to enhance north-south mobility and provide connections between existing and future east-west corridors in the study area. The Northeast Connector will link the planned SR 534, which is based on an approved Project Development and Environment (PD&E) Study, with the planned Osceola/Brevard County Connectors (OBCC). These connections will promote regional connectivity, provide for transit opportunities, and enhance mobility in Osceola County. The link between the planned SR 534 and the OBCC will also provide a seamless limited access, high-speed connection from the Orlando International Airport (OIA) to I-95 in Brevard County. In the interim, before the OBCC is constructed, the Northeast Connector will extend the limited access connection from Cyrils Drive to Nova Road, a major county road. This connection will be vital to providing a limited access, north-south facility within the Northeast District, a large master-planned development in northeast Osceola County.



CENTRAL FLORIDA EXPRESSWAY AUTHORITY	**Northeast Connector Expressway - Phase 1 PD&E Study from Cyrils Drive to Nova Road**	**Figure 1.1.1: Project Study Area**	**Page Number: 1-2**

1.2 Project Background

The Northeast Connector Expressway has been considered in numerous previous studies. The most relevant studies to this project include:

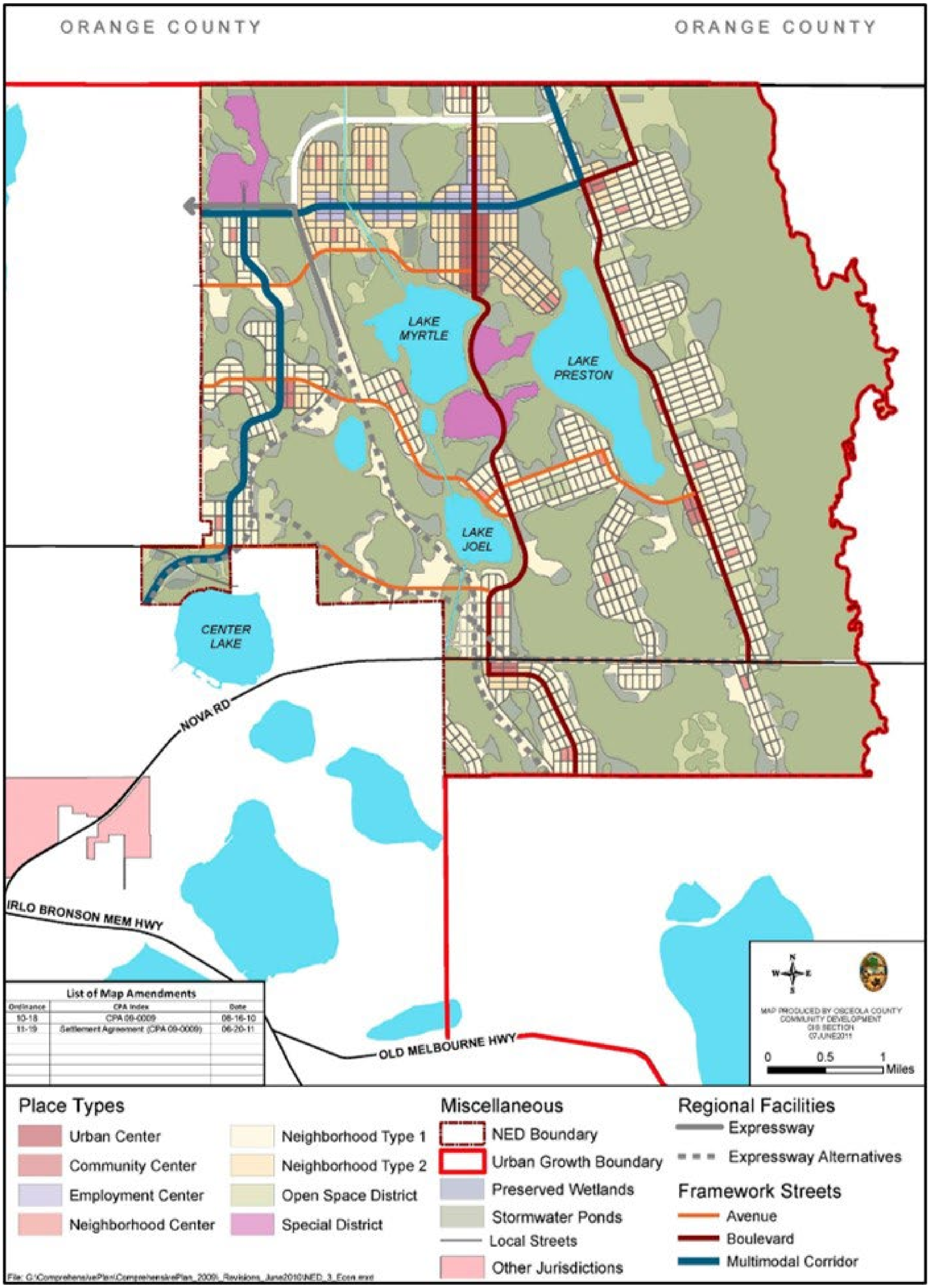
- Northeast District Conceptual Master Plan, 2010;
- Osceola County Expressway Authority (OCX) Master Plan 2040, 2013;
- East Central Florida Corridor Task Force Final Report, 2014;
- North Ranch Sector Plan, 2015; and
- Northeast Connector Expressway Concept, Feasibility, and Mobility Study, 2018.

1.2.1 Northeast District Conceptual Master Plan

The Northeast District planning area is comprised of approximately 17,150 acres of undeveloped land south of the Osceola/Orange County line, from the Econlockhatchee Swamp in the east to Outback Road in the west, then south to approximately one mile south of Nova Road. This development plan was created to facilitate adequate employment opportunities and communities within Osceola County and the expanded Orlando metropolitan area. The Northeast District Conceptual Master Plan was developed to achieve smart growth within the planning area in Osceola County. The plan creates a range of housing and employment opportunities, as well as an integrated transit system, that will reduce vehicle miles traveled and connect neighborhoods to the commercial districts while reducing urban sprawl. The Northeast District Conceptual Master Plan layout and street framework is shown on Figure 1.2.1 and includes:

- 29,320 residential dwelling units;
- 8,540,000 square feet of commercial/office/industrial;
- 1,995,000 square feet of institutional/civic; and
- 5,000 hotel rooms.

Figure 1.2.1: Northeast District Street Framework



Source: Northeast District Element, August 2010

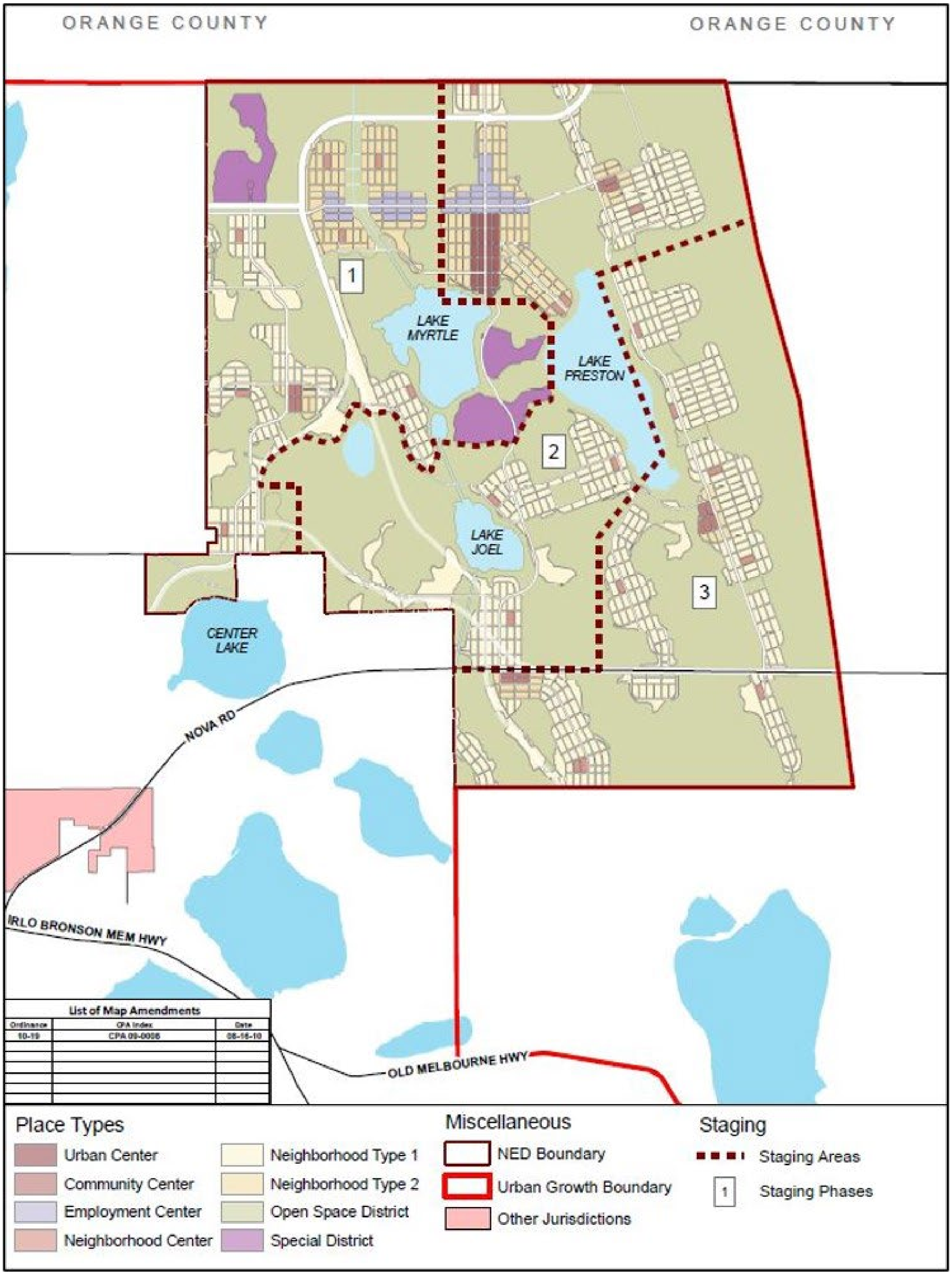
Development within the Northeast District will be constructed in phases. Three phases of development are anticipated as shown on Figure 1.2.2. Phases will be based upon specific measures relating to the creation of jobs, efficient land use, and investments in transportation infrastructure, rather than specific time periods. The first phase entails a reconfiguration of the previously approved plan for Osceola County Mixed Use District 8. The second phase of development begins when 4,000 jobs have been created and 7,000 residential units have been constructed in the Phase 1 area. Furthermore, the Osceola Parkway Expressway (OPE), now referred to as SR 534, and Southport Connector Expressway[1] must be under construction prior to Phase 2 activities proceeding. Phase 3 development may begin once 14,000 cumulative jobs have been created and 14,000 cumulative residential units have been constructed in Phases 1 and 2. Phase 3 cannot begin until the segment of SR 534 that enters the Northeast District has been completed and the Southport Connector is under construction or vice versa.

Framework streets, such as multimodal corridors, boulevards, and avenues, will be constructed to coincide with the transportation needs created by neighborhoods and centers to form a larger grid allowing for multiple travel paths and regional connectivity among core areas, as seen on Figure 1.2.1. Framework streets within the planning area will function as complete streets, therefore establishing walkable, transit-ready urban areas.

The Osceola County Board of County Commissioners approved the Northeast District Conceptual Master Plan at the August 16, 2010 hearing. Negotiations with the Department of Community Affairs resulted in the Board of County Commissioners issuing the Stipulated Settlement Agreement on June 21, 2011, which amended the Northeast District Conceptual Master Plan as well as the Future Land Use Element, the Potable Water Element, the Intergovernmental Coordination Element, the Public Schools Facility Element, and the Transportation Element.

[1] The Southport Connector Expressway from US 192 to the Northeast District as shown in the Northeast District Conceptual Master Plan is now referred to as the Northeast Connector Expressway.

Figure 1.2.2: Northeast District Staging Plan



Source: Northeast District Element, August 2010

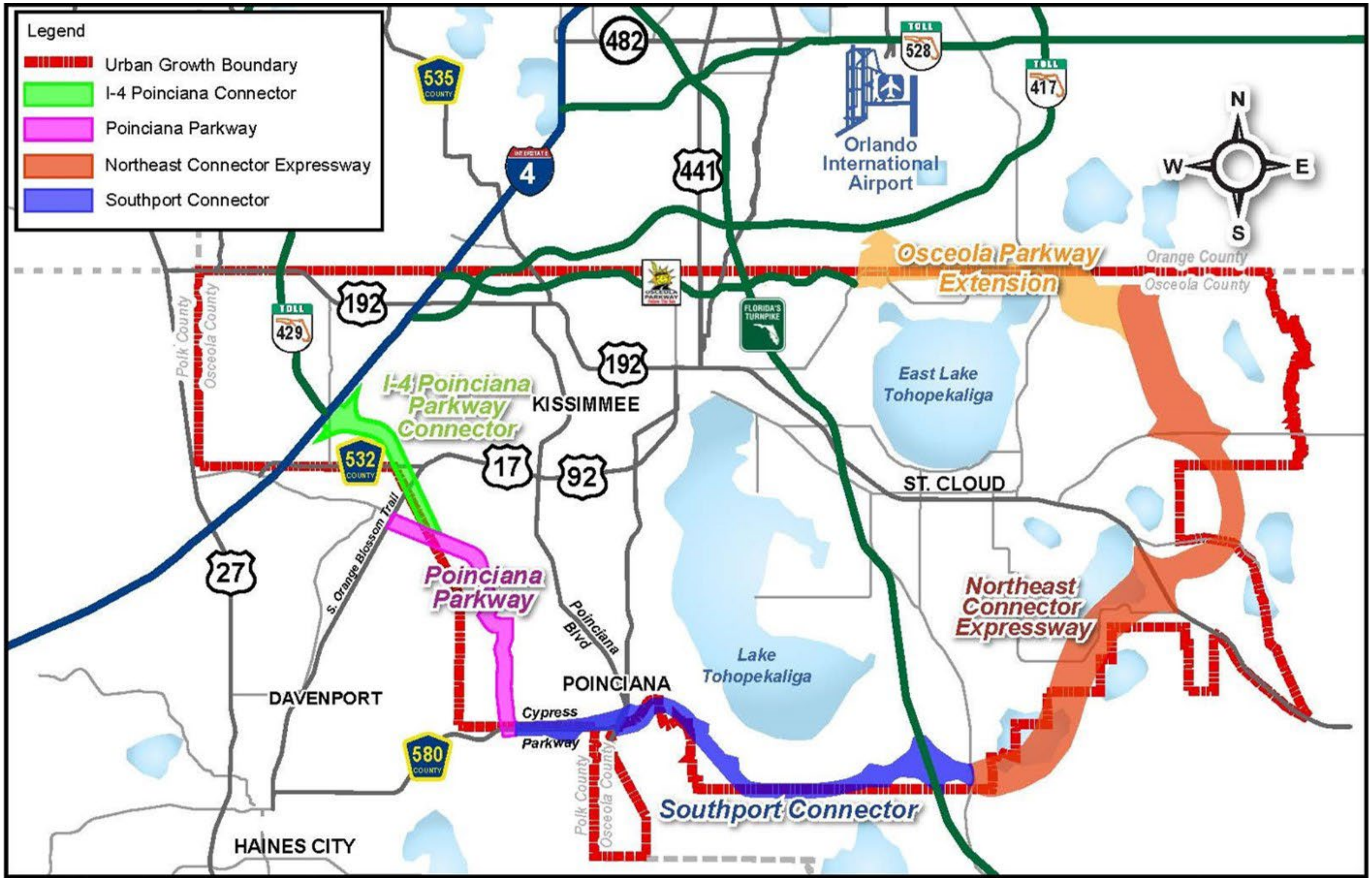
1.2.2 OCX Master Plan 2040

In response to Osceola County's expanding transportation needs, OCX was formed in 2010 and created its first long-range plan in 2012. The final OCX Master Plan 2040 was published in August 2013 and was structured on a series of expressways that form an interior ring of the county's urban growth boundary as shown on Figure 1.2.3. The intent of the expressway system was to connect existing and emerging cities and centers. There are four corridors described in the master plan:

1. Poinciana Parkway (10 miles);
2. Osceola Parkway Extension (9 miles);
3. Southport Connector Expressway (13 miles); and
4. Northeast Connector Expressway (25 miles).

The Northeast Connector Expressway was intended to connect the Southport Connector Expressway at Canoe Creek Road northeast to the Osceola/Orange County line. Potential corridors were originally studied by the Orlando-Orange County Expressway Authority (now referred to as CFX) in 2006 and then further expanded through a feasibility study conducted by Osceola County in 2009 and 2010. Two corridors were adopted as part of the 2011 Osceola County Comprehensive Plan.

Figure 1.2.3: OCX Master Plan Studies



Source: OCX Master Plan 2040, August 2013

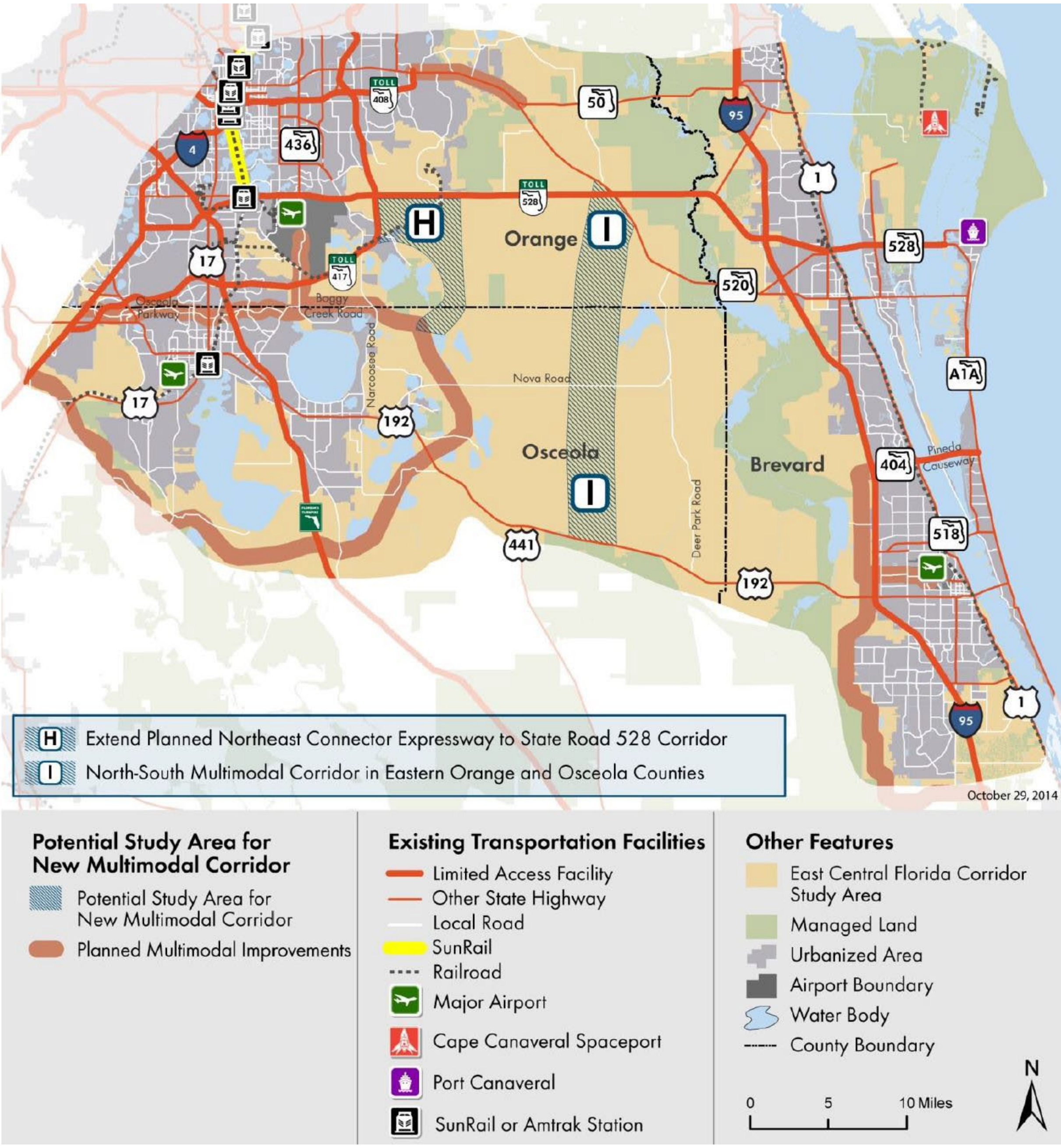
1.2.3 East Central Florida Corridor Task Force Final Report

The East Central Florida Corridor Task Force (Task Force) was created in 2013 through Executive Order 13-319 to develop consensus recommendations for future transportation corridor planning in portions of Brevard, Orange, and Osceola Counties. The Task Force findings as it relates to this study area include:

- The population of the three counties is projected to nearly double from 2 million to 3.8 million residents during the next 50 years.
- Multiple trends point to significant increases in demand for travel between the three counties during the next 50 years, including:
  - Planned development of mixed-use centers on the eastern edge of existing concentration of urban development in Orange and Osceola Counties;
  - Ongoing development under Florida's sector planning law of a long-term master plan for 133,000 acres in eastern Osceola County (North Ranch Sector Plan); and
  - The emergence of life sciences and related technology – based clusters in central Orlando, Innovation Way, Lake Nona, Cape Canaveral, and Melbourne.
- The Task Force noted concerns about the region's ability to achieve economic opportunities and to support growing populations related to planned growth resulting from limited options for both east-west and north-south travel. Of particular concern was the ability to support effective evacuation and response during extreme weather events and other emergencies, especially to and from Brevard County. Limitations include:
  - Of the three east-west highway connections between the three counties (SR 520, SR 528, and SR 50), only SR 528 is a high-speed, high-capacity corridor.
  - Only one east-west highway connection (US 192) exists between Orange, Osceola, and southern Brevard County.

In 2014, the Task Force submitted a Final Report to Governor Scott recommending 21 guiding principles for planning the future east central Florida's transportation corridors, including nine transportation corridors for further study. Five of those emphasize multimodal improvements to existing corridors and four recommend new study areas for new or significantly upgraded corridors. Of the four new corridors, two were east-west corridors and two were north-south. The recommended north-south corridors are shown on Figure 1.2.4. Corridor I was designed to serve the planned population areas within the North Ranch and establish connectivity to other regional destinations and east-west corridors. The Task Force report also recommended continuing the Northeast Connector Expressway project development process.

Figure 1.2.4: Recommended New North-South Corridors



Source: East Central Florida Corridor Task Force Final Report, December 2014

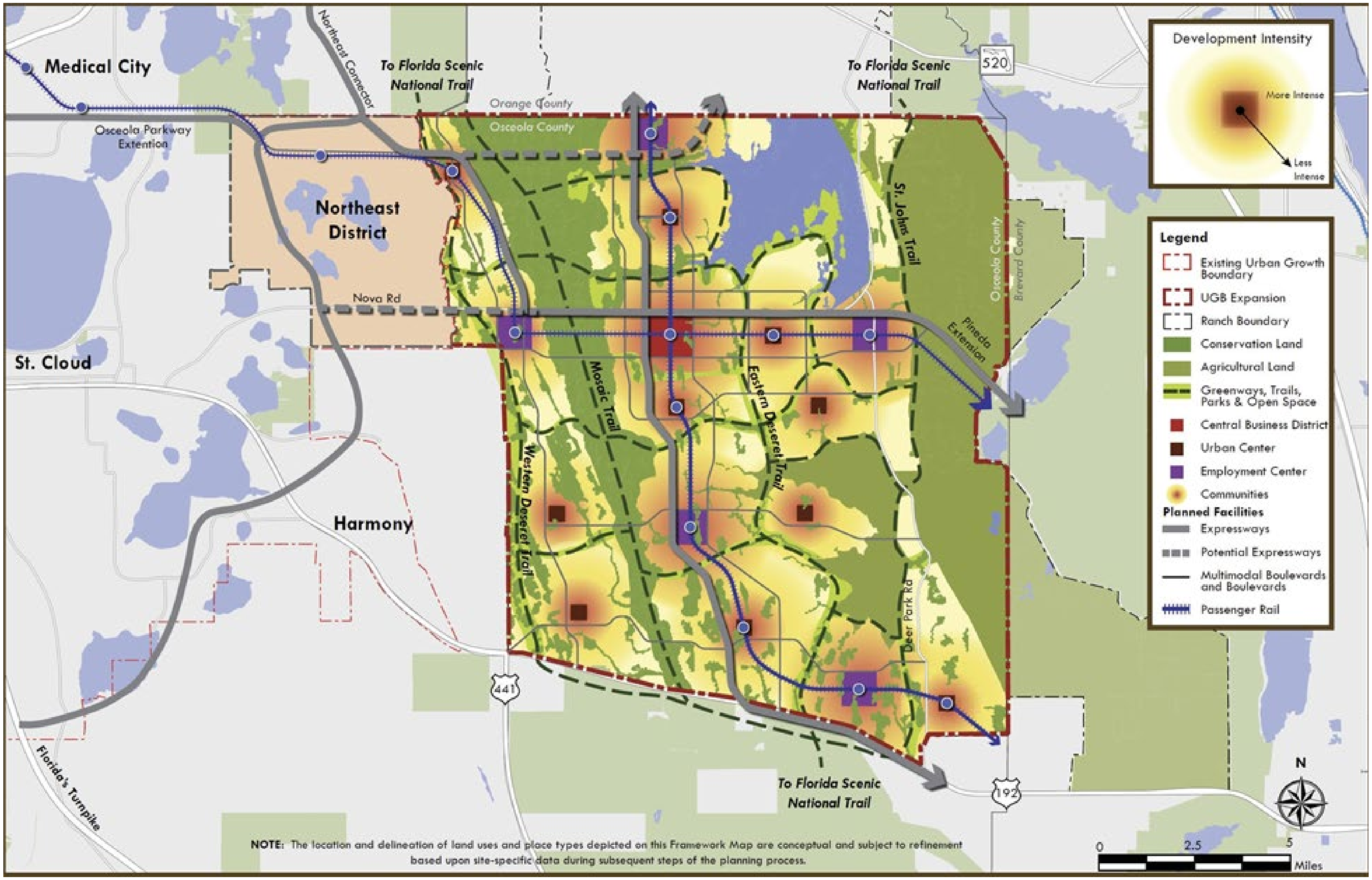
1.2.4 North Ranch Sector Plan

The North Ranch extends from US 192 north to the Osceola/Orange County boundary and from US 441 east to the Osceola/Brevard County boundary as shown on Figure 1.2.5. The North Ranch encompasses approximately 133,000 acres, the equivalent of two cities the size of Orlando, and is adjacent to the previously described Northeast District.

The North Ranch Sector Plan was prepared jointly by Osceola County and Farmland Reserve Inc. (a subsidiary of Deseret Ranches) to plan for regionally significant economic opportunities and job centers, close transportation corridor gaps, and preserve environmental systems and agricultural lands while minimizing public infrastructure investment. The sector plan also intends to stimulate job opportunities and development between Central Florida and the Space Coast as well as reserve acreage for a higher education campus such as a college or university. The sector plan assumes that 182,600 residential units and 83,360,010 square feet of commercial property will be developed by 2080.

New and improved existing transportation corridors identified by the East Central Florida Task Force were promoted and encouraged in the sector plan. These corridors will enhance travel to and from Northern Brevard County and north-south travel between Orange and Osceola Counties. The limited access facilities will be located on the edges of centers and neighborhoods to minimize the amount of disruption caused by their presence. In conservation lands, limited access facilities and fixed transit will be co-located to the highest extent possible in order to minimize their footprint in these areas. Deseret Ranches and Osceola County will work with state and regional agencies to facilitate the development of these corridors. The sector plan was adopted in 2015 by the Osceola County Board of County Commissioners.

Figure 1.2.5: North Ranch Sector Plan – Land Use Framework



Source: North Ranch Sector Plan Open House, September 2014

1.2.5 Northeast Connector Expressway CF&M Study

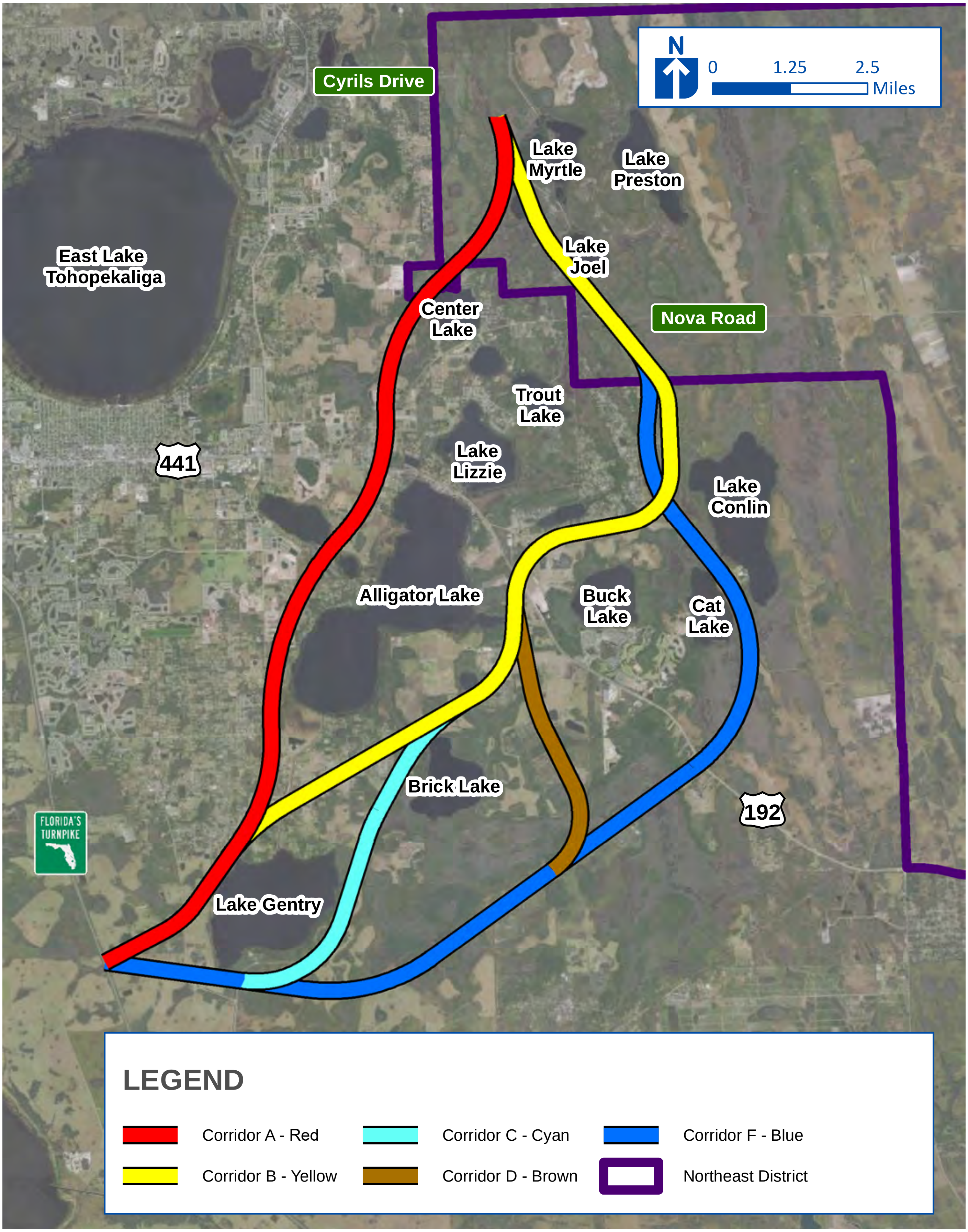
The Northeast Connector Expressway is proposed to extend from the planned Southport Connector Expressway at Florida's Turnpike to the planned Osceola Parkway Extension south of the Osceola/Orange County line. The Concept, Feasibility, and Mobility (CF&M) Study Report for the Northeast Connector Expressway was completed in 2018. The CF&M report addressed the purpose and need for the project, existing conditions within the study area, traffic considerations, design criteria, mobility alternatives evaluation, anticipated impacts to the natural, human, and physical environment, and stakeholder involvement. The study also evaluated the project's feasibility and viability. The established purpose and need for the project was to provide system linkage, provide regional connectivity and mobility, meet social and economic needs, provide additional transportation capacity, achieve consistency with transportation plans, provide multimodal opportunities, and improve safety and evacuation support.

Several mobility alternatives were considered for the Northeast Connector Expressway to address growth in the area and potential impacts on the existing condition. These alternatives included the No-Build Alternative, transportation systems management and operations (TSM&O) alternative, mass transit technology and intermodal facilities, and tolled limited access alternatives. Under the No-Build Alternative scenario, roadways located within the study area would not be improved and would operate at a volume-to-capacity ratio of greater than one, signifying that the demand exceeds the roadway capacity and significant congestion will occur. Therefore, the No-Build Alternative does not address the project's purpose and need.

The TSM&O Alternative is similar to the No-Build Alternative but includes intersection improvements. This alternative does provide enough capacity to meet the design year traffic needs, but this alternative does not fulfill the purpose and need for the project and therefore, TSM&O alternatives were not further evaluated in the study.

Mass transit technology and intermodal facilities were considered for this project; however, due to a lack of high-density development in the study area, mass transit options are not warranted at this time.

The tolled limited access alternatives feature a typical section that can accommodate technological advancements in transportation such as automated vehicles. The tolled limited access alternative was considered for further study. Five corridor alternatives were developed for the tolled limited access alternative as shown on Figure 1.2.6. The red and yellow corridors below are applicable to this project because they join the SR 534 segment emanating from Cyrils Drive.



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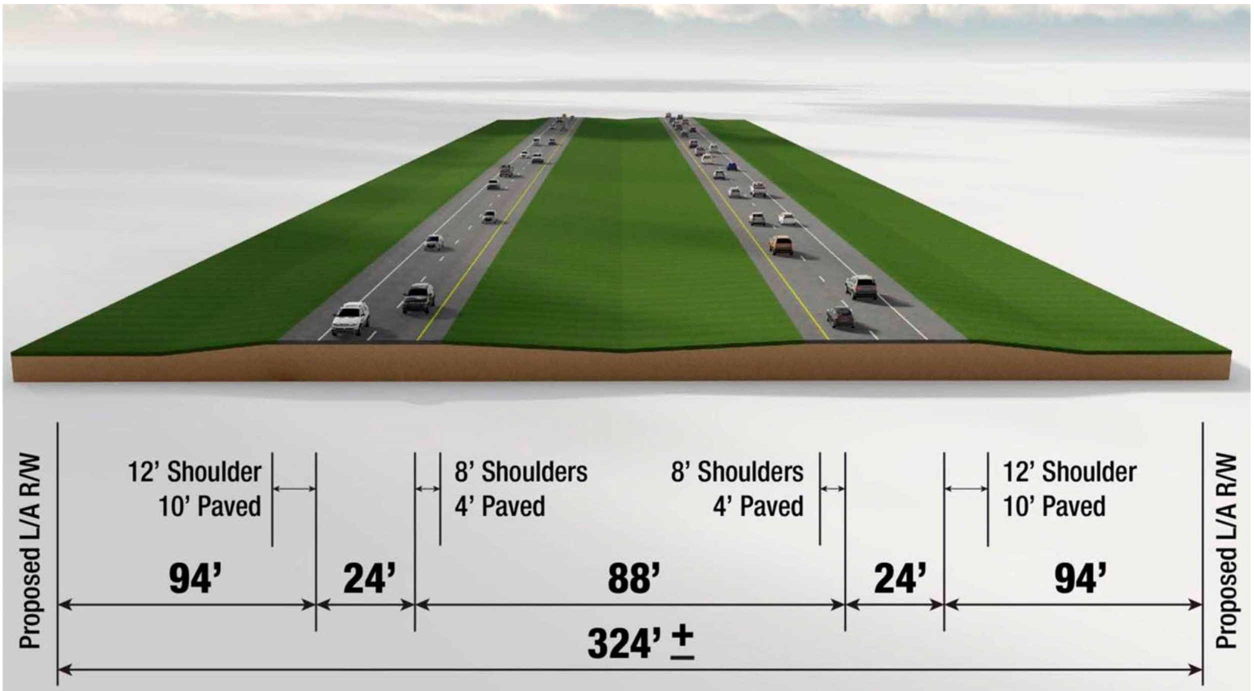
A standard typical section was applied to each corridor. The proposed typical section consists of two 12-foot wide travel lanes in each direction separated by an 88-foot median and eight-foot inside shoulders and 12-foot outside shoulders. The minimum right-of-way footprint for the corridor is 324 feet as shown on Figure 1.2.7.

Figure 1.2.7: CF&M Typical Section



Source: Northeast Connector Expressway CF&M Report, June 2018

Right-of-way needs for each corridor alternative range from 1,349 acres to 1,758 acres and the corridor will impact ponds and lakes, residential areas, and existing utilities. The project costs for the different alternatives vary from $1.2 billion to $1.4 billion in 2017 dollars. There were no "fatal flaws" identified for the project, which is therefore considered feasible from an engineering standpoint. However, at the time of the study (2018), the Northeast Connector Expressway was determined not to be viable, as it would not meet the required toll revenue of 50% of the project cost over 30 years. The Northeast Connector Expressway from the planned Southport Connector Expressway to the planned Osceola Parkway Extension was therefore not immediately advanced to the PD&E phase.

1.3 Related Studies and Projects

Two projects are related to the Northeast Connector project that were not described in Section 1.2: the Osceola Parkway Extension PD&E Study and the Osceola/Brevard County Connectors CF&M Study.

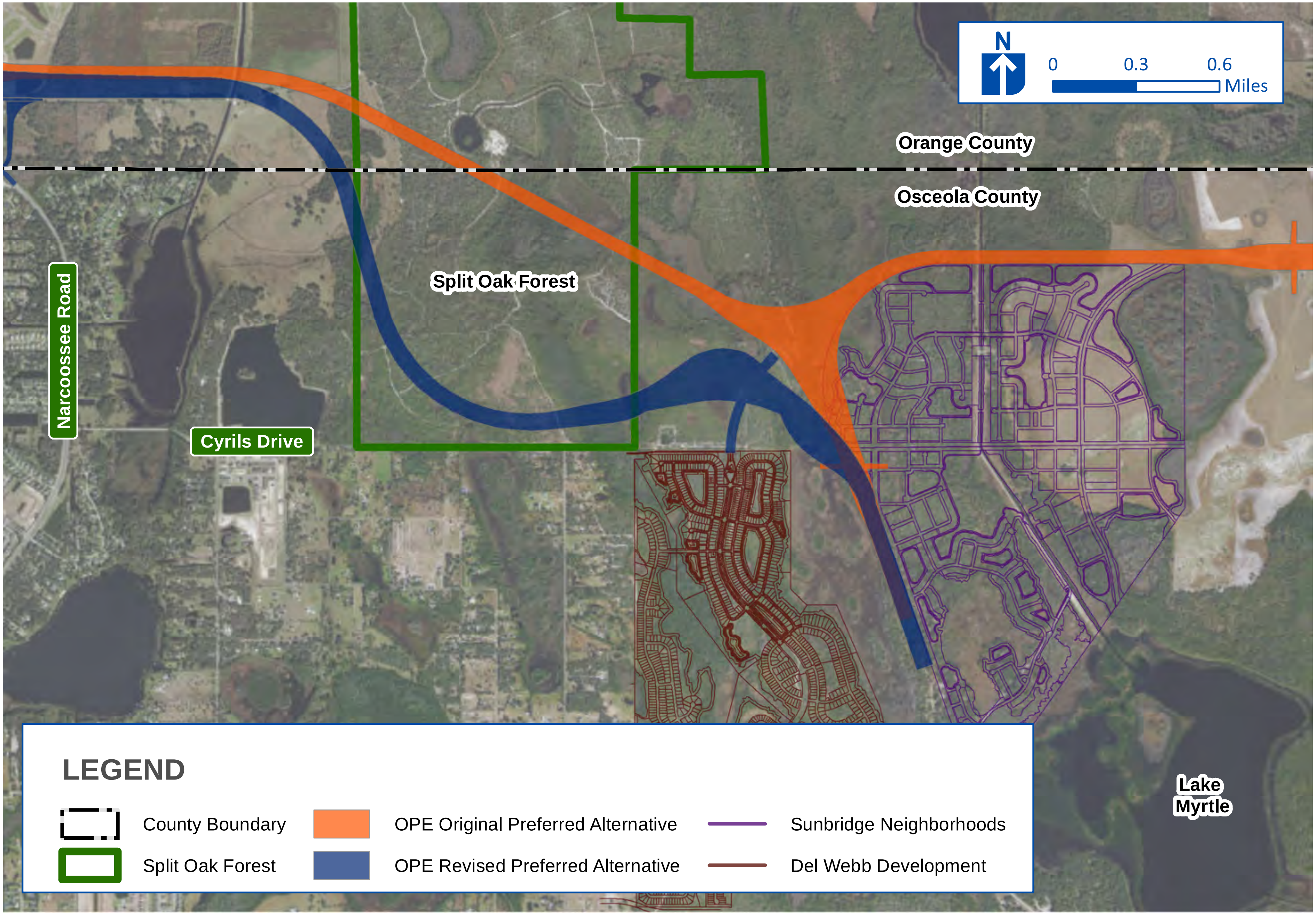
1.3.1 Osceola Parkway Extension PD&E Study

The Osceola Parkway Extension PD&E Study was completed in May 2017 by OCX and Florida's Turnpike. The OPE study evaluated the engineering and environmental effects associated with providing a new limited access roadway from west of Boggy Creek Road to the proposed Northeast Connector Expressway, as well as an expressway connection to SR 417 in the vicinity of the Boggy Creek Road interchange with SR 417. The Preferred Alternative for the eastern section of the project impacted Split Oak Forest in both Orange and Osceola Counties, resulting in a bisection of the park and significant environmental impacts. This alternative also included a two-mile extension east of the proposed interchange with the Northeast Connector Expressway, as shown on Figure 1.3.1.

CFX performed a re-evaluation of the OPE PD&E study which was completed in January 2020. The re-evaluation study area extended from SR 417 near Boggy Creek Road in Orange County to Cyrils Drive in Osceola County. A new Preferred Alternative was developed for the project which minimized impacts to Split Oak Forest. The new concept impacts a small portion of the Osceola County segment of the park, as shown on Figure 1.3.1. The revised Preferred Alternative also converted the previous system-to-system interchange to a local access interchange at Cyrils Drive, resulting in a smaller interchange footprint. The southern terminus of the OPE is the northern terminus for this project.

1.3.2 Osceola/Brevard County Connectors CF&M Study

In March 2020, CFX began the Osceola/Brevard County Connectors CF&M Study. The study will develop and evaluate transportation alternatives from Osceola County to Brevard County with the goal of connecting to I-95. Two corridors, as recommended by the East Central Florida Corridor Task Force, are being analyzed. The Task Force's Corridor D would connect northeast Osceola County to northern Brevard County, while Corridor F would connect northeast Osceola County to central/southern Brevard County, as shown on Figure 1.3.2. The study will determine if the yet-to-be-identified alternatives are feasible from an engineering and environmental standpoint.



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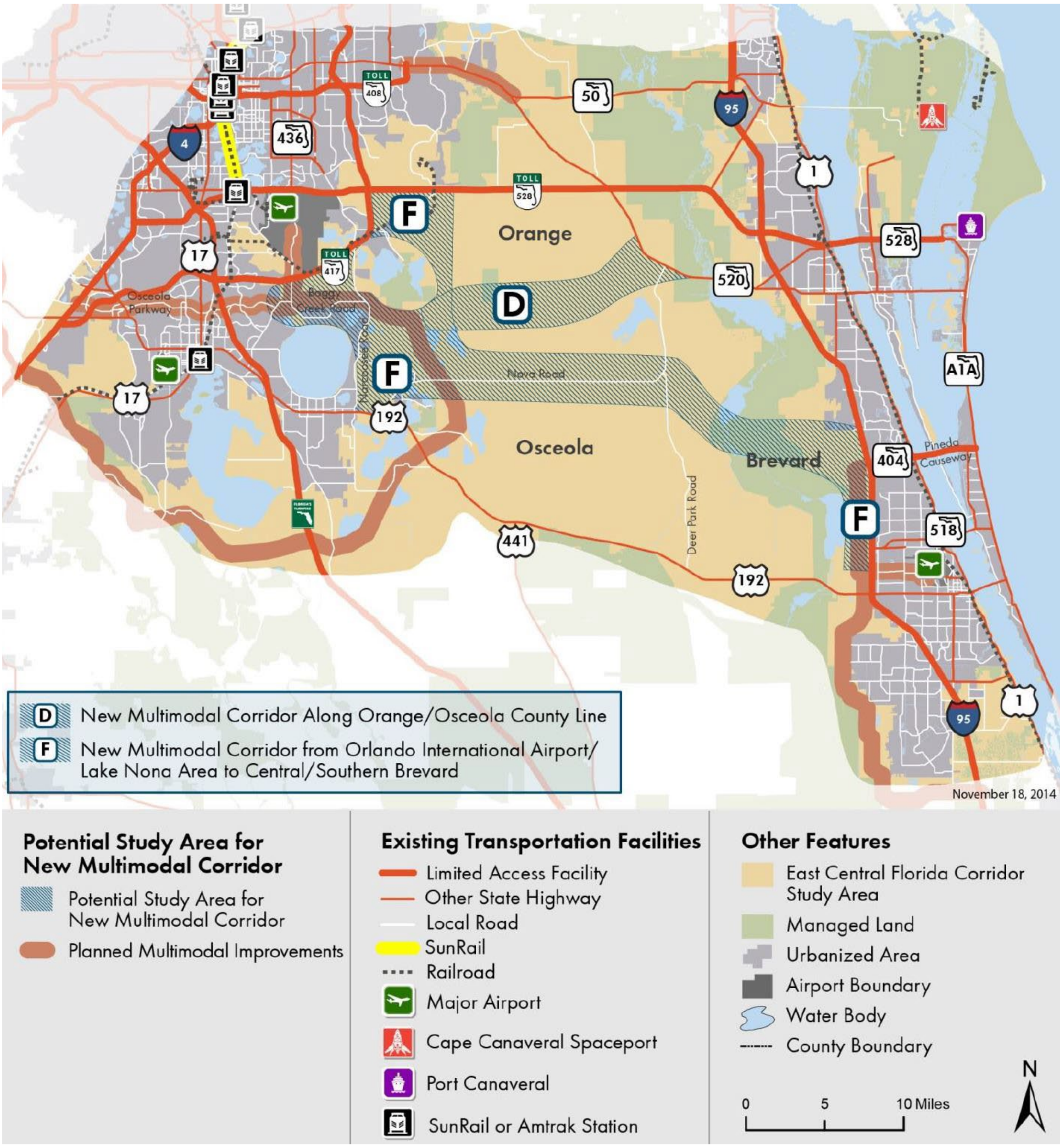
Northeast Connector Expressway - Phase 1
PD&E Study from Cyrils Drive to Nova Road

Figure 1.3.1
OPE Preferred Alternative

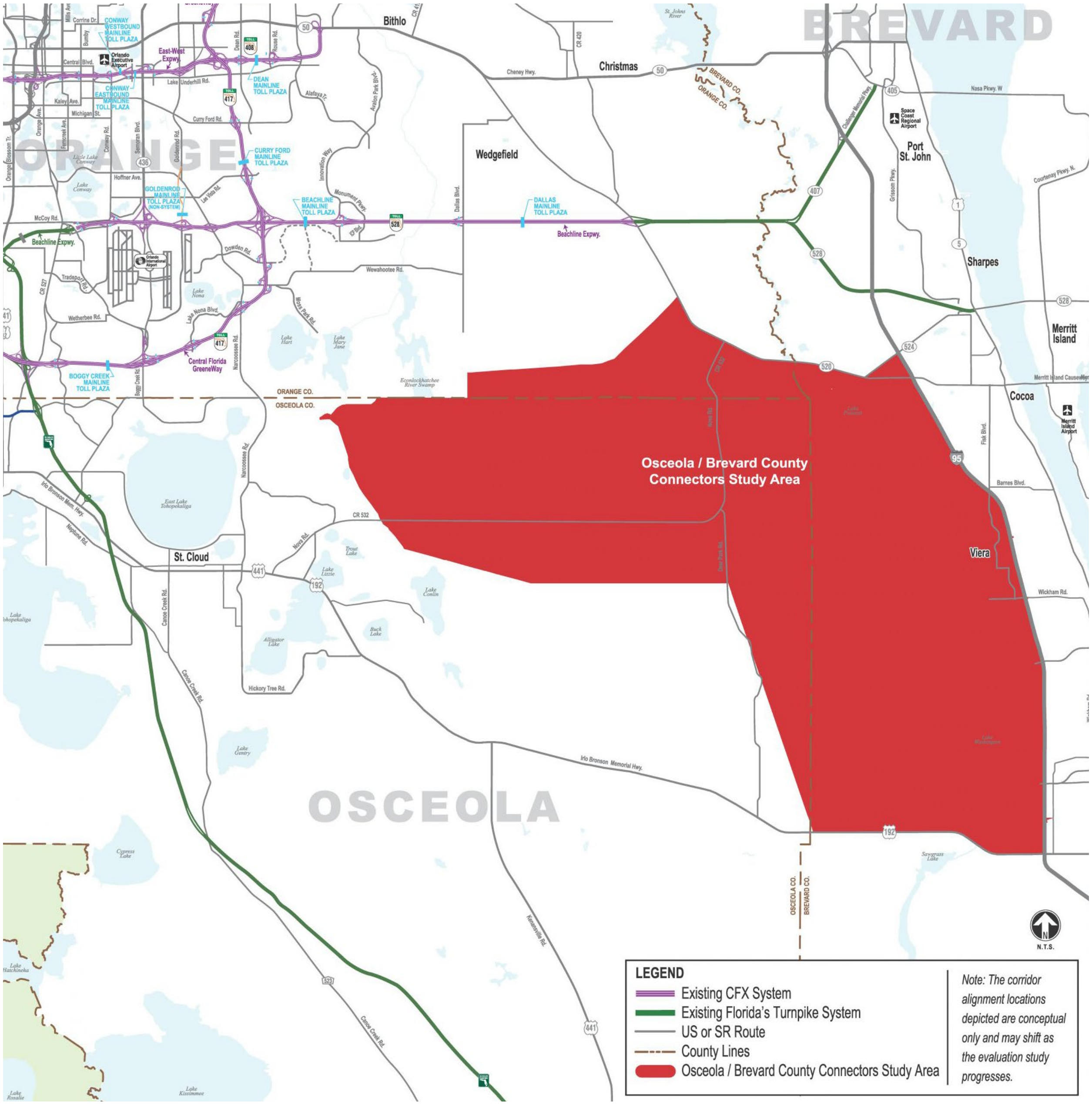
Figure 1.3.2: New Recommended East-West Corridors



Source: Source: East Central Florida Corridor Task Force Final Report, December 2014

The study area is bound by the planned SR 534 to the west and I-95 to the east, a distance of approximately 30 miles. The northern study area boundary, starting on the west, extends along the Osceola and Orange County line, then enters Orange County to intersect with SR 520, west of Nova Road. The southern boundary, starting on the west, runs approximately 2.5 miles south of existing Nova Road eastward to Deer Park Road for approximately 15 miles before it turns south to US 192. The Osceola/Brevard County Connectors CF&M study area is shown on Figure 1.3.3.

Figure 1.3.3: Osceola/Brevard County Connectors CF&M Study Area



Source: https://www.cfxway.com/agency-information/plans-studies/project-studies/osceola-brevard-county-connector/, October 2020

In June 2021, due to a lack of stakeholder consensus, CFX made the decision to pause the study. This pause means that CFX ended the current work as of June 2021. The study may be resumed in the future, but there is currently no specific plan for when and how that would take place. CFX will post the results of the effort completed to date as an Interim CF&M Report on the project's webpage.

1.4 Purpose & Need

The purpose of the Northeast Connector is to enhance north-south mobility and provide connections between existing and future east-west corridors in the study area. The Northeast Connector will link the planned SR 534 with the planned OBCC. These connections will promote regional connectivity, provide for transit opportunities, and enhance mobility in Osceola County and the entire Central Florida region. The link between the planned SR 534 and OBCC will also provide a seamless limited access, high-speed connection from the OIA to I-95 in Brevard County.

The need for the project is to provide system linkage and regional connectivity, meet social and economic needs, provide additional transportation capacity, achieve consistency with transportation plans, provide for multimodal opportunities, and improve safety and evacuation routes. Additionally, the East Central Florida Corridor Task Force Report recommended continuing the project development process for the Northeast Connector. The following sections describe the need for the project in more detail.

1.4.1 Project Status

As described in Section 1.3.2, OCX included the Northeast Connector Expressway in their Master Plan 2040. As part of an interlocal agreement, CFX incorporated portions of the OCX Master Plan 2040 into CFX's Visioning + 2040 Master Plan. As part of this interlocal agreement, CFX conducted CF&M Studies for four transportation corridors to determine if they are viable and fundable in accordance with CFX policies and procedures. One of the corridors was the Northeast Connector Expressway as described in Section 1.2.5. The CF&M Study evaluated numerous corridor alternatives and ultimately determined that there were no fatal flaws, but the project was not considered financially viable (toll revenue over 30 years did not cover at least 50% of project costs). The CFX Governing Board approved the findings of the Northeast Connector Expressway CF&M Study at the March 8, 2018 board meeting but decided not to advance the project to the next study phase at that time.

At the June 11, 2020, CFX Governing Board meeting, the Board authorized the initiation of the Northeast Connector Expressway – Phase 1 PD&E Study. The proposed project is consistent with multiple planning documents, including:

- OCX Master Plan 2040;
- CFX Visioning + 2040 Master Plan;
- CFX Five Year Work Program – Fiscal Year 2022 – 2026 (termed SR 534 Osceola Parkway Extension);
- MetroPlan Orlando 2045 Metropolitan Transportation Plan (MTP);
- East Central Florida Corridor Task Force Final Report;

- Osceola County Northeast District Conceptual Master Plan;
- Osceola County North Ranch Sector Plan; and
- Osceola County 2040 Comprehensive Plan.

1.4.2 System Linkage and Regional Connectivity

System linkage indicates how well the project fits into the area's existing and future transportation system. The Northeast Connector is an important limited access high-speed toll facility segment that is designed to serve Osceola County's urban growth area. Together, SR 534, the Northeast Connector Expressway, the Southport Connector Expressway, and the Poinciana Parkway Extension/I-4 Connector are a significant part of the CFX Visioning + 2040 Master Plan. The proposed expressway system connects high-density residential and commercial areas to the regional limited access network (I-4 and Florida's Turnpike) and the existing CFX expressway system (SR 417, SR 528, and SR 429).

Florida's Strategic Intermodal System (SIS) is a statewide network of high-priority transportation facilities, including highways, freight rail lines, airports, seaports, and other key intermodal facilities. Near the study area, there are no existing SIS corridors. Access to SIS facilities from the Northeast District and adjacent areas is provided through a network of county roads. The Northeast Connector would provide a key connector linking the Northeast District to other residential and commercial areas and major roadway facilities.

The Northeast Connector will also provide a vital north-south connection between the planned SR 534 and the planned OBCC. These connections will promote regional connectivity, provide for transit opportunities, and enhance mobility in Osceola County and the entire Central Florida region. The link between the planned SR 534 and OBCC will also provide a seamless limited access, high-speed connection from the OIA to I-95 in Brevard County.

1.4.3 Capacity

The Northeast Connector is needed to provide additional roadway capacity in the study area, distribute local and regional trips, and relieve congestion on the local roadway network.

A preliminary capacity analysis was conducted to determine the future 2045 No-Build network capacity. The No-Build scenario assumes the currently planned and programmed projects already committed in Metroplan Orlando's 2045 MTP and the SR 534 are constructed. Narcoossee Road is the only existing north-south roadway that serves the study area and is therefore, the focus of the No-Build analysis.

The volume to capacity (V/C) ratios documented from the travel demand model forecasts for Narcoossee Road indicates that in the 2045 No-Build condition several segments of Narcoossee Road are expected to exceed the capacity of the roadway, as presented in Table 1.4.1.

Table 1.4.1: 2045 No-Build – Narcoossee Road Analysis

Narcoossee Road Segment	Number of Lanes	V/C Ratio
North of SR 417	6	0.95
Boggy Creek Road to SR 417	6	1.15
Boggy Creek Road to Jack Brack Road	6	1.64
Jack Brack Road to US 192	6	1.21
South of US 192	6	1.11

Note: V/C > 1 indicates the roadway is over capacity

The Northeast Connector is anticipated to improve traffic operations on Narcoossee Road.

1.4.4 Transportation Demand

The East Central Florida Corridor Task Force recommended a north-south multimodal corridor (Corridor I) to serve the planned population areas within the North Ranch and establish connectivity to other regional destinations and east-west corridors. The current roadway network serving the Northeast District cannot adequately accommodate the anticipated increase in residential units or commercial properties. Portions of the Northeast District are already under construction including the Del Webb Sunbridge development, which will include more than 1,350 homes at its completion, Weslyn Park, which includes 577 homes in the first phase, and the Marina District.

1.4.5 Social Demand and Economic Development

In August 2017, Fishkind and Associates (FKA) developed socioeconomic data for the CF&M Studies for the 2015 base year and 2025, 2035, and 2045 forecast years for the pertinent traffic analysis zones (TAZs). The study area for the FKA analysis includes all of Osceola County and the southern portion of Orange County. This section provides an overview of the population, employment, and economic characteristics of Osceola County.

According to the FKA report, Osceola County represents the tenth fastest-growing county in Florida from 2000 to 2015 with a population increase of 150,000 people. The University of Florida's Bureau of Economic and Business Research (BEBR) and FKA's population forecast for Osceola County anticipate that the population will almost double from 2015 to 2045, from a population in the low 300,000's to a population in the low 600,000's, depending on the model being utilized. Similarly, employment in Osceola County is anticipated to double between 2015 and 2045 from 115,035 to 227,612.

Employment/Population (E/P) ratios are a function of the economic linkages from community to community and the pace at which economic development occurs. According to the FKA report, the Osceola County E/P ratios indicate that Osceola County functions economically as a "bedroom" community for Orange County. By 2045, employment in Orange County and Osceola County is expected to increase by almost 66 percent and 36 percent, respectively.

There are currently 46 approved Developments of Regional Impact (DRI) in Osceola County. FKA estimates that the unbuilt residential and commercial holding capacity of the 46 DRIs within Osceola County total the following: 67,789 residential units, 31.6 million square feet of commercial space and 30,235 hotel rooms. The information in the Socioeconomic Data Forecast Analysis supports the Northeast District Conceptual Master Plan and Osceola County future land use map showing a significant increase in residential and commercial development in the study area.

Based on the anticipated population and employment growth in Osceola County, the Northeast Connector is needed to provide a reliable transportation option.

1.4.6 Modal Interrelationships

Osceola County's Northeast District Conceptual Master Plan created a Multimodal Transit District. Development in the area will follow principles of smart growth and seek to reduce automobile use by enabling multimodal travel. The design will place transit stations within the dense central core with multimodal access via pedestrian and bicycle trails. A significant portion of residents will have pedestrian or bicycle trail access to the transit station in the central core.

The Northeast Connector will connect the Northeast District Multimodal Transit District to SR 534 and therefore also provide connections to the OIA and Lake Nona/Medical City. The connector will also tie into the planned OBCC, which will provide connections to I-95.

CFX has established a multimodal policy to fund or partner on multimodal initiatives where revenue generated from the investment equals the project cost or where toll user benefits are equal to or exceed the project cost. Opportunities to provide multimodal improvements will be considered as part of the alternatives developed to address the purpose and need for this project.

1.4.7 Safety

The Northeast Connector will provide an enhanced evacuation route during emergency evacuations. As noted above, the East Central Florida Corridor Task Force expressed concern over the region's ability to support effective evacuation and response during extreme weather events and other emergencies.

The Florida Division of Emergency Management identified I-4, Florida's Turnpike, and SR 417 as significant evacuation routes in the region. Nova Road is also a critical evacuation route in the study area. The Northeast Connector would provide an indirect connection to SR 417 via the proposed SR 534 and a direct connection to Nova Road. Therefore, the Northeast Connector will enhance emergency evacuation in the study area.

1.5 Commitments

The following commitments have been made for the project:

- Wetland impacts which will result from the construction of this project will be mitigated pursuant to Section 373.4137, F.S., to satisfy all mitigation requirements of Part IV of Chapter 373, F.S., and 33 U.S.C. §1344.
- Any species-specific surveys will first be coordinated with the United States Fish and Wildlife Service (USFWS) and Florida Fish and Wildlife Conservation Commission (FFWCC), then conducted as agreed to with USFWS and FFWCC during permitting phase.
- A preconstruction gopher tortoise burrow survey and any resultant permitting will be conducted in accordance with FFWCC protocols.
- The project will implement the USFWS-approved Standard Protection Measures for the Eastern Indigo Snake (updated August 1, 2017) during the proposed roadway improvements.
- Avoidance and minimization of wetland and listed species impacts will continue to be evaluated and all possible and practicable measures to avoid or minimize these impacts will be incorporated.
- Best Management Practices to control erosion and sedimentation in accordance with Standard Specifications for Road and Bridge Construction will be implemented.
- A Noise Study Addendum will be prepared during the final design phase to identify any new noise sensitive sites. Noise abatement measures will be implemented when identified as reasonable and feasible.

- The final location, number, and design of wildlife crossings will be determined during design, based on site specific conditions and in coordination with Osceola County.

1.6 List of Technical Documents

Table 1.6.1 lists the other technical documents that were prepared as part of this PD&E Study.

Table 1.6.1: Technical Documents Prepared for this Study

Report	Date Completed
Alternatives Corridor Evaluation Report	December 2020
Existing Conditions Technical Memorandum	March 2021
Geotechnical Memorandum	April 2021
Contamination Screening Evaluation Report	April 2021
Location Hydraulics Report	May 2021
Pond Siting Report	May 2021
Cultural Resources Assessment Survey	June 2021
Air Quality Technical Memorandum	June 2021
Water Quality Impact Evaluation	July 2021
Natural Resources Evaluation	August 2021
Noise Study Technical Memorandum	August 2021
Utility Assessment Package	August 2021
Typical Section Package	October 2021
Project Traffic Analysis Report	November 2021
Project Environmental Impact Report	June 2022

2.0 Existing Conditions

The Northeast Connector is a proposed limited access, tolled expressway on a new alignment. As such, there are no existing conditions related to the Northeast Connector. This chapter will document the existing conditions of roadways in the study area (existing and planned) and the general study area features.

2.1 Roadway Conditions

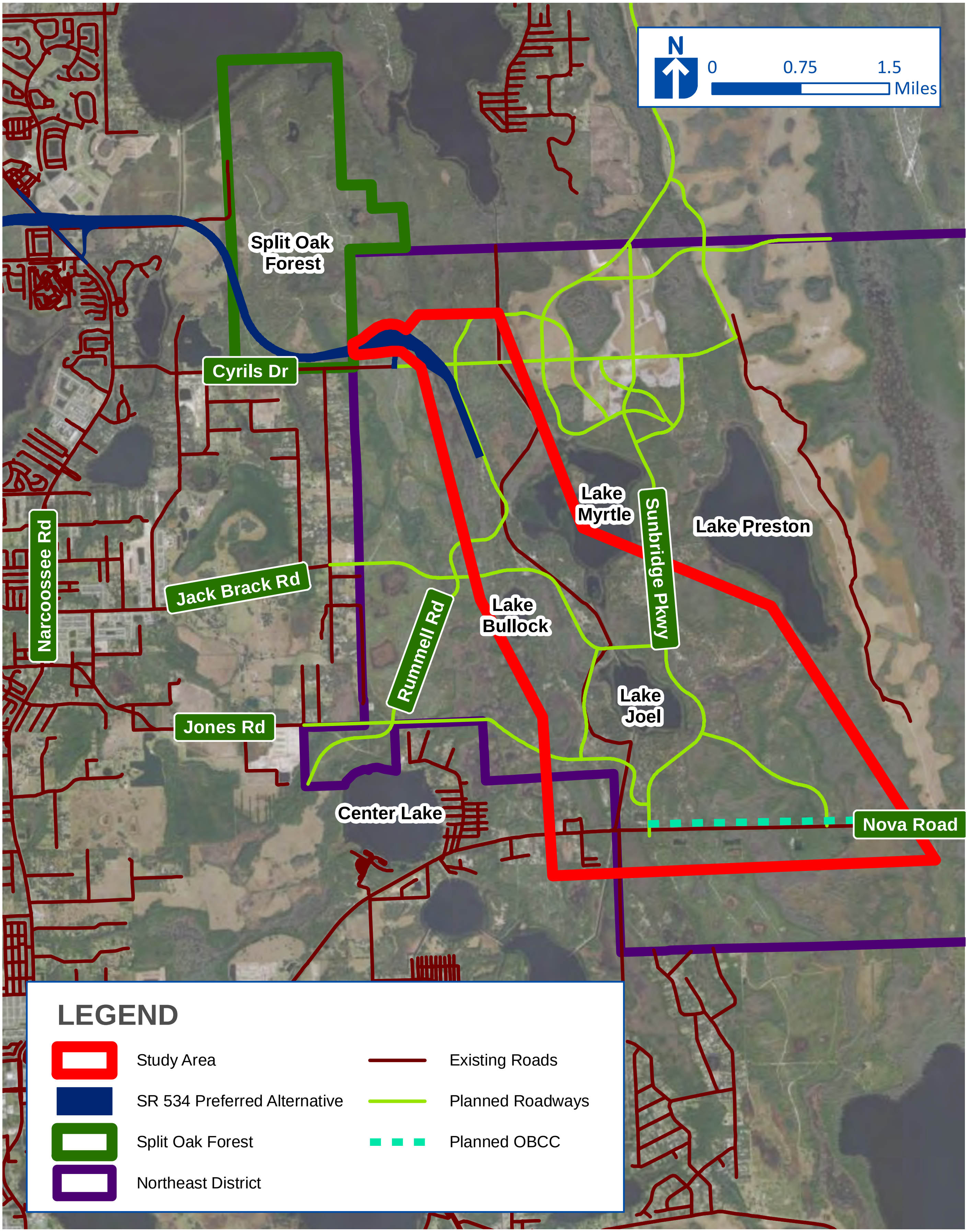
Nova Road and Sungrove Lane are the only existing roadways located within the study area. Sungrove Lane is an existing private north-south dirt road that is used by Deseret Ranches to access their property, which is generally comprised of woodland pastures. Sungrove Lane is not expected to be retained as the Northeast District development expands, and therefore will not be featured in this chapter.

Two planned expressways and three planned east-west local roadways are located within this PD&E study area:

- SR 534 (expressway);
- OBCC (expressway);
- Cyrils Drive (local roadway);
- Jack Brack Road (local roadway); and
- Jones Road (local roadway).

The above-mentioned planned roadways and existing Nova Road will be the focus of this chapter and are shown on Figure 2.1.1.

SR 534 is a planned limited access, tolled expressway that extends into the project study area as shown on Figure 2.1.1. SR 534 is proposed to include a local access interchange with the planned Sunbridge Parkway, just north of Cyrils Drive. A PD&E re-evaluation was completed in January 2020 for this project. Final design for segments of this project is anticipated to begin in 2021. The planned SR 534 typical section features two 12-foot travel lanes in each direction flanked by 12-foot paved inside and outside shoulders. The proposed median width is 82 feet wide, which can accommodate future widening. The ultimate typical section features an eight-lane section, a four-foot buffer, and two potential multi-use lanes with a concrete median barrier wall. The proposed typical section requires 330 feet of limited access right-of-way, which includes a border width of 88 feet on both sides of the roadway.



CENTRAL FLORIDA EXPRESSWAY AUTHORITY	**Northeast Connector Expressway - Phase 1 PD&E Study from Cyrils Drive to Nova Road**	**Figure 2.1.1: Existing and Planned Roadways in the Study Area**	**Page Number: 2-2**

The OBCC is a planned limited access, tolled expressway that is currently in the CF&M study phase. OBCC is preliminarily planned to extend along Nova Road within the study area. Ultimately, OBCC would connect the Northeast Connector to I-95 in Brevard County.

Cyrils Drive, Jack Brack Road, and Jones Road are the three major east-west roadways planned to be extended within the Northeast District Conceptual Master Plan.

Cyrils Drive is currently a two-lane rural roadway from Narcoossee Road to Absher Road. The construction of Del Webb at Sunbridge resulted in Cyrils Drive being extended approximately 3,200 feet (~0.6 mile) to the entrance of the Del Webb neighborhood. Part of the development agreement between Osceola County and the Del Webb development includes widening Cyrils Drive to a four-lane divided urban typical section with 11-foot lanes, a 22-foot raised median, seven-foot buffered bicycle lanes, a five-foot sidewalk on the north side of the road, and a 12-foot multi-use trail on the south side. The proposed typical section requires 119 feet of right-of-way. Cyrils Drive will continue to be extended further east into the study area as more of the Northeast District is constructed.

Jack Brack Road currently extends from Narcoossee Road to Absher Road as a two-lane rural roadway. The Jack Brack Road typical section includes two 11-foot travel lanes (one in each direction), narrow grass shoulders, and shallow grass swales on both sides of the road within approximately 66 feet of existing right-of-way. The Narcoossee Community Conceptual Roadway Design Study completed by Osceola County in February 2018 envisions Jack Brack Road as a proposed two-lane divided urban roadway with 10-foot travel lanes, a 22-foot raised median, seven-foot buffered bicycle lanes, curb and gutter, five-foot sidewalks, and 10-foot grass buffer for a total proposed right-of-way footprint of 90 feet. The Narcoossee Community Conceptual Roadway Design Study shows the proposed improvements extending from Narcoossee Road to approximately 1,400 feet east of Absher Road. This improvement would extend Jack Brack Road to the Northeast District Boundary. The Northeast District Conceptual Master Plan shows Jack Brack Road being extended further east as a two-lane avenue with pedestrian walkways and dedicated bicycle facilities.

Jones Road is an existing two-lane rural roadway from Narcoossee Road to Gerry Court. The Jones Road typical section features two 11-foot lanes between Narcoossee Road and Eagle Road. East of Eagle Road to Gerry Court, the travel lane widths are reduced to eight-foot lanes. Narrow grass shoulder and shallow grass swales exist on both sides of the road. The existing right-of-way varies from 66 feet on the western end to 16.5 feet on the eastern end. The Narcoossee Community Conceptual Roadway Design Study envisions Jones Road as a two-lane divided urban roadway with 10-foot travel lanes, a 22-foot raised median, seven-foot buffered bicycle lanes, curb and gutter, five-foot sidewalks, and 10-foot grass buffer for a total proposed right-of-way footprint of 90 feet. Similar to Jack Brack Road, Jones Road is proposed to be extended as part of the Northeast District Conceptual Master Plan as a two-lane avenue with pedestrian walkways and dedicated bicycle facilities.

Nova Road, also known as County Road 532, is an existing rural minor arterial. The Nova Road typical section features two 12-foot lanes, grass shoulders, and an electric distribution line on the south side of the right-of-way. Approximately 200 feet of existing right-of-way exists along Nova Road within the study area, according to the Osceola County property appraiser. Widening Nova Road is included in the Metroplan Orlando 2040 Long Range Transportation Plan as a funded 2030 need.

2.2 Right-of-Way

The right-of-way footprint for existing and planned roadways located within the study area are included in Table 2.2.1.

Table 2.2.1: Existing and Planned Right-of-Way for Study Area Roadways

Roadway	Status	Right-of-way Width (feet)
SR 534	Planned	330
OBCC	Planned	330 [1]
Cyrils Drive	Planned	119
Jack Brack Road	Planned	90
Jones Road	Planned	90
Nova Road	Existing	200

[1] The exact right-of-way width is not yet known. But the proposed right-of-way width is likely 330 feet.

2.3 Roadway Classification and Context Classification

Nova Road is the only existing public roadway within the study area and has a roadway classification of Rural: Minor Arterial, according to the Florida Department of Transportation (FDOT) Roadway Characteristics Inventory (RCI). Existing Jones Road is located west of the study area and has a defined roadway classification of Rural: Minor Arterial per the FDOT RCI database. None of the other existing roadways in or adjacent to the study area have a defined roadway classification. The planned SR 534 and OBCC are anticipated to be classified as a Principal Arterial: Expressway.

As previously described, the Narcoossee Community Conceptual Roadway Design Study envisions Cyrils Drive, Jack Brack Road, and Jones Road to become urban roadways. According to the Osceola County Roadway Classifications System 2040, Nova Road and Cyrils Drive within the study area are planned boulevards, whereas Jack Brack Road and Jones Road are planned avenues.

2.4 Design and Posted Speeds

The existing and planned speed limits for roadways in the corridor are shown in Table 2.4.1.

Table 2.4.1: Existing and Planned Posted Speed Limits

Roadway	Status	Speed Limit
SR 534	Planned	70 mph
OBCC	Planned	70 mph
Cyrils Drive	Planned	35 mph
Jack Brack Road	Planned	35 mph
Jones Road	Planned	35 mph
Nova Road	Existing	60 mph

2.5 Access Management Classification

The Osceola County Land Development Code contains the transportation criteria for the county. The standards and guidelines for the construction and modification of connections to the public street system in Osceola County are essentially identical to those included in the FDOT standards. For non-classified roadways, the minimum spacing between connections is defined by the posted speed limit. For a 35 mile per hour (mph) roadway, the minimum spacing between connections is 150 feet.

According to Osceola County, the access management class for Nova Road is access Class 4. This classification is a non-restrictive median type with connections every 440 feet and signals every 2,640 feet.

Osceola County also noted that the extension of Cyrils Drive is proposed to be access Class 5, requiring a restrictive median type with connections every 245 feet, directional median openings every 660 feet, and full median openings and/or signals every 1,320 feet. The other planned roadways do not have planned access management classifications, according to Osceola County.

2.6 Adjacent Land Use

The existing land in the corridor is primarily agricultural as shown on Figure 2.6.1. According to the Osceola County property appraiser 2019 data, 99% of the land in the study area is agricultural, 0.6% is public/semi-public (waterbodies), and approximately 0.2% is residential and vacant residential. Forty structures/buildings are located within the study area. The majority of those are located in the southwest quadrant of the study area, near Nova Road.

2.6.1 Community Focal Points

Community focal points are public or private locations or organizations that are important to the local residents and communities. Community focal points include: schools, places of worship, community centers, civic centers, cultural centers, parks, cemeteries, fire stations, law enforcement facilities, government buildings, healthcare facilities, hospitals, day cares, and social service facilities.

No community focal points are located within the study area. Although there are no parks within the study area, five are located adjacent to the study area, shown on Figure 2.6.2. Osceola County Fire Station 52 is also located near the study area.

CENTRAL FLORIDA EXPRESSWAY AUTHORITY	**Northeast Connector Expressway - Phase 1 PD&E Study from Cyrils Drive to Nova Road**	**Figure 2.6.1: Existing Land Use**	**Page Number: 2-7**

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1 PD&E Study from Cyrils Drive to Nova Road

Figure 2.6.2: Community Focal Points

2.6.2 Demographic Profile

The US Environmental Protection Agency (EPA) developed an Environmental Justice (EJ) screening tool, called EJSCREEN. This tool uses the American Community Survey (ACS) data to derive demographic indicators, one of which is referred to as the Demographic Index. The demographic index is a combination of percent low-income[1] and percent minority[2], the two demographic factors that were explicitly named in Executive Order 12898 on Environmental Justice. The demographic index for the study area is 31%, compared to 41% for the State of Florida, based on ACS 2014 to 2018 data. The study area has below average demographic indices as compared to the state, indicating that there is a smaller percentage of minority and low-income persons in the project corridor. The EJSCREEN data indicates that there are 38% people of color in the census block groups that intersect the study area, compared to 46% in the State of Florida. Similarly, 25% of the households in the study area are categorized as low-income, compared to 35% in the State of Florida. Figures 2.6.3 and 2.6.4 show the percent poverty[3] and percentage of minority populations in the study area, based on ACS 2018 census block group data. Census block groups are an area defined by the Census Bureau that usually has between 600 and 3,000 residents. Table 2.6.1 contains the percent of the population by race. The largest minority percentage in the study area is Hispanic at 33%.

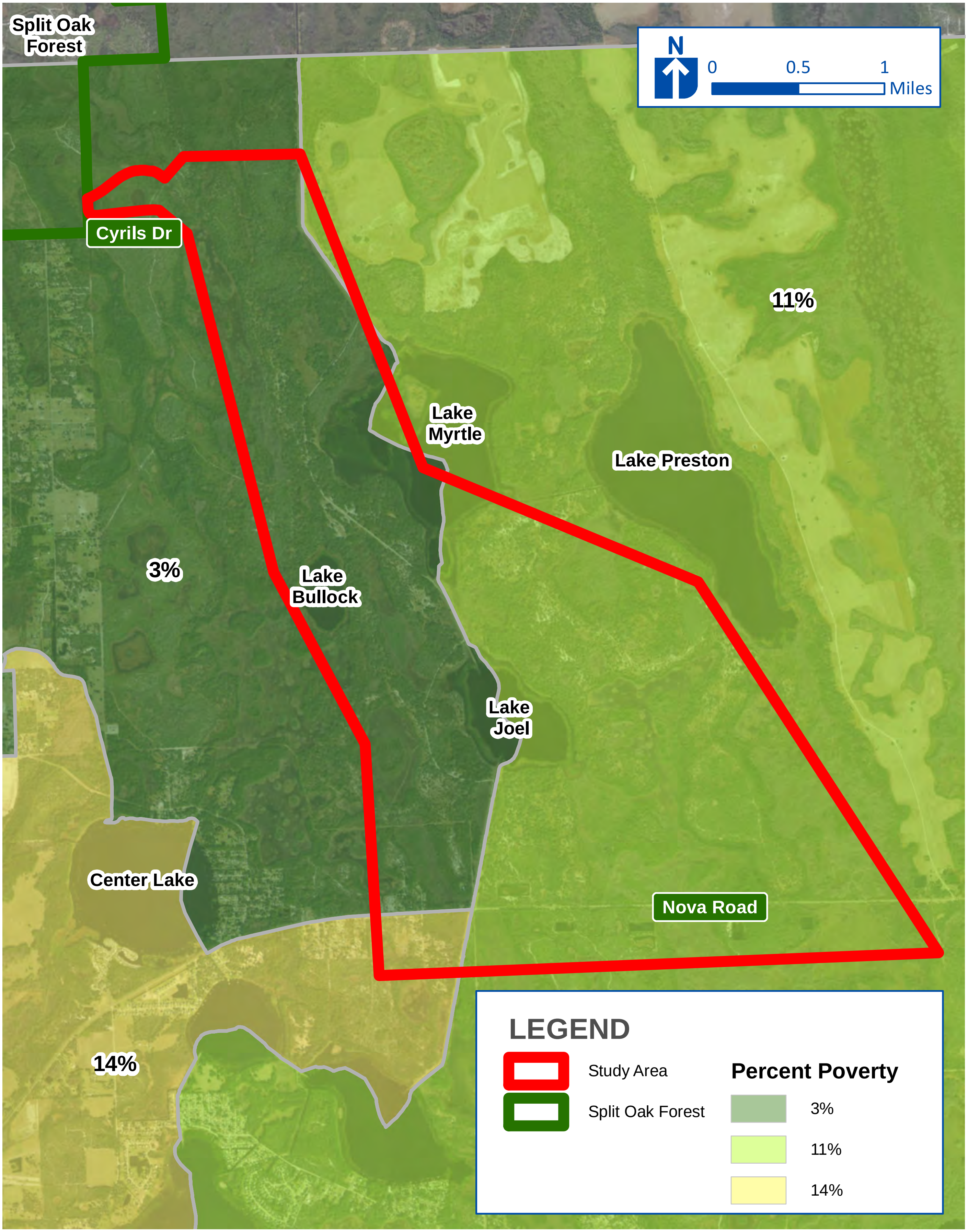
Table 2.6.1: Population by Race in the Study Area

Race	Percentage in Study Area
White	62%
Hispanic	33%
Black	2%
Pacific Islander	1%
Two or more Races	1%

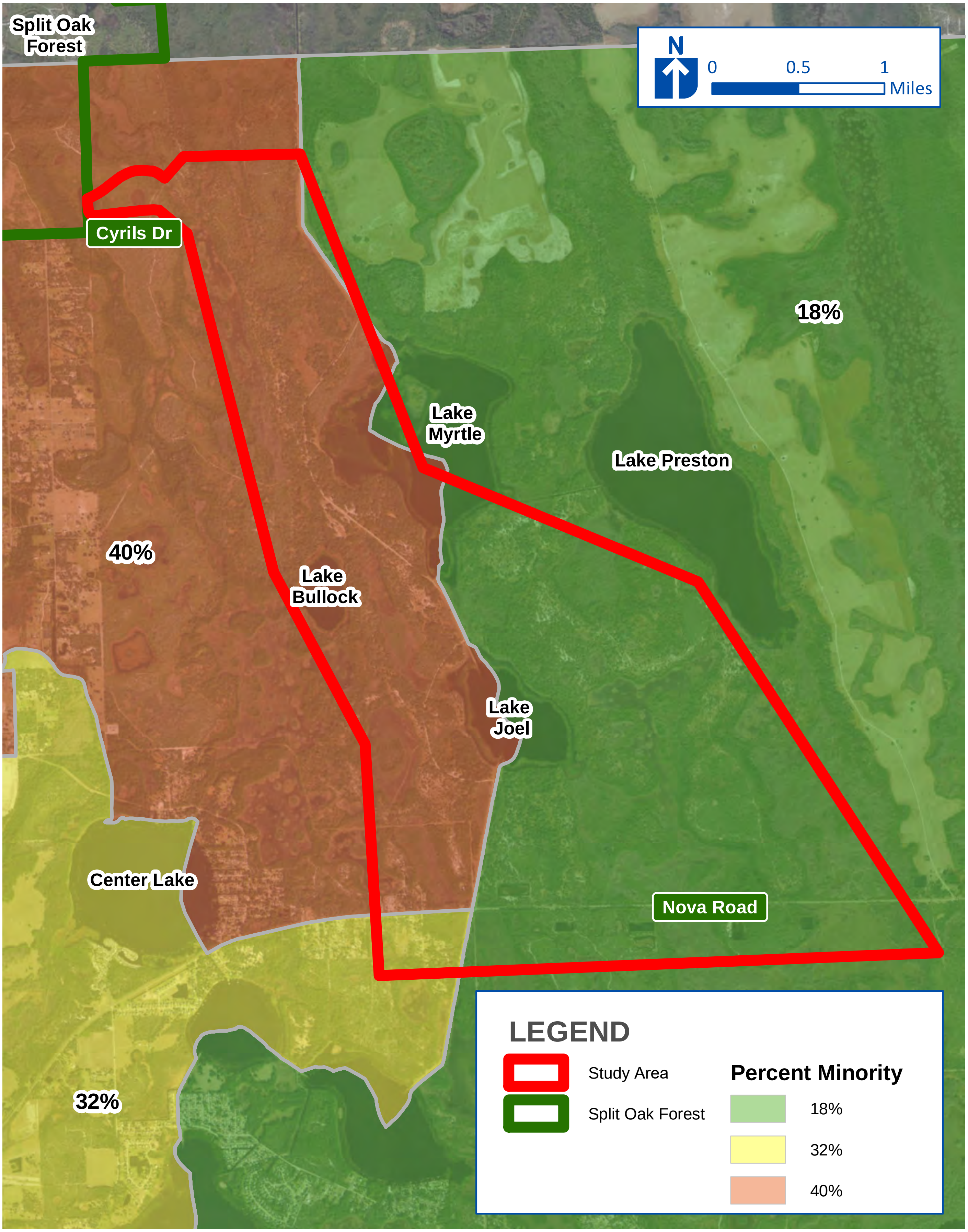
[1] Percent low-income is defined by the EPA as the percent of a census block group's population in households where the household income is less than or equal to twice the federal "poverty level."

[2] Percent minority is defined by the EPA as the percent of individuals in a census block group who list their racial status as a race other than white alone.

[3] Percent poverty is defined by the Census Bureau as the percent of the population with income in the past 12 months below the defined poverty level.



CENTRAL FLORIDA EXPRESSWAY AUTHORITY	**Northeast Connector Expressway - Phase 1 PD&E Study from Cyrils Drive to Nova Road**	**Figure 2.6.3: Percent Poverty in the Study Area**	**Page Number: 2-10**



CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1 PD&E Study from Cyrils Drive to Nova Road

Figure 2.6.4: Percent Minority in the Study Area

Other demographic indicators in the EJSCREEN report include: linguistically isolated populations, population with less than a high school education, population under age 5, and population over age 64. Table 2.6.2 shows all of the demographic indicators for the study area.

Table 2.6.2: EJSCREEN Demographic Indicators

Demographic Indicator	Study Area Percentage	State of Florida Percentage
Demographic Index	31%	41%
People of Color Population	38%	46%
Low Income Population	25%	35%
Linguistically Isolated Population	1%	7%
Population with Less than High School Education	8%	12%
Population under Age 5	7%	5%
Population over Age 64	19%	20%

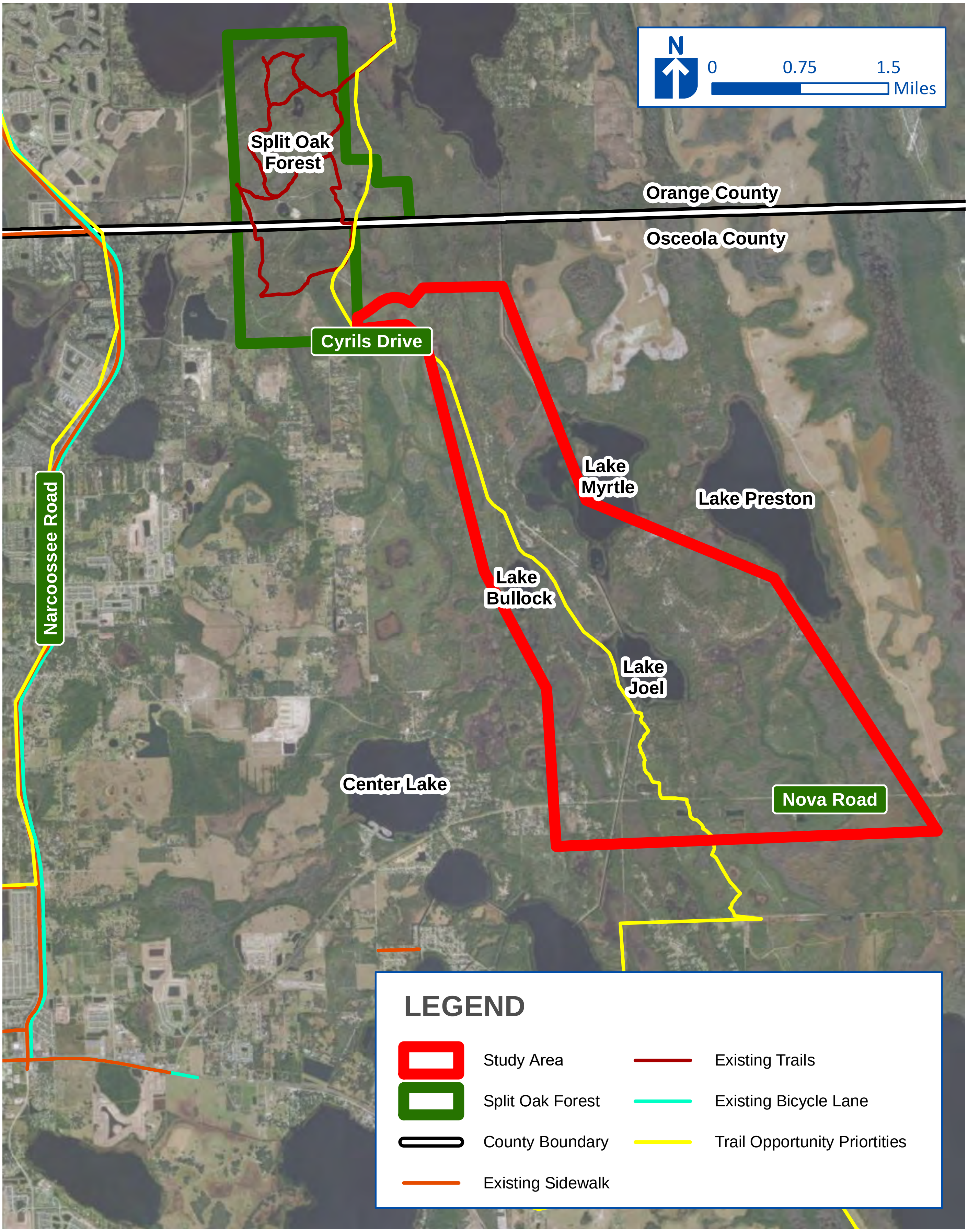
The study area has lower demographic indicators than the State of Florida in every category, except for population under the age of five years old. The study area has seven percent of the population age five or less, compared to five percent in the State of Florida. Interestingly, although 33% of the population in the study area is Hispanic, only one percent of the population is linguistically isolated.

2.7 Vertical and Horizontal Alignment

The Northeast Connector is a proposed facility; therefore, no vertical or horizontal data exists. The proposed horizontal and vertical alignment design criteria are included in Table 3.1.1.

2.8 Pedestrian and Bicycle Accommodations

No pedestrian or bicycle accommodations are present within the study area. However, a priority trail opportunity is identified as the Osceola County Planning Route, shown on Figure 2.8.1. Narcoossee Road is the only existing roadway near the study area that contains bicycle and pedestrian accommodations. However, as described in Section 2.1, the future extensions of Cyrils Drive, Jack Brack Road, and Jones Road are all anticipated to include sidewalk and bicycle lanes. Cyrils Drive will also include a shared use path on the south side of the roadway (sidewalk on north side). The Osceola County 2040 Bicycle and Trails Facility Map also shows a proposed multi-use trail extending in the vicinity of Jack Brack Road from Narcoossee Road to east of the study area.

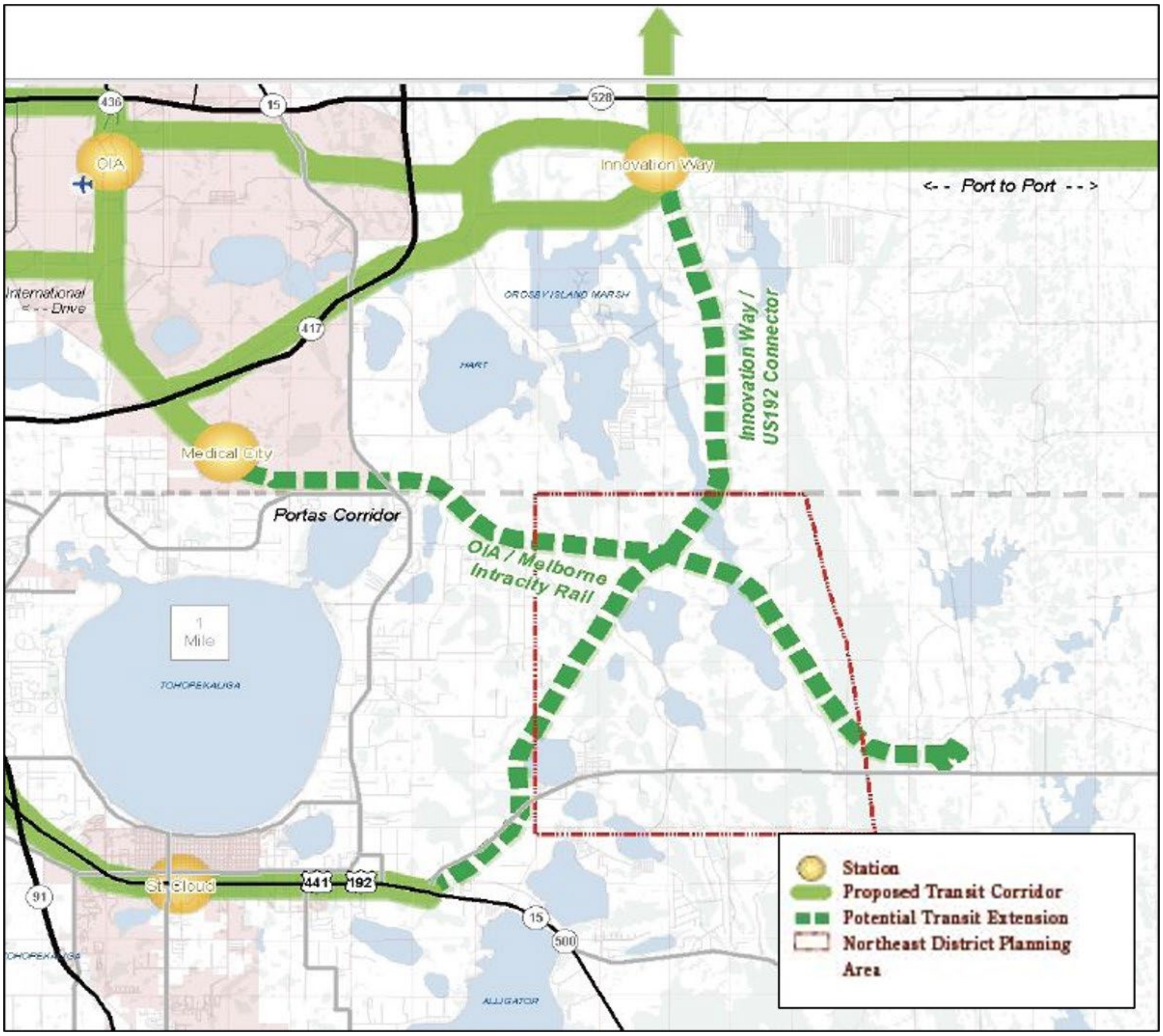


CENTRAL FLORIDA EXPRESSWAY AUTHORITY	Northeast Connector Expressway - Phase 1 PD&E Study from Cyrils Drive to Nova Road	Figure 2.8.1: Pedestrian and Bicycle Accomodations	Page Number: 2-13

2.9 Transit Facilities

No existing transit facilities are located within or adjacent to the study area. However, the Northeast District Conceptual Master Plan included potential regional transit alignments, shown on Figure 2.9.1.

Figure 2.9.1: Potential Regional Transit Alignment in Northeast District



Source: Northeast District Conceptual Master Plan

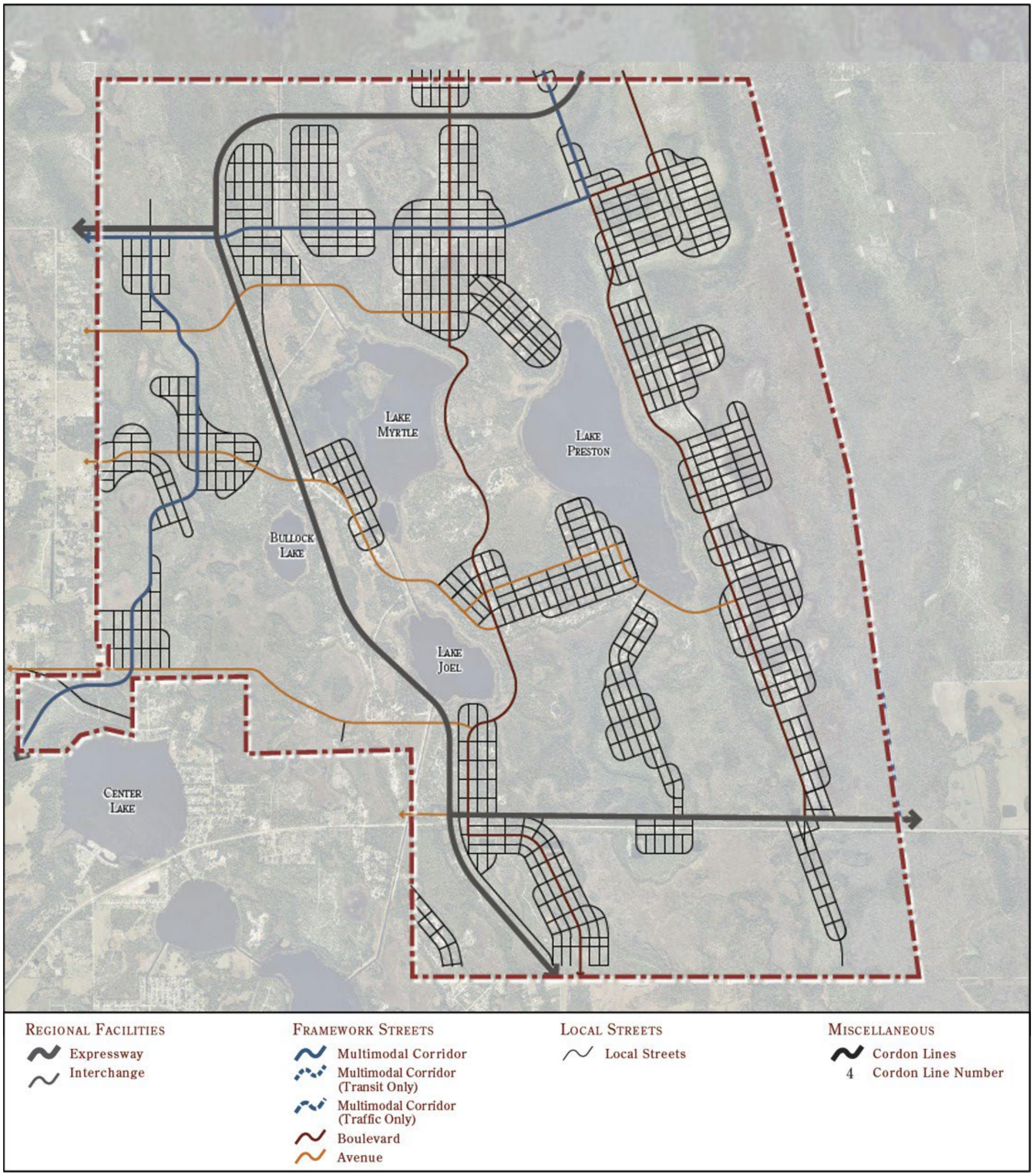
2.10 Pavement Conditions

The Northeast Connector is a proposed facility; therefore, no pavement condition data exists.

2.11 Interchanges and Intersections

No existing intersections or interchanges are located within the study area. The Northeast District Conceptual Master Plan includes planned local roadways and expressways which would result in future intersections and interchanges within the study area as shown on Figure 2.11.1.

Figure 2.11.1: Northeast District Transportation System



Source: Northeast District Conceptual Master Plan

2.12 Railroads

No railroads or railroad crossings are located within or adjacent to the study area.

2.13 Crash Data and Safety Analysis

The Northeast Connector is a proposed facility; therefore, no crash data exists. Within the study area, a single existing roadway, Nova Road, had seven crashes in the five-year period between 2014 and 2018 according to the FDOT Safety Office Traffic Safety Portal (SSOGis). Two of the seven crashes resulted in injury. The majority of crashes (five) occurred during dark, non-lighted conditions. Three of the seven crashes involved hitting an animal, one crash involved a rollover, and three crashes were classified as motor vehicle in transport collisions.

2.14 Drainage

The project is located within the Kissimmee River Watershed within the jurisdiction of South Florida Water Management District (SFWMD), and more specifically, within the Lake Tohopekaliga basin. The existing basins are open basins, which discharge to creeks, canals, wetlands, and ultimately to the adjacent receiving water bodies.

Receiving water bodies for the corridor basin are Lake Joel and Lake Myrtle, which outfall south to Lake Joel via Canal 32C. The ultimate outfall of the project study area is the Kissimmee River, which flows to Lake Okeechobee. The project area is confined to a single Water Body Identification (WBID), Lake Joel (3174F). The project corridor traverses through wetlands that ultimately outfall to Lake Myrtle and Bullock Lake.

The project study area does not directly discharge to an Outstanding Florida Water (OFW) or an impaired waterbody. Notably, East Lake Tohopekaliga (WBID 3172) and Econolockhatchee (WBID 2991) in the vicinity of the corridors are impaired for nutrients, but the study area does not directly discharge to these waterbodies.

The study area is also located within the Lake Okeechobee Basin Management Action Plan (BMAP), adopted 2013, which establishes a Total Phosphorus loading; however, the project area does not directly discharge to this waterbody.

No existing stormwater management systems are present within the study area. Additional information on drainage conditions is contained in the Pond Siting Report, available under separate cover.

2.14.1 Floodplains

The project limits are within the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panel No's. 12097C0120G and 12097C0110G for Osceola County, effective June 18, 2013. The major floodplain impacts are associated with Jim Branch, Lake Myrtle, and Lake Preston. Only flood zones classified as Zone X, Zone AE, and Zone A are present along the corridor. Zone X is an area of minimal flood hazard and was not evaluated for floodplain impacts. Zone AE has an established Base Flood Elevation (BFE) that has been approved by FEMA and ranges from 63 feet to 68 feet North American Vertical Datum (NAVD) within the study area. Zone A has an identified area of inundation resulting from the 100-year storm event, but no BFE has been established.

Approximately 2,953 acres of 100-year floodplains are present within the study area, accounting for approximately 52% of the study area. Almost all of the 100-year floodplains in the study area are classified as Zone AE, and only one small area of Zone A is located in the northwest corner of the study area. The 100-year floodplains in the study area are shown on Figure 2.14.1.

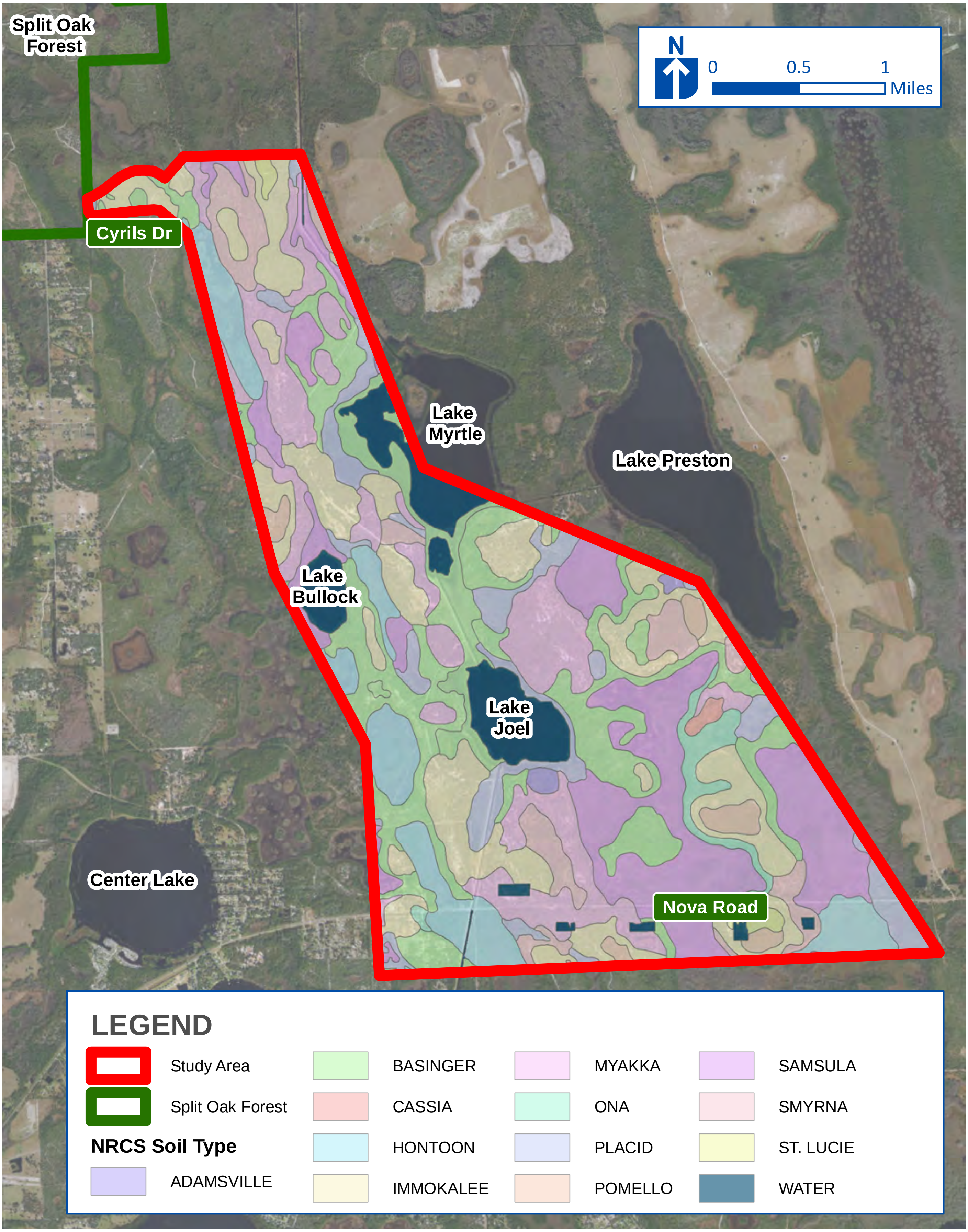
2.15 Soils and Geotechnical Data

The geotechnical investigation for this study consisted of a desktop review of data to identify critical geotechnical conditions. The US Geological Survey (USGS) quadrangle maps indicate a flat topography with natural grades generally ranging from 65 to 70 feet above the natural ground.

The Natural Resources Conservation Service (NRCS) Soil Survey for Osceola County was reviewed for near-surface soil and groundwater information. The NRCS Soil Survey Map of the study area is shown on Figure 2.15.1, and the depicted soils are summarized in Table 2.15.1.

Based on the NRCS maps, most of the soils in the study area are fine sands with varying amounts of silt that are generally suitable for highway construction. However, shallow groundwater (within 1.5 feet of natural ground surface) is prevalent within the study area. In addition, the study area contains several lakes, swamps, and wetlands.

CENTRAL FLORIDA EXPRESSWAY AUTHORITY	Northeast Connector Expressway - Phase 1 PD&E Study from Cyrils Drive to Nova Road	Figure 2.14.1: 100-Year Floodplains in the Study Area	Page Number: 2-18



CENTRAL FLORIDA EXPRESSWAY AUTHORITY	**Northeast Connector Expressway - Phase 1 PD&E Study from Cyrils Drive to Nova Road**	**Figure 2.15.1: NRCS Soils Survey Map**	**Page Number: 2-19**

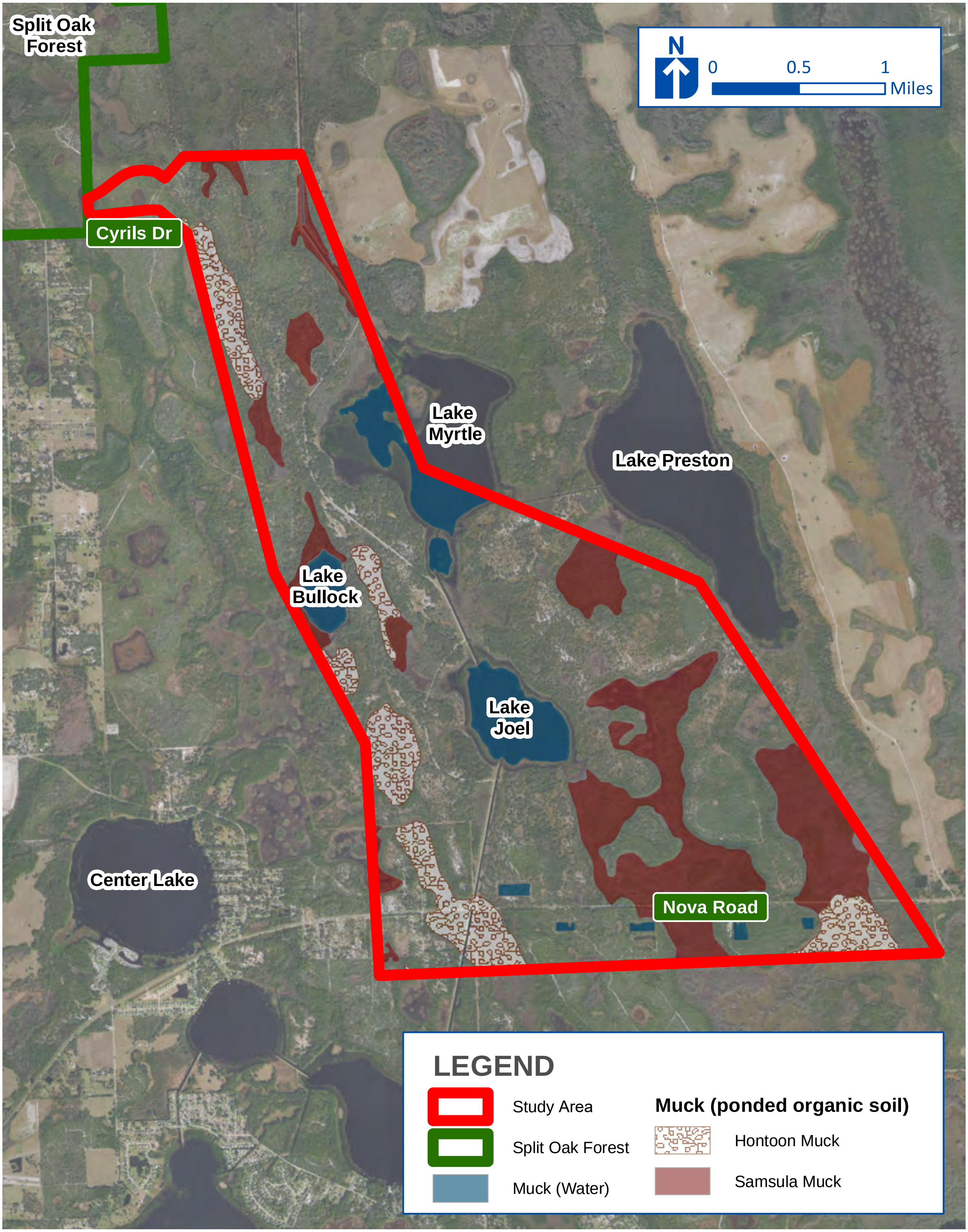
Table 2.15.1: NRCS Soils

Unit No.	Soil Name	Depth (inches)	Soil Description	Depth to Seasonal High Groundwater Depth (ft)	Hydrologic Group
5	Basinger fine sand, 0 to 2 percent slopes	0 - 80	Fine sand	0.0 - 1.0	A/D
6	Basinger fine sand, depressional, 0 to 1 percent slopes	0 - 80	Fine sand	0.0 - 1.0	A/D
9	Cassia fine sand, 0 to 2 percent slopes	0 - 26	Fine sand	1.5 - 3.5	A
		26-42	Loamy sand, sand, fine sand		
		42-80	Sand, fine sand		
15	Hontoon muck, frequently ponded, 0 to 1 percent slopes	0-5	Mucky peat	0.0	A/D
		5-65	Muck		
16	Immokalee fine sand, 0 to 2 percent slopes	0-54	Fine sand	0.5 - 1.5	B/D
		54-80	Fine sand, loamy fine sand, sand		
22	Myakka fine sand, 0 to 2 percent slopes	0-80	Fine sand, sand	0.5 - 1.5	A/D
27	Ona fine sand, 0 to 2 percent slopes	0-80	Fine sand, sand	0.5 - 1.5	B/D
32	Placid fine sand, frequently ponded, 0 to 1 percent slopes	0-80	Fine sand, sand	0.0	A/D
34	Pomello fine sand, 0 to 5 percent slopes	0-47	Fine sand	2.0 - 3.5	A
		47-58	Fine sand		
		58-80	Fine sand		
40	Samsula muck, frequently ponded, 0 to 1 percent slopes	0-32	Muck	0.0	A/D
		32-80	Sand, fine sand		
42	Smyrna fine sand, 0 to 2 percent slopes	0-80	Fine sand, sand	0.5 - 1.5	A/D
43	St. Lucie fine sand, 0 to 5 percent slopes	0-80	Fine sand	---	A

Note:

1. '---' indicates no information shown in the NRCS database.

As shown in Table 2.15.1, there are two types of muck identified in the study area: Hontoon Muck and Samsula Muck. Both of these mucks are frequently ponded and are classified as very poorly drained, organic soils associated with freshwater drainageways, marshes, and swamps. Hontoon Muck and Samsula Muck extend to approximate depths of 5.5 feet and 2.5 feet, respectively. Relic sinkholes often located within lakes and wetlands can contain muck deposits more than 100 feet deep. The areas of muck within the study area, based on available information, are shown on Figure 2.15.2.



CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1 PD&E Study from Cyrils Drive to Nova Road

Figure 2.15.2: Muck in the Study Area

A review of the USGS survey map entitled "Recharge and Discharge Areas of the Floridan Aquifer in the St. Johns River Water Management District and Vicinity, Florida" shows that the study area is located in a zone of low to moderate discharge. Therefore, the relative risk of sinkhole formation in the study area is low to moderate compared to the overall risk across Central Florida.

2.16 Utilities

Sunshine State One Call of Florida utility design tickets were obtained for the study area to ascertain the initial list of utility agency/owners (UAOs). Four UAOs were identified within the study limits: CenturyLink, Comcast, Duke Energy, and Orlando Utilities Commission (OUC). Tohopekaliga Water Authority (TWA) was also identified as a UAO in the study area based on the Master Utility Plans for the Sunbridge Development. Duke Energy is comprised of two separate entities: Distribution and Transmission. Similarly, OUC is comprised of four departments: Transmission, Distribution, Lighting, and Communications.

CenturyLink, Comcast, TWA, Duke Energy (Distribution and Transmission), and OUC (Distribution, Lighting, and Communications) have provided feedback on an initial request for information sent on March 15, 2021. Comcast, Duke Energy (Distribution and Transmission), and OUC Lighting indicated that they have no facilities within the project limits.

CenturyLink provided two maps showing underground copper lines near the north and south project limits. Buried copper lines are present along both sides of Nova Road starting at Sungrove Lane and extending to the west. Buried copper lines are also along Absher Road and Cyrils Drive.

TWA will be the water, sewer, and reclamation provider for the future Sunbridge development. They currently have utilities located along Cyrils Drive and the water treatment plant is currently under construction and located southeast of Cyrils Drive and just north of the future Jack Brack Road extension.

OUC is the electric distribution service provider in the project study area. Existing aerial distribution lines run along the south side of Nova Road and into the adjacent side street and single-family homes in the project study area. OUC overhead transmission with fiber cable is also present in the study area near Nova Road and the C-32C canal. Stakeholder meetings have been held with OUC on October 23, 2020, May 4, 2021, and May 14, 2021 regarding the proposed transmission line that would run parallel to the Northeast Connector within the study limits. More information on these stakeholder meetings is contained in Section 5.1.4.

Additional information on utilities in the study area is contained in the Utility Assessment Report, available under separate cover.

2.17 Lighting

The Northeast Connector is a proposed facility; therefore, no roadway lighting exists. Furthermore, the existing Nova Road within the study area does not have roadway lighting.

2.18 Signs

The Northeast Connector is a proposed facility; therefore, no roadway signs exist.

2.19 Aesthetics Features

The study area is primarily undeveloped with a nature-based viewshed. However, the study area is being developed as part of the Northeast District Conceptual Master Plan. Residential development is beginning on the northern portion of the study area. The Del Webb master plan community is under construction, while the proposed Sunbridge community is in the permitting phase. Both of these developments will alter the aesthetics of the area.

2.20 Bridges and Structures

The Northeast Connector is a proposed facility; therefore, no existing Northeast Connector bridges exists. However, there is one existing bridge within the study area located just south of Lake Joel. This concrete bridge carries a private dirt road over the C-32C canal as shown on Figures 2.20.1 and 2.20.2. The location of this bridge within the study area is shown on Figure 2.20.3. The characteristics of this bridge are discussed further in Section 6.2.3.

Figure 2.20.1: Bridge over C-32C Canal (Looking North)

Figure 2.20.2: Bridge over C-32C Canal (Looking West)

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1 PD&E Study from Cyrils Drive to Nova Road

Figure 2.20.3: Location of Existing Bridge in the Study Area

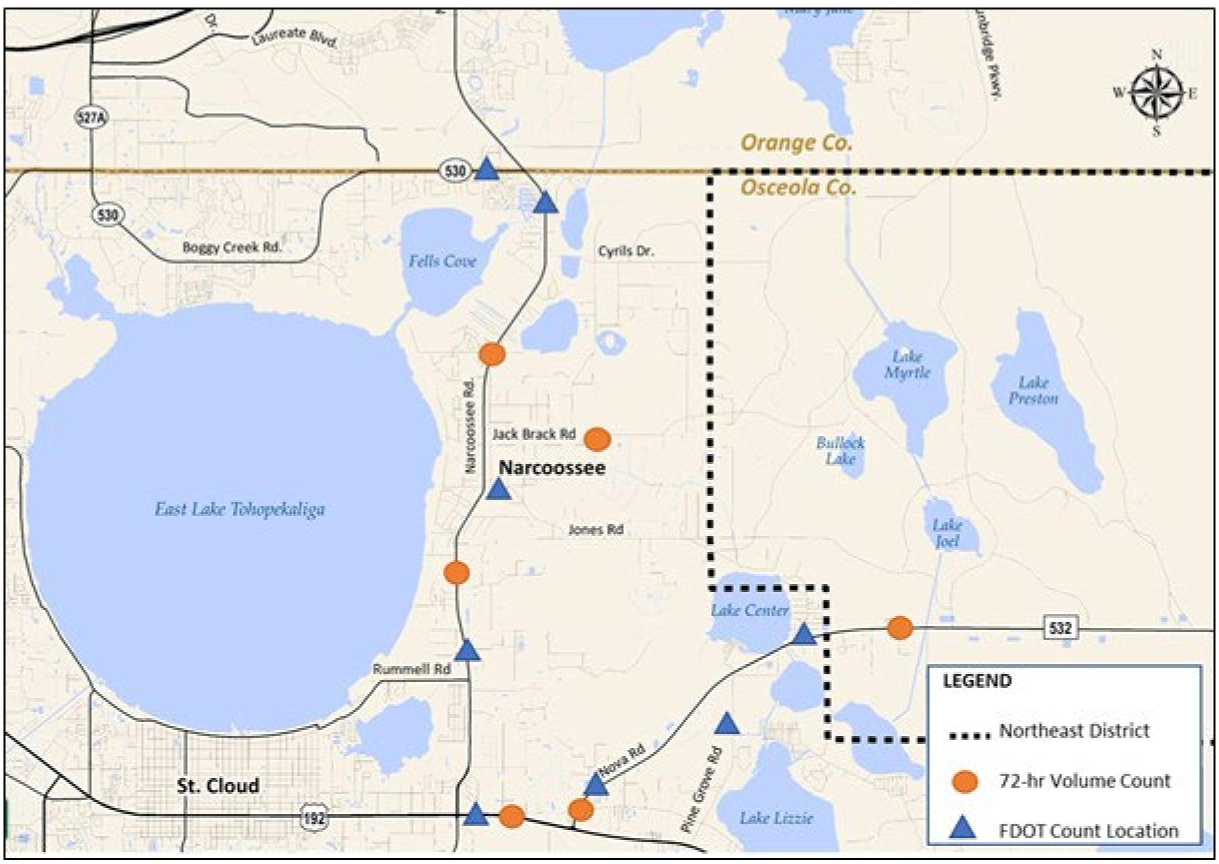
2.21 Traffic Volumes and Operational Analysis

2.21.1 Methodology

Traffic Counts

Multiple methods were used to collect the traffic volume data for the project. A project-specific traffic count program was conducted in January 2021, at a time in which pre-COVID-19 traffic had returned to the system. This traffic is assumed to be year 2020 traffic as it was taken within the first weeks of 2021 and just exceeding pre-COVID-19 conditions. The counts included 72-hour directional counts at six locations in the study area, which are shown on Figure 2.21.1. This information was used to define existing traffic conditions and for model validation. These counts were supplemented with count data from the FDOT Florida Traffic Online website application as shown on Figure 2.21.1.

Figure 2.21.1: Traffic Count Locations



Traffic Analysis Factors

The K Factor is defined as the proportion of the Annual Average Daily Traffic (AADT) that occurs during the design hour. The D Factor is the percentage of traffic moving in the peak travel direction during the peak-hour. The D Factor is calculated by dividing the higher directional volume by the total roadway volume for that hour. The T Factor is the percentage of the AADT volume generated by trucks or commercial vehicles. The K, D, and T Factors are needed to advance design of highway projects and in the calculation of congestion or performance measurements. The peak-hour factor (PHF) is the hourly volume during the peak-hour of the day divided by the peak 15-minute flow rate within that hour and is a measure of fluctuation in demand within the peak-hour. PHF is used in capacity and level of service analysis to account for the variation in traffic volumes during the peak-hour. A PHF of 0.95 was assumed for future conditions.

Performance Measures

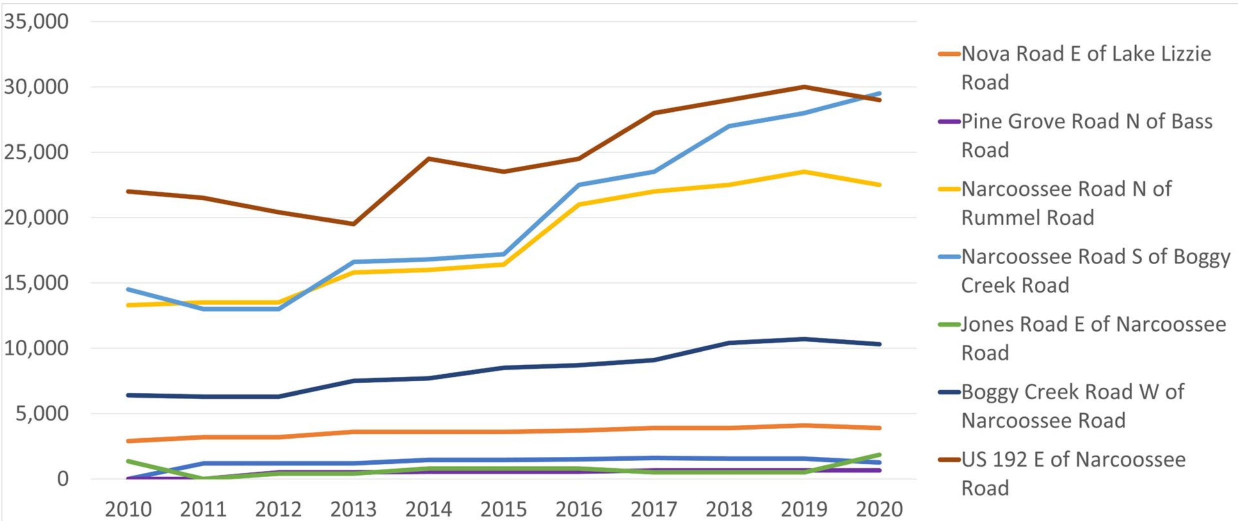
Level of Service (LOS) is considered the primary measure of effectiveness for determining the traffic operational conditions of the roadways analyzed. Per Policy 000-525-006 the level of service target for the State Highway System, the adopted FDOT level of service for state roads, is LOS "D." The LOS "D" volume (or capacity) depends on the type of facility and the number of lanes. Intersection LOS was based on the amount of delay in the peak-hour.

Osceola County does not have adopted level of service standards, but they do provide adjusted service volume thresholds for the peak-hour peak direction. These adjusted volumes are derived from the FDOT generalized peak-hour directional service volume table for interrupted flow facilities on signalized arterials. Level of Service D volumes were used for the roadway capacity, which corresponds to how Osceola County calculates the LOS and volume-to-capacity ratios published on their traffic counts website.

2.21.2 Traffic Volumes

An analysis of existing traffic volumes between 2010 and 2020 shows that traffic volumes have been steadily increasing and annual growth rates ranged between 0.4 percent on Nova Road east of Eden Drive to 10.3 percent of Narcoossee Road south of Boggy Creek Road. A 10 percent annual growth rate is considered extremely high over a 10-year period. The historical traffic volumes are shown on Figure 2.21.2. Traffic growth on the higher volume collectors and arterials is evident, especially on Narcoossee Road and US 192. Growth on the lower volume minor collectors and local roads is relatively flat, specifically on Nova Road and Pine Grove Road.

Figure 2.21.2: Historic AADT in the Study Area



The peaking (K) and directional (D) factors for the AM and PM peak-hours are shown in Table 2.21.1. These factors were developed for roadway segments from the traffic counts taken as part of the data collection effort in January 2021.

Table 2.21.1: K and D Factors for Existing Roadways

Location	Direction	Peak-Hour		Daily	AADT	D-Factor AM Peak	D-Factor PM Peak	K-Factor AM Peak	K-Factor PM Peak
		AM	PM						
Narcoossee Rd N of Jack Brack	NB	1,477	1,004	15,009		67%	42%		
	SB	744	1,392	14,379	28,900	33%	58%	7.6%	8.2%
Narcoossee Rd S of Jones Road	NB	823	1,410	14,543		38%	58%		
	SB	1,346	1,008	14,894	28,600	62%	42%	7.4%	8.2%
Jack Brack Rd E of Narcoossee	EB	179	232	2,508		48%	55%		
	WB	194	191	2,619	5,000	52%	45%	7.3%	8.3%
US 192 b/w Narcoossee Rd & Nova Rd	EB	1,006	1,397	17,220		40%	52%		
	WB	1,502	1,270	17,530	34,100	60%	48%	7.2%	7.7%
Nova Rd N of US 192	NB	200	405	4,271		32%	54%		
	SB	417	343	4,563	8,600	68%	46%	7.0%	8.5%
Nova Rd E of Rockwood Rd	EB	110	57	985		74%	30%		
	WB	39	132	998	2,000	26%	70%	7.5%	9.5%

The peak directions, identified by the greater D-Factor, are highlighted in red in Table 2.21.1. The K-Factors on the local roads in the study area range from 7.0 percent to 7.6 percent in the AM Peak to 7.7 percent to 9.5 percent in PM Peak. These lower values reflect the rural nature of the study area. The D-factors in the study area range from a high of 74 percent in the AM Peak and 70 percent in the PM Peak. For Narcoossee Road, the peak direction is northbound in the AM Peak and southbound in the PM Peak from Jack Brack Road north –

or heading to Orlando, but switches to southbound in the AM peak and northbound in the PM peak south of Jones Road – or heading to St. Cloud. A similar phenomenon occurs on Nova Road, in the vicinity of US 192, where the AM peak is westbound and PM peak is eastbound. East of Fort Hill Road, the AM peak is eastbound and PM peak is westbound – or toward Brevard County. For both US 192 and Jack Brack Road, the AM Peak is westbound and the PM peak is eastbound.

Truck factors were taken from vehicle classification data from the FDOT Florida Traffic Online for three locations: Narcoossee Road, US 192, and Nova Road. Table 2.21.2 shows vehicle classification data on the existing facilities in the study area. Total truck percentages range between 4.6 percent and 15.8 percent, with Narcoossee Road having the lowest truck percentage and Nova Road having the highest (an average of 6.4 percent total trucks and 3.9 percent for heavy trucks).

Table 2.21.2: Vehicle Classification

Count Location	Passenger Vehicles	Total Trucks	Medium Trucks	Heavy Trucks
Narcoossee Road	95.2%	4.6%	2.0%	2.6%
US 192	91.6%	8.1%	3.0%	5.1%
Nova Road	84.1%	15.8%	5.2%	10.6%
Study Area	**93.4%**	**6.4%**	**2.5%**	**3.9%**

2.21.3 Traffic Operational Analysis

The traffic operational analysis employs LOS and volume-to-capacity (v/c) ratio analysis to evaluate existing daily and peak-hour conditions on roadway segments and Synchro Analysis to assess existing peak-hour conditions at intersections. All of the roadway segments operate at an acceptable v/c ratio, less than 1, with Narcoossee Road north of Jack Brack Road operating at a 0.80 v/c ratio for daily traffic and between a 0.70 and 0.74 in the peak hours.

3.0 Project Design Controls & Criteria

3.1 Design Criteria

The design criteria used in the development of the Northeast Connector alternatives is per the CFX scope of services and is detailed below in Table 3.1.1

Table 3.1.1: Geometric Design Criteria

Design Element	Design Standard	Source
Design Year	2045	Scope of Services
Design Vehicle	WB-62FL/WB-67	AASHTO 2004, Pg. 18
Design Speed Rural Freeway Urban Freeway Urban Arterial Rural Arterial Other Frontage Road Service Road Access Road Ramp Directional Loop	 70 mph 60 mph 45 mph 55 mph 45 mph 50 mph As appropriate 50 mph 30 mph	FDOT PPM Vol. 1, Tbl. 1.9.1, 1.9.2
Lane Widths Freeway Ramp 1-lane 2-lane Turning Roadway Arterial Collector/Service Road Bicycle Rural/Urban	 12-ft 15-ft 24-ft Case dependent 12-ft 12-ft 5-ft/4-ft (designated or undesignated)	FDOT PPM Vol. 1, Tbl. 2.1.1, 2.1.2, 2.1.3, & 2.14.1
Cross Slopes (lanes 1 – way) Roadway 2 – lane (2) 3 – lane (3) 4 – lane (4) Bridge Section Max. Lane "Roll – over" DS = 35 mph DS = 35 mph	 -0.02 ft/ft (2) -0.02 ft/ft (2), -0.03 ft/ft (1) +0.02 ft/ft (1), -0.02 ft/ft (2), -0.03(2) -0.02 (typical, uniform, no slope break) 4.0% 5.0% (between through lane & aux. lane) 6.0% (between through lane & aux. lane)	FDOT PPM Vol. 1, Fig. 2.1.1 FDOT PPM Vol. 1, Sec. 2.1.5 FDOT PPM Vol. 1, Fig 2.1.1 PPM Vol. 1, Table 2.1.4

Design Element	Design Standard				Source
<u>Median Width</u>					
Freeway					FDOT PPM Vol. 1, Tbl. 2.2.1
DS = 60 mph	60 to (64-ft)				
DS = 60 mph	40-ft				
All	26-ft (with barrier)				
Arterial & Collector					
DS = 45 mph	22-ft				
DS = 45 mph	40-ft				
Offset Left Turn Lanes					FDOT PPM Vol. 1, Sect. 2.13.3 & Fig. 2.13.2 AASHTO Exh. 9-98
Median width 30-ft	Parallel offset lane				
Median width 30-ft	Taper offset lane				
<u>Shoulder Width (lanes 1-way)</u>	Total (ft)		Paved (ft)		FDOT PPM Vol. 1. Tbl. 2.3.1 to 2.3.4, Fig. 2.3.1 Design Standards Index No. 510
Freeway	Outside	Left	Outside	Left	
3-lane or more	12	12	10	10	
2-lane	12	8	10	4	
Ramp					
1-lane	6	6	4	2	
2-lane	10	8	8	4	
Aux. Lane	12	N/A	10	N/A	
Arterial & Collector (Norm. Volume)					
2-lane divided	10	8	5	0	
1-lane undivided	10	N/A	5	N/A	
Service Road, 2-Lane, 2-Way, Undivided	10	10	5	5	
<u>Shoulder-Cross Slope</u>	0.06	0.05	-	-	
<u>Max. Shoulder "Roll-over"</u>	7.0%	7.0%	-	-	
<u>Bridge section (lanes 1-way)</u>					
2-lane	10	6	-	-	
3-lane or more	10	10	-	-	
1-lane ramp	6	6	-	-	
2-lane ramp	10	6	-	-	
Service Road, 2-Lane, 2-Way, Undivided	10	10	-	-	FDOT PPM Vol. 1, Fig. 2.0.1, 2.0.2, 2.0.4
<u>Border Width</u>					FDOT PPM Vol. 1, Tbl. 2.5.1, 2.5.2 *(CFX Policy)*
Freeway	94-ft, *(94-ft desirable)*				
Ramp	94-ft, *(L.O.C. plus 10-ft as minimum)*				
Arterial/Collector					
DS = 45 mph	40-ft				
DS = 45 mph	33-ft				
Arterial/Collector (Curb & Gutter)					
DS = 45 mph	14-ft (12-ft with bike lane)				
DS = 40 mph	12-ft (10-ft with bike lane)				

Design Element	Design Standard		Source
<u>Roadside Slopes</u>	Fill Height (ft)	Rate	
Front slope	0.0-5 5-10 10-20 >20	1:6 1:6 to CZ & 1:4 1:6 to CZ & 1:3 1:2 with guardrail *(Use 10-ft bench at half the height of fill)*	FDOT PPM Vol. 1, Tbl. 2.4.1
Front slope (curb & gutter)	All	1:2 not flatter than 1:6	*(CFX Policy) Use 1:3 slopes, avoid 1:2 slopes except where necessary*
Back slope		1:4 or 1:3 w/ standard width trap. ditch & 1:6 front slope	
Back slope (curb & gutter)	All	1:2 not flatter than 1:6	
<u>Max. Grade/Max. Change in Grade</u>	Max. Grade	-	FDOT PPM Vol. 1, Tbl. 2.6.1. 2.6.2
Freeway (Rural/Urban)	3.0%	0.20% / 0.40%	
Ramp			
Directional	5.0%	0.60%	
Loop	7.0%	1.00%	
Arterial			
Rural	3.5%	0.50%	
Urban	6.0%	0.70%	
Collector	6.5% to 9.0%	-	
Frontage Road/Service Road	8.0%	0.70%	
Min. Grade Curb & Gutter	0.3%	-	FDOT PPM Vol. 1, Tbl. 2.6.4
<u>Minimum Stopping Sight Distance</u> (Grade 2.0%)	Dsgn. Speed (mph)	Distance (ft)	FDOT PPM Vol. 1, Tbl. 2.7.1
	70	730	
	60	570	
	55	495	
	50	425	
	45	360	
	30	200	
<u>Decision Sight Distance</u> (Per avoidance maneuver)	Dsgn. Speed (mph)	Distance (ft)	AASHTO Exh. 3-3
	70	780-1445	
	60	610-1280	
	55	535-1135	
	50	465-1030	
	45	395-930	
	30	220-620	

Design Element	Design Standard			Source
<u>Horizontal Curve Length</u>	V = Design Speed			
Freeway	30V (15V min.)			
Others	15V (400-ft min.)			
<u>Max. Curvature (Degree of Curve)</u>				
Freeway				
DS = 70 mph Rural	3° 30' 00"			FDOT PPM Vol. 1, Tbl. 2.8.2a
DS = 60 mph Urban	5° 15' 00"			
Arterial				
DS = 55 mph Rural	6° 30' 00"			FDOT PPM Vol. 1, Tbl. 2.8.3
DS = 45 mph Urban	8° 15' 00"			
Collector				
DS = 45 mph Frontage Road	8° 15' 00"			
DS = 50 mph Service Road	8° 15' 00"			
Ramp				
DS = 50 mph Directional	8° 15' 00"			
DS = 30 mph Loop	24° 45' 00"			
<u>Superelevation Transition</u>				
Tangent	80% (50% min.)			
Curve	20% (50% min.)			
Spirals	*(Curves < 1°30'00" do not use spirals)*			FDOT PPM Vol. 1, Sect. 2.9
<u>Superelevation Rates</u>	e_{max}	SE Trans. Rate		
Freeway				
DS = 70 mph Rural	0.10	1:200		*(CFX Policy)*
DS = 60 mph Urban	0.10	1:225		
Arterial				
DS = 55 mph Rural	0.10	1:225		FDOT PPM Vol. 1, Tbl. 2.9.1. 2.9.2, 2.9.3, 2.9.4 Design Standards Ind. No. 510, 511 AASHTO Exh. 3-28
DS = 45 mph Urban	0.05	1:150		
Collector				
DS = 45 mph Frontage Road	0.05	1:150		
DS = 50 mph Service Road	0.10	1:200		
Ramp				
DS = 50 mph Directional Loop	0.10	1:200		
DS = 30 mph Loop	0.10	1:150		
<u>Vertical Curves</u>	Design Speed (mph)	K – value		
Length, L = KA		Crest	Sag	
	70	401	181	
	60	245	136	
	55	185	115	
	50	136	96	
	45	98	79	
	30	31	37	
<u>Minimum Lengths</u>	Crest	Sag		FDOT PPM Vol. 1, Tbl. 2.8.5, 2.8.6 AASHTO Exh. 3-72 (crest), 3-75 (sag)
Freeway				
DS = 70 mph Rural	500-ft	400-ft		*CFX Policy* *Note: FDOT K values for "ALL OTHER FACILITIES" are available*
DS = 60 mph Urban	400-ft	300-ft		
Arterial				
DS = 55 mph Rural	350-ft	250-ft		
DS = 45 mph Urban	135-ft	135-ft		
Collector				
DS = 45 mph Frontage Road	135-ft	135-ft		
DS = 50 mph Service Road	300-ft	200-ft		
Ramp				
DS = 50 mph Directional Loop	300-ft	200-ft		
DS = 30 mph Loop	90-ft	90-ft		

Design Element	Design Standard		Source
Ramps Ramp Terminals Length Taper	Entrance "Parallel – Type" 900 to 1200-ft 300-ft (25:1)	Exit "Taper – Type" 550-ft (2° to 5°, 3° desirable)	Design Standards Ind. No. 525 AASHTO Pg. 850-856
Minimum Spacing Entrance to Exit Exit to Entrance Entrance Exit to Exit Turning Roadways	1,600 to 2000-ft 500-ft 1,000-ft 1,000-ft 600 to 800-ft		AASHTO Exh. 10-68, Pg. 844
Lane Drop Taper	$L = WS$ ($DS = 45$mph) $L = WS^2 / 60$ ($DS \leq 40$ mph) 50:1 min, 70:1 desirable (freeways)		Design Standards Ind. No. 525, 526 AASHTO Pg. 818
Clear Zone Freeway DS = 70 mph Rural DS = 60 mph Urban Arterial DS = 55 mph Rural DS = 45 mph Urban Collector DS = 45 mph Frontage Road DS = 50 mph Service Road Ramp DS = 50 mph Directional 1 to 2-lane DS = 30 mph Loop 1 to 2-lane	 36-ft 36-ft 30-ft 4-ft (Curb & Gutter) as appropriate 4-ft (Curb & Gutter) as appropriate 24-ft 14-ft to 24-ft 10-ft to 18-ft		FDOT PPM Col. 1, Tbl. 2.11.11
Vertical Clearance Over Roadway Over Railroad Sign over Roadway Over Water	 16'-6" 23'-6" 17'-6" 12'-0" min.		FDOT PPM Vol. 1, Tbl. 2.10.1 to 2.10.4, Sect. 2.10.1
limited access Limits Rural Urban Crossroad overpass/no interchange	 300-ft min. 100-ft min. 200-ft		FDOT PPM Vol. 1, Sect. 2.14.1

3.1.1 Design Speed

The proposed mainline design speed is 70 mph. The proposed ramp design speed for the diamond interchange ramps is 50 mph, while the partial cloverleaf loop ramps are designed for 30 mph.

3.1.2 Drainage Design Criteria

The design of the stormwater facilities will comply with the standards set forth by CFX, SFWMD, Osceola County, and FDOT. An Environmental Resource Permit (ERP) will need to be acquired from SFWMD during the design of this project.

All basins are considered open basins. Wet detention systems were analyzed to provide water quality improvements, as well as water quantity attenuation for the project runoff. Wet detention is based on the high-water table prevalent throughout the project limits. The stormwater ponds have been preliminarily designed and sized for the proposed alignment. Required pond sizes for each basin were calculated by evaluating runoff volume using the NRCS Curve Number (CN) method, calculating treatment volume requirements, and reviewing floodplain impacts. These volumes were added together and combined with landscaping and maintenance berm assumptions to result in the total required pond size. Please refer to the summary below for the water quality, water quantity, and detention pond facilities configuration criterion used for the project.

Water Quality Criteria

Per Section 4.2.1 of the 2016 SFWMD Environmental Resource Permit Applicant's Handbook Volume II, wet detention volume shall be provided for the first inch of runoff from the developed project, or the total runoff of 2.5-inches times the percentage of imperviousness, whichever is greater. Proposed offsite ponds are assumed to be wet detention.

Since this is a preliminary analysis for pond sizing capacity, recovery calculations for orifice sizing and permanent pool calculations are not included in the pond sizing considerations.

Per Appendix E of the 2016 SFWMD Environmental Resource Permit Applicant's Handbook Volume II, and as a part of the review of ERP applications, the District evaluates whether discharges from a project will be directed to an OFW or a water body that has been identified as impaired pursuant Chapter 62-303, F.A.C. If a proposed project discharges to an OFW or an impaired water body, the District will require additional protective measures. For an impaired water body, this evaluation would include a site-specific pollutant loading analysis; and for an OFW, this evaluation would include pond storage of an additional 50% water quality treatment volume above the amounts required pursuant to Section 4.2.1, Volume II.

The project study area does not directly discharge to an OFW or an impaired waterbody. Notably, East Lake Tohopekaliga (WBID 3172) and Econolockhatchee (WBID 2991) in the vicinity of the corridors are impaired for nutrients, but the study area does not directly discharge to these waterbodies.

The study area is also within the Lake Okeechobee BMAP adopted in 2013, which establishes a Total Phosphorus loading; however, the project area does not directly discharge to this waterbody. No additional treatment is being considered for this analysis.

Water Quantity Criteria

Per Section 5.2.1 of the 2021 FDOT Drainage Manual, the design must comply with the water quality, rate, and quantity requirements of Section 334.044(15), F.S., Chapter 14-86, F.A.C., Rules of the Department of Transportation only in closed basins or areas subject to historical flooding.

Per Section 5.2.2 of the 2021 FDOT Drainage Manual, the design must comply with state, Water Management District, and, when delegated by the state, local government stormwater management programs.

Per Section 3.2 of the 2016 SFWMD Environmental Resource Permit Applicant's Handbook Volume II, the off-site discharge rate is limited to rates not causing adverse impacts to existing offsite properties, historic discharge rates, rates determined in previous Agency permit actions, or rates specified in District criteria. The project area does not discharge to any locations with rates specified in District criteria.

Per Section 3.3 of the 2016 SFWMD Environmental Resource Permit Applicant's Handbook Volume II, unless otherwise specified by previous Agency permits or criteria, a storm event of a three-day duration and 25-year return frequency shall be used in computing offsite discharge rates. Applicants are advised that local drainage districts or local governments may require more stringent design storm criteria. Osceola County requires stormwater management facilities to be designed for the 10-year/72-hour storm (8.0 inches). For this project, the SFWMD 25-year/72-hour criteria of 10.2 inches of rainfall was used to establish attenuation storage for all proposed ponds. Coordination of governing criteria should be established during a SFWMD Pre-Application Meeting.

Floodplain Compensation Criteria

The SFWMD requires cup-for-cup floodplain compensation between the 100-year elevation and estimated average wet season water table, and this volume can be provided within the proposed stormwater ponds. In addition, SFWMD does not allow stormwater modeling to demonstrate compensation, only cup-for-cup compensation will be allowed.

Pond Geometry Criteria

All proposed ponds for the Northeast Connector are assumed to be wet detention facilities. Dimensions include 0.5-acre minimum surface area at the control elevation, treatment volume will be maintained within the first 18-inches above the normal water level (NWL), and the pond bottom shall be a minimum of 12 feet below the control elevation. Side slopes shall not be steeper than 1:4, with a 20-foot wide berm. One foot of freeboard above the Design

High Water (DHW) to the inside berm will be maintained. Side slopes and berms shall be sodded.

Consistent with the Highway Beautification Policy, the pond aesthetics design approach should be developed early in order to include it in the determination of pond right-of-way acquisition needs. To provide additional area for pond tie-in slopes to the existing ground and additional area for landscaping to meet this Highway Beautification Policy, an additional 20% pond area was added to the outside top of berm area.

4.0 Alternatives Analysis

4.1 No-Build (No-Action) Alternative

A scenario in which the project is not undertaken is included as a benchmark by which the build alternatives can be compared. This scenario is referred to as the No-Build Alternative. The No-Build Alternative is used to show conditions in the project's design year if no transportation improvements are made. In essence, the No-Build Alternative includes the existing transportation system plus any additional funded future transportation projects.

In the case of the Northeast Connector, under the No-Build scenario, the limited access toll road would not be built.

The No-Build Alternative has certain advantages and disadvantages. The advantages of the No-Build Alternative include:

- No disruption or temporary impacts (air, noise, vibration, travel patterns) due to construction activities;
- No right-of-way acquisition; and
- No impacts to the natural environment.

The disadvantages of the No-Build Alternative include:

- Does not meet the project's purpose and need;
- Is not consistent with the following plans:
  - OCX Master Plan 2040;
  - MetroPlan Orlando 2045 MTP;
  - East Central Florida Corridor Task Force Final Report;
  - Osceola County Northeast District Conceptual Master Plan;
  - Osceola County North Ranch Sector Plan; and
  - Osceola County 2040 Comprehensive Plan.
- No traffic relief for Narcoossee Road and other local roadways;
- No improvement to emergency response and evacuation times; and
- Does not meet economic development goals in Osceola County.

4.1.1 No-Build Traffic Analysis

Methodology

The following methodology was used to develop design traffic estimates. First, an examination of historical counts in the project study area was conducted to establish historical growth rates. Traffic forecasts for the year 2025 and 2045 No-Build conditions were developed from the project-specific travel demand model. The No-Build scenarios were then compared against the year 2017 calibrated project-specific model run to establish growth rates for existing facilities in these two future years and model volumes were used for the Northeast Connector and other proposed facilities, including Jack Brack Road Extension.

Using model volumes and model growth rates, 2025 and 2045 No-Build design traffic AADT and Directional Design Hour Volumes (DDHV) were generated. To develop the design traffic, the travel demand model was run for year 2025 and 2045 alternatives. A traffic profile of the Build scenario was developed. Model volumes were used for the ramp terminus intersections and the turning movements balanced to estimate the intersection DDHVs.

CDM Smith used the latest version of the CFX travel demand model with validation year of 2017 and forecast years of 2025 and 2045. This is a regional daily model with a disaggregated zone structure and supporting network in the study area. A K Factor of 11 percent, a D Factor of 60 percent, and a T Factor of four percent are used for the Northeast Connector. A K Factor of nine percent, a D Factor of 55 percent, and a T Factor of six percent are used for cross streets and local roads. For more information on the traffic model, refer to the Project Traffic Analysis Report (PTAR), available under separate cover.

Traffic Forecasts and LOS

The daily traffic forecasts were developed as AADT for the traffic forecast years 2025 and 2045. The daily roadway segment LOS analysis was conducted for the No-Build conditions using the 2020 FDOT Quality and Level of Service Handbook Generalized service volumes tables. A summary 2045 No-Build daily volumes and LOS are provided in Table 4.1.1.

Table 4.1.1: 2045 No-Build AADT and LOS

Location	Type	2045 No-Build				
		Lanes	LOS D	AADT	V/C Ratio	LOS
SR 534, Narcoossee to Sunbridge Pkwy	Freeway	4	83,200	41,800	0.50	B
Jack Brack Rd, W of Northeast Connector	Class 1 Arterial	2	35,800	11,900	0.33	C
Jack Brack Rd, E of Northeast Connector	Class 1 Arterial	2	35,800	11,900	0.33	C
Nova Rd, W of Northeast Connector	Class 1 Arterial	2	35,800	13,100	0.37	C
Nova Rd, E of Northeast Connector	Class 1 Arterial	2	35,800	13,100	0.37	C

Location	Type	2045 No-Build				
		Lanes	LOS D	AADT	V/C Ratio	LOS
Narcoossee Rd, N of Jack Brack Rd	Class 1 Arterial	2	39,800	44,000	1.11	**F**
Narcoossee Rd, S of Jack Brack Rd	Class 1 Arterial	2	39,800	49,600	1.25	**F**
US 192 between Narcoossee Rd and Nova Rd	Class 1 Arterial	3	59,900	53,700	0.90	C

As shown in Table 4.1.1, all the roadway segments on the local road network in the No-Build condition are expected to operate at LOS C or better, except for Narcoossee Road, which is over capacity for a four-lane arterial. SR 534 is forecasted to operate at LOS B in 2045.

Design-Hour Traffic Forecasts and LOS

The DDHV for the traffic forecast years 2025 and 2045 were developed for the No-Build conditions. DDHV were developed using the K and D factors along with the forecasted AADTs. The roadway segment LOS analysis was conducted in the AM Peak and PM Peak hours for the No-Build conditions using the projected DDHVs and the 2020 FDOT Quality and Level of Service Handbook Generalized service volume tables. A summary of No-Build Peak Hour Segment LOS is provided in Table 4.1.2.

Table 4.1.2: 2045 No-Build DDHV

Location	Type	2045 No-Build							
		Lanes	LOS D	AM Peak	V/C Ratio	LOS	PM Peak	V/C Ratio	LOS
SR 534, Narcoossee to Sunbridge Pkwy	NB	2	3,740	2,760	0.74	C	1,840	0.49	B
	SB	2	3,740	1,840	0.49	B	2,760	0.74	C
Jack Brack Rd, W of Northeast Connector	EB	2	1,800	590	0.33	C	485	0.27	C
	WB	2	1,800	485	0.27	C	590	0.33	C
Jack Brack Rd, E of Northeast Connector	EB	2	1,800	485	0.27	C	590	0.33	C
	WB	2	1,800	590	0.33	C	485	0.27	C
Nova Rd, W of Northeast Connector	EB	2	1,800	650	0.36	C	535	0.30	C
	WB	2	1,800	535	0.30	C	650	0.36	C
Nova Rd, E of Northeast Connector	EB	2	1,800	535	0.30	C	650	0.36	C
	WB	2	1,800	650	0.36	C	535	0.30	C
Narcoossee Rd, N of Jack Brack Rd	NB	2	2,000	2,180	1.09	**F**	1,785	0.89	C
	SB	2	2,000	1,785	0.89	C	2,180	1.09	**F**

Location	Type	2045 No-Build							
		Lanes	LOS D	AM Peak	V/C Ratio	LOS	PM Peak	V/C Ratio	LOS
Narcoossee Rd, S of Jack Brack Rd	NB	2	2,000	2,010	1.01	**F**	2,460	1.23	**F**
	SB	2	2,000	2,460	1.23	**F**	2,010	1.01	**F**
US 192 between Narcoossee Rd and Nova Rd	EB	2	3,020	1,935	0.64	C	2,900	0.96	C
	WB	2	3,020	2,900	0.96	C	1,935	0.64	C

As shown in Table 4.1.2, all of the local roads operate at an acceptable LOS, except for Narcoossee Road, which operates at LOS F south of Jack Brack Road in the AM and PM Peak in both the northbound and southbound direction and north of Jack Brack Road in northbound direction in the AM peak and in the southbound direction in the PM Peak. SR 534 is forecasted to operate at an acceptable LOS.

4.2 Transportation System Management and Operations Alternative

The Transportation System Management and Operations (TSM&O) Alternative includes strategies with the operational objective of preserving the capacity and improving the security, safety, and reliability of the transportation system, while minimizing all environmental impacts. These strategies may include upgrades or additions to the existing facility, such as:

- Ramp signals;
- Arterial traffic management systems;
- Traffic incident management;
- Work zone traffic management;
- Road weather management;
- Traveler information services
- Congestion pricing
- Parking management
- Traffic control
- Commercial vehicle operations
- Transit priority signals systems; and
- Freight management.

TSM&O improvements alone do not sufficiently address the purpose and need, and the disadvantages of the No-Build Alternative will remain. The TSM&O Alternative, by itself, is not considered a viable option, and no further evaluation of only the TSM&O Alternative is conducted in this study.

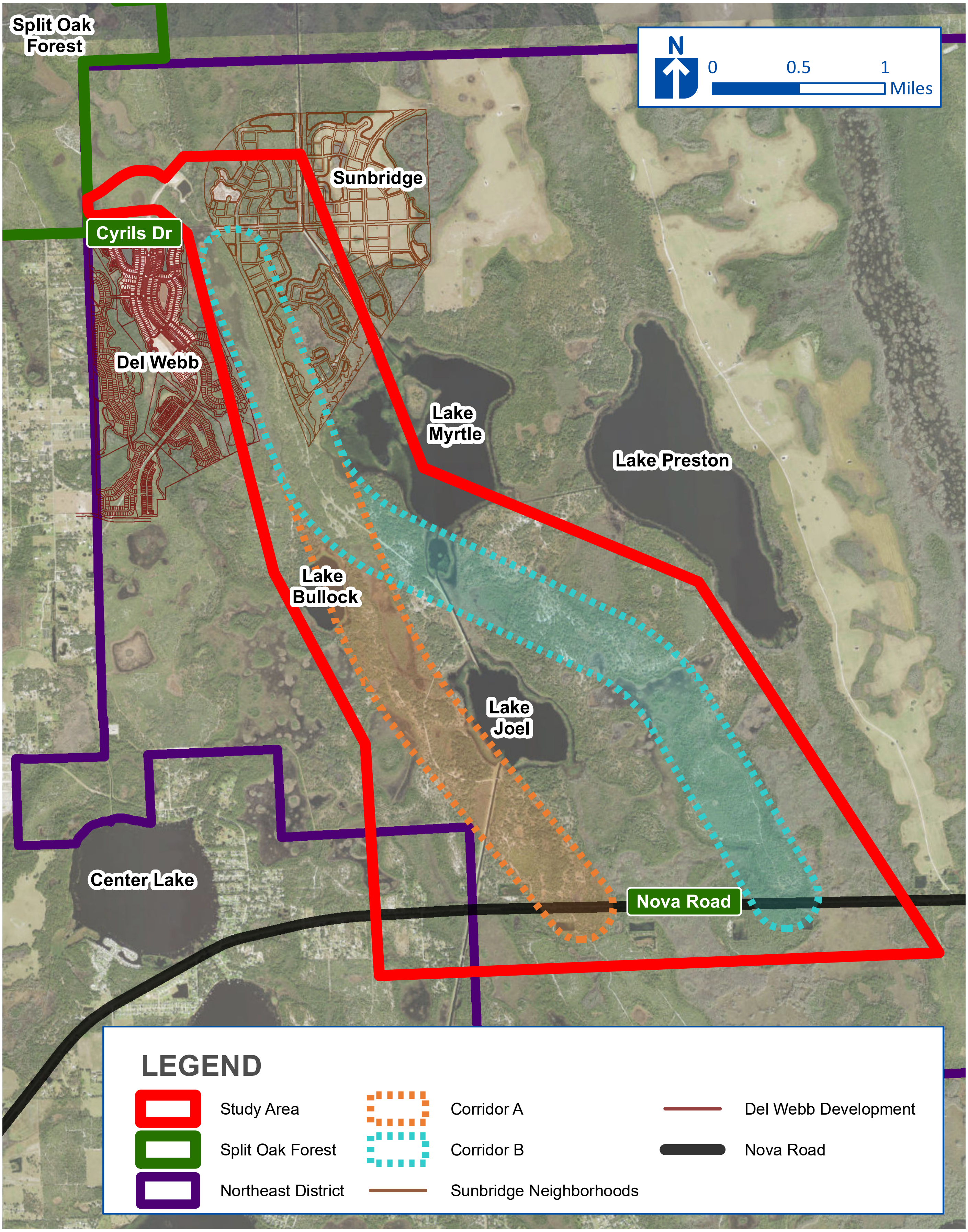
4.3 Multimodal Alternatives

Transit services within the study area would be operated by an agency other than CFX. Potential transit operators include: Central Florida Regional Transportation Authority (LYNX), Osceola County, or a private entity. This approach was suggested in the Central Florida Expressway Multimodal Investment Assessment Report, whose policy statement recommended "funding or partnering on multimodal initiatives where revenue generated from the investment equals the project cost or where toll user benefits are equal to or exceed the project cost." The report advised that CFX's operation of a transit system would not be financially prudent. CFX adopted the multimodal policy statement in March 2017.

As discussed in Section 2.9, no existing transit routes are located in or near the study area. The Osceola County Premium Transit Corridors 2080 Map shows the Northeast Connector as a route for premium transit service. However, this route is not included in the Osceola County 2040 transit maps or the 2045 Metroplan Orlando MTP. Therefore, at this time, no multimodal improvements are recommended for consideration as part of the Northeast Connector alternatives.

4.4 Corridor Analysis

Preliminary corridor options were developed for the proposed Northeast Connector as part of the Alternatives Corridor Evaluation (ACE) process. Corridors were developed to maximize the upland in the study area and, where possible, be consistent with local plans. Two corridors were developed for the project, Corridor A and Corridor B, as shown on Figure 4.4.1. Corridor A was developed to be consistent with the Northeast District Conceptual Master Plan and follows the general alignment of the expressway presented in the Northeast District Street Framework. This corridor begins at the southern terminus of the proposed SR 534 Preferred Alternative and continues at a slightly southeasterly direction until just north of Lake Joel, where the corridor turns more easterly until it terminates at Nova Road. Corridor B follows the same alignment as Corridor A until just north of Lake Bullock, where the alignment turns more easterly until it aligns with Lake Joel, then shifts to a more southerly heading until it terminates at Nova Road. The corridor was developed to "meander" between the environmental constraints of Lake Myrtle and Lake Joel while utilizing as much of the upland property as possible.



CENTRAL FLORIDA EXPRESSWAY AUTHORITY	**Northeast Connector Expressway - Phase 1 PD&E Study from Cyrils Drive to Nova Road**	**Figure 4.4.1: ACE Corridors**	**Page Number: 4-6**

The corridor evaluation considered a number of factors including an assessment of purpose and need compliance, and social, cultural, natural, and physical impacts in order to eliminate all inferior or suboptimal corridor alternatives. Table 4.4.1 provides a summary of this evaluation.

Table 4.4.1: Corridor Evaluation Matrix

Criteria	Corridor A	Corridor B
Purpose and Need	Most Consistent	Somewhat Consistent
Stakeholder Input	Favored	Not Favored
Social		
Consistency with Northeast District Conceptual Master Plan	Consistent	Not Consistent
Total Parcels in Corridor	12	14
Number of Owners in the Corridor	2	2
Total Acreage in Corridor (acres)	1,113	1,315
Number of Buildings in the Corridor	0	0
Cultural		
Previous Cultural Resource Surveys	4	4
Recorded Archaeological Resources	1	1
Historic Parcels	0	0
Historic Linear Resources	1	1
Natural		
Total Wetlands (acres)	329.5	379.6
Surface Waters (acres)	44.9	18.1
Potential Scrub Habitat (acres)*	37.4	87.1
100-Year Floodplain (acres)	49.6	47.2
Prime NRCS Farmland (acres)	315	390
Number of Canal Crossings	3	2
Physical		
Potential Contamination Sites	2	2
Engineering		
Length (miles)	4.3	5.1
Weighted AADT	24,100	17,400
Relative Project Cost	Lower	Higher
Organic Soils/Muck (acres)	245	266
Recommendation	**Recommended to be carried forward**	**Not Recommended to be carried forward**

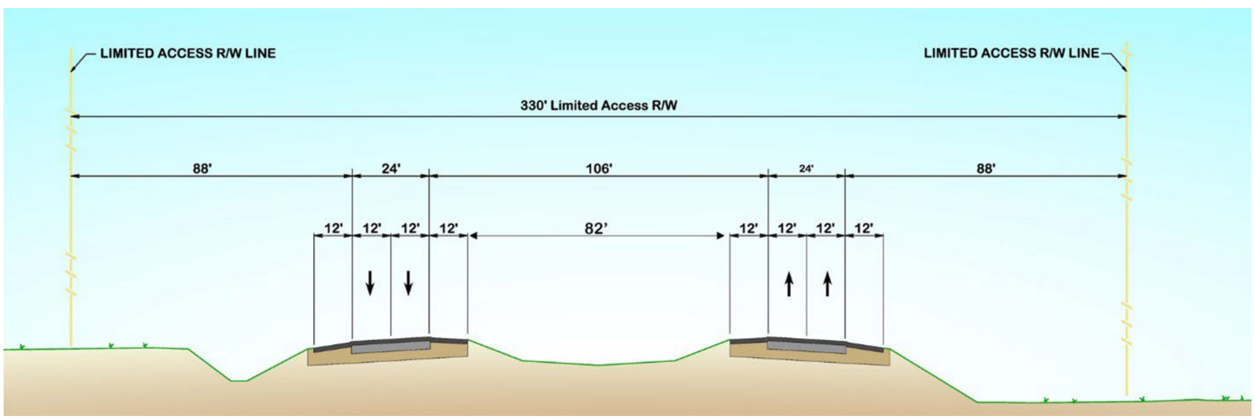
* Note that during a field review on November 17, 2020, no high-quality scrub habitat was found in either project corridor.

Both corridors meet the project's purpose to enhance north-south mobility and provide connections between existing and future east-west corridors. However, Corridor B is not consistent with local master plans and therefore does not meet the project's need. The environmental impacts for Corridor A and B are comparable. The differentiator between corridors is the local plan consistency, which ultimately affects the purpose and need. In that respect, Corridor A is superior to Corridor B and was therefore recommended to be carried forward in the PD&E Study. More information on the corridors analysis is contained in the ACE, available under separate cover.

4.5 Build Alternatives

One typical section is considered for the length of the project. The proposed typical section features two 12-foot travel lanes in each direction flanked by 12-foot paved inside and outside shoulders. The proposed median width is 82 feet wide, which can accommodate future widening. The ultimate typical section features an eight-lane section and two potential multi-use lanes with a concrete median barrier wall. The proposed typical section requires 330 feet of limited access right-of-way, which includes a border width of 88 feet on both sides of the Northeast Connector as shown on Figure 4.5.1.

Figure 4.5.1: Proposed Typical Section



The alternatives for the project are split into two geographic areas:

- Jack Brack Road Segment: Cyrils Drive to south of Jack Brack Road; and
- Nova Road Connection: south of Jack Brack Road to Nova Road.

4.5.1 Jack Brack Road Segment

The Cyrils Drive to south of Jack Brack Road segment features one mainline alignment with two interchange alternatives at the Jack Brack Road extension. The two interchange alignments are identified as follows:

- Diamond Interchange; and
- Partial Cloverleaf Interchange.

The mainline alignment extends south from the proposed SR 534 Preferred Alternative. The alignment is located between the Del Webb community to the west and the planned

Sunbridge neighborhoods to the east. Continuing further south, the alignment is located just east of the Tavistock utility site, currently under construction. The mainline alignment then continues between Lake Myrtle and Bullock Lake, remaining close to the east side of Bullock Lake.

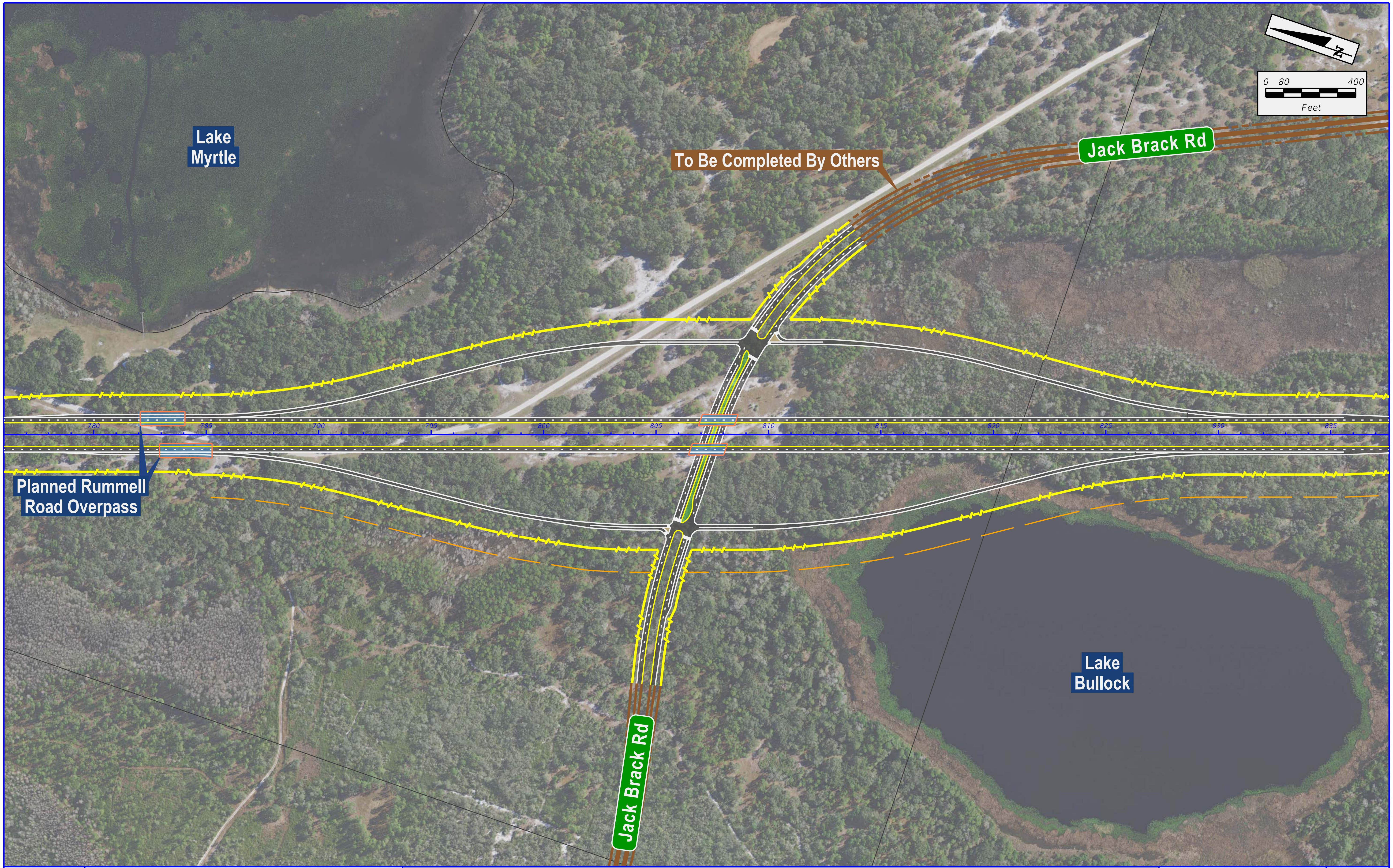
The proposed typical section for the Jack Brack Road extension includes a four-lane divided road with a 40-foot median in the vicinity of the proposed interchange. Outside of the interchange footprint, Jack Brack will be a two-lane divided roadway. The limits of CFX construction extend 300 feet west of the westernmost ramp terminal to 300 feet east of the easternmost ramp terminal.

Diamond Interchange

The Diamond Interchange consists of two exit ramps and two entrance ramps with each quadrant of the interchange containing one ramp as shown on Figure 4.5.2. The exit ramp for the southbound lanes is located in the northwest quadrant of the interchange. The one-lane exit is designed using a 620-foot-long curve with a 3,000-foot exiting radius, followed by a 550-foot tangent segment and a 755-foot-long curve with a radius of 3,000 feet, before a short tangent connecting the ramp to Jack Brack Road. Through the second curve, the ramp begins to taper out developing a second lane approximately 350 feet prior to the signalized intersection.

The exit ramp for the northbound lanes is located in the southeast quadrant and has the same design elements as the southbound exit ramp in that it is a single lane exit ramp that develops into a two-lane ramp prior to a signalized intersection. This ramp utilizes a 628-foot-long curve with a radius of 2,906 feet and a 500-foot tangent followed by a 2,865-foot radius curve that is 750 feet long.

The entrance ramp for the southbound lanes is located in the southwest quadrant while the entrance ramp for the northbound lanes is located in the northeast quadrant. Both ramps begin as two-lane ramps before tapering into single-lane ramps as they enter the mainline alignment. The geometry of the entrance ramp for the southbound lanes consists of a 242-foot-long tangent followed by a 777-foot-long curve with a radius of 3,109 feet, then a 548-foot-long tangent, and a 619-foot-long curve with a radius of 3,015 feet. The geometry of the entrance ramp for the northbound lanes consists of a 347-foot-long tangent followed by a 755-foot-long curve with a radius of 3,000 feet, then a 550-foot-long tangent, and a 620-foot-long curve with a radius of 3,000 feet.



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CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Existing Right-of-Way	Potential OUC Utility Easement	Proposed Pavement
Proposed Right-of-Way	Property Lines	Proposed Structure
Proposed L/A Right-of-Way	Proposed Barrier Wall	

Figure 4.5.2:
Jack Brack Road
Diamond Interchange

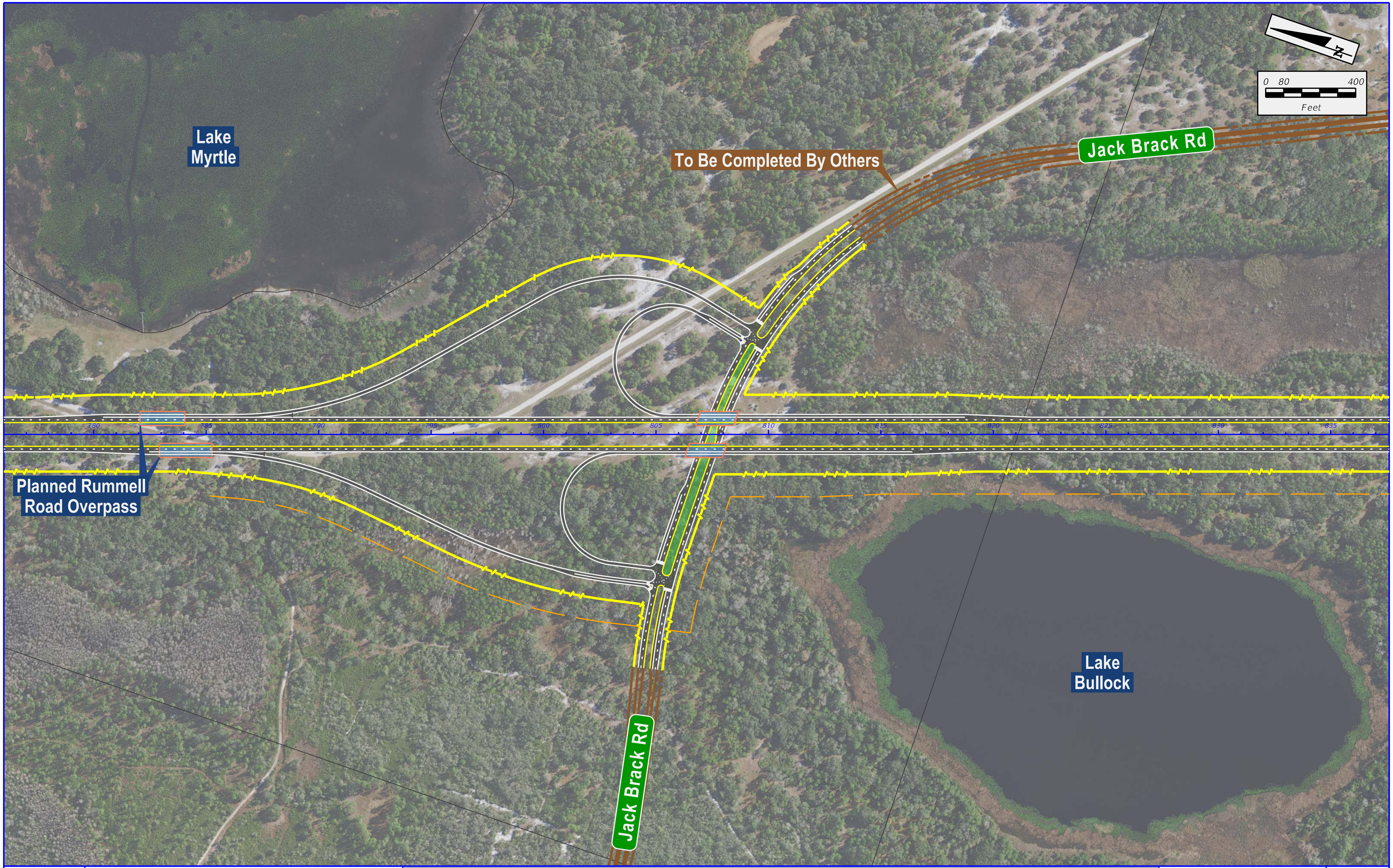
SHEET NO.
4-10

Partial Cloverleaf Interchange

In order to avoid impacts to Bullock Lake and the surrounding wetlands, a partial cloverleaf interchange was designed as shown on Figure 4.5.3. All ramps in this design are located on the north side of Jack Brack Road. The exit and entrance ramps for the southbound lanes are located in the northwest quadrant while the exit and entrance ramps for the northbound lanes are located in the northeast quadrant of the interchange. Both loop ramps are designed to meet a 30-mph design speed with 10 percent superelevation. This design speed requires a curve with a radius of 239 feet with the length of curve for the southbound entrance being 732 feet and the northbound exit ramp being 883 feet. The parallel-type entrance ramp for the southbound lanes is 1,297 feet long and the parallel-type exit ramp for the northbound loop ramp is 1,245 feet long. Both loop ramps are single-lane ramps except for the last 200 feet of the northbound exit ramp where it tapers out to accommodate an additional turn lane.

The geometry for the single-lane exit ramp of the southbound lanes begins with a 667-foot-long curve with a radius of 1,700 feet, followed by a 411-foot tangent, then a 752-foot-long curve with a radius of 2,292 feet, and a 151-foot tangent. The single-lane ramp widens into two lanes approximately 350 feet prior to the signalized intersection in order to provide left and right turn lanes to Jack Brack Road.

The single-lane entrance ramp for the northbound lanes begins with a 220-foot-long taper at the intersection of Jack Brack road and continues north through a series of reverse curves. The first curve is 760 feet long with a radius of 716 feet. The second curve has a radius of 1,652 feet and is 742 feet long. The two curves are separated by a 654-foot-long tangent.



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CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Existing Right-of-Way	Potential OUC Utility Easement
Proposed Right-of-Way	Property Lines
Proposed L/A Right-of-Way	Proposed Barrier Wall
Proposed Pavement	
Proposed Structure	

Figure 4.5.3:
Jack Brack Road
Partial Cloverleaf Interchange

SHEET NO.
4-12

4.5.2 Nova Road Connection

The segment south of Jack Brack Road to Nova Road features two mainline alignments with connections to Nova Road in different locations. Continuing south from Jack Brack Road, the alignment for the two Nova Road Connection alternatives begin to diverge from each other. The two alternatives in this segment are identified as follows:

- Nova Road Connection – Option 1; and
- Nova Road Connection – Option 2.

At this time, the mainline alignment for both alternatives would terminate at Nova Road via a T-intersection; however, a future easterly extension of the mainline alignment is possible if the OBCC project moves forward at this location.

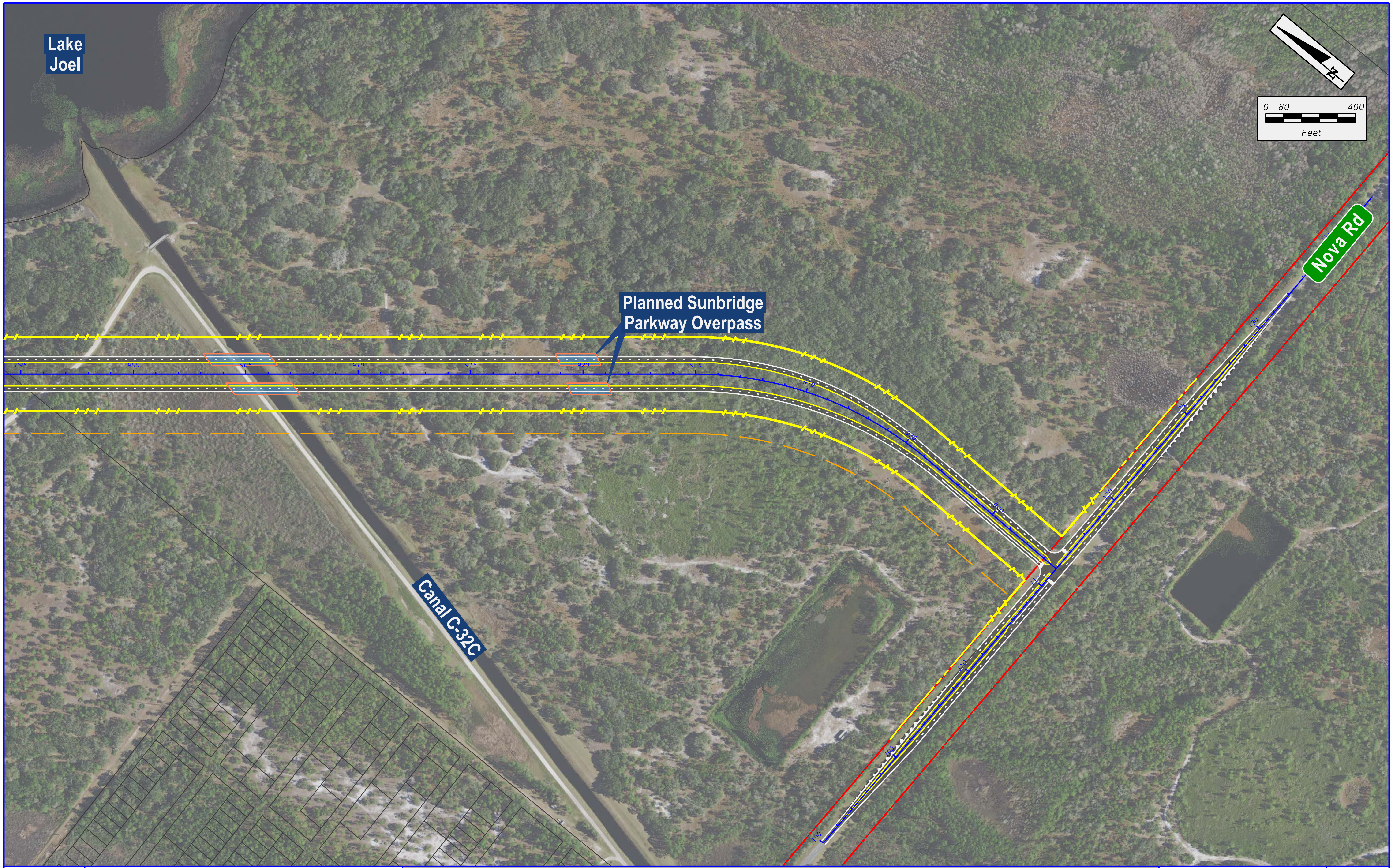
Nova Road Connection – Option 1

South of the Jack Brack Road segment, the mainline alignment diverges between the two alternatives. Nova Road Connection – Option 1 continues with the same southeasterly tangent as it crosses the C-32C canal until the alignment transitions to a more southerly bearing via 1,607-foot radius curve that is 1,131 feet long. The curve directs the alignment to a 747-foot-long tangent which creates a 90-degree connection to Nova Road. The Nova Road Connection – Option 1 alternative is shown on Figure 4.5.4.

Nova Road Connection – Option 2

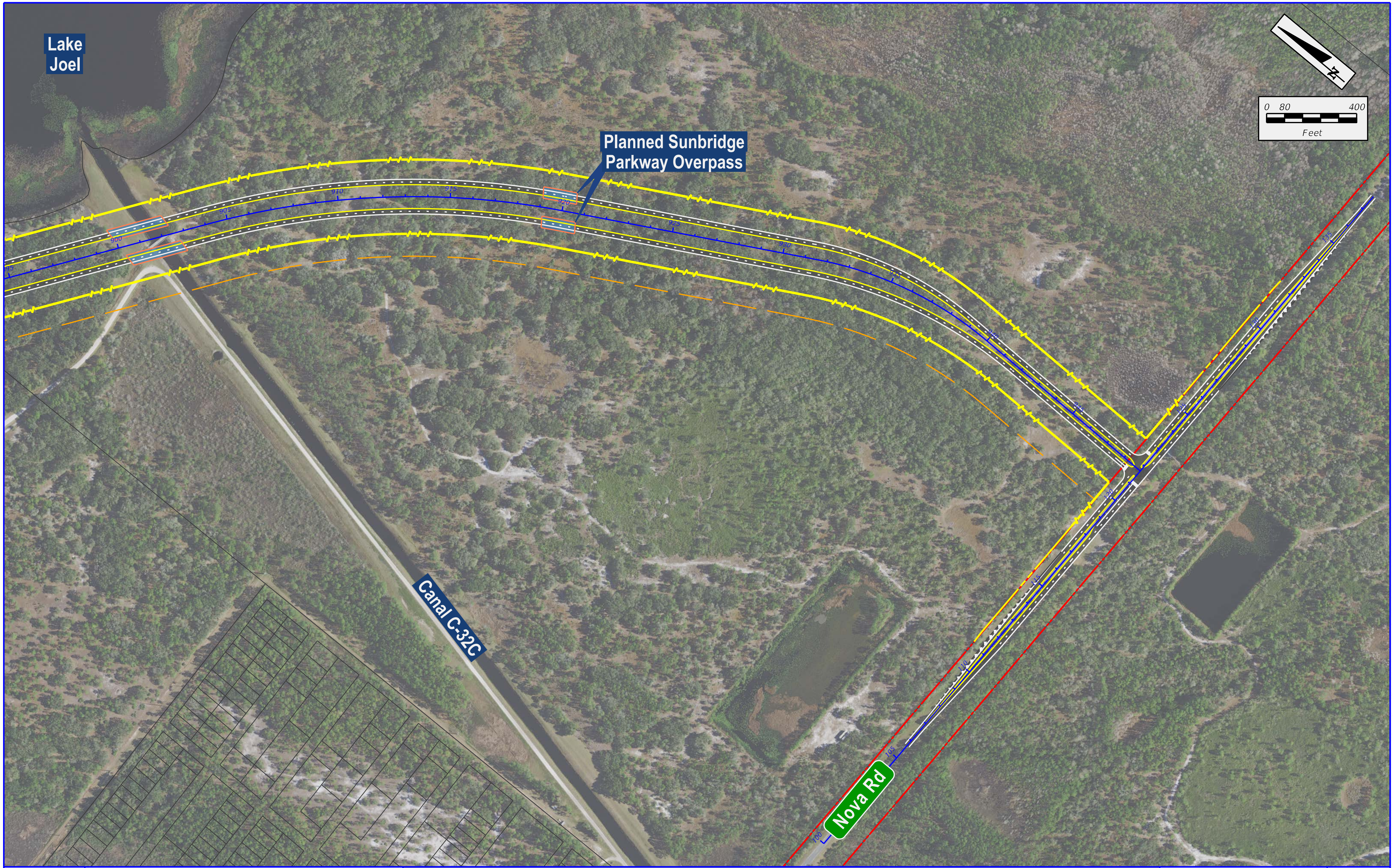
Unlike Option 1, Option 2 immediately curves the alignment eastward via a 5,000-foot radius curve that is 3,122 feet long shifting the alignment closer to Lake Joel. The alignment then continues on a tangent for 1,912 feet as it crosses of the C-32C canal at which point it begins to curve in a more southerly direction for 1,584 feet via a 3,500-foot radius curve. The alignment continues on a tangent for 1,155 feet before curving to a more southerly bearing to become perpendicular to Nova Road. This curve is 844 feet long and has a radius of 1,641 feet, followed by an 894-foot tangent connecting to Nova Road. The Nova Road Connection – Option 2 alternative is shown on Figure 4.5.5.

Appendix A contains detailed concept plan sheets for the four Build Alternatives discussed in Section 4.5.



CENTRAL FLORIDA EXPRESSWAY AUTHORITY	Northeast Connector Expressway - Phase 1 From Cyrils Drive to Nova Road (CR 532) Project Development and Environment Study	Existing Right-of-Way Proposed Right-of-Way Proposed L/A Right-of-Way	Potential OUC Utility Easement Property Lines Proposed Barrier Wall	Proposed Pavement Proposed Structure	Figure 4.5.4: Nova Road Connection - Option 1

SHEET NO. 4-14



CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Legend	
Existing Right-of-Way	Potential OUC Utility Easement
Proposed Right-of-Way	Property Lines
Proposed L/A Right-of-Way	Proposed Barrier Wall
Proposed Pavement	Proposed Structure

Figure 4.5.5:
Nova Road Connection - Option 2

SHEET NO. 4-15

Profiles

The Northeast Connector profiles are a continuation of the profile from the proposed SR 534 Preferred Alternative and assumes that the proposed ground elevation will be three feet above the existing ground. Although identical through the Jack Brack Road segment, the profiles begin to differ once the horizontal alignments diverge for the Nova Road Connection alternatives.

The Northeast Connector profile begins with a 1,000-foot vertical curve with a back grade of 0.3 percent and an ahead grade of -0.5 percent which allows the profile to follow the proposed ground line. The vertical curve provides a K value of 1,250. The ahead grade continues until it meets the 2.0 percent grade, creating a 1,200-foot sag with a K value of 480. The 2.0 percent grade continues as it crosses over the planned Rummell Road creating an 1,800-foot vertical curve with a K value of 514 as it joins the ahead grade of -1.5 percent. The ahead grade continues to create an 800-foot sag vertical curve with a K value of 286 and has an ahead grade of 1.3 percent. The vertical curve crest over Jack Brack Road has a K value of 474 and is 1,800 feet long. The ahead grade of -2.5 percent continues into the 800-foot sag with a K value of 286. The profile continues along the proposed ground in a sawtooth pattern through a crest, sag, and crest utilizing -0.3, 0.5, and -0.3 percent grades, respectively, to provide proper drainage. The first crest is a 1,800-foot vertical curve with a K value of 3,000. The sag has a length of 800 feet with a K value of 1,000. The second crest is a 1,000-foot long (K value of 1,250) vertical curve and is the last vertical curve in common between the two Nova Road Connection alternatives.

The Nova Road Connection – Option 1 profile continues with a 1,100-foot sag (K value of 500) as it meets with the ahead grade of 1.9 percent and climbs to overpass the C-32C canal. The crest has a vertical curve length of 1,800 feet and a K value of 1,125. After crossing over the canal, the profile continues to rise at a 0.3 percent grade to provide clearance over the planned Sunbridge Parkway. The vertical curve cresting over the planned Sunridge Parkway is 1,800 feet long with a K value 667 as it meets a -2.4 percent down grade. The following 800-foot sag (K value of 182) is provided as it meets the 2.0 percent grade that ends at Nova Road. The Nova Road Connection – Option 1 profile is shown in Appendix A.

The Nova Road Connection – Option 2 profile continues with an 800-foot sag (K value 267) with an ahead grade of 2.7 percent. The overpass of the C-32C canal begins with an 1,800-foot-long vertical curve with a K value of 474 and an ahead grade of -0.3 percent. As the profile continues south of the C-32C canal the -0.3 percent grade is held until it forms a 1,800-foot crest overpassing the planned Sunbridge Parkway. This crest has a K value of 1,059 and an ahead grade of -2.0 percent. The -2.0 percent grade continues until it meets the 2.0 percent grade ending at Nova Road, creating the final sag vertical curve of 1,100 feet long with a K value of 275. The Nova Road Connection – Option 2 profile is shown in Appendix A.

Bridges

All bridges will be twin bridges designed to provide 16.5-foot vertical clearance over all crossing side roads. A bridge deck depth of 10 feet is assumed. Bridges will be provided for the following crossroads:

- Planned Rummell Road;
- Planned Jack Brack Road; and
- Planned Sunbridge Parkway.

A fourth set of twin bridges is proposed to overpass the existing C-32C canal. These bridges will provide a vertical clearance of 15 feet above the highest berm elevation along the canal in the vicinity of the mainline alignment crossing and a bridge deck depth of 10 feet is assumed. The Nova Road Connection – Option 1 and Nova Road Connection – Option 2 cross the C-32C canal in different locations. Of the two crossings, Option 2 provides a better crossing due to the reduced skew angle of the canal crossing which in turn reduces the skew angle of the bridge.

4.6 Traffic Analysis

4.6.1 Traffic Forecasts and LOS

The daily traffic forecasts were developed as AADT for the traffic forecast years 2025 and 2045. The daily roadway segment LOS analysis was conducted for the Build conditions using the 2020 FDOT Quality and Level of Service Handbook Generalized service volumes tables. A summary of 2045 Build daily volumes and LOS are provided in Table 4.6.1.

Table 4.6.1: 2045 Build AADT and LOS

Location	Type	2045 Build				
		Lanes	LOS D	AADT	V/C Ratio	LOS
SR 534, Narcoossee Rd to Sunbridge Pkwy	Freeway	4	83,200	57,100	0.69	C
SR 534 Sunbridge Ramps to/from West	Freeway	1	n/a	23,900		
Northeast Connector Sunbridge Ramps to/from East	Freeway	1	n/a	2,600		

Location	Type	2045 Build				
		Lanes	LOS D	AADT	V/C Ratio	LOS
Northeast Connector, Sunbridge Pkwy to Jack Brack Rd	Freeway	4	83,200	35,900	0.43	B
Northeast Connector Jack Brack Ramps to/from North	Freeway	1	n/a	18,600		
Northeast Connector Jack Brack Ramps to/from South	Freeway	1	n/a	1,700		
Northeast Connector, Jack Brack Rd to Nova Rd	Freeway	4	83,200	19,000	0.23	B
Northeast Connector Nova Rd Ramps to/from North	Freeway	1	n/a	19,000		
Jack Brack Rd, W of Northeast Connector	Class 1 Arterial	2	35,800	22,300	0.62	C
Jack Brack Rd, E of Northeast Connector	Class 1 Arterial	2	35,800	22,800	0.64	C
Nova Rd, W of Northeast Connector	Class 1 Arterial	2	35,800	21,500	0.60	C
Nova Rd, E of Northeast Connector	Class 1 Arterial	2	35,800	16,900	0.47	C
Narcoossee Rd, N of Jack Brack Rd	Class 1 Arterial	2	39,800	44,000	1.11	**F**
Narcoossee Rd, S of Jack Brack Rd	Class 1 Arterial	2	39,800	50,200	1.26	**F**
US 192 between Narcoossee Rd and Nova Rd	Class 1 Arterial	3	59,900	53,100	0.89	C

As shown in Table 4.6.1, the local roadway segments are expected to operate at LOS C or better in 2045, except for Narcoossee Road, which is over capacity for a four-lane arterial. SR 534 and the Northeast Connector are forecasted to operate at LOS C or better.

4.6.2 Design-Hour Traffic Forecasts and LOS

The DDHV for the traffic forecast years 2025 and 2045 were developed for the Build conditions. DDHV were developed using the K and D factors along with the forecasted AADTs. The roadway segment LOS analysis was conducted in the AM Peak and PM Peak hours for the Build conditions using the projected DDHVs and the 2020 FDOT Quality and Level of Service Handbook Generalized service volume tables. A summary of the Build peak hour segment LOS is provided in Table 4.6.2.

Table 4.6.2: 2045 Build DDHV and LOS

Location	Type	2045 Build							
		Lanes	LOS D	AM Peak	V/C Ratio	LOS	PM Peak	V/C Ratio	LOS
SR 534, Narcoossee to Sunbridge Pkwy	NB	2	3,740	3,805	1.02	B	2,480	0.66	B
	SB	2	3,740	2,480	0.66	B	3,805	1.02	B
SR 534 Sunbridge Ramps to/from West	WB	1	n/a	1,575			1,050		
	EB	1	n/a	1,050			1,575		
Northeast Connector Sunbridge Ramps to/from East	WB	1	n/a	175			115		
	EB	1	n/a	115			175		
Northeast Connector, Sunbridge Pkwy to Jack Brack Rd	NB	2	3,740	2,405	0.64	B	1,545	0.41	B
	SB	2	3,740	1,545	0.41	B	2,405	0.64	B
Northeast Connector Jack Brack Ramps to/from North	NB	1	n/a	1,230			820		
	SB	1	n/a	820			1,230		
Northeast Connector Jack Brack Ramps to/from South	NB	1	n/a	75			110		
	SB	1	n/a	110			75		
Northeast Connector, Jack Brack Rd to Nova Rd	NB	2	3,740	1,250	0.33	B	835	0.22	B
	SB	2	3,740	835	0.22	B	1,250	0.33	B
Northeast Connector Nova Rd Ramps to/from North	NB	1	n/a	1,250			835		
	SB	1	n/a	835			1,250		
Jack Brack Rd, W of Northeast Connector	EB	2	1,800	1,125	0.63	C	880	0.49	C
	WB	2	1,800	880	0.49	C	1,125	0.63	C
Jack Brack Rd, E of Northeast Connector	EB	2	1,800	925	0.51	C	1,125	0.63	C
	WB	2	1,800	1,125	0.63	C	925	0.51	C
Nova Rd, W of Northeast Connector	EB	2	1,800	1,160	0.64	C	775	0.43	C
	WB	2	1,800	775	0.43	C	1,160	0.64	C
Nova Rd, E of Northeast Connector	EB	2	1,800	745	0.41	C	775	0.43	C
	WB	2	1,800	775	0.43	C	745	0.41	C
Narcoossee Rd,	NB	2	2,000	2,180	1.09	F	1,785	0.89	C

Location	Type	2045 Build							
		Lanes	LOS D	AM Peak	V/C Ratio	LOS	PM Peak	V/C Ratio	LOS
N of Jack Brack Rd	SB	2	2,000	1,785	0.89	C	2,180	1.09	**F**
Narcoossee Rd, S of Jack Brack Rd	NB	2	2,000	2,010	1.01	**F**	2,460	1.23	**F**
	SB	2	2,000	2,460	1.23	**F**	2,010	1.01	**F**
US 192 between Narcoossee Rd and Nova Rd	EB	2	3,020	1,935	0.64	C	2,900	0.96	C
	WB	2	3,020	2,900	0.96	C	1,935	0.64	C

As shown in Table 4.6.2, the local roads in the study area are projected to operate at LOS C in both AM and PM Peak Hours, except for Narcoossee Road. In 2045 under the Build condition, the Northeast Connector is projected to operate at LOS B, while SR 534 is projected to operate at LOS E in the northbound direction in AM Peak Hour and the southbound direction in the PM Peak Hour.

4.6.3 DDHV Intersection Operations

Intersection LOS analysis was conducted using Synchro v.10 for the AM Peak and PM Peak hours for each turning movement. A summary of the 2045 AM and PM Peak Hour Intersection LOS are provided in Table 4.6.3. For analysis purposes, the future intersection geometry at the arterial intersections assumed no changes to the existing condition geometry.

Table 4.6.3: Build AM and PM Peak-Hour Intersection LOS

Intersection		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	TOT
AM Peak														
Northeast Connector at Jack Brack Rd (NB Ramps)	Delay (sec/veh)	82.1	19.9			33.2	8.3	45.1		0.4				33.3
	LOS	F	B			C	A	D		A				C
Northeast Connector at Jack Brack Rd (SB Ramps)	Delay (sec/veh)		29.7	3.1	78.3	12.4					52.0		8.0	27.0
	LOS		C	A	F	B					D		A	C
Northeast Connector at Nova Rd	Delay (sec/veh)	42.5	9.0			34.5	7.3				38.4		7.5	23.6
	LOS	D	A			C	A				D		A	C

Intersection		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	TOT
PM Peak														
Northeast Connector at Jack Brack Rd (NB Ramps)	Delay (sec/veh)	80.3	28.9			50.8	7.1	63.3		0.5				38.6
	LOS	F	C			D	A	E		A				D
Northeast Connector at Jack Brack Rd (SB Ramps)	Delay (sec/veh)		38.5	0.1	106.4	20.3					54.4		11.2	33.2
	LOS		D	A	F	C					D		B	C
Northeast Connector at Nova Rd	Delay (sec/veh)	53.8	19.5			46.6	8.3				22.9		13.4	27.3
	LOS	D	B			D	A				C		B	C

The Synchro Analysis shows that the ramp terminal intersections operate a LOS D or better in 2045 using a single controller at the Jack Brack Road interchange.

4.6.4 Conclusion

The traffic analysis shows that the Northeast Connector will help traffic conditions in the study area in the Build condition by handling between 19,000 and 35,900 AADT in 2045 that would have otherwise used the overburdened local arterials. The Northeast Connector provides an opportunity for high-speed north-south travel for the development of the Northeast District, consistent with the CFX 2040 Master Plan, and provides regional connectivity in this rapidly growing area of Osceola County.

4.7 Comparative Alternative Evaluations

The subsequent sections compare the build alternatives described above in terms of engineering, physical, cultural, natural environment, and sociocultural impacts. A summary and relative comparison of the pertinent impacts of the build alternatives are displayed in Table 4.7.1.

Table 4.7.1: Summary of Engineering Matrix

Estimated Costs	Jack Brack Road Segment		Nova Road Connections	
	Diamond	Partial Cloverleaf	Option 1	Option 2
	Design Elements			
Alternative Length (miles)	1.9	1.9	1.7	1.8
Proposed Number of Bridges	4	4	4	4
Proposed Bridge Length (feet)	751	774	946	804
Projected 2045 Annual Average Daily Traffic (AADT) Volume	30,500	30,500	19,300	19,300
	Physical Impacts			
Major Utility Conflicts - Existing	0	0	0	0
Major Utility Conflicts - Planned	0	0	0	0
Contamination Sites and Facilities	2	2	0	0
Railroad Involvement	None	None	None	None
	Cultural Impacts			
Potential Historic Resources	1	1	0	1
Potential Historic Linear Resources	0	0	2	2
Potential Archaeological Resources	0	0	0	0
	Natural Environment Impacts			
Number of Canal Crossings	0	0	1	1
100-year Floodplain (acres)	28	18	22	21
Wetlands (acres)	15	13	11	7
Surface Waters (acres)	2	0	0.5	0.5
Potential Bald Eagle Nest	0	0	0	0
Potential Species Impacts (composite rating)	Moderate	Moderate	Moderate	Moderate
Mitigation Properties	0	0	0	0
Conservation Easements	0	0	0	0
	Socioeconomic Impacts			
Community Facilities Impacted	0	0	0	0
Parks and Recreation Facilities Impacted	0	0	0	0
Trails Impacted	0	0	0	0
Community Cohesion Effects	None	None	None	None
Socioeconomic Impacts to Special Populations	None	None	None	None
Residential Planned Developments Impacted (acres)	122.7	115.3	65.8	69.7
	Right-of-way Impacts (without ponds)			
Right-of-Way Area (acres)	122.7	115.3	65.8	69.7
Potential Residential Parcel Impacts	0	0	0	0

Estimated Costs	Jack Brack Road Segment		Nova Road Connections	
	Diamond	Partial Cloverleaf	Option 1	Option 2
Potential Non-Residential Parcel Impacts	4	4	3	3
	Estimated Costs ($ millions)			
Roadway Construction	46	46	30	39
Bridges Construction	10	11	10	10
Interchanges Construction	11	10	5	5
Toll Collection Equipment	1	1	2	2
Right-of-Way Cost (without ponds)	11	11	6	6
Mitigation, Wetlands, & Wildlife	2	1	1	1
Engineering/Administration/Legal	16	16	11	13
Total Estimated Alternative Costs	**97**	**96**	**65**	**76**

4.7.1 Design Elements

The two Jack Brack Road alternatives are both 1.9 miles in length and start at the northern project limit which coincides with the proposed SR 534 Preferred Alternative terminus and extend to south of the proposed Jack Brack Road interchange. The two Nova Road Connection alternatives start just south of the Jack Brack Road interchange and continue to Nova Road. Nova Road Connection – Option 2 is slightly longer than Option 1, 1.8 miles versus 1.7 miles, respectively.

The Jack Brack Road alternatives both require four bridges: two parallel bridges over the future Rummell Road and two parallel bridges over Jack Brack Road. The length of bridges for the Jack Brack Road alternatives is similar and varies from 751 feet with the Diamond Interchange to 774 feet with the Partial Cloverleaf Interchange. The Nova Road Connection alternatives both require four parallel bridges: two over the C-32C canal and two over Sunbridge Parkway. Nova Road Connection – Option 1 requires a total of 946 feet of bridge compared to only 804 feet of structure for Option 2.

The Diamond Interchange at Jack Brack Road is anticipated to operate better in terms of traffic operations as development in the region continues to occur. The corridor annual average daily traffic (AADT) generations for the Jack Brack Road alternatives and the Nova Road Connection alternatives are identical, 30,500 AADT and 19,300 AADT, respectively.

4.7.2 Physical Impacts

Five UAOs were identified in the study limits: CenturyLink, Comcast Communications, Duke Energy, Orlando Utilities Commission, and TWA. Comcast, Duke Energy (Distribution and Transmission), and OUC Lighting indicated that they have no facilities within the project limits.

CenturyLink has buried copper lines present along both sides of Nova Road starting at Sungrove Lane and extending to the west, and also along Absher Road and Cyrils Drive. No impacts to these facilities are anticipated.

OUC has aerial distribution lines along the south side of Nova Road and into the adjacent side street and single-family homes in the project study area. OUC overhead transmission with fiber cable is also present in the study area near Nova Road and the C-32C canal. No impacts to the existing overhead transmission lines are anticipated. The aerial distribution line along Nova Road will be impacted. OUC plans to relocate the line to the north side of Nova Road and estimates the cost of relocation as $20,000. The planned OUC transmission line is anticipated to be parallel to the Northeast Connector on the west side of the roadway. No impacts to the transmission line are anticipated.

TWA has utilities located along Cyrils Drive and is the utility provider for the water treatment plant currently under construction just north of the future Jack Brack Road extension. The utilities along Cyrils Drive will not be impacted by the project. The Northeast Connector alignment parallels the water treatment plant under construction, but no impacts are anticipated.

Two contamination sites are located within the Jack Brack Road alignment and will be impacted with both alternatives: Fish Camp (Medium Rating) and Cattle Dipping Vat (High Rating). No known contamination sites are located within either of the Nova Road Connection alternative alignments. No railroads are located in the study area and, hence, there is no railroad involvement or impacts.

4.7.3 Cultural Impacts

One potential historic resource is located within the Jack Brack Road alignment and will be impacted by both alternatives. The historic resource is an old barn and is recommended ineligible for the National Register of Historic Places. No historic linear resources or archaeological resources are located in the Jack Brack Road alignment. Archaeological occurrences are not eligible for the National Register and are therefore not included as potential archaeological resources.

The Nova Road Connection alternatives cross two historic linear resources: C-32C Canal and Sungrove Lane Canal. Both canals are recommended ineligible for listing in the National Register. The Nova Road Connection – Option 2 impacts one potential historic resource, a bridge over the C-32C canal (discussed in Section 2.20). No archaeological resources are located within the Nova Road Connection Alternative footprints.

4.7.4 Natural Environment Impacts

No conservation easements, mitigation properties, or Bald Eagle nests are located within the study area and, therefore, there are no impacts to these resources.

The Jack Brack Road alternatives have no canal crossings. The Diamond Interchange Alternative has higher floodplain, wetland, and surface water impacts than the Partial Cloverleaf Interchange. The Diamond Interchange results in an additional 10 acres of floodplain impacts, two acres of wetland impacts, and two acres of surface water impacts compared to the Partial Cloverleaf Interchange. The composite species rating is moderate for both alternatives.

Both Nova Road Connection alternatives cross the C-32C canal. The floodplain and surface water impacts are similar between alternatives but the Nova Road Connection – Option 2 alternative has lower wetland impacts. Option 1 has four acres more wetland impacts than Option 2. The composite species rating is moderate for both alternatives.

4.7.5 Socioeconomic Impacts

No community facilities, parks, or trails are impacted by any of the proposed alternatives. As discussed in Section 2.8.1, a trail opportunity, identified as the Osceola County Planning Route, generally follows the planned Northeast Connector alignment. No community cohesion impacts are anticipated since the expressway would traverse through vacant agricultural land that is proposed to be developed into the Northeast District. The Northeast District Conceptual Master Plan planned for the Northeast Connector to bisect the property. Similarly, no socioeconomic impacts to special populations are anticipated since the right-of-way needed for the expressway is currently vacant land. The alternatives under consideration are entirely within the Northeast District and, therefore, all of the right-of-way required for each alternative is considered an impact to planned developments. The Diamond Interchange requires 122.7 acres of planned development compared to the Partial Cloverleaf Interchange which requires 115.3 acres. Nova Road Connection – Option 1 requires less planned development acreage than Option 2, 65.8 acres versus 69.7 acres, respectively.

4.7.6 Right-of-Way Impacts

As discussed above, the Diamond Interchange and Nova Road Connection – Option 2 require slightly more right-of-way than the Partial Cloverleaf Interchange or Nova Road Connection – Option 1. No residential parcels are impacted with any alternatives. The Jack Brack Road alternatives both impact a total of four parcels and the Nova Road Connection alternatives both impact a total of three parcels. All of the parcels impacted are owned by Deseret Ranches.

4.7.7 Cost Estimates

The Jack Brack Road alternatives have similar total costs ranging between $96 million and $97 million. The Diamond Interchange is slightly more expensive at $97 million. The Diamond Interchange has a higher interchange construction cost ($11 million versus $10 million) and mitigation cost ($2 million versus $1 million). The Partial Cloverleaf does have higher total bridge cost ($11 million versus $10 million).

The total costs for the Nova Road Connection alternatives range between $65 million and $76 million with Nova Road Connection – Option 2 being the more expensive option to construct. The primary reason for the higher cost is the increased roadway construction cost ($39 million versus $30 million). The other costs are similar.

The cost estimates are contained in Appendix C.

4.8 Selection of the Preferred Alternative

After considering the various social, cultural, environmental, and engineering issues with all of the alternatives, the Diamond Interchange Alternative, and Nova Road Connection – Option 2 Alternative were determined to be the best alternatives to move forward to the Public Hearing. However, after discussion with OUC, it was revealed that the Diamond Interchange did not accommodate the future transmission line. As a result, modifications to the Diamond Interchange ramps south of Jack Brack Road were proposed, and this new interchange configuration is referred to as the Tighter Diamond Interchange. The Tighter Diamond Interchange and the Nova Road Connection – Option 2 Alternatives are the Preferred Alternative and are discussed in more detail in Chapter 6.

5.0 Project Coordination & Public Involvement

Stakeholder and public involvement have been an integral part of this PD&E Study. Multiple opportunities for participation were provided, including:

- Environmental Stewardship Committee meetings;
- Environmental Advisory Group meetings;
- Project Advisory Group meetings;
- Meetings with various stakeholders (e.g., property owners and utility providers)
- Public Meetings.

Staff from Osceola County regularly attended the first study progress meeting of each month throughout the PD&E study to stay informed of the study progress and provide input.

A summary of the stakeholder involvement is provided below.

5.1 Stakeholder Coordination and Meetings

5.1.1 Environmental Stewardship Committee

In March 2020, the CFX governing board approved the creation of the Environmental Stewardship Committee (ESC). The purpose of the ESC is to assist the CFX Board by providing oversight and guidance for protection of Central Florida's natural environment through conservation and sustainable practices.

A total of four ESC meetings were conducted during the PD&E Study. The first meeting, held on August 20, 2020, was a kickoff meeting to introduce the project study area, the purpose and need, study schedule, and the planned approach to the natural environment analysis. The following questions and comments were asked by the ESC after the presentation:

- The Orange County representative asked what is the distance between the Lake Ajay residential community and the project study area?
    - Approximately three miles away.
- One of the citizen representatives suggested the study include the evaluation and establishment of wildlife corridors.
- The Osceola County representative expressed concurrence that upland habitat and protected species will be encountered and requested that upland habitat impacts be handled in a similar manner as wetland impacts.

The second meeting, held on February 18, 2021, updated the ESC on the study progress including the results of the ACE process and the recommended corridor. The following questions and comments were asked by the ESC after the presentation:

- The Orange County representative asked what are the historic linear resources mentioned in the presentation?
    - Canals
- The Orange County representative also asked if there are any multimodal opportunities?
    - The center median could be used for multimodal opportunities in the future. But currently, no multimodal features are being considered as part of the project.
- The Orange County representative requested the ESC be invited to the upcoming virtual public meeting.
    - The virtual meeting invite was sent to the ESC members.
- One of the citizen representatives expressed support for moving forward with Corridor A.
- The Osceola County representative also concurred with moving forward with Corridor A and also mentioned that the Northeast District identified conservation lands and those should be considered during the study.

The third meeting, held on June 17, 2021, updated the ESC on the study progress including the team's recommendation regarding the Preferred Alternative. The following questions and comments were asked by the ESC after the presentation:

- The Orange County representative asked if the OUC transmission line shown in the presentation is the Magnolia to St. Cloud transmission line which recently submitted their application.
    - The team responded that they believed it was the same, but that they would confirm. After the meeting, that information was confirmed, and an email was sent to the representative with that confirmation.
- The Osceola County representative requested that the study team evaluate wildlife crossings for the Preferred Alternative. The goal would be to give wildlife a clear corridor to cross the expressway and keep them away from the planned neighborhoods.
    - The study team agreed to evaluate wildlife crossings.
- The Osceola County representative also asked if gopher tortoise or sand skink surveys were performed for the study?
    - No species surveys were conducted during the PD&E study.
- One of the citizen representatives asked for a comparison of the wetland impacts to the Northeast District Conceptual Master Plan to determine if these wetlands were set aside for preservation or were planned for transportation construction or other development.

- The citizen representative also supported the Osceola County representative's request regarding evaluation of wildlife crossings. He also stated that it would be helpful to show the scrub acreage in the matrix as well.
- The Lake County representative concurred with the citizen representative's request for a categorization of future land use adjacent to the project.

The fourth meeting was held on August 19, 2021 to get a recommendation from the ESC that the CFX Board should move forward to a Public Hearing with the Preferred Alternative. The study team also addressed questions and comments from the third ESC meeting. The following questions and comments were asked by the ESC after the presentation:

- The Orange County representative asked how the species effect determinations were made.
    - The team responded that the species effect determinations were made as part of the Natural Resources Evaluation (NRE) report.
- The citizen representative asked for confirmation that the project would impact 28 acres of "preserved wetlands."
    - The team clarified that 27 acres of "preserved wetlands" would be impacted by the project, based on the 2010 Northeast District Conceptual Master Plan information which does not align with the more recent GIS wetlands data. The majority of that acreage is a result of the Jack Brack Road interchange, which was not shown in the 2010 plan.
- The citizen representative also asked if any protected upland habitat is impacted by the project.
    - The team responded that no known preserved uplands are impacted.
- The citizen representative asked if the "preserved wetlands" from the 2010 plan would be mitigated for by the purchase of mitigation bank credits?
    - The study team clarified that according to the GIS data, only 10 acres of wetlands are actually impacted by the project.
    - CFX stated that their preferred method of mitigation is through mitigation banks. At this time, no other mitigation methods have been vetted.
    - The citizen representative acknowledged the 10 acres of impacts and stated that the number may continue to evolve throughout the project based on better wetland information and tweaks to the alignment. However, he pointed out that the 2010 Northeast District Conceptual Master Plan included a commitment to conservation, and this project reduces that commitment. He recommended adding the equivalent area of conservation land for the "preserved wetlands" impacted.

- CFX stated that Osceola County is actively going through updates to the Northeast District Conceptual Master Plan and that the Northeast Connector footprint will be accounted for in the plan update.
- The Osceola County representative confirmed that the master plan updates are ongoing and added that more wildlife corridors and parkland are included in the plan update. So the mitigation for the "preserved wetlands" shown in the original plan will be handled through the master plan update.

- The citizen representative made a motion to recommend to the project move forward to a Public Hearing. The Osceola County representative seconded the motion. The motion passed unanimously.

5.1.2 Environmental Advisory Group

An Environmental Advisory Group (EAG) was formed to provide input for this study. As a special advisory resource to CFX and the consultant team, the EAG provided input regarding local knowledge, issues, and concerns as well as the environmental analysis and potential project impacts. A total of two EAG meetings were conducted during the PD&E Study.

The first meeting, held on December 15, 2020, at 9:30 a.m., was a kickoff meeting for the project introducing the history of the Northeast Connector, the project study area, the two corridors under evaluation, the environmental and social impacts for each corridor, and an evaluation matrix. Nine EAG members participated in the meeting and a list of those in attendance can be found in the Comments and Coordination Report, available under separate cover. The following questions and comments were asked by the EAG after the presentation:

- The Audubon Society representative agreed with Corridor A in terms of viability but expressed concern about connectivity to the larger limited access system and whether this segment ultimately gets expanded to the east or to the south. The representative also expressed interest in having wildlife crossings for upland and wetland species.
- The Osceola County representative expressed support for Corridor A as the preferred corridor. The representative requested that the study team identify areas where the road would elevate over wetlands. Osceola County also suggested that wildlife crossings for upland and wetland species be considered and recommended that the USFWS be involved in that process. The Osceola County representative also requested the study team consider the conservation easements included in the Northeast District.
- The Breedlove, Dennis, and Associates (BDA) representative expressed agreement with Corridor A because it matches the Northeast District layout. The Northeast District Comprehensive Plan has provisions for wildlife crossings. The BDA associate noted that Phase 1 of the Northeast District has been permitted and is under

construction. Coordination with Tavistock and Suburban Land Reserve should continue throughout the project development process. The study team requested the gopher tortoise permitting information from the Sunbridge permitting process be provided (BDA emailed the applicable information after the meeting).

- The City of St. Cloud representative mentioned that the study area is in a joint planning area but that the project is outside of their City limits. The City's primary focus will be on operational impacts to Nova Road.
- Deseret Ranches also expressed support for Corridor A moving forward. The Deseret Ranches representative mentioned that OUC is planning a transmission line on the west edge of the Northeast District until it turns west towards an existing substation.

The second meeting, held on September 30, 2021, at 9:30 a.m., was a follow-up meeting to explain the alternatives evaluated and the team's recommendation for a preferred alternative. An evaluation matrix with the engineering, physical, cultural, social, and natural environment impacts for each alternative was also presented. Fifteen EAG members participated in the meeting and a list of those in attendance can be found in the Comments and Coordination Report, available under separate cover. The following questions and comments were asked by the EAG after the presentation:

- A representative from St. Johns River Water Management District stated that the project would be under the South Florida Water Management District when the project gets to the permitting phase.
- A representative from the Audubon Society asked for additional explanation on why a moderate species rating was assigned to the alternatives. The study team explained that the moderate rating was primarily assigned based on the potential for gopher tortoise habitat. However, no good high quality scrub habitat was found during field reviews. The Audubon Society asked if formal scrub jay surveys had been completed. The study team indicated that no specific species surveys were performed during the PD&E study and that they would be completed during final design. The Audubon Society representative stated that east-west wildlife corridor crossings should be considered in future phases. He also requested that any mitigation for wetlands and uplands be done within the Northeast District.
- The BDA representative stated that they have performed official scrub jay surveys on the property and have not encountered any within the Northeast Connector study area.
- The Osceola County representative stated that he supported the Preferred Alternative recommendations for the Tighter Diamond and Nova Road Option 2.
- A representative from the Nature Conservancy asked when the locations of future eco-passages would be determined and designed. The study team responded that one of the PD&E Study commitments is to evaluate wildlife crossings further during the

design phase. At that time, the specific number and location of crossings would be determined.

- A representative from FFWCC asked if any species surveys were done during the PD&E Study. The study team stated that species surveys were not performed during the PD&E Study and that they would be done during the final design phase. The FFWCC representative asked for the commitment regarding future species surveys to include coordination with FFWCC in addition to USFWS. The study team agreed to that modification. The representative also requested that coordination with FFWCC occur during the planning and design of the wildlife crossings.
- A representative from Defenders of Wildlife asked what type of species would the wildlife crossings be able to accommodate. The study team stated that no coordination with FFWCC has occurred regarding the size and number of crossings, however, it is believed that large mammal crossings would be beneficial in this area.
- The moderator of the EAG from Dewberry asked the BDA representative if there was guidance within the Northeast District plans on what species would be served with the planned wildlife crossings. The BDA representative stated that yes, corridors were reviewed by the Fish and Game Commission and connections will be designed appropriately based on the species that are anticipated. The report with those findings is eight to 10 years old.
- A representative from the USFWS asked about the project north of this project and potential impacts to conservation land. The study team stated that the Northeast Connector starts south of Cyrils Drive and does not impact any conservation property. A separate study was completed to the north of this project that does impact approximately 160 acres of Split Oak Forest and results in an additional 1,550 acres of mitigation property for compensation.
- The representative from Deseret Ranches thanked the project team for coordinating with all the stakeholders and doing a thorough job.

5.1.3 Project Advisory Group

A Project Advisory Group (PAG) was formed to provide input for this study. As a special advisory resource to CFX and the consultant team, the PAG provided input regarding local knowledge, issues, and concerns as well as the mobility analysis and project alternatives. A total of two PAG meetings were conducted during the PD&E Study.

The first meeting, held on December 15, 2020, at 1:30 p.m., was a kickoff meeting for the project introducing the history of the Northeast Connector, the project study area, the two corridors under evaluation, the environmental and social impacts for each corridor, and an evaluation matrix. Twenty PAG members participated in the meeting and a list of those in attendance can be found in the Comments and Coordination Report. The following questions and comments were asked by the PAG after the presentation:

- Florida's Turnpike asked if any traffic information was available that could be shared?
    - The project team responded that the only traffic information available at that time is the AADT for each corridor. The average AADT for Corridor A is 24,100 and Corridor B is 17,400, those estimates do not include any extensions to the south or east.
- Osceola County stated that Corridor A is consistent with the adopted Northeast District Conceptual Master Plan and, therefore, the county is in favor of that corridor.
- OUC asked about the PD&E Study schedule and when construction could start?
    - A financial viability analysis will be prepared on the Preferred Alternative. Until that analysis is complete, it is not known if the project will move forward. There is no funding in the five-year work program for design or construction.
- The East Central Florida Regional Planning Council (ECFRPC) representative asked about the scale of the maps and stated that ECFRPC does not yet have an opinion on the project but does not agree with how CFX builds roads that promote growth.
- Deseret Ranches stated that this project was part of the Governor's Task Force in 2013 and that this study has a long, well thought-out history.
- Florida's Turnpike concurred with moving forward with Corridor A.
- Osceola County supported what Deseret Ranches stated regarding the project's long history.

The second meeting, held on September 30, 2021, at 1:30 p.m., was a follow-up meeting to explain the alternatives evaluated and the team's recommendation for a preferred alternative. An evaluation matrix with the engineering, physical, cultural, social, and natural environment impacts for each alternative was also presented. Fourteen PAG members participated in the meeting and a list of those in attendance can be found in the Comments and Coordination Report, available under separate cover. The following questions and comments were asked by the PAG after the presentation:

- A representative from Florida's Turnpike Enterprise asked why the Tighter Diamond Interchange was selected as the Preferred Alternative. The study team responded that the Tighter Diamond Interchange is still a diamond interchange configuration, the tight aspect is along the mainline, not on the cross road. The tightening of the ramps in the southwest and southeast quadrants resulted in a significant reduction in surface water and wetland impacts.
- A representative from OUC stated that she had no questions; the concepts reflect the latest revisions that were discussed, and OUC appreciates the ongoing coordination from the study team.

- An Osceola County representative echoed the comments from OUC and thanked the study team for the coordination on this project. Osceola County stated that the Preferred Alternative is a good transportation facility that minimizes impacts.
- A representative from the Greater Osceola Partnership for Economic Prosperity asked how much Nova Road Option 2 costs and what the timeline is for constructing the project. The study team referred back to the alternatives matrix and showed that the Nova Road Option 2 Alternative costs approximately $73 million. The timeline for the project will depend on whether the CFX Governing Board votes to approve/advance the project after the completion of the PD&E Study early next year.
- A Deseret Ranches representative thanked the study team for their extensive coordination with stakeholders and for finding a solution for fitting the roadway and a transmission corridor into a tight area near the proposed Jack Brack Road extension.
- A representative from MetroPlan Orlando stated that she was happy the study team was able to minimize impacts by selecting the Tighter Diamond Interchange at Jack Brack Road and that she supports that recommendation.
- A representative from Osceola County Schools said she had no questions at this time but she did inform the study team that Osceola County is building a bus facility on Nova Road to the southwest of the expressway termination location, across from the Estates of Westerly.

5.1.4 Stakeholder Meetings

In addition to the ESC, EAG, and PAG meetings described above, stakeholder meetings were also held with Deseret Ranches, Suburban Land Reserve (SLR), Tavistock Development Company (Tavistock), and OUC.

On October 2, 2020, at 9:30 a.m. a virtual meeting was held with Deseret Ranches and SLR to discuss the project. A brief presentation on the study area, purpose and need, project constraints, current corridors being evaluated, and study schedule were reviewed. The following is a synopsis of the major discussion items:

- Confirmation that scrub habitat does not refer to scrub-jay habitat.
- Request for information on CFX plan beyond Nova Road.
    - CFX discussed the OBCC project, and that the Northeast Connector CF&M study did not indicate the corridor being ready for the PD&E phase.
- SLR provided an update on the status of the Del Webb and Sunbridge construction and permitting efforts, respectively.
- SLR provided a map showing the future OUC transmission corridor in the study area and suggested a meeting to discuss impacts with OUC.

- The study team briefed the group on the timeline for field reviews and discussed the protocols to use before entering the property.
- Discussed having a call between BDA and the RS&H environmental scientist to discuss the property and previous studies.

On October 16, 2020, at 8:00 a.m. a virtual meeting was held with Tavistock to discuss the project. A brief presentation on the study area, purpose and need, project constraints, current corridors being evaluated, and study schedule were reviewed. The following is a synopsis of the major discussion items:

- Discussion on planned 330-foot typical section and Tavistock reserving land between Del Webb and Sunbridge for the expressway.
- Discussion on OUC transmission line and potential CADD for the proposed alignment.
- Tavistock provided an update on the status of the Sunbridge permitting. The project team requested Sunbridge Neighborhoods C and D files in CADD format.
- Tavistock noted that Corridor B would not be ideal in regard to their planned developments. The project team requested the Northeast District Conceptual Master Plan CADD files.
- Discussion on planned Jack Brack Road interchange and spacing between other interchanges.
- Tavistock provided a potential build-out timeline for their projects in the study area.

On October 23, 2020, at 2:00 p.m. a virtual meeting was held with OUC and their consultant, Burns McDonnell to discuss the proposed 230-kV transmission line in the study area. The following is a synopsis of the major discussion items:

- The OUC Consultant Project Manager showed a map with the proposed transmission corridor starting at Mag Ranch in Orange County, to Sunbridge Parkway, to SR 534, to the Northeast Connector alignment.
- The OUC plan is for the transmission line to go underground at the SR 534 and Cyrils Drive Interchange. OUC would need an easement from CFX for the underground portion. OUC would prefer for the underground portion to run in a straight line with minor shifts to avoid ponds/neighborhoods as needed.
- CFX stated that a linear easement through the CFX right-of-way would be atypical. Additional details regarding requirements, access, and spacing will need to be determined.
- The project team provided an update on the Northeast Connector PD&E Study and informed the group that two 2,000-foot wide corridors were being evaluated as part of an Alternatives Corridor Evaluation process. Once a corridor is selected, alignments with 330-foot typical sections will be developed.

- OUC stated that they anticipate submitting a 100-foot wide transmission corridor that is generally adjacent to the original alignment for the Northeast Connector. It will take approximately one-year for the State of Florida to review and approve the plan. Once the 100-foot corridor is approved, OUC will determine the exact alignment within that corridor. If necessary, OUC can use a less than 100-foot wide corridor, but doing so will increase the frequency of structures and project cost.
- OUC shared that Tavistock has requested they stay on the west side of the proposed Northeast Connector.
- OUC stated that the transmission corridor extending along Narcoossee Road was not well received by the public and is no longer under consideration.

On April 1, 2021, at 10:00 a.m. a virtual meeting was held with Deseret Ranches, SLR, and Tavistock to discuss the project. The focus of the meeting was to discuss potential pond locations. The following is a synopsis of the decisions regarding pond locations:

- Pond 7B is preferred over Pond 7A. Pond 7A conflicts with a water management district easement.
- Floodplain Compensation (FPC) Bullock is in an ideal location.
- Ponds 5A and 6A are located within the roadway right-of-way footprint and are recommended.
- Ponds 3A, 3B, and 4B are all reasonable pond sites and utilize the area between the Northeast Connector and Lake Joel.
- Project team will evaluate moving FPC Joel to be located between Ponds 3A, 3B, and 4B (it was determined after the meeting to be feasible).
- Deseret Ranches commented that the Northeast Connector needs to overpass the planned Sunbridge Parkway. The project team will evaluate if this is feasible (it was determined after the meeting to be feasible).
- RS&H agreed to send a kmz file of the potential pond sites to the group.
- Tavistock agreed to send any proposed development CADD files for projects located near or adjacent to the Northeast Connector.

On May 4, 2021, at 1:00 p.m. a virtual meeting was held with OUC, their consultant, Burns McDonnell, Tavistock, and SLR to discuss the proposed 230-kV transmission line in the study area. The following is a synopsis of the major discussion items:

- The OUC Consultant Project Manager asked for confirmation that the alternatives sent on April 13, 2021 are the latest and that a 100-foot easement is still being reserved. RS&H confirmed that was correct.
- The OUC Consultant Project Manager focused the discussion on a pinch point in the OUC alignment near Bullock Lake. The current roadway alignment would result in the transmission poles being located in Lake Bullock. The OUC consultant stated that

the structure required for the transmission poles to be located in the lake would be very large and expensive. Tavistock and SLR also stated that the appearance of the poles would be a major negative for future development.

- The group discussed several potential solutions and ultimately determined that RS&H would evaluate if a shift in the southeast quadrant ramp at the Jack Brack Road Interchange is feasible to avoid Bullock Lake. The OUC consultant will also evaluate potential solutions that do not require interchange modifications.
- A follow-up meeting was set for May 14th.

On May 14, 2021, at 10:00 a.m. a virtual meeting was held with OUC, their consultant, Burns McDonnell, Tavistock, SLR, and Deseret Ranches to discuss solutions for the pinch point in the transmission line alignment near Bullock Lake. The following is a synopsis of the major discussion items:

- The OUC Consultant Project Manager walked through some of the solutions they developed that did not require modifications to the Jack Brack Interchange:
    1. The transmission line crosses the Northeast Connector mainline alignment north of the interchange and then travels along the east side of the expressway and then cross back to the west side, south of Bullock Lake.
        - Least preferred from the developer standpoint due to future development impacts.
        - CFX stated that perpendicular and diagonal crossings are acceptable.
    2. The transmission line goes underground for approximately 3,600 feet.
        - CFX does not recommend this option. To allow for an underground crossing, CFX would need to show a hardship requirement.
        - OUC also does not support this option due to cost and future maintenance issues.
    3. The transmission line travels along the west side of Bullock Lake before aligning with the expressway.
        - Not preferred by OUC due to additional expense related to the longer distance.
    4. The transmission line crosses the expressway ramps in multiple places and the poles are located within the limited access right-of-way.
        - Not desirable for CFX.
- Discussion then transitioned to potential adjustments in the Jack Brack Road Interchange. RS&H sent an updated interchange concept to Burns McDonnell on Wednesday, May 12, 2021, for their review. The lead Burns McDonnell transmission engineer is out sick this week. It was determined that he would evaluate the revised alignment and determine if it could accommodate the OUC transmission line.

    - On Monday, May 17, 2021, OUC notified RS&H that the revised interchange (Tighter Diamond Interchange) is acceptable.

On July 26, 2021, at 3:00 p.m. a virtual meeting was held with Deseret Ranches, SLR, Tavistock, and Breedlove, Dennis, and Associates (BDA) to discuss the project. The focus of the meeting was to discuss potential wildlife crossings and land preservation. The following is a synopsis of the meeting discussion:

- The 2010 Northeast District Development Program map was discussed regarding the "preserved wetlands." RS&H asked for the raw files to create the map.
    - BDA stated that the Northeast Connector follows the ridge between wetlands and utilizes mostly upland.
    - Tavistock stated that Osceola County created the map and should be able to provide the base GIS files to recreate it.
    - SLR stated that Osceola County will be approving a new Planned Development which will supersede the 2010 Northeast District Comprehensive Plan in August.
- Locations for potential wildlife crossings for the Northeast Connector, Jack Brack Road, and Nova Road were discussed.
    - BDA explained that the original 2010 Northeast District Plan included preliminary information on wildlife linkages. The plan also included discussions related to size of culverts and bridges and how the roadways would interact with those wildlife corridors. Osceola County reviewed the information and requested that more detailed information be submitted during the detailed neighborhood development/permitting phase.
    - Tavistock stated that there are approved concept plans for the northwest part of the study area and that permits have been obtained for the areas northwest of Lake Myrtle and west of Bullock Lake. The concept plans include Habitat Conservation Plans (HCPs) which provide more detailed information on wildlife crossings and linkages. Tavistock suggested that the study team follow-up with Osceola County to receive those HCPs.

5.2 Public Involvement

Two public meetings were conducted for this study: a Public Information Workshop, and a Public Hearing. The following sections provide summaries of these meetings. The Comments and Coordination Report, available under separate cover, contains a more detailed summary of each meeting and includes the public comments from each meeting.

5.2.1 Public Information Workshop

A Public Information Workshop was held Wednesday, March 10, 2021, from 6:30 p.m. to 7:30 p.m. via the ON24 electronic platform.

Public meeting invitation letters were sent on Monday, February 22, 2021, by mail to 27 elected officials, as well as to 89 local, regional, state, and federal agency contacts. Invitation letters were also mailed to 368 property owners and tenants adjacent to the study area. The public workshop was advertised in the Orange and Osceola County editions of the Orlando Sentinel on Sunday, February 28, 2021 and Sunday, March 7, 2021. An ad was printed in the Florida Administrative Register (FAR) on Friday, February 19, 2021, and a press release was distributed to major media outlets on March 3, 2021.

The workshop began at 6:30 p.m. with a live presentation explaining the project and current alternatives under consideration, followed by a question-and-answer (Q&A) period. At 7:00 p.m., the live presentation was given a second time followed by a second round of Q&A. During the virtual workshop, project representatives were available to discuss the study, receive input and answer questions that audience members submitted via the chat function.

A total of 29 people registered to attend the Public Information Workshop including:

- Ricky Booth, Osceola County Commissioner
- Vivian Rodriguez, Office of Congressman Darren Soto
- Juan Lopez, Office of Congressman Darren Soto
- Beverly Hughes, Osceola County Public Schools
- Beth Jackson, Orange County
- Joshua DeVries, Osceola County
- Laura Kinsler, The GrowthSpotter
- Nick Lepp, MetroPlan Orlando

A total of 19 attendees participated in the virtual workshop, and 13 questions and comments were received. One question was received within the 10-day comment period following the meeting. More information on the virtual workshop is provided in the Comments and Coordination Report, available under separate cover.

5.2.2 Public Hearing

A hybrid Public Hearing was held on Thursday, November 18, 2021, from 5:30 p.m. to 7:30 p.m. The hybrid event consisted of an in-person and virtual component.

Public Hearing invitation letters were sent on Thursday, October 28, 2021, by mail to 18 elected officials, as well as to 93 local, regional, state, and federal agency contacts. Invitation letters were also mailed to 490 property owners and tenants adjacent to the study area. The Public Hearing was advertised with legal ads in the Osceola edition of the Orlando Sentinel on Sunday, November 7, 2021 and Sunday, November 14, 2021 as well as the Osceola News-Gazette on Thursday, November 4, 2021 and Thursday, November 11, 2021. An ad was printed in the FAR on Monday, November 1, 2021, and a press release was distributed to major media outlets on Tuesday, November 9, 2021.

The draft environmental and engineering reports were placed on display from October 20 to November 29, 2021 on the study's webpage and at the following locations:

<u>Central Florida Expressway Authority</u>
4974 ORL Tower Road, Orlando, FL 32807
Monday to Friday, 8 a.m. – 5 p.m.

<u>Osceola County Library - St. Cloud Branch</u>
810 13th Street, St. Cloud, FL 34769
Monday to Thursday, 9 a.m. to 9 p.m.;
Friday to Saturday, 9 a.m. to 6 p.m.; and
Sunday, 12 p.m. to 6 p.m.

The in-person hearing was held at St. Cloud High School and started with an open house from 5:30 p.m. to 6:30 p.m. where participants were welcome to view displays, ask questions of the study team, and provide comments. Displays included the preferred alternative, the evaluation matrix, the typical section, and social and environmental constraints. Following the open house, a pre-recorded presentation was played and a formal comment period was held. The virtual meeting was held simultaneously and consisted of the same pre-recorded presentation on loop and the ability for attendees to post questions and comments in the chat for team members to answer. Comments made in the chat were then read into the transcript at the in-person meeting.

A total of 30 attendees – 15 community members and 15 staff members – signed in at the Public Hearing. Most of those attendees were from the Del Webb Sunbridge neighborhood. Don Whyte of Deseret Ranches and Isai Chavez of Osceola County Planning were among the attendees. For the virtual Public Hearing, 31 people registered but only 21 attended, including representatives from Toho Water Authority and the School District of Osceola County.

Two written comments were received at the in-person Public Hearing, and two were given orally to the court reporter. During the virtual Public Hearing, three people asked questions or commented. One organization submitted comment during the 10-day comment period following the Public Hearing. The information below reflects the general nature of the comments received.

- Katrina Shadix of Bear Warriors United wrote her comment and read it during the formal comment period. She advocated for the No-Build option but said if it was going to be built, CFX should consider state of the art wildlife passages, dark skies lighting, etc. She also requested that CFX stop using chemical sprays for weed control due to adverse effects on local wildlife. Ms. Shadix did praise CFX for encouraging participation by the environmental community and for creation of the Environmental Stewardship Committee.
- James and Valerie Griffin live in Del Webb Sunbridge and they expressed concerns with the proximity of planned SR 534 to the east side of the community. They stated that SR 534 would place traffic behind their home and they would like the roadway to be far enough away from their property, so they do not see the road or hear the noise from traffic.
- During the virtual Public Hearing, Dan Smith of Defenders of Wildlife commented how the project would adversely impact wildlife in the area and change the character of this area from rural to urban.
- Following the Public Hearing, Defenders of Wildlife Executive Director Elizabeth Fleming, submitted comments regarding impacts to regional resources and wildlife habitat connectivity. Ms. Fleming recommended that the PD&E Study include commitments for wildlife crossing structures as part of the proposed project.
- Other questions included concerns about the proximity of the expressway to the Del Webb Sunbridge community, possibility of sound walls, and the anticipated construction timeline.

More information on the Public Hearing is provided in the Comments and Coordination Report, available under separate cover.

6.0 Design Features of the Preferred Alternative

As mentioned in Section 4.8, the Tighter Diamond Interchange and the Nova Road Connection – Option 2 Alternatives were selected as the Preferred Alternative. This chapter details the design features, impacts, and characteristics of the Preferred Alternative. Appendix B contains the conceptual plan and profile sheets for the Preferred Alternative.

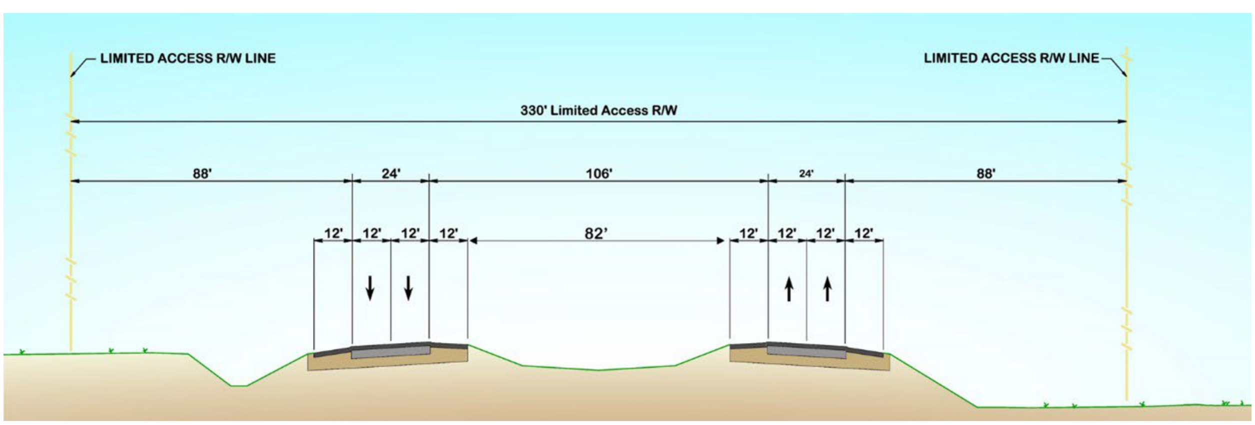
6.1 Engineering Details of the Preferred Alternative

The Tighter Diamond Interchange is identical to the Diamond Interchange described in Section 4.5.1 except for the configuration of the two ramps located south of Jack Brack Road. To accommodate the planned OUC transmission line, the ramp in the southwest quadrant of the interchange needed to be tightened to allow space for transmission poles to be placed west of the limited access right-of-way, east of Lake Bullock. The southeast quadrant ramp was similarly tightened to minimize wetland impacts. The tightening of the two ramps required a change to the mainline profile. A complete description of the horizontal and vertical features of the Preferred Alternative is contained in Section 6.1.4.

6.1.1 Typical Sections

The proposed typical section features two 12-foot travel lanes in each direction flanked by 12-foot paved inside and outside shoulders. The proposed median width is 82 feet wide, which can accommodate future widening. The ultimate typical section features an eight-lane section and two potential multi-use lanes with a concrete median barrier wall. The proposed typical section requires 330 feet of limited access right-of-way, which includes a border width of 88 feet on both sides of the Northeast Connector as shown on Figure 6.1.1. Additional typical sections for the cross roads and ramps are provided in Appendix D – Typical Section Package.

Figure 6.1.1: Proposed Typical Section



6.1.2 Bridges and Structures

The Preferred Alternative includes four sets of twin bridges that cross the following features:

- Planned Rummell Road;
- Planned Jack Brack Road;
- Existing C-32C canal; and
- Planned Sunbridge Parkway.

All bridges accommodate a 16.5-foot vertical clearance over side roads and a 15-foot vertical clearance above the highest berm elevation for canal crossings. A bridge deck depth of 10 feet is assumed. All bridges will utilize prestressed Florida I-Beam girders and the substructures will be comprised of concrete end bents at begin and end supports. Full height Mechanically Stabilized Earth (MSE) walls will extend between each parallel bridge and slope down at 3:1 to the finish grade elevation to the left and right of the bridge limits. The walls are assumed to be oriented parallel to the crossing feature only and do not wrap around the bridge cone of the Northeast Connector embankment.

The Preferred Alternative begins with parallel single-span bridges spanning 175 feet over the future Rummell Road. The 40-degree bridge skew angle provides an opening of approximately 120 feet between MSE walls.

Further south along the Preferred Alternated, a set of single-span bridges will span 173 feet over the future Jack Brack Road. These tangent bridges are on a 19-degree skew and provide a minimum opening of 153 feet between MSE walls.

The 261-foot-long twin bridges over the C-32C canal cross at a 23-degree skew and are comprised of two spans. The first span crosses the maintenance berm and is 116 feet in length; while the second span crosses the canal and is 145 feet in length. A pile bent will be used at the intermediate support.

The southernmost crossing is on a slight horizontal curve as it traverses the future Sunbridge Parkway. The 172-foot-long bridges consist of two 86-foot-long spans supported by multi-column piers at the intermediate support. The parallel bridges cross at a slight skew.

6.1.3 Right-of-Way Relocations

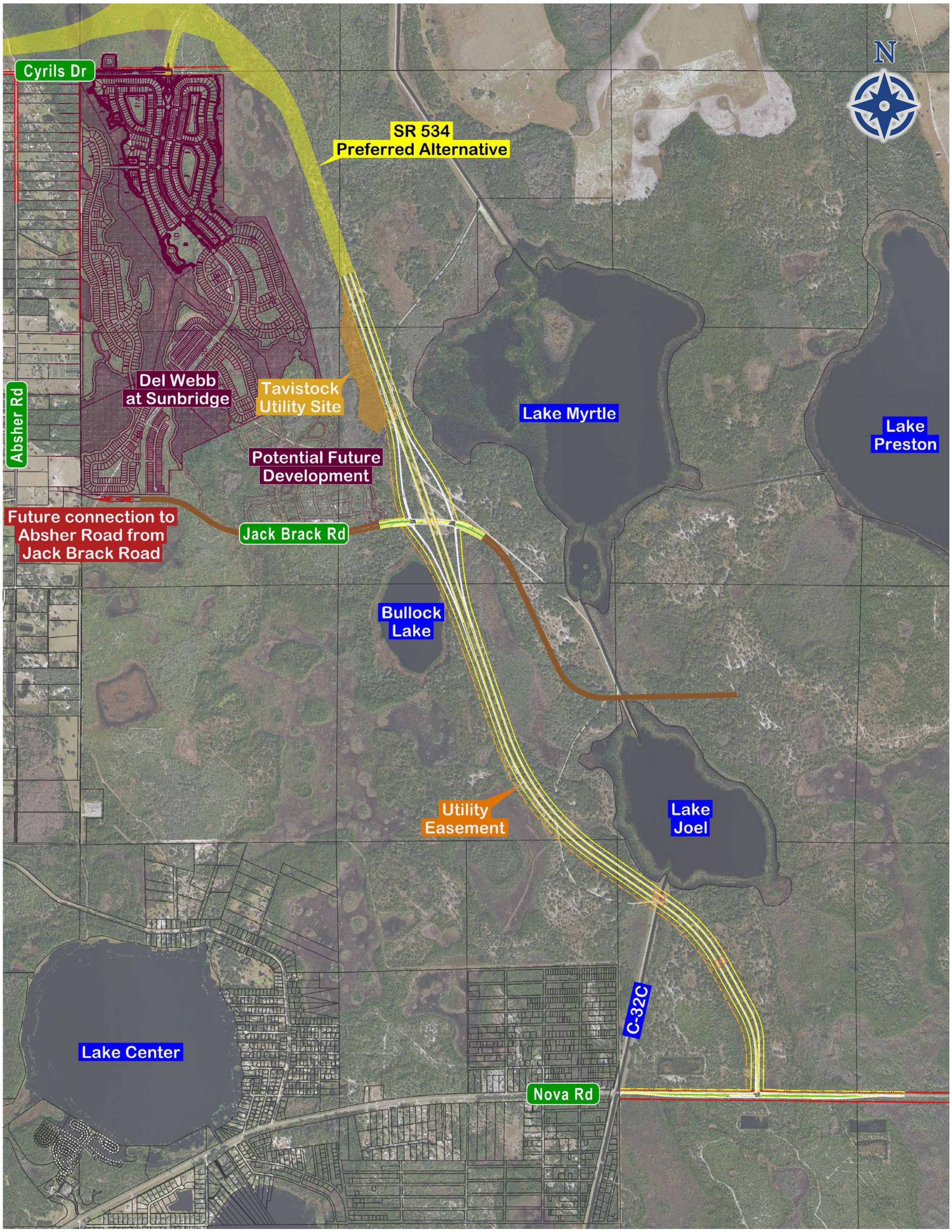
The roadway Preferred Alternative impacts six parcels, owned by one property owner, Deseret Ranches. A total of 184.6 acres of right-of-way are needed for the roadway portion of the Preferred Alternative. The preferred pond and floodplain compensation sites will require another 57.1 acres and will impact one additional parcel, also owned by Deseret Ranches. No relocations are anticipated as a result of the proposed improvements.

6.1.4 Horizontal and Vertical Geometry

The mainline alignment extends south from the proposed SR 534 Preferred Alternative via a 10,038-foot tangent. The alignment is located between the Del Webb community to the west and the planned Sunbridge neighborhoods to the east. Continuing further south, the alignment is located just east of the Tavistock utility site, currently under construction. The mainline alignment then continues between Lake Myrtle and Bullock Lake, remaining close to the east side of Bullock Lake. The mainline alignment overpasses Jack Brack Road, where an interchange is proposed.

South of the Bullock Lake, a 5,000-foot radius curve that is 3,122 feet long shifts the alignment closer to Lake Joel. The alignment then continues on a tangent for 1,912 feet as it crosses the C-32C canal, at which point it begins to curve in a more southerly direction for 1,584 feet via a 3,500-foot radius curve. The alignment continues on a tangent for 1,155 feet before curving to a more southerly bearing to become perpendicular to Nova Road. This curve is 844 feet long and has a radius of 1,641 feet, followed by an 894-foot tangent connecting to Nova Road. An overview of the Preferred Alternative is shown on Figure 6.1.2.

Figure 6.1.2: Preferred Alternative Overview

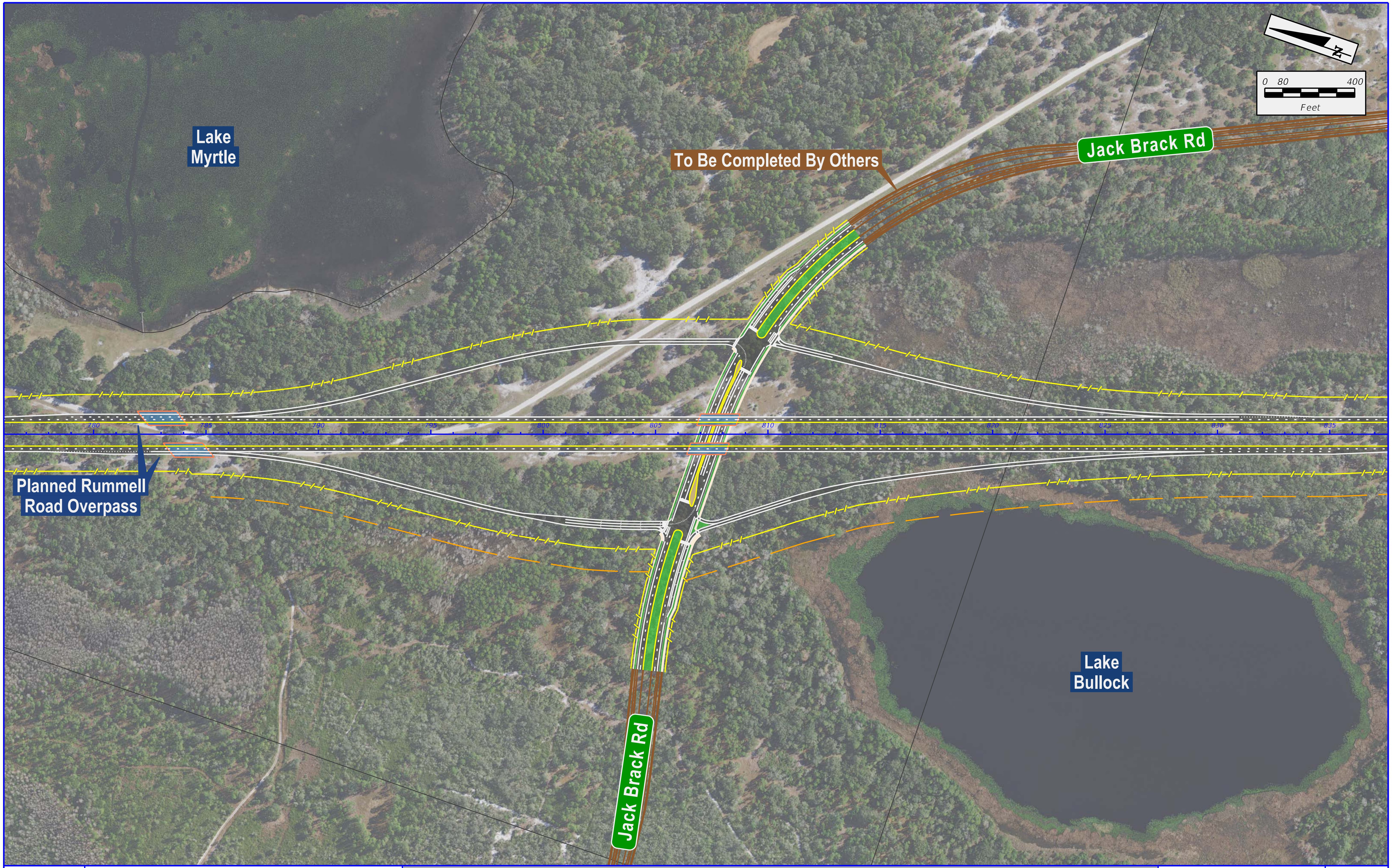


Tighter Diamond Interchange

The Tighter Diamond Interchange consists of two exit ramps and two entrance ramps with each quadrant of the interchange containing one ramp as shown on Figure 6.1.3. The exit ramp for the southbound lanes is located in the northwest quadrant of the interchange. The one-lane exit is designed using a 751-foot-long curve with a 2,985-foot exiting radius, followed by a 550-foot tangent segment and a 755-foot-long curve with a radius of 3,000 feet, before a short tangent connecting the ramp to Jack Brack Road. Through the second curve, the ramp widens to develop a second lane approximately 350 feet prior to the signalized intersection.

The exit ramp for the northbound lanes is located in the southeast quadrant and has the same design elements as the southbound exit ramp in that it is a single lane exit ramp that develops into a two-lane ramp prior to a signalized intersection. This ramp utilizes a 1,030-foot-long curve with a radius of 5,169 feet and a 790-foot tangent.

The entrance ramp for the southbound lanes is located in the southwest quadrant while the entrance ramp for the northbound lanes is located in the northeast quadrant. Both ramps begin as two-lane ramps before tapering into single-lane ramps as they enter the mainline alignment. The geometry of the entrance ramp for the southbound lanes consists of a 330-foot-long tangent followed by a 293-foot-long curve with a radius of 3,800 feet, then a 1,557-foot-long curve with a radius of 11,859 feet that acts as a tangent. The geometry of the entrance ramp for the northbound lanes consists of a 347-foot-long tangent followed by a 755-foot-long curve with a radius of 3,000 feet, then a 550-foot-long tangent, and a 751-foot-long curve with a radius of 2,985 feet.



CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed L/A Right-of-Way
- Potential OUC Utility Easement
- Property Lines
- Proposed Barrier Wall
- Proposed Pavement
- Proposed Structure

Figure 6.1.3:
Jack Brack Road
Tighter Diamond Interchange

SHEET NO.
6-6

Local Roadways

The existing Jack Brack Road is a two-lane, east-west corridor that travels from Narcoossee Road to Absher Road. An extension of Jack Brack Road is proposed by another entity and is planned to extend east from Absher Road, through the proposed Northeast District and under the Northeast Connector mainline. The 0.42-mile portion of Jack Brack Road included in this PD&E Study is a four-lane divided roadway with a 40-foot median. The PD&E Study portion of the roadway is proposed to tie-into the planned two-lane extension of Jack Brack Road starting with a 400-foot tangent oriented in the northeast direction. A 2,580-foot radius curve that is 585 feet shifts the alignment to an easterly direction just before the western most ramps for the Tighter Diamond Interchange. The alignment continues on a tangent for 530 feet under the Northeast Connector mainline. A 2,055-foot curve carries the alignment from under the northbound overpass through the interchange improvements with an 1,810-foot radius oriented in a southerly direction. The ramp intersections on Jack Brack Road are located approximately 850 feet apart. Figure 6.1.4 shows the proposed Jack Brack Road improvements.

Nova Road is currently a two-lane undivided, east-west roadway that travels from US 192 to SR 520. The Nova Road improvements associated with this PD&E Study begin east of the C-32C canal and extend for approximately one-mile and include flaring out to a four-lane divided roadway with a 40-foot median. The proposed alignment was engineered so that the proposed westbound lanes are in alignment with the existing roadway. The eastbound lanes would be constructed to the south of the existing Nova Road. The transition from a two-lane to a four-lane divided roadway was accomplished by following the guidance of Chapter 210 of the FDOT Design Manual. The improvements begin with a 7,321-foot radius curve for 254 feet. The alignment continues with a 225-foot tangent before the transition from a two-lane undivided roadway to a four-lane divided roadway begins. A reverse curve begins the transition with the first curve having a 7,892-foot radius that directs the alignment to the south for a total of 451 feet followed by the second curve that turns the alignment due east with a 11,641-foot radius for 688 feet. A 3,055-foot tangent runs parallel to the existing Nova Road followed by the eastern transition from the four-lane divided roadway down to the existing undivided two-lanes. A 6,000-foot radius curve brings the alignment to the north for 420 feet, followed by a 60-foot tangent. A 5,370-foot radius curve extending 375 feet brings the alignment due east, tying into the existing Nova Road with a 500-foot tangent. Figure 6.1.5 shows the proposed Nova Road improvements.

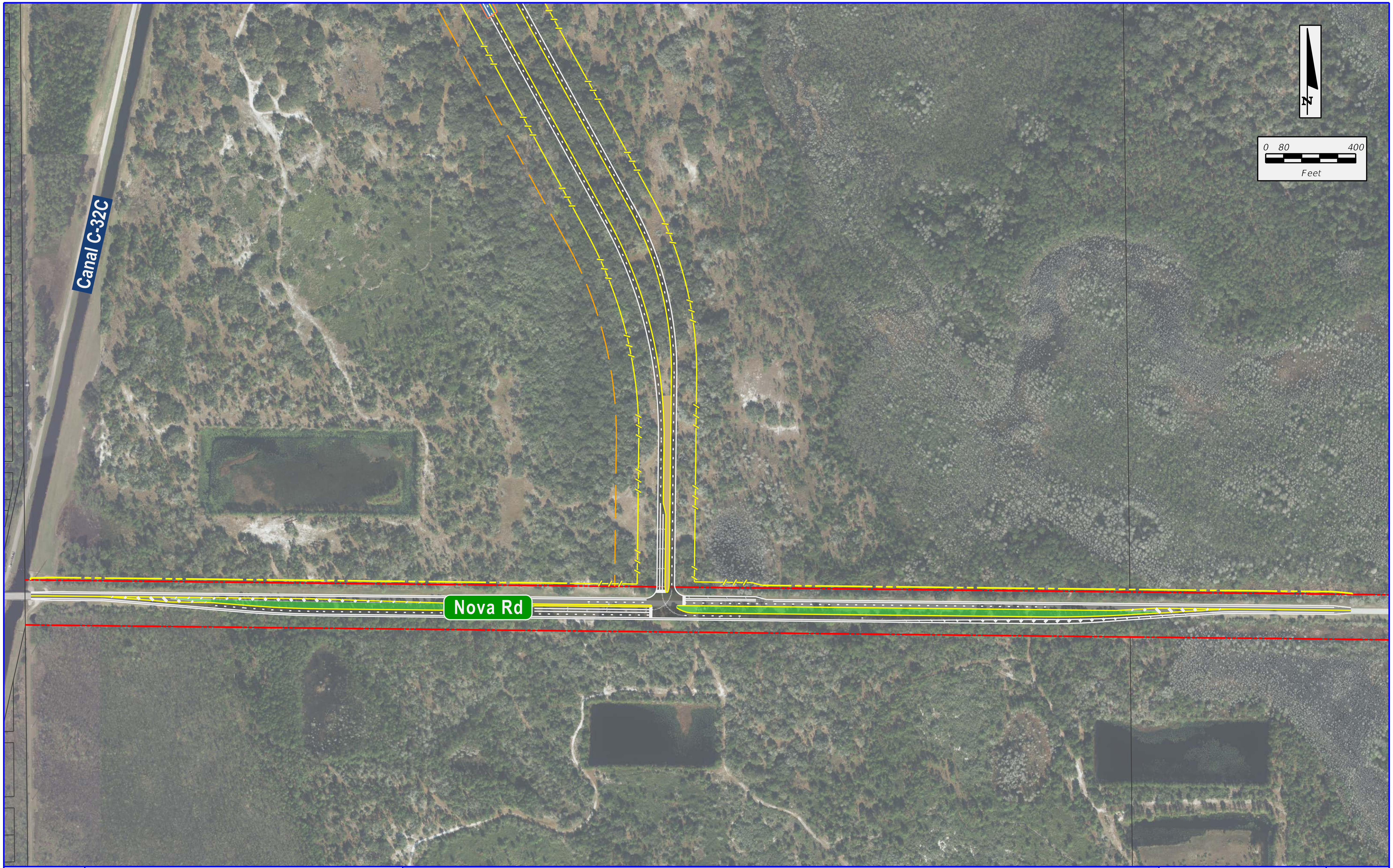
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Existing Right-of-Way	Potential OUC Utility Easement
Proposed Right-of-Way	Property Lines
Proposed L/A Right-of-Way	Proposed Barrier Wall
Proposed Pavement	Proposed Structure

Figure 6.1.4:
Jack Brack Road
Improvements

SHEET NO.
6-8



CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Existing Right-of-Way	Potential OUC Utility Easement
Proposed Right-of-Way	Property Lines
Proposed L/A Right-of-Way	Proposed Barrier Wall
Proposed Pavement	Proposed Structure

Figure 6.1.5:
Nova Road Improvements

SHEET NO.
6-9

Preferred Alternative Profile

The Northeast Connector profile is a continuation of the profile from the proposed SR 534 Preferred Alternative and assumes that the proposed ground elevation will be three feet above the existing ground.

The Northeast Connector profile begins with a 1,000-foot vertical curve with a back grade of 0.3 percent and an ahead grade of -0.5 percent which allows the profile to follow the proposed ground line. The vertical curve provides a K value of 1,250. The ahead grade continues until it meets the 2.0 percent grade, creating a 1,200-foot sag with a K value of 480. The 2.0 percent grade continues as it crosses over the planned Rummell Road creating an 1,800-foot vertical curve with a K value of 514 as it joins the ahead grade of -1.5 percent. The ahead grade continues to create an 800-foot sag vertical curve with a K value of 267. The 1.5 percent grade continues as it crosses over Jack Brack Road creating a 1,800-foot crest with a K value of 400 as it joins a -3.0 percent grade. The ahead grade continues until it meets a 0.3 percent grade creating an 800-foot sag vertical curve with a K value of 242. The profile continues along the proposed ground in a sawtooth pattern through a crest, sag, and crest utilizing -0.3, 0.5, and -0.3 percent grades, respectively, to provide proper drainage. The first crest is a 1,800-foot vertical curve with a K value of 3,000. The sag has a length of 800 feet with a K value of 1,000. The second crest is a 1,000-foot long (K value of 1,250) vertical curve. A 1,110-foot sag vertical curve follows with a K value of 500 and an ahead grade of 1.9 percent. The overpass of the C-32C canal begins with an 1,800-foot-long vertical curve with a K value of 1,125 and an ahead grade of 0.3 percent. As the profile continues south of the C-32C canal the 0.3 percent grade is held until it forms a 1,800-foot crest overpassing the planned Sunbridge Parkway. This crest has a K value of 667 and an ahead grade of -2.4 percent. The -2.4 percent grade continues until it meets the 2.0 percent grade ending at Nova Road, creating the final sag vertical curve which is 800 feet long and has a K value of 182.

The Preferred Alternative profile is shown in Appendix B.

6.1.5 Bicycle and Pedestrian Accommodations

The Northeast Connector is a proposed limited-access facility; therefore, no bicycle or pedestrian facilities will be provided along the expressway. At this time, no multimodal improvements are recommended as part of the Northeast Connector. However, the median can accommodate additional lanes and/or a potential multimodal corridor, if warranted in the future. Seven-foot buffered bicycle lanes, a five-foot sidewalk on the north side, and a 10-foot shared use path on the south side are proposed for Jack Brack Road within the limits of the proposed interchange. Similarly, the section of Nova Road that will be upgraded to four-lanes will include seven-foot buffered bicycle lanes and five-foot sidewalk.

6.1.6 Transit Accommodations

As discussed in Section 2.9, no existing transit accommodations are present within the study area. Therefore, the Preferred Alternative does not include any specific transit accommodations. However, the median can accommodate a future multimodal/transit corridor, if warranted.

6.1.7 Access Management

As a limited access tolled freeway, the Northeast Connector will be a Class 1 Access Management facility. The interchange spacing requirements are determined based on the type of location, Table 6.1.1 shows the freeway spacing requirements. The most appropriate spacing requirement based on the current conditions and planned improvements is Area Type 3, Transitioning Urbanized Areas, which results in a recommended interchange spacing of three miles.

Table 6.1.1: Freeway Interchange Spacing Requirements

<table>
<tr><th>Access Class</th><th>Area Type</th><th>Segment Location</th><th>Interchange Spacing (miles)</th></tr>
<tr><td rowspan="4">1</td><td>1</td><td>Central Business District</td><td>1.0</td></tr>
<tr><td>2</td><td>Existing Urbanized Areas Other than Area Type 1</td><td>2.0</td></tr>
<tr><td>3</td><td>Transitioning Urbanized Areas, and Urban Areas Other than Area Type 1 or 2</td><td>3.0</td></tr>
<tr><td>4</td><td>Rural Areas</td><td>6.0</td></tr>
</table>

The proposed Jack Brack Road interchange is located approximately two miles from the proposed SR 534 / Cyrils Drive interchange, which does not meet the interchange spacing requirement for a transitioning urbanized area. However, that spacing does meet the Area Type 2, Existing Urbanized Areas, interchange spacing requirement. When the Northeast District is fully built-out, Area Type 2, would be an appropriate classification for the study area. The potential future OBCC interchange at Nova Road would be located approximately 2.5 miles from the proposed Jack Brack Road interchange.

6.1.8 Intersection and Interchange Concepts

The Preferred Alternative contains one proposed interchange, which is located at Jack Brack Road and is referred to as the Tighter Diamond Interchange as described in Section 6.1.4. The Preferred Alternative also includes three signalized intersections: two located at the Jack Brack Road interchange ramps, and one at Nova Road.

The two intersections on Jack Brack Road and located approximately 800 feet apart. The westernmost intersection is comprised of the Northeast Connector southbound exit and entrance ramps and Jack Brack Road. Westbound traffic on Jack Brack Road can continue straight or turn left and enter the southbound on-ramp. Eastbound traffic on Jack Brack Road can continue straight or turn right onto the southbound on-ramp. Traffic traveling southbound and exiting the Northeast Connector can either turn right to go westbound on Jack Brack Road, or turn left to travel eastbound on Jack Brack Road. The easternmost intersection is comprised of the Northeast Connector northbound exit and entrance ramps and Jack Brack Road. Westbound traffic on Jack Brack Road can continue straight or turn right and enter the northbound on-ramp. Eastbound traffic on Jack Brack Road can continue straight or turn left onto the northbound on-ramp. Traffic traveling northbound and exiting the Northeast Connector can either turn right, to go eastbound on Jack Brack Road, or turn left to travel westbound on Jack Brack Road.

The Northeast Connector and Nova Road intersection is also a signalized intersection. This intersection is a T-intersection configuration, with the termination of the Northeast Connector only on the north side. Westbound traffic on Nova Road can continue straight or turn right and enter the northbound on-ramp. Eastbound traffic on Nova Road can continue straight or turn left onto the northbound on-ramp. Traffic traveling southbound on the Northeast Connector will dead-end into Nova Road. At the intersection, traffic can either turn right to travel westbound on Nova Road, or turn left, to travel eastbound on Nova Road.

Conceptual plan sheets that show the proposed interchange and signalized intersections are included in Appendix B.

6.1.9 Intelligent Transportation System

The Northeast Connector will include Intelligent Transportation System (ITS) elements that are consistent with CFX's overall ITS strategy.

6.1.10 Utilities

Due to the undeveloped nature of the corridor, no major utility impacts are anticipated. Five UAOs were identified in the study limits: CenturyLink, Comcast Communications, Duke Energy, Orlando Utilities Commission, and TWA. Comcast, Duke Energy (Distribution and Transmission), and OUC Lighting indicated that they have no facilities within the project limits.

CenturyLink has buried copper lines present along both sides of Nova Road starting at Sungrove Lane and extending to the west, and also along Absher Road and Cyrils Drive. No impacts to these facilities are anticipated.

OUC has aerial distribution lines along the south side of Nova Road and into the adjacent side street and single-family homes in the project study area. OUC overhead transmission with fiber cable is also present in the study area near Nova Road and the C-32C canal. No impacts to the existing overhead transmission lines are anticipated. The aerial distribution line along Nova Road will be impacted. OUC plans to relocate the line to the north side of Nova Road and estimates the cost of relocation as $20,000. The planned OUC transmission line is anticipated to be parallel to the Northeast Connector on the west side of the roadway. No impacts to the transmission line are anticipated due to the modifications to the Jack Brack Road interchange, described in Section 6.1.

TWA has utilities located along Cyrils Drive and is the utility provider for the water treatment plant currently under construction just north of the future Jack Brack Road extension. The utilities along Cyrils Drive will not be impacted by the project. The Northeast Connector alignment parallels the water treatment plant under construction, but no impacts are anticipated.

6.1.11 Drainage and Stormwater Management Facilities

The Pond Siting Report (PSR) prepared for this project identified seven drainage basins and recommended two pond sites for each basin. Two types of ponds were evaluated in the PSR: stormwater management facilities, which treat and attenuate the proposed roadway, and floodplain compensation (FPC) ponds, which provide equivalent floodplain storage that is displaced by the proposed roadway. Additionally, the FPC pond will provide attenuation for the 100-year storm event volume that is not already included in the stormwater management ponds. All stormwater management facilities are assumed to be wet.

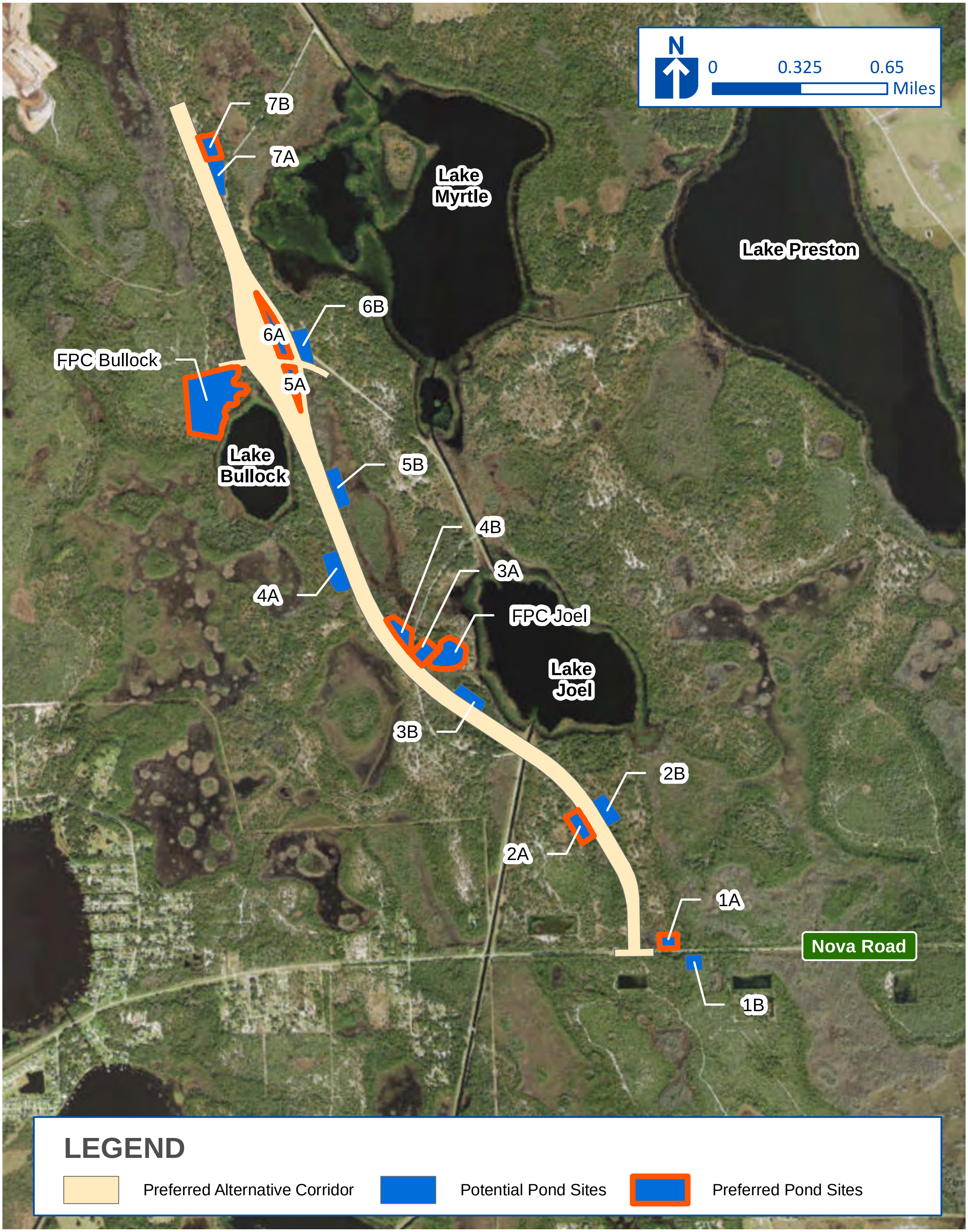
Required pond sizes for each basin were determined by evaluating runoff volume using the NRCS CN method, calculating treatment volume requirements, and including floodplain impacts (as applicable). These volumes were summed and combined with landscaping, pond geometry, side slopes, freeboard, and maintenance berm assumptions to produce an estimated total required pond size. Pond estimates include a 20% increase in area to account for landscaping aesthetics, and tie-ins to the existing ground. Recovery calculations for orifice sizing and permanent pool calculations are not included in the pond sizing considerations. Please note that the recommendations are based on pond sizes determined from preliminary data, reasonable engineering judgment, and assumptions. Pond size requirements may change during final design as more detailed information on Seasonal High Water Table (SHWT), wetland hydrologic information, and final roadway profile become available.

Design considerations for each pond site location included a desktop review of the best available data, which included hydraulic data, hydrology (land use cover, soil types, SHWT, etc.), contamination sites, wetland limits, wildlife sightings, archaeological or historical sites, and conservation areas. No site-specific investigations have been performed or used in this analysis; this includes field survey, geotechnical testing, wetland delineation, threatened and endangered species observations, archaeological/cultural resource investigations, or contamination screenings. The results are summarized in Table 6.1.2, the ponds highlighted in blue indicate a preferred pond site. The ponds are also shown on Figure 6.1.6.

Table 6.1.2: Pond Site Matrix

Pond Site	Wetland Impacts	Wildlife Habitat	Contamination Risk	Floodplain Impacts	Cultural or Archaeological Resource Impacts	Access Issues	Number of Property Owners	Pond Right-of-Way Area (acres)	Construction Cost ($)
1A	**0**	**Moderate**	**Low**	**0**	**Low**	**None**	**1**	**2.2**	**224 k**
1B	0	Moderate	Low	0.6	Low	None	1	2.2	224 k
2A	**0**	**Moderate**	**Low**	**0**	**Low**	**None**	**1**	**3.9**	**384 k**
2B	0	Moderate	Low	0	Low	None	1	3.9	384 k
3A	**0**	**Moderate**	**Low**	**0**	**Low**	**None**	**1**	**3.1**	**306 k**
3B	0	Moderate	Low	1.5	Low	None	1	3.1	305 k
4A	0	Moderate	Low	0	Low	None	1	5.9	601 k
4B	**0**	**Moderate**	**Low**	**0.3**	**Low**	**None**	**1**	**3.7**	**369 k**
5A	**2.55**	**Moderate**	**Low**	**3.2**	**Low**	**None**	**1**	**4.5[1]**	**449 k**
5B	0.4	Moderate	Low	3.1	Low	None	1	4.5	473 k
6A	**0**	**Moderate**	**Low**	**0**	**Low**	**None**	**1**	**4.2[1]**	**435 k**
6B	0	Moderate	Low	0	Low	None	1	4.2	452 k
7A	0.1	Moderate	Low	0.2	Low	None	1	3.3	332 k
7B	**0**	**Moderate**	**Low**	**0**	**Low**	**None**	**1**	**3.4**	**334 k**
FPC Lake Joel	**0**	**Moderate**	**Low**	**0**	**Low**	**None**	**1**	**7.0**	**389 k**
FPC Bullock Lake	**0**	**Moderate**	**Low**	**0**	**Low**	**None**	**1**	**25.1**	**1.5 M**

[1] Ponds 5A and 6A are located inside the roadway right-of-way footprint and do not require any additional right-of-way.



CENTRAL FLORIDA EXPRESSWAY AUTHORITY	Northeast Connector Expressway - Phase 1 PD&E Study from Cyrils Drive to Nova Road	Figure 6.1.6: Pond Sites	Page Number: 6-15

6.1.12 Floodplain Analysis

Potential floodplain impacts as a result of the Northeast Connector were reviewed along the contributing basin for each cross drain. The Location Hydraulics Report (LHR) prepared for this project identified five cross drains (CD) for the Preferred Alternative, as indicated in Table 6.1.3.

Table 6.1.3: Proposed Cross Drain

Cross Drain	Pipe Size	Flow Direction	Within FEMA Floodplain
CD-1	Double 48"	East	No
CD-2	Double 48"	East	Yes, mitigated within FPC pond
CD-4	Double 10'x9'	East	Yes, mitigated within FPC pond
CD-5	Quadruple 6'x3'	South	Yes, mitigated within FPC pond
CD-6	Triple 60"	East	No

Floodplain impacts are not expected to occur within the contributing areas for cross drains CD-1 and CD-6. There is some encroachment of the existing 100-year FEMA floodplain at cross drain CD-2, CD-4, and CD-5 which will be mitigated by routing the floodplain impacted volume to the proposed stormwater management facility or floodplain compensation pond. Floodplain impacts at the footprint of the bridge over C-32C canal were not considered and will be evaluated during the final design phase.

This new alignment project will have encroachments into the floodplain. Proposed cross drains and bridges will perform hydraulically in a manner equal to or greater than the existing condition, and backwater surface elevations are not expected to increase. Floodplain encroachments will be mitigated on a cup-for-cup basis in floodplain compensation sites and treatment/attenuation pond sites, which should result in no increase to the floodplain elevations. These changes will not result in any adverse impacts on the natural and beneficial floodplain values or any changes in flood risk or damage. There will not be a change in the potential for interruption or termination of emergency service or emergency evacuation routes. Therefore, it has been determined that the encroachment type for this study is classified as "minimal."

It has been determined, through consultation with local, state, and federal water resources and floodplain management agencies that there is no regulatory floodway involvement on the project and that the project will not support base floodplain development that is incompatible with existing floodplain management programs.

6.1.13 Transportation Management Plan

The Northeast Connector is a new facility on a new alignment, so the transportation management plan is relatively straight-forward. The majority of the Northeast Connector roadway can be constructed without maintenance of traffic. The connection to Nova Road will be phased as needed, and the details of this phasing will be considered during final design. Depending on the timing of events, phasing may be needed at Jack Brack Road, if it is constructed prior to the Northeast Connector.

6.1.14 Design Variations and Design Exceptions

No design exceptions are anticipated for the Preferred Alternative. Table 6.1.4 summarizes the known design variation for the Preferred Alternative.

Table 6.1.4: Design Variations

Design Variation	Location	Required (ft)	Actual (ft)
Horizontal Curve Length	Southbound entrance ramp at Jack Brack Road	750	293

6.1.15 Cost Estimates

The cost estimate for the Preferred Alternative is summarized in Table 6.1.5. Additional details are provided in Appendix C.

Table 6.1.5: Cost Estimate

Element	Cost ($ million)
Roadway Construction	93.1
Bridges Construction	17.5
Interchanges Construction	19.5
Toll Collection Equipment	2.8
Right-of-Way Cost	21.1
Mitigation, Wetlands, & Wildlife	1.8
Engineering/Administration/Legal	31.2
Total Estimated Cost	**187.0**

6.2 Summary of Environmental Impacts of the Preferred Alternative

This section provides a summary of issues and features that will affect the development of the Preferred Alternative.

6.2.1 Future Land Use

As shown previously on Figure 2.6.1, the existing land use in the study area is primarily agricultural. The Osceola County 2040 Future Land Use Map indicates the study area will be converted to entirely mixed use, as shown on Figure 6.2.1. This land use is consistent with the approved Northeast District Conceptual Master Plan. Therefore, this project is not anticipated to change or effect land use patterns. The land use within the study area is changing based on the approved Northeast District Conceptual Master Plan and Phase 1 is currently under construction.

6.2.2 Parks and Recreation

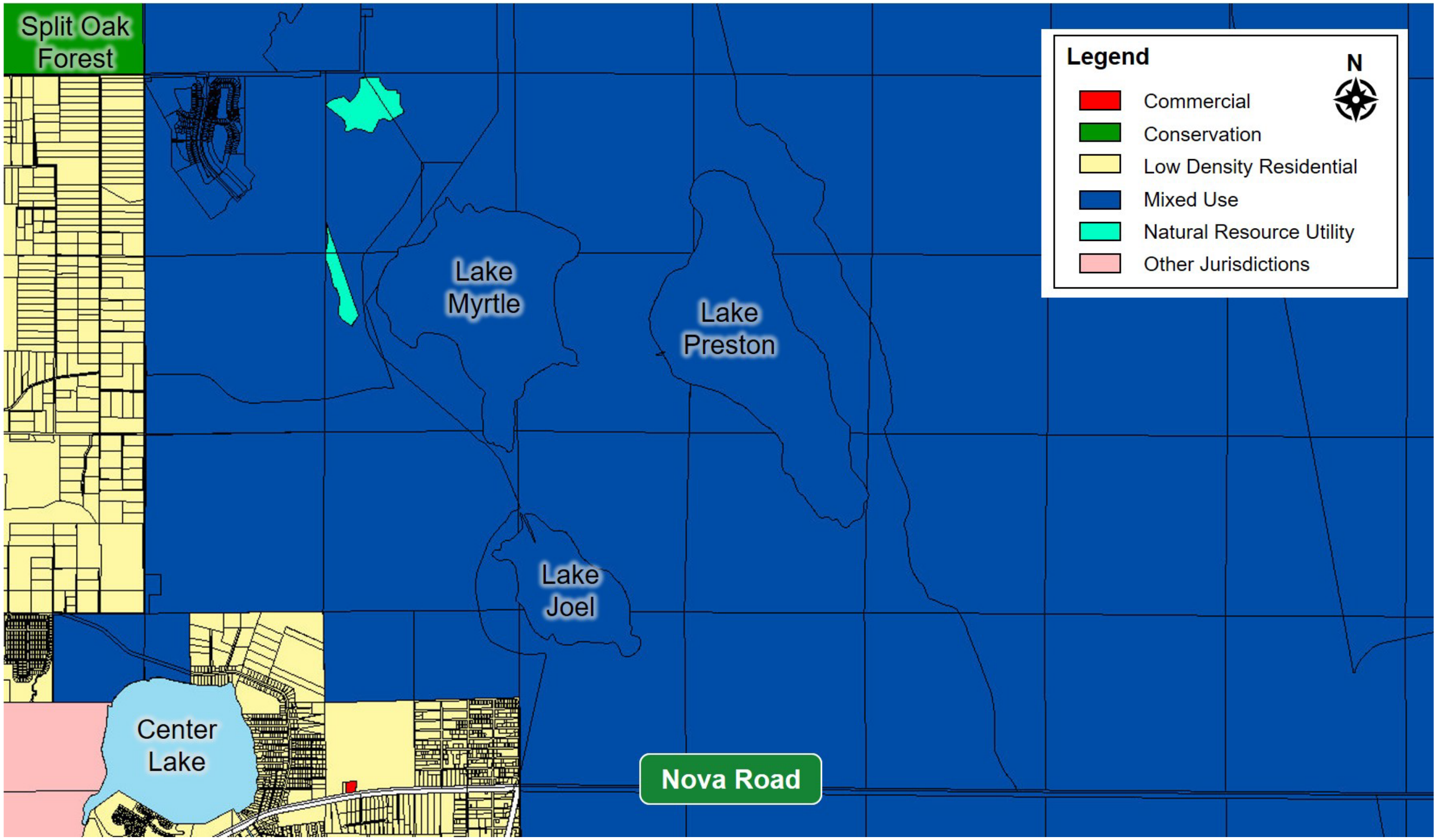
No parks or recreation areas are located within the study area. However, as previously shown on Figure 2.6.2, there are a number of parks and recreation areas surrounding the study area including: Split Oak Forest, Moss Park, Center Lake Boat Ramp, Trout Lake Public Boat Ramp, and Lake Lizzie Conservation Area Trail Head.

6.2.3 Cultural Resources

The cultural resources area of potential effects (APE) was defined to include the proposed Northeast Connector right-of-way and approximately 3,500 feet of existing right-of-way along Nova Road, as shown on Figure 6.2.2. The APE was extended to the back or side property lines of parcels adjacent to the right-of-way, or a distance of no more than 328 feet from the proposed right-of-way. The archaeological survey was conducted within the existing and proposed right-of-way. The historic structure survey was conducted within the entire APE.

The Florida Master Site File (FMSF) data from January 2021 was reviewed to identify any previously recorded cultural resources within the project APE. The FMSF review indicates that three previous cultural resource surveys have been conducted within the current study area, all of which are located at the northern end of the APE. Two of these surveys were conducted for the Osceola Parkway Extension PD&E Study and the third was completed to meet permitting requirements for the Sunbridge development. As a result of these surveys, one archaeological site has been recorded within the Northeast Connector APE. The Sunbridge 3 Site 3 (8OS02933) archaeological site represents a low-density, historic artifact

Figure 6.2.1: Osceola County Future Land Use Map



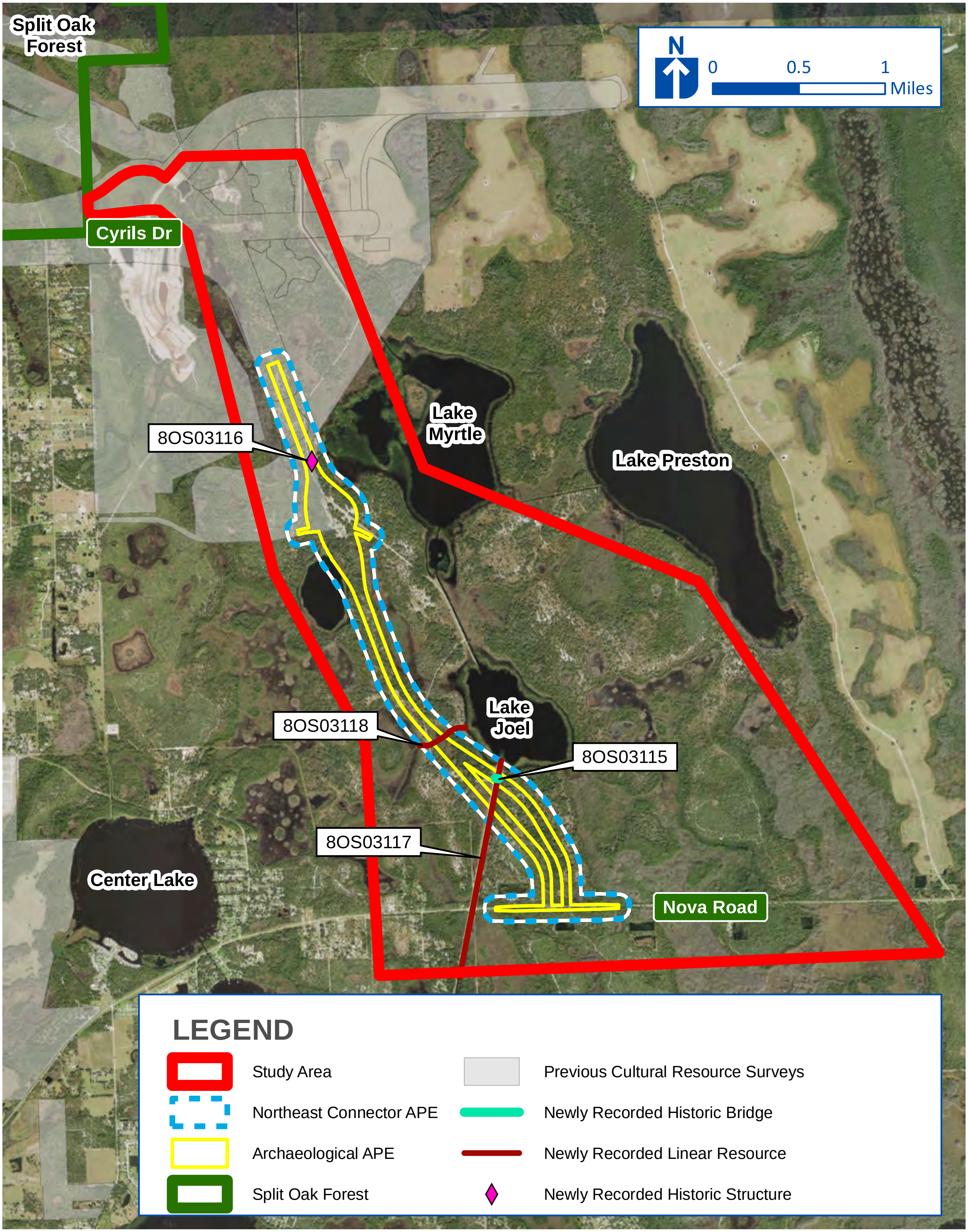
Source: Osceola County Interactive Maps: https://maps.osceola.org/gisweb/WebPages/Map/FundyViewer.aspx scatter dated to the twentieth century. Sunbridge Site 3 is situated outside of the proposed right-of-way but is located within the APE. This site has been determined to be ineligible for the National Register of Historic Places (NRHP) by the State Historic Preservation Officer (SHPO). For more information on this resource's location, refer to the Cultural Resources Assessment Survey (CRAS), available under separate cover.

The archaeological field survey consisted of systematic subsurface shovel testing according to the potential for buried archaeological sites. Flooding and saturated soils were significant problems throughout much of the APE. Shovel tests could not be excavated in standing water, and in some cases, these areas could not be pedestrian surveyed. Shovel testing in these areas was concentrated on raised oak or pine hammocks, which were considered to have a high probability for prehistoric archaeological deposits if they were located within 328 feet of a freshwater or wetland resource. No shovel testing was conducted in previously surveyed areas at the northern end of the APE as these previous surveys used testing methodology consistent with current standards.

With the exception of the 10 shovel tests along Nova Road and eight shovel tests in proximity to access roads and hunting camps, soils in the Northeast Connector archaeological APE appeared to be undisturbed. However, soil saturation and the water table affected the depth to which some shovel tests could be excavated. The archaeological survey included the excavation of 246 shovel tests, of which two were positive for cultural material. Based on these two positive shovel tests and a single surface find, three archaeological occurrences were recorded within the Northeast Connector archaeological APE. Archaeological occurrences are, by definition, ineligible for consideration in the NRHP. No other archaeological occurrences or archaeological sites were recorded within the Northeast Connector archaeological APE.

The architectural survey resulted in the identification and evaluation of four newly recorded historic resources within the Northeast Connector APE. The newly recorded historic resources include two linear resources (8OS03117 and 8OS03118), one bridge (8OS03115), and one structure (8OS03116), shown on Figure 6.2.2. The two linear resources are the C-32C canal and the Sungrove Lane canal, the bridge carries the dirt road over the C-32C canal shown in Section 2.20, and the structure is an old barn built around 1944.

Based on the results of the current survey, the opinion of SEARCH is that all four resources are ineligible for the NRHP, due to a lack of significant historic associations and architectural and/or engineering distinction. No further architectural work is recommended. SHPO concurred with the findings of the CRAS on August 5, 2021.



CENTRAL FLORIDA EXPRESSWAY AUTHORITY	Northeast Connector Expressway - Phase 1 PD&E Study from Cyrils Drive to Nova Road	Figure 6.2.2: Historic Resources Recorded in the APE	Page Number: 6-21

6.2.4 Farmlands

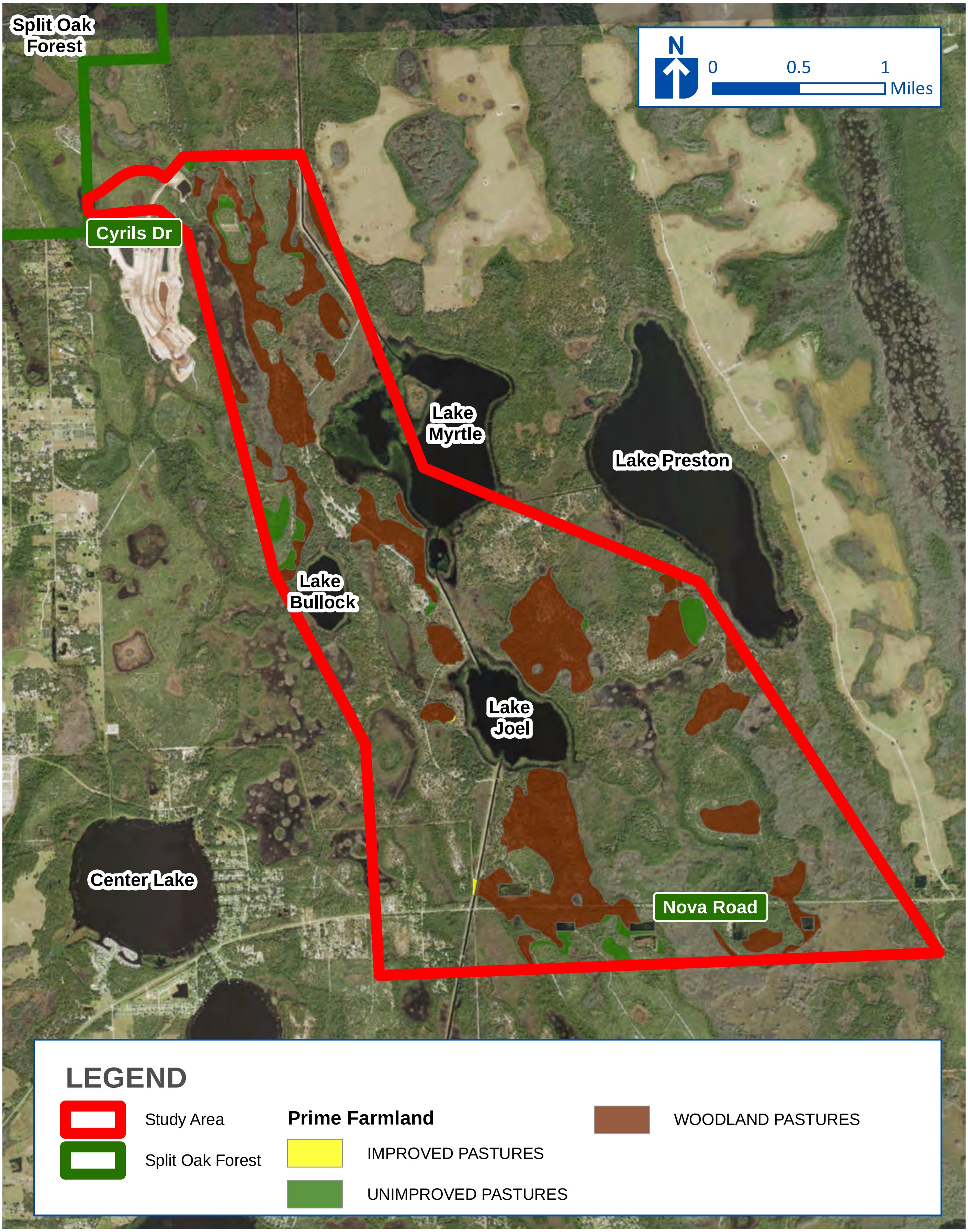
An analysis of the 2018 soil data within the study area indicates there are approximately 1,099 acres of land classified as “Farmland of Unique Importance” by the NRCS. The NRCS prime farmland is scattered throughout the study area as shown on Figure 6.2.3. The majority of the prime farmland in the study area is categorized as woodland pastures (90.3%), but unimproved pasture (9.4%) and improved pastures (0.3%) are also present in the study area.

6.2.5 Wetlands

The project has been evaluated for potential impacts to wetlands in accordance with Executive Order 11990, “Protection of Wetlands.” Formal wetland boundary delineations and surveys were not conducted as a part of this study and will be completed as part of the state and federal permit process. Limited ground truthing by biologists was conducted during field reviews on November 17, 2020. During the field review, a representative sample of wetlands were visited by biologists. There are no wetlands or surface waters designated as Outstanding Florida Waterways within the project study area.

Approximately 406 acres of surface waters are present within the study area. The majority of the surface waters in the study area are named waterbodies: Lake Myrtle, Lake Bullock, and Lake Joel. Wetlands account for approximately 2,167 acres in the study area, constituting approximately 38% of the land area. Wetland types within the study area can be categorized as herbaceous or forested wetland types and include mixed wetland hardwoods, cypress, hydric pine flatwoods, wetland forested mixed, freshwater marshes, wet prairies, and emergent aquatic vegetation. Figure 6.2.4 shows the surface waters and wetlands in the study area.

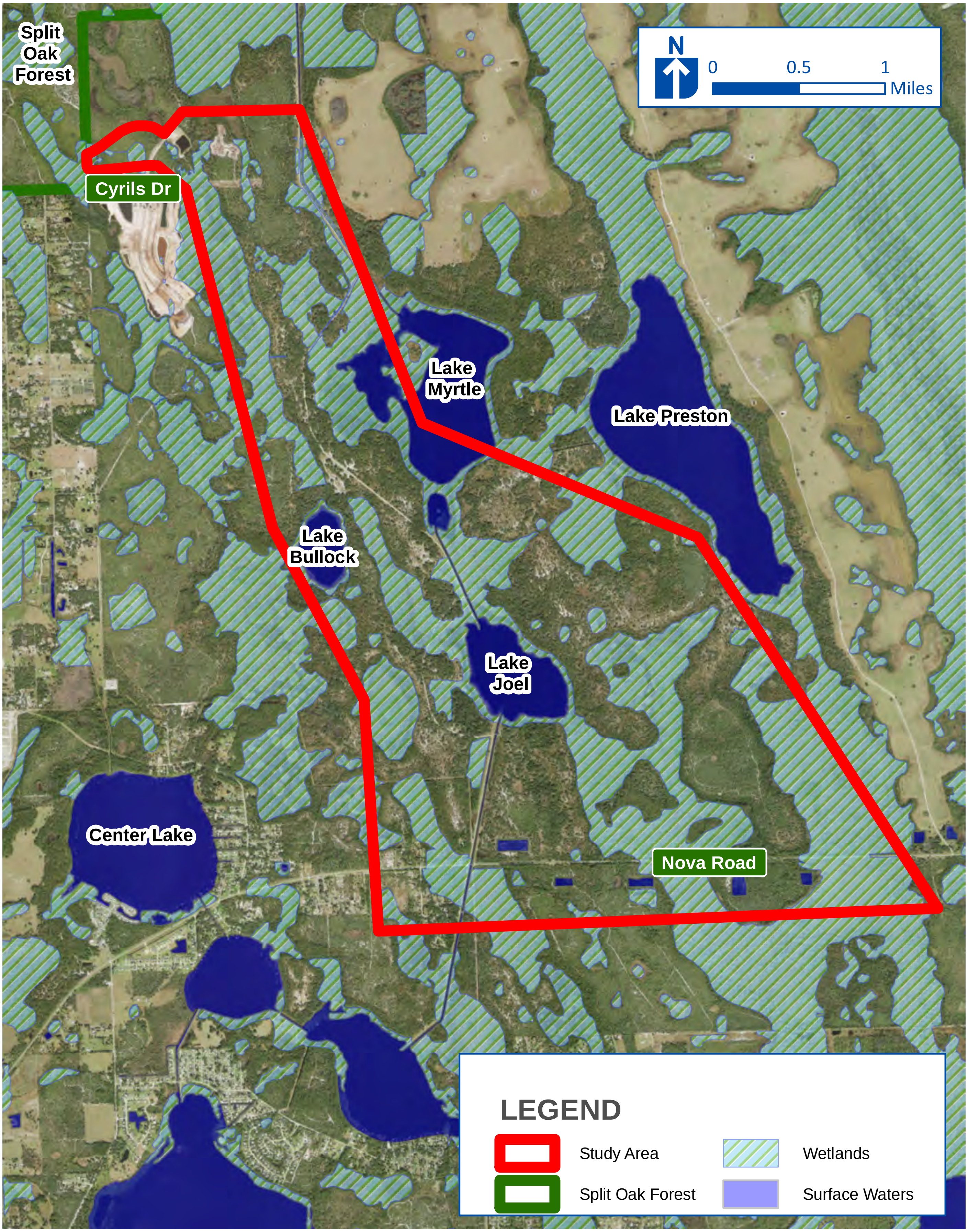
Each of the Build Alternatives has direct impacts to wetlands and/or surface waters. Table 6.2.1 shows the potential wetland impacts for each Build Alternative. Within the Jack Brack Road segment, the Tighter Dimond Interchange has the least amount of wetland and surface water impacts, followed by the Partial Cloverleaf Interchange, and last is the Diamond Interchange. The Tighter Dimond Interchange has 0.5 acres of surface water impacts and a total of 11 acres of wetland impacts compared to the Partial Cloverleaf Interchange, which has no surface water impacts and 13 acres of wetland impacts. The Diamond Interchange has the most surface water and wetland impacts with 2.0 acres of surface water impacts and 14.5 acres of wetland impacts. Within the Nova Road Connection segment, Option 2 has the least amount of wetland and surface water impacts. Option 1 results in 0.5-acre of surface water impacts and 11 acres of wetland impacts compared to Option 2 which has 0.5-acre of surface water impacts and 6.5 acres of wetland impacts.



CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1 PD&E Study from Cyrils Drive to Nova Road

Figure 6.2.3: Prime Farmland in the Study Area



CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1 PD&E Study from Cyrils Drive to Nova Road

Figure 6.2.4: Wetlands and Surface Waters in the Study Area

Table 6.2.1: Wetland Impact Analysis

Segment	Alternative	Impact Type	Impact (acres)
Jack Brack Road	Partial Cloverleaf Interchange	Surface Water	0.0
		Wetland	13.0
	Diamond Interchange	Surface Water	2.0
		Wetland	14.5
	Tighter Diamond Interchange	Surface Water	0.5
		Wetland	11.0
Nova Road Connection	Option 1	Surface Water	0.5
		Wetland	11.0
	Option 2	Surface Water	0.5
		Wetland	6.5

Note: Wetland impact estimates are based on available geographic information systems (GIS) data and are rounded to the nearest one-half acre.

For more information on wetland impacts, refer to the NRE, available under separate cover.

6.2.6 Protected Species and Habitat

The protected species and habitats that may occur in the study area are based on available resources and confirmed by qualified ecologists during limited field reviews. Ecologists documented the types and quality of habitats in the study area. This information was used in conjunction with publicly available GIS resources and field surveys conducted on November 17, 2020, for the purpose of supporting effect determinations for protected resources.

The USFWS's Environmental Conservation Online System (ECOS) provided the list of potentially occurring federally protected species shown in Table 6.2.2. Potentially occurring species which are state-listed or included in *Florida's Imperiled Species Management Plan* (December 2018) are also included in Table 6.2.2.

Table 6.2.2: Listed Species Likelihood of Occurrence

Common Name	Scientific Name	Federal Status	State Status	Likelihood of Occurrence
Mammals				
Florida Panther	*Puma concolor coryi*	*E*	*E*	Low
Florida Black Bear	*Ursus americanus floridanus*	*N*	*N**	Moderate
Reptiles				
Eastern Indigo Snake	*Drymarchon corais couperi*	*T*	*T*	High
American Alligator	*Alligator mississippiensis*	*T(S/A)*	*N*	High
Gopher Tortoise	*Gopherus polyphemus*	*C*	*T*	High
Florida Pine Snake	*Pituophis melanoleucus mugitus*	*N*	*T*	High
Birds				
Everglade Snail Kite	*Rostrhamus sociabilis plumbeus*	*E*	*E*	Moderate
Florida Grasshopper Sparrow	*Ammodramus savannarum floridanus*	*E*	*E*	Low
Red-Cockaded Woodpecker	*Picoides borealis*	*E*	*E*	Low
Wood Stork	*Mycteria americana*	*T*	*T*	High
Audubon's Crested Caracara	*Polyborus plancus audubonii*	*T*	*T*	Low
Florida Scrub-Jay	*Aphelocoma coerulescens*	*T*	*T*	Low
Florida Sandhill Crane	*Grus canadensis pratensis*	*N*	*T*	High
Florida Burrowing Owl	*Athene cunicularia floridana*	*N*	*T*	Low
Little Blue Heron	*Egretta caerulea*	*N*	*T*	High
Tricolored Heron	*Egretta tricolor*	*N*	*T*	High
Roseate Spoonbill	*Ajaia ajaja*	*N*	*T*	Moderate
Bald Eagle	*Haliaeetus leucocephalus*	*N***	*N***	Moderate

E= Endangered; T=Threatened; T(S/A)=Threatened due to Similarity of Appearance; SSC=Species of Special Concern; C – Candidate Species; N=Not Listed;
*The Florida black bear is still protected under Florida Black Bear Conservation Rule 68A-4.009 (F.A.C.) and the FFWCC Florida Black Bear Management Plan
**The Bald eagle is still protected under the *Bald and Golden Eagle Protection Act*, *Migratory Bird Treaty Act* and FFWCC Management Plan regulations

Nine federally listed species were evaluated to determine if the proposed project will affect these species. Based on a review of available data, in conjunction with field reconnaissance and surveys, preliminary effects determinations have been made and are shown in Table 6.2.3.

Table 6.2.3: Federally Listed Species Preliminary Effect Determination

Common Name	Preliminary Effect Determination	Federal Status
Florida Panther	*no effect*	*E*
Eastern Indigo Snake	*may affect, not likely to adversely affect*	*T*
Florida Grasshopper Sparrow	*no effect*	*E*
American Alligator	*may affect, not likely to adversely affect*	*T(S/A)*
Everglade Snail Kite	*no effect*	*E*
Red-Cockaded Woodpecker	*no effect*	*E*
Wood Stork	*may affect, not likely to adversely affect*	*T*
Audubon's Crested Caracara	*may affect, not likely to adversely affect*	*T*
Florida Scrub-Jay	*no effect*	*T*
E= Endangered; T=Threatened; T(S/A)=Threatened due to Similarity of Appearance; SSC=Species of Special Concern; C=Candidate Species; N=Not Listed		

A review of USFWS's ECOS shows that the study area does not include any designated or proposed critical habitat for any threatened or endangered species. For more information on protected species and habitat, refer to the NRE, available under separate cover.

6.2.7 Highway Traffic Noise

A review of the Preferred Alternative determined that this project is a Type I project as defined in Part 2, Chapter 18 of the FDOT PD&E Manual; therefore, an assessment of potential traffic noise impacts and consideration of noise abatement was performed. The Federal Highway Administration (FHWA) has established Noise Abatement Criteria (NAC) for land use activity categories. Maximum noise threshold levels, or criteria levels, have been established for five of the seven activity categories. These criteria determine when an impact occurs and when consideration of noise abatement is required. Noise abatement measures must be considered when predicted noise levels approach or exceed the NAC levels or when a substantial noise increase occurs. A substantial noise increase occurs when the existing noise level is predicted to be exceeded by 15 dB(A) or more as a result of the transportation improvement project. The FDOT defines "approach" as within 1.0 dB(A) of the FHWA criteria. The land surrounding the Preferred Alternative is categorized by NAC as Category F, which includes lands such as agricultural, industrial, and retail that are not considered noise sensitive.

A review of the existing and future land use maps, and planned developments was performed to determine if there are noise sensitive receptors within the corridor. The review of the available land use data determined that there are no noise sensitive receptors within the project corridor that could be impacted by highway traffic noise since the study area consists of undeveloped and agricultural lands. In addition, a review was performed in June 2021 of building permits issued for future developments in the area that would require noise abatement consideration. There are planned developments in the area, however, none of these developments have active residential building permits, so they were not evaluated. In accordance with the FDOT PD&E Manual, no detailed noise modeling, impact analysis, or consideration of noise abatement measures were performed or warranted. Therefore, the project is not anticipated to result in any traffic noise impacts. To avoid incompatible land uses, noise contours were developed and are included in the Noise Study Technical Memorandum, available under separate cover. It is recommended that the status of planned developments be confirmed and those that have obtained active residential building permits be evaluated during the design phase.

6.2.8 Contamination

A desktop contamination screening was performed for the study area using aerial photography, a Google Earth railroad map layer, and the FDEP's Map Direct website. The following contamination concerns exist within the study area and are shown on Figure 6.2.5:

- Cattle ranching;
- A fishing camp; and
- Two petroleum tanks.

No superfund sites were identified within one mile of the study area.

A Level I contamination screening was performed based on the proposed right-of-way footprint. The purpose of this Level I evaluation was to assess the risk of encountering petroleum or hazardous substance contamination of soil, groundwater, surface water, or sediment that could adversely affect this project. The following activities were performed as part of this evaluation: review of public regulatory files, review of historical data sources, a site reconnaissance, and interviews.

The contamination study area was defined by the following distances from the proposed right-of-way:

- All sites within 500 feet;
- Non-landfill solid waste sites within 1,000 feet;
- Solid waste landfills, superfund sites, and national priority list sites within ½ mile.

CENTRAL FLORIDA EXPRESSWAY AUTHORITY	Northeast Connector Expressway - Phase 1 PD&E Study from Cyrils Drive to Nova Road	Figure 6.2.5: Potential Contamination Sites in the Study Area	Page Number: 6-29

The Level I contamination evaluation resulted in the identification of two potential contamination risks: the “Fish Camp,” and a cattle dipping vat.

The “Fish Camp” shown on Figure 6.2.5 has a medium risk of potential contamination. The “Fish Camp” site had one cattle pen visible on aerial photographs from 1944 through 1983. During the site reconnaissance, a farm building (barn), a crop sprayer, a historical cattle pen, a burn pile containing metal objects, and an apparent camp septic tank were observed in the vicinity of the identified “Fish Camp,” as shown on Figures 6.2.6 to 6.2.9.

Figure 6.2.6: Farm Building (8OS03116)

Figure 6.2.7: Crop Sprayer

Figure 6.2.8: Burn Pile

Figure 6.2.9: Historic Cattle Pen

A noteworthy point is that the potentially historic structure (8OS03116) referenced in Section 6.2.3 is the same site/building identified as the “Fish Camp.”

The cattle dipping vat, also shown on Figure 6.2.5, has a high risk of potential contamination. The cattle dipping vat was identified through discussions with Mr. JD Humpherys of SLR who learned of the site from a Deseret Ranches ranch hand. Cattle dipping vats were used until the 1960s to apply pesticides to cattle and other livestock to kill ticks and eliminate tick-borne diseases. Figure 6.2.10 shows the cattle dipping vat located within the study area.

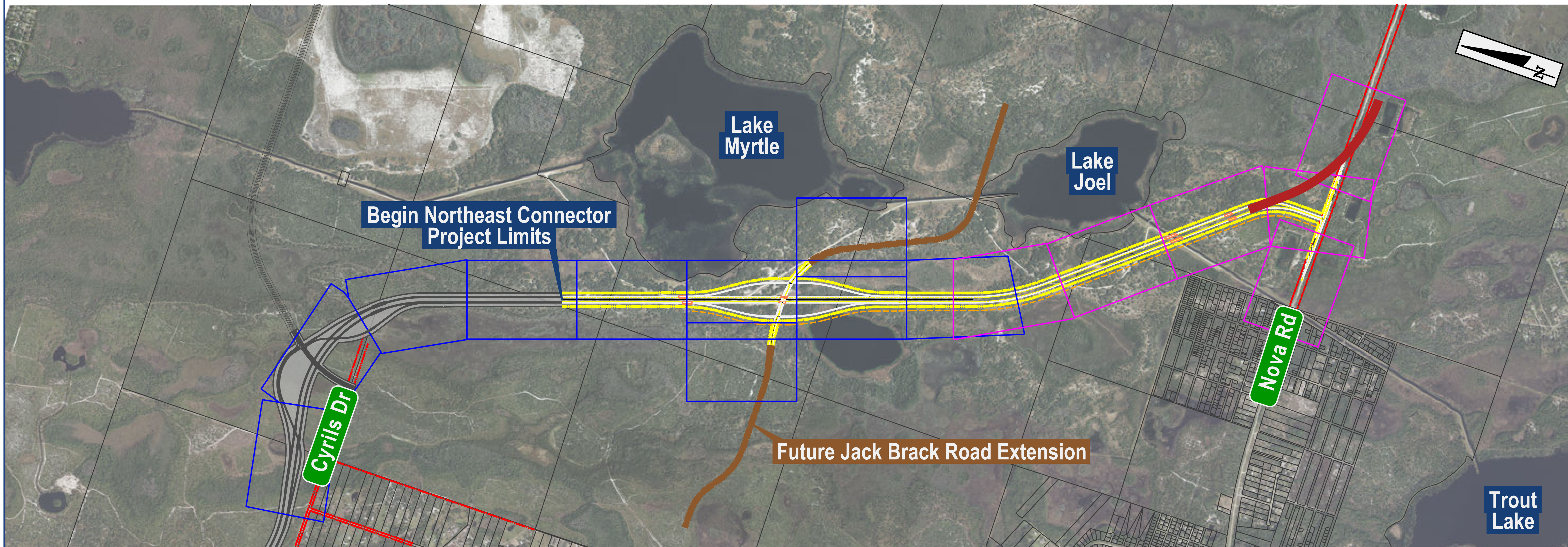
Figure 6.2.10: Cattle Dipping Vat

A Level II contamination assessment is recommended for both the Fish Camp and the cattle dipping vat. Additional information on contamination conditions is contained in the Contamination Screening Evaluation Report (CSER), available under separate cover.

Appendix A

Concept Plans (Build Alternatives)

Appendix A: Build Alternatives (200 Scale)



Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

CFX Project No.: 599-228
Contract No.: 001546

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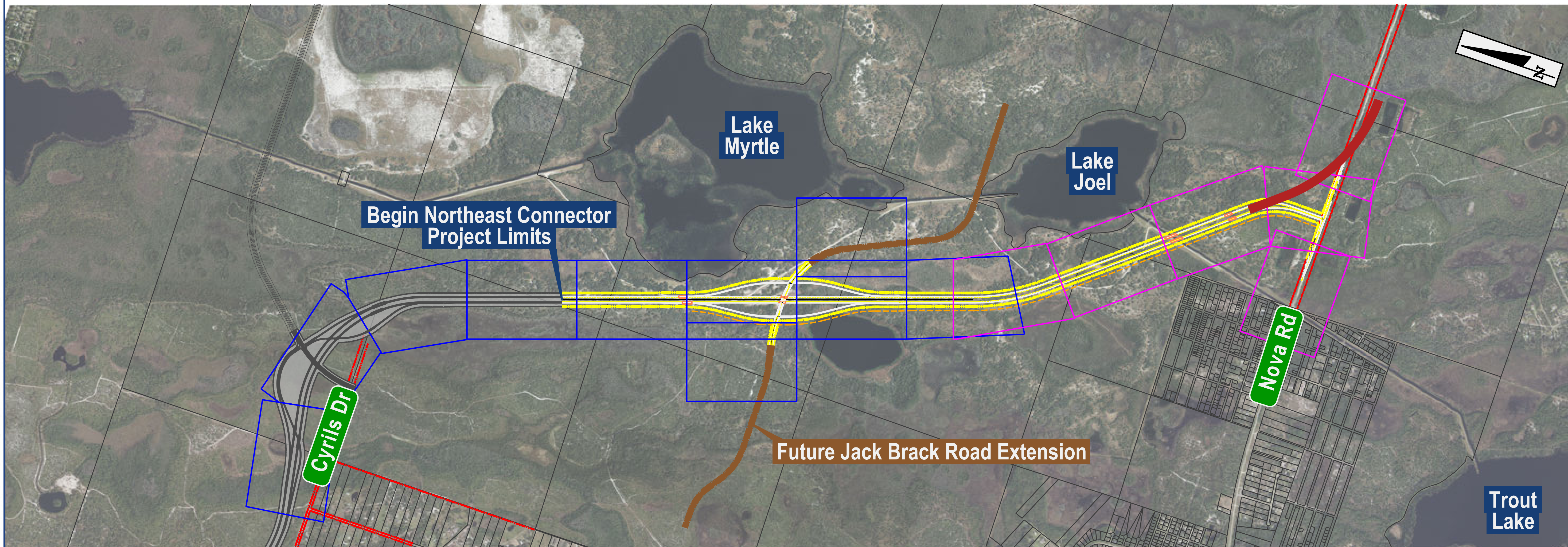
Appendix A: Build Alternatives (200 Scale)



Index of Drawings

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38-46	Jack Brack Road Diamond Interchange Profile Sheets
47-53	Nova Road Connection Option 1 Profile Sheets
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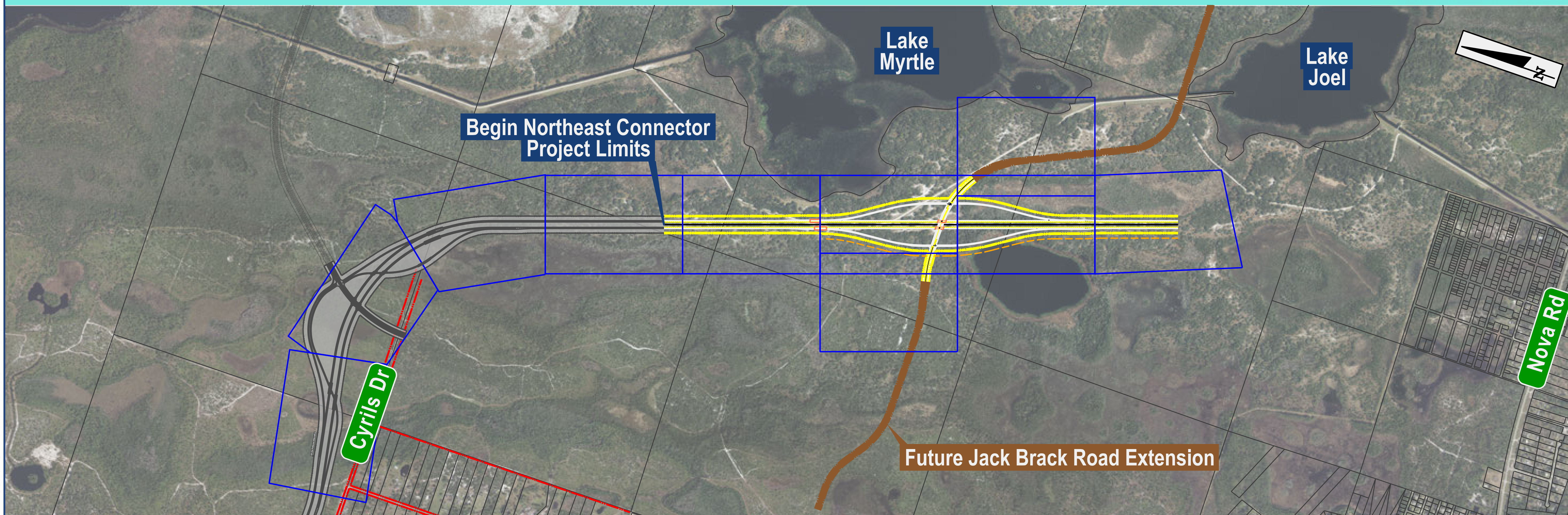
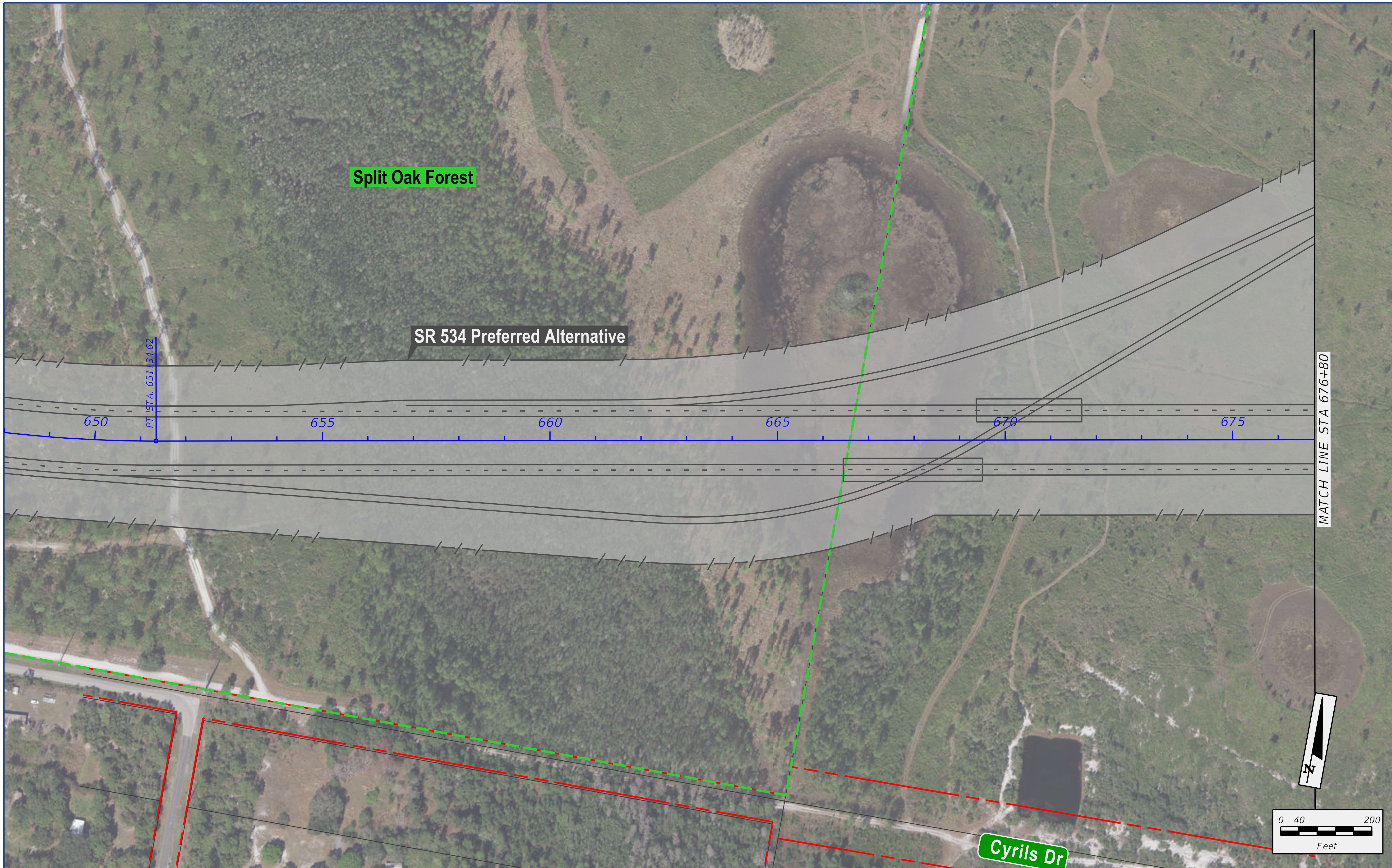
Jack Brack Road Diamond Interchange





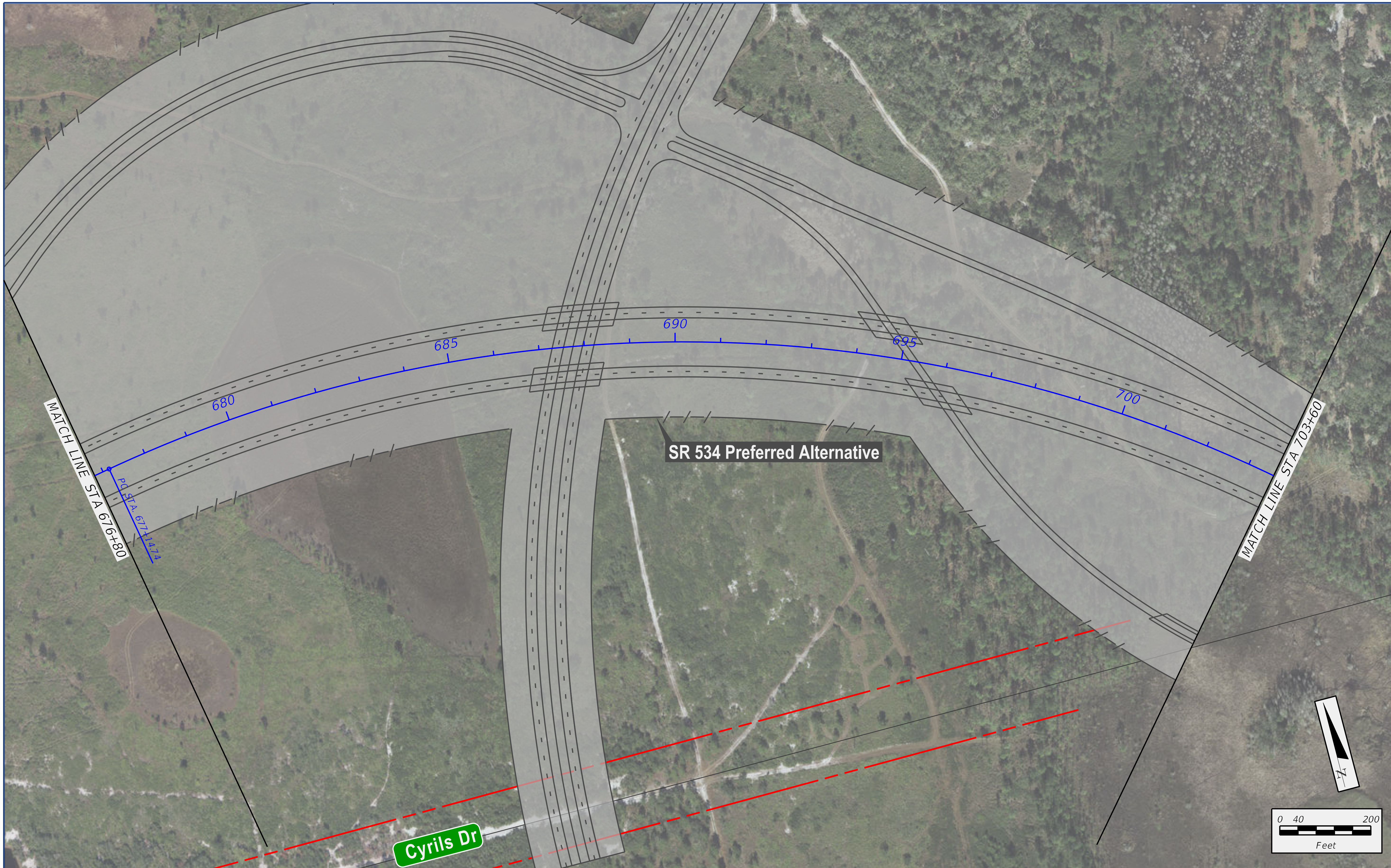
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

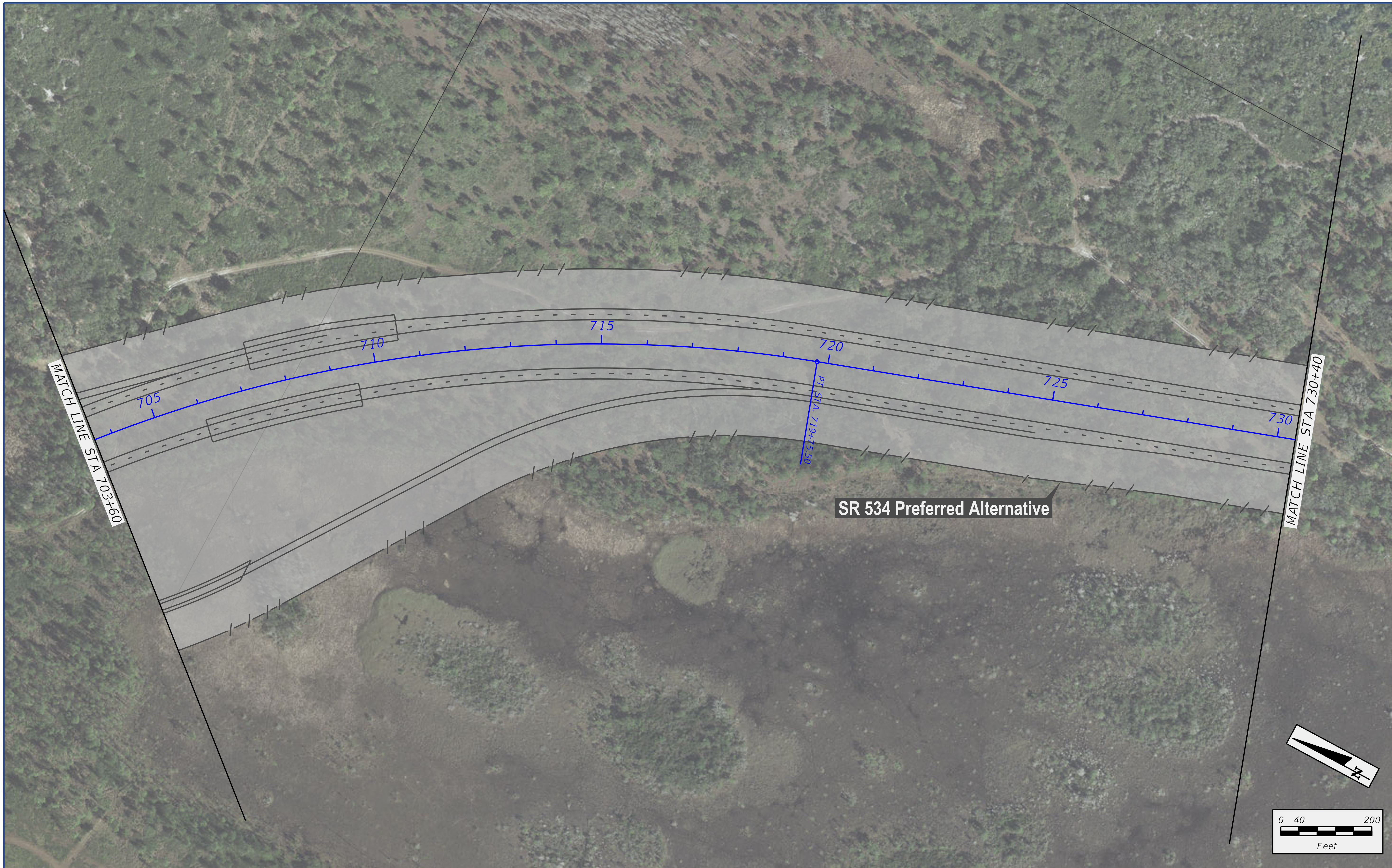
Existing Right-of-Way	Potential OUC Utility Easement
Proposed Right-of-Way	Property Lines
Proposed L/A Right-of-Way	Split Oak Forest
Proposed Barrier Wall	
Proposed Pavement	
Proposed Structure	

Appendix A
Jack Brack Road
Diamond Interchange

SHEET NO.
A-1



CENTRAL FLORIDA EXPRESSWAY AUTHORITY	Northeast Connector Expressway - Phase 1 From Cyrils Drive to Nova Road (CR 532) Project Development and Environment Study	Existing Right-of-Way Proposed Right-of-Way Proposed L/A Right-of-Way Potential OUC Utility Easement Property Lines Split Oak Forest Proposed Barrier Wall Proposed Pavement Proposed Structure	Appendix A Jack Brack Road Diamond Interchange SHEET NO. A-2



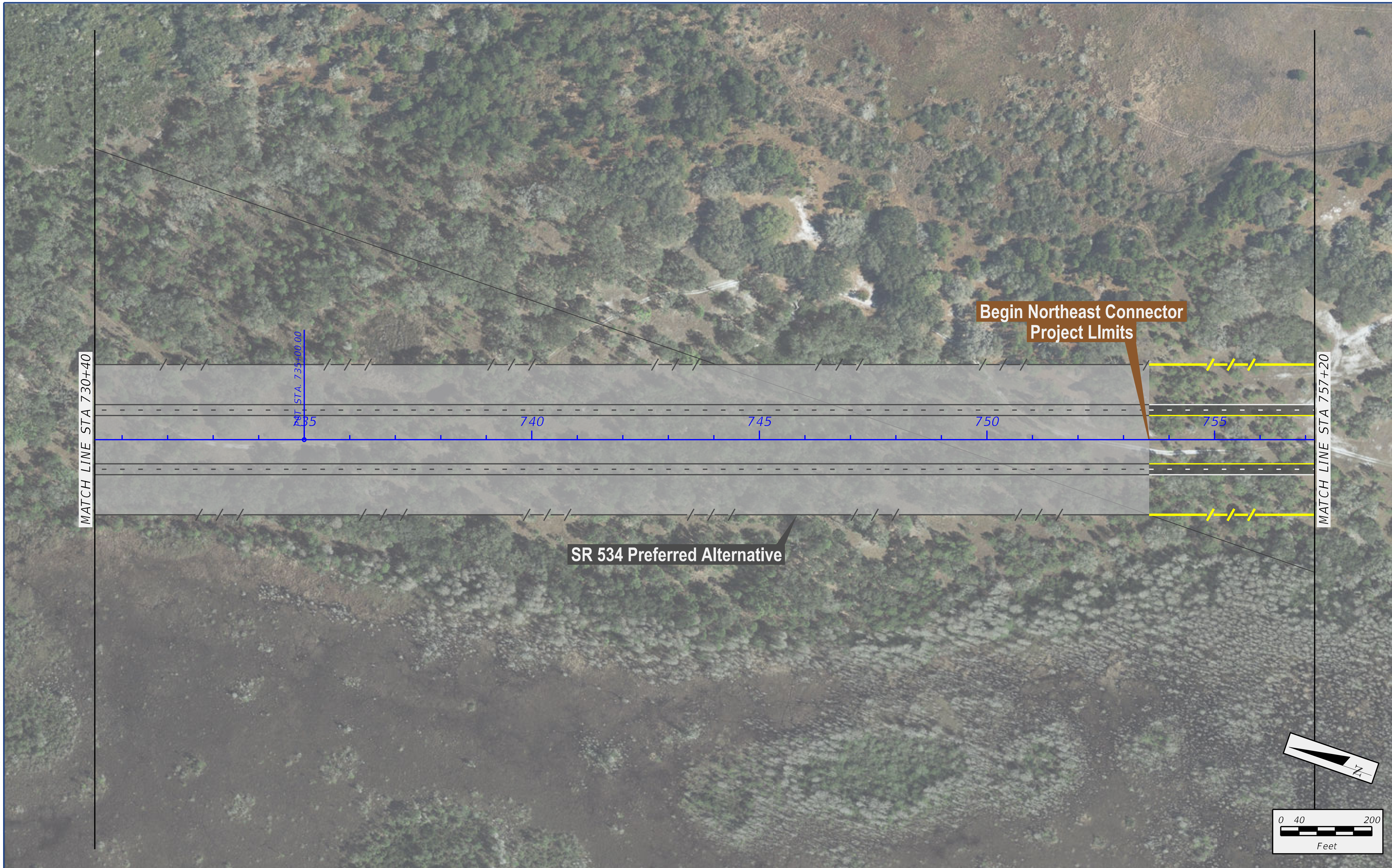
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Existing Right-of-Way	Potential OUC Utility Easement
Proposed Right-of-Way	Property Lines
Proposed L/A Right-of-Way	Split Oak Forest
Proposed Barrier Wall	
Proposed Pavement	
Proposed Structure	

Appendix A
Jack Brack Road
Diamond Interchange

SHEET NO.
A-3



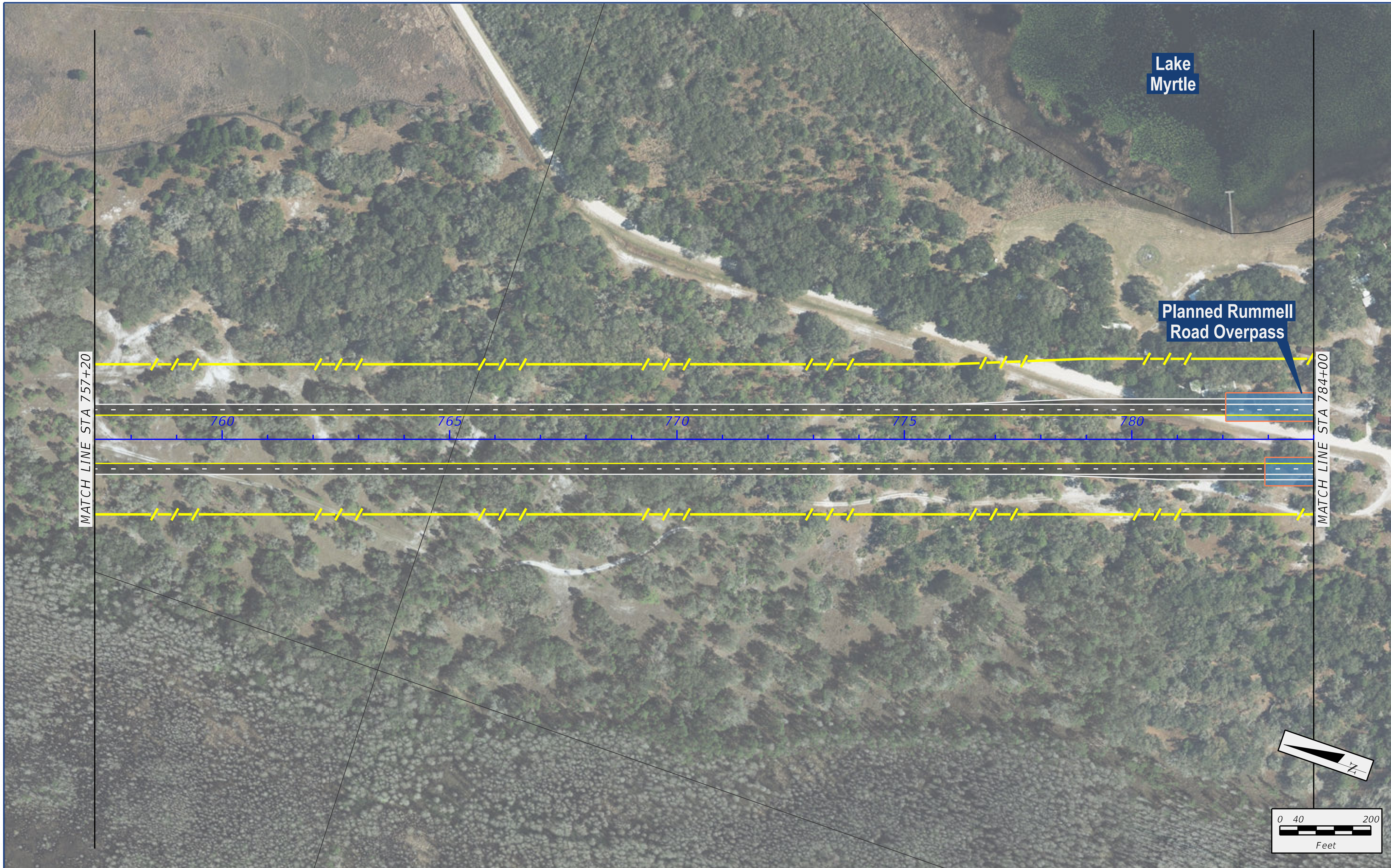
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Existing Right-of-Way
Proposed Right-of-Way
Proposed L/A Right-of-Way
Potential OUC Utility Easement
Property Lines
Split Oak Forest
Proposed Barrier Wall
Proposed Pavement
Proposed Structure

Appendix A
Jack Brack Road
Diamond Interchange

SHEET NO.
A-4

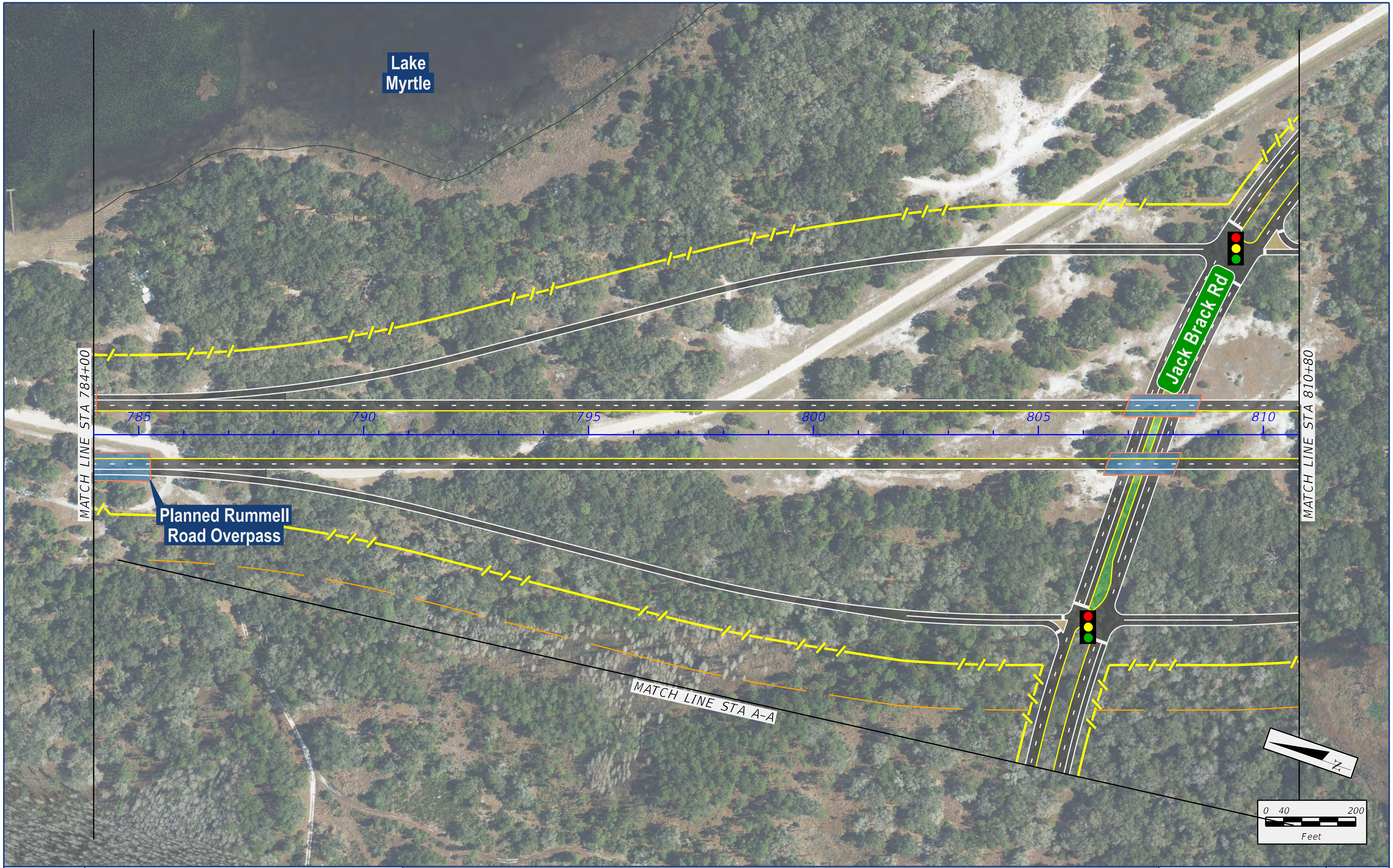


Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Existing Right-of-Way
Proposed Right-of-Way
Proposed L/A Right-of-Way
Potential OUC Utility Easement
Property Lines
Split Oak Forest
Proposed Barrier Wall
Proposed Pavement
Proposed Structure

Appendix A
Jack Brack Road
Diamond Interchange

SHEET NO.
A-5



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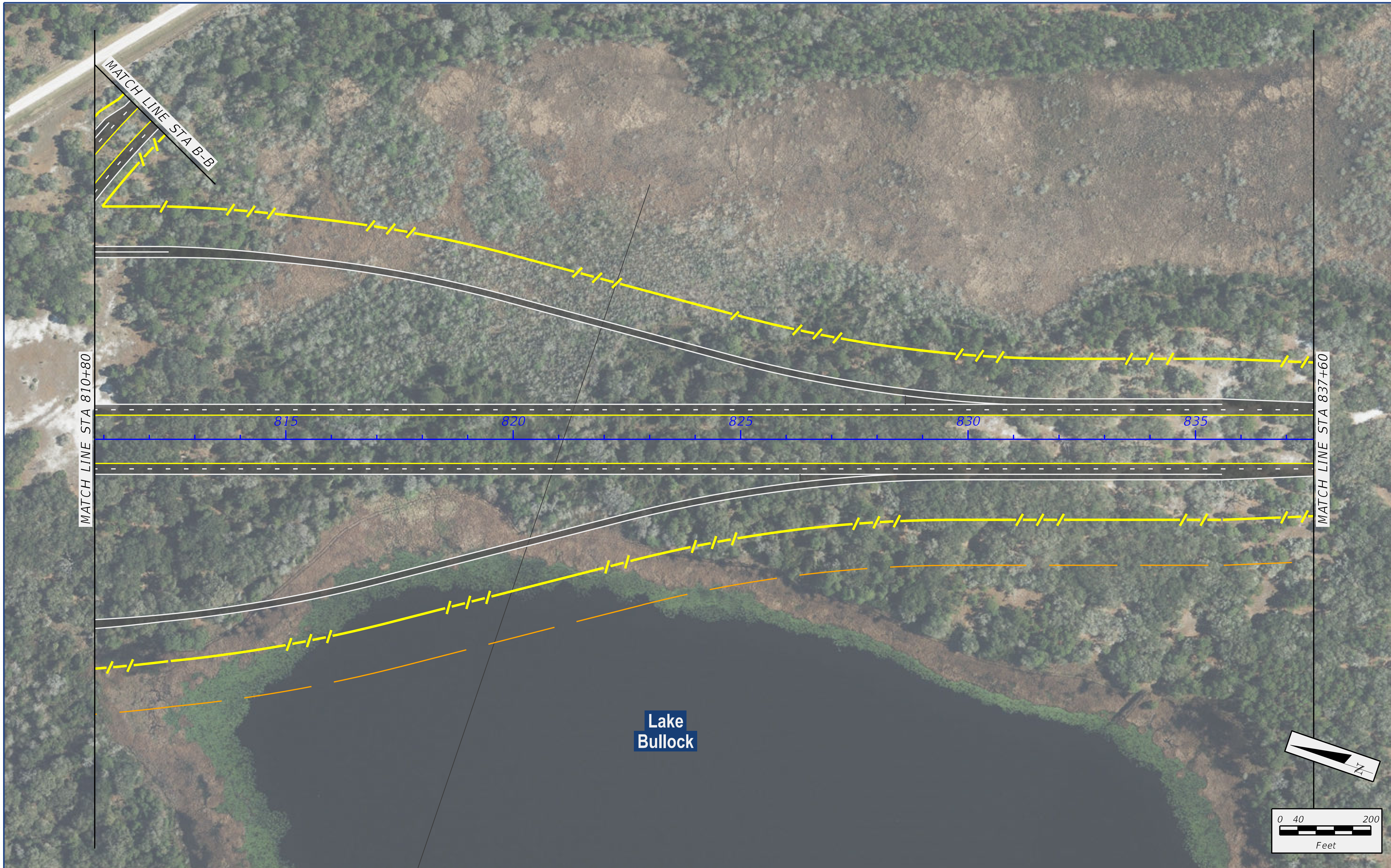
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Existing Right-of-Way	Potential OUC Utility Easement	Proposed Barrier Wall
Proposed Right-of-Way	Property Lines	Proposed Pavement
Proposed L/A Right-of-Way	Split Oak Forest	Proposed Structure

Appendix A
Jack Brack Road
Diamond Interchange

SHEET NO.
A-6



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CENTRAL FLORIDA EXPRESSWAY AUTHORITY	Northeast Connector Expressway - Phase 1 From Cyrils Drive to Nova Road (CR 532) Project Development and Environment Study	Existing Right-of-Way Proposed Right-of-Way Proposed L/A Right-of-Way	Potential OUC Utility Easement Property Lines Split Oak Forest	Proposed Barrier Wall Proposed Pavement Proposed Structure	Appendix A Jack Brack Road Diamond Interchange	SHEET NO. A-7

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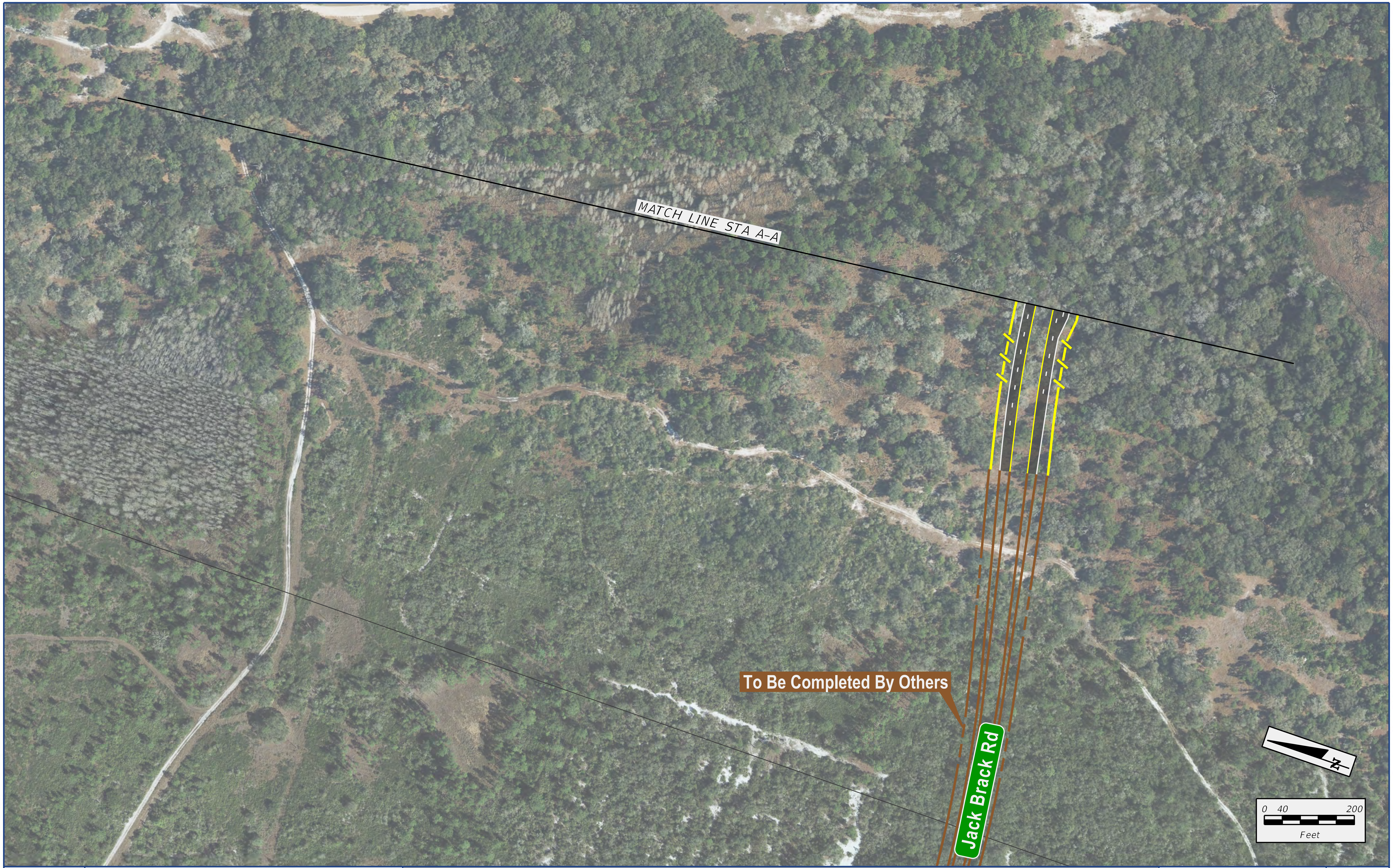
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Existing Right-of-Way	Potential OUC Utility Easement	Proposed Barrier Wall
Proposed Right-of-Way	Property Lines	Proposed Pavement
Proposed L/A Right-of-Way	Split Oak Forest	Proposed Structure

Appendix A
Jack Brack Road
Diamond Interchange

SHEET NO.
A-8



CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

	Existing Right-of-Way		Potential OUC Utility Easement		Proposed Barrier Wall
	Proposed Right-of-Way		Property Lines		Proposed Pavement
	Proposed L/A Right-of-Way		Split Oak Forest		Proposed Structure

Appendix A
Jack Brack Road
Diamond Interchange

SHEET NO.
A-9

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

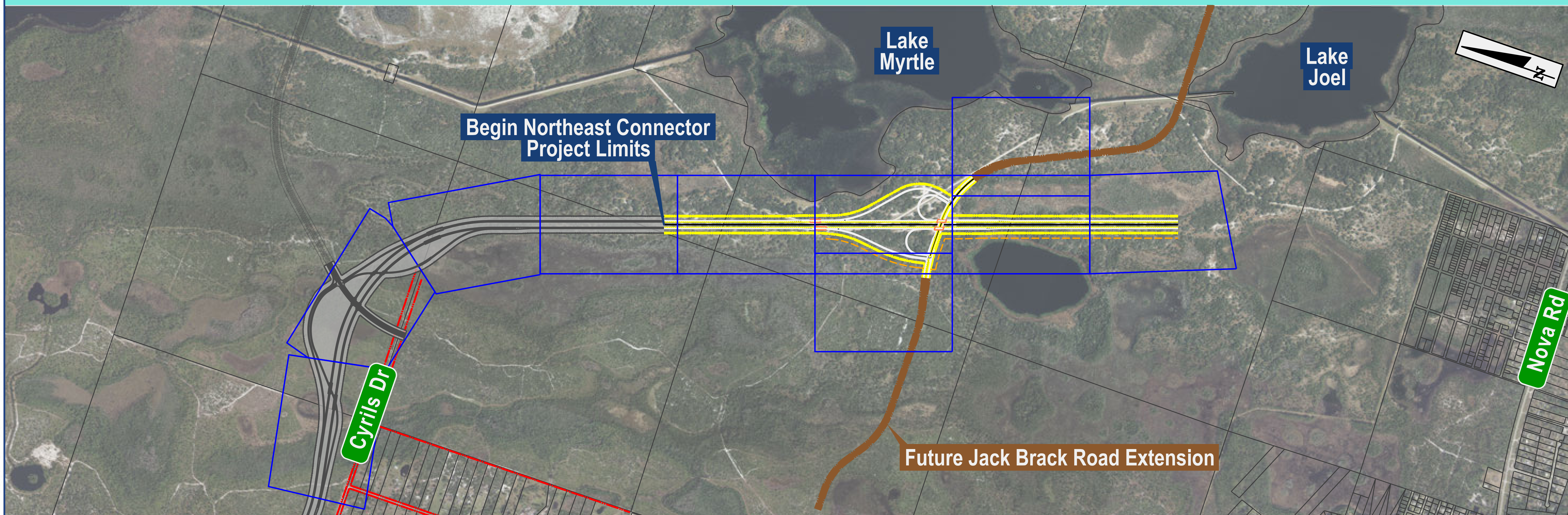
Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

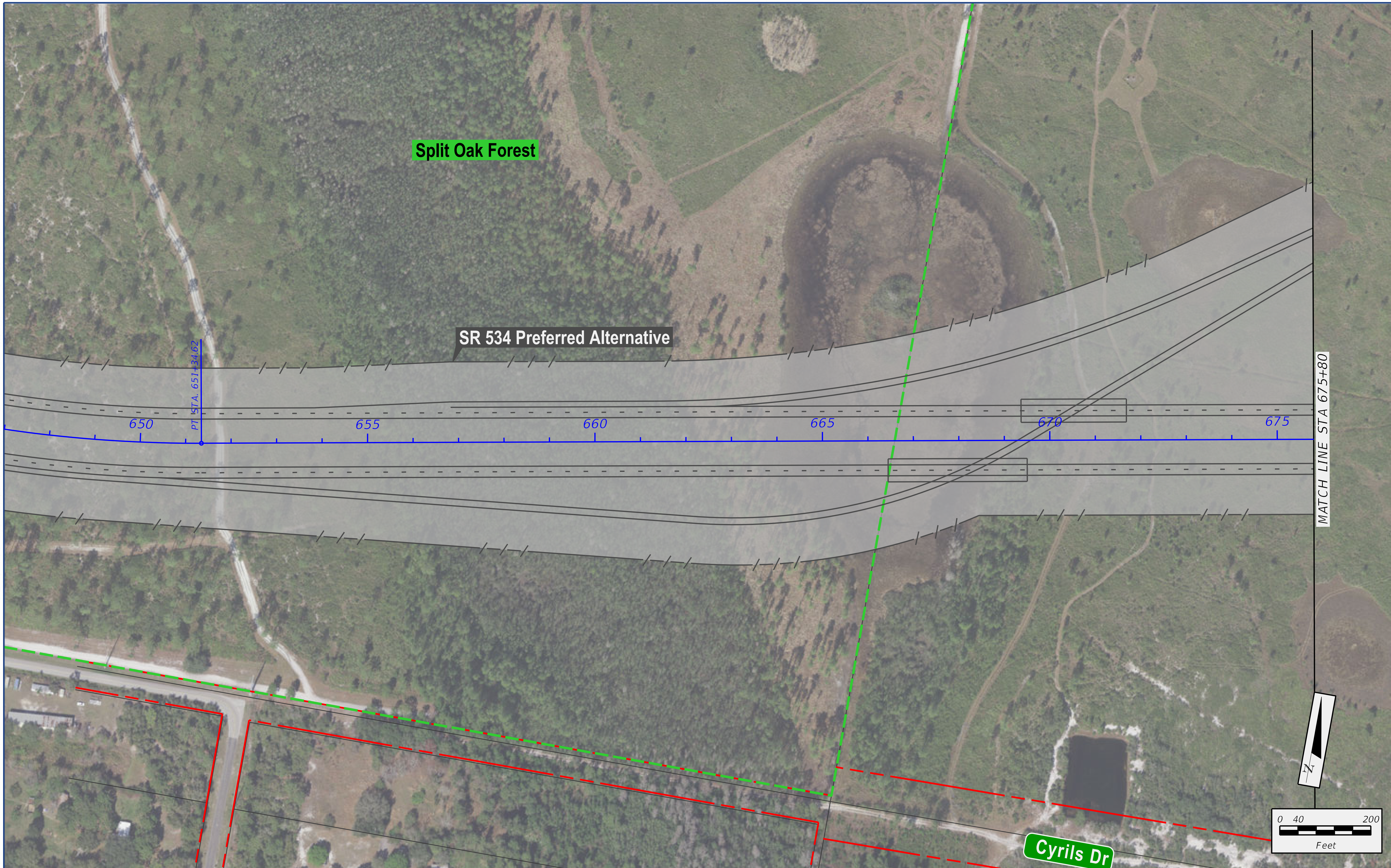
Existing Right-of-Way
Proposed Right-of-Way
Proposed L/A Right-of-Way
Potential OUC Utility Easement
Property Lines
Split Oak Forest
Proposed Barrier Wall
Proposed Pavement
Proposed Structure

Appendix A
Jack Brack Road
Diamond Interchange

SHEET NO.
A-10

Jack Brack Road Partial Cloverleaf Interchange





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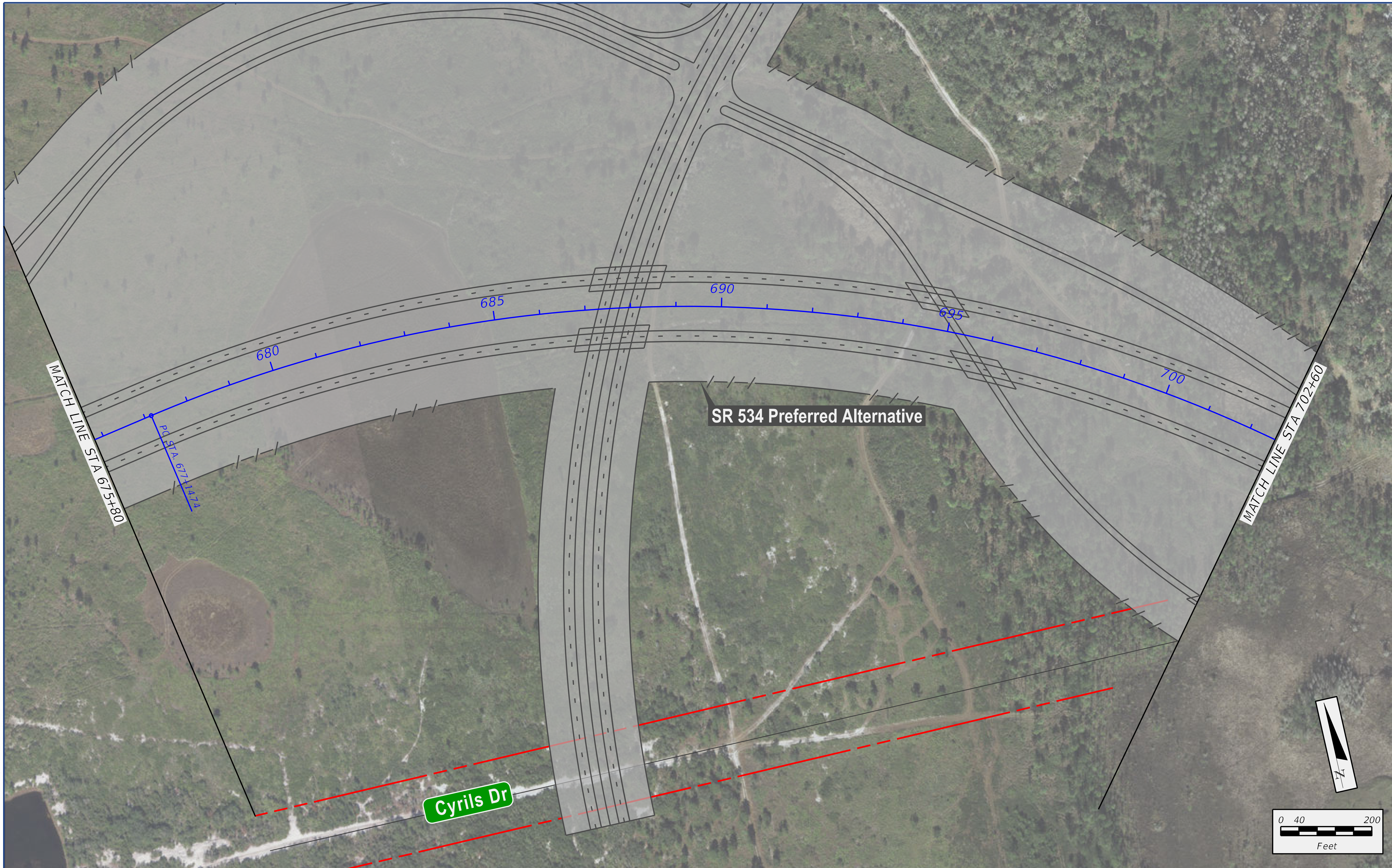
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Legend		
Existing Right-of-Way	Potential OUC Utility Easement	Proposed Barrier Wall
Proposed Right-of-Way	Property Lines	Proposed Pavement
Proposed L/A Right-of-Way	Split Oak Forest	Proposed Structure

Appendix A
Jack Brack Road Partial
Cloverleaf Interchange

SHEET NO.
A-11



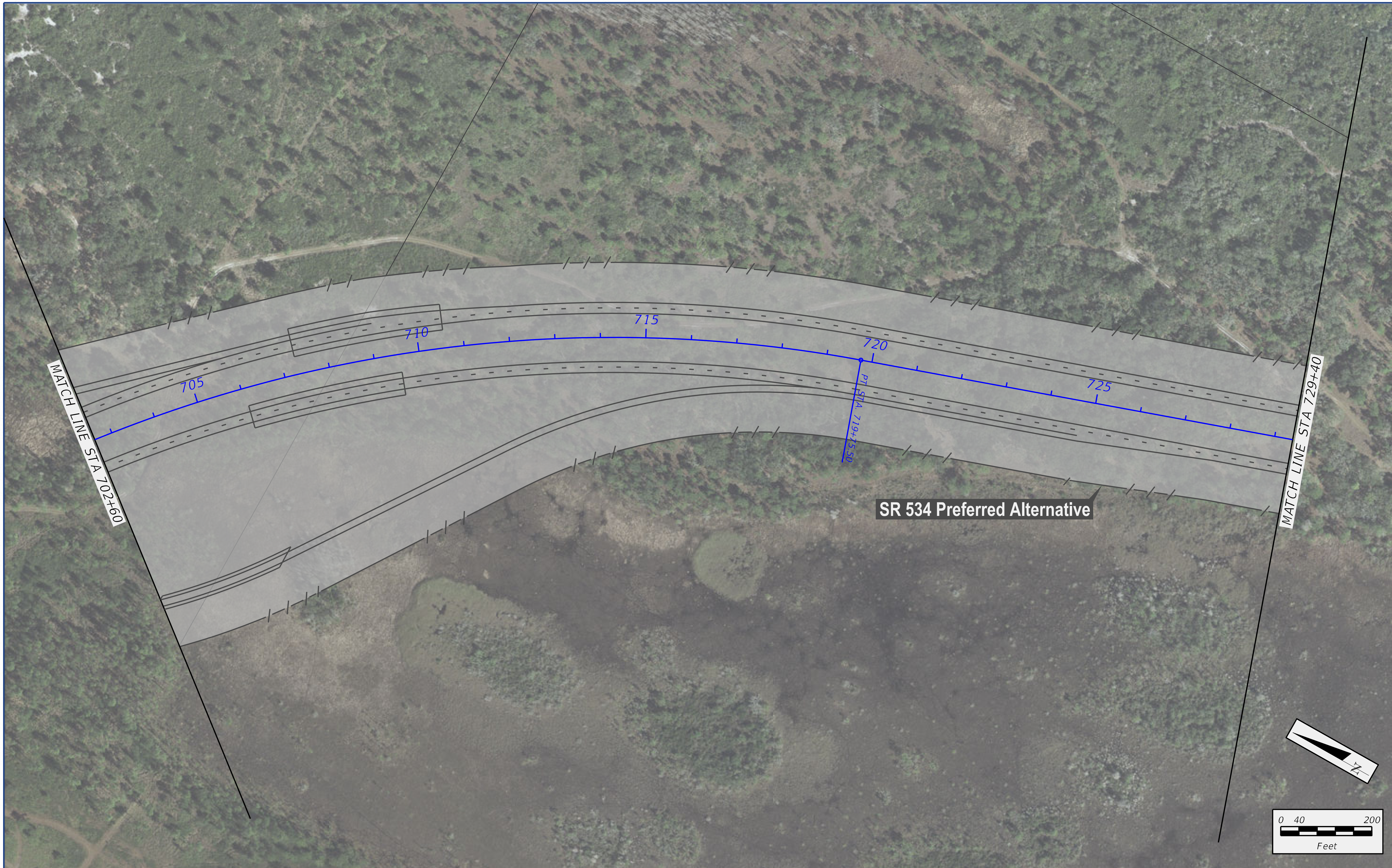
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Existing Right-of-Way	Potential OUC Utility Easement
Proposed Right-of-Way	Property Lines
Proposed L/A Right-of-Way	Split Oak Forest
Proposed Barrier Wall	
Proposed Pavement	
Proposed Structure	

Appendix A
Jack Brack Road Partial
Cloverleaf Interchange

SHEET NO. A-12



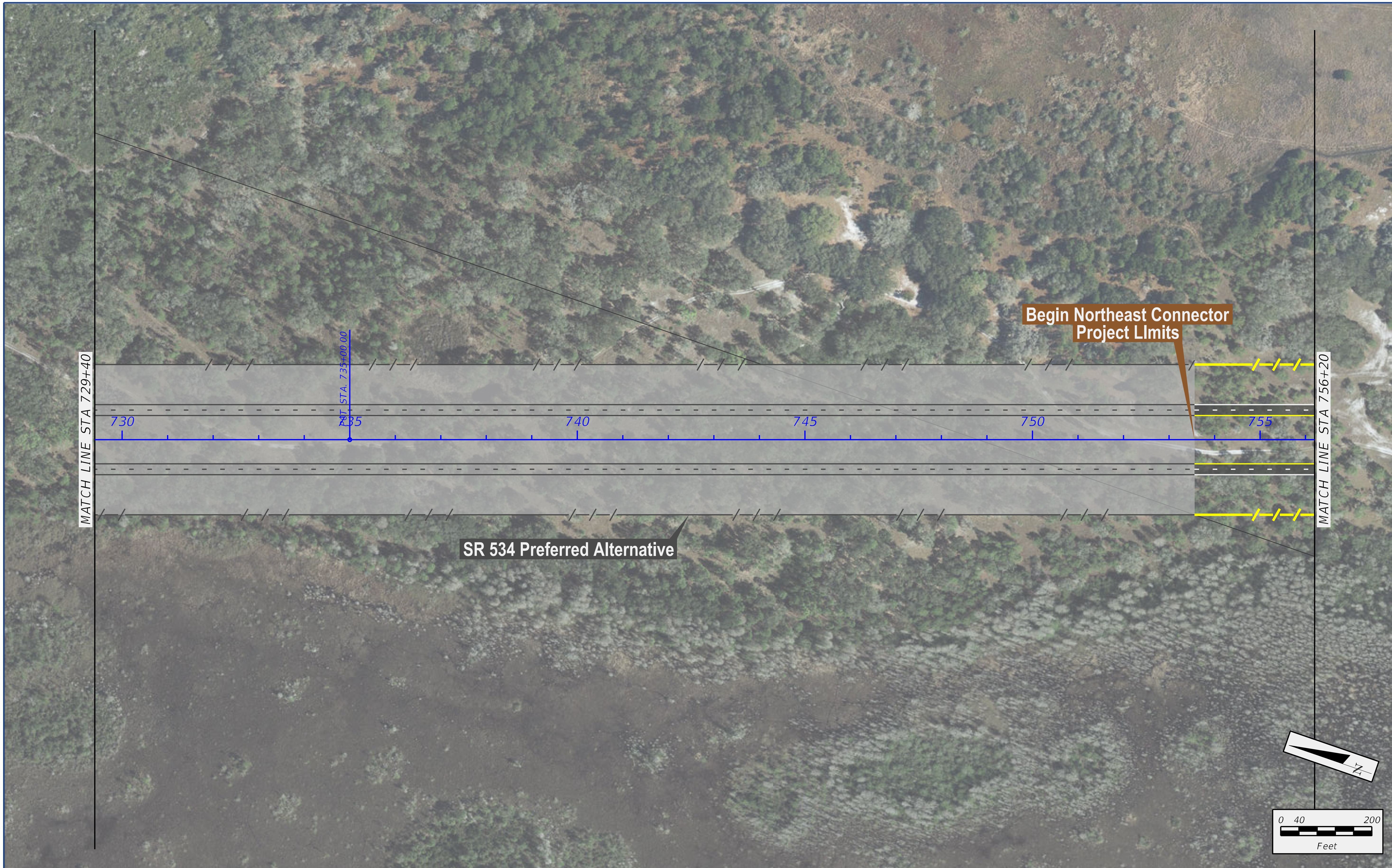
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Existing Right-of-Way	Potential OUC Utility Easement	Proposed Barrier Wall
Proposed Right-of-Way	Property Lines	Proposed Pavement
Proposed L/A Right-of-Way	Split Oak Forest	Proposed Structure

Appendix A
Jack Brack Road Partial
Cloverleaf Interchange

SHEET NO.
A-13



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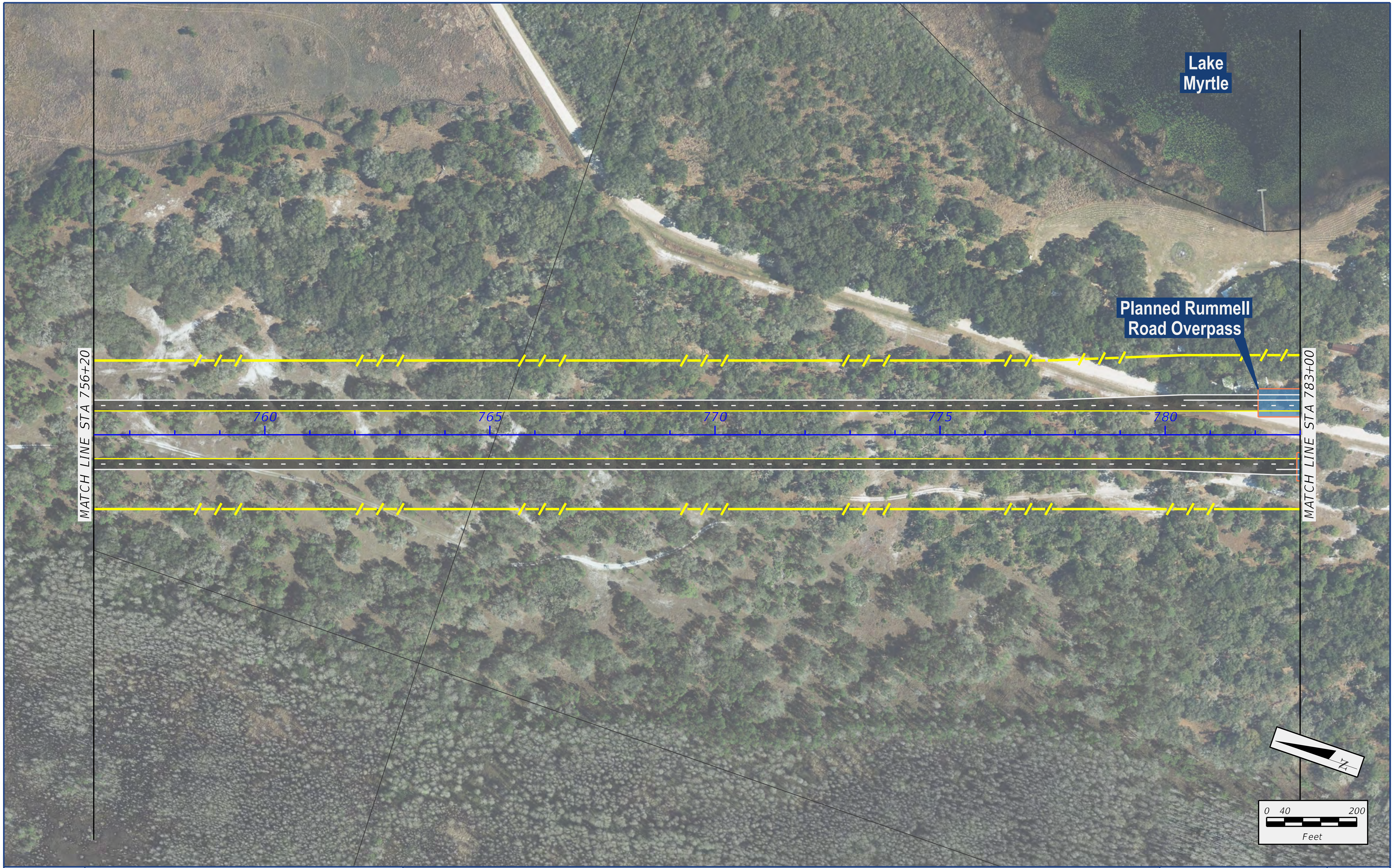
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Existing Right-of-Way	Potential OUC Utility Easement
Proposed Right-of-Way	Property Lines
Proposed L/A Right-of-Way	Split Oak Forest
Proposed Barrier Wall	
Proposed Pavement	
Proposed Structure	

Appendix A
Jack Brack Road Partial
Cloverleaf Interchange

SHEET NO.
A-14



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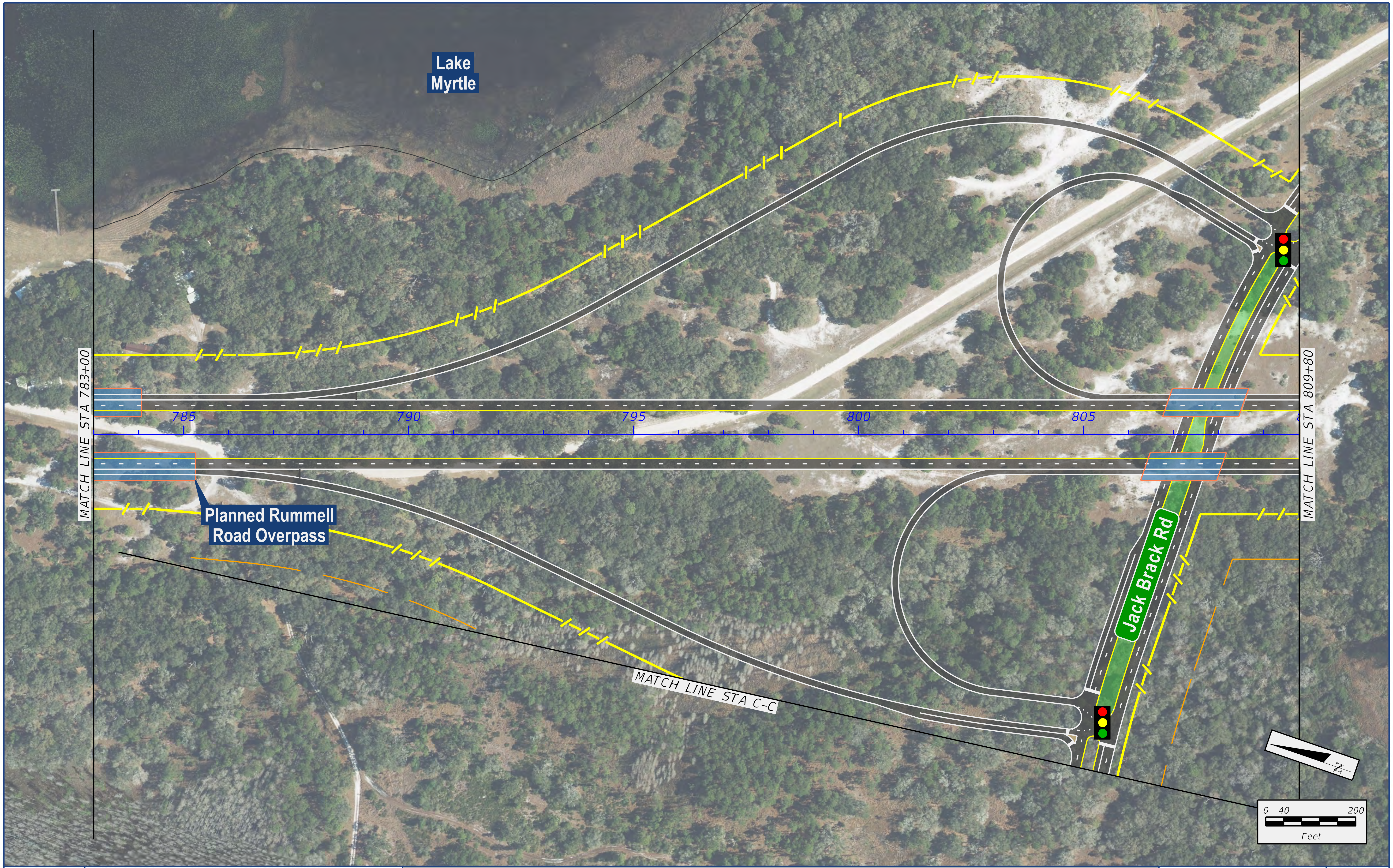
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Existing Right-of-Way	Potential OUC Utility Easement
Proposed Right-of-Way	Property Lines
Proposed L/A Right-of-Way	Split Oak Forest
Proposed Barrier Wall	
Proposed Pavement	
Proposed Structure	

Appendix A
Jack Brack Road Partial
Cloverleaf Interchange

SHEET NO.
A-15



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CENTRAL FLORIDA EXPRESSWAY AUTHORITY	Northeast Connector Expressway - Phase 1 From Cyrils Drive to Nova Road (CR 532) Project Development and Environment Study	Existing Right-of-Way Proposed Right-of-Way Proposed L/A Right-of-Way	Potential OUC Utility Easement Property Lines Split Oak Forest	Proposed Barrier Wall Proposed Pavement Proposed Structure	Appendix A Jack Brack Road Partial Cloverleaf Interchange	SHEET NO. A-16

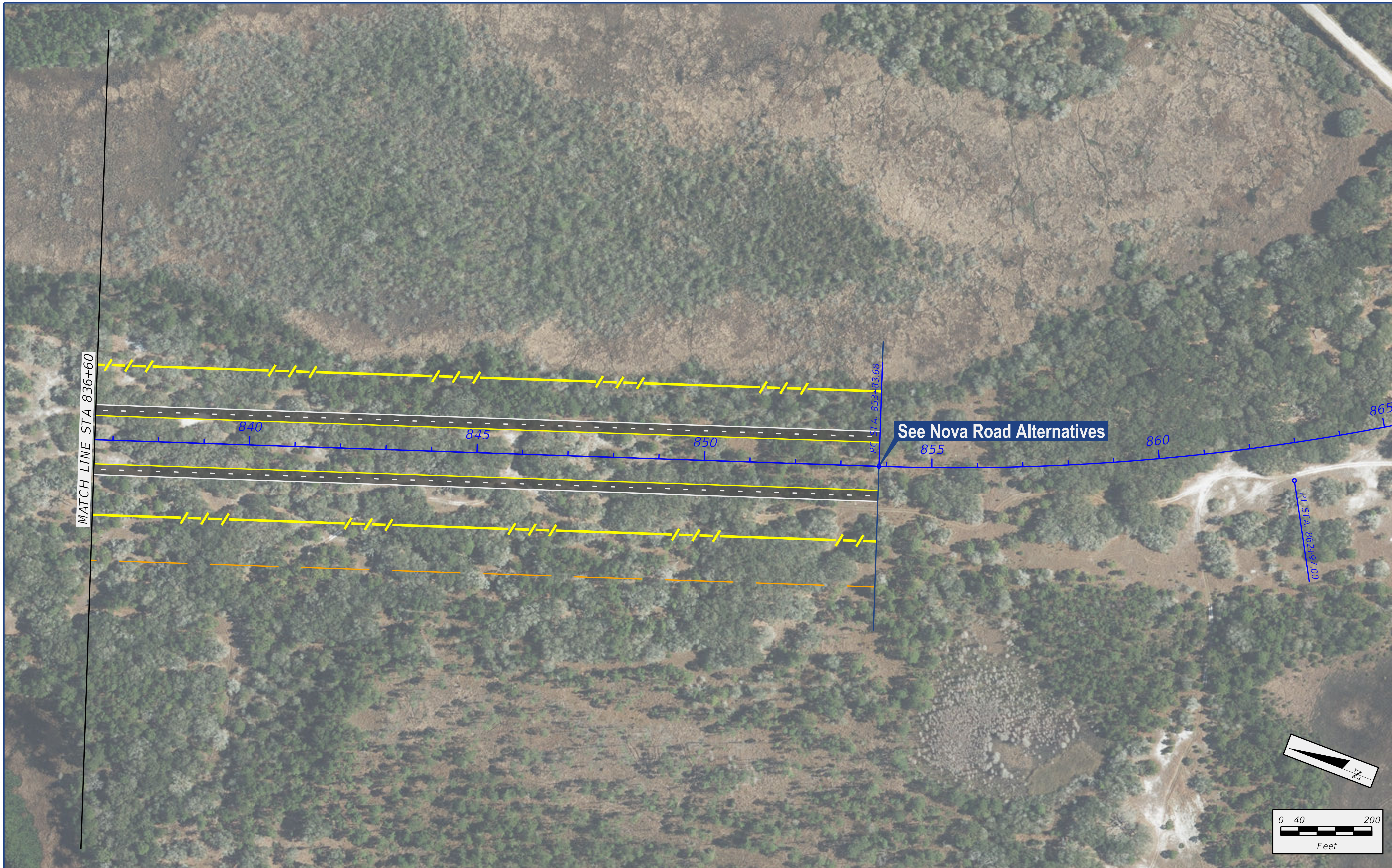
Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Existing Right-of-Way	Potential OUC Utility Easement	Proposed Barrier Wall
Proposed Right-of-Way	Property Lines	Proposed Pavement
Proposed L/A Right-of-Way	Split Oak Forest	Proposed Structure

Appendix A
Jack Brack Road Partial
Cloverleaf Interchange

SHEET NO.
A-17



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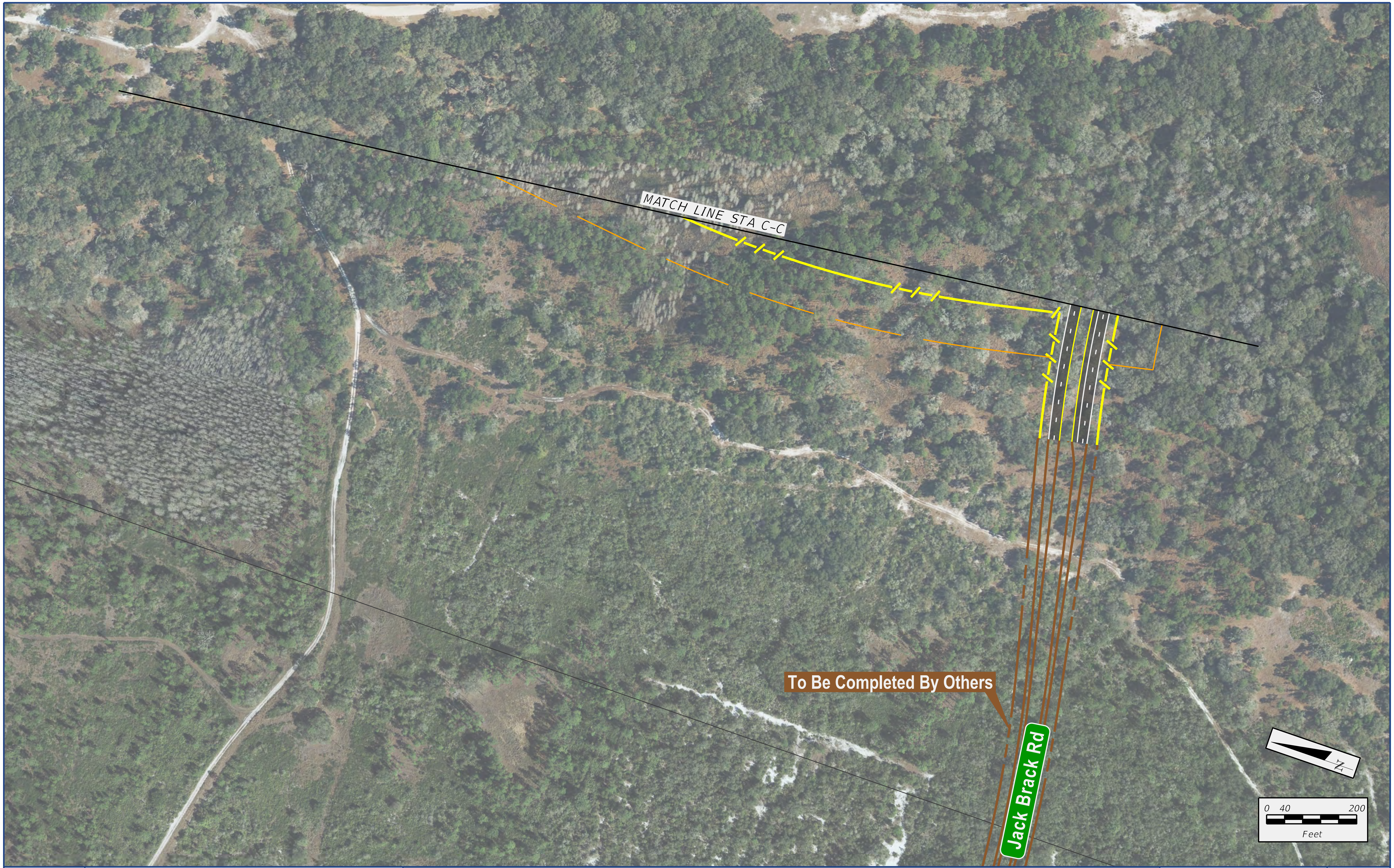
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Existing Right-of-Way	Potential OUC Utility Easement	Proposed Barrier Wall
Proposed Right-of-Way	Property Lines	Proposed Pavement
Proposed L/A Right-of-Way	Split Oak Forest	Proposed Structure

Appendix A
Jack Brack Road Partial
Cloverleaf Interchange

SHEET NO.
A-18



CENTRAL FLORIDA EXPRESSWAY AUTHORITY	Northeast Connector Expressway - Phase 1 From Cyrils Drive to Nova Road (CR 532) Project Development and Environment Study	Existing Right-of-Way Proposed Right-of-Way Proposed L/A Right-of-Way Potential OUC Utility Easement Property Lines Split Oak Forest Proposed Barrier Wall Proposed Pavement Proposed Structure	Appendix A Jack Brack Road Partial Cloverleaf Interchange
			SHEET NO. A-19

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Legend		
Existing Right-of-Way	Potential OUC Utility Easement	Proposed Barrier Wall
Proposed Right-of-Way	Property Lines	Proposed Pavement
Proposed L/A Right-of-Way	Split Oak Forest	Proposed Structure

Appendix A
Jack Brack Road Partial
Cloverleaf Interchange

SHEET NO.
A-20

Nova Road Connection Option 1

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CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Existing Right-of-Way	Potential OUC Utility Easement	Proposed Barrier Wall
Proposed Right-of-Way	Property Lines	Proposed Pavement
Proposed L/A Right-of-Way	Split Oak Forest	Proposed Structure

Appendix A
Nova Road Connection
Option 1

SHEET NO.
A-21

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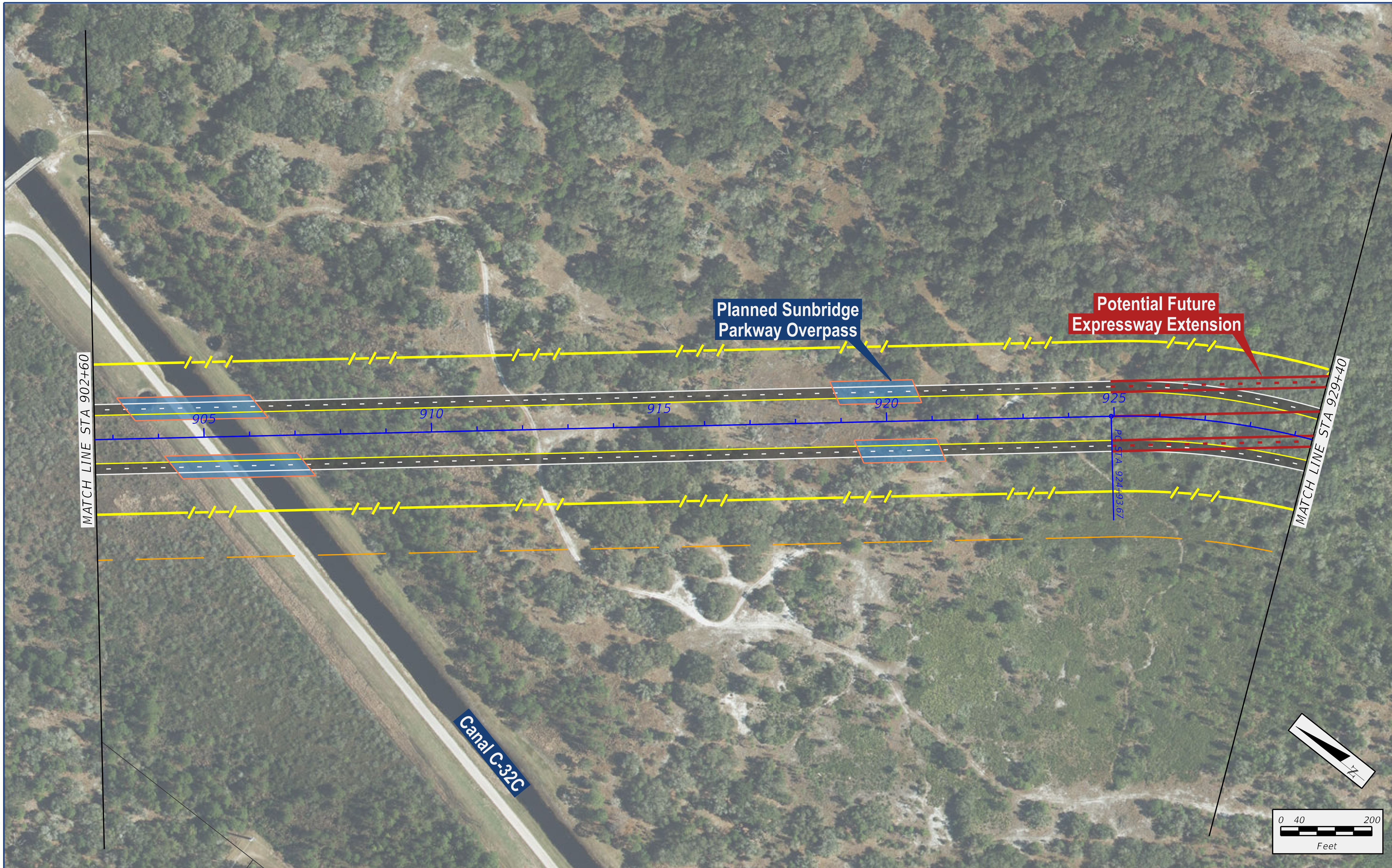
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

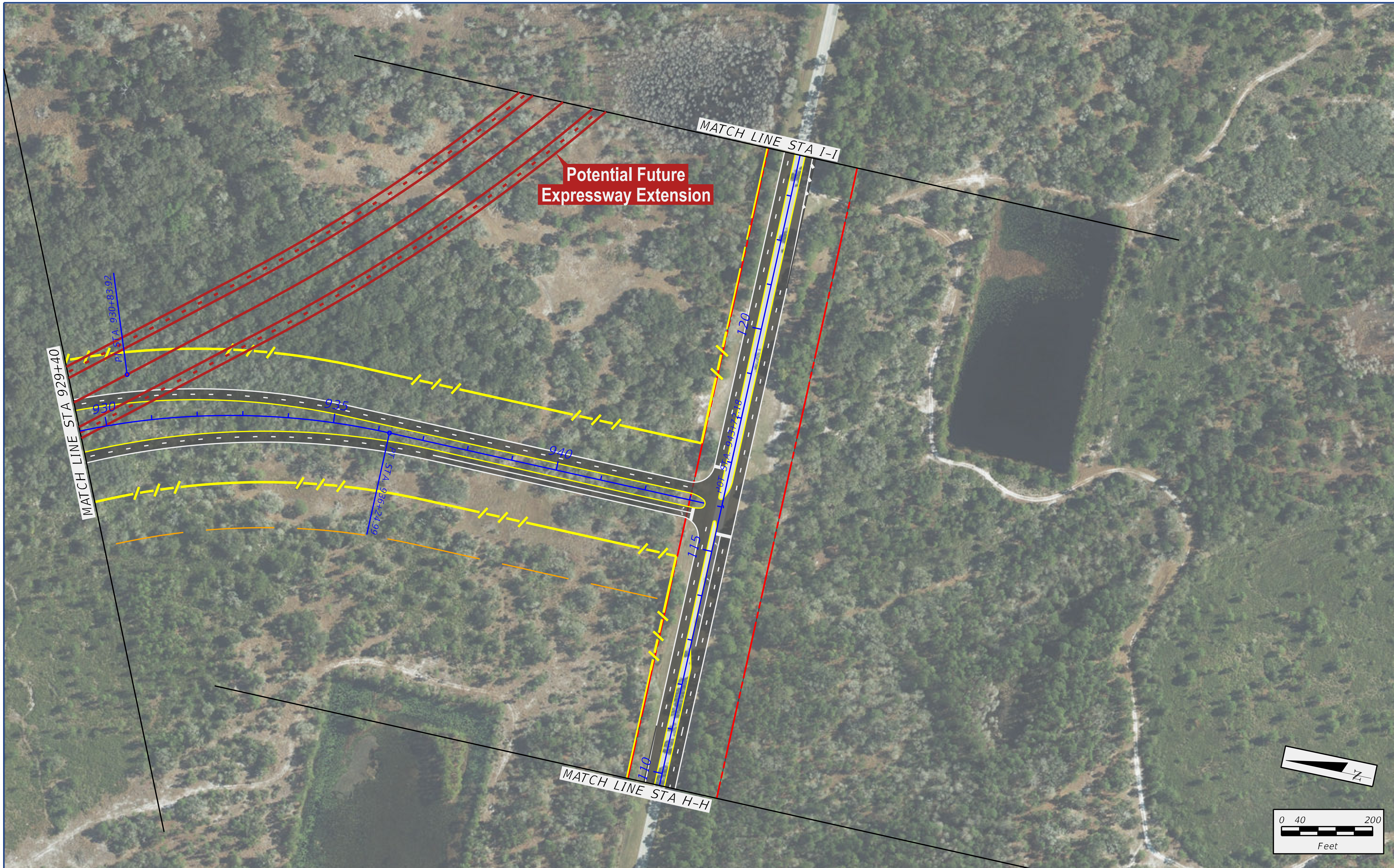
Existing Right-of-Way	Potential OUC Utility Easement	Proposed Barrier Wall
Proposed Right-of-Way	Property Lines	Proposed Pavement
Proposed L/A Right-of-Way	Split Oak Forest	Proposed Structure

Appendix A
Nova Road Connection
Option 1

SHEET NO.
A-22



CENTRAL FLORIDA EXPRESSWAY AUTHORITY	Northeast Connector Expressway - Phase 1 From Cyrils Drive to Nova Road (CR 532) Project Development and Environment Study	Existing Right-of-Way Proposed Right-of-Way Proposed L/A Right-of-Way	Potential OUC Utility Easement Property Lines Split Oak Forest	Proposed Barrier Wall Proposed Pavement Proposed Structure	Appendix A Nova Road Connection Option 1
					SHEET NO. A-23



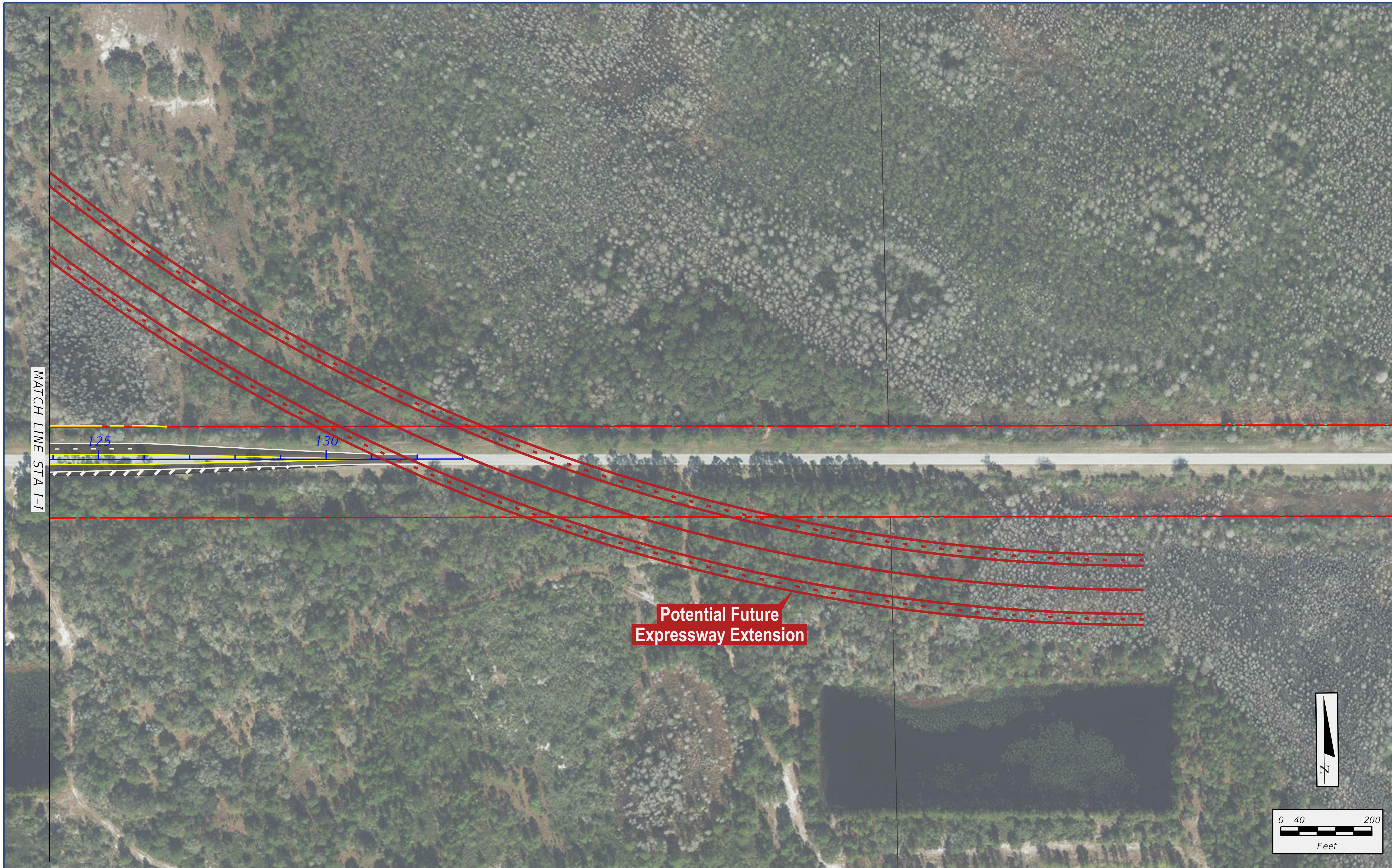
CENTRAL FLORIDA EXPRESSWAY AUTHORITY	Northeast Connector Expressway - Phase 1 From Cyrils Drive to Nova Road (CR 532) Project Development and Environment Study	Appendix A Nova Road Connection Option 1

Existing Right-of-Way
Proposed Right-of-Way
Proposed L/A Right-of-Way
Potential OUC Utility Easement
Property Lines
Split Oak Forest
Proposed Barrier Wall
Proposed Pavement
Proposed Structure

SHEET NO.
A-24

CENTRAL FLORIDA EXPRESSWAY AUTHORITY	Northeast Connector Expressway - Phase 1 From Cyrils Drive to Nova Road (CR 532) Project Development and Environment Study	Appendix A Nova Road Connection Option 1	SHEET NO. A-25

Existing Right-of-Way
Proposed Right-of-Way
Proposed L/A Right-of-Way
Potential OUC Utility Easement
Property Lines
Split Oak Forest
Proposed Barrier Wall
Proposed Pavement
Proposed Structure



CENTRAL FLORIDA EXPRESSWAY AUTHORITY

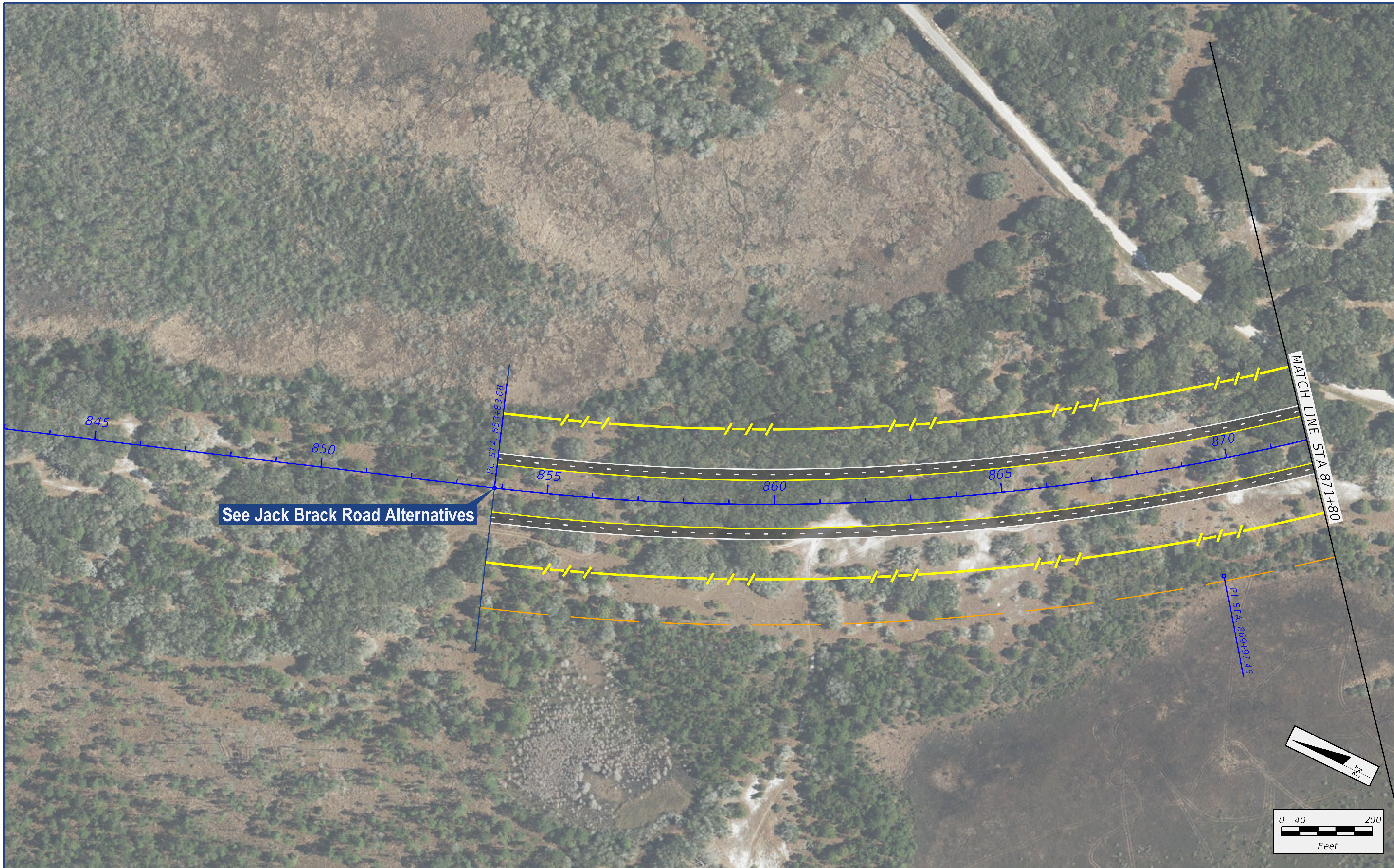
Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Existing Right-of-Way	Potential OUC Utility Easement	Proposed Barrier Wall
Proposed Right-of-Way	Property Lines	Proposed Pavement
Proposed L/A Right-of-Way	Split Oak Forest	Proposed Structure

Appendix A
Nova Road Connection
Option 1

SHEET NO.
A-26

Nova Road Connection Option 2



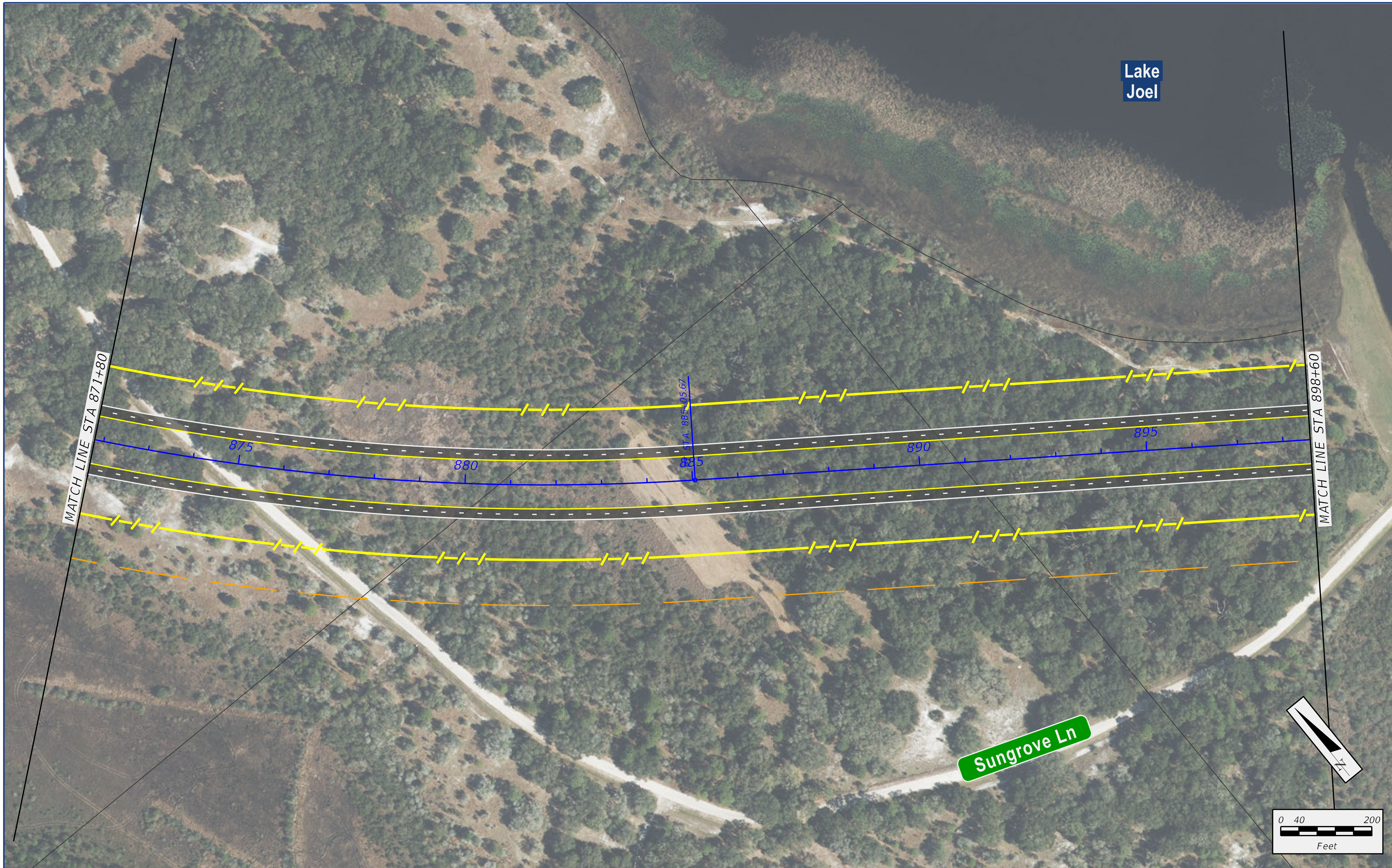
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Existing Right-of-Way
Proposed Right-of-Way
Proposed L/A Right-of-Way
Potential OUC Utility Easement
Property Lines
Split Oak Forest
Proposed Barrier Wall
Proposed Pavement
Proposed Structure

Appendix A
Nova Road Connection
Option 2

SHEET NO.
A-27



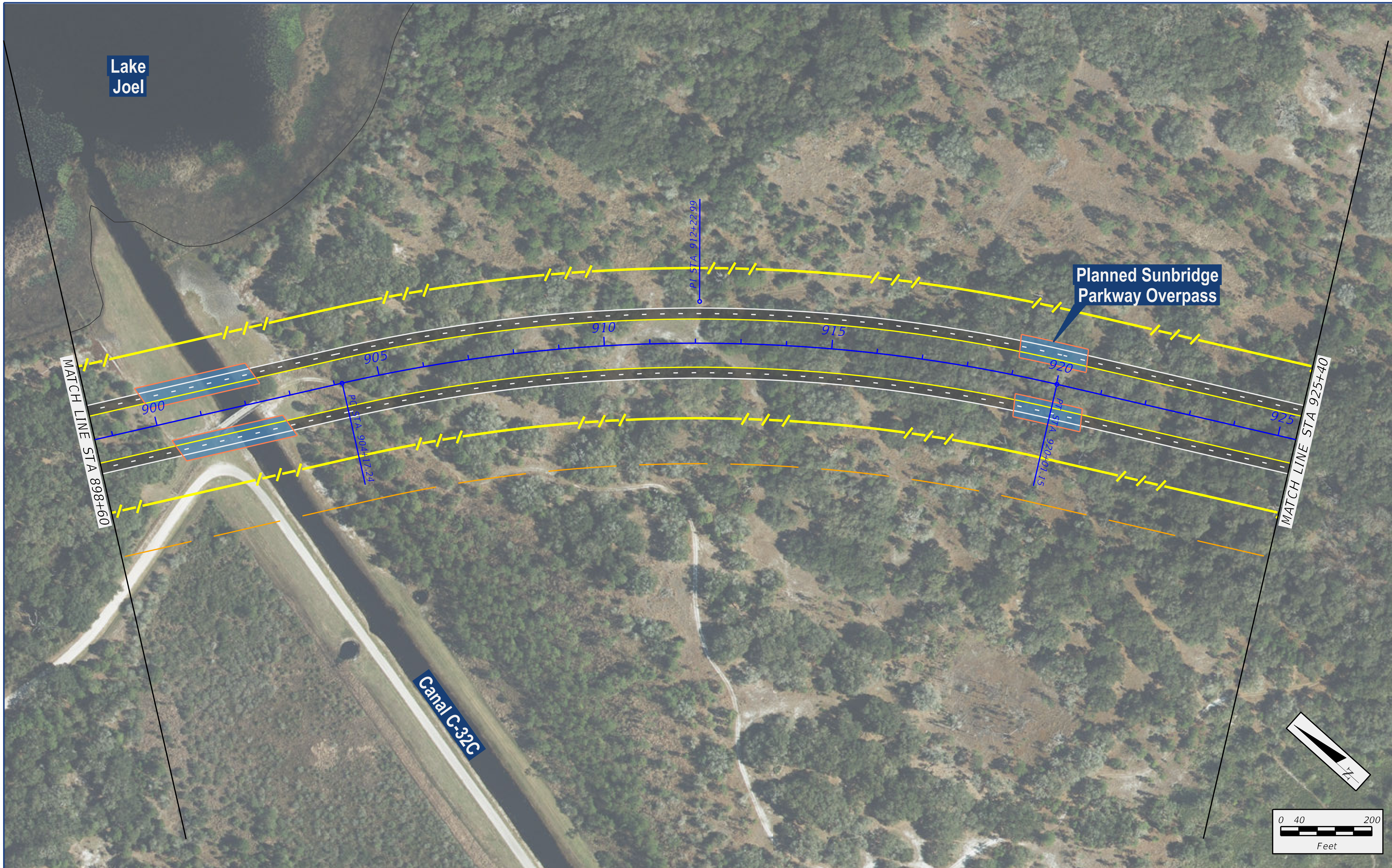
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Existing Right-of-Way
Proposed Right-of-Way
Proposed L/A Right-of-Way
Potential OUC Utility Easement
Property Lines
Split Oak Forest
Proposed Barrier Wall
Proposed Pavement
Proposed Structure

Appendix A
Nova Road Connection
Option 2

SHEET NO.
A-28

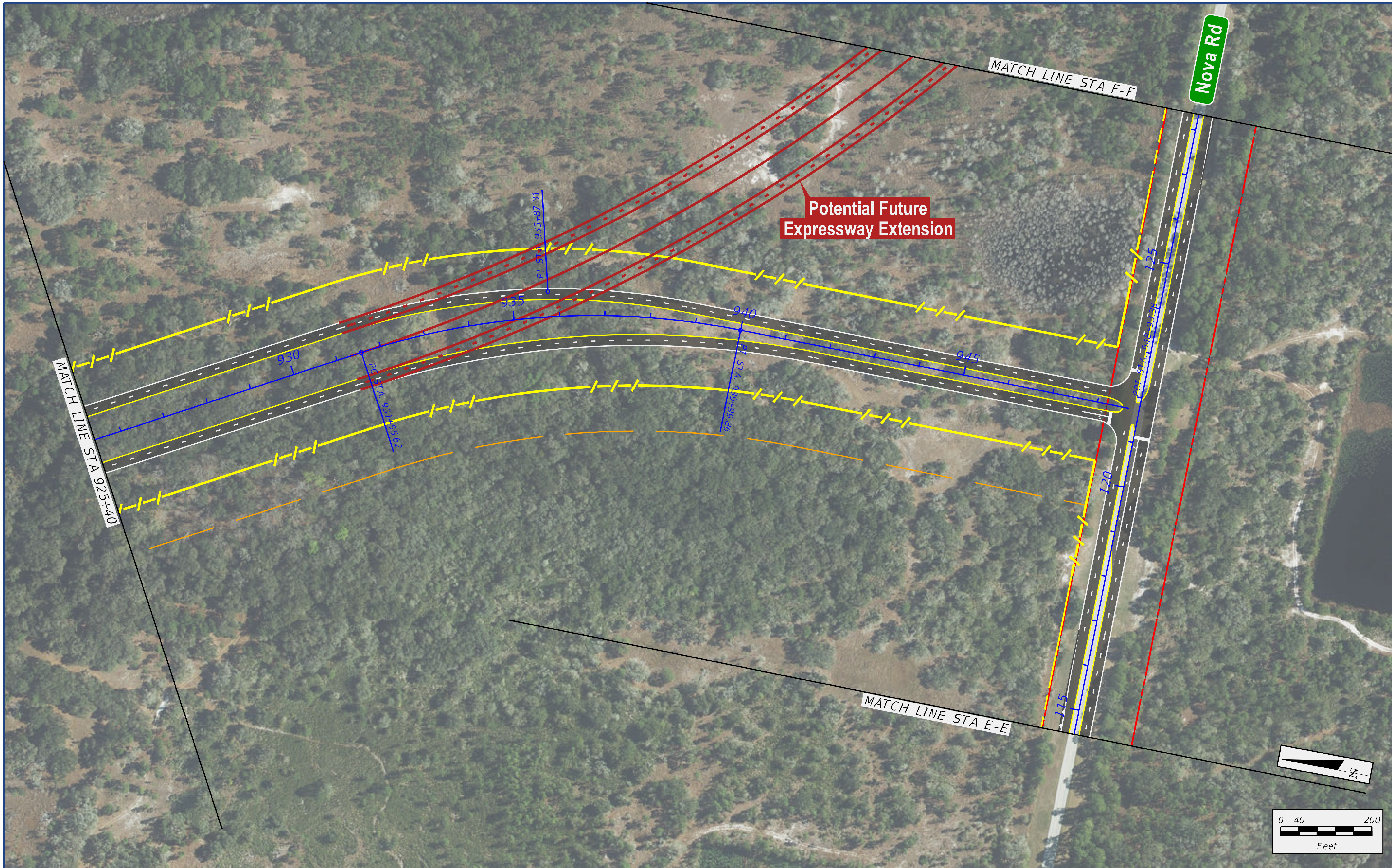


Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

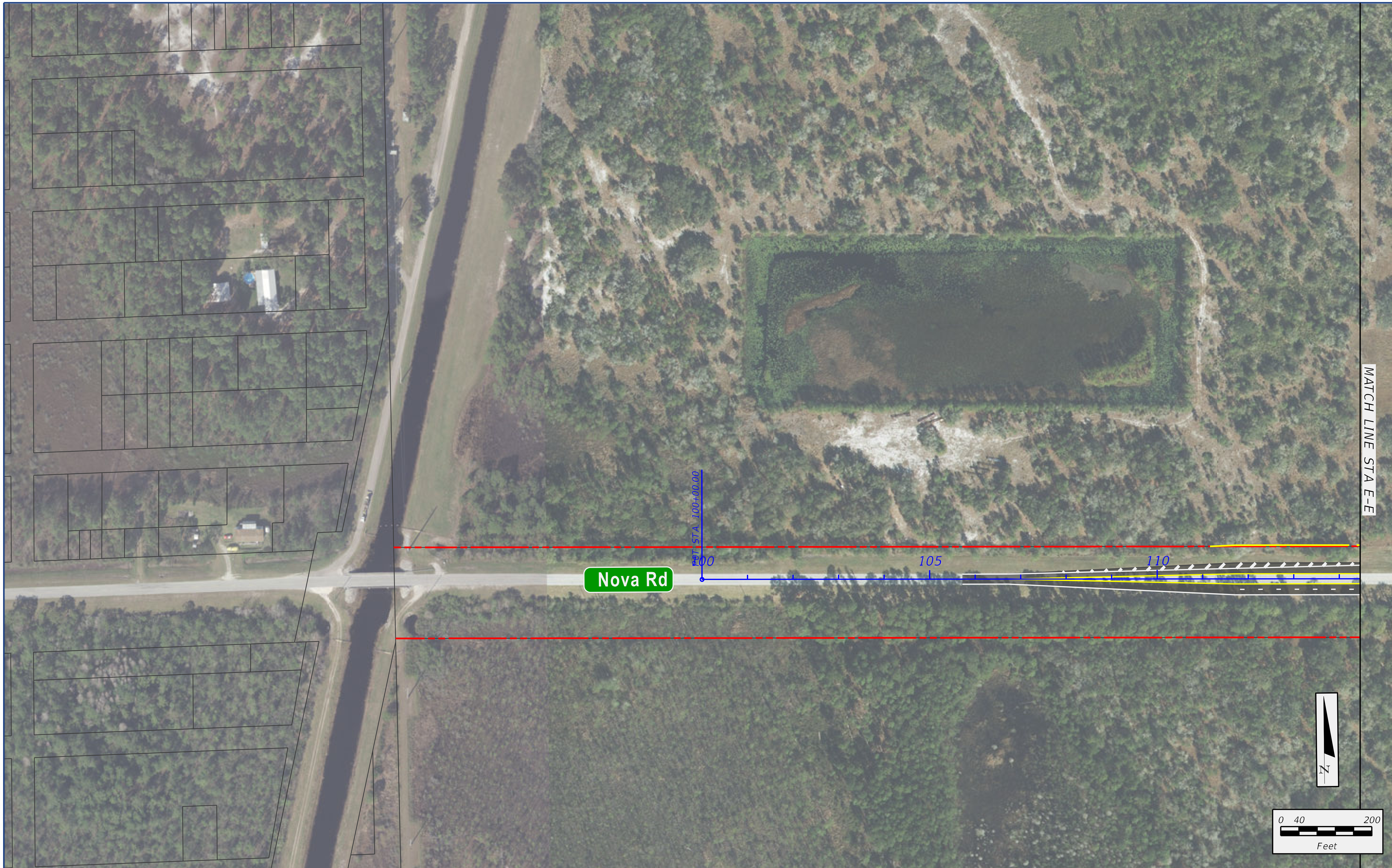
Existing Right-of-Way	Potential OUC Utility Easement	Proposed Barrier Wall
Proposed Right-of-Way	Property Lines	Proposed Pavement
Proposed L/A Right-of-Way	Split Oak Forest	Proposed Structure

Appendix A
Nova Road Connection
Option 2

SHEET NO.
A-29



CENTRAL FLORIDA EXPRESSWAY AUTHORITY	Northeast Connector Expressway - Phase 1 From Cyrils Drive to Nova Road (CR 532) Project Development and Environment Study	Existing Right-of-Way Proposed Right-of-Way Proposed L/A Right-of-Way Potential OUC Utility Easement Property Lines Split Oak Forest Proposed Barrier Wall Proposed Pavement Proposed Structure	Appendix A Nova Road Connection Option 2	SHEET NO. A-30



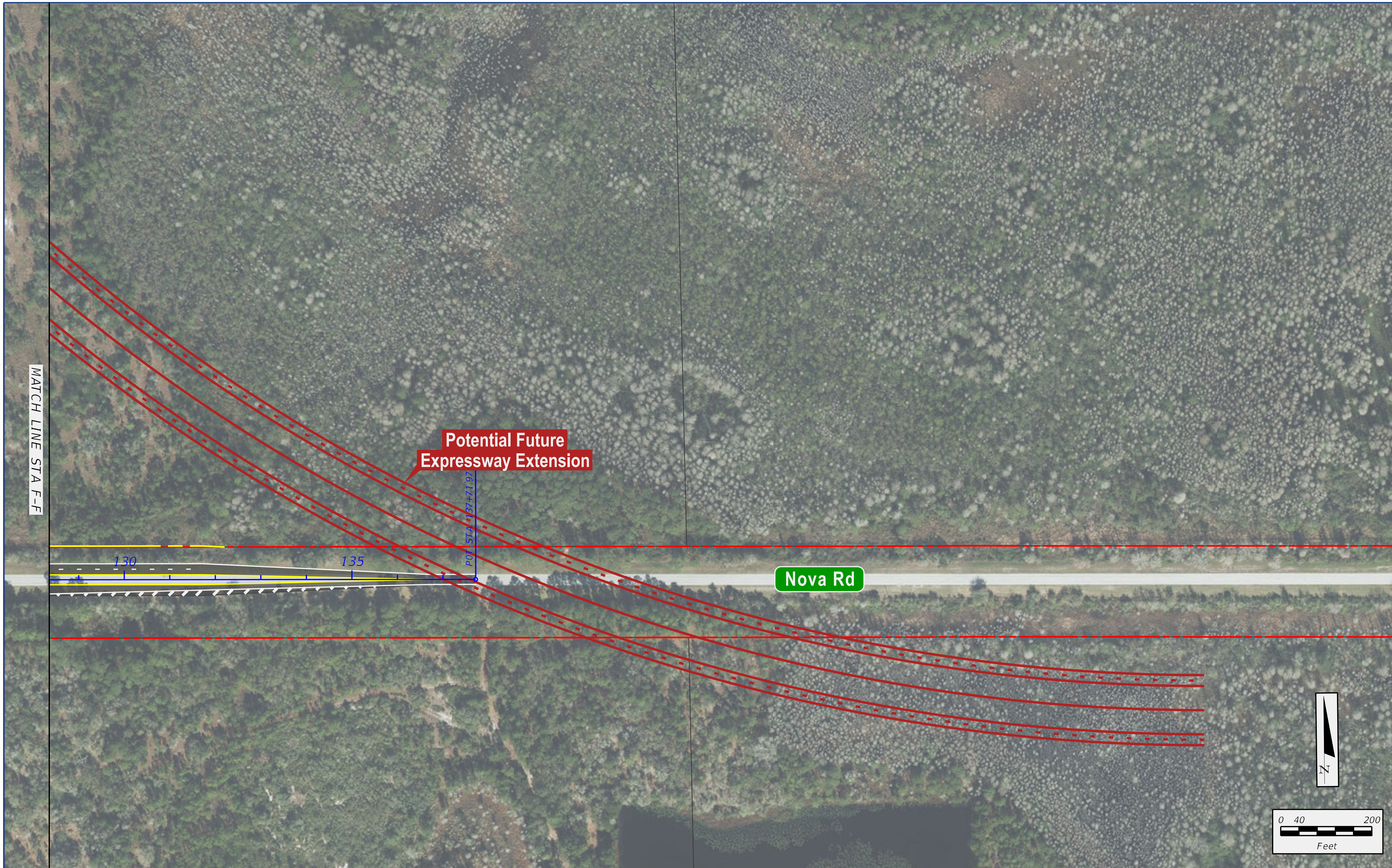
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Existing Right-of-Way	Potential OUC Utility Easement	Proposed Barrier Wall
Proposed Right-of-Way	Property Lines	Proposed Pavement
Proposed L/A Right-of-Way	Split Oak Forest	Proposed Structure

Appendix A
Nova Road Connection
Option 2

SHEET NO.
A-31



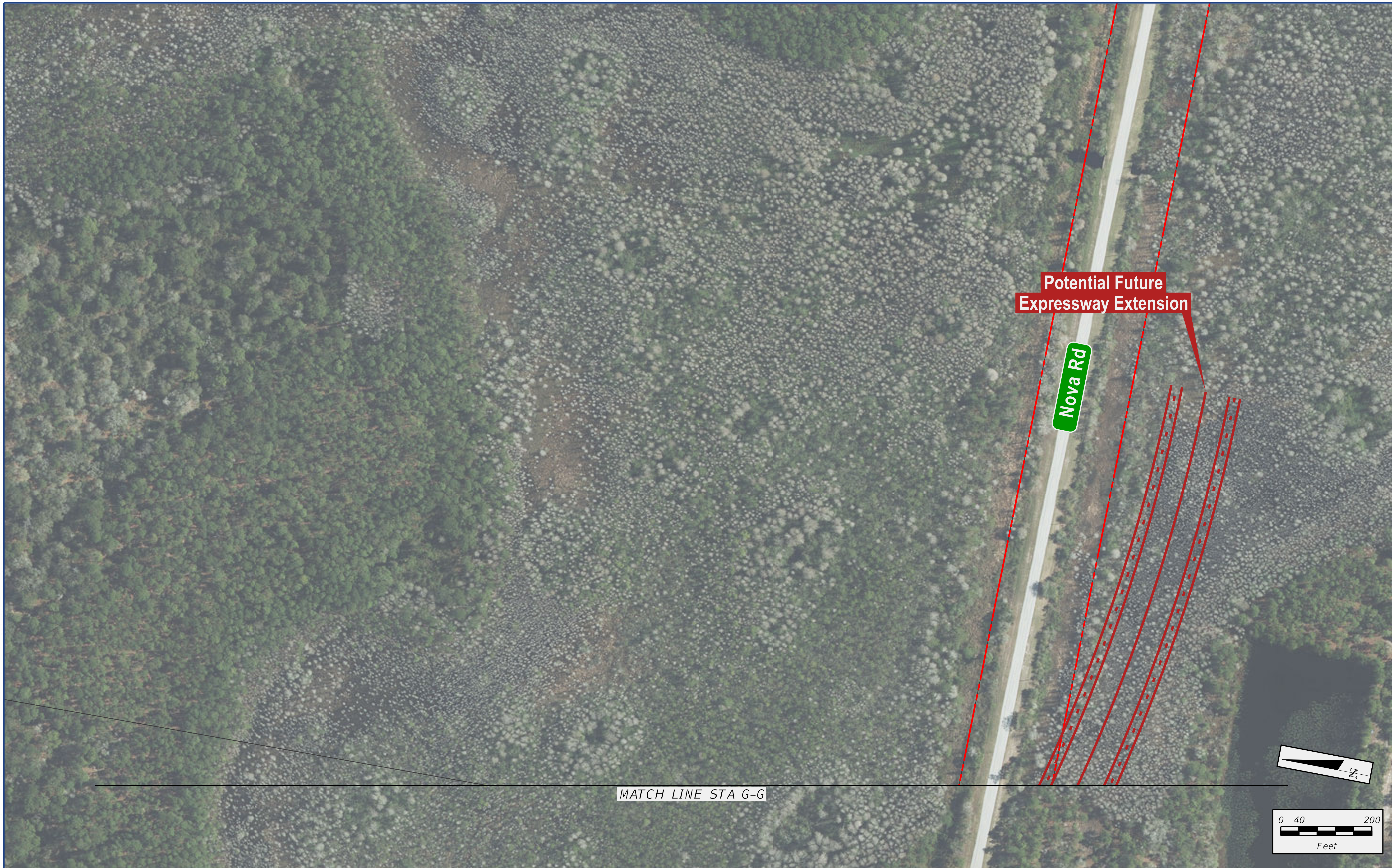
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Legend		
Existing Right-of-Way	Potential OUC Utility Easement	Proposed Barrier Wall
Proposed Right-of-Way	Property Lines	Proposed Pavement
Proposed L/A Right-of-Way	Split Oak Forest	Proposed Structure

Appendix A
Nova Road Connection
Option 2

SHEET NO.
A-32



CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Existing Right-of-Way	Potential OUC Utility Easement
Proposed Right-of-Way	Property Lines
Proposed L/A Right-of-Way	Split Oak Forest
Proposed Barrier Wall	Proposed Pavement
Proposed Structure	

Appendix A
Nova Road Connection
Option 2

SHEET NO.
A-33

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Jack Brack Road Interchange and Nova Road Connection Option 1 Geometry Data

Beginning Jack Brack Road Interchange and Nova Road Connection Option 1 Chain Description
==

Point 412 N 1,457,516.2925 E 588,480.2519 Sta 600+00.00

Course from 412 to PC 4121 S 15° 55' 36.89" E Dist 855.7695

Curve Data

Curve 4121
P.I. Station 634+90.39 N 1,454,159.8913 E 589,438.0527
Delta = 84° 27' 02.36" (LT)
Degree = 1° 58' 25.23"
Tangent = 2,634.6190
Length = 4,278.8536
Radius = 2,903.0000
External = 1,017.2839
Long Chord = 3,901.9107
Mid. Ord. = 753.3065
P.C. Station 608+55.77 N 1,456,693.3739 E 588,715.0844
P.T. Station 651+34.62 N 1,454,634.4760 E 592,029.5748
C.C. N 1,457,489.9889 E 591,506.6455
Back = S 15° 55' 36.89" E
Ahead = N 79° 37' 20.75" E
Chord Bear = S 58° 09' 08.07" E

Course from PT 4121 to PC 4122 N 79° 37' 20.75" E Dist 2,580.1137

Curve Data

Curve 4122
P.I. Station 702+93.99 N 1,455,563.8532 E 597,104.5418
Delta = 81° 22' 28.52" (RT)
Degree = 1° 54' 35.49"
Tangent = 2,579.2498
Length = 4,260.7635
Radius = 3,000.0000
External = 956.3278
Long Chord = 3,911.5816
Mid. Ord. = 725.1632
P.C. Station 677+14.74 N 1,455,099.2424 E 594,567.4831
P.T. Station 719+75.50 N 1,453,125.1683 E 597,944.3903
C.C. N 1,452,148.3162 E 595,107.8854
Back = N 79° 37' 20.75" E
Ahead = S 19° 00' 10.73" E
Chord Bear = S 59° 41' 24.99" E

Course from PT 4122 to 413 S 19° 00' 10.73" E Dist 1,524.4998

Point 413 N 1,451,683.7513 E 598,440.7939 Sta 735+00.00

Course from 413 to PC 4123 S 19° 00' 10.73" E Dist 11,883.6847

Curve Data

Curve 4123
P.I. Station 862+97.00 N 1,439,584.1665 E 602,607.7194
Delta = 20° 42' 12.26" (LT)
Degree = 1° 08' 45.30"
Tangent = 913.3158
Length = 1,806.7131
Radius = 5,000.0000
External = 82.7301
Long Chord = 1,796.9000
Mid. Ord. = 81.3836
P.C. Station 853+83.68 N 1,440,447.7080 E 602,310.3280
P.T. Station 871+90.40 N 1,438,881.5268 E 603,191.1945
C.C. N 1,442,075.7948 E 607,037.8361
Back = S 19° 00' 10.73" E
Ahead = S 39° 42' 23.00" E
Chord Bear = S 29° 21' 16.87" E

Course from PT 4123 to PC 4124 S 39° 42' 23.00" E Dist 5,303.2727

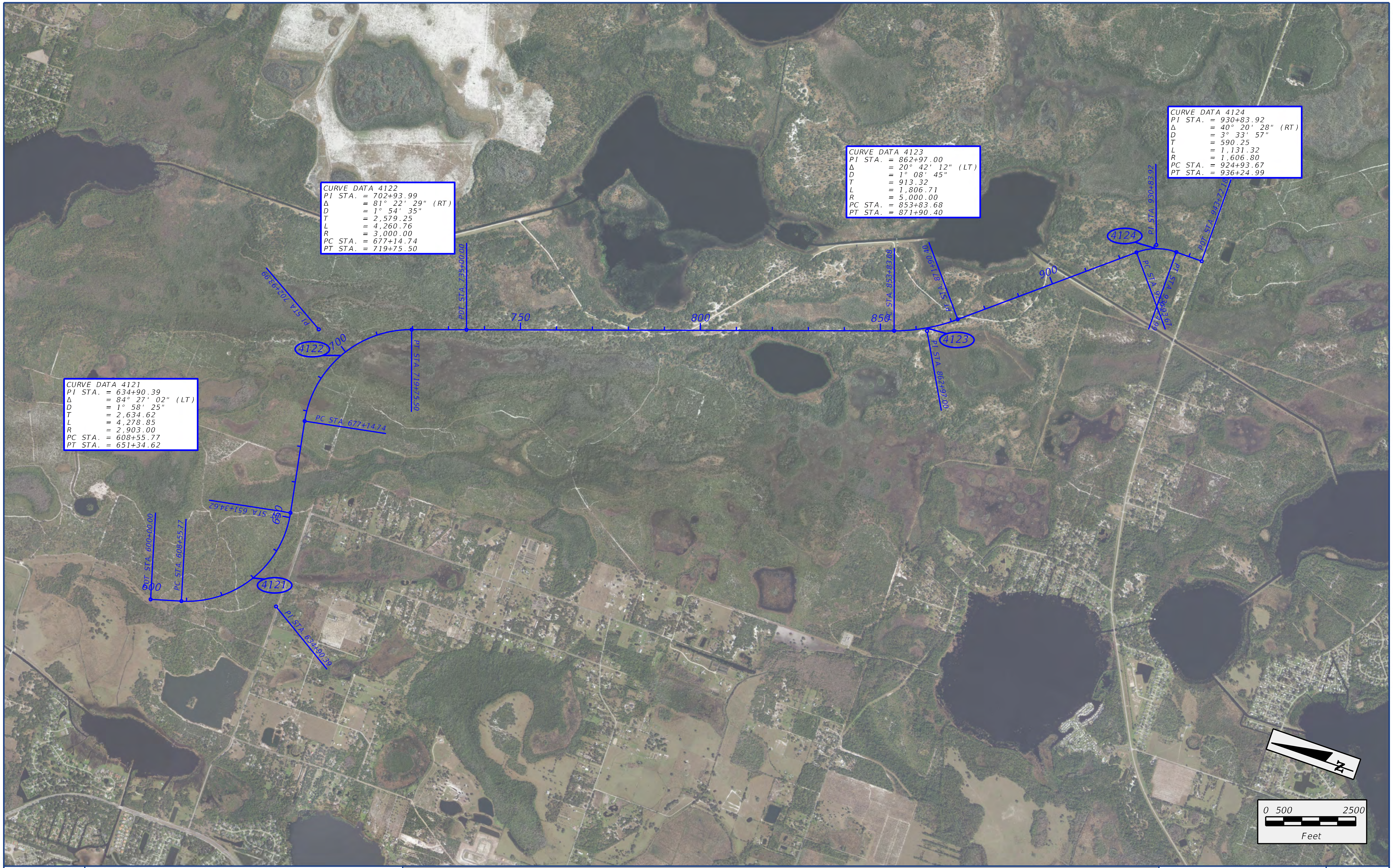
Curve Data

Curve 4124
P.I. Station 930+83.92 N 1,434,347.4728 E 606,956.2927
Delta = 40° 20' 27.94" (RT)
Degree = 3° 33' 56.99"
Tangent = 590.2501
Length = 1,131.3244
Radius = 1,606.8010
External = 104.9830
Long Chord = 1,108.1005
Mid. Ord. = 98.5445
P.C. Station 924+93.67 N 1,434,801.5689 E 606,579.2094
P.T. Station 936+24.99 N 1,433,757.2590 E 606,949.7542
C.C. N 1,433,775.0583 E 605,343.0519
Back = S 39° 42' 23.00" E
Ahead = S 0° 38' 04.94" W
Chord Bear = S 19° 32' 09.03" E

Course from PT 4124 to 414 S 0° 38' 04.94" W Dist 747.1871

Point 414 N 1,433,010.1177 E 606,941.4773 Sta 943+72.18

==
Ending chain description



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CENTRAL FLORIDA EXPRESSWAY AUTHORITY

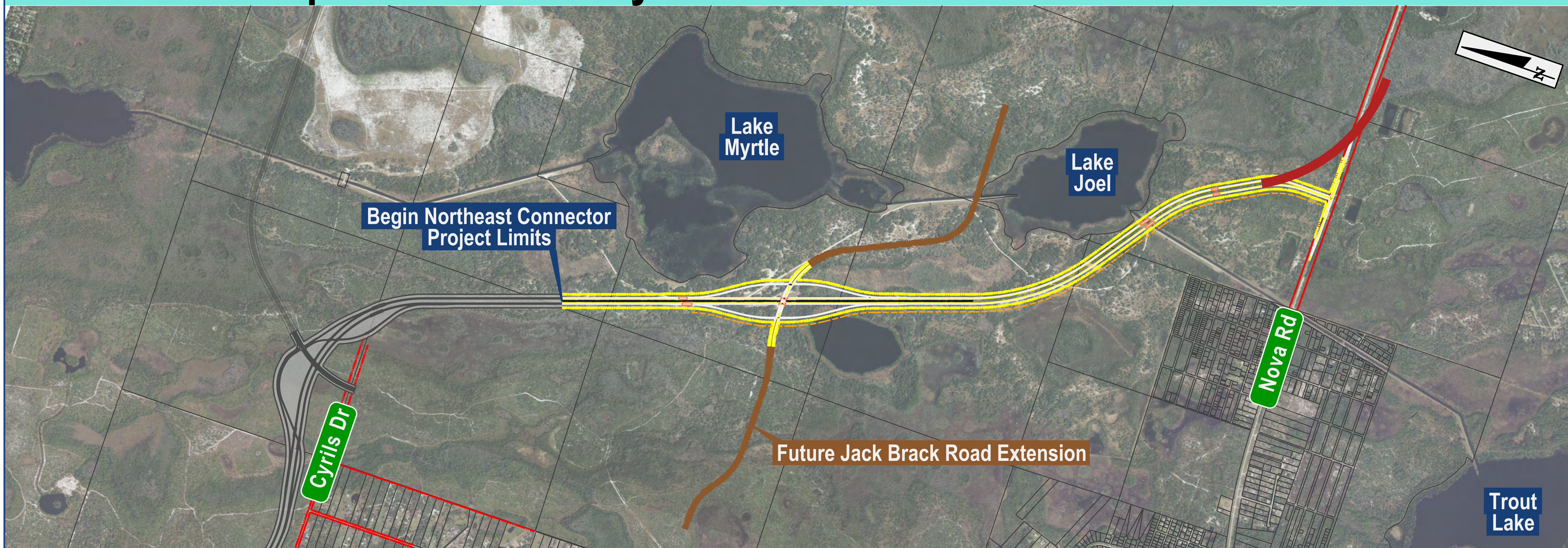
Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Existing Right-of-Way	Potential OUC Utility Easement	Proposed Barrier Wall
Proposed Right-of-Way	Property Lines	Proposed Pavement
Proposed L/A Right-of-Way	Split Oak Forest	Proposed Structure

Appendix A
Jack Brack Road Interchange and Nova Road Connection Option 1 Geometry

SHEET NO.
A-35

Jack Brack Road Interchange and Nova Road Connection Option 2 Geometry Data



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Beginning Jack Brack Road Interchange and Nova Road Connection Option 2 Chain Description
==
Point 456 N 1,457,516.2925 E 588,480.2519 Sta 600+00.00

Course from 456 to PC 4531 S 15° 55' 36.89" E Dist 855.7695

Curve Data

Curve 4531
P.I. Station 634+90.39 N 1,454,159.8913 E 589,438.0527
Delta = 84° 27' 02.36" (LT)
Degree = 1° 58' 25.23"
Tangent = 2,634.6190
Length = 4,278.8536
Radius = 2,903.0000
External = 1,017.2839
Long Chord = 3,901.9107
Mid. Ord. = 753.3065
P.C. Station 608+55.77 N 1,456,693.3739 E 588,715.0844
P.T. Station 651+34.62 N 1,454,634.4760 E 592,029.5748
C.C. N 1,457,489.9889 E 591,506.6455
Back = S 15° 55' 36.89" E
Ahead = N 79° 37' 20.75" E
Chord Bear = S 58° 09' 08.07" E

Course from PT 4531 to PC 4532 N 79° 37' 20.75" E Dist 2,580.1137

Curve Data

Curve 4532
P.I. Station 702+93.99 N 1,455,563.8532 E 597,104.5418
Delta = 81° 22' 28.52" (RT)
Degree = 1° 54' 35.49"
Tangent = 2,579.2498
Length = 4,260.7635
Radius = 3,000.0000
External = 956.3278
Long Chord = 3,911.5816
Mid. Ord. = 725.1632
P.C. Station 677+14.74 N 1,455,099.2424 E 594,567.4831
P.T. Station 719+75.50 N 1,453,125.1683 E 597,944.3903
C.C. N 1,452,148.3162 E 595,107.8854
Back = N 79° 37' 20.75" E
Ahead = S 19° 00' 10.73" E
Chord Bear = S 59° 41' 24.99" E

Course from PT 4532 to 457 S 19° 00' 10.73" E Dist 1,524.4998

Point 457 N 1,451,683.7513 E 598,440.7939 Sta 735+00.00

Course from 457 to PC 4533 S 19° 00' 10.73" E Dist 11,883.6847

Curve Data

Curve 4533
P.I. Station 869+97.45 N 1,438,921.8884 E 602,835.7986
Delta = 35° 46' 31.18" (LT)
Degree = 1° 08' 45.30"
Tangent = 1,613.7673
Length = 3,121.9864
Radius = 5,000.0000
External = 253.9742
Long Chord = 3,071.5173
Mid. Ord. = 241.6972
P.C. Station 853+83.68 N 1,440,447.7080 E 602,310.3280
P.T. Station 885+05.67 N 1,437,991.1617 E 604,154.1280
C.C. N 1,442,075.7948 E 607,037.8361
Back = S 19° 00' 10.73" E
Ahead = S 54° 46' 41.92" E
Chord Bear = S 36° 53' 26.33" E

Course from PT 4533 to PC 4534 S 54° 46' 41.92" E Dist 1,911.5653

Curve Data

Curve 4534
P.I. Station 912+22.99 N 1,436,423.9694 E 606,373.9802
Delta = 25° 55' 44.53" (RT)
Degree = 1° 38' 13.28"
Tangent = 805.7560
Length = 1,583.9147
Radius = 3,500.0000
External = 91.5516
Long Chord = 1,570.4333
Mid. Ord. = 89.2179
P.C. Station 904+17.24 N 1,436,888.6824 E 605,715.7366
P.T. Station 920+01.15 N 1,435,718.2141 E 606,762.7632
C.C. N 1,434,029.4392 E 603,697.1410
Back = S 54° 46' 41.92" E
Ahead = S 28° 50' 57.38" E
Chord Bear = S 41° 48' 49.65" E

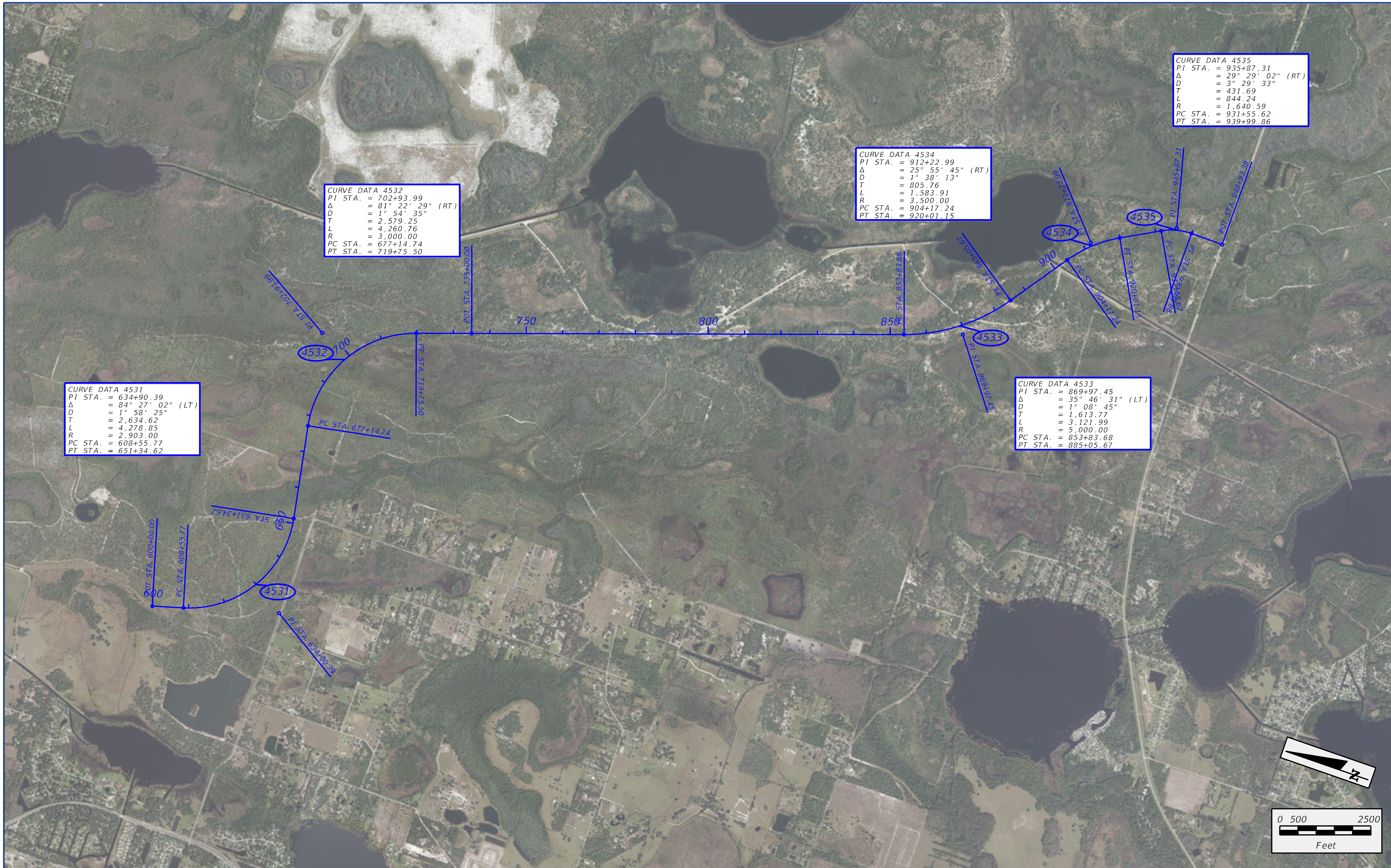
Course from PT 4534 to PC 4535 S 28° 50' 57.38" E Dist 1,154.4679

Curve Data

Curve 4535
P.I. Station 935+87.31 N 1,434,328.9137 E 607,528.0942
Delta = 29° 29' 02.33" (RT)
Degree = 3° 29' 32.57"
Tangent = 431.6869
Length = 844.2371
Radius = 1,640.5933
External = 55.8441
Long Chord = 834.9529
Mid. Ord. = 54.0058
P.C. Station 931+55.62 N 1,434,707.0248 E 607,319.8022
P.T. Station 939+99.86 N 1,433,897.2532 E 607,523.3122
C.C. N 1,433,915.4269 E 605,882.8195
Back = S 28° 50' 57.38" E
Ahead = S 0° 38' 04.94" W
Chord Bear = S 14° 06' 26.22" E

Course from PT 4535 to 458 S 0° 38' 04.94" W Dist 893.5263

Point 458 N 1,433,003.7817 E 607,513.4141 Sta 948+93.38
==
Ending chain description



CENTRAL FLORIDA EXPRESSWAY AUTHORITY

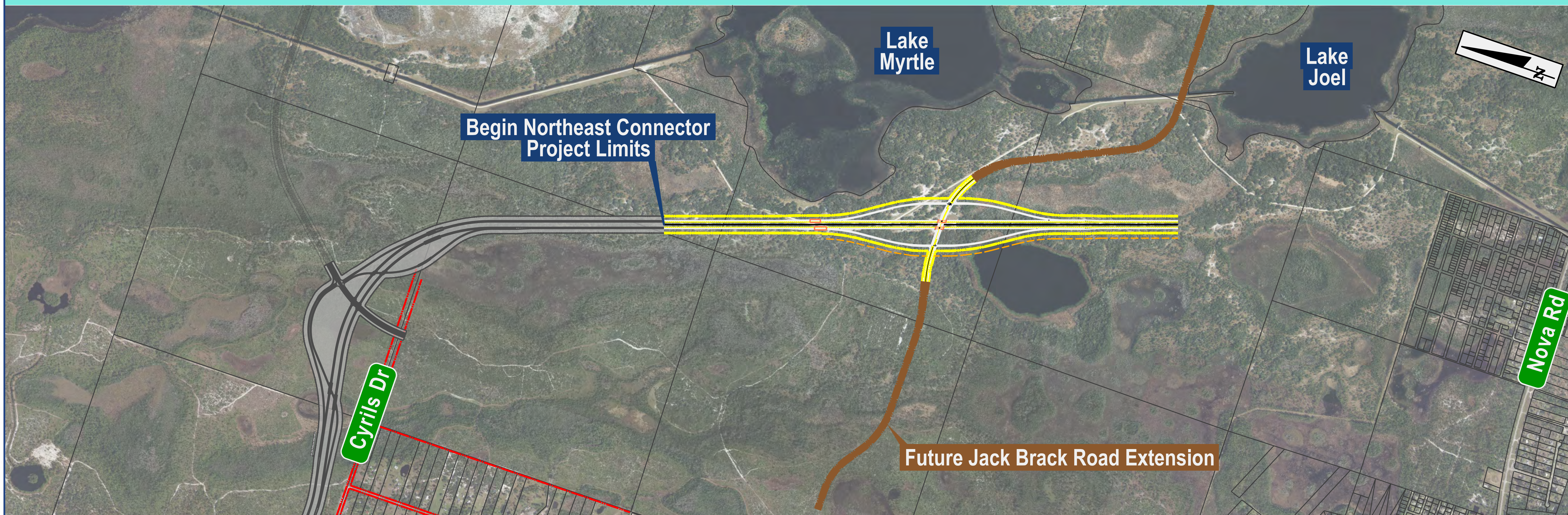
Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

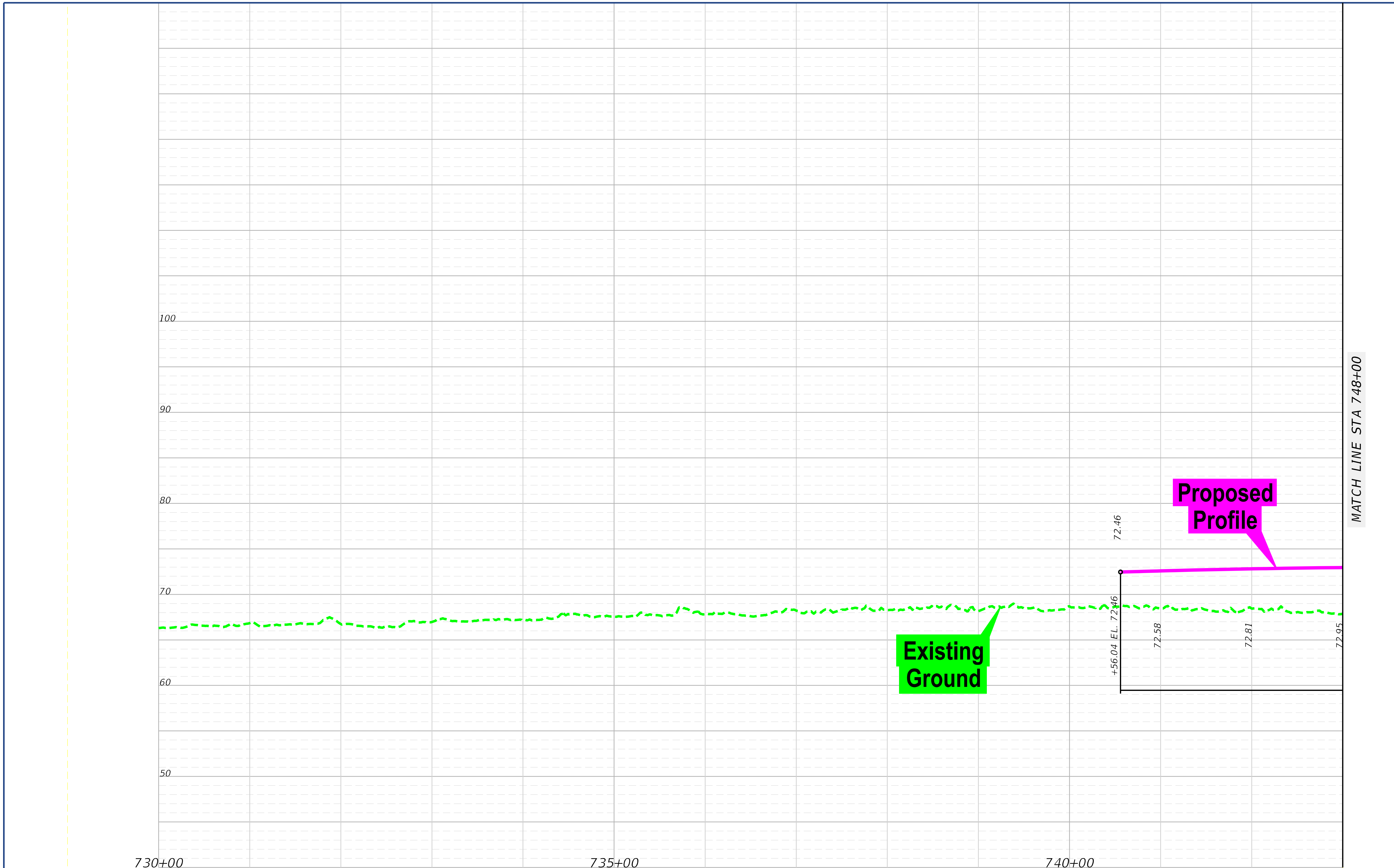
Existing Right-of-Way	Potential OUC Utility Easement
Proposed Right-of-Way	Property Lines
Proposed L/A Right-of-Way	Split Oak Forest
Proposed Barrier Wall	
Proposed Pavement	
Proposed Structure	

Appendix A
Jack Brack Road Interchange and Nova Road Connection
Option 2 Geometry

SHEET NO.
A-37

Jack Brack Road Diamond Interchange
Profile Sheets



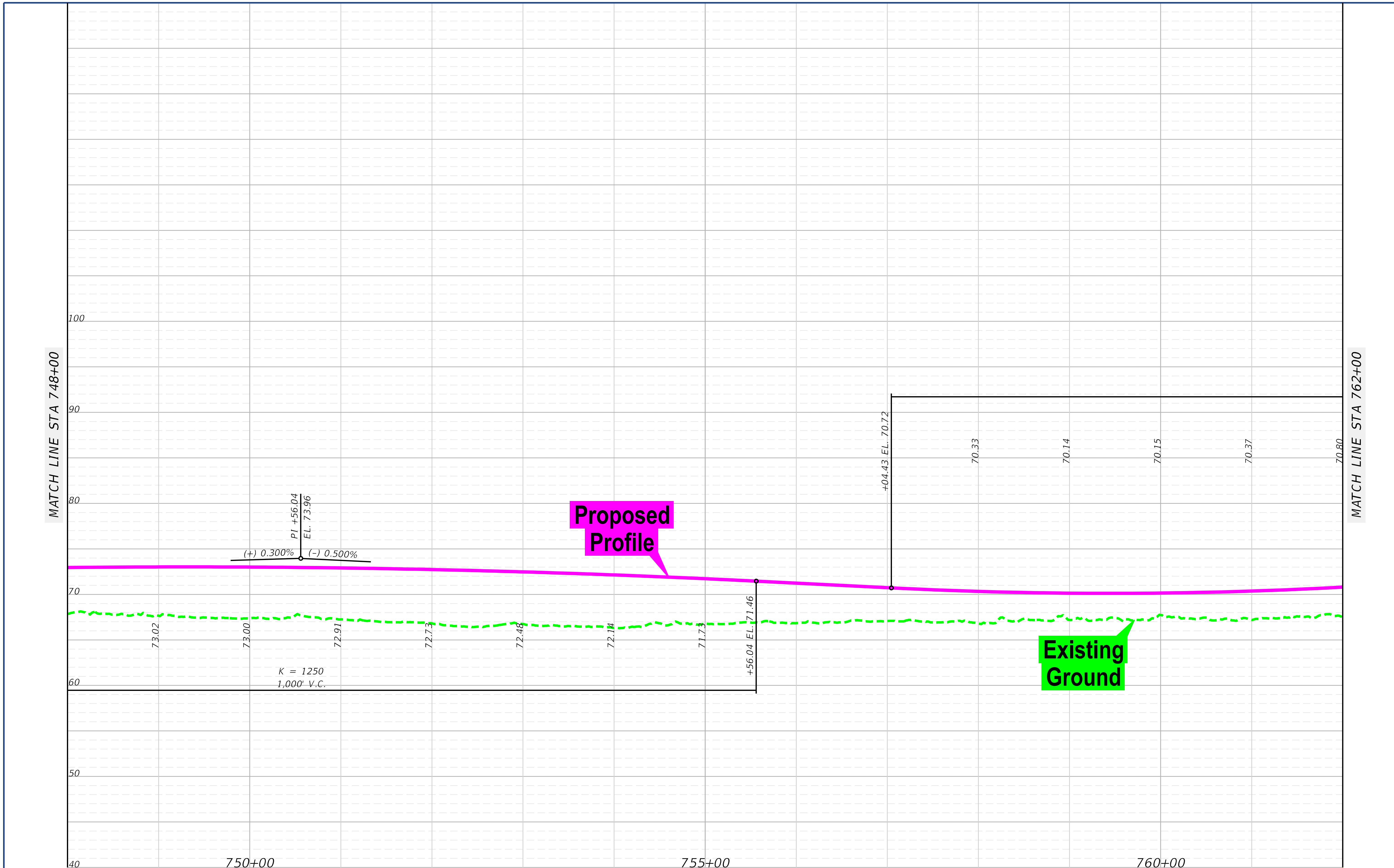


CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Appendix A
Jack Brack Road
Interchange Profile

SHEET NO.
A-38

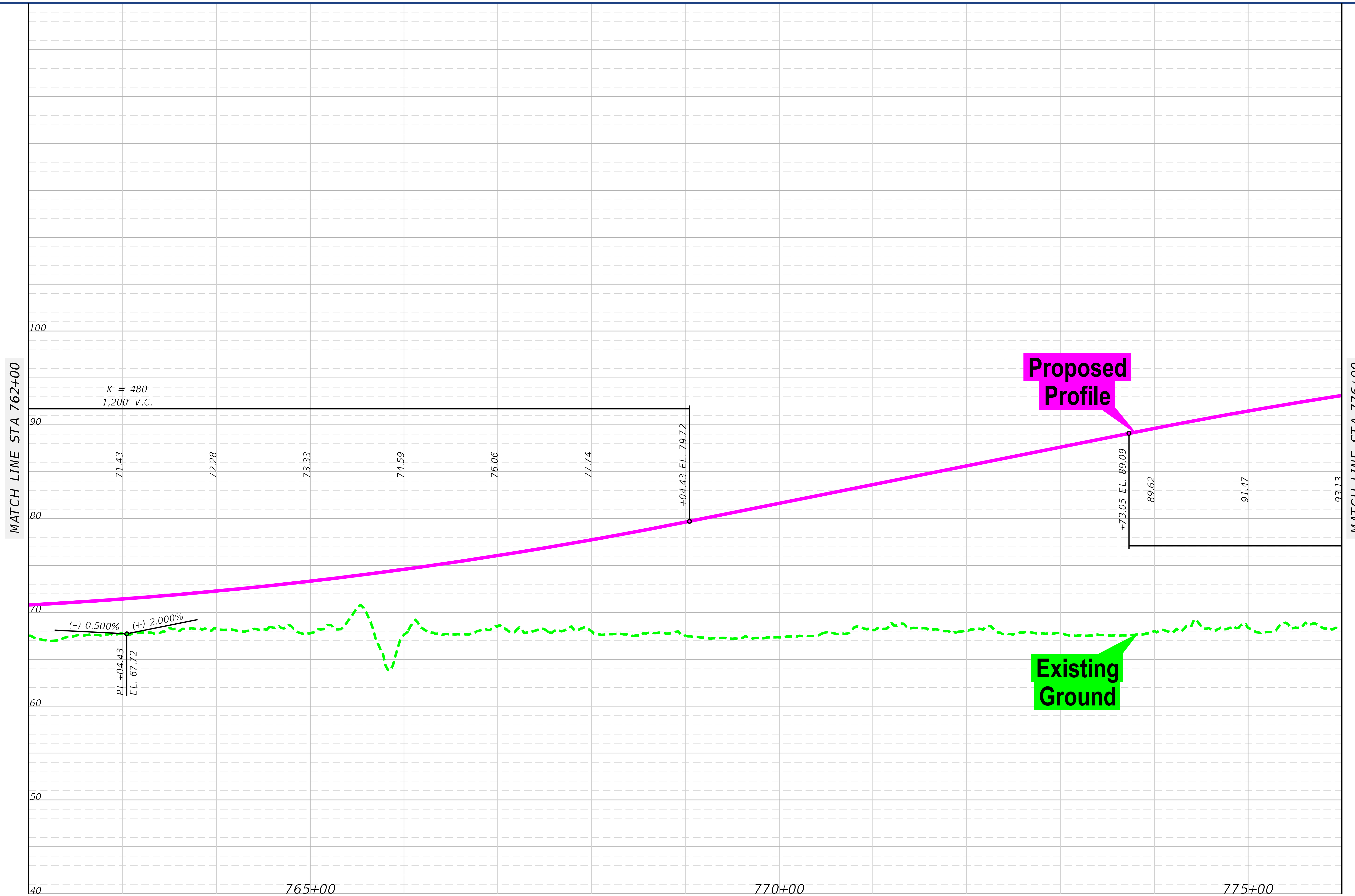


CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

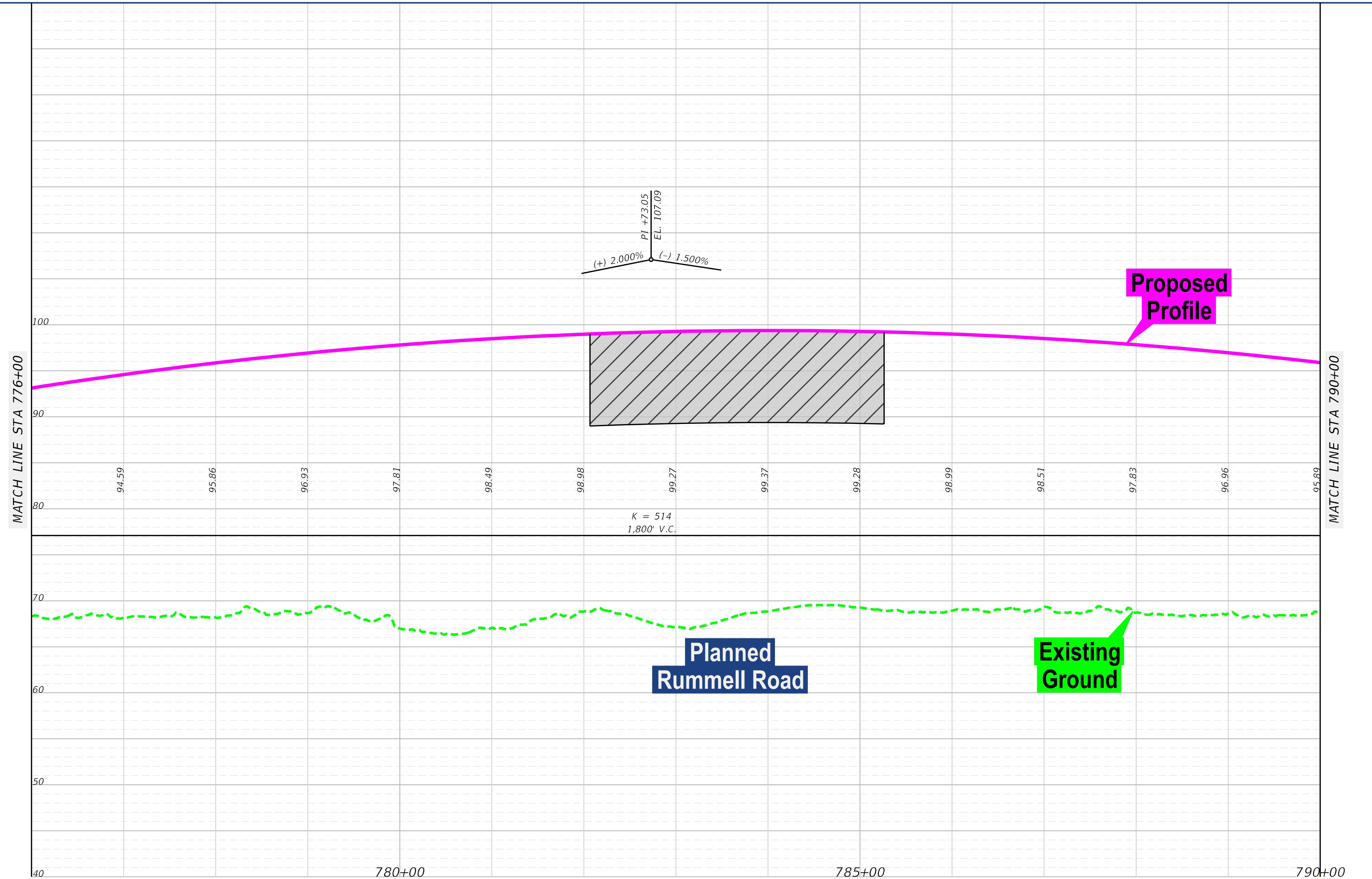
Appendix A
Jack Brack Road
Interchange Profile

SHEET NO.
A-39



CENTRAL FLORIDA EXPRESSWAY AUTHORITY	Northeast Connector Expressway - Phase 1 From Cyrils Drive to Nova Road (CR 532) Project Development and Environment Study	Appendix A Jack Brack Road Interchange Profile

SHEET NO. A-40



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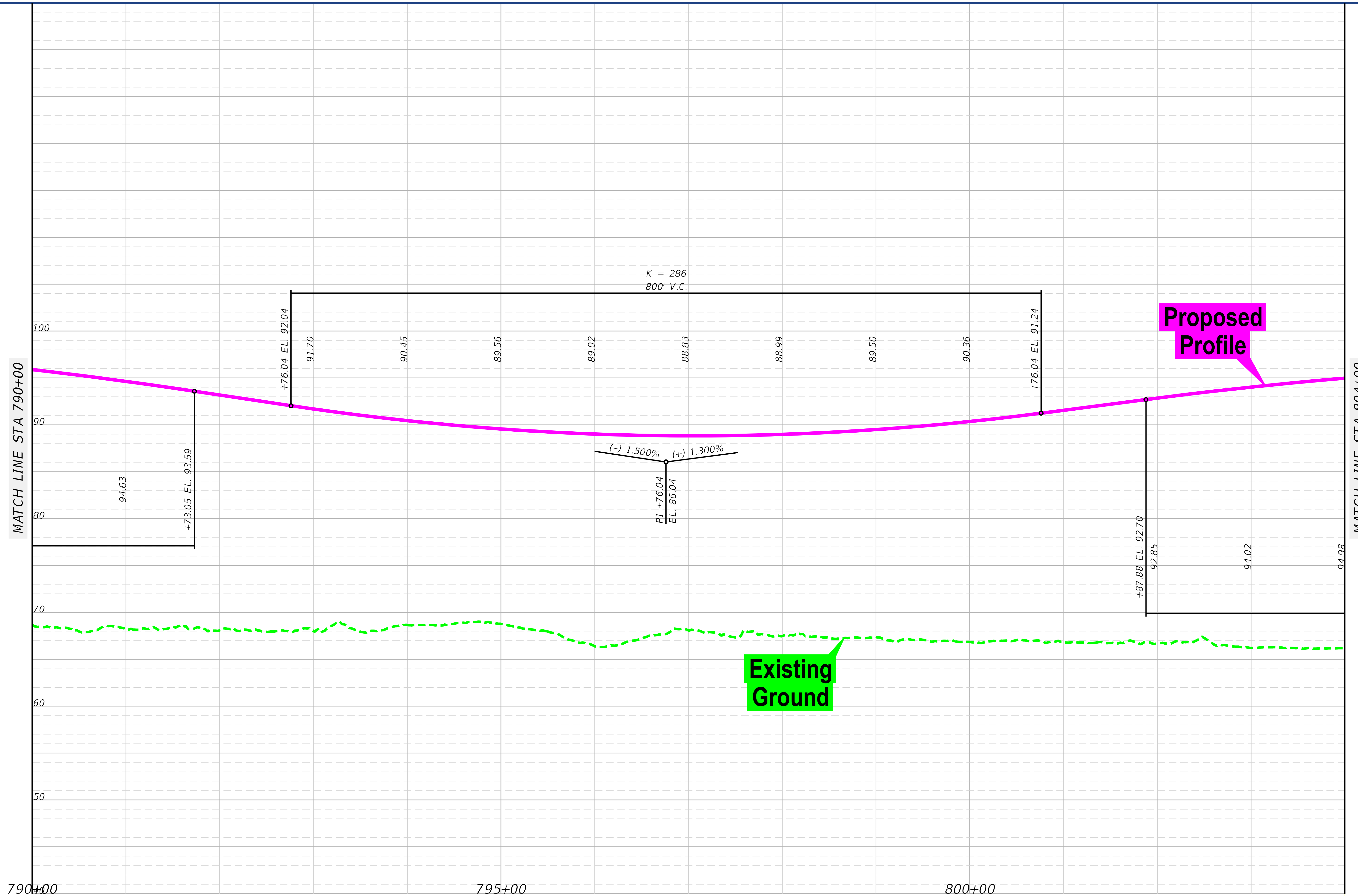
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Appendix A
Jack Brack Road
Interchange Profile

SHEET NO.

A-41

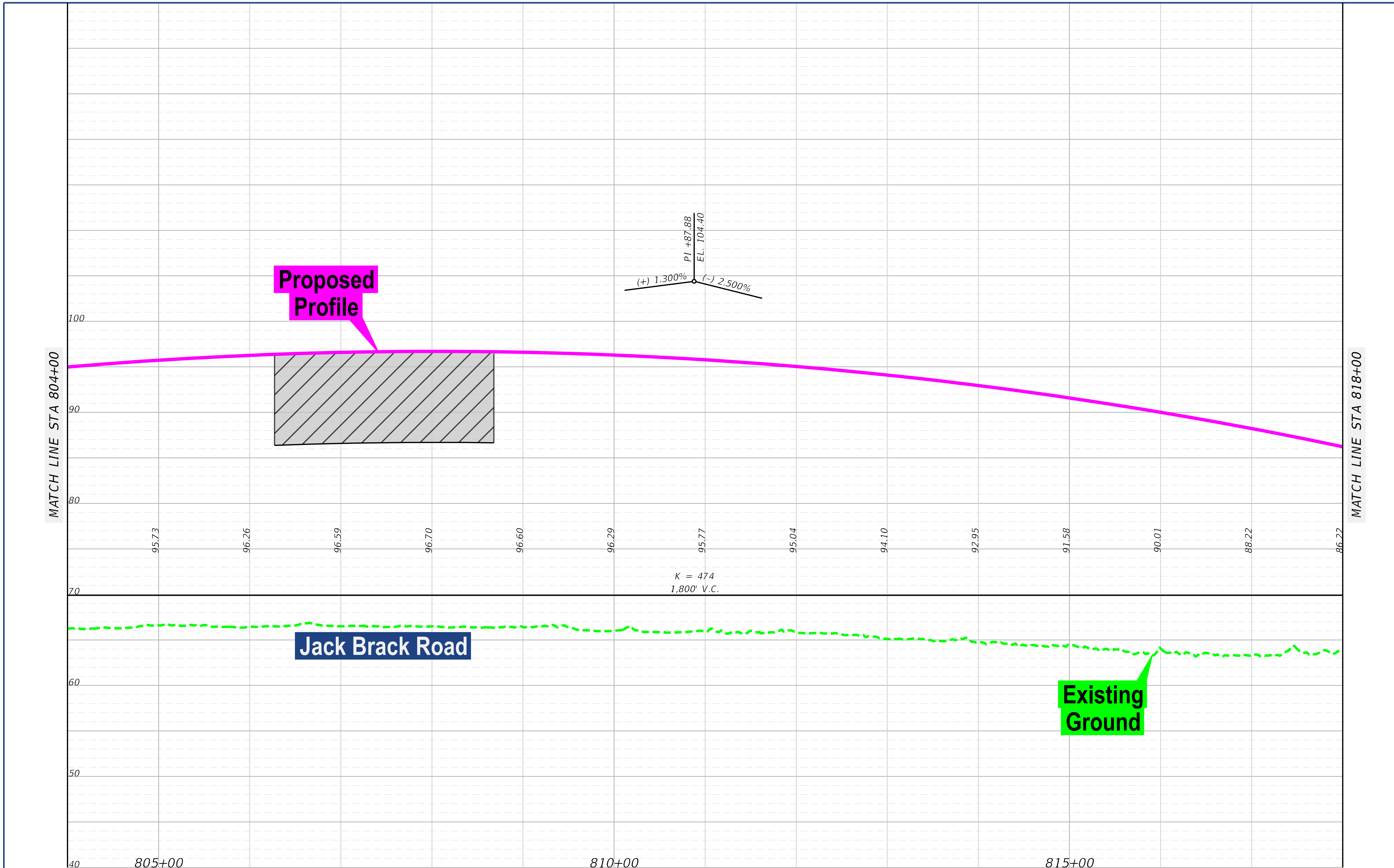


CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Appendix A
Jack Brack Road
Interchange Profile

SHEET NO.
A-42

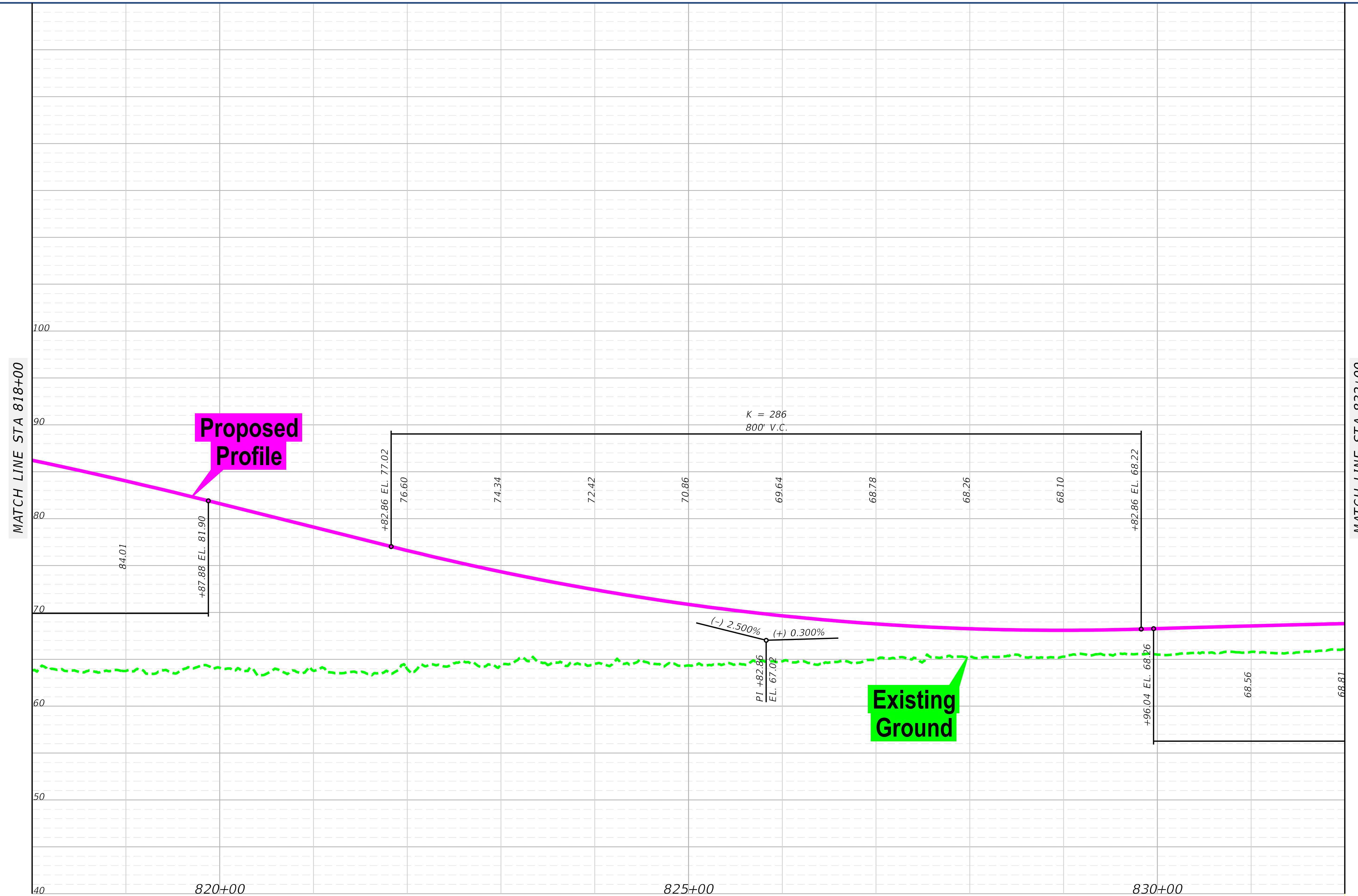


CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Appendix A
Jack Brack Road
Interchange Profile

SHEET NO.
A-43

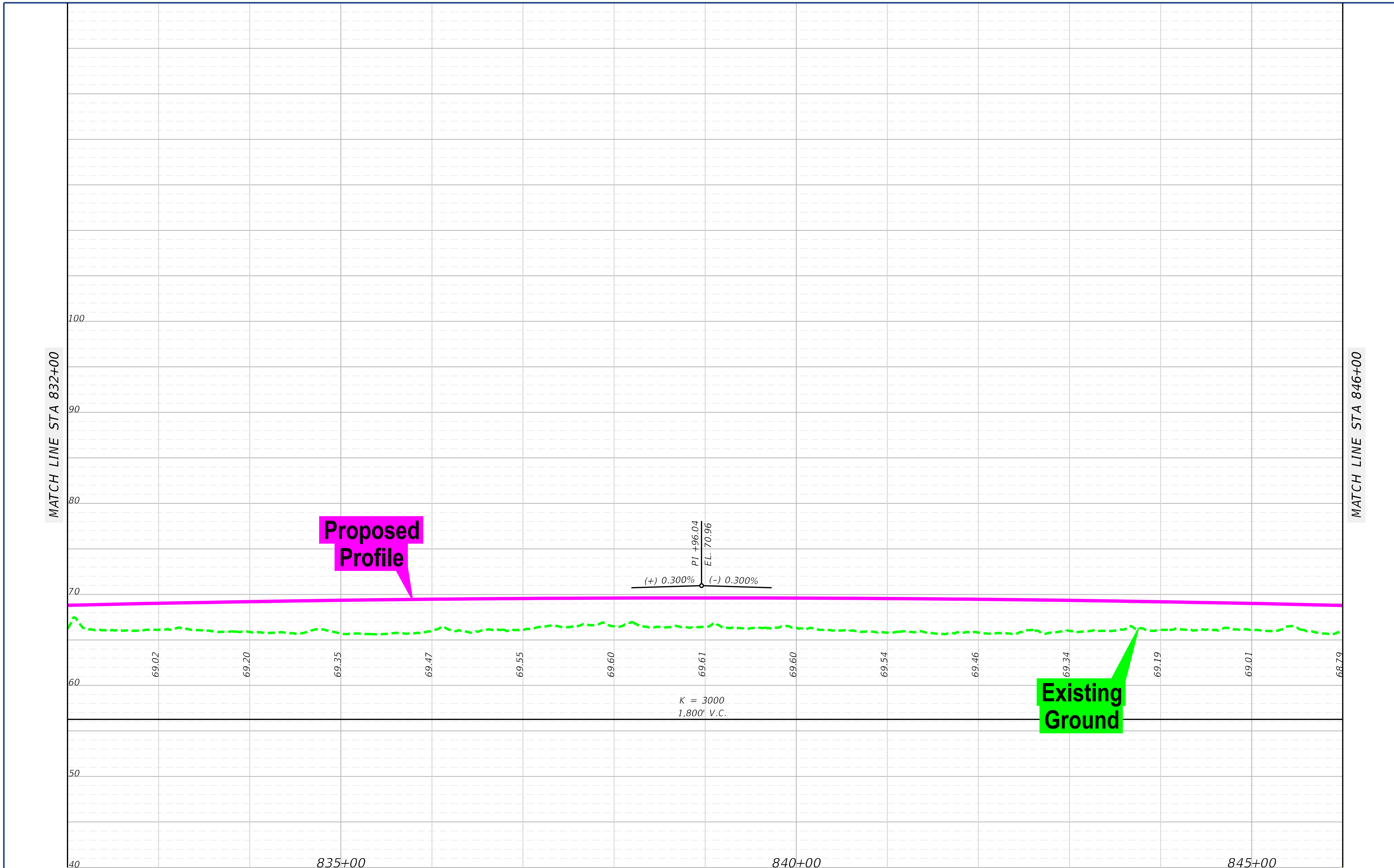


CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Appendix A
Jack Brack Road
Interchange Profile

SHEET NO.
A-44

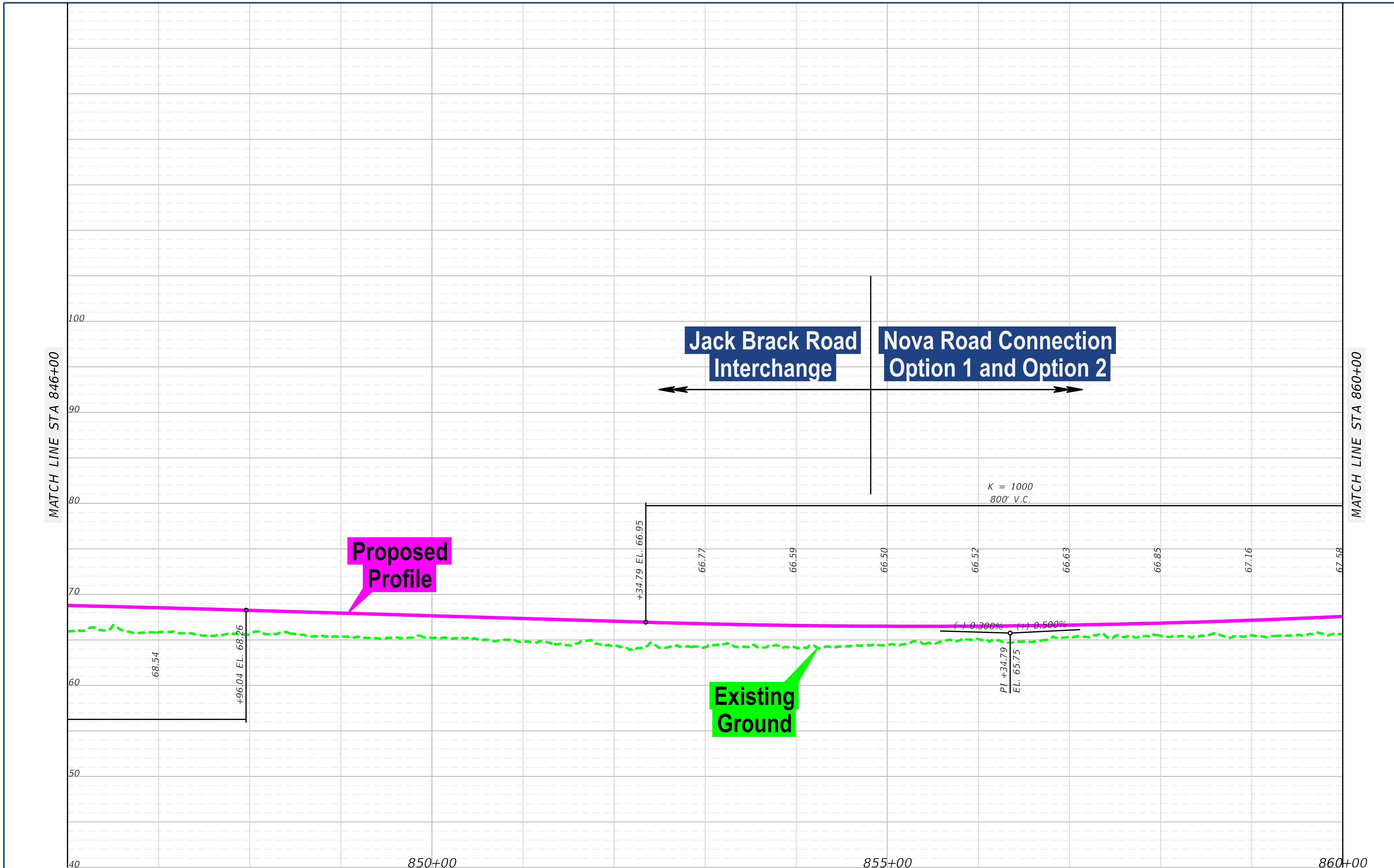


CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Appendix A
Jack Brack Road
Interchange Profile

SHEET NO.
A-45



CENTRAL FLORIDA EXPRESSWAY AUTHORITY

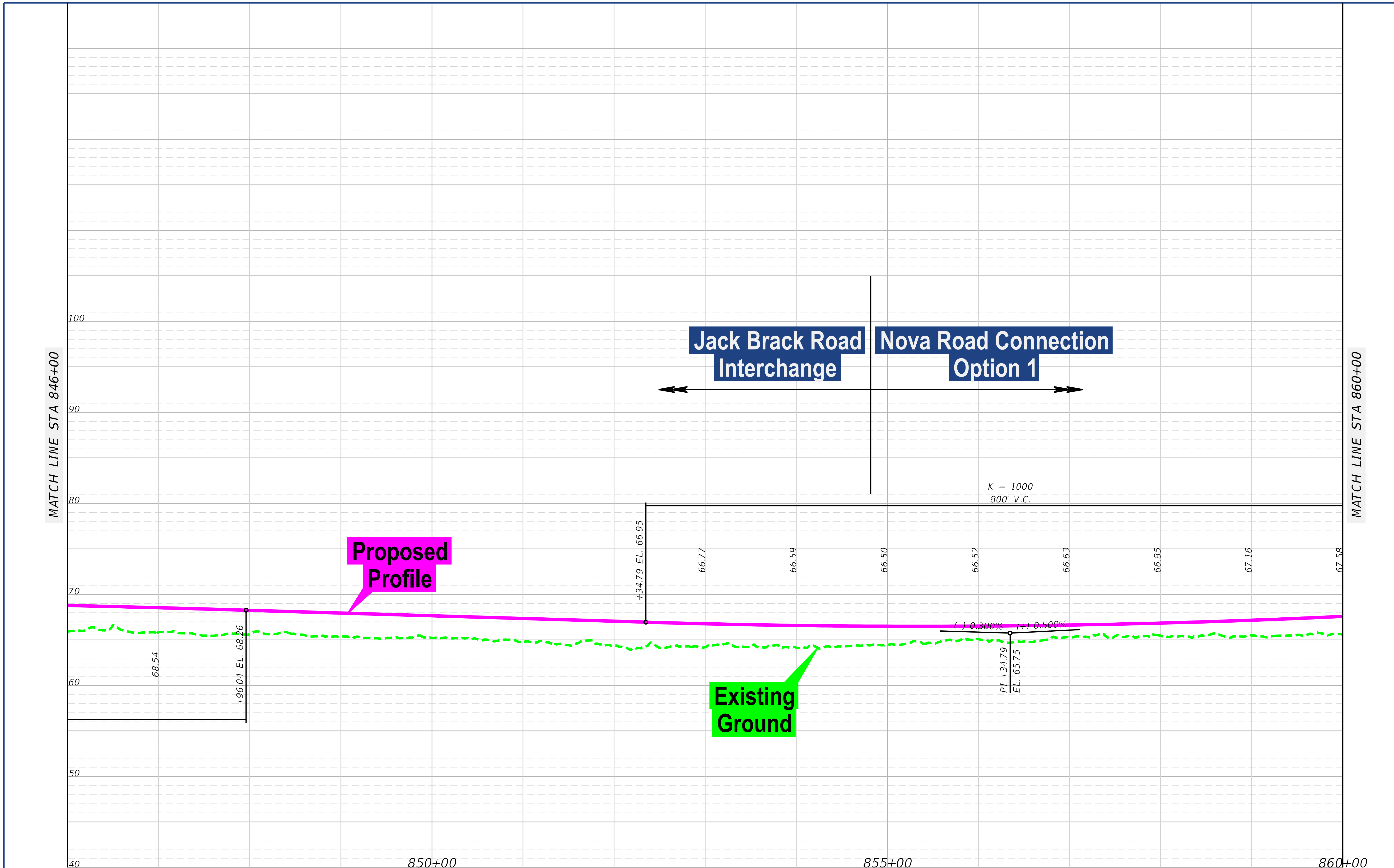
Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Appendix A
Jack Brack Road
Interchange Profile

SHEET NO.
A-46

Nova Road Connection Option 1

Profile Sheets



CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Appendix A
Nova Road Connection
Option 1 Profile

SHEET NO.
A-47

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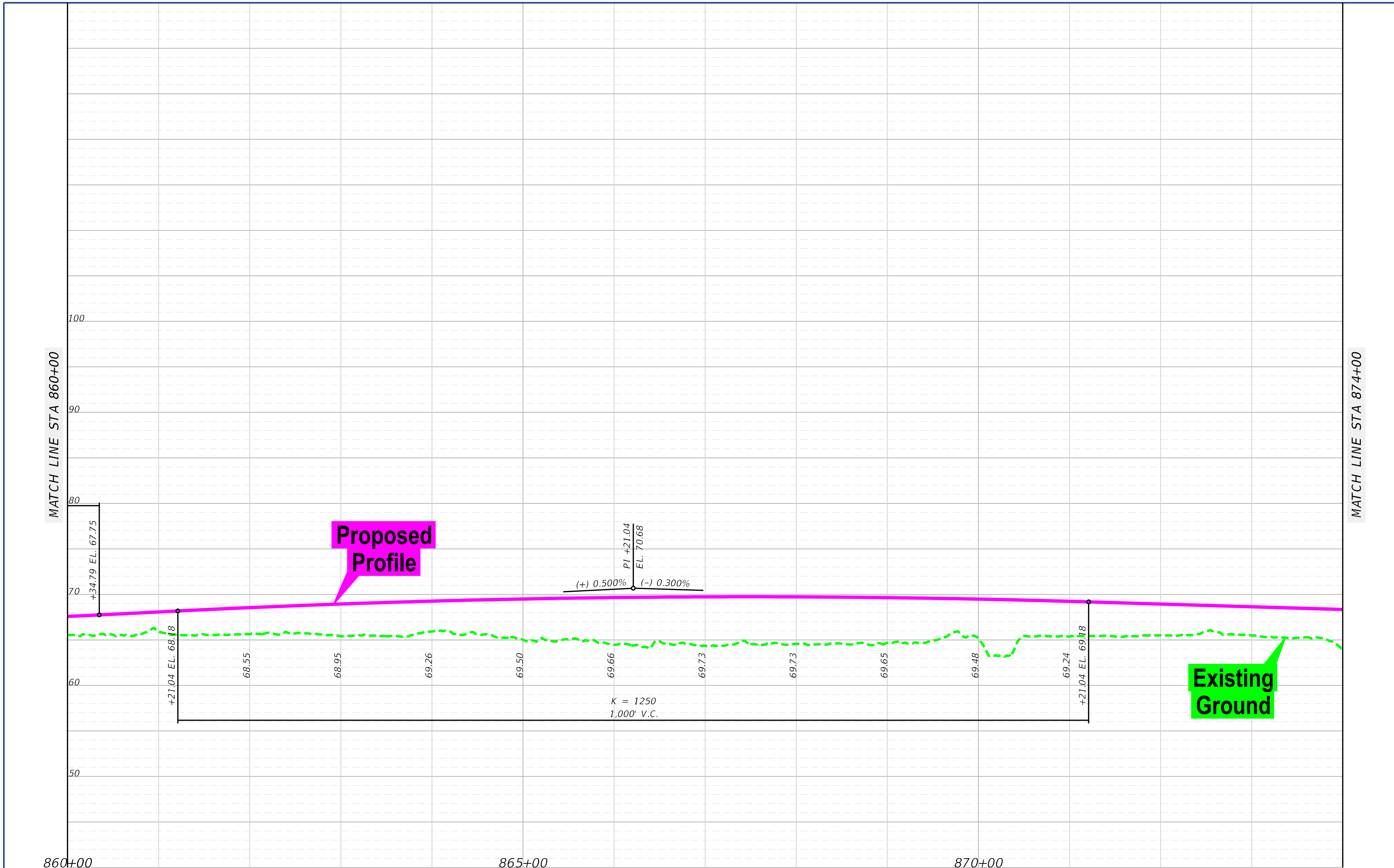
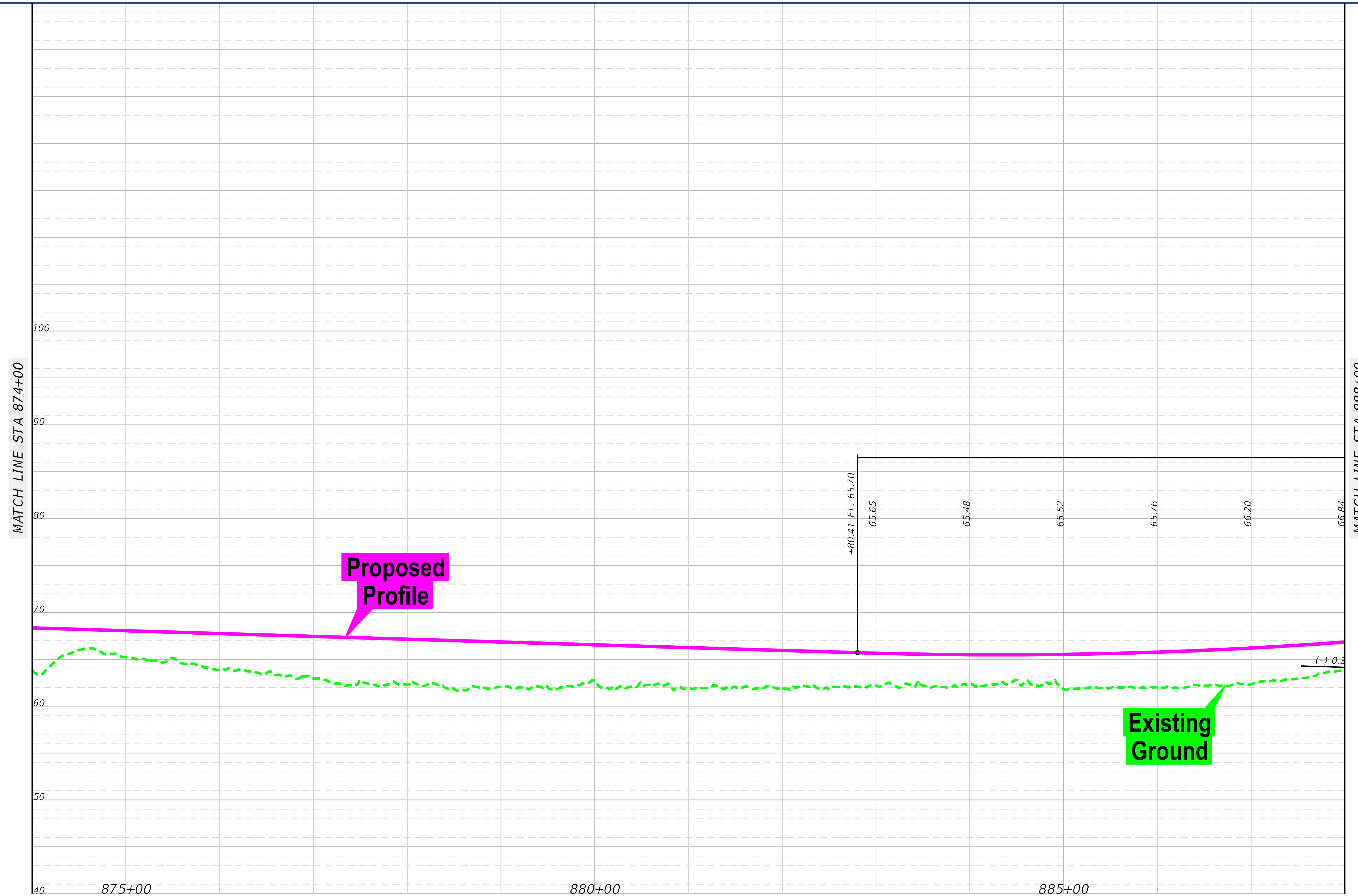


CENTRAL FLORIDA EXPRESSWAY AUTHORITY	Northeast Connector Expressway - Phase 1 From Cyrils Drive to Nova Road (CR 532) Project Development and Environment Study	Appendix A Nova Road Connection Option 1 Profile	SHEET NO. A-48



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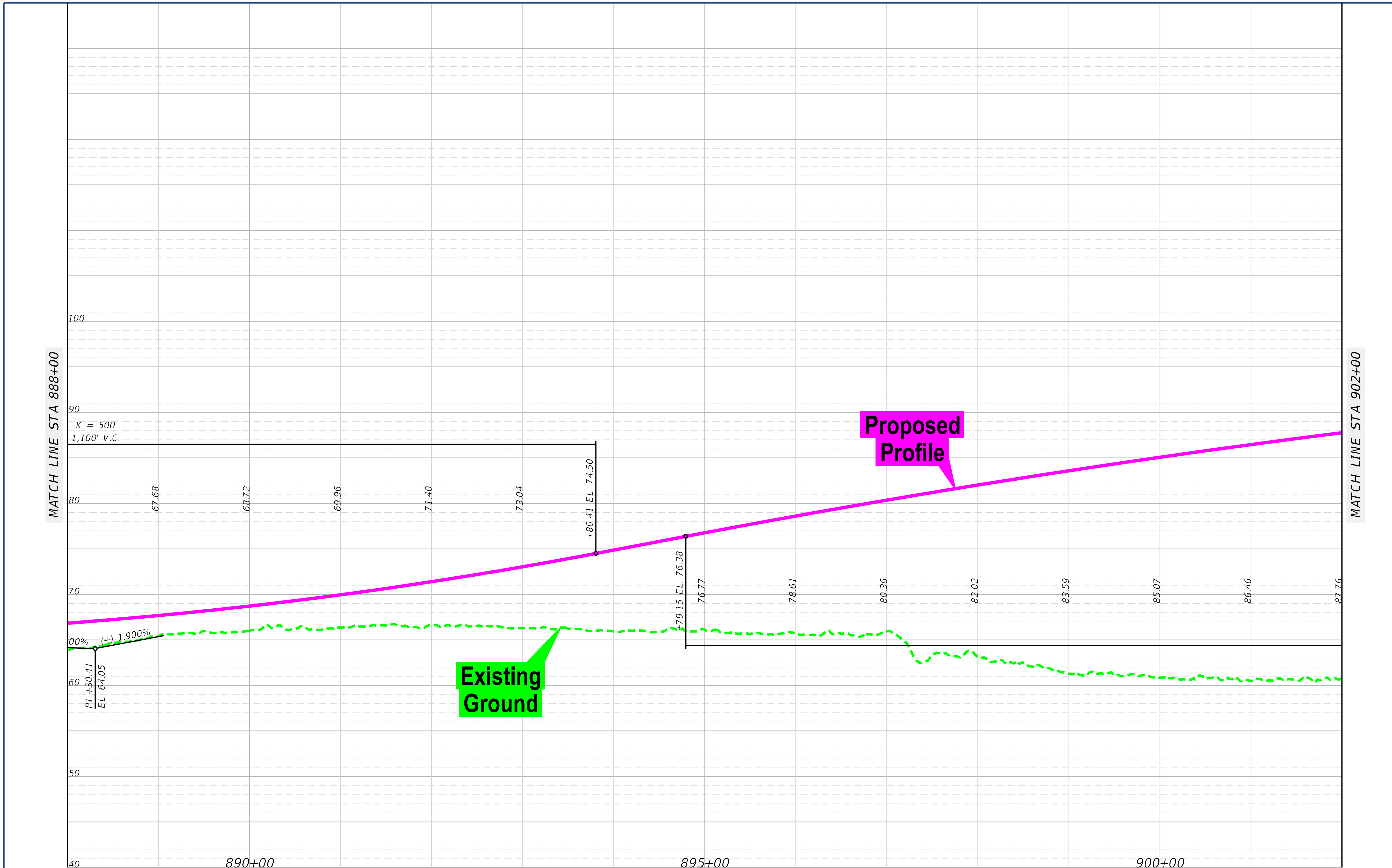
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Appendix A
Nova Road Connection
Option 1 Profile

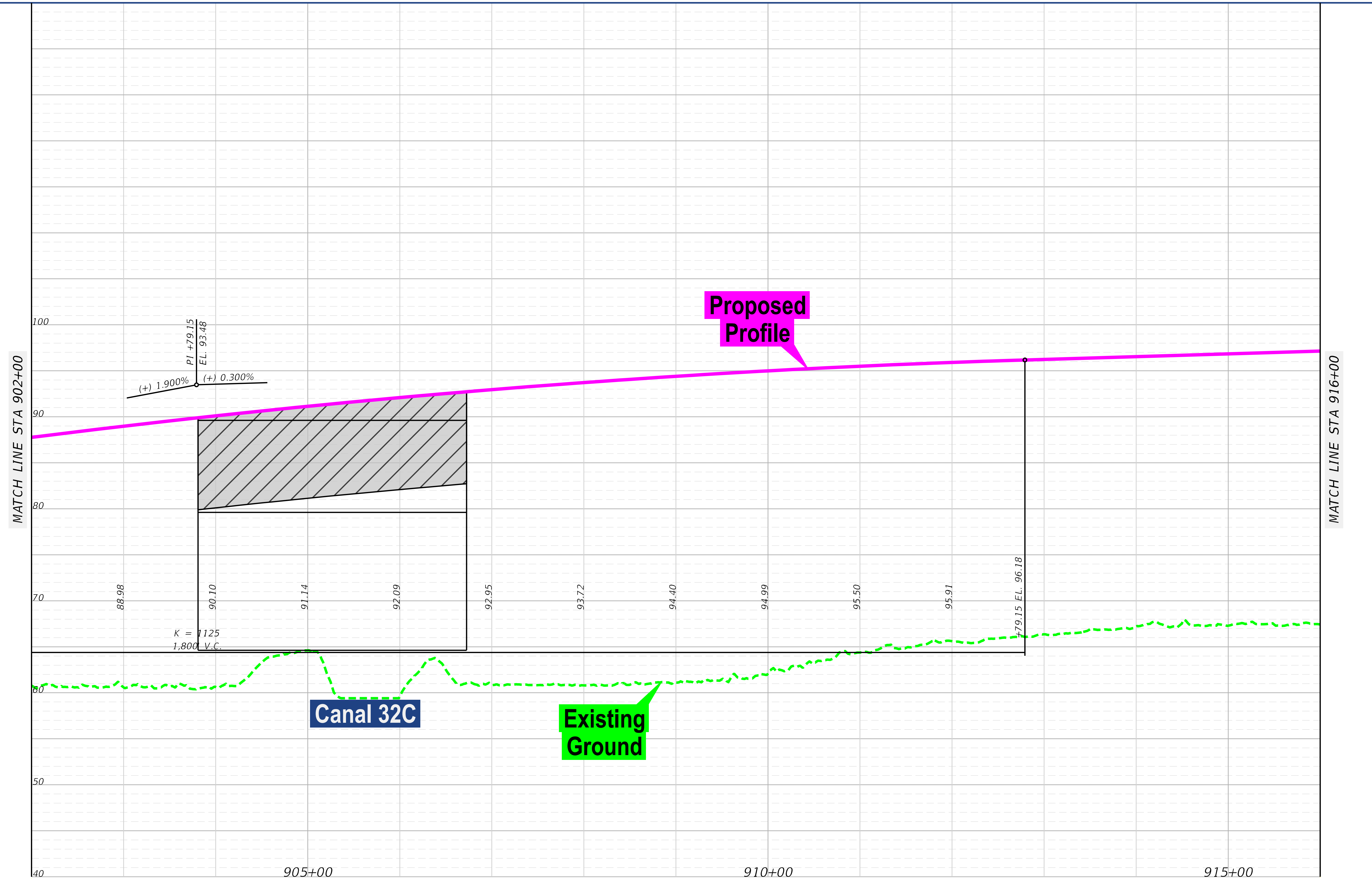
SHEET NO.
A-49



Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Appendix A
Nova Road Connection
Option 1 Profile

SHEET NO.
A-50



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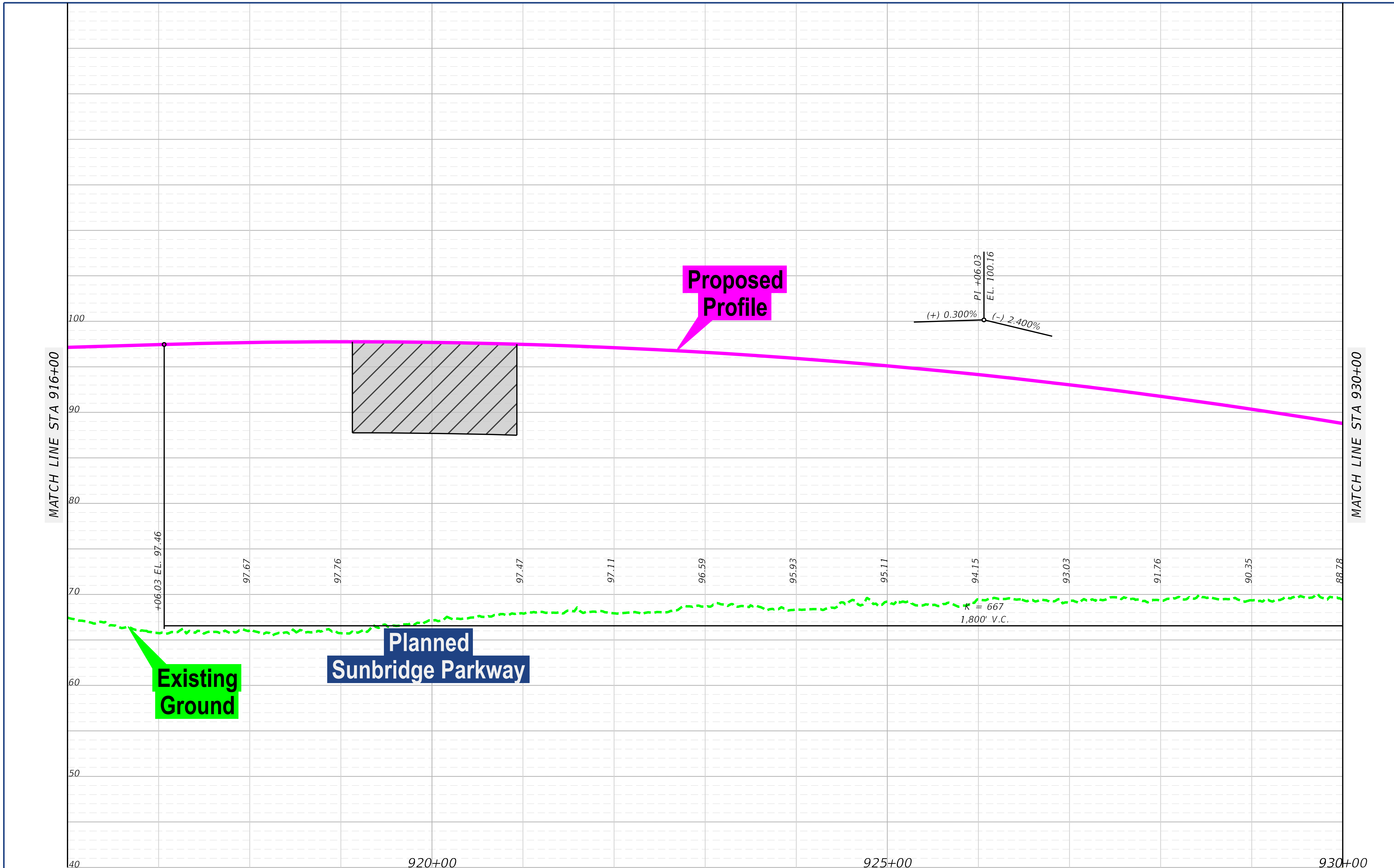
CENTRAL FLORIDA EXPRESSWAY AUTHORITY	Northeast Connector Expressway - Phase 1 From Cyrils Drive to Nova Road (CR 532) Project Development and Environment Study	Appendix A Nova Road Connection Option 1 Profile	SHEET NO. A-51

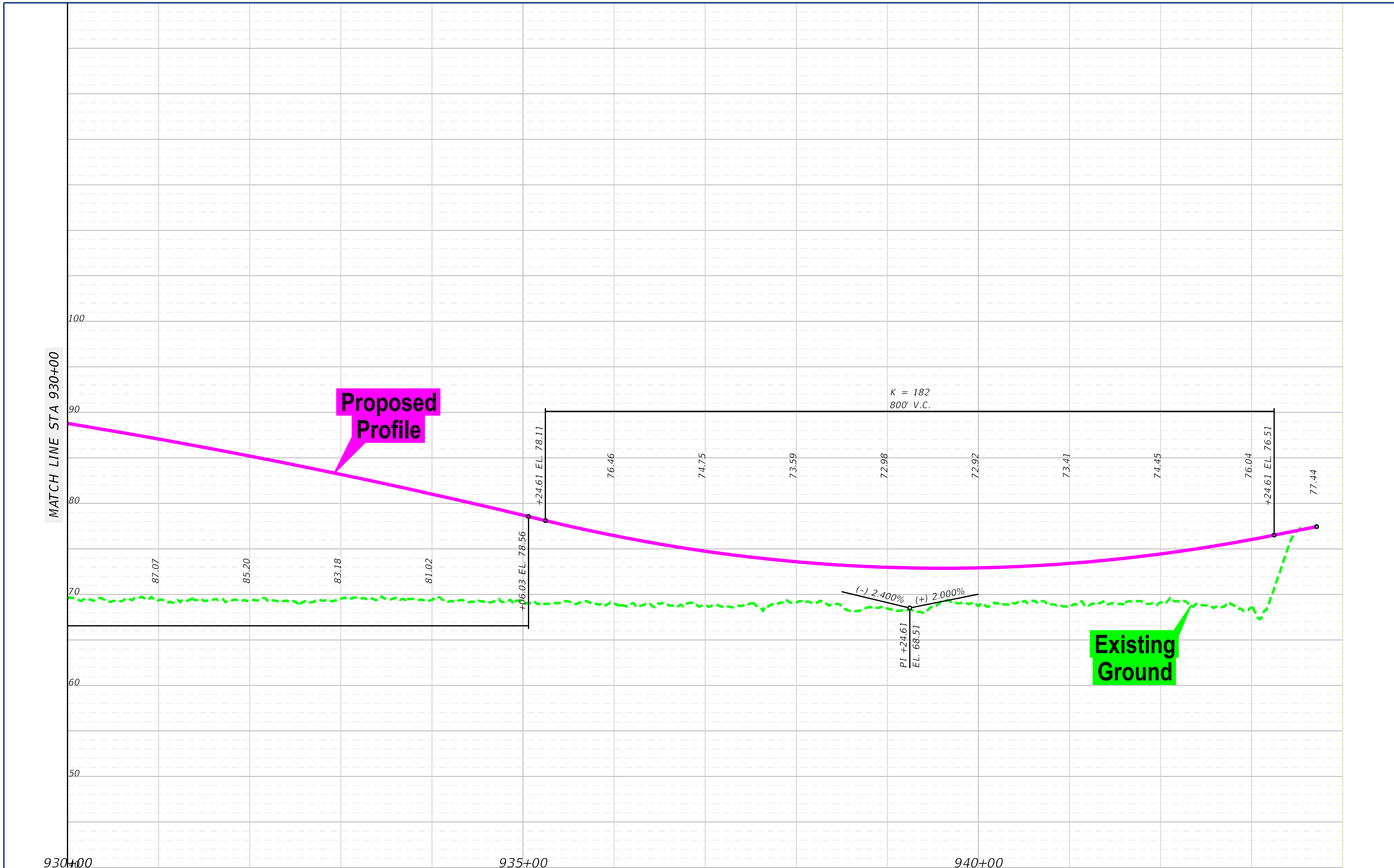


CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Appendix A
Nova Road Connection
Option 1 Profile

SHEET NO.
A-52



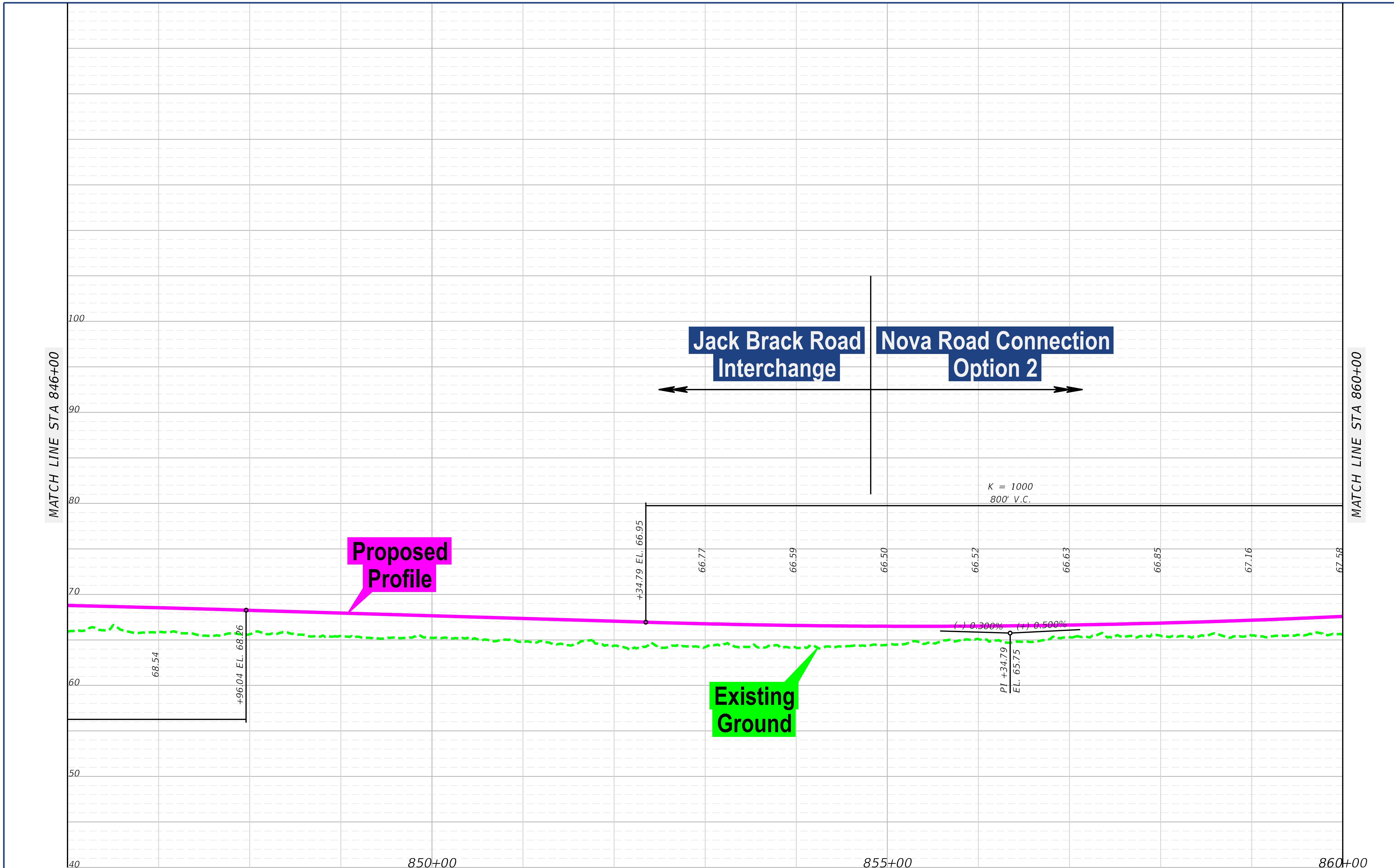
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Appendix A
Nova Road Connection
Option 1 Profile

SHEET NO.
A-53

Nova Road Connection Option 2
Profile Sheets

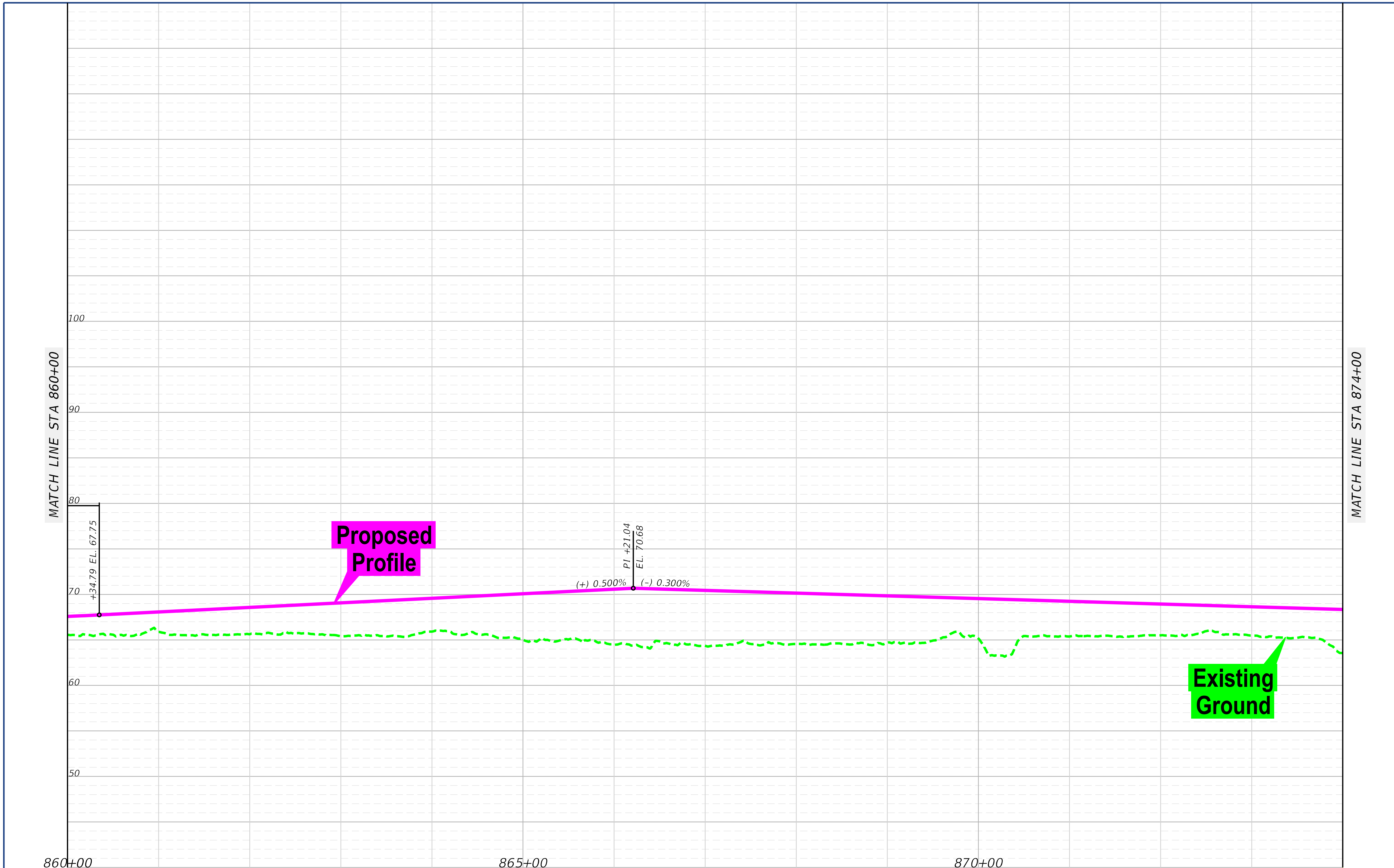


CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Appendix A
Nova Road Connection
Option 2 Profile

SHEET NO.
A-54



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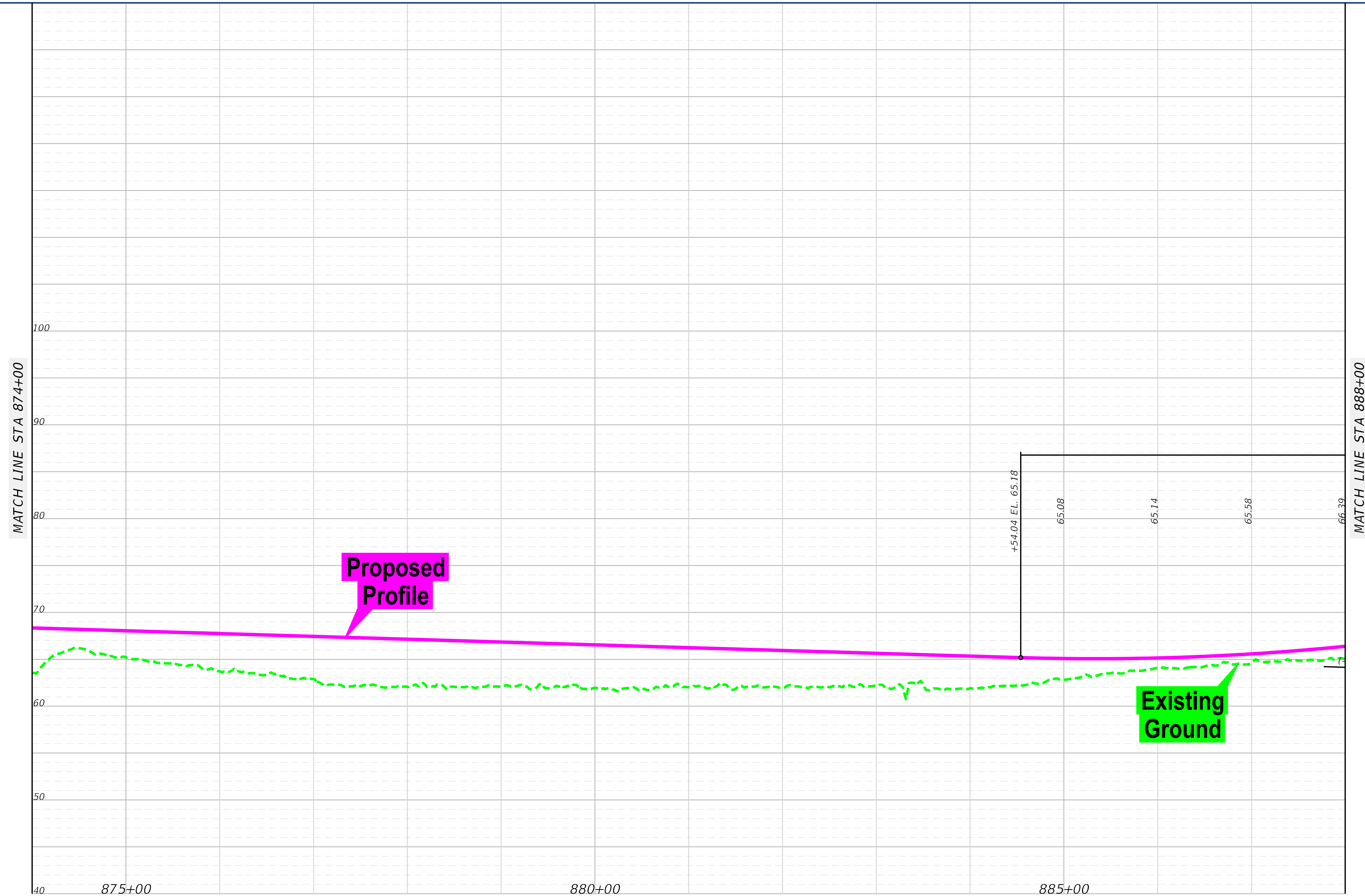
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Appendix A
Nova Road Connection
Option 2 Profile

SHEET NO.
A-55

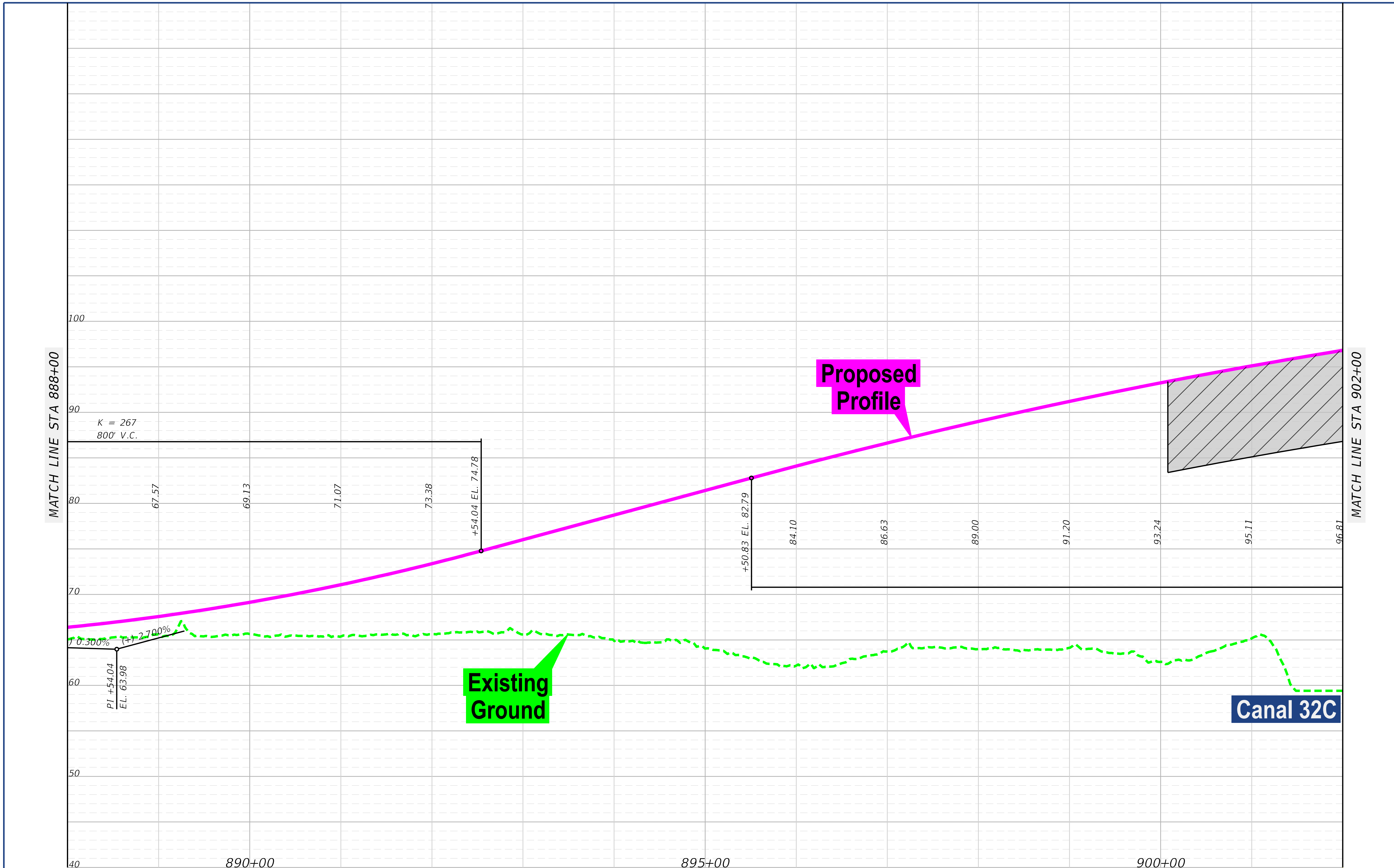


CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

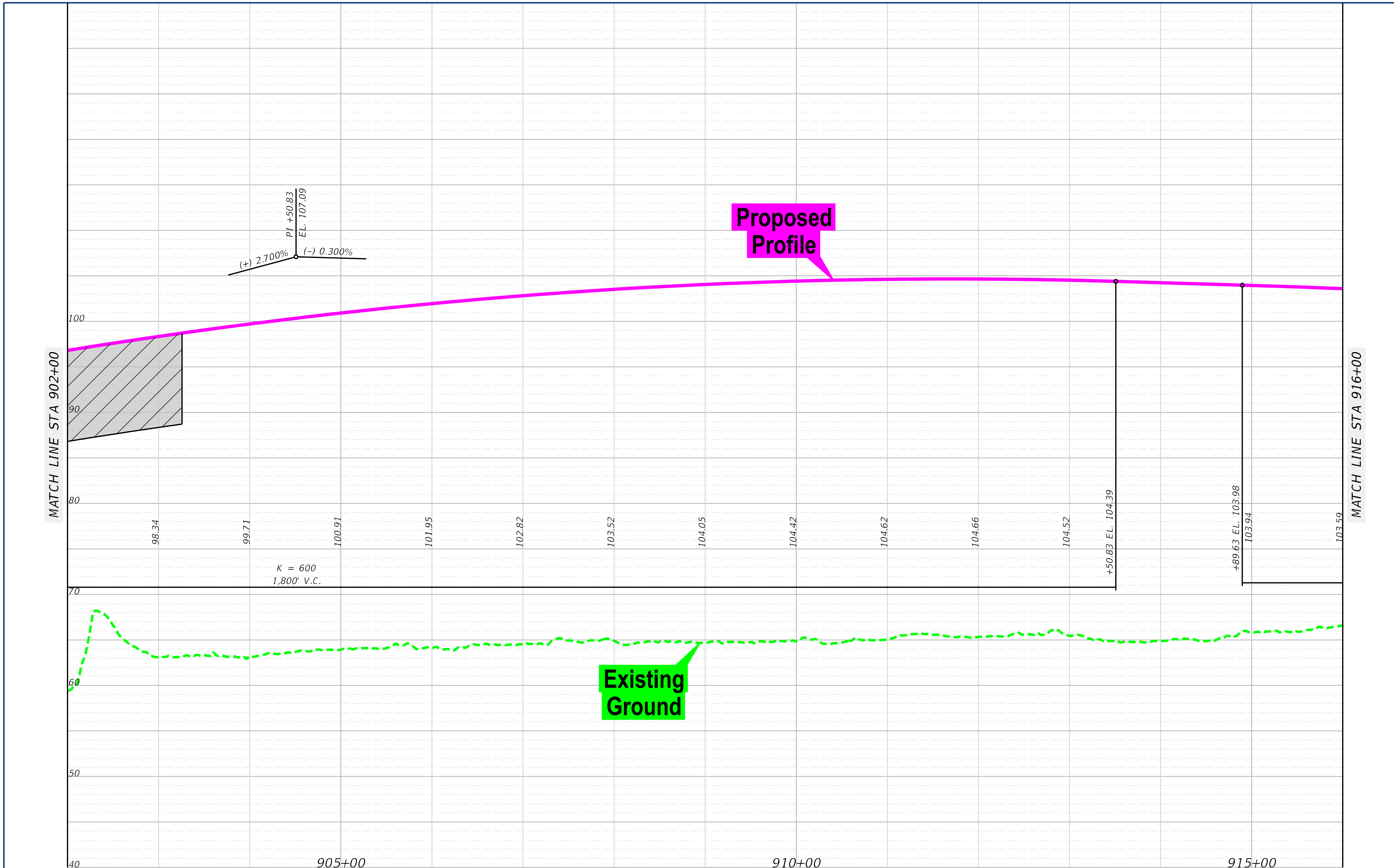
Appendix A
Nova Road Connection
Option 2 Profile

SHEET NO.
A-56



CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1 From Cyrils Drive to Nova Road (CR 532) Project Development and Environment Study	Appendix A Nova Road Connection Option 2 Profile	SHEET NO. A-57

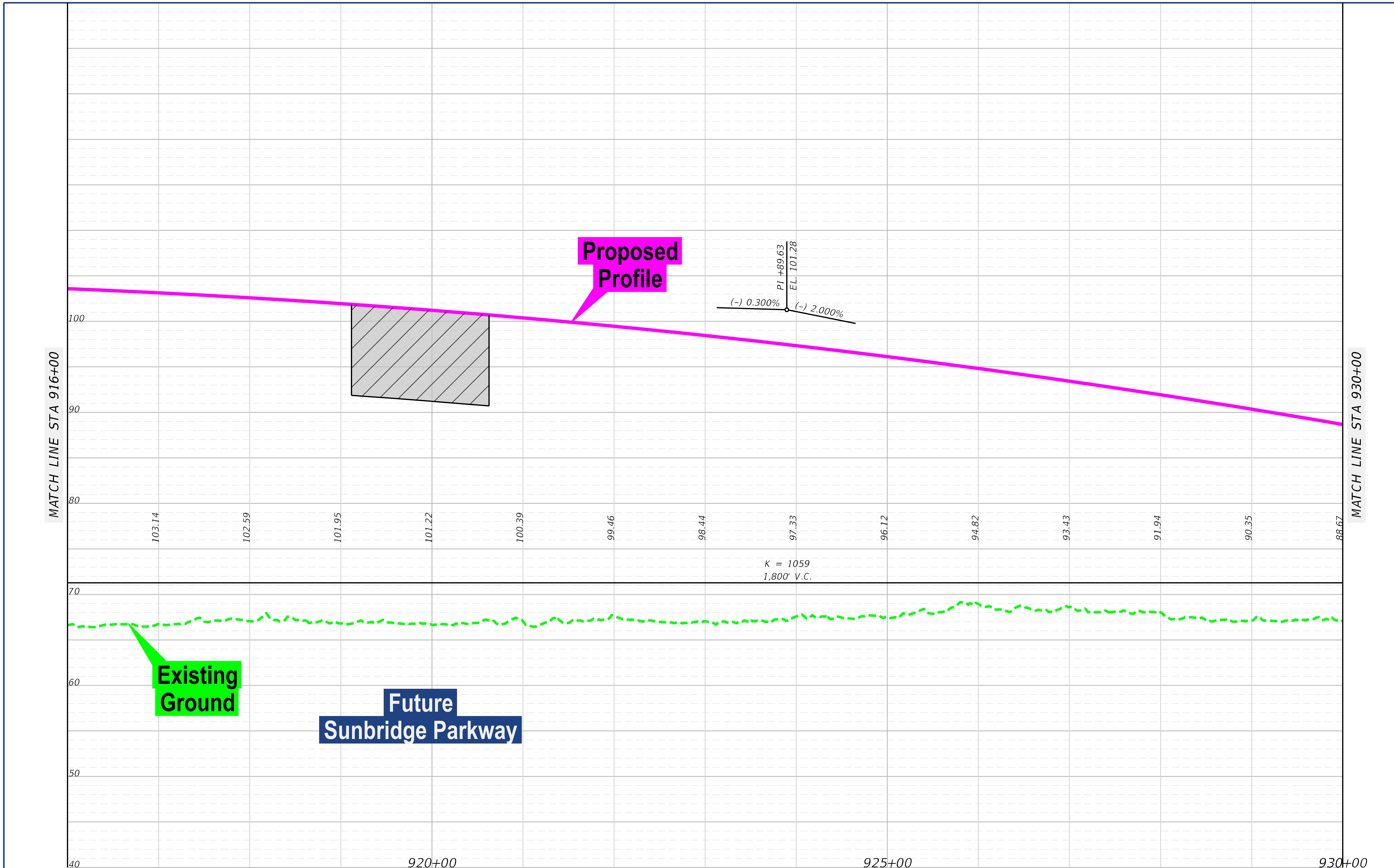


CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Appendix A
Nova Road Connection
Option 2 Profile

SHEET NO.
A-58

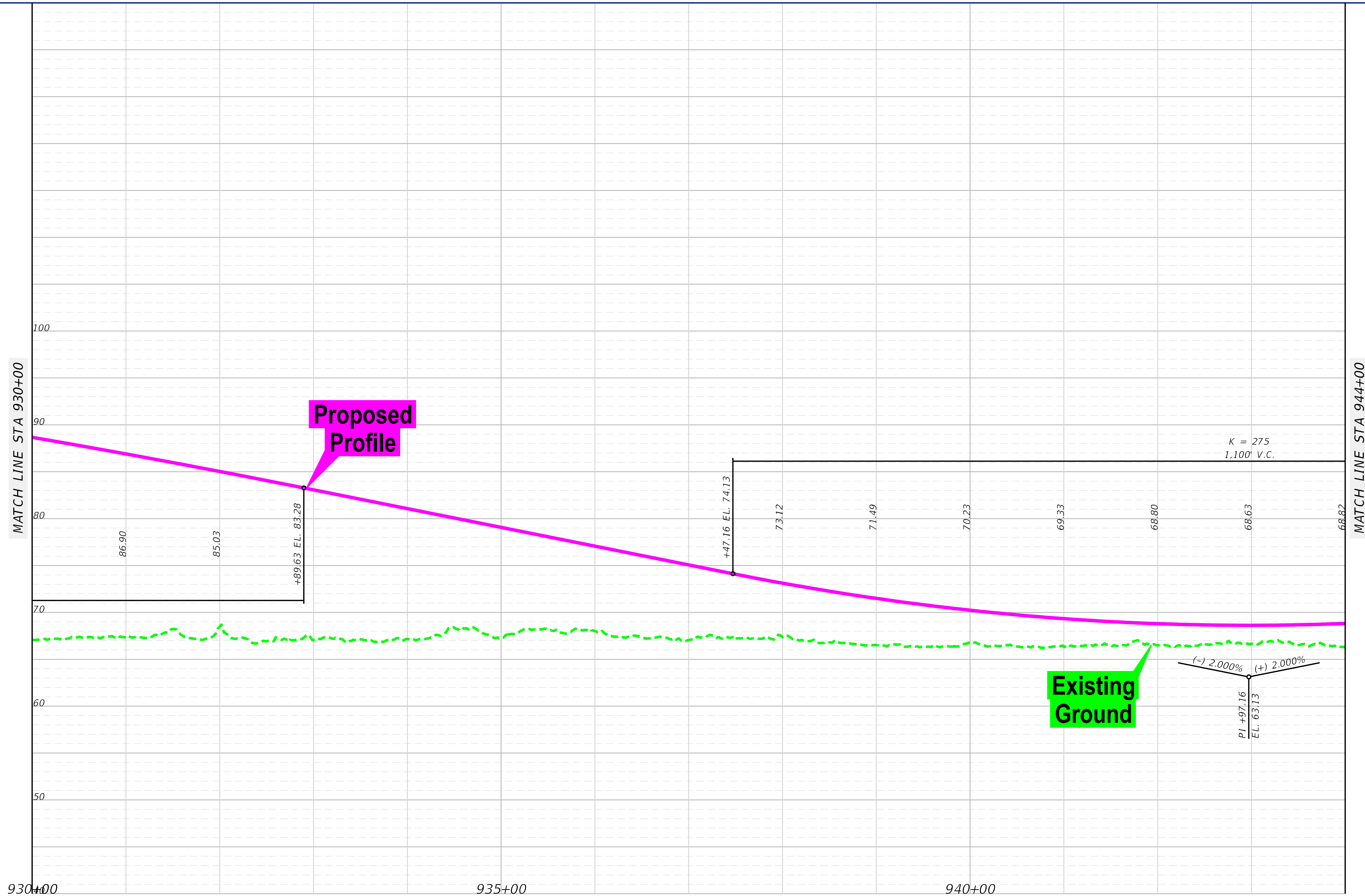


CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Appendix A
Nova Road Connection
Option 2 Profile

SHEET NO.
A-59



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CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Appendix A
Nova Road Connection
Option 2 Profile

SHEET NO.
A-60

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

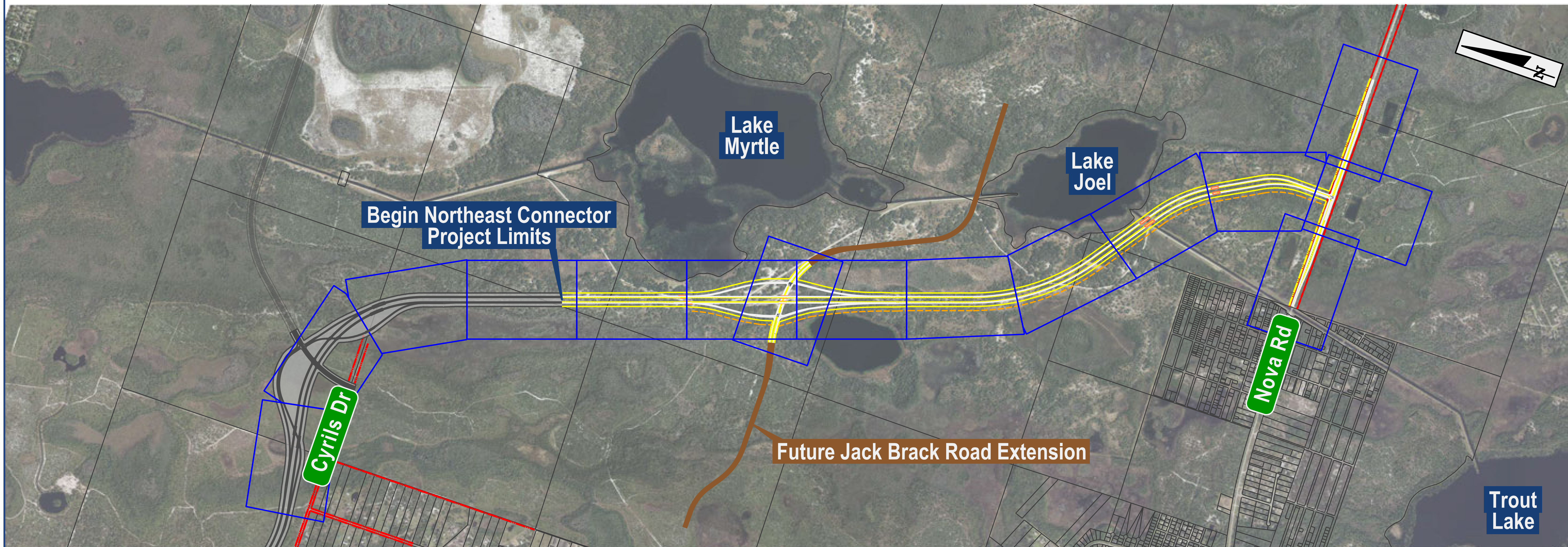
Appendix A
Nova Road Connection
Option 2 Profile

SHEET NO.
A-61

Appendix B

Concept Plans (Preferred Alternative)

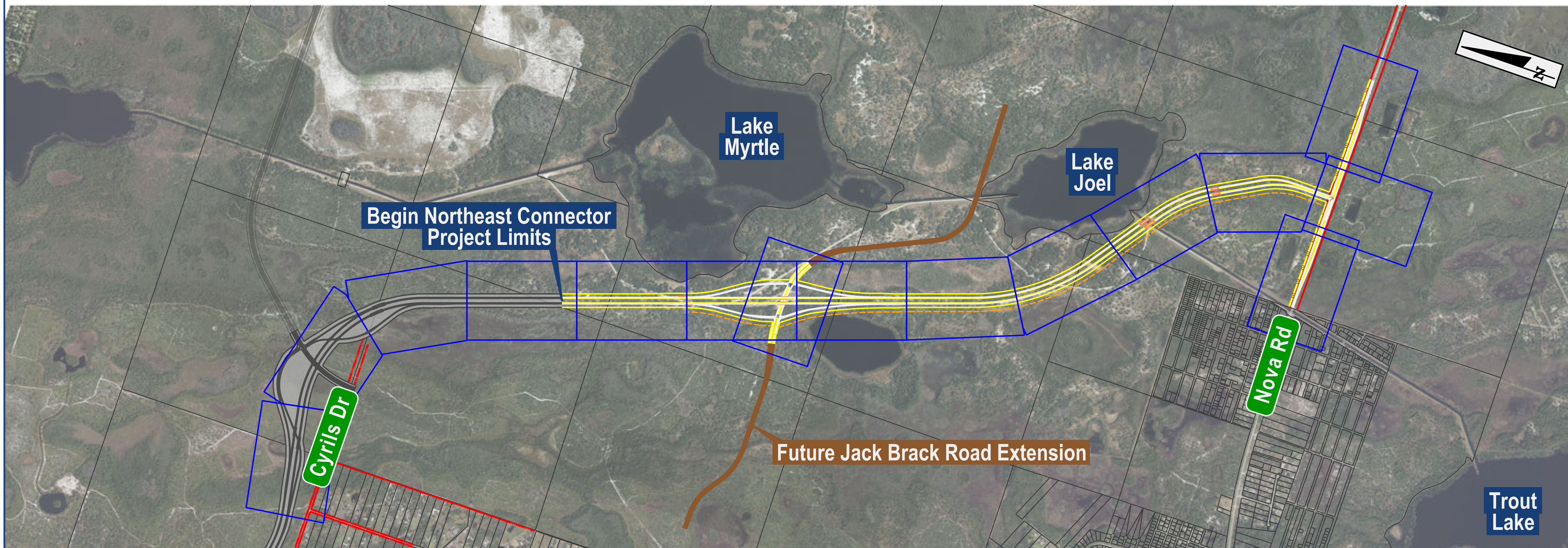
Appendix B: Preferred Alternative (200 Scale)



Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

CFX Project No.: 599-228
Contract No.: 001546

Appendix B: Preferred Alternative (200 Scale)

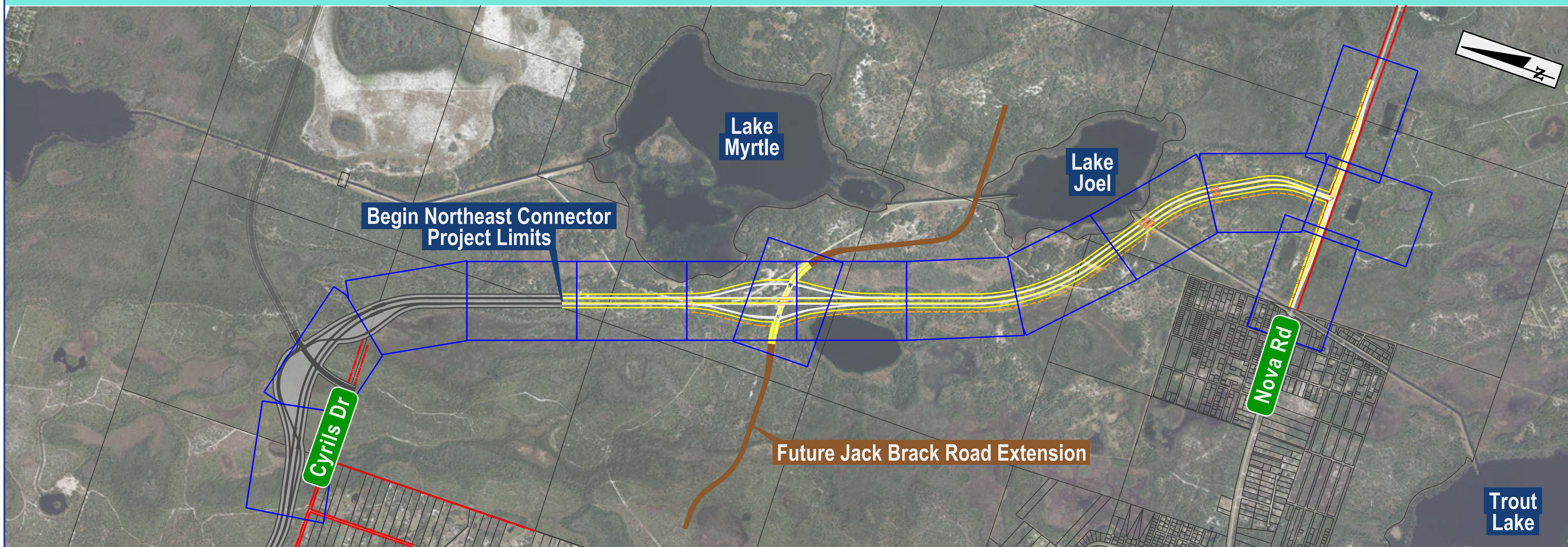


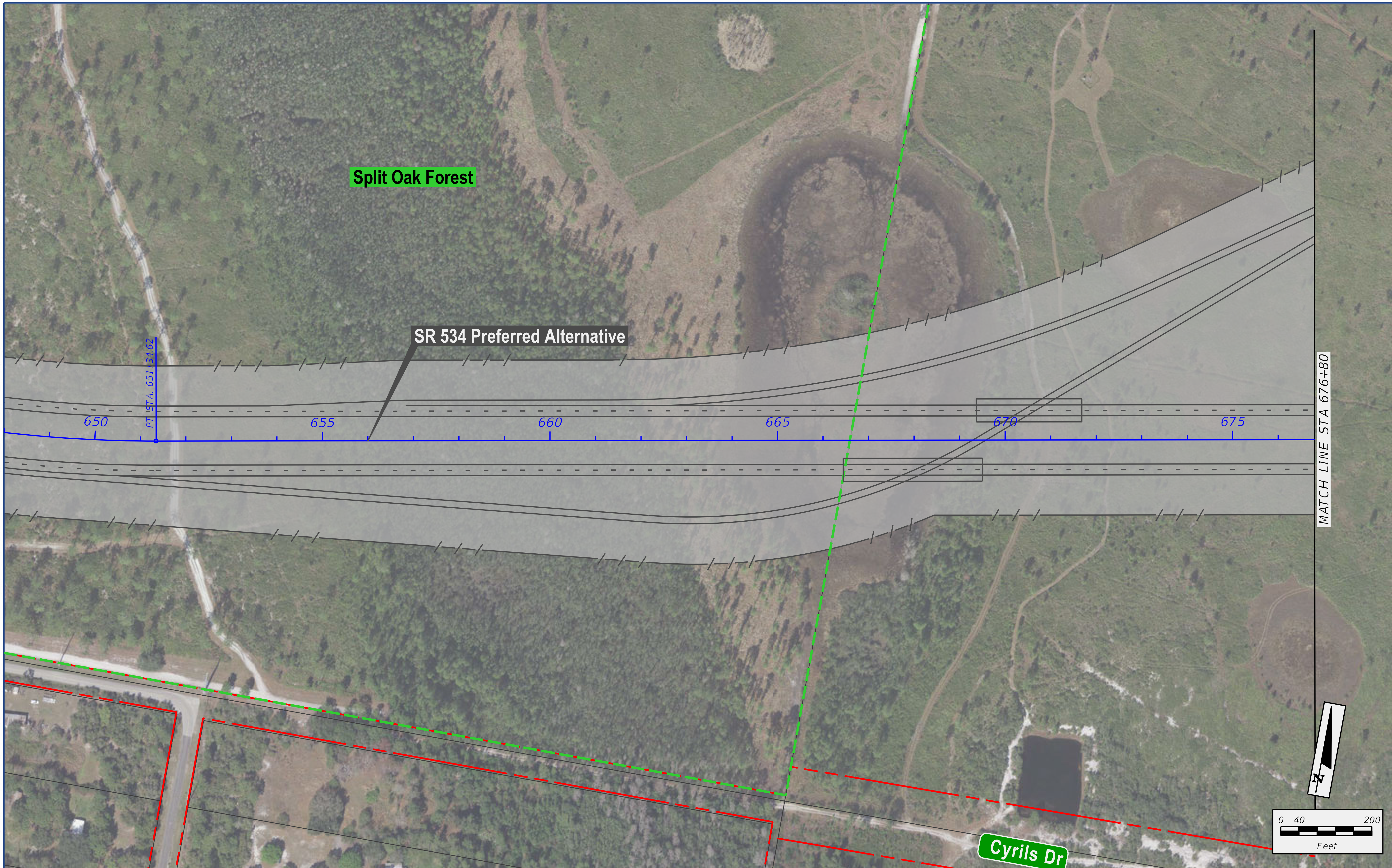
Index of Drawings

Sheet Number	Sheet Description
1-15	Preferred Alternative Plan Sheets
16-17	Preferred Alternative Geometry Data
18-32	Preferred Alternative Profile Sheets

$FILE$ $TIME$ $DATE$ $USER$

Preferred Alternative
Plan Sheets





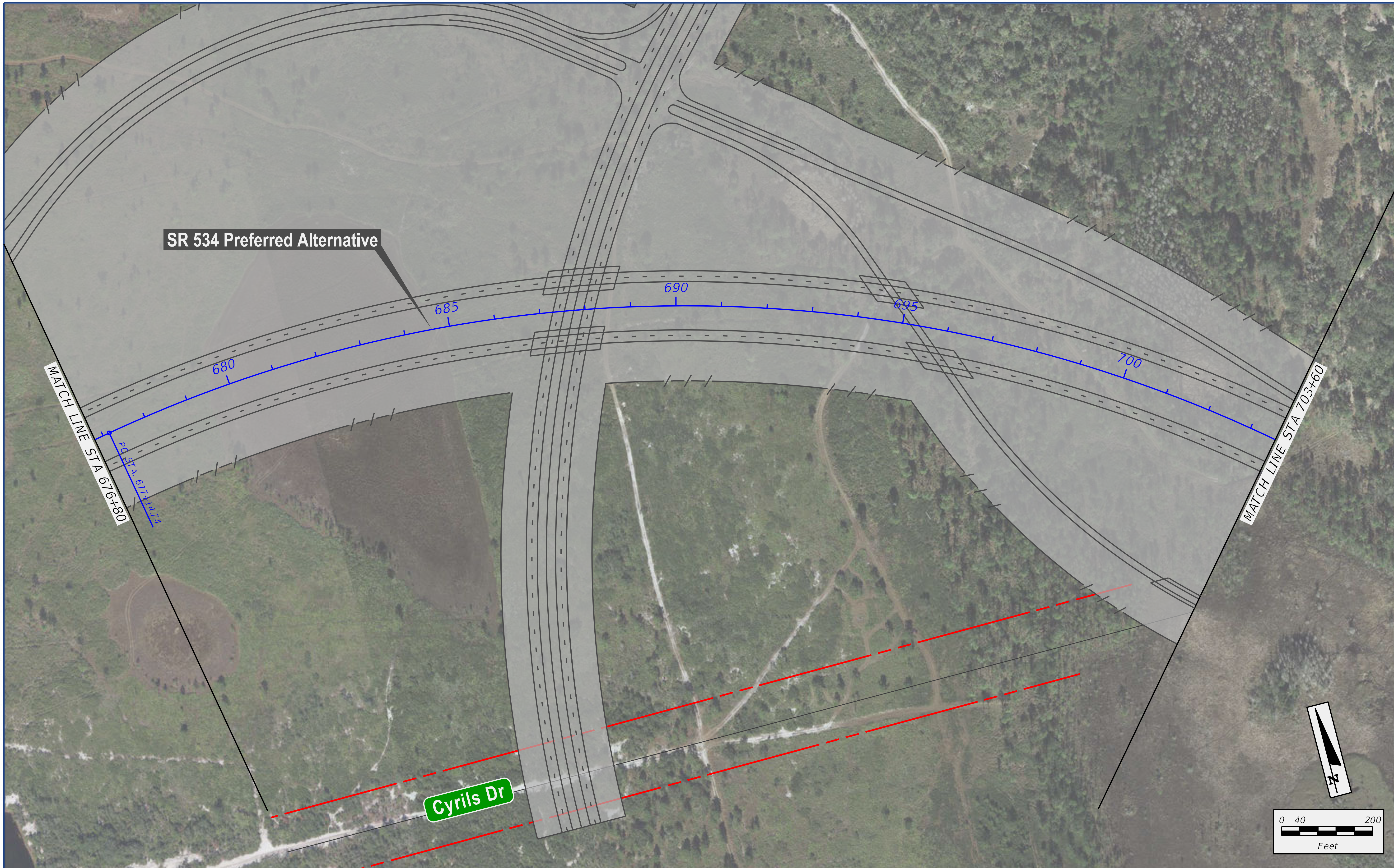
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Existing Right-of-Way	Potential OUC Utility Easement	Proposed Barrier Wall
Proposed Right-of-Way	Property Lines	Proposed Pavement
Proposed L/A Right-of-Way	Split Oak Forest	Proposed Structure

Appendix B
Preferred Alternative

SHEET NO.
B-1



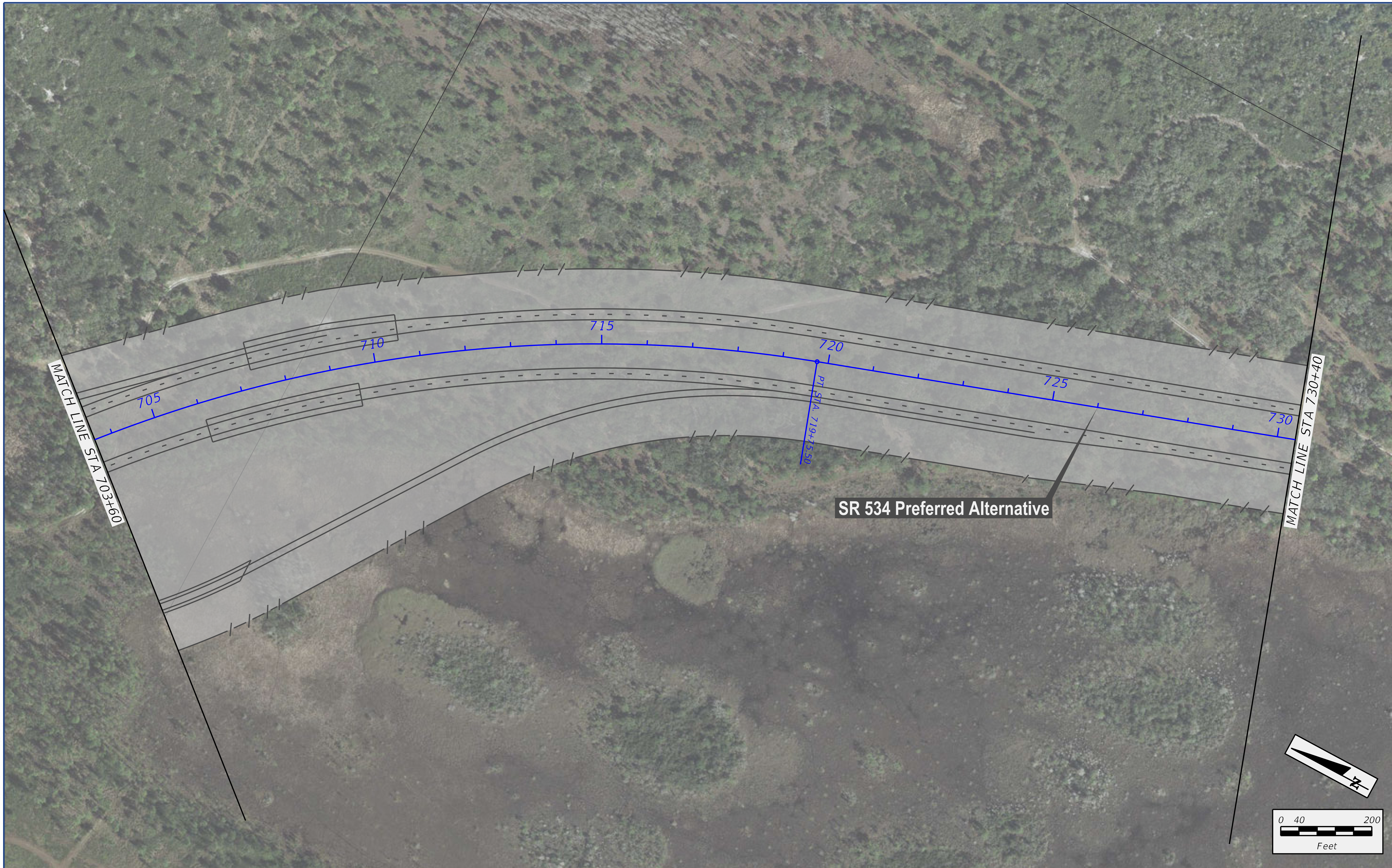
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Existing Right-of-Way	Potential OUC Utility Easement	Proposed Barrier Wall
Proposed Right-of-Way	Property Lines	Proposed Pavement
Proposed L/A Right-of-Way	Split Oak Forest	Proposed Structure

Appendix B
Preferred Alternative

SHEET NO.
B-2



CENTRAL FLORIDA EXPRESSWAY AUTHORITY	Northeast Connector Expressway - Phase 1 From Cyrils Drive to Nova Road (CR 532) Project Development and Environment Study	Existing Right-of-Way Proposed Right-of-Way Proposed L/A Right-of-Way	Potential OUC Utility Easement Property Lines Split Oak Forest	Proposed Barrier Wall Proposed Pavement Proposed Structure

Appendix B
Preferred Alternative

SHEET NO.
B-3

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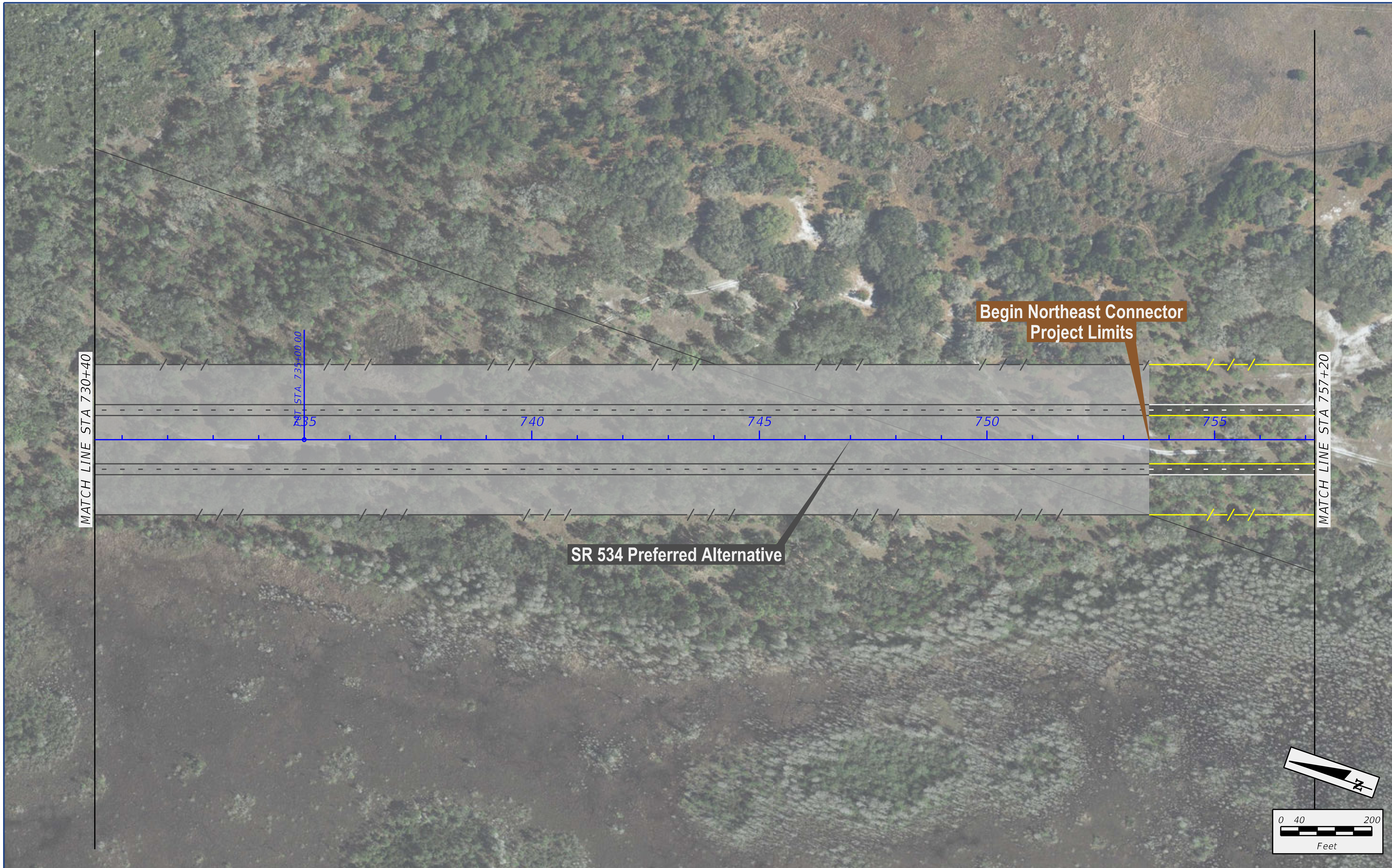


CENTRAL FLORIDA EXPRESSWAY AUTHORITY

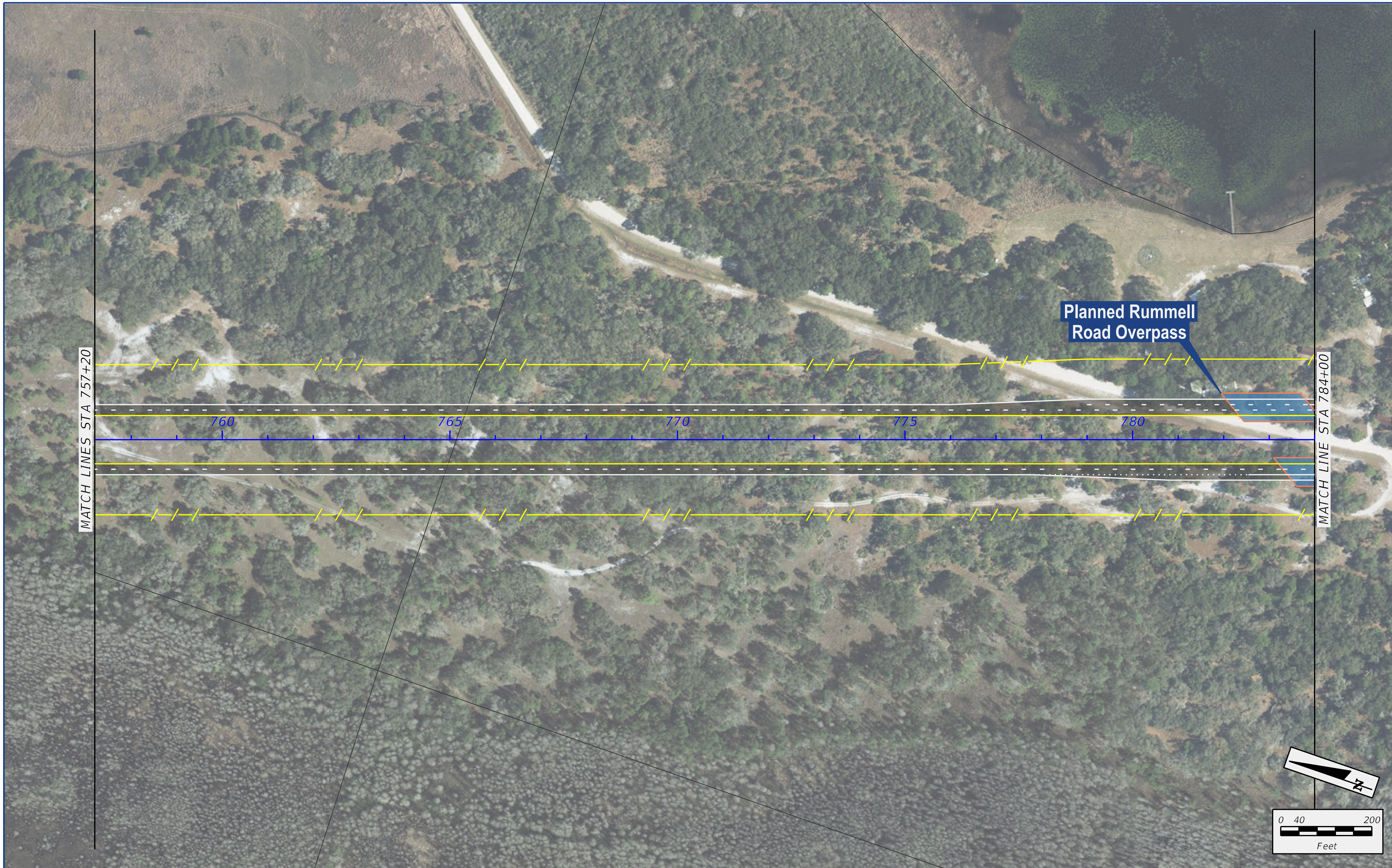
Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Existing Right-of-Way	Potential OUC Utility Easement	Proposed Barrier Wall
Proposed Right-of-Way	Property Lines	Proposed Pavement
Proposed L/A Right-of-Way	Split Oak Forest	Proposed Structure

Appendix B
Preferred Alternative

SHEET NO.
B-4

$USER$ $DATE$ $TIME$ $FILE$



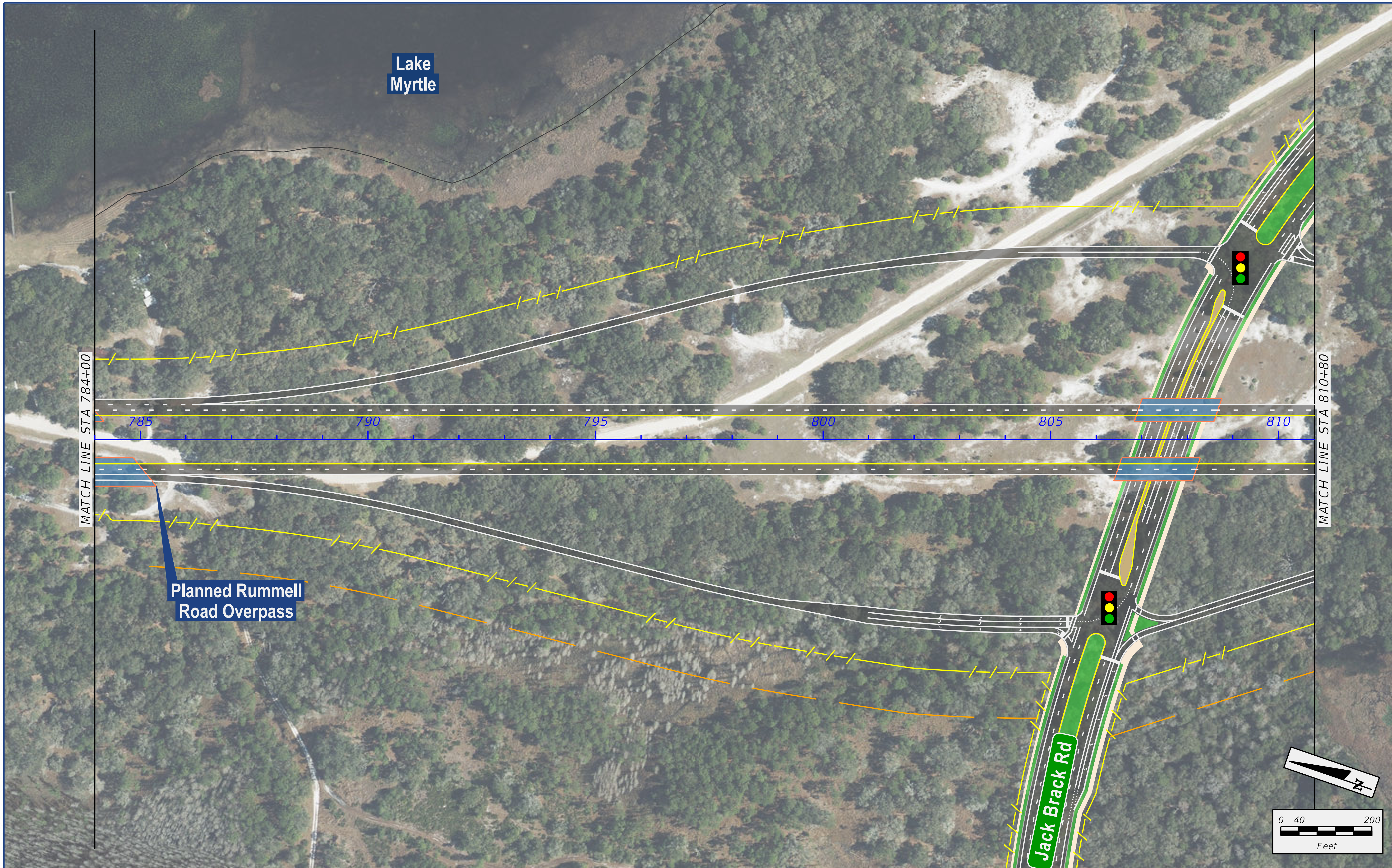
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Existing Right-of-Way	Potential OUC Utility Easement	Proposed Barrier Wall
Proposed Right-of-Way	Property Lines	Proposed Pavement
Proposed L/A Right-of-Way	Split Oak Forest	Proposed Structure

Appendix B
Preferred Alternative

SHEET NO.
B-5



$FILE$ $TIME$ $DATE$ $USER$

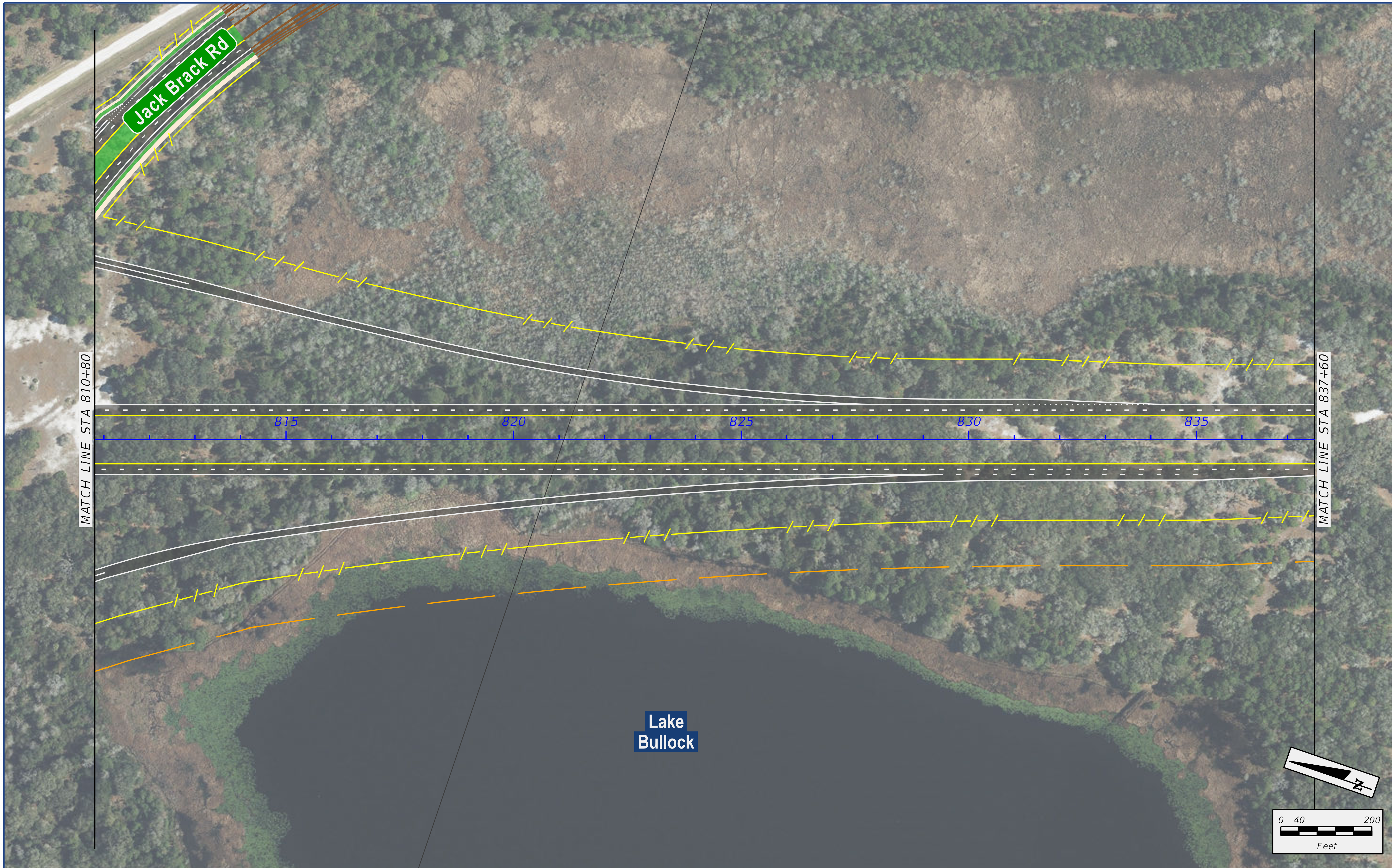
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Existing Right-of-Way	Potential OUC Utility Easement
Proposed Right-of-Way	Property Lines
Proposed L/A Right-of-Way	Split Oak Forest
Proposed Barrier Wall	
Proposed Pavement	
Proposed Structure	

Appendix B
Preferred Alternative

SHEET NO.
B-6



Existing Right-of-Way
Proposed Right-of-Way
Proposed L/A Right-of-Way
Potential OUC Utility Easement
Property Lines
Split Oak Forest
Proposed Barrier Wall
Proposed Pavement
Proposed Structure

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

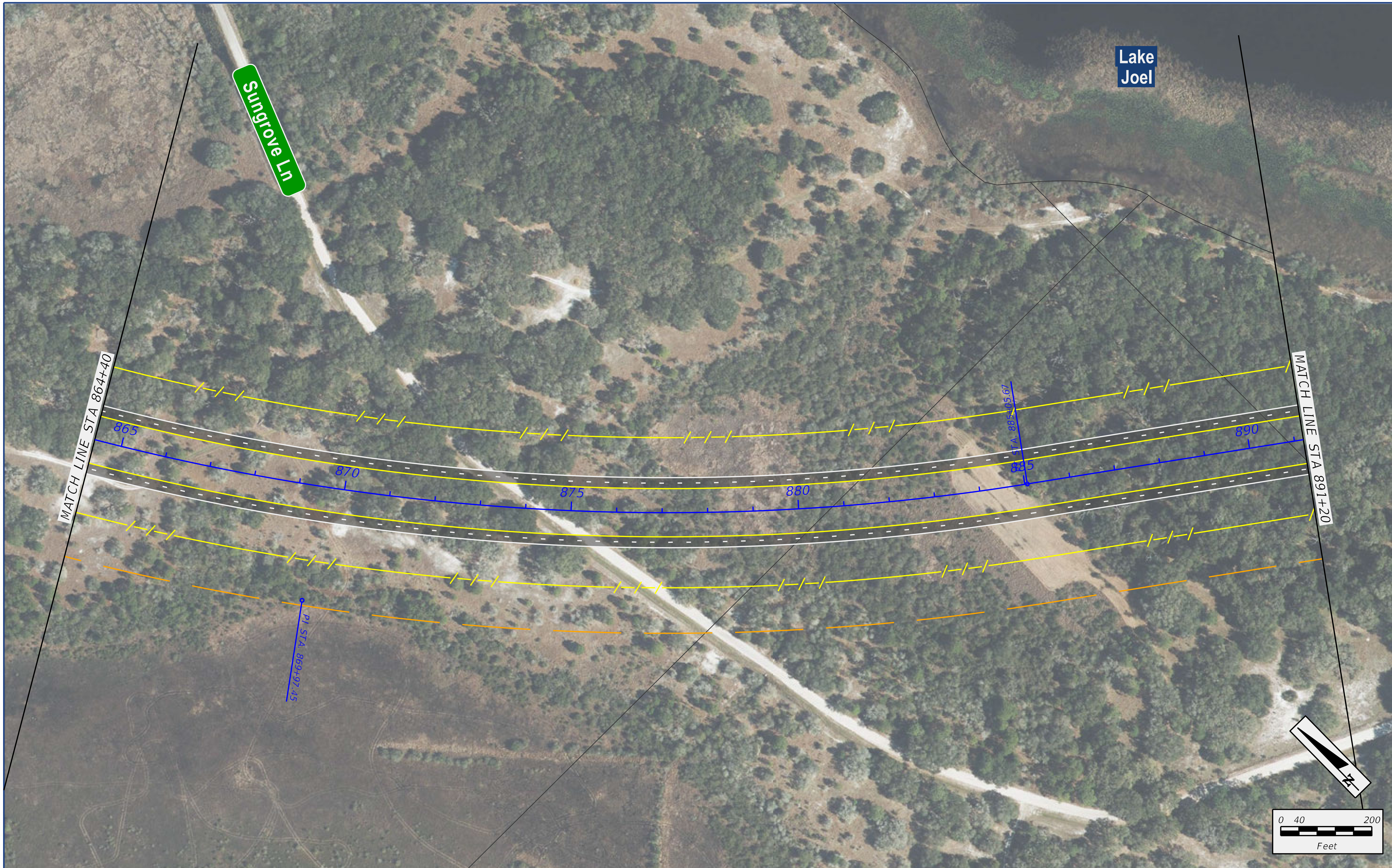
Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Appendix B
Preferred Alternative

SHEET NO.
B-7

$USER$ $DATE$ $TIME$ $FILE$

CENTRAL FLORIDA EXPRESSWAY AUTHORITY	Northeast Connector Expressway - Phase 1 From Cyrils Drive to Nova Road (CR 532) Project Development and Environment Study	Existing Right-of-Way	Potential OUC Utility Easement	Proposed Barrier Wall	Appendix B Preferred Alternative	SHEET NO.
		Proposed Right-of-Way	Property Lines	Proposed Pavement		B-8
		Proposed L/A Right-of-Way	Split Oak Forest	Proposed Structure		



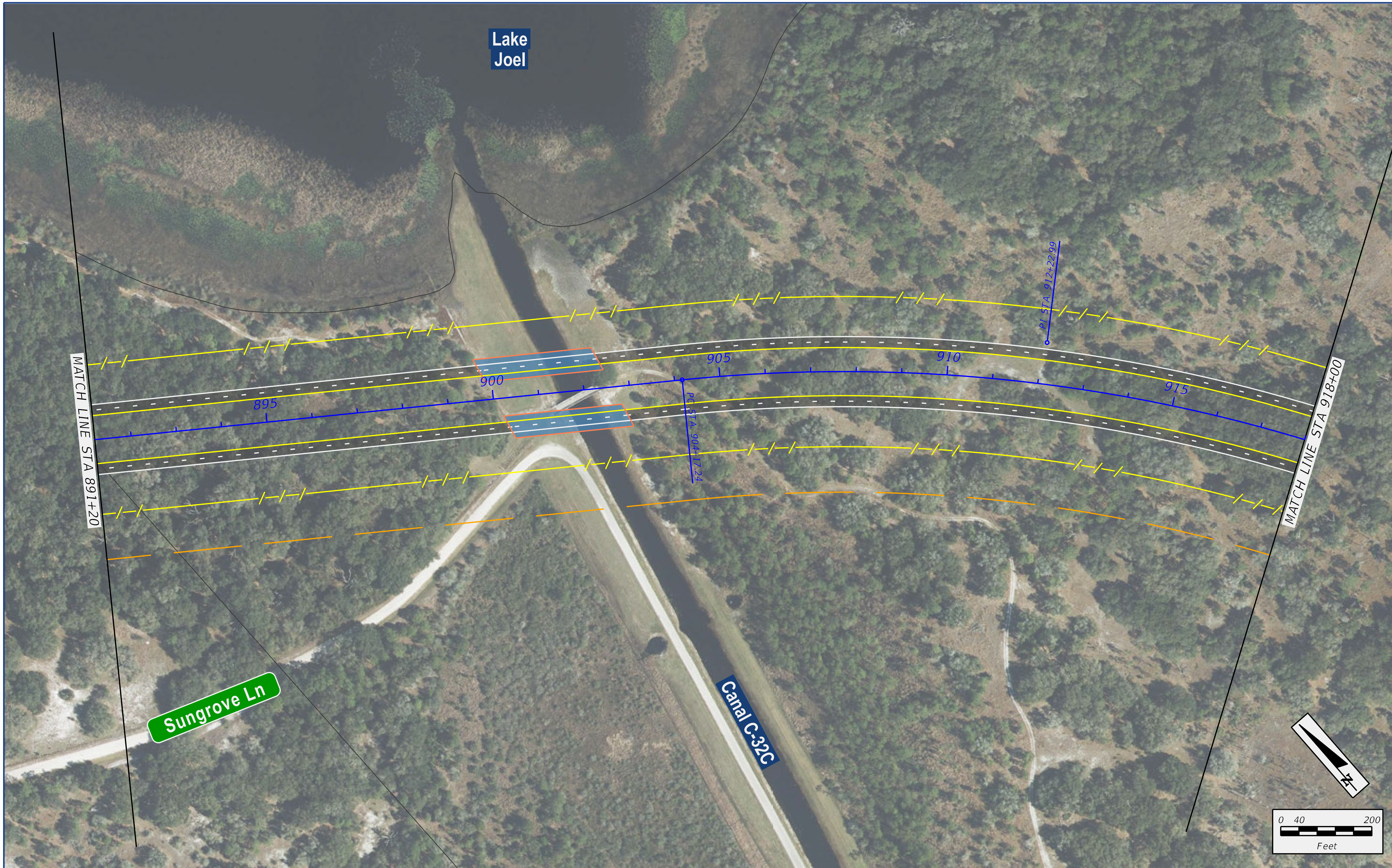
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Existing Right-of-Way	Potential OUC Utility Easement	Proposed Barrier Wall
Proposed Right-of-Way	Property Lines	Proposed Pavement
Proposed L/A Right-of-Way	Split Oak Forest	Proposed Structure

Appendix B
Preferred Alternative

SHEET NO.
B-9



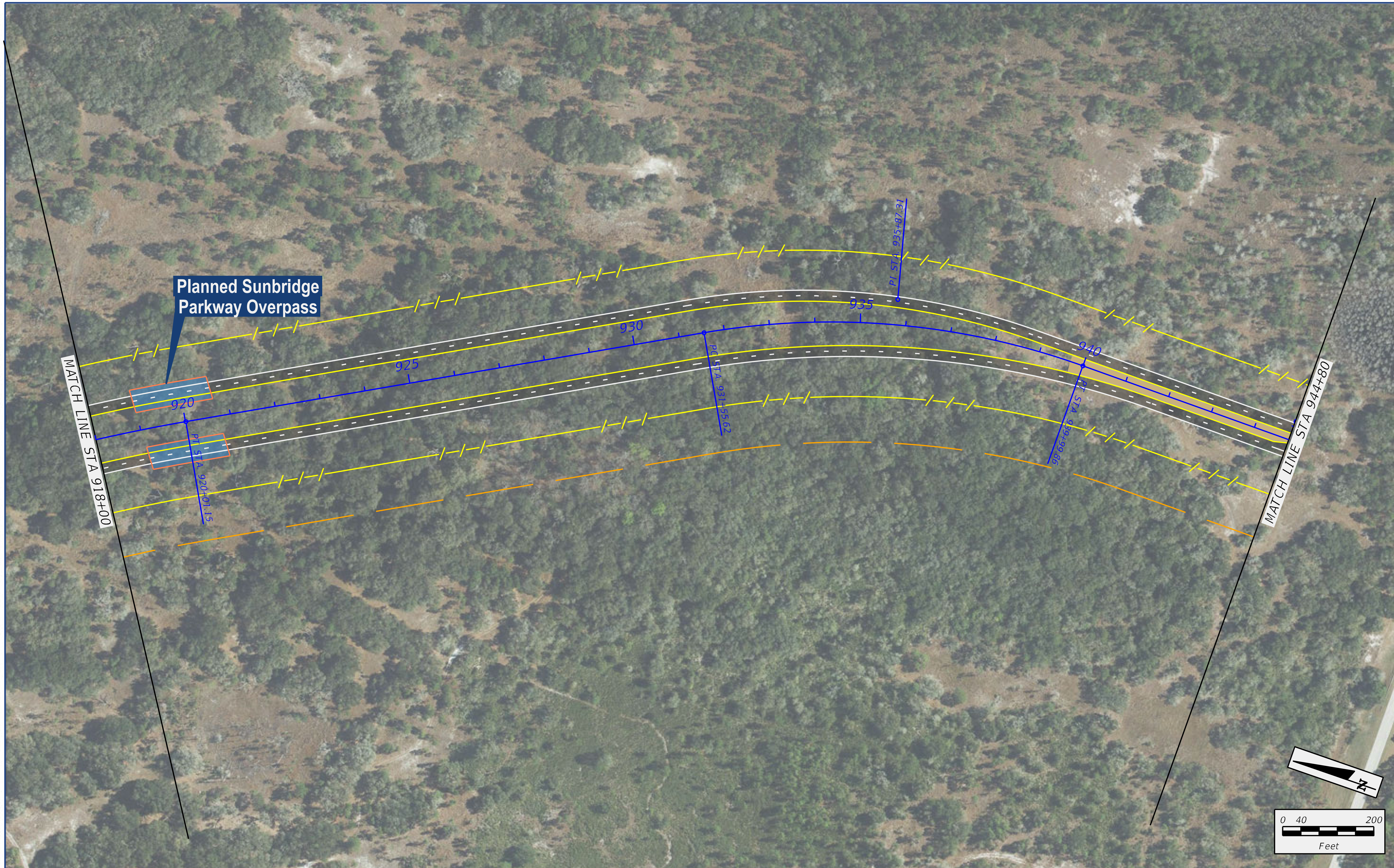
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Existing Right-of-Way	Potential OUC Utility Easement	Proposed Barrier Wall
Proposed Right-of-Way	Property Lines	Proposed Pavement
Proposed L/A Right-of-Way	Split Oak Forest	Proposed Structure

Appendix B
Preferred Alternative

SHEET NO.
B-10



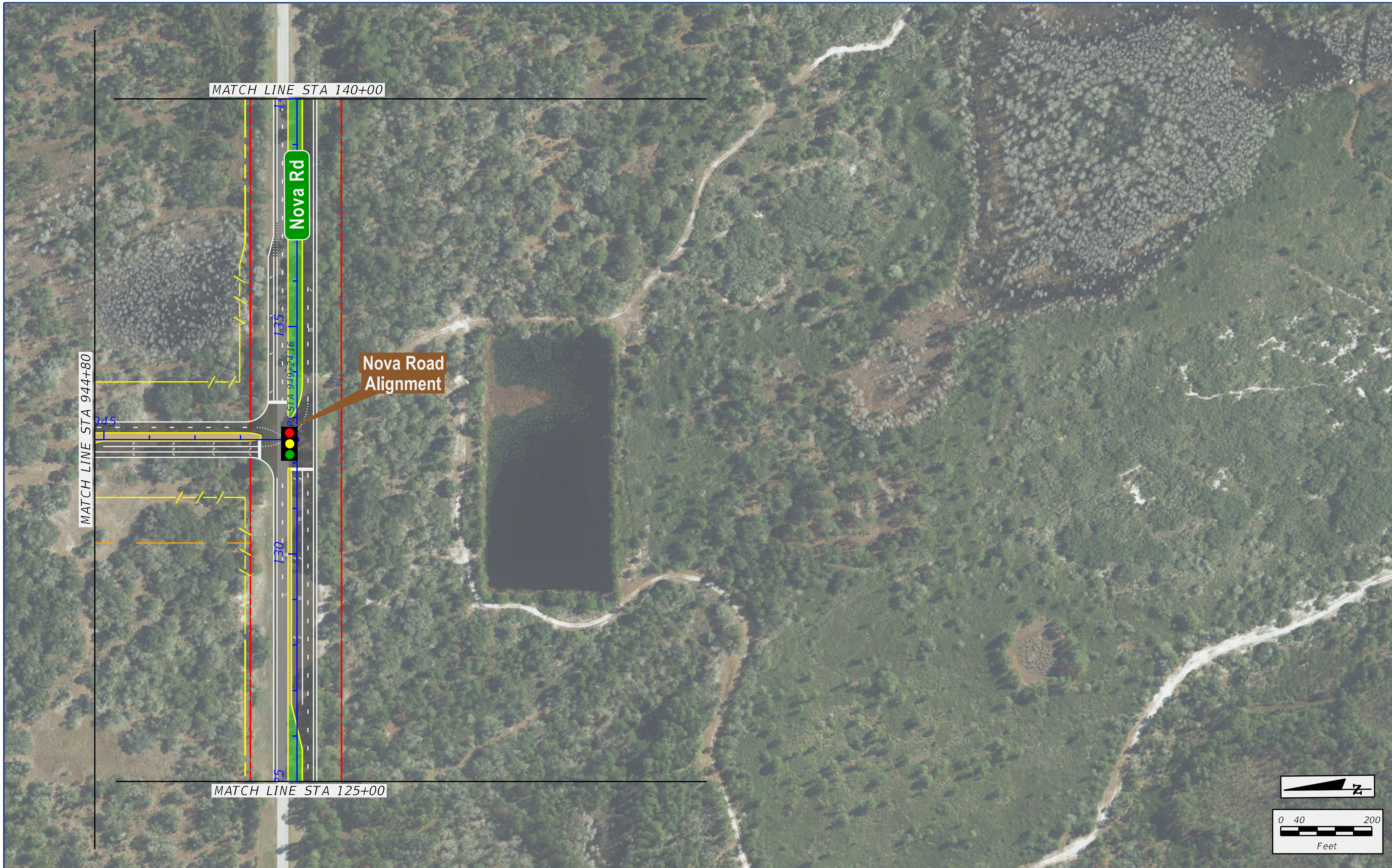
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Existing Right-of-Way
Proposed Right-of-Way
Proposed L/A Right-of-Way
Potential OUC Utility Easement
Property Lines
Split Oak Forest
Proposed Barrier Wall
Proposed Pavement
Proposed Structure

Appendix B
Preferred Alternative

SHEET NO.
B-11



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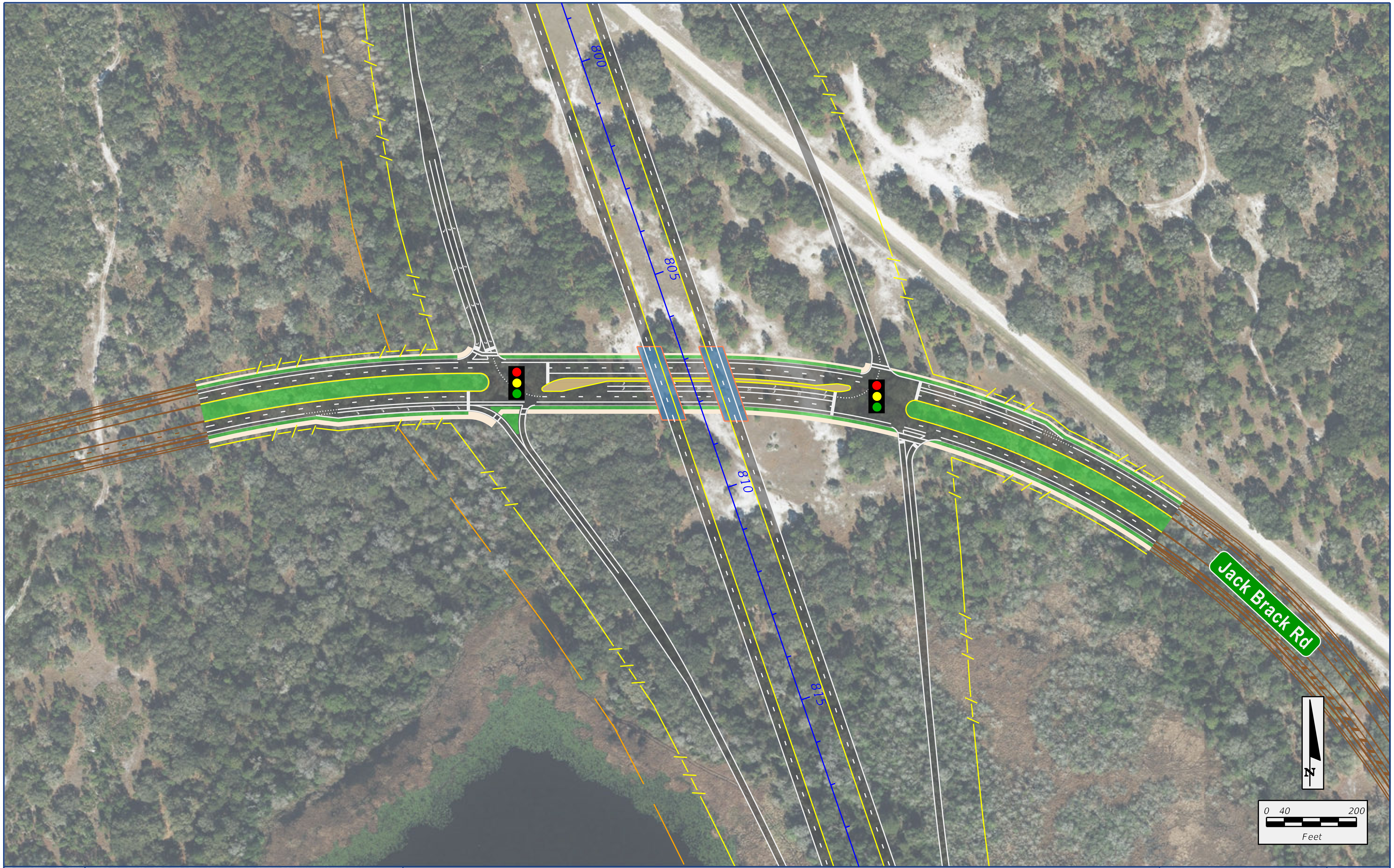
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Existing Right-of-Way	Proposed Right-of-Way
Proposed L/A Right-of-Way	Potential OUC Utility Easement
Property Lines	Split Oak Forest
Proposed Barrier Wall	Proposed Pavement
Proposed Structure	

Appendix B
Preferred Alternative

SHEET NO. B-12



CENTRAL FLORIDA EXPRESSWAY AUTHORITY

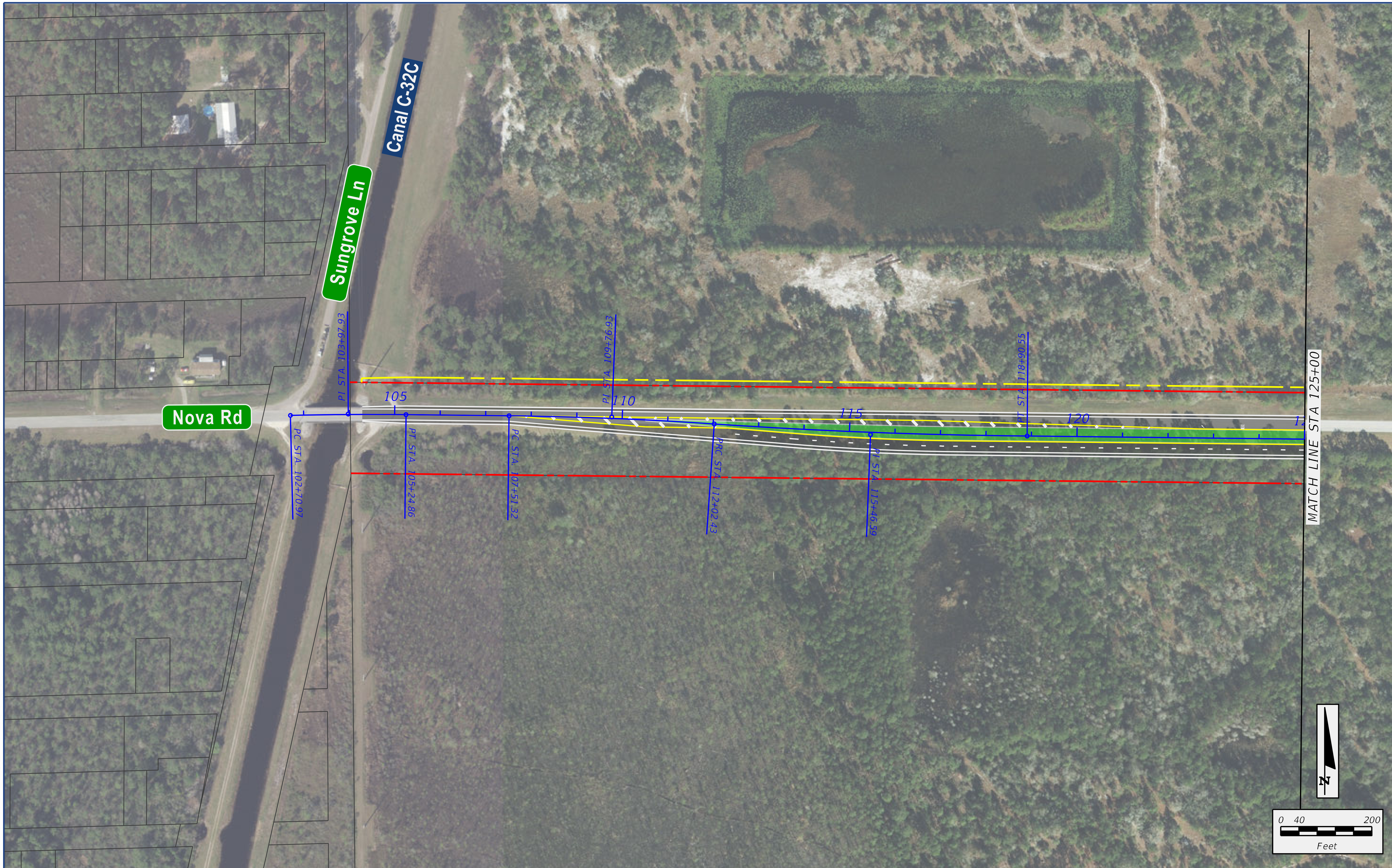
Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Existing Right-of-Way	Potential OUC Utility Easement
Proposed Right-of-Way	Property Lines
Proposed L/A Right-of-Way	Split Oak Forest
Proposed Barrier Wall	
Proposed Pavement	
Proposed Structure	

Appendix B
Preferred Alternative

SHEET NO.
B-13

$FILE$ $TIME$ $DATE$ $USER$



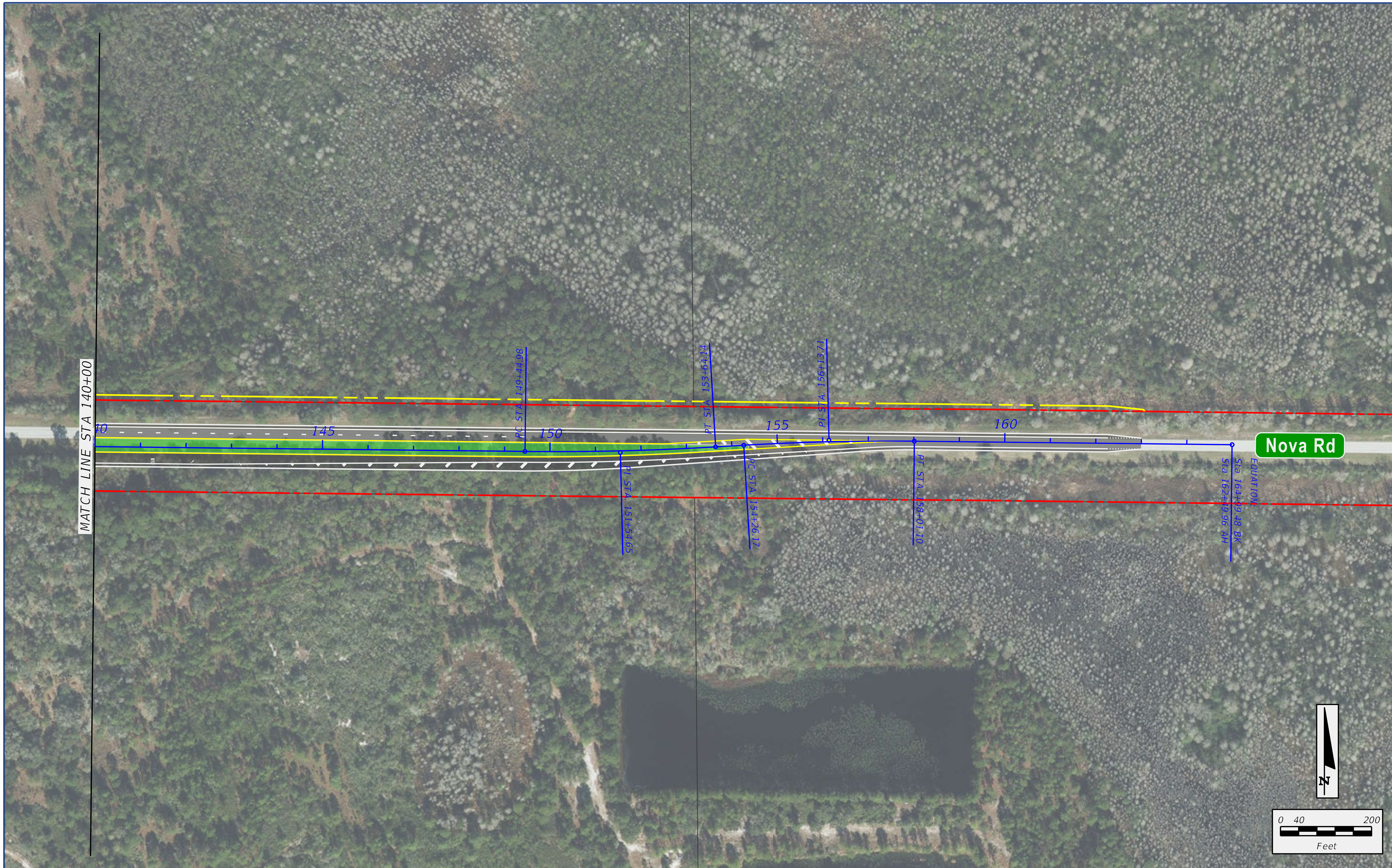
Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Existing Right-of-Way	Potential OUC Utility Easement
Proposed Right-of-Way	Property Lines
Proposed L/A Right-of-Way	Split Oak Forest
Proposed Barrier Wall	
Proposed Pavement	
Proposed Structure	

Appendix B
Preferred Alternative

SHEET NO.
B-14



CENTRAL FLORIDA EXPRESSWAY AUTHORITY	Northeast Connector Expressway - Phase 1 From Cyrils Drive to Nova Road (CR 532) Project Development and Environment Study	Existing Right-of-Way Proposed Right-of-Way Proposed L/A Right-of-Way	Potential OUC Utility Easement Property Lines Split Oak Forest	Proposed Barrier Wall Proposed Pavement Proposed Structure	Appendix B Preferred Alternative	SHEET NO. B-15

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Preferred Alternative

Geometry Data

Beginning Preferred Alternative Chain Description
==
Point 456 N 1,457,516.2925 E 588,480.2519 Sta 600+00.00

Course from 456 to PC 4531 S 15° 55' 36.89" E Dist 855.7695

Curve Data

Curve 4531
P.I. Station 634+90.39 N 1,454,159.8913 E 589,438.0527
Delta = 84° 27' 02.36" (LT)
Degree = 1° 58' 25.23
Tangent = 2,634.6190
Length = 4,278.8536
Radius = 2,903.0000
External = 1,017.2839
Long Chord = 3,901.9107
Mid. Ord. = 753.3065
P.C. Station 608+55.77 N 1,456,693.3739 E 88,715.0844
P.T. Station 651+34.62 N 1,454,634.4760 E 592,029.5748
C.C. N 1,457,489.9889 E 591,506.6455
Back = S 15° 55' 36.89" E
Ahead = N 79° 37' 20.75" E
Chord Bear = S 58° 09' 08.07" E

Course from PT 4531 to PC 4532 N 79° 37' 20.75" E Dist 2,580.1137

Curve Data

Curve 4532
P.I. Station 702+93.99 N 1,455,563.8532 E 597,104.5418
Delta = 81° 22' 28.52" (RT)
Degree = 1° 54' 35.49"
Tangent = 2,579.2498
Length = 4,260.7635
Radius = 3,000.0000
External = 956.3278
Long Chord = 3,911.5816
Mid. Ord. = 725.1632
P.C. Station 677+14.74 N 1,455,099.2424 E 594,567.4831
P.T. Station 719+75.50 N 1,453,125.1683 E 597,944.3903
C.C. N 1,452,148.3162 E 595,107.8854
Back = N 79° 37' 20.75" E
Ahead = S 19° 00' 10.73" E
Chord Bear = S 59° 41' 24.99" E

Course from PT 4532 to 457 S 19° 00' 10.73" E Dist 1,524.4998

Point 457 N 1,451,683.7513 E 598,440.7939 Sta 735+00.00

Course from 457 to PC 4533 S 19° 00' 10.73" E Dist 11,883.6847

Curve Data

Curve 4533
P.I. Station 869+97.45 N 1,438,921.8884 E 602,835.7986
Delta = 35° 46' 31.18" (LT)
Degree = 1° 08' 45.30"
Tangent = 1,613.7673
Length = 3,121.9864
Radius = 5,000.0000
External = 253.9742
Long Chord = 3,071.5173
Mid. Ord. = 241.6972
P.C. Station 853+83.68 N 1,440,447.7080 E 602,310.3280
P.T. Station 885+05.67 N 1,437,991.1617 E 604,154.1280
C.C. N 1,442,075.7948 E 607,037.8361
Back = S 19° 00' 10.73" E
Ahead = S 54° 46' 41.92" E
Chord Bear = S 36° 53' 26.33" E

Course from PT 4533 to PC 4534 S 54° 46' 41.92" E Dist 1,911.5653

Curve Data

Curve 4534
P.I. Station 12+22.99 N 1,436,423.9694 E 606,373.9802
Delta = 25° 55' 44.53" (RT)
Degree = 1° 38' 13.28"
Tangent = 805.7560
Length = 1,583.9147
Radius = 3,500.0000
External = 91.5516
Long Chord = 1,570.4333
Mid. Ord. = 89.2179
P.C. Station 904+17.24 N 1,436,888.6824 E 605,715.7366
P.T. Station 920+01.15 N 1,435,718.2141 E 606,762.7632
C.C. N 1,434,029.4392 E 603,697.1410
Back = S 54° 46' 41.92" E
Ahead = S 28° 50' 57.38" E
Chord Bear = S 41° 48' 49.65" E

Course from PT 4534 to PC 4535 S 28° 50' 57.38" E Dist 1,154.4679

Curve Data

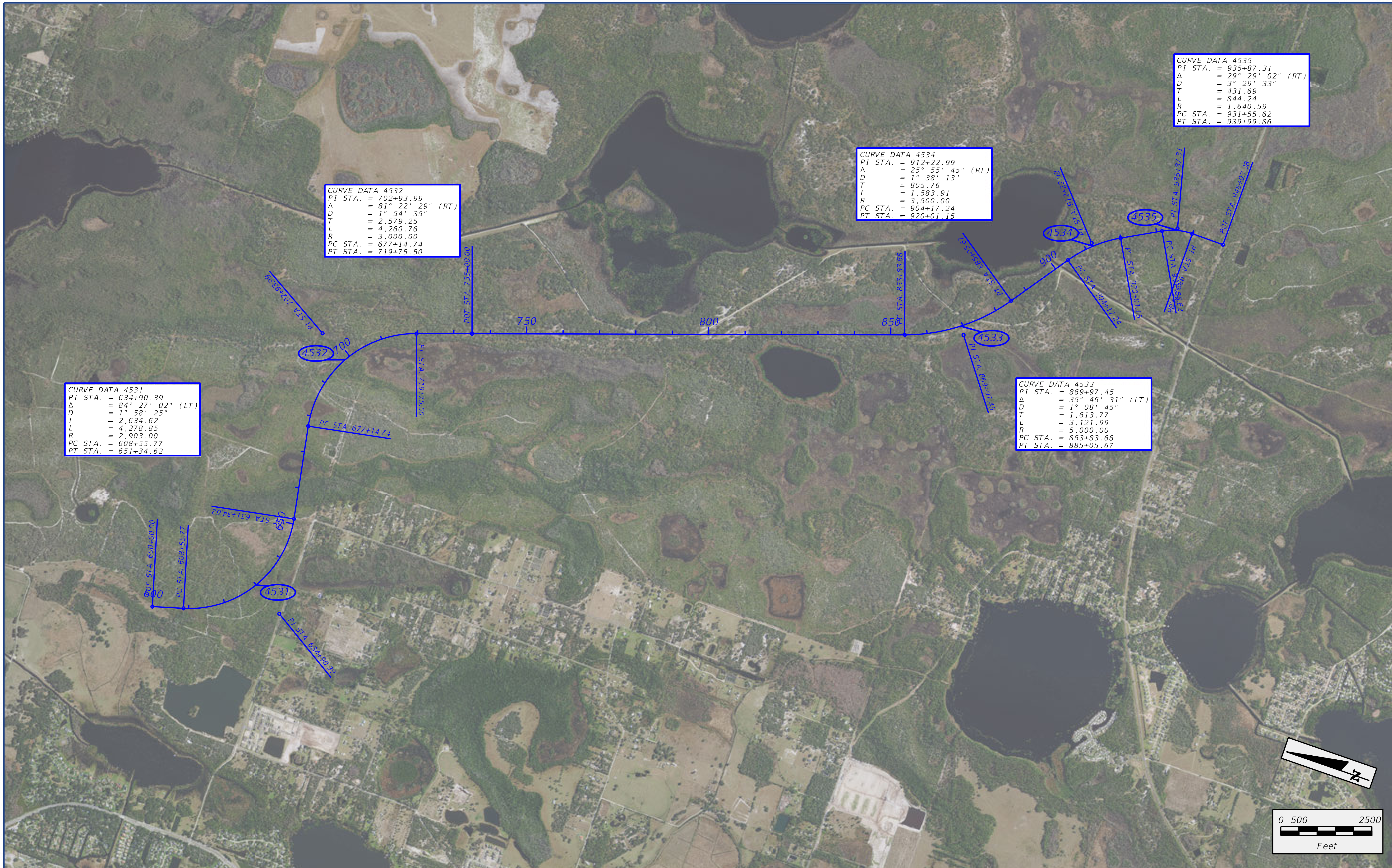
Curve 4535
P.I. Station 935+87.31 N 1,434,328.9137 E 607,528.0942
Delta = 29° 29' 02.33" (RT)
Degree = 3° 29' 32.57"
Tangent = 431.6869
Length = 844.2371
Radius = 1,640.5933
External = 55.8441
Long Chord = 834.9529
Mid. Ord. = 54.0058
P.C. Station 931+55.62 N 1,434,707.0248 E 607,319.8022
P.T. Station 939+99.86 N 1,433,897.2532 E 607,523.3122
C.C. N 1,433,915.4269 E 605,882.8195
Back = S 28° 50' 57.38" E
Ahead = S 0° 38' 04.94" W
Chord Bear = S 14° 06' 26.22" E

Course from PT 4535 to 459 S 0° 38' 04.94" W Dist 924.3006

End Region 1
Equation: Sta 949+24.16 (BK) = Sta 0+00.00 (AH) ----------------
Begin Region 2

Point 459 N 1,432,973.0094 E 607,513.0732 Sta 0+00.00

===
Ending chain 600 description



CENTRAL FLORIDA EXPRESSWAY AUTHORITY

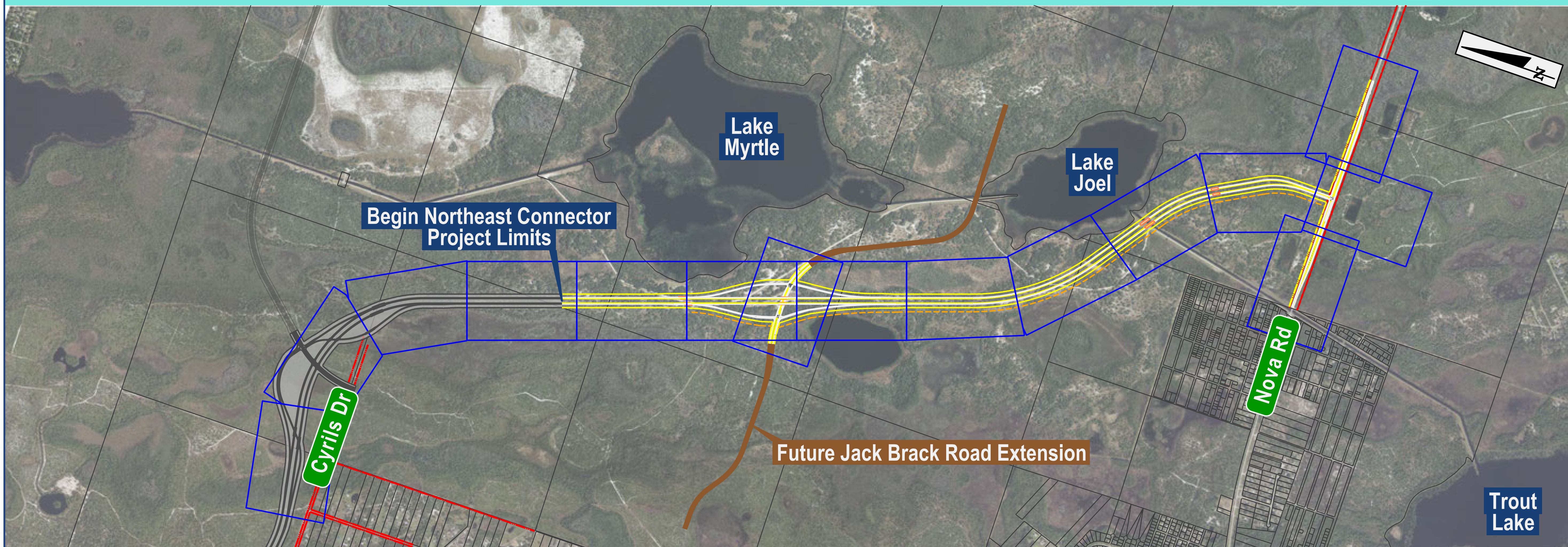
Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

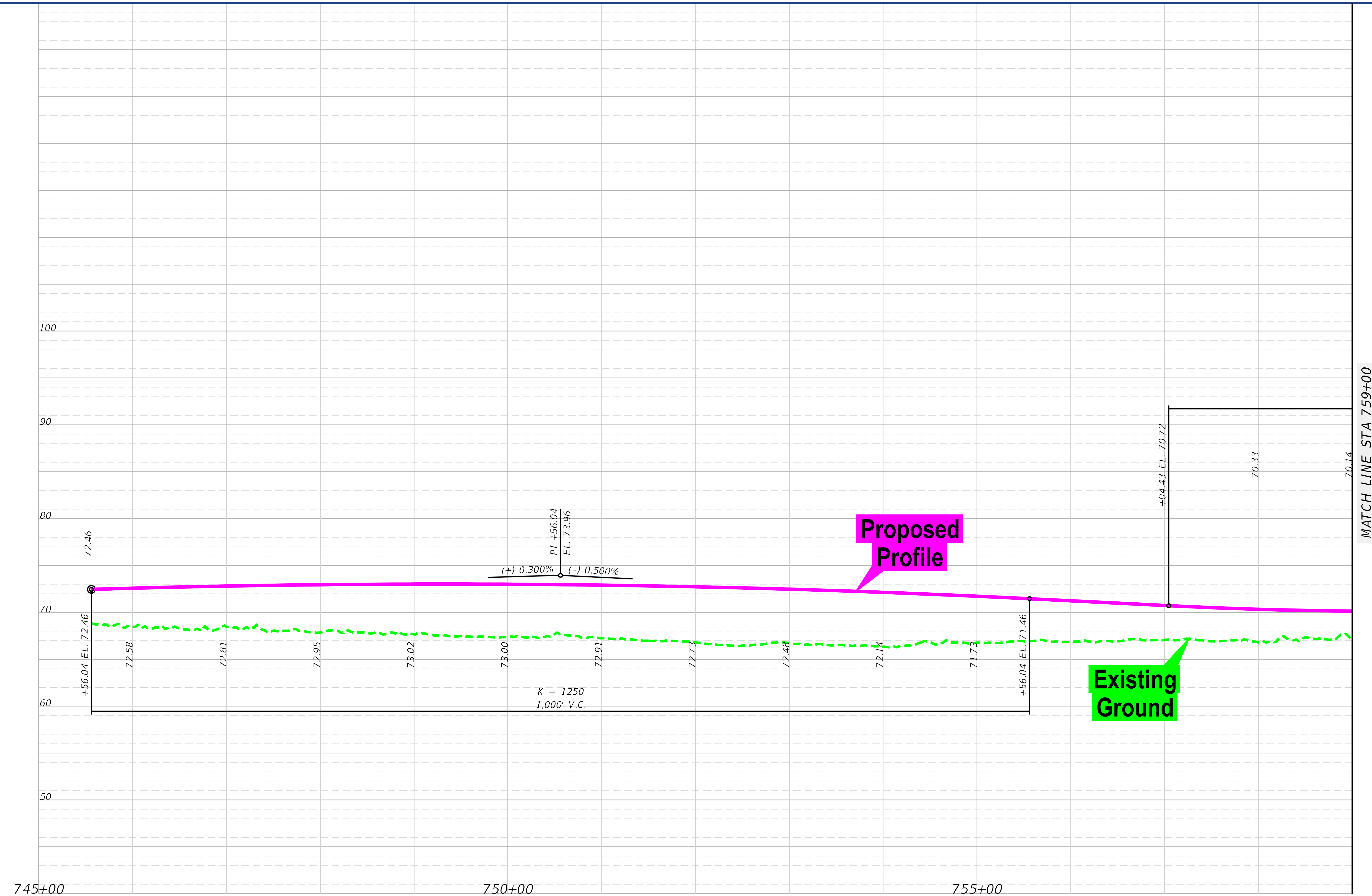
Existing Right-of-Way	Potential OUC Utility Easement
Proposed Right-of-Way	Property Lines
Proposed L/A Right-of-Way	Split Oak Forest
Proposed Barrier Wall	
Proposed Pavement	
Proposed Structure	

Appendix B
Preferred Alternative
Geometry

SHEET NO.
B-17

Preferred Alternative
Profile Sheets





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CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Appendix B
Preferred Alternative
Profile

SHEET NO.
B-18

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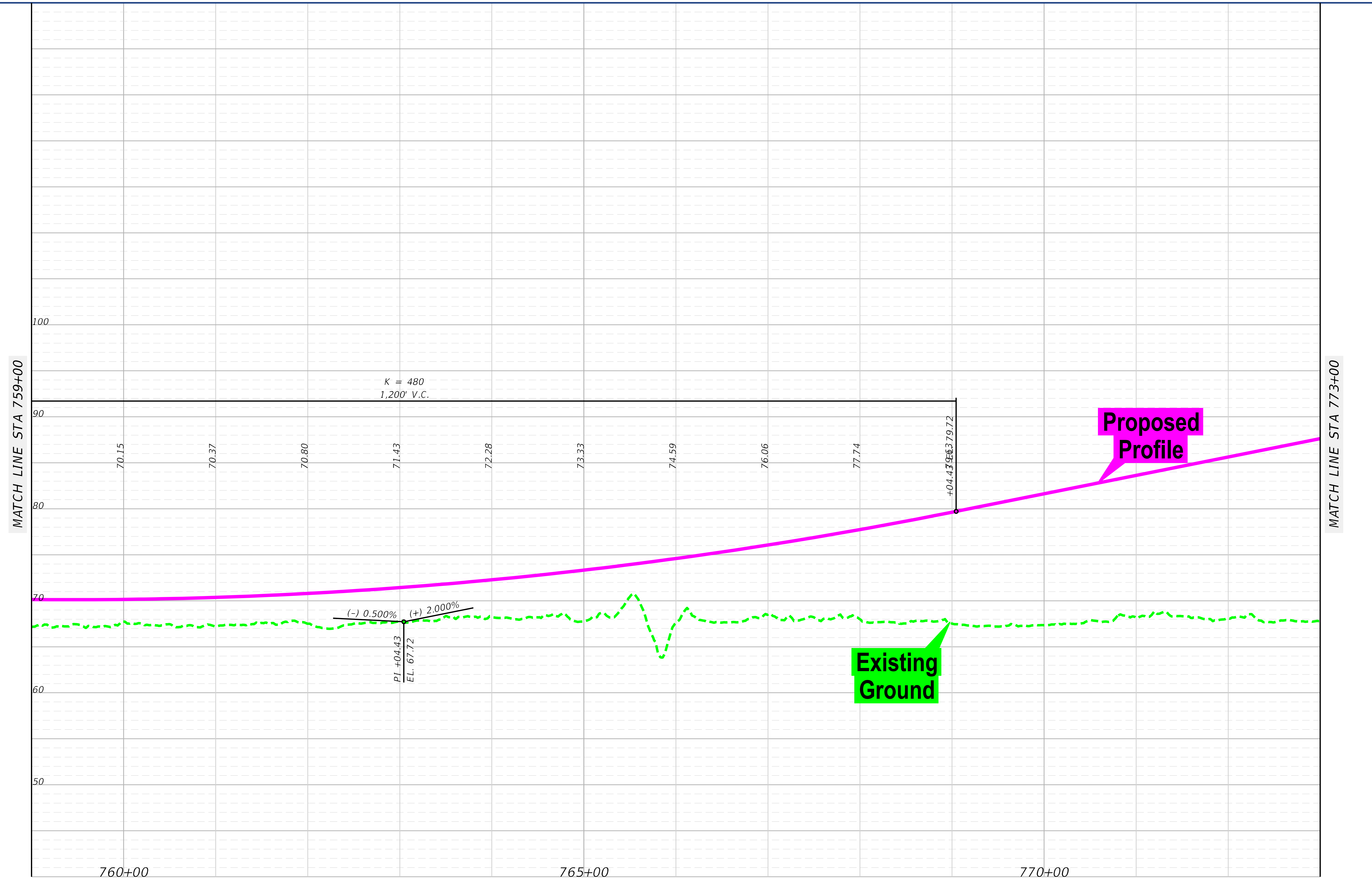
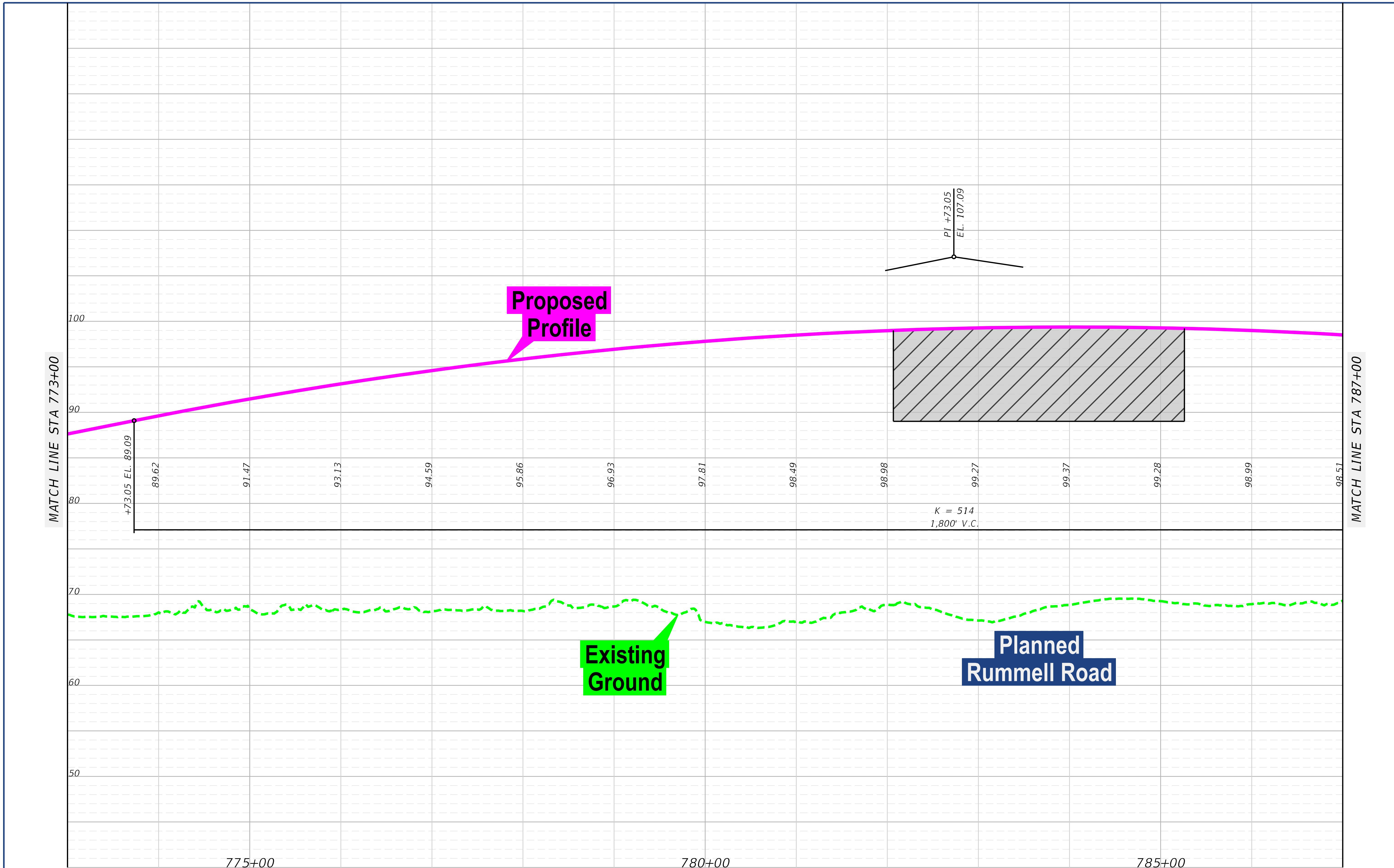


CENTRAL FLORIDA EXPRESSWAY AUTHORITY	Northeast Connector Expressway - Phase 1 From Cyrils Drive to Nova Road (CR 532) Project Development and Environment Study	Appendix B Preferred Alternative Profile	SHEET NO. B-19

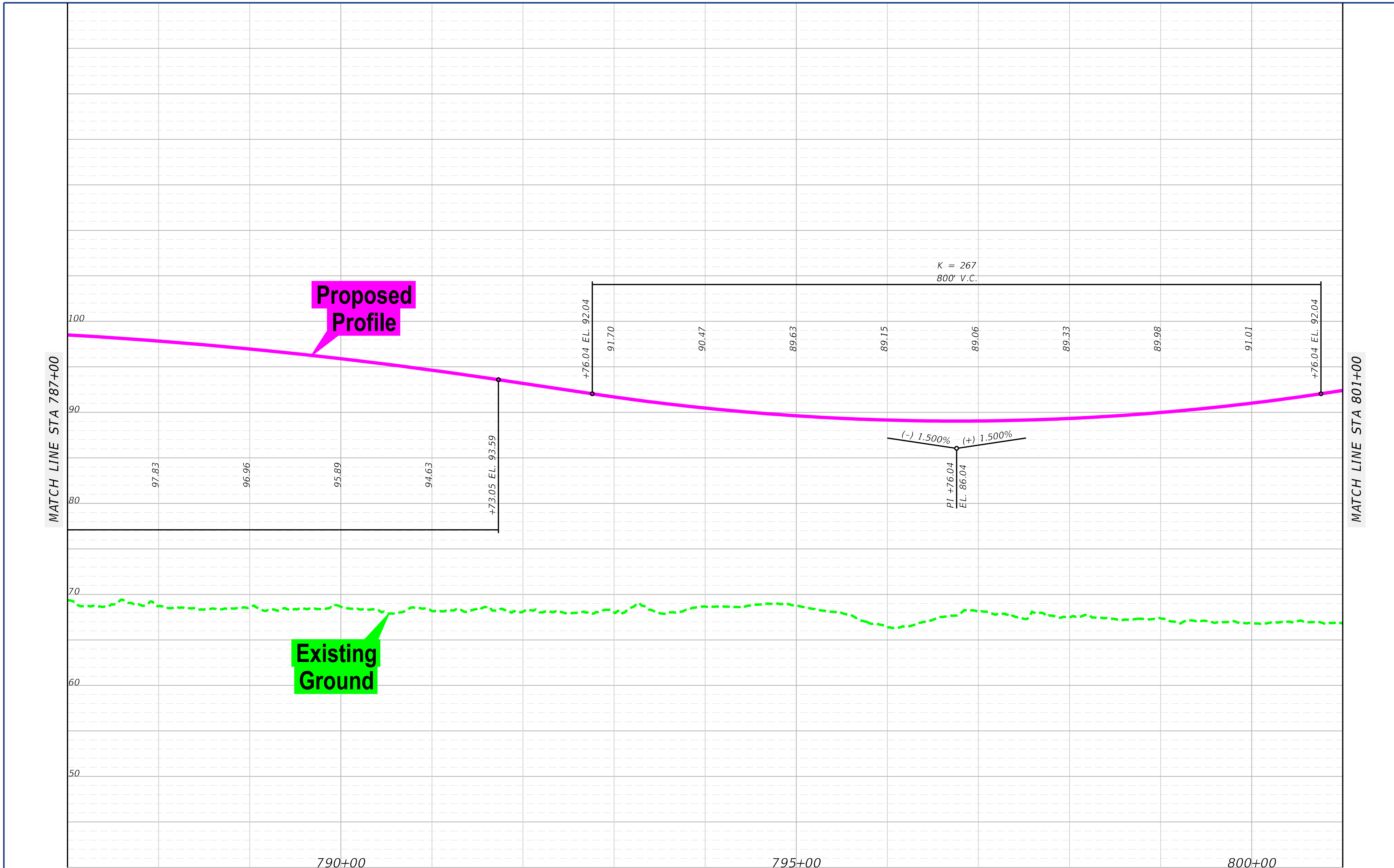


CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Appendix B
Preferred Alternative
Profile

SHEET NO.
B-20

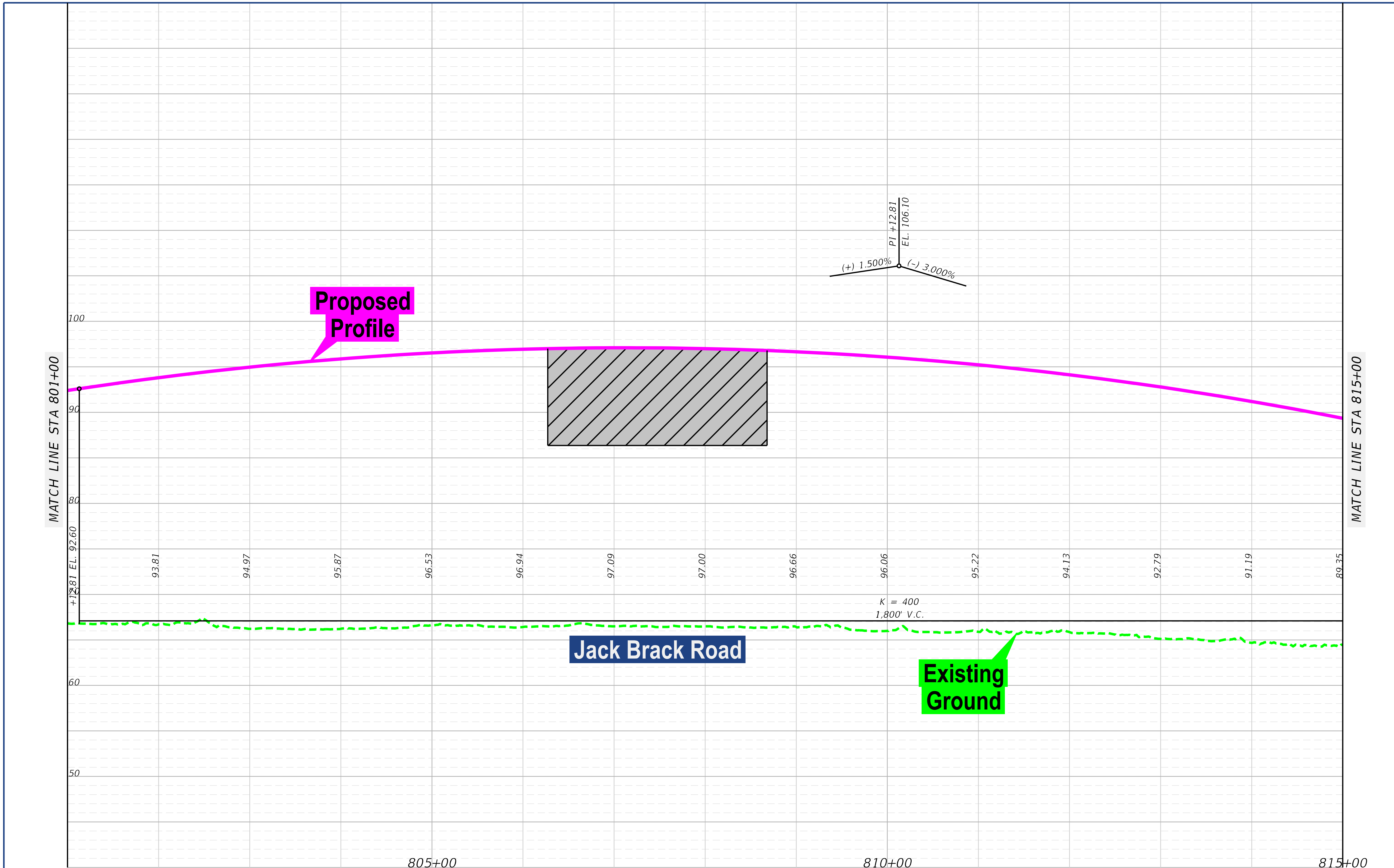


CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Appendix B
Preferred Alternative
Profile

SHEET NO.
B-21

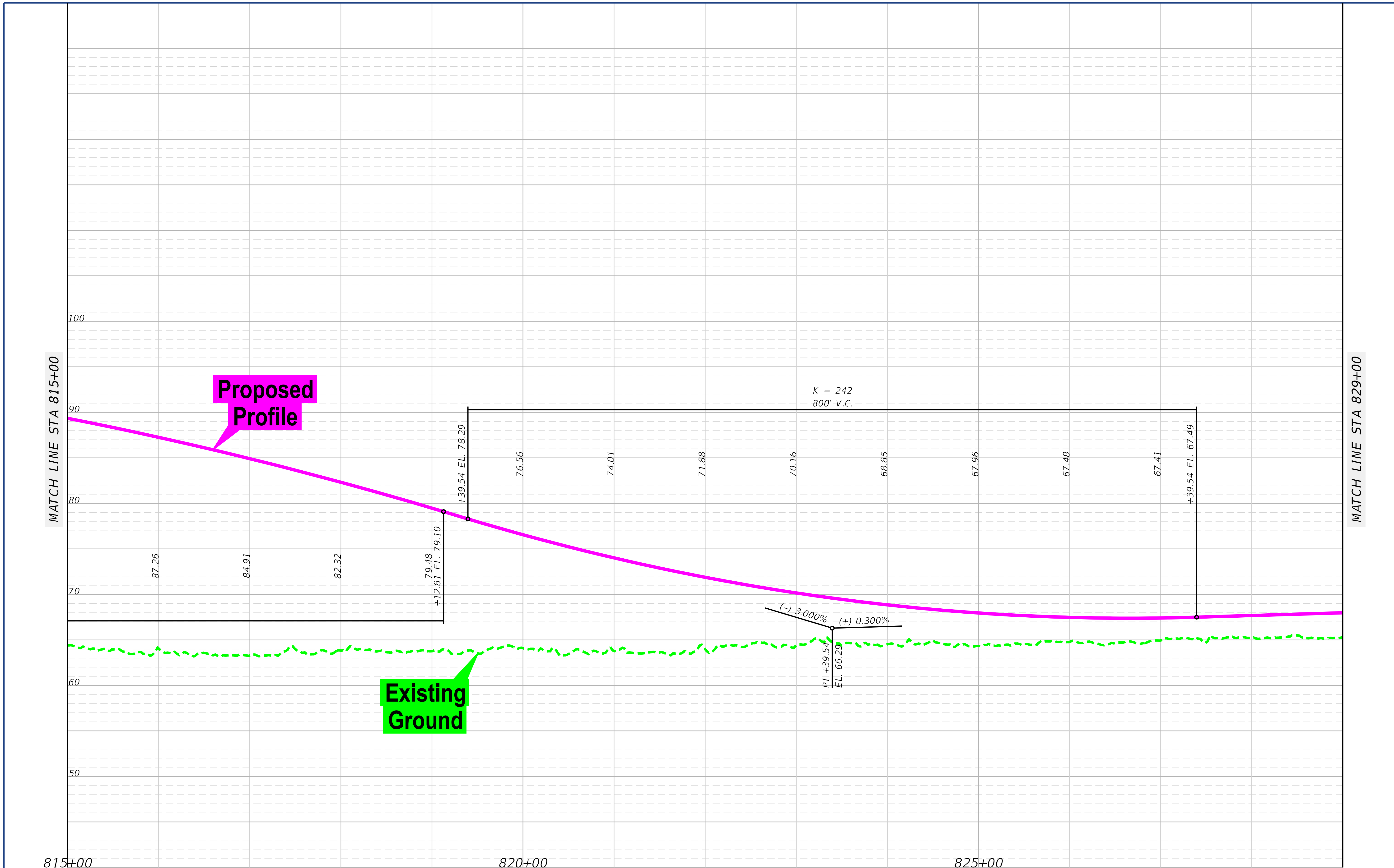


CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Appendix B
Preferred Alternative
Profile

SHEET NO.
B-22

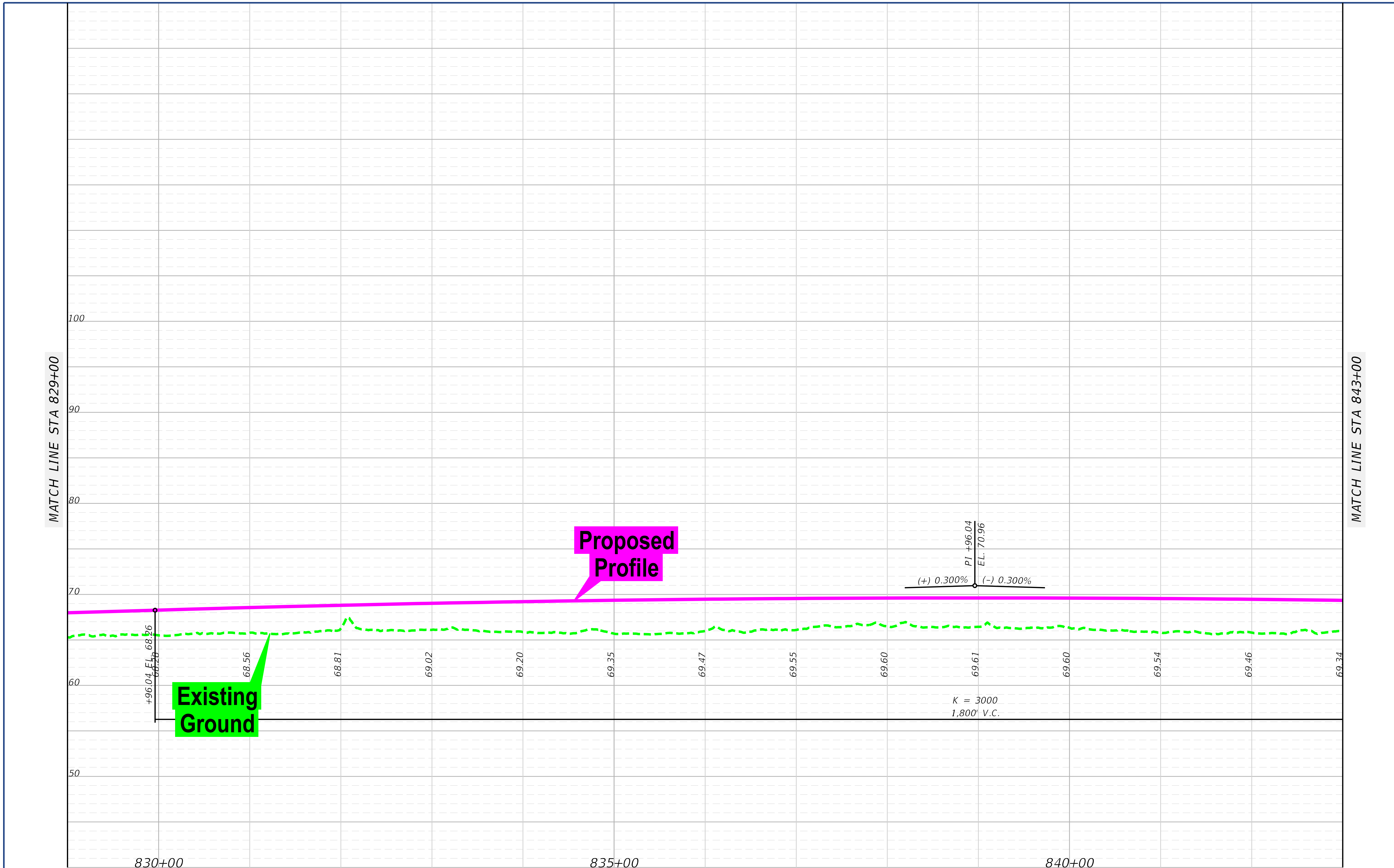


CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Appendix B
Preferred Alternative
Profile

SHEET NO.
B-23



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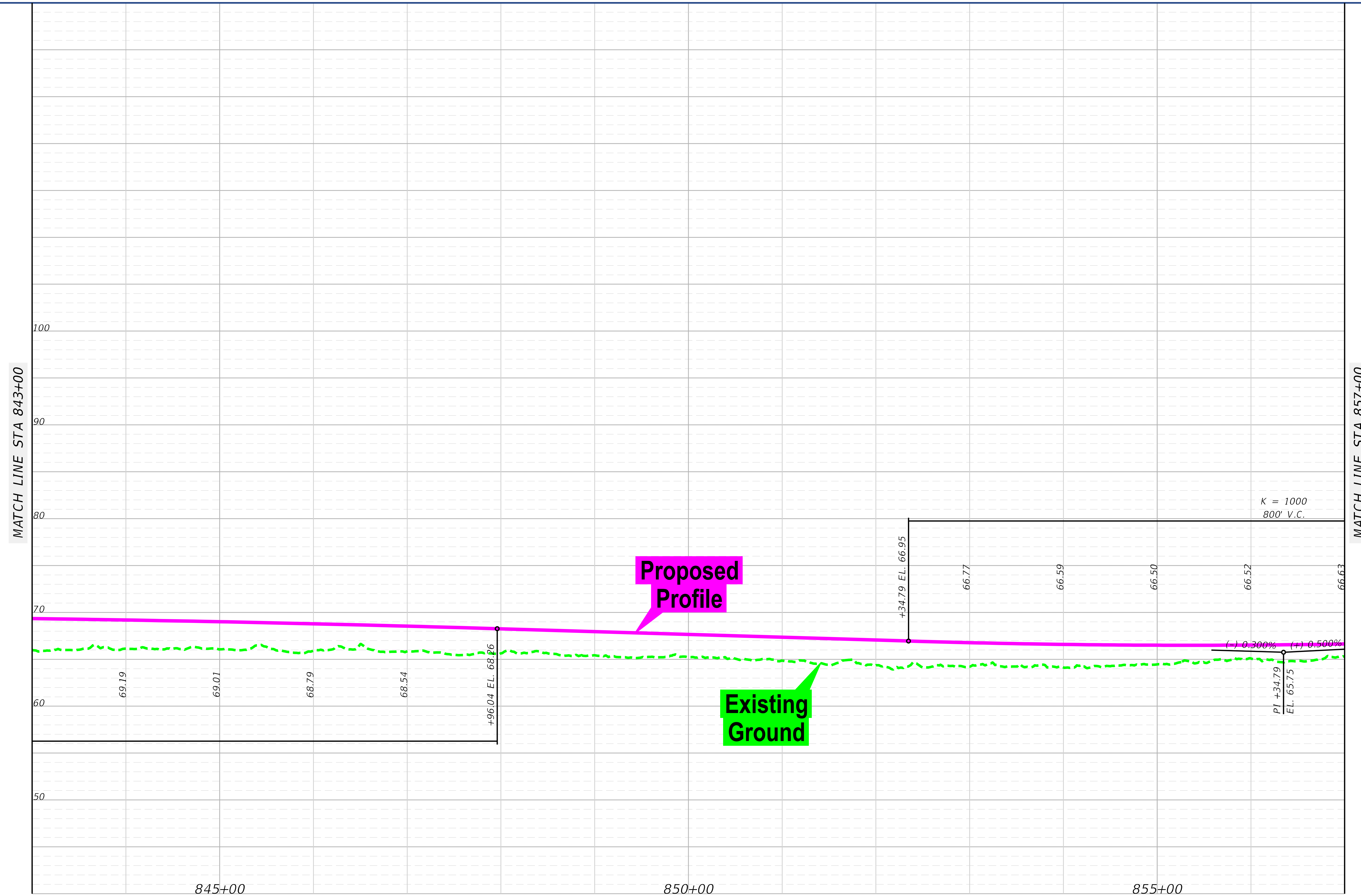
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Appendix B
Preferred Alternative
Profile

SHEET NO.
B-24

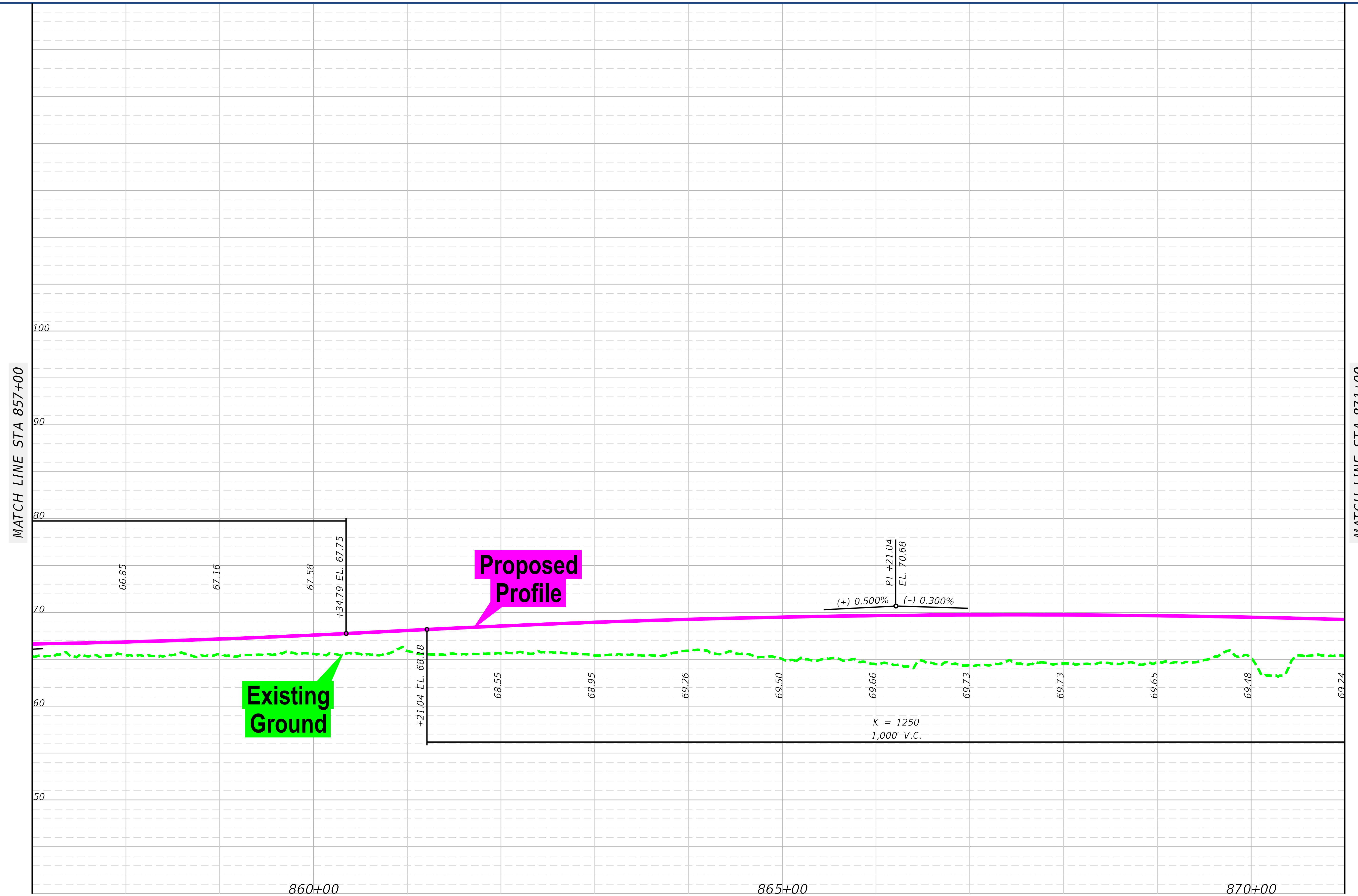


CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Appendix B
Preferred Alternative
Profile

SHEET NO.
B-25



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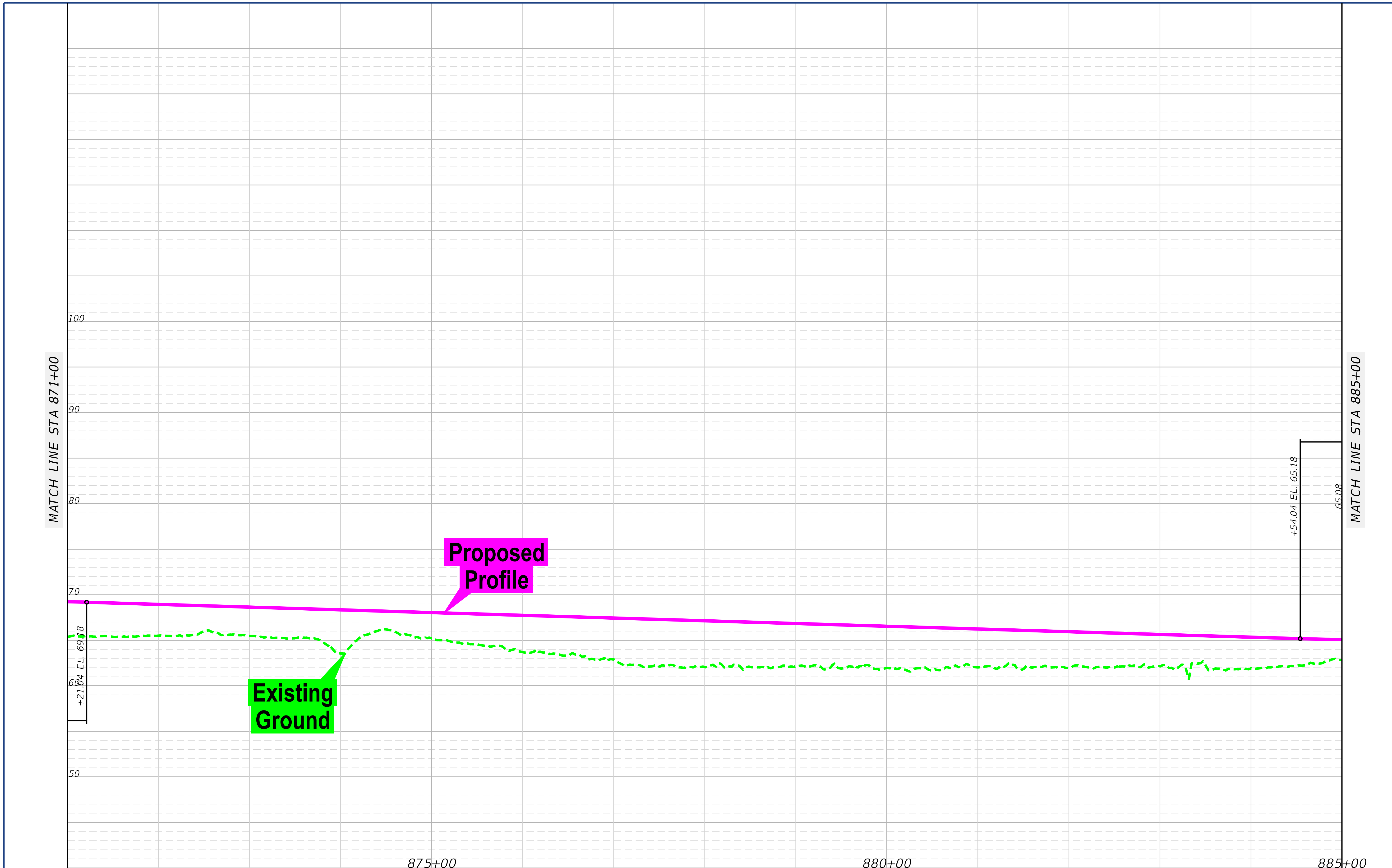
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Appendix B
Preferred Alternative
Profile

SHEET NO.
B-26

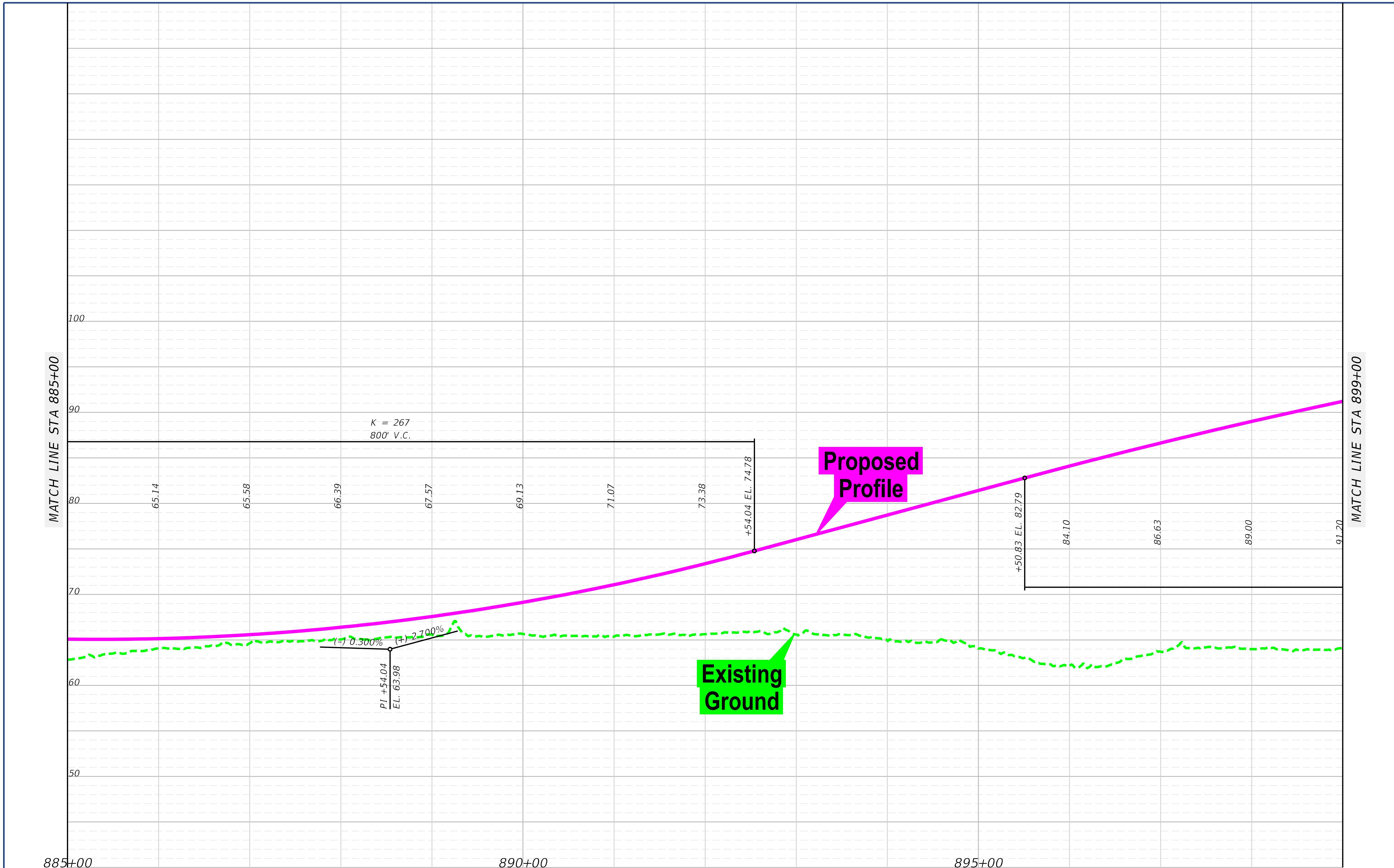


CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Appendix B
Preferred Alternative
Profile

SHEET NO.
B-27

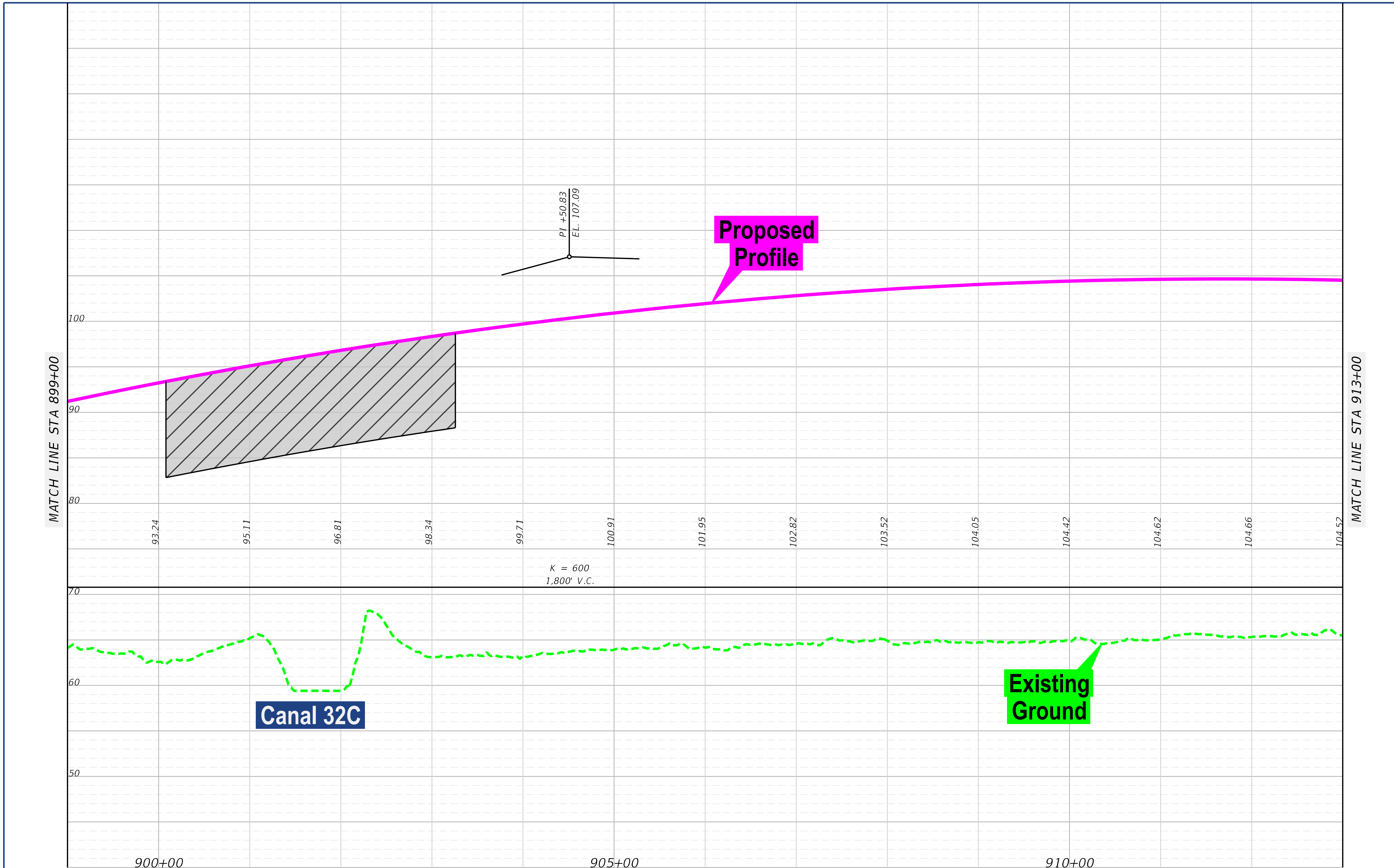


CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Appendix B
Preferred Alternative
Profile

SHEET NO.
B-28



MATCH LINE STA 899+00
MATCH LINE STA 913+00
PI +50.83
EL. 107.09
Proposed Profile
100
90
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60
50
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95.11
96.81
98.34
99.71
100.91
101.95
102.82
103.52
104.05
104.42
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104.66
104.52
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Canal 32C
Existing Ground
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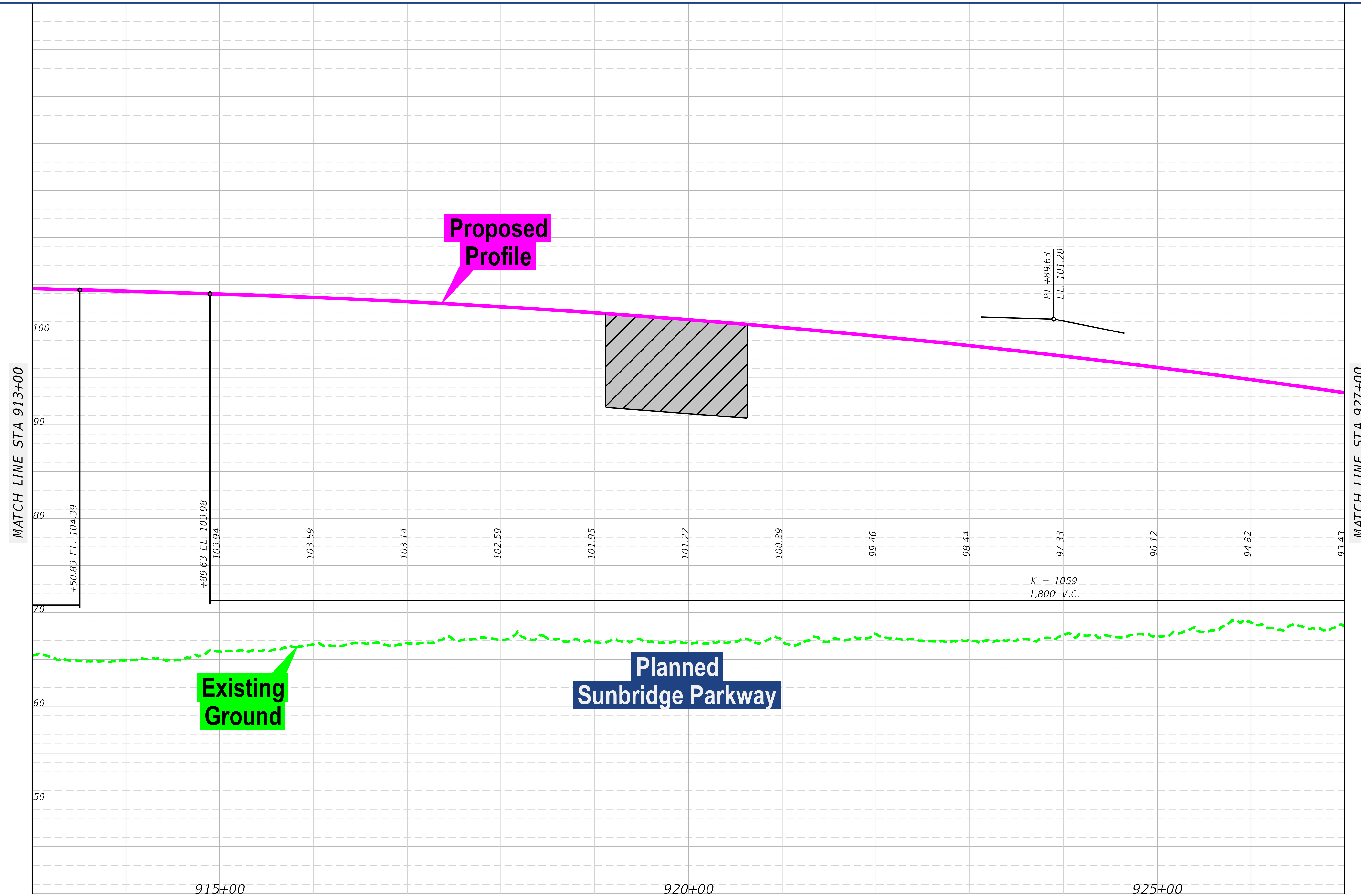
905+00
910+00

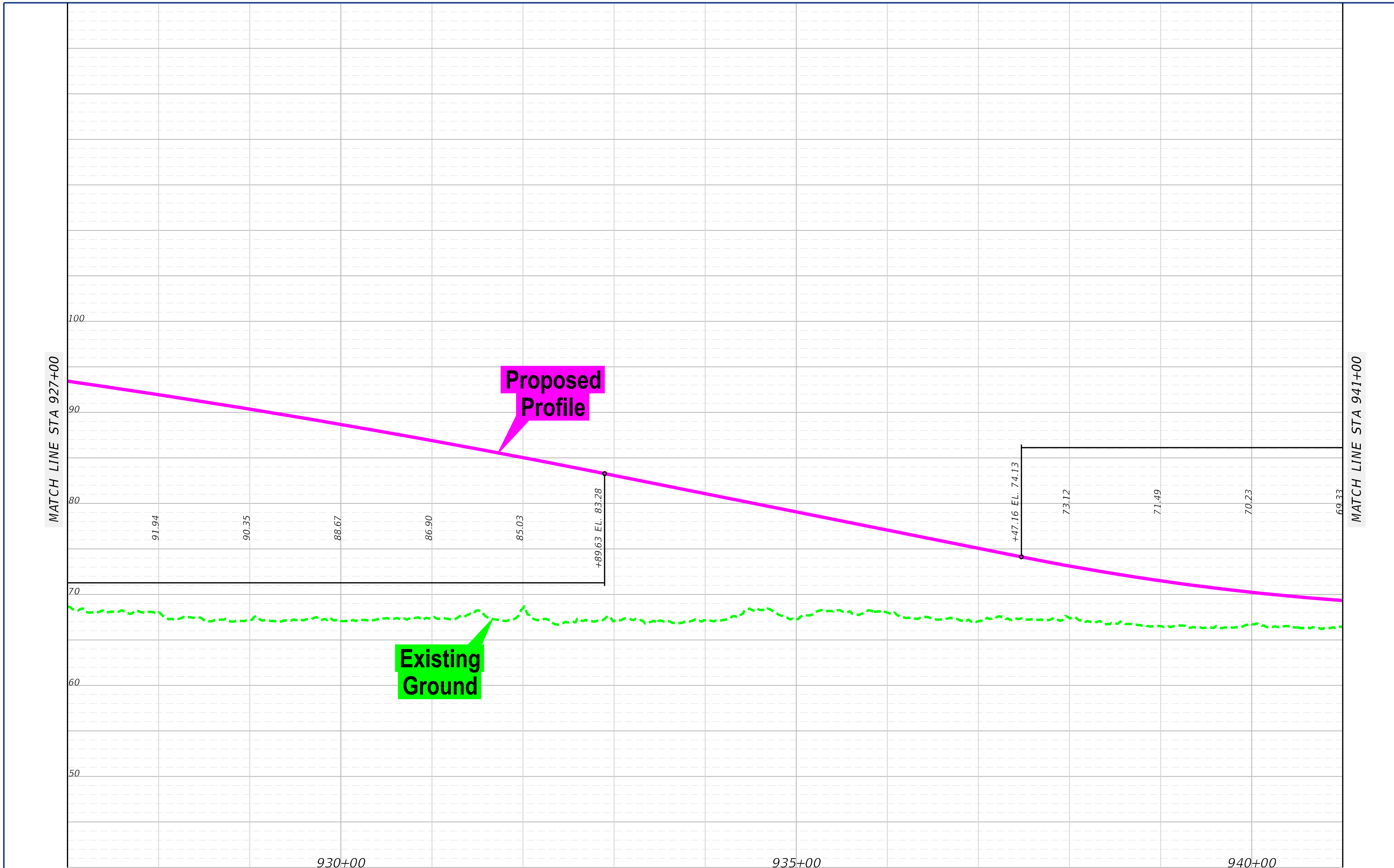


CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Appendix B
Preferred Alternative
Profile

SHEET NO.
B-30



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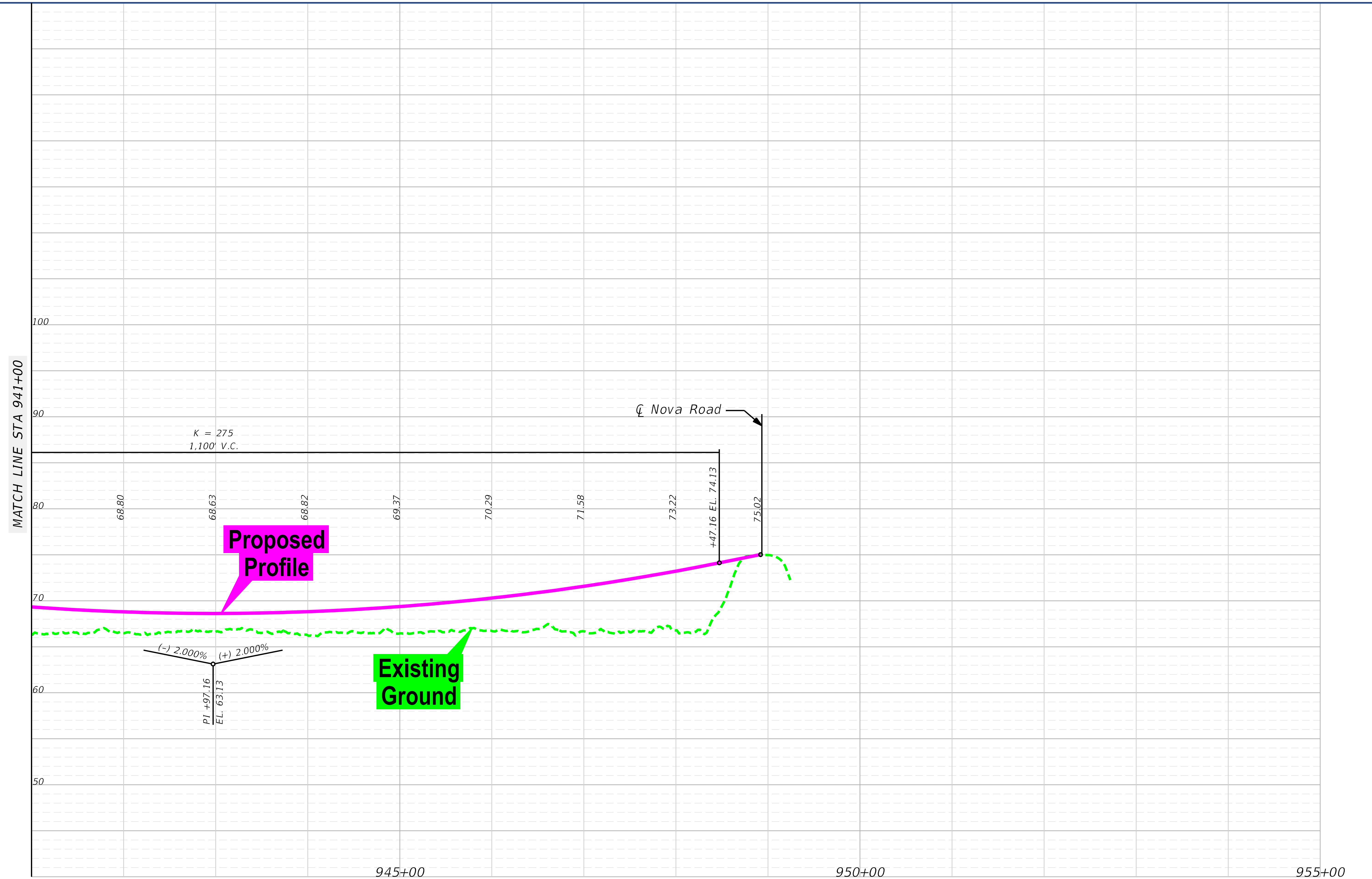
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

Appendix B
Preferred Alternative
Profile

SHEET NO.
B-31



CENTRAL FLORIDA EXPRESSWAY AUTHORITY	Northeast Connector Expressway - Phase 1 From Cyrils Drive to Nova Road (CR 532) Project Development and Environment Study	Appendix B Preferred Alternative Profile	SHEET NO. B-32

Appendix C

Cost Estimates

Jack Brack Road – Diamond Interchange

SUMMARY

ESTIMATED PROBABLE PROJECT COST

Northeast Connector Phase I - Segment A
Jack Brack Diamond Interchange Option

PREPARED BY RS&H

PROJECT CENTERLINE MILES:	1.899
NUMBER OF BRIDGES:	4

NE Connector Mainline				$53,435,164
Jack Brack Diamond Interchange				$9,825,738
TOTAL (2021 CONSTRUCTION COST)				**$63,260,902**
ENGINEERING / ADMINISTRATION / LEGAL (24%)				$15,182,616
RIGHT - OF - WAY	123	ACRES		$11,100,000
MITIGATION	15.0	ACRES	$ 150,000	$2,250,000
TOLL COLLECTION EQUIPMENT	4	LANES @	$ 275,000	$1,100,000
GRAND TOTAL PROJECT COST				**$92,893,518**

ESTIMATED PROBABLE CONSTRUCTION COST

NE Connector - Jack Brack Diamond Interchange (Mainline Roadway)

PREPARED BY *RS&H*

ITEM	QUANTITY			UNIT	UNIT PRICE	TOTAL
** EXPRESSWAYS **						
MAINLINE ROADWAY TYPICAL - Segment 1	2894	lf	0.548	MI	$4,899,924	$2,685,678
MAINLINE ROADWAY TYPICAL - Segment 2	2210	lf	0.419	MI	$4,899,924	$2,050,915
MAINLINE ROADWAY TYPICAL - Segment 3	4551	lf	0.862	MI	$4,899,924	$4,223,400
MAINLINE ADDITIONAL LANE - Segment 1	390	lf	0.074	MI	$425,592	$31,436
MAINLINE ADDITIONAL LANE - Segment 2	665	lf	0.126	MI	$425,592	$53,602
MAINLINE ADDITIONAL LANE - Segment 3	864	lf	0.164	MI	$425,592	$69,642
MAINLINE ADDITIONAL LANE - Segment 4	622	lf	0.118	MI	$425,592	$50,136
** BRIDGES **						
BRIDGE 1A (234 lf x 63 lf)						
SB NE CONNECTOR OVER FUTURE ROAD NETWORK	14,634	sf	14,634	SF	$125	$1,829,250
APPROACH SLABS (BEGIN & END BRIDGE) (DOES NOT INCLUDE EARTHWORK)	1	ea	1	EA	$681,671	$681,671
BRIDGE 1B (200 lf x 63 lf)						
NB NE CONNECTOR OVER FUTURE ROAD NETWORK	12,475	sf	12,475	SF	$125	$1,559,375
APPROACH SLABS (BEGIN & END BRIDGE) (DOES NOT INCLUDE EARTHWORK)	1	ea	1	EA	$673,391	$673,391
BRIDGE 2A (157 lf x 51 lf)						
SB NE CONNECTOR OVER JACK BRACK ROAD	7,930	sf	7,930	SF	$125	$991,250
APPROACH SLABS (BEGIN & END BRIDGE) (DOES NOT INCLUDE EARTHWORK)	1	ea	1	EA	$567,431	$567,431
BRIDGE 2B (160 lf x 51 lf)						
NB NE CONNECTOR OVER JACK BRACK ROAD	8,056	sf	8,056	SF	$125	$1,007,000
APPROACH SLABS (BEGIN & END BRIDGE) (DOES NOT INCLUDE EARTHWORK)	1	ea	1	EA	$569,115	$569,115
RETAINING WALLS (MSE & ABUTMENTS)	28,696	sf	28,696	SF	$34	$975,660
** ADDITIONAL ITEMS **						
ADDITIONAL EARTHWORK FOR FILL OVER 3 FT	1,232,838	cy	1,232,838	CY	$8	$9,862,704
OVERHEAD LIGHTING (INCLUDES WIRING) (2 SIDES, 200' SPACING)	10,028	lf	1.899	MI	$554,800	$1,053,700
OVERHEAD TRUSS SIGNS	8	ea	8	EA	$250,000	$2,000,000
OVERHEAD CANTILEVER SIGNS	6	ea	6	EA	$80,000	$480,000
MULTIPOST SIGNS	8	ea	8	EA	$5,500	$44,000
FIBER OPTIC NETWORK (FON) (CONDUIT, 72 WIRE, PULL BOXES, SPLICE, ETC.)	10,028	lf	1.899	MI	$350,000	$664,735
DYNAMIC MESSAGE SIGNS	0	ea	0	EA	$250,000	$0
RETENTION POND CONSTRUCTION	47.5	ac	47.50	AC	$77,141	$3,664,181
RETENTION POND EXCAVATION	188,191	cy	188,190.50	CY	$5	$997,410
RETENTION POND SODDING	138,424	sy	138,424.00	SY	$3	$346,060
RETENTION POND CLEARING & GRUBBING	36	ac	36.20	AC	$17,000	$615,400
RETENTION POND ADDITIONAL DRAINAGE	1	ea	1.00	EA	$1,288,259	$1,288,259
REMOVE A-8 MATERIAL (ASSUME 4 FT PER SF OF MUCK)	12977	cy	12,977	CY	$5	$68,778
REPLACE A-8 MATERIAL (ASSUME 4 FT PER SF OF MUCK)	12977	cy	12,977	CY	$8	$107,709
MAINLINE TOLL GANTRY (2 LANE, 2 TRUSSES AND EQUIP. BLDG)	0	ea	-	EA	$1,750,000	$0

SUB-TOTAL	$39,211,887
EROSION CONTROL / TEMPORARY DRAINAGE (0.5%)	$196,059
MAINTENANCE OF TRAFFIC (1%)	$392,119
MOBILIZATION (9.5%)	$3,725,129
SUB-TOTAL ROADWAY	$34,671,053
ROADWAY CONTINGENCY (20%)	$6,934,211
SUB-TOTAL BRIDGES	$8,854,142
BRIDGE CONTINGENCY (10%)	$885,414
SUB-TOTAL	$51,344,820
AESTHETICS CONTINGENCY (3%)	$1,540,345
RELOCATE UTILITIES	$0
ALLOWANCE FOR DISPUTES REVIEW BOARD	$50,000
WORK ORDER ALLOWANCE	$500,000
TOTAL (2019 CONSTRUCTION COST)	**$53,435,164**

ESTIMATED PROBABLE CONSTRUCTION COST

Jack Brack Diamond Interchange

PREPARED BY *RS&H*

ITEM	QUANTITY		UNIT		UNIT PRICE	TOTAL
**** RAMPS ****						
ONE LANE RAMPS (OPEN DRAINAGE) - SB EXIT RAMP	1385	lf	0.262	MI	$1,223,837	$321,025
ONE LANE RAMPS (OPEN DRAINAGE) - SB ENTRANCE RAMP	1646	lf	0.312	MI	$1,223,837	$381,522
ONE LANE RAMPS (OPEN DRAINAGE) - NB EXIT RAMP	1580	lf	0.299	MI	$1,223,837	$366,224
ONE LANE RAMPS (OPEN DRAINAGE) - NB ENTRANCE RAMP	1530	lf	0.290	MI	$1,223,837	$354,634
TWO LANE RAMPS (OPEN DRAINAGE) - SB EXIT RAMP	527	lf	0.100	MI	$1,661,517	$165,837
TWO LANE RAMPS (OPEN DRAINAGE) - SB ENTRANCE RAMP	436	lf	0.083	MI	$1,661,517	$137,201
TWO LANE RAMPS (OPEN DRAINAGE) - NB EXIT RAMP	396	lf	0.075	MI	$1,661,517	$124,614
TWO LANE RAMPS (OPEN DRAINAGE) - NB ENTRANCE RAMP	638	lf	0.121	MI	$1,661,517	$200,767
TYPICAL 1 LANE ON-RAMP TAPER W/GORE - MAINLINE UNCHANGED	2	ea	2	EA	$219,329	$438,659
TYPICAL 1 LANE OFF-RAMP TAPER W/GORE - MAINLINE UNCHANGED	2	ea	2	EA	$129,358	$258,716
**** ARTERIAL ROADS ****						
Jack Brack Road						
4-LANE DIVIDED	2213	lf	0.419	MI	$4,429,390	$1,856,485
ADDITIONAL LANES WIDENING TO OUTSIDE - Segment 1	355	lf	0.067	MI	$406,857	$27,355
ADDITIONAL LANES WIDENING TO OUTSIDE - Segment 2	358	lf	0.068	MI	$406,857	$27,586
ADDITIONAL LANES MEDIAN WIDENING - Segment 1	764	lf	0.145	MI	$389,257	$56,324
ADDITIONAL LANES MEDIAN WIDENING - Segment 2	707	lf	0.134	MI	$389,257	$52,122
MEDIAN CROSSOVER - NEW CONSTRUCTION	2	ea	2	EA	$8,080	$16,160.00
DEMOLISH EXISTING ARTERIAL ROAD	0	lf	0.000	MI	$305,760	$0
**** INTERSECTION SIGNALIZATION ****						
SIGNALIZATION PER INTERCHANGE	2	ea	2	EA	$269,948	$539,896
**** ADDITIONAL ITEMS ****						
OVERHEAD LIGHTING (INCLUDES WIRING) (1 SIDE, 200' SPACING)	8,138	lf	1.541	MI	$277,400	$427,553
MULTIPOST SIGNS	8	ea	8	EA	$5,500	$44,000
ITS EQUIPMENT / DEVICES PER INTERCHANGE (CCTV, TMS, ETC.)	1	int	1	INT	$330,000	$330,000
RETENTION POND CONSTRUCTION	0	sf	0.00	AC	$177,813	$0
RAMP TOLL GANTRY (2 RAMPS @ 1 LANE EA, 1 TRUSS AND EQUIP. BLDG)	1	ea	1	EA	$1,250,000	$1,250,000

SUB-TOTAL	$7,376,680
EROSION CONTROL / TEMPORARY DRAINAGE (0.5%)	$36,883
MAINTENANCE OF TRAFFIC (1%)	$73,767
MOBILIZATION (9.5%)	$700,785
SUB-TOTAL	$8,188,115
ROADWAY CONTINGENCY (20%)	$1,637,623
TOTAL (2019 CONSTRUCTION COST)	**$9,825,738**

Bridge Development Report Cost Estimating

Step Three: Cost Estimate Comparison to Historical Bridge Cost

The final step is a comparison of the cost estimate by comparison with historic bridge cost based on a cost per square foot. These total cost numbers are calculated exclusively for the bridge cost as defined in the General Section of this chapter. Price computed by Steps 1 and 2 should be generally within the range of cost as supplied herein. If the cost falls outside the provided range, good justification must be provided.

Bridge Superstructure Type	Total Cost per Square Foot Low	Total Cost per Square Foot High
Short Span Bridges:		
Reinforced Concrete Flat Slab- Simple Span [1]	$115	$160
Pre-cast Concrete Slab - Simple Span [1]	$110	$200
Medium Span Bridges:		
Concrete Deck / Steel Girder - Simple Span [1]	$125	$142
Concrete Deck / Steel Girder - Continuous Span [1]	$135	$170
Concrete Deck / Prestressed Girder - Simple Span [1]	$90	$145
Concrete Deck / Prestressed Girder - Continuous Span [1]	$95	$211
Concrete Deck / Steel Box Girder [1] - Span range from 150' to 280' (for curvature, add 15% premium)	$140	$180
Segmental Concrete Box Girders - Cantilever Construction Span range from 150' to 280'	$140	$160
Demolition Costs:		
Typical	$35	$60
Bascule	$60	$70
Project Type		
Widening (Construction Only)	$85	$160

[1] Increase the cost by twenty percent for phased construction

TYPICAL XWAY / CROSSROAD — Bridge 1A
BRIDGE APPROACH - RURAL - 2:1 SLOPE

TOTAL OUT-TO-OUT WIDTH OF BRIDGE APPROACH >>>>>>>	62.66	FT		
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	31.25	FT	1.37% = 1314'	
AVERAGE % OF APPROACH SLOPE >>>>>>>	1.75%		3.00% = 600'	
ROADWAY WIDTH AT GRADE >>>>>>>	53.66	FT		
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	3	FT		
COST OF BRIDGE APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>			$681,671	
MEDIAN? (ENTER Y OR N) >>>>>>>	Y			
CROSSDRAIN WIDTH >>>>>>>	94			Use 94 for 3 lanes (82+12)
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	1,614	LF		
FEET FROM TOUCHDOWN TO 10' HEIGHT >>>>>>>	400	LF		
DISTANCE OF APPROACH ABOVE 10' HEIGHT (GR & SHO GUT L) >>>>>>>	1,214	LF		
APPROACH SLAB WIDTH >>>>>>>	62.66	FT		

ORIGINAL BRIDGE APPROACH WIDTH >>>>>>>	0	FT
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	0.0	FT
AVERAGE % OF APPROACH SLOPE >>>>>>>	1.75%	
ROADWAY WIDTH AT GRADE >>>>>>>	0	FT
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	0.0	FT
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	0	LF

**** RETAINING WALL AUTOMATIC CALCULATION ****

BRIDGE HEIGHT >>>>>>>	31.25		
BRIDGE WIDTH (OUT-TO-OUT INCLUDING MEDIAN) >>>>>>>	62.66		EXTRA FOR SKEW
SKEW? (ENTER Y or N) >>>>>>>	N		0 SF
TOTAL RE-WALL >>>>>>>	7,196	SF	

CUSTOM BRIDGE APPROACH - RURAL 2:1 SLOPE — DRAINAGE SIDES: 2

BORROW EMBANKMENT	0	CY	$8.30	$0.00
LESS EXISTING EMBANKMENT	0	CY	($8.30)	$0.00
EXCAVATE EXCESS FILL (IF > 0)	0	CY	$5.30	$0.00
COLLECTOR PIPE (24" RCP)	2400	LF	$70.00	$168,000.00
CMP OUTLET PIPE (18" CMP)	600	LF	$35.00	$21,000.00
CROSSDRAINS (18" RCP)	1,128	LF	$35.00	$39,480.00
DITCH BOTTOM INLETS	12	EA	$5,000.00	$60,000.00
INLET (TYPE S)	24	EA	$3,500.00	$84,000.00
MITERED END SECTIONS	12	EA	$5,000.00	$60,000.00
SOD	27,383	SY	$1.50	$41,074.50
SHOULDER GUTTER (LESS S INLETS)	4,729	LF	$24.00	$113,495.59
GUARDRAIL (OUTSIDE ONLY, NOT IN MEDIAN)	4,857	LF	$4.00	$19,428.57
APPROACH SLABS	2	EA	$37,596.00	$75,192.00
			TOTAL $ EA	$681,670.66

TYPICAL XWAY / CROSSROAD — Bridge 1B
BRIDGE APPROACH - RURAL - 2:1 SLOPE

TOTAL OUT-TO-OUT WIDTH OF BRIDGE APPROACH >>>>>>>	62.66	FT	
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	30.35	FT	1.37% = 1314'
AVERAGE % OF APPROACH SLOPE >>>>>>>	1.75%		3.00% = 600'
ROADWAY WIDTH AT GRADE >>>>>>>	53.66	FT	
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	3	FT	
COST OF BRIDGE APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>			$673,391
MEDIAN? (ENTER Y OR N) >>>>>>>	Y		
CROSSDRAIN WIDTH >>>>>>>	94		
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	1,563	LF	
FEET FROM TOUCHDOWN TO 10' HEIGHT >>>>>>>	400	LF	
DISTANCE OF APPROACH ABOVE 10' HEIGHT (GR & SHO GUT L) >>>>>>>	1,163	LF	
APPROACH SLAB WIDTH >>>>>>>	62.66	FT	

ORIGINAL BRIDGE APPROACH WIDTH >>>>>>>	0	FT
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	0.0	FT
AVERAGE % OF APPROACH SLOPE >>>>>>>	1.75%	
ROADWAY WIDTH AT GRADE >>>>>>>	0	FT
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	0.0	FT
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	0	LF

**** RETAINING WALL AUTOMATIC CALCULATION ****

BRIDGE HEIGHT >>>>>>>	30.35		
BRIDGE WIDTH (OUT-TO-OUT INCLUDING MEDIAN) >>>>>>>	62.66		EXTRA FOR SKEW
SKEW? (ENTER Y or N) >>>>>>>	N		0 SF
TOTAL RE-WALL >>>>>>>	6,861	SF	

CUSTOM BRIDGE APPROACH - RURAL 2:1 SLOPE — DRAINAGE SIDES: 2

BORROW EMBANKMENT	0	CY	$8.30	$0.00
LESS EXISTING EMBANKMENT	0	CY	($8.30)	$0.00
EXCAVATE EXCESS FILL (IF > 0)	0	CY	$5.30	$0.00
COLLECTOR PIPE (24" RCP)	2400	LF	$70.00	$168,000.00
CMP OUTLET PIPE (18" CMP)	600	LF	$35.00	$21,000.00
CROSSDRAINS (18" RCP)	1,128	LF	$35.00	$39,480.00
DITCH BOTTOM INLETS	12	EA	$5,000.00	$60,000.00
INLET (TYPE S)	24	EA	$3,500.00	$84,000.00
MITERED END SECTIONS	12	EA	$5,000.00	$60,000.00
SOD	25,703	SY	$1.50	$38,554.50
SHOULDER GUTTER (LESS S INLETS)	4,523	LF	$24.00	$108,558.45
GUARDRAIL (OUTSIDE ONLY, NOT IN MEDIAN)	4,651	LF	$4.00	$18,605.71
APPROACH SLABS	2	EA	$37,596.00	$75,192.00
			TOTAL $ EA	$673,390.66

TYPICAL XWAY / CROSSROAD — Bridge 2A
BRIDGE APPROACH - RURAL - 2:1 SLOPE

TOTAL OUT-TO-OUT WIDTH OF BRIDGE APPROACH >>>>>>>	50.66	FT	
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	30.05	FT	1.37% = 1314'
AVERAGE % OF APPROACH SLOPE >>>>>>>	1.90%		3.00% = 600'
ROADWAY WIDTH AT GRADE >>>>>>>	41.66	FT	
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	3	FT	
COST OF BRIDGE APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>			$567,431
MEDIAN? (ENTER Y OR N) >>>>>>>	Y		
CROSSDRAIN WIDTH >>>>>>>	82		
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	1,424	LF	
FEET FROM TOUCHDOWN TO 10' HEIGHT >>>>>>>	368	LF	
DISTANCE OF APPROACH ABOVE 10' HEIGHT (GR & SHO GUT L) >>>>>>>	1,056	LF	
APPROACH SLAB WIDTH >>>>>>>	50.66	FT	

ORIGINAL BRIDGE APPROACH WIDTH >>>>>>>	0	FT		
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	0.0	FT		
AVERAGE % OF APPROACH SLOPE >>>>>>>	1.90%			
ROADWAY WIDTH AT GRADE >>>>>>>	0	FT		
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	0.0	FT		
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	0	LF		

**** RETAINING WALL AUTOMATIC CALCULATION ****

BRIDGE HEIGHT >>>>>>>	30.05			
BRIDGE WIDTH (OUT-TO-OUT INCLUDING MEDIAN) >>>>>>>	50.66		EXTRA FOR SKEW	
SKEW? (ENTER Y or N) >>>>>>>	Y		1,051	SF
TOTAL RE-WALL >>>>>>>	**7,201**	SF		

CUSTOM BRIDGE APPROACH - RURAL 2:1 SLOPE		DRAINAGE SIDES	2	
BORROW EMBANKMENT	0	CY	$8.30	$0.00
LESS EXISTING EMBANKMENT	0	CY	($8.30)	$0.00
EXCAVATE EXCESS FILL (IF > 0)	0	CY	$5.30	$0.00
COLLECTOR PIPE (24" RCP)	2000	LF	$70.00	$140,000.00
CMP OUTLET PIPE (18" CMP)	500	LF	$35.00	$17,500.00
CROSSDRAINS (18" RCP)	820	LF	$35.00	$28,700.00
DITCH BOTTOM INLETS	10	EA	$5,000.00	$50,000.00
INLET (TYPE S)	20	EA	$3,500.00	$70,000.00
MITERED END SECTIONS	10	EA	$5,000.00	$50,000.00
SOD	23,177	SY	$1.50	$34,765.50
SHOULDER GUTTER (LESS S INLETS)	4,116	LF	$24.00	$98,782.48
GUARDRAIL (OUTSIDE ONLY, NOT IN MEDIAN)	4,223	LF	$4.00	$16,890.95
APPROACH SLABS	2	EA	$30,396.00	$60,792.00
			TOTAL $ EA	$567,430.93

TYPICAL XWAY / CROSSROAD

Bridge 2B

BRIDGE APPROACH - RURAL - 2:1 SLOPE

TOTAL OUT-TO-OUT WIDTH OF BRIDGE APPROACH >>>>>>>	50.66	FT		
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	30.25	FT	1.37% = 1314'	
AVERAGE % OF APPROACH SLOPE >>>>>>>	1.90%		3.00% = 600'	
ROADWAY WIDTH AT GRADE >>>>>>>	41.66	FT		
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	3	FT		
COST OF BRIDGE APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>			**$569,115**	
MEDIAN? (ENTER Y OR N) >>>>>>>	Y			
CROSSDRAIN WIDTH >>>>>>>	82			
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	1,434	LF		
FEET FROM TOUCHDOWN TO 10' HEIGHT >>>>>>>	368	LF		
DISTANCE OF APPROACH ABOVE 10' HEIGHT (GR & SHO GUT L) >>>>>>>	1,066	LF		
APPROACH SLAB WIDTH >>>>>>>	50.66	FT		
ORIGINAL BRIDGE APPROACH WIDTH >>>>>>>	0	FT		
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	0.0	FT		
AVERAGE % OF APPROACH SLOPE >>>>>>>	1.90%			
ROADWAY WIDTH AT GRADE >>>>>>>	0	FT		
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	0.0	FT		
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	0	LF		

**** RETAINING WALL AUTOMATIC CALCULATION ****

BRIDGE HEIGHT >>>>>>>	30.25			
BRIDGE WIDTH (OUT-TO-OUT INCLUDING MEDIAN) >>>>>>>	50.66		EXTRA FOR SKEW	
SKEW? (ENTER Y or N) >>>>>>>	Y		1,060	SF
TOTAL RE-WALL >>>>>>>	**7,278**	SF		

CUSTOM BRIDGE APPROACH - RURAL 2:1 SLOPE		DRAINAGE SIDES	2	
BORROW EMBANKMENT	0	CY	$8.30	$0.00
LESS EXISTING EMBANKMENT	0	CY	($8.30)	$0.00
EXCAVATE EXCESS FILL (IF > 0)	0	CY	$5.30	$0.00
COLLECTOR PIPE (24" RCP)	2000	LF	$70.00	$140,000.00
CMP OUTLET PIPE (18" CMP)	500	LF	$35.00	$17,500.00
CROSSDRAINS (18" RCP)	820	LF	$35.00	$28,700.00
DITCH BOTTOM INLETS	10	EA	$5,000.00	$50,000.00
INLET (TYPE S)	20	EA	$3,500.00	$70,000.00
MITERED END SECTIONS	10	EA	$5,000.00	$50,000.00
SOD	23,514	SY	$1.50	$35,271.00
SHOULDER GUTTER (LESS S INLETS)	4,158	LF	$24.00	$99,793.01
GUARDRAIL (OUTSIDE ONLY, NOT IN MEDIAN)	4,265	LF	$4.00	$17,059.37
APPROACH SLABS	2	EA	$30,396.00	$60,792.00
			TOTAL $ EA	$569,115.38

Bridge End Bents and Wing Walls

Segment 1	Avg Height	Area (sf)
Bridge 1A - Begin Bridge	32.1	4072
Bridge 1A - End Bridge	30.4	3753
Bridge 1B - Begin Bridge	30.2	3716
Bridge 1B - End Bridge	30.5	3772
Bridge 2A - Begin Bridge	29.7	3269
Bridge 2A - End Bridge	30.4	3388
Bridge 2B - Begin Bridge	30.1	3337
Bridge 2B - End Bridge	30.4	3388
Segment 1 Total		**28696**

Formula for Mainline: (62.66(H) + 2H^2)
62.66 is the width of bridge out-to-out (includes barrier wall)
assumes a 2:1 front slope
H = Height of Fill as measured in MicroStation

Formula for Mainline: (50.66(H) + 2H^2)
50.66 is the width of bridge out-to-out (includes barrier wall)
assumes a 2:1 front slope
H = Height of Fill as measured in MicroStation

*Adjusted to remove wingwall(s) where MSE walls are used

Forumlas (DO NOT INPUT VALUES)

Input station range (numerical only)
Input area sf as measured in MicroStaion

Output mainline segments

MSE Walls

Segment 3	Measured Area (sf)
Bridge 1A - Begin Bridge (one side)	
Bridge 1A - End Bridge (one side)	
Bridge 1B - Begin Bridge (one side)	
Bridge 1B - End Bridge (one side)	
Bridge 2A - Begin Bridge	
Bridge 2A - End Bridge	
Bridge 2B - Begin Bridge	
Bridge 2B - End Bridge	
Segment 3 Total	**0**

Additional Earthwork for Retaining Walls				
Segment 3	Width (lf)	Measured Area (sf)	Volume (cf)	Volume (cy)
Bridge 1A Begin Bridge (Northside Only)	0	0	0	0
Bridge 1A End Bridge (Northside Only)	0	0	0	0
Bridge 1B Begin Bridge (Southside Only)	0	0	0	0
Bridge 1B End Bridge (Southside Only)	0	0	0	0
Segment 3 Total				**0**

Formula: Width * Measured Area
Measured Area in MicroStation

Input area sf as measured in MicroStaion
Output

Additional Earthwork over 3 ft Fill

Jack Brack Parclo				Area (sf)	Length	Avg Height	Volume (cf)	Volume (cy)
Area 1	753+56.04	to	758+47.03	675	490.99	1.37	150862	5588
Area 2	760+53.58	to	782+49.63	30089	2196.05	13.70	8208450	304017
Area 3	784+65.94	to	806+75.17	50557	2209.23	22.88	15649301	579604
Area 4	808+32.94	to	828+14.48	32413	1981.54	16.36	9186814	340253
Area 5	833+40.11	to	843+62.24	415	1022.13	0.41	91144	3376
Jack Brack Diamond Total								**1232838**

Formula for Mainline: (218(H) + 4H^2)*Length
218 is the width of roadway from WB outside shoulder to EB outside shoulder
assumes a 4:1 front slope

H = Height of Fill
218 is the width of typical section at a 3 ft fill depth which is taken into account in the cost per mile calculations

Formula for 1-Lane Ramp: (31(H) + 2H^2)*Length
31 is the width of 15 lane, 2 6-foot shoulders, and 2 ft per side for guardrail
assumes a 2:1 front slope
H = Height of Fill

Formula for 2-Lane Ramp: (46(H) + 2H^2)*Length
46 is the width of 24 lanes, 8 ft inside shoulder, 10 ft outside shoulder, and 2 ft per side for guardrail
assumes a 2:1 front slope
H = Height of Fill

*Adjust for Wall Earthwork

Forumlas (DO NOT INPUT VALUES)

Input station range (numerical only)
Input area sf as measured in MicroStaion

Output mainline segments

Additional Earthwork for Muck				
Segment 3	Area (sf)	Avg Height	Volume (cf)	Volume (cy)
Area 1	87593.66	4	350375	12977
Segment 3 Total				**12977**

Formula: Area*Avg Height

Input area sf as measured in MicroStaion

Jack Brack Road –
Partial Cloverleaf Interchange

SUMMARY

ESTIMATED PROBABLE PROJECT COST

Northeast Connector Phase I - Segment A
Jack Brack Partial Cloverleaf Interchange Option

PREPARED BY RS&H

PROJECT CENTERLINE MILES:	1.899
NUMBER OF BRIDGES:	4

NE Connector Mainline				$54,298,395
Jack Brack Partial Cloverleaf Interchange				$8,928,101
TOTAL (2021 CONSTRUCTION COST)				**$63,226,496**
ENGINEERING / ADMINISTRATION / LEGAL (24%)				$15,174,359
RIGHT - OF - WAY	116	ACRES		$10,500,000
MITIGATION	13.0	ACRES @	$ 150,000	$1,950,000
TOLL COLLECTION EQUIPMENT	4	LANES @	$ 275,000	$1,100,000
GRAND TOTAL PROJECT COST				**$91,950,855**

ESTIMATED PROBABLE CONSTRUCTION COST

NE Connector - Jack Brack Partial Cloverleaf Interchange (Mainline Roadway)

PREPARED BY *RS&H*

ITEM	QUANTITY			UNIT	UNIT PRICE	TOTAL
** EXPRESSWAYS **						
MAINLINE ROADWAY TYPICAL - Segment 1	2894	lf	0.548	MI	$4,899,924	$2,685,678
MAINLINE ROADWAY TYPICAL - Segment 2	2197	lf	0.416	MI	$4,899,924	$2,038,851
MAINLINE ROADWAY TYPICAL - Segment 3	4552	lf	0.862	MI	$4,899,924	$4,224,328
MAINLINE ADDITIONAL LANE - Segment 1	256	lf	0.048	MI	$425,592	$20,635
MAINLINE ADDITIONAL LANE - Segment 2	630	lf	0.119	MI	$425,592	$50,781
MAINLINE ADDITIONAL LANE - Segment 3	2960	lf	0.561	MI	$425,592	$238,589
MAINLINE ADDITIONAL LANE - Segment 4	1498	lf	0.284	MI	$425,592	$120,746
** BRIDGES **						
BRIDGE 1A (234 lf x 63 lf)						
SB NE CONNECTOR OVER FUTURE ROAD NETWORK	14,634	sf	14,634	SF	$125	$1,829,250
APPROACH SLABS (BEGIN & END BRIDGE) (DOES NOT INCLUDE EARTHWORK)	1	ea	1	EA	$681,208	$681,208
BRIDGE 1B (200 lf x 63 lf)						
NB NE CONNECTOR OVER FUTURE ROAD NETWORK	12,475	sf	12,475	SF	$125	$1,559,375
APPROACH SLABS (BEGIN & END BRIDGE) (DOES NOT INCLUDE EARTHWORK)	1	ea	1	EA	$673,391	$673,391
BRIDGE 2A (170 lf x 63 lf)						
SB NE CONNECTOR OVER JACK BRACK ROAD	10,604	sf	10,604	SF	$125	$1,325,500
APPROACH SLABS (BEGIN & END BRIDGE) (DOES NOT INCLUDE EARTHWORK)	1	ea	1	EA	$586,872	$586,872
BRIDGE 2B (170 lf x 63 lf)						
NB NE CONNECTOR OVER JACK BRACK ROAD	10,806	sf	10,806	SF	$125	$1,350,750
APPROACH SLABS (BEGIN & END BRIDGE) (DOES NOT INCLUDE EARTHWORK)	1	ea	1	EA	$586,872	$586,872
RETAINING WALLS (MSE & ABUTMENTS)	30,125	sf	30,125	SF	$34	$1,024,233
** ADDITIONAL ITEMS **						
ADDITIONAL EARTHWORK FOR FILL OVER 3 FT	1,218,448	cy	1,218,448	CY	$8	$9,747,584
OVERHEAD LIGHTING (INCLUDES WIRING) (2 SIDES, 200' SPACING)	10,028	lf	1.899	MI	$554,800	$1,053,700
OVERHEAD TRUSS SIGNS	8	ea	8	EA	$250,000	$2,000,000
OVERHEAD CANTILEVER SIGNS	6	ea	6	EA	$80,000	$480,000
MULTIPOST SIGNS	8	ea	8	EA	$5,500	$44,000
FIBER OPTIC NETWORK (FON) (CONDUIT, 72 WIRE, PULL BOXES, SPLICE, ETC.)	10,028	lf	1.899	MI	$350,000	$664,735
DYNAMIC MESSAGE SIGNS	0	ea	0	EA	$250,000	$0
RETENTION POND CONSTRUCTION	47.5	ac	47.50	AC	$77,141	$3,664,181
RETENTION POND EXCAVATION	188,191	cy	188,190.50	CY	$5	$997,410
RETENTION POND SODDING	138,424	sy	138,424.00	SY	$3	$346,060
RETENTION POND CLEARING & GRUBBING	36	ac	36.20	AC	$17,000	$615,400
RETENTION POND ADDITIONAL DRAINAGE	1	ea	1.00	EA	$1,288,259	$1,288,259
REMOVE A-8 MATERIAL (ASSUME 4 FT PER SF OF MUCK)	0	cy	-	CY	$5	$0
REPLACE A-8 MATERIAL (ASSUME 4 FT PER SF OF MUCK)	0	cy	-	CY	$8	$0
MAINLINE TOLL GANTRY (2 LANE, 2 TRUSSES AND EQUIP. BLDG)	0	ea	-	EA	$1,750,000	$0

SUB-TOTAL	$39,898,388
EROSION CONTROL / TEMPORARY DRAINAGE (0.5%)	$199,492
MAINTENANCE OF TRAFFIC (1%)	$398,984
MOBILIZATION (9.5%)	$3,790,347
SUB-TOTAL ROADWAY	$34,669,759
ROADWAY CONTINGENCY (20%)	$6,933,952
SUB-TOTAL BRIDGES	$9,617,452
BRIDGE CONTINGENCY (10%)	$961,745
SUB-TOTAL	$52,182,908
AESTHETICS CONTINGENCY (3%)	$1,565,487
RELOCATE UTILITIES	$0
ALLOWANCE FOR DISPUTES REVIEW BOARD	$50,000
WORK ORDER ALLOWANCE	$500,000
TOTAL (2019 CONSTRUCTION COST)	**$54,298,395**

ESTIMATED PROBABLE CONSTRUCTION COST

Jack Brack Partial Cloverleaf Interchange

PREPARED BY *RS&H*

ITEM	QUANTITY			UNIT	UNIT PRICE	TOTAL
** RAMPS **						
ONE LANE RAMPS (OPEN DRAINAGE) - SB EXIT RAMP	1550	lf	0.294	MI	$1,223,837	$359,270
ONE LANE RAMPS (OPEN DRAINAGE) - SB ENTRANCE RAMP	900	lf	0.170	MI	$1,223,837	$208,608
ONE LANE RAMPS (OPEN DRAINAGE) - NB EXIT RAMP	847	lf	0.160	MI	$1,223,837	$196,324
ONE LANE RAMPS (OPEN DRAINAGE) - NB ENTRANCE RAMP	2417	lf	0.458	MI	$1,223,837	$560,230
TWO LANE RAMPS (OPEN DRAINAGE) - SB EXIT RAMP	426	lf	0.081	MI	$1,661,517	$134,054
TWO LANE RAMPS (OPEN DRAINAGE) - NB EXIT RAMP	238	lf	0.045	MI	$1,661,517	$74,894
TYPICAL 1 LANE ON-RAMP TAPER W/GORE - MAINLINE UNCHANGED	2	ea	2	EA	$219,329	$438,659
TYPICAL 1 LANE OFF-RAMP TAPER W/GORE - MAINLINE UNCHANGED	2	ea	2	EA	$129,358	$258,716
** ARTERIAL ROADS **						
Jack Brack Road						
4-LANE DIVIDED	2204	lf	0.417	MI	$4,429,390	$1,848,935
ADDITIONAL LANES WIDENING TO OUTSIDE - Segment 1	348	lf	0.066	MI	$406,857	$26,816
ADDITIONAL LANES WIDENING TO OUTSIDE - Segment 2	276	lf	0.052	MI	$406,857	$21,268
ADDITIONAL LANES MEDIAN WIDENING - Segment 1	387	lf	0.073	MI	$389,257	$28,531
ADDITIONAL LANES MEDIAN WIDENING - Segment 2	425	lf	0.080	MI	$389,257	$31,332
MEDIAN CROSSOVER - NEW CONSTRUCTION	2	ea	2	EA	$8,080	$16,160.00
DEMOLISH EXISTING ARTERIAL ROAD	0	lf	0.000	MI	$305,760	$0
** INTERSECTION SIGNALIZATION **						
SIGNALIZATION PER INTERCHANGE	2	ea	2	EA	$269,948	$539,896
** ADDITIONAL ITEMS **						
OVERHEAD LIGHTING (INCLUDES WIRING) (1 SIDE, 200' SPACING)	6,378	lf	1.208	MI	$277,400	$335,087
MULTIPOST SIGNS	8	ea	8	EA	$5,500	$44,000
ITS EQUIPMENT / DEVICES PER INTERCHANGE (CCTV, TMS, ETC.)	1	int	1	INT	$330,000	$330,000
RETENTION POND CONSTRUCTION	0	sf	0.00	AC	$177,813	$0
RAMP TOLL GANTRY (2 RAMPS @ 1 LANE EA, 1 TRUSS AND EQUIP. BLDG)	1	ea	1	EA	$1,250,000	$1,250,000

SUB-TOTAL	$6,702,779
EROSION CONTROL / TEMPORARY DRAINAGE (0.5%)	$33,514
MAINTENANCE OF TRAFFIC (1%)	$67,028
MOBILIZATION (9.5%)	$636,764
SUB-TOTAL	$7,440,084
ROADWAY CONTINGENCY (20%)	$1,488,017
TOTAL (2019 CONSTRUCTION COST)	**$8,928,101**

\\rsandh.com\files\Transportation\P\1070102000_NE_Connector_PH1\estimates\2021-09-29_Updated Cost Estimates\[Cost Estimate - Jack Brack - Partial Cloverleaf.xlsx]Jack Brac 01-Oct-21

Bridge Development Report Cost Estimating

Step Three: Cost Estimate Comparison to Historical Bridge Cost

The final step is a comparison of the cost estimate by comparison with historic bridge cost based on a cost per square foot. These total cost numbers are calculated exclusively for the bridge cost as defined in the General Section of this chapter. Price computed by Steps 1 and 2 should be generally within the range of cost as supplied herein. If the cost falls outside the provided range, good justification must be provided.

Bridge Superstructure Type	Total Cost per Square Foot Low	 High
Short Span Bridges:		
Reinforced Concrete Flat Slab- Simple Span ¹	$115	$160
Pre-cast Concrete Slab - Simple Span ¹	$110	$200
Medium Span Bridges:		
Concrete Deck / Steel Girder - Simple Span ¹	$125	$142
Concrete Deck / Steel Girder - Continuous Span ¹	$135	$170
Concrete Deck / Prestressed Girder - Simple Span ¹	$90	$145
Concrete Deck / Prestressed Girder - Continuous Span ¹	$95	$211
Concrete Deck / Steel Box Girder ¹ -	$140	$180
Span range from 150' to 280' (for curvature, add 15% premium)		
Segmental Concrete Box Girders - Cantilever Construction	$140	$160
Span range from 150' to 280'		
Demolition Costs:		
Typical	$35	$60
Bascule	$60	$70
Project Type		
Widening (Construction Only)	$85	$160

¹ Increase the cost by twenty percent for phased construction

TYPICAL XWAY / CROSSROAD — Bridge 1A
BRIDGE APPROACH - RURAL - 2:1 SLOPE

TOTAL OUT-TO-OUT WIDTH OF BRIDGE APPROACH >>>>>>>	62.66	FT		
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	31.2	FT	1.37% = 1314'	
AVERAGE % OF APPROACH SLOPE >>>>>>>	1.75%		3.00% = 600'	
ROADWAY WIDTH AT GRADE >>>>>>>	53.66	FT		
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	3	FT		
COST OF BRIDGE APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>			$681,208	
MEDIAN? (ENTER Y OR N) >>>>>>>	Y			
CROSSDRAIN WIDTH >>>>>>>	94			Use 94 ft since this is a 3 lane bridge (82 lf +12 lf)
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	1,611	LF		
FEET FROM TOUCHDOWN TO 10' HEIGHT >>>>>>>	400	LF		
DISTANCE OF APPROACH ABOVE 10' HEIGHT (GR & SHO GUT L) >>>>>>>	1,211	LF		
APPROACH SLAB WIDTH >>>>>>>	62.66	FT		
ORIGINAL BRIDGE APPROACH WIDTH >>>>>>>	0	FT		
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	0.0	FT		
AVERAGE % OF APPROACH SLOPE >>>>>>>	1.75%			
ROADWAY WIDTH AT GRADE >>>>>>>	0	FT		
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	0.0	FT		
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	0	LF		
** RETAINING WALL AUTOMATIC CALCULATION **				
BRIDGE HEIGHT >>>>>>>	31.2			
BRIDGE WIDTH (OUT-TO-OUT INCLUDING MEDIAN) >>>>>>>	62.66		EXTRA FOR SKEW	
SKEW? (ENTER Y or N) >>>>>>>	N		0 SF	
TOTAL RE-WALL >>>>>>>	7,177	SF		

CUSTOM BRIDGE APPROACH - RURAL 2:1 SLOPE		DRAINAGE SIDES	2	
BORROW EMBANKMENT	0	CY	$8.30	$0.00
LESS EXISTING EMBANKMENT	0	CY	($8.30)	$0.00
EXCAVATE EXCESS FILL (IF > 0)	0	CY	$5.30	$0.00
COLLECTOR PIPE (24" RCP)	2400	LF	$70.00	$168,000.00
CMP OUTLET PIPE (18" CMP)	600	LF	$35.00	$21,000.00
CROSSDRAINS (18" RCP)	1,128	LF	$35.00	$39,480.00
DITCH BOTTOM INLETS	12	EA	$5,000.00	$60,000.00
INLET (TYPE S)	24	EA	$3,500.00	$84,000.00
MITERED END SECTIONS	12	EA	$5,000.00	$60,000.00
SOD	27,288	SY	$1.50	$40,932.00
SHOULDER GUTTER (LESS S INLETS)	4,718	LF	$24.00	$113,221.30
GUARDRAIL (OUTSIDE ONLY, NOT IN MEDIAN)	4,846	LF	$4.00	$19,382.86
APPROACH SLABS	2	EA	$37,596.00	$75,192.00
			TOTAL $ EA	$681,208.16

TYPICAL XWAY / CROSSROAD — Bridge 1B
BRIDGE APPROACH - RURAL - 2:1 SLOPE

TOTAL OUT-TO-OUT WIDTH OF BRIDGE APPROACH >>>>>>>	62.66	FT	
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	30.35	FT	1.37% = 1314'
AVERAGE % OF APPROACH SLOPE >>>>>>>	1.75%		3.00% = 600'
ROADWAY WIDTH AT GRADE >>>>>>>	53.66	FT	
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	3	FT	
COST OF BRIDGE APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>			$673,391
MEDIAN? (ENTER Y OR N) >>>>>>>	Y		
CROSSDRAIN WIDTH >>>>>>>	94		
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	1,563	LF	
FEET FROM TOUCHDOWN TO 10' HEIGHT >>>>>>>	400	LF	
DISTANCE OF APPROACH ABOVE 10' HEIGHT (GR & SHO GUT L) >>>>>>>	1,163	LF	
APPROACH SLAB WIDTH >>>>>>>	62.66	FT	
ORIGINAL BRIDGE APPROACH WIDTH >>>>>>>	0	FT	
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	0.0	FT	
AVERAGE % OF APPROACH SLOPE >>>>>>>	1.75%		
ROADWAY WIDTH AT GRADE >>>>>>>	0	FT	
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	0.0	FT	
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	0	LF	
** RETAINING WALL AUTOMATIC CALCULATION **			
BRIDGE HEIGHT >>>>>>>	30.35		
BRIDGE WIDTH (OUT-TO-OUT INCLUDING MEDIAN) >>>>>>>	62.66		EXTRA FOR SKEW
SKEW? (ENTER Y or N) >>>>>>>	N		0 SF
TOTAL RE-WALL >>>>>>>	6,861	SF	

CUSTOM BRIDGE APPROACH - RURAL 2:1 SLOPE		DRAINAGE SIDES	2	
BORROW EMBANKMENT	0	CY	$8.30	$0.00
LESS EXISTING EMBANKMENT	0	CY	($8.30)	$0.00
EXCAVATE EXCESS FILL (IF > 0)	0	CY	$5.30	$0.00
COLLECTOR PIPE (24" RCP)	2400	LF	$70.00	$168,000.00
CMP OUTLET PIPE (18" CMP)	600	LF	$35.00	$21,000.00
CROSSDRAINS (18" RCP)	1,128	LF	$35.00	$39,480.00
DITCH BOTTOM INLETS	12	EA	$5,000.00	$60,000.00
INLET (TYPE S)	24	EA	$3,500.00	$84,000.00
MITERED END SECTIONS	12	EA	$5,000.00	$60,000.00
SOD	25,703	SY	$1.50	$38,554.50
SHOULDER GUTTER (LESS S INLETS)	4,523	LF	$24.00	$108,558.45
GUARDRAIL (OUTSIDE ONLY, NOT IN MEDIAN)	4,651	LF	$4.00	$18,605.71
APPROACH SLABS	2	EA	$37,596.00	$75,192.00
			TOTAL $ EA	$673,390.66

TYPICAL XWAY / CROSSROAD — Bridge 2A
BRIDGE APPROACH - RURAL - 2:1 SLOPE

TOTAL OUT-TO-OUT WIDTH OF BRIDGE APPROACH >>>>>>>	62.66	FT	
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	30.15	FT	1.37% = 1314'
AVERAGE % OF APPROACH SLOPE >>>>>>>	1.90%		3.00% = 600'
ROADWAY WIDTH AT GRADE >>>>>>>	53.66	FT	
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	3	FT	
COST OF BRIDGE APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>			$586,872
MEDIAN? (ENTER Y OR N) >>>>>>>	Y		
CROSSDRAIN WIDTH >>>>>>>	94		
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	1,429	LF	
FEET FROM TOUCHDOWN TO 10' HEIGHT >>>>>>>	368	LF	
DISTANCE OF APPROACH ABOVE 10' HEIGHT (GR & SHO GUT L) >>>>>>>	1,061	LF	
APPROACH SLAB WIDTH >>>>>>>	62.66	FT	

ORIGINAL BRIDGE APPROACH WIDTH >>>>>>>	0	FT		
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	0.0	FT		
AVERAGE % OF APPROACH SLOPE >>>>>>>	1.90%			
ROADWAY WIDTH AT GRADE >>>>>>>	0	FT		
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	0.0	FT		
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	0	LF		
**** RETAINING WALL AUTOMATIC CALCULATION ****				
BRIDGE HEIGHT >>>>>>>	30.15			
BRIDGE WIDTH (OUT-TO-OUT INCLUDING MEDIAN) >>>>>>>	62.66		EXTRA FOR SKEW	
SKEW? (ENTER Y or N) >>>>>>>	Y		1,306 SF	
TOTAL RE-WALL >>>>>>>	**8,093**	SF		

CUSTOM BRIDGE APPROACH - RURAL 2:1 SLOPE		DRAINAGE SIDES	2	
BORROW EMBANKMENT	0	CY	$8.30	$0.00
LESS EXISTING EMBANKMENT	0	CY	($8.30)	$0.00
EXCAVATE EXCESS FILL (IF > 0)	0	CY	$5.30	$0.00
COLLECTOR PIPE (24" RCP)	2000	LF	$70.00	$140,000.00
CMP OUTLET PIPE (18" CMP)	500	LF	$35.00	$17,500.00
CROSSDRAINS (18" RCP)	940	LF	$35.00	$32,900.00
DITCH BOTTOM INLETS	10	EA	$5,000.00	$50,000.00
INLET (TYPE S)	20	EA	$3,500.00	$70,000.00
MITERED END SECTIONS	10	EA	$5,000.00	$50,000.00
SOD	23,345	SY	$1.50	$35,017.50
SHOULDER GUTTER (LESS S INLETS)	4,137	LF	$24.00	$99,287.75
GUARDRAIL (OUTSIDE ONLY, NOT IN MEDIAN)	4,244	LF	$4.00	$16,975.16
APPROACH SLABS	2	EA	$37,596.00	$75,192.00
			TOTAL $ EA	$586,872.41

TYPICAL XWAY / CROSSROAD

Bridge 2B

BRIDGE APPROACH - RURAL - 2:1 SLOPE

TOTAL OUT-TO-OUT WIDTH OF BRIDGE APPROACH >>>>>>>	62.66	FT		
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	30.15	FT	1.37% = 1314'	
AVERAGE % OF APPROACH SLOPE >>>>>>>	1.90%		3.00% = 600'	
ROADWAY WIDTH AT GRADE >>>>>>>	53.66	FT		
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	3	FT		
COST OF BRIDGE APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>			**$586,872**	
MEDIAN? (ENTER Y OR N) >>>>>>>	Y			
CROSSDRAIN WIDTH >>>>>>>	94			
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	1,429	LF		
FEET FROM TOUCHDOWN TO 10' HEIGHT >>>>>>>	368	LF		
DISTANCE OF APPROACH ABOVE 10' HEIGHT (GR & SHO GUT L) >>>>>>>	1,061	LF		
APPROACH SLAB WIDTH >>>>>>>	62.66	FT		
ORIGINAL BRIDGE APPROACH WIDTH >>>>>>>	0	FT		
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	0.0	FT		
AVERAGE % OF APPROACH SLOPE >>>>>>>	1.90%			
ROADWAY WIDTH AT GRADE >>>>>>>	0	FT		
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	0.0	FT		
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	0	LF		
**** RETAINING WALL AUTOMATIC CALCULATION ****				
BRIDGE HEIGHT >>>>>>>	30.15			
BRIDGE WIDTH (OUT-TO-OUT INCLUDING MEDIAN) >>>>>>>	62.66		EXTRA FOR SKEW	
SKEW? (ENTER Y or N) >>>>>>>	Y		1,306 SF	
TOTAL RE-WALL >>>>>>>	**8,093**	SF		

CUSTOM BRIDGE APPROACH - RURAL 2:1 SLOPE		DRAINAGE SIDES	2	
BORROW EMBANKMENT	0	CY	$8.30	$0.00
LESS EXISTING EMBANKMENT	0	CY	($8.30)	$0.00
EXCAVATE EXCESS FILL (IF > 0)	0	CY	$5.30	$0.00
COLLECTOR PIPE (24" RCP)	2000	LF	$70.00	$140,000.00
CMP OUTLET PIPE (18" CMP)	500	LF	$35.00	$17,500.00
CROSSDRAINS (18" RCP)	940	LF	$35.00	$32,900.00
DITCH BOTTOM INLETS	10	EA	$5,000.00	$50,000.00
INLET (TYPE S)	20	EA	$3,500.00	$70,000.00
MITERED END SECTIONS	10	EA	$5,000.00	$50,000.00
SOD	23,345	SY	$1.50	$35,017.50
SHOULDER GUTTER (LESS S INLETS)	4,137	LF	$24.00	$99,287.75
GUARDRAIL (OUTSIDE ONLY, NOT IN MEDIAN)	4,244	LF	$4.00	$16,975.16
APPROACH SLABS	2	EA	$37,596.00	$75,192.00
			TOTAL $ EA	$586,872.41

Bridge End Bents and Wing Walls

Segment 1	Avg Height	Area (sf)
Bridge 1A - Begin Bridge	32.1	4072
Bridge 1A - End Bridge	30.3	3735
Bridge 1B - Begin Bridge	30.2	3716
Bridge 1B - End Bridge	30.5	3772
Bridge 2A - Begin Bridge	29.9	3662
Bridge 2A - End Bridge	30.4	3753
Bridge 2B - Begin Bridge	29.9	3662
Bridge 2B - End Bridge	30.4	3753
Segment 1 Total		**30125**

Formula for Mainline: (62.66(H) + 2H^2)
62.66 is the width of bridge out-to-out (includes barrier wall)
assumes a 2:1 front slope
H = Height of Fill as measured in MicroStation

Formula for 1-Lane Ramp: (29.66(H) + 2H^2)*Length
29.66 is the width of 15 lane, 2 6-foot shoulders, and 2 - 1.33 ft barrier wall per side
assumes a 2:1 front slope
H = Height of Fill

Formula for 2-Lane Ramp: (44.66(H) + 2H^2)*Length
44.66 is the width of 24 lanes, 8 ft inside shoulder, 10 ft outside shoulder, and 2 - 1.33 ft barrier wall per side
assumes a 2:1 front slope
H = Height of Fill

*Adjusted to remove wingwall(s) where MSE walls are used

Forumlas (DO NOT INPUT VALUES)

Input station range (numerical only)
Input area sf as measured in MicroStaion

Output mainline segments

MSE Walls

Segment 3	Measured Area (sf)
Bridge 1A - Begin Bridge (one side)	
Bridge 1A - End Bridge (one side)	
Bridge 1B - Begin Bridge (one side)	
Bridge 1B - End Bridge (one side)	
Bridge 2A - Begin Bridge	
Bridge 2A - End Bridge	
Bridge 2B - Begin Bridge	
Bridge 2B - End Bridge	
Segment 3 Total	**0**

Additional Earthwork for Retaining Walls				
Segment 3	Width (lf)	Measured Area (sf)	Volume (cf)	Volume (cy)
Bridge 1A Begin Bridge (Northside Only)	0	0	0	0
Bridge 1A End Bridge (Northside Only)	0	0	0	0
Bridge 1B Begin Bridge (Southside Only)	0	0	0	0
Bridge 1B End Bridge (Southside Only)	0	0	0	0
Segment 3 Total				**0**

Formula: Width * Measured Area
Measured Area in MicroStation

Input area sf as measured in MicroStaion
Output

Additional Earthwork over 3 ft Fill

Jack Brack Parclo				Area (sf)	Length	Avg Height	Volume (cf)	Volume (cy)
Area 1	753+56.04	to	758+47.03	675	490.99	1.37	150862	5588
Area 2	760+53.58	to	785+49.63	30089	2496.05	12.05	8010251	296676
Area 3	784+65.94	to	806+62.48	50218	2196.54	22.86	15539924	575553
Area 4	808+31.73	to	828+14.48	32446	1982.75	16.36	9197032	340631
Area 5	833+40.11	to	843+62.24	415	1022.13	0.41	91144	3376
Jack Brack Parclo Total								**1218448**

Formula for Mainline: (218(H) + 4H^2)*Length
218 is the width of roadway from WB outside shoulder to EB outside shoulder
assumes a 4:1 front slope

H = Height of Fill
218 is the width of typical section at a 3 ft fill depth which is taken into account in the cost per mile calculations

Formula for 1-Lane Ramp: (31(H) + 2H^2)*Length
31 is the width of 15 lane, 2 6-foot shoulders, and 2 ft per side for guardrail
assumes a 2:1 front slope
H = Height of Fill

Formula for 2-Lane Ramp: (46(H) + 2H^2)*Length
46 is the width of 24 lanes, 8 ft inside shoulder, 10 ft outside shoulder, and 2 ft per side for guardrail
assumes a 2:1 front slope
H = Height of Fill

*Adjust for Wall Earthwork

Forumlas (DO NOT INPUT VALUES)

Input station range (numerical only)
Input area sf as measured in MicroStaion

Output mainline segments

Additional Earthwork for Muck				
Segment 3	Area (sf)	Avg Height	Volume (cf)	Volume (cy)
Area 1	0	4	0	0
Segment 3 Total				**0**

Formula: Area*Avg Height

Input area sf as measured in MicroStaion

Nova Road Connection – Option 1

SUMMARY

ESTIMATED PROBABLE PROJECT COST

Northeast Connector Phase I - Segment B
Nova Road Connection Option 1

PREPARED BY RS&H

PROJECT CENTERLINE MILES:	1.702
NUMBER OF BRIDGES:	4

NE Connector Mainline				$38,238,490
Nova Road Interchange				$4,117,298
TOTAL (2021 CONSTRUCTION COST)				**$42,355,788**
ENGINEERING / ADMINISTRATION / LEGAL (24%)				$10,165,389
RIGHT - OF - WAY	66	ACRES		$6,000,000
MITIGATION	11.0	ACRES	$ 150,000	$1,650,000
TOLL COLLECTION EQUIPMENT	6	LANES @	$ 275,000	$1,650,000
GRAND TOTAL PROJECT COST				**$61,821,178**

ESTIMATED PROBABLE CONSTRUCTION COST

NE Connector - Nova Road Connection Option 1 (Mainline Roadway)

PREPARED BY *RS&H*

ITEM	QUANTITY		UNIT	UNIT PRICE	TOTAL
** EXPRESSWAYS **					
MAINLINE ROADWAY TYPICAL - Segment 1	4998 lf	0.947	MI	$4,899,924	$4,638,223
MAINLINE ROADWAY TYPICAL - Segment 2	1240 lf	0.235	MI	$4,899,924	$1,150,740
MAINLINE ROADWAY TYPICAL - Segment 3	2279 lf	0.432	MI	$4,899,924	$2,114,948
** BRIDGES **					
BRIDGE 3A (292 lf x 51 lf)					
SB NE CONNECTOR OVER CANAL C-32C	14,787 sf	14,787	SF	$125	$1,848,375
APPROACH SLABS (BEGIN & END BRIDGE) (DOES NOT INCLUDE EARTHWORK)	1 ea	1	EA	$558,199	$558,199
BRIDGE 3B (292 lf x 51 lf)					
NB NE CONNECTOR OVER CANAL C-32C	14,787 sf	14,787	SF	$125	$1,848,375
APPROACH SLABS (BEGIN & END BRIDGE) (DOES NOT INCLUDE EARTHWORK)	1 ea	1	EA	$544,520	$544,520
BRIDGE 4A (181 lf x 51 lf)					
SB NE CONNECTOR OVER SUNBRIDGE PKWY	9,155 sf	9,155	SF	$125	$1,144,375
APPROACH SLABS (BEGIN & END BRIDGE) (DOES NOT INCLUDE EARTHWORK)	1 ea	1	EA	$567,446	$567,446
BRIDGE 4B (181 lf x 51 lf)					
NB NE CONNECTOR OVER SUNBRIDGE PKWY	9,155 sf	9,155	SF	$125	$1,144,375
APPROACH SLABS (BEGIN & END BRIDGE) (DOES NOT INCLUDE EARTHWORK)	1 ea	1	EA	$549,433	$549,433
RETAINING WALLS (MSE & ABUTMENTS)	27,015 sf	27,015	SF	$34	$918,507
** ADDITIONAL ITEMS **					
ADDITIONAL EARTHWORK FOR FILL OVER 3 FT	461,284 cy	461,284	CY	$8	$3,690,272
OVERHEAD LIGHTING (INCLUDES WIRING) (2 SIDES, 200' SPACING)	8,989 lf	1.702	MI	$554,800	$944,526
OVERHEAD TRUSS SIGNS	4 ea	4	EA	$250,000	$1,000,000
OVERHEAD CANTILEVER SIGNS	3 ea	3	EA	$80,000	$240,000
MULTIPOST SIGNS	4 ea	4	EA	$5,500	$22,000
FIBER OPTIC NETWORK (FON) (CONDUIT, 72 WIRE, PULL BOXES, SPLICE, ETC.)	8,989 lf	1.702	MI	$350,000	$595,862
DYNAMIC MESSAGE SIGNS	0 ea	0	EA	$250,000	$0
RETENTION POND CONSTRUCTION	22.9 ac	22.90	AC	$77,141	$1,766,521
RETENTION POND EXCAVATION	82,877 cy	82,876.90	CY	$5	$439,248
RETENTION POND SODDING	55,999 sy	55,998.80	SY	$3	$139,997
RETENTION POND CLEARING & GRUBBING	14 ac	13.80	AC	$17,000	$234,600
RETENTION POND ADDITIONAL DRAINAGE	1 ea	1.00	EA	$304,960	$304,960
REMOVE A-8 MATERIAL (ASSUME 4 FT PER SF OF MUCK)	0 cy	-	CY	$5	$0
REPLACE A-8 MATERIAL (ASSUME 4 FT PER SF OF MUCK)	0 cy	-	CY	$8	$0
MAINLINE TOLL GANTRY (2 LANE, 2 TRUSSES AND EQUIP. BLDG)	1 ea	1	EA	$1,750,000	$1,750,000

SUB-TOTAL	$28,155,501
EROSION CONTROL / TEMPORARY DRAINAGE (0.5%)	$140,778
MAINTENANCE OF TRAFFIC (1%)	$281,555
MOBILIZATION (9.5%)	$2,674,773
SUB-TOTAL ROADWAY	$22,129,001
ROADWAY CONTINGENCY (20%)	$4,425,800
SUB-TOTAL BRIDGES	$9,123,605
BRIDGE CONTINGENCY (10%)	$912,360
SUB-TOTAL	$36,590,767
AESTHETICS CONTINGENCY (3%)	$1,097,723
RELOCATE UTILITIES	$0
ALLOWANCE FOR DISPUTES REVIEW BOARD	$50,000
WORK ORDER ALLOWANCE	$500,000
TOTAL (2019 CONSTRUCTION COST)	**$38,238,490**

ESTIMATED PROBABLE CONSTRUCTION COST

Nova Road Connection Option 1

PREPARED BY *RS&H*

ITEM	QUANTITY		UNIT		UNIT PRICE	TOTAL
** RAMPS **						
** ARTERIAL ROADS **						
Nova Road						
2-LANE UNDIVIDED	200	LF	0.038	MI	$2,212,699	$83,814
4-LANE DIVIDED	2503	lf	0.474	MI	$4,429,390	$2,099,766
MEDIAN CROSSOVER - NEW CONSTRUCTION	1	ea	1	EA	$8,080	$8,080
DEMOLISH EXISTING ARTERIAL ROAD	2703	lf	0.512	MI	$305,760	$156,528
BOX CULVERT EXTENSION - CONCRETE IV	92	cy		EA	$1,032	$94,925
BOX CULVERT EXTENSION - REBAR WEIGHT	12772	lb		EA	$1	$11,878
** INTERSECTION SIGNALIZATION **						
SIGNALIZATION PER INTERCHANGE	1	ea	1	EA	$142,064	$142,064
** ADDITIONAL ITEMS **						
OVERHEAD LIGHTING (INCLUDES WIRING) (1 SIDE, 200' SPACING)	2,703	lf	0.512	MI	$277,400	$142,010
MULTIPOST SIGNS	4	ea	4	EA	$5,500	$22,000
ITS EQUIPMENT / DEVICES PER INTERCHANGE (CCTV, TMS, ETC.)	1	int	1	INT	$330,000	$330,000
RETENTION POND CONSTRUCTION	0	sf	0.00	AC	$177,813	$0
RAMP TOLL GANTRY (2 RAMPS @ 1 LANE EA, 1 TRUSS AND EQUIP. BLDG)	-	ea	-	EA	$1,250,000	$0

SUB-TOTAL	$3,091,065
EROSION CONTROL / TEMPORARY DRAINAGE (0.5%)	$15,455
MAINTENANCE OF TRAFFIC (1%)	$30,911
MOBILIZATION (9.5%)	$293,651
SUB-TOTAL	$3,431,082
ROADWAY CONTINGENCY (20%)	$686,216
TOTAL (2019 CONSTRUCTION COST)	**$4,117,298**

Bridge Development Report Cost Estimating

Step Three: Cost Estimate Comparison to Historical Bridge Cost

The final step is a comparison of the cost estimate by comparison with historic bridge cost based on a cost per square foot. These total cost numbers are calculated exclusively for the bridge cost as defined in the General Section of this chapter. Price computed by Steps 1 and 2 should be generally within the range of cost as supplied herein. If the cost falls outside the provided range, good justification must be provided.

Bridge Superstructure Type	Total Cost per Square Foot Low	High
Short Span Bridges:		
Reinforced Concrete Flat Slab- Simple Span [1]	$115	$160
Pre-cast Concrete Slab - Simple Span [1]	$110	$200
Medium Span Bridges:		
Concrete Deck / Steel Girder - Simple Span [1]	$125	$142
Concrete Deck / Steel Girder - Continuous Span [1]	$135	$170
Concrete Deck / Prestressed Girder - Simple Span [1]	$90	$145
Concrete Deck / Prestressed Girder - Continuous Span [1]	$95	$211
Concrete Deck / Steel Box Girder [1] - Span range from 150' to 280' (for curvature, add 15% premium)	$140	$180
Segmental Concrete Box Girders - Cantilever Construction Span range from 150' to 280'	$140	$160
Demolition Costs:		
Typical	$35	$60
Bascule	$60	$70
Project Type		
Widening (Construction Only)	$85	$160

[1] Increase the cost by twenty percent for phased construction

TYPICAL XWAY / CROSSROAD — Bridge 3A

BRIDGE APPROACH - RURAL - 2:1 SLOPE

TOTAL OUT-TO-OUT WIDTH OF BRIDGE APPROACH >>>>>>>	50.66	FT	
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	30.75	FT	1.37% = 1314'
AVERAGE % OF APPROACH SLOPE >>>>>>>	2.10%		3.00% = 600'
ROADWAY WIDTH AT GRADE >>>>>>>	41.66	FT	
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	3	FT	
COST OF BRIDGE APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>			**$558,199**
MEDIAN? (ENTER Y OR N) >>>>>>>	Y		
CROSSDRAIN WIDTH >>>>>>>	82		
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	1,321	LF	
FEET FROM TOUCHDOWN TO 10' HEIGHT >>>>>>>	333	LF	
DISTANCE OF APPROACH ABOVE 10' HEIGHT (GR & SHO GUT L) >>>>>>>	988	LF	
APPROACH SLAB WIDTH >>>>>>>	50.66	FT	
ORIGINAL BRIDGE APPROACH WIDTH >>>>>>>	0	FT	
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	0.0	FT	
AVERAGE % OF APPROACH SLOPE >>>>>>>	2.10%		
ROADWAY WIDTH AT GRADE >>>>>>>	0	FT	
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	0.0	FT	
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	0	LF	
**** RETAINING WALL AUTOMATIC CALCULATION ****			
BRIDGE HEIGHT >>>>>>>	30.75		
BRIDGE WIDTH (OUT-TO-OUT INCLUDING MEDIAN) >>>>>>>	50.66		EXTRA FOR SKEW
SKEW? (ENTER Y or N) >>>>>>>	Y		1,081 SF
TOTAL RE-WALL >>>>>>>	**7,472**	SF	

CUSTOM BRIDGE APPROACH - RURAL 2:1 SLOPE — DRAINAGE SIDES: 2

BORROW EMBANKMENT	0	CY	$8.30	$0.00
LESS EXISTING EMBANKMENT	0	CY	($8.30)	$0.00
EXCAVATE EXCESS FILL (IF > 0)	0	CY	$5.30	$0.00
COLLECTOR PIPE (24" RCP)	2000	LF	$70.00	$140,000.00
CMP OUTLET PIPE (18" CMP)	500	LF	$35.00	$17,500.00
CROSSDRAINS (18" RCP)	820	LF	$35.00	$28,700.00
DITCH BOTTOM INLETS	10	EA	$5,000.00	$50,000.00
INLET (TYPE S)	20	EA	$3,500.00	$70,000.00
MITERED END SECTIONS	10	EA	$5,000.00	$50,000.00
SOD	22,044	SY	$1.50	$33,066.00
SHOULDER GUTTER (LESS S INLETS)	3,847	LF	$24.00	$92,325.94
GUARDRAIL (OUTSIDE ONLY, NOT IN MEDIAN)	3,954	LF	$4.00	$15,814.86
APPROACH SLABS	2	EA	$30,396.00	$60,792.00
			TOTAL $ EA	$558,198.80

TYPICAL XWAY / CROSSROAD — Bridge 3B

BRIDGE APPROACH - RURAL - 2:1 SLOPE

TOTAL OUT-TO-OUT WIDTH OF BRIDGE APPROACH >>>>>>>	50.66	FT	
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	28.95	FT	1.37% = 1314'
AVERAGE % OF APPROACH SLOPE >>>>>>>	2.10%		3.00% = 600'
ROADWAY WIDTH AT GRADE >>>>>>>	41.66	FT	
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	3	FT	
COST OF BRIDGE APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>			**$544,520**
MEDIAN? (ENTER Y OR N) >>>>>>>	Y		
CROSSDRAIN WIDTH >>>>>>>	82		
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	1,236	LF	
FEET FROM TOUCHDOWN TO 10' HEIGHT >>>>>>>	333	LF	
DISTANCE OF APPROACH ABOVE 10' HEIGHT (GR & SHO GUT L) >>>>>>>	903	LF	
APPROACH SLAB WIDTH >>>>>>>	50.66	FT	
ORIGINAL BRIDGE APPROACH WIDTH >>>>>>>	0	FT	
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	0.0	FT	
AVERAGE % OF APPROACH SLOPE >>>>>>>	2.10%		
ROADWAY WIDTH AT GRADE >>>>>>>	0	FT	
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	0.0	FT	
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	0	LF	
**** RETAINING WALL AUTOMATIC CALCULATION ****			
BRIDGE HEIGHT >>>>>>>	28.95		
BRIDGE WIDTH (OUT-TO-OUT INCLUDING MEDIAN) >>>>>>>	50.66		EXTRA FOR SKEW
SKEW? (ENTER Y or N) >>>>>>>	Y		1,005 SF
TOTAL RE-WALL >>>>>>>	**6,784**	SF	

CUSTOM BRIDGE APPROACH - RURAL 2:1 SLOPE — DRAINAGE SIDES: 2

BORROW EMBANKMENT	0	CY	$8.30	$0.00
LESS EXISTING EMBANKMENT	0	CY	($8.30)	$0.00
EXCAVATE EXCESS FILL (IF > 0)	0	CY	$5.30	$0.00
COLLECTOR PIPE (24" RCP)	2000	LF	$70.00	$140,000.00
CMP OUTLET PIPE (18" CMP)	500	LF	$35.00	$17,500.00
CROSSDRAINS (18" RCP)	820	LF	$35.00	$28,700.00
DITCH BOTTOM INLETS	10	EA	$5,000.00	$50,000.00
INLET (TYPE S)	20	EA	$3,500.00	$70,000.00
MITERED END SECTIONS	10	EA	$5,000.00	$50,000.00
SOD	19,325	SY	$1.50	$28,987.50
SHOULDER GUTTER (LESS S INLETS)	3,504	LF	$24.00	$84,097.37
GUARDRAIL (OUTSIDE ONLY, NOT IN MEDIAN)	3,611	LF	$4.00	$14,443.43
APPROACH SLABS	2	EA	$30,396.00	$60,792.00
			TOTAL $ EA	$544,520.30

TYPICAL XWAY / CROSSROAD — Bridge 4A

BRIDGE APPROACH - RURAL - 2:1 SLOPE

TOTAL OUT-TO-OUT WIDTH OF BRIDGE APPROACH >>>>>>>	50.66	FT	
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	31.95	FT	1.37% = 1314'
AVERAGE % OF APPROACH SLOPE >>>>>>>	2.10%		3.00% = 600'
ROADWAY WIDTH AT GRADE >>>>>>>	41.66	FT	
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	3	FT	
COST OF BRIDGE APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>			**$567,446**
MEDIAN? (ENTER Y OR N) >>>>>>>	Y		
CROSSDRAIN WIDTH >>>>>>>	82		
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	1,379	LF	
FEET FROM TOUCHDOWN TO 10' HEIGHT >>>>>>>	333	LF	
DISTANCE OF APPROACH ABOVE 10' HEIGHT (GR & SHO GUT L) >>>>>>>	1,046	LF	

APPROACH SLAB WIDTH >>>>>>>	50.66	FT		
ORIGINAL BRIDGE APPROACH WIDTH >>>>>>>	0	FT		
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	0.0	FT		
AVERAGE % OF APPROACH SLOPE >>>>>>>	2.10%			
ROADWAY WIDTH AT GRADE >>>>>>>	0	FT		
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	0.0	FT		
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	0	LF		
**** RETAINING WALL AUTOMATIC CALCULATION ****				
BRIDGE HEIGHT >>>>>>>	31.95			
BRIDGE WIDTH (OUT-TO-OUT INCLUDING MEDIAN) >>>>>>>	50.66		EXTRA FOR SKEW	
SKEW? (ENTER Y or N) >>>>>>>	Y		1,131 SF	
TOTAL RE-WALL >>>>>>>	**7,945**	SF		

CUSTOM BRIDGE APPROACH - RURAL 2:1 SLOPE		DRAINAGE SIDES	2	
BORROW EMBANKMENT	0	CY	$8.30	$0.00
LESS EXISTING EMBANKMENT	0	CY	($8.30)	$0.00
EXCAVATE EXCESS FILL (IF > 0)	0	CY	$5.30	$0.00
COLLECTOR PIPE (24" RCP)	2000	LF	$70.00	$140,000.00
CMP OUTLET PIPE (18" CMP)	500	LF	$35.00	$17,500.00
CROSSDRAINS (18" RCP)	820	LF	$35.00	$28,700.00
DITCH BOTTOM INLETS	10	EA	$5,000.00	$50,000.00
INLET (TYPE S)	20	EA	$3,500.00	$70,000.00
MITERED END SECTIONS	10	EA	$5,000.00	$50,000.00
SOD	23,942	SY	$1.50	$35,913.00
SHOULDER GUTTER (LESS S INLETS)	4,075	LF	$24.00	$97,811.66
GUARDRAIL (OUTSIDE ONLY, NOT IN MEDIAN)	4,182	LF	$4.00	$16,729.14
APPROACH SLABS	2	EA	$30,396.00	$60,792.00
			TOTAL $ EA	$567,445.80

TYPICAL XWAY / CROSSROAD

Bridge 4B

BRIDGE APPROACH - RURAL - 2:1 SLOPE

TOTAL OUT-TO-OUT WIDTH OF BRIDGE APPROACH >>>>>>>	50.66	FT		
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	29.6	FT	1.37% = 1314'	
AVERAGE % OF APPROACH SLOPE >>>>>>>	2.10%		3.00% = 600'	
ROADWAY WIDTH AT GRADE >>>>>>>	41.66	FT		
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	3	FT		
COST OF BRIDGE APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>			**$549,433**	
MEDIAN? (ENTER Y OR N) >>>>>>>	Y			
CROSSDRAIN WIDTH >>>>>>>	82			
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	1,267	LF		
FEET FROM TOUCHDOWN TO 10' HEIGHT >>>>>>>	333	LF		
DISTANCE OF APPROACH ABOVE 10' HEIGHT (GR & SHO GUT L) >>>>>>>	934	LF		
APPROACH SLAB WIDTH >>>>>>>	50.66	FT		
ORIGINAL BRIDGE APPROACH WIDTH >>>>>>>	0	FT		
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	0.0	FT		
AVERAGE % OF APPROACH SLOPE >>>>>>>	2.10%			
ROADWAY WIDTH AT GRADE >>>>>>>	0	FT		
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	0.0	FT		
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	0	LF		
**** RETAINING WALL AUTOMATIC CALCULATION ****				
BRIDGE HEIGHT >>>>>>>	29.6			
BRIDGE WIDTH (OUT-TO-OUT INCLUDING MEDIAN) >>>>>>>	50.66		EXTRA FOR SKEW	
SKEW? (ENTER Y or N) >>>>>>>	Y		1,032 SF	
TOTAL RE-WALL >>>>>>>	**7,030**	SF		

CUSTOM BRIDGE APPROACH - RURAL 2:1 SLOPE		DRAINAGE SIDES	2	
BORROW EMBANKMENT	0	CY	$8.30	$0.00
LESS EXISTING EMBANKMENT	0	CY	($8.30)	$0.00
EXCAVATE EXCESS FILL (IF > 0)	0	CY	$5.30	$0.00
COLLECTOR PIPE (24" RCP)	2000	LF	$70.00	$140,000.00
CMP OUTLET PIPE (18" CMP)	500	LF	$35.00	$17,500.00
CROSSDRAINS (18" RCP)	820	LF	$35.00	$28,700.00
DITCH BOTTOM INLETS	10	EA	$5,000.00	$50,000.00
INLET (TYPE S)	20	EA	$3,500.00	$70,000.00
MITERED END SECTIONS	10	EA	$5,000.00	$50,000.00
SOD	20,289	SY	$1.50	$30,433.50
SHOULDER GUTTER (LESS S INLETS)	3,628	LF	$24.00	$87,068.80
GUARDRAIL (OUTSIDE ONLY, NOT IN MEDIAN)	3,735	LF	$4.00	$14,938.67
APPROACH SLABS	2	EA	$30,396.00	$60,792.00
			TOTAL $ EA	$549,432.97

Bridge End Bents and Wing Walls

Segment 1	Avg Height	Area (sf)
Bridge 1A - Begin Bridge	29.4	3218
Bridge 1A - End Bridge	32.1	3687
Bridge 1B - Begin Bridge	28.9	3134
Bridge 1B - End Bridge	29.0	3151
Bridge 2A - Begin Bridge	31.9	3651
Bridge 2A - End Bridge	29.5	3235
Bridge 2B - Begin Bridge	32.0	3669
Bridge 2B - End Bridge	29.7	3269
Segment 1 Total		**27015**

Formula for Mainline: (50.66(H) + 2H^2)
50.66 is the width of bridge out-to-out (includes barrier wall)
assumes a 2:1 front slope
H = Height of Fill as measured in MicroStation
Formula for 1-Lane Ramp: (29.66(H) + 2H^2)*Length
29.66 is the width of 15 lane, 2 6-foot shoulders, and 2 - 1.33 ft barrier wall per side
assumes a 2:1 front slope
H = Height of Fill

Formula for 2-Lane Ramp: (44.66(H) + 2H^2)*Length
44.66 is the width of 24 lanes, 8 ft inside shoulder, 10 ft outside shoulder, and 2 - 1.33 ft barrier wall per side
assumes a 2:1 front slope
H = Height of Fill

*Adjusted to remove wingwall(s) where MSE walls are used

Forumlas (DO NOT INPUT VALUES)

Input station range (numerical only)
Input area sf as measured in MicroStaion

Output mainline segments

MSE Walls

Segment 3	Measured Area (sf)
Bridge 1A - Begin Bridge (one side)	
Bridge 1A - End Bridge (one side)	
Bridge 1B - Begin Bridge (one side)	
Bridge 1B - End Bridge (one side)	
Bridge 2A - Begin Bridge	
Bridge 2A - End Bridge	
Bridge 2B - Begin Bridge	
Bridge 2B - End Bridge	
Segment 3 Total	**0**

Additional Earthwork for Retaining Walls				
Segment 3	Width (lf)	Measured Area (sf)	Volume (cf)	Volume (cy)
Bridge 1A Begin Bridge (Northside Only)	0	0	0	0
Bridge 1A End Bridge (Northside Only)	0	0	0	0
Bridge 1B Begin Bridge (Southside Only)	0	0	0	0
Bridge 1B End Bridge (Southside Only)	0	0	0	0
Segment 3 Total				**0**

Formula: Width * Measured Area
Measured Area in MicroStation

Input area sf as measured in MicroStaion
Output

Additional Earthwork over 3 ft Fill

Jack Brack Parclo				Area (sf)	Length	Avg Height	Volume (cf)	Volume (cy)
Area 1	+1.00	to	888+86.54	2868	88885.54	0.03	625594	23171
Area 2	889+53.47	to	903+88.77	20005	1435.3	13.94	5476397	202830
Area 3	906+72.65	to	919+12.61	19109	1239.96	15.41	5343716	197916
Area 4	920+93.31	to	943+37.29	4465	2243.98	1.99	1008907	37367
Nova Road Connection Option 1 Total								**461284**

Formula for Mainline: (218(H) + 4H^2)*Length

218 is the width of roadway from WB outside shoulder to EB outside shoulder (first 3 ft are 6:1)
218 is the width of typical section at a 3 ft fill depth which is taken into account in the cost per mile calculations

Formula for 1-Lane Ramp: (31(H) + 2H^2)*Length
31 is the width of 15 lane, 2 6-foot shoulders, and 2 ft per side for guardrail
assumes a 2:1 front slope
H = Height of Fill

Formula for 2-Lane Ramp: (46(H) + 2H^2)*Length
46 is the width of 24 lanes, 8 ft inside shoulder, 10 ft outside shoulder, and 2 ft per side for guardrail
assumes a 2:1 front slope
H = Height of Fill

*Adjust for Wall Earthwork

Forumlas (DO NOT INPUT VALUES)

Input station range (numerical only)
Input area sf as measured in MicroStaion

Output mainline segments

Additional Earthwork for Muck				
Segment 3	Area (sf)	Avg Height	Volume (cf)	Volume (cy)
Area 1	0	4	0	0
Segment 3 Total				**0**

Formula: Area*Avg Height

Input area sf as measured in MicroStaion

Nova Road Connection – Option 2

SUMMARY

ESTIMATED PROBABLE PROJECT COST

Northeast Connector Phase I - Segment B
Nova Road Connection Option 2

PREPARED BY RS&H

PROJECT CENTERLINE MILES:	1.801
NUMBER OF BRIDGES:	4

NE Connector Mainline				$47,393,740
Nova Road Interchange				$4,117,298
TOTAL (2021 CONSTRUCTION COST)				**$51,511,039**
ENGINEERING / ADMINISTRATION / LEGAL (24%)				$12,362,649
RIGHT - OF - WAY	70	ACRES		$6,300,000
MITIGATION	7.0	ACRES	$ 150,000	$1,050,000
TOLL COLLECTION EQUIPMENT	6	LANES @	$ 275,000	$1,650,000
GRAND TOTAL PROJECT COST				**$72,873,688**

ESTIMATED PROBABLE CONSTRUCTION COST

NE Connector - Nova Road Connection Option 2 (Mainline Roadway)

PREPARED BY *RS&H*

ITEM	QUANTITY			UNIT	UNIT PRICE	TOTAL
** EXPRESSWAYS **						
MAINLINE ROADWAY TYPICAL - Segment 1	4625	lf	0.876	MI	$4,899,924	$4,292,073
MAINLINE ROADWAY TYPICAL - Segment 2	1654	lf	0.313	MI	$4,899,924	$1,534,938
MAINLINE ROADWAY TYPICAL - Segment 3	2831	lf	0.536	MI	$4,899,924	$2,627,213
** BRIDGES **						
BRIDGE 3A (250 lf x 51 lf)						
SB NE CONNECTOR OVER CANAL C-32C	12,652	sf	12,652	SF	$125	$1,581,500
APPROACH SLABS (BEGIN & END BRIDGE) (DOES NOT INCLUDE EARTHWORK)	1	ea	1	EA	$659,440	$659,440
BRIDGE 3B (250 lf x 51 lf)						
NB NE CONNECTOR OVER CANAL C-32C	12,652	sf	12,652	SF	$125	$1,581,500
APPROACH SLABS (BEGIN & END BRIDGE) (DOES NOT INCLUDE EARTHWORK)	1	ea	1	EA	$569,536	$569,536
BRIDGE 4A (152 lf x 51 lf)						
SB NE CONNECTOR OVER CANAL C-32C	7,653	sf	7,653	SF	$125	$956,625
APPROACH SLABS (BEGIN & END BRIDGE) (DOES NOT INCLUDE EARTHWORK)	1	ea	1	EA	$674,629	$674,629
BRIDGE 4B (152 lf x 51 lf)						
NB NE CONNECTOR OVER CANAL C-32C	7,651	sf	7,651	SF	$125	$956,375
APPROACH SLABS (BEGIN & END BRIDGE) (DOES NOT INCLUDE EARTHWORK)	1	ea	1	EA	$677,257	$677,257
RETAINING WALLS (MSE & ABUTMENTS)	30,766	sf	30,766	SF	$34	$1,046,047
** ADDITIONAL ITEMS **						
ADDITIONAL EARTHWORK FOR FILL OVER 3 FT	1,265,176	cy	1,265,176	CY	$8	$10,121,408
OVERHEAD LIGHTING (INCLUDES WIRING) (2 SIDES, 200' SPACING)	9,510	lf	1.801	MI	$554,800	$999,270
OVERHEAD TRUSS SIGNS	4	ea	4	EA	$250,000	$1,000,000
OVERHEAD CANTILEVER SIGNS	3	ea	3	EA	$80,000	$240,000
MULTIPOST SIGNS	4	ea	4	EA	$5,500	$22,000
FIBER OPTIC NETWORK (FON) (CONDUIT, 72 WIRE, PULL BOXES, SPLICE, ETC.)	9,510	lf	1.801	MI	$350,000	$630,398
DYNAMIC MESSAGE SIGNS	0	ea	0	EA	$250,000	$0
RETENTION POND CONSTRUCTION	22.9	ac	22.90	AC	$77,141	$1,766,521
RETENTION POND EXCAVATION	82,877	cy	82,876.90	CY	$5	$439,248
RETENTION POND SODDING	55,999	sy	55,998.80	SY	$3	$139,997
RETENTION POND CLEARING & GRUBBING	13	ac	13.30	AC	$17,000	$226,100
RETENTION POND ADDITIONAL DRAINAGE	1	ea	1.00	EA	$304,960	$304,960
REMOVE A-8 MATERIAL (ASSUME 4 FT PER SF OF MUCK)	0	cy	-	CY	$5	$0
REPLACE A-8 MATERIAL (ASSUME 4 FT PER SF OF MUCK)	0	cy	-	CY	$8	$0
MAINLINE TOLL GANTRY (2 LANE, 2 TRUSSES AND EQUIP. BLDG)	1	ea	1	EA	$1,750,000	$1,750,000

SUB-TOTAL	$34,797,035
EROSION CONTROL / TEMPORARY DRAINAGE (0.5%)	$173,985
MAINTENANCE OF TRAFFIC (1%)	$347,970
MOBILIZATION (9.5%)	$3,305,718
SUB-TOTAL ROADWAY	$29,921,800
ROADWAY CONTINGENCY (20%)	$5,984,360
SUB-TOTAL BRIDGES	$8,702,909
BRIDGE CONTINGENCY (10%)	$870,291
SUB-TOTAL	$45,479,359
AESTHETICS CONTINGENCY (3%)	$1,364,381
RELOCATE UTILITIES	$0
ALLOWANCE FOR DISPUTES REVIEW BOARD	$50,000
WORK ORDER ALLOWANCE	$500,000
TOTAL (2019 CONSTRUCTION COST)	**$47,393,740**

ESTIMATED PROBABLE CONSTRUCTION COST

Nova Road Connection Option 2

PREPARED BY *RS&H*

ITEM	QUANTITY			UNIT	UNIT PRICE	TOTAL
** RAMPS **						
** ARTERIAL ROADS **						
Nova Road						
2-LANE UNDIVIDED	200	LF	0.038	MI	$2,212,699	$83,814
4-LANE DIVIDED	2503	lf	0.474	MI	$4,429,390	$2,099,766
MEDIAN CROSSOVER - NEW CONSTRUCTION	1	ea	1	EA	$8,080	$8,080
DEMOLISH EXISTING ARTERIAL ROAD	2703	lf	0.512	MI	$305,760	$156,528
BOX CULVERT EXTENSION - CONCRETE IV	92	cy		EA	$1,032	$94,925
BOX CULVERT EXTENSION - REBAR WEIGHT	12772	lb		EA	$1	$11,878
** INTERSECTION SIGNALIZATION **						
SIGNALIZATION PER INTERCHANGE	1	ea	1	EA	$142,064	$142,064
** ADDITIONAL ITEMS **						
OVERHEAD LIGHTING (INCLUDES WIRING) (1 SIDE, 200' SPACING)	2,703	lf	0.512	MI	$277,400	$142,010
MULTIPOST SIGNS	4	ea	4	EA	$5,500	$22,000
ITS EQUIPMENT / DEVICES PER INTERCHANGE (CCTV, TMS, ETC.)	1	int	1	INT	$330,000	$330,000
RETENTION POND CONSTRUCTION	0	sf	0.00	AC	$177,813	$0
RAMP TOLL GANTRY (2 RAMPS @ 1 LANE EA, 1 TRUSS AND EQUIP. BLDG)	-	ea	-	EA	$1,250,000	$0

SUB-TOTAL	$3,091,065
EROSION CONTROL / TEMPORARY DRAINAGE (0.5%)	$15,455
MAINTENANCE OF TRAFFIC (1%)	$30,911
MOBILIZATION (9.5%)	$293,651
SUB-TOTAL	$3,431,082
ROADWAY CONTINGENCY (20%)	$686,216
TOTAL (2019 CONSTRUCTION COST)	**$4,117,298**

Bridge Development Report Cost Estimating

Step Three: Cost Estimate Comparison to Historical Bridge Cost

The final step is a comparison of the cost estimate by comparison with historic bridge cost based on a cost per square foot. These total cost numbers are calculated exclusively for the bridge cost as defined in the General Section of this chapter. Price computed by Steps 1 and 2 should be generally within the range of cost as supplied herein. If the cost falls outside the provided range, good justification must be provided.

	Total Cost per Square Foot	
Bridge Superstructure Type	**Low**	**High**
Short Span Bridges:		
Reinforced Concrete Flat Slab- Simple Span [1]	$115	$160
Pre-cast Concrete Slab - Simple Span [1]	$110	$200
Medium Span Bridges:		
Concrete Deck / Steel Girder - Simple Span [1]	$125	$142
Concrete Deck / Steel Girder - Continuous Span [1]	$135	$170
Concrete Deck / Prestressed Girder - Simple Span [1]	$90	$145
Concrete Deck / Prestressed Girder - Continuous Span [1]	$95	$211
Concrete Deck / Steel Box Girder [1] -	$140	$180
Span range from 150' to 280' (for curvature, add 15% premium)		
Segmental Concrete Box Girders - Cantilever Construction	$140	$160
Span range from 150' to 280'		
Demolition Costs:		
Typical	$35	$60
Bascule	$60	$70
Project Type		
Widening (Construction Only)	$85	$160

[1] Increase the cost by twenty percent for phased construction

TYPICAL XWAY / CROSSROAD — Bridge 3A

BRIDGE APPROACH - RURAL - 2:1 SLOPE

TOTAL OUT-TO-OUT WIDTH OF BRIDGE APPROACH >>>>>>>	50.66	FT	
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	32.55	FT	1.37% = 1314'
AVERAGE % OF APPROACH SLOPE >>>>>>>	1.90%		3.00% = 600'
ROADWAY WIDTH AT GRADE >>>>>>>	41.66	FT	
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	3	FT	
COST OF BRIDGE APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>			**$659,440**
MEDIAN? (ENTER Y OR N) >>>>>>>	Y		
CROSSDRAIN WIDTH >>>>>>>	82		
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	1,555	LF	
FEET FROM TOUCHDOWN TO 10' HEIGHT >>>>>>>	368	LF	
DISTANCE OF APPROACH ABOVE 10' HEIGHT (GR & SHO GUT L) >>>>>>>	1,187	LF	
APPROACH SLAB WIDTH >>>>>>>	50.66	FT	
ORIGINAL BRIDGE APPROACH WIDTH >>>>>>>	0	FT	
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	0.0	FT	
AVERAGE % OF APPROACH SLOPE >>>>>>>	1.90%		
ROADWAY WIDTH AT GRADE >>>>>>>	0	FT	
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	0.0	FT	
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	0	LF	
**** RETAINING WALL AUTOMATIC CALCULATION ****			
BRIDGE HEIGHT >>>>>>>	32.55		
BRIDGE WIDTH (OUT-TO-OUT INCLUDING MEDIAN) >>>>>>>	50.66		EXTRA FOR SKEW
SKEW? (ENTER Y or N) >>>>>>>	y		1,156 SF
TOTAL RE-WALL >>>>>>>	**8,186**	SF	

CUSTOM BRIDGE APPROACH - RURAL 2:1 SLOPE — DRAINAGE SIDES: 2

BORROW EMBANKMENT	0	CY	$8.30	$0.00
LESS EXISTING EMBANKMENT	0	CY	($8.30)	$0.00
EXCAVATE EXCESS FILL (IF > 0)	0	CY	$5.30	$0.00
COLLECTOR PIPE (24" RCP)	2400	LF	$70.00	$168,000.00
CMP OUTLET PIPE (18" CMP)	600	LF	$35.00	$21,000.00
CROSSDRAINS (18" RCP)	984	LF	$35.00	$34,440.00
DITCH BOTTOM INLETS	12	EA	$5,000.00	$60,000.00
INLET (TYPE S)	24	EA	$3,500.00	$84,000.00
MITERED END SECTIONS	12	EA	$5,000.00	$60,000.00
SOD	27,540	SY	$1.50	$41,310.00
SHOULDER GUTTER (LESS S INLETS)	4,621	LF	$24.00	$110,901.42
GUARDRAIL (OUTSIDE ONLY, NOT IN MEDIAN)	4,749	LF	$4.00	$18,996.21
APPROACH SLABS	2	EA	$30,396.00	$60,792.00
			TOTAL $ EA	$659,439.63

TYPICAL XWAY / CROSSROAD — Bridge 3B

BRIDGE APPROACH - RURAL - 2:1 SLOPE

TOTAL OUT-TO-OUT WIDTH OF BRIDGE APPROACH >>>>>>>	50.66	FT	
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	30.3	FT	1.37% = 1314'
AVERAGE % OF APPROACH SLOPE >>>>>>>	1.90%		3.00% = 600'
ROADWAY WIDTH AT GRADE >>>>>>>	41.66	FT	
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	3	FT	
COST OF BRIDGE APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>			**$569,536**
MEDIAN? (ENTER Y OR N) >>>>>>>	Y		
CROSSDRAIN WIDTH >>>>>>>	82		
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	1,437	LF	
FEET FROM TOUCHDOWN TO 10' HEIGHT >>>>>>>	368	LF	
DISTANCE OF APPROACH ABOVE 10' HEIGHT (GR & SHO GUT L) >>>>>>>	1,069	LF	
APPROACH SLAB WIDTH >>>>>>>	50.66	FT	
ORIGINAL BRIDGE APPROACH WIDTH >>>>>>>	0	FT	
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	0.0	FT	
AVERAGE % OF APPROACH SLOPE >>>>>>>	1.90%		
ROADWAY WIDTH AT GRADE >>>>>>>	0	FT	
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	0.0	FT	
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	0	LF	
**** RETAINING WALL AUTOMATIC CALCULATION ****			
BRIDGE HEIGHT >>>>>>>	30.3		
BRIDGE WIDTH (OUT-TO-OUT INCLUDING MEDIAN) >>>>>>>	50.66		EXTRA FOR SKEW
SKEW? (ENTER Y or N) >>>>>>>	y		1,062 SF
TOTAL RE-WALL >>>>>>>	**7,298**	SF	

CUSTOM BRIDGE APPROACH - RURAL 2:1 SLOPE — DRAINAGE SIDES: 2

BORROW EMBANKMENT	0	CY	$8.30	$0.00
LESS EXISTING EMBANKMENT	0	CY	($8.30)	$0.00
EXCAVATE EXCESS FILL (IF > 0)	0	CY	$5.30	$0.00
COLLECTOR PIPE (24" RCP)	2000	LF	$70.00	$140,000.00
CMP OUTLET PIPE (18" CMP)	500	LF	$35.00	$17,500.00
CROSSDRAINS (18" RCP)	820	LF	$35.00	$28,700.00
DITCH BOTTOM INLETS	10	EA	$5,000.00	$50,000.00
INLET (TYPE S)	20	EA	$3,500.00	$70,000.00
MITERED END SECTIONS	10	EA	$5,000.00	$50,000.00
SOD	23,598	SY	$1.50	$35,397.00
SHOULDER GUTTER (LESS S INLETS)	4,169	LF	$24.00	$100,045.64
GUARDRAIL (OUTSIDE ONLY, NOT IN MEDIAN)	4,275	LF	$4.00	$17,101.47
APPROACH SLABS	2	EA	$30,396.00	$60,792.00
			TOTAL $ EA	$569,536.12

TYPICAL XWAY / CROSSROAD — Bridge 4A

BRIDGE APPROACH - RURAL - 2:1 SLOPE

TOTAL OUT-TO-OUT WIDTH OF BRIDGE APPROACH >>>>>>>	50.66	FT	
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	34.3	FT	1.37% = 1314'
AVERAGE % OF APPROACH SLOPE >>>>>>>	1.90%		3.00% = 600'
ROADWAY WIDTH AT GRADE >>>>>>>	41.66	FT	
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	3	FT	
COST OF BRIDGE APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>			**$674,629**
MEDIAN? (ENTER Y OR N) >>>>>>>	Y		
CROSSDRAIN WIDTH >>>>>>>	82		
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	1,647	LF	
FEET FROM TOUCHDOWN TO 10' HEIGHT >>>>>>>	368	LF	
DISTANCE OF APPROACH ABOVE 10' HEIGHT (GR & SHO GUT L) >>>>>>>	1,279	LF	
APPROACH SLAB WIDTH >>>>>>>	50.66	FT	

ORIGINAL BRIDGE APPROACH WIDTH >>>>>>>	0	FT		
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	0.0	FT		
AVERAGE % OF APPROACH SLOPE >>>>>>>	1.90%			
ROADWAY WIDTH AT GRADE >>>>>>>	0	FT		
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	0.0	FT		
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	0	LF		
** RETAINING WALL AUTOMATIC CALCULATION **				
BRIDGE HEIGHT >>>>>>>	34.3			
BRIDGE WIDTH (OUT-TO-OUT INCLUDING MEDIAN) >>>>>>>	50.66		EXTRA FOR SKEW	
SKEW? (ENTER Y or N) >>>>>>>	y		1,230 SF	
TOTAL RE-WALL >>>>>>>	**8,904**	SF		

CUSTOM BRIDGE APPROACH - RURAL 2:1 SLOPE		DRAINAGE SIDES	2	
BORROW EMBANKMENT	0	CY	$8.30	$0.00
LESS EXISTING EMBANKMENT	0	CY	($8.30)	$0.00
EXCAVATE EXCESS FILL (IF > 0)	0	CY	$5.30	$0.00
COLLECTOR PIPE (24" RCP)	2400	LF	$70.00	$168,000.00
CMP OUTLET PIPE (18" CMP)	600	LF	$35.00	$21,000.00
CROSSDRAINS (18" RCP)	984	LF	$35.00	$34,440.00
DITCH BOTTOM INLETS	12	EA	$5,000.00	$60,000.00
INLET (TYPE S)	24	EA	$3,500.00	$84,000.00
MITERED END SECTIONS	12	EA	$5,000.00	$60,000.00
SOD	30,789	SY	$1.50	$46,183.50
SHOULDER GUTTER (LESS S INLETS)	4,989	LF	$24.00	$119,743.53
GUARDRAIL (OUTSIDE ONLY, NOT IN MEDIAN)	5,117	LF	$4.00	$20,469.89
APPROACH SLABS	2	EA	$30,396.00	$60,792.00
			TOTAL $ EA	$674,628.92

TYPICAL XWAY / CROSSROAD

Bridge 4B

BRIDGE APPROACH - RURAL - 2:1 SLOPE

TOTAL OUT-TO-OUT WIDTH OF BRIDGE APPROACH >>>>>>>	50.66	FT		
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	34.6	FT	1.37% = 1314'	
AVERAGE % OF APPROACH SLOPE >>>>>>>	1.90%		3.00% = 600'	
ROADWAY WIDTH AT GRADE >>>>>>>	41.66	FT		
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	3	FT		
COST OF BRIDGE APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>			**$677,257**	
MEDIAN? (ENTER Y OR N) >>>>>>>	Y			
CROSSDRAIN WIDTH >>>>>>>	82			
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	1,663	LF		
FEET FROM TOUCHDOWN TO 10' HEIGHT >>>>>>>	368	LF		
DISTANCE OF APPROACH ABOVE 10' HEIGHT (GR & SHO GUT L) >>>>>>>	1,295	LF		
APPROACH SLAB WIDTH >>>>>>>	50.66	FT		
ORIGINAL BRIDGE APPROACH WIDTH >>>>>>>	0	FT		
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	0.0	FT		
AVERAGE % OF APPROACH SLOPE >>>>>>>	1.90%			
ROADWAY WIDTH AT GRADE >>>>>>>	0	FT		
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	0.0	FT		
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	0	LF		
** RETAINING WALL AUTOMATIC CALCULATION **				
BRIDGE HEIGHT >>>>>>>	34.6			
BRIDGE WIDTH (OUT-TO-OUT INCLUDING MEDIAN) >>>>>>>	50.66		EXTRA FOR SKEW	
SKEW? (ENTER Y or N) >>>>>>>	y		1,242 SF	
TOTAL RE-WALL >>>>>>>	**9,030**	SF		

CUSTOM BRIDGE APPROACH - RURAL 2:1 SLOPE		DRAINAGE SIDES	2	
BORROW EMBANKMENT	0	CY	$8.30	$0.00
LESS EXISTING EMBANKMENT	0	CY	($8.30)	$0.00
EXCAVATE EXCESS FILL (IF > 0)	0	CY	$5.30	$0.00
COLLECTOR PIPE (24" RCP)	2400	LF	$70.00	$168,000.00
CMP OUTLET PIPE (18" CMP)	600	LF	$35.00	$21,000.00
CROSSDRAINS (18" RCP)	984	LF	$35.00	$34,440.00
DITCH BOTTOM INLETS	12	EA	$5,000.00	$60,000.00
INLET (TYPE S)	24	EA	$3,500.00	$84,000.00
MITERED END SECTIONS	12	EA	$5,000.00	$60,000.00
SOD	31,362	SY	$1.50	$47,043.00
SHOULDER GUTTER (LESS S INLETS)	5,052	LF	$24.00	$121,259.32
GUARDRAIL (OUTSIDE ONLY, NOT IN MEDIAN)	5,181	LF	$4.00	$20,722.53
APPROACH SLABS	2	EA	$30,396.00	$60,792.00
			TOTAL $ EA	$677,256.84

Bridge End Bents and Wing Walls

Segment 1	Avg Height	Area (sf)
Bridge 1A - Begin Bridge	31.2	3527
Bridge 1A - End Bridge	33.9	4016
Bridge 1B - Begin Bridge	30.8	3458
Bridge 1B - End Bridge	29.8	3286
Bridge 2A - Begin Bridge	35.0	4223
Bridge 2A - End Bridge	33.6	3960
Bridge 2B - Begin Bridge	35.3	4280
Bridge 2B - End Bridge	33.9	4016
Segment 1 Total		**30766**

Formula for Mainline: (50.66(H) + 2H^2)
50.66 is the width of bridge out-to-out (includes barrier wall)
assumes a 2:1 front slope
H = Height of Fill as measured in MicroStation
Formula for 1-Lane Ramp: (29.66(H) + 2H^2)*Length
29.66 is the width of 15 lane, 2 6-foot shoulders, and 2 - 1.33 ft barrier wall per side
assumes a 2:1 front slope
H = Height of Fill

Formula for 2-Lane Ramp: (44.66(H) + 2H^2)*Length
44.66 is the width of 24 lanes, 8 ft inside shoulder, 10 ft outside shoulder, and 2 - 1.33 ft barrier wall per side
assumes a 2:1 front slope
H = Height of Fill

*Adjusted to remove wingwall(s) where MSE walls are used

Forumlas (DO NOT INPUT VALUES)

Input station range (numerical only)
Input area sf as measured in MicroStaion

Output mainline segments

MSE Walls

Segment 3	Measured Area (sf)
Bridge 1A - Begin Bridge (one side)	
Bridge 1A - End Bridge (one side)	
Bridge 1B - Begin Bridge (one side)	
Bridge 1B - End Bridge (one side)	
Bridge 2A - Begin Bridge	
Bridge 2A - End Bridge	
Bridge 2B - Begin Bridge	
Bridge 2B - End Bridge	
Segment 3 Total	**0**

Additional Earthwork for Retaining Walls				
Segment 3	Width (lf)	Measured Area (sf)	Volume (cf)	Volume (cy)
Bridge 1A Begin Bridge (Northside Only)	0	0	0	0
Bridge 1A End Bridge (Northside Only)	0	0	0	0
Bridge 1B Begin Bridge (Southside Only)	0	0	0	0
Bridge 1B End Bridge (Southside Only)	0	0	0	0
Segment 3 Total				**0**

Formula: Width * Measured Area
Measured Area in MicroStation

Input area sf as measured in MicroStaion
Output

Additional Earthwork over 3 ft Fill

Jack Brack Parclo				Area (sf)	Length	Avg Height	Volume (cf)	Volume (cy)
Area 1	864+88.90	to	884+48.58	2420	1959.68	1.23	539514	19982
Area 2	889+54.62	to	900+16.78	14314	1062.16	13.48	3892052	144151
Area 3	902+57.70	to	919+11.72	57523	1654.02	34.78	20542083	760818
Area 4	920+62.75	to	940+92.98	32181	2030.23	15.85	9055851	335402
Area 5	945+42.04	to	948+60.97	578	318.93	1.81	130194	4823
Nova Road Connection Option 2 Total								**1265176**

Formula for Mainline: (218(H) + 4H^2)*Length

218 is the width of roadway from WB outside shoulder to EB outside shoulder (first 3 ft are 6:1)

218 is the width of roadway from WB outside shoulder to EB outside shoulder (first 3 ft are 6:1)
218 is the width of typical section at a 3 ft fill depth which is taken into account in the cost per mile calculations

Formula for 1-Lane Ramp: (31(H) + 2H^2)*Length
31 is the width of 15 lane, 2 6-foot shoulders, and 2 ft per side for guardrail
assumes a 2:1 front slope
H = Height of Fill

Formula for 2-Lane Ramp: (46(H) + 2H^2)*Length
46 is the width of 24 lanes, 8 ft inside shoulder, 10 ft outside shoulder, and 2 ft per side for guardrail
assumes a 2:1 front slope
H = Height of Fill

*Adjust for Wall Earthwork

Forumlas (DO NOT INPUT VALUES)

Input station range (numerical only)
Input area sf as measured in MicroStaion

Output mainline segments

Additional Earthwork for Muck				
Segment 3	Area (sf)	Avg Height	Volume (cf)	Volume (cy)
Area 1	0	4	0	0
Segment 3 Total				**0**

Formula: Area*Avg Height

Input area sf as measured in MicroStaion

Preferred Alternative

SUMMARY

ESTIMATED PROBABLE PROJECT COST

NE Connector - Preferred Alternative

PREPARED BY RS&H

PROJECT CENTERLINE MILES:	3.706
NUMBER OF BRIDGES:	8

NE Connector Mainline				$102,436,030
Jack Brack Interchange				$9,855,213
Nova Road Interchange				$7,407,046
TOTAL (2021 CONSTRUCTION COST)				**$112,291,243**
ENGINEERING / ADMINISTRATION / LEGAL (24%)				$26,949,898
RIGHT - OF - WAY	193	ACRES		$21,105,000
MITIGATION	18.0		$ 150,000	$2,700,000
TOLL COLLECTION EQUIPMENT	10	LANES @	$ 275,000	$2,750,000
GRAND TOTAL PROJECT COST				**$165,796,141**

ESTIMATED PROBABLE CONSTRUCTION COST

NE Connector Preferred Alternative (Mainline Roadway)

PREPARED BY *RS&H*

ITEM	QUANTITY			UNIT	UNIT PRICE	TOTAL
** EXPRESSWAYS **						
MAINLINE ROADWAY TYPICAL - Segment 1	2922	lf	0.553	MI	$4,899,924	$2,711,662
MAINLINE ROADWAY TYPICAL - Segment 2	2219	lf	0.420	MI	$4,899,924	$2,059,267
MAINLINE ROADWAY TYPICAL - Segment 3	9159	lf	1.735	MI	$4,899,924	$8,499,698
MAINLINE ROADWAY TYPICAL - Segment 4	1639	lf	0.310	MI	$4,899,924	$1,521,018
MAINLINE ROADWAY TYPICAL - Segment 5	1898	lf	0.359	MI	$4,899,924	$1,761,374
MAINLINE ROADWAY - 4 LANES UNDIVIDED - Segment 1	954	lf	0.181	MI	$2,618,087	$473,041
MAINLINE ADDITIONAL LANE - Segment 1	448	lf	0.085	MI	$425,592	$36,111
MAINLINE ADDITIONAL LANE - Segment 2	1139	lf	0.216	MI	$425,592	$91,809
MAINLINE ADDITIONAL LANE - Segment 3	731	lf	0.138	MI	$425,592	$58,922
MAINLINE ADDITIONAL LANE - Segment 4	491	lf	0.093	MI	$425,592	$39,577
MAINLINE ADDITIONAL LANE - Segment 5	344	lf	0.065	MI	$425,592	$27,728
MAINLINE ADDITIONAL LANE - Segment 6	369	lf	0.070	MI	$425,592	$29,743
BRIDGE 1A (175 lf x 63 lf)						
SB NE CONNECTOR OVER FUTURE ROAD NETWORK	10,946	sf	10,946	SF	$125	$1,368,250
APPROACH SLABS (BEGIN & END BRIDGE) (DOES NOT INCLUDE EARTHWORK)	1	ea	1	EA	$680,286	$680,286
BRIDGE 1B (175 lf x 63 lf)						
NB NE CONNECTOR OVER FUTURE ROAD NETWORK	10,946	sf	10,946	SF	$125	$1,368,250
APPROACH SLABS (BEGIN & END BRIDGE) (DOES NOT INCLUDE EARTHWORK)	1	ea	1	EA	$674,307	$674,307
BRIDGE 2A (173 lf x 51 lf)						
SB NE CONNECTOR OVER JACK BRACK ROAD	8,734	sf	8,734	SF	$125	$1,091,750
APPROACH SLABS (BEGIN & END BRIDGE) (DOES NOT INCLUDE EARTHWORK)	1	ea	1	EA	$546,799	$546,799
BRIDGE 2B (175 lf x 51 lf)						
NB NE CONNECTOR OVER JACK BRACK ROAD	8,860	sf	8,860	SF	$125	$1,107,500
APPROACH SLABS (BEGIN & END BRIDGE) (DOES NOT INCLUDE EARTHWORK)	1	ea	1	EA	$546,799	$546,799
BRIDGE 3A (261 lf x 51 lf)						
SB NE CONNECTOR OVER FUTURE ROAD NETWORK	13,202	sf	13,202	SF	$125	$1,650,250
APPROACH SLABS (BEGIN & END BRIDGE) (DOES NOT INCLUDE EARTHWORK)	1	ea	1	EA	$466,038	$466,038
BRIDGE 3B (261 lf x 51 lf)						
NB NE CONNECTOR OVER FUTURE ROAD NETWORK	13,202	sf	13,202	SF	$125	$1,650,250
APPROACH SLABS (BEGIN & END BRIDGE) (DOES NOT INCLUDE EARTHWORK)	1	ea	1	EA	$453,738	$453,738
BRIDGE 4A (172 lf x 51 lf)						
SB NE CONNECTOR OVER JACK BRACK ROAD	8,672	sf	8,672	SF	$125	$1,084,000
APPROACH SLABS (BEGIN & END BRIDGE) (DOES NOT INCLUDE EARTHWORK)	1	ea	1	EA	$667,177	$667,177
BRIDGE 4B (172 lf x 51 lf)						
NB NE CONNECTOR OVER JACK BRACK ROAD	8,670	sf	8,670	SF	$125	$1,083,750
APPROACH SLABS (BEGIN & END BRIDGE) (DOES NOT INCLUDE EARTHWORK)	1	ea	1	EA	$665,928	$665,928
RETAINING WALLS (MSE & ABUTMENTS)	59,742	sf	59,742	SF	$34	$2,031,216
** ADDITIONAL ITEMS **						
ADDITIONAL EARTHWORK FOR FILL OVER 3 FT	2,444,965	cy	2,444,965	CY	$8	$19,559,720
OVERHEAD LIGHTING (INCLUDES WIRING) (2 SIDES, 200' SPACING)	19,536	lf	3.700	MI	$0	$0
OVERHEAD TRUSS SIGNS	12	ea	12	EA	$250,000	$3,000,000
OVERHEAD CANTILEVER SIGNS	9	ea	9	EA	$80,000	$720,000
MULTIPOST SIGNS	12	ea	12	EA	$5,500	$66,000
FIBER OPTIC NETWORK (FON) (CONDUIT, 72 WIRE, PULL BOXES, SPLICE, ETC.)	19,536	lf	3.700	MI	$350,000	$1,295,000
DYNAMIC MESSAGE SIGNS	0	ea	0	EA	$250,000	$0
RETENTION POND CONSTRUCTION	70.4	ac	70.40	AC	$77,141	$5,430,702
RETENTION POND EXCAVATION	271,067	cy	271,067.40	CY	$5	$1,436,657
RETENTION POND SODDING	194,423	sy	194,422.80	SY	$3	$486,057
RETENTION POND CLEARING & GRUBBING	50	ac	49.50	AC	$17,000	$841,500
RETENTION POND ADDITIONAL DRAINAGE	1	ea	1.00	EA	$1,288,259	$1,288,259
REMOVE A-8 MATERIAL (ASSUME 4 FT PER SF OF MUCK)	2029	cy	2,029	CY	$5	$10,754
REPLACE A-8 MATERIAL (ASSUME 4 FT PER SF OF MUCK)	2029	cy	2,029	CY	$8	$16,841
MAINLINE TOLL GANTRY (2 LANE, 2 TRUSSES AND EQUIP. BLDG)	1	ea	1	EA	$1,750,000	$1,750,000

SUB-TOTAL	$70,347,727
EROSION CONTROL / TEMPORARY DRAINAGE (0.5%)	$351,739
MAINTENANCE OF TRAFFIC (1%)	$703,477
MOBILIZATION (9.5%)	$6,683,034
SUB-TOTAL ROADWAY	$68,585,748
ROADWAY CONTINGENCY (20%)	$13,717,150

SUB-TOTAL BRIDGES	$15,105,071
BRIDGE CONTINGENCY (10%)	$1,510,507
SUB-TOTAL	$98,918,476
AESTHETICS CONTINGENCY (3%)	$2,967,554
RELOCATE UTILITIES	$0
ALLOWANCE FOR DISPUTES REVIEW BOARD	$50,000
WORK ORDER ALLOWANCE	$500,000
TOTAL (2019 CONSTRUCTION COST)	**$102,436,030**

ESTIMATED PROBABLE CONSTRUCTION COST

Jack Brack Tighter Diamond Interchange

PREPARED BY *RS&H*

ITEM	QUANTITY		UNIT		UNIT PRICE	TOTAL
**** RAMPS ****						
ONE LANE RAMPS (OPEN DRAINAGE) - SB EXIT RAMP	1384	lf	0.262	MI	$1,223,837	$320,794
ONE LANE RAMPS (OPEN DRAINAGE) - SB ENTRANCE RAMP	1555	lf	0.295	MI	$1,223,837	$360,429
ONE LANE RAMPS (OPEN DRAINAGE) - NB EXIT RAMP	1232	lf	0.233	MI	$1,223,837	$285,562
ONE LANE RAMPS (OPEN DRAINAGE) - NB ENTRANCE RAMP	1530	lf	0.290	MI	$1,223,837	$354,634
TWO LANE RAMPS (OPEN DRAINAGE) - SB ENTRANCE RAMP	459	lf	0.087	MI	$1,661,517	$144,439
TWO LANE RAMPS (OPEN DRAINAGE) - SB EXIT RAMP	648	lf	0.123	MI	$1,661,517	$203,913
TWO LANE RAMPS (OPEN DRAINAGE) - NB EXIT RAMP	590	lf	0.112	MI	$1,661,517	$185,662
THREE LANE RAMPS (OPEN DRAINAGE) - NB ENTRANCE RAMP	525	lf	0.099	MI	$2,206,997	$219,446
TYPICAL 1 LANE ON-RAMP TAPER W/GORE - MAINLINE UNCHANGED	2	ea	2	EA	$219,329	$438,659
TYPICAL 1 LANE OFF-RAMP TAPER W/GORE - MAINLINE UNCHANGED	2	ea	2	EA	$129,358	$258,716
**** ARTERIAL ROADS ****						
Jack Brack Road						
4-LANE DIVIDED	2213	lf	0.419	MI	$4,429,390	$1,856,485
ADDITIONAL LANES WIDENING TO OUTSIDE - Segment 1	315	lf	0.060	MI	$406,857	$24,273
ADDITIONAL LANES WIDENING TO OUTSIDE - Segment 2	324	lf	0.061	MI	$406,857	$24,966
ADDITIONAL LANES MEDIAN WIDENING - Segment 1	622	lf	0.118	MI	$389,257	$45,856
ADDITIONAL LANES MEDIAN WIDENING - Segment 2	560	lf	0.106	MI	$389,257	$41,285
ADDITIONAL LANES MEDIAN WIDENING - Segment 3	507	lf	0.096	MI	$389,257	$37,378
MEDIAN CROSSOVER - NEW CONSTRUCTION	2	ea	2	EA	$8,080	$16,160.00
DEMOLISH EXISTING ARTERIAL ROAD	0	lf	0.000	MI	$305,760	$0
**** INTERSECTION SIGNALIZATION ****						
SIGNALIZATION PER INTERCHANGE	2	ea	2	EA	$269,948	$539,896
**** ADDITIONAL ITEMS ****						
OVERHEAD LIGHTING (INCLUDES WIRING) (1 SIDE, 200' SPACING)	7,923	lf	1.501	MI	$277,400	$416,258
MULTIPOST SIGNS	8	ea	8	EA	$5,500	$44,000
ITS EQUIPMENT / DEVICES PER INTERCHANGE (CCTV, TMS, ETC.)	1	int	1	INT	$330,000	$330,000
RETENTION POND CONSTRUCTION	0	sf	0.00	AC	$177,813	$0
RAMP TOLL GANTRY (2 RAMPS @ 1 LANE EA, 1 TRUSS AND EQUIP. BLDG)	1	ea	1	EA	$1,250,000	$1,250,000

SUB-TOTAL	$7,398,809
EROSION CONTROL / TEMPORARY DRAINAGE (0.5%)	$36,994
MAINTENANCE OF TRAFFIC (1%)	$73,988
MOBILIZATION (9.5%)	$702,887
SUB-TOTAL	$8,212,678
ROADWAY CONTINGENCY (20%)	$1,642,536
TOTAL (2019 CONSTRUCTION COST)	**$9,855,213**

ESTIMATED PROBABLE CONSTRUCTION COST

Nova Road Interchange

PREPARED BY *RS&H*

ITEM	QUANTITY		UNIT		UNIT PRICE	TOTAL
**** RAMPS ****						
**** ARTERIAL ROADS ****						
Nova Road						
2-LANE UNDIVIDED						
Segment 1	324	lf	0.061	MI	$3,194,262	$196,012
Segment 2	499	lf	0.095	MI	$3,194,262	$301,882
4-LANE DIVIDED	4375	lf	0.829	MI	$4,429,390	$3,670,186
ADDITIONAL LANES WIDENING TO OUTSIDE - Segment 1	344	lf	0.065	MI	$406,857	$26,507
ADDITIONAL LANES MEDIAN WIDENING - Segment 1	568	lf	0.108	MI	$389,257	$41,875
ADDITIONAL LANES MEDIAN WIDENING - Segment 2	518	lf	0.098	MI	$389,257	$38,188
MEDIAN CROSSOVER - NEW CONSTRUCTION	1	ea	1	EA	$8,080	$8,080.00
DEMOLISH EXISTING ARTERIAL ROAD	5198	lf	0.984	MI	$305,760	$301,012
BOX CULVERT EXTENSION - CONCRETE IV	177	cy		EA	$1,032	$182,627
BOX CULVERT EXTENSION - REBAR WEIGHT	29378	lb		EA	$1	$27,322
**** INTERSECTION SIGNALIZATION ****						
SIGNALIZATION PER INTERCHANGE	1	ea	1	EA	$142,064	$142,064
**** ADDITIONAL ITEMS ****						
OVERHEAD LIGHTING (INCLUDES WIRING) (1 SIDE, 200' SPACING)	5,198	lf	0.984	MI	$277,400	$273,092
MULTIPOST SIGNS	4	ea	4	EA	$5,500	$22,000
ITS EQUIPMENT / DEVICES PER INTERCHANGE (CCTV, TMS, ETC.)	1	int	1	INT	$330,000	$330,000
RETENTION POND CONSTRUCTION	0	sf	0.00	AC	$177,813	$0
RAMP TOLL GANTRY (2 RAMPS @ 1 LANE EA, 1 TRUSS AND EQUIP. BLDG)	-	ea	-	EA	$1,250,000	$0

SUB-TOTAL	$5,560,845
EROSION CONTROL / TEMPORARY DRAINAGE (0.5%)	$27,804
MAINTENANCE OF TRAFFIC (1%)	$55,608
MOBILIZATION (9.5%)	$528,280
SUB-TOTAL	$6,172,538
ROADWAY CONTINGENCY (20%)	$1,234,508
TOTAL (2019 CONSTRUCTION COST)	**$7,407,046**

Bridge Development Report Cost Estimating

Step Three: Cost Estimate Comparison to Historical Bridge Cost

The final step is a comparison of the cost estimate by comparison with historic bridge cost based on a cost per square foot. These total cost numbers are calculated exclusively for the bridge cost as defined in the General Section of this chapter. Price computed by Steps 1 and 2 should be generally within the range of cost as supplied herein. If the cost falls outside the provided range, good justification must be provided.

Bridge Superstructure Type	Total Cost per Square Foot Low	High
Short Span Bridges:		
Reinforced Concrete Flat Slab- Simple Span [1]	$115	$160
Pre-cast Concrete Slab - Simple Span [1]	$110	$200
Medium Span Bridges:		
Concrete Deck / Steel Girder - Simple Span [1]	$125	$142
Concrete Deck / Steel Girder - Continuous Span [1]	$135	$170
Concrete Deck / Prestressed Girder - Simple Span [1]	$90	$145
Concrete Deck / Prestressed Girder - Continuous Span [1]	$95	$211
Concrete Deck / Steel Box Girder [1] - Span range from 150' to 280' (for curvature, add 15% premium)	$140	$180
Segmental Concrete Box Girders - Cantilever Construction Span range from 150' to 280'	$140	$160
Demolition Costs:		
Typical	$35	$60
Bascule	$60	$70
Project Type		
Widening (Construction Only)	$85	$160

[1] Increase the cost by twenty percent for phased construction

TYPICAL XWAY / CROSSROAD

BRIDGE APPROACH - RURAL - 2:1 SLOPE

Bridge 1A

TOTAL OUT-TO-OUT WIDTH OF BRIDGE APPROACH >>>>>>>	62.66	FT	
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	31.1	FT	1.37% = 1314'
AVERAGE % OF APPROACH SLOPE >>>>>>>	1.75%		3.00% = 600'
ROADWAY WIDTH AT GRADE >>>>>>>	53.66	FT	
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	3	FT	
COST OF BRIDGE APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>			**$680,286**
MEDIAN? (ENTER Y OR N) >>>>>>>	Y		
CROSSDRAIN WIDTH >>>>>>>	94		Use 94 ft since this is a 3 lane bridge (82 lf +12 lf)
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	1,606	LF	
FEET FROM TOUCHDOWN TO 10' HEIGHT >>>>>>>	400	LF	
DISTANCE OF APPROACH ABOVE 10' HEIGHT (GR & SHO GUT L) >>>>>>>	1,206	LF	
APPROACH SLAB WIDTH >>>>>>>	62.66	FT	
ORIGINAL BRIDGE APPROACH WIDTH >>>>>>>	0	FT	
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	0.0	FT	
AVERAGE % OF APPROACH SLOPE >>>>>>>	1.75%		
ROADWAY WIDTH AT GRADE >>>>>>>	0	FT	
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	0.0	FT	
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	0	LF	
**** RETAINING WALL AUTOMATIC CALCULATION ****			
BRIDGE HEIGHT >>>>>>>	31.1		
BRIDGE WIDTH (OUT-TO-OUT INCLUDING MEDIAN) >>>>>>>	62.66		EXTRA FOR SKEW
SKEW? (ENTER Y or N) >>>>>>>	Y		1,355 SF
TOTAL RE-WALL >>>>>>>	**8,495**	SF	

CUSTOM BRIDGE APPROACH - RURAL 2:1 SLOPE — DRAINAGE SIDES: 2

BORROW EMBANKMENT	0	CY	$8.30	$0.00
LESS EXISTING EMBANKMENT	0	CY	($8.30)	$0.00
EXCAVATE EXCESS FILL (IF > 0)	0	CY	$5.30	$0.00
COLLECTOR PIPE (24" RCP)	2400	LF	$70.00	$168,000.00
CMP OUTLET PIPE (18" CMP)	600	LF	$35.00	$21,000.00
CROSSDRAINS (18" RCP)	1,128	LF	$35.00	$39,480.00
DITCH BOTTOM INLETS	12	EA	$5,000.00	$60,000.00
INLET (TYPE S)	24	EA	$3,500.00	$84,000.00
MITERED END SECTIONS	12	EA	$5,000.00	$60,000.00
SOD	27,100	SY	$1.50	$40,650.00
SHOULDER GUTTER (LESS S INLETS)	4,695	LF	$24.00	$112,672.73
GUARDRAIL (OUTSIDE ONLY, NOT IN MEDIAN)	4,823	LF	$4.00	$19,291.43
APPROACH SLABS	2	EA	$37,596.00	$75,192.00
			TOTAL $ EA	$680,286.16

TYPICAL XWAY / CROSSROAD

BRIDGE APPROACH - RURAL - 2:1 SLOPE

Bridge 1B

TOTAL OUT-TO-OUT WIDTH OF BRIDGE APPROACH >>>>>>>	62.66	FT	
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	30.45	FT	1.37% = 1314'
AVERAGE % OF APPROACH SLOPE >>>>>>>	1.75%		3.00% = 600'
ROADWAY WIDTH AT GRADE >>>>>>>	53.66	FT	
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	3	FT	
COST OF BRIDGE APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>			**$674,307**
MEDIAN? (ENTER Y OR N) >>>>>>>	Y		
CROSSDRAIN WIDTH >>>>>>>	94		
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	1,569	LF	
FEET FROM TOUCHDOWN TO 10' HEIGHT >>>>>>>	400	LF	
DISTANCE OF APPROACH ABOVE 10' HEIGHT (GR & SHO GUT L) >>>>>>>	1,169	LF	
APPROACH SLAB WIDTH >>>>>>>	62.66	FT	
ORIGINAL BRIDGE APPROACH WIDTH >>>>>>>	0	FT	
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	0.0	FT	
AVERAGE % OF APPROACH SLOPE >>>>>>>	1.75%		
ROADWAY WIDTH AT GRADE >>>>>>>	0	FT	
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	0.0	FT	
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	0	LF	
**** RETAINING WALL AUTOMATIC CALCULATION ****			
BRIDGE HEIGHT >>>>>>>	30.45		
BRIDGE WIDTH (OUT-TO-OUT INCLUDING MEDIAN) >>>>>>>	62.66		EXTRA FOR SKEW
SKEW? (ENTER Y or N) >>>>>>>	Y		1,321 SF
TOTAL RE-WALL >>>>>>>	**8,219**	SF	

CUSTOM BRIDGE APPROACH - RURAL 2:1 SLOPE — DRAINAGE SIDES: 2

BORROW EMBANKMENT	0	CY	$8.30	$0.00
LESS EXISTING EMBANKMENT	0	CY	($8.30)	$0.00
EXCAVATE EXCESS FILL (IF > 0)	0	CY	$5.30	$0.00
COLLECTOR PIPE (24" RCP)	2400	LF	$70.00	$168,000.00
CMP OUTLET PIPE (18" CMP)	600	LF	$35.00	$21,000.00
CROSSDRAINS (18" RCP)	1,128	LF	$35.00	$39,480.00
DITCH BOTTOM INLETS	12	EA	$5,000.00	$60,000.00
INLET (TYPE S)	24	EA	$3,500.00	$84,000.00
MITERED END SECTIONS	12	EA	$5,000.00	$60,000.00
SOD	25,887	SY	$1.50	$38,830.50
SHOULDER GUTTER (LESS S INLETS)	4,546	LF	$24.00	$109,107.02
GUARDRAIL (OUTSIDE ONLY, NOT IN MEDIAN)	4,674	LF	$4.00	$18,697.14
APPROACH SLABS	2	EA	$37,596.00	$75,192.00
			TOTAL $ EA	$674,306.66

TYPICAL XWAY / CROSSROAD

BRIDGE APPROACH - RURAL - 2:1 SLOPE

Bridge 2A

TOTAL OUT-TO-OUT WIDTH OF BRIDGE APPROACH >>>>>>>	50.66	FT	
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	30.5	FT	1.37% = 1314'
AVERAGE % OF APPROACH SLOPE >>>>>>>	2.25%		3.00% = 600'
ROADWAY WIDTH AT GRADE >>>>>>>	41.66	FT	
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	3	FT	
COST OF BRIDGE APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>			**$546,799**
MEDIAN? (ENTER Y OR N) >>>>>>>	Y		
CROSSDRAIN WIDTH >>>>>>>	82		
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	1,222	LF	
FEET FROM TOUCHDOWN TO 10' HEIGHT >>>>>>>	311	LF	
DISTANCE OF APPROACH ABOVE 10' HEIGHT (GR & SHO GUT L) >>>>>>>	911	LF	

APPROACH SLAB WIDTH >>>>>>>	50.66	FT	
ORIGINAL BRIDGE APPROACH WIDTH >>>>>>>	0	FT	
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	0.0	FT	
AVERAGE % OF APPROACH SLOPE >>>>>>>	2.25%		
ROADWAY WIDTH AT GRADE >>>>>>>	0	FT	
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	0.0	FT	
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	0	LF	
**** RETAINING WALL AUTOMATIC CALCULATION ****			
BRIDGE HEIGHT >>>>>>>	30.5		
BRIDGE WIDTH (OUT-TO-OUT INCLUDING MEDIAN) >>>>>>>	50.66		EXTRA FOR SKEW
SKEW? (ENTER Y or N) >>>>>>>	Y		1,070 SF
TOTAL RE-WALL >>>>>>>	**7,375**	SF	

CUSTOM BRIDGE APPROACH - RURAL 2:1 SLOPE — DRAINAGE SIDES: 2

BORROW EMBANKMENT	0	CY	$8.30	$0.00
LESS EXISTING EMBANKMENT	0	CY	($8.30)	$0.00
EXCAVATE EXCESS FILL (IF > 0)	0	CY	$5.30	$0.00
COLLECTOR PIPE (24" RCP)	2000	LF	$70.00	$140,000.00
CMP OUTLET PIPE (18" CMP)	500	LF	$35.00	$17,500.00
CROSSDRAINS (18" RCP)	820	LF	$35.00	$28,700.00
DITCH BOTTOM INLETS	10	EA	$5,000.00	$50,000.00
INLET (TYPE S)	20	EA	$3,500.00	$70,000.00
MITERED END SECTIONS	10	EA	$5,000.00	$50,000.00
SOD	20,209	SY	$1.50	$30,313.50
SHOULDER GUTTER (LESS S INLETS)	3,538	LF	$24.00	$84,914.13
GUARDRAIL (OUTSIDE ONLY, NOT IN MEDIAN)	3,645	LF	$4.00	$14,579.56
APPROACH SLABS	2	EA	$30,396.00	$60,792.00
			TOTAL $ EA	$546,799.19

TYPICAL XWAY / CROSSROAD — Bridge 2B

BRIDGE APPROACH - RURAL - 2:1 SLOPE

TOTAL OUT-TO-OUT WIDTH OF BRIDGE APPROACH >>>>>>>	50.66	FT	
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	30.5	FT	1.37% = 1314'
AVERAGE % OF APPROACH SLOPE >>>>>>>	2.25%		3.00% = 600'
ROADWAY WIDTH AT GRADE >>>>>>>	41.66	FT	
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	3	FT	
COST OF BRIDGE APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>			**$546,799**
MEDIAN? (ENTER Y OR N) >>>>>>>	Y		
CROSSDRAIN WIDTH >>>>>>>	82		
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	1,222	LF	
FEET FROM TOUCHDOWN TO 10' HEIGHT >>>>>>>	311	LF	
DISTANCE OF APPROACH ABOVE 10' HEIGHT (GR & SHO GUT L) >>>>>>>	911	LF	
APPROACH SLAB WIDTH >>>>>>>	50.66	FT	
ORIGINAL BRIDGE APPROACH WIDTH >>>>>>>	0	FT	
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	0.0	FT	
AVERAGE % OF APPROACH SLOPE >>>>>>>	2.25%		
ROADWAY WIDTH AT GRADE >>>>>>>	0	FT	
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	0.0	FT	
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	0	LF	
**** RETAINING WALL AUTOMATIC CALCULATION ****			
BRIDGE HEIGHT >>>>>>>	30.5		
BRIDGE WIDTH (OUT-TO-OUT INCLUDING MEDIAN) >>>>>>>	50.66		EXTRA FOR SKEW
SKEW? (ENTER Y or N) >>>>>>>	Y		1,070 SF
TOTAL RE-WALL >>>>>>>	**7,375**	SF	

CUSTOM BRIDGE APPROACH - RURAL 2:1 SLOPE — DRAINAGE SIDES: 2

BORROW EMBANKMENT	0	CY	$8.30	$0.00
LESS EXISTING EMBANKMENT	0	CY	($8.30)	$0.00
EXCAVATE EXCESS FILL (IF > 0)	0	CY	$5.30	$0.00
COLLECTOR PIPE (24" RCP)	2000	LF	$70.00	$140,000.00
CMP OUTLET PIPE (18" CMP)	500	LF	$35.00	$17,500.00
CROSSDRAINS (18" RCP)	820	LF	$35.00	$28,700.00
DITCH BOTTOM INLETS	10	EA	$5,000.00	$50,000.00
INLET (TYPE S)	20	EA	$3,500.00	$70,000.00
MITERED END SECTIONS	10	EA	$5,000.00	$50,000.00
SOD	20,209	SY	$1.50	$30,313.50
SHOULDER GUTTER (LESS S INLETS)	3,538	LF	$24.00	$84,914.13
GUARDRAIL (OUTSIDE ONLY, NOT IN MEDIAN)	3,645	LF	$4.00	$14,579.56
APPROACH SLABS	2	EA	$30,396.00	$60,792.00
			TOTAL $ EA	$546,799.19

TYPICAL XWAY / CROSSROAD — Bridge 3A

BRIDGE APPROACH - RURAL - 2:1 SLOPE

TOTAL OUT-TO-OUT WIDTH OF BRIDGE APPROACH >>>>>>>	50.66	FT	
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	32.5	FT	1.37% = 1314'
AVERAGE % OF APPROACH SLOPE >>>>>>>	2.70%		3.00% = 600'
ROADWAY WIDTH AT GRADE >>>>>>>	41.66	FT	
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	3	FT	
COST OF BRIDGE APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>			**$466,038**
MEDIAN? (ENTER Y OR N) >>>>>>>	Y		
CROSSDRAIN WIDTH >>>>>>>	82		
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	1,093	LF	
FEET FROM TOUCHDOWN TO 10' HEIGHT >>>>>>>	259	LF	
DISTANCE OF APPROACH ABOVE 10' HEIGHT (GR & SHO GUT L) >>>>>>>	834	LF	
APPROACH SLAB WIDTH >>>>>>>	50.66	FT	
ORIGINAL BRIDGE APPROACH WIDTH >>>>>>>	0	FT	
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	0.0	FT	
AVERAGE % OF APPROACH SLOPE >>>>>>>	2.70%		
ROADWAY WIDTH AT GRADE >>>>>>>	0	FT	
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	0.0	FT	
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	0	LF	
**** RETAINING WALL AUTOMATIC CALCULATION ****			
BRIDGE HEIGHT >>>>>>>	32.5		
BRIDGE WIDTH (OUT-TO-OUT INCLUDING MEDIAN) >>>>>>>	50.66		EXTRA FOR SKEW
SKEW? (ENTER Y or N) >>>>>>>	Y		1,154 SF
TOTAL RE-WALL >>>>>>>	**8,165**	SF	

CUSTOM BRIDGE APPROACH - RURAL 2:1 SLOPE — DRAINAGE SIDES: 2

BORROW EMBANKMENT	0	CY	$8.30	$0.00
LESS EXISTING EMBANKMENT	0	CY	($8.30)	$0.00
EXCAVATE EXCESS FILL (IF > 0)	0	CY	$5.30	$0.00
COLLECTOR PIPE (24" RCP)	1600	LF	$70.00	$112,000.00
CMP OUTLET PIPE (18" CMP)	400	LF	$35.00	$14,000.00
CROSSDRAINS (18" RCP)	656	LF	$35.00	$22,960.00
DITCH BOTTOM INLETS	8	EA	$5,000.00	$40,000.00
INLET (TYPE S)	16	EA	$3,500.00	$56,000.00
MITERED END SECTIONS	8	EA	$5,000.00	$40,000.00
SOD	19,316	SY	$1.50	$28,974.00
SHOULDER GUTTER (LESS S INLETS)	3,249	LF	$24.00	$77,974.33
GUARDRAIL (OUTSIDE ONLY, NOT IN MEDIAN)	3,334	LF	$4.00	$13,337.48
APPROACH SLABS	2	EA	$30,396.00	$60,792.00
			TOTAL $ EA	$466,037.81

TYPICAL XWAY / CROSSROAD — Bridge 3B

BRIDGE APPROACH - RURAL - 2:1 SLOPE

TOTAL OUT-TO-OUT WIDTH OF BRIDGE APPROACH >>>>>>>	50.66	FT		
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	30.45	FT	1.37% = 1314'	
AVERAGE % OF APPROACH SLOPE >>>>>>>	2.70%		3.00% = 600'	
ROADWAY WIDTH AT GRADE >>>>>>>	41.66	FT		
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	3	FT		
COST OF BRIDGE APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>			$453,738	
MEDIAN? (ENTER Y OR N) >>>>>>>	Y			
CROSSDRAIN WIDTH >>>>>>>	82			
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	1,017	LF		
FEET FROM TOUCHDOWN TO 10' HEIGHT >>>>>>>	259	LF		
DISTANCE OF APPROACH ABOVE 10' HEIGHT (GR & SHO GUT L) >>>>>>>	758	LF		
APPROACH SLAB WIDTH >>>>>>>	50.66	FT		
ORIGINAL BRIDGE APPROACH WIDTH >>>>>>>	0	FT		
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	0.0	FT		
AVERAGE % OF APPROACH SLOPE >>>>>>>	2.70%			
ROADWAY WIDTH AT GRADE >>>>>>>	0	FT		
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	0.0	FT		
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	0	LF		
**** RETAINING WALL AUTOMATIC CALCULATION ****				
BRIDGE HEIGHT >>>>>>>	30.45			
BRIDGE WIDTH (OUT-TO-OUT INCLUDING MEDIAN) >>>>>>>	50.66		EXTRA FOR SKEW	
SKEW? (ENTER Y or N) >>>>>>>	Y		1,068	SF
TOTAL RE-WALL >>>>>>>	7,355	SF		

CUSTOM BRIDGE APPROACH - RURAL 2:1 SLOPE		DRAINAGE SIDES	2	
BORROW EMBANKMENT	0	CY	$8.30	$0.00
LESS EXISTING EMBANKMENT	0	CY	($8.30)	$0.00
EXCAVATE EXCESS FILL (IF > 0)	0	CY	$5.30	$0.00
COLLECTOR PIPE (24" RCP)	1600	LF	$70.00	$112,000.00
CMP OUTLET PIPE (18" CMP)	400	LF	$35.00	$14,000.00
CROSSDRAINS (18" RCP)	656	LF	$35.00	$22,960.00
DITCH BOTTOM INLETS	8	EA	$5,000.00	$40,000.00
INLET (TYPE S)	16	EA	$3,500.00	$56,000.00
MITERED END SECTIONS	8	EA	$5,000.00	$40,000.00
SOD	16,785	SY	$1.50	$25,177.50
SHOULDER GUTTER (LESS S INLETS)	2,945	LF	$24.00	$70,685.44
GUARDRAIL (OUTSIDE ONLY, NOT IN MEDIAN)	3,031	LF	$4.00	$12,122.67
APPROACH SLABS	2	EA	$30,396.00	$60,792.00
			TOTAL $ EA	$453,737.61

TYPICAL XWAY / CROSSROAD — Bridge 4A

BRIDGE APPROACH - RURAL - 2:1 SLOPE

TOTAL OUT-TO-OUT WIDTH OF BRIDGE APPROACH >>>>>>>	50.66	FT		
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	34.55	FT	1.37% = 1314'	
AVERAGE % OF APPROACH SLOPE >>>>>>>	2.00%		3.00% = 600'	
ROADWAY WIDTH AT GRADE >>>>>>>	41.66	FT		
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	3	FT		
COST OF BRIDGE APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>			$667,177	
MEDIAN? (ENTER Y OR N) >>>>>>>	Y			
CROSSDRAIN WIDTH >>>>>>>	82			
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	1,578	LF		
FEET FROM TOUCHDOWN TO 10' HEIGHT >>>>>>>	350	LF		
DISTANCE OF APPROACH ABOVE 10' HEIGHT (GR & SHO GUT L) >>>>>>>	1,228	LF		
APPROACH SLAB WIDTH >>>>>>>	50.66	FT		
ORIGINAL BRIDGE APPROACH WIDTH >>>>>>>	0	FT		
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	0.0	FT		
AVERAGE % OF APPROACH SLOPE >>>>>>>	2.00%			
ROADWAY WIDTH AT GRADE >>>>>>>	0	FT		
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	0.0	FT		
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	0	LF		
**** RETAINING WALL AUTOMATIC CALCULATION ****				
BRIDGE HEIGHT >>>>>>>	34.55			
BRIDGE WIDTH (OUT-TO-OUT INCLUDING MEDIAN) >>>>>>>	50.66		EXTRA FOR SKEW	
SKEW? (ENTER Y or N) >>>>>>>	Y		1,240	SF
TOTAL RE-WALL >>>>>>>	9,009	SF		

CUSTOM BRIDGE APPROACH - RURAL 2:1 SLOPE		DRAINAGE SIDES	2	
BORROW EMBANKMENT	0	CY	$8.30	$0.00
LESS EXISTING EMBANKMENT	0	CY	($8.30)	$0.00
EXCAVATE EXCESS FILL (IF > 0)	0	CY	$5.30	$0.00
COLLECTOR PIPE (24" RCP)	2400	LF	$70.00	$168,000.00
CMP OUTLET PIPE (18" CMP)	600	LF	$35.00	$21,000.00
CROSSDRAINS (18" RCP)	984	LF	$35.00	$34,440.00
DITCH BOTTOM INLETS	12	EA	$5,000.00	$60,000.00
INLET (TYPE S)	24	EA	$3,500.00	$84,000.00
MITERED END SECTIONS	12	EA	$5,000.00	$60,000.00
SOD	29,694	SY	$1.50	$44,541.00
SHOULDER GUTTER (LESS S INLETS)	4,782	LF	$24.00	$114,764.16
GUARDRAIL (OUTSIDE ONLY, NOT IN MEDIAN)	4,910	LF	$4.00	$19,640.00
APPROACH SLABS	2	EA	$30,396.00	$60,792.00

TOTAL $ EA	$667,177.16

TYPICAL XWAY / CROSSROAD — Bridge 4B

BRIDGE APPROACH - RURAL - 2:1 SLOPE

TOTAL OUT-TO-OUT WIDTH OF BRIDGE APPROACH >>>>>>>	50.66	FT	
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	34.4	FT	1.37% = 1314'
AVERAGE % OF APPROACH SLOPE >>>>>>>	2.00%		3.00% = 600'
ROADWAY WIDTH AT GRADE >>>>>>>	41.66	FT	
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	3	FT	
COST OF BRIDGE APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>			**$665,928**
MEDIAN? (ENTER Y OR N) >>>>>>>	Y		
CROSSDRAIN WIDTH >>>>>>>	82		
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	1,570	LF	
FEET FROM TOUCHDOWN TO 10' HEIGHT >>>>>>>	350	LF	
DISTANCE OF APPROACH ABOVE 10' HEIGHT (GR & SHO GUT L) >>>>>>>	1,220	LF	
APPROACH SLAB WIDTH >>>>>>>	50.66	FT	
ORIGINAL BRIDGE APPROACH WIDTH >>>>>>>	0	FT	
TOTAL BRIDGE EMBANKMENT HEIGHT >>>>>>>	0.0	FT	
AVERAGE % OF APPROACH SLOPE >>>>>>>	2.00%		
ROADWAY WIDTH AT GRADE >>>>>>>	0	FT	
TOTAL EMBANKMENT HEIGHT AT GRADE >>>>>>>	0.0	FT	
LENGTH OF APPROACH (AUTOMATICALLY CALCULATED) >>>>>>>	0	LF	

**** RETAINING WALL AUTOMATIC CALCULATION ****

BRIDGE HEIGHT >>>>>>>	34.4		
BRIDGE WIDTH (OUT-TO-OUT INCLUDING MEDIAN) >>>>>>>	50.66		EXTRA FOR SKEW
SKEW? (ENTER Y or N) >>>>>>>	Y		1,234 SF
TOTAL RE-WALL >>>>>>>	**8,946**	SF	

CUSTOM BRIDGE APPROACH - RURAL 2:1 SLOPE — DRAINAGE SIDES: 2

BORROW EMBANKMENT	0	CY	$8.30	$0.00
LESS EXISTING EMBANKMENT	0	CY	($8.30)	$0.00
EXCAVATE EXCESS FILL (IF > 0)	0	CY	$5.30	$0.00
COLLECTOR PIPE (24" RCP)	2400	LF	$70.00	$168,000.00
CMP OUTLET PIPE (18" CMP)	600	LF	$35.00	$21,000.00
CROSSDRAINS (18" RCP)	984	LF	$35.00	$34,440.00
DITCH BOTTOM INLETS	12	EA	$5,000.00	$60,000.00
INLET (TYPE S)	24	EA	$3,500.00	$84,000.00
MITERED END SECTIONS	12	EA	$5,000.00	$60,000.00
SOD	29,421	SY	$1.50	$44,131.50
SHOULDER GUTTER (LESS S INLETS)	4,752	LF	$24.00	$114,044.16
GUARDRAIL (OUTSIDE ONLY, NOT IN MEDIAN)	4,880	LF	$4.00	$19,520.00
APPROACH SLABS	2	EA	$30,396.00	$60,792.00
			TOTAL $ EA	$665,927.66

Bridge End Bents and Wing Walls

Segment 1	Avg Height	Area (sf)
Bridge 1A - Begin Bridge	32.3	4110
Bridge 1A - End Bridge	29.9	3662
Bridge 1B - Begin Bridge	30.7	3809
Bridge 1B - End Bridge	30.2	3716
Bridge 2A - Begin Bridge	30.4	3388
Bridge 2A - End Bridge	30.6	3423
Bridge 2B - Begin Bridge	30.5	3406
Bridge 2B - End Bridge	30.5	3406
Bridge 3A - Begin Bridge	30.8	3458
Bridge 3A - End Bridge	34.2	4072
Bridge 3B - Begin Bridge	30.4	3388
Bridge 3B - End Bridge	30.5	3406
Bridge 4A - Begin Bridge	35.2	4261
Bridge 4A - End Bridge	33.9	4016
Bridge 4B - Begin Bridge	35.2	4261
Bridge 4B - End Bridge	33.6	3960
Segment 1 Total		**59742**

Formula for Mainline: (62.66(H) + 2(H^2)
62.66 is the width of bridge out-to-out (includes barrier wall)
assumes a 2:1 front slope
H = Height of Fill as measured in MicroStation

Formula for Mainline: (50.66(H) + 2(H^2)
50.66 is the width of bridge out-to-out (includes barrier wall)
assumes a 2:1 front slope
H = Height of Fill as measured in MicroStation

Formula for 1-Lane Ramp: (29.66(H) + 2H^2)*Length
29.66 is the width of 15 lane, 2 6-foot shoulders, and 2 - 1.33 ft barrier wall per side
assumes a 2:1 front slope
H = Height of Fill

Formula for 2-Lane Ramp: (44.66(H) + 2H^2)*Length
44.66 is the width of 24 lanes, 8 ft inside shoulder, 10 ft outside shoulder, and 2 - 1.33 ft barrier wall per side
assumes a 2:1 front slope
H = Height of Fill

*Adjusted to remove wingwall(s) where MSE walls are used

Forumlas (DO NOT INPUT VALUES)

Input station range (numerical only)
Input area sf as measured in MicroStaion

Output mainline segments

MSE Walls

Segment 3	Measured Area (sf)
Bridge 1A - Begin Bridge (one side)	
Bridge 1A - End Bridge (one side)	
Bridge 1B - Begin Bridge (one side)	
Bridge 1B - End Bridge (one side)	
Bridge 2A - Begin Bridge	
Bridge 2A - End Bridge	
Bridge 2B - Begin Bridge	
Bridge 2B - End Bridge	
Bridge 3A - Begin Bridge	
Bridge 3A - End Bridge	
Bridge 3B - Begin Bridge	
Bridge 3B - End Bridge	
Bridge 4A - Begin Bridge	
Bridge 4A - End Bridge	
Bridge 4B - Begin Bridge	
Bridge 4B - End Bridge	
Segment 3 Total	0

H = Height of Fill as measured in MicroStation

Additional Earthwork for Retaining Walls				
Segment 3	Width (lf)	Measured Area (sf)	Volume (cf)	Volume (cy)
Bridge 1A Begin Bridge (Northside Only)	0	0	0	0
Bridge 1A End Bridge (Northside Only)	0	0	0	0
Bridge 1B Begin Bridge (Southside Only)	0	0	0	0
Bridge 1B End Bridge (Southside Only)	0	0	0	0
Segment 3 Total				**0**

Formula: Width * Measured Area
Measured Area in MicroStation

Input area sf as measured in MicroStaion
Output

Additional Earthwork over 3 ft Fill

Jack Brack Parclo				Area (sf)	Length	Avg Height	Volume (cf)	Volume (cy)
Area 1	753+56.04	to	758+47.03	677	490.99	1.38	151320	5605
Area 2	760+53.58	to	782+77.53	30878	2223.95	13.88	8446282	312826
Area 3	784+51.66	to	806+69.88	51514	2218.22	23.22	16015316	593160
Area 4	808+43.51	to	825+65.14	27149	1721.63	15.77	7630971	282629
Area 5	833+40.11	to	843+62.24	415	1022.13	0.41	91144	3376
Area 6	862+26.70	to	884+48.58	2558	2221.88	1.15	569424	21090
Area 7	889+54.62	to	900+02.54	13917	1047.92	13.28	3773210	139749
Area 8	902+63.13	to	919+01.67	57039	1638.54	34.81	20376810	754697
Area 9	920+72.82	to	940+92.98	31872	2020.16	15.78	8959470	331833
Area 10	945+42.07	to	948+92.00	578	349.93	1.65	129823	4809
Jack Brack Parclo Total								**2444965**

Formula for Mainline: (218(H) + 4H^2)*Length
218 is the width of roadway from WB outside shoulder to EB outside shoulder
assumes a 4:1 front slope

H = Height of Fill
Formula for Mainline: (218(H) + 4H^2)*Length
218 is the width of roadway from WB outside shoulder to EB outside shoulder
assumes a 4:1 front slope

H = Height of Fill
218 is the width of typical section at a 3 ft fill depth which is taken into account in the cost per mile calculations

Formula for 1-Lane Ramp: (31(H) + 2H^2)*Length
31 is the width of 15 lane, 2 6-foot shoulders, and 2 ft per side for guardrail
assumes a 2:1 front slope
H = Height of Fill

Formula for 2-Lane Ramp: (46(H) + 2H^2)*Length
46 is the width of 24 lanes, 8 ft inside shoulder, 10 ft outside shoulder, and 2 ft per side for guardrail
assumes a 2:1 front slope
H = Height of Fill

*Adjust for Wall Earthwork

Forumlas (DO NOT INPUT VALUES)

Input station range (numerical only)
Input area sf as measured in MicroStaion

Output mainline segments

Additional Earthwork for Muck				
Segment 3	Area (sf)	Avg Height	Volume (cf)	Volume (cy)
Area 1	13694	4	54776	2029
Segment 3 Total				**2029**

Formula: Area*Avg Height

Input area sf as measured in MicroStaion

Appendix D

Typical Section Package

CENTRAL FLORIDA EXPRESSWAY AUTHORITY (CFX)

TYPICAL SECTION PACKAGE

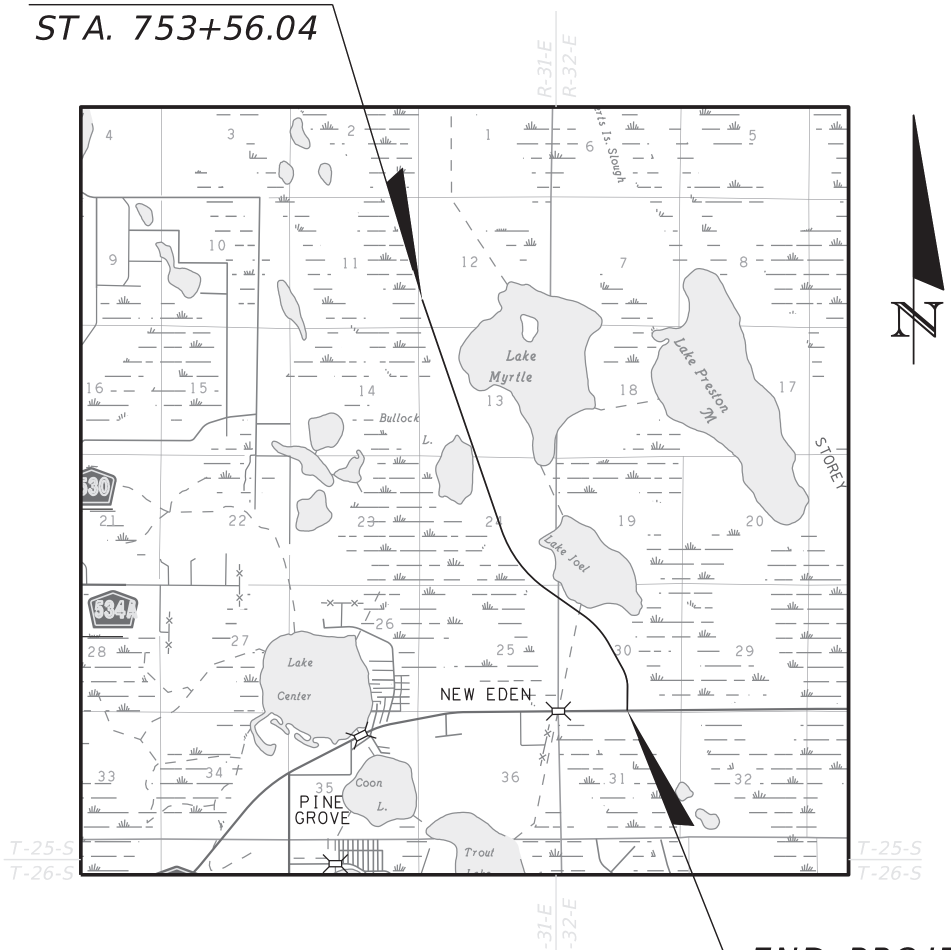
OSCEOLA COUNTY

STATE ROAD NO. N/A

Northeast Connector Expressway (SR 534) - Phase 1
From Cyrils Drive to Nova Road (CR 532)

CFX PROJECT NO. 599-228

BEGIN PROJECT
STA. 753+56.04



END PROJECT
STA. 949+24.15

DANIEL KRISTOFF JR.
LICENSE
No 30379
STATE OF FLORIDA
PROFESSIONAL ENGINEER

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY:

ON THE DATE ADJACENT TO THE SEAL

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

RS&H, INC.
10748 DEERWOOD PARK BLVD SOUTH
JACKSONVILLE, FL 32256
CERTFICATE OF AUTHORIZATION: 5620
DANIEL KRISTOFF, JR, P.E. NO. 30379

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

TYPICAL SECTION PACKAGE

$DATE$ $TIME$

PROJECT CONTROLS

CONTEXT CLASSIFICATION

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

FUNCTIONAL CLASSIFICATION

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

HIGHWAY SYSTEM

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

ACCESS CLASSIFICATION

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

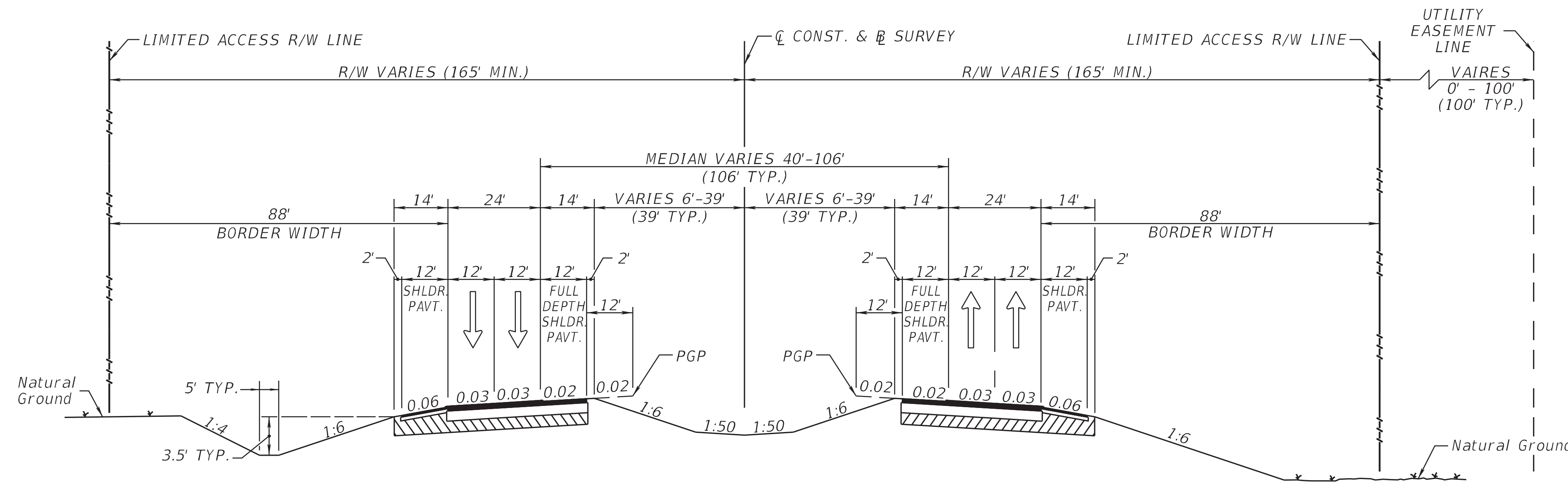
CRITERIA

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

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

1. BORDER WIDTH

TYPICAL SECTION No. 1



INTERIM TYPICAL SECTION
NORTHEAST CONNECTOR EXTENSION (SR 534)

STA. 753+56.04 TO STA. 939+70.66

TRAFFIC DATA
STA. 753+56.04 TO STA. 807+53.43

CURRENT YEAR = 2020 AADT = N/A
ESTIMATED OPENING YEAR = 2025 AADT = 19,800
ESTIMATED DESIGN YEAR = 2045 AADT = 35,900
K = 11% D = 60% T = 4 % (24 HOUR)
DESIGN SPEED = 70 MPH
POSTED SPEED = 70 MPH

TRAFFIC DATA
STA. 807+53.43 TO STA. 939+70.66

CURRENT YEAR = 2020 AADT = N/A
ESTIMATED OPENING YEAR = 2025 AADT = 5,800
ESTIMATED DESIGN YEAR = 2045 AADT = 19,000
K = 11% D = 60% T = 4 % (24 HOUR)
DESIGN SPEED = 70 MPH
POSTED SPEED = 70 MPH

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

SHEET NO.

PROJECT CONTROLS

CONTEXT CLASSIFICATION

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

FUNCTIONAL CLASSIFICATION

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

HIGHWAY SYSTEM

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

ACCESS CLASSIFICATION

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

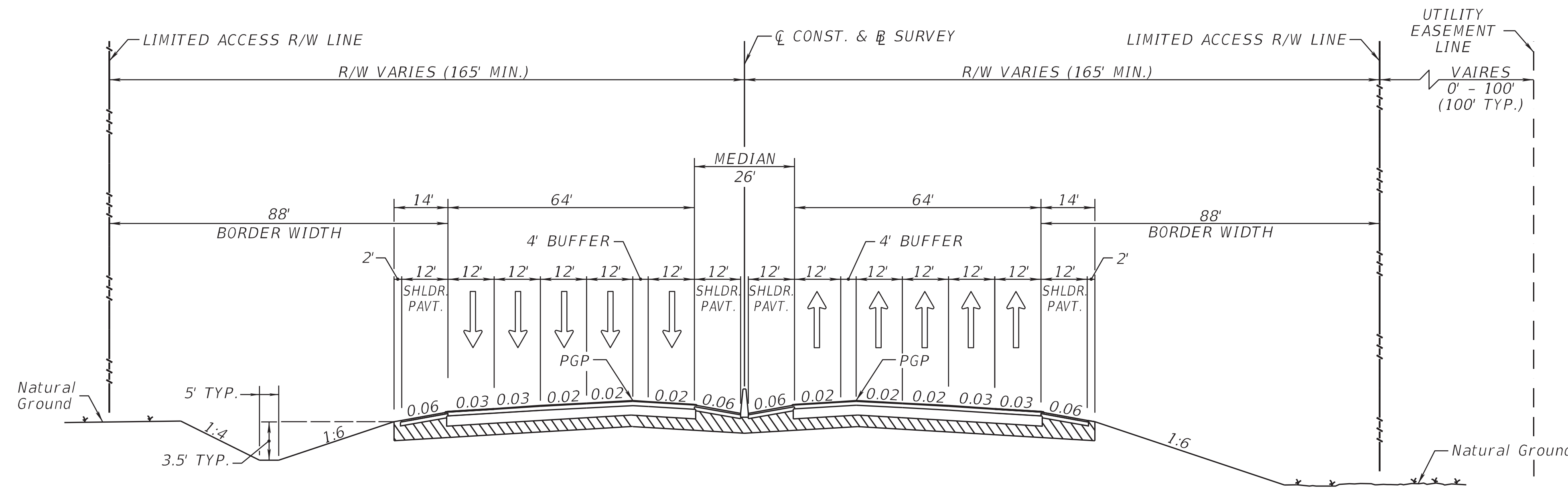
CRITERIA

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

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

1. BORDER WIDTH

TYPICAL SECTION No. 2



ULTIMATE TYPICAL SECTION
NORTHEAST CONNECTOR EXTENSION (SR 534)

STA. 753+56.04 TO STA. 939+70.66

TRAFFIC DATA
STA. 753+56.04 TO STA. 807+53.43

CURRENT YEAR = 2020 AADT = N/A
ESTIMATED OPENING YEAR = 2025 AADT = 19,800
ESTIMATED DESIGN YEAR = 2045 AADT = 35,900
K = 11% D = 60% T = 4 % (24 HOUR)
DESIGN SPEED = 70 MPH
POSTED SPEED = 70 MPH

TRAFFIC DATA
STA. 807+53.43 TO STA. 939+70.66

CURRENT YEAR = 2020 AADT = N/A
ESTIMATED OPENING YEAR = 2025 AADT = 5,800
ESTIMATED DESIGN YEAR = 2045 AADT = 19,000
K = 11% D = 60% T = 4 % (24 HOUR)
DESIGN SPEED = 70 MPH
POSTED SPEED = 70 MPH

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PROJECT CONTROLS

CONTEXT CLASSIFICATION

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

FUNCTIONAL CLASSIFICATION

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

HIGHWAY SYSTEM

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

ACCESS CLASSIFICATION

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

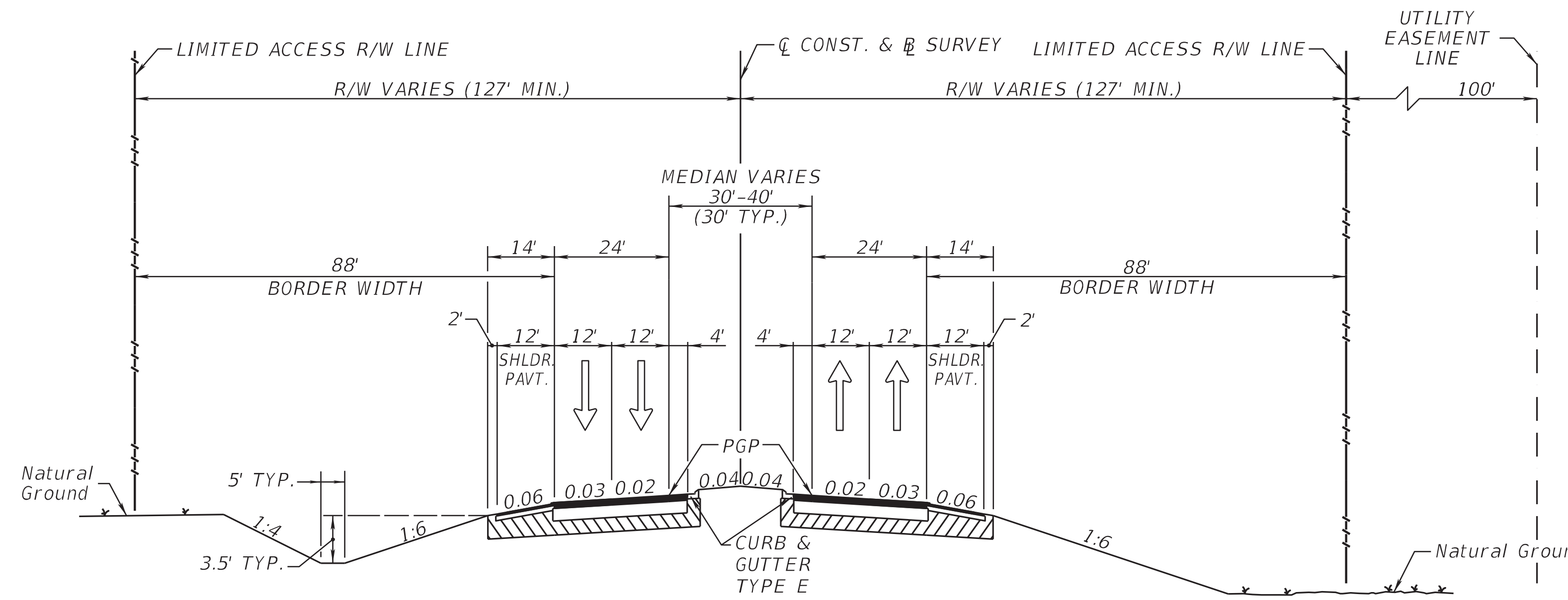
CRITERIA

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

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

1. BORDER WIDTH

TYPICAL SECTION No. 3



TYPICAL SECTION
NORTHEAST CONNECTOR EXTENSION (SR 534)

STA. 939+70.66 TO STA. 949+24.15

TRAFFIC DATA

CURRENT YEAR = 2020 AADT = N/A
ESTIMATED OPENING YEAR = 2025 AADT = 5,800
ESTIMATED DESIGN YEAR = 2045 AADT = 19,000
K = 11% D = 60% T = 4 % (24 HOUR)
DESIGN SPEED = 50 MPH
POSTED SPEED = 50 MPH

PROJECT CONTROLS

CONTEXT CLASSIFICATION

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

FUNCTIONAL CLASSIFICATION

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

HIGHWAY SYSTEM

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

ACCESS CLASSIFICATION

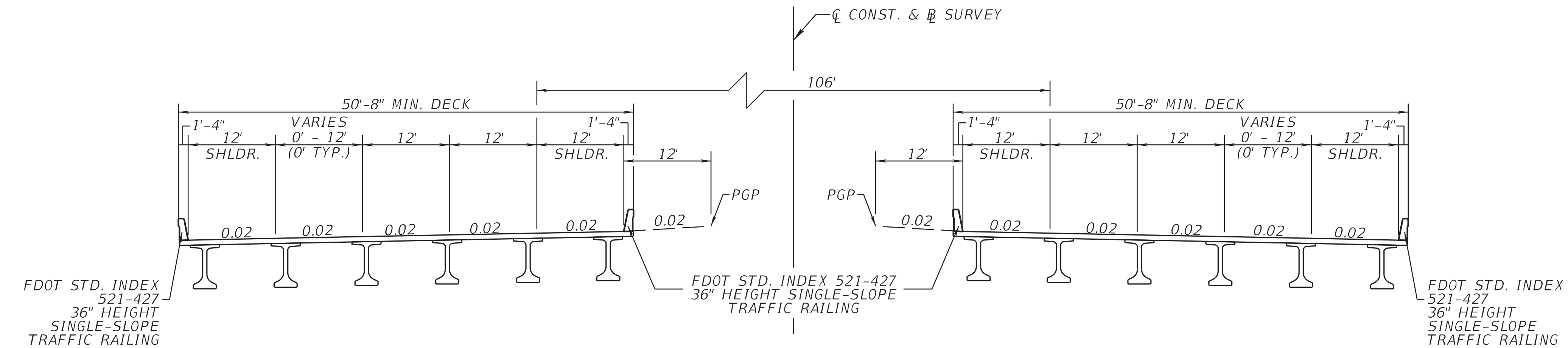
(X) 1 - FREEWAY
( ) 2 - RESTRICTIVE w/Service Roads
( ) 3 - RESTRICTIVE w/660 ft. Connection Spacing
( ) 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
( ) 5 - RESTRICTIVE w/440 ft. Connection Spacing
( ) 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
( ) 7 - BOTH MEDIAN TYPES
( ) N/A

CRITERIA

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

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 4



BRIDGE TYPICAL SECTION

NORTHEAST CONNECTOR EXTENSION (SR 534)

OVER FUTURE PLANNED LOCAL ROAD
OVER JACK BRACK ROAD
OVER CANAL 32C
OVER FUTURE SUNBRIDGE PARKWAY

TRAFFIC DATA
STA. 753+56.04 TO STA. 807+53.43

CURRENT YEAR = 2020 AADT = N/A
ESTIMATED OPENING YEAR = 2025 AADT = 19,000
ESTIMATED DESIGN YEAR = 2045 AADT = 35,900
K = 11% D = 60% T = 4 % (24 HOUR)
DESIGN SPEED = 70 MPH
POSTED SPEED = 70 MPH

TRAFFIC DATA
STA. 807+53.43 TO STA. 939+70.66

CURRENT YEAR = 2020 AADT = N/A
ESTIMATED OPENING YEAR = 2025 AADT = 5,800
ESTIMATED DESIGN YEAR = 2045 AADT = 19,000
K = 11% D = 60% T = 4 % (24 HOUR)
DESIGN SPEED = 70 MPH
POSTED SPEED = 70 MPH

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PROJECT CONTROLS

CONTEXT CLASSIFICATION

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

FUNCTIONAL CLASSIFICATION

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

HIGHWAY SYSTEM

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

ACCESS CLASSIFICATION

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

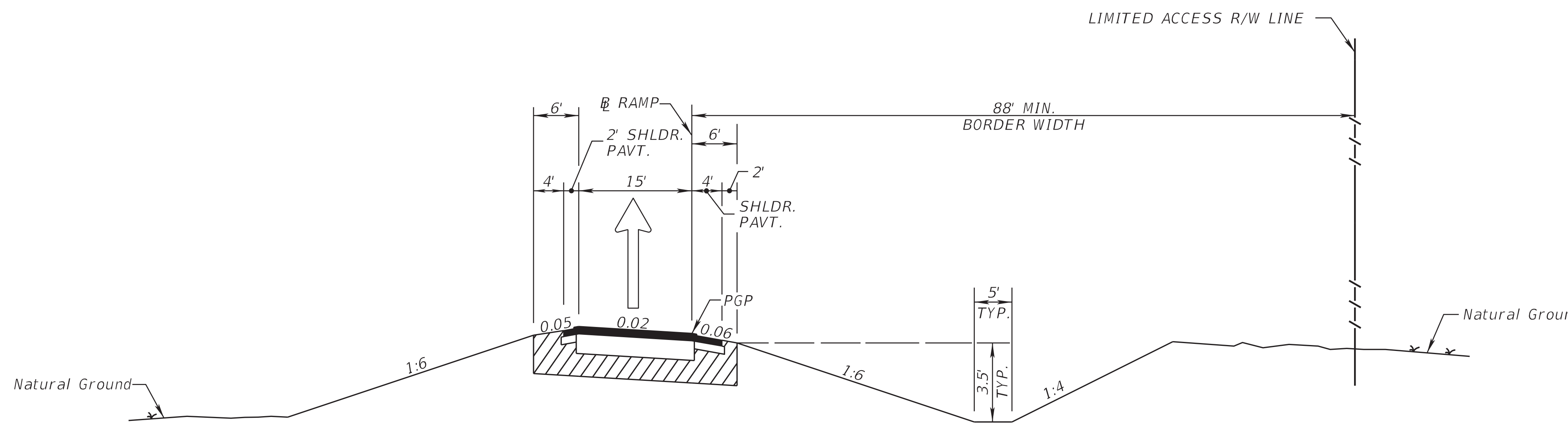
CRITERIA

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

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

1. BORDER WIDTH

TYPICAL SECTION No. 5



TYPICAL SECTION
SINGLE LANE RAMP

NB & SB EXIT RAMPS FROM NORTHEAST CONNECTOR TO JACK BRACK ROAD
NB & SB ENTRANCE RAMPS TO NORTHEAST CONNECTOR FROM JACK BRACK ROAD

TRAFFIC DATA SB EXIT RAMP & NB ENTRANCE RAMP

CURRENT YEAR = 2020 AADT = N/A
ESTIMATED OPENING YEAR = 2025 AADT = 15,500
ESTIMATED DESIGN YEAR = 2045 AADT = 18,600
K = 11% D = 60% T = 4 % (24 HOUR)
DESIGN SPEED = 50 MPH
POSTED SPEED = 50 MPH

TRAFFIC DATA NB EXIT RAMP & SB ENTRANCE RAMP

CURRENT YEAR = 2020 AADT = N/A
ESTIMATED OPENING YEAR = 2025 AADT = 1,500
ESTIMATED DESIGN YEAR = 2045 AADT = 1,700
K = 11% D = 60% T = 4 % (24 HOUR)
DESIGN SPEED = 50 MPH
POSTED SPEED = 50 MPH

PROJECT CONTROLS

CONTEXT CLASSIFICATION

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

FUNCTIONAL CLASSIFICATION

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

HIGHWAY SYSTEM

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

ACCESS CLASSIFICATION

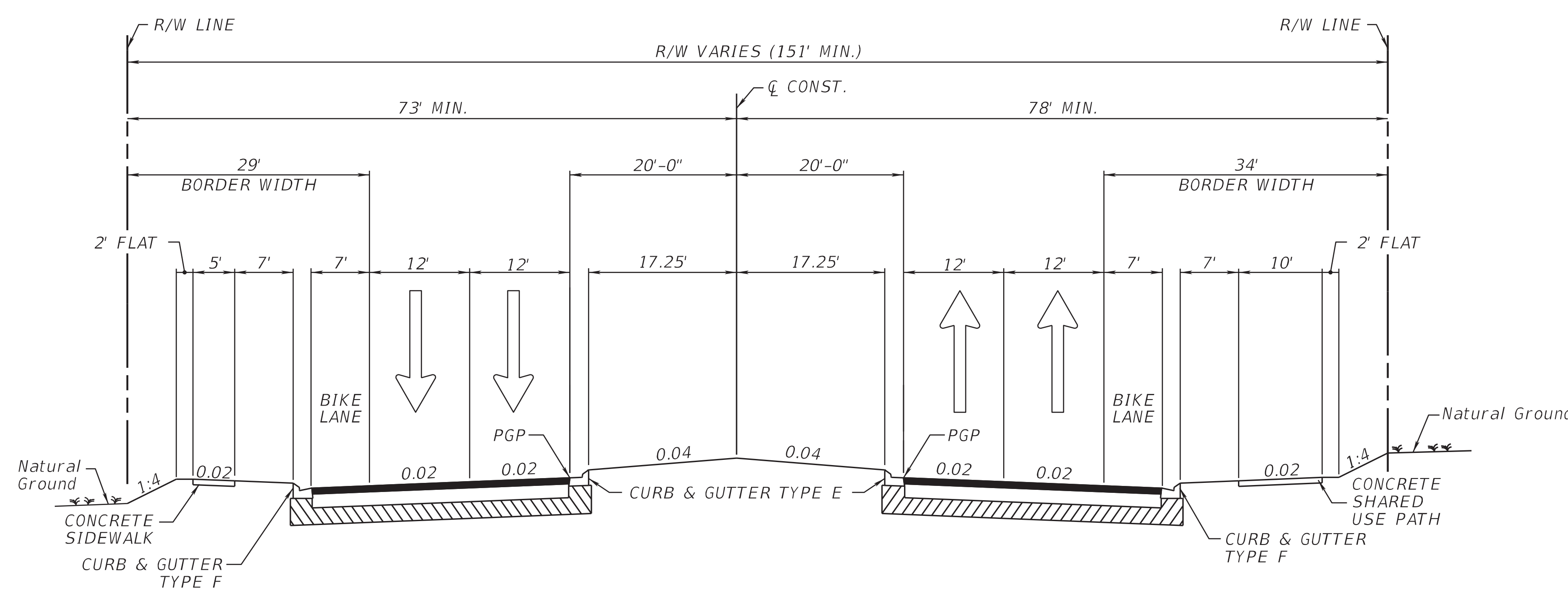
( ) 1 - FREEWAY
( ) 2 - RESTRICTIVE w/Service Roads
( ) 3 - RESTRICTIVE w/660 ft. Connection Spacing
( ) 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
( ) 5 - RESTRICTIVE w/440 ft. Connection Spacing
( ) 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
( ) 7 - BOTH MEDIAN TYPES
(X) N/A

CRITERIA

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

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 6



TYPICAL SECTION
JACK BRACK ROAD

TRAFFIC DATA
WEST JACK BRACK ROAD

CURRENT YEAR = 2020 AADT = N/A
ESTIMATED OPENING YEAR = 2025 AADT = 12,600
ESTIMATED DESIGN YEAR = 2045 AADT = 22,300
K = 9 % D = 55% T = 4 % (24 HOUR)
DESIGN SPEED = 35 MPH
POSTED SPEED = 35 MPH

TRAFFIC DATA
EAST JACK BRACK ROAD

CURRENT YEAR = 2020 AADT = N/A
ESTIMATED OPENING YEAR = 2025 AADT = 12,800
ESTIMATED DESIGN YEAR = 2045 AADT = 22,800
K = 9 % D = 55% T = 4 % (24 HOUR)
DESIGN SPEED = 35 MPH
POSTED SPEED = 35 MPH

PROJECT CONTROLS

CONTEXT CLASSIFICATION

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

FUNCTIONAL CLASSIFICATION

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

HIGHWAY SYSTEM

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

ACCESS CLASSIFICATION

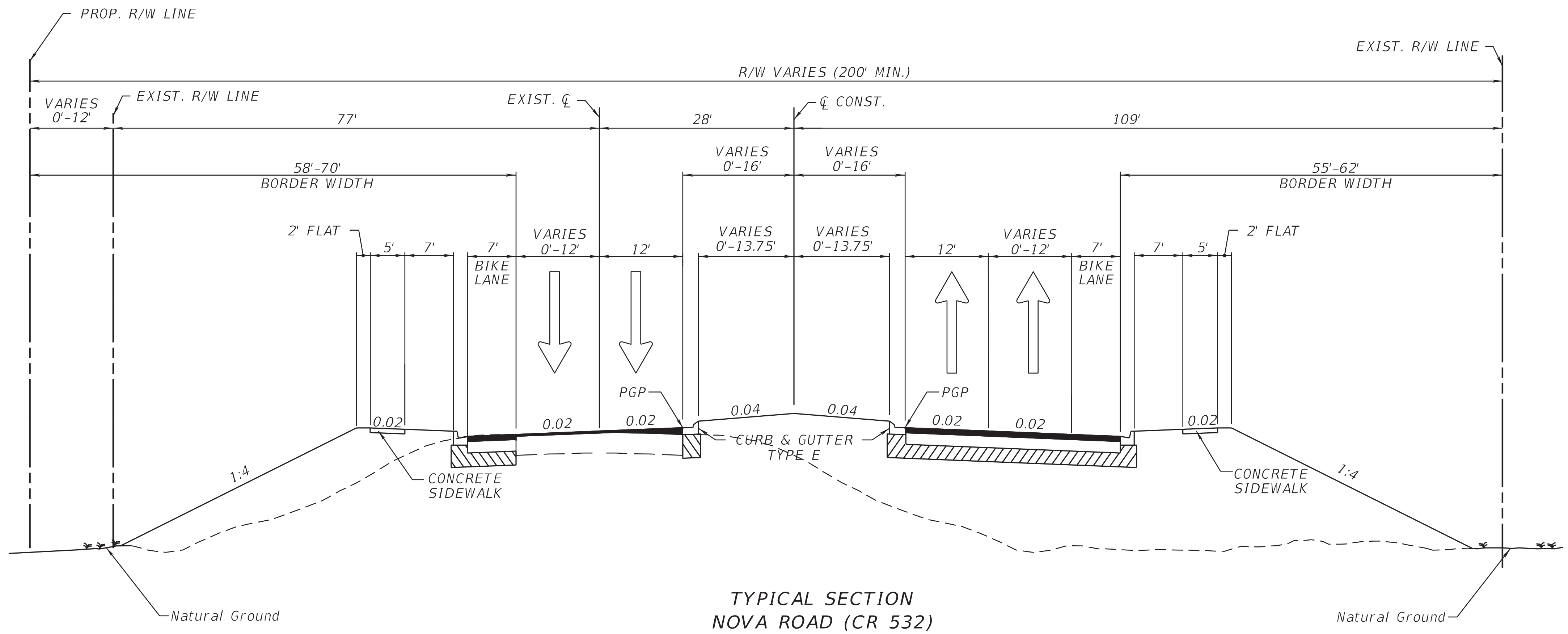
( ) 1 - FREEWAY
( ) 2 - RESTRICTIVE w/Service Roads
( ) 3 - RESTRICTIVE w/660 ft. Connection Spacing
( ) 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
( ) 5 - RESTRICTIVE w/440 ft. Connection Spacing
( ) 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
( ) 7 - BOTH MEDIAN TYPES
(X) N/A

CRITERIA

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

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 7



TYPICAL SECTION
NOVA ROAD (CR 532)

STA. 104+51.73 TO STA. 162+99.48

TRAFFIC DATA
STA. 104+51.73 TO STA. 132+51.16

CURRENT YEAR = 2020 AADT = 8,600
ESTIMATED OPENING YEAR = 2025 AADT = 9,600
ESTIMATED DESIGN YEAR = 2045 AADT = 21,500
K = 9 % D = 55% T = 6 % (24 HOUR)
DESIGN SPEED = 50 MPH
POSTED SPEED = 50 MPH

TRAFFIC DATA
STA. 132+51.16 TO 162+99.48

CURRENT YEAR = 2020 AADT = 2,000
ESTIMATED OPENING YEAR = 2025 AADT = 8,300
ESTIMATED DESIGN YEAR = 2045 AADT = 16,900
K = 9 % D = 55% T = 6 % (24 HOUR)
DESIGN SPEED = 50 MPH
POSTED SPEED = 50 MPH