

## **Project Description**

The Florida Department of Transportation (FDOT) is conducting an update of the PD&E studies for the extension of express lanes for SR 400 (I-4). The project limits in the original PD&E studies were:

- West of Memorial Boulevard (SR 546) to the Polk/Osceola County Line, (29.5 miles)
- CR 532 (Polk/Osceola County Line) to West of SR 528 Beachline Expressway (13.7 miles), and
- West of SR 528 Beachline Expressway to SR 472 (43 miles).

The corresponding environmental documents include: Environmental Assessment/Finding of No Significant Impact (EA/FONSI) for SR 400 (I-4) from West of Memorial Boulevard (SR 546) to the Polk/Osceola County Line (FPN 201210, 1998) and from CR 532 (Polk/Osceola County Line to West of SR 528 Beachline Expressway (FPN 242526 and 242483, 1999) and Final Environmental Impact Statement (FEIS) for I-4 from SR 528 Beachline Expressway to SR 472 (FPN 242486, 242592 and 242703, 2002).

The re-evaluation study is being conducted to document changes from the FONSI for SR 400 (I-4) from CR 532 (Polk/Osceola County Line) to West of SR 528 Beachline Expressway (December 23, 1999), including environmental and engineering analysis of the original design concept which showed two high occupancy vehicle (HOV) lanes, to the current proposed design, which includes four managed lanes operating under a variable price toll plan.

The proposed improvements to I-4 include widening the existing six lane divided urban interstate to a ten lane divided highway. Generally speaking, the typical section will be consistent throughout Segment 1 and will have three 12-foot general use travel lanes with 12-foot inside and 10-foot outside shoulders and two 12-foot express lanes with 4-foot inside and 10-foot outside shoulders, in each direction. A barrier wall in between the shoulders will separate the express lanes from the general use lanes. Three 12-foot auxiliary lanes will be provided in some areas in the eastbound direction and up to two auxiliary lanes will be provided in some locations in the westbound direction. Stormwater ponds will be included to provide treatment throughout the corridor.

The project area for this survey included the portions of Segment 1 occurring within Osceola County, from I-4 at CR 532 (Osceola-Polk Line Road) to the Orange/Osceola county line, and the potential right-of-way areas for pond sites and other improvements adjacent to the I-4 corridor. Survey areas are depicted on the attached maps.

## **Survey Scope**

Because the project area occurs within the USFWS Consultation Area for sand skinks and blue-tailed mole skinks, there is a higher likelihood of skink occupancy within suitable habitats. No previous evidence of skinks was noted in the original PD&E report from May 2000, nor was a species-specific

survey performed. However, guidance from USFWS on the skink now classifies areas with skink soils as potential skink habitat (at or above elevation 82), whether or not natural xeric scrub habitat occurs over the soils. Areas over skink soils but altered for human uses include but are not limited to pine plantations, active or inactive citrus groves, pastures, residential developments, and neglected vegetative cover like old fields and overgrown scrub, all present potential opportunities for skink habitat. For this project, the right-of-way and potential pond sites were surveyed for all potential listed wildlife species including skinks. A pedestrian survey was conducted to identify suitable habitat and included searching for skink trails in areas of open sand. Skink soils were also mapped for the project corridor to identify the areas of coverage that overlap with proposed roadway and pond site improvements. Coordination with USFWS staff indicated that a skink cover board survey would need to be performed over all areas of soil coverage within the project footprint in order to make a suitable determination on their involvement. Areas could be excluded from survey coverage if field investigations by a state-certified soil scientist indicated that existing soils either were not present as mapped or no longer exhibited the appropriate characteristics of the skink soils. A Florida Association of Environmental Soil Scientists certified soil scientist (Terry Zable of Atkins) conducted field investigations over the project right-of-way to determine the presence/absence of mapped skink soils prior to the initiation of the cover board survey (attached as **Appendix A**). Based upon the results of this study, the mapped soils were amended, and cover board surveys were subsequently conducted over any remaining areas that were determined to still contain suitable mapped skink soils. The cover board survey was conducted according to the USFWS Survey Protocol for Peninsular Florida for the Sand Skink and Blue-tailed Mole Skink (USFWS 2011).

### **Survey Methodology**

Per the USFWS Survey Protocol, the coverboard survey was conducted during the survey window of March 1<sup>st</sup> through May 15<sup>th</sup>. Plywood coverboards measuring 2' x 2' were placed in areas of bare sand or sparse vegetation to meet a minimum coverage of 40 boards per acre within the areas of suitable soils previously mapped out. A grid system was set up to pre-determine the board placement within each area, and the boards were placed in the field in the most suitable areas within the grids. Final positions of the boards were recorded with a Trimble GPS Unit, and each board was marked with a unique designation. Raking, grading, and manipulation of the soils and vegetation were conducted to ensure full contact of the coverboard with the soil surface. Areas with heavy coverage of grasses within the survey areas necessitated removal of vegetation to place the coverboards. Coverboards were placed beginning on March 24, 2014 and completed by April 8, 2014 and all boards were allowed to acclimate for a minimum of 7 days prior to the first sampling event. The first sampling event began on April 10, 2014 and was completed on April 16, 2014. Subsequent events occurred April 21-23, April 28-29, and May 5-6. The boards were collected from the field on May 21-22 and were checked informally for any sign of sand skinks.

### **Survey Area Descriptions**

Each survey area was given a unique designation and is described below.

Unit U – Pomello fine sand 0 – 5%,  
Candler sand 0 – 5%

Unit U is located within the right-of-way of I-4 eastbound at the end of the on-ramp from SR 429 and consists of open sand, low scrubby plants such as prickly pear cactus, and some bahia grass. Maintenance (mowing) of this area occurs throughout the year.



Unit V – Pomello fine sand 0 – 5%

Unit V is located along the right-of-way of I-4 westbound to the east of the Old Lake Wilson Road overpass and consists of open sand and Bahia grass. Maintenance (mowing) of this area occurs throughout the year.



Unit W – Pomello fine sand 0 – 5%,  
Candler sand 0 – 5%

Unit W is located within the right-of-way of I-4 westbound east of Old Lake Wilson Road and consists of Bahia grass with sparse areas of open sand. An FDOT maintenance truck got stuck in this area during the survey between events 1 and 2 and used some of the cover boards to get the truck out. Maintenance (mowing) of this area occurs throughout the year.



Unit X – Candler sand 0 – 5%

Unit X is located within a portion of the median between I-4 westbound and the on-ramp to SR 429 northbound. The area consists of maintained Bahia grass.



Unit Y – Candler sand 0 – 5%, Candler sand 5 – 12%

Unit Y is located within the right-of-way of the SR 429 on-ramp from I-4 westbound, and consists of maintained Bahia grass within much of the area, but is primarily open sand as it progresses further west. The area within the right-of-way is maintained, but the area outside on the other side of the fence contains open sand, scrub, and sandhill vegetation.



Unit Z - Candler sand 0 – 5%, Candler sand 5 – 12%

Unit Z is located within the right-of-way of SR 429 just prior to the off-ramp to I-4 westbound and consists of Bahia grass and recently sodded grass areas.



Unit AA – Candler sand 0 – 5%

Unit AA is located adjacent to the off-ramp from SR 429 to I-4 westbound and consists of maintained Bahia grass.



Unit BB – Candler sand 5 – 12%

Unit BB is located within the right-of-way of I-4 eastbound just north of the Tradition Boulevard overpass and consists of open sand and maintained Bahia grass.



Unit CC – Candler sand 5 -12%

Unit CC is located within the right-of-way of I-4 eastbound just south of the Tradition Boulevard overpass and consists of maintained Bahia grass and some open sandy soil.



Unit DD – Pompano fine sand, Candler sand 5 – 12%

Unit DD is located within the right-of-way of I-4 eastbound, south of the Tradition Boulevard overpass and consists of maintained Bahia grass and some open sandy soil.



Unit EE – Pompano fine sand, Pomello fine sand 0 – 5%, Candler sand 0 – 5%

Unit EE is located within the right-of-way of I-4 eastbound between the interchange with CR-532 and the Tradition Boulevard overpass. The site consists of maintained Bahia grass and some open sandy soil.



Unit FF – Pomello fine sand 0 – 5%

Unit FF is located within the right-of-way of I-4 westbound between the interchange with CR-532 and the Tradition Boulevard overpass. The site consists of Bahia grass and some open sandy soil.



Unit GG – Pomello fine sand 0 – 5%,  
Tavares fine sand 0 – 5%

Unit GG is located within the right-of-way of I-4 eastbound between the interchange with CR-532 and the Tradition Boulevard overpass. The site consists of maintained Bahia grass and some open sandy soil.



Unit HH – Candler sand 0 – 5%, Tavares  
fine sand 0 -5%

Unit HH is located within the right-of-way of I-4 westbound between the interchange with CR-532 and the Tradition Boulevard overpass. The site consists of maintained Bahia grass and some open sandy soil.



Unit II – Pomello fine sand 0 – 5%,  
Candler sand 0 -5%

Unit II is located within the right-of-way of I-4 eastbound, east of the interchange with CR-532. The site consists of maintained Bahia grass and some open sandy soil.



Unit JJ – Candler sand 0 -5%

Unit JJ is located within the right-of-way of I-4 westbound, east of the interchange with CR-532. The site consists of maintained Bahia grass and some open sandy soil.



Unit KK – Candler sand 0 -5%

Unit KK is located within the right-of-way of I-4 eastbound, east of the interchange with CR-532. The site consists of maintained Bahia grass, maintained St. Augustine grass, and some open sandy soil.





Sand Skink Cover Board Survey			
Unit	Acreage	Number of Boards	Boards per Acre
U	0.84	38	45
V	0.07	5	71
W	0.64	28	44
X	0.39	16	41
Y	2.52	113	45
Z	0.35	16	46
AA	0.65	30	46
BB	0.20	11	55
CC	0.25	12	48
DD	0.16	11	68
EE	0.77	31	40
FF	0.23	10	43
GG	0.69	40	58
HH	0.91	40	44
II	1.69	85	50
JJ	0.56	26	46
KK	0.76	41	54

### Survey Results

Cover boards were inspected for signs of sand skinks by lifting each board and visually inspecting the area beneath. After each inspection, the area under the board was smoothed out, and the boards were placed back down in the original position. During the first survey event, any boards with vegetation or debris still under them were raked, re-graded, and smoothed out. Any boards that were moved, damaged, or removed were noted on the data sheets.

Event 1 – April 10, 11, 14 and 16, 2014

Numerous 6-lined race runners were observed and several different types of curves and lines were observed under boards, but no sand skink tracks or other signs of sand skinks were observed. Southern toads, 5-lined skinks, eastern narrow-mouthed toads, and brown anoles were also observed.



Event 2 – April 21, 22, and 23, 2014

Tracks from an unknown species were observed under several boards, but no signs or tracks of sand skinks were observed. Eastern narrow-mouthed toads and 6-lined race runners were observed under numerous boards throughout the survey corridor.



Event 3 – April 28 and 29, 2014

No signs of sand skinks were observed under any of the cover boards. Many 6-lined race runners and eastern narrow-mouthed toads were observed, as were several pine bark scorpions.



Event 4 – May 5 and 6, 2014

No signs of sand skinks were observed under any of the cover boards. 6-lined race runners and eastern narrow-mouthed toads were common under the boards throughout the survey area.



### **Survey Summary**

No sand skinks or evidence of sand skinks was observed during the survey. Many different types of species were encountered, but no continuous sinusoidal tracks were found either under the cover boards or at any other place within the survey area.

## **DATA SHEETS**

Date:	4/10/2014	Survey Event:	1	Start Time:	9:20 AM	End Time:	3:30 PM
Start Temp:	64 F	End Temp:	76 F	Wind Speed/Direction:	0-10 NW		
Visibility:	Clear	Precipitation:	None				
Sites Sampled (in order):	C, D, B, K, J						
Biologists/Technicians:	Mike Dinardo, Mike Drauer, Mike Holdsworth, Matt Leonard, Kevin Muldrew						
Observations:	A skink with a blue tail was observed under board D69, but a positive ID could not be made. An 8 inch "S" shaped curve was observed under coverboard B60, which was determined to not be from a sand skink. No other signs of sand skinks were found under coverboards or in open sand. Numerous six-lined racerunners were observed under coverboards.						

Date:	4/11/2014	Survey Event:	1	Start Time:	8:45 AM	End Time:	3:35 PM
Start Temp:	65 F	End Temp:	80 F	Wind Speed/Direction:	0-10 N/NE		
Visibility:	Partly Cloudy	Precipitation:	None				
Sites Sampled (in order):	A, F, G, H						
Biologists/Technicians:	Mike Drauer, Mike Holdsworth, Kevin Muldrew						
Observations:	No signs of sand skinks were found under coverboards or in open sand. Numerous six-lined racerunners were observed under coverboards. Site A included observations of southern toads, five-lined skinks, eastern narrow-mouthed toads, and some brown anoles under coverboards.						

Date:	4/14/2014	Survey Event:	1	Start Time:	8:55 AM	End Time:	4:46 PM
Start Temp:	70 F	End Temp:	89 F	Wind Speed/Direction:	5-10 SE		
Visibility:	Partly Cloudy	Precipitation:	None				
Sites Sampled (in order):	I, L, M, N, O, O (24), Q, R, T, S, P, KK, II, GG, EE, DD, CC, BB, U, V, W, FF, HH, JJ						
Biologists/Technicians:	Mike Drauer, Mike Holdsworth, Matt Leonard, Kevin Muldrew						
Observations:	No signs of sand skinks were found under coverboards or in open sand. Several tracks of an unknown species, not a sand skink, were found under coverboards I15 and I25. A southern toad, a five-lined skink, a eastern narrow-mouthed toad, and numerous six-lined racerunners were observed under coverboards.						

Date:	4/16/2014	Survey Event:	1	Start Time:	8:50 AM	End Time:	10:43 AM
Start Temp:	55 F	End Temp:	60 F	Wind Speed/Direction:	5-10 NW		
Visibility:	Clear	Precipitation:	None				
Sites Sampled (in order):	X, Y, Z, AA						
Biologists/Technicians:	Mike Drauer, Matt Leonard, Kevin Muldrew						
Observations:	No signs of sand skinks were found under coverboards or in open sand. Numerous six-lined racerunners were observed under coverboards.						

Date:	4/21/2014	Survey Event:	2	Start Time:	9:35 AM	End Time:	2:45 PM
Start Temp:	65 F	End Temp:	75 F	Wind Speed/Direction:	0-5 NE		
Visibility:	Mostly Cloudy	Precipitation:	None				
Sites Sampled (in order):	C, D, B, J						
Biologists/Technicians:	Mike Holdsworth, Kevin Muldrew						
Observations:	No signs of sand skinks were found under coverboards or in open sand. Numerous six-lined racerunners and several eastern narrow-mouthed toads were found under coverboards.						

Date:	4/22/2014	Survey Event:	2	Start Time:	8:45 AM	End Time:	4:05 PM
Start Temp:	65 F	End Temp:	86 F	Wind Speed/Direction:	5-10 S/SW		
Visibility:	Partly Cloudy	Precipitation:	None				
Sites Sampled (in order):	K, I, H, G, F, L, M, N, O, O(24), Q, R, S, T, KK, II, GG, EE, DD, CC, U, BB, P						
Biologists/Technicians:	Mike Drauer, Mike Holdsworth, Matt Leonard						
Observations:	Tracks of an unknown species, not a sand skink, were found under coverboards K50 and G63. No signs of sand skinks were found under coverboards or in open sand. Numerous six-lined racerunners were found under coverboards.						

Date:	4/23/2014	Survey Event:	2	Start Time:	8:40 AM	End Time:	11:02 AM
Start Temp:	65 F	End Temp:	70 F	Wind Speed/Direction:	0-5 W/NW		
Visibility:	Clear	Precipitation:	None				
Sites Sampled (in order):	V, W, X, Y, Z, AA, FF, HH, JJ						
Biologists/Technicians:	Mike Drauer, Mike Holdsworth, Kevin Muldrew						
Observations:	No signs of sand skinks were found under coverboards or in open sand. A green anole, several eastern narrow-mouthed toads, and numerous six-lined racerunners were found under coverboards.						

Date:	4/28/2014	Survey Event:	3	Start Time:	9:30 AM	End Time:	3:26 PM
Start Temp:	80 F	End Temp:	92 F	Wind Speed/Direction:	0-10 SE		
Visibility:	Clear	Precipitation:	None				
Sites Sampled (in order):	C, D, B, J, K						
Biologists/Technicians:	Mike Drauer, Mike Holdsworth, Kevin Muldrew						
Observations:	No signs of sand skinks were found under coverboards or in open sand. Several six-lined racerunners were found under coverboards.						

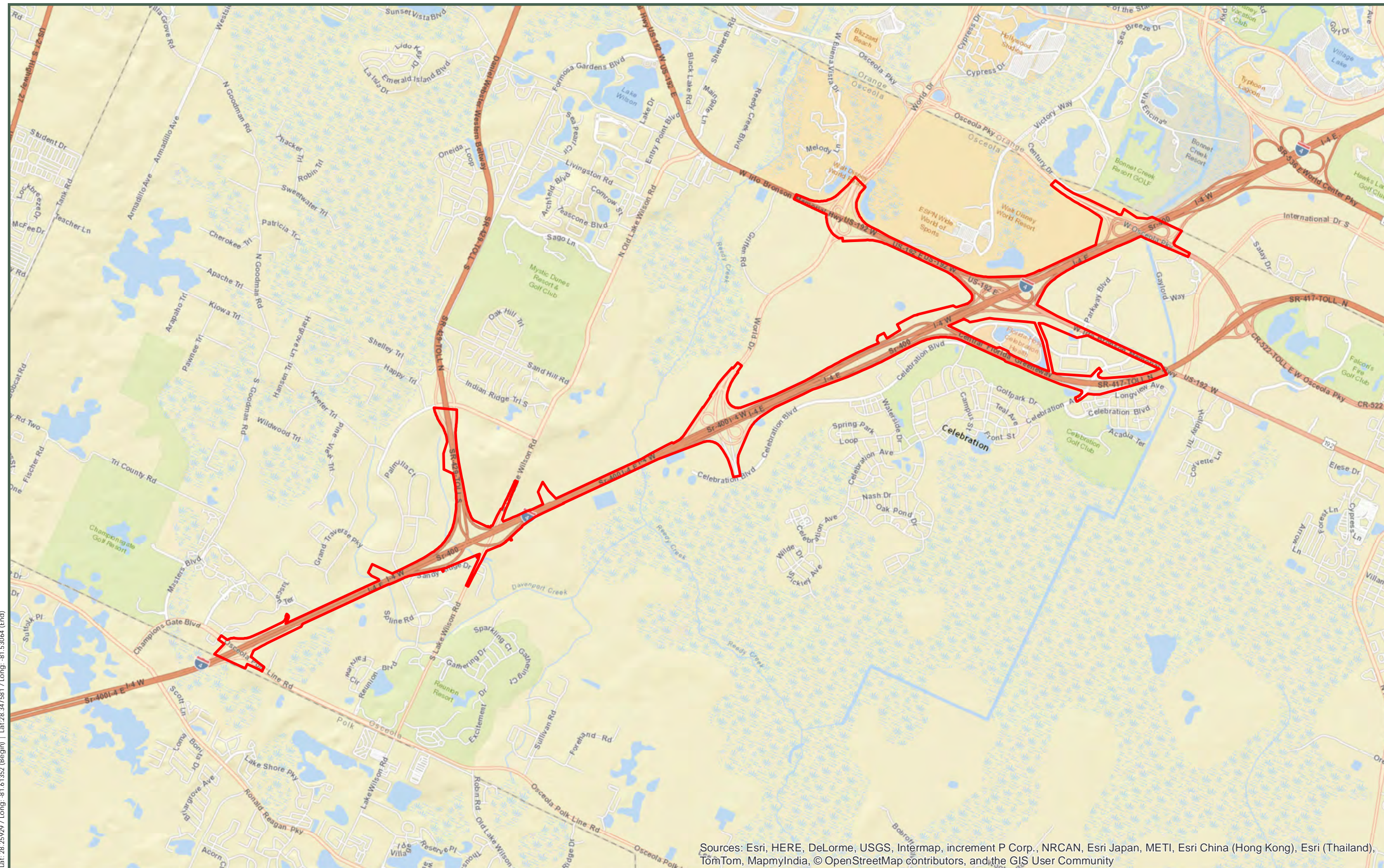
Date:	4/29/2014	Survey Event:	3	Start Time:	9:15 AM	End Time:	3:00 PM
Start Temp:	78 F	End Temp:	90 F	Wind Speed/Direction:	0-5 S		
Visibility:	Mostly Cloudy	Precipitation:	None				
Sites Sampled (in order):	F, V,W, X, Y, G, H, I, Z, AA, FF, HH, JJ, L, M, N, O, O(24), BB, P, Q, R, S, T, KK, II, GG, EE, DD, CC, U						
Biologists/Technicians:	Mike Drauer, Mike Holdsworth, Matt Leonard, Kevin Muldrew						
Observations:	No signs of sand skinks were found under coverboards or in open sand. Numerous six-lined racerunners, several eastern narrow-mouthed toads, and a brown anole were found under coverboards.						

Date:	5/5/2014	Survey Event:	4	Start Time:	9:00 AM	End Time:	2:27 PM
Start Temp:	65 F	End Temp:	85 F	Wind Speed/Direction:	0-5 W		
Visibility:	Clear	Precipitation:	None				
Sites Sampled (in order):	C, D, B, I, H, G, F, K, J, L, M, N, R, Q, S, T, U, P, O, O(24)						
Biologists/Technicians:	Mike Drauer, Mike Holdsworth, Matt Leonard, Kevin Muldrew						
Observations:	No signs of sand skinks were found under coverboards or in open sand. Numerous six-lined racerunners and several eastern narrow-mouthed toads were found under coverboards.						

Date:	5/6/2014	Survey Event:	4	Start Time:	8:38 AM	End Time:	10:55 AM
Start Temp:	70 F	End Temp:	80 F	Wind Speed/Direction:	0-5 W		
Visibility:	Clear	Precipitation:	None				
Sites Sampled (in order):	V, W, X, Y, Z, FF, HH, JJ, KK, AA, BB, II, GG, EE, DD, CC						
Biologists/Technicians:	Mike Drauer, Mike Holdsworth, Matt Leonard, Kevin Muldrew						
Observations:	No signs of sand skinks were found under coverboards or in open sand. Numerous six-lined racerunners and one eastern narrow-mouthed toad were found under coverboards.						




## **FIGURES**



### Map Key

Estimated R/W SR 400 PD&E Study

 Segment 1 (Osceola Co.)

Segment 1 (Osceola County):  
 Begin Station 626+39.92  
 End Station 1042+95  
 Begin MP 0.00 / End MP 7.885  
 Total Length 7.885 miles

Title:  
 SR 400 SAND SKINK SURVEY MEMO-  
 Osceola County  
 Location Map

Client/Project:  
 Florida Department of Transportation- D5  
 SR 400 Project Development & Environment Study  
 SR 400 (I-4) W of CR 532 (County Line)-Polk County  
 (16320) to County Line - Osecola County (92130)

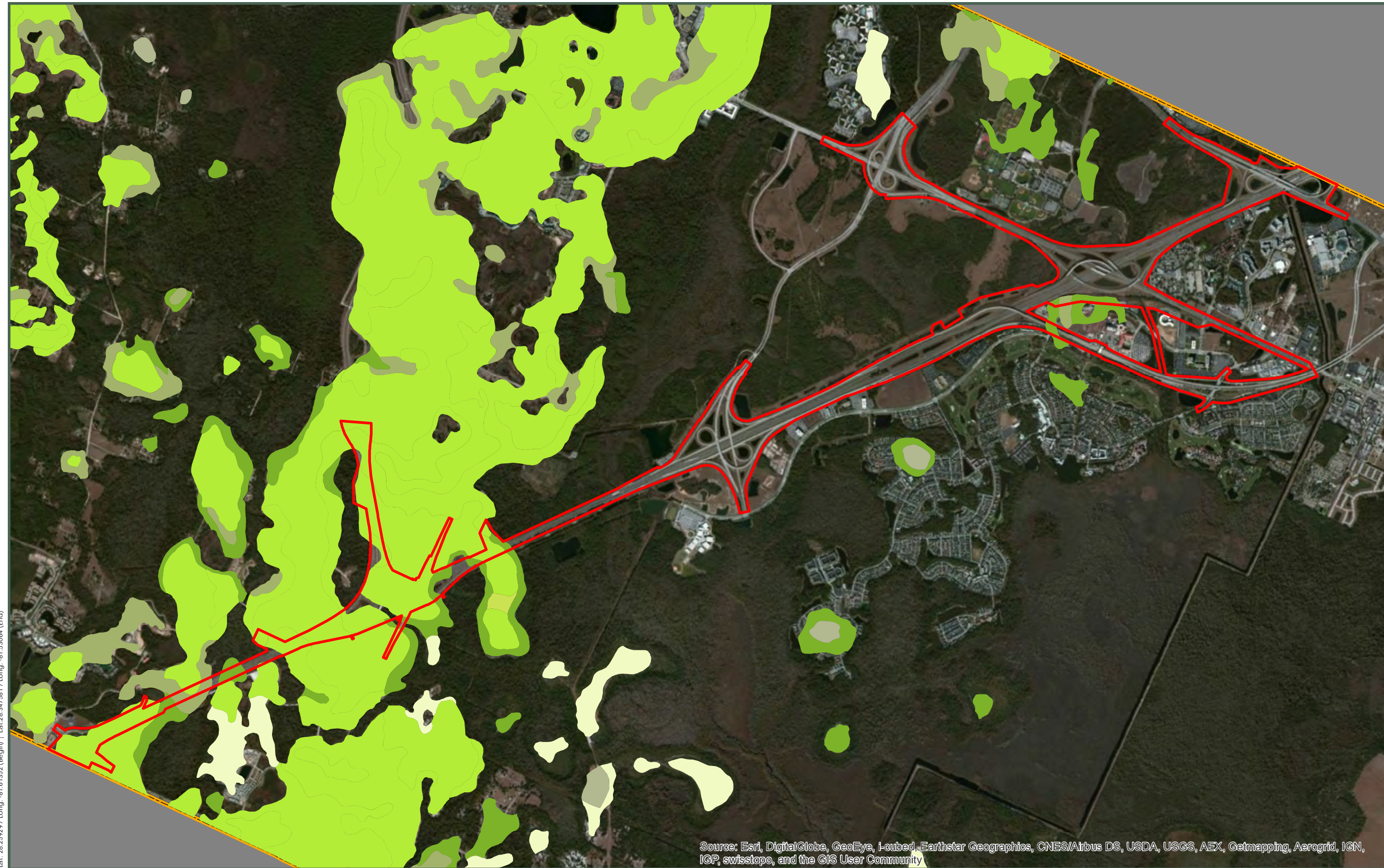
Project Location:  
 25S/27E/1, 12-13, 22-23, 27, 33-34  
 25S/28E/5-8

Prepared by: mLeonard 2014/08/12  
 Technical Review by: mDrauer 2014/08/12  
 Independent Review by: jMoore 2014/08/12

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

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### Map Key

Estimated R/W SR 400 PD&E Study

- Segment 1 (Osceola Co.)
- County Line

Sand Skink Soil Series

- ARCHBOLD (2)
- CANDLER (3) (4) (5) (7) (8)
- PAOLA (28)
- POMELLO (20) (21) (22) (34)
- SATELLITE (34) (41) (77)
- ST. LUCIE (43)
- TAVARES (44) (46) (63)

Lat: 28.25929 / Long: -81.61352 (Begin) | Lat:28.347581 / Long: -81.53064 (End)

Source: Esri, DigitalGlobe, GeoEye, I-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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 NRCS Soil Unit Map

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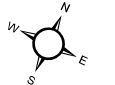
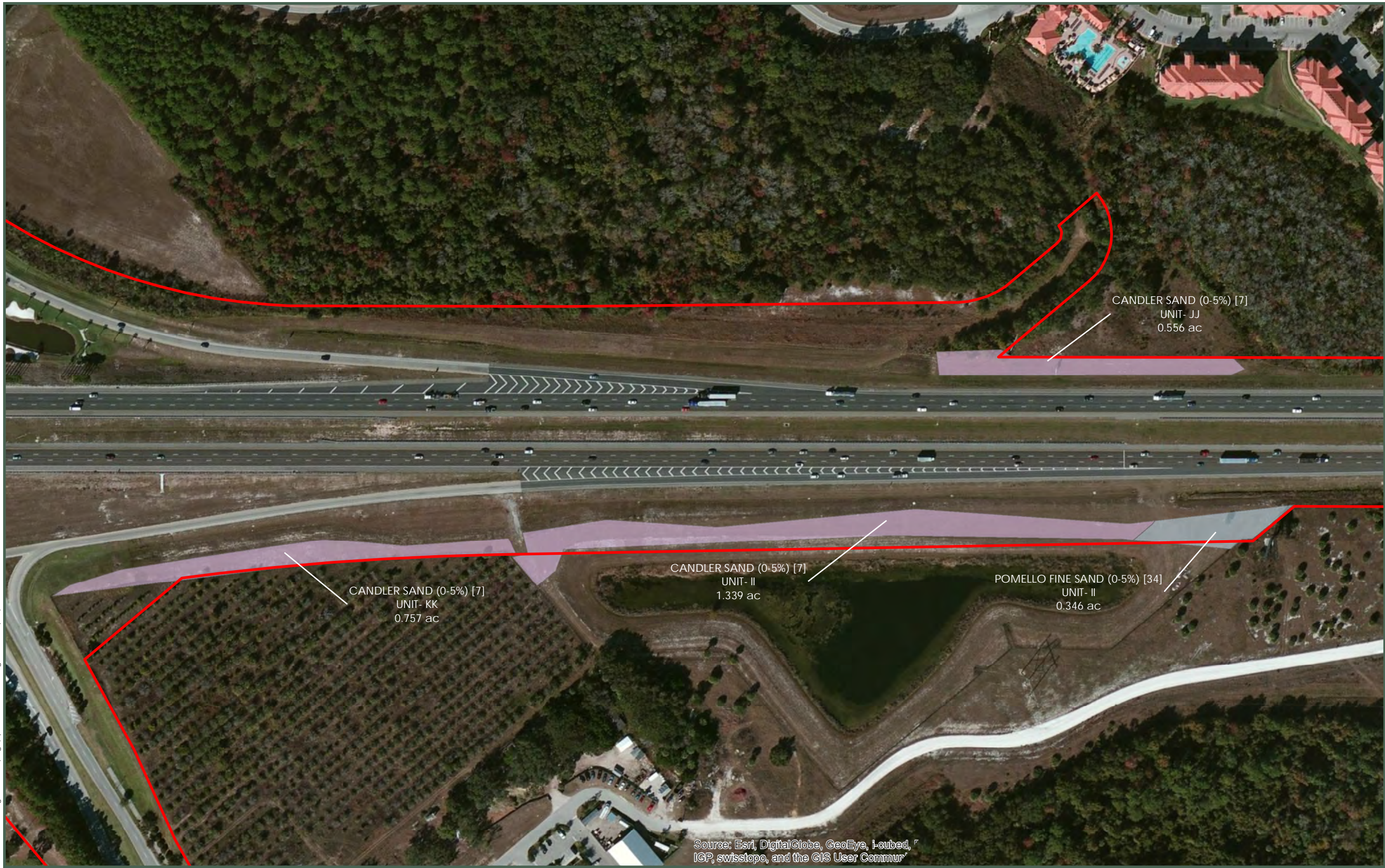
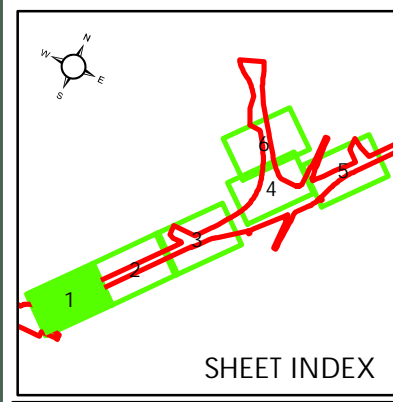


Figure B

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- ### Map Key
- Estimated R/W SR 400 PD&E Study
  - Segment 1 (Osceola Co.)
  - County Line
- ### Soil Units of Survey
- CANDLER SAND (0-5%)
  - CANDLER SAND (5-12%)
  - POMELLO (FINE SAND 0-5%)
  - POMELLO FINE SAND (0-5%)
  - POMPANO FINE SAND (DEP)
  - ST. LUCIE (FINE SAND 0-5%)
  - TAVARES FINE SAND (0-5%)
  - TAVARES-MILLHOPPER (FINE SAND 0-5%)



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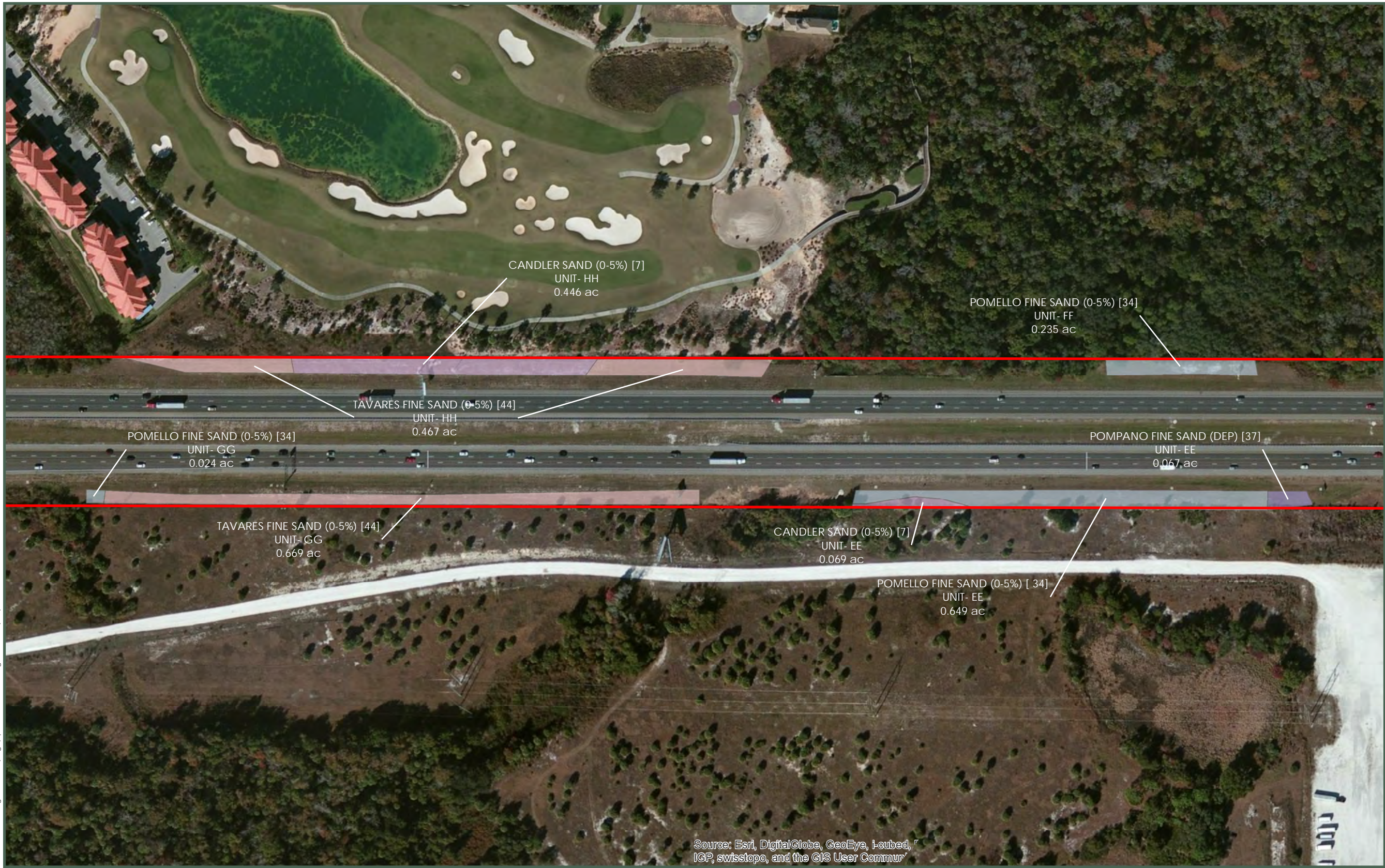
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Source: Esri, DigitalGlobe, GeoEye, i-cubed, IGP, swisstopo, and the GIS User Commur

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

Figure C - Sheet 1 of 6

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- Segment 1 (Osceola Co.)
- County Line

### Soil Units of Survey

- CANDLER SAND (0-5%)
- CANDLER SAND (5-12%)
- POMELLO (FINE SAND 0-5%)
- POMELLO FINE SAND (0-5%)
- POMPANO FINE SAND (DEP)
- ST. LUCIE (FINE SAND 0-5%)
- TAVARES FINE SAND (0-5%)
- TAVARES-MILLHOPPER (FINE SAND 0-5%)

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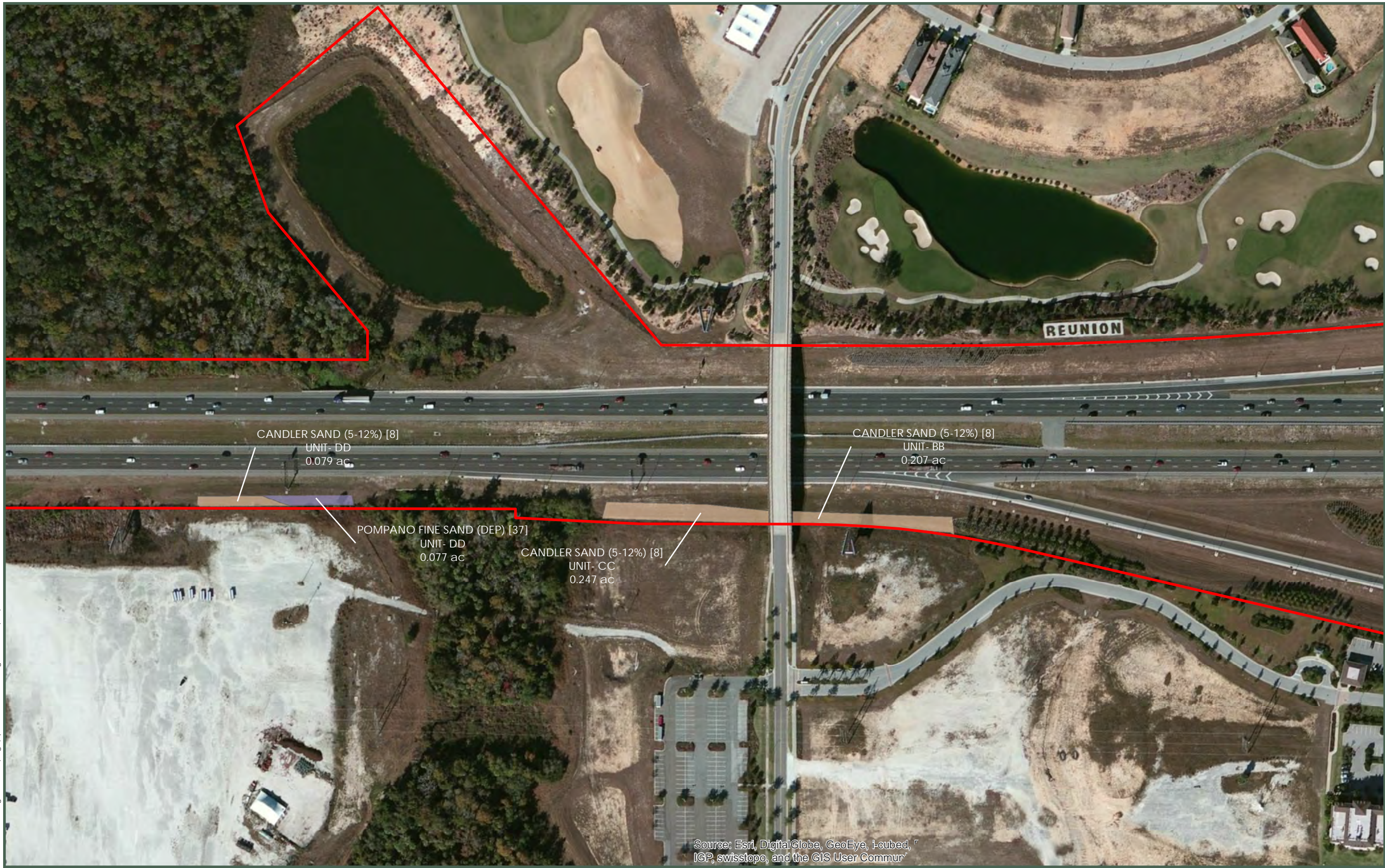
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Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

Figure C - Sheet 2 of 6

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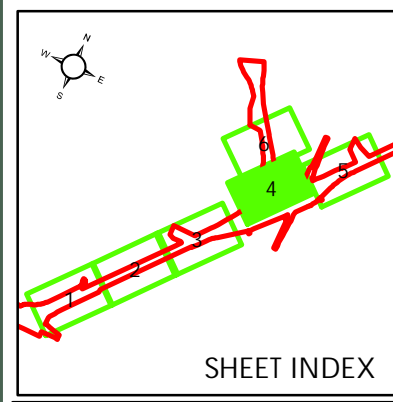
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Figure C - Sheet 3 of 6

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- ### Map Key
- Estimated R/W SR 400 PD&E Study
  - Segment 1 (Osceola Co.)
  - County Line
- ### Soil Units of Survey
- CANDLER SAND (0-5%)
  - CANDLER SAND (5-12%)
  - POMELLO (FINE SAND 0-5%)
  - POMELLO FINE SAND (0-5%)
  - POMPANO FINE SAND (DEP)
  - ST. LUCIE (FINE SAND 0-5%)
  - TAVARES FINE SAND (0-5%)
  - TAVARES-MILLHOPPER (FINE SAND 0-5%)



Title:  
 SR 400 SAND SKINK SURVEY MEMO-  
 Osceola County  
 Sand Skink Survey Units Map

Client/Project:  
 Florida Department of Transportation- D5  
 SR 400 Project Development & Environmental Study  
 SR 400 (I-4) W of CR 532 (County Line)-Polk County  
 (16320) to County Line - Osecola County (92130)

Project Location:  
 25S/27E/1, 12-13, 22-23, 27, 33-34  
 25S/28E/5-8

Prepared by: mLeonard 2014/08/12  
 Technical Review by: mDrauer 2014/08/12  
 Independent Review by: jMoore 2014/08/12

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Figure C - Sheet 4 of 6

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**Map Key**

Estimated R/W SR 400 PD&E Study

- Segment 1 (Osceola Co.)
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**Soil Units of Survey**

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**SHEET INDEX**

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Figure C - Sheet 5 of 6

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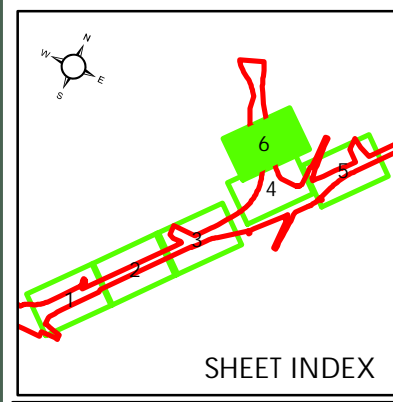
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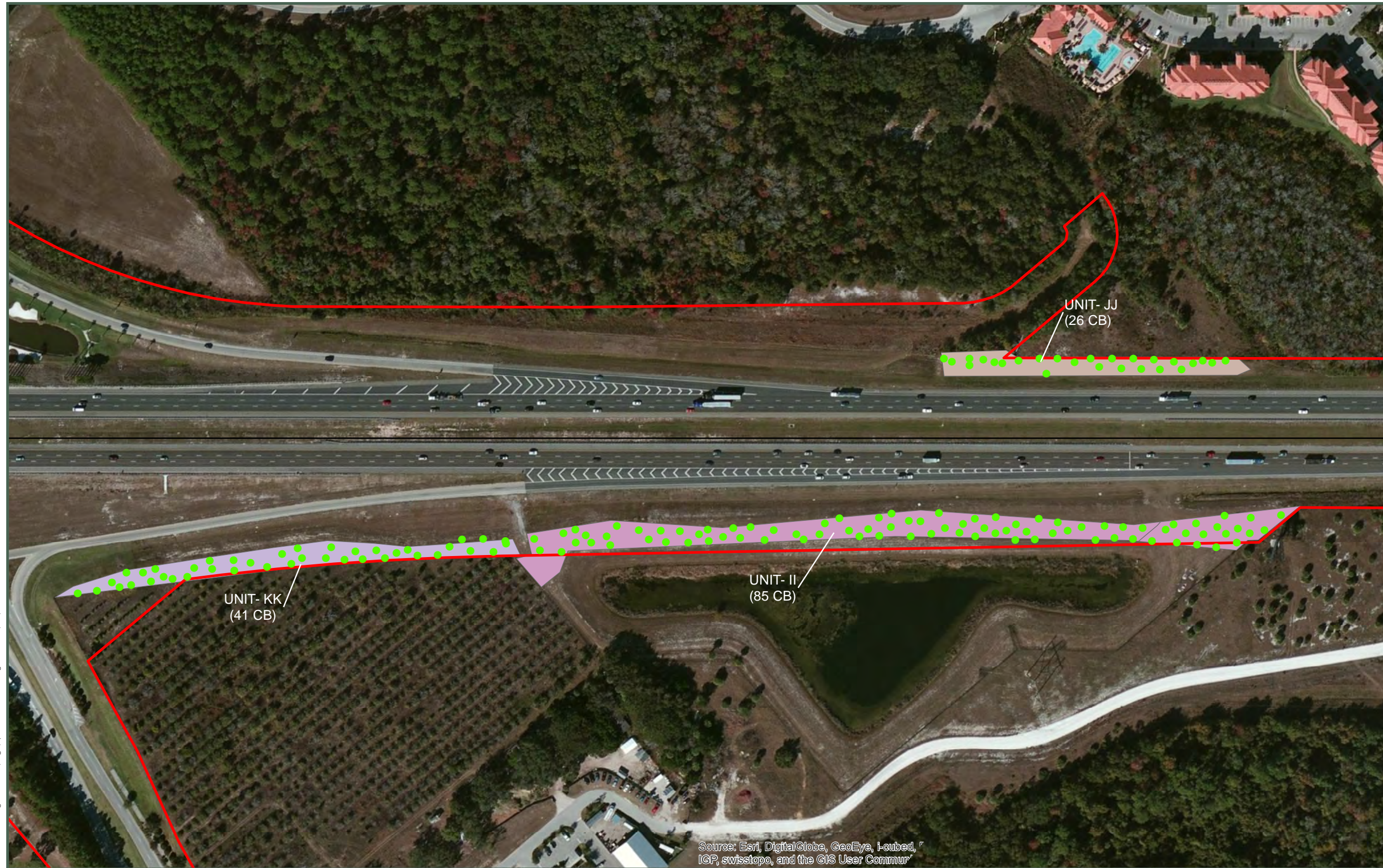
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














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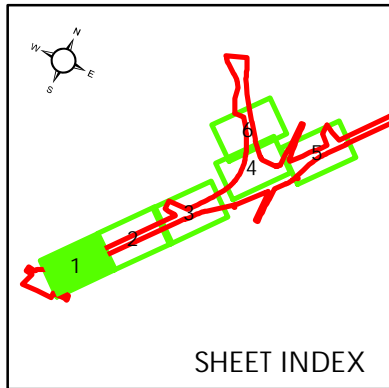
Estimated R/W SR 400 PD&E Study

-  Segment 1 (Osceola Co.)
-  County Line
-  Coverboard Locations

### Survey Units

- |  |  |
|--|--|
|  UNIT- AA |  UNIT- JJ |
|  UNIT- BB |  UNIT- KK |
|  UNIT- CC |  UNIT- U  |
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Notes: CB = Coverboards

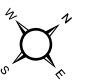


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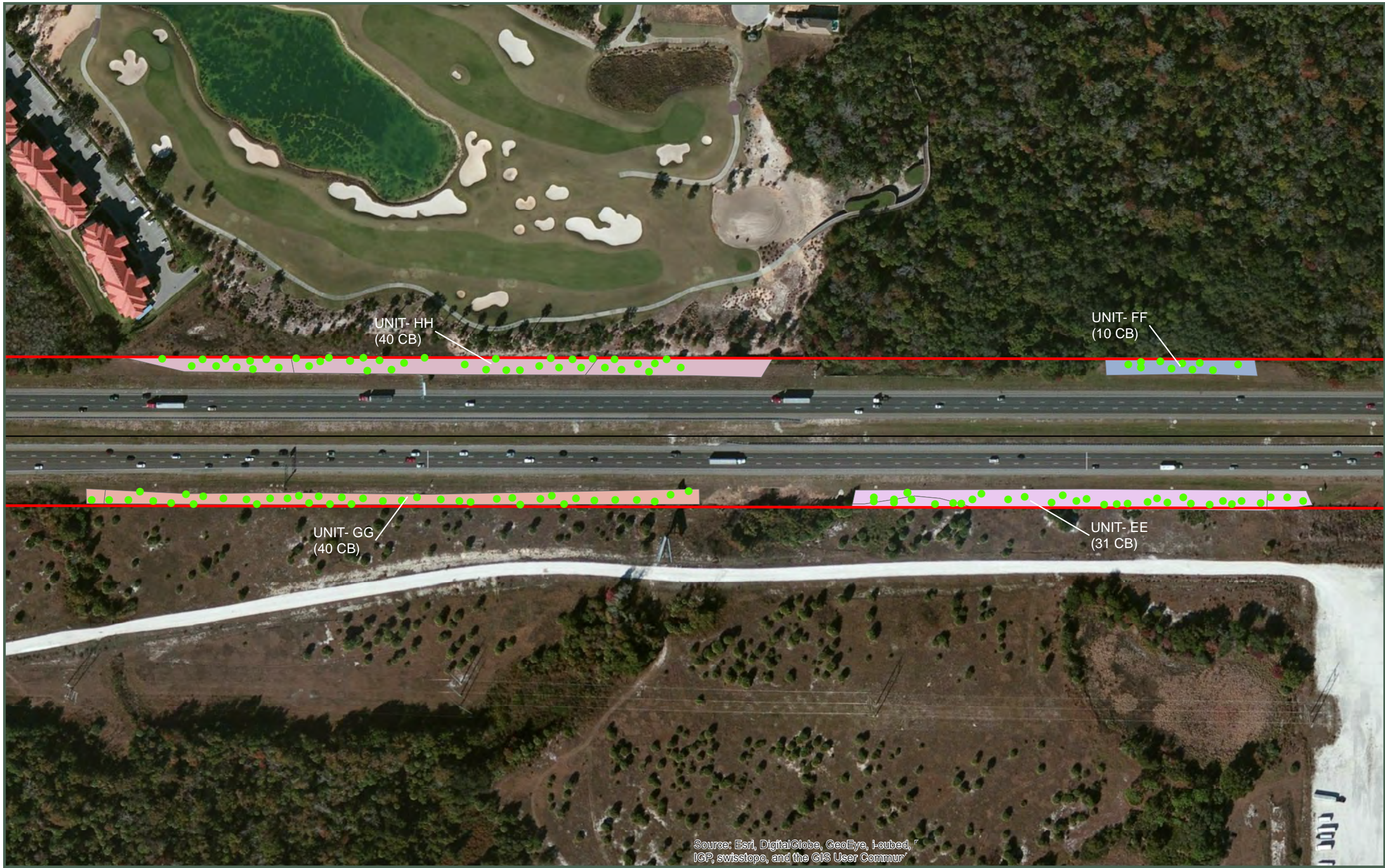
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1" = 200'

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2024230168



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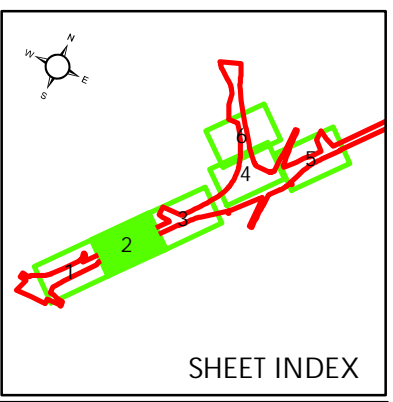
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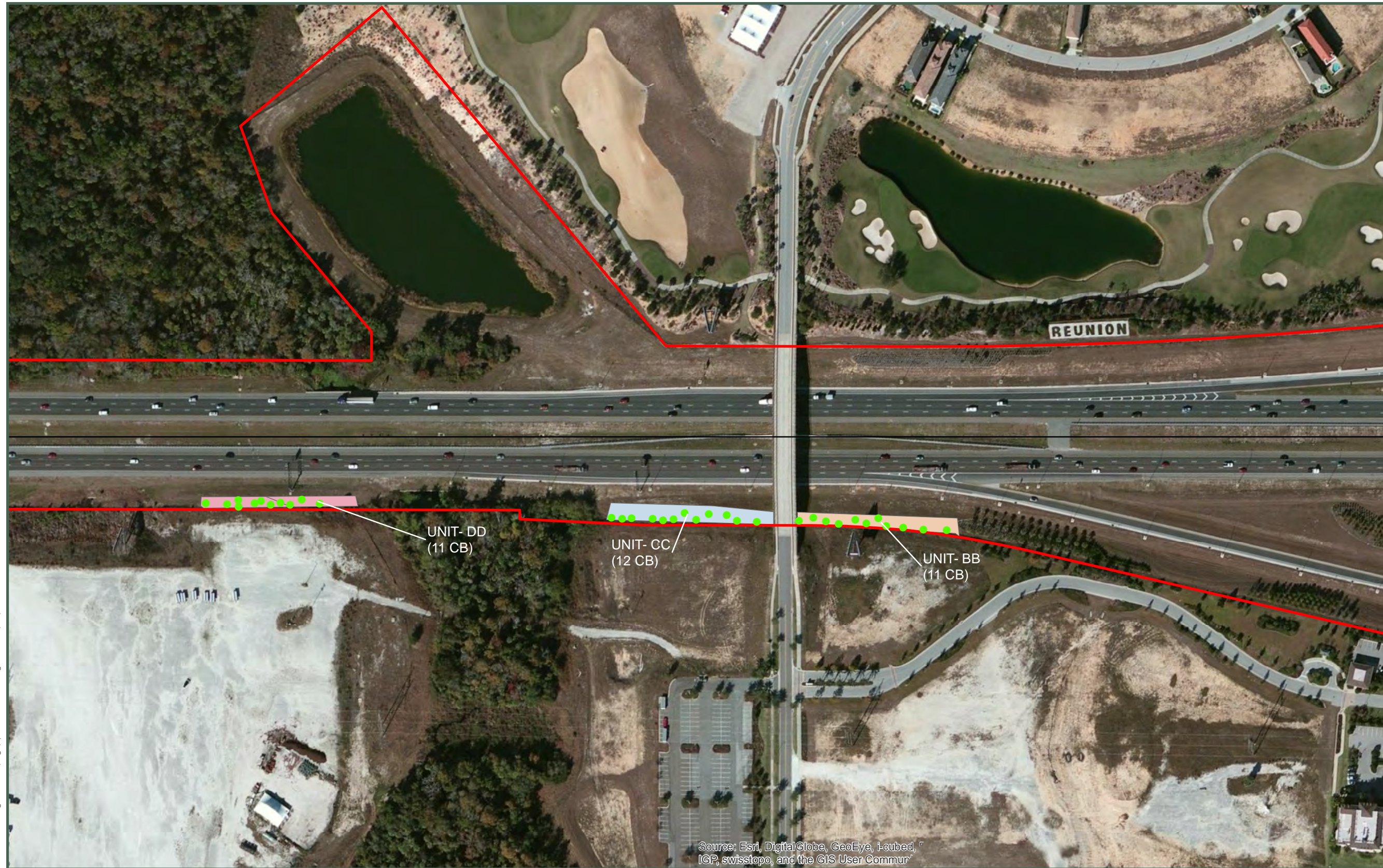
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Figure D - Sheet 2 of 6

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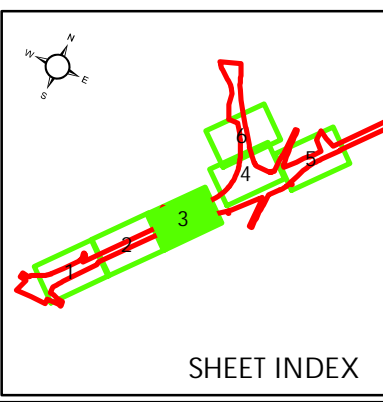
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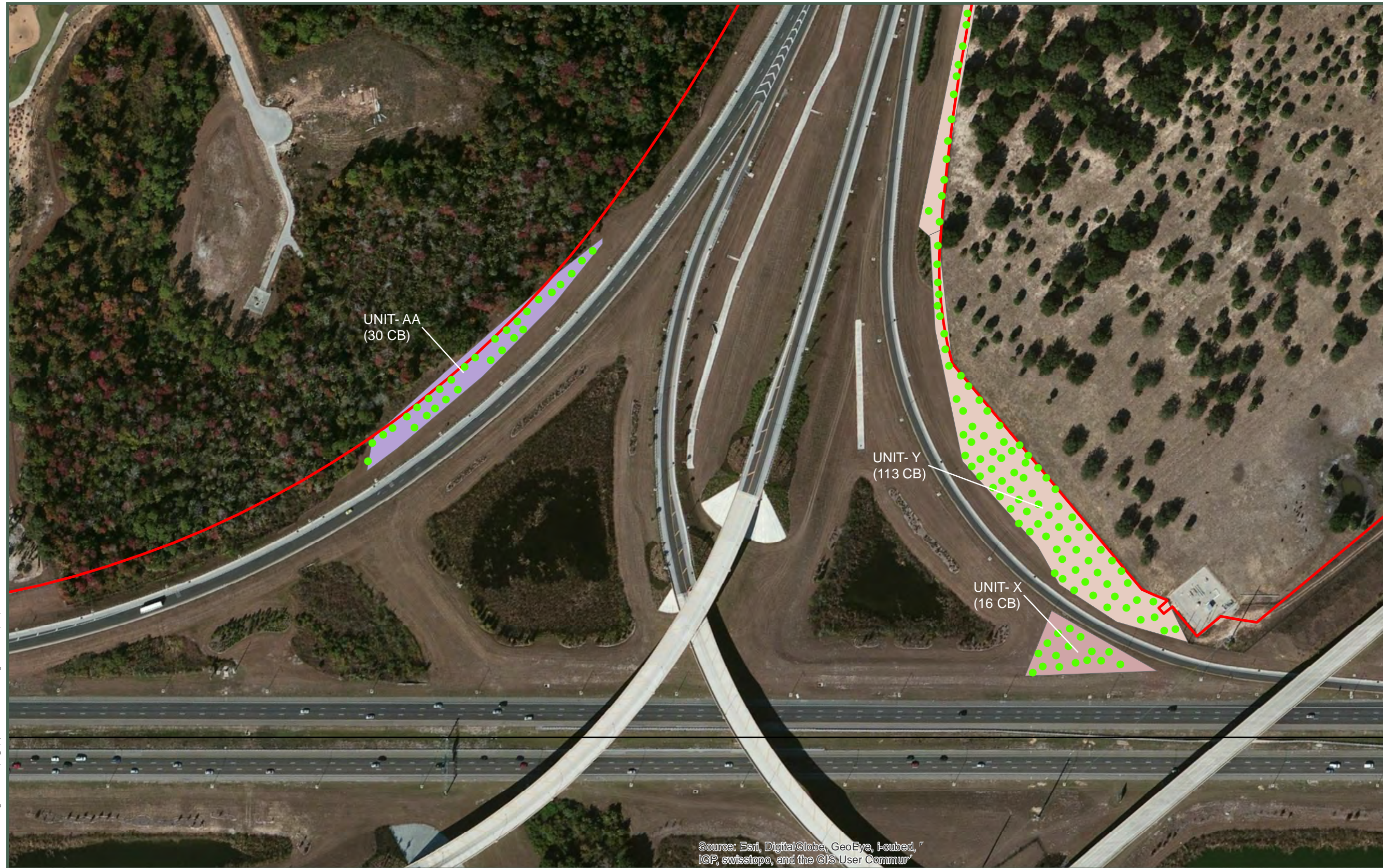
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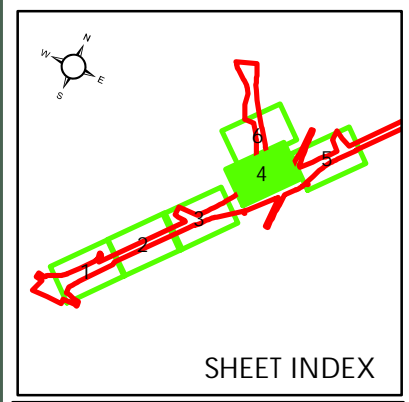
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Figure D - Sheet 4 of 6

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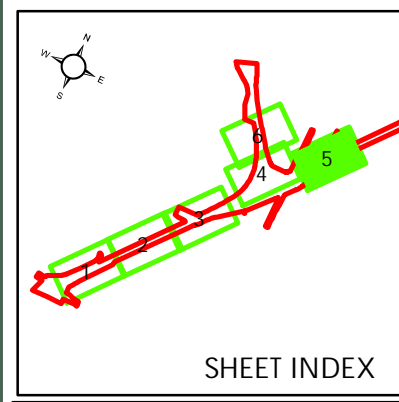
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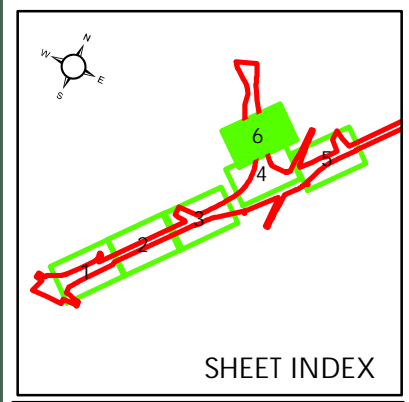
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## **APPENDIX A**

### **ATKINS SOIL INVESTIGATION REPORT**



**Florida Department of  
Transportation, District 5  
State Road 400 (I-4) and  
State Road 429, FDOT Project ID  
432100-1**

**Osceola County, Florida**

Florida Sand Skink (*Neoseps  
reynoldsi*) Soil Investigation Report

March 18, 2014

Prepared by:

Atkins

482 South Keller Road

Orlando, Florida 32810

**Field Investigation Dates:** March 7 through March 11, 2014.

**Project / Location:** Florida Department of Transportation (FDOT), Florida Sand Skink (*Neoseps reynoldsi*) Soil Investigation, State Road 400 (Interstate Highway 4) between SR 532 and SR 429, Osceola County Florida (**Exhibit 1**).

**Project Number:** 100039095

**Client:** Florida Department of Transportation, District 5.

**Inspection Staff:** Sarah Oxford (Senior Scientist I), Craig Stout (Senior Scientist II), Terry Zable (Senior Program Manager/Project Director). Report prepared and submitted by Terry Zable.

**Project Footprint:** State Road 400 (I-4) right-of-way (ROW) and interchange areas beginning just west of State Road 532 (SR 532) to one-quarter mile east of the State Road 429 (SR429) interchange, including access ramps to and from SR 429 onto I-4, in Osceola County, Florida (**Exhibit 1**).

**Introduction:** At the client's request, the project site as described above was investigated to identify potential areas that may have been subject to past soil alterations (filling, excavation, and excavation/filling) which may have sufficiently altered the soils such that they no longer exhibit surface or shallow surface characteristics for suitable Florida Sand Skink (*Neoseps reynoldsi*) soils as identified by U.S. Fish and Wildlife Service (USFWS) within the Osceola County Consultation Area. The entire project area was field reviewed and soil borings were undertaken where there was not a reasonable probability that the soils in the area had been previously excavated (slope cuts, swales, ditches, ponds), filled (ramps, treatment pond berms, road beds), or excavation/filling due to roadway alterations, stormwater treatment areas or utility, lighting and/or signage features. Soil borings were also performed to verify areas where natural, unaltered suitable soils were mapped, and road construction activities appeared to have not impacted the soil surface. The soil series identified by USFWS as suitable sand skink habitat soils which have been mapped as occurring within the project area consists of: Candler, Pomello, and Tavares soil series.

In order to accurately describe the existing soil conditions within the project footprint, the entire project was separated into 35 study areas (**Exhibit 2**), which are independently described below. Soil borings performed in the study area were hand augured utilizing a bucket auger and directly filled after each excavation. A push probe was also utilized to verify the limits of fill, when filled areas were identified, no soil borings were performed where filling or excavation was obvious. The location of each soil boring, or probe location was memorialized utilizing a Trimble Pro Global Positioning System (GPS) unit. Soil Boring locations are shown on the attached soil boring location map (**Exhibit 4**), and details regarding the individual soil borings are listed in the Soil Boring Description (**Exhibit 6**). In addition to the recorded locations, one or more representative photographs were taken within each of the 35 study areas (**Exhibit 5**).

## **Study Areas:**

Study Area 1 Located between the I-4 east bound exit ramp to SR 523 and the I-4 interchange overpass. With the exception of overpass ramps and roadways, this area is relatively flat and is vegetated with a mixture of grass and sedges. A total of 13 soil borings were performed within the area (**Exhibit 4A**), and all bore locations reflected either sandy surface soils with limestone material or, finer textured loamy soils with or without limerock. Based on the field review, this area appears to be entirely composed of fill material.

Study Area 2 Small study area bordered by SR 532 and the eastbound I-4 exit lane to SR 522. The soils identified in this area are either finer textured loamy sand, or fine sand with limestone. The soils observed

are not similar to the Candler series mapped in this area. Based upon the soils observed it is assumed that this area was filled, and/or altered during road construction.

Study Area 3 Located adjacent to the eastbound I-4 exit ramp onto SR 532, which is bordered by the exit ramp and ROW fence. The portion of the study area located immediately adjacent to the access ramp is fill material composed of sandy and loamy sand soils with mixed lime rock occurring at a depth of 8 -12 inches. Closer to the ROW fence, it appears that the natural slope has been graded to create a level roadway. The slope grading that occurred removed several feet of the soil surface which exposes finer textured subsoil. Therefore, the soils observed in this study area do not exhibit profiles similar to the mapped Candler series and are either fill material or a truncated soil profile with exposed subsoil. At this time, no significant areas of Candler soil can be found within this study area.

Study Area 4 Located along the south side of the SR 532 access ramp to I-4. A majority of this area contains the side slope of a sand ridge that was cut and graded to provide a more level roadway contour. Depending upon the location, it appears that up to 20 feet of vertical height may have been removed from the ridge for roadway construction. Several soil borings were conducted along the relatively undisturbed ridge top that revealed soil profiles consistent with the mapped Candler series. The side slopes are composed with truncated soil profiles, and much of the area supports maintained turf and ornamental landscape plantings. The portion of the study area containing Candler soils was delineated, and a GPS boundary has been created (**Exhibit 3A**).

Study Area 5 This is a small study area located between the eastbound I-4 access ramp from SR 532 and the I-4 overpass of SR 532. Soil borings performed within this area all revealed soils with a sandy surface and limestone material occurring between depths of 2 to 6 inches of the surface, indicating that the entire study area appears to be composed of fill containing limestone material.

Study Area 6 This study area is located along the east bound travel lanes of I-4, beginning just east of the terminus of SR 532 access ramp onto I-4 and continuing east until intersecting with an un-named wetland system. Field investigation reveal that portions of this study area located adjacent to the travel lanes are composed of sandy fill with limestone material. Other sections of this study area bordering the ROW fence do not appear to have been impacted by roadway excavation and filling activities and soil borings indicate profiles consistent with the original mapped Candler soil series. The portions of the study area with suitable sand skink soils were delineated and are shown in **Exhibit 3A**.

Study Area 7 This study area is located along the east bound travel lanes of I-4, beginning just east of the un-named wetland system bordering Study Area 6, and continuing east until intersecting with an un-named wetland system located west of the Tradition Boulevard overpass. Portions of this study area which are located adjacent to travel lanes are composed of sandy fill with limestone material. The remaining portions of this area bordering the ROW fence do not appear to have been impacted by roadway excavation and filling activities and soil borings indicate profiles consistent with either Pomello or Tavares soil series, both mapped for this area. All identified suitable sand skink soils were delineated and are shown in **Exhibits 3A and 3B**.

Study Area 8 This study area is located along the east side of eastbound I-4 travel lanes, beginning at the east edge wetland area that borders Study Area 7, and terminating at a drainage area located within the interchange. All portions of this study area are located within landscapes that were either excavated and graded to lower slopes, or were filled for ramps, bridge piers, travel lanes, or ornamental planting areas. Although this area was historically mapped as Candler series, there are no natural grades remaining within the FDOT ROW that have not been significantly altered by road building activities, and therefore the soils within this study area cannot be identified as the Candler series.

Study Area 9 This study area is located between the east sides of the eastbound I-4 travel lanes and the west side of the I-4 to SR 429 access ramp. This study area is entirely composed of soils that were excavated to reduce elevations and modify grades, or were excavated to create stormwater swales and a treatment pond. Although this area was historically mapped as Candler series, there are no natural

grades remaining within the FDOT ROW that have not been significantly altered by road building activities. Therefore, the soils within this study area cannot be identified as the Candler series.

Study Area 10 This study area is located between the eastbound I-4 travel lanes and SR 545. All portions of this study area are located within landscapes that were either excavated and graded to lower the slopes to create ponds, or were filled for ramps, bridge piers, or travel lanes. Although this area was historically mapped as Candler series, there are no natural grades remaining within the FDOT ROW that have not been significantly altered by road building activities. Therefore, the existing soils located within this study area cannot be identified as the Candler series.

Study Area 11 This study area is the eastern most segment of the I-4/SR429 interchange, and is bordered by SR545, westbound I-4 and the SR 429 access ramp to I-4, located between the eastbound I-4 travel lanes and SR 545. All portions of this study area are located within landscapes that were either excavated and graded to lower the existing slopes to create ponds, or were filled for ramps, bridge piers, or travel lanes. Although this area was historically mapped as Candler series, there are no natural grades remaining within the FDOT ROW that have not been significantly altered by road building activities. Therefore the existing soils within this study area cannot be identified as the Candler series.

Study Area 12 This study area is located along the east bound travel lanes of I-4, beginning at the SR 429 access ramp to west bound I-4, and continuing east approximately one-quarter mile and terminating at the eastern project limits. The portions of this study area are located adjacent to travel lanes that are composed of fill, with an excavated swale. Additional portions of the study area located east of the swale to the ROW fence do not appear to have been impacted by roadway filling and excavation activities and soil borings indicate profiles consistent with the Candler soil series. The portions of the study area with suitable sand skink soils were delineated and are shown in **Exhibit 3D**.

Study Area 13 This study area consists of the project I-4 median section from the intersection of SR 532 and I-4, to approximately one-quarter mile east of the intersection of I-4 and SR 429. The roadway median for this section of I-4 consists of a relatively continuous swale feature that intercepts and directs stormwater runoff from roadway surfaces. The median swale is an excavated system that is set at a lower elevation than the existing travel lanes. Although the median area was historically mapped as a Candler series, I-4 roadway construction activities have altered the soils so that these areas no longer can be classified as Candler series.

Study Area 14 This study area contains the stormwater treatment pond located one-quarter mile east of the I-4 and SR 429 interchange, and northwest of the westbound I-4 travel lanes. The existing stormwater treatment pond consists of constructed berms produced from fill material and stabilized with grass side slopes. The pond area is entirely constructed of excavated or fill material, and does not contain areas with natural soil profiles. Therefore, this study area does not contain soils suitable for sand skink habitat.

Study Area 15 This study area is located along the west bound travel lanes of I-4, beginning one-quarter mile east of the I-4 and SR 429 interchange, and continuing west to a small wetland depressional feature located east of SR 545. Portions of this study area located adjacent to travel lanes are composed of roadway fill material, with excavated swale and sideslope features. The portions of the study area northwest of the swale and cut sideslope features to the I-4 ROW fence have not been impacted by roadway construction activities and soil borings indicate profiles consistent with the Candler soil series. The portions of the study area with suitable sand skink soils have been delineated and are shown in **Exhibit 3D**.

Study Area 16 This area is located along the west bound travel lanes of I-4, between SR 545 and a small wetland depressional feature just east of SR 545. Portions of this study area located adjacent to travel lanes are composed of roadway fill material, with excavated swale and side-slope features. The portions of the study area located northwest of the swale and cut side-slope features to the I-4 ROW fence have not been impacted by roadway construction activities and soil borings indicate profiles consistent with the Candler soil series. The portions of the study area with suitable sand skink soils have been delineated and are shown in **Exhibit 3D**.

Study Area 17 This area is located along the eastern side-slope of the north side of SR 545 overpass at I-4. This entire study area is composed of either overpass side-slope, or compacted limerock roadway. Although this area was historically mapped as Candler series, all portions of this study area have been filled and there are no areas that were observed to contain suitable sand skink soils.

Study Area 18 This area is located along the west side-slope of the north side of SR 545 overpass at I-4. This entire study area is composed of a filled overpass side-slope. Although this area was historically mapped as Candler series, all portions of this study area were observed to have been filled and no areas were observed to contain suitable sand skink soils.

Study Area 19 This area is located along the east side of the northbound travel lanes of SR 429, beginning at the merge of the northbound SR 429 access ramp from west bound I-4 and continuing north approximately one-quarter mile, terminating at the northern project limits. The portions of this study area located adjacent to travel lanes are composed of fill, with an excavated swale. Portions of the study area east of the swale feature to the ROW fence do not appear to have been impacted by roadway filling and excavation activities and soil borings indicate profiles consistent with the Candler soil series. The portions of the study area with suitable sand skink soils have been delineated and are shown in **Exhibits 3C and 3D**.

Study Area 20 This area is located in the north-eastern quadrant of the I-4/SR429 interchange and is bordered on the west by the westbound I-4 access ramp to SR 429 and on the east by the eastbound access ramp to SR 429. Most portions of this study area are located within landscapes that were either excavated and graded to lower slopes to create ponds, or were filled for ramps, bridge piers, or travel lanes. Although this area was historically mapped as Candler series, at this time there is only one area located at the eastern boundary of this study area that was identified to have not been significantly altered by road building activities and supports soils consistent with the Candler series (**Exhibit 3C**). The remaining portions of this study area cannot be identified as the Candler series.

Study Area 21 This study area is located in the north-western quadrant of the I-4/SR429 interchange and is bordered on the west by the westbound I-4 access ramp from SR 429, and on the east by the SR429 access ramp to eastbound I-4. All portions of this study area are located within landscapes that were either excavated and graded to lower slopes in order to create ponds, or were filled for ramps, bridge piers, or travel lanes. Although this area was historically mapped as Candler series, there are no field identified natural grades remaining within the study area that have not been significantly altered by road construction activities and therefore the soils within this area cannot be identified as the Candler series.

Study Area 22 This study area is located between the eastbound I-4 access ramp to SR 429 and the SR429 access ramp to westbound I-4. This entire study area is composed of filled overpass side-slope. Although this area was historically mapped as Candler series, all portions of this study area have been filled and field investigations indicate that there are no remaining areas with suitable sand skink soils.

Study Area 23 This study area is located along the southbound travel lanes of SR 429, north of the SR 429 and I-4 interchange. Portions of this study area located adjacent to travel lanes are composed of roadway fill material, with an excavated swale. However, the remaining portions of the study area located west of the swale to the SR 429 ROW fence have not been impacted by roadway construction activities and soil borings indicate profiles consistent with the Candler soil series. The portions of the study area with suitable sand skink soils have been delineated and are shown in **Exhibit 3C**.

Study Area 24 This study area is the SR 429 median section, from the northern SR 429 project limits to the mapped limits of the Candler soil series. The roadway median for this section of SR 429 consists of a roadway swale that intercepts and directs stormwater runoff from roadway surfaces. The median swale appears to have been excavated and is set at a lower elevation than the SR 429 travel lanes. Although the median area was historically mapped as Candler series, SR 429 roadway construction activities have altered the soils so that these areas no longer can be classified as Candler series.

Study Area 25 This area is located along the west side of the SR 429 access ramp to westbound I-4. The portions of this study area located adjacent to travel lanes are composed of roadway fill material, with an excavated swale. In addition, there are excavated side-slopes, however the remaining portions of the study area between the cut side-slopes and SR 429 ROW fence have not been impacted by roadway construction activities and soil borings indicate profiles consistent with the Candler soil series. The portions of the study area with suitable sand skink soils have been delineated and are shown in **Exhibit 3C**.

Study Area 26 This area is located in the western most quadrant of the I-4/SR429 interchange, and is bordered on the west by the SR 429 access ramp to westbound I-4, and on the east by the westbound travel lanes of I-4. All portions of this study area are located within landscapes that were either excavated and graded to lower slopes to create ponds, or were filled for ramps, or travel lanes. Although this area was historically mapped as Candler series, there are no natural grades that can be identified within the study area that have not been significantly altered by road building activities. Therefore, the soils within this area cannot be identified as the Candler series.

Study Area 27 This area is located along the west side of the SR 429 access ramp to westbound I-4. All portions of this study area were observed to contain fill material. In addition, this study area also contained an excavated swale and excavated side-slopes.

Study Area 28 This study area consists of a stormwater treatment pond located west of the I-4 travel lanes and bordered by a wetland system to southwest and a residential subdivision to the north. The stormwater treatment pond consists of a constructed bermed pond of fill material, containing grass sideslopes that adjoins a landscaped subdivision berm on the northeast. In addition to the stormwater pond, there is an excavated access area connecting to I-4. All portions of the study area have been filled or excavated and therefore does not support soil profiles consistent with the Candler series mapped for this area.

Study Area 29 This is a small study area located along westbound I-4 travel lanes bordered on the east and west by wetland features, and west of Study Area 28. Portions of this study area located adjacent to travel lanes are composed of fill, with an excavated swale. However, the remaining portion of the study area west of the swale to the ROW fence does not appear to have been impacted by roadway filling and excavation activities. This area contains suitable sand skink soils that were delineated and are shown in **Exhibit 3B**.

Study Area 30 This study area is located along the westbound travel lanes of I-4 just east of the of the SR 532 and I-4 interchange. Portions of this study area located adjacent to travel lanes are composed of roadway fill material, with an excavated swale. However, the remaining portions of the study area located west of the swale to the I-4 ROW fence have not been impacted by roadway construction activities and soil borings indicate profiles consistent with the Tavares soil series. The portions of the study area with suitable sand skink soils have been delineated and are shown in **Exhibits 3A and 3B**.

Study Area 31 This study area is located along the westbound travel lanes of I-4, east of the SR 532 and I-4 interchange. Portions of the study area located adjacent to travel lanes are composed of roadway fill material, with an excavated swale. However, the remaining portions of the study area located west of the swale to the I-4 ROW fence have not been impacted by roadway construction activities and soil borings indicate profiles consistent with the Pomello soil series. The portions of the study area with suitable sand skink soils have been delineated and are shown in **Exhibit 3A**.

Study Area 32 Study area 32 is located adjacent to the westbound exit ramp to SR 532. This area is a relatively flat area that contains a herbaceous vegetative (mixed grasses and sedges) structure. A total of six (6) soil borings were performed within this study area, of which all bore locations reflected sandy surface soils with limestone material. It appears that all portions of this study area have been filled.

Study Area 33 This study area is located between the I-4 overpass of SR 532 and the westbound I-4 exit ramp to SR 523. The study area contains either overpass side-slope fill, or landscaped pond features with

simulated golf green and sand traps. All portions of this area have been filled and landscaped. There are no suitable sand skink soils within the study area.

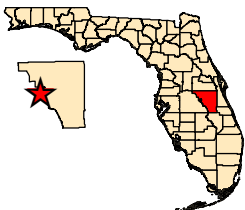
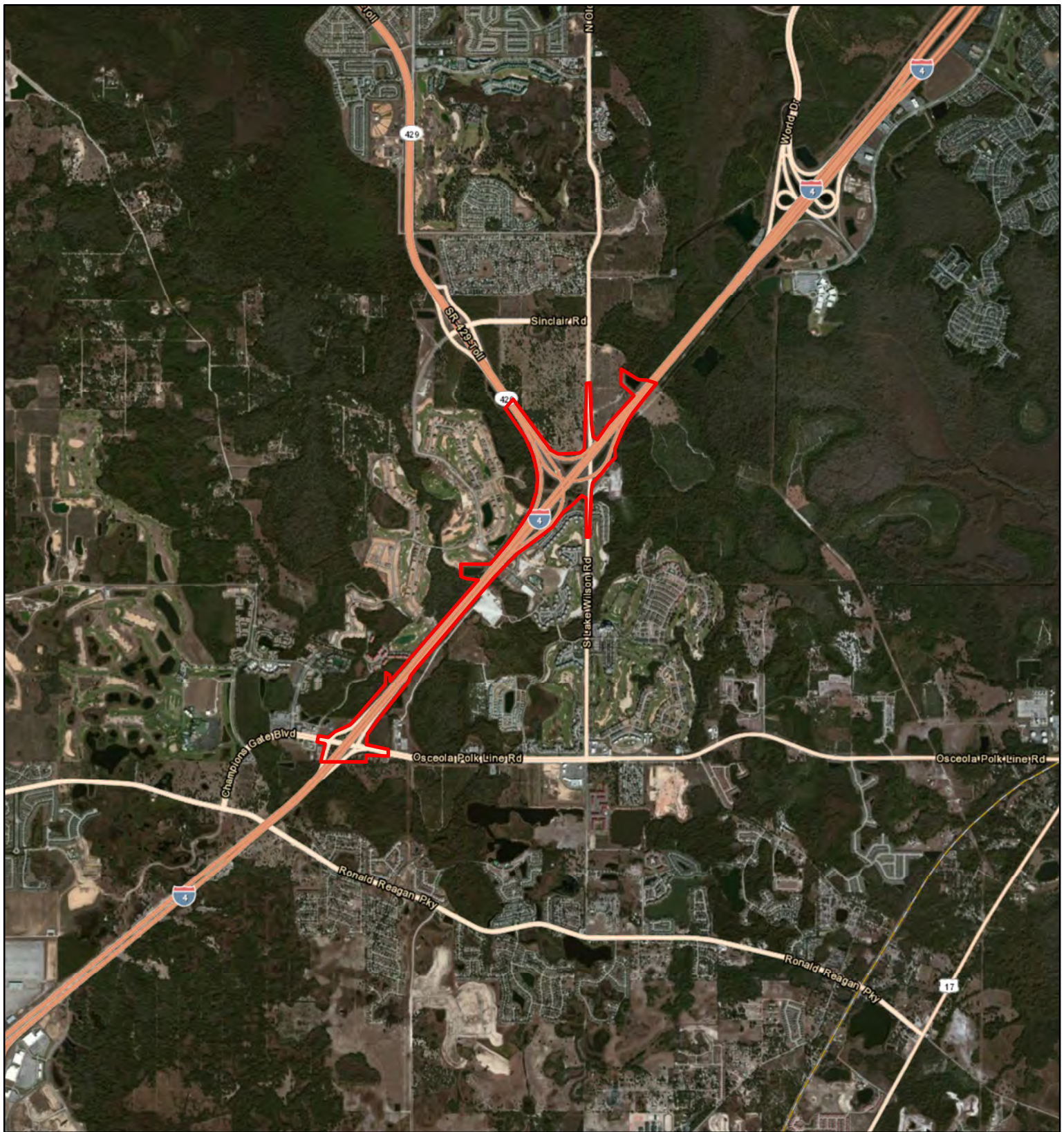
Study Area 34 This study area consists of a landscaped access ramp from SR 532 to westbound I-4. The area contains an excavated pond with irrigated landscaped buffers. There are no natural soils located within this area.

Study Area 35 This study area is located between the I-4 overpass of SR 532 and the SR 523 access ramp to westbound I-4. All portions of this area are either identified as overpass side-slope fill, or landscaped pond and ornamental planting areas. All portions of this area have been filled, and landscaped. There are no suitable sand skink soils within the study area.

## Summary:

At the clients request, the project site as described above was investigated to identify potential areas that may have been subject to past soil alterations (filling, excavation, and excavation/filling) which may have sufficiently altered the soils such that they no longer exhibit surface or shallow surface characteristics for suitable Florida Sand Skink soils as identified by U.S. Fish and Wildlife Service (USFWS) within the Osceola County Consultation Area. In order to accurately describe the existing soil conditions within the project footprint, the entire project was separated into 35 study areas. These study areas were field reviewed and soil borings were undertaken where there was a reasonable probability that the soils in the area had been previously excavated (slope cuts, swales, ditches, ponds), filled (ramps, treatment pond berms, road beds), or excavation/filling due to roadway alterations, stormwater treatment areas or utility, lighting and/or signage features. Soil borings were also performed to verify areas where natural, unaltered suitable soils were mapped, and road construction activities appeared to have not impacted the soil surface. The soil series identified by USFWS as suitable sand skink habitat soils which have been mapped as occurring within the project area consists of: Candler, Pomello, and Tavares soil series.

Generally all areas immediately adjacent to paved road surfaces, constructed treatment ponds, ramps or bridge structures or created landscape buffers have all been subject to filling. In addition, areas that were subject to excavation for the creation of ponds, swales, ditches or sideslope contouring all exhibit truncated soil profiles. In some cases these area were also filled after excavation to achieve final grade of install limerock or road bedding material. Areas supporting soil profiles similar to the mapped soil units generally were located along or in close proximity to ROW limits or were located at the top of ridges where sideslope contouring had not taken place. The areas supporting the natural soil profiles were field delineated, and are shown in the report **Exhibit 3**.



Soil Site Investigation  
Project Footprint Map

Florida Department of Transportation  
District 5  
State Road 400 (I-4) and State Road 429  
Osceola County, Florida

 Project Footprint

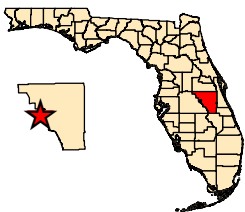
**Exhibit 1**

1 inch = 4,000 feet

Exhibit Date:  
03.17.14








Soil Site Investigation  
Soil Survey Areas Overall

Florida Department of Transportation  
District 5  
State Road 400 (I-4) and State Road 429  
Osceola County, Florida

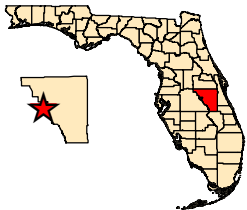
 Soil Survey Areas

**Exhibit 2**

1 inch = 1,500 feet

Exhibit Date:  
03.17.14





Soil Site Investigation  
Soil Survey Areas

Florida Department of Transportation  
District 5  
State Road 400 (I-4) and State Road 429  
Osceola County, Florida

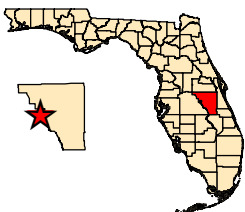
 Soil Survey Areas

**Exhibit 2A**

1 inch = 500 feet

Exhibit Date:  
03.17.14





Soil Site Investigation  
Soil Survey Areas

Florida Department of Transportation  
District 5  
State Road 400 (I-4) and State Road 429  
Osceola County, Florida

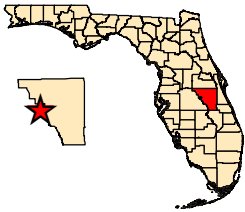
 Soil Survey Areas

**Exhibit 2B**

1 inch = 500 feet

Exhibit Date:  
03.17.14






Soil Site Investigation  
Soil Survey Areas

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Florida Department of Transportation  
District 5  
State Road 400 (I-4) and State Road 429  
Osceola County, Florida

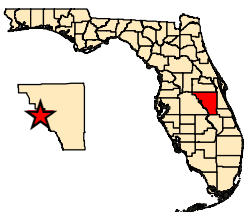
 Soil Survey Areas

**Exhibit 2C**

1 inch = 500 feet

Exhibit Date:  
03.17.14





Soil Site Investigation  
Soil Survey Areas

Florida Department of Transportation  
District 5  
State Road 400 (I-4) and State Road 429  
Osceola County, Florida

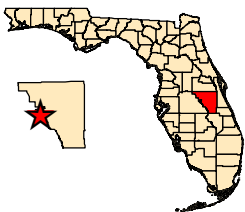
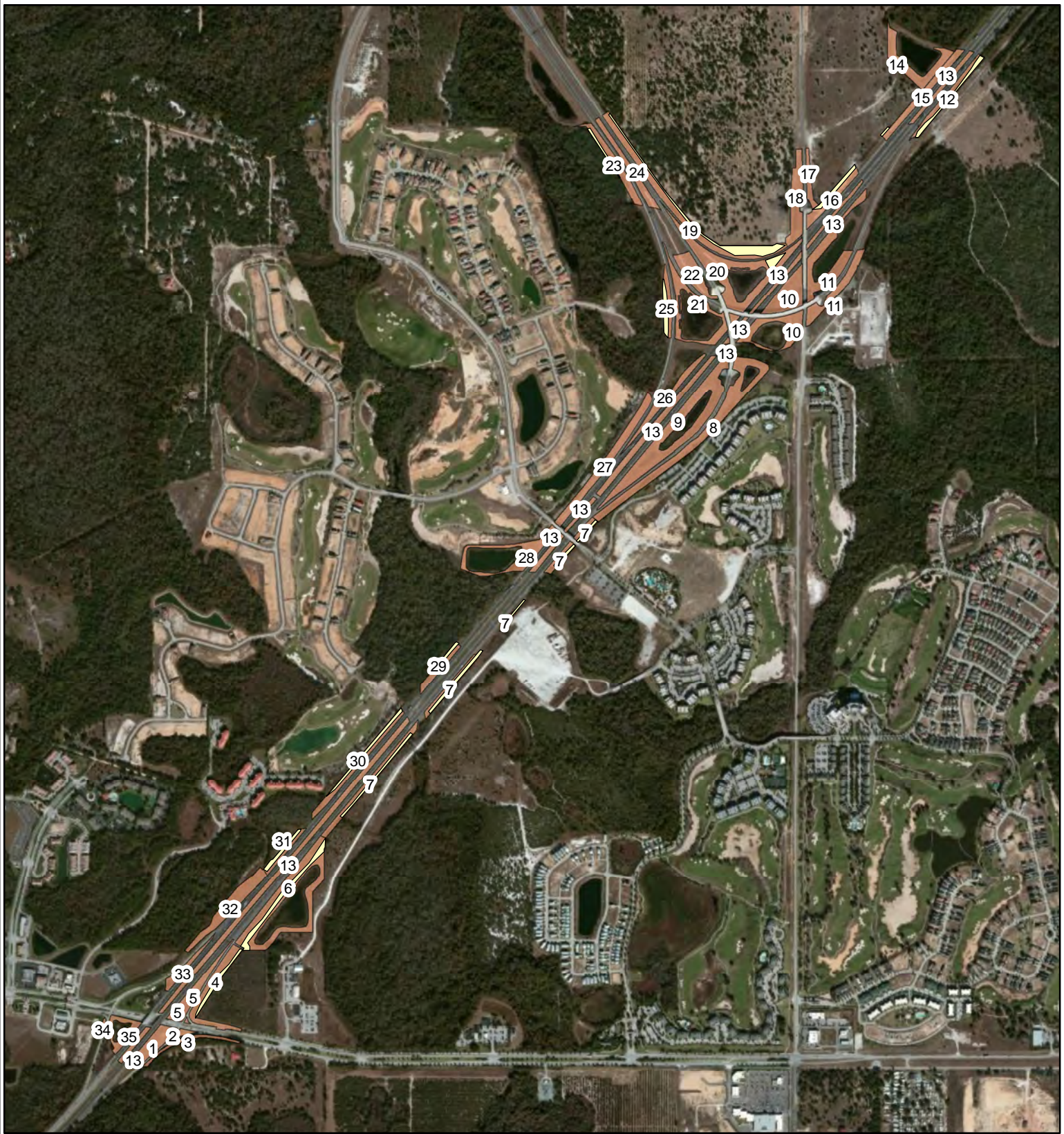
 Soil Survey Areas

**Exhibit 2D**

1 inch = 500 feet



Exhibit Date:  
03.17.14





Soil Site Investigation  
Potential Sand Skink Habitat  
Overall Map

Florida Department of Transportation  
District 5  
State Road 400 (I-4) and State Road 429  
Osceola County, Florida

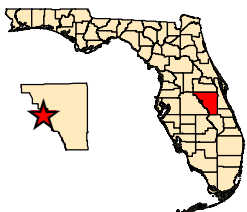
-  Potential Sand Skink Habitat
-  Unsuitable Sand Skink Habitat

**Exhibit 3**

1 inch = 1,500 feet



Exhibit Date:  
03.17.14





Soil Site Investigation  
Potential Sand Skink Habitat

Florida Department of Transportation  
District 5  
State Road 400 (I-4) and State Road 429  
Osceola County, Florida

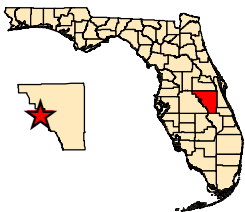
-  Potential Sand Skink Habitat
-  Unsuitable Sand Skink Habitat

**Exhibit 3A**

1 inch = 500 feet



Exhibit Date:  
03.17.14





Soil Site Investigation  
Potential Sand Skink Habitat

Florida Department of Transportation  
District 5  
State Road 400 (I-4) and State Road 429  
Osceola County, Florida

-  Potential Sand Skink Habitat
-  Unsuitable Sand Skink Habitat

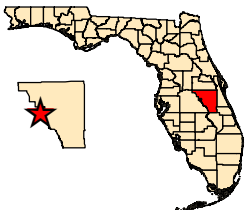
**Exhibit 3B**

1 inch = 500 feet

Exhibit Date:  
03.17.14









Soil Site Investigation  
Potential Sand Skink Habitat

Florida Department of Transportation  
District 5  
State Road 400 (I-4) and State Road 429  
Osceola County, Florida

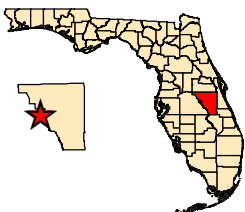
-  Potential Sand Skink Habitat
-  Unsuitable Sand Skink Habitat

**Exhibit 3C**

1 inch = 500 feet

Exhibit Date:  
03.17.14







Soil Site Investigation  
 Potential Sand Skink Habitat

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Florida Department of Transportation  
 District 5  
 State Road 400 (I-4) and State Road 429  
 Osceola County, Florida

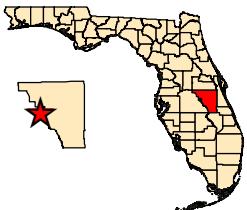
-  Potential Sand Skink Habitat
-  Unsuitable Sand Skink Habitat

**Exhibit 3D**

1 inch = 500 feet

Exhibit Date:  
 03.17.14





Soil Site Investigation  
Soil Borings  
Overall Map

Florida Department of Transportation  
District 5  
State Road 400 (I-4) and State Road 429  
Osceola County, Florida

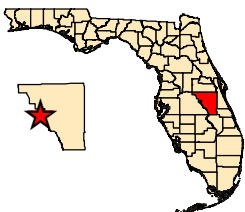
**Exhibit 4**

1 inch = 1,500 feet

Exhibit Date:  
03.17.14

- Soil Borings
- Soil Survey Areas





Soil Site Investigation  
Soil Borings

Florida Department of Transportation  
District 5  
State Road 400 (I-4) and State Road 429  
Osceola County, Florida

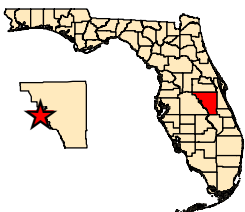
- Soil Borings
- █ Soil Survey Areas

**Exhibit 4A**

1 inch = 500 feet

Exhibit Date:  
03.17.14





Soil Site Investigation  
Soil Borings

Florida Department of Transportation  
District 5  
State Road 400 (I-4) and State Road 429  
Osceola County, Florida

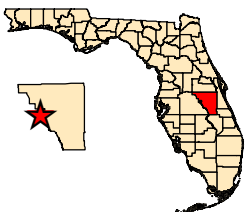
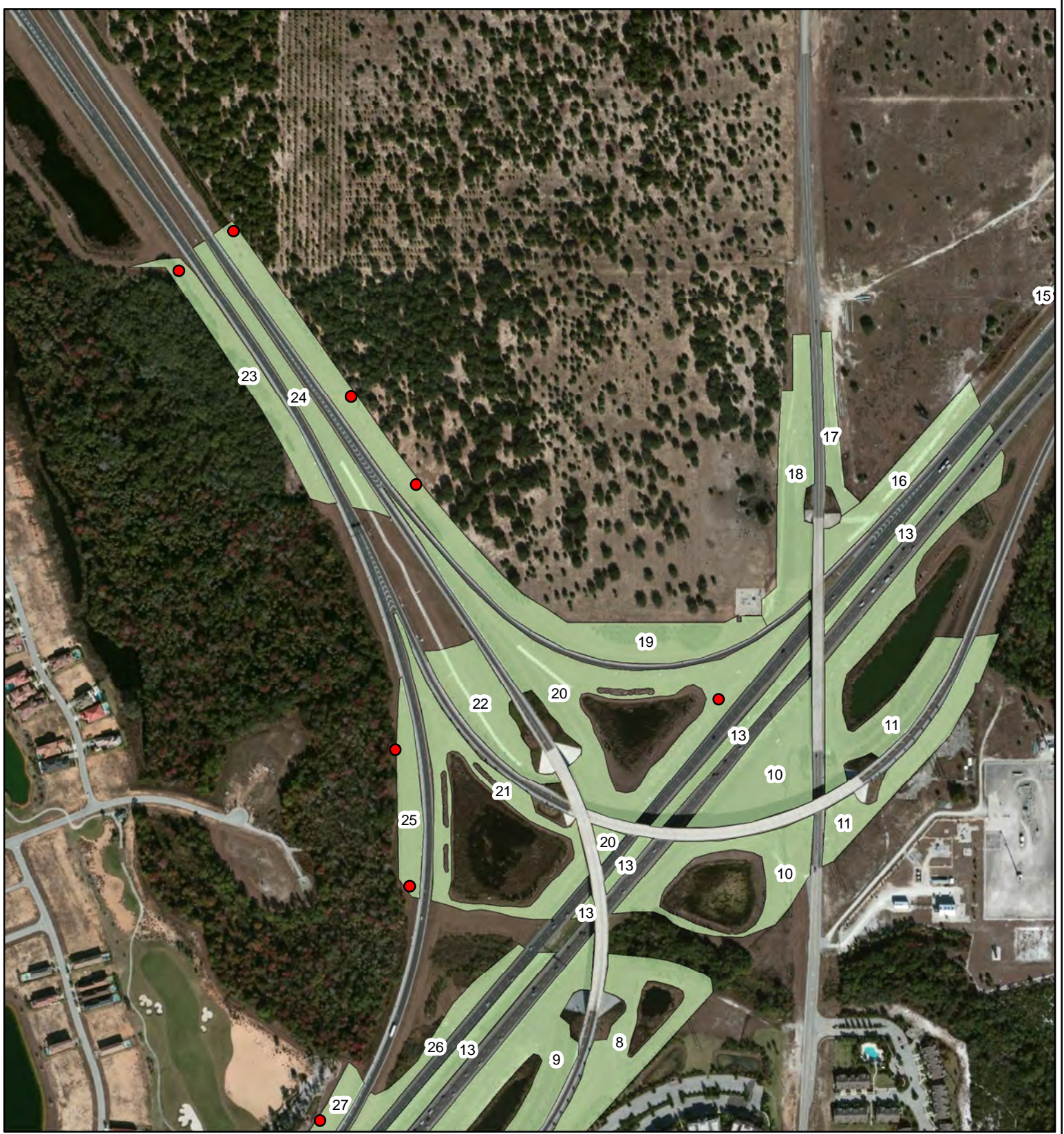
- Soil Borings
- Soil Survey Areas

**Exhibit 4B**

1 inch = 500 feet

Exhibit Date:  
03.17.14





Soil Site Investigation  
Soil Borings

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Florida Department of Transportation  
District 5  
State Road 400 (I-4) and State Road 429  
Osceola County, Florida

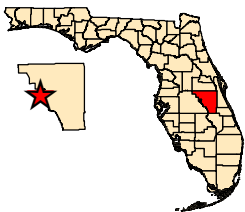
- Soil Borings
- Soil Survey Areas

**Exhibit 4C**

1 inch = 500 feet

Exhibit Date:  
03.17.14

N  
▲



Soil Site Investigation  
Soil Borings

Florida Department of Transportation  
District 5  
State Road 400 (I-4) and State Road 429  
Osceola County, Florida

- Soil Borings
- ▭ Soil Survey Areas

**Exhibit 4D**

1 inch = 500 feet

Exhibit Date:  
03.17.14



Florida Department of Transportation District 5  
State Road 400 (I-4) and State Road 429  
Osceola County, Florida



Area 1 facing SW



Area 2 facing NE



Area 3 facing NE



Area 4 facing N



Florida Department of Transportation District 5  
State Road 400 (I-4) and State Road 429  
Osceola County, Florida



Area 5 facing S



Area 5 facing N



Area 6 facing E



Area 6 facing NE

Florida Department of Transportation District 5  
State Road 400 (I-4) and State Road 429  
Osceola County, Florida



Area 7 facing NE



Area 7 facing NE



Area 7 facing NE



Area 7 facing NE

Florida Department of Transportation District 5  
State Road 400 (I-4) and State Road 429  
Osceola County, Florida



Area 8 facing E



Area 8 facing NE



Area 9 facing SW



Area 9 facing NE

Florida Department of Transportation District 5  
State Road 400 (I-4) and State Road 429  
Osceola County, Florida



Area 9 facing NE



Area 10 facing ESE



Area 10 facing NNE



Area 11 facing E

Florida Department of Transportation District 5  
State Road 400 (I-4) and State Road 429  
Osceola County, Florida



Area 11 facing NE



Area 12 facing NE



Area 14 facing NW



Area 15 facing SW

Florida Department of Transportation District 5  
State Road 400 (I-4) and State Road 429  
Osceola County, Florida



Area 16 facing SW



Area 17 facing N



Area 18 facing N



Area 19 facing W

Florida Department of Transportation District 5  
State Road 400 (I-4) and State Road 429  
Osceola County, Florida



Area 20 facing SW



Area 21 facing NE



Area 22 facing W



Area 23 facing E

Florida Department of Transportation District 5  
State Road 400 (I-4) and State Road 429  
Osceola County, Florida



Area 25 facing NE



Area 26 facing SW



Area 27 facing NW



Area 28 facing W



Florida Department of Transportation District 5  
State Road 400 (I-4) and State Road 429  
Osceola County, Florida



Area 30 facing SW



Area 31 facing S



Area 32 facing NE



Area 33 facing SE

Florida Department of Transportation District 5  
State Road 400 (I-4) and State Road 429  
Osceola County, Florida



Area 34 facing S



Area 35 facing E



Area 35 facing S

## **Exhibit 6**

### **SR 400 and SR 429, SOIL BORING DESCRIPTIONS**

Soil Boring 1A - At this location it was determined that approximately 10 inches of fill has been placed for road building. The material consisted of sand and organic material.

Soil Boring 1B - At this location it was determined approximately 13 inches of fill has been placed for road building. The material consisted of sand and organic materials (on loam, and clay).

Soil Boring 1C - At this location it was determined approximately 13 inches of fill has been placed for road building. The material consisted of sand and organic materials (on loam, and clay).

Soil Boring 1D - At this location it was determined approximately 14 inches of fill has been placed for road building. The material consisted of sand and limestone materials (on loam, and clay).

Soil Boring 1E - At this location it was determined approximately 10 inches of fill has been placed for road building. The material consisted of sand and limestone materials (on loam, and clay).

Soil Boring 1F - At this location it was determined approximately 12 inches of fill has been placed for road building. The material consisted of sand and limestone materials (on loam, and clay).

Soil Boring 1G - At this location it was determined that fill has been placed for road building. The material consisted of sand, with compacted limestone material.

Soil Boring 1H - At this location it was determined that fill has been placed for road building. The material consisted of sand, with compacted limestone material.

Soil Boring 1I - At this location it was determined approximately 12 inches of fill has been placed for road building. The material consisted of sand and organic materials (on loam, and clay).

Soil Boring 1J - At this location it was determined that fill has been placed for road building. The material consisted of sand, with compacted limestone material.

Soil Boring 1L - At this location it was determined approximately 10 inches of fill has been placed for road building. The material consisted of sand and limestone materials (on loam, and clay).

Soil Boring 1M - At this location it was determined approximately 11 inches of fill has been placed for road building. The material consisted of sand and limestone materials (on loam, and clay).

Soil Boring 2A - At this location it was determined approximately 8 inches of fill has been placed for road building. The material consisted of sand and limestone materials (on loam, and clay).

Soil Boring 2B - At this location it was determined approximately 13 inches of fill has been placed for road building. The material consisted of sand and organic materials (on loam, and clay).

Soil Boring 2C - At this location it was determined that fill has been placed for road building. The material consisted of sand, with compacted limestone material.

Soil Boring 3A - At this location it was determined approximately 12 inches of fill has been placed for road building. The material consisted of sand and organic materials (on loam, and clay).

Soil Boring 3B - At this location it was determined approximately 12 inches of fill has been placed for road building. The material consisted of sand and organic materials (on loam, and clay).

Soil Boring 3C - At this location it was determined approximately 10 inches of fill has been placed for road building. The material consisted of sand and limestone materials (on loam, and clay).

Soil Boring 4A - At this location it was determined that the soil profile was consistent with the mapped soil unit Candler series.

Soil Boring 4B - At this location it appears the natural slope has been altered by excavation or grading resulting in a truncated soil profile with subsoil consistent with the Candler series observed at the surface.

Soil Boring 4C - At this location it was determined approximately 8 inches of fill has been placed for road building. The material consisted of sand and limestone materials (on loam, and clay).

Soil Boring 5A - At this location it was determined that approximately 6 inches of fill has been placed for road building. The material consisted of sand, with limestone material.

Soil Boring 5B - At this location it was determined that fill has been placed for road building. The material consisted of sand, with compacted limestone material.

Soil Boring 5C - At this location it was determined that fill has been placed for road building. The material consisted of sand, with compacted limestone material.

Soil Boring 5D - At this location it was determined that fill has been placed for road building. The material consisted of sand, with compacted limestone material.

Soil Boring 5E - At this location it was determined that fill has been placed for road building. The material consisted of sand, with compacted limestone material.

Soil Boring 6A - At this location it was determined approximately 6 inches of fill has been placed for road building. The material consisted of sand and limestone materials.

Soil Boring 6B - At this location it was determined that the soil profile was consistent with the mapped soil unit Tavares series.

Soil Boring 6C - At this location it was determined that the soil profile was consistent with the soil map unit Candler series.

Soil Boring 7A - At this location it was determined that approximately 6 inches of fill has been placed for road building. The material consisted of sand, with limestone material with compacted limestone material below.

Soil Boring 7B - At this location it was determined that approximately 6 inches of fill has been placed for road building. The material consisted of sand, with limestone material with compacted limestone material below.

Soil Boring 7C - At this location it was determined that approximately 6 inches of fill has been placed for road building. The material consisted of sand, with limestone material with compacted limestone material below.

Soil Boring 7D - At this location it was determined that approximately 6 inches of fill has been placed for road building. The material consisted of sand, with limestone material with compacted limestone material below.

Area 8 - All excavated slope or swales for filled roadways or ramps.

Area 9 - All excavated slope or swale, or filled roadways and shoulders, ramps, ramp and bridge structures, stormwater treatment ponds, landscape planting areas.

Area 10 - All excavated pond or swales, or for filled roadway or road shoulders.

Area 11 - All excavated slope or swales for filled roadways or ramps.

Soil Boring 12A - At this location it was determined that the soil profile was consistent with the mapped soil unit Candler series.

Area 13 - Roadway median between east and west bound lanes, this area composed of roadway fill and excavated swale.

Area 14 - Treatment pond with filled berm, also excavated slope.

Area 15 - Roadside shoulder area fill, excavated sideslopes. Area along ROW fence exhibited soil profile consistent with Candler soil map unit.

Area 16 - Roadside shoulder area fill, excavated swale. Area along ROW fence exhibited soil profile consistent with Candler soil map unit.

Area 17 - Fill and pavement.

Area 18 - Fill mound adjacent to overpass ramp.

Area 19 - Area between road fill and ROW fence exhibited soil profile consistent with Candler soil map unit.

Area 20 - This area is dominated by a treatment pond and roadway fill, however the eastern portions contain soils consistent with the Candler series.

Area 21 - Ramp and roadway fill, excavated pond.

Area 22 - This area is filled ramp sideslope.

Area 23 - Area between road fill and ROW fence exhibited soil profile consistent with Candler soil map unit.

Area 24 - Roadway median, filled roadway shoulders and excavated swale.

Area 25 - Area between road fill and ROW fence exhibited soil profile consistent with Tavares soil map unit.

Area 26 - This area is located between filled I-4 travel lanes and filled SR 429 access ramp.

Soil boring 27A - At this location it was determined that approximately 6 inches of fill has been placed for road building. The material consisted of sand, with compacted limestone material.

Soil Boring 27B - At this location it was determined that approximately 3 inches of fill has been placed for road building. The material consisted of sand, with compacted limestone material.

Soil Boring 27B - At this location it was determined that approximately 2- 3 inches of fill has been placed for road building. The material consisted of sand, with compacted limestone material.

Soil Boring 28A - At this location it was determined that approximately 6 inches of fill has been placed for road building. The material consisted of sand, with compacted limestone material. Also excavated pond and sideslopes.

Soil Boring 29 - Area between road fill and ROW fence exhibited soil profile consistent with Candler soil map unit.

Soil Boring 30A - Area between road fill and ROW fence exhibited soil profile consistent with Candler soil map unit.

Soil Boring 30B - At this location it was determined approximately 4-6 inches of fill has been placed for road building. The material consisted of sand and organic materials (on loam, and clay).

Soil Boring 31A - Area between road fill and ROW fence exhibited soil profile consistent with Candler soil map unit.

Soil Boring 31B - At this location (road shoulders) it was determined approximately 5-6 inches of fill has been placed for road building. The material consisted of sand and limestone material.

Soil Boring 32A - At this location it appears that 10 inches of fill has been placed. The material consisted of sand and organic materials.

Soil Boring 32B - At this location it appears that 5 inches of fill has been placed. The material consisted of sand and organic materials.

Soil Boring 32C - At this location it appears that 4 inches of fill have been placed. The material consisted of sand and organic materials (on loam, and clay).

Soil Boring 32D - At this location it appears that 4 inches of fill has been placed. The material consisted of sand and organic materials (on loam, and clay).

Soil Boring 32E - At this location it appears that 5 inches of fill has been placed. The material consisted of sand and organic materials (on loam, and clay).

Area 33 - This area is composed of filled I-4 overpass ramp and treatment pond, simulated golf green and landscaped buffers.

Area 34 - This area is a landscaped filled access ramp to I-4.

Area 35 - This area is composed of filled I-4 overpass ram, and treatment pond, maintained turf, and landscaped buffers.