

## TECHNICAL MEMORANDUM

December 14, 2022

Revised September 18, 2023

From: Daniel C. Stanfill, P.E. and Richard P. McCormick, P.G.

To: Mr. Michael Garau, P.E.

Subject: Existing Geotechnical Conditions Technical Memorandum  
**SR 408 WB CAPACITY IMPROVEMENTS FROM I-4 TO GOLDENROD ROAD**  
CFX 408-175  
GEC Project No. 5116GE

Based on TWO 2 under Contract Number 001844 dated August 29, 2022, Geotechnical and Environmental Consultants, Inc. (GEC) is pleased to present this Existing Geotechnical Conditions Memorandum for the CFX SR 408 Westbound Capacity Improvements PD&E study. This PD&E Study is split into two sections of SR 408; SR 408 from east of I-4 to Bumby Avenue (Project 1) and SR 408 from SR 436 to Goldenrod Road (Project 2). GEC has reviewed available documents, the USGS Quadrangle Map, the NRCS Orange County Soil Survey and current plans to prepare this Memorandum. **Figures 1 and 2**, which are attached, shows the USGS Quadrangle Map and NRCS Soil Survey for the project location. The following observations are noted.

- Natural ground surface topography varies from +75 to +110 feet NGVD in the Project 1 area (see **Figure 1**) and from +90 to +100 feet NGVD in the Project 2 area.
- Land use in both project areas is primarily residential and light commercial.
- Near surface soils for both projects are primarily poorly drained sand soils. Project 2 contains organic muck soils (soil type 41).
- The muck soils were likely removed for the original SR 408 construction.
- Groundwater depth varies based on topography but is generally within 5 feet of natural grade.
- Review of available plans indicate the bridges were originally supported on 18-inch precast piles extending 50 to 100 feet below natural grade.
- Piles for the inside widening that was performed about 15 years ago utilized steel HP piles, extending 80 to 120 feet below natural grade.

- Geotechnical considerations include exploration for highly compressible organic muck soils, evaluation of variable groundwater conditions and deep Standard Penetration Test (SPT) borings for bridge foundation design.
- Bridges should be supported on a deep driven pile substructure due to Karst environment and likely high Factored Loads required.
- Dry stormwater ponds may be feasible depending on pond location, the presence of the clay confining layer and groundwater levels.

**USE OF THIS MEMORANDUM**

GEC has prepared this memorandum for the exclusive use of our client, The Balmoral Group, Kimley-Horn, and CFX and for application to our client’s project. GEC will not be held responsible for any other party’s interpretation or use of this report’s data or recommendations without our written authorization.

GEC has performed the services described in this report in a manner consistent with that level of care and skill ordinarily exercised by members of our profession currently practicing in Central Florida. No other representation is made or implied in this document.

The conclusions and recommendations should be disregarded if the final project design differs from the project description in this report. If such changes are contemplated, GEC should be retained to review the new plans to assess the applicability of this report in light of proposed changes.

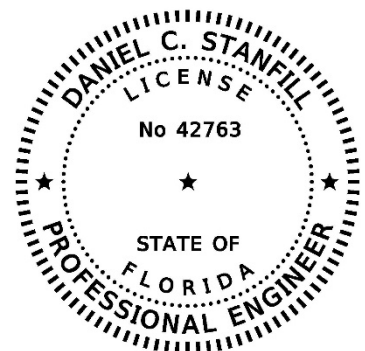
We appreciate the opportunity to work with The Balmoral Group, Kimley-Horn and CFX on this project. If you have any questions concerning this report, or if we may be of further assistance, please contact us.

Sincerely,

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.

Richard P. McCormick, P.G.  
 Chief Geologist  
 Florida License No. 2096

Daniel C. Stanfill, P.E.  
 Senior Vice President  
 Florida License No. 42763



This Report has been digitally signed and sealed by Daniel C. Stanfill, P.E. on the date adjacent to the seal. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

## **ATTACHMENTS**



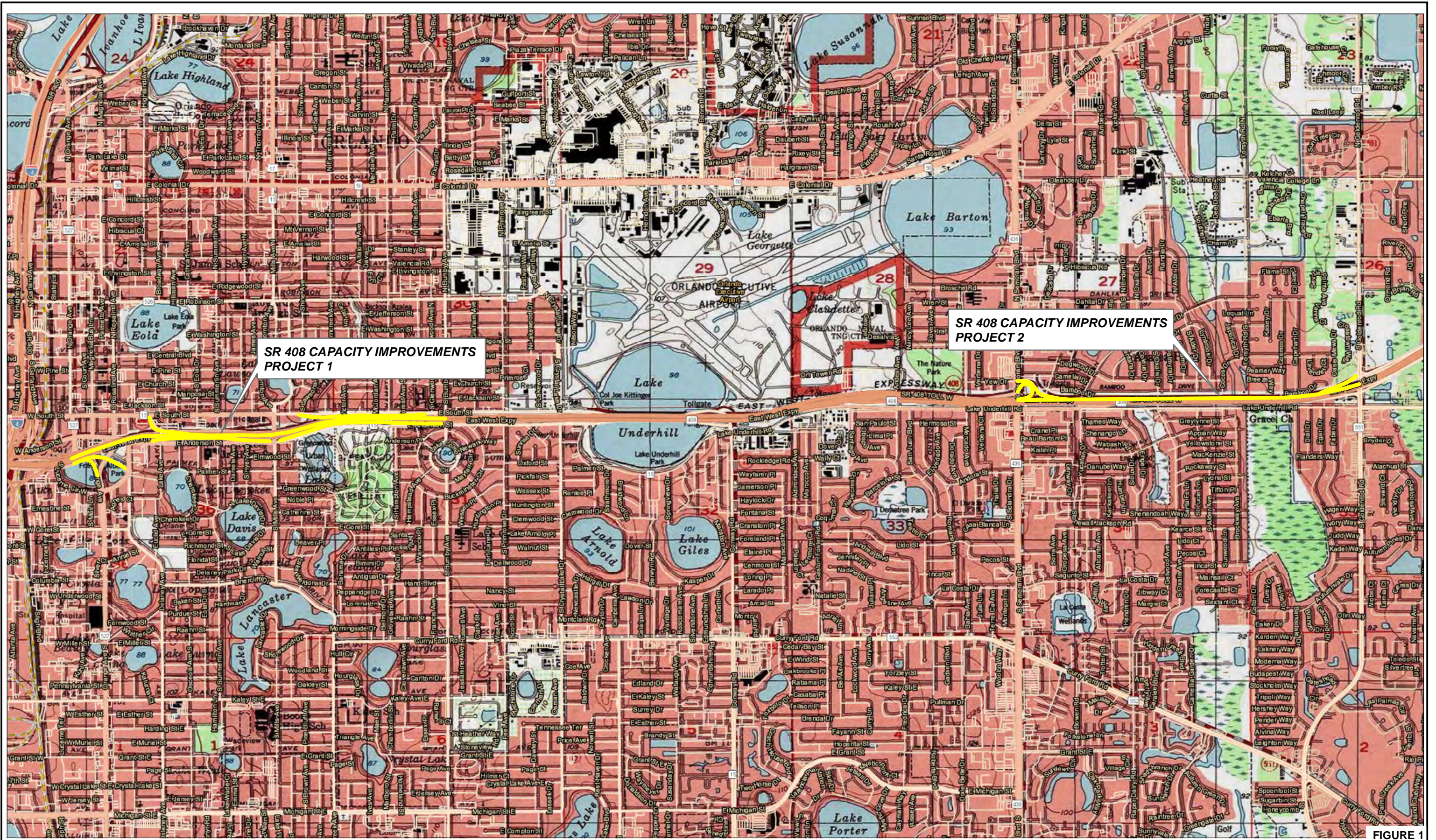
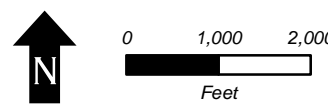


FIGURE 1

USGS Orlando East, FL Quadrangle Map  
 Dated: 1980



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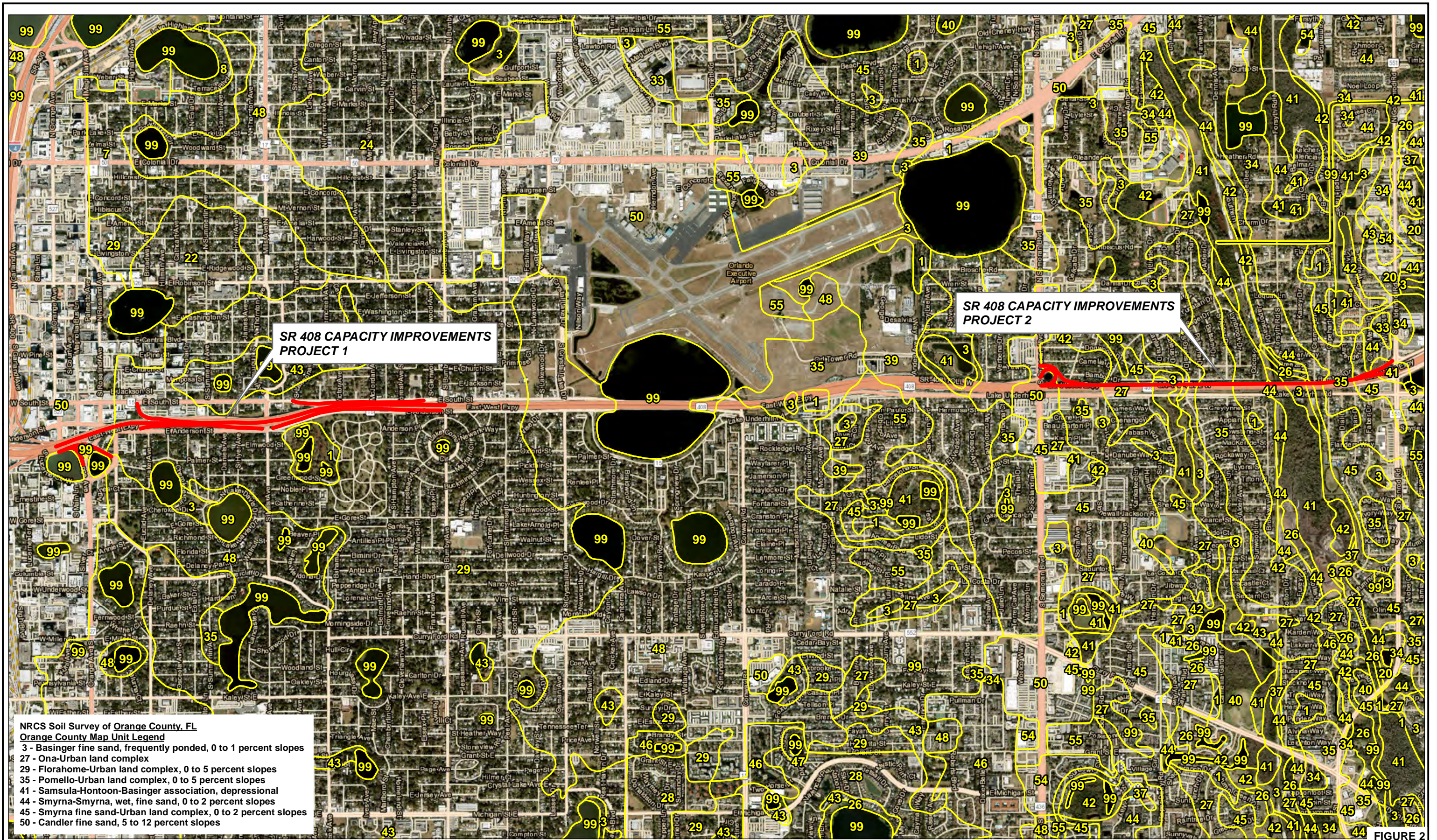
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**CENTRAL  
 FLORIDA  
 EXPRESSWAY  
 AUTHORITY**

USGS QUADRANGLE MAP

SHEET  
 NO.



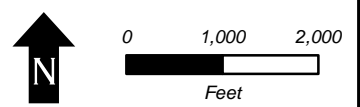


**SR 408 CAPACITY IMPROVEMENTS PROJECT 1**

**SR 408 CAPACITY IMPROVEMENTS PROJECT 2**

- NRCS Soil Survey of Orange County, FL  
Orange County Map Unit Legend**
- 3 - Basinger fine sand, frequently ponded, 0 to 1 percent slopes
  - 27 - Ona-Urban land complex
  - 29 - Florahome-Urban land complex, 0 to 5 percent slopes
  - 35 - Pomello-Urban land complex, 0 to 5 percent slopes
  - 41 - Samsula-Hontoon-Basinger association, depressional
  - 44 - Smyrna-Smyrna, wet, fine sand, 0 to 2 percent slopes
  - 45 - Smyrna fine sand-Urban land complex, 0 to 2 percent slopes
  - 50 - Candler fine sand, 5 to 12 percent slopes

FIGURE 2



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*NRCS SOIL SURVEY MAP*

SHEET NO.