UTILITY ASSESSMENT PACKAGE

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

August 2021

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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 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** shows the Northeast Connector Expressway – Phase 1 study area.

The goal of the Northeast Connector Expressway is to enhance north-south mobility and provide connections between existing and future east-west corridors in the study area. The Northeast Connector Expressway 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, which is currently in the planning phase. These connections will promote regional connectivity, provide for transit opportunities, and enhance mobility in Osceola County. The link between the planned SR 534 and Osceola / Brevard County Connectors 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 Osceola / Brevard County Connectors are constructed, the Northeast Connector Expressway 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.

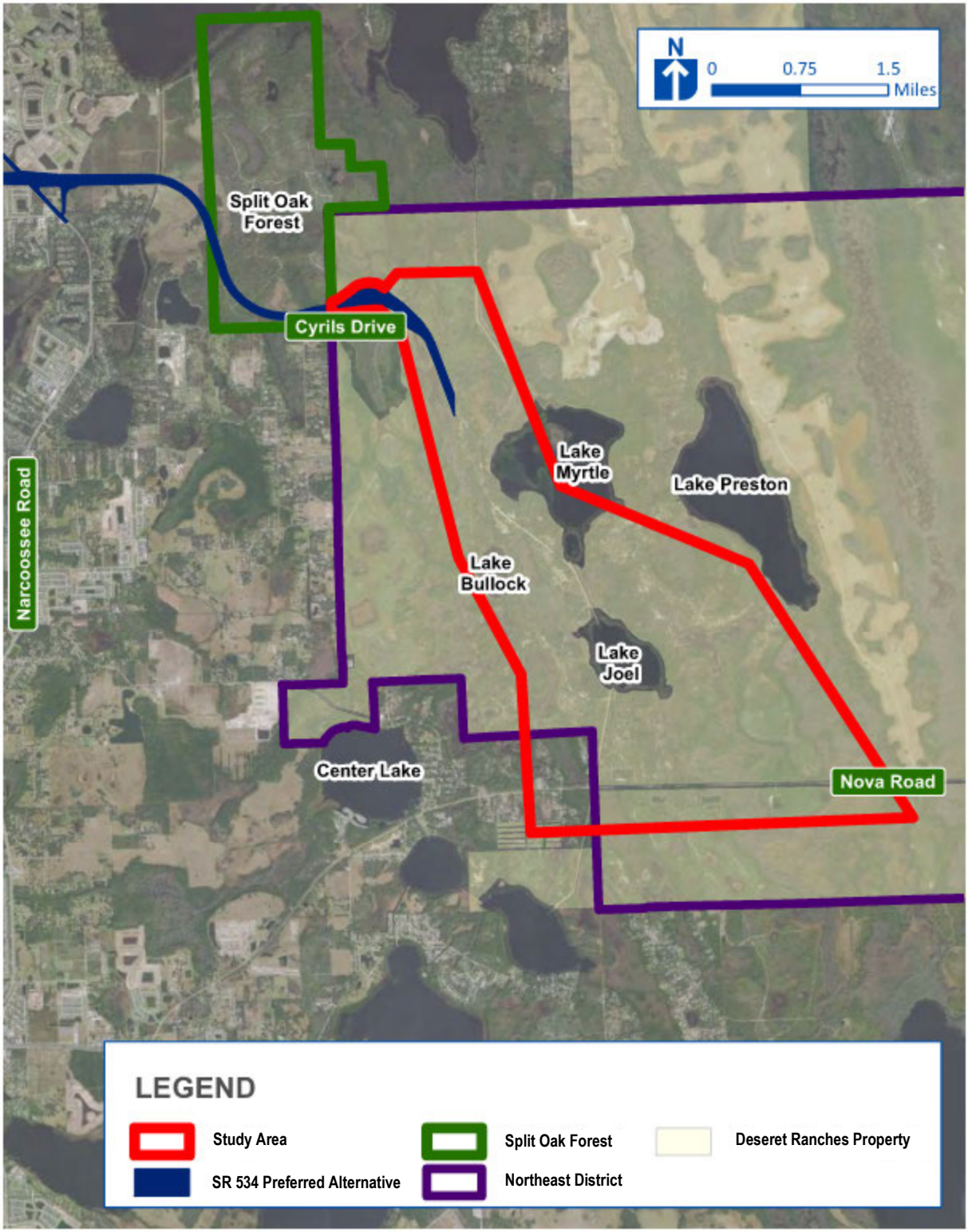


Figure 1 - Project Study Area

Purpose of Utility Assessment Package

This Utility Assessment Package has been assembled to provide information on existing and planned utilities within the study limits. This package contains information on the names of utility companies, aerials denoting the location of major existing and proposed facilities, descriptions of the identified utilities, project coordination efforts, potential impacts, and, where known, information on the cost of relocation. All Utility Agency Owner (UAO) dispositions will be documented. A preliminary cost estimate and anticipated time frames for relocation of major utilities will also be acquired, where necessary, as part of this study.

Existing Roadway Facilities

There is a mixture of roadways with different functional classifications within the project study area. Listed below are the roadways within the project study area affected by the different build alternatives as well as a description of their typical section.

Nova Road (CR 532) from Barrywood Lane to Storey Bend (Osceola County):

Nova Road is a two-lane undivided roadway in Osceola County. Single family residential homes border the road to the north and south. Several side streets also connect to Nova Road and have single family residential homes. Based on 2021 Osceola County Property Appraiser aerial imagery, the road consists of 10-foot travel lanes.

Cyrils Drive from Franklin Road to Absher Road (Osceola County):

Cyrils Drive is a two-lane undivided roadway in Osceola County. Based on 2021 Osceola County Property Appraiser aerial imagery, the road consists of 10-foot travel lanes. Additionally, construction on the Del Webb community, a multiple single family home community, east of Absher Road is in progress. Cyrils Drive east of Absher Road is now a four-lane divided roadway. The Del Webb community lies within the project study area.

Sungrove Lane (Osceola County):

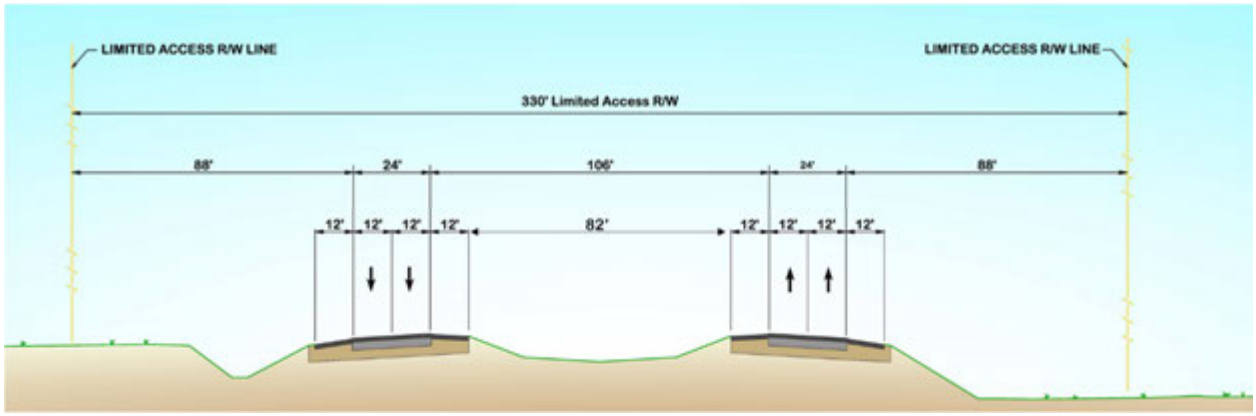
Based on 2021 Osceola County Property Appraiser aerial imagery, Sungrove Lane is an unmarked, private, unpaved roadway in rural Osceola County.

Proposed Roadway Improvements

Alternatives Description

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 as shown on **Figure 2**. 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 Expressway.

Figure 2 - Proposed Typical Section



The alternatives for the project are split into two geographic areas (Refer to **Appendix B**):

- Jack Brack Road: Cyrils Drive to south of Jack Brack Road
- Nova Road Connection: south of Jack Brack Road to Nova Road

Jack Brack Road Alternatives

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

- Partial Cloverleaf Interchange
- Diamond Interchange
- Tighter Diamond 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 stays just east of the Tavistock utility site, currently under construction. The mainline alignment then continues between Lake Myrtle and Bullock Lake, staying close to the east side of Bullock Lake.

Partial Cloverleaf Interchange

The Partial Cloverleaf Interchange is located at the proposed extension of Jack Brack Road. The Partial Cloverleaf Interchange is located on the northern side of Jack Brack Road in order to avoid impacts to Bullock Lake and the associated wetlands. The southbound lanes will have an exit ramp and entrance loop ramp on the west side of the expressway while the northbound lanes will have an entrance ramp and exit loop ramp on the east side. Easy access to and from the expressway will be present for eastbound and westbound traffic on Jack Brack Road.

Diamond Interchange

The Diamond Interchange has exit ramps in the southeast and northwest quadrants of the interchange that will allow for traffic exiting the expressway to continue east or west along Jack Brack Road. There are also entrance ramps in the northeast and southwest corners of the interchange that will allow for traffic traveling in the eastbound or westbound direction to enter the expressway in either direction.

Tighter Diamond Interchange

The Tighter Diamond Interchange is identical to the Diamond Interchange except for the configuration of the two ramps located south of Jack Brack Road. To accommodate the planned Orlando Utility Commission 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, but east of Lake Bullock. The southeast quadrant ramp was similarly tightened to minimize wetland impacts. The Tighter Diamond Interchange Alternative was not reviewed by the UAOs; however, the alternative has only minor differences from the Diamond Interchange Alternative which was reviewed by the UAOs.

Nova Road Connection Alternatives

The south of Jack Brack Road to Nova Road segment features two mainline alignments with connections to Nova Road in different locations. The two alternatives in this segment are identified as follows:

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

Nova Road Connection – Option 1

South of Jack Brack Road interchange, the mainline alignment diverges between the two alternatives. Nova Road Connection – Option 1 continues on a southeasterly tangent, crosses the C-32C canal, and continues on that tangent until it terminates at Nova Road. Just north of Nova Road, the alignment bends to provide a 90-degree T-intersection at Nova Road.

Nova Road Connection – Option 2

Nova Road Connection – Option 2 is similar to Option 1; however, the alignment differs slightly. Option 2 introduces a reverse curve in the alignment to shift the alignment closer to Lake Joel. The crossing of the C-32C canal is less skewed than in Option 1. This reverse curve also shifts the T-intersection at

Nova Road further to the east. Similar to Option 1, the alignment terminates at Nova Road with a 90-degree T-intersection.

Existing Utility Agency Owner (UAO) Assessment

The UAOs in the study area were determined using a variety of sources. First, a Sunshine 811 Design Ticket was made to identify the utility providers and operators registered with the service. Next, these utility providers were contacted to establish the proper personnel to assist with locating and identifying existing facilities. Lastly, conceptual plans and alternatives were sent for review to the previously mentioned personnel. Based on these conceptual plans, UAOs were asked to provide mark-ups, maps, and other documentation depicting the locations of their utilities, the type of facilities and infrastructure for their utilities, and right-of-way or easement agreements along with any other property interest within their service areas. In addition, each UAO was requested to provide rough cost estimates for those existing utilities or planned utilities being relocated as a result of avoidance and mitigation measures directly related to proposed corridor alternatives within the project study area. All information concerning the UAOs disposition has been documented even if it was determined that the UAO would not be affected by the project. The UAOs identified on the project are summarized in **Table 1**. The responses from the UAOs are provided in **Appendix A**. A contact log was developed to record and keep track of coordination efforts with the UAOs; **see Appendix D**.

Table 1 – List of Utility Contact Information

Utility Owner	Contact	Email/ Phone	FACILITIES
CenturyLink	Ty Leslie	michel.t.leslie@centurylink.com 407-814-5293	Fiber, Telephone
Comcast Communications	Andrew Sweeney	andrew_sweeney@comcast.com 904-738-6898	CATV
Duke Energy Distribution	Tomas Macias	Tomas.Macias@duke-energy.com 407-938-6619	Electric
Duke Energy Transmission	Aric Rogers	Arogers@pike.com 813-909-1245	Transmission
Orlando Utilities Commision - Electric	Mike Galloway	MGalloway@ouc.com (407)434-4148	Electric
Orlando Utilities Commision - Lighting	Carmelo Nieves	CNieves@ouc.com 407) 434-6537	Lighting
Orlando Utilities Commision - Communications	Fred Urban	FUrban@ouc.com 407-434-4127	Communications
Orlando Utilities Commision - Transmission	---	---	Transmission
Toho Water Authority	Mike Pampouk	mpampouk@tohowater.com 407-944-5000	Water, Reclaim, Sewer

Notes:

1. "---" Contact information could not be established or confirmed based on preliminary coordination efforts

Four UAOs were identified within the study limits based on the Sunshine 811 Design Ticket (provided in **Appendix C**): CenturyLink, Comcast Communications, Duke Energy, and Orlando Utilities Commission (OUC). Duke Energy is comprised of two separate entities, Distribution and Transmission, and OUC is comprised of Transmission, Distribution, Lighting, and Communications. Tohopekaliga Water Authority (TWA) was also identified as a UAO within the study limits based on acquired Master Utility Plans for the future Sunbridge Development.

Findings and Results

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

CenturyLink has provided two maps showing underground copper lines near the project limits (refer to **Appendix A**). One map shows buried lines along both sides of Nova Road with the utility runs ending at Sungrove Lane. The other map shows buried lines along Absher Road and Cyrils Drive. No impacts to these facilities are anticipated.

TWA has provided plan mark-ups showing several utilities along Cyrils Drive. In addition, TWA identified a water treatment plant under construction located southeast of Cyrils Drive and just north of the future Jack Brack Road extension; the facility limits are approximately between Station 757+00 and Station 783+00 as defined in the Build Alternative Plan Sheets (refer to **Appendix B**). Estimated relocation costs were not provided. All documentation received can be found in **Appendix A**. Refer to Table 2 for further information regarding TWA's facilities.

OUC is the electric distribution service provider in the project study area. Existing aerial distribution lines run along Nova Road and into the adjacent side streets and single family homes. The aerial lines continue east, past Sungrove Lane, and terminate approximately 1.5 miles from Sungrove Lane. Within this segment the distribution lines are located on the south side of Nova Road. Based on the Master Utility Plan for the Sunbridge Development, OUC will provide the power for the Sunbridge Water Reclamation Facility (Refer to **Appendix E**). It is likely that OUC will also be the electric distribution provider for these future developments. Existing OUC transmission lines are also present in the project study limits and run north and south of Nova Road.

As previously mentioned, an initial request for information was sent to OUC's Development Services Department on March 15, 2021. The Development Services Department facilitates all requests for information regarding planned developments, and distributes the request to all affected OUC departments. Project work order number #748559 was assigned to our project, and should be referenced for any and all coordination efforts moving forward. The review period is estimated to be six to eight weeks. Several OUC departments have provided feedback.

OUC Communications Department provided mapping and mark-ups of their facility. Fred Urban, Senior Engineer for the Department, identified aerial fiber optic cable along the existing OUC overhead transmission line. No impacts to these facilities are anticipated.

OUC Distribution Department has provided mapping and mark-ups for their impacted facility. Existing overhead electric lines along Nova Road, east of Sungrove Lane, on the south side will be impacted by the proposed interchange. Mark-ups provided by Mike Galloway, Senior Engineering Associate for the Department, show OUC relocating the overhead electric to the north side of Nova Road, just after Sungrove Lane and just passed the proposed footprint of the expressway extension, before ultimately

crossing back to the south side and tying into the existing facility. Mike had estimated the relocation efforts on this segment to be approximately $20,000.

To date, specific contacts for OUC Transmission have yet to be established based on the initial request for information sent to OUC's Development Services Department. However, early coordination with the OUC Transmission Department has been ongoing since the beginning of this study. Several meetings have occurred with the OUC Transmission Department and their representatives in reference to a planned transmission line. Meeting minutes are available for these meetings (refer to **Appendix F**). A summary of the meeting minutes can be found below. Coordination efforts are ongoing.

Summary of OUC Transmission Meetings

October 23, 2020

At this meeting, OUC Transmission Department representatives, with their consultant, Burns and McDonnel, expressed interest in a planned transmission line. Carolyn Greenwell is the Project Manager for Burns and McDonnell and she is facilitating the location of the planned transmission line. OUC will send RS&H the current corridor of the planned transmission line, and RS&H will send OUC KMZ files of their preferred corridor for review. A follow up meeting was planned for 4 to 6 weeks out. A meeting was ultimately set up for May 4, 2021. Coordination efforts continued throughout this time. OUC provided RS&H their planned transmission line alignment that that would parallel the Northeast Connector Expressway, on the west side from the Sunbridge Water Reclamation Facility to just north of Nova Road.

May 4, 2021

Carolyn Greenwell, the Project Manager for Burns and McDonnell, discussed several constraints involving Lake Bullock and the Jack Brack Road Interchange with their planned transmission line. Mitigation and avoidance alternatives were discussed and will be further evaluated by CFX and RS&H. RS&H will look to shift the Southeast quadrant of the interchange to avoid Lake Bullock. OUC will also evaluate alternatives that do not require interchange modifications. Carolyn had estimated that the cost for overhead transmission is approximately $2 to $2.5 million per mile, and that the cost to underground transmission is approximately $10 million per mile. A follow up meeting is scheduled for May 14th, 2021.

May 14, 2021

Carolyn Greenwell discussed four potential options for the planned transmission alignment. All options, along with the different stakeholders' feedback, are discussed in great detail in the Meeting Minutes (refer to **Appendix F**). RS&H sent Burns and McDonnell's representatives a revised interchange option at Jack Brack Road, referred to as the Tighter Diamond Interchange, prior to the meeting. Burns and McDonnell's representatives evaluated the alignment after the meeting and confirmed that it was acceptable for the proposed OUC alignment.

Table 2 – Utility Assessment and Estimated Relocation Cost

UAO	Assessment/ Evaluation	Relocation Cost
CenturyLink	Buried copper lines were identified on both sides of Nova Road. This run of utilities ends at Sungrove Lane. Buried copper lines were identified on Absher Road and Cyrils Drive. No impacts to the underground facilities are anticipated.	N/A
Comcast Communications	No facilities within project limits	N/A
Duke Energy Distribution	No facilities within project limits	N/A
Duke Energy Transmission	No facilities within project limits	N/A
Orlando Utilities Commision - Communications	Mark-ups from Fred Urban show aerial fiber optic cable along the existing OUC overhead transmission lines located north of Nova Road. No impacts are anticipated to the overhead transmission line.	N/A
Orlando Utilities Commision - Distribution	Mark-ups from Mike Galloway show OUC relocating a portion of their overhead electric from the south side of Nova Road to the north side. The limits of relocation begin just east of Sungrove Lane and terminate just passed the point where the expressway extension meets Nova Road. Approximately 2,400 ft of conductor is anticipated to be relocated. Eleven (11) new poles are proposed.	$20,000
Orlando Utilities Commision - Lighting	No facilities within project limits	N/A
Orlando Utilities Commision - Transmission	No Response; See Meeting Minutes (refer to **Appendix F**).	$2 to $2.5 million per mile (Overhead Transmission) $10 million per mile (Underground Transmission)
Toho Water Authority	A force main, water main, and reclaim main were identified along Cyrils Drive. The force main and reclaim main are located on the north side of the road. The water main is on the south side. The Cyrils Drive Interchange, as part of the SR 534 Preferred Alternative, will impact these utilities. In addition, a water treatment plant is under construction in undeveloped land located southeast of Cyrils Drive and just north of the future Jack Brack Road Extension; facility limits are approximately between Station 757+00 and Station 783+00 as defined in the Build Alternative Plan Sheets (refer to **Appendix B**). Impacts to the facility appear to be avoided based on Build Alternative Plan Sheets.	N/A

Utility Mitigation and Cost

To date, OUC Distribution has determined a relocation cost of $20,000 based on anticipated impacts from the Build Alternatives. Mark-ups from OUC Distribution suggests 2,400 ft of conductor to be relocated and eleven (11) new poles to be installed.

No information has been provided from OUC Transmission on their existing transmission facility. It is also unclear on whether the planned transmission line will require additional costs based on mitigation measures in order to accommodate the expressway extension. Potential costs are outlined in Table 2.

APPENDIX A

Utility Contact Letters & Responses

Armando Perez

From: Armando Perez
Sent: Monday, March 15, 2021 4:31 PM
To: Leslie, Ty T
Cc: Sherman Klaus
Subject: NE Connector PD&E Study - Utility Coordination

Mr. Leslie,

The Balmoral Group is providing utility coordination services as part of the Central Florida Expressway Authority's PD&E Study for the Northeast Connector Expressway – Phase 1 from Cyrils Drive to Nova Road (CR 532). Please address all correspondence, verbal and written to The Balmoral Group.

In an effort to better coordinate the selection of corridor alternatives and their impacts on utilities, I am providing a package of documentation of the project study area for your review. (See One Drive Link)

Given the scope of the study, we identified a baseline of utility information to aid us in our coordination efforts. Please provide the information per corridor alternative.

1. Locations of existing and planned utilities
2. A description of existing and planned utilities
3. Relevant easement or property rights documentation (if facilities are located in the right of way pursuant to any document other than a utility permit)

Please provide a set of mark-ups as part of your review. Please include any mapping, or other supportive documentation relevant to any of your encountered facilities. Also, please fill out the Initial Utility Contact Form (See One Drive Link).

In addition to the documentation, I am requesting a cost estimate and anticipated time frames for relocation of major utilities where conflicts are anticipated to be unavoidable (include ROW costs). We will review your information and coordinate prior to the subsequent phase to discuss further dispositions.

If the project area is outside of your utility service please respond in kind.

Please return this information to me by April 16th, 2021.

Thank you for your cooperation. Please feel free to contact me for additional information, or questions.

One Drive Link:
https://1drv.ms/u/s!AjzUtehBxI7gggOn9XCpi0I1y8Q1?e=To0yAe

Armando T. Perez, P.E.

The Balmoral Group
165 Lincoln Avenue | Winter Park, FL 32789
Phone: 561-692-2297 | Fax: 407-629-2183

Armando Perez

From: Rypkema, Xan <xan.rypkema@lumen.com>
Sent: Tuesday, April 20, 2021 3:48 PM
To: Armando Perez
Subject: Under Review 599-228 & 001546 - NE Connector Expressway, St Cloud.
Attachments: map p077475 .2.pdf; map P077475 1.pdf

Thank you for your project notification. LUMEN has reviewed your utility notice dated **04/15/2021** regarding the **P-077475 FL** | **599-228 & 001546 - NE Connector Expressway, St Cloud.** ("Project"). In response to your inquiry please find the enclosed drawings indicating the approximate location of the LUMEN facilities (the "Facilities").

LUMEN Local/National does not have facilities within your proposed construction area.

LUMEN Local/National has facilities within your proposed construction area. Please find the enclosed drawings indicating the location of the LUMEN facilities. Once you have completed your review, please respond back if LUMEN facilities appear to be in conflict. A LUMEN engineer will be assigned when engineering plans are ready for review.

LUMEN Local/National facilities are under review by our LUMEN Field Engineer(s) listed below. For questions concerning the details of this review, please contact them directly. Currently, the estimated completion date of review is **5/5/2021**.

LUMEN Local/National is leasing facilities within your proposed construction Zone, which may have potential conflicts. Please verify that you have contacted all communications providers listed on your One Call Ticket.

LUMEN Local/National - The information provided in your initial request is insufficient to determine if the location of your proposed construction will conflict with LUMEN facilities. Please provide additional detailed location maps, drawings (PDF preferred), and description for further conflict review.

LUMEN Local/National has facilities within your proposed construction zone, but it has been determined that no relocation will be necessary. However, due to the proximity of your project to our facilities, a LUMEN representative will be required on-site when construction begins.

[LUMEN National Engineer-Name | Email | PhoneNumber]/ [LUMEN Local Engineer-Name | Email | PhoneNumber]

Please contact your State One Call prior to construction service (click link for state specific requirements).

Any changes or additions to the project plans or parameters should be submitted to Network Relocations for review of potential new impacts to the LUMEN facilities. **Note**: the location(s) of facilities shown on these drawings you receive from us, are only approximate. LUMEN hereby disclaims any responsibility for the accuracy of this information. Please

contact Network Relocations regarding the above mentioned project if you should have any questions. Please reference the file number **P-077475 FL** with any future communications.

Thank you for your cooperation!

Xan Marie Rypkema
Business Analyst
Network Relocations
xan.rypkema@Lumen.com

We have combined!! To better serve everyone, there is now a single email inbox for LUMEN. One team is monitoring both national and local network relocations & road moves. Please add **relocations@lumen.com to your contacts list for inquiries, updates, and use it for all future notifications.**

LUMEN
E-mail: relocations@lumen.com

From: Leslie, Ty T <Michel.T.Leslie@centurylink.com>
Sent: Thursday, April 15, 2021 3:08 PM
To: relocations <relocations@centurylink.com>
Cc: Byrnes, David R <david.r.byrnes@centurylink.com>
Subject: FW: NE Connector PD&E Study - Utility Coordination

Ty Leslie
Sr. Mgr. Local Network Implementation
33 N. Main St. Winter Garden, FL. 34787
tel: 407-814-5293 | cell: 407-504-8386
michel.t.leslie@lumen.com

From: Armando Perez <ATPerez@balmoralgroup.us>
Sent: Monday, March 15, 2021 4:31 PM
To: Leslie, Ty T <Michel.T.Leslie@centurylink.com>
Cc: Sherman Klaus <sklaus@balmoralgroup.us>
Subject: NE Connector PD&E Study - Utility Coordination

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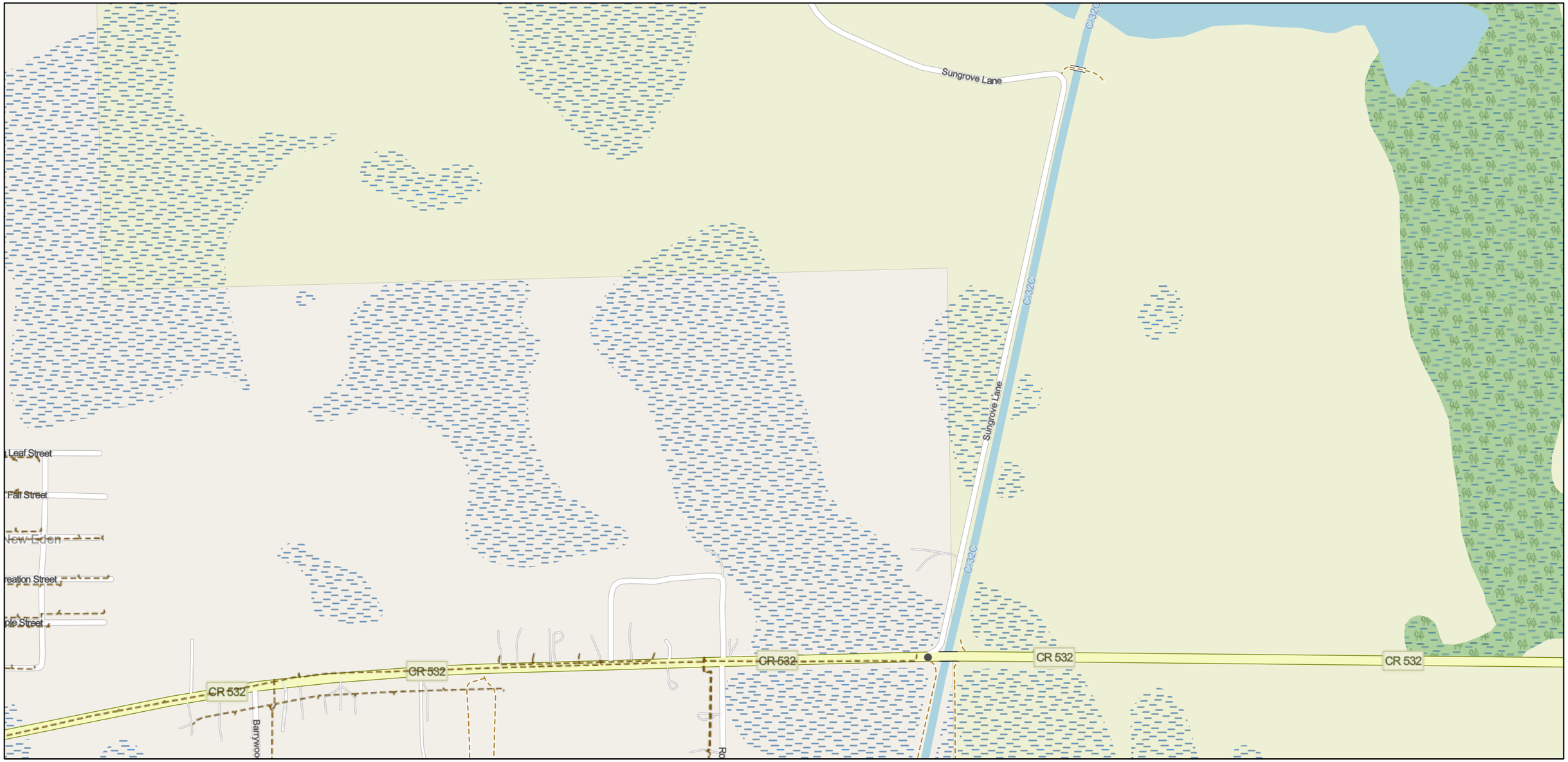
Armando T. Perez, P.E.

The Balmoral Group
165 Lincoln Avenue | Winter Park, FL 32789
Phone: 561-692-2297 | Fax: 407-629-2183
Visit our website for more information!

LUMEN Relocate Utility Map



4/20/2021, 1:43:07 PM

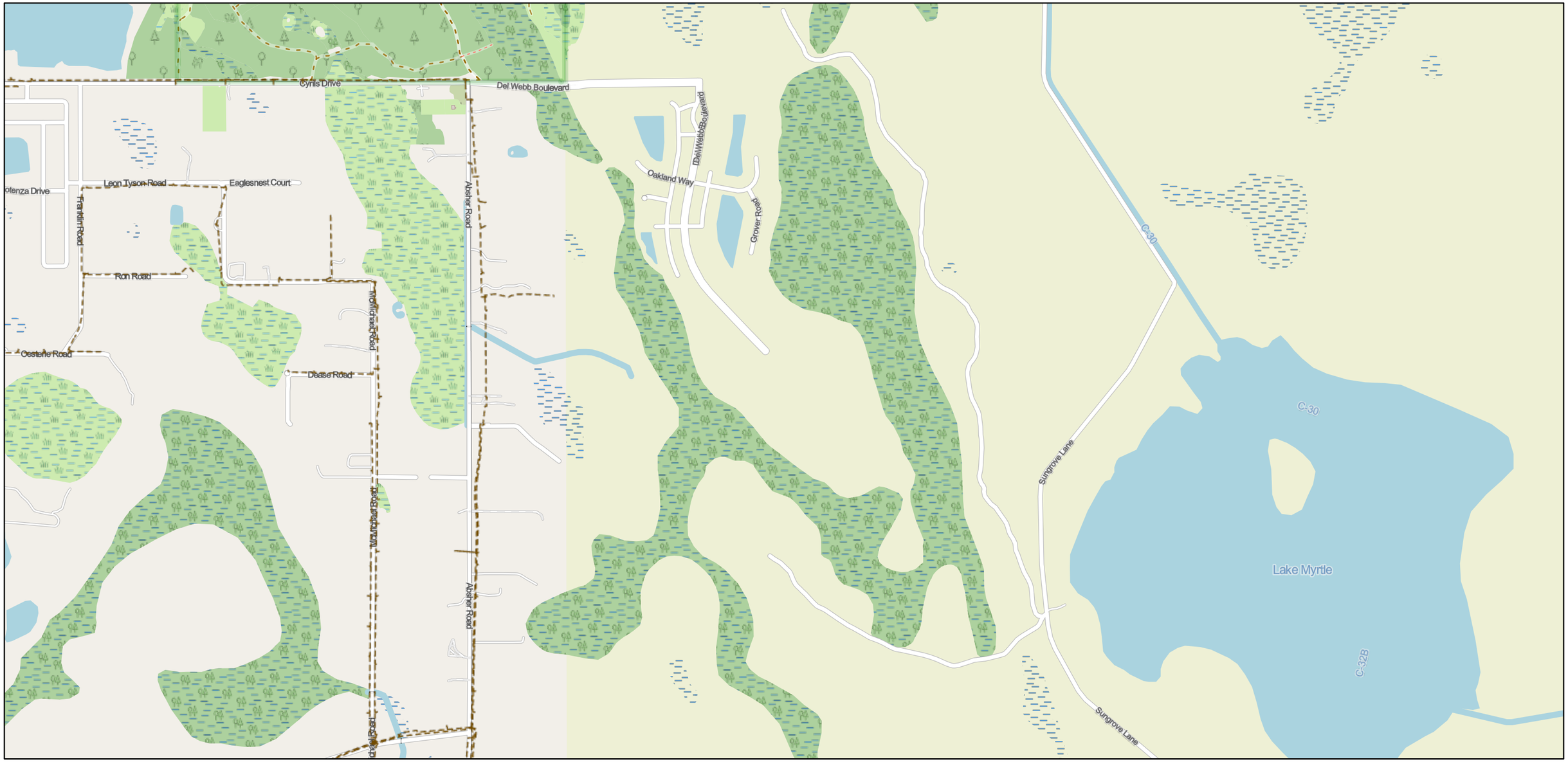
Local Copper UG Route

1:9,028

0 0.07 0.15 0.3 mi

0 0.15 0.3 0.6 km

LUMEN Relocate Utility Map



4/20/2021, 11:00:43 AM

Local Copper UG Route

Local Copper Aerial Route

1:18,056

0 0.17 0.35 0.7 mi

0 0.3 0.6 1.2 km

Armando Perez

From: Armando Perez
Sent: Monday, March 15, 2021 4:32 PM
To: 'andrew_sweeney@comcast.com'
Cc: Sherman Klaus
Subject: NE Connector PD&E Study - Utility Coordination

Mr. Sweeney,

The Balmoral Group is providing utility coordination services as part of the Central Florida Expressway Authority's PD&E Study for the Northeast Connector Expressway – Phase 1 from Cyrils Drive to Nova Road (CR 532). Please address all correspondence, verbal and written to The Balmoral Group.

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Armando T. Perez, P.E.

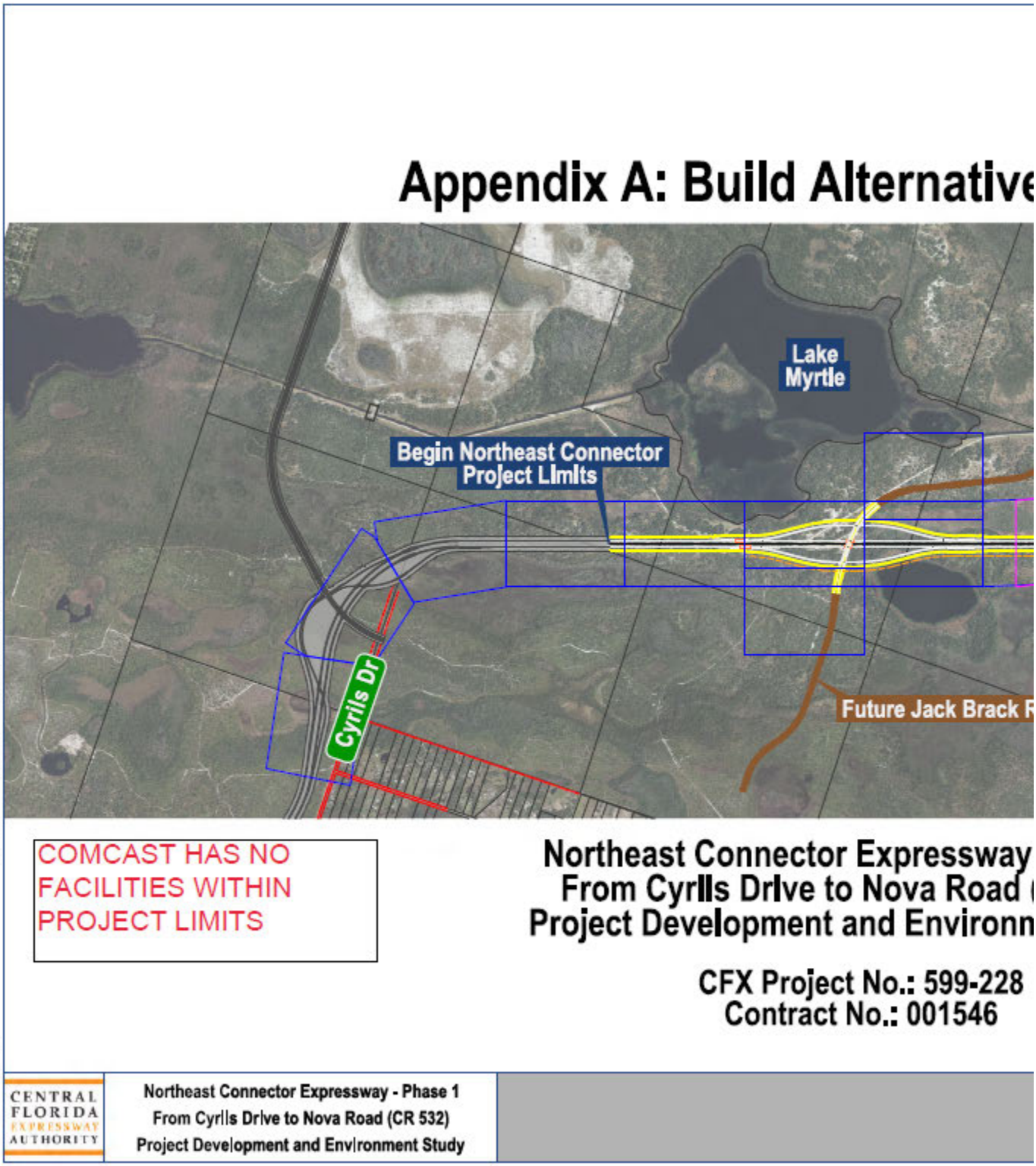
The Balmoral Group
165 Lincoln Avenue | Winter Park, FL 32789
Phone: 407-629-2185 x 122 | Fax: 407-629-2183

Armando Perez

From: David McElroy <david@fibercoregroup.com>
Sent: Friday, March 19, 2021 10:48 AM
To: Armando Perez
Cc: Rodney Hand; Ron Bostick; Michael Palmer; Chavarria Blanco, Chavarria; Rivera, Cesar; Devyn McElroy; Jennifer Sanders
Subject: Re: Survey has been Assigned for Forced Relocates REQ0000610721 CFX NE Connector PD&E
Attachments: REQ0000610721 Back up.JPG; Email.pdf

Comcast has no facilities within project limits.

Cindy attached is the back up.



Thank you,

David McElroy, President / CEO
(602) 318-5808 cell
www.advancedfibergroup.com

On Thu, Mar 18, 2021 at 11:21 AM Chavarria Blanco, Chavarria <cchavarria-rios@ftsolutions.com> wrote:

Hi David,

Please add to your work schedule per Gene.

Thank you,

Cindy E. Chavarria Blanco
Office Administrator
Fiber Technologies Solutions, LLC
1515 CR 210 W
Bldg# 300
St Augustine, FL 32095
Main#: 904- 907 -2964

On Tue, Mar 16, 2021 at 11:23 AM Chavarria Blanco, Chavarria <cchavarria-rios@ftsolutions.com> wrote:

Please remove it from your schedule.

Thank you,

Cindy E. Chavarria Blanco
Office Administrator
Fiber Technologies Solutions, LLC
1515 CR 210 W
Bldg# 300
St Augustine, FL 32095
Main#: 904- 907 -2964

On Tue, Mar 16, 2021 at 10:42 AM Chavarria Blanco, Chavarria <cchavarria-rios@ftsolutions.com> wrote:

Missed to attach the email on file.

Thank you,

Cindy E. Chavarria Blanco
Office Administrator

Fiber Technologies Solutions, LLC
1515 CR 210 W
Bldg# 300
St Augustine, FL 32095
Main#: 904- 907 -2964

On Tue, Mar 16, 2021 at 10:42 AM Chavarria Blanco, Chavarria <cchavarria-rios@ftsolutions.com> wrote:

Thank you,

Cindy E. Chavarria Blanco
Office Administrator
Fiber Technologies Solutions, LLC
1515 CR 210 W
Bldg# 300
St Augustine, FL 32095
Main#: 904- 907 -2964

---------- Forwarded message ---------
From: **Thomas S Osebold** <scott_osebold@cable.comcast.com>
Date: Tue, Mar 16, 2021 at 9:41 AM
Subject: Survey has been Assigned for Forced Relocates REQ0000610721 CFX NE Connector PD&E
To: cchavarria-rios@ftsolutions.com <cchavarria-rios@ftsolutions.com>

You have been assigned a Survey task by Thomas S Osebold.

Request or Job: Request
Category: Betterments
Type: Forced Relocates
P2 Id: REQ0000610721
Description: CFX NE Connector PD&E
Division: CENTRAL DIVISION
Region:FLORIDA
Market:LAKE COUNTY
Area:AD WHISPER LAKES-SPLIT-ORLANDO DMA
Address:CFX NE Connector PD&E
SYSTEM:8535
PRINCIPLE:1000
AGENT:1540
Task Due Date:03/25/2021

To report any issues or give feedback, please submit a ticket here 

Appendix A: Build Alternatives (200 Scale)

COMCAST HAS NO FACILITIES WITHIN PROJECT LIMITS

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

Armando Perez

From: Armando Perez
Sent: Monday, March 15, 2021 4:33 PM
To: 'DEFDistributionGOV'; 'DEFTransmissionGov@duke-energy.com'
Cc: Sherman Klaus
Subject: NE Connector PD&E Study - Utility Coordination

The Balmoral Group is providing utility coordination services as part of the Central Florida Expressway Authority's PD&E Study for the Northeast Connector Expressway – Phase 1 from Cyrils Drive to Nova Road (CR 532). Please address all correspondence, verbal and written to The Balmoral Group.

In an effort to better coordinate the selection of corridor alternatives and their impacts on utilities, I am providing a package of documentation of the project study area for your review. (See One Drive Link)

Given the scope of the study, we identified a baseline of utility information to aid us in our coordination efforts. Please provide the information per corridor alternative.

1. Locations of existing and planned utilities
2. A description of existing and planned utilities
3. Relevant easement or property rights documentation (if facilities are located in the right of way pursuant to any document other than a utility permit)

Please provide a set of mark-ups as part of your review. Please include any mapping, or other supportive documentation relevant to any of your encountered facilities. Also, please fill out the Initial Utility Contact Form (See One Drive Link).

In addition to the documentation, I am requesting a cost estimate and anticipated time frames for relocation of major utilities where conflicts are anticipated to be unavoidable (include ROW costs). We will review your information and coordinate prior to the subsequent phase to discuss further dispositions.

If the project area is outside of your utility service please respond in kind.

Please return this information to me by April 16th, 2021.

Thank you for your cooperation. Please feel free to contact me for additional information, or questions.

One Drive Link:
https://1drv.ms/u/s!AjzUtehBxI7gggOn9XCpi0I1y8Q1?e=To0yAe

Armando T. Perez, P.E.

The Balmoral Group
165 Lincoln Avenue | Winter Park, FL 32789
Phone: 407-629-2185 x 122 | Fax: 407-629-2183
Visit our website for more information!

Armando Perez

From: Aric Rogers <ARogers@pike.com>
Sent: Thursday, March 18, 2021 10:54 AM
To: Armando Perez
Cc: Jennifer Williams
Subject: THOR: none; #599-228; Northeast Connector Expressway – Phase I from Cyrils Drive to Nova Road (CR 532); Osceola County; Duke Energy Transmission Utility Review (22-036)
Attachments: 22-036 Sender Email.pdf; 22-036 Duke Energy Transmission Statement Letter.pdf; 22-036 COVER SHEET.PDF

Good morning, Armando:

This email contains important information regarding your request for utility review.

Please utilize the "Read Receipt" feature attached to this email notification to confirm this transmittal.

Project #:	#599-228
Project Phase:	PD&E Study
Plan Date:	March 03, 2021
County:	Osceola
State Road:	N/A
Description:	Northeast Connector Expressway – Phase I from Cyrils Drive to Nova Road (CR 532)

Please find the following attached to this email:

1. One (1) copy of correspondence requesting facilities review
2. One (1) project plan cover sheet
3. One (1) certified letter from Duke Energy Transmission stating facility determination

Electronic submittal of the project review is a part of our initiative to go paperless and will apply only to projects of No Involvement.

Please feel free to contact me with you have any questions or concerns.

Kindly,

Aric Rogers
Operations Support Specialist I

Pike Engineering, LLC
4427 Pet Lane, Suite 101
Lutz, FL 33559
T: 813.909.1245
ARogers@pike.com
www.pike.com

March 18, 2021

Armando T. Perez, P.E.
c/o The Balmoral Group
165 Lincoln Avenue
Winter Park, FL 32789

Re:	**Project #:**	**#599-228**
	Project Phase:	**PD&E Study**
	Plan Date:	**March 03, 2021**
	County:	**Osceola**
	State Road:	**N/A**
	Description:	**Northeast Connector Expressway – Phase I from Cyrils Drive to Nova Road (CR 532)**

We hereby certify that **Duke Energy Florida, LLC, a Florida Limited Liability Company, d/b/a Duke Energy Transmission,** does not have facilities located within the limits of the above-referenced project. No alterations are required.

Please find enclosed items listed below for the above-referenced project:

1. One (1) copy of correspondence requesting facilities review
2. One (1) project plan cover page

If you have further questions, I can be reached by sending an email to DEFTransmissionGov@duke-energy.com.

(Scott Van Velzor in lieu of) Francis Castro

Duke Energy Transmission Line Engineering

Initial Utility Contact Form

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Date:	March 17, 2021
Company Name:	Duke Energy Distribution
Phone Number:	520-366-7254
Email Address:	Tomas.Macias@Duke-Energy.com
Contract # and Description:	CFX Project #: 599-228 Northeast Connector PD&E Study, From Cyrils Drive to Nova Road (CR 532) Osceola County, FL
Emergency number to be inserted on plans	321-263-5883

Existing facilities are located:

_____ Within existing CFX Right-of-Way **(between Station: _____ to Station: _____)**
_____ Within existing County/City Right-of-Way
_____ Within railroad Right-of-Way
_____ Within an easement or fee title property
__X__ No facilities within project limits
_____ No utility conflicts *(Has facilities within limits but is not affected)*
_____ There will not be a claim for reimbursement
_____ There will be a claim for reimbursement *
_____ Facilities located along Interstate corridor

*** Please provide any document(s) [i.e. fee title property deed or easement document(s)] within the project limits that formulates the basis for your entitlement to be reimbursed for your utility work. NOTE: A preliminary cost estimate for any utility work within this entitled area is required.**

Enclosed please find:

_____ Marked Roadway Plans
_____ Legal Documents
_____ Company Utility Plans
_____ Preliminary Cost Estimate

POLE OWNERS: List Joint Pole Users

COMMENTS:
Not Involved.

Signed: Tomas Macias
Title: Engr. Tech III

Armando Perez

From: Armando Perez
Sent: Monday, March 15, 2021 4:35 PM
To: Development Services
Cc: Sherman Klaus
Subject: NE Connector PD&E Study - Utility Coordination

The Balmoral Group is providing utility coordination services as part of the Central Florida Expressway Authority's PD&E Study for the Northeast Connector Expressway – Phase 1 from Cyrils Drive to Nova Road (CR 532). Please address all correspondence, verbal and written to The Balmoral Group.

In an effort to better coordinate the selection of corridor alternatives and their impacts on utilities, I am providing a package of documentation of the project study area for your review. (See One Drive Link)

Given the scope of the study, we identified a baseline of utility information to aid us in our coordination efforts. Please provide the information per corridor alternative.

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3. Relevant easement or property rights documentation (if facilities are located in the right of way pursuant to any document other than a utility permit)

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In addition to the documentation, I am requesting a cost estimate and anticipated time frames for relocation of major utilities where conflicts are anticipated to be unavoidable (include ROW costs). We will review your information and coordinate prior to the subsequent phase to discuss further dispositions.

If the project area is outside of your utility service please respond in kind.

Please return this information to me by April 16th, 2021.

Thank you for your cooperation. Please feel free to contact me for additional information, or questions.

One Drive Link:
https://1drv.ms/u/s!AjzUtehBxI7gggOn9XCpi0I1y8Q1?e=To0yAe

Armando T. Perez, P.E.

The Balmoral Group
165 Lincoln Avenue | Winter Park, FL 32789
Phone: 407-629-2185 x 122 | Fax: 407-629-2183
Visit our website for more information!

Armando Perez

From: Development Services <DevelopmentServices@ouc.com>
Sent: Friday, March 19, 2021 8:56 AM
To: Armando Perez
Cc: Sherman Klaus; Development Services
Subject: RE: NE Connector PD&E Study - Utility Coordination

Follow Up Flag: Follow up
Flag Status: Flagged

Good Morning Armando:

We created work order # **748559** for this project.

Your request has been forwarded to OUC Electric, Lighting and Transmission Engineering for review.

The assigned OUC Engineers will be in contact with you regarding the request.

The current review time for projects is 6-8 weeks.

Please e-mail me back if you have any questions.

Sincerely,

Linda T. Juliao
Development Services Specialist
Orlando Utilities Commission
100 W. Anderson St
Orlando, FL 32801
407-236-9651

From: Armando Perez [mailto:ATPerez@balmoralgroup.us]
Sent: Monday, March 15, 2021 4:35 PM
To: Development Services <DevelopmentServices@ouc.com>
Cc: Sherman Klaus <sklaus@balmoralgroup.us>
Subject: NE Connector PD&E Study - Utility Coordination

The Balmoral Group is providing utility coordination services as part of the Central Florida Expressway Authority's PD&E Study for the Northeast Connector Expressway – Phase 1 from Cyrils Drive to Nova Road (CR 532). Please address all correspondence, verbal and written to The Balmoral Group.

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Please return this information to me by April 16th, 2021.

Thank you for your cooperation. Please feel free to contact me for additional information, or questions.

One Drive Link:
https://1drv.ms/u/s!AjzUtehBxI7gggOn9XCpi0I1y8Q1?e=To0yAe

Armando T. Perez, P.E.

The Balmoral Group
165 Lincoln Avenue | Winter Park, FL 32789
Phone: 407-629-2185 x 122 | Fax: 407-629-2183
Visit our website for more information!

Armando Perez

From: Urban, Fred <FUrban@ouc.com>
Sent: Friday, May 28, 2021 2:28 PM
To: Armando Perez
Cc: Willis, Adonis T.
Subject: Cyrils Road Extension
Attachments: OUC Trasmission and Fiber Line.JPG

Follow Up Flag: Follow up
Flag Status: Flagged

Armando

Please see attached GIS drawing of the existing OUC overhead Transmission line with Fiber Cable.

I wasn't sure how to find exact location on your drawings.

Hope this helps.

OUC
Fred Urban
Senior Engineer
6003 Pershing Ave.
Orlando, Fl. 32822
O 407-434-4127
C 321-377-1065


2829 YRD DE - STR? - .72 cnt
2829 STR17 - STR25 - .72 cnt
2829 STR4 - STR17 - 72 cnt

Armando Perez

From: Galloway, Mike <MGalloway@ouc.com>
Sent: Saturday, June 12, 2021 10:43 AM
To: Armando Perez
Cc: Sherman Klaus
Subject: RE: CCON #748559 - NE Connector PD&E Study (Utility Coordination)
Attachments: NOVA RD SHEET 1-EENGcolor.pdf; NOVA RD SHEET 2-EENGcolor.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Armondo
Here are the markups for OUC distribution. The only conflict will be on Nova Rd and I have marked the Nova plans as shown.

Thanks

MICHAEL GALLOWAY
OUC The Reliable One

Sr. Engineering Associate

6003 Pershing Ave.
Orlando, FL 32822
C: (321)436-6201
O: (407)434-4148

mgalloway@ouc.com
For more information about OUC • LinkedIn | OUC.com

From: Armando Perez [mailto:ATPerez@balmoralgroup.us]
Sent: Thursday, June 03, 2021 10:54 AM
To: Galloway, Mike <MGalloway@ouc.com>
Cc: Sherman Klaus <sklaus@balmoralgroup.us>
Subject: CCON #748559 - NE Connector PD&E Study (Utility Coordination)

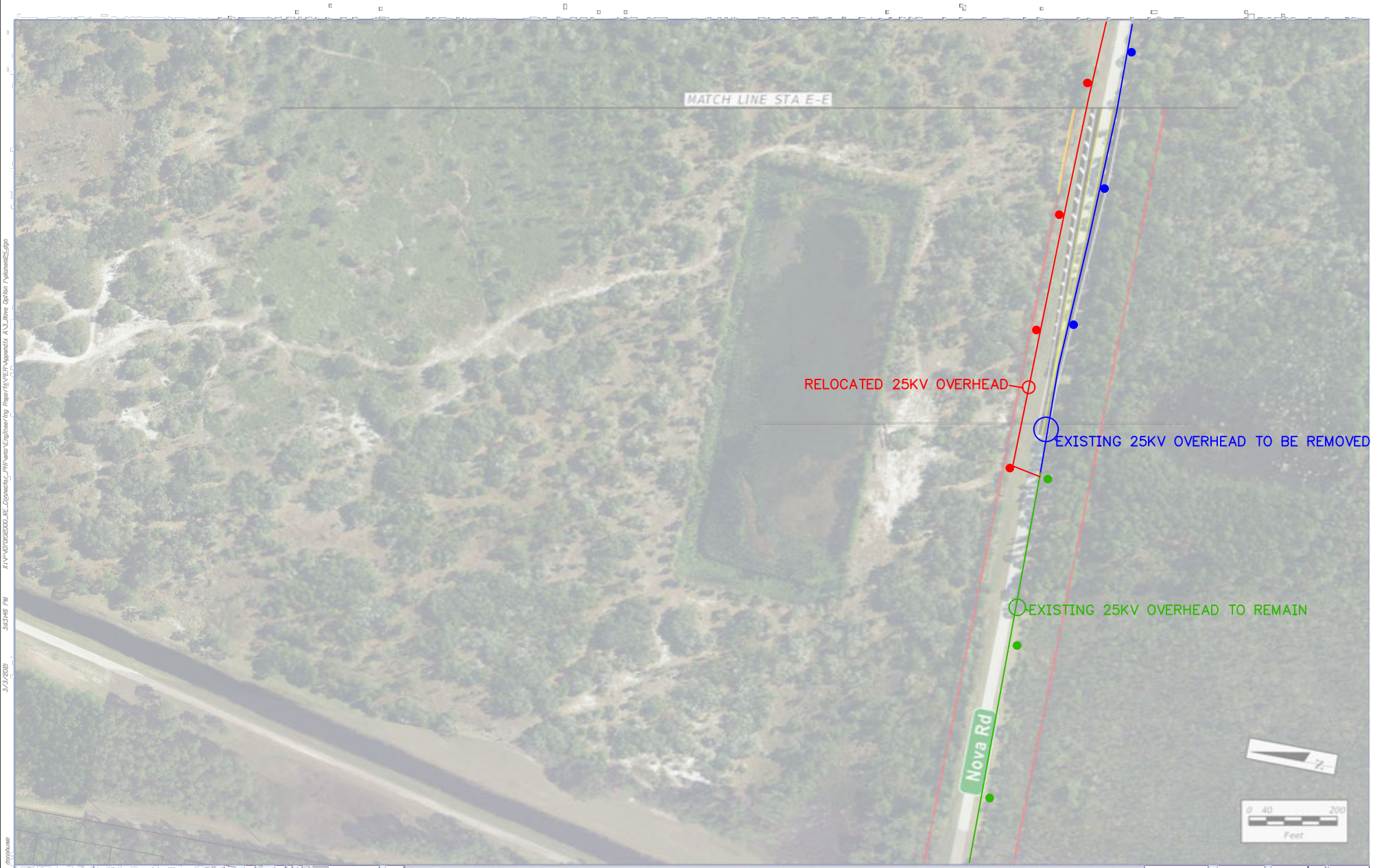
Hello Mike,

It was good talking to you this morning. I will follow up next week to check on your progress.

Thank you and please reach out if you need anything,

Armando T. Perez, P.E.

The Balmoral Group
165 Lincoln Avenue | Winter Park, FL 32789
Phone: 561-692-2297 | Fax: 407-629-2183
Visit our website for more information!



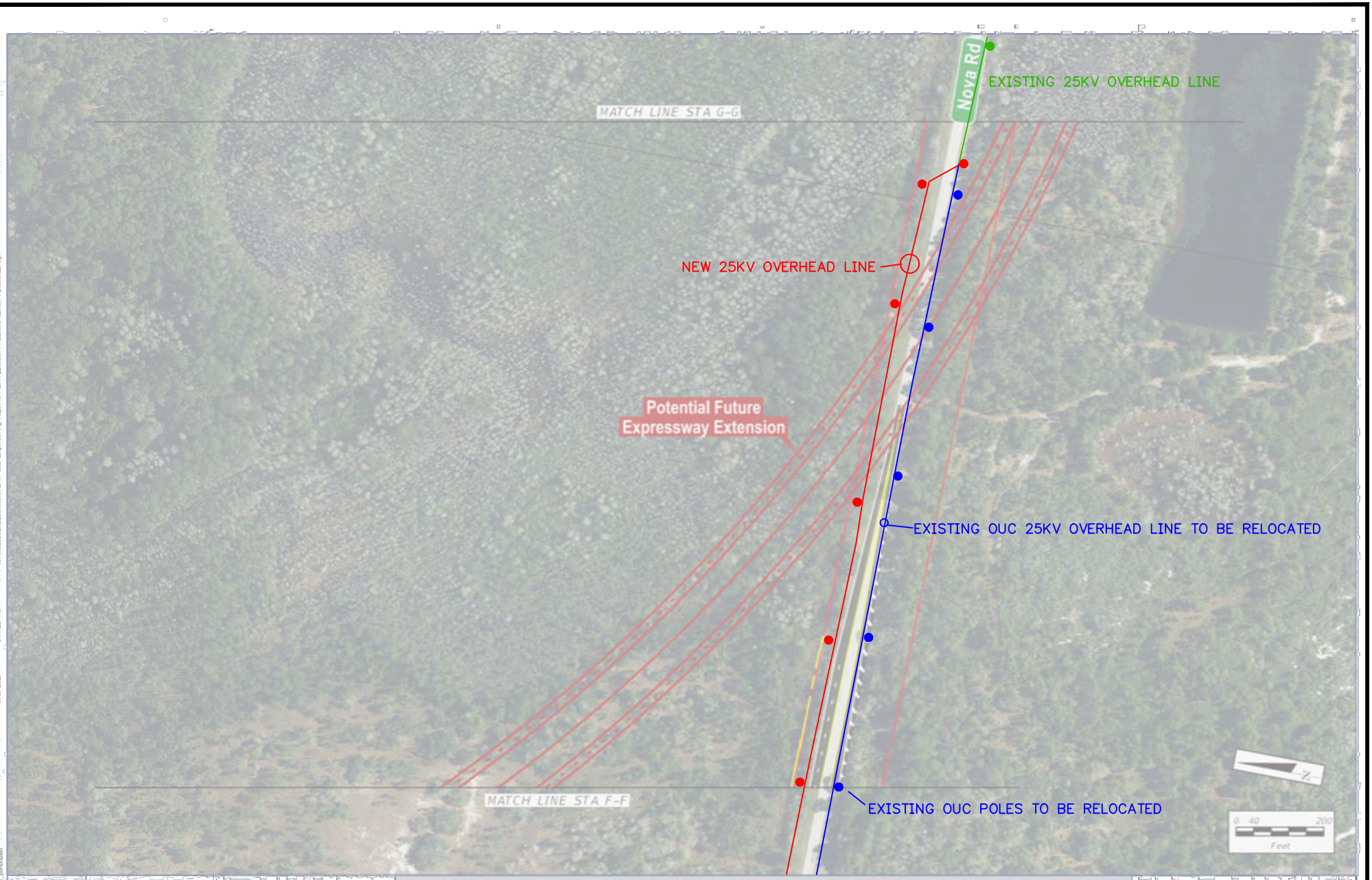
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

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-25



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
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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-26

Armando Perez

From: Nieves, Carmelo <CNieves@ouc.com>
Sent: Monday, May 10, 2021 3:00 PM
To: Armando Perez
Subject: NE Connector PD&E Study - Utility Coordination
Attachments: Initial Contact Response Form.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Mr. Pérez,

Good afternoon. Please find attached Initial Contact Response Form for the subject project. Please contact me should you have any question or concern.

Regards,

Carmelo Nieves
Project Engineer Distribution
Orlando Utilities Commission
Office: (407) 434-6537
Cell Phone: (407) 274-8431
CNieves@ouc.com

Initial Utility Contact Form

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Date:	April 16, 2021 (return by date)
Company Name:	OUC
Phone Number:	407-274-8431
Email Address:	cnieves@ouc.com
Contract # and Description:	CFX Project #: 599-228 Northeast Connector PD&E Study, From Cyrils Drive to Nova Road (CR 532) Osceola County, FL
Emergency number to be inserted on plans	

Existing facilities are located:

_____ Within existing CFX Right-of-Way **(between Station: _____ to Station: _____)**
_____ Within existing County/City Right-of-Way
_____ Within railroad Right-of-Way
_____ Within an easement or fee title property
__X__ No facilities within project limits
_____ No utility conflicts *(Has facilities within limits but is not affected)*
_____ There will not be a claim for reimbursement
_____ There will be a claim for reimbursement *
_____ Facilities located along Interstate corridor

*** Please provide any document(s) [i.e. fee title property deed or easement document(s)] within the project limits that formulates the basis for your entitlement to be reimbursed for your utility work. NOTE: A preliminary cost estimate for any utility work within this entitled area is required.**

Enclosed please find:

_____ Marked Roadway Plans
_____ Legal Documents
_____ Company Utility Plans
_____ Preliminary Cost Estimate

POLE OWNERS: List Joint Pole Users

COMMENTS:

Signed: Carmelo Nieves
Title: Project Distribution Engineer- Lighting

Armando Perez

From: Armando Perez
Sent: Monday, March 15, 2021 4:36 PM
To: 'mpampouk@tohowater.com'
Cc: Sherman Klaus
Subject: NE Connector PD&E Study - Utility Coordination

Mr. Pampouk,

The Balmoral Group is providing utility coordination services as part of the Central Florida Expressway Authority's PD&E Study for the Northeast Connector Expressway – Phase 1 from Cyrils Drive to Nova Road (CR 532). Please address all correspondence, verbal and written to The Balmoral Group.

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Thank you for your cooperation. Please feel free to contact me for additional information, or questions.

One Drive Link:
https://1drv.ms/u/s!AjzUtehBxI7gggOn9XCpi0I1y8Q1?e=To0yAe

Armando T. Perez, P.E.

The Balmoral Group
165 Lincoln Avenue | Winter Park, FL 32789
Phone: 407-629-2185 x 122 | Fax: 407-629-2183

Armando Perez

From: Mike Pampoukis <Mpampouk@tohowater.com>
Sent: Friday, April 16, 2021 7:41 AM
To: Armando Perez
Cc: Sherman Klaus
Subject: RE: NE Connector PD&E Study - Utility Coordination
Attachments: TWA UTILITIES EAST OF NARCOOSSEE RD.pdf; Build Alternatives Plan Sheets TWA MUPS.pdf

Armando,

Please find attached information on TWA utilities east of Narcoossee Rd. TWA utilities end as shown on attached map at Del Webb Development. No utilities on Nova Road or Jack Brack Rd.

Thank you.

Mike Pampoukis
Senior Engineering Technician
Toho Water Authority
951 Martin Luther King Blvd.
407-944-5043 ext 5043

From: Armando Perez [mailto:ATPerez@balmoralgroup.us]
Sent: Thursday, April 15, 2021 3:36 PM
To: Mike Pampoukis <Mpampouk@tohowater.com>
Cc: Sherman Klaus <sklaus@balmoralgroup.us>
Subject: RE: NE Connector PD&E Study - Utility Coordination

Hello Mike,

We are submitting a Preliminary Draft of our Utility Assessment Report tomorrow for this project. I was wondering how you and your team were progressing with our request for information.

Do you think you will have your assessment complete tomorrow? If not, do you think you could provide us some information regarding the existing utilities (locations and descriptions).

Let me know if you need additional information.

Thanks

Armando T. Perez, P.E.

The Balmoral Group
165 Lincoln Avenue | Winter Park, FL 32789
Phone: 561-692-2297 | Fax: 407-629-2183
Visit our website for more information!

From: Armando Perez
Sent: Monday, March 15, 2021 4:36 PM
To: 'mpampouk@tohowater.com' <mpampouk@tohowater.com>
Cc: Sherman Klaus <sklaus@balmoralgroup.us>
Subject: NE Connector PD&E Study - Utility Coordination

Mr. Pampouk,

The Balmoral Group is providing utility coordination services as part of the Central Florida Expressway Authority's PD&E Study for the Northeast Connector Expressway – Phase 1 from Cyrils Drive to Nova Road (CR 532). Please address all correspondence, verbal and written to The Balmoral Group.

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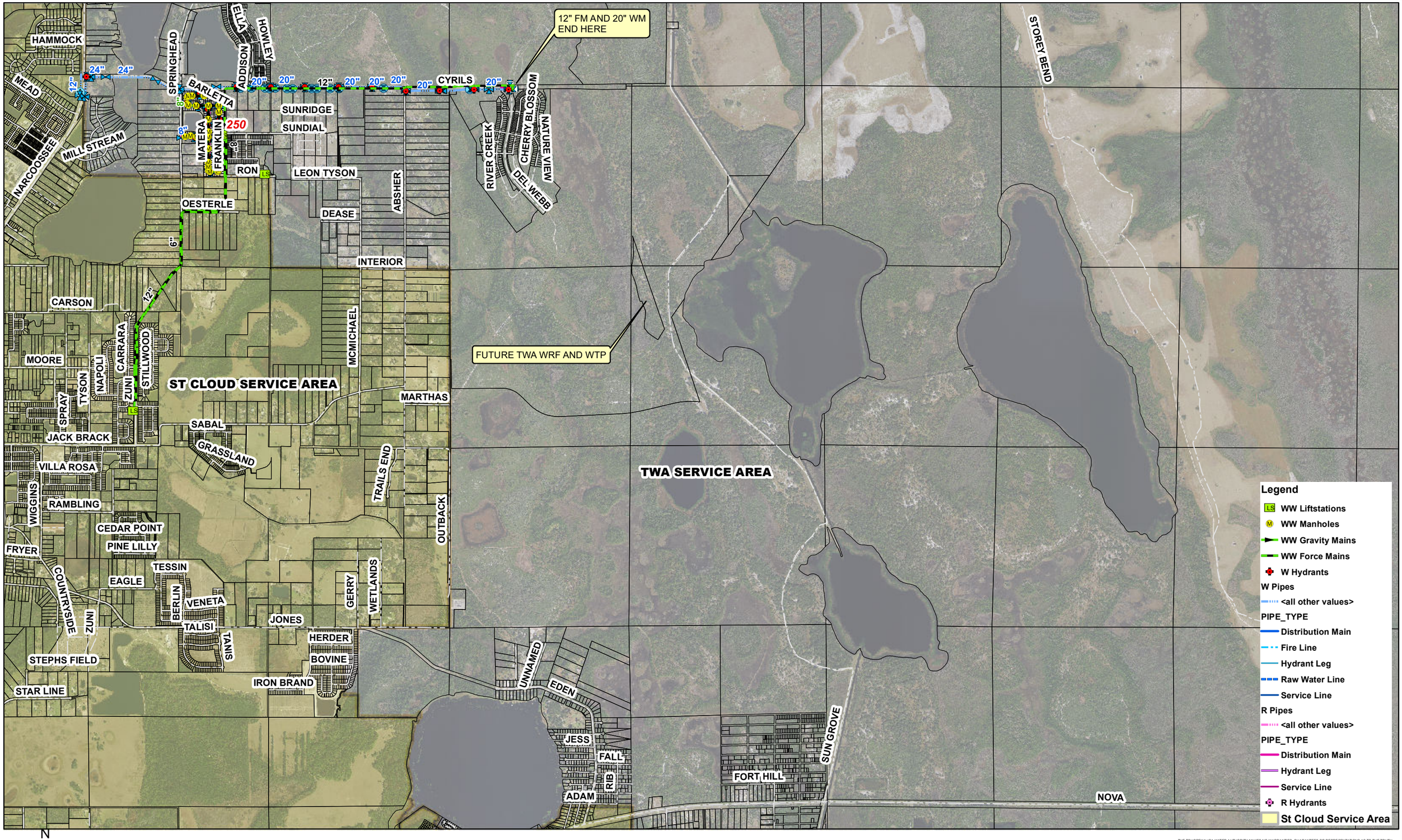
Thank you for your cooperation. Please feel free to contact me for additional information, or questions.

One Drive Link:
https://1drv.ms/u/s!AjzUtehBxI7gggOn9XCpi0I1y8Q1?e=To0yAe

Armando T. Perez, P.E.

The Balmoral Group
165 Lincoln Avenue | Winter Park, FL 32789
Phone: 407-629-2185 x 122 | Fax: 407-629-2183
Visit our website for more information!



N

1 inch = 2,500 feet

TWA UTILITIES

C:\Users\mpampouk\Desktop\Sept Avail Map.mxd
9/9/2019 at 11:34:24 AM
PRODUCED BY: Mike

Split Oak Forest

SR 534 Preferred Alternative

650 655 660 665 670 675

MATCH LINE STA 676+80

12" FM

20" WM

12" FM

Cyrils Dr

TWA MARKUPS 04/16/2021

N

0 40 200
Feet

X:\PV\07010\2000_NE_Connector_PH\roma\Engineering Reports\PER\Appendix A\V_Jack Brock Diamond\plotnem01.dgn
3/3/2021 2:58:16 PM
donohuem

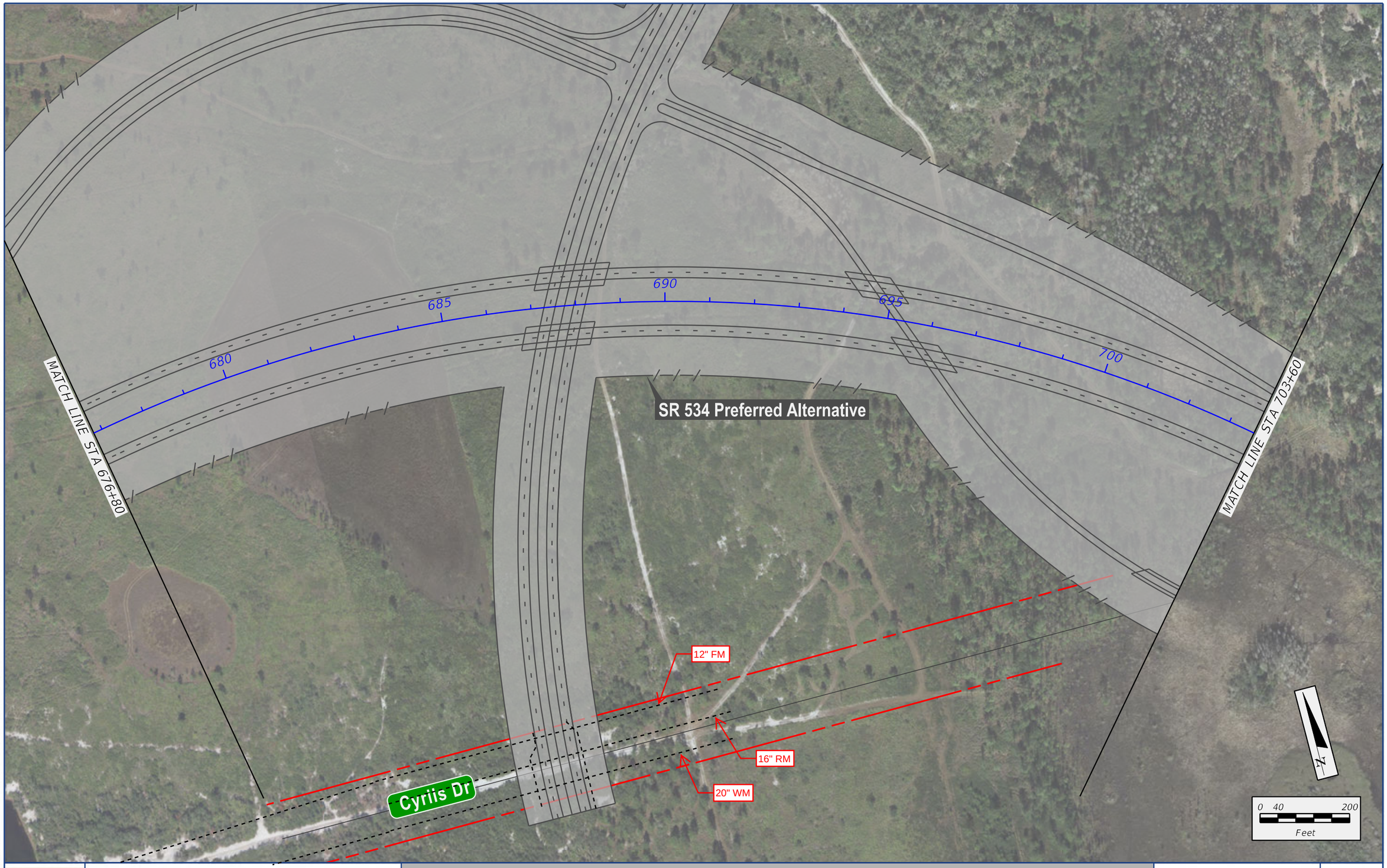
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

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-1



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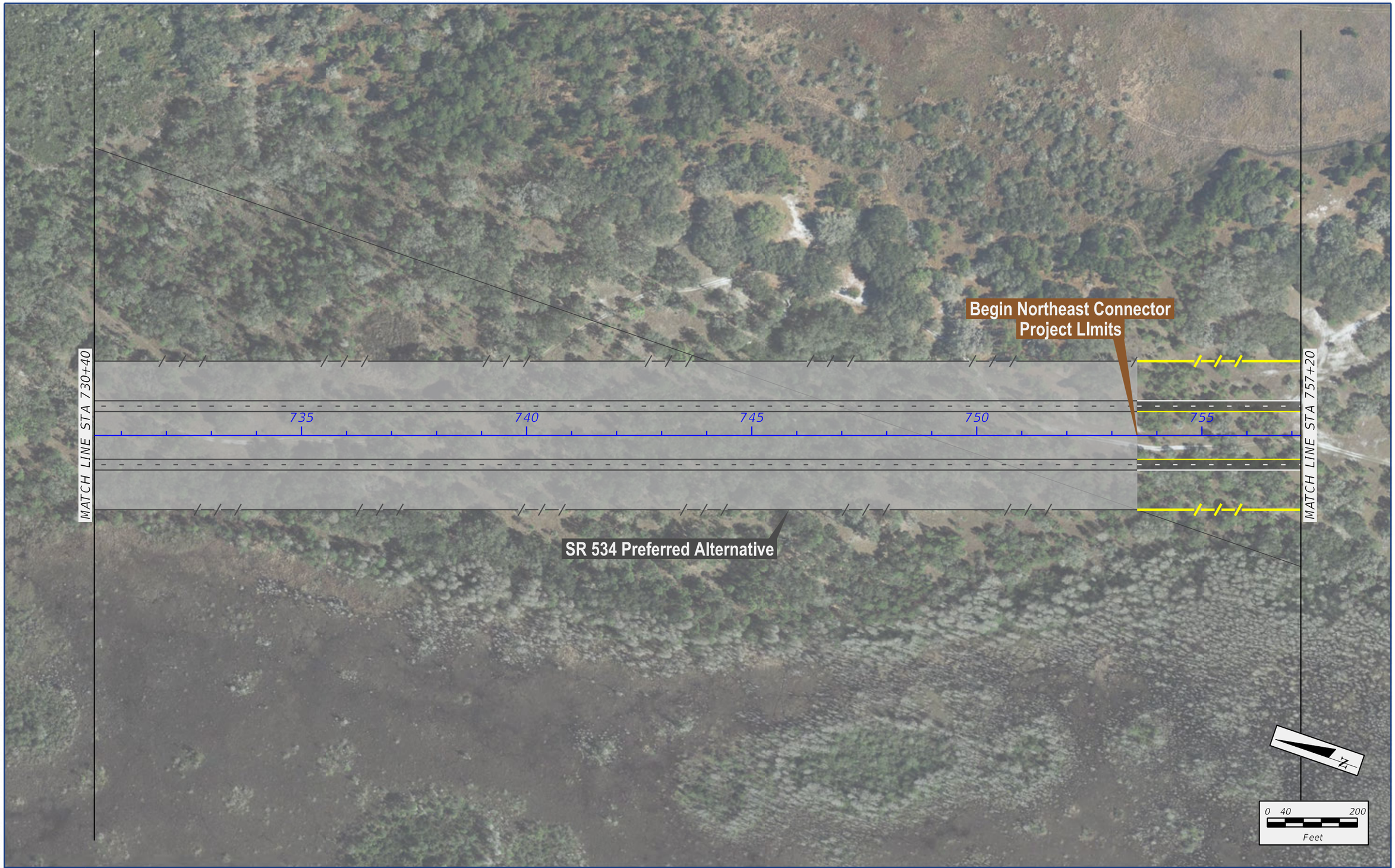
3/3/2021 2:58:53 PM
donohuem

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 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-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

Lake Myrtle

FUTURE WRF AND WTP SITE

MATCH LINE STA 757+20

760 765 770 775 780

MATCH LINE STA 784+00

FUTURE WRF AND WTP SITE

0 40 200
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
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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
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

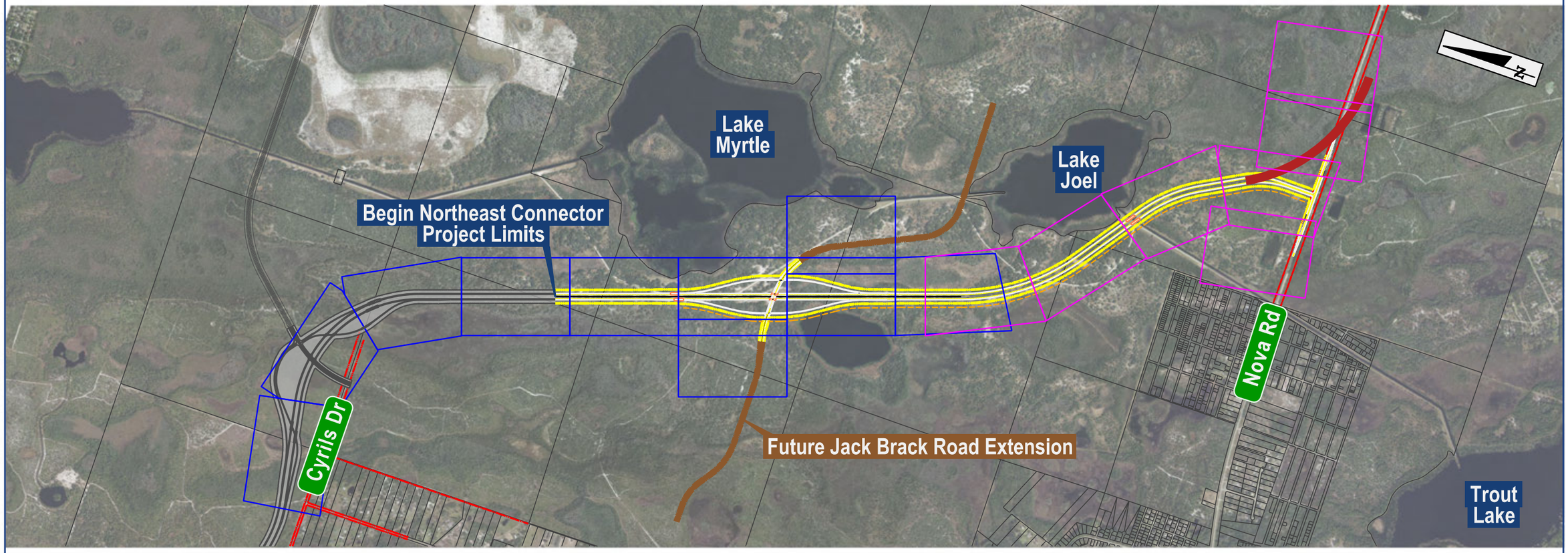
Appendix A
Jack Brack Road Partial
Cloverleaf Interchange

SHEET NO.
A-15

APPENDIX B

PD&E Project Recommended Alternative Plan Sheets

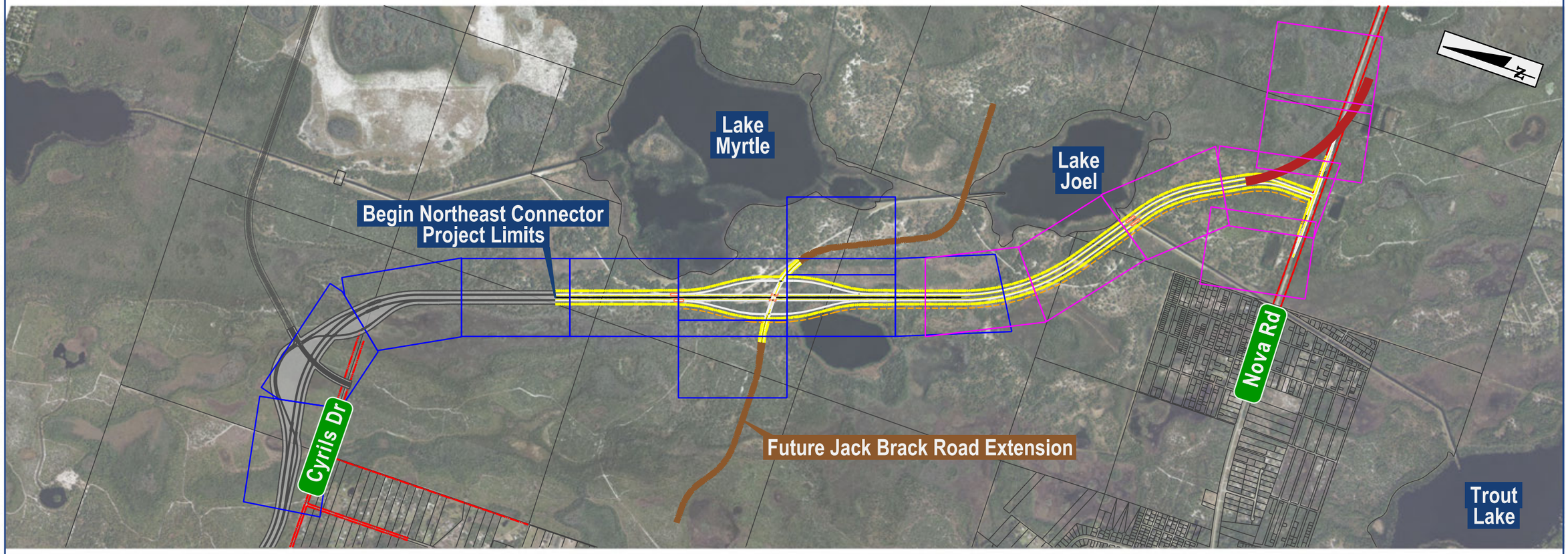
Appendix A: Build Alternatives (200 Scale)



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

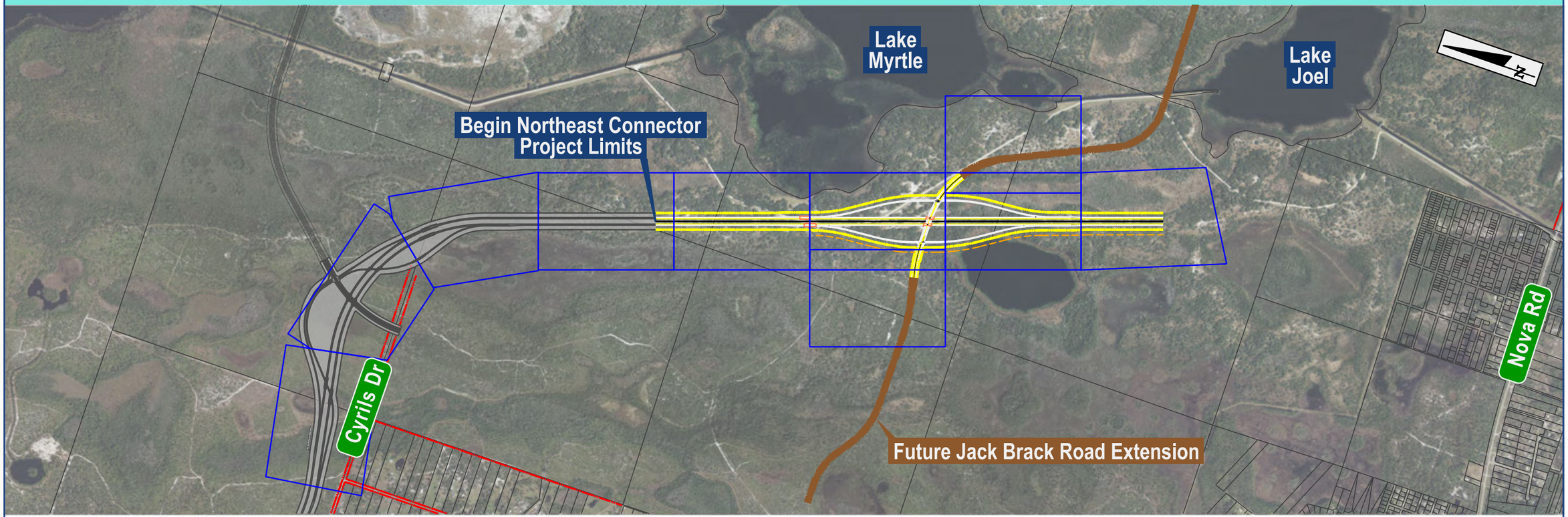
CFX Project No.: 599-228
Contract No.: 001546

Appendix A: Build Alternatives (200 Scale)



Index of Drawings

Jack Brack Road Diamond Interchange



Split Oak Forest

SR 534 Preferred Alternative

650 655 660 665 670 675

MATCH LINE STA 676+80

Cyrils Dr

N

0 40 200
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
Proposed Right-of-Way
Proposed L/A Right-of-Way
Potential OUC Utility Easement
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Proposed Barrier Wall
Proposed Pavement
Proposed Structure

Appendix A
Jack Brack Road
Diamond Interchange

SHEET NO.
A-1

MATCH LINE STA 676+80

680

685

690

695

700

MATCH LINE STA 703+60

SR 534 Preferred Alternative

Cyrils Dr

N

0 40 200
Feet

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
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Existing Right-of-Way
Proposed Right-of-Way
Proposed L/A Right-of-Way
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Property Lines
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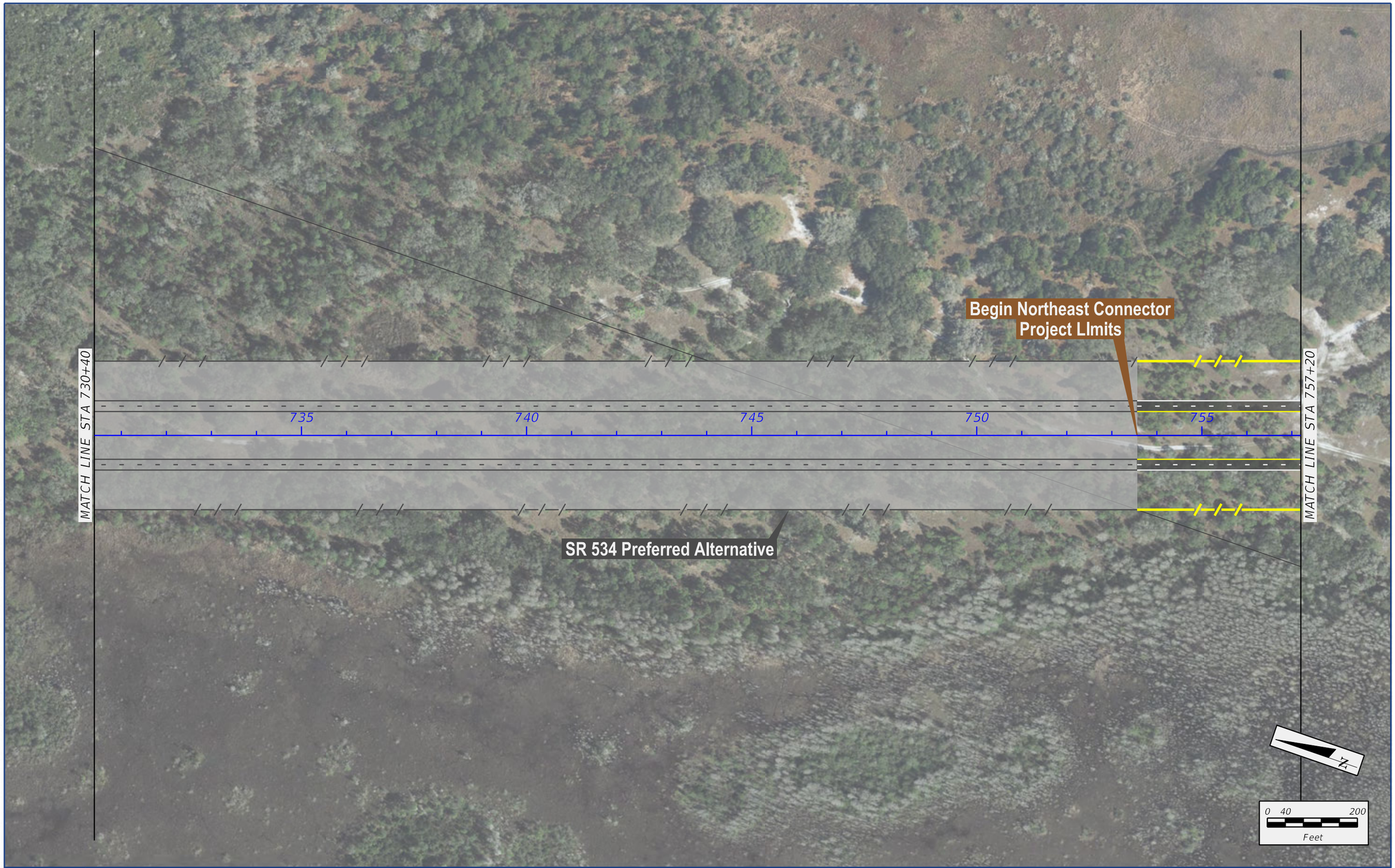
Proposed Barrier Wall
Proposed Pavement
Proposed Structure

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 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-3



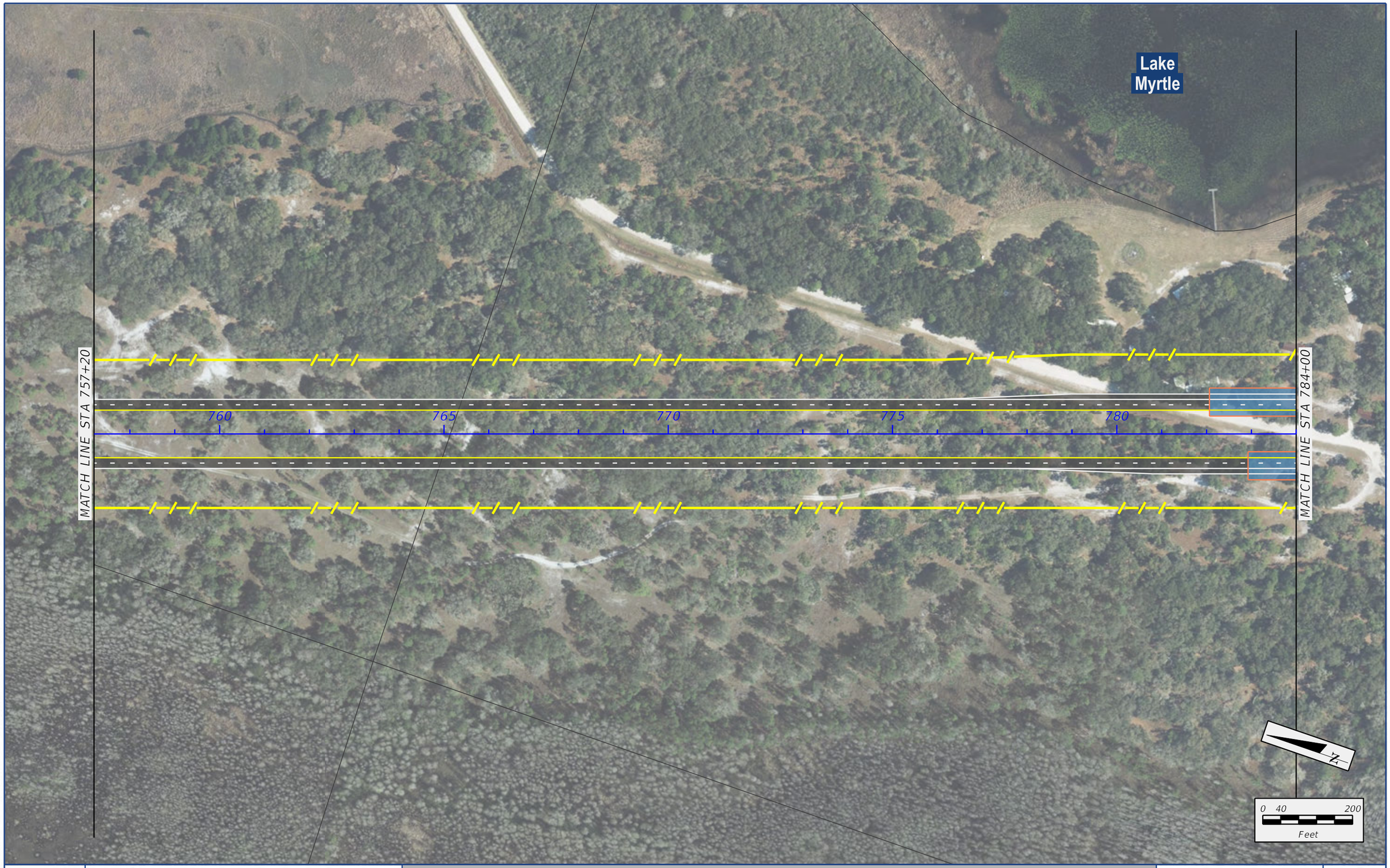
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

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



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-5

Lake Myrtle

Jack Brack Rd

MATCH LINE STA 784+00

MATCH LINE STA 810+80

785 790 795 800 805 810

MATCH LINE STA A-A

N

0 40 200

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 Split Oak Forest Proposed Barrier Wall Proposed Pavement Proposed Structure
Appendix A Jack Brack Road Diamond Interchange	SHEET NO. A-6	

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MATCH LINE STA B-B

MATCH LINE STA 810+80

MATCH LINE STA 837+60

815

820

825

830

835

Lake Bullock

0 40 200

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
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
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-8

MATCH LINE STA A-A

To Be Completed By Others

Jack Brack Rd

N

0 40 200
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
- Split Oak Forest
- Proposed Barrier Wall
- Proposed Pavement
- Proposed Structure

Appendix A
Jack Brack Road
Diamond Interchange

SHEET NO.
A-9

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CENTRAL FLORIDA EXPRESSWAY AUTHORITY

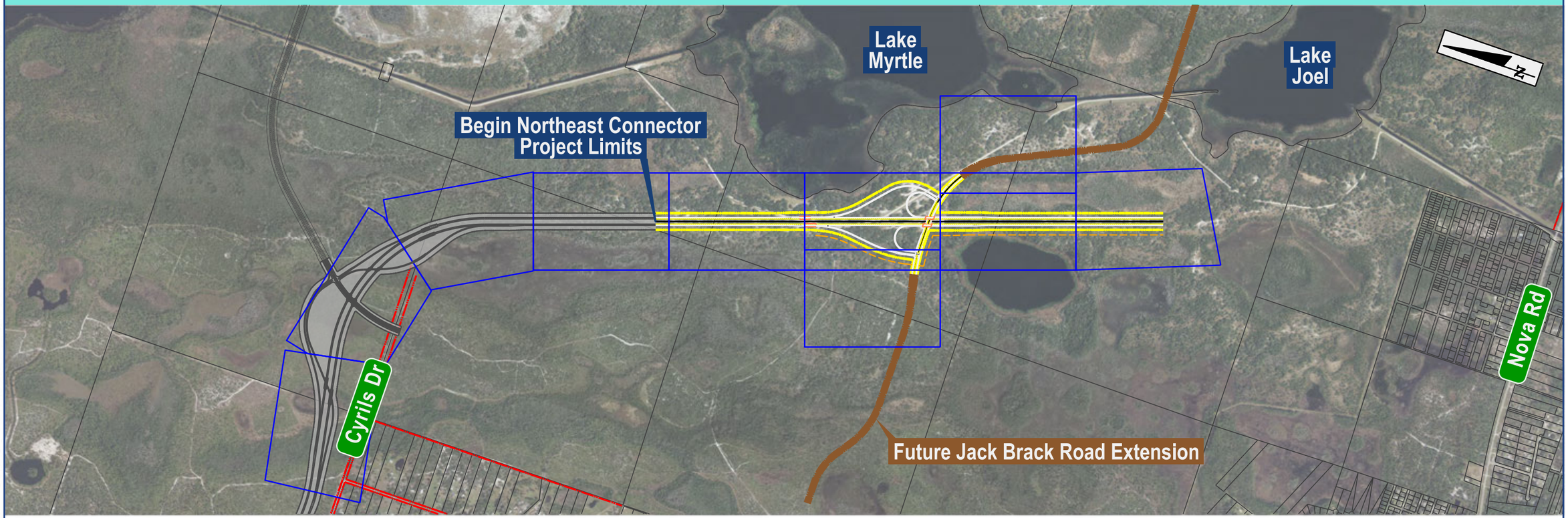
Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

- 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-10

Jack Brack Road Partial Cloverleaf Interchange



Split Oak Forest

SR 534 Preferred Alternative

650 655 660 665 670 675

MATCH LINE STA 675+80

Cyrils Dr

N

0 40 200

Feet

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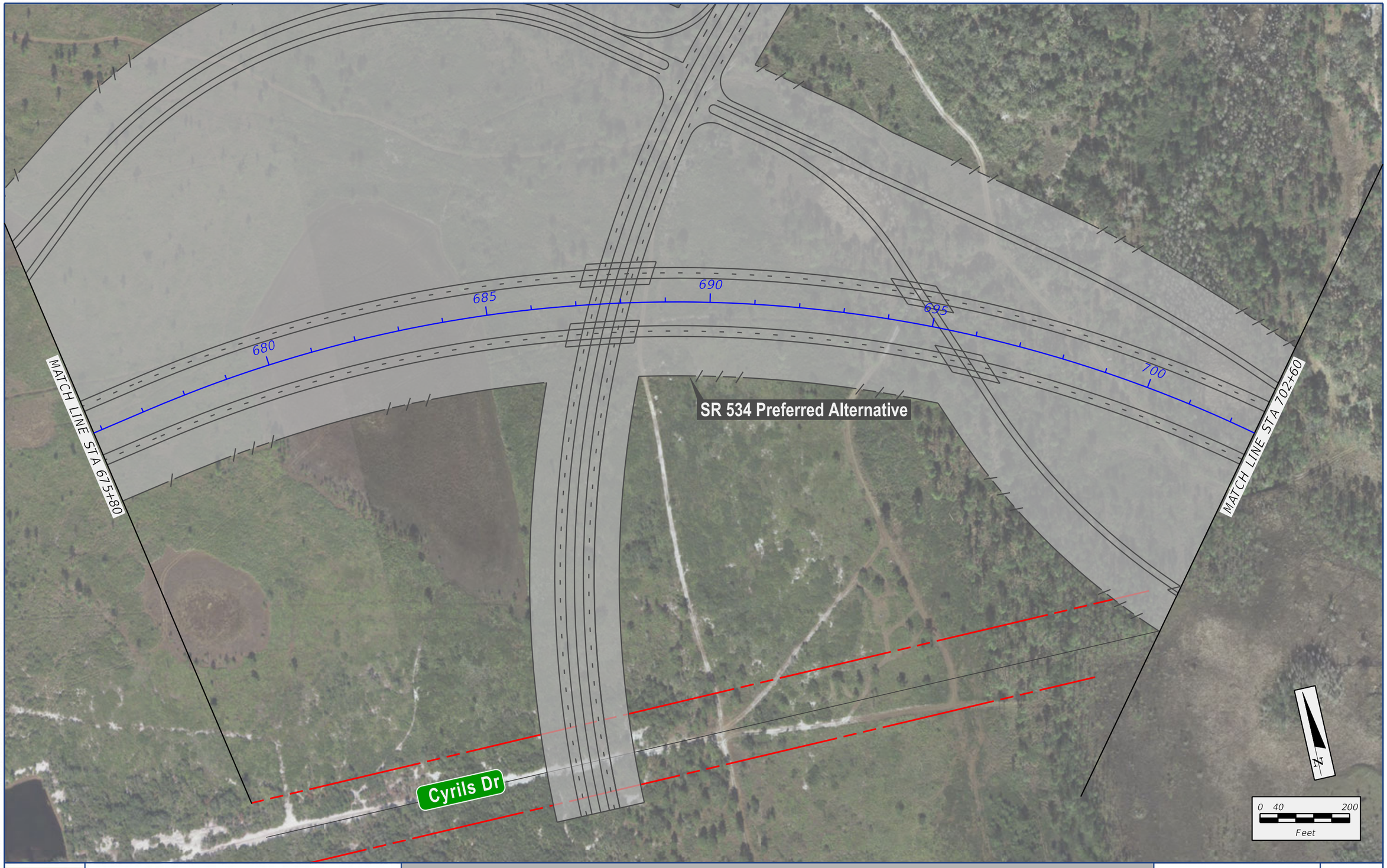
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

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

Existing Right-of-Way
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-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 A Jack Brack Road Partial Cloverleaf Interchange

SHEET NO.
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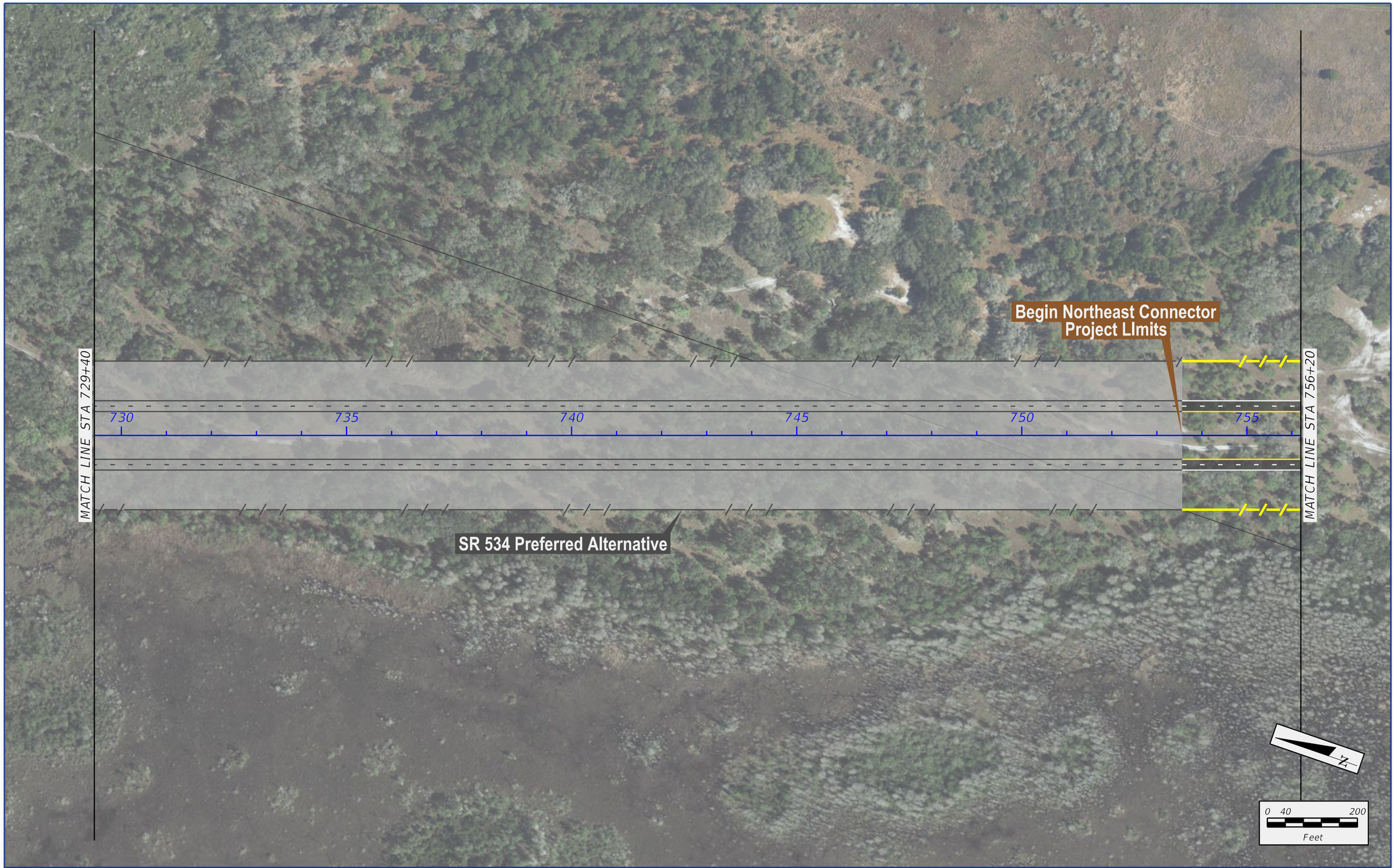
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

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-13



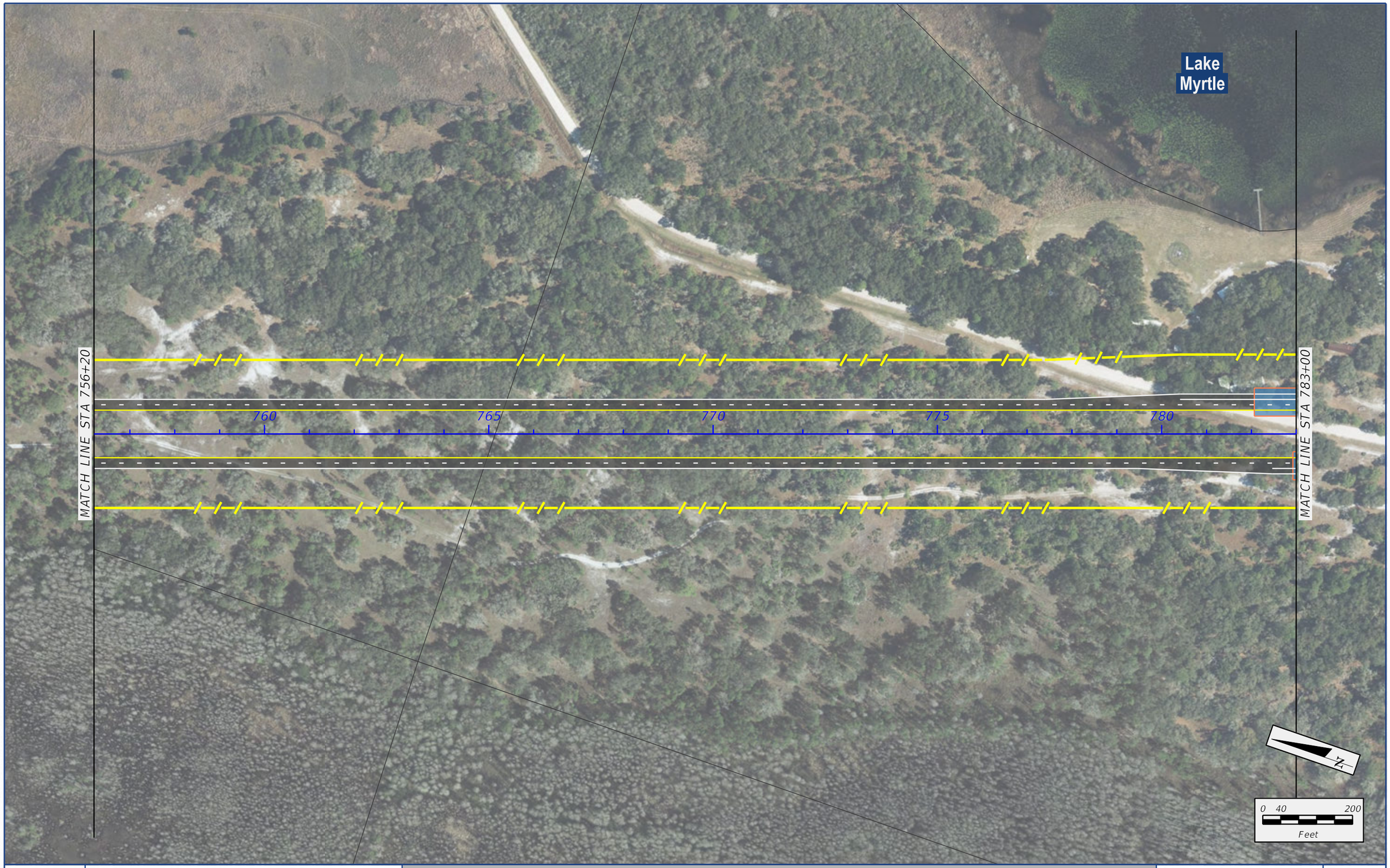
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

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-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
- 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-15

Lake Myrtle

Jack Brack Rd

MATCH LINE STA 783+00

MATCH LINE STA 809+80

MATCH LINE STA C-C

785 790 795 800 805

N

0 40 200
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 Split Oak Forest Proposed Barrier Wall Proposed Pavement Proposed Structure
Appendix A Jack Brack Road Partial Cloverleaf Interchange	SHEET NO. A-16	

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MATCH LINE STA D-D

MATCH LINE STA 809+80

MATCH LINE STA 836+60

810 815 820 825 830 835

Lake Bullock

N

0 40 200
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
Split Oak Forest
Proposed Barrier Wall
Proposed Pavement
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
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-18

MATCH LINE STA C-C

To Be Completed By Others

Jack Brack Rd

N

0 40 200
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 Split Oak Forest	Proposed Barrier Wall Proposed Pavement Proposed Structure	Appendix A Jack Brack Road Partial Cloverleaf Interchange	SHEET NO. A-19

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CENTRAL FLORIDA EXPRESSWAY AUTHORITY

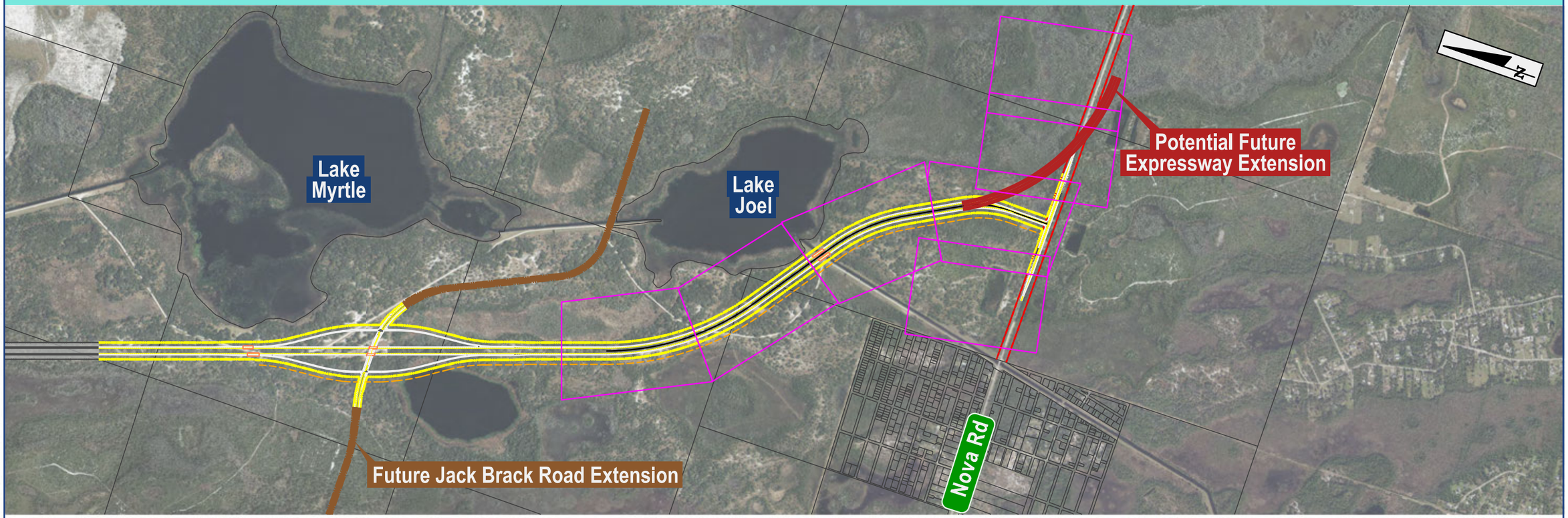
Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

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-20

Nova Road Connection Option 1



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

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845
850
855
860
865
870
MATCH LINE STA 871+80
See Jack Brack Road Alternatives
N
0 40 200
Feet

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
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Proposed Right-of-Way
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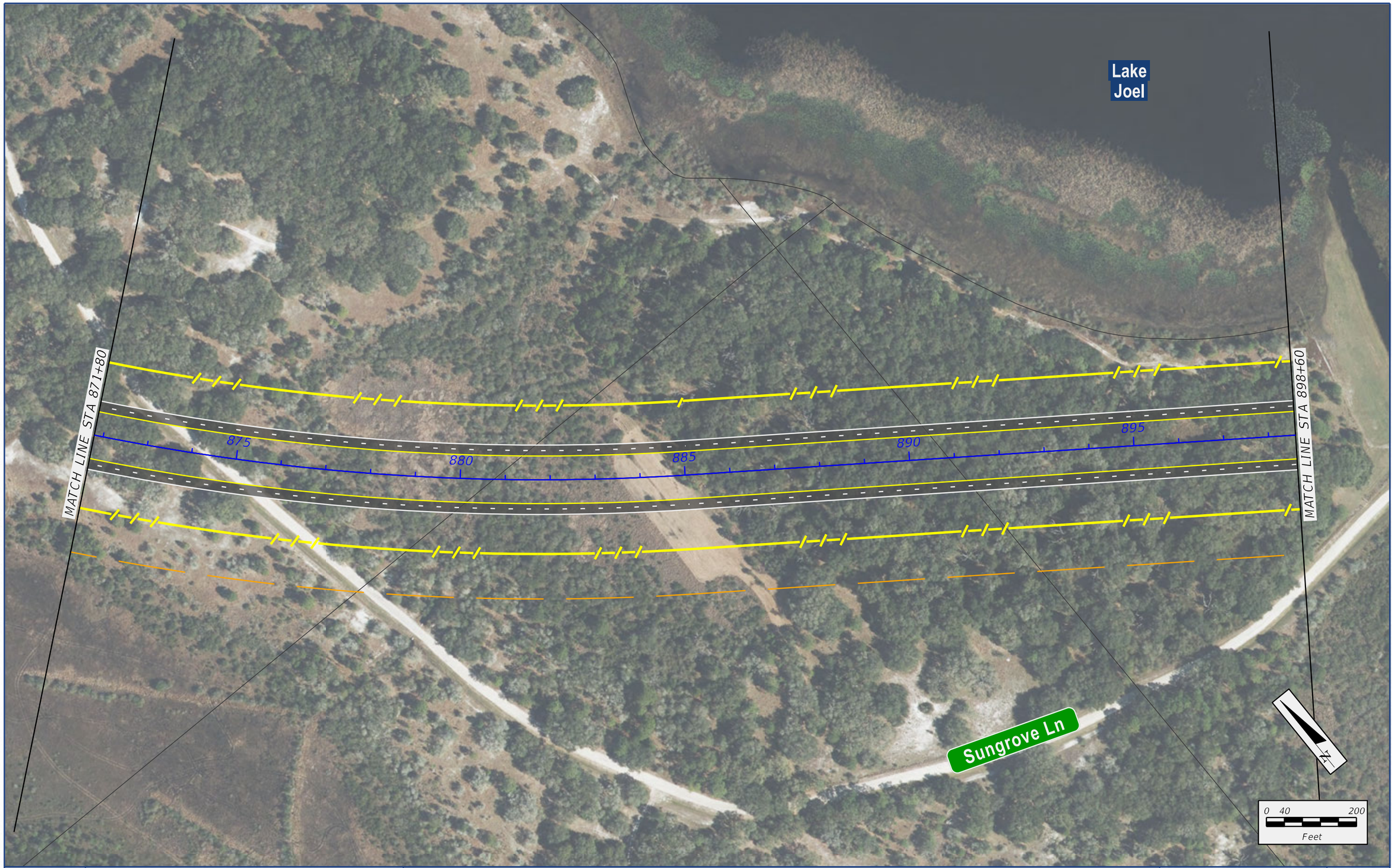
Property Lines
Split Oak Forest
Proposed Barrier Wall
Proposed Pavement
Proposed Structure

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

Appendix A
Nova Road Connection
Option 1

SHEET NO.
A-22

Lake Joel

MATCH LINE STA 898+60

MATCH LINE STA 925+40

900 905 910 915 920 925

Canal C-32C

N

0 40 200
Feet

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Northeast Connector Expressway - Phase 1
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Existing Right-of-Way
Proposed Right-of-Way
Proposed L/A Right-of-Way
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Property Lines
Split Oak Forest
Proposed Barrier Wall
Proposed Pavement
Proposed Structure

Appendix A
Nova Road Connection
Option 1

SHEET NO.
A-23

MATCH LINE STA F-F

Potential Future
Expressway Extension

Nova Rd

935

940

930

945

MATCH LINE STA 925+40

MATCH LINE STA E-E

N

0 40 200
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 Split Oak Forest	Proposed Barrier Wall Proposed Pavement Proposed Structure	Appendix A Nova Road Connection Option 1	SHEET NO. A-24

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MATCH LINE STA E-E

Nova Rd

N

0 40 200
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 Split Oak Forest Proposed Barrier Wall Proposed Pavement Proposed Structure	Appendix A Nova Road Connection Option 1

SHEET NO.
A-25

MATCH LINE STA G-G

Nova Rd

Potential Future
Expressway Extension

MATCH LINE STA F-F

N

0 40 200
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
Split Oak Forest
Proposed Barrier Wall
Proposed Pavement
Proposed Structure

Appendix A
Nova Road Connection
Option 1

SHEET NO.
A-26

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CENTRAL FLORIDA EXPRESSWAY AUTHORITY

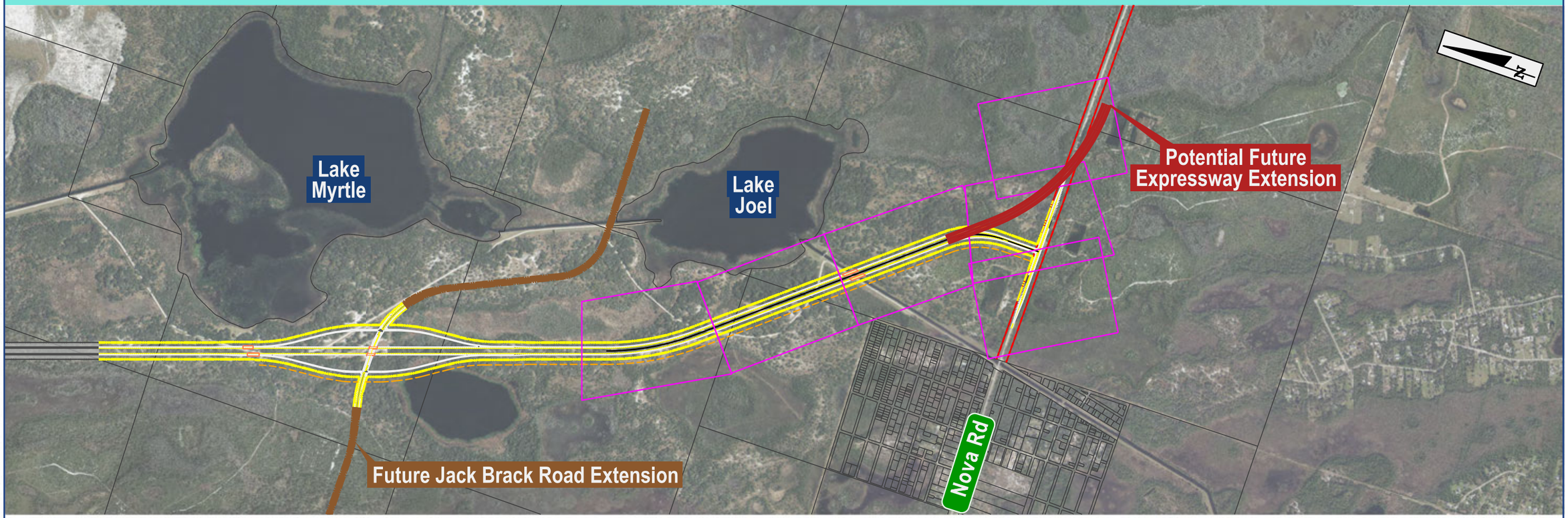
Northeast Connector Expressway - Phase 1
From Cyrils Drive to Nova Road (CR 532)
Project Development and Environment Study

- 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
Nova Road Connection
Option 1

SHEET NO.
A-27

Nova Road Connection Option 2



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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 Nova Road Connection Option 2

SHEET NO.
A-28

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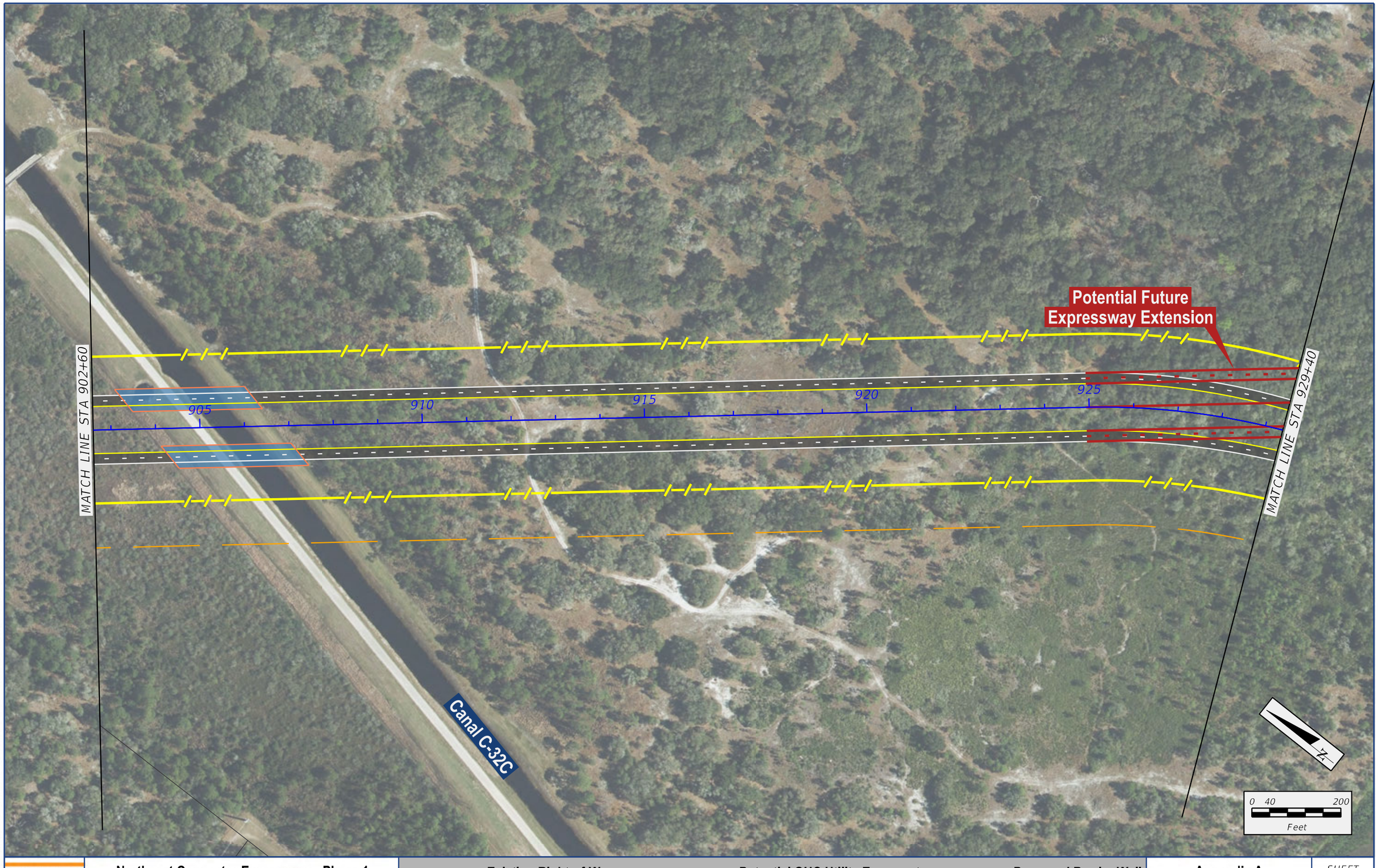
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

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 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

MATCH LINE STA I-I

MATCH LINE STA 929+40

930

935

940

Potential Future
Expressway Extension

Nova Rd

MATCH LINE STA H-H

N

0 40 200
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
Split Oak Forest
Proposed Barrier Wall
Proposed Pavement
Proposed Structure

Appendix A
Nova Road Connection
Option 2

SHEET NO.
A-31

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3/3/2021 3:17:59 PM
donohuem

MATCH LINE STA H-H

Nova Rd

0 40 200
Feet

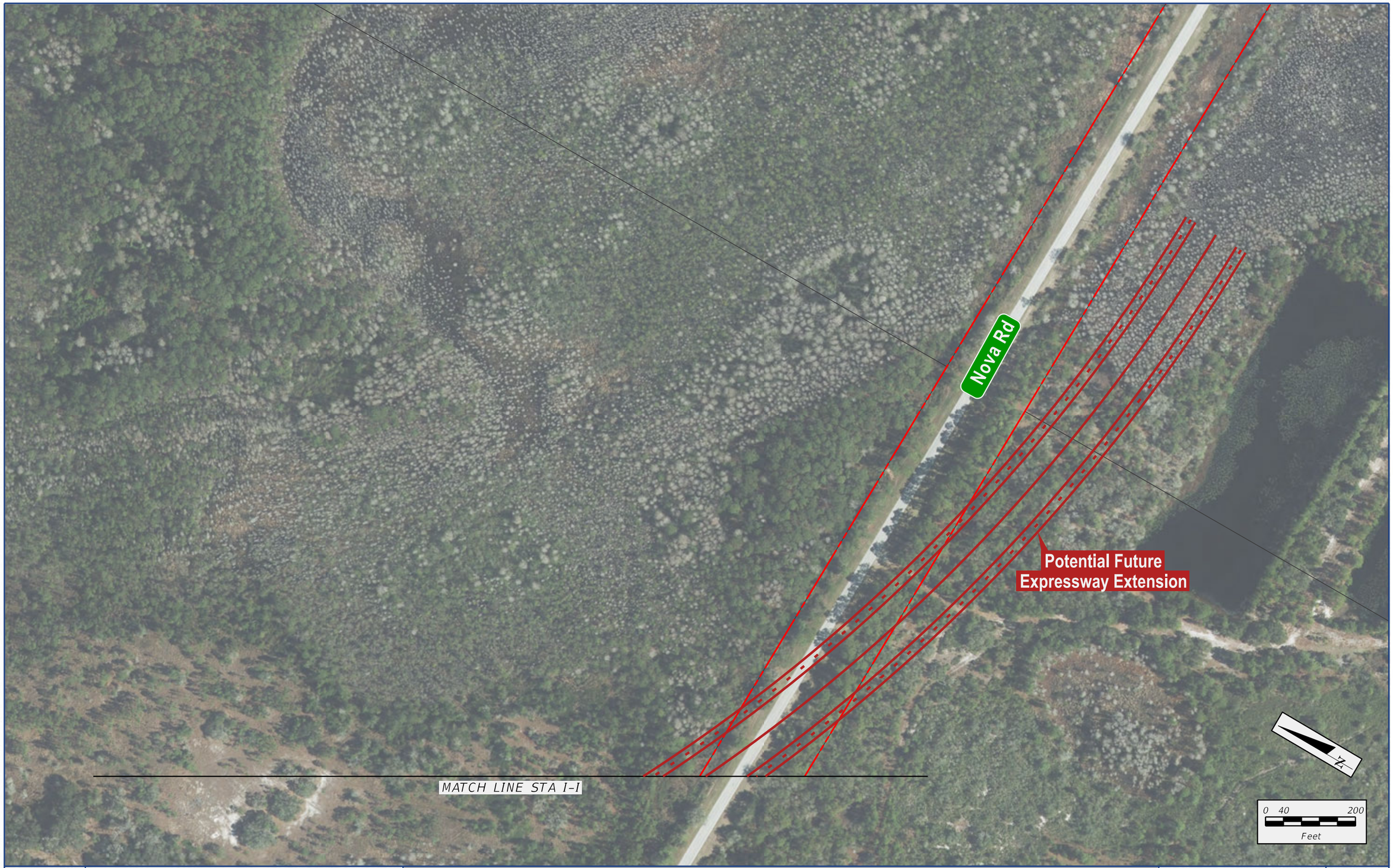
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

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
Split Oak Forest
Proposed Barrier Wall
Proposed Pavement
Proposed Structure

Appendix A
Nova Road Connection
Option 2

SHEET NO.
A-32



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3:19:11 PM
3/3/2021
donohuem

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-33

APPENDIX C

Sunshine 811 Design Ticket

Armando Perez

From: Sunshine 811 Exactix <no-reply@exactix.sunshine811.com>
Sent: Tuesday, February 23, 2021 2:58 PM
To: Armando Perez
Subject: SSOCOF CONFRM 2021/02/23 #00000 054105786-000 NORM DSGN NEW

CONFRM 00000 CALL SUNSHINE 02/23/21 14:57:36ET 054105786-000 DESIGN GRID NE CONNECTOR EXPRESSWAY PHASE 1 FROM CYRILS DRIVE TO NOVA ROAD Ticket : 054105786 Rev:000 Taken: 02/23/21 14:56ET

State: FL Cnty: OSCEOLA GeoPlace: ST CLOUD
CallerPlace: ST CLOUD
Subdivision:

Address :
Street : NOVA RD
Cross 1 : EDEN DR
Within 1/4 mile: Y

Locat: NE CONNECTOR EXPRESSWAY PHASE 1
:
Remarks : NE CONNECTOR EXPRESSWAY PHASE 1 FROM CYRILS DRIVE TO NOVA ROAD IN RESPONSE TO RECEIPT OF A DESIGN TICKET, SSOCOF PROVIDES THE ORIGINATOR OF THE DESIGN TICKET WITH A LIST OF SSOCOF MEMBERS IN THE VICINITY OF THE DESIGN PROJECT. SSOCOF DOES NOT NOTIFY SSOCOF MEMBERS OF THE RECEIPT BY SSOCOF OF A DESIGN TICKET. IT IS THE SOLE RESPONSIBILITY OF THE DESIGN ENGINEER TO CONTACT SSOCOF MEMBERS TO REQUEST INFORMATION ABOUT THE LOCATION OF SSOCOF MEMBERS'
UNDERGROUND FACILITIES. SUBMISSION OF A DESIGN TICKET WILL NOT SATISFY THE REQUIREMENT OF CHAPTER 556, FLORIDA STATUTES, TO NOTIFY SSOCOF OF AN INTENT TO EXCAVATE OR DEMOLISH. THAT INTENT MUST BE MADE KNOWN SPECIFICALLY TO SSOCOF IN THE MANNER REQUIRED BY LAW. IN AN EFFORT TO SAVE TIME ON FUTURE CALLS, SAVE YOUR DESIGN TICKET NUMBER IF YOU INTEND TO BEGIN EXCAVATION WITHIN 90 DAYS OF YOUR DESIGN REQUEST. THE DESIGN TICKET CAN BE REFERENCED, AND THE INFORMATION ON IT CAN BE USED TO SAVE TIME WHEN YOU CALL IN THE EXCAVATION REQUEST.
*** LOOKUP BY MANUAL ***
:
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Grids : 2817B8109D 2817B8110C 2817B8110D 2817C8107A 2817C8107B
Grids : 2817C8107C 2817C8108A 2817C8108B 2817C8108C 2817C8108D
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Grids : 2817C8110D 2817D8107A 2817D8107B 2817D8107C 2817D8108A

Grids : 2817D8108B 2817D8108C 2817D8108D 2817D8109A 2817D8109B
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Work date: 02/23/21 Time: 14:42ET Hrs notc: 000 Category: 6 Duration: UNKNOWN Due Date : 02/25/21 Time: 23:59ET
Exp Date : 03/25/21 Time: 23:59ET Work type: DESIGN Boring: N White-lined: N
Ug/Oh/Both: U Machinery: N Depth: UNK Permits: N N/A Done for : DESIGN

Company : THE BALMORAL GROUP Type: CONT Co addr : 165 LINCOLN AVE
City : WINTER PARK State: FL Zip: 32789
Caller : ARMANDO PEREZ Phone: 407-629-2185 Contact : ARMANDO PEREZ Phone: 561-692-2297
BestTime: 8AM-5PM
Email : ATPEREZ@BALMORALGROUP.US

Submitted: 02/23/21 14:56ET Oper: ARM Chan: WEB Mbrs :
CNTL01 BILL MCCLOUD 850-599-1444
CENTURYLINK
1325 BLAIRSTONE RD RM 113
TALLAHASSEE, FL 32301
Level 1: CASE BY CASE BASIS
Level 2: CASE BY CASE BASIS
Level 3: CASE BY CASE BASIS
Level 4: CASE BY CASE BASIS
FPC322 STEPHANIE OLMO 407-905-3376
DUKE ENERGY
452 E CROWN POINT RD
WINTER GARDEN, FL 34787
Level 1: SERVICES NOT PROVIDED BY MEMBER
Level 2: SERVICES NOT PROVIDED BY MEMBER
Level 3: SERVICES NOT PROVIDED BY MEMBER
Level 4: SERVICES NOT PROVIDED BY MEMBER
LCA395 ANDREW SWEENEY 904-738-6898
COMCAST CABLE
5934 RICHARD ST
JACKSONVILLE, FL 32216
Level 1:
Level 2:
Level 3:
Level 4:
OUC582 ORLANDO ALANCASTRO

ORLANDO UTILITIES COMMISSION
6003 PERSHING AVE
ORLANDO, FL 32822
Level 1: NO CHARGE
Level 2: SERVICES NOT PROVIDED BY MEMBER
Level 3: SERVICES NOT PROVIDED BY MEMBER
Level 4: NOT AVAILABLE

Sunshine811

ARMANDO PEREZ

Home

Tickets

New | List | Dashboard

054105786 v0

Function: New
Notify By: Manual
Agent: ARMANDO PEREZ
Taken: 02/23/2021 02:56 PM
Status: Complete

Cancel | Copy

Ticket | Text | Service Areas | Responses | Revisions

1

Find by Ticket Number

Excavator Information

Company ID: 300230
Excavator ID: 372638
Phone: (407) 629-2185
Company Name: THE BALMORAL GROUP - THE BALMORAL GROUP
Contact Name: ARMANDO PEREZ
Company Type: CONTRACTOR
Address: 165 LINCOLN AVE, WINTER PARK, FL, 32789
Email: ATPEREZ@BALMORALGROUP.US
Fax:
Call Back Time: 8AM-5PM
Mobile/Cell Phone:
Field Contact: ARMANDO PEREZ
Ph/Fax (Cell): (561) 692-2297
Working For: DESIGN
Work Type: DESIGN

Dates

Underwater: No
Start: 02/23/2021 02:42 PM
Priority: Design
Renewal: 03/23/2021
Expires: 03/25/2021
Due: 02/25/2021 11:59 PM

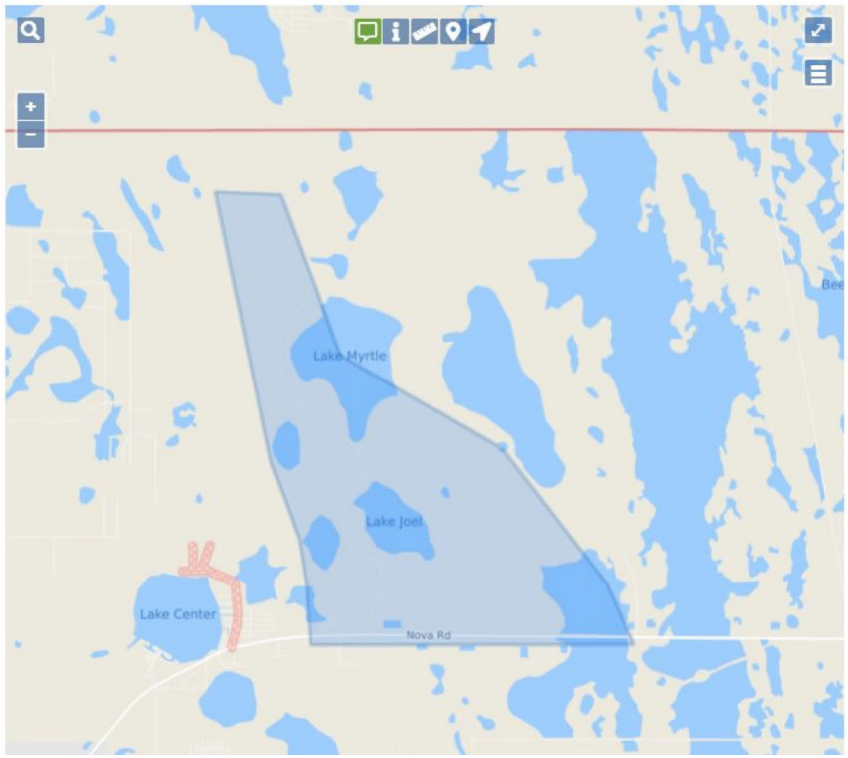
Work Information

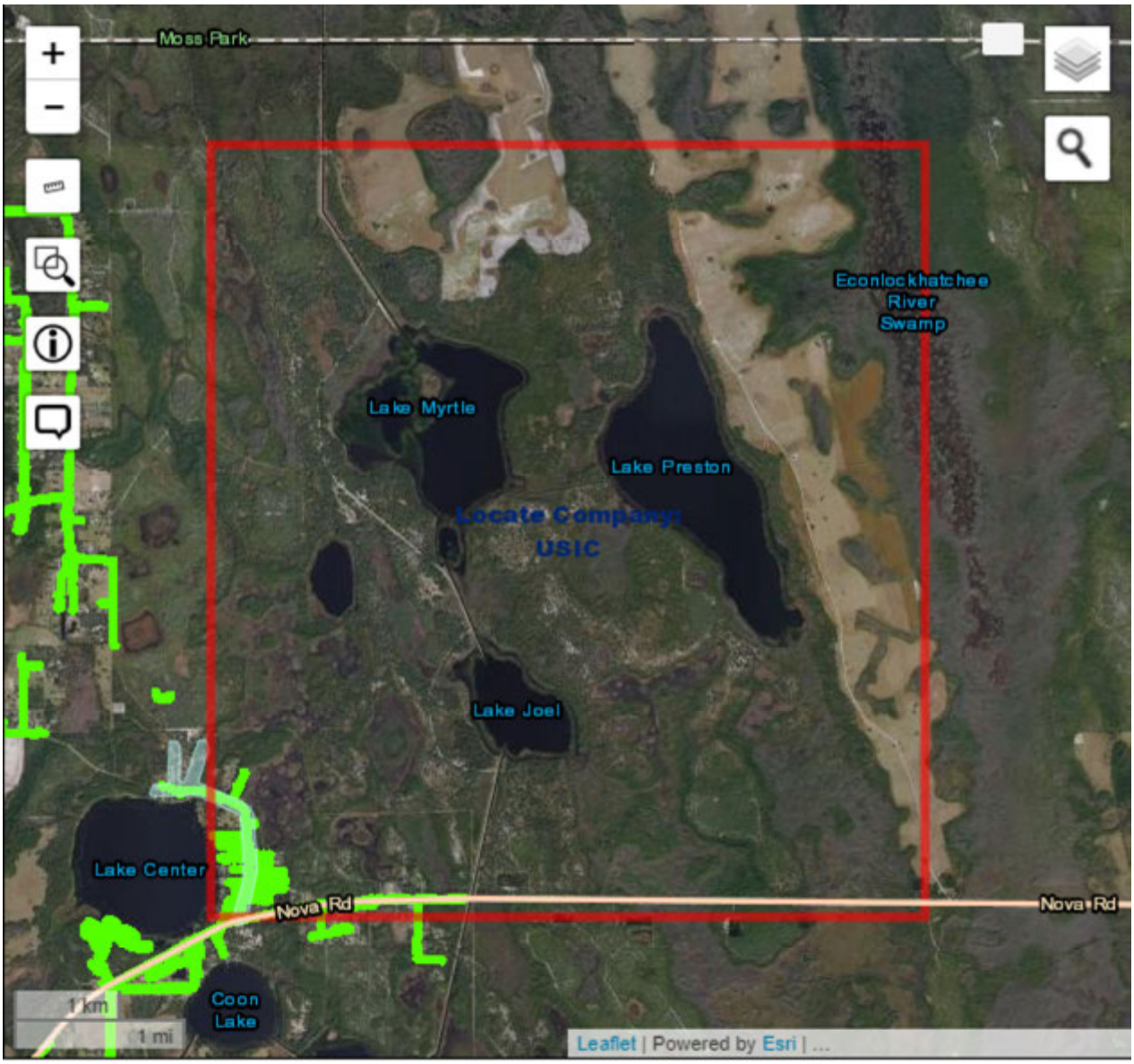
Depth: 0 Unknown
Using Machinery: No
White Lined: No
Duration: 0 Unknown
Directional Drilling: No
Permit Needed: No
Permit Number: N/A
Damage: No

Site Information

Dig Site Type: Street/Address
FL, OSCEOLA, ST CLOUD
NOVA RD
Near: EDEN DR (3718 FT)
Within 1/4 Mile: Yes
How Far:
Subdivision:
Lot:
Locate: NE CONNECTOR EXPRESSWAY PHASE 1
Remarks: NE CONNECTOR EXPRESSWAY PHASE 1 FROM CYRILS DRIVE TO NOVA ROAD
Header: NE CONNECTOR EXPRESSWAY PHASE 1 FROM CYRILS DRIVE TO NOVA ROAD

Map | Attachments | QA (0) | Help

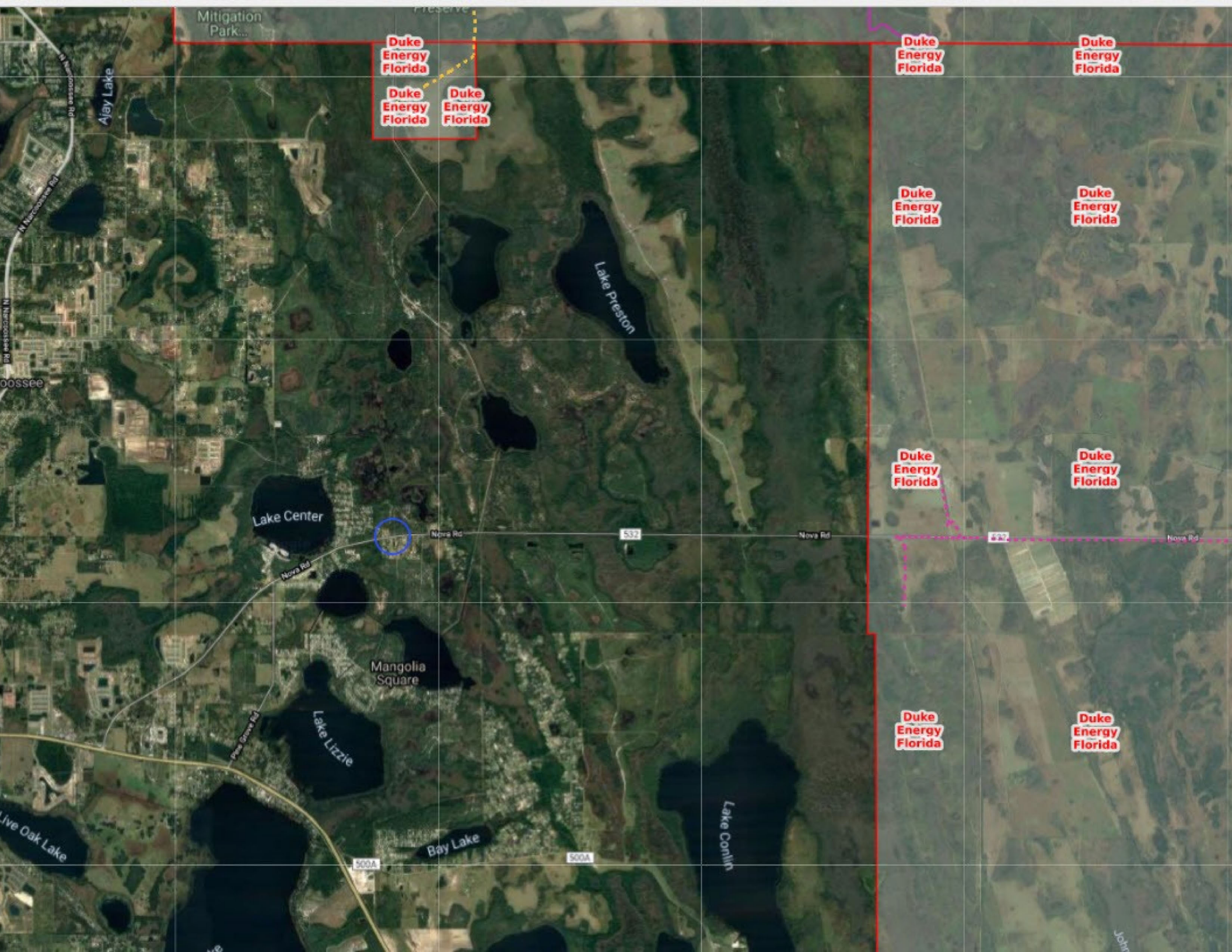




National Buried Asset
National Buried Asset
National Aerial / 3rd Party
IOF Fiber Route
Local Buried Asset
Local Buried Asset
Local Buried Asset
Local Buried Asset
Local Aerial Asset

CenturyLink™

This email is for informational purposes only. Please do not reply as this is an unmanned inbox.


Mitigation Park...
Duke Energy Florida
Duke Energy Florida
Duke Energy Florida
Duke Energy Florida
Duke Energy Florida
Duke Energy Florida
Duke Energy Florida
Duke Energy Florida
Duke Energy Florida
Duke Energy Florida
Duke Energy Florida
Duke Energy Florida
Ajay Lake
N Narcoossee Rd
Lake Preston
Lake Center
Nova Rd
532
Mangolia Square
Lake Lizzie
Pine Grove Rd
Live Oak Lake
Bay Lake
500A
Lake Conlin

APPENDIX D

Utility Contact Log

UTILITY CONTACT LOG
CFX Project No. 599-228 Northeast Connector Expressway Phase I
Contract No. 001546

Legend:	Awaiting Confirmation	Confimed Correct Contact	Contact Not Confirmed	Preliminary Coordination Complete	Updated: 09/12/2019 AP

UTILITY OWNER	CONTACT	TELEPHONE	PHYSICAL ADDRESS	EMAIL ADDRESS	TYPE & FACILITIES	COMMENTS
CenturyLink	Bill McCloud Ty Leslie Network Relocations	850-599-1444 407-814-5293		michel.t.leslie@centurylink.com relocations@lumen.com	Fiber, Telephone	02/23/2021: Left voicemail for Ty Leslie to confirm if he is responsible for this area. 02/24/2021: Spoke to Ty. He informed me that he is the responsible person (for all of Osceola County) 03/15/2021: Request sent. 04/15/2021: Sent a follow up email checking on status of UAO Asssessment. 04/20/2021: Received email from Lumen Company. They reviewed our Plans and provided mapping. Please send all correspondence to the Network Relocations email address. Please reference the file number P-077475 FL with any future communications
Comcast Communications	Andrew Sweeney	904-738-6898		andrew_sweeney@comcast.com David McElroy <david@fibercoregroup.com> Chavarria Blanco, Chavarria <cchavarria-rios@ftsolutions.com>	CATV	02/23/2021: Left voicemail for Andrew Sweeney. 02/23/2021: Andrew called me back. He provided me his email, and requested our Plans for review. 03/15/2021: Request sent. 03/19/2021: Received letter of no conflict
Duke Energy	Stephanie Olmo Aric Rogers Tomas Macias	407-905-3376 813-909-1245		defdistributiongov@duke-energy.com deftransmissiongov@duke-energy.com Arogers@pike.com Tomas.Macias@duke-energy.com	Electric/ Transmission	02/23/2021: Spoke to Julio Tardaguila. I asked him if he could help identify any Duke Energy services lines in the project study area. He provided me a map of the area. It appears that the northernmost limit of our project study area could conflict with some utilities. I will reach out to the Gate Keeper website for additional information. 02/25/2021: Spoke with Scott Vanvelzor. He confirmed that no Duke Energy Transmission Lines were in the project study limits. 03/15/2021: Request sent. 03/17/2021: Aric Rogers responded for Transmission Department. He will be our point of contact. 03/17/2021: Received letter of no conflict from Duke Distribtuion Department. 03/18/2021: Received letter of no conflict from Duke Transmission department.
Orlando Utilities Commission	Linda T. Juliao Carmelo Nieves (Lighting) Fred Urban (Communications) Mike Galloway (Distribution)	407-236-9651 407-434-6537 407-274-8431 (Cell) O 407-434-4127 C 321-377-1065 321-436-6201	Development Services Specialist Orlando Utilities Commission 100 W. Anderson St Orlando, FL 32801	developmentservices@ouc.com CNieves@ouc.com Urban, Fred <FUrban@ouc.com> Galloway, Mike <MGalloway@ouc.com>	Electric Lighting Communications Distribution Transmission	Contact information based onprevious OPE PD&E Study. Remember to include CCON # (# 748559) on any correspondence email. 03/15/2021: Request sent. 03/19/2021: Received work order No. from development services. (current review time 6-8 weeks) 05/05/2021: Called development services. Left voicemail. 05/10/2021: Received email from Carmelo (Lighting Division). He attached contact form with "no facilities within project limits". 05/27/2021: Fred Urban called (OUC Communication). He asked for information regarding our project. He said he would provide mark-ups and mapping. He said his facilities are on the transmission poles along Cyrils Drive and Absher Road. Awaiting email response. 05/28/2021: Fred Urban responded with GIS drawing 06/03/2021: Mike Galloway called. He informed me that he is the Distribution manager. He informed me that he has facilities on Cyrils, Abscher, and Nova. I explained that the project limits for NE Connector don't include Cyrils so the main impacts would likely be Nova Road. He Concurred. He mentioned that throughout the footprint of the road there are random lines (not many) that use to provide power to fish camps and hunt camps in that vicinity. He says that his mapping likely doesn't show it but that he has frequented the area so he is aware of them. He says that they should not be an issue for us if they are encountered because they plan on abandoning and/or removing the lines (whenever appropriate). He says that he can have mark-ups to me by next week 06/12/2021: Mike Galloway sent back mark-ups. 06/14/2021: I called Mike and asked about the cost for relocating his facility. He said that based on eleven new poles and approximately 2,400 ft

UTILITY CONTACT LOG
CFX Project No. 599-228 Northeast Connector Expressway Phase I
Contract No. 001546

Legend:	Awaiting Confirmation	Confimed Correct Contact	Contact Not Confirmed	Preliminary Coordination Complete	Updated: 09/12/2019 AP

UTILITY OWNER	CONTACT	TELEPHONE	PHYSICAL ADDRESS	EMAIL ADDRESS	TYPE & FACILITIES	COMMENTS
						of conductor relocation that he estimates $20,000.
Toho Water Authority	Mike Pampouk	407-944-5000	408-3400	mpampouk@tohowater.com	Water, Sewer, Reclaim	Contact information based onprevious OPE PD&E Study. Remember to include CCON # on any correspondence email. 03/11/2021: Spoke with Mike. He informed me to send any requests to his email. He will work on it if available and if not he will assign an engineer. 03/15/2021: Request sent. 04/15/2021: Sent a follow up email checking on status of UAO Asssessment. 04/16/2021: Received Plan Mark-ups from Mike. No cost estimates included.

NOTES:
1. First contacts (upper most) are the UAO's original as indicated on Sunshine 811 Design Ticket.
2. Contacts crossed out with slash indicate incorrect personnel

APPENDIX E

Master Utility Plan
Preliminary Design Report – Sunbridge Water Reclamation Facility Phase I

PRELIMINARY DESIGN REPORT

SUNBRIDGE

WATER RECLAMATION FACILITY

PHASE I

PREPARED FOR:

TAVISTOCK EAST II, LLC
Project #SLR-31

TAVISTOCK® GROUP

PREPARED BY:

Reiss Engineering, Inc.
1016 Spring Villas Pt.
Winter Springs, Florida 32708
(407) 679-5358

REI Project No. 164003

REISS ENGINEERING

January 2021

Document	Sunbridge WRF Phase I Preliminary Design Report
Prepared By	Eric Knoppel, E.I., Reiss Engineering
QA/QC Approved	James Hagerty, P.E., Reiss Engineering
Authorized	Scott Hoxworth, P.E., Reiss Engineering

This report is intended for review by Tavistock East II, LLC and other parties as considered necessary by Tavistock East II, LLC and Reiss Engineering, Inc. This report has been prepared under the supervision of James L. Hagerty, FL P.E. Lic. 43969.

James L. Hagerty, State of Florida, Professional Engineer, License No. 43696

This item has been digitally signed and sealed by James L. Hagerty on the date indicated here.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1.0 INTRODUCTION

1.1 Background

Tavistock East II, LLC. (Tavistock) is planning the development of Sunbridge, a new community northeast of the City of St. Cloud in Osceola County, Florida. Tavistock and the Tohopekaliga Water Authority (TWA) have entered into an agreement with Reiss Engineering, Inc. (REI) to provide engineering design and technical services during construction for a new Water Treatment Plant (WTP) to supply drinking water to the new community and a new Water Reclamation Facility (WRF) to treat domestic wastewater generated by the Sunbridge Northeast District (Sunbridge NED) community.

Tavistock and TWA have selected a site that is located on a 19.5-acre parcel in eastern Osceola County to meet the needs of the proposed development and readily developable (uplands) for the proposed water and water reclamation facilities.

Installation of the wastewater collection and conveyance system began in April 2019 on Cyrils Road. The new WRF is anticipated to be operational in 2022 and will receive raw wastewater from the new community, as well as wastewater flows from the Sunbridge WTP. Prior to placing the Sunbridge WRF online, there is an agreement with the City of St. Cloud to direct the wastewater from the new communities to the St. Cloud wastewater collection and conveyance system. The agreement provides for up to 300,000 gallons per day to be sent to the City of St. Cloud for treatment.

The new Sunbridge WRF is proposed to be built in three phases. Phase I will consist of a new 1.0 million gallon per day (MGD) WRF, as described herein. The ultimate build-out capacity of the Sunbridge WRF has been planned to provide up to 7.0 MGD of treatment capacity, after the completion of Phase III.

Tavistock East has applied for an exploratory deep injection well permit from FDEP and is reviewing off-site areas for spray irrigation and reuse storage. A supplemental document will be submitted to FDEP discussing the system water balance with further details of the wet-weather effluent management and reclaimed water storage systems.

1.2 Objective

The purpose of this report is to provide the Florida Department of Environmental Protection (FDEP), Tavistock, and TWA with a Preliminary Design Report (PDR) for the design, permitting, and construction of the new 1.0 MGD Sunbridge WRF.

2.0 PROPOSED SITE AND SERVICE AREA

2.1 Site Information

2.1.1 Water Reclamation Facility Site Location

The Sunbridge WRF will be located at the same site as the Sunbridge WTP in the Sunbridge NED Community, located in east Osceola County Florida. The future Northeast Connector Expressway Extension proposed by the Central Florida Expressway Authority and the future Rummell Road proposed by Tavistock will be adjacent to the Sunbridge WRF and WTP site along the east boundary.

2.1.2 Site Survey

Allen & Company prepared a sketch and description of the tract boundary dated July 20, 2018, for the site. The current sketch and description are presented in **Appendix A**. The final topographic survey of the site was completed in June 2019 and will be incorporated into the final design of the Sunbridge WRF.

2.1.3 Site Pavement

The Sunbridge WRF roadway will include a 24-feet wide, paved loop road with an inverted crown section for stormwater conveyance infrastructure. The roadways will be designed to facilitate vehicular loads for chemical deliveries and sludge hauling, as well as crane access to all major process units. Vehicle turning analysis will be taken into consideration to provide appropriate vehicular access. Site parking shall be provided in accordance with Osceola County's Land Development Regulations.

2.1.4 Site Access

Initial access to the site will be provided via Sungrove Lane which is an existing gravel field road that is accessed off Nova Road. Future access will be via Rummell Road which will run along the east boundary of the site.

Access into the site will be controlled by chain link fencing around the perimeter of the entire site, in accordance with TWA Utility Standards. Two access points shall be provided with motorized gates and Hi/Lo call boxes, stationary black and white cameras, remote push button audio for remote push button operation from plant operator control station and CCTV.

2.1.5 Site Lighting

Site lighting at the Sunbridge WRF will include LED lighting on metal poles and concrete base with photocell control and manual on/off photocell bypass for maintenance and testing.

Process structures will be illuminated by site lighting where structures are low enough to receive lighting from common site poles. LED rail mounted jelly jars will be used for stairs and tall structures requiring maintenance access. Exterior wall mounted full cutoff LED lighting will be provided over personnel doors and weatherproof battery backup will be provided for egress doors.

Interior lighting will include LED 2x2 aluminum frame LED indirect, white finish, vacancy sensors except in electrical rooms where only LED strip fixtures and manual switches will be provided. All interior backup battery emergency and egress exit lighting will include red lettering. All canopies will include vapor-tight, non-metallic LED lights with manual switches and emergency battery backup power.

2.1.6 Elevations and Flood Protection

Existing Topography of the site ranges from 64 to 68 feet (Vertical Datum NAVD 88). Minimum roadway and finished floor elevations were determined with the master drainage analysis and designed to meet South Florida Water Management District and Osceola County criteria. Building Finished Floor Elevations were set above the 100-year/72-Hour flood Elevation.

FEMA Letter of Map Revision (Case16-042860P) approved by FEMA on January 20, 2017 established a 100-year flood elevation of 65.5 located along the western boundary of the site.

2.1.7 Stormwater Management System

The stormwater management system was designed to meet Osceola County and South Florida Water Management District criteria. The stormwater management system will be a combination of inlets and swales with conveyance to a wet detention pond at the north side of the site and outfalls to the wetland system to the west.

The construction of the wet detention pond and stormwater conveyance infrastructure was completed in June 2020 as a part of the construction of the Sunbridge WTP.

2.1.8 Geotechnical Evaluation

Andreyev Engineering, Inc. completed a geotechnical report in June 2019 during the design phase of the Sunbridge WTP, which is located at the same site as the Sunbridge WRF. The geotechnical investigation includes standard penetration tests from locations across the site and can be found in **Appendix B**.

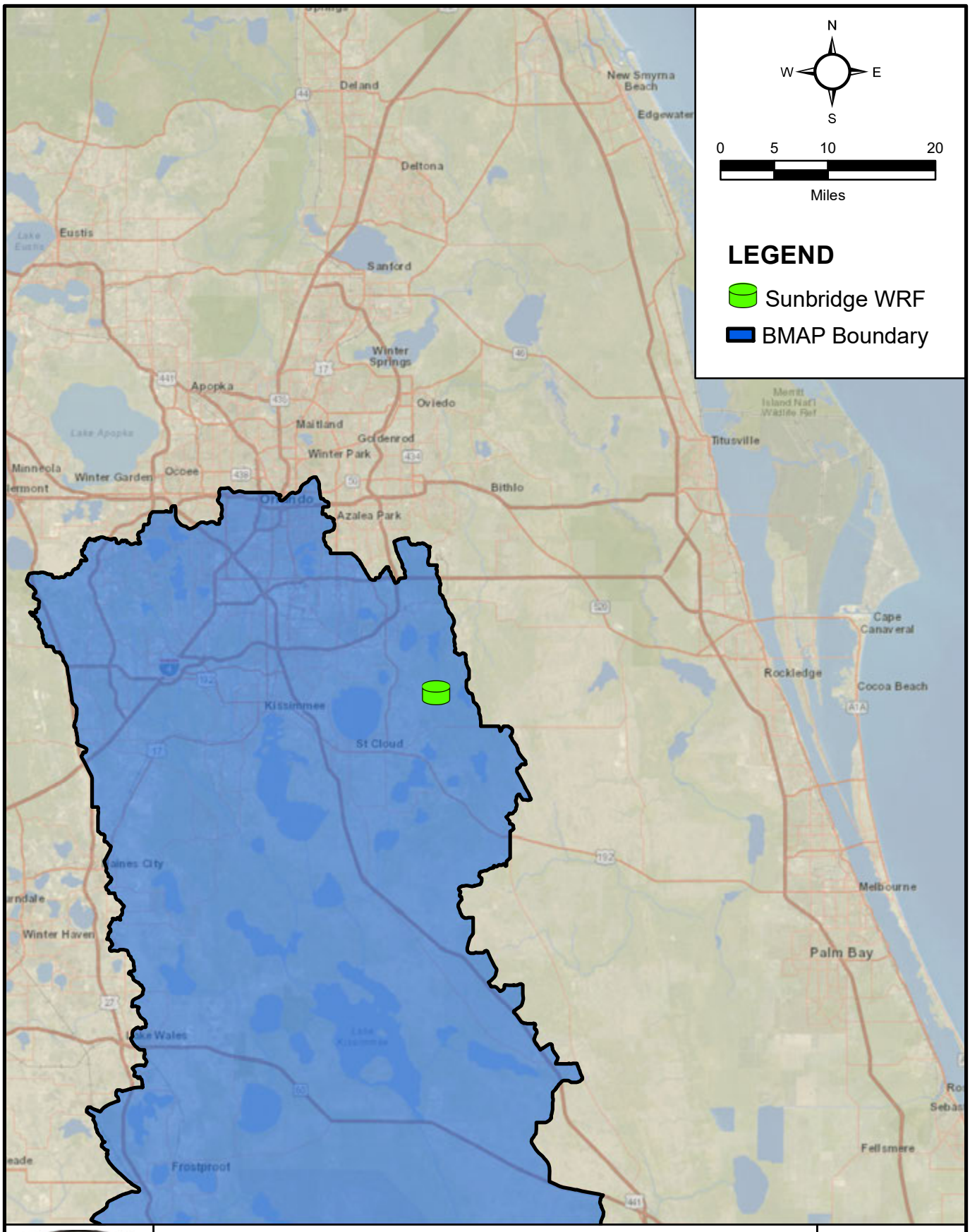
During the final design phase of the Sunbridge WRF, additional standard penetration test (SPTs) will be obtained in the vicinity of process structures and buildings based on the approved preliminary site plan. Up to five additional SPTs are anticipated for the Sunbridge WRF's larger process structures.

2.1.9 Lake Okeechobee Basin Management Action Plan

Lake Okeechobee and its watershed have been subjected to hydrologic, land use, and other anthropogenic modifications over the past century that have degraded its water quality and affected the water quality of the connected Caloosahatchee and St. Lucie River and Estuary watersheds. To help address the nutrient impairment, FDEP adopted a total maximum daily load (TMDL) to identify the target load for nutrient discharges into the lake. In addition, a Basin Management Action Plan (BMAP) was implemented to be considered as the "blueprint" for restoring impaired waters by reducing nutrient pollutant loadings to meet the allowable TMDL limitations. BMAPs represent a comprehensive set of strategies to help address the nutrient loading concerns by addressing permit limits on wastewater facilities, urban and agricultural best management practices, conservation programs, financial assistance, and revenue generating activities.

In January 2019, Executive Order 19-12 (Item C) included a requirement to update and secure all restoration plans, within one year, for waterbodies impacting South Florida Communities, including the Lake Okeechobee BMAP. As a result, the Lake Okeechobee BMAP was updated in January 2020 to include updates to the modeling, sub watershed loading targets, and management actions to achieve nutrient reductions, and a revised monitoring plan to continue to track trends in water quality.

The proposed WRF location lies within the boundary of the Lake Okeechobee BMAP and presents new effluent limitations for wastewater facilities discharging into the Lake Okeechobee Basin. These effluent limitations will be further discussed in **Section 3.3** of this report. The Sunbridge Phase I WRF and its location in relation to the Lake Okeechobee BMAP boundary are shown on **Figure 2-1**.



Tavistock East II, LLC
Sunbridge WRF Phase I

Lake Okeechobee BMAP Boundary Limits

FIGURE 2-1

P:\164000 Tavistock East II\00_Projects\164003 - Tavistock WTP WWTP Design\Study-Report\Final_Report\WWTP\Figures\GIS\Figure 2-1 Sunbridge WRF BMAP Boundary.mxd

2.2 Utilities Service Area

In October 2018, a Master Utility Plan (MUP) was developed by Poulos and Bennett, LLC (P&B) for the new Sunbridge Northeast District (Sunbridge NED) Community's wastewater collection and transmission system service areas. The proposed buildout area for the wastewater collection and transmission service areas can be found on **Figure 2-2**, as developed by P&B. The P&B 2019 Sunbridge NED Wastewater MUP, as approved by TWA and the Sunbridge Stewardship District, can be found in **Appendix C**.

2.2.1 Population Projection

The 2018 Sunbridge NED Wastewater MUP evaluated and identified population projections for the Sunbridge Community wastewater and reclaimed water service area. The estimated population was determined to be 46,566 people, as shown in **Table 2-1** below.

Table 2-1. Residential Development Program by Neighborhood

Neighborhood	Detached Units	Attached Units	Dwelling Units	Total Population
East	4,760	490	5,520	13,607
Central	4,190	1,050	5,240	13,576
Urban	2,620	3,280	5,900	8,549
Narcoossee	3,910	280	4,190	13,834
Total	**15,480**	**5,100**	**20,580**	**46,566**

2.2.2 Land Use and Wastewater Generation Projection

The primary customers to be served in Phase I include residential, commercial, office, and civic land uses. Projected wastewater generation rates were developed based on land usage, as summarized in **Table 2-2** from the 2019 Wastewater MUP.

Table 2-2. Land Use Generation Rates

Land Use	Generation Rate	Units
Residential Single Family (SF)	276	gpd/lot
Residential Multi- Family (MF)		
1st Bedroom	138	gpd/unit
Additional bedroom	69	gpd/unit
2 Bedroom	207	gpd/unit
Commercial		
0 – 50,000 sf	.100	gpd/sf
50,001 – 100,000 sf	.075	gpd/sf
> 100,000 sf	.050	gpd/sf
Office	0.15	gpd/sf
Civic	0.15	gpd/sf
Hotel	202.2	gpd/room

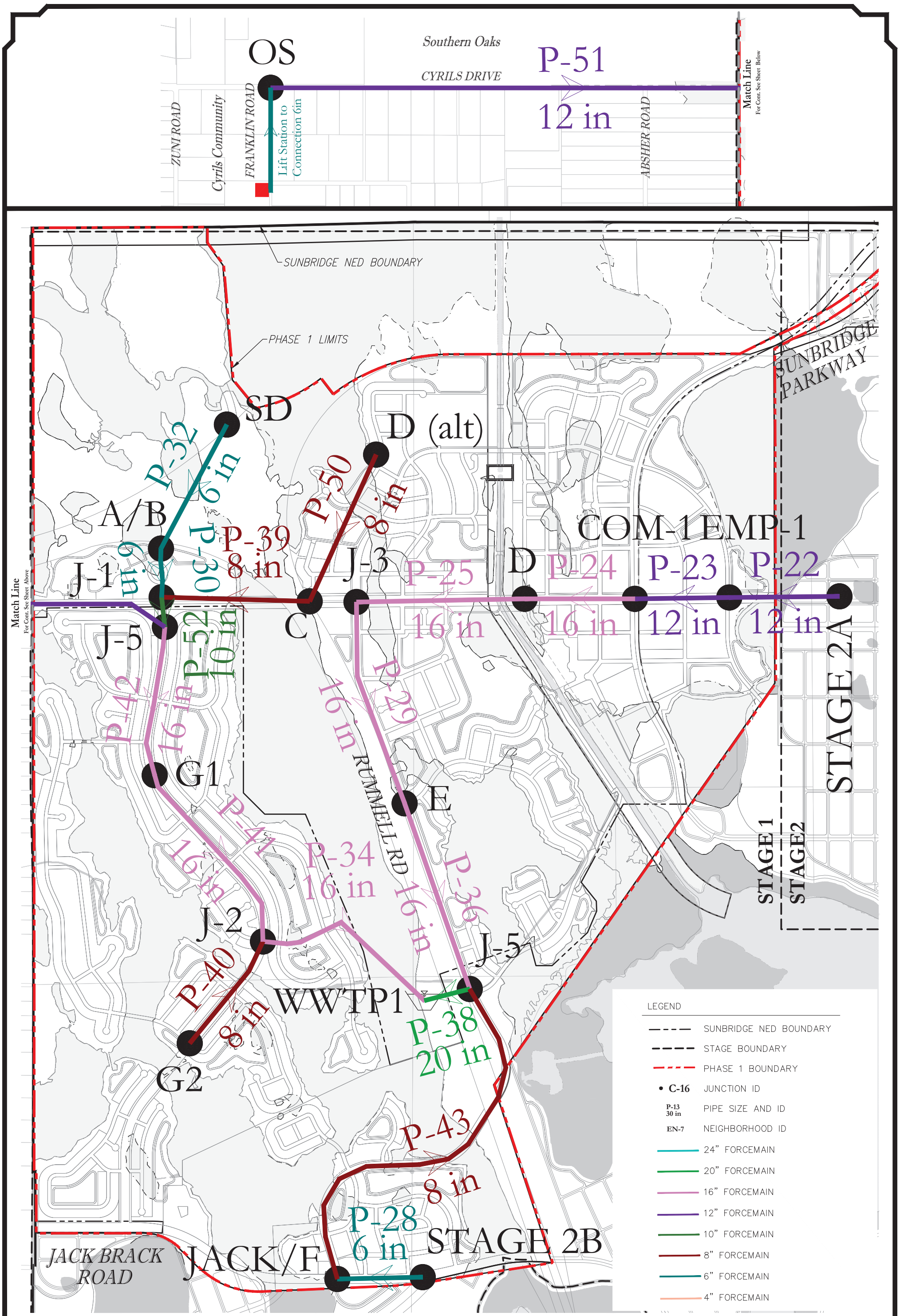


Figure 2-2. Sunbridge NED Phase I Wastewater Service Area

Sunbridge NED

October 17, 2018
P & B Job No.: 17-042

2602 E. Livingston St.
Orlando, Florida 32803- 407.487.2594

POULOS & BENNETT

www.poulosandbennett.com
Certificate of Authorization No. 28567

Z:\2017\17-042 TAVISTOCK – SUNBRIDGE\MASTER UTILITIES\PW & WW ALTERNATE SITE\CAD\EXH & FIGS\MUP WASTEWATER PHASE 1

The corresponding wastewater flow projections for each property to be served by the Phase I Sunbridge WRF are presented in **Table 2-3**. The location and description of each of these land use areas are identified in the Neighborhood Key Map on **Figure 2-3**.

Table 2-3. Sunbridge NED Wastewater Generation Summary

Property Serviced	Land Use	ADF Projection (gpd)
Neighborhood A/B	Commercial Civic	3,000
Neighborhood C	Civic Residential-SF Residential-MF	141,660
Neighborhood D	Residential-SF Residential-MF Office Civic	188,868
Cyrils East Community Center	Residential-MF Commercial Office Hotel Civic	117,220
Neighborhood F	Residential-SF	102,948
Neighborhood G	Residential-SF Civic	380,370
Total		**934,066**

Planning for future expansions are to be coordinated with FDEP and consistent with Chapter 62-600.405, FAC which outlines the requirements for wastewater facility expansions. Chapter 62-600.405(3) states that when the three-month ADF, for the most recent three consecutive months, exceeds 50% of the permitted capacity of the treatment plant or reuse and disposal systems, the permittee shall submit to FDEP a capacity analysis report.

Neighborhoods Key Map

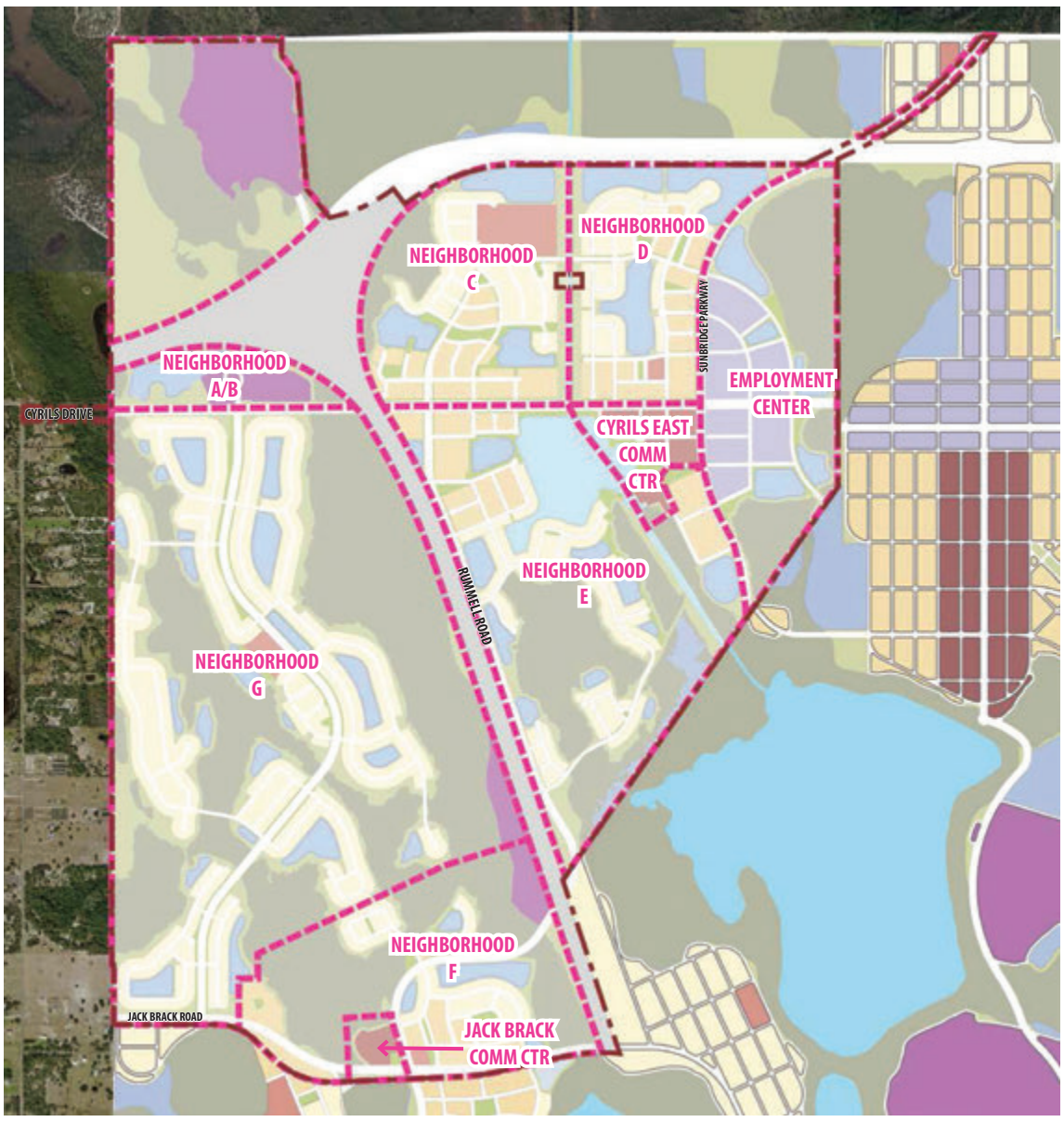


TABLE 1: SUNBRIDGE DEVELOPMENT PROGRAM *(REVISED)*

NEIGHBORHOOD	Units	*Det*	*Att TH*	*Att MF*	Comm (sf)	Office (sf)	Industrial (sf)	Civic (sf)	Hotel (Rm)
Neighborhood A/B	0 359	*0* *164*	*0* *195*	--	15,000 20,000	0 90,000	--	10,000 25,000	--
Neighborhood C	489 733	*341* *289*	*82* *114*	*66* *330*	--	--	--	75,000 75,000	--
Neighborhood D	740 699	*370* *291*	*82* *120*	*288* *288*	--	20,000 20,000	--	10,000 10,000	--
Neighborhood E	921 610	*371* *310*	*40* *93*	*510* *207*	--	--	--	--	--
Neighborhood F	373 450	*251* *265*	*122* *185*	--	--	--	--	0 75,000	--
Neighborhood G	1,370 1,370	*1,370* *1,370*	--	--	--	--	--	15,000 15,000	--
Jack Brack Comm Ctr	12 43	--	*12* *43*	--	75,000 100,000	10,000 25,000	--	5,000 5,000	--
Cyrils East Comm Ctr	270 270	--	--	*270* *270*	200,000 200,000	125,000 125,000	--	15,000 15,000	150 150
Special District	-- --	--	--	--	32,000 --	680,000 --	400,000 --	48,000 --	-- --
Employment Center	300 300	--	--	*300* *300*	60,000 60,000	1,750,000 1,750,000	--	--	300 300
TOTAL	4,475 4,834	*2,703* *2,689*	*338* *750*	*1,434* *1,395*	382,000 380,000	2,585,000 2,010,000	400,000 --	178,000 220,000	450 450

TABLE 2: SUNBRIDGE / ADOPTED CMP DEVELOPMENT PROGRAM COMPARISON *(REVISED)*

	Units	*Det*	*Att*	Comm (sf)	Office (sf)	Industrial (sf)	Civic (sf)	Hotel (Rm)
Approved Sunbridge CP-1	4,834	*2,689*	*2,145*	380,000	2,585,000	--	220,000	450
Revised Sunbridge CP-1R	4,475	*2,703*	*1,772*	382,000	1,905,000	400,000	178,000	450
DIFFERENCE	(359)	*14*	*(373)*	2,000	680,000	400,000	(42,000)	0

TABLE 3: SUNBRIDGE / ADOPTED CMP EMPLOYMENT COMPARISON *(REVISED)*

	Office			Industrial			Commercial			Cumulative Total Employment
	SF	SF/ Employee	Total Employees	SF	SF/ Employee	Total Employees	SF	SF/ Employee	Total Employees	
Approved Sunbridge CP-1	2,010,000	180	11,166	--	700	0	380,000	400	950	12,116
Revised Sunbridge CP-1R	2,585,000	180	14,361	400,000	700	571	382,000	400	955	15,887
DIFFERENCE	680,000	--	3,195	400,000	--	571	2,000	--	5	3,771

Note: SF per employee for NED derived from Fiscal Impact Model supporting NED Comprehensive Plan Amendment, 2010
SF per employee for Sunbridge Office land use category derived from "The Metrics of Distributed Work - Financial and Performance Benefits of Emerging Work Model, O'Neill and Wymer, 2011

TABLE 4: SUNBRIDGE ACREAGE BREAKDOWN *(REVISED)*

NEIGHBORHOOD	Net Developable	Submerged	Wetlands	Open Space	Ponds	Framework + Local Streets	Expressway	TOTAL
Neighborhood A/B	15.2 66.7	-	4.2 48.3	12.6 23.7	14.5 31.1	8.0 30.4	-	54.5 200.2
Neighborhood C	102.8 99.3	3.4 -	25.3 22.9	18.3 13.6	28.2 28.6	32.6 33.8	-	210.6 198.2
Neighborhood D	76.5 81.8	3.7 -	-	18.8 21.5	36.2 32.8	34.0 32.5	-	169.2 168.6
Neighborhood E	105.4 105.2	15.1 15.1	111.0 114.2	47.9 42.2	75.7 72.2	53.6 49.7	-	408.6 398.6
Neighborhood F	76.6 93.3	-	115.6 55.0	20.9 32.8	13.2 27.3	39.7 45.6	-	266.0 254.0
Neighborhood G	246.5 234.7	-	355.5 356.9	129.5 127.5	64.6 64.6	94.3 95.7	-	890.4 879.3
Employment Ctr	65.7 65.7	-	89.7 89.7	15.3 15.3	25.0 25.0	30.1 30.1	-	225.7 225.7
Cyrils East Comm Ctr	23.1 23.1	-	1.3 1.3	0.6 0.6	9.3 9.3	9.7 9.7	-	43.9 43.9
Jack Brack Comm Ctr	7.0 18.3	-	3.5 3.8	3.1 1.3	0.0 5.0	2.5 10.0	-	16.1 38.5
Expressway	-	-	-	-	-	-	175.4 159.6	175.4 159.6
Special District	68.7 54.7	-	75.0 45.5	90.8 33.5	-	1.3 1.1	-	235.7 134.9
Parkway (north)	-	-	-	-	-	7.5 8.4	2.5 -	10.0 8.4
TOTAL	787.4 842.8	22.1 15.1	781.1 737.8	357.6 312.4	266.7 295.9	313.2 347.0	177.9 159.1	2,705.9 2,710.4

* - Schools included in net developable area.

TABLE 5: SUNBRIDGE / ADOPTED CMP LAND BASIS COMPARISON *(REVISED)*

NEIGHBORHOOD	Net Developable	Submerged	Wetlands	Open Space	Ponds	Framework + Local Streets	Expressway	TOTAL
Approved Sunbridge CP-1	842.8	15.1	737.8	312.4	295.9	347.0	159.1	2,710.4
Revised Sunbridge CP-1R	787.4	22.1	781.1	357.6	266.7	313.2	177.9	2705.9
DIFFERENCE	(124.8)	7.0	42.5	112.4	(29.2)	(37.2)	27.5	*

* - Acreage does not match due to rounding

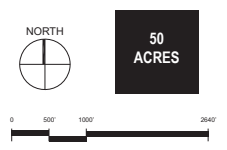
TABLE 6: SUNBRIDGE PROPOSED NEIGHBORHOOD DENSITIES *(REVISED)*

NEIGHBORHOOD	Net Developable Acres	Units	Density
Neighborhood A/B	8.3 52.0	0 359	N/A 6.9 DU/Ac
Neighborhood C	70.1 69.2	489 733	7.0 DU/Ac 10.6 DU/Ac
Neighborhood D	69.4 65.9	740 699	10.7 DU/Ac 10.6 DU/Ac
Neighborhood E	91.9 86.2	921 610	10.0 DU/Ac 7.1 DU/Ac
Neighborhood F	60.8 67.6	373 450	6.1 DU/Ac 6.7 DU/Ac
Neighborhood G	215.4 215.4	1,370 1,370	6.4 DU/Ac 6.4 DU/Ac
OVERALL	525.7 556.2	4,475 4,834	8.5 DU/Ac 8.7 DU/Ac

* - Overall includes residential developable acres and units in Centers.

Sunbridge

Figure 2-3. Sunbridge NED Neighborhoods Key Map



TAVISTOCK DEVELOPMENT COMPANY

COMMUNITY SOLUTIONS GROUP
A GAI Consultants, Inc. Service Group

3.0 REGULATORY DESIGN CRITERIA

3.1 Permitting Requirements

Required permits that are anticipated for the design and construction of the Phase I Sunbridge WRF include:

- FDEP Environmental Resource Permit
  (Approved, FDEP Permit No. 378050-001-EI)
- FDEP Domestic Wastewater Facilities Permit
- Osceola County Land Development Approval
  (Approved, Osceola County Site Development Permit No. SDP19-0090)
- Osceola County Building Permit

3.2 Class I Reliability Standards

According to Chapter 62-610 of the Florida Administrative Code (FAC), a facility that will provide public access reclaimed water must be capable of providing Class I treatment reliability. Class I reliability standards were developed by the United States Environmental Protection Agency (EPA) in 1974 and have been the standard since its conception. Requirements for Class I reliability, as described in EPA's "*Design Criteria for Mechanical, Electrical, and Fluid System and Component Reliability"* are described in **Table 3-1**. These requirements represent the Class I reliability standards that pertain to the Phase I Sunbridge WRF. Proposed modifications under the Phase II and Phase III expansions will be designed to meet all Class I reliability requirements.

Table 3-1. EPA Class I Reliability Standards

Component	Section Reference	Class I Requirements
Trash removal	211.1	Shall contain components to remove and/or comminute trash and all other large solids contained in the wastewater.
Removal of settled solids	211.3	All components, channels, pump wells, and piping shall be accessible for cleaning out settled solids.
Mechanically-Cleaned Screens	212.1.1	A backup bar screen shall be provided. It is permissible for the backup bar screen to be designed for manual cleaning only.
Unit operation bypass	211.5	Shall include provisions for bypassing around each unit operation, except as follows. Unit operations with two or more units involving open basins shall not be required to have provisions for bypassing if the peak flow can be handled hydraulically with the largest flow capacity unit out of service.
Backup Pumps	212.1.2	Shall be provided for each set of pumps which perform the same function. The capacity of the pumps shall be such that with any one pump out of service, the remaining pumps will have capacity to handle peak flow.
Aeration Basin	212.1.6.1	Backup basin shall be required; however, at least two equal volume basins shall be provided.
Blowers or Mechanical Aerators	212.1.6.2	Shall be a sufficient number of blowers or mechanical aerators to enable the design oxygen transfer to be maintained with the largest capacity unit out of service.
Air Diffusers	212.1.6.3	Shall be designed such that the largest section of diffusers can be isolated without measurably impairing the oxygen transfer capability of the system.
Chemical Flash Mixer	212.1.7	At least two mixing basins or a backup means for adding and mixing chemicals, separate from the basin, shall be provided. If only one basin if provided, at least two mixing devices and a bypass around the basin shall be provided.
Final sedimentation basins	212.1.5	Shall be a sufficient number of units of a size, such that with the largest flow capacity unit out of service, the remaining units shall have a design flow capacity of at least 75% of the total design flow.
Disinfection Contact Basins	212.1.9	Shall be a sufficient number of units of a size, such that with the largest flow capacity unit out of service, the remaining units shall have a design flow capacity of at least 50% of the total design flow.
Power Sources	231	Two separate and independent sources of electric power shall be provided to the facility from either two separate utility substations or from a single substation and a facility generator.
Backup Power Sources	231	At a minimum, the capacity of the backup power source shall be sufficient to operate all vital components, during peak flow, together with critical lighting and ventilation.

3.3 Basin Management Action Plan Effluent Limits

The 2020 Lake Okeechobee BMAP introduced in **Section 2.1.9**, requires that all individually permitted domestic wastewater facilities and their associated effluent disposal methods to meet more stringent nutrient effluent limits. New or renewed wastewater facility permits within the Lake Okeechobee BMAP area must require at least quarterly sampling of the effluent discharge, at the point of discharge, for total nitrogen (TN) and total phosphorus (TP). Quarterly reporting of sampling results shall be included in the facilities' monthly discharge monitoring reports (DMRs) submitted to FDEP. The TN and TP effluent limits, as described in the 2020 Lake Okeechobee BMAP, are presented in **Table 3-2**.

Table 3-2. Lake Okeechobee BMAP Effluent Limits

Permitted Capacity	Direct Surface Discharge	Rapid-Rate Land Application	All Other Disposal Methods, Including Reuse
≥ 0.50 MGD	TN = 3 mg/L TP = 1 mg/L	TN = 3 mg/L TP = 1 mg/L	TN = 10 mg/L TP = 6 mg/L

The Phase I Sunbridge WRF will utilize public access reuse for effluent disposal (further discussed in **Section 6.1**). As a result, the facility will be required to meet the TN limit (≤ 10.0 mg/L) and TP limit (≤ 6.0 mg/L) listed under the "All Other Disposal Methods, Including Reuse" column in **Table 3-2** above.

3.4 Staffing Requirements

General classification and staffing requirements of a domestic WRF are defined under Chapter 62-699.310, FAC. The Phase I Sunbridge WRF is classified as a Category I, Class B facility which is defined as an activated sludge treatment plant required to meet permit limits for total nitrogen and total phosphorus, with or without filtration, at a permitted capacity of 0.5 MGD up to 3.0 MGD. The facility shall be staffed by a Class C, or higher operator for 16 hours per week, 7 days per week. The lead chief operator must be Class B, or higher.

More stringent staffing requirements for a water reclamation facility providing public access reuse and/or land application systems are defined in Chapter 62-610.462(2), FAC. Under this rule, the facility shall be staffed by a Class C, or higher operator for 24 hours per day, 7 days per week. The lead chief operator shall be a minimum Class B, or higher if required by Chapter 62-699, FAC.

TWA will be staffing and operating the WRF and reuse system. Facility operations will be monitored via TWA's SCADA system at the South Bermuda WRF, 24 hours a day, 7 days a week. TWA proposed staffing the Sunbridge WRF with a Class C or higher operator for 16 hours a day, 7 days a week, and the lead operator will be a Class B operator or higher. TWA will have stand-by operators on-call to address any issues that develop at the Sunbridge WRF.

4.0 WASTEWATER FLOWS AND CHARACTERISTICS

4.1 Influent Wastewater Flows

The Sunbridge WRF is to provide an initial capacity of 1.00 MGD on an average daily flow (ADF) basis with proposed phased expansions to 3.50 MGD and 7.00 MGD in the future. Recommended peaking factors were developed by Poulos & Bennett in their 2018 Wastewater MUP and have been adopted to determine the maximum daily flow (MDF) and peak hour flow (PHF) values. The initial Phase I and future projected design flows, based on their respective peaking factors, is presented below in **Table 4-1**.

Table 4-1. Proposed Design Flows

Flow Description	Phase I	Phase II	Phase III	Peaking Factor
Average Daily Flow, ADF (MGD)	1.00	3.50	7.00	-
Maximum Daily Flow, MDF (MGD)	1.65	5.78	11.55	1.65
Peak Hour Flow, PHF (MGD)	3.00	10.50	21.00	3.00

4.2 Influent Wastewater Characteristics

Major influent parameters considered in the Sunbridge WRF Phase I design include carbonaceous biological oxygen demand (cBOD), total suspended solids (TSS), Total Kjeldahl Nitrogen (TKN), and total phosphorus (TP). The initial ADF and MDF influent design characteristics for the Sunbridge WRF were provided by TWA, as identified in Tetra Tech's "*NED WRF Design Criteria Package, 2019",* and are set forth in **Table 4-2**.

Table 4-2. Influent Wastewater Design Characteristics

Parameter	ADF	MDF
cBOD (mg/L)	300	300
TSS (mg/L)	300	300
TKN (mg/L)	45	45
TP (mg/L)	10	10
cBOD Loading (ppd)	2,510	4,130
TSS Loading (ppd)	2,510	4,130
TKN Loading (ppd)	380	620
TP Loading (ppd)	90	140

4.3 Effluent Quality

The Sunbridge WRF will be required to provide sufficient treatment to meet public access reuse (PAR) standards, as defined in Chapter 62-610, FAC. In addition to typical PAR quality standards, the 2020 Lake Okeechobee BMAP effluent limits must be met, as described in **Section 3.3**. The initial design effluent parameters and limitations for the are presented in **Table 4-3**. Effluent goals and regulatory requirements are described in further detail in **Section 6.1**.

Table 4-3. Effluent Design Limits

Parameter	Phase I
cBOD (mg/L)	5
TSS (mg/L)	5
TN (mg/L)	10
TP (mg/L)	6

4.4 Process Design Loadings

From the influent and effluent concentrations established in the previous sections, process design loadings for ADF are shown in **Table 4-4**. These values consider the total influent loading into the WRF, less the expected effluent discharged, to determine the required removal in the treatment process. The resulting values identify the process design loadings that were used to size each unit operation and process of the Sunbridge WRF.

Table 4-4. Process Design Loadings at ADF

Parameter	Influent Loading (ppd)	Effluent Discharge (ppd)	Design Loading (ppd)
cBOD Loading (ppd)	2,510	50	2,460
TSS Loading (ppd)	2,510	50	2,460
TKN Loading (ppd)	380	90	290
TP Loading (ppd)	90	60	30

5.0 PROCESS DESIGN CRITERIA

5.1 Introduction

The purpose of this section is to provide a detailed description of the basis of design criteria used for each treatment process for the final design the Phase I Sunbridge WRF. Influent basis of design parameters were discussed in **Section 4.0** and can be found in **Table 4-2** and effluent design criteria can be found in **Table 4-3**.

The following components will be included in the Phase I Sunbridge WRF design and will be further discussed in the following sections.

- One (1) Influent Screening Facility
- Two (2) Field-Erected Treatment Plants
- Four (4) Aerobic Zone Blowers
- Two (2) Disc Filter Units
- Two (2) Chlorine Contact Chambers
- One (1) Sodium Hypochlorite Storage and Feed System
- One (1) Sludge Holding Tank
- Two(2) Sludge Holding Tank Blowers
- One (1) Duplex Plant Drain Pump Station
- One (1) Effluent Transfer Pump Station
- One (1) 5 MG Reclaimed Water Ground Storage Tank
- One (1) Reclaimed Water Pump Station
- One (1) 1 Million Gallon Reject Storage Pond
- One (1) Duplex Reject Storage Pond Pump Station
- One (1) Electrical Building
- One (1) Emergency Generator

5.2 Site Layout

The overall Phase I site plan is shown on **Figure 5-1** and includes all components of the initial Sunbridge WRF as well as the completed design components of the Sunbridge WTP.

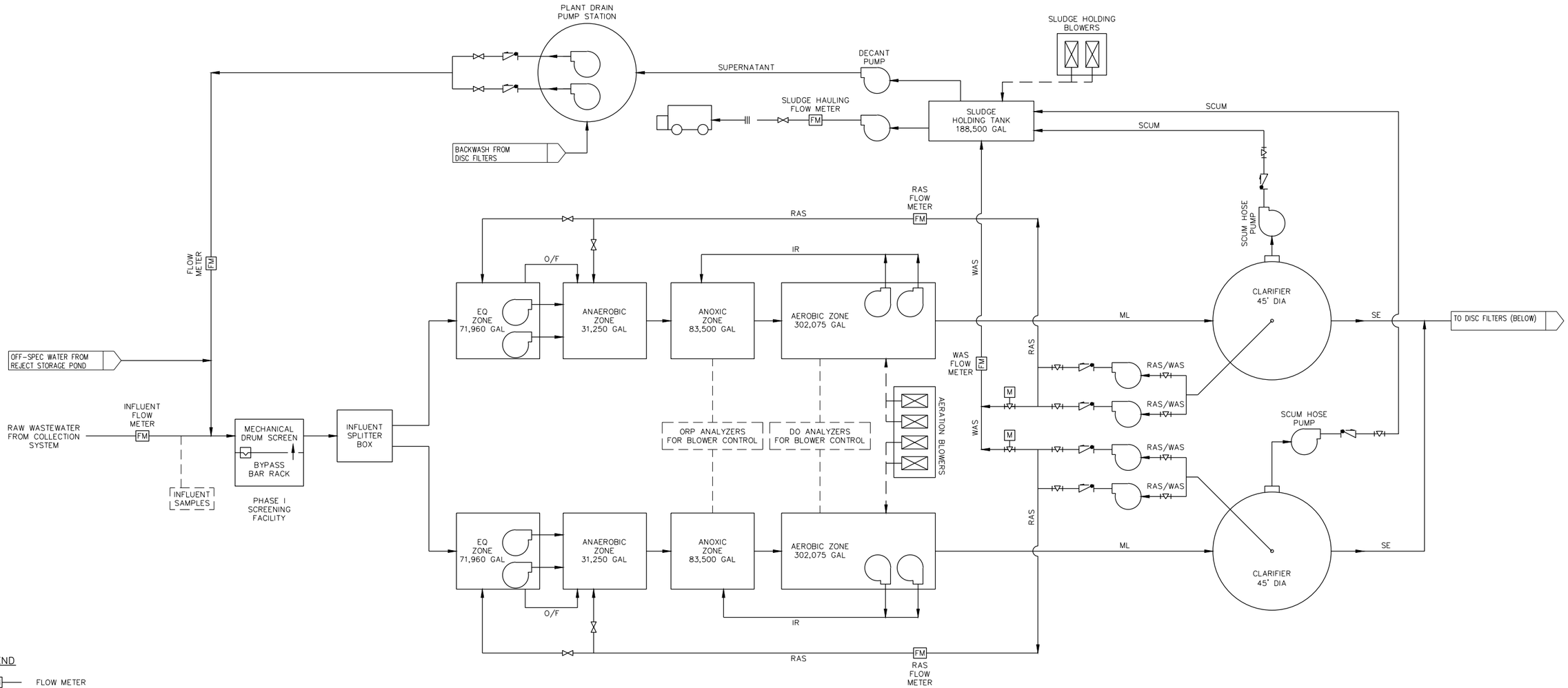
5.3 Process Flow Diagram

The Phase I process flow diagram for the Sunbridge WRF is shown on **Figure 5-2** and includes all liquid and solids treatment processes with their respective treatment capacities.

Graphic Scale in Feet
0 50' 100'

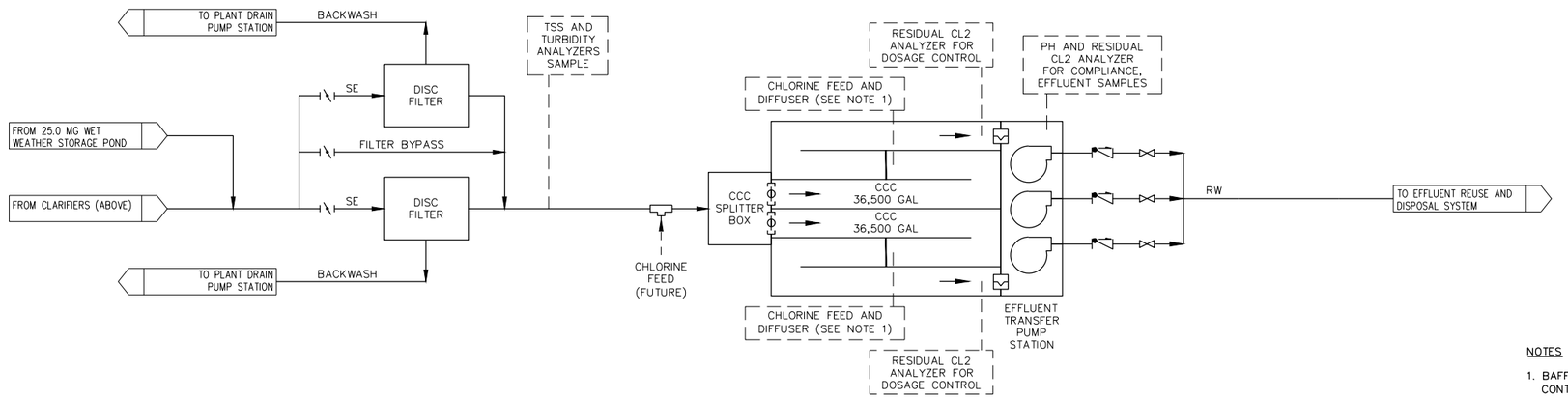
RECLAIMED WATER PUMP STATION
DISTRIBUTION FLOW METERING STATION
STANDBY GENERATOR
ELECTRICAL BUILDING
UTILITY TRANSFORMER
RAS/WAS PUMP STATION NO.1
PLANT DRAIN PUMP STATION
SLUDGE HOLDING TANK BLOWERS
SLUDGE HOLDING TANK
DISK FILTERS
AERATION BLOWERS
CHLORINE CONTACT CHAMBERS
EFFLUENT TRANSFER PUMP STATION
5.0 MG REUSE STORAGE TANK
SUNBRIDGE WATER TREATMENT PLANT
FIELD ERECTED TREATMENT PLANT NO.1
INFLUENT SCREENING
FIELD ERECTED TREATMENT PLANT NO.2
REJECT STORAGE POND PUMP STATION
1.0 MG REJECT STORAGE POND
SODIUM HYPOCHLORITE FEED AND STORAGE AREA
RAS/WAS PUMP STATION NO.2
ROADWAY
RETENTION POND

RE	SUNBRIDGE WATER RECLAMATION FACILITY	PHASE I SITE PLAN	FIGURE 5-1



LEGEND

- FM — FLOW METER
- GATE VALVE
- PLUG VALVE, ECCENTRIC
- CHECK VALVE
- HOSE CONNECTION
- BUTTERFLY VALVE
- INJECTOR, EDUCTOR, BLENDER
- SLIDE GATE
- WEIR
- M — MOTOR
- PUMP
- BLOWER



NOTES

1. BAFFLE AND DIFFUSER LOCATED TO PROVIDE 30 MINUTE CONTACT TIME AT 1.0 MGD ADF (DESIGN FLOW)

RE	SUNBRIDGE WATER RECLAMATION FACILITY	PROCESS FLOW DIAGRAM

FIGURE 5-2

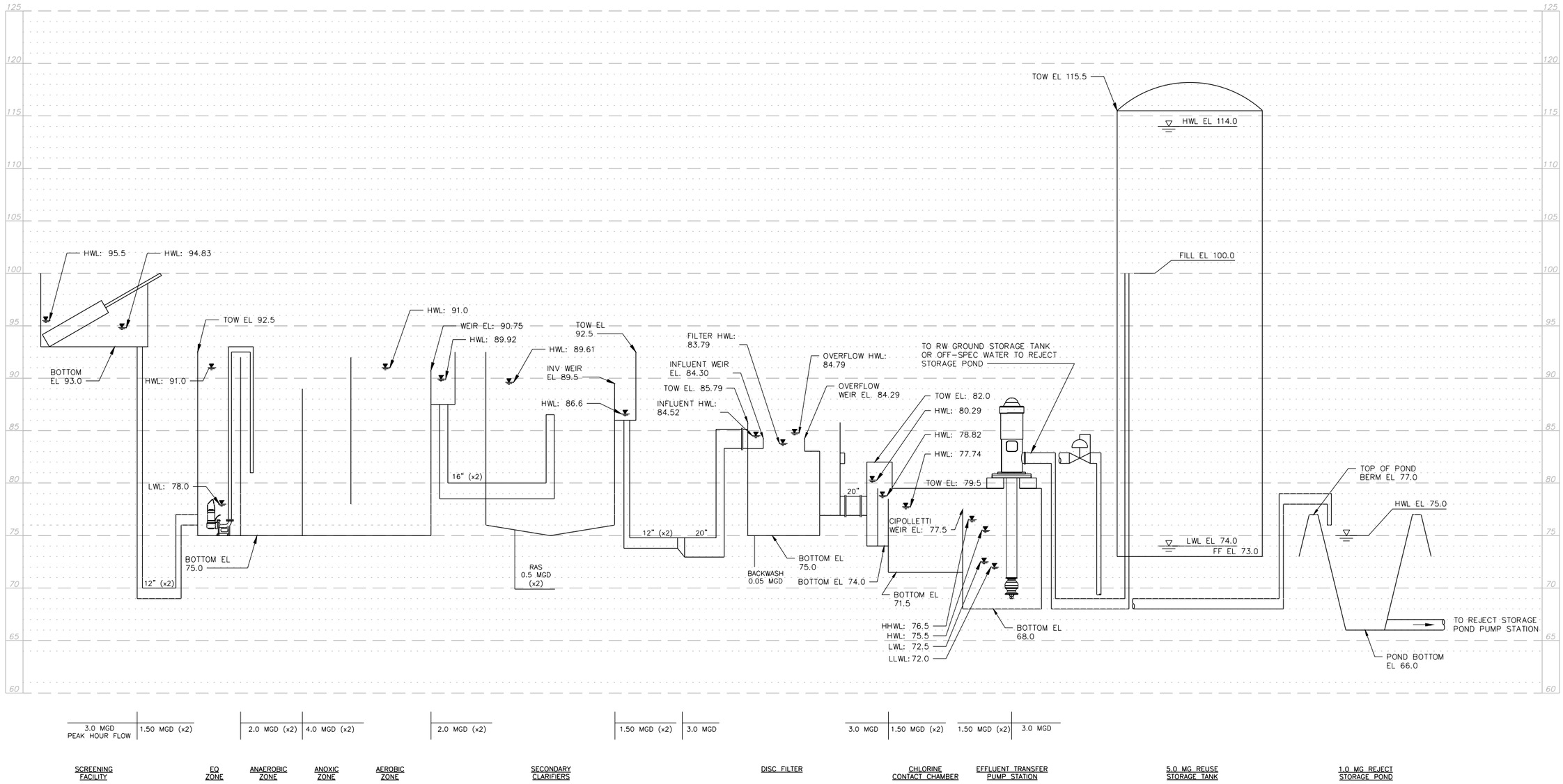
5.4 Hydraulic Profile

The Phase I Sunbridge WRF hydraulic profile is shown on **Figure 5-3** for all major treatment process structures.

5.5 Process Design Assumptions

The following process design assumptions were used throughout the preliminary design of the Sunbridge WRF. Parameters and values identified below were obtained from common industry references and standard design values.

- Influent Volatile Suspended Solids (VSS) Fraction = 80%
- Operating Mixed Liquor Suspended Solids (MLSS) = 2,250 to 3,750 mg/l
- Operating Mixed Liquor Volatile Suspended Solids (MLVSS) = 75% of MLSS
- Design Aerobic Solids Retention Time (SRT) = 7 to 8 days
- Net Solids Yield = 0.85 to 1.0 lbs. TSS/lbs. cBOD
- Design Operating Dissolved Oxygen (DO) = 2.0 mg/l
- cBOD Oxygen Required = 1.10 lbs. O_2/lbs. cBOD
- TKN Oxygen Required = 4.57 lbs. O_2/lbs. TKN
- Denitrification Oxygen Credit = 2.86 lbs. O_2/lbs. NO_3 Reduced
- Return Activated Sludge (RAS) Rate = 0.40 to 1.00 ADF
- Internal Recycle Rate = 4.0 ADF
- Minimum Freeboard = 1.5 feet



HYDRAULIC PROFILE

RE	SUNBRIDGE WATER RECLAMATION FACILITY	HYDRAULIC PROFILE	FIGURE 5–3

5.6 Preliminary Treatment

Preliminary treatment of raw influent wastewater into a WRF may include flow measurement, screening, and grit removal. Screening influent wastewater removes large solids such as rags, paper, plastics, and metals to protect downstream operations and equipment from damage and clogging. Grit removal is recommended at large WRFs to remove grit particles such as sand, gravel, mineral matter, coffee grounds, eggshells, fruit rinds, and seeds; however, grit removal is not commonly provided at small, field erected treatment plants. In addition, Class I Reliability does not require a method for removing grit when a WRF does not pump or dewater sludge.

5.6.1 Screening Facility

The initial Phase I screening facility will include a temporary, elevated 304 stainless steel structure with a packaged screening system sized to handle peak flows of 3.0 MGD. The packaged screening system will be mounted on top of the elevated steel structure and will include a fully automatic, mechanically cleaned rotating drum fine screen (mechanically cleaned screen) and a bypass channel with a manual bar rack. Both the mechanically cleaned screen and bypass channel manual bar rack will be included as a packaged unit and will be housed in a 304 stainless steel tank, supplied with a mounting flange for level sensor and removable panel access. The elevated steel structure will be hot dipped galvanized to protect the structural integrity throughout its expected life cycle. An influent flow meter will be provided on the raw wastewater influent pipe prior to entering the packaged screening system. In Phase II, it is anticipated that the temporary screening facility will be demolished and replaced with a permanent, concrete headworks structure with new screens and grit removal technologies.

The screening facility will be designed to remove 6 mm, or larger, solids from the raw influent wastewater via the mechanically cleaned screen. The headworks will include aby-pass channel fitted with a manual bar rack sized to remove 1.0-inch, and larger, solids. In the event that the mechanically cleaned screen is taken offline or exceeds capacity, raw unscreened wastewater will overflow an internal weir and spill into the side by-channel and flow through the manual bar rack. The mechanical screen and by-pass channel are designed to pass the entire peak flow of 3.0 MGD. Screenings removed from the raw influent wastewater through the mechanically screen will be washed, compacted, and dewatered before discharging into a dumpster.

Once the influent has passed through the screening facility, it will flow into a splitter box to equally split the flow between to the two field erected treatment plants. Manually operated weir gates will be provided on the splitter box discharges to the two packaged treatment plants. If one of the plants is out of service, the weir gates can be raised to divert flow from the out of service process to the process that is operational.

5.7 Field Erected Treatment Plant

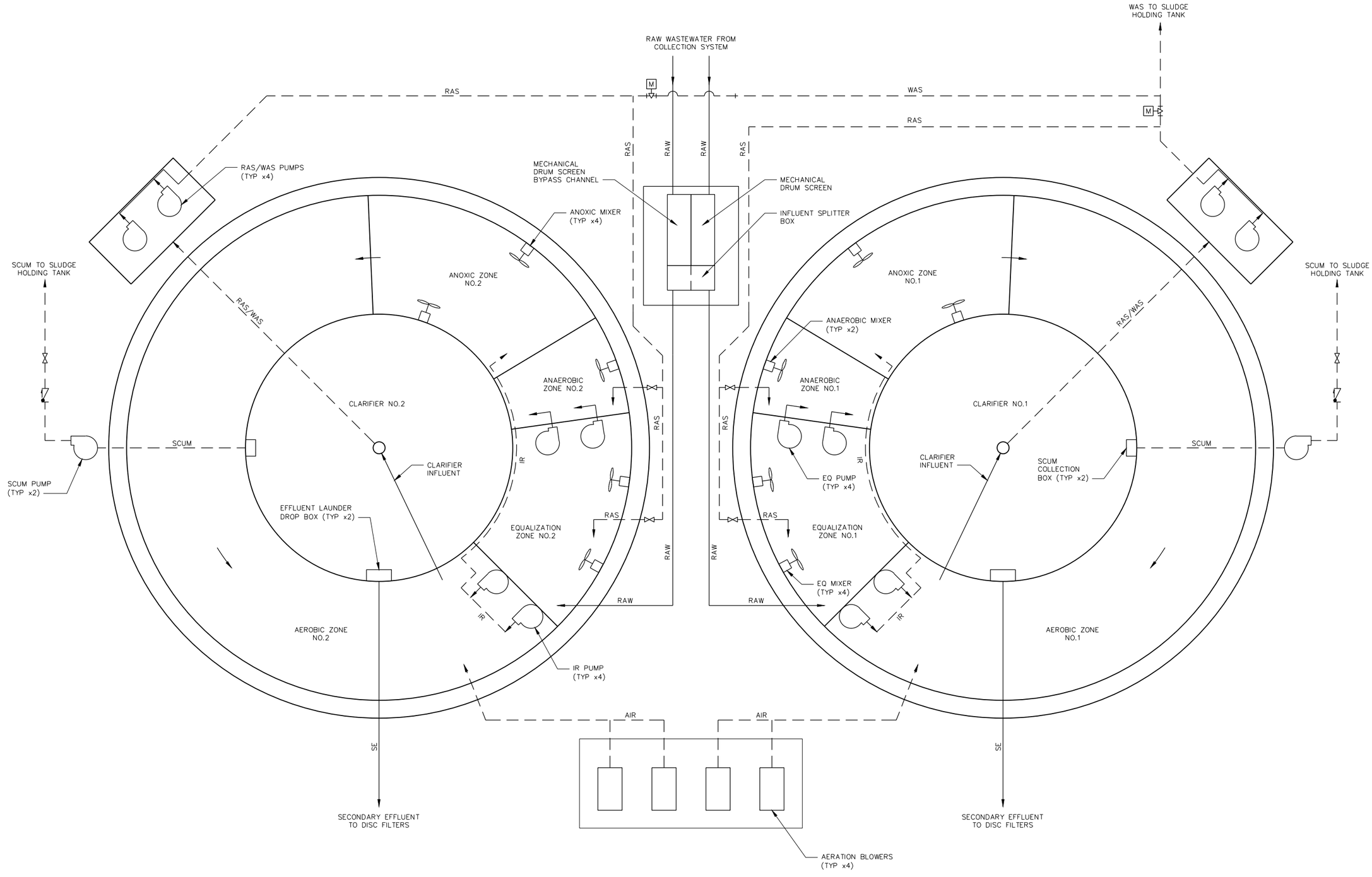
Phase I biological (secondary) treatment will be accomplished via two 0.5 MGD mirror imaged field erected treatment plants (FETPs) utilizing a typical three-stage anaerobic anoxic/oxic process to provide for biological nutrient removal (BNR). The two FETPs will be designed to meet Class I Reliability standards and will include flow equalization (EQ), anaerobic, anoxic, aerobic, and center clarification zones within an 85-foot diameter reinforced concrete tank. The inner tank walls and bulkheads will be constructed of steel bulkheads and coated with a corrosions resistant paint system. ,. The proposed volumes and hydraulic retention times (HRTs) for each of the FETP's biological process zones are summarized in **Table 5-1**.

Table 5-1. Summary of FETP Biological Process Zones

Process Zone	Volume, each (gal)	Volume, total (gal)	HRT (hrs)
EQ	71,960	143,920	3.5
Anaerobic	31,250	62,500	1.5
Anoxic	83,500	167,000	4.0
Aerobic	302,075	604,150	14.5
Total	**488,785**	**977,570**	**23.5**

During Phase II, it is anticipated that both FETPs will be converted into 85-foot diameter clarifiers and new, separate process basins will be constructed. The 85-foot diameter concrete tank will be constructed with an outer diameter peripheral launder and drop box with the clarifier center column and sludge discharge pipes capped at the bottom of the tank.

Stairways with intermediate landing, aluminum handrails, and stair treads will be installed to provide access to critical process equipment. An access bridge with aluminum handrails, toe plates, and bar grating will be provided between the two FETPs to allow access to both units. A preliminary plan view of the FETPs and their associated piping, valves, and equipment are shown on **Figure 5-4**.



SUNBRIDGE WATER RECLAMATION FACILITY

FIELD ERECTED TREATMENT PLANT
PLAN VIEW

FIGURE
5-4

5.7.1 Flow Equalization Zone

As a part of the FETPs for Phase I, in-line flow equalization will be provided within the first outer zone of the FETPs to dampen flows during instantaneous peak flow events. The EQ storage volume provides sufficient volume to store 14% of the average day design flow. The total EQ storage volume provided within each FETP is 71,960 gallons (0.072 MG), for a total EQ storage volume of 143,920 (0.144 MG).

Two 15 horsepower, wet-pit submersible influent EQ pumps with guide rails and hoists will be installed within each EQ zone. Each EQ zone is designed as a flow through system and can to receive up to 1.5 MGD PHF, equalize, and constantly pump a steady influent flow into the anoxic zone. Each influent EQ zone will have two pumps, each having a pumping capacity of 1,042 gallons per minute, or 1.50 MGD.

In the event the PHF exceeds the EQ zone's pumping and storage capacity or there is a pump failure, each EQ zone has an overflow that will discharge to the anaerobic zone. A 304 stainless steel flow regulator splitter box will be included for use with the EQ zone pumping system for each FETP. In addition, two 3 horsepower submersible influent EQ mixers with guide rails and hoists will be provided for each FETP. The mixers will be controlled by a level indicator in the EQ zone and will shut down when liquid levels recede below the minimum required submergence level. A summary of the flow EQ zone design criteria can be found in **Table 5-2**.

Table 5-2. Flow Equalization Zone Design Criteria

Criteria	Phase I
Number of Zones	2
Volume (gal)	
Each Zone	71,960
Total	143,920
Volume (cf)	
Each Zone	9,625
Total	19,2450
Surface Water Depth (ft)	16
HRT at ADF (hrs)	3.5
Submersible Mixers	
Units per Zone	2
Horsepower, each	3
Horsepower, total	12
EQ Pumps	
Units per Zone	2
Capacity, each (MGD)	1.5
Horsepower, each	15
Horsepower, total	60

5.7.2 Anaerobic Zone

Influent from the EQ zones will enter into an anaerobic zone where the polyphosphates stored in bacterial cells can be converted to phosphates and released into the wastewater. Organic matter in the anaerobic zone is fermented to create a source of volatile fatty acids (VFAs), particularly acetate and propionate, which in turn serves as food sources for phosphorus accumulating organisms (PAOs). PAOs are aerobic bacteria and although they cannot reproduce in an anaerobic environment, they do have the ability to consume VFAs under strict anaerobic conditions and, as a result, store intracellular carbon compounds.

Return activated sludge is pumped back to the anaerobic zone from the clarifiers to limit the amount of oxygen and nitrates present in the anaerobic zone. The presence of oxygen and/or nitrates will disrupt the process by placing PAOs at a competitive disadvantage with other bacterial populations. If PAOs fail to accumulate carbon compounds in the anaerobic zone through the metabolism (and release) of stored polyphosphate sources, they will not take up phosphates in the subsequent aerobic zone. To promote anaerobic conditions and mixing of the liquid stream, one 3 horsepower mixer will be provided within each anaerobic zone.

An upfront anaerobic zone will be provided in each of the FETPs to provide phosphorus removal. Phase I will provide 31,250 gallons (0.03 MGD) of anaerobic volume within each FETP, for a total anaerobic volume of 62,500 gallons (0.06 MGD). Typical hydraulic retention time (HRT) for anaerobic zones ranges from 0.5 to 1.5 hours. The Phase I anaerobic zone will be designed to provide an HRT of 1.5 hours at ADF. A summary of the anaerobic zone criteria is presented in **Table 5-3**.

Table 5-3. Anaerobic Zone Design Criteria

Criteria	Phase I
Number of Zones	2
Volume (gal)	
Each Zone	31,250
Total	62,500
Volume (cf)	
Each Zone	4,180
Total	8,360
Surface Water Depth (ft)	16
HRT at ADF (hrs)	1.5
Submersible Mixers	
Units per Zone	1
Horsepower, each	3
Horsepower, total	6

5.7.3 Anoxic Zone

Anoxic zones are utilized upstream of aerobic zones and serve to achieve higher levels of denitrification. Denitrification is described as the conversion of nitrate (NO_3) to nitrite (NO_2) then to nitrogen gas (N_2) by heterotrophic bacteria. For each pound of NO_3 denitrified, 2.86 pounds of cBOD oxygen demand are recovered and 3.57 pounds of alkalinity (as $CaCO_3$) are produced. Mixed liquor, a combination of raw wastewater and microorganisms, from the aeration zone is constantly recirculated back to the anoxic zone, using internal recycle pumps to provide a constant supply of NO_3. Two internal recycle (IR) pumps will be provided and designed to provide pumping capacity 4 times the ADF, or 4.0 MGD, for each FETP. Additional IR pump design details are included in **Section 5.7.6**.

In addition, denitrification will reduce oxygen requirements by 2.86 lbs. of oxygen per pound of NO_3 removed within the anoxic zones. Based on process modeling, approximately 185 pounds of NO_3 will be removed per day in the anoxic zones which results in reduced process air oxygen requirements by 520 pounds of oxygen per day at ADF.

Mixing of the mixed liquor within the anoxic zone is required and will be designed to maintain a complete mix of the anoxic zone contents. Mixing horsepower will be designed consistent with Metcalf & Eddy's "*Wastewater Engineering: Treatment and Reuse"* (2009), recommended power requirements for anoxic mixing ranges between 0.3 to 0.5 horsepower per 1,000 cubic feet of liquid volume. Two 3 horsepower mixers will be provided within each FETP anoxic zone resulting in 0.54 horsepower per 1,000 cubic feet of liquid volume. Phase I will provide 83,500 gallons (0.084 MG) of anoxic volume within each FETP, for a total anoxic volume of 167,000 gallons (0.167 MG). Design criteria for the FETPs' anoxic zones are presented in **Table 5-4**.

Table 5-4. Anoxic Zone Design Criteria

Criteria	Phase I
Number of Zones	2
Volume (gal)	
Each Zone	83,500
Total	167,000
Volume (cf)	
Each Zone	11,165
Total	22,330
Surface Water Depth (ft)	16
HRT at ADF (hrs)	4.0
Submersible Mixers	
Units per Zone	2
Horsepower, each	3
Horsepower, total	12

5.7.4 Aerobic Zone

The aerobic zone is where autotrophic bacteria (nitrifiers) convert ammonia (NH_4) to NO_2, then to NO_3 in a process referred to as nitrification. For each pound of ammonia oxidized to NO_3, 4.57 pounds of oxygen are consumed, 7.14 pounds of alkalinity (as $CaCO_3$) are destroyed, and 0.15 pounds of new nitrifier cells are produced.

Phase I will provide 302,075 gallons (0.302 MG) of aerobic volume within each FETP, for a total aerobic volume of 604,150 gallons (0.604 MG). According to Ten State Standards, organic loading rates within an activated sludge aeration reactor should not exceed 40 pounds of cBOD per day per 1,000 cubic feet of liquid volume. Based on the design (ADF) cBOD loading of 2,460 pounds per day and a total aerobic volume of 80,770 cubic feet, the system will operate around an organic loading rate of 30.5 pounds of cBOD per 1,000 cubic feet per day.

Oxygen demands for the aerobic zones were calculated based on the sum of the demands from cBOD and nitrification oxygen usage minus the oxygen credited back to the system from denitrification. **Table 5-5** summarizes the oxygen demands and credits, along with the total design oxygen demands, at ADF and MDF conditions for both FETPs.

Table 5-5. Aerobic Zone Oxygen Demands

Parameter	ADF (lbs. O_2/day)	MDF (lbs. O_2/day)
cBOD Oxygen Demand	2,710	4,470
Nitrification Oxygen Demand	1,130	1,870
Denitrification Oxygen Credit	(-) 520	(-) 860
Total Oxygen Demand	**3,320**	**5,480**

Aeration will be achieved via floor-mounted, fine bubble flexible membrane tube diffusers within each aerobic zone of the FETPs. Each FETP aerobic zone will be supplied process air via two variable speed, positive displacement (PD), rotary lobe blowers. The four blowers will be located outside within a supplied, sound attenuating enclosure under a sun-shaded canopy. Process air will be supplied to the aerobic zone diffusers air header and drop pipes.

The blowers will be designed to meet Class 1 Reliability requirements which state that there shall be a sufficient number of blowers (air flow) to enable the design oxygen transfer to be maintained during average day air demands, with the largest capacity blower out of service. Each blower will be sized to deliver 750 standard cubic feet per minute (scfm) of process air to meet process and Class 1 Reliability requirements. The blowers will be controlled by DO probes in the aerobic zones and ORP probes in the anoxic zones to allow set point DO and ORP control. Providing DO and/or ORP control will help alleviate DO recirculation into the anoxic zones from the IR pumps and will help minimize electrical demands. Design criteria for the FETPs' aerobic zones are presented in **Table 5-6**.

Table 5-6. Aerobic Zone Design Criteria

Criteria	Phase I
Number of Zones	2
Volume (gal) Each Zone Total	 302,075 604,150
Volume (cf) Each Zone Total	 40,385 80,770
Surface Water Depth (ft)	16
HRT at ADF (hrs)	14.5
Organic Loading Rate (ppd/1,000 cf)	30.5
Process Air Flow Required (scfm) ADF MDF	 1,100 1,800
Aerobic Zone Blowers Type Number of Blowers per Zone Capacity, each (scfm) Horsepower, each Horsepower, total	 PD, VFD 2 750 60 240

5.7.5 Clarification Zone

Mixed liquor from the aerobic zone enters the clarification zone via a center support column pipe where it is slowly and evenly dispersed into the clarifier via a stilling well (energy dissipator). Solids settle to the bottom of the clarifier where a sludge collection mechanism collects and transfers the settled solids (sludge) to the next treatment process. Clarified effluent flows over peripheral weirs, located at the top of each clarifier, and into the effluent trough where it then flows by gravity to the next treatment process. A rotating surface skimmer collects scum on the surface of the clarifiers and is collected in a scum trough and discharged via airlift for disposal.

According to Ten State Standards, surface overflow rate at design PHF and peak solids loading rate based on MDF are to be under 1,000 gallons per day per square foot (for WRFs having to meet an effluent TSS concentration less than 20.0 mg/L) and 40 pounds per day per square foot, respectively. Solids loading rates were calculated assuming a system mixed liquor suspended solids (MLSS) concentration of 3,500 mg/L and a RAS flow rate of 60 percent at ADF and PHF. In addition, weir loading rates should range between 10,000 to 20,000 gallons per day per linear foot, based on PHF. Each clarifier was sized to meet Class I Reliability standards for 75 percent of influent flows, with one unit out of service. Design criteria for the FETPs' clarification zones are presented in **Table 5-7**.

Table 5-7. Secondary Clarification Design Criteria

Criteria	Phase I
Number of Zones	2
Diameter (ft)	45
Surface Area (sf)	
Each Zone	1,590
Total	3,180
Side Water Depth (ft)	13.5
Volume (gal)	
Each Zone	160,700
Total	321,400
Weir Length (ft)	125
Surface Overflow Rate (gpd/sf)	
ADF	314
MDF	519
MDF (Class I)	778
Solids Loading Rate (ppd/sf)	
ADF	14.7
MDF	20.6
MDF (Class I)	31.0
Peak Weir Loading Rate (gpd/ft)	12,050

5.7.6 Clarifier Scum Collection and Disposal

The FETP clarifiers will include collection and disposal components to remove floatable solids (scum) from the water surface such as fats, oils, and grease. A rotating surface skimmer arm will collect and discharge surface scum to the scum collection trough and will be discharged from the FETP units via airlift mechanism. A hose pump, or similar type pump, will pump the collected scum from the FETP unit to the sludge holding tank with a backup alternative to route the scum discharge to the headworks.

5.7.7 Internal Recycle Pumping System

Internal recycle (IR) pumps, located at the effluent end of the aeration zones, shall provide constant recirculation of nitrified mixed liquor back to the anoxic zone. Typical IR flow rates for a conventional activated sludge system range from 100 to 400 percent of influent, at ADF, per Metcalf & Eddy's "*Wastewater Engineering: Treatment and Reuse"*(2009). The IR pumping system will be designed for a maximum pumping capacity of 400 percent ADF and will include variable frequency drives (VFDs) for pump turndown.

Two 15 horsepower, wet-pit submersible IR pumps, driven by VFDs, will be installed at the effluent end of each FETP aerobic zone. Each IR pumping system will be sized for a maximum capacity of 4.0 MGD for each FETP. Mixed liquor from the end of the aerobic zones will be pumped back to the anoxic zones and will provide a continuous supply of nitrates to the anoxic tank. IR pump discharge piping will include valves and magnetic flow meters to control the amount of flow returned to the anoxic zone. Design criteria for the IR pumping system is presented in **Table 5-8**.

Table 5-8. Internal Recycling Pumping System Design Criteria

Criteria	Phase I
Number of IR Pumps Each FETP Total	 2 4
Maximum Capacity, each (MGD)	2.0
Percent IR:ADF Ratio (%)	400
Horsepower, each	15
Horsepower, total	60

5.7.8 Return Activated Sludge

The return activated sludge (RAS) pumping system is designed to return settled, activated sludge from the clarifiers back to the anaerobic zone to maintain an adequate population of microorganisms within the biological treatment system. Based on Ten State Standards, design flows for RAS should range from 15 to 100 percent of influent ADF for a conventional activated sludge process.

Two 5 horsepower, dry-pit submersible RAS pumps driven by VFDs will be installed outside and adjacent to each FETP on concrete pads. The RAS pumping system will be designed to return RAS back to the anaerobic zone, with the option to divert the RAS to the EQ zones. Each RAS pump is sized to provide a flow range of 15 to 50 percent of ADF (50 to 175 gpm). With both RAS pumps operating, each FETP will be capable of providing a total RAS flow between 30 to 100 percent of ADF (0.3 to 1.0 MGD). Design criteria for the RAS pumping system is presented in **Table 5-9**.

Table 5-9. RAS Pumping System Design Criteria

Criteria	Phase I
Number of RAS Pumps Each FETP Total	 2 4
Capacity Range, each (gpm)	50 – 175
Percent RAS:ADF Ratio (%)	30 – 100
Horsepower, each	5
Horsepower, total	20

5.7.9 Waste Activated Sludge

Most sludge that is withdrawn from the clarifier underflow returns to the upstream end of the biological treatment process via the RAS pumping station. To keep the ratio of available biomass to the amount of "food" supplied to the system, some sludge must be wasted. Wasted sludge is commonly referred to as waste activated sludge (WAS) and is typically pumped to a solids storage tank. WAS will be wasted via the RAS pumping system through a dedicated WAS line. The WAS line will include a flow meter and a modulating pinch valve to control the amount of WAS sent to the sludge holding tank.

5.8 Filtration

Filtration is the final polishing step required to meet public access reuse high level disinfection requirements. Filtration is aimed at removing the fine suspended solids that are carried over with the secondary effluent from the clarifiers. Per the public access reuse requirements established in Chapter 62-600.440, FAC, the filtration process must reduce the total suspended solids to 5.0 mg/L, or less prior to disinfection. Ten State Standards states that hydraulic loading rates shall not exceed 5.0 gallons per minute per square foot based on the design PHF applied to the filter system. In addition, Class I Reliability requires that the filters be capable of handling 75 percent of average day design flow, with one filter out of service.

The proposed disc filters will include two, 4-disc capacity filter units with all 4 discs installed for Phase I. The Phase I filtration system will be designed to handle 1.0 MGD at ADF and 3.0 MGD at PHF, with one filter unit out of service. Backwash rates are based on a standard 2 to 3 percent of total flow through the filter units. The proposed disc filter units are to be self-contained, cloth media disc filters housed in a 304 stainless steel tank and mounted on a concrete slab. Design criteria for the Phase I disc filter units are based on Aqua Aerobic System's AquaDisk® cloth media filter and are summarized in **Table 5-10**.

Table 5-10. Filtration Design Criteria

Criteria	Phase I
Flow (MGD)	
ADF	1.00
PHF	3.00
Number of Units/Discs per Unit	2/4
Filter Area per Disc (sf)	53.8
Total Filter Surface Area (sf)	430.4
Hydraulic Loading (gpm/sf)	
ADF (Two Units Online)	1.6
ADF (One Unit Online)	3.2
PHF (Two Units Online)	4.8
Maximum Backwash Rate (gpd)	50,000
Filter Drive Motor Horsepower	3
Wash Water Pump Horsepower	8

5.9 High-Level Disinfection

Disinfection of the filtered effluent must meet high-level disinfection criteria for public access reuse of reclaimed water. High level disinfection requirements, per Chapter 62-600.440 FAC, must produce an effluent with no detectable fecal coliforms and must provide a minimum chlorine residual of 1.0 mg/L after a contact time of 15 minutes under PHF, and 30 minutes under ADF conditions when using chlorine as the source for disinfection. A minimum CT, the product of total chlorine residual, C in mg/L, and contact time, T in minutes, at PHF shall be met based on the concentration of fecal coliforms in the effluent following filtration and prior to disinfection. The disinfection design criteria have been establish based on FDEP regulations for a CT ratio of 40 for filter effluent containing less than 10,000 fecal coliform per 100 mL. In addition, Class I Reliability requires that with the largest unit out of service, the remaining units shall have the capacity to treat at least 50 percent of the total design flow.

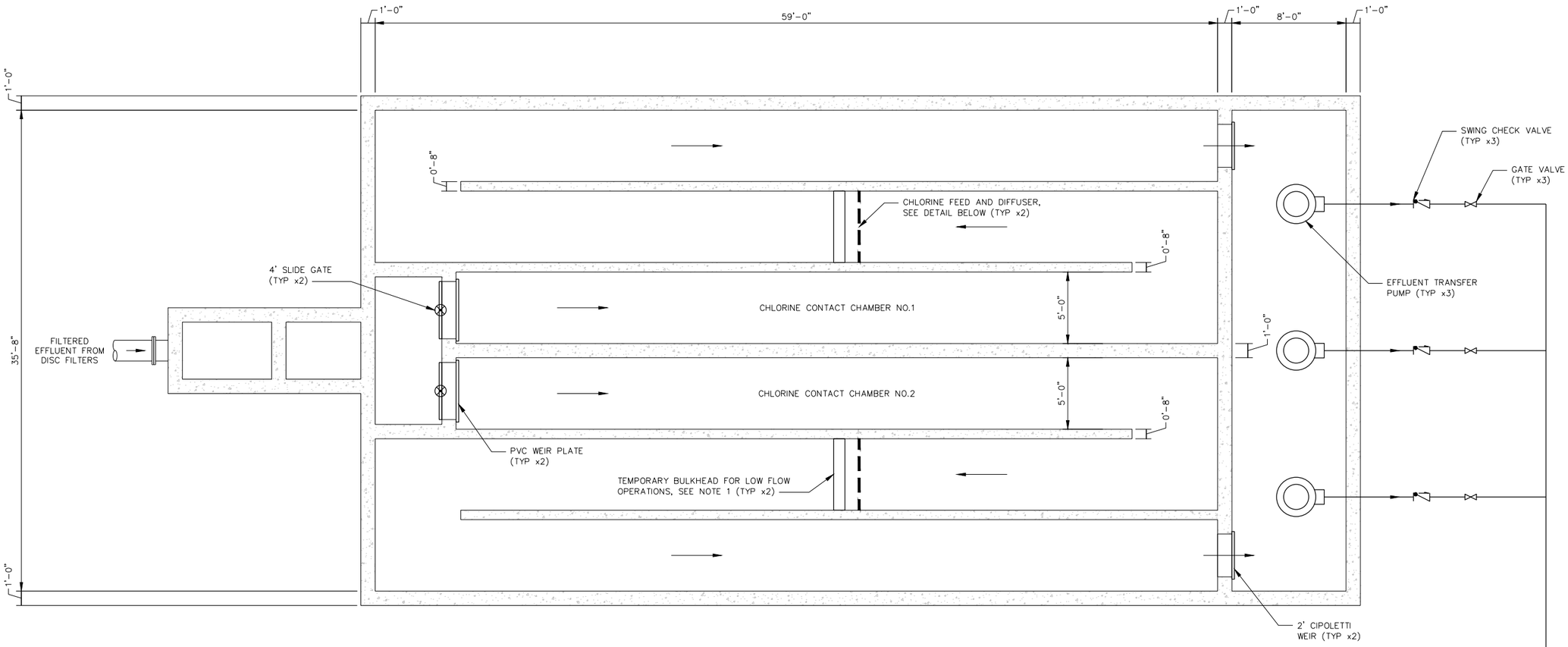
The Phase I chlorine contact chambers (CCCs) will be constructed of reinforced concrete and designed to provide long and narrow channels to produce a plug flow regime. The CCCs contact time are designed to provide 30-minute contact time for Phase 1 and the proposed Phase II average day flow of 3.5 mgd.

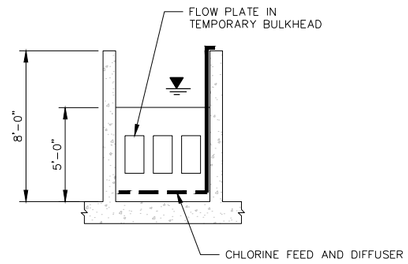
Two 36,500 gallon CCCs will be constructed, each sized to provide a minimum of 30 minutes contact time at ADF and 15 minutes contact time at PHF at 3.5 mgd and 7.0 mgd, respectively. In Phase I, a temporary baffle wall and chlorine diffusers will be installed in the basin at a location that provides 30-minute contact time for the Phase I average day flow and 15-minute contact time at the peak hour design flow. It is recommended to install the baffle walls at a location to reduce the chlorine contact time to avoid losing chlorine residual at the end of the basin during summer operations. Design criteria for the CCCs are presented in **Table 5-11**.

Filtered effluent from the filtration process will flow by gravity into a concrete splitter box, located at the front-end of the CCC structure. The splitter box will be designed to split flows evenly into the two CCCs via a slide gate and weir plate at each CCC entrance. A Cipolletti weir will be installed at the end of the CCC basins with an ultrasonic level transducer installed to calculate the effluent flow rate for sodium hypochlorite dosage control. A sample pump inside the CCC will feed a residual chlorine analyzer to monitor the sodium hypochlorite dosage. For compliance monitoring of high level disinfection, a sample pump inside the effluent transfer pump station wet well will feed a residual chlorine analyzer to continuously monitor total chlorine residual of the CCC effluent.

Table 5-11. Chlorine Contact Chamber Design Criteria

Criteria	Phase I[1]	Phase 2[2]
Number of CCCs	2	2
Flow (MGD) ADF PHF	 1.00 3.00	 3.50 7.00
Volume (gal) Each CCC Total	 20,833 41,666	 36,500 73,000
Detention Time (mins) ADF PHF	 30 15	 30 15
Chlorine Residual to meet CT (mg/L) ADF PHF	 0.8 2.3	 0.8 2.3





NOTES

1. TEMPORARY BULKHEADS SHALL BE PLACED AT PROPOSED LOCATION TO PROVIDE MINIMUM CONTACT TIME OF 30 MINUTES AT AVERAGE DAY FLOW OF 1.0 MGD AND 15 MINUTES CONTACT TIME AT PEAK HOUR FLOW OF 3.0 MGD.

SUNBRIDGE WATER RECLAMATION FACILITY

CHLORINE CONTACT CHAMBERS
PLAN VIEW

FIGURE
5-5

5.10 Sodium Hypochlorite Storage and Feed System

The proposed sodium hypochlorite storage and feed system will inject chlorine solution upstream of the CCCs as influent flows under a gate and into the CCC splitter box. The feed system is designed to feed based on achieving an average dosage of 6.0 mg/L and a maximum of 10.0 mg/L at the influent of the CCCs. A single chemical skid, with two metering pumps (duplex skid), will be provided for the sodium hypochlorite feed system to achieve the required feed rate at the influent of the CCCs. A second duplex skid will be provided to chlorinate the reclaimed water pump station and will be sized based on metering a 2.0 mg/L dosage. Both duplex metering pump skids will be sized such that the maximum required dosage can be achieved with one pump operating.

Flow control of the chemical solution will be adjustable via speed control of the metering pumps (automatically) and the flow measured upstream of the CCC. This flow meter will also serve as the plant effluent flow meter. The speed output of the sodium hypochlorite metering pumps will be controlled automatically to match the desired dosage to demand by using a flow-proportional dosage signal coupled with a dosage input. Chlorine residual measured in the contact basin downstream of the feed point will provide continuous monitoring and alarm for remote operator process control.

The bulk sodium hypochlorite storage tank(s) will be double wall manufactured of HDPE corrosion resistant materials. Since direct sunlight and heat accelerates the degradation of sodium hypochlorite over time, a sunshade enclosure will be constructed around the bulk storage tank(s) to reduce ultraviolet (UV) exposure. The tank will include level monitoring, air ventilation, and other appurtenances for safety, access, and operational purposes.

The feed sodium hypochlorite will come from the 750 gallon bulk storage tanks. . The hypochlorite fed will be fitted with a chemical feed flow meter. The feeding system will also include a continuous chlorine residual monitoring system with SCADA alarms activated by low and high chlorine residual levels. A float switch will be installed in a sump within the sodium hypochlorite containment area to detect a chemical spill and activate a SCADA alarm.

An ultrasonic level sensor mounted on the bulk storage tank will provide storage tank level readings to an RTU/PLC. A sight glass, drain, overflow (with overflow containments), and proper venting will also be provided on the tank.

An emergency eyewash and shower station will be provided adjacent to the bulk sodium hypochlorite storage area for operator safety in case of accidental exposure. Safety goggles, and/or face shields, rubber gloves and boots, as well as respiratory protection will be provided for handling and transferring the sodium hypochlorite solution.

A summary of the design criteria for the sodium hypochlorite storage and feed system are listed in **Table 5-12** for the CCCs and in **Table 5-13** for the reclaimed water system.

Table 5-12. CCC Sodium Hypochlorite Storage and Feed System Design Criteria

Criteria	Phase I
Dosage Rate (gph)	
ADF	51
PHF	151
Peak Dosage Rate at PHF (gpd)	251
Storage (days)	21
Number of Tanks	2
Storage Volume (gal)	
Minimum Each Tank	680
Minimum Total	1,360
Metering Pumps	
Number of Pumps, per Duplex Skid	3
Type	Diaphragm
ADF Capacity, each (gph at 100 psi)	2.1
PHF Capacity, each (gph at 100 psi)	6.3

Table 5-13. Reclaimed Water System Sodium Hypochlorite Feed System Design Criteria

Criteria	Phase I
Dosage Rate (gpd)	
ADF @ 1.0 MGD	17
PHF @ 6.0 MGD	108
Peak Dosage Rate at PHF (gpd)	162
Metering Pumps	
Number of Pumps, per Duplex Skid	2
Type	Diaphragm
ADF Capacity, each (gph at 100 psi)	0.7
PHF Capacity, each (gph at 100 psi)	4.5

5.11 Plant Drain Pump Station

A single, submersible plant drain pump station will be provided to transmit sanitary wastewater and side stream flows back to the headworks of the facility. The plant drain station will be designed to conform with TWA Utility Standards for a triplex lift station; however, only two pumps will be provided for Phase I. The wet well will be sized for a future increased capacity. Anticipated flows that will be sent to the plant drain pump station include process structure drains, disc filter backwash water, and WTP operations building sanitary flows.

5.12 Sludge Holding and Disposal

Wasted sludge from the biological treatment process will be drawn from the RAS pressurized pipe and sent to an aerated sludge holding tank. The holding tank will be constructed of reinforced, cast-in-place concrete using common wall construction. Aeration will be provided to the sludge holding tank via fixed, floor mounted, coarse bubble diffusers with air supplied by positive displacement blowers. Two VFD driven PD blowers will be installed to provide sufficient aeration and mixing within the sludge holding tank. Both blowers will be located adjacent to the sludge holding tank within a sound attenuating enclosure, to be supplied by the manufacturer, under a sun-shaded canopy.

A submersible pump will be suspended from a hoist on top of each holding tank to decant supernatant from the stored sludge to pre-thicken the sludge from one percent (or less) up to two percent solids, reducing the sludge volume within the holding tank. Each holding tank will include a 300 gpm sludge loading pump, quick disconnect, and magnetic flow meter for sludge hauling and disposal. A loading truck will have the ability to connect directly to the quick disconnect to pump sludge out of the holding tank.

Ten States Standards recommends a minimum air supply of 30 cubic feet per minute (cfm) per 1,000 cubic feet of sludge volume, with the largest unit out of service when utilizing coarse bubble diffusers for aeration. The aeration system was designed to meet this requirement by providing a total air flow of 750 cfm, with one blower offline. Two, 40 horsepower positive displacement (PD) blowers will be provided with VFDs. A minimum of 7 days of storage will be provided for Phase I. Design criteria for the aerated sludge holding tank are provided in **Table 5-14**.

Table 5-14. Aerated Sludge Holding Tank Design Criteria

Criteria	Phase I
WAS Production (ppd)	
ADF	2,220
MDF	3,660
WAS Flow @ 1% Solids (gpd)	
ADF	26,600
MDF	43,900
Tank Dimensions, L (ft) x W (ft)	60 x 30
Side Water Depth (ft)	14
Storage Volume Provided (gal)	188,500
Aeration Diffuser Type	Coarse Bubble
Air Supply (cfm/1,000 cf)	30
Sludge Holding Tank Blowers	
Type	PD, VFD
Number of Blowers	2
Capacity, each (cfm)	750
Horsepower, each	40
Horsepower, total	80
Sludge Loading Pump Capacity (gpm)	300

6.0 EFFLUENT DISPOSAL

A dedicated public access reuse (PAR) distribution system is the primary effluent disposal option for Phase I. Design of the dedicated PAR system requires a minimum of three days of reclaimed water storage and one day of reject water storage. A 5.0 MG reclaimed water ground storage tank (GST) and a 1.0 MG lined, reject storage pond have been included in the design for Phase I effluent management. In addition, an exploratory deep well construction permit has been submitted for wet-weather effluent disposal and investigation are ongoing for off-site storage areas and agricultural aeras for spray irrigation.

As discussed in **Section 3.3**, the January 2020 Lake Okeechobee BMAP establishes total nitrogen and total phosphorus limits for a variety of effluent disposal options. The Sunbridge WRF will be located within this BMAP and was designed to comply with the new nutrient limitations. Phase I will utilize a PAR system for effluent disposal and will be required to meet a total nitrogen limit of less than 10.0 mg/L and a total phosphorus limit of less than 6.0 mg/L. Compliance with these nutrient limitations will be required by January 31, 2025. Phase I effluent goals and regulatory standards for PAR effluent limits are listed in **Table 6-1**.

Table 6-1. Effluent Treatment Goals and Regulatory Effluent Standards

Parameter	Unit	Max/Min	PAR
Carbonaceous Biological Oxygen Demand, cBOD	mg/L	Max Max Max Max	20.0[1] 30.0[2] 45.0[3] 60.0[4]
Total Suspended Solids, TSS	mg/L	Max Max Max Max	5.0[4]
Total Nitrogen, TN	mg/L	Max	10.0[1]
Total Phosphorus, TP	mg/L	Max	6.0[1]
Fecal Coliform	Percent #/100 mL	Max Min	75% non-detectable[2] < 25/100 mL[4]
pH	s.u.	Min Max	6.0[4] 8.5[4]
Chlorine Residual	mg/L	Min	1.0[4]

[1] Annual Average
[2] Monthly Average
[3] Weekly Average
[4] Single Sample

6.1 Public Access Reuse

The PAR system for Phase I will be the primary method for effluent disposal by providing reclaimed water irrigation to the Sunbridge NED Community and its homeowners. In addition to the 2018 Sunbridge NED Wastewater MUP, P&B also completed a Reclaimed Water MUP, in January 2019, for the Sunbridge NED Community's reclaimed water distribution system service areas. The proposed buildout area for the reclaimed water distribution service areas can be found on **Figure 6-1**, as prepared by P&B. The completed P&B 2019 Sunbridge NED Reclaimed Water MUP, as approved by Tavistock, can be found in **Appendix D**.

Based on the Sunbridge NED Reclaimed Water MUP, the projected average day reuse demand for the Phase I Sunbridge NED Community is 1,837,176 gallons per day, with a peak hour demand of 6,246,397 gallons per day. Based on the estimated reuse demand in Table RW2, located in the Reclaimed Water MUP in **Appendix D**, the average day to peak hour factor is 3.4.

Managing and allocating reclaimed water supply to the Sunbridge NED Community Development Plan will require storage and demand management. Unlike potable water systems that can permit withdraws to meet peak day and seasonal demands, the amount of reclaimed water produced is fixed based on the amount generated at the Sunbridge WRF. A combination of supplemental supply, storage, and demand management will be essential to balance out reclaimed water customer needs. Maximum monthly reuse supply demands for the nearby St. Cloud PAR system from 2011 to 2019 are shown in **Table 6-2.** Over this period, the maximum monthly average day demand peaking factor (1.47) occurred in May 2015 and April 2017.

Table 6-2. St. Cloud PAR System Maximum Month Demands

Year	Month	Average Day (MGD)	Max Month (MGD)	Peaking Factor
2011	May	2.667	3.275	1.23
2012	May	2.858	3.259	1.14
2013	Jan	2.595	3.043	1.17
2014	Aug	2.461	3.229	1.31
2015	May	2.629	3.862	1.47
2016	Nov	2.633	3.427	1.30
2017	Apr	3.117	4.569	1.47
2018	Mar	3.281	4.290	1.31
2019	Oct	3.737	4.699	1.26

REI's understanding is that irrigation demand in the Phase I Sunbridge development will be met by using reclaimed water and potable water. Customers connected to the PAR system will be supplied reclaimed water to provide for their irrigation demands. The estimated maximum monthly demand to achieve an annual average reclaimed water capacity of 1.0 MGD is 1.47 MGs, based on the nearby St. Cloud system's historical operational data. For the Phase I PAR system design, a maximum day factor of 1.5 will be assumed for planning supplemental water demands.

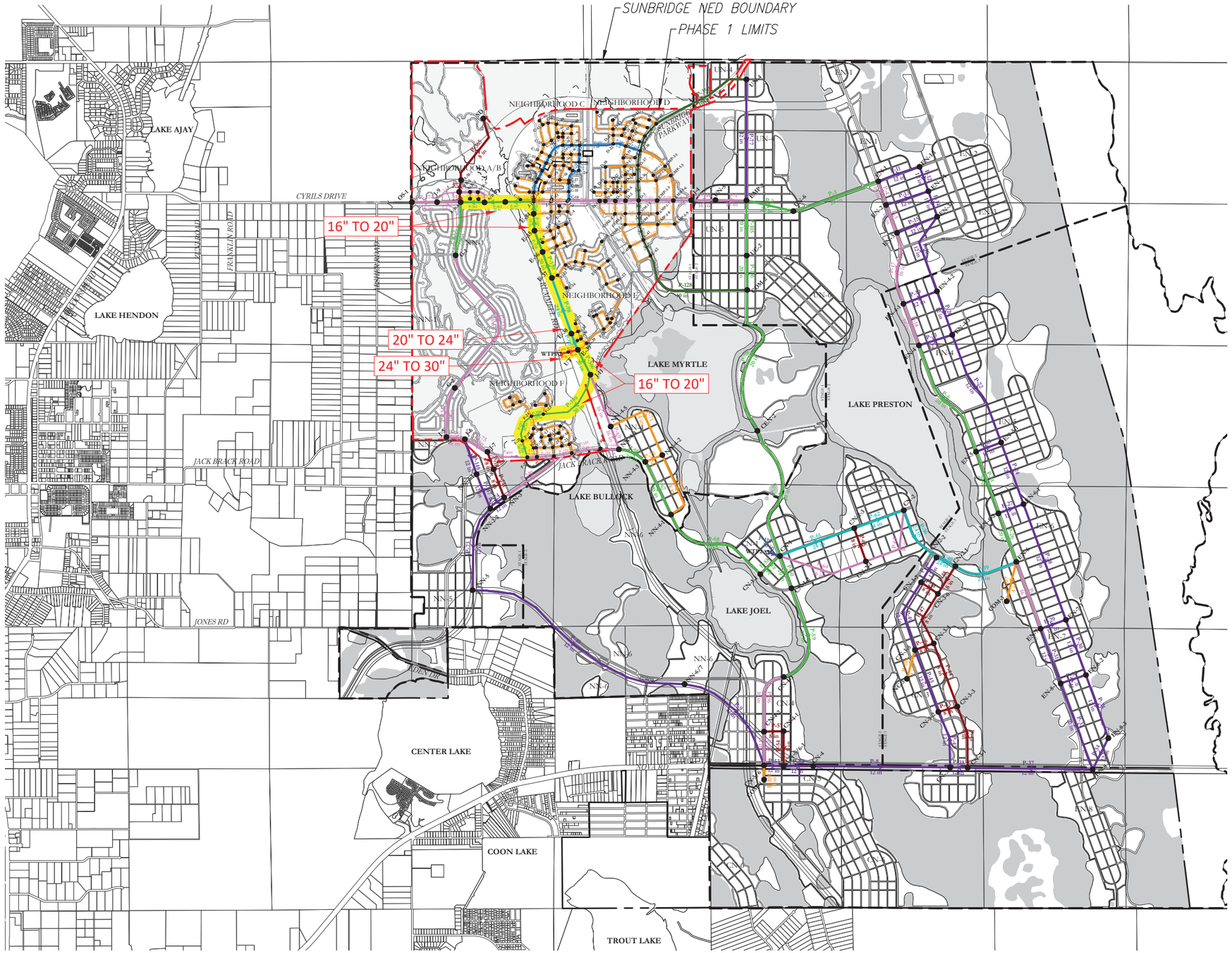


Figure 6-1. Sunbridge NED Reclaimed Water Service Area

Sunbridge NED

May 3, 2020
P & B Job No.: 17-042

2602 E. Livingston St.
Orlando, Florida 32803- 407.487.2594
POULOS & BENNETT
www.poulosandbennett.com
Certificate of Authorization No. 28567

Z:\2017\17-042 TAVISTOCK - SUNBRIDGE\MASTER UTILITIES\2020-04 MUP REVISION\CAD\EXH & FIGS\MUP RECLAIMED WATER EXHIBIT

6.2 Effluent Reuse and Disposal Design Criteria

The proposed Phase I PAR system is designed to comply with Chapter 62-600, FAC which requires continuous operation of the wastewater treatment and collection system. In addition, reclaimed water storage of the Sunbridge WRF's permitted capacity is required for a minimum of three days, and a minimum of one day for reject water storage. The Phase I effluent reuse and disposal system will include an effluent transfer pump station, one 5.0 MG ground storage tank (GST), a reclaimed water pump station, a 1.0 MGD reject water storage pond, and a reject water pump station. A process flow diagram of the Phase I effluent reuse and disposal system is shown on **Figure 6-2**.

6.2.1 Effluent Transfer Pumping System

After high-level disinfection, the chlorinated effluent will flow into an effluent pump station where it will be pumped to the onsite ground storage tank (GST). The effluent transfer pump station will include three 25 horsepower constant speed, vertical turbine pumps each with a pumping capacity of 1.5 MGD. A firm pumping capacity of 3.0 MGD will be provided at an operating pressure of 25 psi, with one pump out of service. Operation of the effluent transfer pumps will be based on the water level inside the effluent pump station wet well. Design criteria for the effluent transfer pumping system is provided in **Table 6-3**.

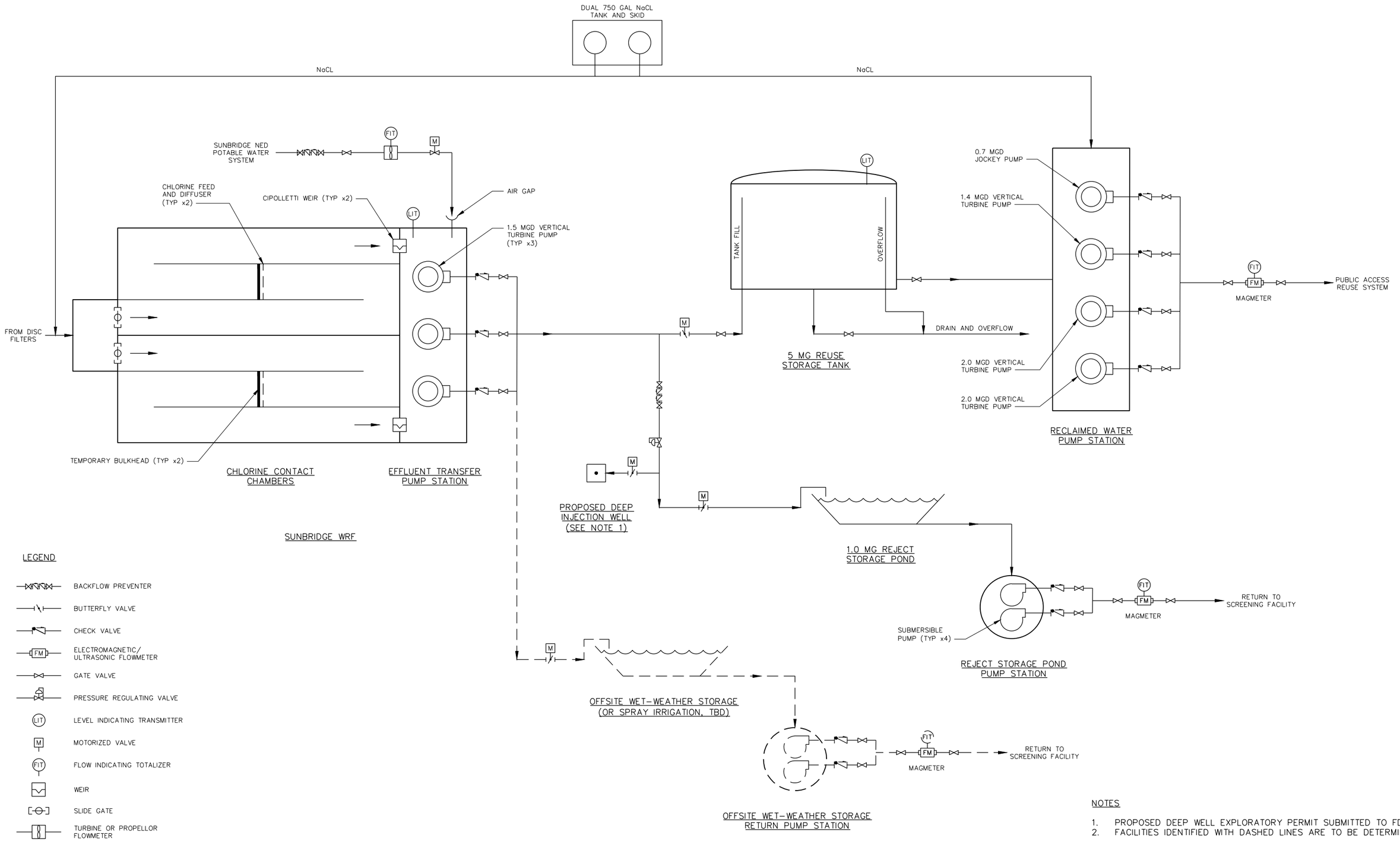
Table 6-3. Effluent Transfer Pumping System Design Criteria

Criteria	Phase I
Number of Pumps	3
Capacity, each (gpm)	1,045
Operating Pressure (psi)	25
Horsepower, each	25
Horsepower, total	75

6.2.2 Reclaimed Water Ground Storage Tank

Reclaimed water will enter the GST from the effluent transfer pump station via a 20-inch diameter standpipe which will help maintain a constant head on the effluent transfer pumps. Reclaimed water will be pumped out of the GST through a 24-inch diameter outlet pipe connected to the reclaimed water transfer pump station suction header. The pipe sizes were designed based on the buildout (Phase III) flow of 7.0 MGD. An internal drain will be provided to completely drain the GST for inspection and maintenance purposes.

Reclaimed water storage will be provided for Phase I with a 5.0 MG, pre-stressed concrete ground storage tank (GST). The GST will have an inside diameter of 145 feet and a maximum side water depth at 40'-6" with a minimum freeboard of 1'-6". The tank will have four precast concrete overflows with removable mesh screens and concrete erosion pads at ground level in the event where the GST's capacity is exceeded.



SUNBRIDGE WRF

LEGEND

- BACKFLOW PREVENTER
- BUTTERFLY VALVE
- CHECK VALVE
- ELECTROMAGNETIC/ ULTRASONIC FLOWMETER
- GATE VALVE
- PRESSURE REGULATING VALVE
- LEVEL INDICATING TRANSMITTER
- MOTORIZED VALVE
- FLOW INDICATING TOTALIZER
- WEIR
- SLIDE GATE
- TURBINE OR PROPELLOR FLOWMETER

NOTES

1. PROPOSED DEEP WELL EXPLORATORY PERMIT SUBMITTED TO FDEP.
2. FACILITIES IDENTIFIED WITH DASHED LINES ARE TO BE DETERMINED.

SUNBRIDGE WATER RECLAMATION FACILITY

EFFLUENT REUSE AND DISPOSAL PROCESS FLOW DIAGRAM

FIGURE 6-2

An access hatch will be provided on the GST roof and will be accessible via a ladder and safety cage attached to the exterior of the GST. In addition, a ladder and safety cage will also be installed on the interior wall of the GST to allow access into and out of the tank. Screened ports will be constructed on the roof of the GST to allow for ventilation and overflow discharge. The site and yard piping will be designed to accommodate the addition of a second 5.0 MG GST when the facility is expanded. Reclaimed Water Pumping System

A reclaimed water pump station will be provided to pump stored reclaimed water from the GST into the Sunbridge PAR system. The reclaimed water pump station will include one jockey pump (Reclaimed Pump No. 1), which will be replaced by a larger pump in the future once a future GST in online, and three vertical turbine pumps (Reclaimed Pumps No. 2, No.3, and No. 4) driven by VFDs. The reclaimed water pumps will be sized based on max design future peak flows with a firm capacity of 3,750 gallons per minute (5.4 MGD) and for a minimum flow of 1,875 gallons per minute (2.7 MGD) at a design pressure range from 42 to 61 pounds per square inch. Design criteria for the reclaimed water pumps are presented on **Table 6-4**.

Table 6-4. Reclaimed Water Pumps Design Criteria

Criteria	Phase I
Reclaimed (Jockey) Pump No. 1	
Capacity, each (MGD)	0.7
Estimated Horsepower	25
Reclaimed Pump No. 2	
Capacity, each (MGD)	1.4
Estimated Horsepower	50
Reclaimed Pump No. 3 and No. 4	
Capacity, each (MGD)	2.0
Capacity, total (MGD)	4.0
Estimated Horsepower	75

6.2.3 Reject Water Storage Pond and Pump Station

A lined, reject storage pond will be provided with a total storage capacity of 1.0 MGD to adequately store reject water under ADF conditions. Two 5 horsepower submersible pumps, each sized for 200 gpm, will be provided at the lined storage pond to return reject water back to the headworks of the facility following a reject event, as needed. A flow metering device will be provided on the effluent line of the reject storage pond pump station to measure flows being returned back to the headworks. The reject pond will include a bottom liner and will be designed to prevent seepage of stored reject water into the ground and to prevent liner uplift due to groundwater levels. As a part of the contract documents, a formal QA/QC plan for the design and installation of the liner will be required of the Contractor through a formal submittal.

6.2.4 Wet-Weather Storage

Tavistock is investigating off-site aeras for construction of reclaimed water storage and are in discussions with local agricultural operations to locate potential areas for slow rate spray irrigation systems. A supplemental document to this PDR will be submitted once this work is completed, and a water balance is prepared, to determine the amount of storage and/or wet-weather disposal volume is required to comply with FDEP regulations.

The approximate boundary and location of the proposed wet-weather storage pond, in relation to the Sunbridge WTP and WRF Utility Track, is shown below on **Figure 6-3**.

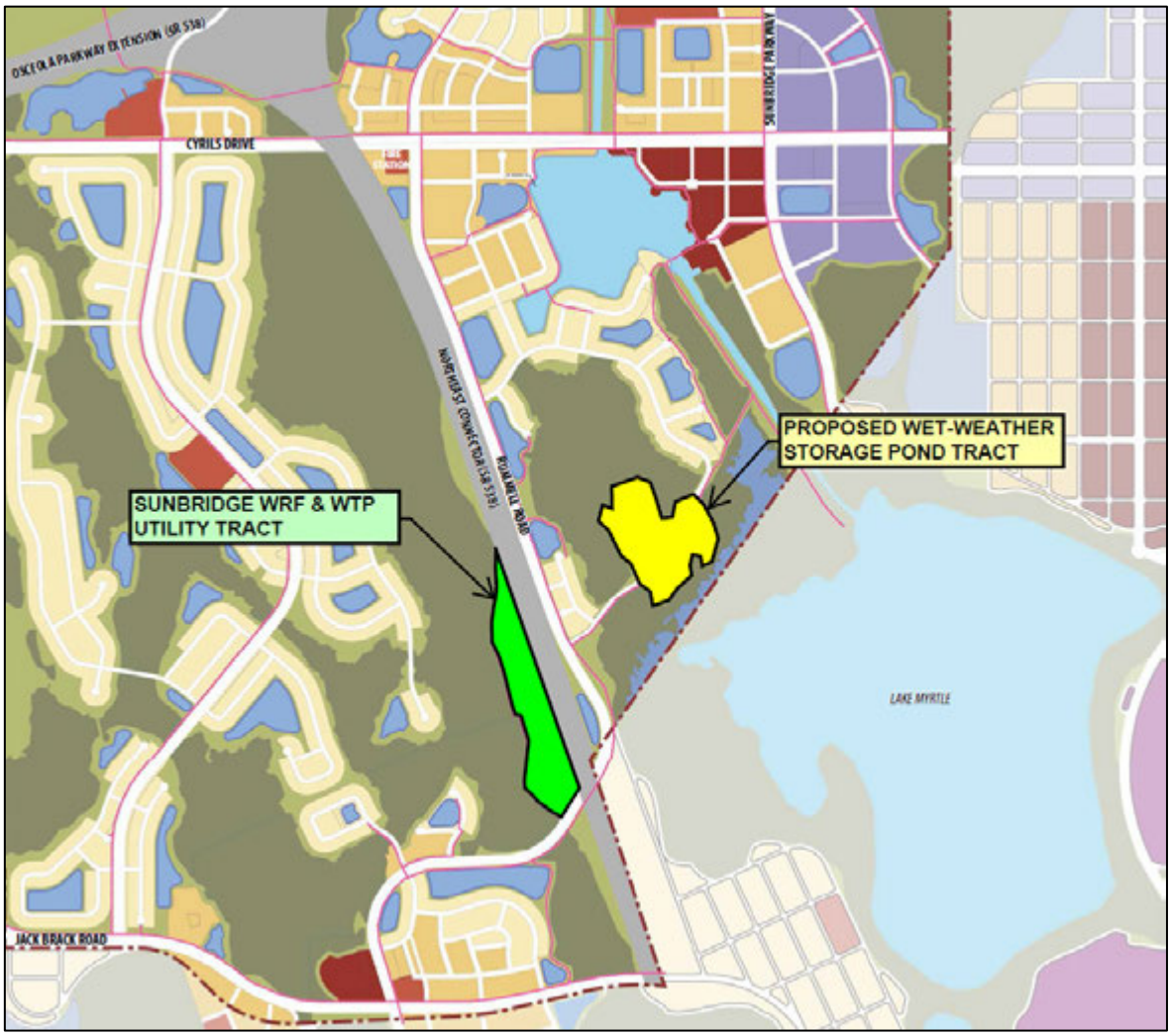


Figure 6-3. Proposed Wet-Weather Storage Pond Location

The Phase I service areas wastewater flows are presented in Table 2-3 Sunbridge NED Wastewater Generation Summary. The 2018 Master Utility Plan estimated the proposed irrigation area in aeras in each of the proposed service areas and **Table 6-5** presents the irrigation areas summary for the proposed Phase I service areas. The average weekly irrigation demand for the 272 acres is 7.4 MG/week based on an irrigation rate of 1 inch per week.

Table 6-5. Sunbridge NED Irrigation Area Summary

Property Serviced	Land Use	Irrigation Area (acres)
Neighborhood A/B	Commercial Civic	8.25
Neighborhood C	Civic Residential-SF Residential-MF	49.0
Neighborhood D	Residential-SF Residential-MF Office Civic	41.25
Cyrils East Community Center	Residential-MF Commercial Office Hotel Civic	9.95
Neighborhood F	Residential-SF	30.57
Neighborhood G	Residential-SF Civic	133.40
Total		**272.42**

7.0 ELECTRICAL SYSTEM

7.1 Electrical Distribution System

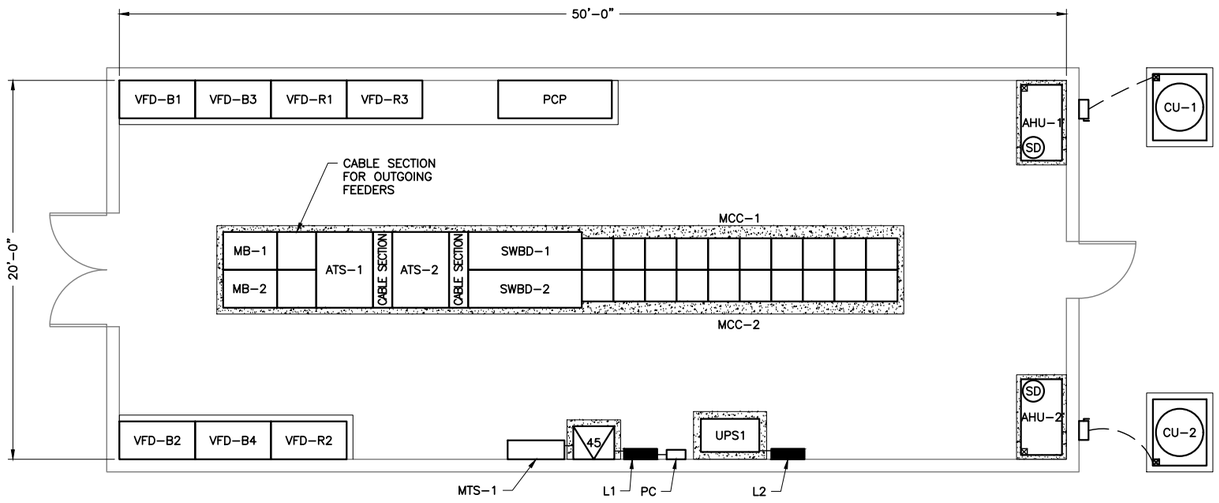
The purpose of this section is to provide a description of the electrical design criteria and equipment selection for the Sunbridge WRF. The facility will be powered with a utilization voltage of 480 volts from OUC with a new pad-mounted transformer located adjacent to the Electrical Building. The two new 480V Main Breakers, Automatic Transfer Switches, Switchboards and Motor Control Centers will be housed in the New Electrical Building, as shown on **Figure 7-1**. The standby emergency generator will also be located adjacent to the New Electrical Building. The proposed electrical system will consist of a dual 1,000-amp, 480-volt, 3-phase, 3-wire distribution system, as shown on **Figures 7-2, 7-3, and 7-4**, to meet Class 1 reliability.

The utility service will be connected to a pair of 1,000-amp main circuit breakers provided with an Arc Flash Reduction Maintenance Switch. Each main circuit breaker will supply a downstream Automatic Transfer Switch (ATS) which, in turn, will each supply a 1,000-amp Switchboard and 600-amp Motor Control Center. Facility loads will be evenly divided between the two Switchboards and MCCs, providing additional reliability and provide for maintenance capabilities. The electrical distribution equipment will be located in an environmentally controlled Electrical Building. Motor Control Centers and VFDs will be as manufactured by Square D or Allen Bradley to meet TWA standards.

The 1,000 amp automatic transfer switches shall be free standing construction utilizing fixed mounted circuit breakers. Transfer switches shall be open transition and provided with an in-phase monitor feature, which will permit a transfer or re-transfer between two live sources. The transfer switch shall be positively interlocked both mechanically and electrically to prevent simultaneous closing of both sources under either automatic or manual operation.

Standards and codes to which the electrical design and equipment will conform to include:

- National Electrical Code (NEC).
- Life Safety Code (NFPA 101).
- Florida Building Code (FBC).
- American National Standards Institute (ANSI).
- National Electrical Manufacturers Association (NEMA).
- National Fire Protection Association (NFPA 820): Standard for Fire Protection in Wastewater Treatment and Collection Facilities
- Institute of Electrical and Electronic Engineers (IEEE).
- Insulated Cable Engineers Association (ICEA).
- American Society for Testing and Materials (ASTM).
- Underwriters' Laboratories, Inc. (UL).
- Local codes and standards.

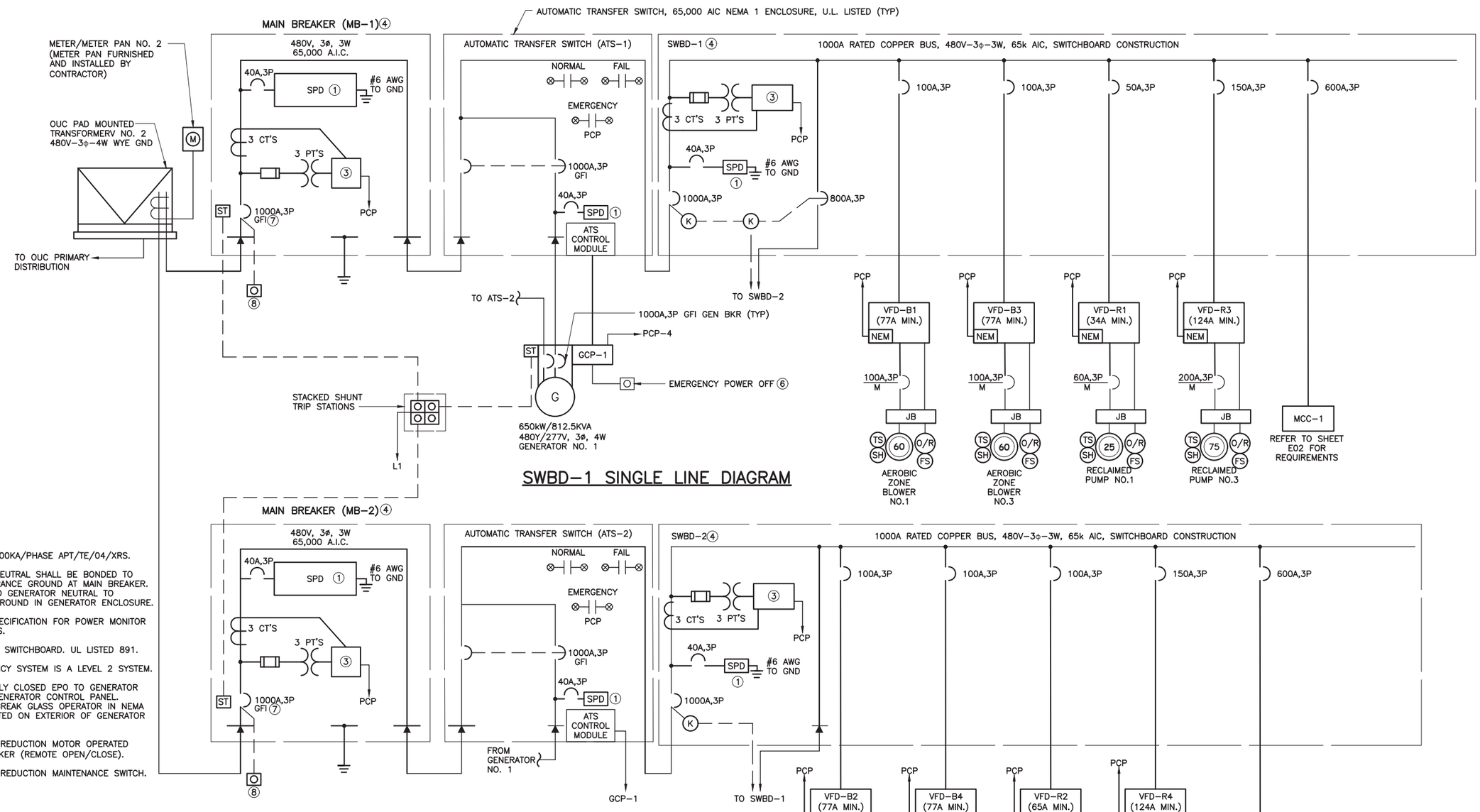


ELECTRICAL BUILDING POWER PLAN

SCALE: 1/4"=1'-0"

1 0 1 2 3 7'

EDA
Electrical Design Associates
6965 PIAZZA GRANDE AVE., STE. 311
ORLANDO, FLORIDA 32835
PHONE: (407) 745-5604
FAX: (407) 745-5603
C.O.A. No. 8079
WILLIAM C. NELSON, P.E.
Florida P.E. No. 42017



SWBD-1 SINGLE LINE DIAGRAM

SWBD-2 SINGLE LINE DIAGRAM

NOTES:

① SPD RATED 200KA/PHASE APT/TE/04/XRS.

② GENERATOR NEUTRAL SHALL BE BONDED TO SERVICE ENTRANCE GROUND AT MAIN BREAKER. DO NOT BOND GENERATOR NEUTRAL TO GENERATOR GROUND IN GENERATOR ENCLOSURE.

③ REFER TO SPECIFICATION FOR POWER MONITOR REQUIREMENTS.

④ QED-2 STYLE SWITCHBOARD. UL LISTED 891.

⑤ THE EMERGENCY SYSTEM IS A LEVEL 2 SYSTEM.

⑥ WIRE NORMALLY CLOSED EPO TO GENERATOR E-STOP IN GENERATOR CONTROL PANEL. EMERGENCY BREAK GLASS OPERATOR IN NEMA 4 BOX. LOCATED ON EXTERIOR OF GENERATOR ENCLOSURE.

⑦ ARC ENERGY REDUCTION MOTOR OPERATED CIRCUIT BREAKER (REMOTE OPEN/CLOSE).

⑧ ARC ENERGY REDUCTION MAINTENANCE SWITCH.

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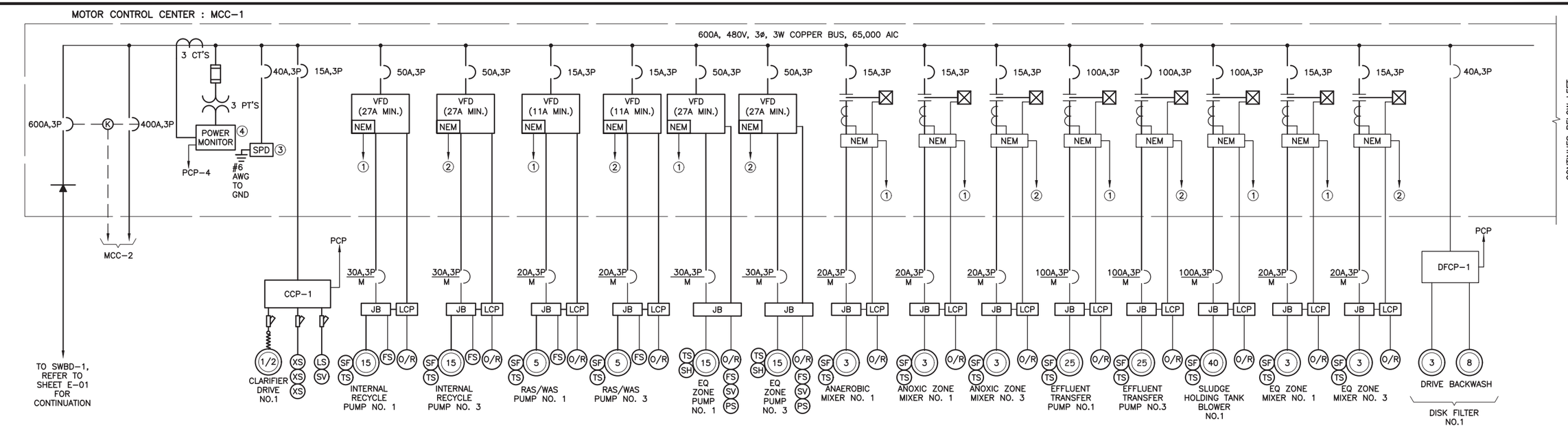
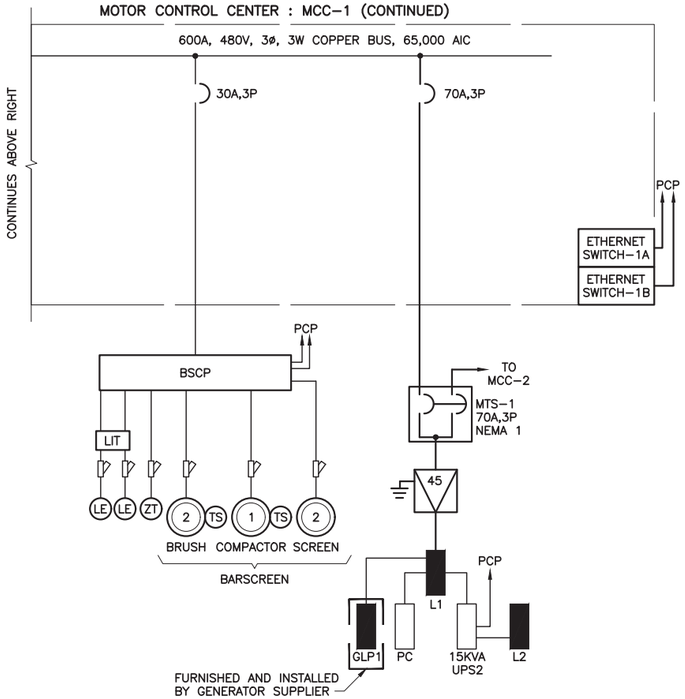
RE

SUNBRIDGE WATER RECLAMATION FACILITY

SWBD-1 & SWBD-2
SINGLE LINE DIAGRAMS

FIGURE 7-2





NOTES:

① CAT 6 DH TO ETHERNET SWITCH NO. 1A/2A BY MCC SUPPLIER.

② CAT 6 DH TO ETHERNET SWITCH NO. 1B/2B BY MCC SUPPLIER.

③ APT TE/04/XRS/25/X OR APPROVED EQUAL.

④ POWER MONITOR. REFER TO SPECIFICATION FOR REQUIREMENTS.

MCC-1 SINGLE LINE DIAGRAM

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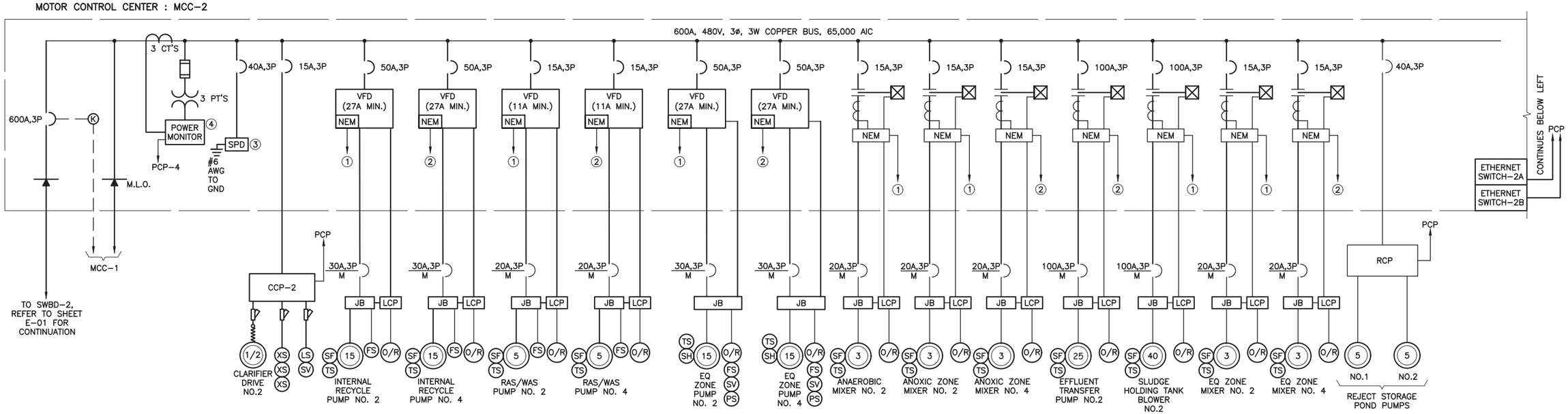
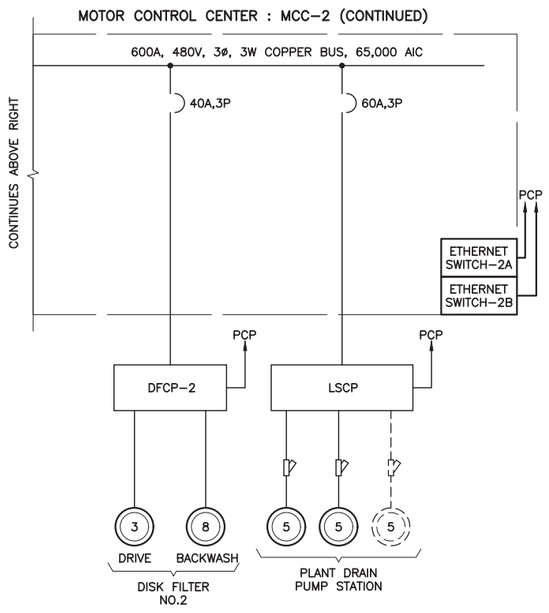
RE	SUNBRIDGE WATER RECLAMATION FACILITY	MCC-1 SINGLE LINE DIAGRAM	FIGURE 7-3





NOTES:

1. CAT 6 DH TO ETHERNET SWITCH NO. 1A/2A BY MCC SUPPLIER.
2. CAT 6 DH TO ETHERNET SWITCH NO. 1B/2B BY MCC SUPPLIER.
3. APT TE/04/XRS/25/X OR APPROVED EQUAL.
4. POWER MONITOR. REFER TO SPECIFICATION FOR REQUIREMENTS.

MCC-2 SINGLE LINE DIAGRAM

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6965 PIAZZA GRANDE AVE., STE. 311
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RE	SUNBRIDGE WATER RECLAMATION FACILITY	MCC-2 SINGLE LINE DIAGRAM	FIGURE 7-4

7.2 Diesel Engine Standby Generator

Standby power includes the installation of a new 650KW/812.5KVA standby emergency generator sized to operate the new WRF loads. The design will be based on the manufacturers: Caterpillar or Cummins. The standby generator (Tier 2 or 3) will be sized for Phase I loads and will be furnished with a base-mounted fuel storage tank, non-walk-in sound attenuated aluminum enclosure, and staircase with access platform, as required. Fuel storage capacity will be sufficient to provide 96 hours of run time at rated load (approximately 4,656 gallons). Fuel level along with generator status and alarm monitoring will available via Ethernet TCP/IP.

7.3 Electrical Conduits

Conduit material of construction will be based on moisture, temperature, exposure to damage, corrosion, voltage, and cost, as follows:

- Exposed indoor and outdoor runs in non-corrosive areas will be aluminum.
- Underground, embedded in or under structural concrete slabs or in concrete-encased duct banks will be PVC Schedule 40.
- Exposed indoor and outdoor runs in corrosive areas will be PVC Schedule 80.
- Below grade elbows, embedded elbows, and risers transitioning to exposed grade shall be PVC coated aluminum or equivalent.
- Provide a #10 ground wire in all conduits containing shielded (4-20 mA) conductors.
- Provide 316 stainless steel hardware in corrosive areas and outdoor areas.

7.4 Wire and Cable

Copper conductors shall be used throughout and be provided as follows:

- Stranded conductors will be used for all applications.
- The current-carrying capacity of conductors will be based on 75° C insulation ratings. Conductors No. 6 AWG and smaller will have THHN/THWN or THHN-2 insulation, while larger conductors will have XHHW-2 insulation.
- Individual No. 14 AWG conductors will be used for discrete control circuits, unless it is practical to use multi-conductor cables to group control circuits.
- Twisted, shielded pair control cable No. 16 AWG with an aluminum Mylar® tape shield will be used for analog signals.
- Motors in variable speed applications will be served with shielded VFD rated cable suitable for the required application.

7.5 Motors and Motor Control

Smart Motor Control Centers will be furnished, as shown on **Figure 7-3** and **Figure 7-4**, with Ethernet TCP/IP interface with SCADA. Busses will be tin-plated copper. In constant speed applications using contactor-based starters, overload protection will be provided within the motor starter. For fractional horsepower equipment not normally requiring motor starters, manual motor starters with overload protection will be furnished. Fractional horsepower fans and other similarly sized equipment will be furnished with overload protection integral with the motors.

VFDs will be provided with solid state starter bypass starters that operate the driven equipment in the event of a VFD failure. To meet harmonics limits established in IEEE 519-2014, VFDs equipped with passive filters or VFDs with 18-pulse rectifiers will be furnished, as required.

Motors rated from 1/2 horsepower (hp) to 500 horsepower will be powered at 480 volts, three-phase. Motors rated less than 1/2 horsepower will be powered at 120 volts, single-phase. Thermostats embedded in motor windings will be provided for motors rated 100 horsepower and larger in constant speed applications, and for motors rated 10 horsepower and larger in variable speed applications. Motors rated above 100 horsepower will be furnished with thermistors. Safety disconnects will be provided at all motor loads not within line of sight of their control equipment.

7.6 Grounding and Lightning Protection

Both main circuit breakers will be bonded to a grounding electrode, which may consist of a building steel column that is bonded to the underground rebar, or a made electrode system (triad or connection to ground loop around the building). In addition, ground rods will be driven outside the building to supplement the grounding electrode. Grounding electrodes of ground mats or embedded rods and cables shall have a maximum resistance to ground of 5 ohms.

The parts of all electrical equipment, devices, panelboards, and metallic raceways that do not carry current will be connected to the ground conductors. The transformer neutrals of wye-connected transformers will be solidly grounded through a grounding conductor connected to the grounding system. A ground wire will be installed in all raceways that contain power conductors of any voltage.

A lightning protection system will be provided and installed for the proposed Electrical Building and for all structures greater than 15 feet above grade. The lightning protection system will comply with provisions of Code for Lightning Protection Systems as adopted by the National Fire Protection Association and Lightning Protection Institute. Lightning protection cable shall be Class I copper. Fittings and straps will be cast copper. Air terminals will be copper as required to match roof conductors, will have proper base support for surface on which they are attached, and will be securely anchored to this surface. Terminals shall project a minimum of 10 inches above the top of the object to which it is attached. Roof conductors will consist of copper that complies with the weight and construction requirements of the Code, will be routed to interconnect with air terminals and, in general, will provide a two-way minimum path to ground. Down conductors will be copper and concealed within the structure.

Ground connections will be made in accordance with requirements of all applicable codes. Ground rods will be placed in a minimum of 2 feet from building foundations. In addition to the aforementioned artificial grounds, one down conductor of each two-path system will be connected to a metal water piping system with approved water pipe type strap connector. All ground rods will be 5/8 inches in diameter, with a minimum length of 20 feet, copper weld type.

7.7 Surge Protection Devices

High Performance Surge Protection Devices (SPDs) will provide effective high energy transient voltage surge suppression, surge current diversion, and high frequency noise attenuation in all electrical modes for equipment connected downstream from the utility meter or load side of the main circuit breakers. The unit shall be connected in parallel with the facility wiring system. Systems shall be designed, manufactured, tested, and installed in accordance with the following applicable documents and standards:

- Underwriters Laboratories (UL1449 2nd Addition and UL 1283)
- National Electrical Manufacturers Association (NEMA LS1 – 1992)
- ANSI/IEEE (C62.41 – 1991 and C62.45 – 1992)
- Military Standards (MIL – STD 220A)
- National Electrical Code (NEC)
- Underwriter's Laboratories 248

8.0 INSTRUMENTATION AND CONTROL

8.1 General

The Plant Instrumentation and Control System (PICS) will be designed to automatically control processes in accordance with operator instructions. To achieve this requires a Programmable Logic Controller (PLC) based sub-system interconnected with a PC-based Human Machine Interface (HMI) sub-system. The PLC sub-system will interface with process equipment and field monitoring components to provide automatic process control without the need for continual operator interaction. The HMI sub-system will provide visual indications of current processes and allow operators to adjust current control functions. To provide maximum system reliability and availability, the PICS will include the following major elements:

- Modification of the existing Sunbridge WTP SCADA system, database, and screens, to include all wastewater PLCs.
- Fiber optic network communications links between PICS equipment at separate locations to prevent lightning and noise interference.
- Lightning surge protection on all field power and instrument wiring to protect from lightning damage.
- Uninterruptible Power Supplies for all PLC and HMI equipment will be provided to maintain operation while the emergency power system is brought online.
- Relay based logic to provide back-up operation of critical plant processes in the event of PLC failure.

The HMI sub-system will also be designed to provide administrative functions between on-site users and to support future, remote access to selected TWA employees to said administration functions and to operator interface.

8.2 Network Architecture

The network architecture will comprise of one main PLC, two remote I/O panels, three OEM supplied PLCs and an in-plant lift station PLC. The main PLC will be located in the electrical building. Each clarifier control panel will be configured with a remote I/O panel for clarifier and RAS/WAS control and monitoring. Each disk filter will be configured with a local control panel and an OEM supplied PLC which will be responsible for control and monitoring of the filtering process. The bar screen will be configured with a local control panel and an OEM supplied PLC which will be responsible for control and monitoring of the bar screen and compactor operation. The in-plant lift station will be configured with a local control panel that will be configured with a PLC for control and monitoring. A remote I/O panel will be installed at the Reuse tank for tank monitoring.

All PLC equipment will be interconnected via a fiber network configured in a star pattern with dual fiber links. The electrical building will be the central fiber hub for the Sunbridge WRF. The electrical building will be connected to the Sunbridge WTP via dual fiber links. All fiber links will be installed in separate conduits to provide a level of redundancy.

The above PLC equipment will be interconnected with the HMI sub-system by an Ethernet/IP network over fiber.

8.3 HMI Sub System

The existing HMI sub-system includes dual redundant servers running GE Proficy/iFix 5.9 HMI application software. These servers are rack-mounted in the Network Interface Panel (NIP) in the Operations Building at the Sunbridge WTP.

8.4 Instrumentation

All VFDs, motor actuated valves, flow meters and power meters will be connected to the PLC system via Ethernet/IP. Where devices are field mounted, a fiber connection will be required for optical isolation and a fiber optic termination cabinet will be installed.

8.5 PLC Sub System

All PLC components will be Allen/Bradley CompactLogix series. Each will be installed within a 316 stainless steel enclosure rated appropriately for its location. An Operator Interface Panel (OIT) will be front panel mounted on all enclosures that contain PLC (i.e. including the remote I/O panel) to allow local operator interface with the processes monitored and controlled at that location.

Each PLC and remote I/O enclosure will be equipped with a mixed media Ethernet switch. A separate fiber optic patch panel will be mounted adjacent to each PLC to interface with the overall PICS.

8.6 I&C Design Criteria

Control of all process equipment will be possible through the following methods:

- Manual. This is intended only for maintenance at the equipment location. It will allow operators to control the equipment while at the equipment location using physical indicators and switches. For remotely located starters and VFDs this will involve operators to set the required operating conditions at the starter/VFD the controlling the equipment using the local Off/Remote switch.
- Local/Manual. In this mode, control is performed manually at the equipment location or at the starter/VFD using physical switches and controls (including speed control where applicable).

- Remote/Manual. In this mode the local switch is set to remote and the operator and, where applicable adjusts speed, through the HMI by placing the HMI H/O/A software switch to manual.
- Auto. In this mode the local switch is set to remote and the HMI H/O/A software switch is placed in AUTO.

Automatic process control will be provided by the PLC as follows:

- EQ Zone Pumps. The pumps will be started and stopped by level floats.
- Aeration Blowers. Aeration blowers will be controlled on Aeration Tank dissolved oxygen (DO) operator adjustable set point or by Anoxic Tank oxidation reduction potential (ORP) operator adjustable set point.
- Return Activated Sludge/Waste Activated Sludge (RAS/WAS) Pumps. The pumps will be controlled on flow rate to maintain an operator adjustable set-point.
- Internal Recycle Pumps. The pumps will be controlled on flow rate to maintain an operator adjustable set-point.
- Effluent Transfer Pumps. These will be controlled to maintain an operator adjustable level in the Chlorine Contact Chamber wet well.
- Reclaimed Water Pumps. The pumps will be controlled on pressure to maintain an operator adjustable set-point.
- Sodium Hypochlorite. Sodium Hypochlorite pumps will be controlled based on Chlorine Contact Chamber splitter box flow and an operator adjustable dosage set-point.
- Reject Storage Pond Pump Station. The reject storage pond pump station will be controlled based on operator adjusted pump speed set-point.

All automatic control parameters will be adjustable via the HMI and local OIT.

9.0 ENVIRONMENTAL CONSIDERATIONS

9.1 General

The purpose of this section is to assess the environmental effects of the project on the surrounding land and its citizens. These considerations include odor and noise control, public accessibility, proximity to existing and proposed residential areas, flood protection, lighting, and aerosol drift.

9.2 Odor and Noise Control

The Sunbridge WRF is a new greenfield facility. It is anticipated that the incoming wastewater from new neighborhood build-outs will travel short distances to the facility. The new headworks screening structure is small and incoming wastewater will spend little time in the open screening channel and flow will then be enclosed until it is mixed with the RAS before entering the secondary treatment system. Subsequently, little hydrogen sulfide odor should be generated at the new headworks. Screenings are expected to be washed and compacted before being stored in an adjacent dumpster for disposal.

The biomass in the RAS will reduce the odor potential of the mixed liquor (influent combined with the RAS) as it enters the equalization zone of the FETP below the water surface so there is no splashing. While a typical light musty odor is associated with activated sludge, this is not normally a nuisance or concern.

The sludge holding tank has potential for odor however this tank will be continuously aerated, and the tank has no primary sludge so the potential to generate odors will be notably reduced. The other unit processes in the facility are not expected to generate odors.

Noises from the new WRF shall be limited by noise attenuating enclosures around the aeration and sludge holding tank blowers and standby generator. An optional blower building or storing blowers inside the new electrical building can also be considered. The aforementioned equipment is not in close proximity to proposed residential areas as described in **Section 9.4**. The pumps on site will produce little, if any, noise.

Short-term environmental impacts during construction of the proposed water reclamation facility are not expected to be significant. The site has already been prepped from the previous water treatment plant construction and earthwork, grading and clearing will be minimal. Noise levels from construction will be limited by requiring sound attenuation on noisy equipment and requiring that construction occur only during weekdays and daylight hours to minimize noise impacts to area neighborhoods.

9.3 Aerosol Drift

Aerosol drift is not expected to be a concern. The aerobic zones and sludge holding tank will be the only components of the facility that have the potential to create an aerosol. No vertical turbine surface aerators will be utilized, and aerosol spray will be limited in nature due to the use of fine and medium bubble diffuser aeration systems.

9.4 Proximity to Existing and Proposed Residential Areas

The closest residential areas are just over 1,000 feet away and are separated from the proposed water reclamation facility by the wetlands on the west side, by the future highway on the east side, by the WTP on the south side and by the stormwater pond on the north side of the property. Trees along the west property line provide a visual and sound buffer. In addition to the aforementioned noise control measures, the contract documents will also include requirements for dust, erosion, and sedimentation control during construction.

9.5 Other Environmental Considerations

It is anticipated that the proposed project will not adversely impact unique, endangered, or threatened species, agricultural lands, or significant historical or archeological resources. The proposed project will be compatible with the land use shown in the Osceola County Future Land Use Map. Also, the proposed project will not result in any significant adverse impacts on any potable groundwater resources due to effluent quality, application rates, and regulatory agency setback distances between the application areas and public potable water supply wells.

An Environmental Conditions report was performed by BDA Environmental Consultants in July 2019. The findings of this evaluation are provided in **Appendix E** along with the U.S. Fish and Wildlife Service's concurrence that the area evaluated is unsuitable for sand skink and blue-tailed mole skink habitat.

10.0 PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST

This section presents the preliminary opinion of probable construction costs (OPCC) of the Phase I Sunbridge WRF, as described in this report. The costs described in the following table are based on quotes received from equipment manufacturer's representatives and recent costs for similar structures and facilities in the industry. The costs listed include material cost, installation cost, labor, sales tax, overhead, and profit. Miscellaneous costs such as providing tools, office furniture, or vehicles for daily operation of the facility are not included in this estimate. The preliminary cost estimate for the Phase I Sunbridge WRF is estimated to be $21,151,000 and is broken down by each facility component in **Table 10-1** below.

Table 10-1. Preliminary OPCC

Component	Estimated Cost
General Conditions	$315,000
Civil and Sitework	$875,000
Screening Facility	$485,000
Field Erected Treatment Plants	$4,210,000
Disc Filters	$965,000
Chlorine Contact Chambers	$440,000
Chemical Storage and Feed Systems	$88,000
Plant Drain Pump Station	$250,000
Sludge Holding Tank	$730,000
Effluent Transfer Pump Station	$310,000
5.0 MG Ground Storage Tank	$2,485,000
Reclaimed Water Pump Station	$540,000
Reject Water Storage Pond and Pump Station	$500,000
Emergency Standby Generator	$360,000
Electrical System	$1,959,000
Instrumentation and Controls	$980,000
Subtotal Construction Cost	**$15,492,000**
Escalation (4%)	$620,000
Overhead and Profit (14%)	$2,169,000
FETP Quote Contingency (10%)	$421,000
GST Quote Contingency (10%)	$249,000
General Contingency (25%)	$2,200,000
Total Construction Cost	**$21,151,000**

APPENDIX A

UTILITY TRACT BOUNDARY

LEGAL DESCRIPTION
THIS IS NOT A SURVEY

A TRACT OF LAND LYING IN SECTIONS 12 AND 13, TOWNSHIP 25 SOUTH, RANGE 31 EAST, DESCRIBED AS FOLLOWS:

COMMENCE AT THE SOUTHWEST CORNER OF SAID SECTION 12 FOR A POINT OF REFERENCE; THENCE RUN NORTH 00°41'02" EAST, ALONG THE WEST LINE OF THE SOUTHWEST QUARTER OF SAID SECTION 12, A DISTANCE OF 889.37 FEET; THENCE DEPARTING SAID WEST LINE, RUN SOUTH 89°18'58" EAST, 27.26 FEET TO THE POINT OF BEGINNING; THENCE RUN SOUTH 19°00'11" EAST, 2905.76 FEET; THENCE RUN SOUTH 31°49'35" WEST, 375.66 FEET; THENCE RUN NORTH 43°21'34" WEST, 22.11 FEET; THENCE RUN NORTH 57°36'47" WEST, 177.22 FEET; THENCE RUN NORTH 54°57'01" WEST, 142.11 FEET; THENCE RUN NORTH 36°28'25" WEST, 187.41 FEET; THENCE RUN NORTH 01°30'36" WEST, 157.22 FEET; THENCE RUN NORTH 08°19'42" EAST, 171.30 FEET; THENCE RUN NORTH 01°34'47" EAST, 181.07 FEET; THENCE RUN NORTH 19°25'52" WEST, 154.09 FEET; THENCE RUN NORTH 19°43'19" WEST, 156.97 FEET; THENCE RUN SOUTH 72°02'06" WEST, 56.18 FEET; THENCE RUN NORTH 15°59'47" WEST, 168.89 FEET; THENCE RUN NORTH 12°08'21" WEST, 184.04 FEET; THENCE RUN NORTH 10°12'11" WEST, 104.60 FEET; THENCE RUN NORTH 18°16'53" WEST, 176.22 FEET; THENCE RUN NORTH 20°03'35" WEST, 222.93 FEET; THENCE RUN NORTH 03°32'16" WEST, 156.43 FEET; THENCE RUN NORTH 04°33'27" EAST, 22.24 FEET; THENCE RUN NORTH 00°40'55" EAST, 91.20 FEET; THENCE RUN NORTH 10°45'25" EAST, 139.44 FEET; THENCE RUN NORTH 09°24'44" EAST, 161.69 FEET; THENCE RUN NORTH 02°40'32" WEST, 153.61 FEET; THENCE RUN NORTH 04°16'37" WEST, 134.73 FEET; THENCE RUN NORTH 01°34'20" EAST, 169.47 FEET; THENCE RUN NORTH 12°32'10" WEST, 97.01 FEET TO THE POINT OF BEGINNING.

THE ABOVE DESCRIBED TRACT OF LAND LIES IN OSCEOLA COUNTY, FLORIDA AND CONTAINS 23.16 ACRES MORE OR LESS.

SHEET 1 OF 2
SEE SHEET 2 OF 2
FOR SKETCH OF DESCRIPTION

ALLEN & COMPANY
Professional Surveyors & Mappers
16 East Plant Street
Winter Garden, Florida 34787 * (407) 654 5355

SURVEYOR'S NOTES: SKETCH 6

1. THIS SKETCH IS NOT VALID UNLESS SIGNED AND SEALED WITH AN EMBOSSED SURVEYOR'S SEAL.
2. BEARINGS SHOWN HEREON ARE ASSUMED AND BASED ON THE WEST LINE OF THE SOUTHWEST QUARTER OF SECTION 12, TOWNSHIP 25 SOUTH, RANGE 31 EAST, BEING NORTH 00°41'02" EAST.
3. THE LEGAL DESCRIPTION WAS PREPARED WITHOUT BENEFIT OF TITLE.
4. THE ADJOINING RECORDING INFORMATION SHOWN HEREON WAS OBTAINED FROM THE ORANGE COUNTY PROPERTY APPRAISER PUBLIC ACCESS SYSTEM.
5. DELINEATION OF THE LANDS SHOWN HEREON ARE AS PER THE CLIENT'S INSTRUCTIONS.

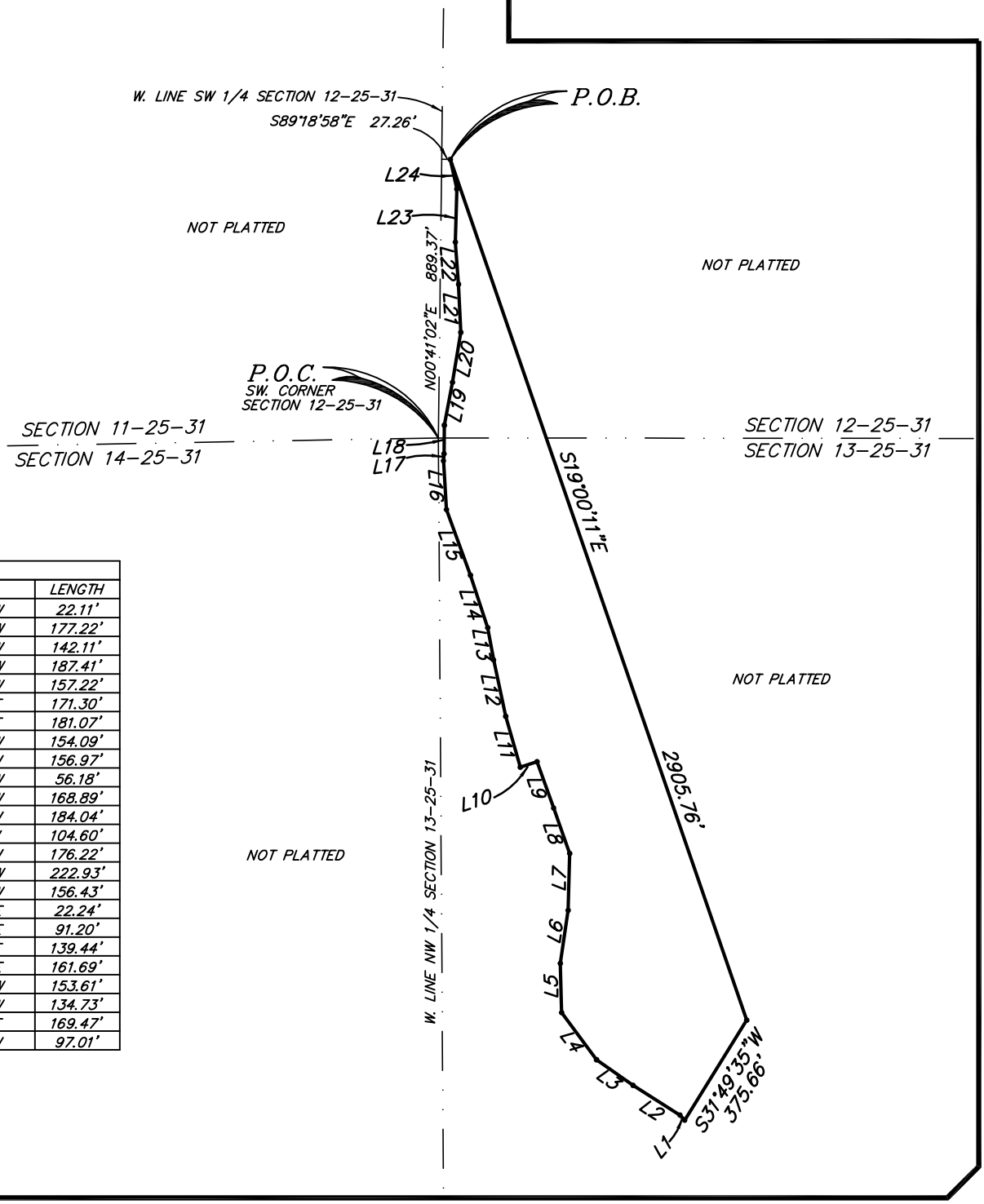
JOB NO.	20170156	CALCULATED BY:	SEJ
DATE:	7-20-18	DRAWN BY:	SEJ
SCALE:	1"=500'	CHECKED BY:	MR
FIELD BY:	N/A		

FOR THE LICENSED BUSINESS # 6723 BY:

JAMES L. RICKMAN P.S.M. # 5633

LEGAL DESCRIPTION

THIS IS NOT A SURVEY



LINE TABLE		
LINE	BEARING	LENGTH
L1	N43°21'34"W	22.11'
L2	N57°36'47"W	177.22'
L3	N54°57'01"W	142.11'
L4	N36°28'25"W	187.41'
L5	N01°30'36"W	157.22'
L6	N08°19'42"E	171.30'
L7	N01°34'47"E	181.07'
L8	N19°25'52"W	154.09'
L9	N19°43'19"W	156.97'
L10	S72°02'06"W	56.18'
L11	N15°59'47"W	168.89'
L12	N12°08'21"W	184.04'
L13	N10°12'11"W	104.60'
L14	N18°16'53"W	176.22'
L15	N20°03'35"W	222.93'
L16	N03°32'16"W	156.43'
L17	N04°33'27"E	22.24'
L18	N00°40'55"E	91.20'
L19	N10°45'25"E	139.44'
L20	N09°24'44"E	161.69'
L21	N02°40'32"W	153.61'
L22	N04°16'37"W	134.73'
L23	N01°34'20"E	169.47'
L24	N12°32'10"W	97.01'

ALLEN & COMPANY
Professional Surveyors & Mappers
16 East Plant Street
Winter Garden, Florida 34787 * (407) 654 5355

SKETCH 6

LEGEND:

P.O.C.....POINT OF COMMENCEMENT

P.O.B.....POINT OF BEGINNING

● .....CHANGE IN DIRECTION

JOB NO.	20170156	CALCULATED BY:	SEJ
DATE:	7-20-18	DRAWN BY:	SEJ
SCALE:	1"=500'	CHECKED BY:	MR
FIELD BY:	N/A		

SHEET 1 OF 2
SEE SHEET 1 OF 2
FOR LEGAL DESCRIPTION

APPENDIX B

GEOTECHNICAL REPORT

Andreyev Engineering, Inc.

SANFORD OFFICE
4055 St. John's Parkway
Sanford, Florida 32771
407-330-7763

▼ Groundwater ▼ Environmental ▼ Geotechnical ▼ Construction Materials Testing

June 24, 2019
GPGW-19-050

To: **RIESS Engineering, Inc.**
1016 Spring Villas Point
Winter Springs, FL 32803

Attention: **Mr. Ervin Myers, P.E.**

Subject: **Geotechnical Investigation, Sunbridge Water Treatment Plant Site, Sun Grove Lane, St. Cloud, Osceola County, Florida**

Dear Mr. Myers:

As requested, Andreyev Engineering, Inc. (AEI) has completed a geotechnical investigation for the above referenced project location. The purpose of this investigation was to obtain geotechnical data to assist in the design and construction of the proposed ground storage tank, and associated water treatment plant facility structures, and the stormwater retention pond area.

As you are aware, AEI performed preliminary evaluations of the site previously, and the results of those field explorations have been incorporated to this report. For ease of reference, previous soil borings performed at the time of AEI's original investigation are referenced in this report and shown on **Figure 3.** Field investigation results (Figures 3, 4 and 5) from the preliminary report are included in **Attachment A**.

This report presents the results of our geotechnical investigation along with an evaluation of the soil and groundwater conditions encountered. In addition, it provides geotechnical engineering recommendations for site preparation, foundation design, and evaluation of the stormwater retention system.

SITE LOCATION AND PROJECT DESCRIPTION

The subject site is located along Sun Grove Lane, in Sections 11, 12, 13, & 14, Township 25 South, and Range 31 East, in St. Cloud, Osceola County, Florida. We have included the U.S.G.S. Topographic Map, which depicts the location of the site, on the attached **Figure 1**. In addition, the Natural Resources Conservation Service (NRCS) Soil Map, which depicts the location and general soil types of the subject site, is presented on the attached **Figure 2**. The proposed water treatment facility will include the construction of one (1) 90-foot diameter ground storage tank, four (4) single-story buildings for operations and storage, and other foundations to support pumps, generators, and facility equipment. Estimated structural loads for the tanks and supporting structure foundations were provided by REISS.

PURPOSE AND SCOPE OF SERVICES

The purpose of this geotechnical investigation and evaluation was to assess the shallow soil and groundwater conditions, provide recommendations regarding site suitability for foundation support of the proposed tank, buildings, and support structures on shallow foundations, and provide recommendations for stormwater pond design with aquifer parameters for recovery analysis.

The scope of this investigation included:

- Drilled five (5) Standard Penetration Test (SPT) borings, designated as TB-1, TB-3 through TB-5, and TB-9, to a depth of 15 feet below ground surface, within the proposed facility support structure areas, for general subsurface soil evaluation.

- Drilled one (1) Standard Penetration Test (SPT) boring, designated as TB-2, to a depth of 50 feet below ground surface, near the center of the proposed ground storage tank, for general foundation design evaluation.

- Drilled three (3) Standard Penetration Test (SPT) borings, designated as TB-6 through TB-8, to a depth of 25 feet below ground surface, within the proposed building areas, for general foundation evaluation.

- Measured the depth of the groundwater table at each boring location.

- Estimated normal seasonal high and low groundwater table levels

Samples were recovered from the borings and returned to AEI's laboratory for visual classification and stratification. Soil strata were classified according to the Unified Soil Classification System (USCS). Approximate boring locations are shown on **Figure 3**, and results of the Standard Penetration Test (SPT) borings, in profile form, are presented on **Figures 4**. On the profiles, horizontal lines designating the interface between differing materials represent approximate boundaries. The actual transition between layers is typically gradual.

NATURAL RESOURCES CONSERVATION SERVICE SOIL SURVEY

The publication titled "Soil Survey of Osceola County, Florida" published by the U.S. Department of Agriculture; Natural Resources Conservation Service (NRCS) was reviewed. For your reference, we have included a portion of the NRCS Soil Map which depicts the location of the subject site on the attached **Figure 2**. The two (2) soil map units for the subject project location are identified as:

Soil Map Unit 16: ***Immokalee Fine Sand, 0 to 2 percent slopes***

Brief Description: "This is a poorly drained, nearly level soil in broad flatwoods areas. Slopes range from 0 to 2 percent. Typically, the surface layer is 7 inches of very dark gray fine sand. The fine sand subsurface layer is 30 inches thick. The upper 6 inches is light gray, and the lower 23 inches is white and has faint brown mottles. The subsoil, 10 inches thick, is fine sand weakly cemented by organic matter. The upper 4 inches is black and has very dark brown and grayish brown mottles, and the lower 6 inches is dark reddish brown and has reddish yellow and black mottles. The next layer is 18 inches of dark brown fine sand that has reddish yellow and dark brown mottles. Below this is dark grayish brown fine sand which extends to a depth of 80 inches

or more. This layer is mottled with black and very dark grayish brown. The water table is at a depth of less than 10 inches for 2 months in most years and within a depth of 10 to 40 inches for 8 months or more in most years. It is at a depth of more than 40 inches during dry periods. Permeability is rapid in the surface and subsurface layers, moderate to moderately rapid in the subsoil, and rapid below. Available water capacity is low in the surface layer, very low in the subsurface layer, medium in the subsoil, and very low in the substratum. Natural fertility and organic matter content are low. This soil has medium potential for septic tank absorption fields, sewage lagoon areas, dwellings without basements, small commercial buildings, local roads and streets, playgrounds, trench sanitary landfills, and shallow excavations. Adequate water control measures are needed to realize this potential. In addition, mounding may be needed in places for septic tank absorption fields. Sealing or lining with impervious material is also needed for sewage lagoon areas and trench sanitary landfills; surface stabilization, for playgrounds; and shoring of side walls, for shallow excavations."

Soil Map Unit 22: ***Myakka Fine Sand, 0 to 2 percent slops***

Brief Description: "This is poorly drained, nearly level soil in broad areas in the flatwoods. Slopes range from 0 to 2 percent. Typically, Myakka soils have a surface layer of very dark gray fine sand about 7 inches thick. The subsurface layer is light gray fine sand about 20 inches thick. It has very dark grayish brown and brown streaks along root channels. The subsoil is fine sand that is weakly cemented with organic matter It is black in the upper 6 inches and dark reddish brown and very dark gray in the lower 4 inches. Next is a 6-inch layer of dark yellowish-brown fine sand that has dark reddish-brown stains along root channels. The next 27 inches is light yellowish-brown fine sand. It is underlain by a layer of weakly cemented, dark reddish-brown fine sand that extends to a depth of 80 inches or more. The water table is at a depth of less than 10 inches for 1 to 4 months in most years and a depth of more than 40 inches during very dry seasons. Permeability is rapid in the surface and subsurface layers, moderate to moderately rapid in the subsoil, and rapid in the substratum. Available water capacity is very low above the subsoil, medium in the subsoil, and very low below the subsoil. Natural fertility and organic matter content are low. This soil has medium potential for septic tank absorption fields, sewage lagoon areas, dwellings without basements, small commercial buildings, local roads and streets, and playgrounds. To realize this potential, however, adequate water control measures are needed. In addition, mounding may be needed in places for septic tank absorption fields; sealing or lining with impervious material is needed for sewage lagoon areas; and surface stabilization is needed for playgrounds."

SOIL AND GROUNDWATER CONDITIONS

Soil Conditions

The soil types encountered at the boring locations are presented in the form of soil profile on the attached **Figure 4**. The stratification presented is based on visual examination of the recovered soil samples and the interpretation of the field logs by a geotechnical engineer.

In general, the borings encountered the following soil Strata:

- Gray to Brown fine sand to slightly silty fine sand (Stratum 1)
- Brown to Dark Brown slightly silty fine sand (Stratum 2)
- Brown to Gray slightly silty to silty fine sand (Stratum 3)
- Pale Brown silty fine sand with trace clay (Stratum 4)
- Brownish-gray clayey fine sand (Stratum 5)
- Gray fat clay (Stratum 6)

- Gray silty fine sand with trace shell (Stratum 7)
- Gray silty clay with shell (Stratum 8)
- Gray clayey silt (Stratum 9)
- Sandy shell with cemented sands (Stratum 10)
- Gray cemented silty fine sand with shell (Stratum 11)
- Limestone (Stratum 12)
- Peat/Muck to Black organic sine sand (Stratum 13)

Standard Penetration Test (SPT) borings measure soil density using a split spoon sampler advanced by a 140-pound hammer dropped repeatedly a distance of 30 inches. The N-value, which is shown next to the corresponding depths of the boring profiles, are the number of blows by the hammer required to advance the split spoon sampler one (1) foot. Split spoon sampling was conducted continuously in the upper 10 feet and at 5-foot intervals thereafter. Also included, adjacent to the SPT borings, are the blow counts or "N" values. The "N" values have been empirically correlated with various soil properties and are considered to be indicative of the relative density of cohesionless soils and the consistency of cohesive material. The upper four feet of the SPT borings were drilled manually to prevent damage to possible underground utilities. Upon completion of drilling, the SPT boreholes were backfilled with additional bentonite and soil materials.

Correlation of the SPT-N values with relative density, unconfined compressive strength and consistency are provided in the following table:

Coarse-Grained Soils		**Fine Grained Soils**		
Penetration Resistance N (blows/ft)	Relative Density of Sand	Penetration Resistance N (blows/ft)	Unconfined Compressive Strength of Clay (tons/ft^2)	Consistency of Clay
0-4	Very Loose	<2	<0.25	Very Soft
4-10	Loose	2-4	0.25-0.50	Soft
10-30	Medium-Dense	4-8	0.50-1.00	Medium
30-50	Dense	8-15	1.00-2.00	Stiff
>50	Very Dense	15-30	2.00-4.00	Very Stiff
		>30	>4.00	Hard

Please refer to **Figure 3** for boring locations and **Figure 4** for strata depths, and encountered soil conditions. The stratification lines represent the approximate boundaries between soil types. The actual transition may be gradual. Minor variations not considered important to our engineering evaluations may have been abbreviated or omitted for clarity.

Groundwater Conditions

At the time of drilling, groundwater was encountered at each boring location, ranging between 4.5 and 6.0 feet, below the ground surface. The groundwater measurements are referenced on **Figure 4** adjacent to the corresponding soil profiles. Based on the encountered subsurface conditions, our local experience, review of the NRCS Soil Survey, and antecedent rainfall

conditions, the normal seasonal high groundwater level at TB-2 and TB-4 is estimated to exist slightly above the identified hardpan type cemented soils in a temporary perched condition after periods of heavy or extended rainfall and at about 2 foot above measured levels at TB-1, TB-3, and TB-5 through TB-9.

EVALUATION AND RECOMMENDATIONS

General

The following conclusions and recommendations are based on the project characteristics previously described, the data obtained in our field exploration and our experience with similar subsurface conditions and construction types. If the final tank, buildings, and pond locations/designs are significantly different from those presented in this report or shown on the **Figure 3**, or if subsurface conditions appear different from those presented in the soil profiles shown on **Figure 4** are encountered during construction, we should be notified immediately so that we can review our recommendations presented in the following sections, to amend these recommendations if needed.

Based on the results of this investigation and our evaluation of the encountered subsurface conditions, it is our opinion that the site soils are generally suitable to support the proposed water treatment facility, provided that proper site soil preparation and soil densification are carried out. It is critical that site preparation and soil densification procedures are thorough to ensure consistent and uniform support conditions for the proposed site improvements.

For the purposes of all structure, building, slab, and/or roadway foundation support onsite, any organic material including topsoil, peat, muck, and organic fine sand, are unsuitable due to their nature to compress under the weight of structures, resulting in structural settlement and cracking. As a result, all organic matter in building areas, roadway areas, and other settlement sensitive areas, should be properly removed and replaced with suitable compacted sandy material.

Conventional pavement section design and construction using flexible or semi flexible pavement sections appear to be possible at this site provided that a two-foot separation is maintained between the pavement base coarse, estimated normal seasonal high groundwater table level, and the top of any encountered cemented hardpan soils encountered. The shallowest hardpan type soils were encountered at a depth of 4 feet at TB-2 and TB-4.

Dependent on final site grades, shallow dry stormwater retention system design and wet stormwater retention/detention system design are recommended for the proposed retention pond location.

More specific recommendations for the building areas, paved roadway areas, stormwater retention pond areas and the lift station are provided below.

Site Preparation

For site preparation and grading purposes, all structural support areas plus a minimum margin of 5 feet beyond their outer lines, should be cleared and stripped to remove all surface vegetation, roots, topsoil, organic debris, or any other encountered deleterious materials. Due to the very loose to loose soil conditions encountered near the ground surface in the ground storage tank area, we recommend additional over-excavation and replacement site preparation work to create an engineered fill layer below the structure, this is discussed further in the section below. After over-excavation, clearing, stripping, and grubbing, the excavated grades should be proofrolled

using a large vibratory roller (Dynapac CA-25 or equivalent), to provide uniform subgrade conditions, in order to limit total and differential structure settlements. All fill required to bring the site to final grade should be inorganic, non-plastic, granular soil (clean sands) with less than 10% passing a U.S #200 sieve. In structural areas, the fill should be placed in level lifts not to exceed 12 inches loose and should be compacted to a minimum of 95% of the soil's modified Proctor maximum dry density as determined by ASTM Specification D-1557. In-place density tests should be performed on each lift by an experienced engineering technician working under the direction of a registered geotechnical engineer to verify that the recommended degree of compaction has been achieved. We suggest a minimum testing frequency of one (1) test per lift per 2,500 square feet of area within structural limits and one (1) test per lift per 10,000 square feet in pavement areas. This fill should extend a minimum of 5 feet beyond building lines to prevent possible erosion or undermining of footing bearing soils. Further, fill slopes should not exceed 2 horizontal to 1 vertical (2H: 1V). All fill placed in utility line trenches and adjacent to footings beneath slabs on grade should also be properly placed and compacted to the specifications stated above. However, in these restricted working areas, compaction should be accomplished with lightweight, hand-guided compaction equipment and lift thicknesses should be limited to a maximum of 4 inches loose thickness.

Storage Tank Foundation

Based on our test boring results, the proposed tank can be supported by shallow foundation systems (reinforced slab/ring foundation), provided that the site subgrade preparation recommendations discussed herein are followed.

Based on available information, the 90-foot diameter ground storage tank is expected to develop foundation loads of about 2,000 psf based on a design water depth of 21.00 feet.

The storage tank foundation systems should bear on properly placed and compacted cohesionless (sand) structural fill. As discussed in the site preparation recommendations above, after site stripping and grubbing, and prior to construction of the slab/footing system or placement of any fill, the near surface soils in the tank areas (plus a 5-foot margin beyond the tank perimeter) shall be over-excavated to a depth of 4 feet below existing grade. The excavated bottom areas should be improved by vibratory compaction, as described earlier in this report, to provide uniform subgrade conditions and densify the encountered subgrade soil. This is intended to limit the total and differential settlements of the tanks. The backfill material consisting of clean sand with less than 7% fines may then be placed back and compacted in uniform 12-inch lifts. Any fill required to bring the tank foundation to final grade shall be properly compacted in accordance to the recommendations described earlier. Compaction operations should be controlled by the contractor so as to not adversely impact any adjacent structures.

Perimeter strip or wall foundations under the storage tank walls should be proportioned using a maximum net allowable uniform bearing pressure of 2,500 pounds per square feet. All strip wall footings should be embedded a minimum of 24 inches below adjacent compacted grade on both sides and should be a minimum of 3.0 feet in width. This minimum footing size should be used regardless of whether or not the allowable bearing pressure dictates a smaller size. Post-construction differential settlement of less than 2 inches (after excavation and replacement, as described above), between the center and edge of the tank is estimated.

Pipe grades and pipe connections within 20 feet of the tank should be designed considering the expected settlement.

The settlement of the storage tank should be monitored during the initial filling of the tank. The tank manufacturer should incorporate settlement monitoring points to permit this operation. Initially, we recommend that 25% loading increments be utilized and held for one to two weeks each until the tank is 100% full. Monitoring of the settlement points will determine the actual loading frequency. Pipe connections to and under the tanks should be connected after the initial filling.

Building and Support Structure Foundation Design

Once the existing subgrade and new fill soils in the proposed structural support areas have been prepared in accordance with the preceding recommendations, the proposed buildings and support structures can be constructed on a system of conventional shallow spread or strip footings bearing at minimum depths below the finished floor elevations. Footings, which bear in densified existing soils or in new structural fill, may be designed based on a maximum allowable bearing pressure of 2,500 pounds per square foot. Minimum footing dimensions of 16 inches for strip footings and 18 inches for column footings should be used even though the maximum allowable bearing pressures may not be fully developed in all cases. Footings should bear at least 18 inches below finished exterior grades. For monolithic slab construction, footings should bear at least 12 inches below finished exterior grades. Footing subgrade soils should be approved by the geotechnical engineer prior to placement of concrete and steel. As a minimum acceptance criterium, the footing subgrade soils should be compacted to a minimum density of 95% of the soils modified Proctor maximum dry density for a depth of 24 inches.

Paved Areas

In general, the compacted subsurface soils will be suitable for support of a flexible (limerock) or semi-flexible (soil-cement and crushed concrete) type pavement base after subgrade preparation. The use of one system over another is normally governed by the depth to the encountered and/or seasonal high groundwater table. Soil cement is typically used in areas where the wet season groundwater table levels are within 12 inches of the proposed bottom of the pavement subbase. As a possible pavement design alternative, AEI also presents recommendations for a rigid pavement section.

Typical flexible and semi-flexible pavement sections are as follows:

Limerock Base

1-1/2” to 2-1/2” asphaltic concrete wearing surface

6” to 8" limerock base course, quality of limerock to be in accordance with current Florida Department of Transportation specifications and compacted to a minimum density equivalent to 98 percent of the modified Proctor maximum density (AASHTO T-180).

12” stabilized subbase with minimum Limerock Bearing Ratio (LBR) of 40 percent. The subbase should be compacted to a minimum density equivalent to 98 percent of the modified Proctor maximum density (AASHTO T-180). The subgrade material, below the subbase, shall be compacted to minimum density of 98% of the modified Proctor maximum density of the soil.

Soil-Cement Base

1-1/2” to 2-1/2” asphaltic concrete wearing surface

6" to 8" soil-cement base designed and constructed in accordance with current Portland Cement Association recommended methods.

12" subgrade consisting of free draining natural fine sand or fine sand fill with less than 7 percent passing a U.S. #200 sieve. Subgrade to be compacted to a minimum density of 98 percent of the modified Proctor maximum density (AASHTO T-180).

Crushed Concrete Base

1-1/2" to 2-1/2" asphaltic concrete wearing surface

6" to 8" crushed concrete base with the quality of crushed concrete to be in accordance with current Florida Department of Transportation specifications and should have a minimum Limerock Bearing Ratio (LBR) of 150 and be compacted to at least 98 percent of the Modified proctor maximum dry density per ASTM D-1557.

12" stabilized subbase with minimum Limerock Bearing Ratio (LBR) of 40 percent. The subbase should be compacted to a minimum density equivalent to 98 percent of the modified Proctor maximum density per ASTM D-1557. The subgrade material, below the subbase, shall be compacted to minimum density of 98% of the modified Proctor maximum density of the soil per ASTM D-1557.

Type of Development	ADT (average daily traffic)	Limerock - Soil Cement - Crushed Concrete Base Thickness	Wearing Surface Thickness
Commercial/Industrial	< 1,500	6"	1 ½"
	>1,500	8"	2 ½"

The pavement section should be designed based on expected traffic including truck loads. Traffic should not be allowed on the subgrade prior to placement of the base to avoid rutting. The final pavement thickness design should be checked by the project civil engineer using data contained in this report and anticipated traffic conditions.

As a possible pavement section design alternative, AEI presents recommendations for a rigid pavement section as follows:

Rigid Pavement

6" reinforced concrete wearing surface: Designed to withstand the design traffic loads and jointed to reduce the chances for crack development. The concrete should have a minimum unconfined compressive strength of 3,000 psi.
12" subgrade: consisting of free draining natural fine sand or fine sand fill. Subgrade to be compacted to a minimum density equivalent to 98 percent of the modified Proctor maximum density (AASHTO T-180).

Retention Pond Area

Based on the results of the borings and field permeability tests, the proposed stormwater retention area, located in the vicinity of PZ-1, appear suitable for shallow dry or wet retention/detention stormwater system design. The on-site Strata 1 and 2 sandy soils, excavated from the proposed retention pond areas, should be suitable for general fill purposes.

For analysis and design purposes the following aquifer characteristics should be used. These aquifer characteristics were determined from the results of the field and laboratory investigations, adjusting for depth and soil variability:

Location	PZ-1 (GS Elevation = 68.3)
Bottom of Aquifer *	20.0 (El=48.3)
Seasonal High Groundwater Level *	2.1 (El=66.2)
Seasonal Low Groundwater Level *	6.1 (El=62.2)
Average Wet Season Groundwater Level *	4.1 (El=64.25)
Avg. Unsat. Vertical Hydraulic Conductivity (ft/day)	9.0
Avg. Horizontal Hydraulic Conductivity (ft/day)	9.8
Storage Coefficient	0.20

*- feet below land surface

The permeability rates of the Strata 1 and 3 soils are estimated based on our visual and tactile classification and experience with similar soil types. Factors of safety have not been applied to the above weighted average permeability values. For the purpose of recovery analysis in accordance with water management district rules, a factor of safety of 2 should be applied to the unsaturated vertical permeability to account for long-term performance and siltation of the pond bottom.

The following formulas were used in the calculation of both the weighted average vertical and horizontal weighted average permeability values.

$$\text{Weighted Average Vertical Permeability} = \frac{\sum L}{\frac{L_1}{Kv_1} + \frac{L_2}{Kv_2} + \frac{L_3}{Kv_3} + \ldots\ldots\ldots \frac{L_n}{Kv_n}}$$

$$\text{Weighted Average Horizontal Permeability} = \frac{Kh_1.L_1 + Kh_2.L_2 + Kh_3.L_3 + \ldots . Kh_n.L_n}{\sum L}$$

Excavations

Any and all excavations should be constructed in accordance with applicable local, state and federal regulation including those outlined by the Occupational Safety and Health Administration (OSHA). It is the contractor's sole responsibility for designing and constructing safe and stable excavations. Excavations should be sloped, benched or braced as required to maintain stability of the excavation sides and bottoms. Excavations should take into account loads resulting from equipment, fill stockpiles and existing construction. Any shoring need to maintain a safe excavation should be designed by a professional engineer registered in the State of Florida in accordance with local, state and federal guidelines.

LIMITATIONS

This report has been prepared for the exclusive use of RIESS Engineering, Inc. and their designers, based on our understanding of the project as stated in this report. Any modifications in design concepts from the description stated in this report should be made known to AEI for possible modification of recommendations presented in this report. This exploration was performed in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made as to the professional advice presented herein. Statements regarding all geotechnical recommendations are for use by the designers and are not intended for use by potential contractors. The geotechnical exploration and recommendations submitted herein are based on the data obtained from the soil borings presented on **Figure 4**. The report does not reflect any variations which may occur adjacent to, between, or away from the borings. The nature and extent of the variations between the borings may not become evident until during construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations presented in this report. An on-site visit may be required by a geotechnical engineer to note the characteristics of the variations during the construction period. This geotechnical investigation examined the general soil conditions used to characterize the proposed ground storage tank, buildings and slabs, drilled to depths 15 to 50 feet below ground surface, and was not intended to investigate deeper soil conditions with regards to the presence or absence of Karst activity.

CLOSURE

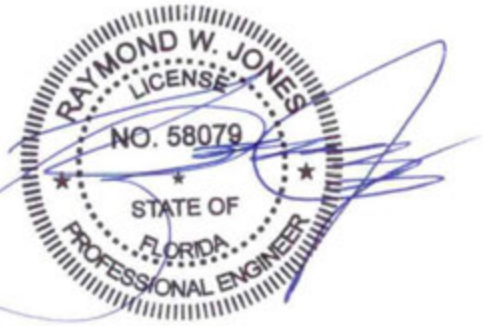
AEI appreciates the opportunity to participate in this project, and we trust that the information herein is sufficient for your immediate needs. If you have any questions or comments concerning the contents of this report, please do not hesitate to contact the undersigned.

Sincerely,

ANDREYEV ENGINEERING, INC.

This item has been digitally signed and sealed by Raymond Jones, P.E. on 6/26/19.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

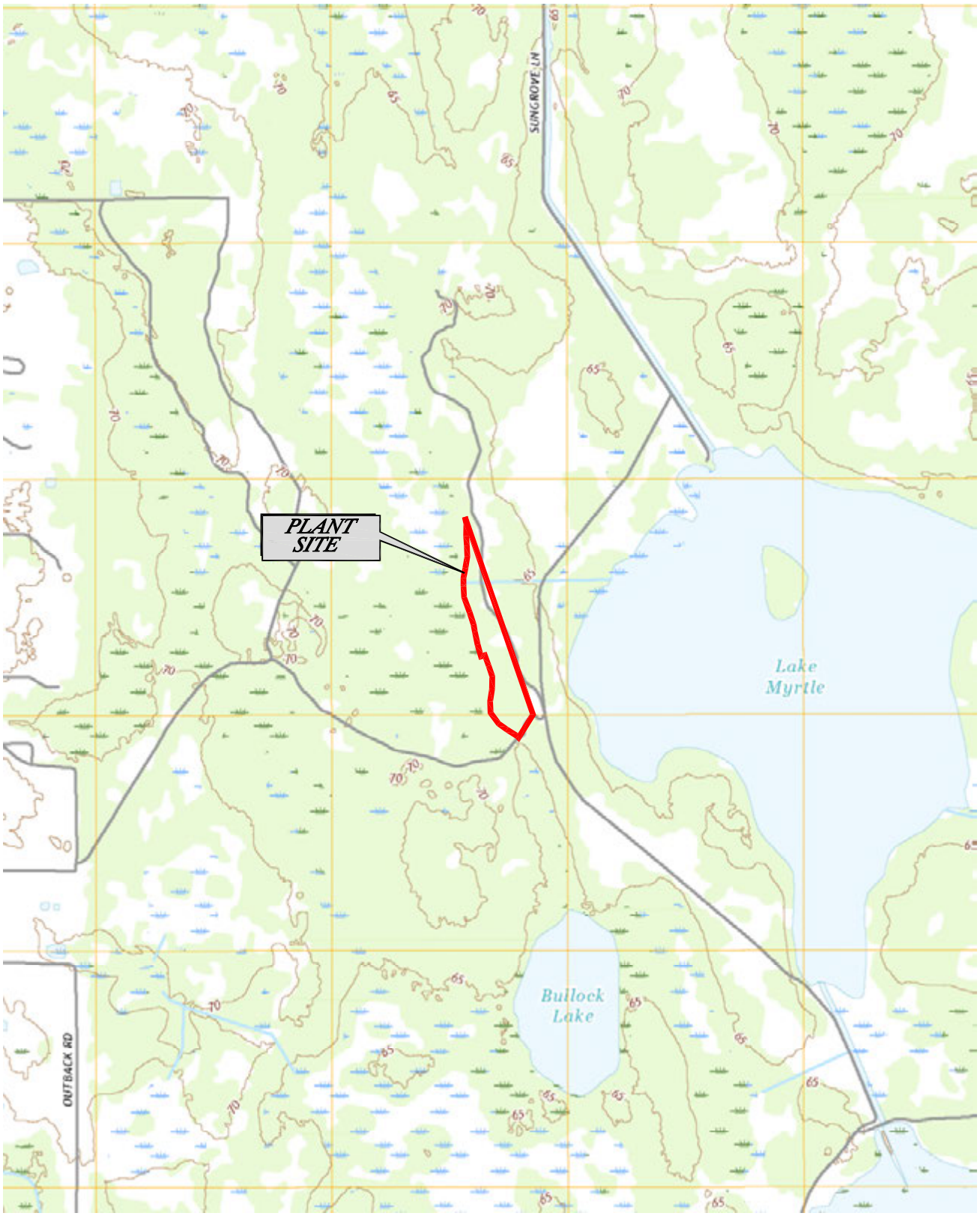


Mark Livingston
Project Manager

Raymond W. Jones, P.E.
Vice President
Florida Registration No.58079

Attachment A: Previous Field Investigation Results

FIGURES



REFERENCE:
U.S.G.S. NARCOOSSEE, FLA.
QUADRANGLE MAP
DATED 2018
SECTIONS 11, 12, 13 & 14
TOWNSHIP 25 SOUTH
RANGE 31 EAST

Andreyev Engineering, Inc.

APPROXIMATE SCALE:	DATE: 06/05/19	ENGINEER: RJ
1"=2000'	PN: GPGW-19-050	DRAWN BY: DLS

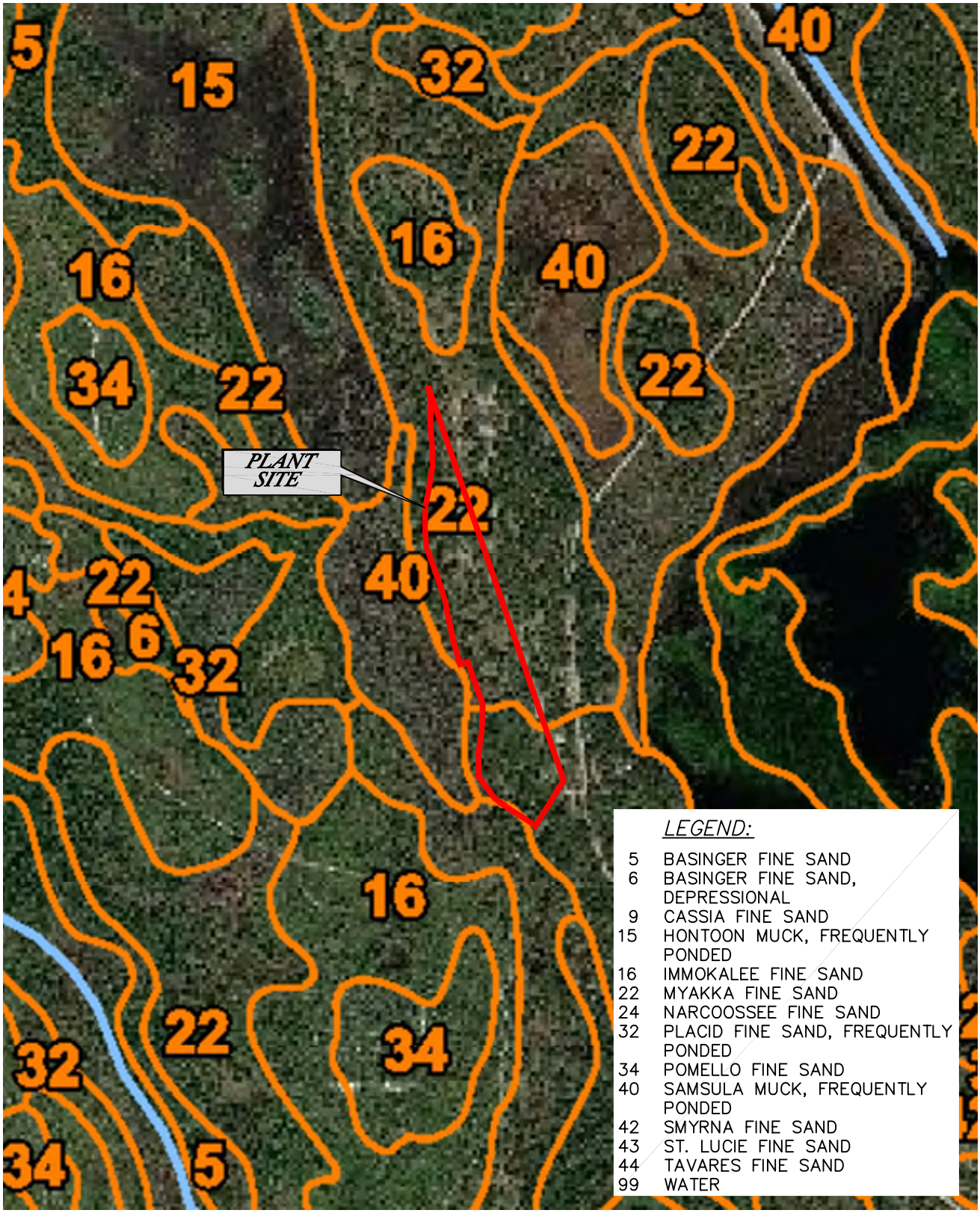
GEOTECHNICAL INVESTIGATION

SUNBRIDGE UTILITY PLANT SITE

ST. CLOUD, OSCEOLA COUNTY, FL

U.S.G.S. TOPOGRAPHIC MAP

FIGURE 1



REFERENCE:
U.S.D.A. N.R.C.S. WEB SOIL SURVEY

Andreyev Engineering, Inc.

APPROXIMATE SCALE:	DATE: 06/05/19	ENGINEER: RJ
1"=1000'	PN: GPGW-19-050	DRAWN BY: DLS

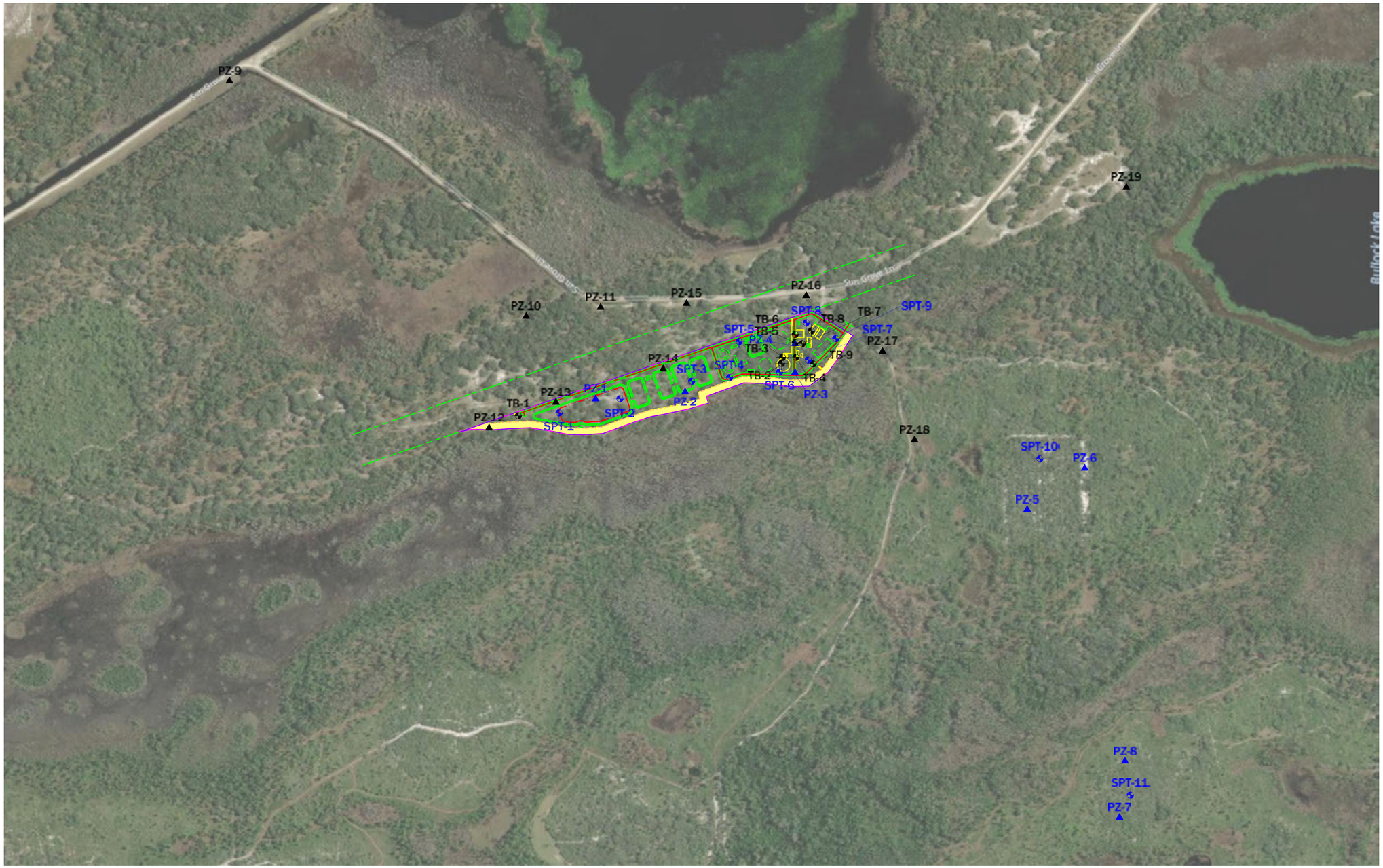
GEOTECHNICAL INVESTIGATION

SUNBRIDGE UTILITY PLANT SITE

ST. CLOUD, OSCEOLA COUNTY, FL

N.R.C.S. SOIL SURVEY MAP

FIGURE 2



LEGEND:

- APPROXIMATE LOCATION OF SPT BORING
- APPROXIMATE LOCATION OF PIEZOMETER
- PREVIOUS LOCATION OF SPT BORING
- PREVIOUS LOCATION OF PIEZOMETER

NORTH

0 400 800 1600

GRAPHIC SCALE: 1"=800'

Andreyev Engineering, Inc.

GEOTECHNICAL INVESTIGATION

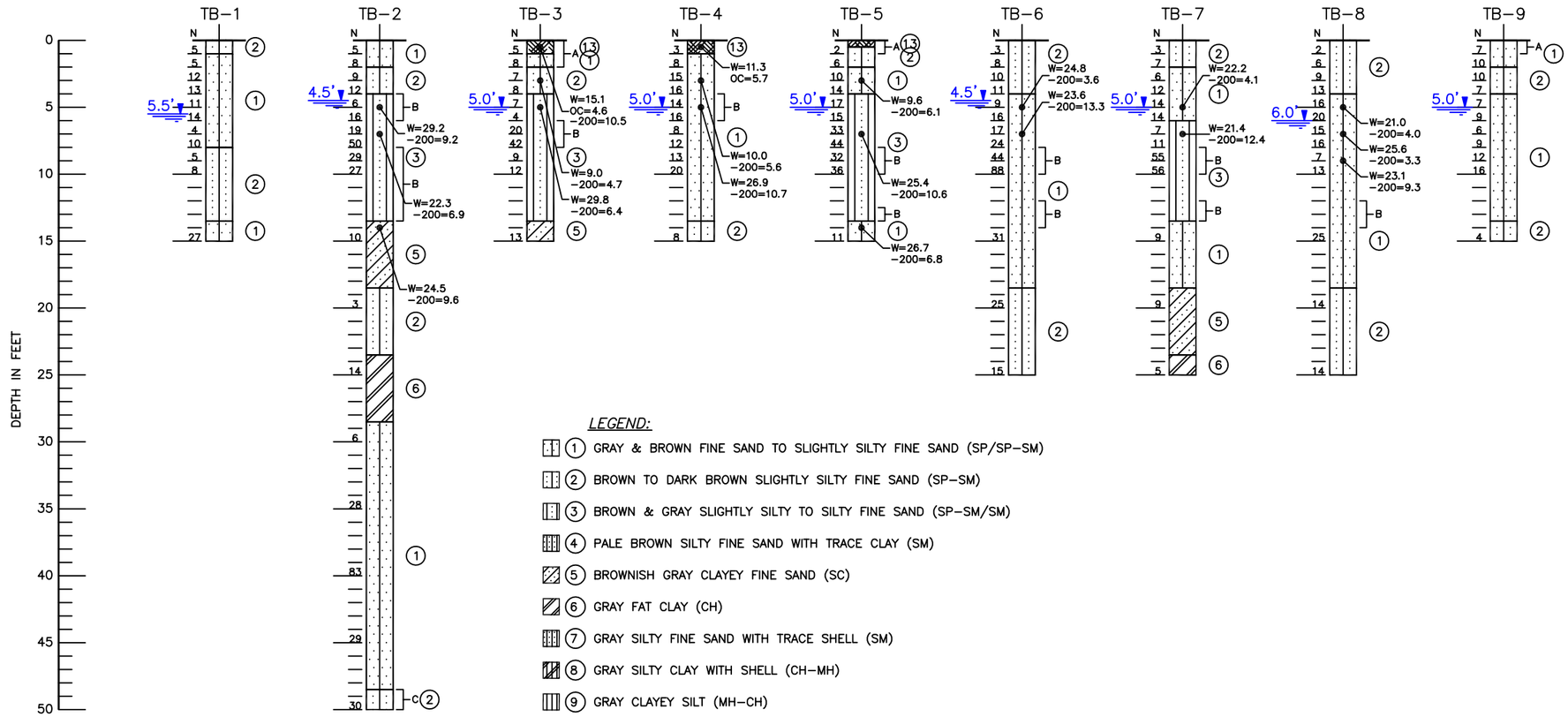
SUNBRIDGE UTILITY PLANT SITE

ST. CLOUD, OSCEOLA COUNTY, FL

BORING LOCATION PLAN

APPROXIMATE SCALE:	DATE: 06/05/19	ENGINEER: RJ
1"=800'	PN: GPGW-19-050	DRAWN BY: DLS

FIGURE 3



LEGEND:

(1) GRAY & BROWN FINE SAND TO SLIGHTLY SILTY FINE SAND (SP/SP–SM)

(2) BROWN TO DARK BROWN SLIGHTLY SILTY FINE SAND (SP–SM)

(3) BROWN & GRAY SLIGHTLY SILTY TO SILTY FINE SAND (SP–SM/SM)

(4) PALE BROWN SILTY FINE SAND WITH TRACE CLAY (SM)

(5) BROWNISH GRAY CLAYEY FINE SAND (SC)

(6) GRAY FAT CLAY (CH)

(7) GRAY SILTY FINE SAND WITH TRACE SHELL (SM)

(8) GRAY SILTY CLAY WITH SHELL (CH–MH)

(9) GRAY CLAYEY SILT (MH–CH)

(10) SANDY SHELL WITH CEMENTED SANDS

(11) GRAY CEMENTED SILTY FINE SAND WITH SHELL (SM)

(12) LIMESTONE

(13) PEAT/MUCK TO BLACK ORGANIC FINE SAND (PT)

A ORGANIC ROOT MATERIAL

B CEMENTED SAND, HARDPAN TYPE

C SAND STONE, SHELL PIECES

(SP) UNIFIED SOIL CLASSIFICATION SYSTEM GROUP SYMBOL

1.0' DEPTH TO GROUNDWATER (B–1 – B–4 & PZ–1 – PZ–4 MAY 2018 AND

N STANDARD PENETRATION RESISTANCE, IN BLOWS PER FOOT

W MOISTURE CONTENT, IN PERCENT

–200 PERCENT OF FINES PASSING THE U.S. No. 200 SIEVE

OC ORGANIC CONTENT, IN PERCENT

Andreyev Engineering, Inc.

GEOTECHNICAL INVESTIGATION

SUNBRIDGE UTILITY PLANT SITE

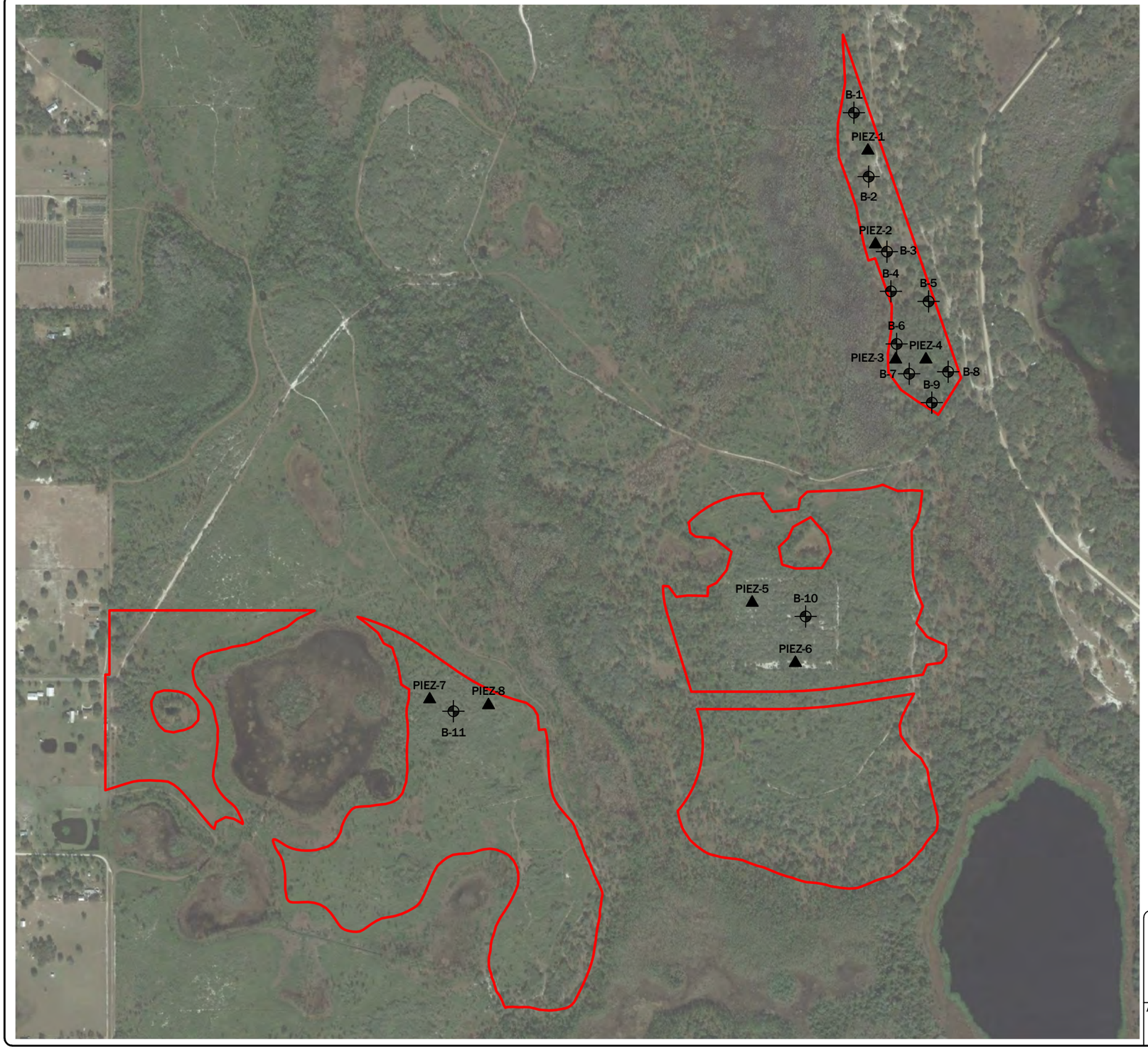
ST. CLOUD, OSCEOLA COUNTY, FL

SOIL PROFILES

FIGURE 4

APPROXIMATE SCALE:	DATE: 06/05/19	ENGINEER: RJ
1"=10'	PN: GPGW–19–050	DRAWN BY: DLS

ATTACHMENT A



HUDSON

LEGEND:

APPROXIMATE SUBJECT PROPERTY BOUNDARY

APPROXIMATE LOCATION OF SPT BORING

APPROXIMATE LOCATION OF PIEZOMETER

0 400 800 1600

GRAPHIC SCALE: 1"=800'

Andreyev Engineering, Inc.

PRELIMINARY GEOTECHNICAL & HYDROGEOLOGICAL INVESTIGATION

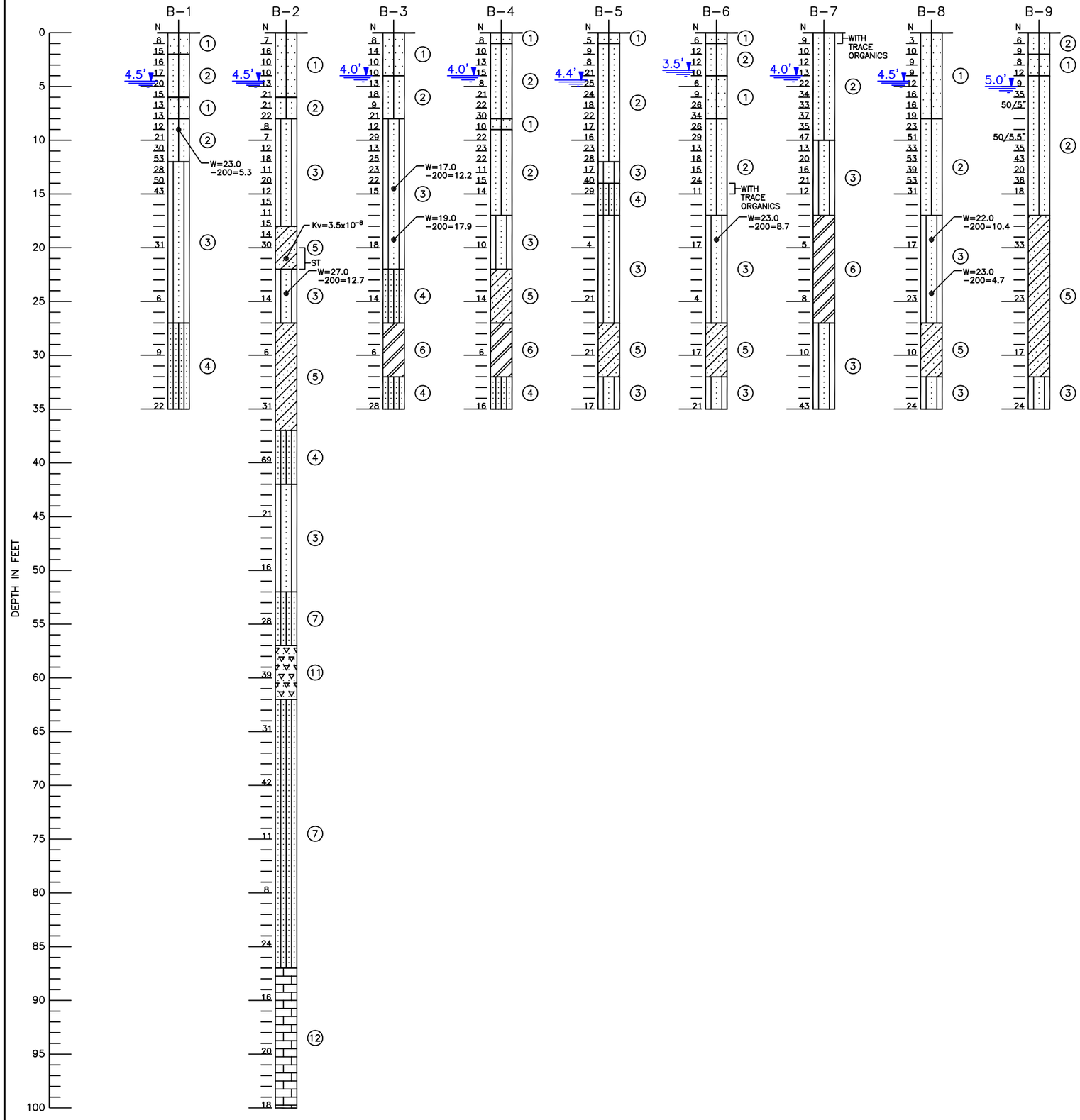
SUNBRIDGE UTILITY PLANT

OSCEOLA COUNTY, FL

BORING LOCATION PLAN

FIGURE 3

APPROXIMATE SCALE:	DATE: 06/01/18	ENGINEER: JE
1"=800'	PN: APGT-18-057	DRAWN BY: DLS



LEGEND:

1. GRAY & BROWN FINE SAND TO SLIGHTLY SILTY FINE SAND (SP/SP–SM)
2. BROWN TO DARK BROWN SLIGHTLY SILTY FINE SAND (SP–SM)
3. BROWN & GRAY SLIGHTLY SILTY TO SILTY FINE SAND (SP–SM/SM)
4. PALE BROWN SILTY FINE SAND WITH TRACE CLAY (SM)
5. BROWNISH GRAY CLAYEY FINE SAND (SC)
6. GRAY FAT CLAY (CH)
7. GRAY SILTY FINE SAND WITH TRACE SHELL (SM)
8. GRAY SILTY CLAY WITH SHELL (CH–MH)
9. GRAY CLAYEY SILT (MH–CH)
10. SANDY SHELL WITH CEMENTED SANDS
11. GRAY CEMENTED SILTY FINE SAND WITH SHELL (SM)
12. LIMESTONE

(SP) UNIFIED SOIL CLASSIFICATION SYSTEM GROUP SYMBOL

1.0' DEPTH TO GROUNDWATER, MAY 2018

N STANDARD PENETRATION RESISTANCE, IN BLOWS PER FOOT

50/1" 50 HAMMER BLOWS TO ADVANCE SAMPLING TOOL ONE INCH

ST SHELBY TUBE

WH BORING ADVANCED UNDER STATIC WEIGHT OF DRILL HAMMER & ROD

Kv VERTICAL COEFFICIENT OF PERMEABILITY, IN FEET PER DAY

W MOISTURE CONTENT, IN PERCENT

–200 PERCENT OF FINES PASSING THE U.S. No. 200 SIEVE

Andreyev Engineering, Inc.

PRELIMINARY GEOTECHNICAL & HYDROGEOLOGICAL INVESTIGATION

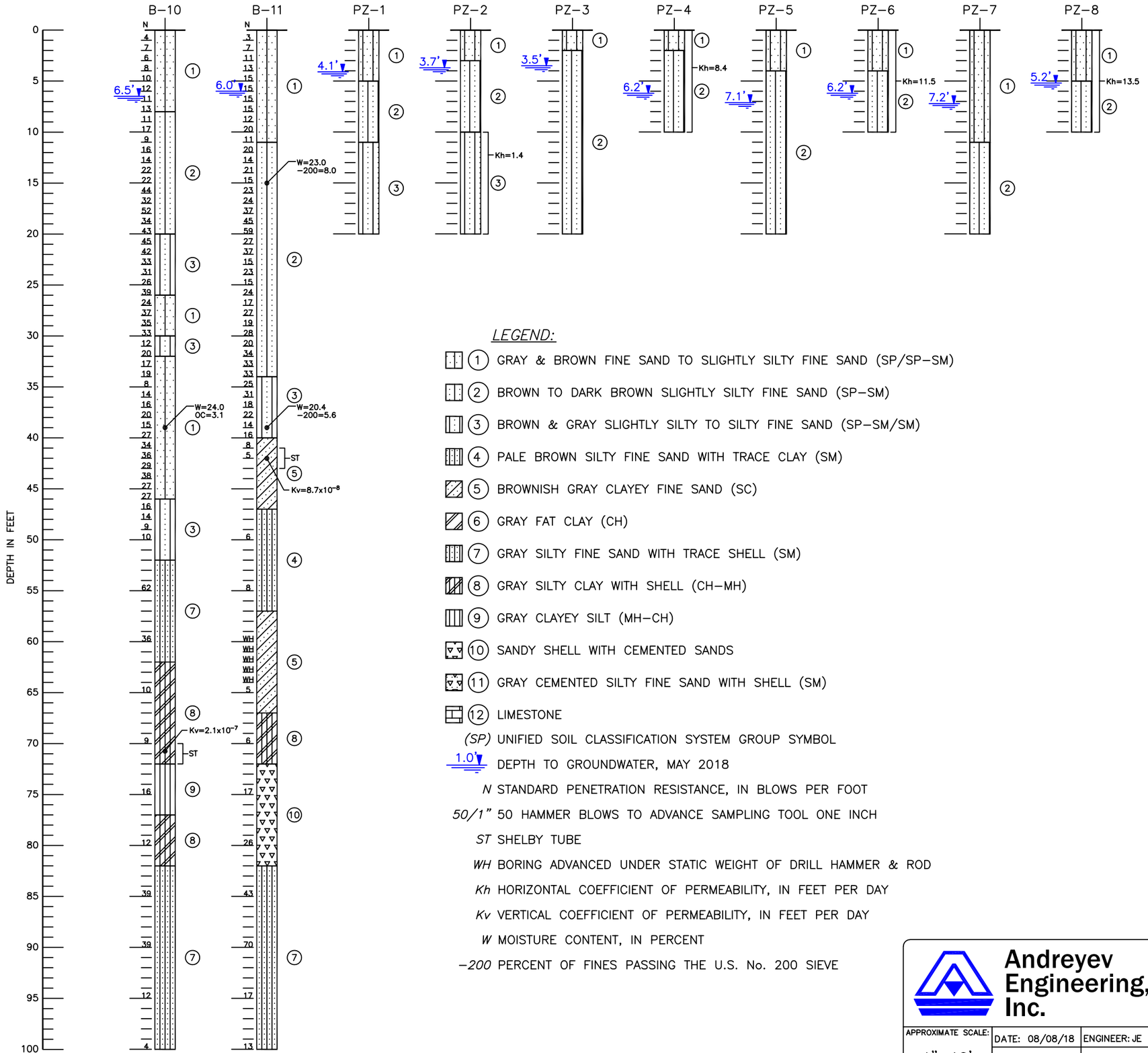
SUNBRIDGE UTILITY PLANT

OSCEOLA COUNTY, FL

SOIL PROFILES

FIGURE 4

APPROXIMATE SCALE:	DATE: 08/08/18	ENGINEER: JE
1"=10'	PN: APGT–18–057	DRAWN BY: DLS



LEGEND:

1. GRAY & BROWN FINE SAND TO SLIGHTLY SILTY FINE SAND (SP/SP–SM)
2. BROWN TO DARK BROWN SLIGHTLY SILTY FINE SAND (SP–SM)
3. BROWN & GRAY SLIGHTLY SILTY TO SILTY FINE SAND (SP–SM/SM)
4. PALE BROWN SILTY FINE SAND WITH TRACE CLAY (SM)
5. BROWNISH GRAY CLAYEY FINE SAND (SC)
6. GRAY FAT CLAY (CH)
7. GRAY SILTY FINE SAND WITH TRACE SHELL (SM)
8. GRAY SILTY CLAY WITH SHELL (CH–MH)
9. GRAY CLAYEY SILT (MH–CH)
10. SANDY SHELL WITH CEMENTED SANDS
11. GRAY CEMENTED SILTY FINE SAND WITH SHELL (SM)
12. LIMESTONE

(SP) UNIFIED SOIL CLASSIFICATION SYSTEM GROUP SYMBOL

1.0' DEPTH TO GROUNDWATER, MAY 2018

N STANDARD PENETRATION RESISTANCE, IN BLOWS PER FOOT

50/1" 50 HAMMER BLOWS TO ADVANCE SAMPLING TOOL ONE INCH

ST SHELBY TUBE

WH BORING ADVANCED UNDER STATIC WEIGHT OF DRILL HAMMER & ROD

Kh HORIZONTAL COEFFICIENT OF PERMEABILITY, IN FEET PER DAY

Kv VERTICAL COEFFICIENT OF PERMEABILITY, IN FEET PER DAY

W MOISTURE CONTENT, IN PERCENT

–200 PERCENT OF FINES PASSING THE U.S. No. 200 SIEVE

Andreyev Engineering, Inc.

PRELIMINARY GEOTECHNICAL & HYDROGEOLOGICAL INVESTIGATION

SUNBRIDGE UTILITY PLANT

OSCEOLA COUNTY, FL

SOIL PROFILES

APPROXIMATE SCALE:	DATE: 08/08/18	ENGINEER: JE
1"=10'	PN: APGT–18–057	DRAWN BY: DLS

FIGURE 5

APPENDIX C

SUNBRIDGE NED WASTEWATER MASTER UTILITY PLAN

(PROVIDED SEPARATELY)

APPENDIX D

SUNBRIDGE NED RECLAIMED WATER MASTER UTILITY PLAN

(PROVIDED SEPARATELY)

APPENDIX E

ENVIRONMENTAL CONDITIONS REPORT

BDA
ENVIRONMENTAL CONSULTANTS

2015077-240

ENVIRONMENTAL CONDITIONS REPORT FOR THE APPLICATION FOR AN ENVIRONMENTAL RESOURCE PERMIT FOR THE WATER AND WASTEWATER FACILITY PROJECT SITE, SUNBRIDGE/NORTHEAST DISTRICT PROPERTY, OSCEOLA COUNTY, FLORIDA

Submitted to:

Mr. Jason Andreotta
Florida Department of Environmental Protection
Director of District Management
Central District
Suite 232
3319 Maguire Boulevard
Orlando, Florida 32803
Phone: 561-681-6639

On behalf of:

Mr. James L. Zboril
Tavistock East Services, LLC
Suite 200
6900 Tavistock Lakes Boulevard
Orlando, Florida 32827
Phone: 407-313-8264

July 2, 2019

Submitted by:

D. Dale Dowling, B.S.
Principal Scientist

W. Michael Dennis, Ph.D.
President

BREEDLOVE, DENNIS & ASSOCIATES, INC.

☑ 330 W. Canton Ave. ~ Winter Park, FL 32789-3195
Phone: 407-677-1882 ~ Fax: 407-657-7008

☐ 30 East Liberty St. ~ Brooksville, FL 34601-2910
Phone: 352-799-9488 ~ Fax: 352-799-9588

TABLE OF CONTENTS

1.0 INTRODUCTION

Tavistock East II, LLC is seeking a Mass Grade Construction Environmental Resource Permit (ERP) through the Florida Department of Environmental Protection (FDEP) for the proposed regional water and wastewater treatment facility (WTP) located within Phase I West of the overall Sunbridge/Northeast District (NED) property. The WTP site consists of approximately 23.15 acres located in Sections 12 and 13, Township 25 South, Range 31 East, of Osceola County, Florida (Exhibit 1). An aerial photograph depicting the project is included as Exhibit 2.

The WTP site has been reviewed by Breedlove, Dennis & Associates, Inc. (BDA) scientists to evaluate existing conditions. The review consisted of an on-site assessment of the vegetative communities, hydrologic conditions, and wildlife utilization; as well as a review of maps and ancillary documents including, the Natural Resources Conservation Service (NRCS) soils map, U.S. Geological Survey topographic map, and aerial photography. A review of existing databases for species of wildlife and plants listed for protection under provisions of the Endangered Species Act (ESA) and Florida rules (11, 20) was also conducted to document the occurrence of wildlife or plant species listed as Threatened or Endangered (T&E) by the U.S. Fish and Wildlife Service (USFWS) and wildlife listed as State-designated Threatened (ST) or State Species of Special Concern (SSC) by the Florida Fish and Wildlife Conservation Commission (FWC).

The project consists of the construction of a proposed regional WTP and associated Surface Water Management System (SWMS). The work will be conducted in uplands with the exception of a 0.16 acre of surface water ditch impact. No mitigation is proposed.

This application provides an overview of the project with documentation of the current environmental conditions, soils and hydrologic information, and the occurrence or potential for occurrence of T&E and plant species. Design and engineering information for the project has been prepared and submitted by Poulos & Bennet, LLC.

2.0 ECOLOGICAL CONDITIONS

Breedlove, Dennis & Associates, Inc. scientists reviewed the WTP site in order to gather information relative to the vegetative community structure. Data was collected regarding habitat conditions and the occurrence and/or likelihood of occurrence for fish, wildlife, and T&E species on the site.

The on-site land use and vegetative cover types were classified by BDA scientists through selective groundtruthing during field investigations and aerial photo-interpretation to characterize the habitats and provide the basis for an assessment of the occurrence or potential for occurrence of listed wildlife and plant species. The characterization of the vegetative communities and land use types was based on the Florida Land Use, Cover and Forms Classification System (FLUCFCS) (12) (Exhibit 3). The following describes the general composition and conditions of the various community types identified within the project. Botanical nomenclature (scientific names), as presented in this report, is per Wunderlin et al.

2.1 Vegetative Communities

The project site consists of 23.15 acres which includes 22.95 acres of uplands, 0.18 acre of surface waters and 0.02 acre of wetlands.

2.1.1 Uplands

The 22.95 acres of uplands on the WTP site consisted of the Live Oak -427 community. This cover type included a canopy of live oak (*Quercus virginiana*) and slash pine (*Pinus elliottii*); gallberry (*Ilex glabra*) and saw palmetto (*Serenoa repens*) dominated the understory. Groundcover species included narrowleaf silkgrass (*Pityopsis graminifolia*), slender flattop goldenrod (*Euthamia caroliniana*), broomsedge

bluestem (*Andropogon virginicus*), big carpetgrass (*Axonopus furcatus*), Michaux's croton (*Croton michauxii*), variable witchgrass (*Dichanthelium commutatum*), blackroot (*Pterocaulon pycnostachyum*), Elliott's milkpea (*Galactia elliottii*), and reindeer lichen (*Cladonia* sp.). A level four FLUCFCS has been designated within the Live Oak cover type. The designation was requested by Osceola County and identifies areas of large-diameter live oak with little to no understory.

2.1.2 Wetlands and Surface Waters

Wetland and surface water communities within the site comprised approximately 0.20 acre, consisting of 0.18 acre of Ditch/Swale - 516 and 0.02 acre of Wetland Forested Mixed - 630. The extent of wetlands presented herein is based on the South Florida Water Management District (SFWMD) approved Formal Wetland Determination No. 160622-6.

The Ditch/Swale cover type comprised approximately 0.18 acre and was installed as part of historic land uses. The vegetation is variable and dependent on the depth of hydrology but characterized in general by bandanna of the Everglades (*Canna flaccida*), frogbite (*Limnobium spongia*), torpedograss (*Panicum repens*), pickerelweed (*Pontederia cordata*), arrowhead (*Sagittaria* sp.), and lizard's tail (*Saururus cernuus*).

The Wetland Forested Mixed - 630 community comprised approximately 0.02 acre of the project. This forested cover type was typically characterized by a canopy of species such as cypress (*Taxodium* sp.), swamp tupelo (*Nyssa sylvatica* var. *biflora*), red maple (*Acer rubrum*), dahoon (*Ilex cassine*), laurel oak (*Quercus laurifolia*), sweetbay (*Magnolia virginiana*), loblolly bay (*Gordonia lasianthus*), and swamp bay (*Persea palustris*), with varying densities of pine (*Pinus* sp.). Additional vegetative species

associated with this cover type included species such as swamp fern (*Blechnum serrulatum*), Virginia chain fern (*Woodwardia virginica*), lizard's tail, blue maidencane (*Amphicarpum muhlenbergianum*), and cinnamon fern (*Osmunda cinnamomea*). This cover type is located along the fire suppressed edge of Wetland W1d and is part of the wetland buffers subject to future mitigation. This cover type is not part of the proposed impacts.

2.2 Soils

Soils on the site are depicted on Exhibit 4. The Soil Survey Geographic database (34) created by the U.S. Department of Agriculture, NRCS, for Osceola County, Florida, identifies the following soil types as occurring within the project: Immokalee fine sand, No. 16; Myakka fine sand, zero to two percent slopes, No. 22.

2.3 Protected Wildlife and Plants

Species of wildlife and plants listed for protection under provisions of the ESA of 1973, as amended (6) and wildlife species listed for protection under provisions of the Florida Rule (Chapter 68A-27.0001-27.007, Florida Administrative Code [F.A.C.]) (20) (Listed Species) known to occur within Osceola County, Florida, are represented in Exhibit 5.

The likelihood of occurrence for Listed Species is based on a comparison of known general habitat requirements by these species with the habitats found on or near the site; the quantity, quality, and adjacency of these habitats; as well as any observations of these species during field investigations. The likelihood of occurrence for Listed Species referenced in this report was rated as high, moderate, low, unlikely, or not applicable based on knowledge of a species' habitat preference and site conditions. A

likelihood of occurrence given as "unlikely" indicates that no, or very limited, suitable habitat for this species exists on-site, but the site is within the documented range of the species; "not applicable" indicates that the habitat for this species does not exist on or adjacent to the site.

Amphibians/Reptiles

Eastern Indigo Snake (Federally Threatened [FT], FWC; Threatened [T], USFWS): The eastern indigo snake (*Drymarchon corais couperi*) is classified as FT by the FWC and T by the USFWS. Eastern indigo snakes are found in a variety of habitats throughout Florida and occasionally utilize wetland habitats and the burrows of other animals, including gopher tortoise (*Gopherus polyphemus*) burrows. They have relatively large home ranges and apparently require a mosaic of habitats to complete their life cycle, often feeding along wetland edges. Florida Fish and Wildlife Conservation Commission habitat models (5, 7, 9, 14) indicate that the majority of the site was mapped as potentially suitable eastern indigo snake habitat. The USFWS provides an *Effects Determination Key for the Eastern Indigo Snake* (39) to evaluate project impacts. The *Standard Protection Measures for the Eastern Indigo Snake* (40) will be employed during all construction activities to minimize potential adverse effects from construction to the eastern indigo snake. Eastern indigo snakes have not been observed on the site, but they have a moderate potential for occurrence based on the presence of a mix of habitats adjacent to the proposed project and the high likelihood of occurrence of gopher tortoise burrows.

Gopher Tortoise (ST, FWC; Candidate, USFWS): The gopher tortoise is listed as ST by the FWC but is not listed as T or Endangered by the USFWS. However, the USFWS determined in their most recent 12-month finding that listing of the gopher tortoise as a threatened species in the eastern portion of its range is warranted under the ESA of 1973, as amended. Listing of the gopher tortoise at present is

precluded by higher priority actions and the species was added to the candidate species list with the publication of the 12-month finding. Gopher tortoise burrows have been observed on the site. Florida Fish and Wildlife Conservation Commission potential habitat models (5, 7, 9, 14) indicate that the uplands within the project area were mapped as habitats potentially suitable for gopher tortoises. FWC models also indicate the presence of larger areas of potential gopher tortoise habitat contiguous with the proposed project. A 100% survey of areas of suitable gopher tortoise habitat was conducted on May 17, 2019, in accordance with the Gopher Tortoise Permitting Guidelines (21) to conclusively determine the population size and distribution of gopher tortoises. Eight gopher tortoise burrows were observed on the site during the May 17, 2019, census. An FWC Conservation Permit will be obtained prior to any land alteration.

Sand Skink and Bluetail Mole Skink (FT, FWC; T, USFWS): The sand skink (*Neoseps [=Plestiodon] reynoldsi*) and bluetail mole skink (*Eumeces [=Plestiodon] egregius lividus*) are classified as FT by the FWC and T by the USFWS. The USFWS issued the revised *Peninsular Florida Species Conservation and Consultation Guide for Sand and Bluetail Mole Skinks* (Guidelines) on February 7, 2012. The Guidelines establish a consultation area for the sand skink and bluetail mole skink that includes the seven counties in which the documented range exists for those species. Osceola County is one of those counties; however, the site is not located within the USFWS consultation area. In addition, the site is not located within the range for the sand skink and bluetail mole skink as indicated by Christman (2, 3) and is not within areas that meet the USFWS criteria for sand skink surveys based on soil types, counties of occurrence, and elevation. The Guidelines generally describe suitable habitat as specific loose soil types occurring above 82 feet above sea level under natural and degraded cover types that include the on-site

uplands. However, the site elevations do not meet the criteria. Sand skinks are unlikely to occur on the project site based on the absence of suitable habitat conditions.

Birds

Audubon's Crested Caracara (FT, FWC; T, USFWS): The Audubon's crested caracara (*Caracara plancus audubonii*) is listed as FT by FWC and T by USFWS. The site is located within the USFWS consultation area for crested caracaras and is within the northern extent of the breeding range of the crested caracara as mapped by Layne (26). The crested caracara is a bird of open xeric to mesic habitat, primarily native prairie habitats and associated wetlands, cabbage palms (*Sabal palmetto*), and cabbage palm-live oak hammocks. The bulk of the population is found in south central Florida on large cattle ranches with improved pasture. The nearest records of caracara nests and sightings are located more than 13 miles southwest of the project between Lakes Toho and Kissimmee. Preferred habitat conditions, such as improved pasture with mature cabbage palms, are not present in the vegetative composition of the site. Therefore, there is a low likelihood that the site could support nesting caracaras.

Bald Eagle: Recovery goals have been achieved for this species; therefore, the bald eagle (*Haliaeetus leucocephalus*) is no longer listed or protected under the ESA of 1973, as amended. The bald eagle was also removed from Florida's Endangered and Threatened Species List. The bald eagle is protected under provisions of the Bald and Golden Eagle Protection Act (BGEPA) (1) and the Migratory Bird Treaty Act (28). The USFWS implemented the National Bald Eagle Management Guidelines (National Guidelines) (37) to assist private landowners and others to minimize the likelihood of causing "disturbance" to bald eagles, as defined under the BGEPA. For activities that cannot be conducted consistent with the National

Guidelines, coordination with the USFWS for guidance should be conducted prior to undertaking any activity that may result in "disturbance" of bald eagles.

Breedlove, Dennis & Associates, Inc. scientists reviewed the FWC Eagle Nesting locations database (15) to determine the historic documented locations of all nests that occur on or in close proximity to the project site. The FWC database does not include records of a bald eagle nest on or within 660 feet of the site. The nearest recorded bald eagle nest (No. OR029) is located approximately 1.50 miles northwest of Sunbridge at NED near Lake Hart, was last known active during the 2011 nesting season, and was last surveyed in 2016 (Figure 6). Development activities occurring beyond 660 feet from active bald eagle nests will be in compliance with the National Guidelines. No bald eagles or bald eagle nests were observed during field investigations, therefore, no impact or disturbance to nesting bald eagles is expected. Surveys for bald eagles will be repeated prior to land clearing activities.

Everglade Snail Kite (Federally Endangered [FE], FWC; E, USFWS): The Everglade snail kite (*Rostrhamus sociabilis plumbeus*) is classified as FE by the FWC and E by the USFWS. The site is located within the USFWS consultation area for the snail kite. However, the site is not located within the historic breeding range of the snail kite as mapped by Rodgers (30). Snail kites nest in shrub-dominated wetlands associated with lakes, rivers, and extensive wetland systems in central and south Florida. Snail kites will occasionally nest in herbaceous wetlands when wetland shrubs are lacking as long as hydrologic conditions are suitable. Snail kites feed almost exclusively on Florida apple snails (*Pomacea paludosa*) by aerially hunting and capturing snails found on emergent vegetation in relatively shallow open water systems. There are numerous records of Everglade snail kite nests in the herbaceous wetlands

surrounding Lake Tohopekaliga, approximately 11 miles southwest of the site. Everglade snail kites are unlikely to occur on the site based on the absence of suitable habitat conditions.

Florida Sandhill Crane (ST, FWC): The Florida sandhill crane is listed as ST by the FWC. The greater sandhill crane (*Grus canadensis*) also occurs in Florida as a wintering migrant, arriving in Florida during October and November and beginning spring migration in late February (33). Florida sandhill cranes nest in shallow, emergent palustrine wetlands, particularly those dominated by pickerelweed and maidencane (*Panicum hemitomon*). They feed in a variety of open, upland habitats, mostly prairies, but also human-manipulated habitats such as sod farms, ranchlands, pastures, golf courses, airports, and suburban subdivisions (29, 42). Home ranges of individual pairs overlap with those of adjacent pairs, and average approximately 1,100 acres. Core nesting territories within home ranges vary from approximately 300 acres to 625 acres and are aggressively defended from other cranes (*Antigone* sp.) (42). Although there are no nest records within the project site, the site is within a Breeding Bird Atlas (BBA) block in which Florida sandhill cranes were observed nesting (25). No sandhill crane nests were observed on the project site. The likelihood of nesting for the Florida sandhill crane is unlikely; however, there is a moderate likelihood that Florida sandhill cranes forage on the site.

Florida Scrub-Jay (FT, FWC; T, USFWS): The Florida scrub-jay (*Aphelocoma coerulescens*) is listed as FT by FWC and T by USFWS. The WTP site is located within the USFWS consultation area for Florida scrub-jays; however, available databases contain no records of Florida scrub-jay territories within the site's vicinity (16, 24). The nearest database occurrence record for scrub-jays is approximately 1.5 miles northwest of the site within the Split Oak Forest Mitigation Park in Orange County from 1995. Although 85% of documented Florida scrub-jay dispersal is within two miles of the natal territory, scrub-

jays may occasionally disperse up to five miles to establish territories of their own (10, 32). Recolonization of vacant patches of habitat rarely occurs beyond about 7.4 miles (31). Florida scrub-jay territories that are within 7.4 miles of one another are considered to be members of the same metapopulation (32, 33). This information suggests that the project is within dispersal distance of recorded Florida scrub-jay territories. Based on the FWC habitat models (5, 7) and site investigations, no habitat exists for the Florida scrub-jay on the site. Therefore, Florida scrub-jays are unlikely to occur within the WTP site.

Red-Cockaded Woodpecker (FE, FWC; E, USFWS): The red-cockaded woodpecker (*Picoides borealis*) is listed as a FE by FWC and E by USFWS. The site is located within the USFWS consultation area for red-cockaded woodpeckers. Based on the Florida Natural Areas Inventory (FNAI) data for Osceola County, no records of red-cockaded woodpecker family groups or cavity trees are documented in the vicinity of the site. However, based on the FNAI data for Orange County, there are numerous records of red-cockaded woodpecker cavity trees on the TM Mitigation Bank and the TM Ranch-TM Econ Mitigation Area approximately 2.8 miles northeast of the site. The red-cockaded woodpecker groups in the TM Ranch Mitigation Bank comprise a connected and small but viable population of red-cockaded woodpeckers. Female red-cockaded woodpeckers usually disperse no further than two miles to establish territories of their own in areas where populations are dense; but in areas where populations are sparsely distributed, females may disperse up to 15 miles (36). Foraging habitat comprised of open stands of pines greater than a 10-inch diameter at breast height that typically occurs within 0.5 mile of clusters of cavity trees, and gaps in foraging habitat usually do not exceed 200 feet (36). The site is not within the typical 0.5-mile foraging distance around recorded red-cockaded woodpecker groups northeast of the site or within normal dispersal distances of female red-cockaded woodpeckers. No red-cockaded woodpeckers

or cavity trees were observed on or within the vicinity of the site area during field investigations. Since the site is not within foraging distance for red-cockaded woodpeckers and no potential habitat exists on the site, it is unlikely that red-cockaded woodpeckers occur.

Southeastern American Kestrel (ST, FWC): The southeastern American kestrel (*Falco sparverius paulus*) is listed as ST by FWC. Two subspecies of American kestrels (*Falco sparverius*) occur in Florida, the eastern American kestrel (*Falco sparverius sparverius*) and the southeastern American kestrel. The eastern American kestrel winters in Florida, arriving in September and leaving during March/April (33). The southeastern American kestrel is a permanent resident in Florida. Southeastern American kestrels and eastern American kestrels co-occur in Florida during the winter and are virtually indistinguishable in the field. According to the FWC Imperiled Species Management Plan (ISMP) (17), the site is not located within or in the vicinity of the primary or secondary Kestrel Management Units. In addition, available databases including the Florida BBA contain no occurrence records of southeastern American kestrels on or near the site. Based on the FWC ISMP database and scientific literature, there is a low probability for the southeastern American kestrel to occur on the site.

Wading Bird Rookeries (1999): The FWC wading bird rookery database from the 1999 statewide survey (13) and the FWC database (23) active wading bird colonies contain no records of rookeries used by listed species of wading birds on the site (Exhibit 6). The nearest wading bird rookery (No. 612037) is located 2.3 miles north of the site. The active rookery contained nests of species listed as ST by the FWC during the 1999 statewide survey. There are no additional records of wading bird rookeries within 9.3 miles of the site that were known to be active in 1999 or that were documented as active within the last five years (23). Listed species of wading birds will fly up to approximately 9.3 miles from the nesting

site to forage in wetlands and return food to incubating adults and nestlings (5). Wetlands within 9.3 miles of the rookeries of listed wading bird species are considered important to wading bird nesting success. Due to the limited acreage and quality of foraging habitat, there is a low likelihood for wading birds to forage on the site.

Wood Stork (FT, FWC; T, USFWS): The wood stork (*Mycteria americana*) is listed as a FT by FWC and T by USFWS. The USFWS uses a regulatory tool known as the Core Foraging Area (CFA) to determine the potential effects of development activities on wood stork colonies that have been active within ten years of initiation of consultation. The CFA in Osceola County, Florida, has been determined by the USFWS South Florida Ecological Services Office in Vero Beach as a circle, 18.6 miles in radius, around a nesting colony (38). The site is located within the 18.6-mile CFA of three known wood stork colonies that have been active in the last 10 years (Exhibit 6). The Lake Mary Jane colony is located approximately 2.3 miles north of the WTP site and was last known to be active in 2017. The Lake Conlin colony is located approximately 6.5 miles to the southeast and was last known to be active in 2013. The Gatorland colony is located approximately 12.6 miles west of the site and was last known to be active in 2017. The suitability of on-site wetlands as foraging habitat was evaluated to determine the potential effects of the proposed project on these colonies. The USFWS describes suitable wood stork foraging habitat (SFH) as "...any area containing open (<25% aquatic vegetation), calm water, and having a permanent or seasonal water depth between two and 15 inches (five to 38 cm) deep. Stork foraging habitat supports and concentrates, or is capable of supporting and concentrating small fish, frogs, and other aquatic prey. Examples of SFH include, but are not limited to, freshwater marshes and stock ponds, shallow, seasonally flooded roadside or agricultural ditches, narrow tidal creeks or shallow tidal pools, managed impoundments, and depressions in cypress heads and swamp sloughs" (38) Due to the

limited acreage and quality of foraging habitat, there is a low likelihood that wood storks will forage on the site.

Mammals

Southern Fox Squirrel: The Sherman's Fox Squirrel has been determined to not be a separate species from the Southern Fox Squirrel; therefore, both the common name and scientific name have been revised. Effective December 2018 the Sherman's fox squirrel (*Sciurus niger shermani*) was removed from the Florida Endangered and Threatened species list. However, take of the southern fox squirrel is still prohibited pursuant to Chapter 68A-29.002 F.A.C. (22). Take is defined as the species or their young, homes, dens or nests shall not be taken, transported, stored, served, bought, sold or possessed in any manner at any time unless specifically permitted except as authorized in Commission-approved guidelines or by permit from the executive director.

Suitable nesting habitat for the southern fox squirrel occurs on the WTP site. No fox squirrels or their nests were observed during the on-site investigations. Prior to land clearing, surveys will be conducted in accordance with the FWC ISMP Sherman's Fox Squirrel Species Guidelines. If any active nests are documented in the future, coordination with the FWC will be initiated to address any potential impacts that may occur to southern fox squirrels.

3.0 PROPOSED PROJECT

The WTP project site consists of approximately 23.15 acres located within the NED Element of the Osceola County Comprehensive Plan. The project will provide regional drinking water, wastewater and utilities infrastructure, and along with the associated SWMS. The SWMS will provide adequate storage and treatment of stormwater runoff pursuant to ERP stormwater treatment criteria. Construction of the site will occur in the uplands, with the exception of a 0.16-acre of surface water/ditch impact. No mitigation is proposed for the surface water impact. A total of 3.71 areas of buffers with an average width of 50 feet are provided to address indirect effects, should they occur, from the project on adjacent wetland functions (Exhibit 7).

The engineering and stormwater management design has been prepared by Poulos & Bennet, LLC, as part of this ERP application and provides complete detail on the proposed project and SWMS. The proposed SWMS will provide water quality treatment for project and will more than replace the wildlife habitat functions provided by the 0.16-acre surface water/ditch.

Table one from Form 62-330.060(1) Section C and both the ERP Applicant's Handbook Volume I (A.H. Volume 1), effective October 1, 2013, and the SFWMD Applicant's Handbook Volume II, implemented October 1, 2013, is provided as Exhibit 8. This table provides a summary of the acreage of surface waters and wetlands present on the WTP site.

4.0 ENVIRONMENTAL RESOURCE PERMIT REVIEW AND ISSUANCE CRITERIA

The A.H. Volume I list the environmental criteria for issuance of an ERP.

4.1 Environmental Conditions for Issuance

The A.H. Volume I (Section 10.1.1) lists seven conditions for the issuance of an ERP. The applicant provides, through this permit application, reasonable assurances that all seven conditions will be met.

1. **A regulated activity will not adversely impact the value of functions provided to fish, wildlife and listed species, including aquatic and wetland-dependent species, by wetlands and other surface waters.**

   Listed Species with potential for occurrence on the site is discussed in Section 2.4. The gopher tortoise was the only Listed Species documented to occur on the site. Gopher tortoises will be relocated to a permitted gopher tortoise recipient site in accordance with the FWC Gopher Tortoise Permitting Guidelines. Any functions provided by the surface waters will be replaced by the SWMS. Therefore, no adverse impacts to the value of functions provided to fish, wildlife, listed species, or aquatic and wetland dependent species are expected.

2. **A regulated activity located in, on, or over wetlands or other surface waters, will not be contrary to the public interest, or if such an activity significantly degrades or is located within an Outstanding Florida Water (OFW), that the regulated activity will be clearly in the public interest.**

   The proposed project will provide a regional water and wastewater facility that will benefit the surrounding region. The proposed project has been designed to meet local standards, comply

with local regulations, and comply with the stormwater management criteria of the FDEP. The WTP site is not located within an OFW nor will it significantly degrade an OFW.

3. **A regulated activity will not adversely affect the quality of receiving waters such that the water quality standards set forth in Chapters 62-3, 62-4, 62-302, 62-520, 62-522 and 62-550, F.A.C., including any antidegradation provisions of Sections 62-4.242(1)(a) and (b), 62-4.242(2) and (3), and 62-302.300 and any special standards for OFWs and Outstanding National Resource Waters set forth in Sections 62-4.242(2) and (3), F.A.C., will be violated.**

Development of the proposed site will not adversely affect the quality of receiving waters. The appropriate pollution abatement, stormwater attenuation, and flood control will be provided pursuant to the stormwater management criteria of the FDEP.

4. **A regulated activity located in, adjacent to or in close proximity to Class II waters or located in waters classified by the Department as approved, restricted, or conditionally restricted for shellfish harvesting pursuant to Chapter 16R-7, F.A.C., will comply with the additional criteria in Section 10.2.5 of the Handbook.**

The WTP site is not adjacent to, or in close proximity of, a Class II water, nor is it located within areas utilized for shellfish harvesting.

5. **The construction of vertical seawalls in estuaries and lagoons will comply with the additional criteria in Section 10.2.6 of the Handbook.**

The construction plans for the area subject to modification do not include any vertical seawalls. Furthermore, the project site is not located within an estuary or lagoon.

6. **A regulated activity will not cause adverse secondary impacts to the water resources.**

The proposed project's stormwater design will meet the FDEP's criteria for pollution abatement and storm water attenuation. Therefore, the physical, chemical, and biological treatment processes for stormwater discharge will occur within the proposed stormwater pond. Other Best Management Practices (BMPs) including, but not limited to, the construction of swales, erosion and sediment control structures, and turbidity barriers will be used to ensure sedimentation pollution will either be eliminated or maintained within acceptable limits. The contractor shall be responsible for providing these temporary erosion and sedimentation control measures during construction or until final controls become effective.

7. **A regulated activity will not cause unacceptable cumulative impacts upon wetlands and other surface waters.**

Development of the WTP site is not anticipated to cause unacceptable cumulative impacts to wetlands or other surface waters. The functions provided by the upland cut ditch (D4) will be fully replaced by the SWMS, thereby avoiding unacceptable cumulative impacts. The SWMS will meet all water quality and quantity criteria of the FDEP to prevent any cumulative impacts to the receiving waters.

4.2 Elimination or Reduction of Impacts

Pursuant to Section 10.2.1 of the A.H. Volume I, the following factors are considered in determining whether an application will be approved by the Agency: the degree of impact to wetland and other surface water functions caused by a proposed activity; whether the impact to these functions can be

mitigated; and the practicability of design modifications for the site that could eliminate or reduce impacts to these functions, including alignment alternatives for a proposed linear system.

The proposed project activities result in the impact to 0.16 acre of surface water/ditches. No mitigation is proposed. The SWMS will provide functional value and habitat greater than the 0.16 area impact. There are no practicable design modifications that need to be considered.

4.3 Fish, Wildlife, Protected Species, and Their Habitats

Pursuant to the criteria stated in Section 10.2.2 of the A.H. Volume I, the proposed project provides reasonable assurance that development will not cause adverse impacts to:

(a) the abundance and diversity of fish, wildlife, listed species, and the bald eagle, which is protected under the BGEPA, 16 U.S.C. 668-668d (April 30, 2004); and

(b) the habitat of fish, wildlife, and listed species.

As discussed in Section 2.4 of this report, appropriate measures have been taken to minimize impacts to listed wildlife species. The listed species of wildlife documented on the site include gopher tortoise. A 100% survey of all areas of suitable gopher tortoise habitat was conducted on May 17, 2019. A conservation permit and gopher tortoise relocation effort will be conducted prior to development in accordance with the FWC Gopher Tortoise Permitting Guidelines. Therefore, the proposed project will not cause adverse impacts to fish, wildlife, Listed Species, or their habitats. See also Sections 4.1 and 4.7.

4.3.1 Habitat Review Factors

Section 10.2.2.3 of the A.H. Volume I provide five criteria for the FDEP to consider when assessing the value of functions that any wetland or other surface water provides to fish, wildlife, and listed species. Responses to the five criteria are summarized below and demonstrate the proposed project will not impact the values of wetlands or other surface waters so as to cause adverse impacts to the abundance, diversity, and habitat of fish, wildlife, and listed species.

A. *Condition* — The WTP site is located primarily in uplands. The SWMS will provide greater value than the 0.16 acre of impact to the upland cut ditch proposed for impact by the project. Impacts have been reduced to the greatest extent practicable (refer to Section 4.3).

B. *Hydrologic Connection* — The SWMS has been designed pursuant to the criteria of the FDEP.

C. *Uniqueness* —There are no unique floral components within the WTP project area based on the site investigations. See Section 2.3 for a discussion of faunal components noted during the on-site investigations.

D. *Location* — The WTP site is located within the Urban Growth Boundary for Osceola County and has been reviewed and approved for regional development.

E. *Fish and Wildlife Utilization* — The surface water provides moderate to less than optimal habitat for resting, feeding, breeding, nesting or denning by fish and wildlife. No listed species were observed within the on-site surface water. The construction of stormwater ponds as part of the

SWMS will provide suitable foraging habitat for wetland-dependent wildlife species post-development.

4.4 Water Quantity

Pursuant to Section 10.2.2.4 of the A.H. Volume I, the development of the site will not result in any adverse impacts to water quantity characteristics of the wetlands. The SWMS will be utilized to maintain and further establish the WTP site's drainage and provide floodwater storage.

4.5 Public Interest Test

Section 10.2.3 of the A.H. Volume I provide seven criteria for the SFWMD to determine whether a project is not contrary to the public interest or, if such an activity significantly degrades or is within an OFW, that the regulated activity is clearly in the public interest. Summarized below are responses to the seven criteria, which demonstrate the proposed development of the site is not contrary to the public interest.

1. **Whether the regulated activity will adversely affect the public health, safety, or welfare or the property of others.**

   The proposed project will be designed to meet applicable local, state, and federal regulations. Therefore, development of the project will not adversely affect the public health, safety, welfare, or the property of others.

2. **Whether the regulated activity will adversely affect the conservation of fish and wildlife, including endangered or threatened species, or their habitats.**

During on-site investigations, observations were made to determine which wildlife species utilize the WTP site, and which species have the potential to occur on the site. The results of these observations are discussed in Sections 2.3 and 4.1 of this report. Based on these observations, development of the WTP site will not adversely affect the conservation of fish and wildlife, or their habitats. Appropriate management strategies will be determined for any Listed Species, as necessary, if affected by site development and consultations with the appropriate agencies will be conducted as needed.

3. **Whether the regulated activity will adversely affect navigation or the flow of water or cause harmful erosion or shoaling.**

No navigable water bodies exist within the WTP project limits. Development will be designed in accordance with FDEP permitting criteria, which require post-development water volumes and flows to be equal to pre-development water volumes and flows. No harmful erosion or shoaling should occur as a result of the development. Therefore, this proposed project will not adversely affect navigation or the flow of water or cause harmful erosion or shoaling.

4. **Whether the regulated activity will adversely affect the fishing or recreational values or marine productivity in the vicinity of the activity.**

Water quality, flows, and volumes for the proposed project will be designed to meet all applicable state permitting criteria. The SWMS will be designed to provide water quality treatment to ensure no degradation of off-site waters occurs. In addition, there will be no significant adverse changes in flows and volumes of water, as required by the FDEP permitting criteria.

The parcels are inland; therefore, there are no marine productivity functions provided. As such, the proposed project will not adversely affect the fishing or recreational values or marine productivity in the vicinity of the subject property.

5. **Whether the regulated activity will be of a temporary or permanent nature.**

Development will be of a permanent nature.

6. **Whether the regulated activity will adversely affect or will enhance significant historical and archaeological resources under the provisions of Section 267.061, F.S.**

An archaeological review of the overall Sunbridge/NED site was conducted, and no significant historical or archaeological resources were discovered. A report was submitted to the Florida Department of State, Division of Historical Resources (DHR). This proposed project is not expected to adversely affect significant historical and archaeological resources.

7. **The current condition and relative value of the functions being performed by areas affected by the proposed regulated activity.**

Based on field investigations, the proposed project is not expected to adversely affect the value of functions provided to fish, wildlife, and Listed Species; including, aquatic and wetland-dependent species. Any loss of functions being performed by the surface water to be impacted will be offset and/or replaced by development of the SWMS.

4.6 Water Quality

Pursuant to Section 10.2.4 of the A.H. Volume I, an applicant must provide reasonable assurance the regulated activity will not violate water quality standards in areas where water quality standards apply. In accordance with the conceptually approved SFWMD permit, the SWMS to be constructed for the proposed project will meet the requirements and standards of the FDEP and BMPs will be utilized to ensure water quality criteria will not be violated.

4.7 Secondary Impacts

Section 10.2.7 of the A.H. Volume I provide four criteria for the FDEP to determine whether a regulated activity will cause adverse secondary impacts to the water resource. Responses to the four criteria are summarized below and demonstrate the development of the proposed project will not cause adverse secondary impacts to the water resource.

1. Impacts to Water Quality

The proposed project will comply with all water quality design criteria and, therefore, should provide reasonable assurance there will not be any secondary impacts to the water quality functions of the remaining wetlands adjacent to the site resulting from the construction of the project. Best Management Practices will be utilized to ensure water quality criteria will not be violated during the short-term construction and long-term operation of the SWMS.

2. Impacts to Upland Habitat for Bald Eagles or Aquatic and Wetland-Dependent Listed Species

The nearest recorded bald eagle nest, No. OR029, is located approximately 1.5 miles northwest of the WTP site. Therefore, consistent with the National Guidelines, adverse impacts to bald eagles is not expected. The SWMS and extensive wetland preservation and enhancement detailed in the conceptually approved mitigation and habitat management plan will provide nesting habitat for Florida sandhill crane and wading birds.

3. Impacts to Historical and Archaeological Resources

An archaeological review of the overall Sunbridge/NED site was conducted, and no significant historical or archaeological resources were discovered. A report was submitted to the Florida Department of State, DHR. This proposed project is not expected to adversely affect significant historical and archaeological resources.

4. Impacts to Wetland and Surface Water Functions as a Result of Future Phases or System Expansions

The site is located within the conceptually permitted Phase 1 West project (Permit No. 49-02650-P). Future phases or system expansions associated with the Sunbridge development will be permitted separately and impacts to wetland and surface water functions will be addressed within those applications.

4.8 Cumulative Impacts

Please refer to section 4.1-7.

5.0 MITIGATION

A total of 0.16 acre of surface water/ditches will be impacted as the result of the development of the WTP site. The SWMS will provide foraging habitat for wildlife. No mitigation is proposed or required.

6.0 REFERENCES

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EXHIBIT 1

LOCATION OF THE WATER AND WASTEWATER FACILITY PROJECT SITE, OSCEOLA COUNTY, FLORIDA

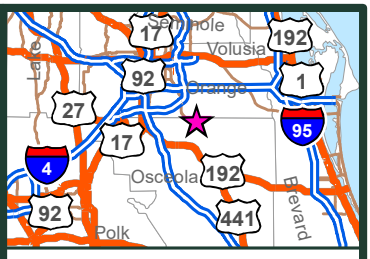
Source: Project boundary provided by Poulos and Bennett; 2019-04-23.

Legend

Project Boundary

Sections 12 and 13, Township 25 S., Range 31 E.

USGS NARCOOSSEE, Fla. Quadrangle (7½ Minute Topographic Map)



0 1,000 2,000 Feet

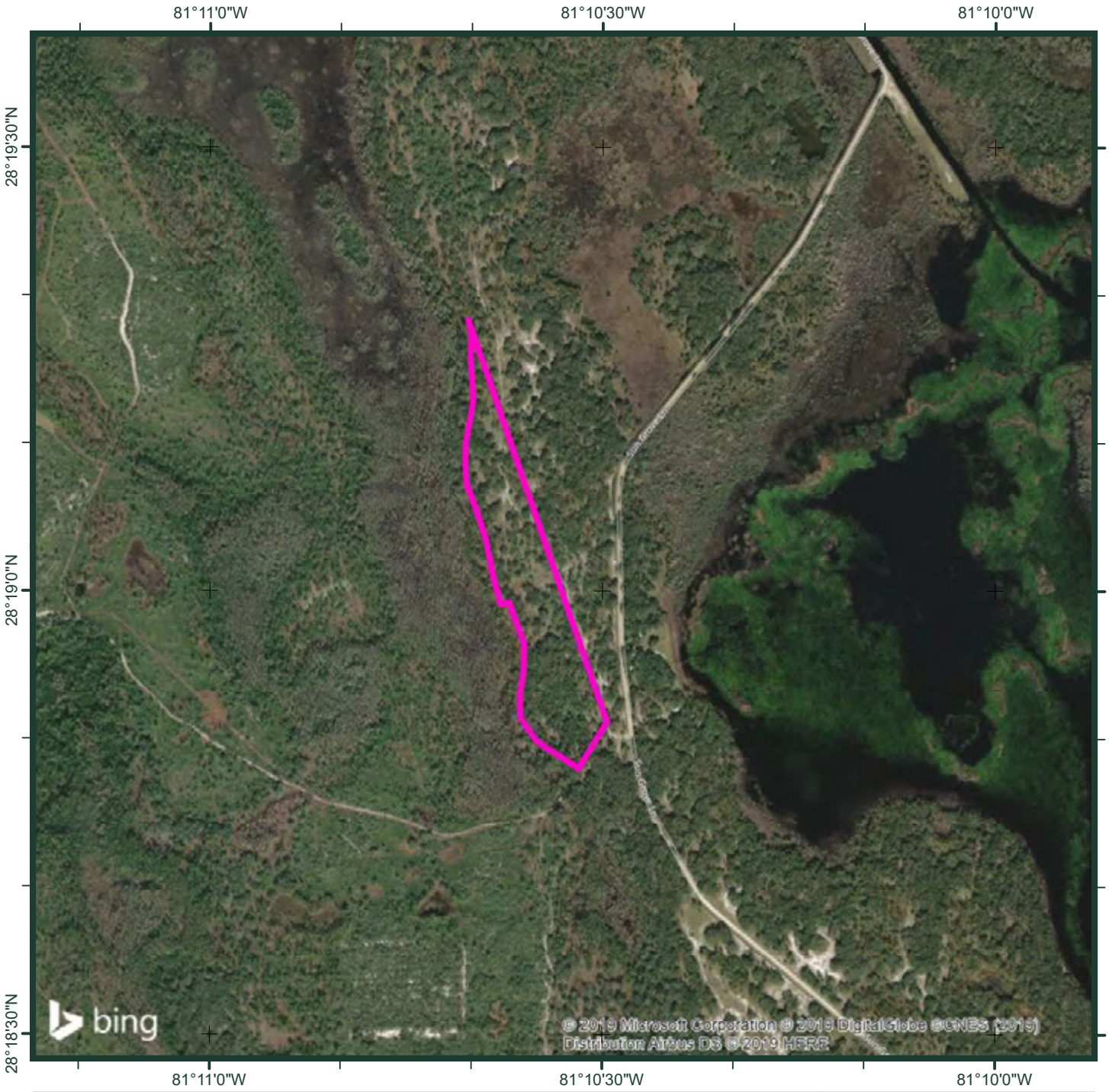
1 inch = 2,000 feet

EXHIBIT 1.
LOCATION OF THE WATER AND WASTEWATER FACILITY PROJECT SITE, OSCEOLA COUNTY, FLORIDA.

BDA BREEDLOVE, DENNIS & ASSOCIATES, INC.
Environmental Consultants
330 W. Canton Ave., Winter Park, FL 32789 • 407-677-1882

EXHIBIT 2

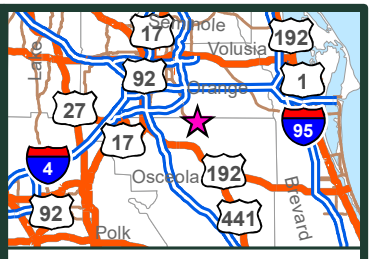
AERIAL PHOTOGRAPH OF THE WATER AND WASTEWATER FACILITY PROJECT SITE, OSCEOLA COUNTY, FLORIDA



Legend

Project Boundary

Source: Project boundary provided by Poulos and Bennett; 2019-04-23.



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1 inch = 1,000 feet

EXHIBIT 2.
AERIAL PHOTOGRAPH OF THE WATER AND WASTEWATER FACILITY
PROJECT SITE, OSCEOLA COUNTY, FLORIDA.

BDA BREEDLOVE, DENNIS & ASSOCIATES, INC.
Environmental Consultants
330 W. Canton Ave., Winter Park, FL 32789 • 407-677-1882

CBT • 6/27/2019 • P:\ATG\2015077\Permit_Use\WaterTreatmentSite\ERP_201906\ARCGIS\Aerial.mxd

EXHIBIT 3

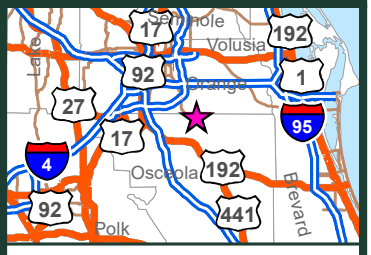
FLORIDA LAND USE, COVER AND FORMS CLASSIFICATION SYSTEM MAP FOR THE WATER AND WASTEWATER FACILITY PROJECT SITE, OSCEOLA COUNTY, FLORIDA

Legend

Project Boundary

FLUCFCS

- 427 - Live Oak (22.95 ac)
- 516 - Ditch / Swale (0.18 ac)
- 630 - Wetland Forested Mixed (0.02 ac)



0 225 450 Feet

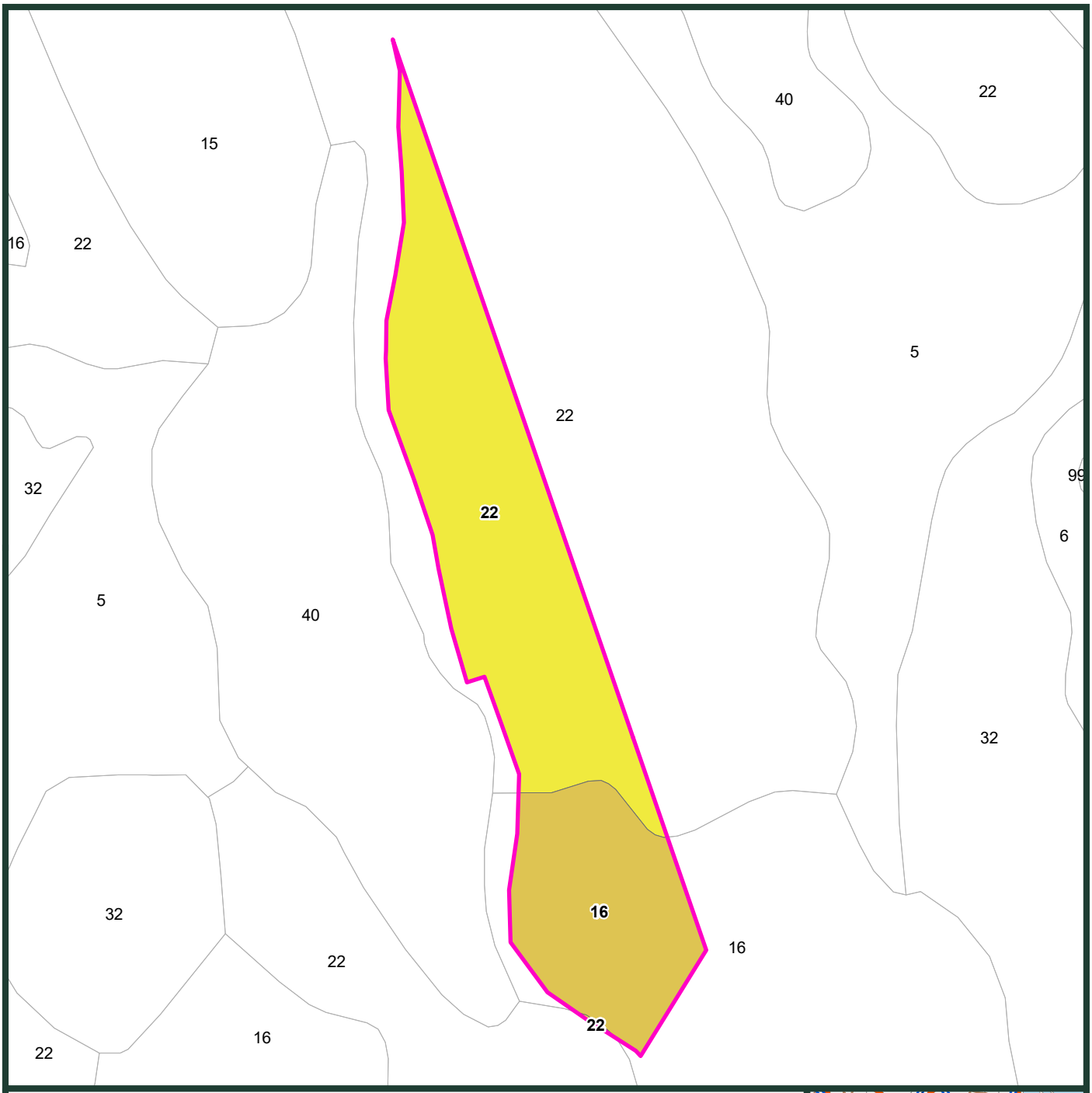
1 inch = 450 feet

EXHIBIT 3.
FLORIDA LAND USE, COVER AND FORMS CLASSIFICATION SYSTEM MAP FOR THE WATER AND WASTEWATER FACILITY PROJECT SITE, OSCEOLA COUNTY, FLORIDA.

BDA
BREEDLOVE, DENNIS & ASSOCIATES, INC.
Environmental Consultants
330 W. Canton Ave., Winter Park, FL 32789 • 407-677-1882

EXHIBIT 4

NATURAL RESOURCE CONSERVATION SERVICE SOILS MAP FOR THE WATER AND WASTEWATER FACILITY PROJECT SITE, OSCEOLA COUNTY, FLORIDA



Legend

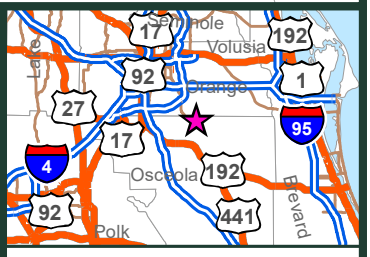
Source: U.S. Department of Agriculture, Natural Resources Conservation Service, Soil Survey Geographic (SSURGO) database

Project Boundary

NRCS Soils

16 - Immokalee fine sand (7.61 ac)

22 - Myakka fine sand, 0 to 2 percent slopes (15.54 ac)



0 225 450 Feet

1 inch = 450 feet

EXHIBIT 4.
NATURAL RESOURCE CONSERVATION SERVICE SOILS MAP FOR THE WATER AND WASTEWATER FACILITY PROJECT SITE, OSCEOLA CO., FL.

BDA BREEDLOVE, DENNIS & ASSOCIATES, INC.
Environmental Consultants
330 W. Canton Ave., Winter Park, FL 32789 • 407-677-1882

EXHIBIT 5

LISTED SPECIES WITH POTENTIAL FOR OCCURRENCE WITHIN THE WATER AND WASTEWATER FACILITY PROJECT SITE, OSCEOLA COUNTY, FLORIDA

Exhibit 5 **Listed Species with Potential for Occurrence within the Water and Wastewater Facilty Project Site, Osceola County, Florida.**

Species	Habitat of Occurrence	Likelihood of Occurrence	Designated Status[1]
			USFWS[2]
PLANTS			
Bonamia grandiflora Florida bonamia	Scrub, dry pinelands.	Low	T
Chionanthus pygmaeus pygmy fringe-tree	Scrub, sandhill, xeric hammock.	Unlikely	E
Eriogonum longifolium var. gnaphalifolium scrub buckwheat	Sandhill, scrub.	Unlikely	T
Lupinus aridorum scrub lupine	Sand pine scrub.	Unlikely	E
Nolina brittoniana Britton's beargrass	Scrub, sandhill, scrubby flatwoods, xeric hammock.	Low	E
Paronychia chartacea papery whitlow-wort	Scrub, sandhill.	Unlikely	T
Polygala lewtonii Lewton's polygala	Xeric oak scrub, sandhill.	Low	E
Polygonella myriophylla sandlace	Scrub.	Unlikely	E

Exhibit 5 Continued.

Species	Habitat of Occurrence	Likelihood of Occurrence	Designated Status[1]	
			USFWS[2]	
Prunus geniculata scrub plum	Sandhill, xeric oak scrub.	Unlikely	E	
Warea amplexifolia clasping warea	Sandhill.	Not Applicable	E	
Species	**Habitat of Occurrence**	**Likelihood of Occurrence**	**Designated Status[1]**	
			USFWS[2]	**FWC[3,4]**
REPTILES				
Alligator mississippiensis American alligator	Freshwater marsh, cypress swamp, mixed hardwood swamp, shrub swamp, bottomland hardwoods, lakes, ponds, rivers, streams.	Low	T (S/A)	FT(S/A)
Drymarchon corais couperi eastern indigo snake	Xeric oak scrub, sand pine scrub, sandhill, pine flatwoods, pine rocklands, tropical hardwood hammock, hydric hammock, wet prairie, mangrove swamp.	Moderate	T	FT
Eumeces egregious lividus bluetail mole skink	Xeric oak scrub, sand pine scrub, sandhill, xeric hammock.	Unlikely	T	FT
Gopherus polyphemus gopher tortoise	Sandhill, sand pine scrub, xeric oak scrub, coastal strand, xeric hammock, dry prairie, pine flatwoods, mixed hardwood-pine	High (Observed)	—	ST

Exhibit 5 Continued.

Species	Habitat of Occurrence	Likelihood of Occurrence	Designated Status[1]	
			USFWS[2]	FWC[3,4]
	forests, ruderal.			
Neoseps reynoldsi sand skink	Rosemary scrub, sand pine scrub, xeric oak scrub, scrubby flatwoods, xeric hammock.	Unlikely	T	FT
BIRDS				
Ammodramus savannarum floridanus Florida grasshopper sparrow	Dry prairie.	Unlikely	E	FE
Antigone canadensis pratensis Florida sandhill crane	Dry prairie, freshwater marsh, pasture.	Moderate	—	ST
Aphelocoma coerulescens Florida scrub-jay	Xeric oak scrub.	Unlikely	T	FT
Athene cunicularia floridana Florida burrowing owl	Sandhill, dry prairie, pastures, ruderal.	Low	—	ST
Dryobates (=Picoides) borealis red-cockaded woodpecker	Sandhill, pine flatwoods.	Unlikely	E	FE
Egretta caerulea little blue heron	Freshwater marsh, various types of forested wetlands, lakes, streams, salt mash, mangrove swamp, tidal mud flats.	Low	—	ST
Egretta tricolor	Salt marsh, mangrove swamp, tidal	Low	—	ST

Exhibit 5 Continued.

Species	Habitat of Occurrence	Likelihood of Occurrence	Designated Status[1]	
			USFWS[2]	FWC[3,4]
tricolored heron	mud flats, tidal creeks, tidal ditches, freshwater marsh, various types of forested wetlands, lakes and ponds.			
Falco sparverius paulus southeastern American kestrel	Sandhill, pine flatwoods, dry prairie, pasture, old field.	Low	—	ST
Grus americana whooping crane	Dry prairie, freshwater marsh, pasture.	Unlikely	E, XN	FXN
Mycteria americana wood stork	Freshwater marsh, various types of forested wetlands, ponds, salt marsh, mangrove swamp, tidal mud flats, lagoons, flooded pastures.	Low	T	FT
Polyborus plancus audubonii Audubon's crested caracara	Dry prairie, cabbage palm–live oak hammock, freshwater marsh, pasture.	Low	T	FT
Rostrhamus sociabilis plumbeus Everglade snail kite	Freshwater marsh, lakes.	Unlikely	E	FE
MAMMALS				
Eumops floridanus Florida bonneted bat	Pine flatwoods, cabbage palm-live oak hammock, tropical hardwood hammock, cypress swamp, urban.	Unlikely	E	FE
Puma concolor coryi Florida panther	Cypress swamp, pine flatwoods, upland hardwood hammock, cabbage palm-live oak hammock,	Unlikely	E	FE

Exhibit 5 Continued.

Species	Habitat of Occurrence	Likelihood of Occurrence	Designated Status[1]	
			USFWS[2]	FWC[3,4]
	mixed hardwood swamp, freshwater marsh.			
Trichechus manatus latirostris Florida manatee	Estuarine bays and lagoons, seagrass beds, rivers, spring runs.	Not Applicable	E	FE

[1] Federal Designations: E = Endangered; T = Threatened; T(S/A) = Threatened Due to Similarity of Appearance; XN = Experimental Non-essential; State Designations: ST = State-designated Threatened; SSC = State Species of Special Concern; ST(S/A) = State-designated Threatened Due to Similarity of Appearance; FE = Federally-designated Endangered; FT = Federally-designated Threatened; FT(S/A) = Federally-designated Threatened Due to Similarity of Appearance; FXN = Federally-designated Experimental Non-essential.

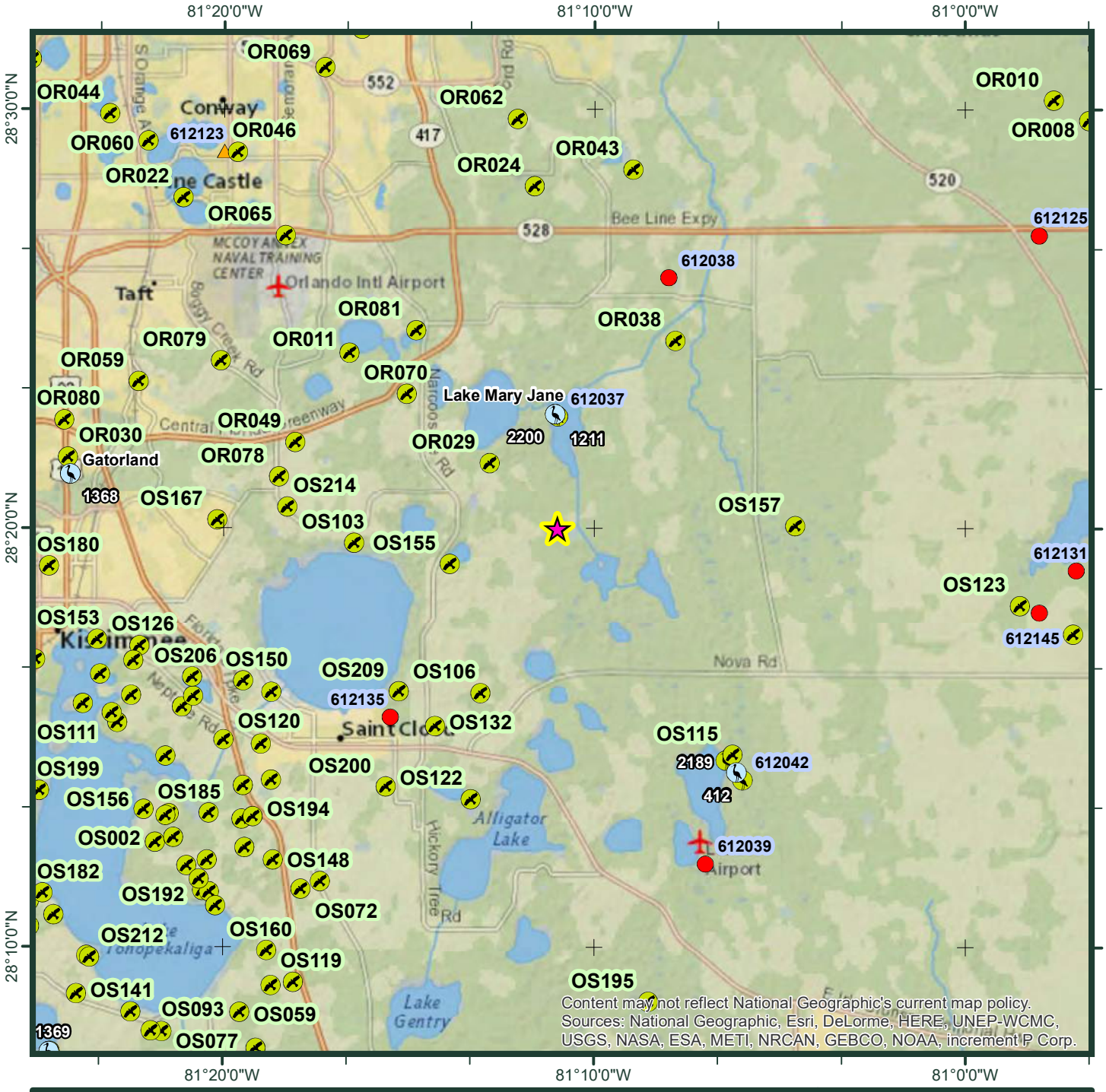
[2] U.S. Fish and Wildlife Service.

[3] Florida Fish and Wildlife Conservation Commission.

[4] Species are listed as "Federally-designated endangered or threatened species" on the Florida Endangered and Threatened Species list; however, regulatory authorizations for take are only provided by the federal agency administering the species under the Endangered Species Act of 1973, as amended.

EXHIBIT 6

LISTED SPECIES NESTING IN THE VICINITY OF LOCATION OF THE WATER AND WASTEWATER FACILITY PROJECT SITE, OSCEOLA COUNTY, FLORIDA



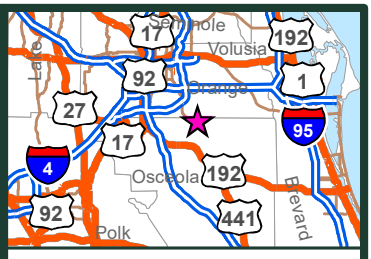
Legend

Source: Florida Fish and Wildlife Conservation Commission (FFWC).

- Project Location
- Eagle's Nests (2016)
- Wood Stork Colonies (2018)
- Wading Bird Colonies (2019)

Wading Bird Rookeries (1999)

- Active
- Inactive
- Not checked



0 2 4 Mi.

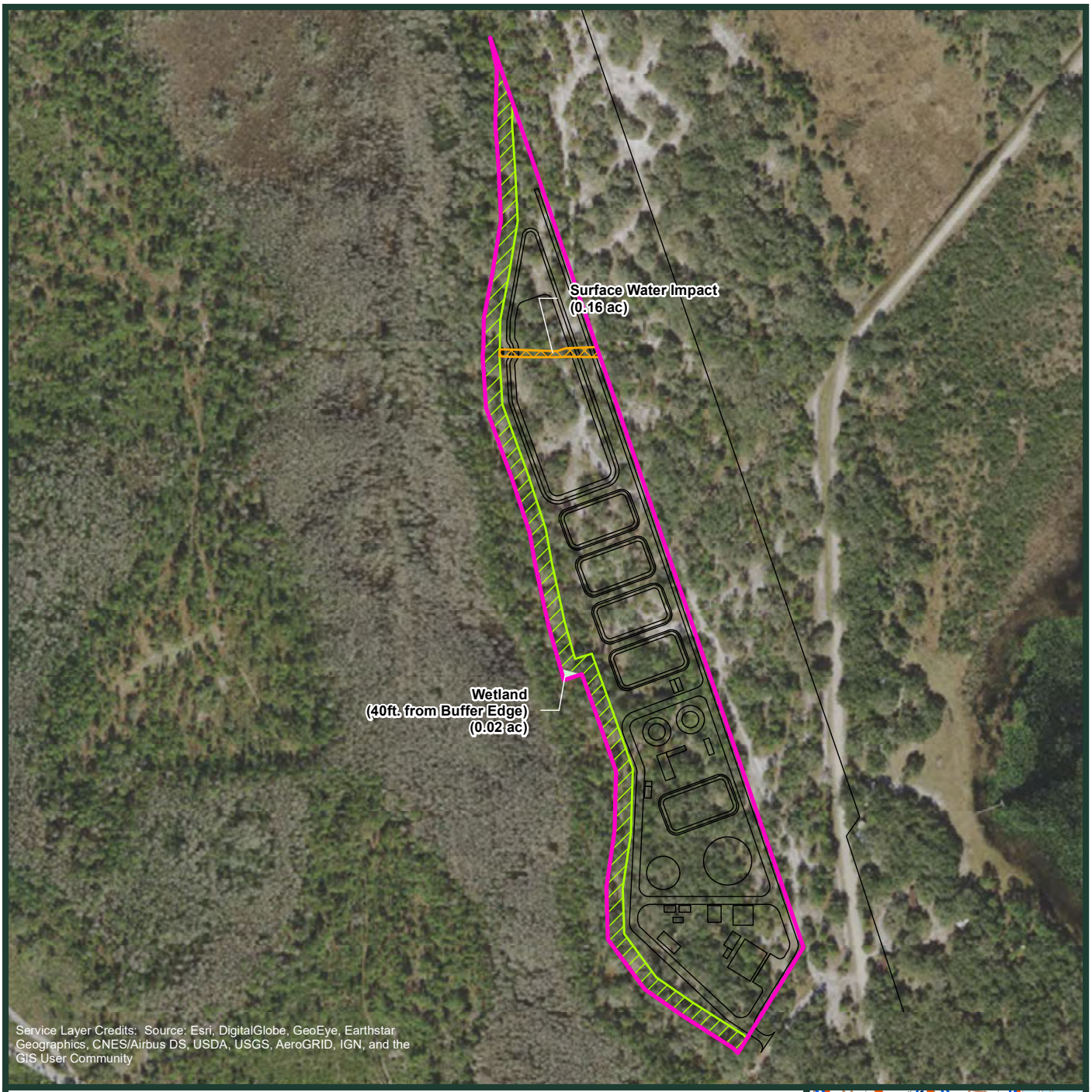
1 inch = 4 miles

EXHIBIT 6.
LISTED SPECIES NESTING IN THE VICINITY OF THE WATER AND WASTEWATER FACILITY PROJECT SITE, OSCEOLA COUNTY, FLORIDA.

BDA BREEDLOVE, DENNIS & ASSOCIATES, INC.
Environmental Consultants
330 W. Canton Ave., Winter Park, FL 32789 • 407-677-1882

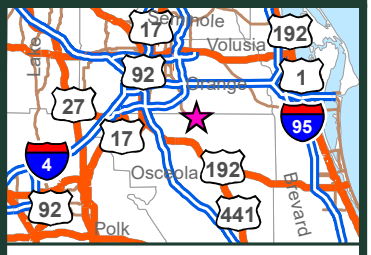
EXHIBIT 7 (REVISED)

PROPOSED DEVELOPMENT PLAN FOR THE WATER AND WASTEWATER FACILITY PROJECT SITE, OSCEOLA COUNTY, FLORIDA



Legend

- Project Boundary
- Proposed Water Treatment Facility
- Surface Water Impact
- Upland Buffer (3.71 ac)
- Wetland (In Buffer)



0 225 450 Feet

1 inch = 450 feet

EXHIBIT 7 (REVISED).
PROPOSED DEVELOPMENT PLAN FOR THE WATER AND WASTEWATER FACILITY PROJECT SITE, OSCEOLA COUNTY, FLORIDA.

BDA BREEDLOVE, DENNIS & ASSOCIATES, INC.
Environmental Consultants
330 W. Canton Ave., Winter Park, FL 32789 • 407-677-1882

EXHIBIT 8

TABLE ONE: PROJECT WETLAND AND OTHER SURFACE WATER AND IMPACT SUMMARY

EXHIBIT 8 TABLE ONE: PROJECT WETLAND (WL) AND OTHER SURFACE WATER (SW) IMPACT SUMMARY

WL & SW ID	WL & SW TYPE	WL & SW SIZE	WL & SW NOT IMPACTED	TEMPORARY WL & SW IMPACTS			PERMANENT WL & SW IMPACTS			MITIGATION ID
				WL & SW TYPE	IMPACT SIZE	IMPACT CODE	WL & SW TYPE	IMPACT SIZE	IMPACT CODE	
W1	630	0.02	0.02	-	-	-	-	-	-	Not Applicable
SW1	516	0.18	0.02	-	-	-	516	0.16	F	Not Applicable
Project Totals	**-**	**0.20**	**0.04**	-	-	-	**516**	**0.16**	**F**	

Comments:

Codes (multiple entries per cell not allowed):

Wetland Type: From an established wetland classification system.

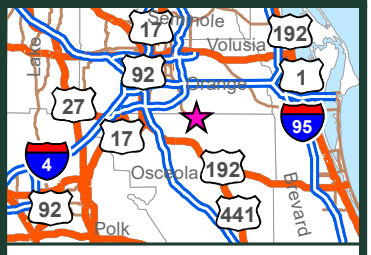
Impact Type: D = dredge; F = fill; N = change hydrology; S = shading; C = clearing; O = other.

Legend

Project Boundary

FLUCFCS

- 427 - Live Oak (22.95 ac)
- 516 - Ditch / Swale (0.18 ac)
- 630 - Wetland Forested Mixed (0.02 ac)



0 225 450 Feet

1 inch = 450 feet

EXHIBIT 3.
FLORIDA LAND USE, COVER AND FORMS CLASSIFICATION SYSTEM MAP FOR THE WATER AND WASTEWATER FACILITY PROJECT SITE, OSCEOLA COUNTY, FLORIDA.

BDA
BREEDLOVE, DENNIS & ASSOCIATES, INC.
Environmental Consultants
330 W. Canton Ave., Winter Park, FL 32789 • 407-677-1882

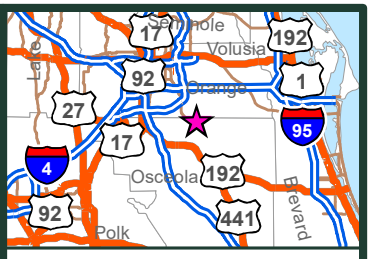
Source: Project boundary provided by Poulos and Bennett; 2019-04-23.

Legend

Project Boundary

Sections 12 and 13, Township 25 S., Range 31 E.

USGS NARCOOSSEE, Fla. Quadrangle (7½ Minute Topographic Map)



0 1,000 2,000 Feet

1 inch = 2,000 feet

EXHIBIT 1.
LOCATION OF THE WATER AND WASTEWATER FACILITY PROJECT SITE, OSCEOLA COUNTY, FLORIDA.

BDA BREEDLOVE, DENNIS & ASSOCIATES, INC.
Environmental Consultants
330 W. Canton Ave., Winter Park, FL 32789 • 407-677-1882

APPENDIX F

Meeting Minutes (OUC Transmission)

301 E. Pine St, Suite 350
Orlando, Florida 32801

O 407-893-5800
F 407-264-6624
rsandh.com

MEETING MINUTES:

Project Name:	Northeast Connector Expressway Phase 1
Project Number:	CFX Contract # 001546
Meeting Date:	October 23, 2020 (2:00 to 3:00 p.m.)
Meeting Place:	Virtual (Teams Meeting)
Subject:	Orlando Utilities Commission Coordination Meeting

A stakeholder meeting was held with the Orlando Utilities Commission (OUC) and their consultant (Burns McDonnell) to discuss a new 230-kV transmission line near the Northeast Connector Expressway Phase 1 project. The meeting was held via Teams on Friday, October 23, 2020. The list of meeting attendees is included on the last page.

The following is a synopsis of the meeting discussion:

- Glenn introduced the RS&H project team and Jonathan as the CFX General Engineering Consultant (GEC) and Project Manager.
- Carolyn Greenwell introduced herself as the OUC consultant Project Manager and then reviewed the proposed OUC transmission corridor starting at Mag Ranch in Orange County. The transmission corridor then runs east until it hits the Sunbridge Parkway, then follows the Sunbridge Parkway south until it reaches the Split Oak Forest donation property. The transmission corridor then extends west, following the donation property boundary until it reaches the Cyrils Drive and Osceola Parkway Extension (OPE) interchange. At that location (indicated as point 102 in the kmz file), the transmission line would go underground. The transmission line would re-establish above-ground just south of the interchange, on the west side of the OPE (indicated as point 101 in the kmz file).
    - The segment from the Orange/Osceola County line to the OPE/Cyrils Drive interchange would be co-located adjacent to the OPE roadway right-of-way.
    - Glenn clarified that that the roadway north and east of location point 102 would be a local/arterial roadway built by Tavistock. CFX is responsible for the section of roadway within the yellow (limited access right-of-way), anything outside of that will be built by Tavistock or Suburban Land Reserve (SLR).
    - The first phase of the OPE project would include constructing the interchange ramps to/from the west only. The rest of the interchange would be built when the OPE mainline is extended to Nova Road (which is currently in the PD&E phase).
    - When the OPE is constructed OUC would need an easement from CFX for the underground portion (points 102 to 101). Ideally, the OUC facility would run underground at a straight line, but due

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to ponds, it will likely shift in some areas. The line also needs to avoid the Sunbridge and Del Webb neighborhoods.
    - Glenn stated that it would be atypical to have a straight/linear easement through CFX right-of-way, so the details regarding requirements, access, and spacing will need to be determined.
- Dan provided a brief update on the Northeast Connector Expressway Phase I project and upcoming schedule.
    - Currently 2 corridors are being evaluated for possible environmental impacts. Each corridor is 2,000 feet wide.
    - The NE Connector corridor will be selected at the conclusion of the Alternatives Corridor Evaluation (ACE) phase, which should be completed in about a month.
    - An alignment with a 330-foot typical section will then be developed within the selected corridor. The current schedule of activities should result in a definitive alignment by March of 2021.
- Glenn mentioned that Clint Beaty (Tavistock) envisioned the transmission corridor and the alignment being adjacent to each other.
- Glenn inquired about OUC's schedule for the transmission corridor.
    - Anticipate submitting a 100-foot corridor to the state in the next couple of weeks
    - Then it is a year-long process with the state to review and agree
    - Once the corridor is approved, OUC will determine an exact alignment.
- OUC agreed to send the current alignment to CFX (complete).
- Tavistock has requested that OUC remain on the western side of the Northeast Connector Expressway alignment.
    - CFX will continue to share information and when an alignment is developed, will send to OUC.
    - OUC stated there is time to coordinate the details during the state review process.
    - Once a corridor is selected and alignments can be developed, OUC will draw the 100-foot corridor to ensure there are no fatal flaws when assessing the roadway alternative impacts.
    - If necessary, OUC stated that in select areas they can go below to less than a 100-foot corridor but doing so will increase the frequency of structures and the project cost. The 100-foot corridor seems to be the ideal width.
- OUC mentioned that the transmission corridor extending down Narcoossee Road was not well received by the public and it is no longer under consideration.
- The OUC parcel on Clapp Simms Duda Road near Narcoossee Road will need 4 to 5 acres of the 10 acres available.

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- Action Items:
    1. OUC will send current corridor to RS&H (complete).
    2. RS&H will share kmz of preferred roadway and ponds with OUC (complete).
    3. OUC will set another status update meeting in 4 to 6 weeks

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Distribution: Participant List

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MEETING MINUTES:

Project Name:	Northeast Connector Expressway Phase 1
Project Number:	CFX Contract # 001546
Meeting Date:	May 4, 2021 (1:00 to 2:00 p.m.)
Meeting Place:	Virtual (Teams Meeting)
Subject:	Orlando Utilities Commission Coordination Meeting

A stakeholder meeting was held with the Orlando Utilities Commission (OUC) and their consultant (Burns McDonnell) to discuss a new 230-kV transmission line near the Northeast Connector Expressway Phase 1 project. The meeting was held via Teams on Tuesday, May 4, 2021. The list of meeting attendees is included on the last page.

The following is a synopsis of the meeting discussion:

- Carolyn Greenwell introduced herself as the Project Manager for Burns McDonnell on the new transmission line project. Richard is the transmission lead engineer.
- OUC is close to submitting their application to the State.
- Carolyn asked for confirmation that the April 13, 2021 linework is the latest and that 100-foot easement for the transmission line is still being used. RS&H confirmed that was correct.
- Carolyn directed the teams focus to a pinch point in the OUC alignment near Bullock Lake (see image below). The current alignment would result in the transmission poles being located in Lake Bullock. The structure required for that would be very large and expensive. It would also be an eye sore for future development.
    - OUC asked if RS&H could shift the Jack Brack Road interchange to the east, so that the utility easement could avoid Lake Bullock. Or, if that is not feasible, could OUC place the transmission poles between the southwest ramp and the mainline.
        i. Dan responded that shifting the interchange to the east would be difficult due to the wetland systems, Jack Brack Road alignment, and the location of the utility site and Sunbridge neighborhoods to the north. However, we have another interchange configuration, the Partial Cloverleaf Interchange that only has ramps north of Jack Brack Road. This interchange configuration is less desirable due to the long-term traffic operations and difficulty in converting the interchange in the future.
        ii. Jonathan responded that CFX does not like to do joint-use ponds because sharing right-of-way is challenging. The utility poles in the limited access

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right-of-way presents the same challenge. It is unlikely that CFX would support that plan, but ultimately, it would need to go to Glenn for approval.

iii. CFX would prefer not to have the transmission line crossing the ramp or mainline.

- Dan asked what is the longest span length possible between poles?
  - Carolyn responded that it depends on height of structure and type of structure however, a good number for this project is about 800 feet.
- Carolyn stated that the cost of overhead transmission is approximately $2 to $2.5 million per mile. The cost to go underground is about 5 times that at $10 million per mile.
- Kelsey asked if it was feasible / palatable for the transmission line to go around the west side of Bullock Lake?
  - JD stated that there is no real development fronting Lake Bullock. There is also very little development on the west side of Lake Bullock due to the expansive wetland system. Tavistock is open to exploring going around the west side of Lake Bullock as an option.
- Jonathan stated that he did find a recent example of a transmission line crossing over New Independence Parkway near the SR 429 interchange (see image below). The span is about 375 feet. However, this crossing is over the local roadway, not the interchange ramp. Any type of roadway crossing or sharing of right-of-way would need Glenn's approval.

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- Carolyn stated restated that there are three current options:
  - OUC transmission line crosses the mainline underground and travels on east side of the expressway in the vicinity of the interchange (not preferred by Tavistock).
  - OUC transmission line crosses over Jack Brack Road interchange ramp(s) (not preferred by CFX).
  - OUC transmission line travels around the west side of Lake Bullock (need additional evaluation for potential wetland impacts and Tavistock to evaluate further).
- The proposed transmission line provides electric stability for the Sunbridge neighborhoods.
- Tavistock asked if the Absher Road corridor has been considered?
  - Carolyn stated that OUC would have to purchase homes for Absher route.
- Dan asked what footprint was needed for the transmission poles at ground level?
  - Dan Slack stated that assuming a 140-foot tall pole, an 80-foot radius around most of the pole would be needed/desirable.
- Clint asked if going under the interchange ramps would be okay with CFX?
  - Jonathan stated that it would need to be discussed with Glenn.
- Carolyn asked for confirmation that no mainline or ramp changes could be made by RS&H to potentially facilitate locating the poles outside of the right-of-way, but not in Lake Bullock?
  - Dan stated that the mainline alignment cannot move but RS&H will evaluate tightening up the southwest ramp to avoid Bullock Lake.
  - Jonathan asked that RS&H make sure that any ramp changes do not prohibit / limit interchange improvements in the future.
- Carolyn is going to set a follow-up meeting for May 14th or 17th. RS&H and OUC will evaluate potential options to present at the follow-up meeting.

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Action Items:

1. RS&H to evaluate way to shift the southeast quadrant interchange ramp at Jack Brack Road to avoid Bullock Lake.
2. OUC will evaluate solutions that do not require interchange modifications.
3. Carolyn will set a follow-up meeting for May 14th or 17th with the group.

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MEETING MINUTES:

Project Name:	Northeast Connector Expressway Phase 1
Project Number:	CFX Contract # 001546
Meeting Date:	May 14, 2021 (10:00 to 11:00 a.m.)
Meeting Place:	Virtual (Teams Meeting)
Subject:	Orlando Utilities Commission Coordination Meeting

A stakeholder meeting was held with the Orlando Utilities Commission (OUC) and their consultant (Burns McDonnell) to discuss a new 230-kV transmission line near the Northeast Connector Expressway Phase 1 project. The meeting was held via Teams on Friday, May 14, 2021. The list of meeting attendees is included on the last page.

The following is a synopsis of the meeting discussion:

- Carolyn mentioned that there were four potential options discussed at the last meeting which we will discuss further with the group today.
- The first option was for the transmission line to cross the Northeast Connector mainline alignment north of interchange and then travel along the east side of the connector and then cross back to the west side.
    - Least preferred from developer perspective due to development impacts.
    - CFX stated that perpendicular and diagonal crossings are acceptable. We are looking for best resolution for everyone involved. But would be resistant to longitudinal crossing of right-of-way.
    - Burns McDonnell presented a kmz file showing what the transmission poles would look like.
- The second option would be to go underground between pole 93 and 89. That would result in 3,600 feet of underground.
    - CFX does not recommend this option. Would need to show hardship requirement.
    - OUC also does not support this option.
- Tavistock does not support shifting the mainline alignment to the east because it will impact additional planned residential development. Tavistock is not supportive of shifting Jack Brack Road alignment. Don Whyte though it was worth considering adjusting the mainline alignment to the east, including straightening Jack Brack Road alignment.
- The third option would be to go around the west side of Lake Bullock.
    - Not preferred by OUC due to additional cost.
- The fourth option is for the pole to cross the ramp back and forth.

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    - Not desirable for CFX. In locations where this is
- RS&H sent a Tighter Diamond interchange to OUC and Burns McDonnell on Wednesday. The group evaluated that design. A 1,100 foot span would get the transmission poles out of the pond and out of the majority of the wetland. That span length was undesirable to OUC and the stakeholders. The ideal span length is 700 to 750 feet. The Tighter Diamond Interchange allowed for a 750-foot span with the northern pole on the upland and the southern pole in a wetland but outside of Lake Bullock. OUC stated that they would evaluate the feasibility of the transmission line within the proposed easement associated with the Tighter Diamond Interchange.

Action Items:

1. Burns McDonnell will evaluate a potential transmission line alignment based on the Tighter Diamond Interchange.

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