

BRIDGE ANALYSIS REPORT

Florida Department of Transportation

District 6

SR 994/SW 200th Street/Quail Roost Drive PD&E Study

From West of SW 137th Avenue to East of SW 127th Avenue

Miami-Dade County, Florida

Financial Management Number: 445804-1-22-01

ETDM Number: 14429

June 18, 2024

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by the Florida Department of Transportation (FDOT) pursuant to 23 U.S.C. § 327 and a Memorandum of Understanding dated May 26, 2022, and executed by the Federal Highway Administration and FDOT.



BRIDGE ANALYSIS REPORT

**SR 994 / SW 200th St / Quail Roost Drive
Project Development & Environment Study
From West of SW 137th Avenue to East of SW 127th Avenue
Miami-Dade County, Florida**

Financial Management Number: 445804-1-22-01
FAP Project Number: Not Assigned
Efficient Transportation Decision-Making Number: 14429

Prepared for:
*Florida Department of Transportation
District 6
1000 NW 111th Avenue
Miami, Florida 33172*

June 18, 2024

FINAL BRIDGE ANALYSIS REPORT

**SR 994 (SW 200th Street/Quail Roost Drive)
from SW 137th Avenue to SW 127th Avenue**

**FPID NO. 445804-1-22-01
MIAMI-DADE COUNTY**

Prepared For:

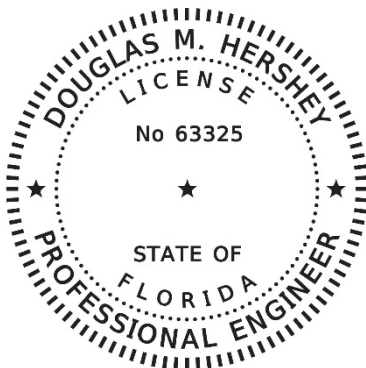


**FLORIDA DEPARTMENT OF TRANSPORTATION
DISTRICT 6**

Prepared by:

**H.W. Lochner, Inc.
4300 West Cypress Street, Suite 500
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June 2024



DOUGLAS M HERSHEY Date: 2024.06.18
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This item has been digitally signed and sealed by Douglas M. Hershey, 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. The official record of the above referenced section(s) is the electronic file digitally signed and sealed under Rule 61G15-23.004(3)(d)1, F.A.C.

EXECUTIVE SUMMARY

This Bridge Analysis Report documents the evaluation process and recommendations for construction of a new bridge carrying SR 994 over Black Creek Canal. The recommended bridge is a three-span structure having an overall length of 100'-0". The bridge superstructure will consist of prestressed concrete 12" Florida Slab Beams with a 6" cast-in-place concrete topping. The overall bridge width is 101'-8" and includes two 11-foot travel lanes in each direction, one 11-foot westbound left turn lane, a raised median, 1'-4" shoulders and 18'-2" wide raised sidewalks. 32" vertical shape traffic railings with bullet rail are used adjacent to the sidewalks. Square prestressed concrete piling will be used for all foundations and the substructure will consist of pile bents. The bridge will be phase constructed on the existing alignment.

The estimated construction cost is \$3,669,056. This includes the new bridge and approach slabs, existing bridge demolition and a 10% contingency for miscellaneous items.

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1.0 INTRODUCTION

1.1 Location

The SR 994 (SW 200th Street) Bridge over the Black Creek Canal is in Miami-Dade County, Florida approximately 0.6 miles east of SR 825 (SW 137th Avenue) and 0.45 miles west of Burr Road (SW 127th Avenue). A project location map is shown in Figure 1.

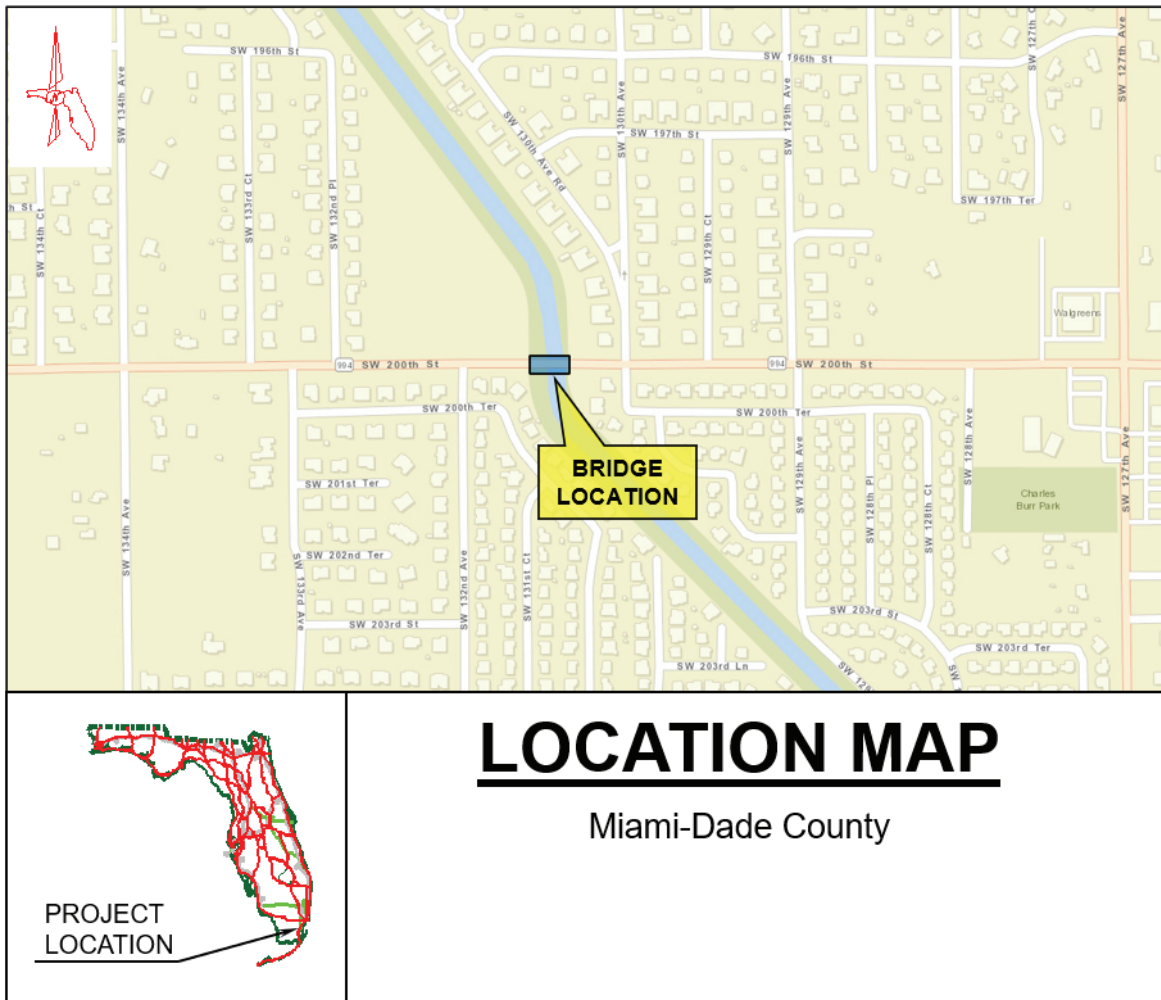


Figure 1 – Project Location Map

1.2 Project Description

A Project Development and Environment (PD&E) Study is being conducted to evaluate the widening of SR 994/SW 200th Street/Quail Roost Drive from west of SW 137th Avenue to east of SW 127th Avenue. The proposed four-lane section will connect to the existing four-lane section of SR 994 beginning just west of SW 127th Avenue. The total project length is approximately 1.2 miles. Included in the PD&E Study is the replacement of the SR 994 bridge over the Black Creek Canal.

2.0 EXISTING CONDITIONS

2.1 Existing Roadway Conditions

2.1.1 Functional Classification

SR 994 is classified as an urban minor arterial for most of the project limits including the location of the existing bridge.

2.1.2 Roadway Typical Section

SR 994 is a two-lane roadway (one lane in each direction) from west of SW 137th Avenue to west of SW 127th Avenue. From west of SW 127th Avenue to SR 821, SR 994 is a four-lane roadway. The existing SR 994 typical section consists of two undivided 11.5-foot travel lanes with unpaved shoulders and open drainage. Curb and gutter exist at the SR 994/SW 134th Avenue intersection and east of SW 127th Avenue. Sidewalks are non-continuous and generally located at residential subdivisions and there are no existing designated bike lanes on SR 994.

2.1.3 Right-of-Way

The right-of-way along the corridor varies from 30 feet to 92 feet.

2.1.4 Existing Navigation

The Black Creek Canal is not considered navigable; therefore, no provisions need to be made for boat traffic.

2.2 Existing Bridge

SR 994 over Black Creek Canal (Bridge No. 870633) is a functionally obsolete 3-span structure constructed in 1962. It is 38'-0" wide and has three equal span lengths of 29'-4" resulting in a total bridge length of 88'-0". The existing superstructure consists of eight 15-inch thick, 4-foot wide prestressed concrete sonovoid slab units with a 1-inch-thick asphalt overlay. Transverse post-tensioning tendons are used at the 1/3 point along each span to connect the individual slab units. 12" square prestressed concrete piles are used at each end bent and 14" square prestressed concrete piles are used at the two intermediate bents.



Figure 2 – Existing Bridge Elevation Looking North



Figure 3 – Existing Bridge Aerial

2.3 Utilities

Based upon a Sunshine 811 design ticket obtained on December 15, 2020, there are eight Utility Agency Owners (UAOs) along the project limits. These utilities include electric, water, sewer and communications. In the immediate vicinity of the existing bridge the following utilities have been identified:

- Water line crossing over the Black Creek Canal located south of the existing bridge
- Joint use poles containing overhead electric and communication lines located south of the existing bridge

The water line crossing is shown in Figures 2 and 3 and the overhead electric and communication lines are shown in Figure 3. The water line crossing and the joint use poles are expected to relocate further to the south due to conflicts with the proposed bridge and no utilities are expected to be placed on the proposed bridge.

Additional utility related information can be found in the “Utility Assessment Package” located in Appendix H of the Preliminary Engineering Report (PER).

3.0 STRUCTURES DESIGN

3.1 Geotechnical Report and Environmental Classification

Geotechnical information has been provided by GEOSOL, Inc. The Preliminary Bridge Geotechnical Report can be found in Appendix B.

The corrosivity test results of the water sample indicate the environmental classification for the bridge is slightly aggressive for the superstructure and moderately aggressive for the substructure. The following items are noted:

- pH = 8.0
- Resistivity = 1,067 Ohm-cm
- Chlorides = 56 ppm
- Sulfates = 9 ppm

3.2 Hydraulic Analysis and Scour

A hydraulic analysis including a scour determination will be performed during Final design. As documented in Appendix E, the South Florida Water Management District will require articulating concrete block (ACB) within the existing canal 1:1 slope for 25 feet beyond the proposed bridge coping.

3.3 Structures Design Criteria

3.3.1 Design Method

The Load and Resistance Factor Design (LRFD) methodology and English Units will be used for the structures design for this project.

3.3.2 Specifications

The structure shall be designed in accordance with:

- FDOT Structures Manual, January 2024 edition (includes the Structures Design Guidelines referred to herein as SDG and the Structures Detailing Manual referred to herein as SDM).
- AASHTO LRFD Bridge Design Specifications, 9th Edition (referred to herein as LRFD)
- FDOT Standard Specifications for Road and Bridge Construction, FY 2024-25 edition.
- 2024 FDOT Design Manual (referred to herein as FDM).
- FDOT FY 2024-25 Standard Plans.
- 2023 FDOT Load Rating Manual.

3.3.3 Concrete Materials

For all classes of concrete, the calculation for Modulus of Elasticity, E_c , (in accordance with LRFD 5.4.2.4) uses a 0.145 kcf unit weight (un-reinforced concrete), and the 1.0 aggregate source correction factor, K_1 , for the assumed use of Florida limerock coarse aggregate, in accordance with SDG 1.4.1. Normal weight concrete is assumed for the design. The following concrete classifications and strengths as specified in SDG Section 1.4.3 will be used for the project.

Concrete Element	Concrete Class	28-day Strength	Modulus of Elasticity
Superstructure			
- Approach Slabs	II (Bridge Deck)	4,500 psi	4,145 ksi
- Bridge Deck	II (Bridge Deck)	4,500 psi	4,145 ksi
- Traffic Barriers/Raised Sidewalk	II	3,400 psi	3,778 ksi
- Prestressed Concrete Beams	VI	8,500 psi	5,112 ksi
Substructure			
- CIP Substructure	IV	5,500 psi	4,428 ksi
- Prestressed Concrete Piling	V	6,500 psi	4,679 ksi

The concrete cover for each component is in accordance with SDG Table 1.4.2-1.

3.3.4 Steel Materials

The steel materials to be used in the project are:

Reinforcing Steel (SDG 1.4.1B)

- ASTM A615, Grade 60 deformed carbon-steel bar
- ASTM A1064, Grade 75 deformed welded wire reinforcement (WWR)

Prestressing Strands (SDG 4.3.1)

- ASTM A416, Grade 270, low-relaxation strands

3.3.5 Design Loads

The following loads are used in the project design:

Dead Loads (SDG 2.2 and LRFD 3.5.1)

- Compacted Soil 115 lb/ft³
- Reinforced Concrete (Structural) 150 lb/ft³
- Traffic Railing Barrier (32" Vertical Shape) 385 lb/ft (Index 521-423)
- Future Wearing Surface 15 lb/ft² (SDG Table 2.2-1 – Short Bridges)
- Bullet Railing 10 lb/ft (Index 521-820, 515-021 & 515-022)
- Utilities 0 lb/ft (No utilities attached to bridge)

Live Loads (LRFD 3.6)

- Design vehicular live load shall be the HL-93 designation (LRFD 3.6.1.2.1)
- Design pedestrian load shall be 75 psf (LRFD 3.6.1.6).
- The multiple presence of live loads that occupy the lanes of a bridge shall be considered and the corresponding multiple presence factor shall be applied in accordance with LRFD Table 3.6.1.1.2-1.
- Dynamic load allowance shall be applied in accordance with LRFD 3.6.2.
- Bridge shall be load rated for the FL120 permit loading.

Wind Loads (SDG 2.4 and LRFD 3.8)

- Design wind speed on completed structure shall be 170 mph (Miami-Dade County).

Seismic Effects (SDG 2.3 and LRFD 3.10)

- The project structure is exempt from seismic requirements in accordance with SDG 2.3.
 - Elastomeric bearings will be used.
- Substructures shall satisfy minimum support length criteria in accordance with LRFD 4.7.4.4.

Thermal Loads (SDG 2.7.1)

- Movement of bridge structures shall be calculated assuming the following uniform temperature range:

Superstructure Material	Temperature Range (Degrees Fahrenheit)			
	Mean	High	Low	Range
Concrete Only	70	105	35	70

3.3.6 Vertical Clearance

There are several criteria that are contemplated as part of the vertical clearance requirements over the Black Creek Canal. These include the following:

- South Florida Water Management District
 - 2 feet above the design water surface elevation of EL. 5.0 (NGVD).
 - 4.5 feet above the optimum water control elevation of EL. 4.3 (NGVD).
- FDM
 - Section 260.8.1
 - “The minimum vertical clearance between the design flood stage and the low member of a bridge is 2 feet. This clearance is necessary to allow the majority of debris to pass without causing damage to the structure.”
 - Section 222.2.1.2
 - “Provide a minimum 7-foot vertical clearance over the entire walking surface.”
 - Figure 266.2.1 Note 2
 - “...provided an 8-foot minimum headroom is maintained.”
 - Section 224.8
 - “Provide a 10-foot vertical clearance from the lowest edge of an overhead obstruction to any portion of the path under the obstruction. An 8-foot clearance is allowed for overhead signs and for other overhead obstructions under constrained conditions.”

In June 2024, the trail underpass alternative was eliminated from consideration; therefore, only the South Florida Water Management District and FDM 260.8.1 criteria remain as applicable criterion. The proposed roadway profile will be set to satisfy the applicable requirements.

3.3.7 Horizontal Clearance

There are several criteria that are considered related to horizontal clearance. These include the following:

- South Florida Water Management District
 - The center span must be centered on the centerline of the canal.
 - The center span must have a minimum clear opening of 25 feet as measured from the faces of the pile bents.

- Approach spans must have a minimum spacing of 20 feet as measured on centers.
- FDM
 - Section 224.7
 - “For Urban Side Paths, the following criteria reflect the lower design speed. Provide a minimum 2-foot buffer area adjacent to both sides of the path, including placement of signs. Signs, plantings or other items must be located outside of the 2-foot buffer. Maintain a graded area with a maximum 1:6 slope adjacent to both sides of the path within the 2-foot minimum buffer area.”
 - Section 262.1
 - “For retaining walls greater than 5 feet in height, provide a 10-foot maintenance area (1:10 or flatter) in front of the wall face with suitable access for maintenance vehicles.” Per the Standard Plans Instructions for Index 548-020, the flat area at the base of the retaining wall can be reduced to a minimum of 4-foot where the 10-foot cannot be provided.

In June 2024, the trail underpass alternative was eliminated from consideration; therefore, the FDM 224.7 criteria is no longer applicable.

By eliminating the trail underpass from consideration, the roadway profile can be lowered. This results in an exposed gravity wall height measured from the proposed groundline to the top of the gravity wall of less than 5 feet; therefore, the FDM 262.1 criteria is not applicable.

The spans lengths for the proposed bridge will be set to ensure compliance with the remaining applicable requirements.

4.0 BRIDGE ALTERNATIVES

4.1 Typical Section

As shown in Exhibit C located in Appendix A, the bridge typical section consists of two 11-foot eastbound travel lanes, two 11-foot westbound travel lanes, one 11-foot westbound left turn lane and a variable width raised median. There are 1'-4" shoulders between the thru travel lanes and the adjacent raised sidewalk and median as required by FDM Figure 260.1.3. The raised sidewalk on each side has a width of 18'-2" to match the approaching roadway section. 32" vertical shape traffic railings with bullet rail are used adjacent to the sidewalk. The overall bridge width is 101'-8".

4.2 Construction Phasing

Construction phasing of the proposed bridge will be required. Details related to the phasing will be determined during final design; however, the current plan is to utilize a simple two-phased approach. In Phase 1 existing vehicular and pedestrian traffic is maintained in its current configuration while construction of the northern and southern portions of the proposed bridge are built. Phase 2 moves westbound traffic onto the northern portion built during Phase 1 and eastbound traffic onto the southern portion built during Phase 1 while the existing bridge is removed, and the middle portion of the proposed bridge is constructed.

4.3 Span Arrangement

Selecting an appropriate span arrangement is a key design issue for a new bridge. The location of the begin bridge, end bridge, centerline of the existing canal and location of the existing pile bents drive many of the decisions related to span arrangement while ensuring the items noted in Section 3.3.7 are satisfied.

The existing bridge is centered on the Black Creek Canal with three equal spans of 29'-4". To avoid conflicts with existing pile foundations, the proposed span arrangement will be set to ensure the proposed pile bents are offset longitudinally from the existing pile bents. Span 2 will be centered on the Black Creek Canal with a span length of 40'-6". Exhibits A and B in Appendix A show the proposed span arrangement.

4.4 Foundation Alternatives

Several foundation alternatives, including shallow foundations, drilled shafts, steel piles (pipe & H-sections), precast prestressed concrete piles and auger cast-in-place piles are considered viable foundation options. The preliminary geotechnical report located in Appendix C discusses each of these alternatives.

Precast prestressed concrete (PPC) piles are a widely used and proven foundation system in Florida. PPC piles are readily available and generally have a lower cost per ton of capacity than other pile types. The minimum PPC pile size for the bridge foundations is 18 inches as required by FDOT SDG Table 3.5.1-1; however, 24-inch piles may be required based upon structural requirements that will be determined during final design. Due to the proximity of the proposed bridge to the existing bridge, existing utilities and nearby residences, predrilled pile holes in accordance with Specification Section 455 will be used to prevent refusal conditions and pile damage and to mitigate vibration to the aforementioned existing facilities. Vibration and settlement monitoring shall be carried out in accordance with Specification Section 108. **PPC piles are the recommended foundation type for this bridge.**

4.5 Superstructure Alternatives

To keep the proposed profile as low as possible, only shallow superstructure options are considered viable. As noted in Section 4.3 and shown in Exhibits A and B, the longest span length is 40'-6".

4.5.1 Cast-in-Place Concrete

The minimum slab thickness for a 3-span continuous cast-in-place flat slab having a maximum span length of 40'-6" is approximately 21 inches. SDG Section 9.2.3 indicates the cost for cast-in-place reinforced concrete flat slabs, excluding premiums associated with phased construction, is from \$140/SF to \$320/SF. This superstructure type requires shoring to support the weight of the wet concrete.

4.5.2 Prestressed Concrete

Florida Slab Beams (FSB's) are a viable prestressed concrete option. Table 1 provides guidance from the Instructions for Standard Plans (Index 450-450) related to maximum recommended span lengths.

Table of Recommended Maximum Span Lengths (CL Bearing to CL Bearing) [Short Bridges]		
Beam Type	Beam Width	
	4'-0"	5'-0"
12" FSB	40'-11"	43'-11"
15" FSB	52'-11"	56'-3"

Table 1 – Florida Slab Beam Maximum Span Length Recommendations

Based upon the maximum span length, 12" FSB's with a 6" cast-in-place topping can provide the necessary structural capacity with a superstructure depth of 18 inches. No temporary shoring is needed to erect these beams. SDG Section 9.2.3 indicates the cost for pretensioned slab beams with a cast-in-place topping, excluding premiums associated with phased construction, is from \$180/SF to \$300/SF. **FSB's are the recommended superstructure type for the proposed bridge.**

4.6 Substructure Alternatives

The most common type of substructure used for short span bridges crossing small waterways is pile bents. The existing bridge utilizes pile bents. **Pile bents are the recommended substructure type for the proposed bridge.**

4.7 Retaining Walls

Permanent and temporary retaining walls are required for the project.

Permanent walls include gravity walls along the roadway approaches to minimize the proposed right-of-way required.

Anticipated temporary walls include temporary MSE walls where the proposed ground is higher than the existing ground and temporary sheet pile walls for end bent cap excavation and construction adjacent to the existing bridge.

5.0 CONSTRUCTION COST ESTIMATE

A detailed cost estimate is not required per the scope of services. To determine a preliminary construction cost estimate, information from SDG Section 9 was used. SDG Section 9.2.3 indicates the estimated bridge cost for new construction of a pretensioned slab beam with a cast-in-place concrete topping is between \$180/SF and \$300/SF. This total does not consider cost premiums associated with phased construction or construction over water. These premiums are 20% and 3%, respectively. Assuming a mid-range cost plus a 23% premium gives a bridge cost estimate of approximately \$295/SF. Table 2 summarizes the estimated costs for the main structures related elements.

Element	Units	Cost/Unit	Total Cost
New Bridge	10,167 SF	\$295/SF	\$2,999,265
Approach Slab Concrete	226 CY	\$400/CY	\$90,400
Approach Slab Reinforcing	45,200 LB	\$1.05/LB	\$45,200
Existing Bridge Demo	3,344 SF	\$60/SF	\$200,640
Miscellaneous Items	10%	---	\$333,551

Table 2 – Estimated Construction Costs

The total cost for the items listed in Table 2 is \$3,669,056.

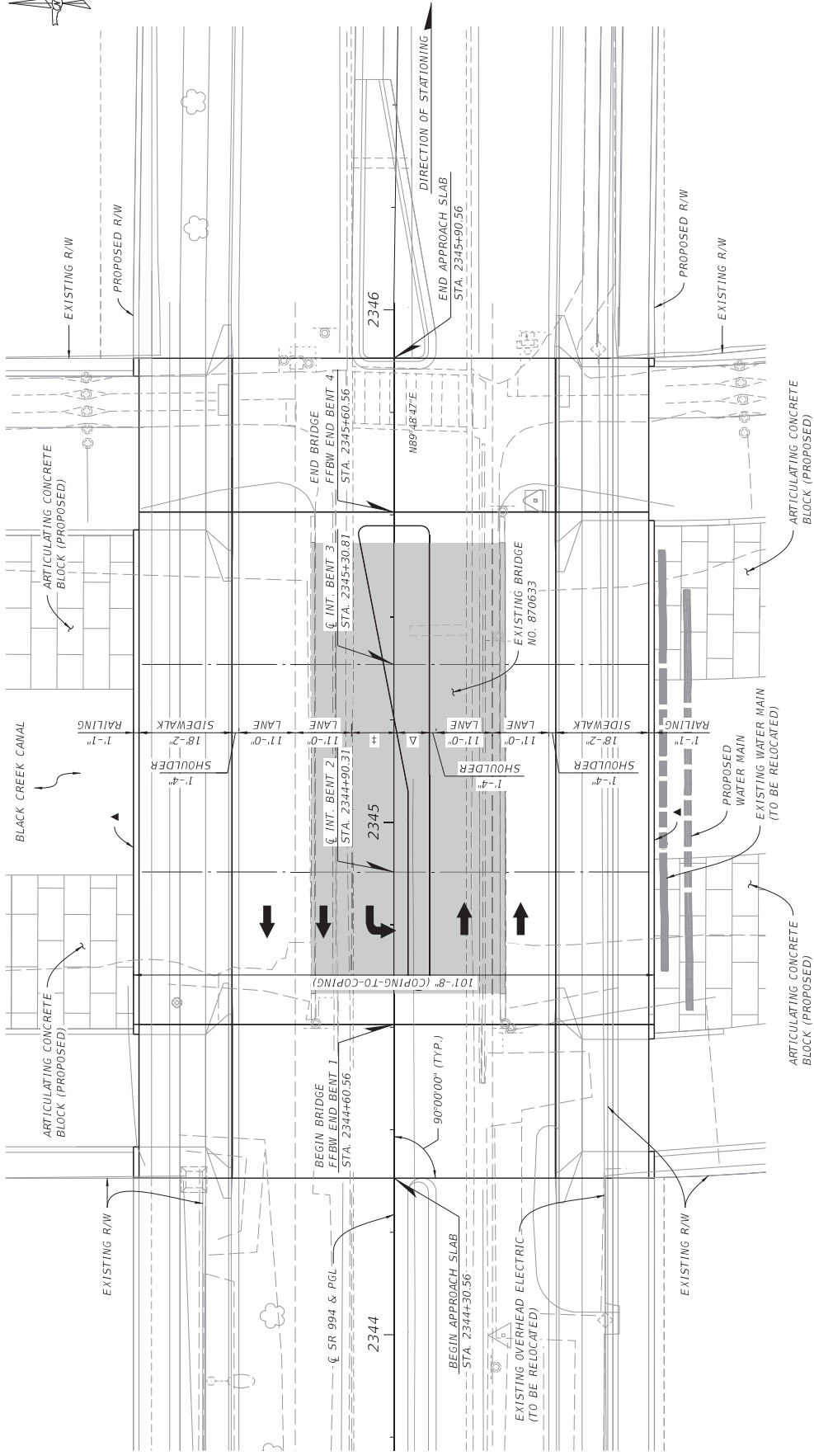
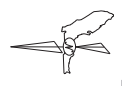
6.0 RECOMMENDATION

Based on the criteria and methodology outlined in this Bridge Analysis Report, the recommended structure type for the proposed SR 994 over Black Creek Canal Bridge replacement is:

- The bridge has a total length of 100'-0" and consists of three spans (29'-9", 40'-6" & 29'-9") as shown in Exhibits A and B located in Appendix A.
- The bridge has a total width of 101'-8" and will be constructed in two phases.
- The superstructure consists of prestressed concrete 12" Florida Slab Beams with a 6" thick cast-in-place concrete topping as shown in Exhibit C located in Appendix A.
- The substructure consists of pile bents founded on precast prestressed concrete piles. The size of the piles will be determined during final design.
- The estimated construction cost is \$3,669,056.

APPENDIX A

Exhibits



PLAN

LEGEND

- Δ VARIES (4'-2" TO 13'-10"), RAISED MEDIAN
- ± VARIES (1'-4" TO 11'-0"), LEFT TURN LANE
- ▲ TRAFFIC RAILING (32" VERTICAL SHAPE) (INDEX 521-423) WITH POST "C1" AND BULLET RAIL (INDEX 515-021)
- REMOVAL OF EXISTING BRIDGE

DATE	BY	DATE	DESCRIPTION

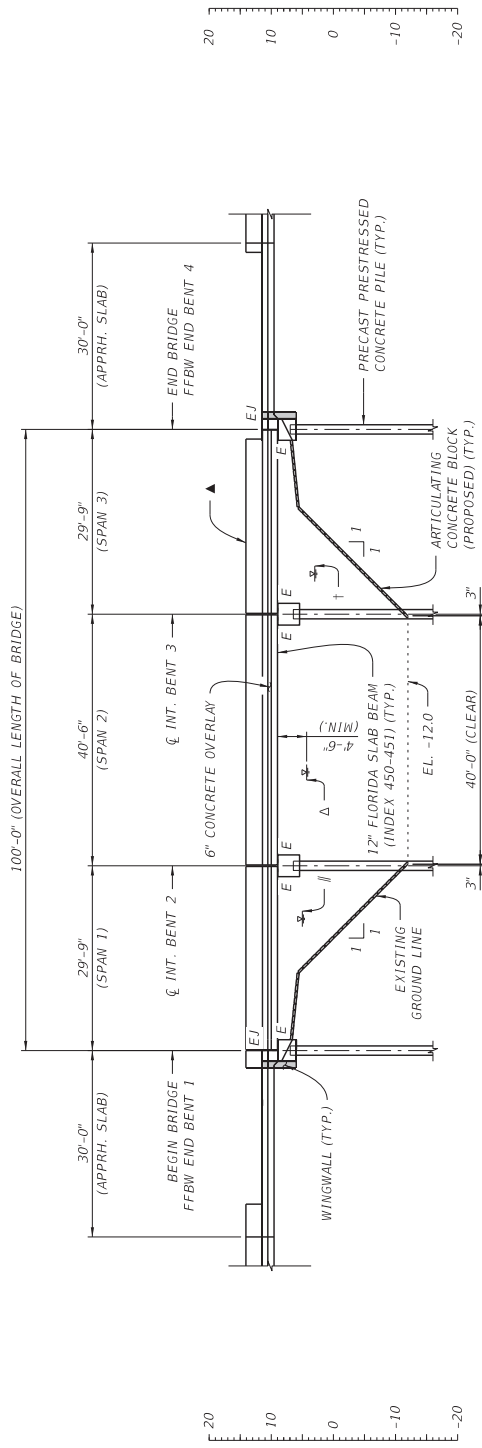
DOUGLAS M. HERSHEY, P.E.
 P.E. LICENSE NUMBER 63325
 H.W. LOCHNER, INC.
 4300 WEST CYPRESS STREET, SUITE 500
 TAMPA, FL 33607

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION	SR 994	MIAMI-DADE	445804-1-22-01
ROAD NO.	SR 994	MIAMI-DADE	445804-1-22-01
PROJECT NAME:	SR 994/SW 200TH STREET/JUALI ROOST DRIVE FROM WEST OF SW 137TH AVENUE TO EAST OF SW 127TH AVENUE		

PROJECT NO.	SR 994
SHEET NO.	BI-1
DATE	6/18/2024
TIME	11:54:42 AM

EXHIBIT A

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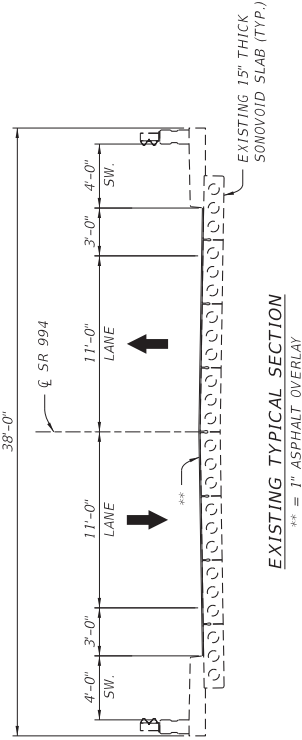


ELEVATION
(BULLET RAIL AND POST NOT SHOWN FOR CLARITY)

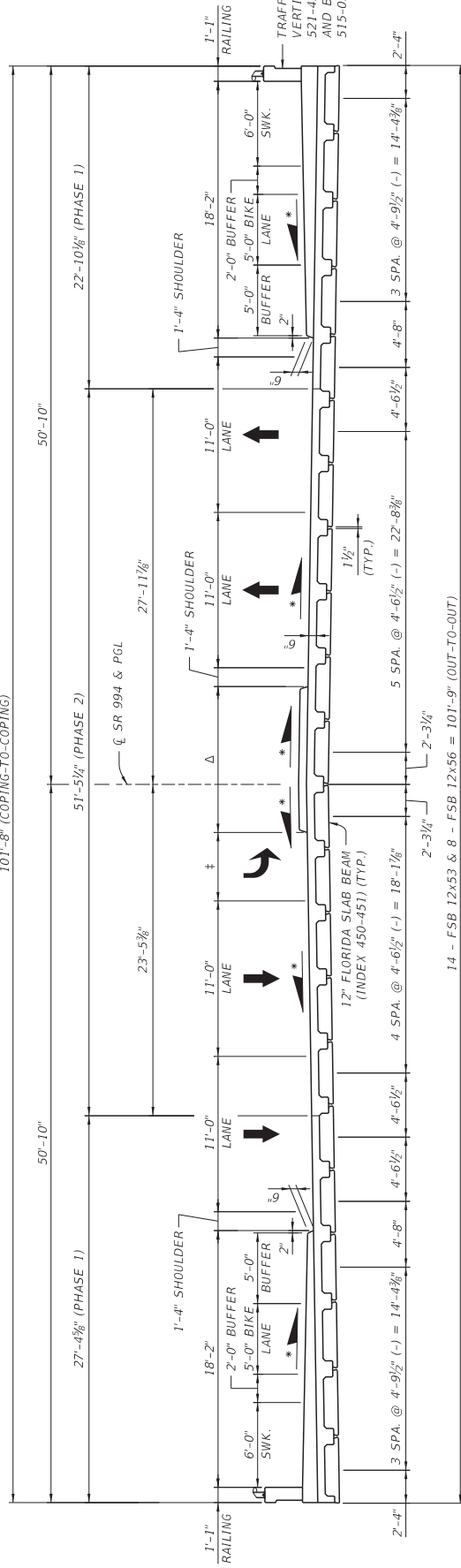
- LEGEND:**
- || EL. 5.0 (DESIGN HIGH WATER ELEVATION)
 - Δ EL. 4.3 (OPTIMUM WATER CONTROL ELEVATION)
 - + EL. 3.0 (AVERAGE DRY SEASON WATER LEVEL)
 - ▲ TRAFFIC RAILING (3" VERTICAL SHAPE) (INDEX 521-423) WITH POST "C" AND BULLET RAIL (INDEX 515-021)

REVISIONS		DESCRIPTION	
DATE	BY	DATE	DESCRIPTION

DRAWN BY: DOUGLAS M. HERSHEY, P.E. P.E. LICENSE NUMBER 63325 H.W. LOCHNER, INC. 4300 WEST CYPRESS STREET, SUITE 500 TAMPA, FL 33607		STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION	
CHECKED BY: [Signature]	DATE: [Date]	PROJECT NAME: SR 994 / I / AM / D / DE	PROJECT NO: 445804-1-22-01
DESIGNED BY: [Signature]	DATE: [Date]	COUNTY: MIAMI-DADE	ROAD NO: SR 994
CHECKED BY: [Signature]	DATE: [Date]	CONTRACT NO: 445804-1-22-01	PROJECT NAME: SR 994 / I / AM / D / DE
SHEET TITLE: ELEVATION		SHEET NO. 1	
EXHIBIT B		SR 994 / SW 200TH STREET / QUAIL ROOST DRIVE FROM WEST OF SW 137TH AVENUE TO EAST OF SW 127TH AVENUE	
DATE: 6/18/2024		DRAWN BY: /hermasdz	



101'-8" (COPING-TO-COPING)



PROPOSED TYPICAL SECTION
 Δ = VARIES (4'-2" TO 13'-10"), RAISED MEDIAN
 † = VARIES (1'-4" TO 11'-0"), LEFT TURN LANE
 * = 2% SLOPE

EXHIBIT C

REVISIONS		TYPICAL SECTIONS	
DATE	BY	DESCRIPTION	DATE

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION	SR 994/SW 130TH STREET/OUAIL ROOST DRIVE FROM WEST OF SW 137TH AVENUE TO EAST OF SW 127TH AVENUE
MIAMI-DADE COUNTY	SR 994
FINANCIAL PROJECT ID	445804-1-22-01
ROAD NO.	SR 994
CHECKED BY:	SR
DESIGNED BY:	SR
DATE	
RESIGNED BY:	
CHECKED BY:	
DATE	
DESIGNED BY:	
DATE	
RESIGNED BY:	
CHECKED BY:	
DATE	

APPENDIX B

Preliminary Bridge Geotechnical Report



**PROJECT DEVELOPMENT AND ENVIRONMENTAL
(PD&E) STUDY
SR 994/ SW 200TH STREET/QUAIL ROOST DRIVE
FROM WEST OF SW 137TH AVENUE
TO EAST OF SW 127TH AVENUE
MIAMI-DADE COUNTY, FLORIDA
FPID No. 445804-1-22-01**

**PRELIMINARY GEOTECHNICAL REPORT FOR
BRIDGE WIDENING/REPLACEMENT**

**SR 997 BRIDGE OVER BLACK CREEK CANAL
(BRIDGE NO. 870633)**

PREPARED FOR: GANNETT FLEMING, INC.

PREPARED BY: GEOSOL, INC.

SEPTEMBER 17, 2021

September 17, 2021

Gannett Fleming, Inc.
800 NW 62nd Avenue, Suite 490
Miami, Florida 33126

Attention: Ms. Alina Fernandez, P.E. - Vice President

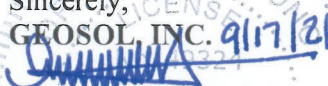
Re: **Preliminary Geotechnical Report for Bridges Widening/Replacement
SR 997 Bridge Over Black Creek Canal (Bridge No. 870633)**
Project Development and Environment (PD&E) Study
SR 994/ SW 200th Street/Quail Roost Drive
From West of SW 137th Avenue
To East of SW 127th Avenue
Miami-Dade County, Florida
FPID No. 445804-1-22-01
GEOSOL Project No. 221126

Dear Ms. Fernandez:

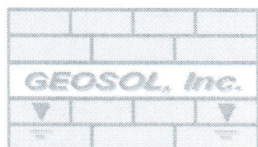
GEOSOL, Inc. (GEOSOL) is pleased to submit the enclosed preliminary geotechnical report for the proposed widening/replacement of the SR 997 bridge over Black Creek Canal (Bridged No. 870633) associated with the above-referenced project. As we understand it, this geotechnical report will be used as documentation for the Project Development and Environmental (PD&E) studies for this project. These services were provided in accordance with the FDOT's *Soils and Foundation Handbook* and our scope of services negotiated with FDOT on May 5, 2021. Authorization for our services was provided by means of a Subconsultant Agreement between Gannett Fleming, Inc. and GEOSOL dated June 17, 2021.

The results of the preliminary field exploration and laboratory testing programs, together with our preliminary geotechnical engineering evaluations and recommendations for the proposed bridge widening/replacement that is part of the project are presented in the accompanying report. For the final design phase of this project, it is recommended that a final design-level geotechnical exploration program be performed in accordance with the latest version of the FDOT's *Soils and Foundations Handbook*.

GEOSOL appreciates the opportunity to submit this geotechnical report and looks forward to a successful team effort on this and future projects. If you have any questions, please do not hesitate to call our office.

Sincerely,
GEOSOL, INC. 9/17/21

Oracio Riccobono, P.E.
Chief Geotechnical Engineer
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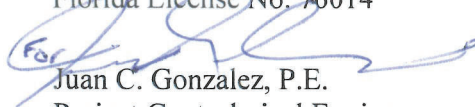

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1.0 INTRODUCTION

1.1 Project Information

The Florida Department of Transportation (FDOT) District 6 is conducting a Project Development and Environmental (PD&E) study for the improvement of SR 994/ SW 200th Street/Quail Roost Drive from West of SW 137th Avenue to East of SW 127th Avenue (MP 4.000 to MP 5.162) in Miami-Dade County, Florida. We understand that the objective of the PD&E study is to evaluate the widening of SR 994/ SW 200th Street/Quail Roost Drive from West of SW 137th Avenue to East of SW 127th Avenue and document information necessary for FDOT to reach a decision on the feasibility, location, and conceptual design that will improve mobility and accessibility. The total length of the project is about 1.162 miles (about 6,135 feet). Sheet 1 of Appendix “A” presents a Site Vicinity Map.

Based on our review of the preliminary plans and the project information provided to us, we understand that the proposed improvements that are part of the project include either the widening or replacement of the existing SR 993 bridge over Black Creek Canal (Canal C-1W) from two (2) lanes to four (4) lanes roadway section. The existing bridge is located approximately 300 feet east of SW 132nd Avenue, and has a typical section that includes two (2) undivided travel lanes approximately 11 feet wide and 6-ft concrete sidewalks adjacent to each travel lane. The bridge is a three-span structure approximately 95 feet long and 38 feet wide.

This report was specifically prepared to obtain preliminary geotechnical information for the above-referenced bridge widening or replacement. This report presents our preliminary field exploration and laboratory testing programs as well as our preliminary geotechnical engineering evaluations and recommendations for the proposed bridge wall structures. A separate preliminary report was prepared for the proposed roadway improvements that are being considered for this project.

For this preliminary report, we considered supporting the proposed bridge widening or replacement on deep foundation systems, including drilled shafts, driven piles, and Auger Cast-in-Place (ACIP) piles. It is to be noted, though, that if ACIP piles are used, it will require approval from FDOT Central Office. We also considered a shallow foundation system (spread footings). As we understand it, the final foundation systems will be selected after the final design level geotechnical investigation and analyses is performed.

1.2 Purpose

The purpose of this preliminary study was to evaluate the underground conditions (i.e. subsoil, rock and groundwater conditions) in light of the planned bridges widening or replacement described above. The results of the field and laboratory testing programs together with our preliminary geotechnical engineering recommendations for the proposed bridge foundations are included in this report.



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GEOSOL Project No.: 221126**2.0 SCOPE OF STUDY****2.1 Geotechnical Scope**

In preparation of this preliminary geotechnical report, we have performed the following services:

1. Discussed with GF the scope of the field exploration program.
2. Performed site reconnaissance and marked the location of the test borings in the field.
3. Filed for a roadway closure permit with the FDOT Traffic Operations Section.
4. Obtained underground utility clearance notifications at each test boring location.
5. Provided Maintenance of Traffic during the performance of the field testing in accordance with the Index Plan 102-600 series of the FDOT Roadway and Traffic Design Standards.
6. Performed a total of two (2) Standard Penetration Test (SPT) borings to depths of 80 feet below existing grades for the proposed bridge widening/replacement.
7. Patched the surface of the test boring locations and restored the sites to their original condition.
8. Inspected retained soil/rock samples for visual classification and performed laboratory and corrosion tests on selected representative samples.
9. Reviewed the field and laboratory data and evaluated the data for various foundation systems.
10. Prepared a preliminary geotechnical engineering report summarizing the results of the preliminary field and laboratory testing programs as well as the preliminary foundation evaluations.

2.2 Report Format

This preliminary geotechnical report begins with a discussion of the field and laboratory testing programs followed by a general discussion regarding the subsurface conditions, preliminary geotechnical engineering evaluations and recommendations, construction considerations, and report limitations. The site vicinity, USDA soils survey, and USGS maps, the boring location plan sheets, and Report of Core Boring sheets are presented in Appendix "A". The laboratory test results are presented in Appendix "B". The results of the preliminary bridge foundation evaluations are presented in Appendix "C". The FHWA Report Checklist is presented in Appendix "D".



3.0 SITE DESCRIPTION

The site of the study is generally located along SR 994/SW 200th Street/Quail Roost Drive from West of SW 137th Avenue to East of 127th Avenue in Miami-Dade County, Florida. Within the project limits SR 994 is classified as a rural minor arterial to the center of SW 137th Avenue, and as an urban minor arterial east of NW 137th Avenue. The existing typical roadway section generally consists of a two (2) lane (one in each direction) roadway with paved outside shoulders and turning lanes. Residential areas are generally present within the project limits.

4.0 FIELD EXPLORATION

4.1 General

A field exploration program was conducted consisting of Standard Penetration Test (SPT) borings performed at the site of the proposed bridge widening/replacement. A total of two (2) SPT borings (BR-1 and BR-2) were performed for this phase of the project on land to depths of 80 feet below existing grades. Additionally, one (1) sample (D50) was collected from the canal bottom for D50 analyses for use in scour evaluations.

The field exploration program was performed between August 20 and 24. The Boring Location Plan sheet is presented on Sheet 4 in Appendix "A". The Report of Core Boring sheet is shown on Sheet 5 in Appendix "A". This sheet presents the boring location information, subsurface conditions and groundwater levels encountered at the time of drilling. In addition, these profiles present the results of the laboratory testing on selected representative soil samples.

4.2 Field Test Locations

The test locations were marked in the field by representatives of GEOSOL utilizing the Google Earth KMZ file provided to us by GF that show the proposed improvement limits, standard taping procedures and existing landmarks. The tests were performed as close as possible to the proposed improvements considering constraints such as existing utilities and equipment accessibility. The latitude and longitude coordinates were obtained using a hand-held Global Positioning System (GPS) device (Garmin eTrex 20X) at the test boring location. The GPS data were converted to northing and easting coordinates using the U.S. Army Corps of Engineers software "Corpscon". The ground surface elevations from each test boring location were not provided to us at this point. The test boring location information is presented in Table 1 of Appendix "A" and the Boring Location Plans in Sheet 4 of Appendix "A".



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GEOSOL Project No.: 221126**4.3 Standard Penetration Test (SPT)**

The SPT borings performed were drilled utilizing truck-mounted drill rigs (Foremost-Mobile model B-53) equipped with recently calibrated automatic hammers. The SPT boring procedure was conducted in general conformance with ASTM D-1586. After seating the sampler six (6) inches, the number of successive blows required to drive the sampler twelve (12) inches into the soil constitutes the test result commonly referred to as the "N"-value. The "N"-value has been empirically correlated with various soil properties and is considered to be indicative of the relative density of cohesionless soils and the consistency of cohesive soils. The N-value information for each SPT boring is presented in the Report of Core Boring sheet. The recovered split spoon samples from the SPT borings were visually classified in the field with representative portions of the samples placed in jars and transported to our office for review by a Geotechnical Engineer and verification of the field classification.

4.4 Water Level Measurements

Water level depths were obtained during the test boring operations. They are noted on the Report of Core Boring Sheets presented in Appendix "A". In relatively pervious soils such as sandy soils and porous rocks the indicated depths are usually groundwater levels. Seasonal variations, tidal conditions, temperature, land-use, and recent rainfall conditions may influence the depths of the groundwater.

4.5 Traffic Control and Signs

Barricades, cones, sign devices, and off-duty police officers were continuously used as necessary and in general compliance with Roadway and Traffic Design Standards Index Drawings.

4.6 Rock Coring

For the PD&E study, rock coring was not performed at the bridge site. If drilled shafts, ACIP piles, or spread footings are ultimately selected for bridge support, rock coring and strength testing will be required in accordance with the latest version of the FDOT *Soils and Foundations Handbook*.



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GEOSOL Project No.: 221126**5.0 LABORATORY TESTING****5.1 General**

Representative soil and rock samples collected from the SPT borings were visually reviewed in the laboratory by a geotechnical engineer to confirm the field classifications. The soil samples were then classified using the Unified Soil Classification System (USCS) in general accordance with the American Society of Testing and Materials (ASTM) test designation D-2488, titled “Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)” and ASTM D-2487 titled “Standard Test Method for Classification of Soils for Engineering Purposes”. The soil classification was based on visual observations with the aids of laboratory testing results, which consist of grain-size analysis, percent passing the No. 200 sieve, and natural moisture content. In addition, environmental classification testing was performed on water samples obtained from the SPT borings. The tests were performed on selected samples believed to be representative of the materials encountered. A summary of the laboratory test results is provided in Tables 2 and 3 in Appendix “B” of this report.

5.2 Grain-Size Analysis

The grain-size analyses were conducted in general accordance with the FDOT Test Designation FM1-T88 (ASTM Test Designation D-422, titled “Particle-Size Analysis of Soils”). The grain-size analysis test measures the percentage passing the No. 200 Sieve. In this manner, the grain-size distribution of a soil is measured. The percentage by weight passing the No. 200 sieve is the amount of silt and clay sized particles. A summary of these test results are presented on Table 2 in Appendix “B”. The grain-size analysis curves are presented in Appendix “B” of this report.

5.3 Moisture Content

Laboratory moisture content test consists of the determination of the percentage of moisture contents in selected samples in general accordance with FDOT Test Designation FM1-T265 {ASTM Test Designation D-2216, titled “Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil-Aggregate Mixtures”}. Briefly, the moisture content is determined by weighing a sample of the selected material and then drying it in a warm oven. Care is taken to use a gentle heat so as not to destroy any organics. The sample is removed from the oven and reweighed. The difference of the two weights is the amount of moisture removed from the sample. The weight of the moisture divided by the weight of the dry soil sample is the percentage by weight of moisture in the sample. The moisture content test results are presented in Table No. 2 attached in Appendix “B”.



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GEOSOL Project No.: 221126**5.4 Environmental Classification**

As part of the laboratory testing program, environmental corrosion tests on water samples recovered from the SPT borings in the vicinity of the proposed bridges. Environmental corrosion tests include parameters such as pH, resistivity, sulfates content and chlorides content. The environmental corrosion tests were conducted in general accordance with the FDOT Test Designations FM5-550, 5-551, 5-552, and 5-553. Based on the FDOT's "Structures Design Guidelines", Section 1.3, the environment in the bridge areas has been classified as slightly aggressive for the superstructures and moderately aggressive for the substructures and indicated in the Report of Core Boring Sheet in Appendix "A". The test results obtained are presented on Table 3 in Appendix "B".

6.0 GENERALIZED SUBSURFACE CONDITIONS**6.1 Regional Geology**

The Miami area of southern Florida is underlain by an alternating sequence of cemented and uncemented Pleistocene sedimentary deposits (Pleistocene Epoch, deposited 10,000 to 2 million years before the present). A near surface poorly cemented, oolitic Miami Limestone is underlain by a wide variety of loose to dense quartz sands and coarse to fine-grained limestones (Fort Thompson Formation). However, in many portions of Miami-Dade, surface sand deposits of the Pamlico Formation and man-made fill materials are encountered. The Pamlico Formation is composed of unfossiliferous, unconsolidated quartz fine sand. The man-made fill deposit generally consists of granular fill material. The thickness of these deposits is in the order of three (3) to five (5) feet. Generally, the Pamlico formation overlies the Miami Limestone Formation. In the west part of the county, portions of the Everglades interfingers with the Pamlico Formation sands. The Everglades soils consist of peat, organic silt and calcareous silt marl. Generally, the Everglades soils have a thickness in the order of three (3) to seven (7) feet and overlie the Miami Limestone Formation.

The limestones found in the Miami area are much softer than the hard rock formations found elsewhere in the U.S. Although the limestone in Miami can be very porous and have a sponge-like open interconnected network of vugs and small voids, large cavities prone to sinkhole activity are not generally found in the Miami area because the rock formations of South Florida are relatively young, as compared to those encountered in other parts of Florida.



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The *Soil Survey of Miami-Dade County Area, Florida*, published by the United States Department of Agriculture (USDA), was reviewed for general near-surface soil information within the general project vicinity. This information indicates that there are three (3) primary mapping units for this project. The map soil units encountered are as follow:

- ❖ Perine marl, drained (6)
- ❖ Biscayne marl, drained (16)
- ❖ Water (99)

A reproduction of the USDA map for the project area is illustrated on Sheet 2 in Appendix “A”.

7.0 SITE SUBSURFACE CONDITIONS**7.1 General**

The groundwater table was measured at each boring location during the performance of the test borings and confirmed immediately following completion of drilling operations. Test borings were performed during the wet season. The groundwater table depths within the roadway borings were measured after a short stabilization period. The groundwater depths ranged from approximately 6.2 to 6.9 feet, with an average of about 6.6 feet, below existing grades. This information is shown on the Report of Core Boring sheet presented in Appendix “A” of this report. Fluctuation in the observed groundwater levels should be expected due to rainfall variation, construction activity and other factors. We recommend that The Designer consider the possibility of such fluctuation.

7.2 Groundwater Conditions

The estimated seasonal high water table each year is the level in the August-September period at the end of the rainy season during a year of average (normal) rainfall. The water table elevations associated with a flood would be much higher than the seasonal high water table elevations. The normal high water levels would more approximate the seasonal high water table elevations. The seasonal high water table is affected by a number of factors. The drainage characteristic of the soils, the land surface elevation, relief points such as lakes, canals, swamp areas, etc., and distance to relief points are some of the more important factors influencing the seasonal high water table elevation.

The borings performed by GEOSOL were generally done during the wet season and the SHGWT is expected to be slightly above the levels measured at the borings performed for this study. Based on our interpretation of the site conditions using the results of our test boring data, we estimate that the normal seasonal high water table is about 6 to 12 inches above the water levels measured in the boring locations.



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Based on our interpretation of the site conditions using the results of our test boring data, Miami-Dade County historical groundwater maps, and United States Geological Survey (USGS) historical groundwater data, we estimate that the normal seasonal high water table should range from about +4 to +5 feet (NGVD, 1929). The range in SHGWT is presented due to the fact that limited groundwater data was collected during the PD&E study. The recommendation for SHGWT should be refined and revisited during final design phase.

8.0 GEOTECHNICAL DESIGN PARAMETERS FOR FOUNDATION DESIGN

8.1 General

The geotechnical design parameters for this study were obtained on the basis of empirical relationships between the SPT “N”-values and the shear strength of the soil/rock strata. The subsequent sections provide derivation of geotechnical design parameters for use in preliminary foundation design for the proposed bridge widening. The derivation of the geotechnical design parameters are presented in Appendix “C”. It is to be noted that the SPT borings performed by GEOSOL were done with the use of an automatic hammer and The SPT “N”-values obtained from each boring were corrected for hammer efficiency – in order to use the empirical relationships that were derived based on the safety hammer N-values - in accordance with the recommended relationship presented in the FDOT *Soils and Foundations Handbook* ($N_{\text{safety}} = 1.24 * N_{\text{automatic}}$). Hence, any references to SPT “N”-values in the following paragraphs only have been corrected to safety hammer N-values (N_{safety}) for use in foundation design.

The ground surface at the boring locations was covered by either a topsoil layer or an asphalt pavement layer. The following stratification was encountered either below the topsoil layer or below the asphalt pavement at the borings performed by GEOSOL:

❖ Granular Fill:

The soils from this layer generally consist of fine to medium-grained sand. The materials from this stratum may classify as SP, SP-SM, or SM in accordance with the USCS. The relative density of this layer is medium dense with N_{safety} -values ranging between 21 and 26, with a statistical average N_{safety} -value of about 24 bpf. Based on established empirical relationship between the N-value and the internal friction angle (ϕ) as well as statistical evaluation of the data, we recommend an internal friction angle (ϕ) and total unit weight (γ_t) of 34 degrees and 115 pounds per cubic foot (pcf), respectively. The active, passive, and at-rest earth pressure of coefficients (i.e. K_a , K_p , and K_o) for this layer are 0.26, 5.15 and 0.44, respectively.



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❖ **Sandy Silt:**

This layer was generally encountered below the granular fill layer at depths ranging from 2 and 9.5, with thickness ranging from 5.5 to 6 feet, with an average thickness of about 5.8 feet. The materials from this Stratum consist of sandy silt and classify as ML in accordance with the USCS. The consistency of this layer is stiff with N-values ranging from 9 to 11 blows per foot, with a statistical average N-value of 10 bpf. Based on established empirical relationship between the N-value and the internal friction angle (ϕ) as well as statistical evaluation of the data, we recommend an internal friction angle (ϕ) and total unit weight (γ_t) of 23 degrees and 90 pounds per cubic foot (pcf), respectively. The active, passive, and at-rest earth pressure of coefficients (i.e. K_a , K_p , and K_o) for this layer are 0.44, 2.28 and 0.61, respectively.

❖ **Natural Upper Limestone Formation:**

The upper rock formation at the site is soft, occasionally moderately hard. This material was generally intermittingly with the upper sand layer. This formation is very porous. Based on results of the SPT borings, the N_{safety} -values obtained from the SPT borings ranged from 10 to 17 blows per foot (bpf), with a statistical average N_{safety} -value of about 14 bpf. Based on the variable strength properties of the limestone formation, and in accordance with FDOT's *Soils and Foundation Handbook*, we recommend that the limestone be modeled as gravel with an internal friction angle (ϕ) and total unit weight (γ_t) of 35 degrees and 120 pounds per cubic foot (pcf), respectively. The active, passive, and at-rest earth pressure of coefficients (i.e. K_a , K_p , and K_o) for this layer are 0.25, 5.63 and 0.43, respectively.

❖ **Natural Sand:**

The sand stratum was encountered below the sandy silt and intermittingly with the upper limestone formation. The soils from this layer generally consist of fine to medium-grained sand. The materials from this stratum may classify as SP in accordance with the USCS. The relative density of this layer is medium dense with N_{safety} -values ranging between 10 and 11, with a statistical average N_{safety} -value of about 10 bpf. Based on established empirical relationship between the N-value and the internal friction angle (ϕ) as well as statistical evaluation of the data, we recommend an internal friction angle (ϕ) and total unit weight (γ_t) of 31 degrees and 110 pounds per cubic foot (pcf), respectively. The active, passive, and at-rest earth pressure of coefficients (i.e. K_a , K_p , and K_o) for this layer are 0.29, 4.28 and 0.48, respectively.



❖ **Natural Lower Limestone Formation:**

The natural lower limestone formation was generally encountered below the sand layer. The natural lower limestone formation is the bearing stratum for deep foundations in Miami-Dade County. The strength of the limestone formation encountered throughout the project alignment was variable. Since rock cores have not been obtained, the shear strength properties of this rock formation were obtained from established empirical correlations. Based on results of the SPT borings, the N_{safety} -values obtained from the SPT borings ranged from 29 bpf and over 50 blows per 2 inches of penetration (split-spoon sampler refusal conditions), with a statistical average N_{safety} -value of about 38 bpf. Based on the variable strength properties of the limestone formation, we recommend that the limestone be modeled as rock with a design unit skin friction (f_{su}) value of 3.5 tons per square foot (tsf) and a Cohesion (c) value of 7.0 tsf. We recommend a total unit weight (γ_t) of 120 pcf. The shear strength value was derived based on empirical correlations presented in the FDOT’s *Soils and Foundations Handbook*.

Table “A” below presents a summary of preliminary geotechnical soil/rock parameters for use in preliminary foundation analyses and design. For specific subsurface stratification, refer to the Report of Core Boring sheet presented in Appendix “A”.

TABLE “A”- SUMMARY OF PRELIMINARY GEOTECHNICAL DESIGN PARAMETERS

GENERAL MATERIAL DESCRIPTION	UNIT WEIGHT, γ (PCF)		FRICTION ANGLE, ϕ (Degrees)	DESIGN UNIT SKIN FRICTION, f_{su} (TSF)	COHESION (C) (TSF)	EARTH PRESSURE COEFFICIENTS		
	TOTAL	EFFECTIVE				ACTIVE (Ka)	PASSIVE (Kp)	AT-REST (Ko)
Granular Fill (SP/SP-SM/SM)	115	53	34	-	-	0.26	5.15	0.44
Sandy Silt (ML)	90	28	23	-	-	0.44	2.28	0.61
Natural Upper Limestone	120	58	35	-	-	0.25	5.63	0.43
Natural Sand (SP)	110	48	31	-	-	0.29	4.28	0.48
Natural Lower Limestone	120	58	-	3.5	7.0	-	-	-

Included in Appendix “C” are preliminary FB-Multiplier Parameters for use in laterally loaded driven pile/drilled shaft/ACIP pile analyses.



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9.0 PRELIMINARY BRIDGE FOUNDATION EVALUATION

9.1 General

We understand that the existing bridges are either being considered for widening or replacement. The existing bridges are supported by square precast prestressed concrete driven pile foundations. The project is in PD&E phase and final design loading information is not yet available. We understand that the bridge design methodology will be Load and Resistance Factor Design.

The PD&E study phase of the project consists of preparing a preliminary geotechnical report to aid FDOT in reaching a decision on the feasibility, location, and conceptual design that will improve mobility and accessibility. Deep foundations (driven piles, drilled shafts, and ACIP piles), as well as shallow foundations were considered for support of the proposed bridge improvements. Each of the foundation alternatives is discussed individually in the following sections.

9.2 Foundation Alternatives for Bridge Structures

Foundation alternatives for the project considered the results of our field study and performance of foundation systems near the project site. Based on our experience with similar projects, we considered the following foundation alternatives:

- ❖ Shallow Foundations
- ❖ Straight Sided Drilled Shafts
- ❖ Steel Piles, Including Pipe and H-Sections
- ❖ Precast Prestressed Concrete Piles
- ❖ Auger Cast-in-Place (ACIP) Piles

The following sections discuss our preliminary foundation recommendations for each alternative:

9.2.1 Shallow Foundations

For the most part, the soil borings performed for the proposed bridge widening or replacement disclosed loose sandy soils and unsuitable sandy silt (ML) in the upper part of the subsurface profile. The use of shallow foundations will require extensive excavations for the removal of the unsuitable sandy silt (ML) that were encountered at the bridge boring locations at depths ranging from 2 and 9.5, with thickness ranging from 5.5 to 6 feet, with an average thickness of about 5.8 feet.

Additionally, due to the groundwater levels measured during the field exploration program, dewatering will likely be required to cast the spread footings in the dry, which can add a significant cost to the project and excessive settlement to the existing utilities.



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Also, given the relatively large magnitude of the applied loads, large footings would be required and relatively large settlements would result, making the use of shallow foundations uneconomical and unfeasible.

Further, spread footings will be subjected to the effects of scour due to the fact that the bridges cross over the Black Creek Canal. Also, Substantial dewatering and possible cofferdam with tremie seal will be required to cast the footings in the dry, which can add a significant cost to the project.

Furthermore, the difficulties associated with spread footing construction, presence of underground utilities, and potential MOT impacts due to relatively large footing sizes make them an unpractical and not cost effective, in our opinion, foundation alternative.

However, when a final-design level geotechnical investigation is performed, a re-evaluation may be performed to determine feasibility of using a shallow foundation system for bridge support.

9.2.2 Drilled Shafts

❖ General

Drilled shafts are a feasible foundation alternative for the support of the proposed bridge widening or replacement. Drilled shafts have the advantage of being able to develop high axial and lateral capacities in a single unit and their use reduces construction vibration concerns (using special vibration free-oscillatory type equipment for case installation) and noise in the vicinity of existing structures. However, the quality control of drilled shaft installation requires more engineering judgment and precaution compared to the driven piles to ensure that the specifications are complied. Also, drilled shafts require additional testing (i.e. cross-hole-sonic logging, static or dynamic load testing, shaft inspection device, etc.) that typically make them more expensive than driven piles. The minimum drilled shaft diameters allowed by the FDOT *Structures Design Guidelines* for redundant and non-redundant foundations are 42 and 48 inches, respectively.

We are providing evaluations and recommendations for the PD&E study phase of the project. It should be noted that for this preliminary report, rock coring and testing have not been performed in order to derive the design shear strength parameters for drilled shaft foundation design in accordance with the FDOT's *Soils and Foundations Handbook*. Therefore, for this report we have evaluated drilled shaft capacities using established empirical relationships between the SPT N-value and the shear strength of the rock strata as presented in the FDOT's *Soils and Foundations Handbook*. If drilled shafts are ultimately selected for support of any of the bridge improvements, rock coring and testing will be required to confirm the preliminary shear strength parameters and to provide final recommendations regarding drilled shaft foundations.



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Drilled shafts were evaluated using the manual entitled *Drilled Shafts: Construction Procedures and LRF Design Methods*, published by the Federal Highway Administration (FHWA), and the *FDOT Soils and Foundations Handbook*. The drilled shaft capacities were evaluated by using the preliminary soil/rock shear strength properties previously summarized in Table “A” of this report.

❖ *Axial Capacity*

For this preliminary phase, we have prepared curves of axial capacity versus depth for drilled shaft diameters of 42, 48, 54, 60, and 72 inches. The curves were prepared using the software for axially loaded drilled shafts, “FB-Deep” v3.0.0, which was developed based on the procedures outlined in based upon Federal Highway Administration report "Drilled Shafts: Construction Procedure and Design Methods". As previously stated the SPT “N”-values from the borings performed of this study were obtained using an automatic hammer. Per FDOT Soils and Foundation Handbook a correction factor of $N_{safety} = 1.24 * N_{automatic}$ was used for the program FB-Deep software input. The FB-Deep runs for borings performed by GEOSOL are presented in Appendix “C”.

The nominal resistances that the drilled shafts may develop were multiplied by resistance factors of 0.5 and 0.6 for non-redundant and redundant drilled shaft foundations, respectively. These resistance factors were selected because our preliminary shaft capacities based on side friction resistance only. Appendix “C” presents our preliminary drilled shaft capacity evaluations.

Since it is early in the design phase, the drilled shaft foundation configuration (i.e. # of shafts) has not been determined. If at all possible, we recommend that non-redundant drilled shaft foundations not be used, as significantly more stringent FDOT design and construction requirements apply (i.e. shaft inspection device at each shaft, cross-hole sonic logging at each shaft, SPT boring and rock coring at each shaft location, etc.). The performance of a load testing program may be required to allow for an opportunity to evaluate end bearing capacity of the drilled shafts and possibly shortening the shaft lengths. The axial capacities presented in Appendix “C” are based on side friction resistance only, since the full mobilization of end bearing capacity would require large tip movement and on the order of 5 to 10 percent of the shaft diameter.

If drilled shafts are to be selected for foundation support, requirements for a load testing program, including the recommended type, will be specified during the final design phase. If load testing is performed for the drilled shafts of this project, then the resistance factor (ϕ) could be increased. For example, for Statnamic load testing, ϕ can be increased from 0.60 to 0.70.



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GEOSOL Project No.: 221126❖ *Lateral Deflections*

At this point the design loading information is not available. During the final design phase if drilled shafts are selected for bridge support, lateral deflections will need to be checked and minimum tip elevations will need to be established once the design loads are available and one a final design-level geotechnical field investigation has been performed.

❖ *Drilled Shaft Settlement*

Settlements of drilled shaft supported bridge foundations are typically small and tolerable for a typical shaft group. At this point the design loading information is not available. During the final design phase if drilled shafts are selected for bridge support, settlements will need to be checked at the Service limit state once the design loads are available and one a final design-level geotechnical field investigation has been performed.

❖ *Drilled Shaft Construction*

The installation of the drilled shafts should be carried out in accordance with Section 455 of the *FDOT Standard Specifications for Road and Bridge Construction*.

❖ *Load Testing*

Load test types include static load tests, dynamic load tests, Osterberg load tests and Statnamic load tests. Factors to be considered when evaluating the benefits and costs of providing loaded tested shafts include: subsurface conditions, design loads, testing equipment, mobilization and vibration concerns. Generally, the more variable the subsurface conditions at the site the less cost effective are static load tests. If drilled shafts are selected, we recommend that the load test be of either Statnamic or Osterberg types. Generally, Statnamic load tests are less expensive and quicker to perform than Osterberg type load tests. However, given the explosive nature of the Statnamic load test and the nearby residential and commercial structures, we do not recommend the use of a Statnamic load test. The Osterberg load test appears to be the most feasible type of load testing program.



If drilled shaft foundations are selected for bridge support, we recommend that as a minimum one (1) compression load test is planned. The location of the load tests should be selected considering the subsurface conditions and design loading. We recommend that load testing be performed in the vicinity of a test boring at the intended location of the drilled shaft where significant shortening of the shafts could be realized. Potential bent location for load testing will be selected during final design if drilled shafts are selected. The test shafts should be instrumented in order to gain information regarding the unit skin friction characteristics of each subsurface stratum as well as end bearing load behavior. The recommended load testing location and load testing recommendations will be provided in the final geotechnical report.

9.2.3 Steel Piles

Steel pile types include pipe piles and H-sections. Previous experience has shown that steel H-piles sections and pipe piles are generally more expensive per linear foot than prestressed concrete piles. Steel piles are well suited to conditions with high variability in anticipated penetration depths where frequent splicing is expected. Typical sizes of pipe piles range from 13 to 16 inches in diameter. The steel piles do not develop as much compression and tension capacities for similar penetration depths as square driven prestressed concrete piles and rough cost data indicates that the steel pipe piles are more expensive than similar sizes of square prestressed concrete piles. Steel H-sections are inappropriate for this project because of inferior capacities compared to pipe piles at similar costs. As a result, we did not consider this alternative any further.

9.2.4 Precast Prestressed Concrete Driven Piles

Square precast prestressed concrete driven piles are also considered an appropriate foundation type. They are a widely used and proven foundation system in South Florida. Precast prestressed concrete piles are readily available and generally have a lower cost per ton of capacity than other driven pile types. The minimum size for prestressed concrete piles should be 18-inch square, as referenced in the *FDOT Structures Design Guidelines*. However, 24 or 30-inch square precast concrete piles may also be utilized based on the requirements of the structural design.



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❖ Compression Capacity

We have prepared curves of axial capacity versus tip elevation for 18-, 24-, and 30-inch square driven piles based on the borings performed for this project. These curves were prepared using software for axially loaded driven piles, “FB-Deep” v3.0.0, which was developed based on the procedures outlined in FDOT Research Bulletin 121. As previously stated the SPT “N”-values from the borings performed of this study were obtained using an automatic hammer. Since the program FB-Deep software uses SPT “N”-values obtained with a safety hammer, the SPT “N”-values obtained from the borings performed on land with the use of an automatic hammer were converted to safety hammer “N”-values using the FDOT *Soils and Foundation Handbook* correction of $N_{\text{safety}} = 1.24 * N_{\text{automatic}}$. The FB-Deep runs for borings performed by GEOSOL are presented in Appendix “C”.

From the FB-Deep computer outputs, the Davisson Capacity values shall be used to predict the Nominal Bearing Resistance (NBR). The nominal bearing resistance may be estimated as follows:

$$R_n = \frac{\text{Factored Design Load} + \text{Downdrag} + \text{Net Scour}}{\Phi}$$

where,

- Φ = Resistance Factor = 0.75 compression design with 100% dynamic testing or
- Resistance Factor = 0.65 compression design with at least 5% dynamic testing

Once design loads, scour information and pile cut-off elevation information is available during the final design phase, recommendations for test pile lengths and required nominal bearing resistance can be provided by the Geotechnical Engineer of Record.

❖ Lateral Deflections

At this point, the final design loading information is not yet available. During the final design phase if driven piles are selected for bridge support, lateral deflections will need to be checked and minimum tip elevations will need to be established once the design loads are available and once a final design-level geotechnical field investigation has been performed.



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GEOSOL Project No.: 221126❖ *Pile Settlements*

Settlements of driven pile supported bridge foundations are typically small and tolerable for a typical pile group. At this point the design loading information is not available. During the final design phase if driven piles are selected for bridge support, settlements will need to be checked at the Service limit state once the design loads are available and once a final design-level geotechnical field investigation has been performed.

❖ *Pile Installation*

The installation on the driven piles for the proposed bridges widening should be carried out in accordance with Section 455 of the FDOT *Standard Specifications for Road and Bridge Construction*.

❖ *Preforming*

Given the presence of dense fill materials, and due to the close proximity of the proposed bridge widening/replacement to existing structures and/or utilities, preforming will likely be required in order to prevent refusal conditions and pile damage, and to protect the existing structures and/or utilities during pile driving operations. The need for preforming shall be evaluated during the final design phase once design loading information is available and once a final design-level geotechnical investigation has been performed. All preforming shall be carried out in accordance with Sections 455 of the FDOT "*Standard Specifications for Road and Bridge Construction*". Additionally, all preformed pile holes shall be backfilled in accordance with Section 455 of the FDOT "*Standard Specifications for Road and Bridge Construction*".

❖ *Protection of Existing Structures*

All structures and substructure located in the vicinity of pile driving operations should be protected as well as monitored and surveyed for possible vibration damage and settlement in accordance with Sections 108 and 455-1.1 of the FDOT *Standard Specifications for Road and Bridge Construction*. Pre-forming may be required to reduce vibration impacts to existing structures and substructures and will be specified at a later time. Additionally, 100% dynamic testing during pile driving may be considered to reduce vibration impacts to existing structures and substructures. During final design, based on the selected foundation type, specific structures and substructures to be monitored will be identified.



❖ *Summary of Foundation Design*

As previously stated, the final design loading information has not been provided to us at this time. Once the design loading information is available and once a final design-level geotechnical field investigation has been performed, the preliminary foundation analyses will need to be revisited in order to provide final recommendations regarding the required nominal bearing resistance, minimum tip elevations and test pile lengths. The pile lengths required for production will be determined at the time of test pile installation and monitoring using dynamic load testing.

❖ *Pile Data Table*

As previously stated, the final design loading information has not been provided to us at this time. Once the design loading information is available and once a final design-level geotechnical field investigation has been performed, a pile data table for the proposed driven piles will need to be prepared. The pile lengths required for production will be determined at the time of test pile installation and monitoring using dynamic load testing.

9.2.5 Auger Cast-in-Place (ACIP) Piles

Auger Cast-in-Place (ACIP) Piles were also considered for support of the proposed bridge widening or replacement. Typically, ACIP piles are installed by rotating a continuous flight hollow-stem auger into the ground to the required pile depth with sufficient crowd (downward thrust) to prevent mining of the soil. While the auger is drilled into the ground, the flights of the auger are filled with soil, providing lateral support and maintaining the stability of the hole. Grout is injected through the hollow center of the auger shaft under continuous positive pressure as the auger is being withdrawn. Simultaneous pumping of the grout or concrete and withdrawing of the auger provides continuous support of the hole. A reinforcing steel cage, as specified, is inserted into the column of fluid grout immediately following the completion of grout placement and withdrawal of the auger.

It is to be noted that for the interior piers that are located in the Black Creek Canal, substantial dewatering and possible cofferdam with tremie seal will be required to cast the pile cap, which can add a significant cost to the project, and may make the use of ACIP pile foundation systems for support of the proposed bridge improvement not feasible.

ACIP pile installation reduces construction vibration concerns and noise in the vicinity of existing structures and/or utilities when compared to driven piles. Additionally, ACIP piles greatly alleviate the quality control issues and additional testing (i.e. cross-hole-sonic logging, shaft inspection device, etc.) associated with drilled shafts.



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ACIP piles have been successfully used on numerous transportation infrastructure projects in Miami-Dade County including the Miami-Dade Transit elevated guideway bridges, Miami International Airport (MIA) parking garages, MIA transportation hub, MIA vehicular bridges, City of Miami Beach West Avenue vehicular bridge, and a 200-foot high air traffic control tower at the Miami-Opa-Locka Executive Airport. We are providing preliminary evaluations and recommendations for this phase of the project.

Per FDOT Structure Design Guidelines, the use of ACIP pile for support of bridges requires the approval of the State Structure Design Engineer.

❖ Axial Capacity

For this preliminary phase, we have prepared curves of axial capacity versus depth for ACIP pile diameter of 24 inches. The curves were prepared using the software for axially loaded drilled shafts, “FB-Deep” v3.0.0, which was developed based on the procedures outlined in based upon Federal Highway Administration report "Drilled Shafts: Construction Procedure and Design Methods". As previously stated the SPT “N”-values from the borings performed of this study were obtained using an automatic hammer. Per FDOT Soils and Foundation Handbook a correction factor of $N_{safety} = 1.24 * N_{automatic}$ was used for the program FB-Deep software input. The FB-Deep runs for borings performed by GEOSOL are presented in Appendix “C”.

It should be noted that for this preliminary report, rock coring and testing have not been performed in order to derive the design shear strength parameters for ACIP pile foundation design in accordance with the FDOT’s *Soils and Foundations Handbook*. Therefore, for this report we have evaluated ACIP pile capacities using established empirical relationships between the SPT N-value and the shear strength of the rock strata as presented in the FDOT’s *Soils and Foundations Handbook*. If ACIP piles are ultimately selected for support of any of the bridge improvements, rock coring and testing will be required to confirm the preliminary shear strength parameters and to provide final recommendations regarding ACIP pile foundations.

The factored compression and uplift capacities predictions of the ACIP piles were obtained by multiplying the ultimate capacities by a resistance factor (ϕ) for Load and Resistance Factor Design (LRFD). Resistance factors (ϕ) of 0.50 and 0.40 were selected for the factored compression and uplift capacities, respectively, for the ACIP piles in accordance with Section 3.5.20 of the FDOT Structures Design Guidelines (SDG).

The axial capacities presented in Appendix “C” are based on side friction resistance only, and ignore the contribution of soil layers as required by Section 3.5.20 of the FDOT SDG. Additionally, the axial capacities ignore the ACIP pile end bearing capacity, since the full mobilization of end bearing capacity would require large tip movement and on the order of 5 to 10 percent of the pile diameter.



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If ACIP piles are to be selected for foundation support, requirements for a load testing program, including the recommended type, will be required during the final design phase.

❖ Lateral Deflections

At this point the design loading information is not available. During the final design phase if ACIP piles are selected for bridge support, lateral deflections will need to be checked and minimum tip elevations will need to be established once the design loads are available and one a final design-level geotechnical field investigation has been performed.

❖ ACIP Pile Settlement

Settlements of ACIP pile supported bridge foundations are typically small and tolerable for a typical pile group. At this point the design loading information is not available. During the final design phase if ACIP piles are selected for bridge support, settlements will need to be checked at the Service limit state once the design loads are available and one a final design-level geotechnical field investigation has been performed.

❖ ACIP pile Construction

The installation and testing of the ACIP Piles shall be carried out in accordance with the latest version of the FDOT Developmental Specifications for Auger Cast Piles Including Bridges (Dev455ACP for Projects Including Bridges).

❖ Load Testing

ACIP piles are typically load tested in accordance with ASTM D-1143 (Standard Test Methods for Deep Foundations Under Static Axial Compressive Load), ASTM D-3689 (Standard Test Methods for Deep Foundations Under Static Axial Tensile Load), and ASTM D 3966 (Standard Test Methods for Deep Foundations Under Lateral Load).

If ACIP pile foundations are selected for bridge support, we recommend that as a minimum of one (1) compression load test is planned. The location of the load test should be selected considering the subsurface conditions and design loading. We recommend that load testing be performed in the vicinity of a test boring at the intended location of the ACIP piles. Potential location for load testing and load testing recommendations shall be selected during final design if ACIP piles are selected.



9.2.6 Scour

We understand that scour is a concern for the proposed bridge crossing over the Black Creek Canal. At this point, the scour elevations are not yet available. Once the design loads are available, foundation analyses and recommendations will need to consider scour elevations. Table “B” below presents a summary D₅₀ analysis performed on soils collected from the canal bottom for use in preliminary scour analysis.

TABLE “B” – SUMMARY OF D₅₀ VALUES FOR SCOUR ANALYSIS

LOCATION	MATERIAL TYPE	USCS SYMBOL	SAMPLE No.	SAMPLE DEPTH BELOW MUDLINE (FEET)	D ₅₀ (mm)
Center Middle of Black Creek Canal Adjacent to Existing Bridge	Brown Silty Fine to Medium SAND with Some Limestone Fragments	SM	1	0-2	0.8

10.0 EXCAVATION RECOMMENDATIONS

If required temporary excavations of the existing subsurface materials may be accomplished as follows:

- **Granular Soils:** Temporary excavation maximum side slopes of 1V:2H in the granular subsurface materials are stable and have a minimum factor of safety of 1.3.
- **Sandy Silt:** Temporary excavation maximum side slopes of 1V:3H in the sandy silt are stable and have a minimum factor of safety of 1.3.
- **Limestone Formations:** Temporary excavation maximum side slopes of 1V:1H in the natural limestone formations are stable and also have a minimum factor of safety of 1.3.

If steeper side slopes are required, The Designer should evaluate the need for temporary ground support systems such as temporary sheet piles during excavation. The temporary ground support systems may be designed using the preliminary soil/rock parameters presented in Table “A” of this report.



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11.0 FHWA REPORT CHECKLIST

As referenced in the Structures Design Guidelines, conformance to the FHWA Report “Checklist and Guidelines for Review of Geotechnical Reports and Preliminary Plans and Specifications” prepared by the Geotechnical and Materials Branch, FHWA, Washington, D.C. is required when preparing geotechnical reports. The FHWA checklist for this report is enclosed in Appendix “D”.

12.0 RECOMMENDATIONS FOR FURTHER GEOTECHNICAL STUDIES

For this PD&E phase of the project, a limited number of test borings were performed to support the bridge foundation design. Once the preferred alternative and foundation system for the bridges is chosen, a final design-level geotechnical investigation program will be required for the bridge structure. The final design-level geotechnical investigation program should be performed in accordance with the latest version of the FDOT *Soils and Foundations Handbook*. If drilled shafts, ACIP piles, or spread footings are chosen as a foundation for support of the proposed bridges, rock coring and laboratory testing on rock core specimens will be required for final design of the foundations in accordance with the latest version of the FDOT *Soils and Foundations Handbook*.

13.0 REPORT LIMITATIONS

Our professional services have been performed, our preliminary findings obtained, and our preliminary recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. This company is not responsible for the conclusions, opinions or recommendations made by others based on the data collected. No other warranties are expressed or implied.

The preliminary scope of the investigation was intended to evaluate subsurface conditions within the influence of the expected bridge foundations for the PD&E phase of the project. The preliminary analyses and preliminary recommendations submitted in this report are based upon the preliminary data obtained from the test borings performed at the locations indicated. The applicability of the report should also be reviewed in the event significant changes occur in the design, nature or location of the proposed bridge structure.

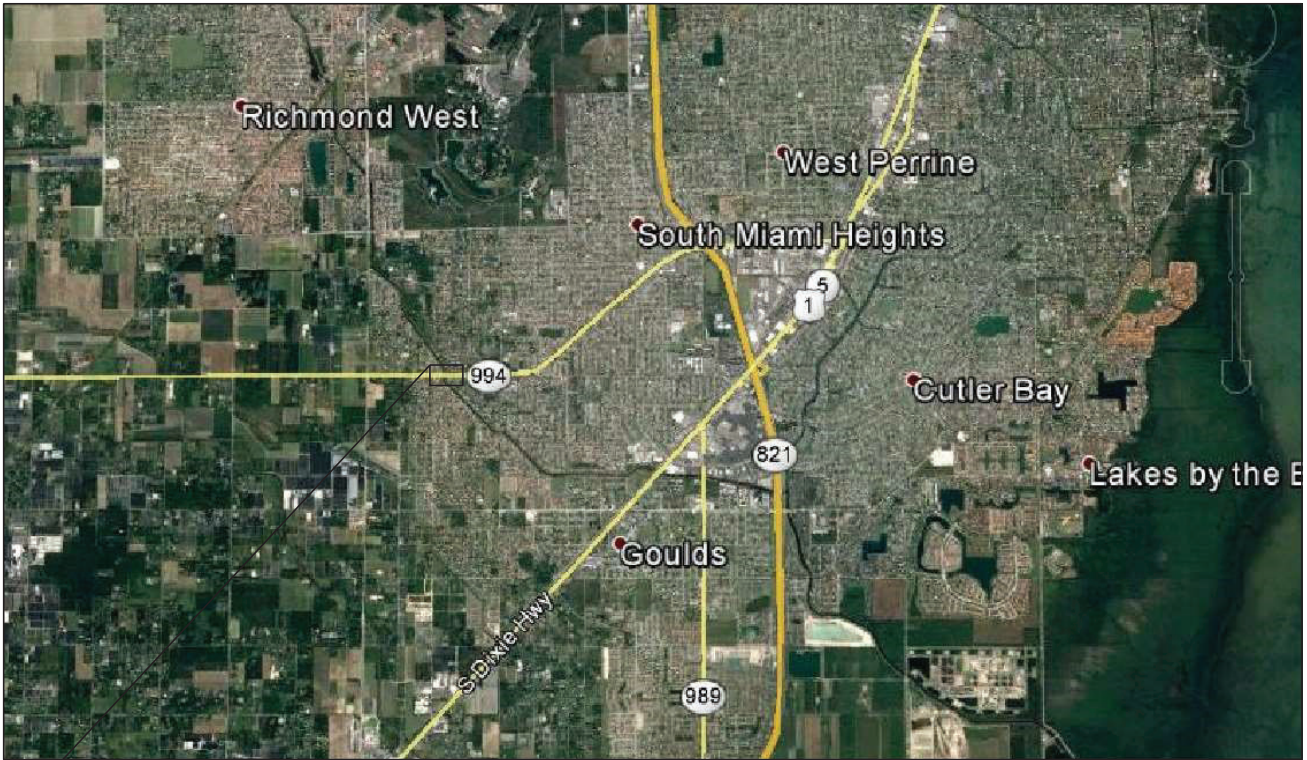
The scope of our services does not include any environmental assessment or investigation for the presence or absence of hazardous or toxic materials in the soil, groundwater, or surface water within or beyond the site studied. Any statements in this report regarding odors, staining of soils, or other unusual conditions observed are strictly for the information of our client.



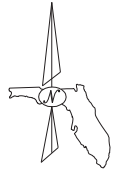
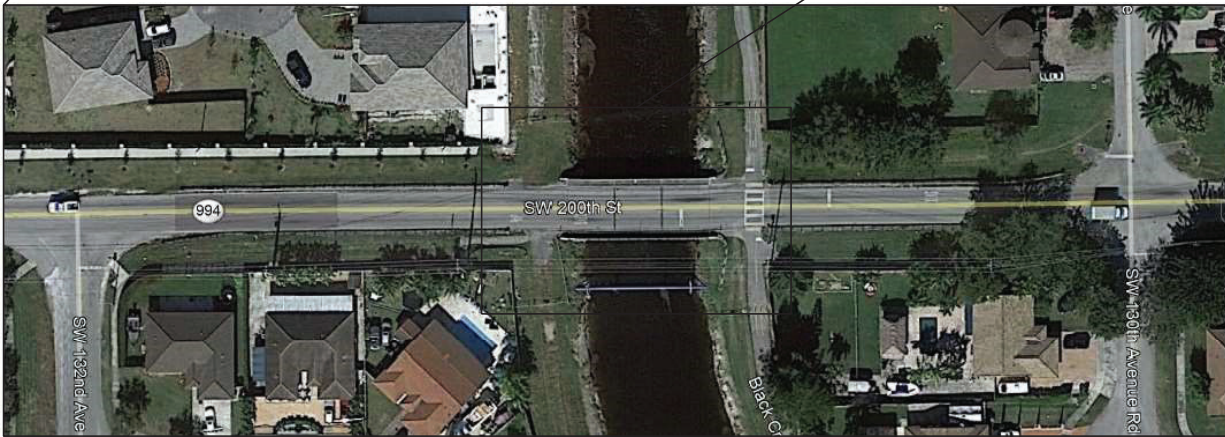
APPENDIX “A”

- Sheet 1: Site Vicinity Map
- Sheet 2: USDA Soils Survey Map
- Sheet 3: US Geologic Survey Map
- Table 1: Summary of Field Test Locations
- Sheet 4: Boring Location Plan
- Sheet 5: Report of Core Borings





APPROXIMATE SITE LOCATION



SITE VICINITY MAP

COUNTY: MIAMI-DADE COUNTY, FLORIDA

REFERENCE: GOOGLE EARTH, 2021

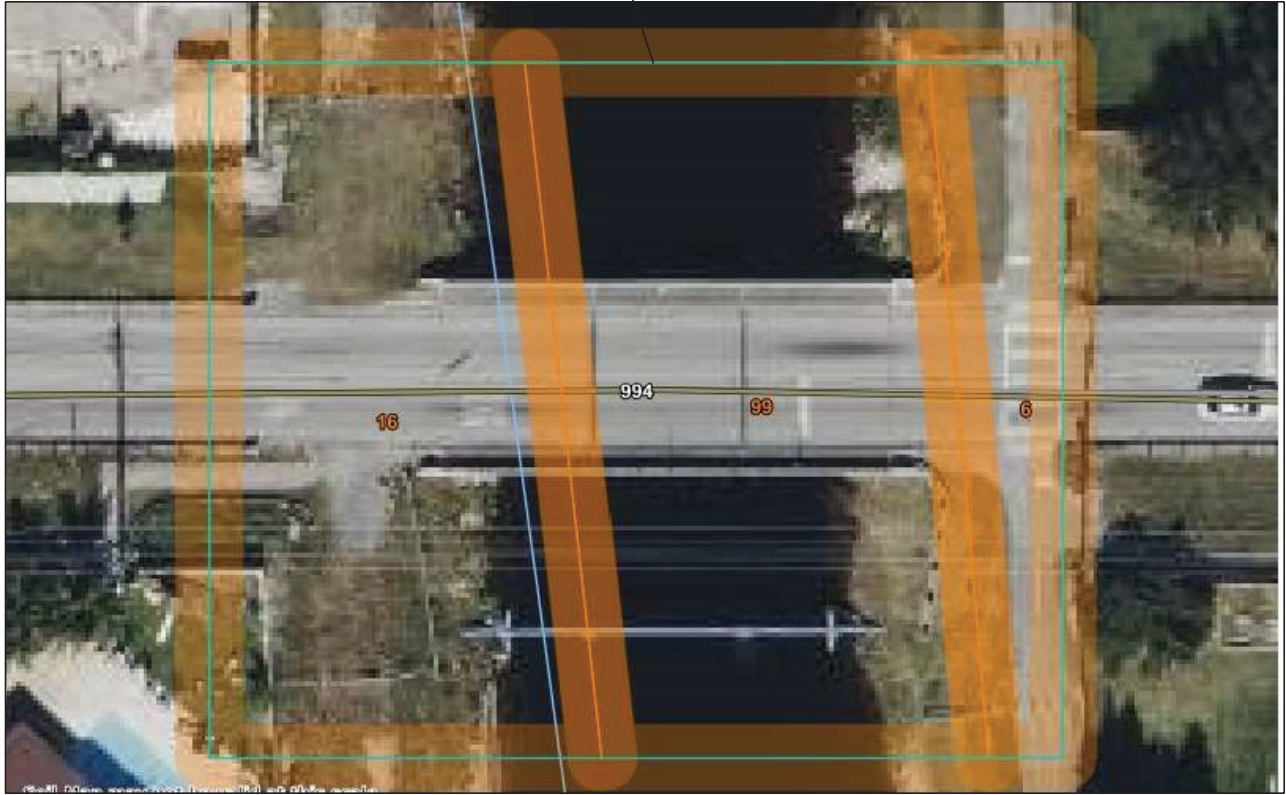
DATE: SEPTEMBER, 2021

SITE VICINITY MAP

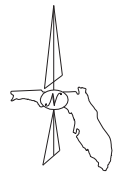
SR 994/SW 200th STREET/QUAIL ROOST DRIVE
FROM WEST OF SW 137TH AVENUE TO
EAST OF SW 127TH AVENUE
MIAMI-DADE COUNTY, FLORIDA
FM No.: 445804-1-22-01

<small>DRAWN</small> JM	<small>SCALE</small> N.T.S.	<small>PROJ. No.</small> 221126
<small>CHECKED</small> OR	<small>DATE</small> SEPT., 2021	<small>SHEET</small> 1

APPROXIMATE SITE LOCATION



USDA SOILS SURVEY MAP



MAP UNIT	SOIL NAME
6	Perine marl, drained
16	Biscayne marl, drained
99	Water

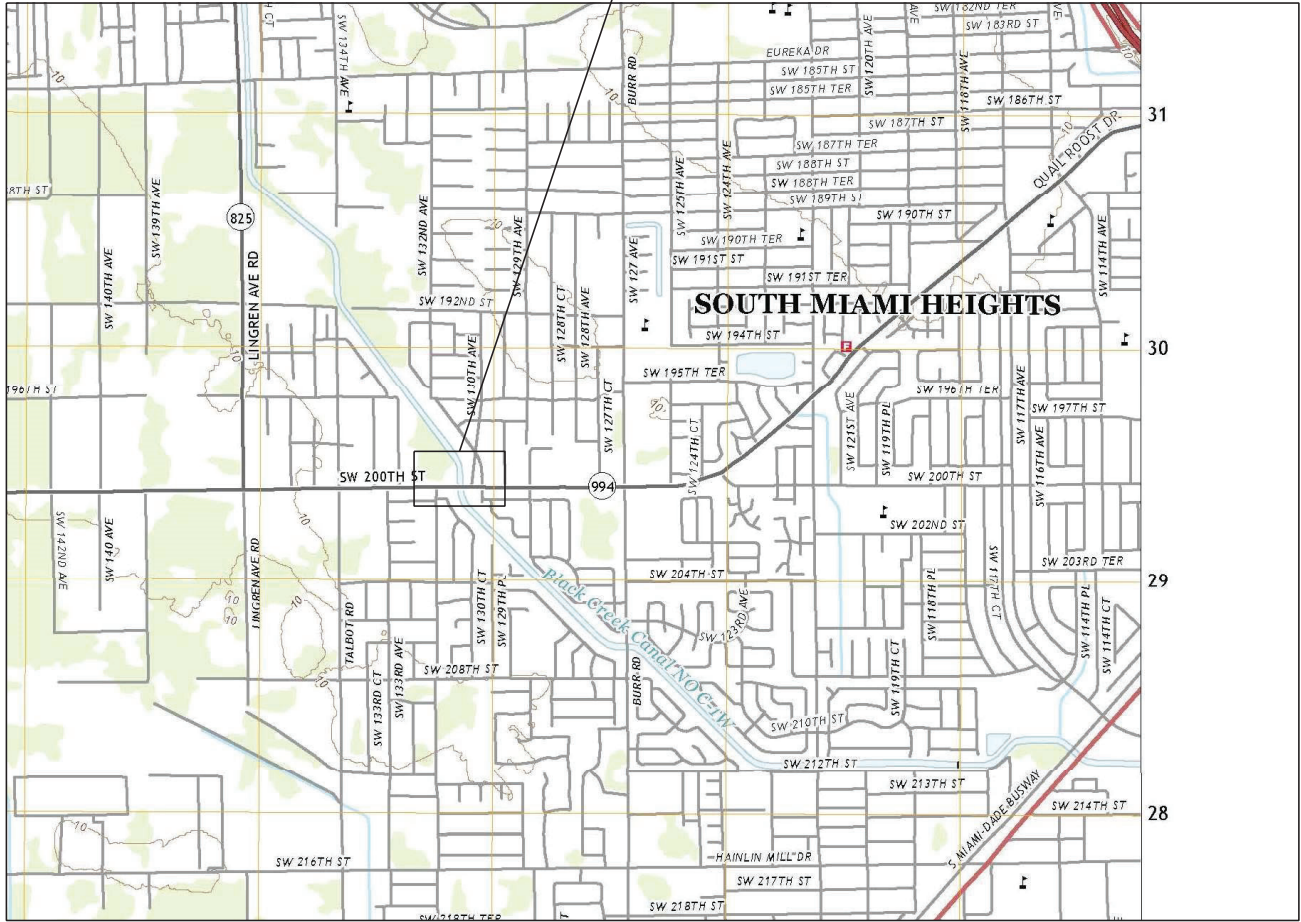
COUNTY: MIAMI-DADE COUNTY, FLORIDA
REFERENCE: NRCS WEB SOILS SURVEY, 2021
DATE: SEPTEMBER, 2021

USDA SOILS SURVEY MAP

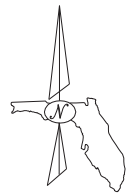
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APPROXIMATE SITE LOCATION



US GEOLOGIC SURVEY MAP



COUNTY: GOULDS, FLORIDA

REFERENCE: MIAMI, FL
U.S. GEOLOGIC SURVEY, 2018

DATE: SEPTEMBER, 2021

US GEOLOGIC SURVEY MAP

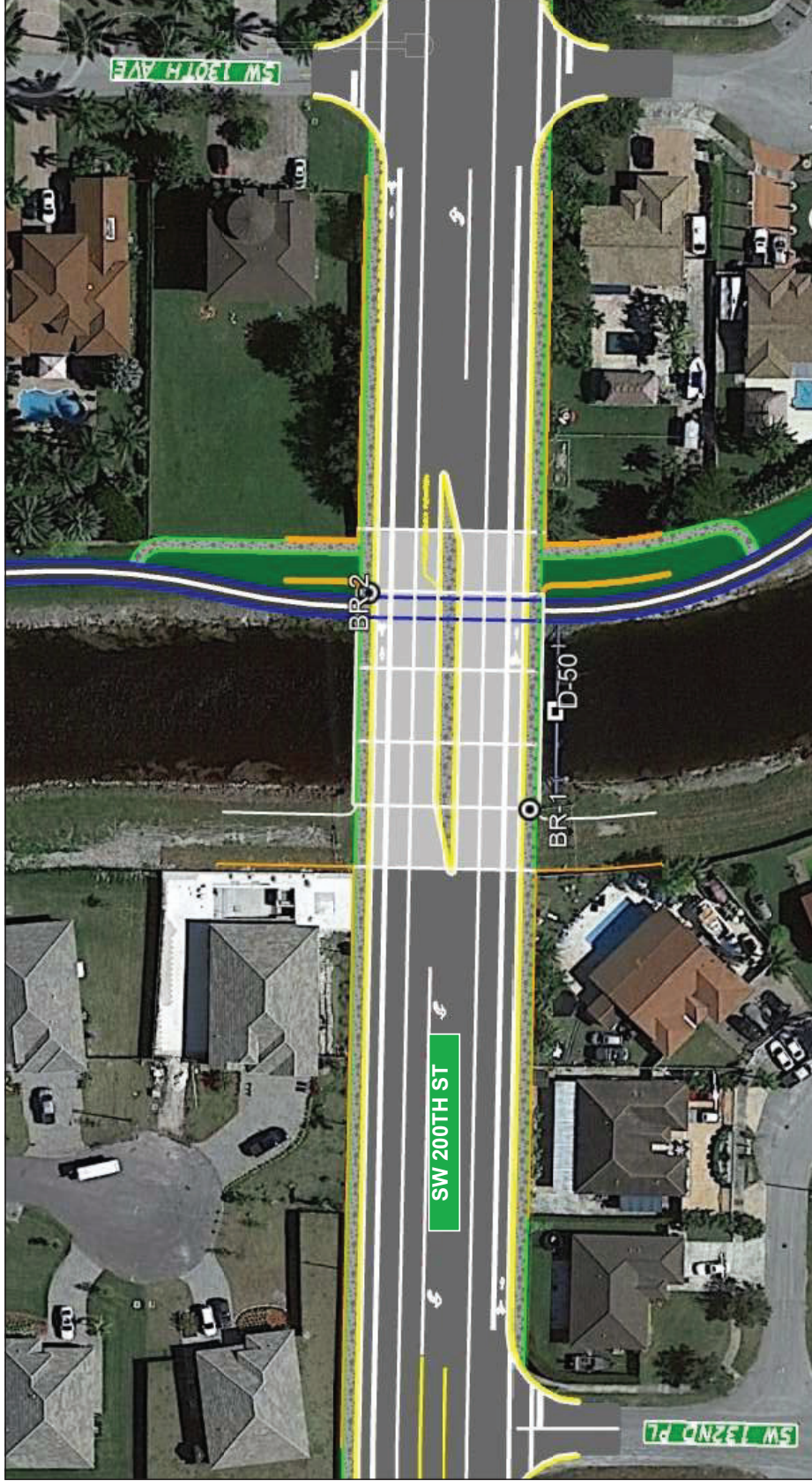
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DRAWN	JM	SCALE	N.T.S.	PROJ. No.	221126
CHECKED	OR	DATE	SEPT., 2021	SHEET 3	

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GEOSOL Project No. 221126

TABLE 1 - SUMMARY OF TEST BORING LOCATIONS

BORING / TEST No.	APPROXIMATE TEST LOCATION (FEET)			GROUND SURFACE ELEVATION (FEET)
	NORTHING	EASTING	LATITUDE	
BR-1	453753	852567	25.580739	N/A
BR-2	453832	852670	25.580956	N/A
D-50	453742	852615	25.580707	N/A

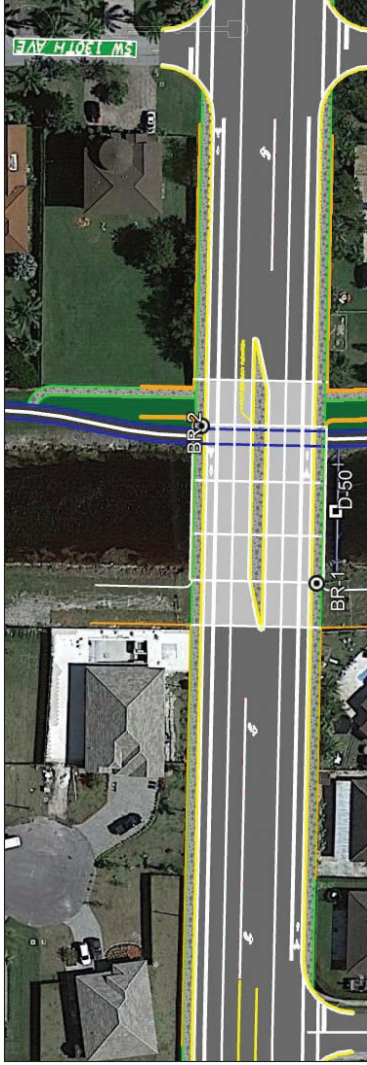


LEGEND

- BR-1: APPROXIMATE SPT BORING LOCATION
- D-50: APPROXIMATE PARTICLE SIZE DISTRIBUTION (D-50) TEST LOCATION

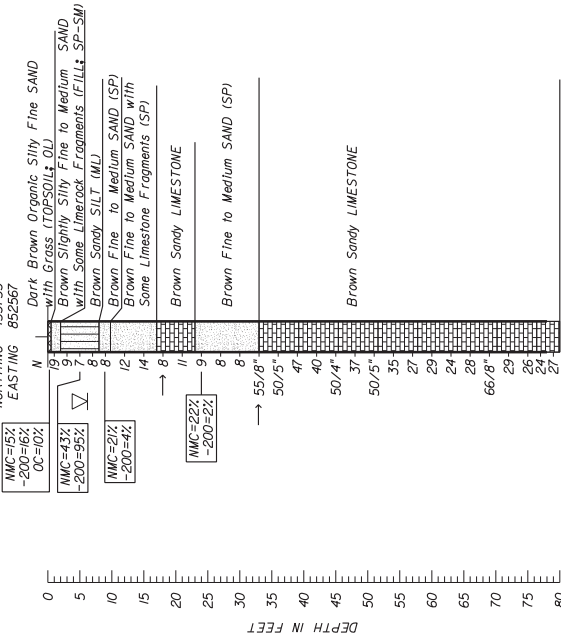
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

ENGINEER OF RECORD GEOSOL, INC. ORACIO RICCIARDINI, P.E., 5735 J. W. WELLS STREET MIAMI LAKES, FL 33094 PHONE: 1305 828-4367		STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD NO. SR 994 COUNTY MIAMI-DADE FINANCIAL PROJECT ID 445804-1-22-01		SHEET TITLE: TEST LOCATION PLANS	
DRAWN BY: E.M. 09-21 CHECKED BY: D.R.R. 09-21 DESIGNED BY: D.R.R. 09-21 CHECKED BY: D.R.R. 09-21		PROJECT NAME: PROJECT DEVELOPMENT AND ENVIRONMENTAL (PDE) STUDY SR 994 / SW 200TH STREET/ADJACENT ROOST DRIVE FROM WEST OF SW 137TH AVENUE TO EAST OF SW 127TH AVENUE		REF. DIM. NO. SHEET NO. 4	



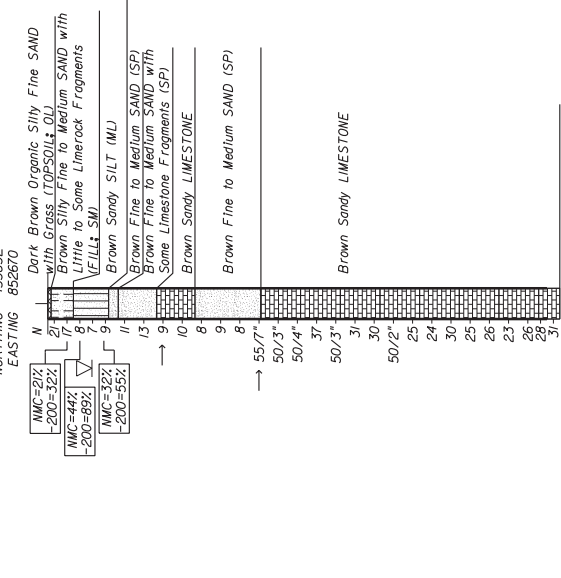
BORING LOCATION PLAN

BOR # BR-1
 DATE 8/24/2021
 DRILLER R.Morales
 RIG B-53
 HAMMER Auto
 LATITUDE 25.580739
 LONGITUDE -80.404145
 NORTHING 453753
 EASTING 852567



Boring Terminated at Depth of 80ft
 Casing Length 78ft

BOR # BR-2
 DATE 8/20/2021
 DRILLER R.Morales
 RIG B-53
 HAMMER Auto
 LATITUDE 25.580956
 LONGITUDE -80.403833
 NORTHING 453832
 EASTING 852670



Boring Terminated at Depth of 80ft
 Casing Length 78ft

LEGEND

- TOPSOIL
- SAND (FILL) SP-SM
- SANDY SAND (FILL) SM
- SAND (SP)
- LIMESTONE
- SANDY SILT (ML)

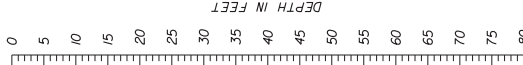
WATER TABLE AT TIME OF DRILLING

- SPT BORING LOCATION
- D50 SAMPLE LOCATION
- CASING USED

NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR PENETRATION UNLESS OTHERWISE NOTED.

- NATURAL MOISTURE CONTENT (%)
- FINES PASSING THE #200 SIEVE (%)
- ORGANIC CONTENT (%)
- PERIODIC TOTAL LOSS OF DRILLING FLUID CIRCULATION (100%)

NOTES:
 1) SPT BORINGS PERFORMED PER ASTM D-1586 WITH A HAMMER WEIGHT OF 140 LBS FALLING 30 INCHES. ENVIRONMENTAL CLASSIFICATION: SUPERFICIER: SLIGHTLY AGGRESSIVE SUBSTRUCTURE: MODERATELY AGGRESSIVE
 WATER: 8.0 SULFATE: 9 CHLORIDE: 56 RESISTIVITY: 1487
 CONSTRUCTION NOTES: THE STRATA ENCOUNTERED WITHIN THE PROJECT THAT OFFER HIGH RESISTANCE TO DRIVING AND EXCAVATION. SPECIAL EQUIPMENT AND BREAKING TOOLS ARE TYPICALLY REQUIRED TO PENETRATE THESE LAYERS. THESE LAYERS ARE ALSO DIFFICULT TO DEWATER DUE TO THEIR HIGH POROSITY AND PERMEABILITY. FOR DRILLED SHAFTS, THESE LAYERS TYPICALLY REQUIRE PREFORMING HOLES TO MINIMIZE TIP ELEVATION TO PREVENT REFUSAL CONDITIONS, STRUCTURAL DAMAGE, OR TO MINIMIZE THE CONTRACTOR IS ADVISED THAT DURING THE EXCAVATION FOR INSTALLATION OF SATURATED SANDY SOILS MAY BE ENCOUNTERED DURING THE EXCAVATION FOR INSTALLATION OF FOUNDATIONS.
 2) THE CONTRACTOR IS ADVISED THAT PERIODIC TOTAL LOSS OF DRILLING FLUID CIRCULATION WHICH MAY MAKE IT DIFFICULT TO MAINTAIN THE FLUID LEVEL IN THE EXCAVATION.



REVISIONS		DESCRIPTION	
BY	DATE	BY	DESCRIPTION

ENGINEER OF RECORD:		STATE OF FLORIDA	
GEOSOL, INC. ORACIO ACCARDINO, P.E. 5725 N. WINDYWAY STREET MIAMI LAKES, FL 33004 PHONE: (305) 828-4367		DEPARTMENT OF TRANSPORTATION	
DRAWN BY: E.M. DP-21		COUNTY: MIAMI-DADE	
CHECKED BY: J. ACCARDINO		ROAD NO.: 994	
DESIGNED BY: E.M. DP-21		FINANCIAL PROJECT ID: 4458004-1-22-01	
CHECKED BY: J. ACCARDINO		PROJECT NAME: PROJECT DEVELOPMENT AND ENVIRONMENTAL (PDE) STUDY SR 994, SW 200TH STREET/QUAL ROOST DRIVE FROM WEST OF SW 137TH AVENUE TO EAST OF SW 127TH AVENUE	
D.R. DP-21		SHEET TITLE: REPORT OF CORE BORINGS	
		REF. Dwg. No.	
		SHEET NO. 5	

APPENDIX “B”

Table 2 – Summary of Laboratory Test Results

Table 3 – Summary of Environmental Classification Test Results

Grain Size Analysis Test Curves

Natural Moisture Content Test Results

Percent Passing the No. 200 Sieve Test Results

Organic Content Test Results

Environmental Classification Test Results

SFWMD Readings at the S-148 Spillway on Canal C-1 at FEC Railroad

Dade County Design Standard WC-2.2: Average October Ground Water Level



TABLE 2 - SUMMARY OF LABORATORY TEST RESULTS
SR 994/ SW 200TH ST/QUAIL ROOST DR FROM W OF SW 137TH AVE TO E OF SW 127TH AVE
MIAMI-DADE COUNTY, FLORIDA
GEOSOL Project No.: 221126

BORING NUMBER	SAMPLE NUMBER	USCS SYMBOL	Sample Depth (FEET)	Sieve Analysis (Percent Passing)								Organic Content (%)	Natural Moisture Content (%)		
				1"	3/4"	3/8"	#4	#10	#40	#60	#100			#200	
BR-1	1	OL	0.0 - 0.5	-	-	-	-	-	-	-	-	-	16	10	15
BR-1	3	ML	4.0 - 6.0	100	100	100	100	100	100	100	100	100	98	95	43
BR-1	5	SP	8.0 - 9.8	100	100	100	100	100	100	95	70	18	4	-	21
BR-1	10	SP	23.0 - 25.0	100	100	100	100	99	88	64	14	2	-	-	22
BR-2	2	SM	2.0 - 4.0	94	87	81	73	66	58	50	40	32	-	-	21
BR-2	3	ML	4.0 - 6.0	100	100	100	100	100	97	95	93	89	-	-	44
BR-2	5	ML	8.0 - 9.5	100	100	100	100	100	93	87	76	55	-	-	32
D-50	1	SM	22.0 - 24.0	85	83	73	62	56	46	40	32	28	-	-	58

TABLE 3 - SUMMARY OF ENVIRONMENTAL CLASSIFICATION TEST RESULTS
SR 994/ SW 200TH ST/QUAIL ROOST DR FROM W OF SW 137TH AVE TO E OF SW 127TH AVE
MIAMI-DADE COUNTY, FLORIDA
GEOSOL Project No.: 221126

Sample Location	Sample Type	Depth (ft)	pH	Resistivity (ohm-cm)	Chloride (ppm)	Sulfate (ppm)	FDOT ENVIRONMENTAL CLASSIFICATION	
							Steel	Concrete
A-15	WATER	7.9	8.0	1,067	56	9	MA	MA

NOTES: (1) The following FDOT laboratory test methods were utilized.

4500H+ (pH)

EPA-300 (Equivalent to FM5-552: Chlorides)

EPA 120.1 (Equivalent to FM5-551: Resistivity)

EPA-300 (Equivalent to FM5-553: Sulfates)

(2) SA: SLIGHTLY AGGRESSIVE

(3) MA: MODERATELY AGGRESSIVE

(4) EA: EXTREMELY AGGRESSIVE

FDOT Criteria for Substructure Environmental Classification (FDOT *Structures Design Guidelines*)

Classification	Environmental Condition	Units	Steel		Concrete	
			Water	Soil	Water	Soil
Extremely Aggressive (If any of these conditions exist)	pH		< 6.0		< 5.0	
	Cl	ppm	> 2000		> 2000	
	SO ₄	ppm	N.A.		> 1500	> 2000
	Resistivity	Ohm-cm	< 1000		< 500	
Slightly Aggressive (If all of these conditions exist)	pH		> 7.0		> 6.0	
	Cl	ppm	< 500		< 500	
	SO ₄	ppm	N.A.		< 150	< 1000
	Resistivity	Ohm-cm	> 5000		> 3000	
Moderately Aggressive	This classification must be used at all sites not meeting requirements for either slightly aggressive or extremely aggressive environments.					
pH = acidity (-log ₁₀ H ⁺ ; potential of Hydrogen), Cl = chloride content, SO ₄ = Sulfate content.						

MOISTURE CONTENT TEST RESULTS (ASTM D-2216)

PROJECT NAME: SR 994/ SW 200TH ST/QUAIL ROOST DR FROM W OF SW 137TH AVE TO
LOCATION: MIAMI-DADE COUNTY, FLORIDA
PROJECT No.: 221126
DATE: 8/30/2021

Boring No.	BR-2	BR-2	BR-2	BR-1
Sample No.	2	3	5	5
Sample Depth (Feet)	2-4	4-6	8-9.5	8-9.8
Tare No.	4M	941	232	4K
Tare plus wet soil (grams)	385.6	338.3	330.8	364.1
Tare plus dry soil (grams)	319.3	237.8	252.9	301.4
Water Ww (grams)	66.3	100.5	77.9	62.7
Tare (grams)	7.7	7.3	7.7	7.6
Dry soil Ws (grams)	311.6	230.5	245.2	293.8
Water Content w (%)	21.3	43.6	31.8	21.3

Boring No.	BR-1	BR-1	BR-1	D-50
Sample No.	3	10	1	1
Sample Depth (Feet)	4-6	23-25	0-0.5	22-24
Tare No.	C-1	B-5	N-2	04
Tare plus wet soil (grams)	316.5	447.2	277.5	528.3
Tare plus dry soil (grams)	223.7	366.5	242.5	336.1
Water Ww (grams)	92.8	80.7	35.0	192.2
Tare (grams)	7.5	7.7	7.5	7.5
Dry soil Ws (grams)	216.2	358.8	235.0	328.6
Water Content w (%)	42.9	22.5	14.9	58.5

MATERIAL PASSING THE # 200 SIEVE TEST RESULTS (AASHTO T-11)

PROJECT NAME: SR 994/ SW 200TH ST/QUAIL ROOST DR FROM W OF SW 137TH AVE TO E OF SW 127TH AVI
LOCATION: MIAMI-DADE COUNTY, FLORIDA
PROJECT No.: 221126
DATE: 8/30/2021

Boring No.	BR-2	BR-2	BR-2	BR-1
Sample No.	2	3	5	5
Sample Depth (Feet)	2-4	4-6	8-9.5	8-9.8
Original Dry Weight of Soil (grams)	311.6	230.5	245.2	293.8
Weight of Soil After Washing (grams)	210.8	24.7	109.5	283.3
Weight of Soil Passing 200 Sieve (grams)	100.8	205.8	135.7	10.5
Percent of Soil Passing 200 Sieve (%)	32.3	89.3	55.3	3.6

Boring No.	BR-1	BR-1	BR-1	D-50
Sample No.	3	10	1	1
Sample Depth (Feet)	4-6	23-25	0-0.5	22-24
Original Dry Weight of Soil (grams)	216.2	358.8	150.0	328.6
Weight of Soil After Washing (grams)	11.8	350.4	126.5	237.2
Weight of Soil Passing 200 Sieve (grams)	204.4	8.4	23.5	91.4
Percent of Soil Passing 200 Sieve (%)	94.5	2.3	15.7	27.8

GRAIN SIZE DATA SHEET

DATE: 8/24/2021

PROJECT NAME: SR 994/ SW 200TH ST/QUAIL ROOST DR FROM W OF SW 137TH AVE TO E OF SW 127TH A
 GEOSOL PROJECT No. 221126
 GENERAL LOCATION: MIAMI-DADE COUNTY, FLORIDA

Boring No. BR-2
 Sample No. 2
 Depth (feet) 2-4

SOIL DESCRIPTION: Brown Silty Fine to Medium SAND with Little to Some Limerock Fragments (FILL; SM)

			Tare #		Dry Soil Wt.	
			4M		311.6	
Sieve Size	Sieve Sizes	Cumulative Wt. Retained	% RETAINED	% PASSING	% PASSING TOTAL SAMPLE	WEIGHT RETAINED (Grams)
75	75mm 3"	0.0	0.0	100	100	0.0
50	50mm 2"	0.0	0.0	100	100	0.0
37.5	37.5mm 1.5"	0.0	0.0	100.0	100.0	0.0
25	25mm 1"	18.1	5.8	94.2	94.2	18.1
19	19mm 3/4"	39.3	12.6	87.4	87.4	21.2
9.5	9.5mm 3/8"	60.6	19.4	80.6	80.6	21.3
4.75	4.75mm #4	83.1	26.7	73.3	73.3	22.5
2.36	2 mm #10	104.5	33.5	66.5	66.5	21.4
0.6	425um #40	129.8	41.7	58.3	58.3	25.3
0.3	250um #60	154.6	49.6	50.4	50.4	24.8
0.15	150um #100	185.5	59.5	40.5	40.5	30.9
0.075	75um #200	210.8	67.7	32.3	32.3	25.3
PAN	-	311.6	100.0	0.0	0.0	100.8

NOTES: Percent passing the #200 sieve was determined by the wash method.

ASTM D 2487 Classification of Soil for Engineering Purposes

Coarse Gravel	< 3" and > 3/4"
Fine Gravel	< 3/4" and > #4

Coarse Sand	< #4 and > #10
Medium Sand	< #10 and > #40
Fine Sand	< #40 and > #200

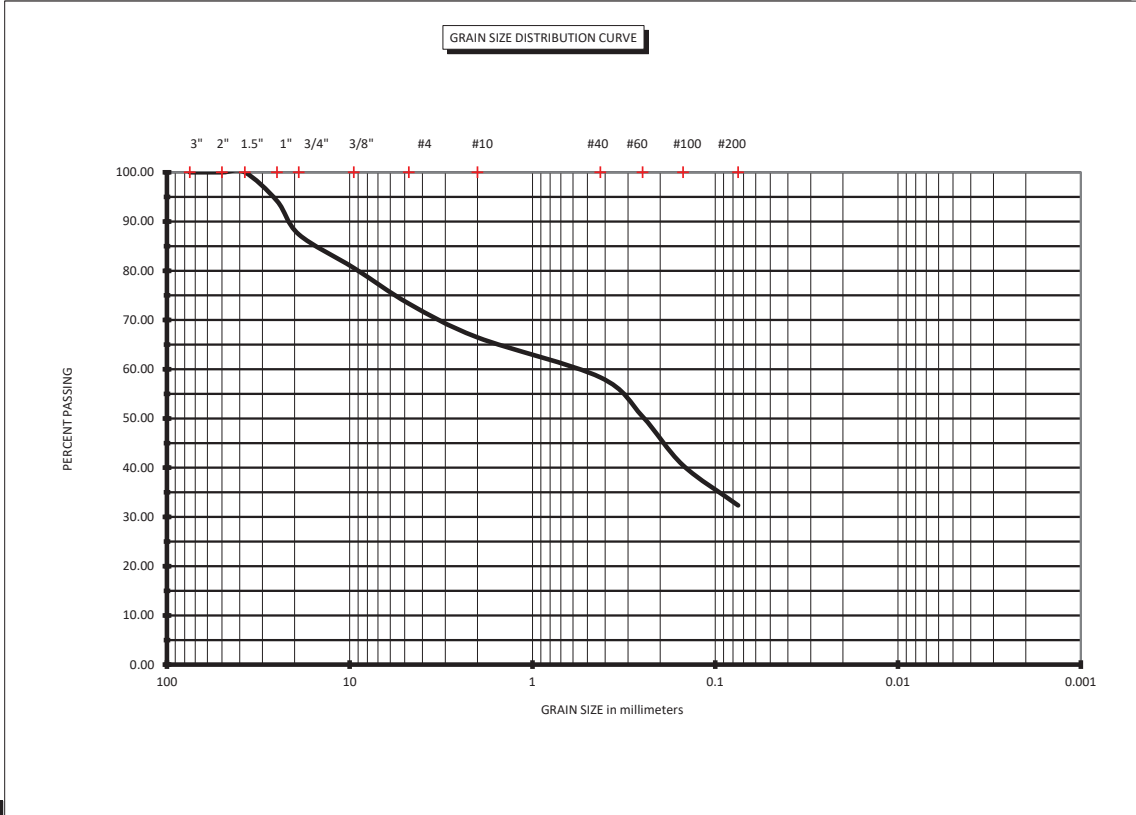
Cu = D60 / D10
 Cc = (D30)² / (D10 x D60)
 1000 um = 1 mm

tested by: E. Masis computed by: S. Zhang checked by: O. Riccobono

GRAIN SIZE DATA SHEET

DATE: 8/24/2021

PROJECT NAME: SR 994/ SW 200TH ST/QUAIL ROOST DR FROM W OF SW 137TH AVE TO E OF SW 127TH AVE
 GEOSOL PROJECT No. 221126
 GENERAL LOCATION: MIAMI-DADE COUNTY, FLORIDA



ASTM D 2487 Classification of Soil for Engineering Purposes		Coarse Sand	< #4 and > #10	Cu = D60 / D10
Coarse Gravel	< 3" and > 3/4"	Medium Sand	< #10 and > #40	Cc = (D30) ² / (D10 x D60)
Fine Gravel	< 3/4" and > #4	Fine Sand	< #40 and > #200	

BORING # BR-2 SAMPLE # 2 Depth (feet) 2-4

SOIL DESCRIPTION: **Brown Silty Fine to Medium SAND with Little to Some Limerock Fragments (FILL; SM)**

Natural Moisture Content: **21.3%**

GRAIN SIZE DATA SHEET

DATE: 8/26/2021

PROJECT NAME: SR 994/ SW 200TH ST/QUAIL ROOST DR FROM W OF SW 137TH AVE TO E OF SW 127TH
 GEOSOL PROJECT No. 221126
 GENERAL LOCATION: MIAMI-DADE COUNTY, FLORIDA

Boring No. BR-2
 Sample No. 3
 Depth (feet) 4-6

SOIL DESCRIPTION: Brown Sandy SILT (ML)

			Tare #		Dry Soil Wt.	
			941		230.5	
Sieve Size	Sieve Sizes	Cumulative Wt. Retained	% RETAINED	% PASSING	% PASSING TOTAL SAMPLE	WEIGHT RETAINED (Grams)
75	75mm 3"	0.0	0.0	100	100	0.0
50	50mm 2"	0.0	0.0	100	100	0.0
37.5	37.5mm 1.5"	0.0	0.0	100.0	100.0	0.0
25	25mm 1"	0.0	0.0	100.0	100.0	0.0
19	19mm 3/4"	0.0	0.0	100.0	100.0	0.0
9.5	9.5mm 3/8"	0.0	0.0	100.0	100.0	0.0
4.75	4.75mm #4	0.0	0.0	100.0	100.0	0.0
2.36	2 mm #10	0.0	0.0	100.0	100.0	0.0
0.6	425um #40	7.0	3.0	97.0	97.0	7.0
0.3	250um #60	11.1	4.8	95.2	95.2	4.1
0.15	150um #100	16.0	6.9	93.1	93.1	4.9
0.075	75um #200	24.7	10.7	89.3	89.3	8.7
PAN	-	230.5	100.0	0.0	0.0	205.8

NOTES: Percent passing the #200 sieve was determined by the wash method.

ASTM D 2487 Classification of Soil for Engineering Purposes

Coarse Gravel	< 3" and > 3/4"
Fine Gravel	< 3/4" and > #4

Coarse Sand	< #4 and > #10
Medium Sand	< #10 and > #40
Fine Sand	< #40 and > #200

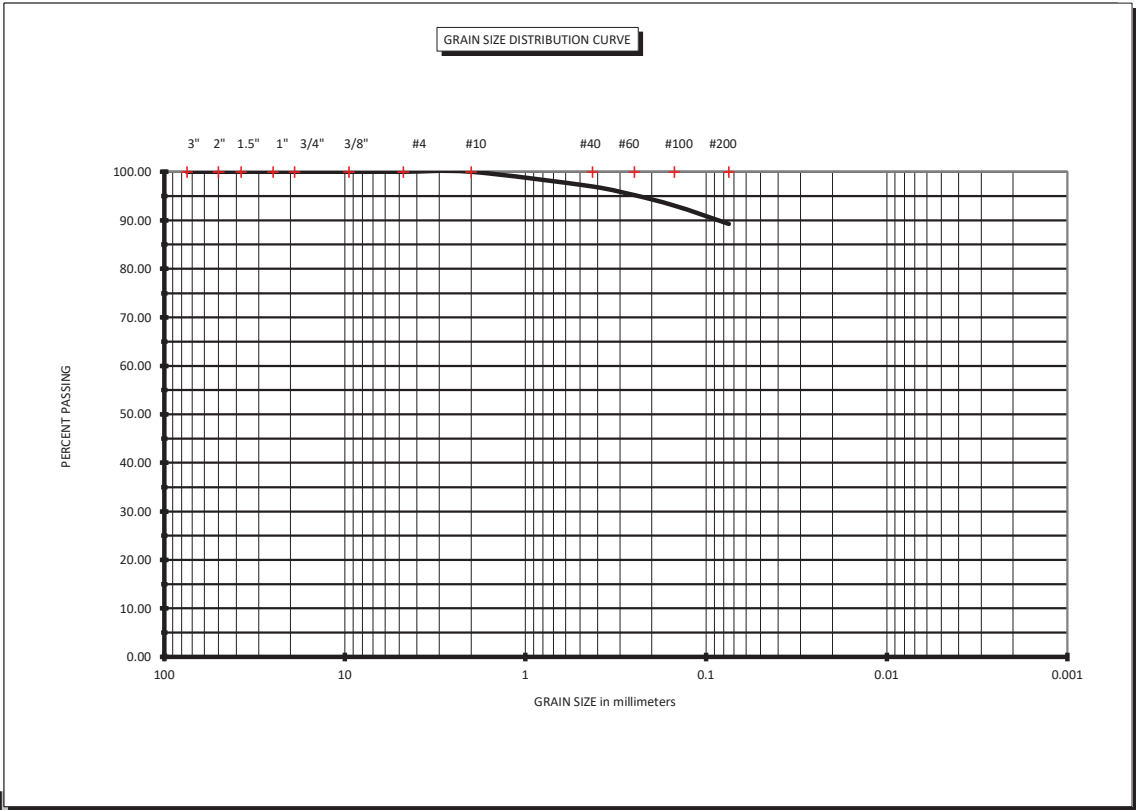
Cu = D60 / D10
 Cc = (D30)² / (D10 x D60)
 1000 um = 1 mm

tested by: E. Masis computed by: S. Zhang checked by: O. Riccobono

GRAIN SIZE DATA SHEET

DATE: 8/26/2021

PROJECT NAME: SR 994/ SW 200TH ST/QUAIL ROOST DR FROM W OF SW 137TH AVE TO E OF SW 127TH AVE
 GEOSOL PROJECT No. 221126
 GENERAL LOCATION: MIAMI-DADE COUNTY, FLORIDA



ASTM D 2487 Classification of Soil for Engineering Purposes		Coarse Sand	< #4 and > #10	Cu = D60 / D10
Coarse Gravel	< 3" and > 3/4"	Medium Sand	< #10 and > #40	Cc = (D30)^2 / (D10 x D60)
Fine Gravel	< 3/4" and > #4	Fine Sand	< #40 and > #200	

BORING # BR-2 SAMPLE # 3 Depth (feet) 4-6

SOIL DESCRIPTION: Brown Sandy SILT (ML)

Natural Moisture Content: 43.6%

GRAIN SIZE DATA SHEET

DATE: 8/26/2021

PROJECT NAME: SR 994/ SW 200TH ST/QUAIL ROOST DR FROM W OF SW 137TH AVE TO E OF SW 127TH
 GEOSOL PROJECT No. 221126
 GENERAL LOCATION: MIAMI-DADE COUNTY, FLORIDA

Boring No. BR-2
 Sample No. 5
 Depth (feet) 8-9.5

SOIL DESCRIPTION: Brown Sandy SILT with Roots (ML)

			Tare #		Dry Soil Wt.	
			232		245.2	
Sieve Size	Sieve Sizes	Cumulative Wt. Retained	% RETAINED	% PASSING	% PASSING TOTAL SAMPLE	WEIGHT RETAINED (Grams)
75	75mm 3"	0.0	0.0	100	100	0.0
50	50mm 2"	0.0	0.0	100	100	0.0
37.5	37.5mm 1.5"	0.0	0.0	100.0	100.0	0.0
25	25mm 1"	0.0	0.0	100.0	100.0	0.0
19	19mm 3/4"	0.0	0.0	100.0	100.0	0.0
9.5	9.5mm 3/8"	0.0	0.0	100.0	100.0	0.0
4.75	4.75mm #4	0.0	0.0	100.0	100.0	0.0
2.36	2 mm #10	0.0	0.0	100.0	100.0	0.0
0.6	425um #40	18.0	7.3	92.7	92.7	18.0
0.3	250um #60	32.8	13.4	86.6	86.6	14.8
0.15	150um #100	58.7	23.9	76.1	76.1	25.9
0.075	75um #200	109.5	44.7	55.3	55.3	50.8
PAN	-	245.2	100.0	0.0	0.0	135.7

NOTES: Percent passing the #200 sieve was determined by the wash method.

ASTM D 2487 Classification of Soil for Engineering Purposes

Coarse Gravel	< 3" and > 3/4"
Fine Gravel	< 3/4" and > #4

Coarse Sand	< #4 and > #10
Medium Sand	< #10 and > #40
Fine Sand	< #40 and > #200

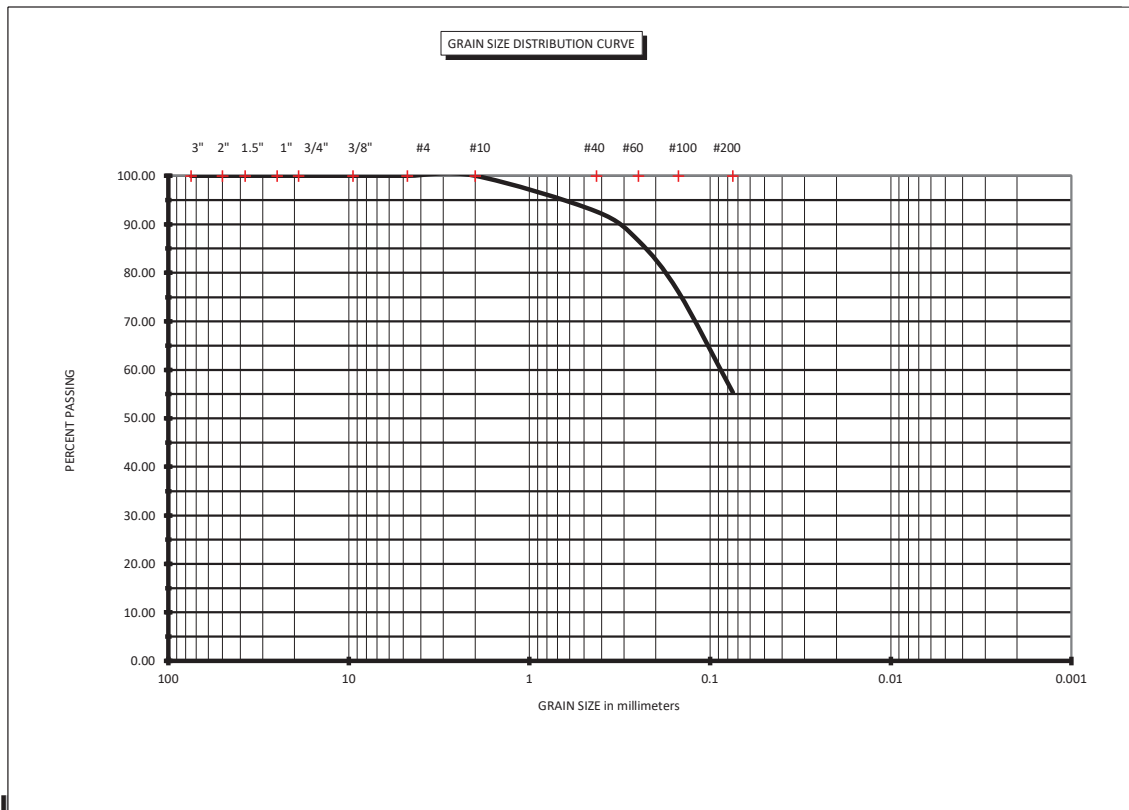
Cu = D60 / D10
 Cc = (D30)² / (D10 x D60)
 1000 um = 1 mm

tested by: E. Masis computed by: S. Zhang checked by: O. Riccobono

GRAIN SIZE DATA SHEET

DATE: 8/26/2021

PROJECT NAME: SR 994/ SW 200TH ST/QUAIL ROOST DR FROM W OF SW 137TH AVE TO E OF SW 127TH AVE
GEOSOL PROJECT No. 221126
GENERAL LOCATION: MIAMI-DADE COUNTY, FLORIDA



ASTM D 2487 Classification of Soil for Engineering Purposes		Coarse Sand	< #4 and > #10	$C_u = D_{60} / D_{10}$
Coarse Gravel	< 3" and > 3/4"	Medium Sand	< #10 and > #40	$C_c = (D_{30})^2 / (D_{10} \times D_{60})$
Fine Gravel	< 3/4" and > #4	Fine Sand	< #40 and > #200	

BORING # BR-2 **SAMPLE #** 5 **Depth (feet)** 8-9.5

SOIL DESCRIPTION: Brown Sandy SILT with Roots (ML)

Natural Moisture Content: 31.8%

GRAIN SIZE DATA SHEET

DATE: 8/30/2021

PROJECT NAME: SR 994/ SW 200TH ST/QUAIL ROOST DR FROM W OF SW 137TH AVE TO E OF SW 127TH
 GEOSOL PROJECT No. 221126
 GENERAL LOCATION: MIAMI-DADE COUNTY, FLORIDA

Boring No. BR-1
 Sample No. 5
 Depth (feet) 8-9.8

SOIL DESCRIPTION: Brown Fine to Medium SAND (SP)

			Tare #		Dry Soil Wt.	
			4K		293.8	
Sieve Size	Sieve Sizes	Cumulative Wt. Retained	% RETAINED	% PASSING	% PASSING TOTAL SAMPLE	WEIGHT RETAINED (Grams)
75	75mm 3"	0.0	0.0	100	100	0.0
50	50mm 2"	0.0	0.0	100	100	0.0
37.5	37.5mm 1.5"	0.0	0.0	100.0	100.0	0.0
25	25mm 1"	0.0	0.0	100.0	100.0	0.0
19	19mm 3/4"	0.0	0.0	100.0	100.0	0.0
9.5	9.5mm 3/8"	0.0	0.0	100.0	100.0	0.0
4.75	4.75mm #4	0.0	0.0	100.0	100.0	0.0
2.36	2 mm #10	0.0	0.0	100.0	100.0	0.0
0.6	425um #40	14.0	4.8	95.2	95.2	14.0
0.3	250um #60	87.7	29.9	70.1	70.1	73.7
0.15	150um #100	239.9	81.7	18.3	18.3	152.2
0.075	75um #200	283.3	96.4	3.6	3.6	43.4
PAN	-	293.8	100.0	0.0	0.0	10.5

NOTES: Percent passing the #200 sieve was determined by the wash method.

ASTM D 2487 Classification of Soil for Engineering Purposes

Coarse Gravel	< 3" and > 3/4"
Fine Gravel	< 3/4" and > #4

Coarse Sand	< #4 and > #10
Medium Sand	< #10 and > #40
Fine Sand	< #40 and > #200

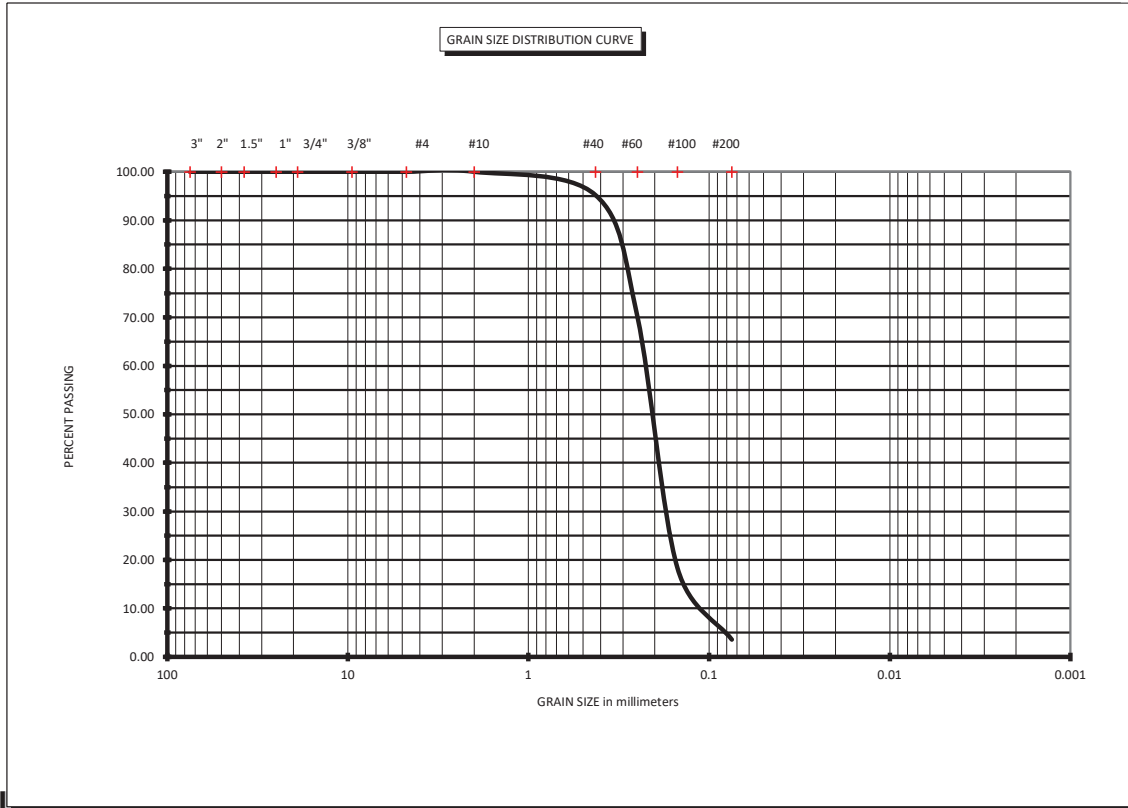
Cu = D60 / D10
 Cc = (D30)² / (D10 x D60)
 1000 um = 1 mm

tested by: J. Manolakis computed by: S. Zhang checked by: O. Riccobono

GRAIN SIZE DATA SHEET

DATE: 8/30/2021

PROJECT NAME: SR 994/ SW 200TH ST/QUAIL ROOST DR FROM W OF SW 137TH AVE TO E OF SW 127TH AVE
GEOSOL PROJECT No. 221126
GENERAL LOCATION: MIAMI-DADE COUNTY, FLORIDA



ASTM D 2487 Classification of Soil for Engineering Purposes		Coarse Sand	< #4 and > #10	$C_u = D_{60} / D_{10}$
Coarse Gravel	< 3" and > 3/4"	Medium Sand	< #10 and > #40	$C_c = (D_{30})^2 / (D_{10} \times D_{60})$
Fine Gravel	< 3/4" and > #4	Fine Sand	< #40 and > #200	

BORING # BR-1 **SAMPLE #** 5 **Depth (feet)** 8-9.8

SOIL DESCRIPTION: Brown Fine to Medium SAND (SP)

Natural Moisture Content: 21.3%

GRAIN SIZE DATA SHEET

DATE: 8/30/2021

PROJECT NAME: SR 994/ SW 200TH ST/QUAIL ROOST DR FROM W OF SW 137TH AVE TO E OF SW 127TH
 GEOSOL PROJECT No. 221126
 GENERAL LOCATION: MIAMI-DADE COUNTY, FLORIDA

Boring No. BR-1
 Sample No. 3
 Depth (feet) 4-6

SOIL DESCRIPTION: Brown Sandy SILT (ML)

			Tare #		Dry Soil Wt.	
			C-1		216.2	
Sieve Size	Sieve Sizes	Cumulative Wt. Retained	% RETAINED	% PASSING	% PASSING TOTAL SAMPLE	WEIGHT RETAINED (Grams)
75	75mm 3"	0.0	0.0	100	100	0.0
50	50mm 2"	0.0	0.0	100	100	0.0
37.5	37.5mm 1.5"	0.0	0.0	100.0	100.0	0.0
25	25mm 1"	0.0	0.0	100.0	100.0	0.0
19	19mm 3/4"	0.0	0.0	100.0	100.0	0.0
9.5	9.5mm 3/8"	0.0	0.0	100.0	100.0	0.0
4.75	4.75mm #4	0.0	0.0	100.0	100.0	0.0
2.36	2 mm #10	0.0	0.0	100.0	100.0	0.0
0.6	425um #40	0.0	0.0	100.0	100.0	0.0
0.3	250um #60	0.8	0.4	99.6	99.6	0.8
0.15	150um #100	3.4	1.6	98.4	98.4	2.6
0.075	75um #200	11.8	5.5	94.5	94.5	8.4
PAN	-	216.2	100.0	0.0	0.0	204.4

NOTES: Percent passing the #200 sieve was determined by the wash method.

ASTM D 2487 Classification of Soil for Engineering Purposes

Coarse Gravel	< 3" and > 3/4"
Fine Gravel	< 3/4" and > #4

Coarse Sand	< #4 and > #10
Medium Sand	< #10 and > #40
Fine Sand	< #40 and > #200

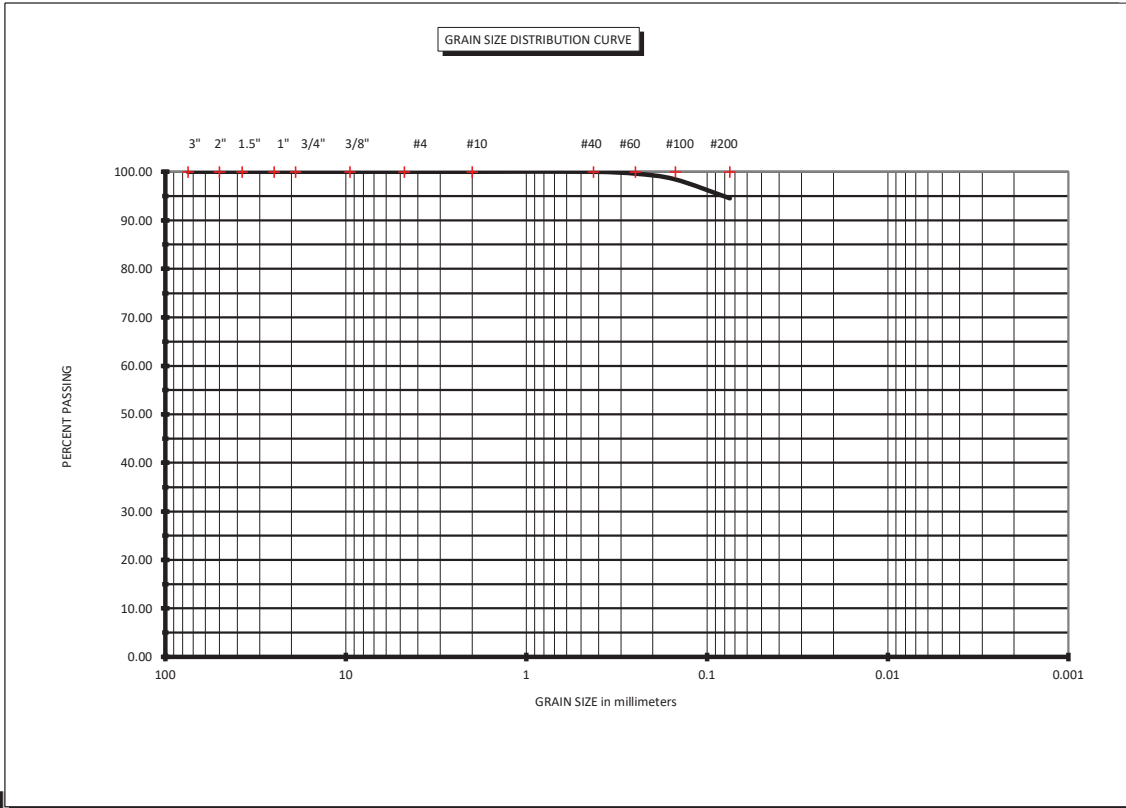
Cu = D60 / D10
 Cc = (D30)² / (D10 x D60)
 1000 um = 1 mm

tested by: J. Manolakis computed by: S. Zhang checked by: O. Riccobono

GRAIN SIZE DATA SHEET

DATE: 8/30/2021

PROJECT NAME: SR 994/ SW 200TH ST/QUAIL ROOST DR FROM W OF SW 137TH AVE TO E OF SW 127TH AVE
 GEOSOL PROJECT No. 221126
 GENERAL LOCATION: MIAMI-DADE COUNTY, FLORIDA



ASTM D 2487 Classification of Soil for Engineering Purposes		Coarse Sand	< #4 and > #10	Cu = D60 / D10
Coarse Gravel	< 3" and > 3/4"	Medium Sand	< #10 and > #40	Cc = (D30)^2 / (D10 x D60)
Fine Gravel	< 3/4" and > #4	Fine Sand	< #40 and > #200	

BORING # BR-1 SAMPLE # 3 Depth (feet) 4-6

SOIL DESCRIPTION: Brown Sandy SILT (ML)

Natural Moisture Content: 42.9%

GRAIN SIZE DATA SHEET

DATE: 8/30/2021

PROJECT NAME: SR 994/ SW 200TH ST/QUAIL ROOST DR FROM W OF SW 137TH AVE TO E OF SW 127TH
 GEOSOL PROJECT No. 221126
 GENERAL LOCATION: MIAMI-DADE COUNTY, FLORIDA

Boring No. BR-1
 Sample No. 10
 Depth (feet) 23-25

SOIL DESCRIPTION: Brown Fine to Medium SAND (SP)

			Tare #		Dry Soil Wt.	
			B-5		358.8	
Sieve Size	Sieve Sizes	Cumulative Wt. Retained	% RETAINED	% PASSING	% PASSING TOTAL SAMPLE	WEIGHT RETAINED (Grams)
75	75mm 3"	0.0	0.0	100	100	0.0
50	50mm 2"	0.0	0.0	100	100	0.0
37.5	37.5mm 1.5"	0.0	0.0	100.0	100.0	0.0
25	25mm 1"	0.0	0.0	100.0	100.0	0.0
19	19mm 3/4"	0.0	0.0	100.0	100.0	0.0
9.5	9.5mm 3/8"	0.0	0.0	100.0	100.0	0.0
4.75	4.75mm #4	0.0	0.0	100.0	100.0	0.0
2.36	2 mm #10	1.9	0.5	99.5	99.5	1.9
0.6	425um #40	43.1	12.0	88.0	88.0	41.2
0.3	250um #60	128.3	35.8	64.2	64.2	85.2
0.15	150um #100	309.3	86.2	13.8	13.8	181.0
0.075	75um #200	350.4	97.7	2.3	2.3	41.1
PAN	-	358.8	100.0	0.0	0.0	8.4

NOTES: Percent passing the #200 sieve was determined by the wash method.

ASTM D 2487 Classification of Soil for Engineering Purposes

Coarse Gravel	< 3" and > 3/4"
Fine Gravel	< 3/4" and > #4

Coarse Sand	< #4 and > #10
Medium Sand	< #10 and > #40
Fine Sand	< #40 and > #200

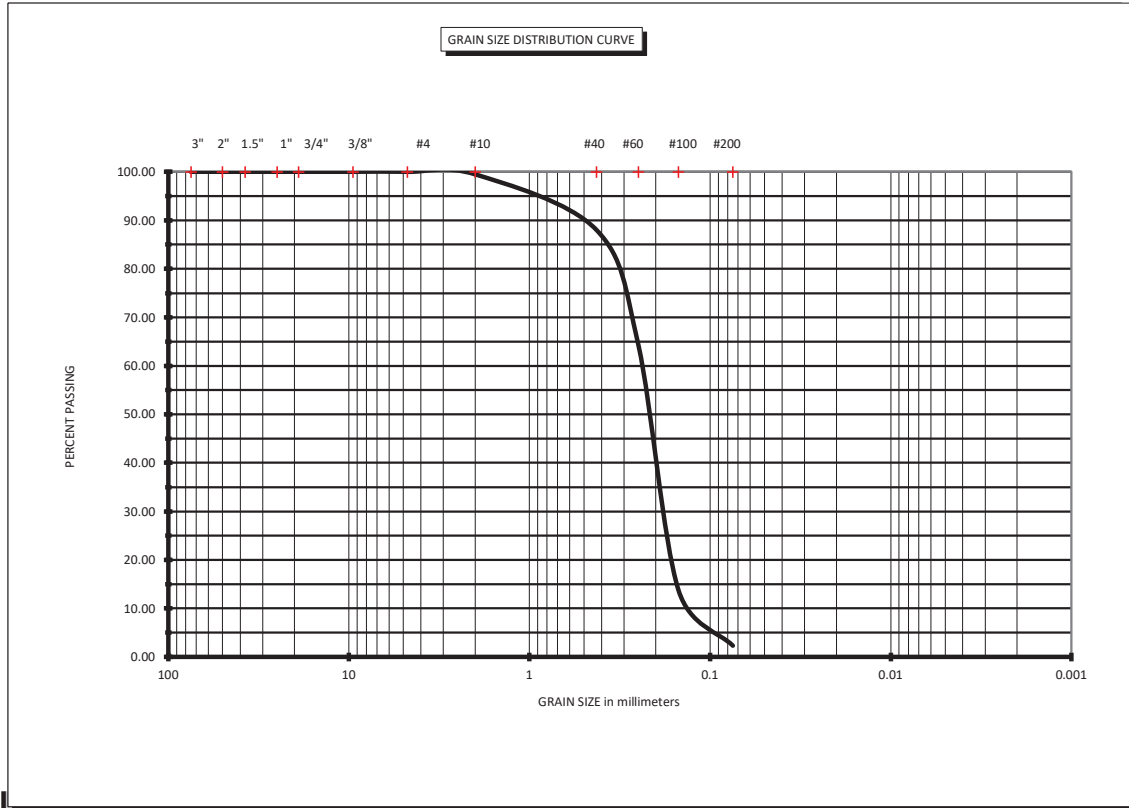
Cu = D60 / D10
 Cc = (D30)² / (D10 x D60)
 1000 um = 1 mm

tested by: J. Manolakis computed by: S. Zhang checked by: O. Riccobono

GRAIN SIZE DATA SHEET

DATE: 8/30/2021

PROJECT NAME: SR 994/ SW 200TH ST/QUAIL ROOST DR FROM W OF SW 137TH AVE TO E OF SW 127TH AVE
 GEOSOL PROJECT No. 221126
 GENERAL LOCATION: MIAMI-DADE COUNTY, FLORIDA



ASTM D 2487 Classification of Soil for Engineering Purposes		Coarse Sand	< #4 and > #10	Cu = D60 / D10
Coarse Gravel	< 3" and > 3/4"	Medium Sand	< #10 and > #40	Cc = (D30)^2 / (D10 x D60)
Fine Gravel	< 3/4" and > #4	Fine Sand	< #40 and > #200	

BORING # BR-1 SAMPLE # 10 Depth (feet) 23-25

SOIL DESCRIPTION: Brown Fine to Medium SAND (SP)

Natural Moisture Content: 22.5%

GRAIN SIZE DATA SHEET

DATE: 8/23/2021

PROJECT NAME: Proposed Quail Roost Drive PDE_GANNETT FLEMING
 GEOSOL PROJECT No. 221126
 GENERAL LOCATION: MIAMI-DADE COUNTY, FLORIDA

Boring No. D-50
 Sample No. 1
 Depth (feet) 22-24

SOIL DESCRIPTION: Brown Silty Fine to Medium SAND with Some Limestone Fragments (SM)

			Tare #		Dry Soil Wt.	
			04		328.6	
Sieve Size	Sieve Sizes	Cumulative Wt. Retained	% RETAINED	% PASSING	% PASSING TOTAL SAMPLE	WEIGHT RETAINED (Grams)
75	75mm 3"	0.0	0.0	100	100	0.0
50	50mm 2"	0.0	0.0	100	100	0.0
37.5	37.5mm 1.5"	0.0	0.0	100.0	100.0	0.0
25	25mm 1"	50.0	15.2	84.8	84.8	50.0
19	19mm 3/4"	56.5	17.2	82.8	82.8	6.5
9.5	9.5mm 3/8"	87.8	26.7	73.3	73.3	31.3
4.75	4.75mm #4	123.9	37.7	62.3	62.3	36.1
2.36	2 mm #10	145.4	44.2	55.8	55.8	21.5
0.6	425um #40	176.0	53.6	46.4	46.4	30.6
0.3	250um #60	197.4	60.1	39.9	39.9	21.4
0.15	150um #100	222.3	67.7	32.3	32.3	24.9
0.075	75um #200	237.2	72.2	27.8	27.8	14.9
PAN	-	328.6	100.0	0.0	0.0	91.4

NOTES: Percent passing the #200 sieve was determined by the wash method.

ASTM D 2487 Classification of Soil for Engineering Purposes

Coarse Gravel	< 3" and > 3/4"
Fine Gravel	< 3/4" and > #4

Coarse Sand	< #4 and > #10
Medium Sand	< #10 and > #40
Fine Sand	< #40 and > #200

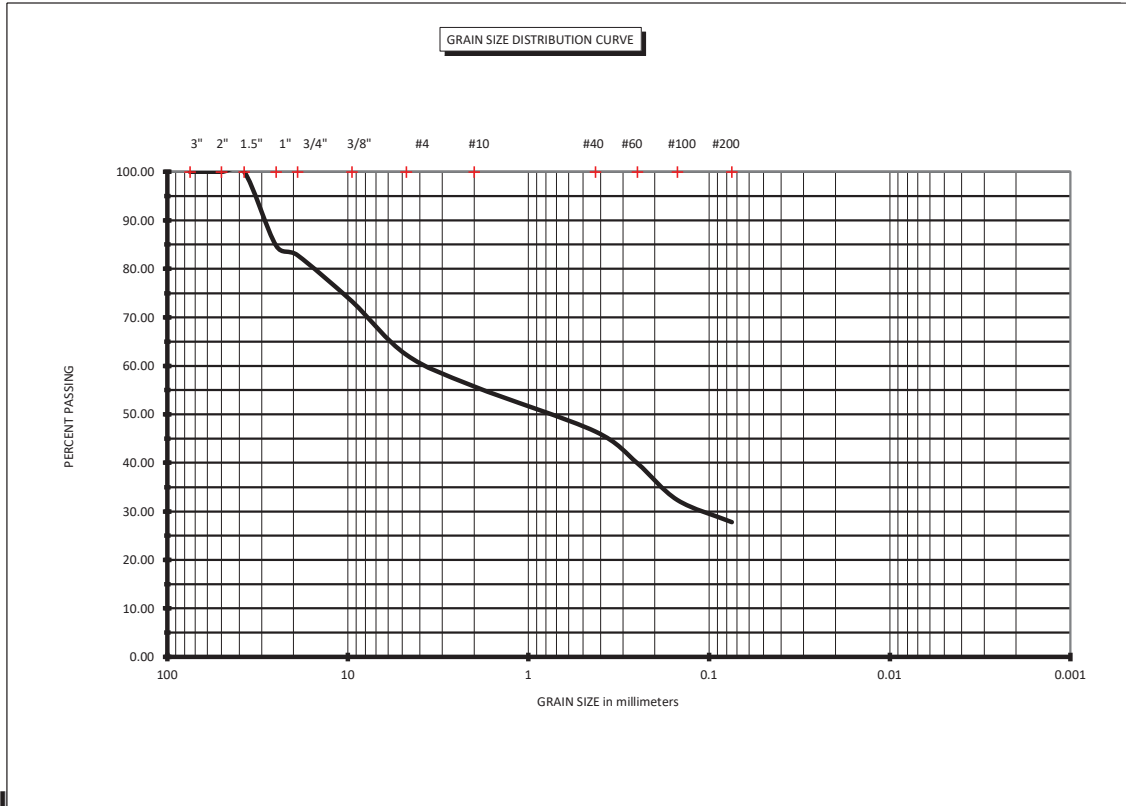
Cu = D60 / D10
 Cc = (D30)^2 / (D10 x D60)
 1000 um = 1 mm

tested by: J. Manolakis computed by: S. Zhang checked by: O. Riccobono

GRAIN SIZE DATA SHEET

DATE: 8/23/2021

PROJECT NAME: Proposed Quail Roost Drive PDE_GANNETT FLEMING
GEOSOL PROJECT No. 221126
GENERAL LOCATION: MIAMI-DADE COUNTY, FLORIDA



ASTM D 2487 Classification of Soil for Engineering Purposes		Coarse Sand	< #4 and > #10	Cu = D60 / D10
Coarse Gravel	< 3" and > 3/4"	Medium Sand	< #10 and > #40	Cc = (D30)^2 / (D10 x D60)
Fine Gravel	< 3/4" and > #4	Fine Sand	< #40 and > #200	

BORING # D-50 **SAMPLE #** 1 **Depth (feet)** 22-24

SOIL DESCRIPTION: Brown Silty Fine to Medium SAND with Some Limestone Fragments (SM)

Natural Moisture Content: 58.5%

ORGANIC CONTENT TEST RESULTS (ASTM D-2974)

PROJECT NAME: SR 994/ SW 200TH ST/QUAIL ROOST DR FROM W OF SW 137TH AVE TO E OF SW 127TH /
LOCATION: MIAMI-DADE COUNTY, FLORIDA
PROJECT No.: 221126
DATE: 8/30/2021

Boring No.	BR-1
Sample No.	1
Sample Depth (Feet)	0-0.5
Crucible No.	O8
Weight of Crucible and Oven-Dried Sample (grams)	77.0
Weight of Crucible and Sample after Ignition (grams)	72.5
Weight of Crucible (grams)	34.0
Weight of Oven-Dried Soil (grams)	43.0
Weight Loss due to Ignition (grams)	4.5
Percent Organics (%)	10.5

ANALYTICAL RESULTS

Project: Proposed Quail Roost Drive PDE
Pace Project No.: 35659013

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Sample: A-15									
Lab ID: 35659013001									
Collected: 08/26/21 17:00 Received: 08/27/21 16:40 Matrix: Water									
4500H+ pH, Electrometric									
Analytical Method: SM 4500-H+B									
Pace Analytical Services - Ormond Beach									
pH at 25 Degrees C	8.0	Std. Units	0.10	0.10	1		09/08/21 16:26		Q
Resistivity									
Analytical Method: EPA 120.1 Resistivity									
Pace Analytical Services - Ormond Beach									
Resistivity	1067	ohms-cm	0.50	0.50	1		09/02/21 15:38		N2
300.0 IC Anions 28 Days									
Analytical Method: EPA 300.0									
Pace Analytical Services - Ormond Beach									
Chloride	55.9	mg/L	5.0	2.5	1		08/29/21 11:56	16887-00-6	
Sulfate	9.2	mg/L	5.0	2.5	1		08/29/21 11:56	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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DBHYDRO | reports

DBKEY STATION TYPE UNITS FQ STAT STRATA OPNUM RCDR AGENCY START END CNTY LAT LONG SEC TWP RNG ALTERNATE ID
 16188 S148_H STG ft NGVD29 DA MEAN 0 TELE WMD 1995 2021 DAD 253412 802259 12 56 39 S148-H

Period of Record Statistical Summary by Year Month For DBKEY 16188
 For Period 19950331 to 20210915

DBKEY	Station	Data Type	Year	Month	Sample Size	Minimum	Mean	Maximum	Median	Std. Dev.
16188	S148_H	STG	1995	04	27	4.279	4.445	4.667	4.451	.11
16188	S148_H	STG	1995	05	31	3.824	4.374	4.725	4.502	.27
16188	S148_H	STG	1995	06	30	2.355	4.131	5.258	4.587	1.02
16188	S148_H	STG	1995	07	31	2.307	2.784	3.293	2.712	.33
16188	S148_H	STG	1995	08	31	1.915	2.392	2.847	2.421	.27
16188	S148_H	STG	1995	09	30	1.989	2.317	2.605	2.308	.16
16188	S148_H	STG	1995	10	31	2.257	2.641	3.359	2.599	.31
16188	S148_H	STG	1995	11	30	1.936	3.801	5.100	4.883	1.41
16188	S148_H	STG	1995	12	31	4.854	4.938	5.046	4.928	.05
16188	S148_H	STG	1996	01	31	4.071	4.744	5.014	4.824	.28
16188	S148_H	STG	1996	02	29	3.634	4.143	4.547	4.216	.34
16188	S148_H	STG	1996	03	31	3.254	3.473	3.621	3.505	.12
16188	S148_H	STG	1996	04	30	3.198	3.440	3.668	3.440	.15
16188	S148_H	STG	1996	05	31	3.337	3.800	4.956	3.649	.47
16188	S148_H	STG	1996	06	30	3.805	4.385	5.114	4.256	.40
16188	S148_H	STG	1996	07	31	4.162	4.815	5.139	4.859	.28
16188	S148_H	STG	1996	08	31	3.780	4.783	5.082	4.876	.28
16188	S148_H	STG	1996	09	30	3.814	4.671	5.149	4.667	.31
16188	S148_H	STG	1996	10	31	2.225	3.055	4.922	2.777	.90
16188	S148_H	STG	1996	11	30	2.337	3.972	4.810	4.602	1.00
16188	S148_H	STG	1996	12	31	3.608	3.820	4.639	3.757	.23
16188	S148_H	STG	1997	01	31	3.454	3.569	3.725	3.557	.07
16188	S148_H	STG	1997	02	28	3.374	3.542	3.803	3.480	.14
16188	S148_H	STG	1997	03	31	3.196	3.369	3.491	3.389	.07
16188	S148_H	STG	1997	04	30	3.297	3.572	4.668	3.424	.42
16188	S148_H	STG	1997	05	31	3.999	4.188	4.593	4.166	.15
16188	S148_H	STG	1997	06	30	1.670	3.088	4.642	2.676	.94
16188	S148_H	STG	1997	07	31	2.638	4.335	5.078	4.793	.82
16188	S148_H	STG	1997	08	31	3.732	4.735	5.147	4.858	.41
16188	S148_H	STG	1997	09	30	2.439	3.293	4.887	3.031	.77
16188	S148_H	STG	1997	10	31	2.298	4.365	4.955	4.778	.93
16188	S148_H	STG	1997	11	30	3.863	4.207	4.539	4.236	.23
16188	S148_H	STG	1997	12	31	2.541	4.178	4.760	4.508	.66
16188	S148_H	STG	1998	01	31	4.077	4.402	4.707	4.457	.21
16188	S148_H	STG	1998	02	28	3.159	3.405	4.140	3.333	.26
16188	S148_H	STG	1998	03	31	3.141	3.409	3.778	3.393	.15
16188	S148_H	STG	1998	04	30	3.119	3.471	3.669	3.515	.15
16188	S148_H	STG	1998	05	31	3.329	3.565	4.034	3.497	.17
16188	S148_H	STG	1998	06	30	3.531	3.775	4.175	3.761	.17
16188	S148_H	STG	1998	07	31	3.162	4.236	4.939	4.325	.42
16188	S148_H	STG	1998	08	31	3.317	4.443	5.130	4.420	.56
16188	S148_H	STG	1998	09	30	2.737	4.186	5.118	4.508	.94
16188	S148_H	STG	1998	10	31	2.712	4.495	5.149	5.032	.98
16188	S148_H	STG	1998	11	30	3.850	4.915	5.145	4.976	.28
16188	S148_H	STG	1998	12	31	4.931	5.079	5.133	5.094	.05
16188	S148_H	STG	1999	01	31	4.790	5.004	5.148	5.019	.11
16188	S148_H	STG	1999	02	28	4.725	4.955	5.123	4.989	.12
16188	S148_H	STG	1999	03	31	4.392	4.553	4.724	4.546	.09
16188	S148_H	STG	1999	04	30	3.977	4.214	4.459	4.168	.15
16188	S148_H	STG	1999	05	31	3.967	4.281	4.765	4.195	.26
16188	S148_H	STG	1999	06	30	4.158	4.694	5.061	4.737	.24
16188	S148_H	STG	1999	07	31	3.236	4.598	4.976	4.788	.51
16188	S148_H	STG	1999	08	31	2.910	4.499	5.002	4.560	.38
16188	S148_H	STG	1999	09	30	2.289	4.048	5.133	4.480	.88
16188	S148_H	STG	1999	10	31	2.117	2.983	4.941	2.383	1.01
16188	S148_H	STG	1999	11	30	1.977	3.519	5.059	3.730	1.42
16188	S148_H	STG	1999	12	31	4.945	5.025	5.078	5.033	.03
16188	S148_H	STG	2000	01	31	4.667	4.846	4.975	4.875	.10
16188	S148_H	STG	2000	02	29	4.774	4.969	5.128	4.970	.12
16188	S148_H	STG	2000	03	31	4.018	4.828	5.125	4.917	.30
16188	S148_H	STG	2000	04	30	3.701	4.520	5.207	4.992	.65
16188	S148_H	STG	2000	05	31	3.589	4.256	5.005	4.072	.58
16188	S148_H	STG	2000	06	30	3.616	4.555	5.028	4.805	.51
16188	S148_H	STG	2000	07	31	4.711	5.022	5.224	5.019	.14
16188	S148_H	STG	2000	08	31	2.410	4.419	5.106	4.864	.89
16188	S148_H	STG	2000	09	30	2.524	4.854	5.208	5.033	.59
16188	S148_H	STG	2000	10	31	2.343	4.097	5.204	4.681	1.10
16188	S148_H	STG	2000	11	30	3.855	4.552	5.169	4.611	.54
16188	S148_H	STG	2000	12	31	3.720	4.176	4.966	3.991	.43
16188	S148_H	STG	2001	01	31	3.366	3.843	4.951	3.771	.39
16188	S148_H	STG	2001	02	28	2.810	3.070	3.335	3.068	.17
16188	S148_H	STG	2001	03	31	2.731	2.848	3.086	2.851	.07
16188	S148_H	STG	2001	04	30	2.674	3.085	3.492	3.111	.29
16188	S148_H	STG	2001	05	31	2.689	3.218	3.596	3.264	.24
16188	S148_H	STG	2001	06	30	3.277	3.532	4.168	3.514	.21
16188	S148_H	STG	2001	07	31	3.927	4.499	5.078	4.605	.39
16188	S148_H	STG	2001	08	31	3.192	4.022	4.863	3.958	.35
16188	S148_H	STG	2001	09	30	2.214	4.073	5.106	4.027	.89
16188	S148_H	STG	2001	10	31	2.014	3.856	5.153	4.354	1.26
16188	S148_H	STG	2001	11	30	2.321	4.653	5.144	5.059	.94
16188	S148_H	STG	2001	12	31	4.819	4.988	5.167	5.015	.10
16188	S148_H	STG	2002	01	31	3.972	4.762	5.107	4.784	.22
16188	S148_H	STG	2002	02	28	3.737	4.292	4.870	4.478	.42
16188	S148_H	STG	2002	03	31	3.933	4.125	4.342	4.097	.10
16188	S148_H	STG	2002	04	30	3.162	3.579	3.935	3.585	.25
16188	S148_H	STG	2002	05	31	2.696	2.884	3.140	2.877	.13
16188	S148_H	STG	2002	06	30	3.181	3.687	4.303	3.592	.35
16188	S148_H	STG	2002	07	31	3.189	3.772	4.896	3.643	.55
16188	S148_H	STG	2002	08	31	3.200	3.340	3.509	3.329	.08
16188	S148_H	STG	2002	09	30	3.181	3.433	3.772	3.479	.15
16188	S148_H	STG	2002	10	31	3.323	4.119	5.166	3.589	.78
16188	S148_H	STG	2002	11	30	3.785	4.446	5.145	4.603	.35
16188	S148_H	STG	2002	12	31	4.398	4.643	4.966	4.644	.14
16188	S148_H	STG	2003	01	31	4.164	4.480	4.812	4.433	.19
16188	S148_H	STG	2003	02	28	3.945	4.356	4.801	4.288	.29
16188	S148_H	STG	2003	03	31	3.716	4.331	4.869	4.359	.39
16188	S148_H	STG	2003	04	30	3.865	4.489	4.877	4.601	.35
16188	S148_H	STG	2003	05	31	3.848	4.319	4.957	4.279	.29
16188	S148_H	STG	2003	06	30	2.417	4.200	4.850	4.258	.49
16188	S148_H	STG	2003	07	31	4.275	4.657	5.156	4.637	.27
16188	S148_H	STG	2003	08	31	3.303	4.465	5.021	4.568	.40
16188	S148_H	STG	2003	09	30	3.444	3.990	4.761	4.006	.23
16188	S148_H	STG	2003	10	31	3.386	4.289	4.718	4.280	.31
16188	S148_H	STG	2003	11	30	3.108	3.507	4.335	3.348	.37

16188	S148_H	STG	2003	12	31	3.068	4.652	5.060	4.805	.55
16188	S148_H	STG	2004	01	31	3.574	3.957	4.895	3.741	.42
16188	S148_H	STG	2004	02	29	3.546	3.845	4.960	3.702	.41
16188	S148_H	STG	2004	03	31	3.606	4.354	5.072	4.287	.55
16188	S148_H	STG	2004	04	30	3.281	3.502	3.769	3.487	.15
16188	S148_H	STG	2004	05	31	3.122	3.775	4.551	3.778	.43
16188	S148_H	STG	2004	06	30	2.949	3.082	3.307	3.051	.10
16188	S148_H	STG	2004	07	31	2.846	3.085	3.609	2.971	.23
16188	S148_H	STG	2004	08	31	3.135	3.418	4.348	3.393	.24
16188	S148_H	STG	2004	09	30	3.185	3.423	3.764	3.438	.16
16188	S148_H	STG	2004	10	31	3.160	3.622	5.059	3.324	.63
16188	S148_H	STG	2004	11	30	3.145	3.386	3.508	3.414	.09
16188	S148_H	STG	2004	12	31	3.058	3.470	3.782	3.412	.23
16188	S148_H	STG	2005	01	31	3.363	3.450	3.564	3.442	.06
16188	S148_H	STG	2005	02	28	3.174	3.340	3.477	3.343	.10
16188	S148_H	STG	2005	03	31	3.131	3.396	3.646	3.304	.20
16188	S148_H	STG	2005	04	30	3.368	3.535	3.643	3.533	.08
16188	S148_H	STG	2005	05	31	3.370	3.661	4.263	3.635	.18
16188	S148_H	STG	2005	06	30	3.145	3.909	5.164	3.852	.71
16188	S148_H	STG	2005	07	31	1.986	3.443	3.905	3.609	.50
16188	S148_H	STG	2005	08	31	1.929	3.441	4.908	3.564	.57
16188	S148_H	STG	2005	09	30	1.924	3.133	5.113	3.210	.88
16188	S148_H	STG	2005	10	31	1.844	3.381	4.878	3.347	.85
16188	S148_H	STG	2005	11	30	4.879	4.980	5.117	4.935	.09
16188	S148_H	STG	2005	12	31	4.653	5.009	5.183	5.029	.14
16188	S148_H	STG	2006	01	31	3.721	4.333	4.839	4.508	.40
16188	S148_H	STG	2006	02	28	3.664	4.131	4.482	4.230	.28
16188	S148_H	STG	2006	03	31	3.592	4.007	4.748	3.846	.40
16188	S148_H	STG	2006	04	30	3.115	3.340	3.576	3.347	.14
16188	S148_H	STG	2006	05	31	2.809	3.145	3.521	3.097	.21
16188	S148_H	STG	2006	06	30	3.395	3.517	3.618	3.511	.06
16188	S148_H	STG	2006	07	31	3.216	4.139	4.711	4.222	.41
16188	S148_H	STG	2006	08	31	2.300	4.296	5.072	4.749	.77
16188	S148_H	STG	2006	09	30	3.807	4.339	5.153	4.160	.52
16188	S148_H	STG	2006	10	31	3.813	4.099	4.932	3.960	.30
16188	S148_H	STG	2006	11	30	4.121	4.781	5.135	4.864	.23
16188	S148_H	STG	2006	12	31	3.714	4.284	4.910	4.194	.45
16188	S148_H	STG	2007	01	31	3.680	4.138	4.686	4.013	.39
16188	S148_H	STG	2007	02	28	3.480	3.624	3.722	3.646	.07
16188	S148_H	STG	2007	03	31	3.182	3.356	3.482	3.368	.10
16188	S148_H	STG	2007	04	30	3.066	3.638	4.125	3.702	.37
16188	S148_H	STG	2007	05	31	3.331	3.513	3.722	3.495	.10
16188	S148_H	STG	2007	06	30	3.139	3.741	4.861	3.691	.50
16188	S148_H	STG	2007	07	31	3.840	4.540	4.941	4.643	.28
16188	S148_H	STG	2007	08	31	4.122	4.730	5.087	4.823	.28
16188	S148_H	STG	2007	09	30	3.499	4.094	4.712	4.098	.19
16188	S148_H	STG	2007	10	31	3.248	4.381	5.154	4.900	.77
16188	S148_H	STG	2007	11	30	3.773	4.096	4.564	3.962	.27
16188	S148_H	STG	2007	12	31	3.432	3.631	3.892	3.608	.14
16188	S148_H	STG	2008	01	31	3.148	3.284	3.462	3.275	.08
16188	S148_H	STG	2008	02	29	2.959	3.171	3.312	3.202	.12
16188	S148_H	STG	2008	03	31	3.051	3.154	3.240	3.161	.06
16188	S148_H	STG	2008	04	30	3.196	3.713	4.102	3.750	.31
16188	S148_H	STG	2008	05	31	3.149	3.349	3.591	3.329	.13
16188	S148_H	STG	2008	06	30	3.057	3.286	3.699	3.222	.20
16188	S148_H	STG	2008	07	31	3.037	3.465	3.941	3.298	.36
16188	S148_H	STG	2008	08	31	2.659	3.218	3.627	3.212	.23
16188	S148_H	STG	2008	09	30	3.119	3.261	3.745	3.205	.15
16188	S148_H	STG	2008	10	31	3.161	3.272	3.503	3.253	.09
16188	S148_H	STG	2008	11	30	3.121	3.293	3.583	3.254	.13
16188	S148_H	STG	2008	12	31	3.637	4.070	4.327	4.148	.24
16188	S148_H	STG	2009	01	31	3.512	3.686	3.992	3.658	.14
16188	S148_H	STG	2009	02	28	3.207	3.355	3.500	3.339	.08
16188	S148_H	STG	2009	03	31	2.941	3.136	3.285	3.146	.11
16188	S148_H	STG	2009	04	30	2.723	2.970	3.243	2.952	.17
16188	S148_H	STG	2009	05	31	2.196	2.771	4.068	2.625	.52
16188	S148_H	STG	2009	06	30	3.091	3.794	4.503	3.564	.48
16188	S148_H	STG	2009	07	31	3.075	3.261	4.157	3.170	.27
16188	S148_H	STG	2009	08	31	3.459	4.224	4.647	4.122	.32
16188	S148_H	STG	2009	09	30	3.822	3.927	4.112	3.897	.09
16188	S148_H	STG	2009	10	31	3.832	4.468	4.823	4.704	.39
16188	S148_H	STG	2009	11	30	3.839	4.175	4.767	4.083	.28
16188	S148_H	STG	2009	12	31	4.074	4.316	4.678	4.299	.17
16188	S148_H	STG	2010	01	31	3.813	3.949	4.198	3.916	.11
16188	S148_H	STG	2010	02	28	3.990	4.283	4.548	4.270	.13
16188	S148_H	STG	2010	03	31	3.952	4.265	4.575	4.274	.18
16188	S148_H	STG	2010	04	30	4.266	4.403	4.627	4.387	.10
16188	S148_H	STG	2010	05	31	4.220	4.377	4.590	4.345	.11
16188	S148_H	STG	2010	06	30	3.742	4.236	4.736	4.238	.30
16188	S148_H	STG	2010	07	31	3.227	4.235	4.613	4.450	.38
16188	S148_H	STG	2010	08	31	3.976	4.204	4.435	4.189	.12
16188	S148_H	STG	2010	09	30	3.586	4.180	4.426	4.204	.18
16188	S148_H	STG	2010	10	31	3.169	4.183	4.775	4.120	.41
16188	S148_H	STG	2010	11	30	3.808	4.077	4.346	4.052	.16
16188	S148_H	STG	2010	12	31	3.523	3.646	3.819	3.638	.08
16188	S148_H	STG	2011	01	31	3.408	3.630	3.895	3.561	.16
16188	S148_H	STG	2011	02	28	3.153	3.490	3.798	3.506	.20
16188	S148_H	STG	2011	03	31	2.688	2.913	3.160	2.930	.15
16188	S148_H	STG	2011	04	30	2.355	2.638	2.859	2.630	.17
16188	S148_H	STG	2011	05	31	1.894	2.144	2.341	2.173	.13
16188	S148_H	STG	2011	06	30	1.604	1.778	2.185	1.732	.16
16188	S148_H	STG	2011	07	31	2.260	3.312	3.896	3.438	.54
16188	S148_H	STG	2011	08	31	3.772	4.278	4.689	4.365	.32
16188	S148_H	STG	2011	09	30	4.148	4.467	4.711	4.464	.18
16188	S148_H	STG	2011	10	31	4.062	4.280	4.660	4.278	.17
16188	S148_H	STG	2011	11	30	4.051	4.568	4.961	4.557	.28
16188	S148_H	STG	2011	12	31	4.414	4.654	4.768	4.707	.10
16188	S148_H	STG	2012	01	31	4.124	4.350	4.490	4.392	.11
16188	S148_H	STG	2012	02	29	3.911	4.288	4.642	4.292	.23
16188	S148_H	STG	2012	03	31	3.443	3.696	3.995	3.680	.14
16188	S148_H	STG	2012	04	30	3.214	3.399	3.867	3.372	.15
16188	S148_H	STG	2012	05	31	3.505	4.131	4.556	4.129	.27
16188	S148_H	STG	2012	06	30	3.569	3.678	3.851	3.668	.07
16188	S148_H	STG	2012	07	31	3.582	3.778	4.199	3.733	.16
16188	S148_H	STG	2012	08	31	3.159	3.914	4.427	4.037	.40
16188	S148_H	STG	2012	09	30	3.142	3.341	3.832	3.278	.19
16188	S148_H	STG	2012	10	31	3.056	3.281	3.496	3.245	.14
16188	S148_H	STG	2012	11	30	3.932	4.305	4.445	4.326	.13
16188	S148_H	STG	2012	12	31	3.614	4.086	4.679	4.078	.29
16188	S148_H	STG	2013	01	31	3.473	3.531	3.596	3.529	.03
16188	S148_H	STG	2013	02	28	3.346	3.471	3.571	3.481	.08
16188	S148_H	STG	2013	03	31	3.106	3.282	3.503	3.239	.11
16188	S148_H	STG	2013	04	30	3.078	3.436	3.628	3.460	.16
16188	S148_H	STG	2013	05	31	3.223	3.998	4.361	4.133	.30
16188	S148_H	STG	2013	06	30	3.047	3.186	3.393	3.181	.09
16188	S148_H	STG	2013	07	7	3.181	3.394	3.612	3.433	.18
16188	S148_H	STG	2013	08	30	3.058	3.191	3.334	3.203	.09
16188	S148_H	STG	2013	09	30	3.087	3.227	3.523	3.191	.10
16188	S148_H	STG	2013	10	31	3.180	3.925	4.789	3.911	.65
16188	S148_H	STG	2013	11	30	3.653	4.335	4.763	4.304	.23
16188	S148_H	STG	2013	12	31	3.231	4.350	4.798	4.374	.37
16188	S148_H	STG	2014							

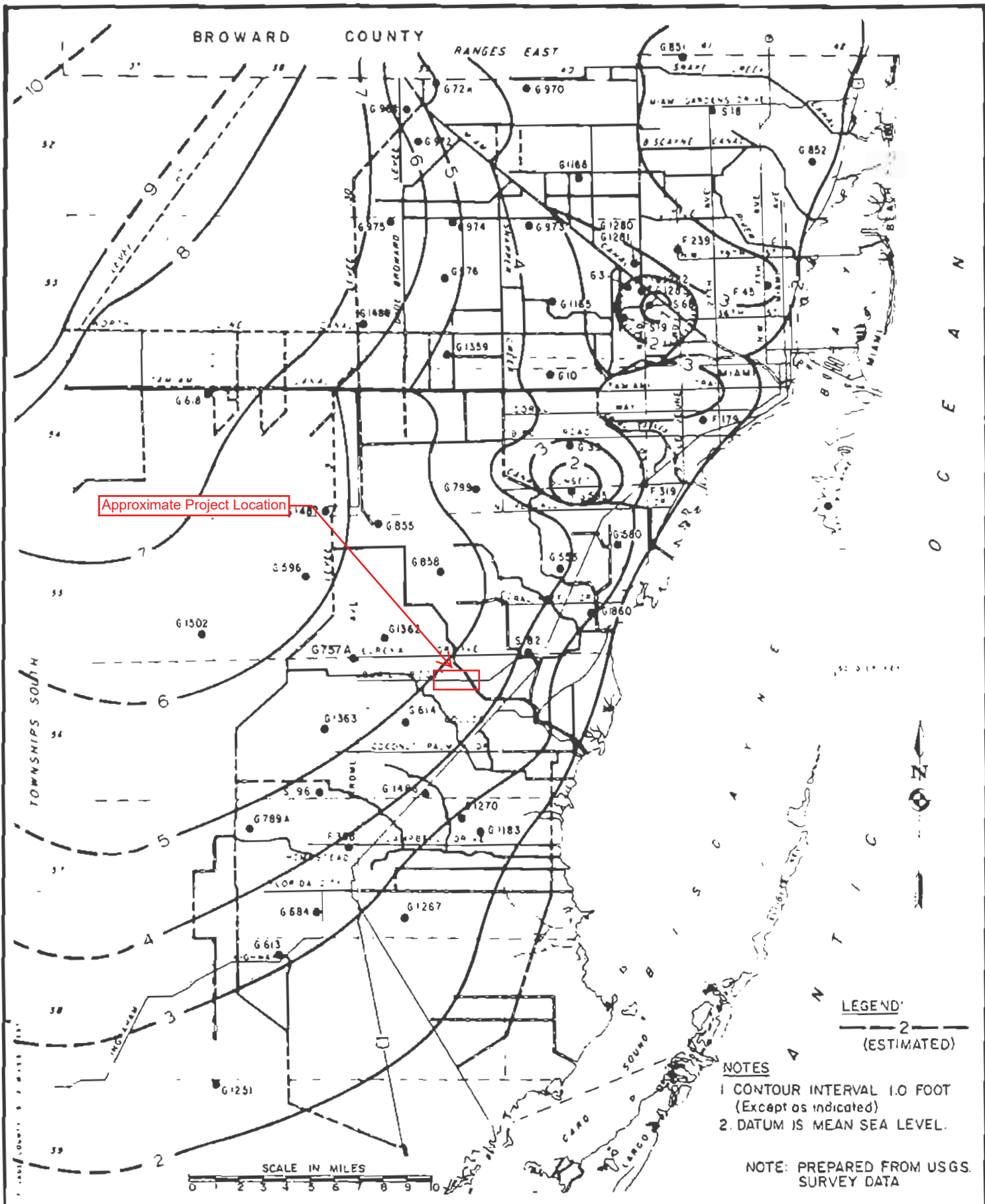
16188	S148_H	STG	2014	02	28	3.933	4.134	4.389	4.115	.12
16188	S148_H	STG	2014	03	31	3.605	3.753	4.012	3.686	.13
16188	S148_H	STG	2014	04	30	3.246	3.472	3.683	3.469	.12
16188	S148_H	STG	2014	05	31	2.893	3.029	3.286	3.001	.11
16188	S148_H	STG	2014	06	30	2.914	3.721	4.407	3.833	.50
16188	S148_H	STG	2014	07	31	3.288	3.880	4.455	3.765	.35
16188	S148_H	STG	2014	08	31	3.633	4.171	4.445	4.171	.17
16188	S148_H	STG	2014	09	30	3.476	4.053	4.408	4.042	.18
16188	S148_H	STG	2014	10	31	3.730	3.929	4.332	3.829	.20
16188	S148_H	STG	2014	11	30	3.862	4.034	4.263	4.023	.10
16188	S148_H	STG	2014	12	31	3.642	3.750	3.856	3.740	.07
16188	S148_H	STG	2015	01	31	3.563	3.705	3.948	3.645	.13
16188	S148_H	STG	2015	02	28	3.371	3.479	3.717	3.454	.09
16188	S148_H	STG	2015	03	31	3.017	3.191	3.355	3.204	.10
16188	S148_H	STG	2015	04	30	2.681	2.817	3.135	2.786	.11
16188	S148_H	STG	2015	05	31	2.894	3.173	3.391	3.220	.18
16188	S148_H	STG	2015	06	30	2.851	3.128	3.331	3.132	.16
16188	S148_H	STG	2015	07	31	2.929	3.187	3.608	3.091	.23
16188	S148_H	STG	2015	08	31	3.670	3.963	4.127	3.963	.09
16188	S148_H	STG	2015	09	30	3.781	4.231	4.765	4.299	.34
16188	S148_H	STG	2015	10	31	3.747	4.299	4.770	4.384	.33
16188	S148_H	STG	2015	11	30	4.005	4.211	4.412	4.220	.13
16188	S148_H	STG	2015	12	31	3.090	3.460	4.440	3.307	.36
16188	S148_H	STG	2016	01	31	3.079	3.197	3.394	3.185	.07
16188	S148_H	STG	2016	02	29	2.567	2.892	3.336	2.790	.24
16188	S148_H	STG	2016	03	31	2.590	2.692	2.875	2.680	.07
16188	S148_H	STG	2016	04	30	2.573	2.778	3.297	2.746	.19
16188	S148_H	STG	2016	05	31	3.084	3.315	3.504	3.320	.11
16188	S148_H	STG	2016	06	30	3.055	3.201	3.647	3.163	.13
16188	S148_H	STG	2016	07	31	3.072	3.275	3.420	3.313	.11
16188	S148_H	STG	2016	08	31	3.016	3.547	4.200	3.362	.43
16188	S148_H	STG	2016	09	30	3.111	3.696	4.152	3.830	.33
16188	S148_H	STG	2016	10	31	3.077	3.244	3.427	3.241	.10
16188	S148_H	STG	2016	11	30	3.130	3.831	4.170	3.890	.30
16188	S148_H	STG	2016	12	31	3.665	3.804	3.928	3.786	.07
16188	S148_H	STG	2017	01	31	3.476	3.603	3.871	3.604	.09
16188	S148_H	STG	2017	02	28	3.149	3.306	3.471	3.301	.09
16188	S148_H	STG	2017	03	31	3.065	3.209	3.383	3.176	.10
16188	S148_H	STG	2017	04	30	2.944	3.241	3.680	3.186	.23
16188	S148_H	STG	2017	05	31	2.765	3.103	3.483	3.082	.25
16188	S148_H	STG	2017	06	30	2.753	3.176	3.434	3.191	.17
16188	S148_H	STG	2017	07	31	3.055	3.200	3.375	3.186	.09
16188	S148_H	STG	2017	08	31	3.067	3.179	3.376	3.165	.06
16188	S148_H	STG	2017	09	30	1.509	2.615	5.817	2.264	.88
16188	S148_H	STG	2017	10	30	2.037	2.584	2.985	2.710	.27
16188	S148_H	STG	2017	11	30	2.698	2.749	2.822	2.740	.03
16188	S148_H	STG	2017	12	31	2.681	2.770	2.920	2.768	.06
16188	S148_H	STG	2018	01	31	2.697	3.172	3.554	3.169	.29
16188	S148_H	STG	2018	02	28	3.501	3.805	4.012	3.859	.16
16188	S148_H	STG	2018	03	31	3.344	3.609	3.943	3.596	.17
16188	S148_H	STG	2018	04	30	3.094	3.201	3.328	3.191	.07
16188	S148_H	STG	2018	05	31	3.087	3.336	3.691	3.312	.15
16188	S148_H	STG	2018	06	30	3.126	3.237	3.458	3.209	.09
16188	S148_H	STG	2018	07	31	3.146	3.288	3.445	3.277	.09
16188	S148_H	STG	2018	08	31	2.389	3.105	3.539	3.143	.23
16188	S148_H	STG	2018	09	30	2.274	2.627	3.177	2.656	.26
16188	S148_H	STG	2018	10	31	2.880	3.638	3.859	3.681	.19
16188	S148_H	STG	2018	11	30	3.665	3.800	4.008	3.779	.09
16188	S148_H	STG	2018	12	31	3.539	3.635	3.718	3.641	.05
16188	S148_H	STG	2019	01	31	3.433	3.585	3.841	3.570	.11
16188	S148_H	STG	2019	02	28	3.665	3.770	3.868	3.765	.06
16188	S148_H	STG	2019	03	31	3.532	3.621	3.699	3.613	.05
16188	S148_H	STG	2019	04	30	3.539	3.713	3.858	3.735	.09
16188	S148_H	STG	2019	05	31	3.426	3.611	3.774	3.625	.09
16188	S148_H	STG	2019	06	30	3.111	3.635	4.189	3.665	.31
16188	S148_H	STG	2019	07	31	3.083	3.430	3.855	3.399	.25
16188	S148_H	STG	2019	08	31	3.056	3.253	3.652	3.210	.16
16188	S148_H	STG	2019	09	30	3.069	3.775	4.168	3.925	.36
16188	S148_H	STG	2019	10	31	3.665	4.034	4.290	4.039	.16
16188	S148_H	STG	2019	11	30	3.815	3.922	4.023	3.925	.06
16188	S148_H	STG	2019	12	31	3.721	3.927	4.344	3.835	.21
16188	S148_H	STG	2020	01	31	3.671	3.934	4.310	3.894	.18
16188	S148_H	STG	2020	02	29	3.886	4.015	4.179	3.996	.08
16188	S148_H	STG	2020	03	31	3.184	3.532	3.862	3.546	.20
16188	S148_H	STG	2020	04	30	2.686	2.898	3.169	2.901	.13
16188	S148_H	STG	2020	05	31	2.471	2.928	3.941	2.779	.40
16188	S148_H	STG	2020	06	30	3.084	3.310	3.896	3.241	.22
16188	S148_H	STG	2020	07	31	3.101	3.739	4.273	3.916	.40
16188	S148_H	STG	2020	08	31	3.054	3.452	3.835	3.520	.26
16188	S148_H	STG	2020	09	30	3.353	3.716	3.949	3.752	.16
16188	S148_H	STG	2020	10	31	3.210	3.633	4.305	3.492	.38
16188	S148_H	STG	2020	11	30	3.191	3.371	3.780	3.351	.12
16188	S148_H	STG	2020	12	31	2.712	2.965	3.654	2.765	.36
16188	S148_H	STG	2021	01	31	2.576	2.840	3.328	2.746	.23
16188	S148_H	STG	2021	02	28	3.137	3.366	3.524	3.400	.10
16188	S148_H	STG	2021	03	31	3.190	3.383	3.498	3.375	.07
16188	S148_H	STG	2021	04	30	3.094	3.226	3.421	3.212	.08
16188	S148_H	STG	2021	05	31	3.250	3.503	3.715	3.492	.13
16188	S148_H	STG	2021	06	30	3.403	3.873	4.405	3.797	.27
16188	S148_H	STG	2021	07	31	3.206	3.839	4.296	3.822	.22
16188	S148_H	STG	2021	08	31	3.658	3.976	4.164	3.972	.12
16188	S148_H	STG	2021	09	13	3.770	3.934	4.133	3.950	.13

Provisional data are excluded from this statistical report.

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METROPOLITAN
DADE COUNTY
PUBLIC WORKS
DEPARTMENT

APPROVED
4/5 72

REVISED
2/19/75
4/14/77

DESIGN STANDARDS
AVERAGE OCTOBER
GROUND WATER LEVEL
1960-75

W.C.
2.2
SHEET 1 OF 1

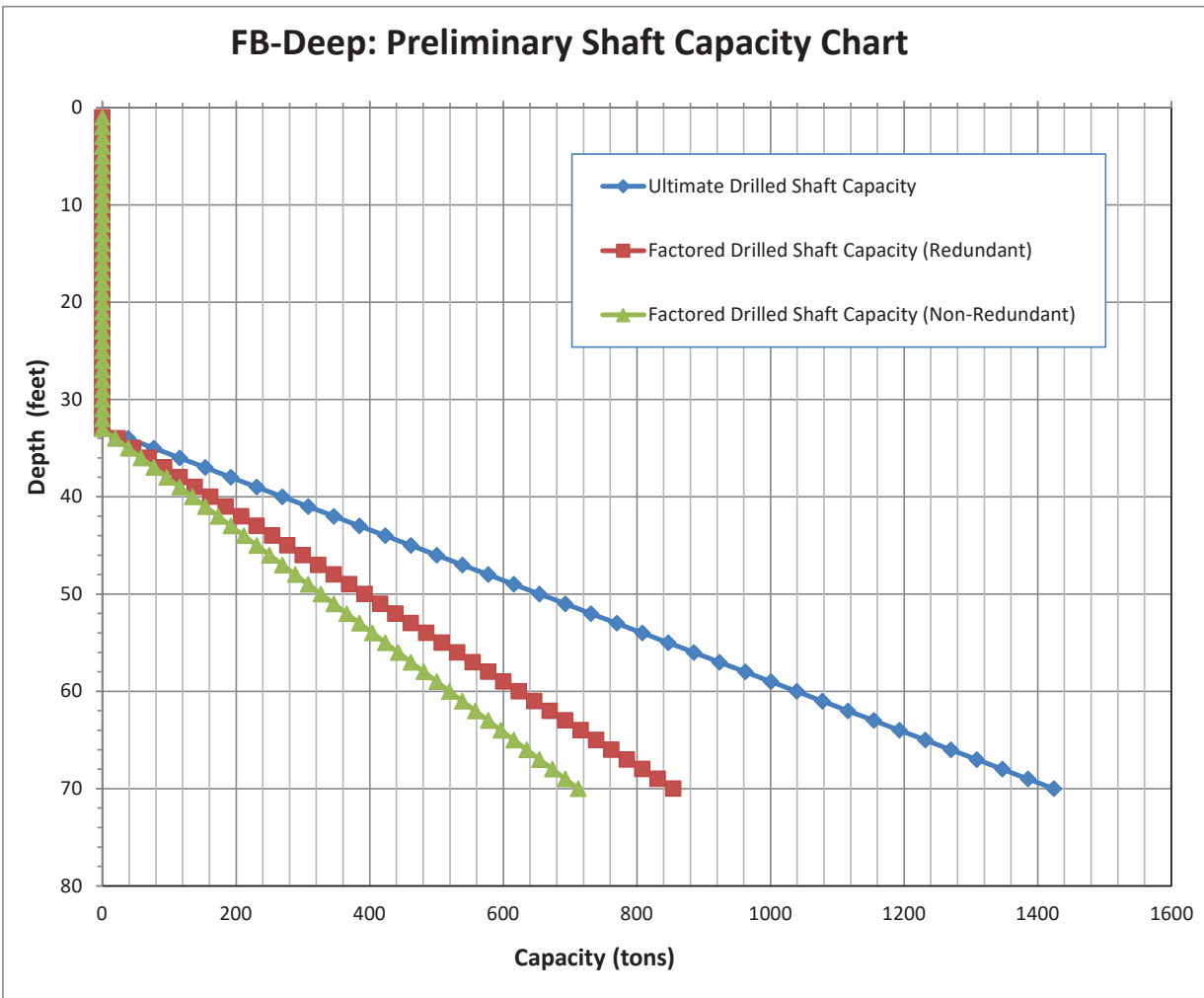
APPENDIX “C”

Driven Piles: “FB-Deep” Axial Compression Pile Capacity
Graphs & Output Printouts
Drilled Shafts: “FB-Deep” Axial Compression Shaft Capacity
Graphs & Output Printouts
ACIP piles: “FB-Deep” Axial Compression Pile Capacity
Graphs & Output Printouts
Derivation of Geotechnical Design Parameters
FB-MultiPier Geotechnical Parameters



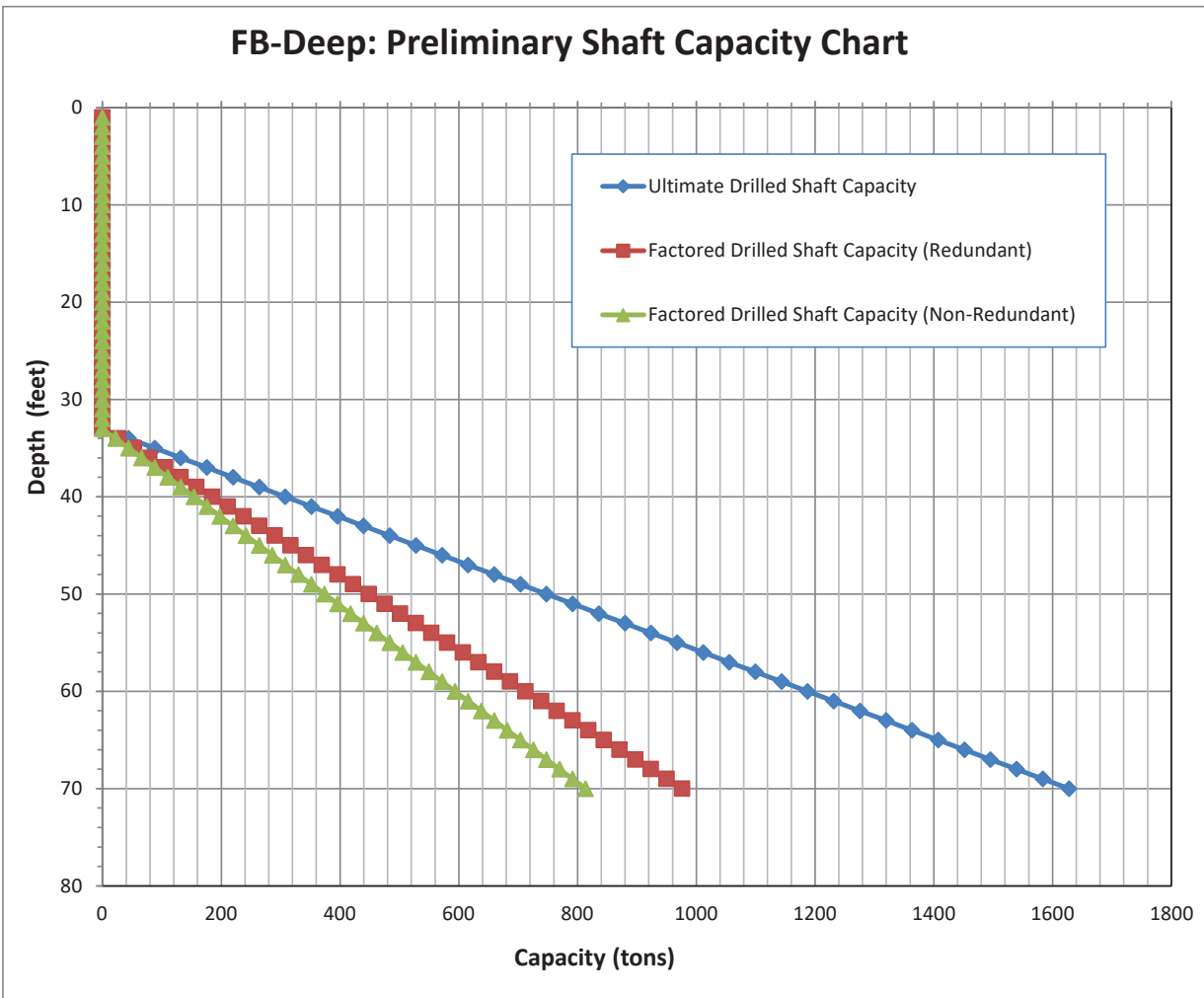
Project: SR 994/Quail Roost Drive From West of SW 137th Avenue to East of SW 127th Avenue
FPID No. 445804-1-22-01
Location: Miami-Dade County, Florida
Boring No.: BR-1 - 42-inch Diameter Drilled Shaft

FB-Deep: Preliminary Shaft Capacity Chart



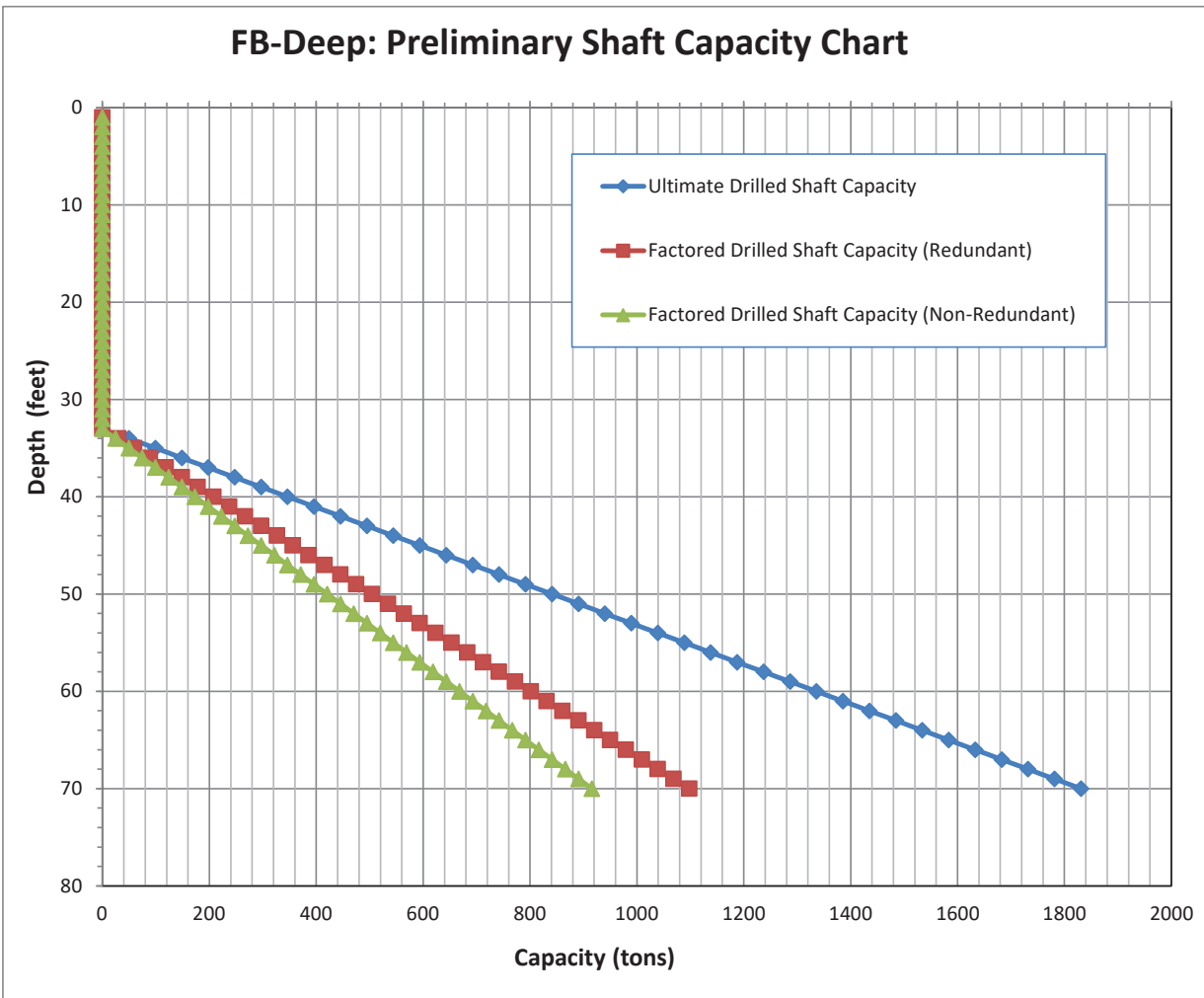
Project: SR 994/Quail Roost Drive From West of SW 137th Avenue to East of SW 127th Avenue
FPID No. 445804-1-22-01
Location: Miami-Dade County, Florida
Boring No.: BR-1 - 48-inch Diameter Drilled Shaft

FB-Deep: Preliminary Shaft Capacity Chart



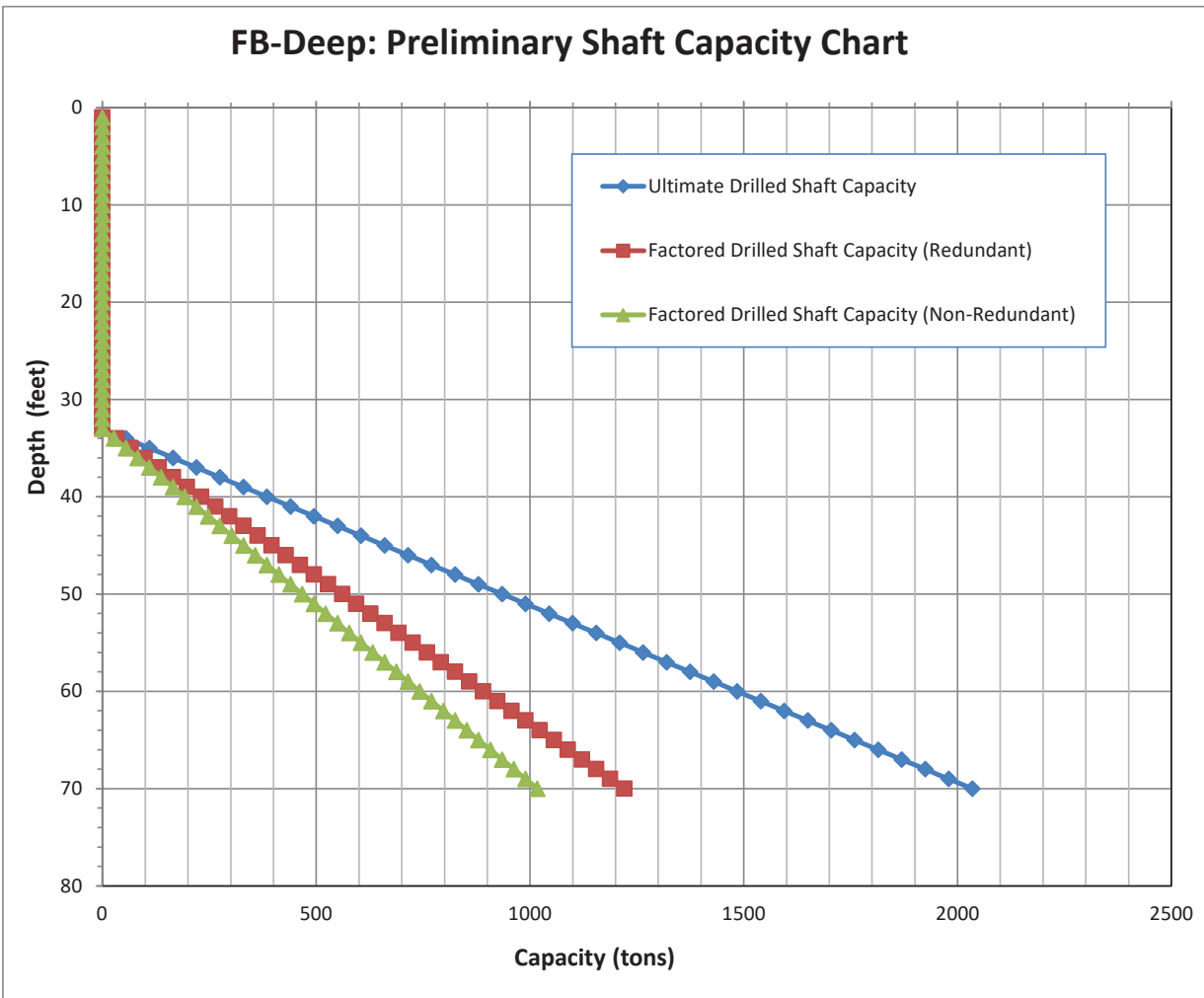
Project: SR 994/Quail Roost Drive From West of SW 137th Avenue to East of SW 127th Avenue
FPID No. 445804-1-22-01
Location: Miami-Dade County, Florida
Boring No.: BR-1 - 54-inch Diameter Drilled Shaft

FB-Deep: Preliminary Shaft Capacity Chart



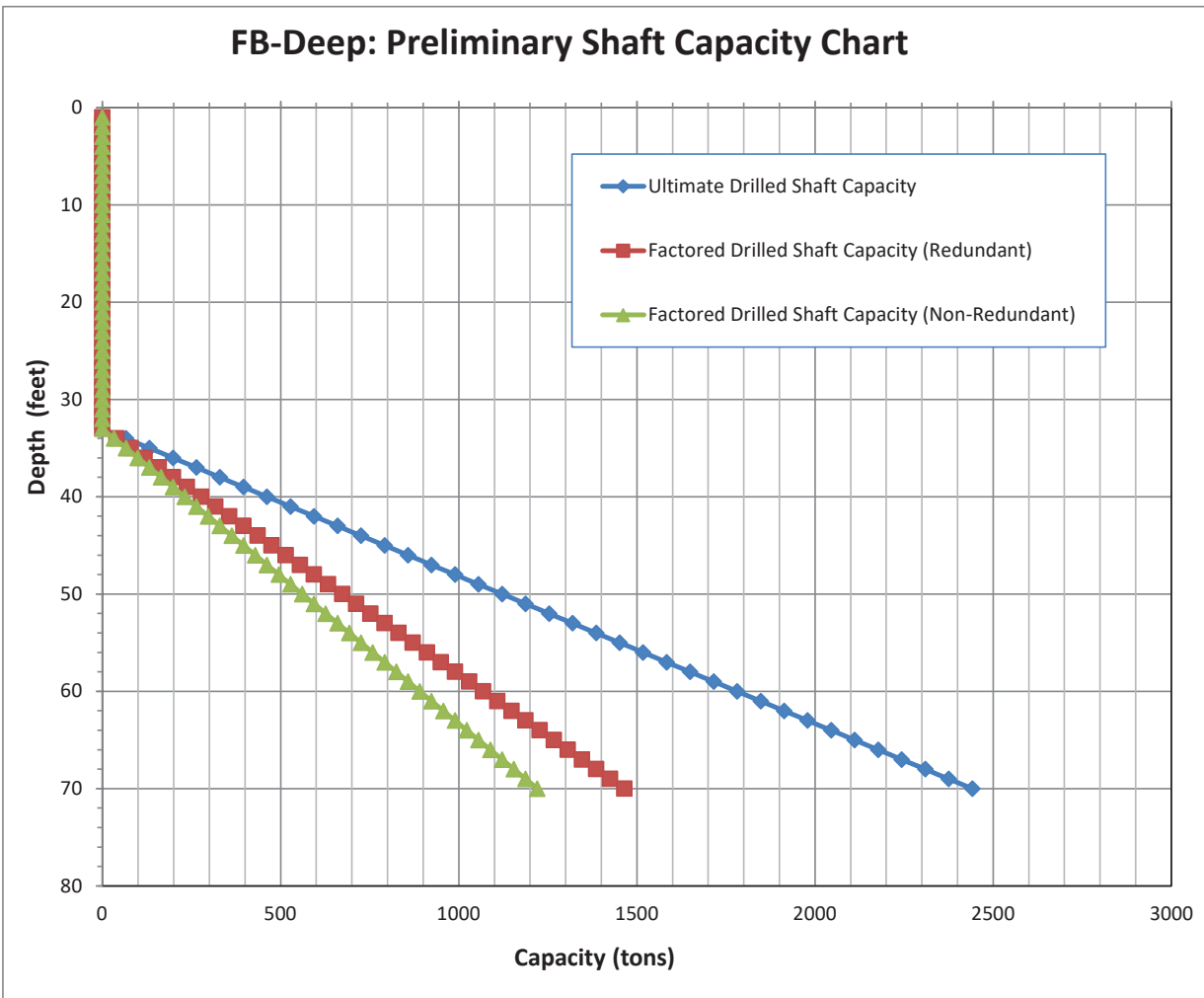
Project: SR 994/Quail Roost Drive From West of SW 137th Avenue to East of SW 127th Avenue
FPID No. 445804-1-22-01
Location: Miami-Dade County, Florida
Boring No.: BR-1 - 60-inch Diameter Drilled Shaft

FB-Deep: Preliminary Shaft Capacity Chart



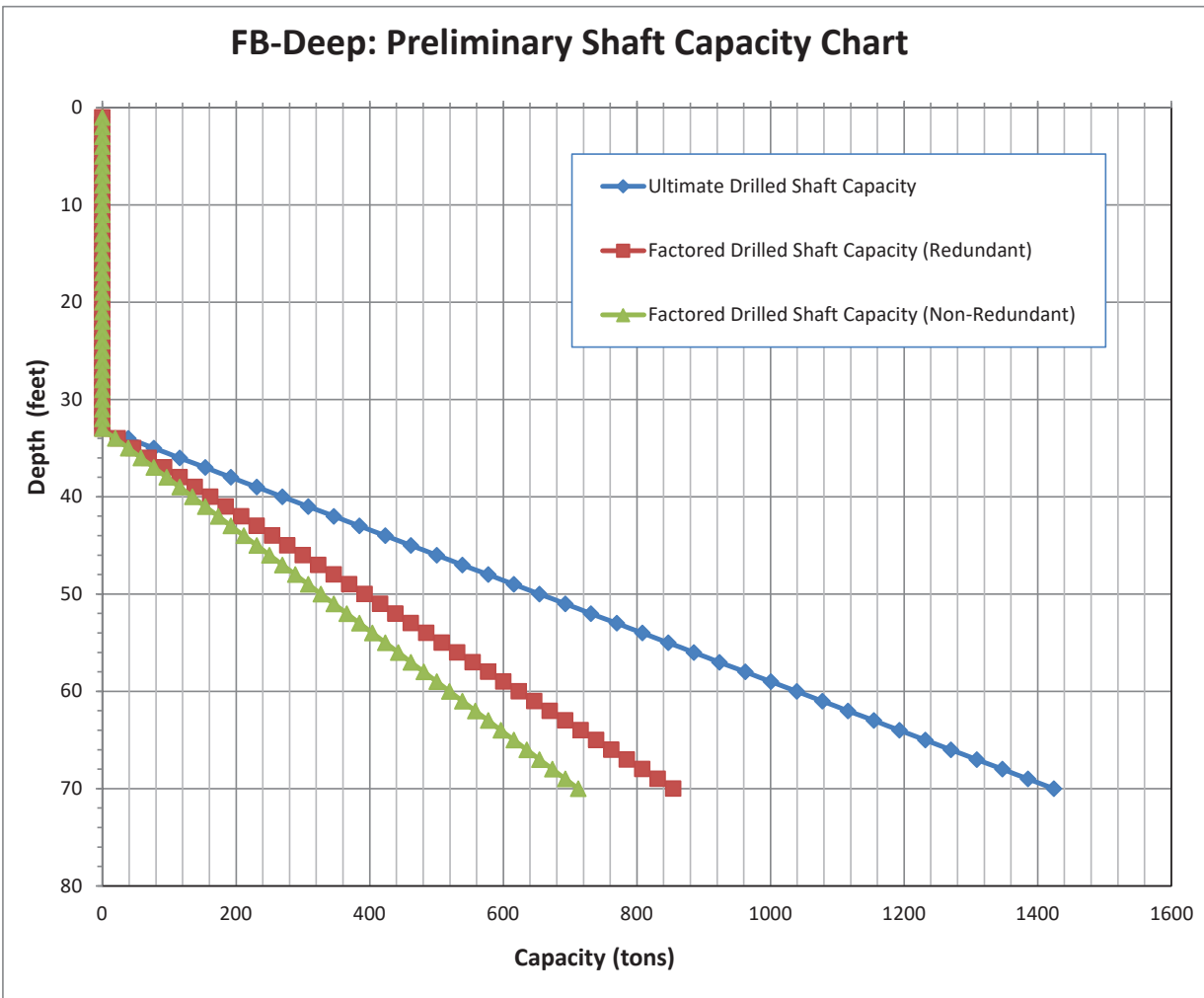
Project: SR 994/Quail Roost Drive From West of SW 137th Avenue to East of SW 127th Avenue
FPID No. 445804-1-22-01
Location: Miami-Dade County, Florida
Boring No.: BR-1 - 72-inch Diameter Drilled Shaft

FB-Deep: Preliminary Shaft Capacity Chart



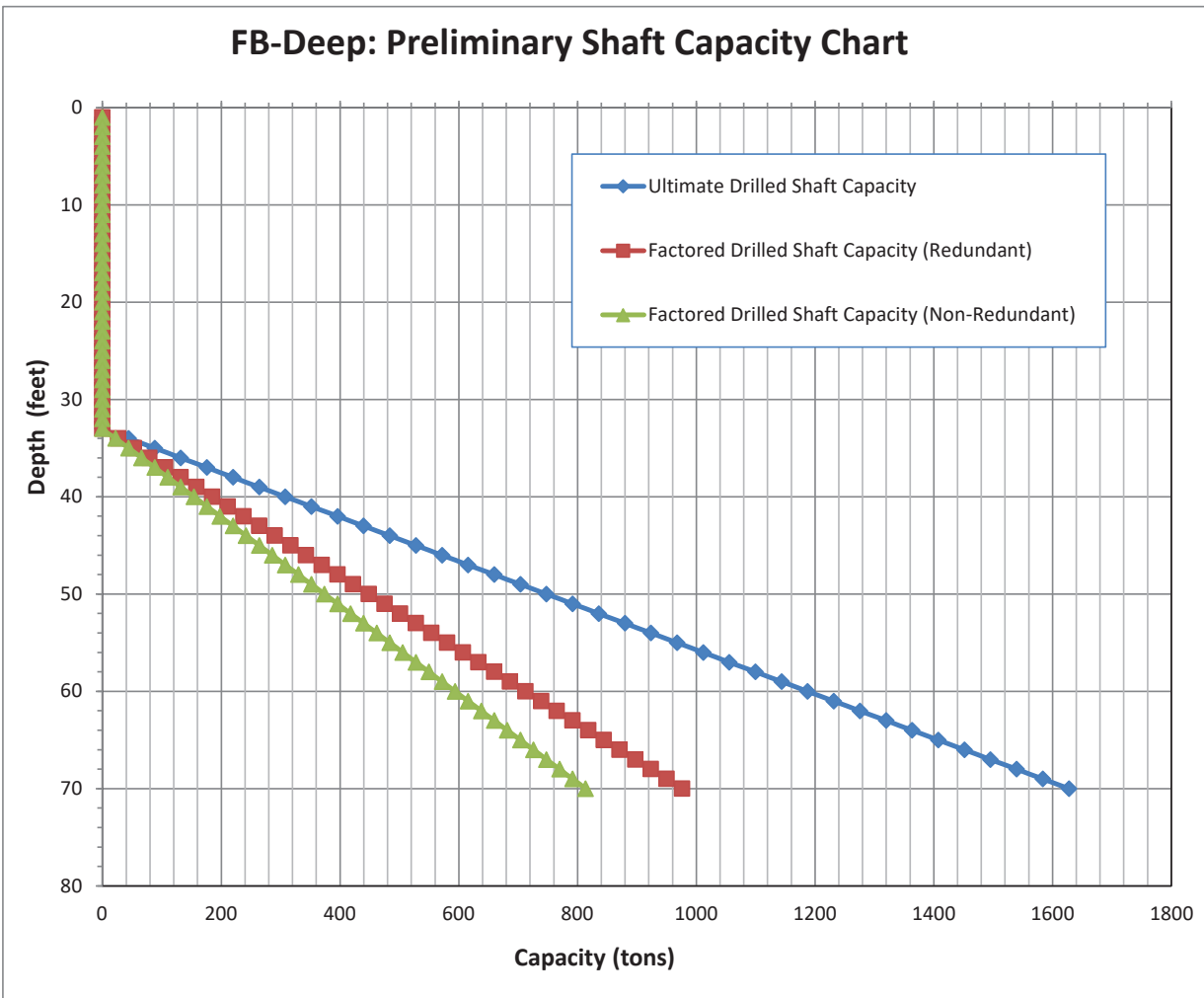
Project: SR 994/Quail Roost Drive From West of SW 137th Avenue to East of SW 127th Avenue
FPID No. 445804-1-22-01
Location: Miami-Dade County, Florida
Boring No.: BR-2 - 42-inch Diameter Drilled Shaft

FB-Deep: Preliminary Shaft Capacity Chart



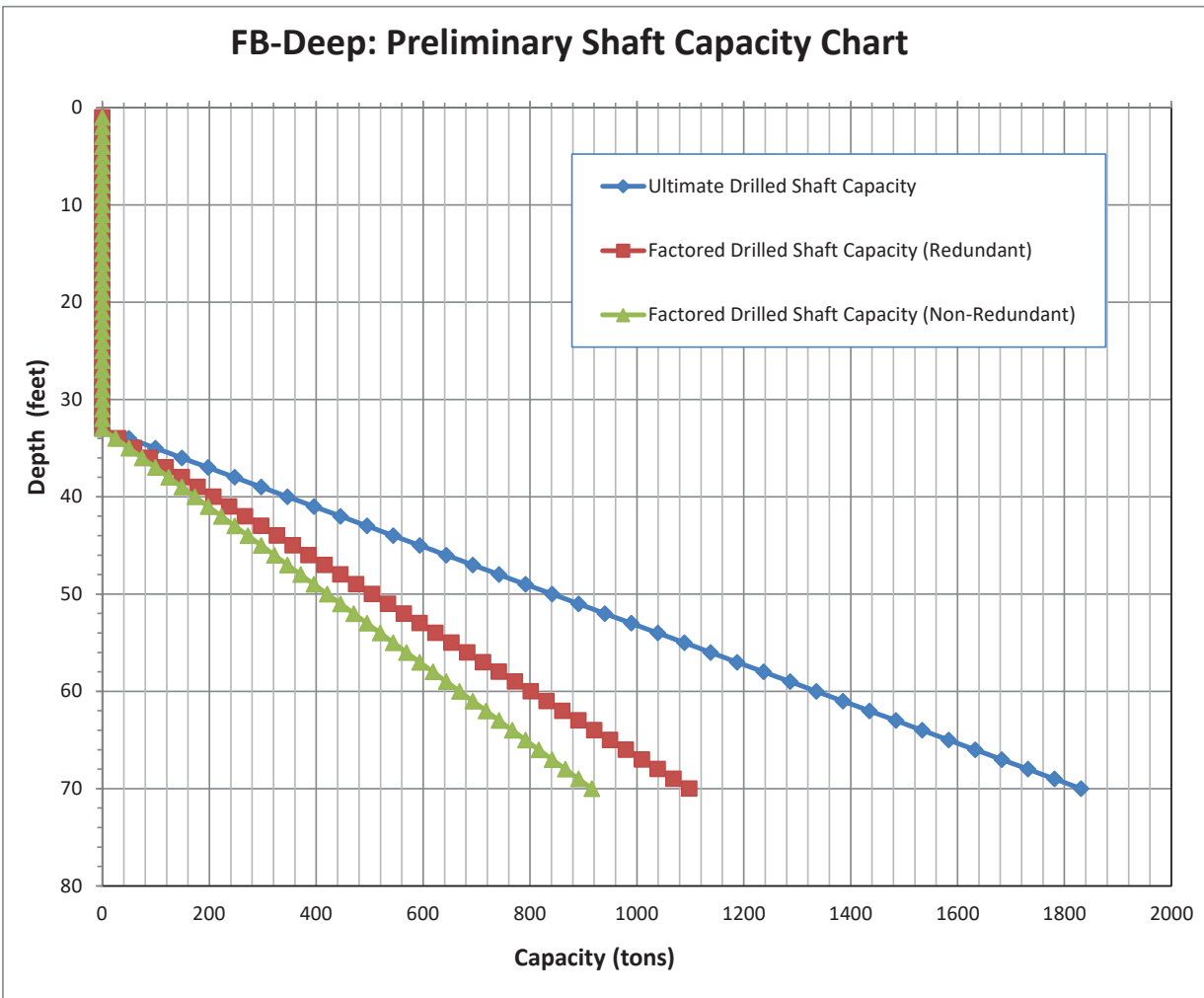
Project: SR 994/Quail Roost Drive From West of SW 137th Avenue to East of SW 127th Avenue
FPID No. 445804-1-22-01
Location: Miami-Dade County, Florida
Boring No.: BR-2 - 48-inch Diameter Drilled Shaft

FB-Deep: Preliminary Shaft Capacity Chart



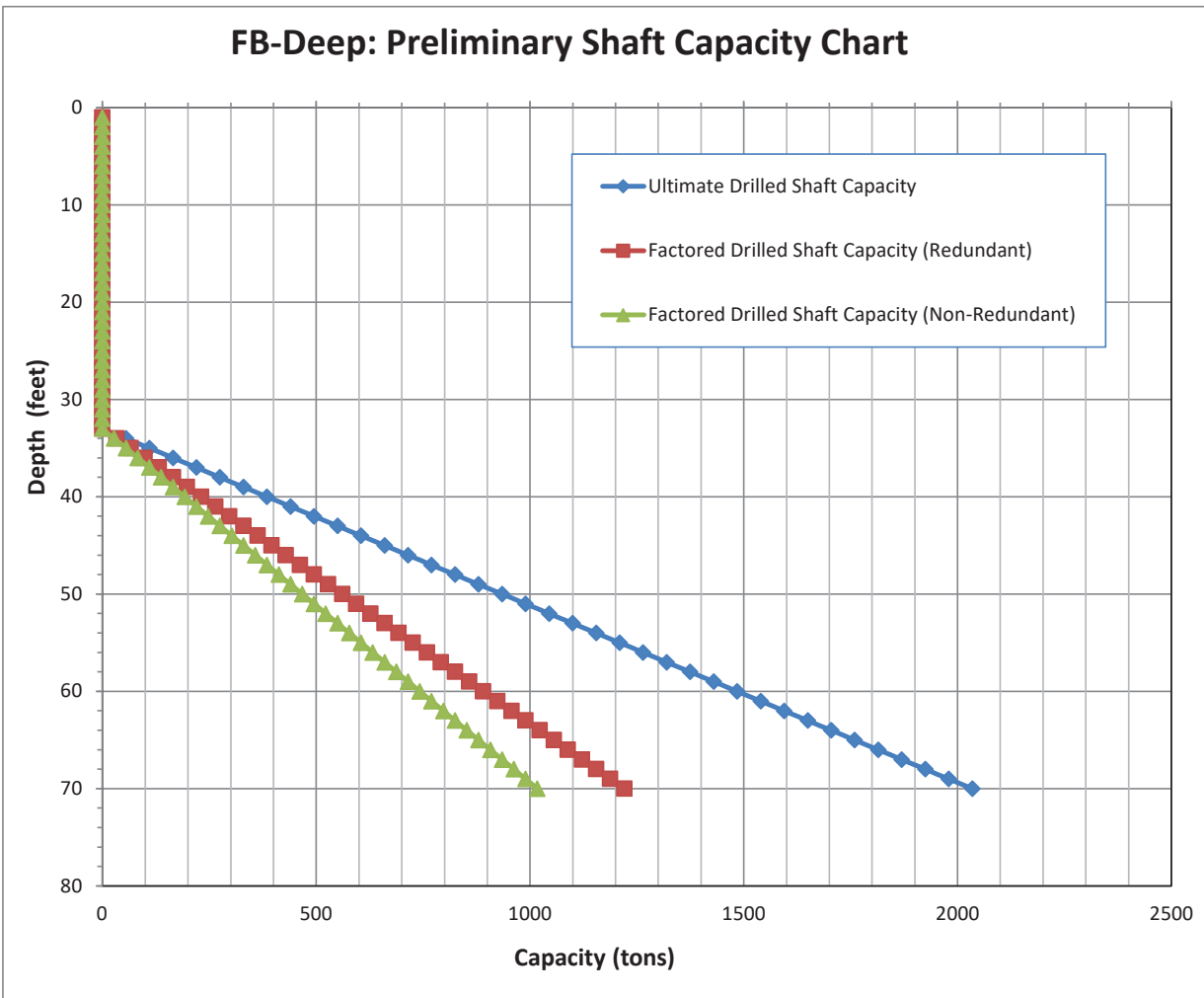
Project: SR 994/Quail Roost Drive From West of SW 137th Avenue to East of SW 127th Avenue
FPID No. 445804-1-22-01
Location: Miami-Dade County, Florida
Boring No.: BR-2 - 54-inch Diameter Drilled Shaft

FB-Deep: Preliminary Shaft Capacity Chart



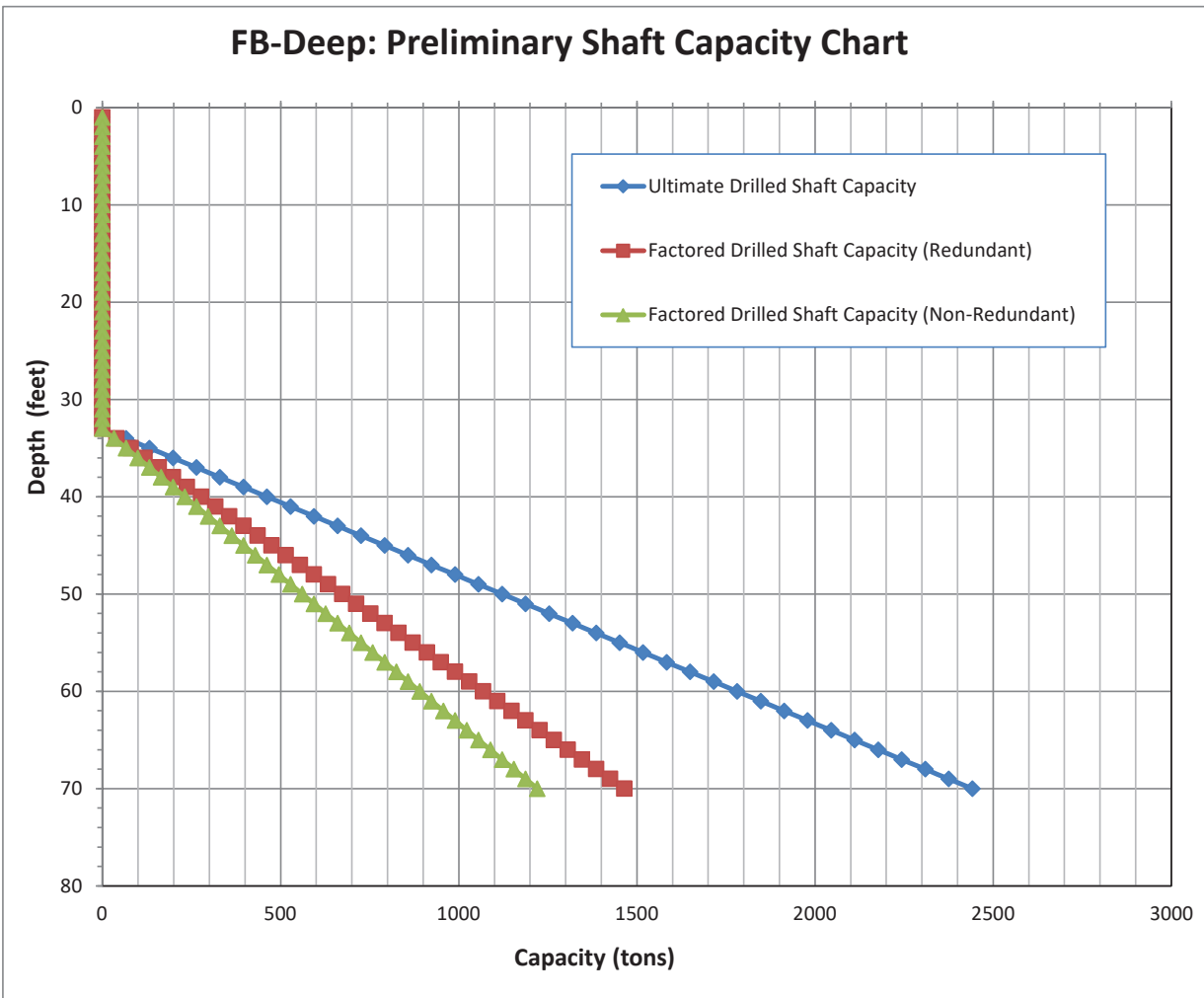
Project: SR 994/Quail Roost Drive From West of SW 137th Avenue to East of SW 127th Avenue
FPID No. 445804-1-22-01
Location: Miami-Dade County, Florida
Boring No.: BR-2 - 60-inch Diameter Drilled Shaft

FB-Deep: Preliminary Shaft Capacity Chart



Project: SR 994/Quail Roost Drive From West of SW 137th Avenue to East of SW 127th Avenue
FPID No. 445804-1-22-01
Location: Miami-Dade County, Florida
Boring No.: BR-2 - 72-inch Diameter Drilled Shaft

FB-Deep: Preliminary Shaft Capacity Chart



General Information:

Input file: Drive PDE_GANNETT FLEMING\FB-Deep\Drilled Shafts\BR-1 - DS.in
 Project number: 221126
 Job name: SR 997 Bridge Over Black Creek Canal (Bridge No. 870633)
 Engineer: Adnan Ismail, P.E.
 Units: English

Analysis Information:

Analysis Type: Drilled Shaft Analysis

Soil Information:

Boring date: 8/24/2021
 Boring number: BR-1
 Station number: Offset:
 Ground Elevation: 0.00(ft)
 Water table Elevation = -6.20(ft)

Rock side-friction is calculated using: McVay's method

ID	Depth (ft)	Elevation (ft)	SPT Blows (Blows/ft)	Unit Weight (pcf)	Soil Type
1	0.00	0.00	N/A	0.00	5- Cavity layer
2	1.00	-1.00	N/A	0.00	5- Cavity layer
3	3.00	-3.00	N/A	0.00	5- Cavity layer
4	5.00	-5.00	N/A	0.00	5- Cavity layer
5	7.00	-7.00	N/A	105.00	5- Cavity layer
6	9.00	-9.00	N/A	105.00	5- Cavity layer
7	12.00	-12.00	N/A	120.00	5- Cavity layer
8	15.00	-15.00	N/A	120.00	5- Cavity layer
9	18.00	-18.00	N/A	120.00	5- Cavity layer
10	21.00	-21.00	N/A	120.00	5- Cavity layer
11	24.00	-24.00	N/A	110.00	5- Cavity layer
12	27.00	-27.00	N/A	110.00	5- Cavity layer
13	30.00	-30.00	N/A	110.00	5- Cavity layer
14	33.00	-33.00	N/A	120.00	4- Lime Stone/Very shelly sand
15	36.00	-36.00	N/A	120.00	4- Lime Stone/Very shelly sand
16	39.00	-39.00	N/A	120.00	4- Lime Stone/Very shelly sand
17	42.00	-42.00	N/A	120.00	4- Lime Stone/Very shelly sand
18	45.00	-45.00	N/A	120.00	4- Lime Stone/Very shelly sand
19	48.00	-48.00	N/A	120.00	4- Lime Stone/Very shelly sand
20	51.00	-51.00	N/A	120.00	4- Lime Stone/Very shelly sand
21	54.00	-54.00	N/A	120.00	4- Lime Stone/Very shelly sand
22	57.00	-57.00	N/A	120.00	4- Lime Stone/Very shelly sand
23	60.00	-60.00	N/A	120.00	4- Lime Stone/Very shelly sand
24	63.00	-63.00	N/A	120.00	4- Lime Stone/Very shelly sand
25	66.00	-66.00	N/A	120.00	4- Lime Stone/Very shelly sand
26	69.00	-69.00	N/A	120.00	4- Lime Stone/Very shelly sand
27	72.00	-72.00	N/A	120.00	4- Lime Stone/Very shelly sand
28	75.00	-75.00	N/A	120.00	4- Lime Stone/Very shelly sand
29	77.00	-77.00	N/A	120.00	4- Lime Stone/Very shelly sand
30	79.00	-79.00	N/A	120.00	4- Lime Stone/Very shelly sand

ID	Cu-DIR (tsf)	qu (tsf)	qt (tsf)	Em (ksi)	qb (tsf)
1	N/A	N/A	N/A	N/A	N/A
2	N/A	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A	N/A
6	N/A	N/A	N/A	N/A	N/A
7	N/A	N/A	N/A	N/A	N/A
8	N/A	N/A	N/A	N/A	N/A
9	N/A	N/A	N/A	N/A	N/A
10	N/A	N/A	N/A	N/A	N/A
11	N/A	N/A	N/A	N/A	N/A
12	N/A	N/A	N/A	N/A	N/A

13	N/A	N/A	N/A	N/A	N/A
14	N/A	49.00	1.00	78.26	24.50
15	N/A	49.00	1.00	78.26	24.50
16	N/A	49.00	1.00	78.26	24.50
17	N/A	49.00	1.00	78.26	24.50
18	N/A	49.00	1.00	78.26	24.50
19	N/A	49.00	1.00	78.26	24.50
20	N/A	49.00	1.00	78.26	24.50
21	N/A	49.00	1.00	78.26	24.50
22	N/A	49.00	1.00	78.26	24.50
23	N/A	49.00	1.00	78.26	24.50
24	N/A	49.00	1.00	78.26	24.50
25	N/A	49.00	1.00	78.26	24.50
26	N/A	49.00	1.00	78.26	24.50
27	N/A	49.00	1.00	78.26	24.50
28	N/A	49.00	1.00	78.26	24.50
29	N/A	49.00	1.00	78.26	24.50
30	N/A	49.00	1.00	78.26	24.50

ID RQD F.M. S.R.I. Rock Recovery

1	N/A	N/A	N/A
2	N/A	N/A	N/A
3	N/A	N/A	N/A
4	N/A	N/A	N/A
5	N/A	N/A	N/A
6	N/A	N/A	N/A
7	N/A	N/A	N/A
8	N/A	N/A	N/A
9	N/A	N/A	N/A
10	N/A	N/A	N/A
11	N/A	N/A	N/A
12	N/A	N/A	N/A
13	N/A	N/A	N/A
14	1.00	ROUGH	1.000
15	1.00	ROUGH	1.000
16	1.00	ROUGH	1.000
17	1.00	ROUGH	1.000
18	1.00	ROUGH	1.000
19	1.00	ROUGH	1.000
20	1.00	ROUGH	1.000
21	1.00	ROUGH	1.000
22	1.00	ROUGH	1.000
23	1.00	ROUGH	1.000
24	1.00	ROUGH	1.000
25	1.00	ROUGH	1.000
26	1.00	ROUGH	1.000
27	1.00	ROUGH	1.000
28	1.00	ROUGH	1.000
29	1.00	ROUGH	1.000
30	1.00	ROUGH	1.000

Drilled Shaft Data:

Unit weight of concrete = 150.00(pcf), Concrete Slump = 9.00(in)
 Modulus of Elasticity of concrete = 4030.00(ksi)

Shaft Geometry:

ID	Length (ft)	Tip Elev. (ft)	Case Len. (ft)	Diameter (in)	Base Diam. (in)	Bell Len. (ft)
1	1.00	-1.00	5.00	42.00	42.00	0.00
2	2.00	-2.00	5.00	42.00	42.00	0.00
3	3.00	-3.00	5.00	42.00	42.00	0.00
4	4.00	-4.00	5.00	42.00	42.00	0.00
5	5.00	-5.00	5.00	42.00	42.00	0.00
6	6.00	-6.00	5.00	42.00	42.00	0.00
7	7.00	-7.00	5.00	42.00	42.00	0.00
8	8.00	-8.00	5.00	42.00	42.00	0.00
9	9.00	-9.00	5.00	42.00	42.00	0.00
10	10.00	-10.00	5.00	42.00	42.00	0.00
11	11.00	-11.00	5.00	42.00	42.00	0.00
12	12.00	-12.00	5.00	42.00	42.00	0.00
13	13.00	-13.00	5.00	42.00	42.00	0.00
14	14.00	-14.00	5.00	42.00	42.00	0.00
15	15.00	-15.00	5.00	42.00	42.00	0.00

16	16.00	-16.00	5.00	42.00	42.00	0.00
17	17.00	-17.00	5.00	42.00	42.00	0.00
18	18.00	-18.00	5.00	42.00	42.00	0.00
19	19.00	-19.00	5.00	42.00	42.00	0.00
20	20.00	-20.00	5.00	42.00	42.00	0.00
21	21.00	-21.00	5.00	42.00	42.00	0.00
22	22.00	-22.00	5.00	42.00	42.00	0.00
23	23.00	-23.00	5.00	42.00	42.00	0.00
24	24.00	-24.00	5.00	42.00	42.00	0.00
25	25.00	-25.00	5.00	42.00	42.00	0.00
26	26.00	-26.00	5.00	42.00	42.00	0.00
27	27.00	-27.00	5.00	42.00	42.00	0.00
28	28.00	-28.00	5.00	42.00	42.00	0.00
29	29.00	-29.00	5.00	42.00	42.00	0.00
30	30.00	-30.00	5.00	42.00	42.00	0.00
31	31.00	-31.00	5.00	42.00	42.00	0.00
32	32.00	-32.00	5.00	42.00	42.00	0.00
33	33.00	-33.00	5.00	42.00	42.00	0.00
34	34.00	-34.00	5.00	42.00	42.00	0.00
35	35.00	-35.00	5.00	42.00	42.00	0.00
36	36.00	-36.00	5.00	42.00	42.00	0.00
37	37.00	-37.00	5.00	42.00	42.00	0.00
38	38.00	-38.00	5.00	42.00	42.00	0.00
39	39.00	-39.00	5.00	42.00	42.00	0.00
40	40.00	-40.00	5.00	42.00	42.00	0.00
41	41.00	-41.00	5.00	42.00	42.00	0.00
42	42.00	-42.00	5.00	42.00	42.00	0.00
43	43.00	-43.00	5.00	42.00	42.00	0.00
44	44.00	-44.00	5.00	42.00	42.00	0.00
45	45.00	-45.00	5.00	42.00	42.00	0.00
46	46.00	-46.00	5.00	42.00	42.00	0.00
47	47.00	-47.00	5.00	42.00	42.00	0.00
48	48.00	-48.00	5.00	42.00	42.00	0.00
49	49.00	-49.00	5.00	42.00	42.00	0.00
50	50.00	-50.00	5.00	42.00	42.00	0.00
51	51.00	-51.00	5.00	42.00	42.00	0.00
52	52.00	-52.00	5.00	42.00	42.00	0.00
53	53.00	-53.00	5.00	42.00	42.00	0.00
54	54.00	-54.00	5.00	42.00	42.00	0.00
55	55.00	-55.00	5.00	42.00	42.00	0.00
56	56.00	-56.00	5.00	42.00	42.00	0.00
57	57.00	-57.00	5.00	42.00	42.00	0.00
58	58.00	-58.00	5.00	42.00	42.00	0.00
59	59.00	-59.00	5.00	42.00	42.00	0.00
60	60.00	-60.00	5.00	42.00	42.00	0.00
61	61.00	-61.00	5.00	42.00	42.00	0.00
62	62.00	-62.00	5.00	42.00	42.00	0.00
63	63.00	-63.00	5.00	42.00	42.00	0.00
64	64.00	-64.00	5.00	42.00	42.00	0.00
65	65.00	-65.00	5.00	42.00	42.00	0.00
66	66.00	-66.00	5.00	42.00	42.00	0.00
67	67.00	-67.00	5.00	42.00	42.00	0.00
68	68.00	-68.00	5.00	42.00	42.00	0.00
69	69.00	-69.00	5.00	42.00	42.00	0.00
70	70.00	-70.00	5.00	42.00	42.00	0.00

Drilled Shaft Capacity (sorted by shaft diameter):

=====
Strength reduction factors: Skin-friction = 1.00, End-bearing = 0.00

ID	Diameter (in)	Length (ft)	Skin Fric. (tons)	End Bearing (tons)	Capacity (tons)
1	42.00	1.00	0.000	0.000	0.000
2	42.00	2.00	0.000	0.000	0.000
3	42.00	3.00	0.000	0.000	0.000
4	42.00	4.00	0.000	0.000	0.000
5	42.00	5.00	0.000	0.000	0.000
6	42.00	6.00	0.000	0.000	0.000
7	42.00	7.00	0.000	0.000	0.000
8	42.00	8.00	0.000	0.000	0.000
9	42.00	9.00	0.000	0.000	0.000
10	42.00	10.00	0.000	0.000	0.000
11	42.00	11.00	0.000	0.000	0.000
12	42.00	12.00	0.000	0.000	0.000
13	42.00	13.00	0.000	0.000	0.000
14	42.00	14.00	0.000	0.000	0.000
15	42.00	15.00	0.000	0.000	0.000

16	42.00	16.00	0.000	0.000	0.000
17	42.00	17.00	0.000	0.000	0.000
18	42.00	18.00	0.000	0.000	0.000
19	42.00	19.00	0.000	0.000	0.000
20	42.00	20.00	0.000	0.000	0.000
21	42.00	21.00	0.000	0.000	0.000
22	42.00	22.00	0.000	0.000	0.000
23	42.00	23.00	0.000	0.000	0.000
24	42.00	24.00	0.000	0.000	0.000
25	42.00	25.00	0.000	0.000	0.000
26	42.00	26.00	0.000	0.000	0.000
27	42.00	27.00	0.000	0.000	0.000
28	42.00	28.00	0.000	0.000	0.000
29	42.00	29.00	0.000	0.000	0.000
30	42.00	30.00	0.000	0.000	0.000
31	42.00	31.00	0.000	0.000	0.000
32	42.00	32.00	0.000	0.000	0.000
33	42.00	33.00	0.000	0.000	0.000
34	42.00	34.00	38.485	0.000	38.485
35	42.00	35.00	76.969	0.000	76.969
36	42.00	36.00	115.454	0.000	115.454
37	42.00	37.00	153.938	0.000	153.938
38	42.00	38.00	192.423	0.000	192.423
39	42.00	39.00	230.907	0.000	230.907
40	42.00	40.00	269.392	0.000	269.392
41	42.00	41.00	307.876	0.000	307.876
42	42.00	42.00	346.361	0.000	346.361
43	42.00	43.00	384.845	0.000	384.845
44	42.00	44.00	423.330	0.000	423.330
45	42.00	45.00	461.814	0.000	461.814
46	42.00	46.00	500.299	0.000	500.299
47	42.00	47.00	538.783	0.000	538.783
48	42.00	48.00	577.268	0.000	577.268
49	42.00	49.00	615.752	0.000	615.752
50	42.00	50.00	654.237	0.000	654.237
51	42.00	51.00	692.721	0.000	692.721
52	42.00	52.00	731.206	0.000	731.206
53	42.00	53.00	769.690	0.000	769.690
54	42.00	54.00	808.175	0.000	808.175
55	42.00	55.00	846.659	0.000	846.659
56	42.00	56.00	885.144	0.000	885.144
57	42.00	57.00	923.628	0.000	923.628
58	42.00	58.00	962.113	0.000	962.113
59	42.00	59.00	1000.597	0.000	1000.597
60	42.00	60.00	1039.082	0.000	1039.082
61	42.00	61.00	1077.566	0.000	1077.566
62	42.00	62.00	1116.051	0.000	1116.051
63	42.00	63.00	1154.535	0.000	1154.535
64	42.00	64.00	1193.020	0.000	1193.020
65	42.00	65.00	1231.504	0.000	1231.504
66	42.00	66.00	1269.989	0.000	1269.989
67	42.00	67.00	1308.473	0.000	1308.473
68	42.00	68.00	1346.958	0.000	1346.958
69	42.00	69.00	1385.442	0.000	1385.442
70	42.00	70.00	1423.927	0.000	1423.927

Drilled Shaft Capacity at User-Defined Settlement (sorted by shaft diameter):

***** Capacity is NOT modified by the strength reduction factors *****

User-Defined Settlement = 5.00%

ID	Diameter (in)	Length (ft)	Skin Fric. (tons)	End Bearing (tons)	Capacity (tons)
1	42.00	1.00	0.000	0.000	0.000
2	42.00	2.00	0.000	0.000	0.000
3	42.00	3.00	0.000	0.000	0.000
4	42.00	4.00	0.000	0.000	0.000
5	42.00	5.00	0.000	0.000	0.000
6	42.00	6.00	0.000	0.000	0.000
7	42.00	7.00	0.000	0.000	0.000
8	42.00	8.00	0.000	0.000	0.000
9	42.00	9.00	0.000	0.000	0.000
10	42.00	10.00	0.000	0.000	0.000
11	42.00	11.00	0.000	0.000	0.000
12	42.00	12.00	0.000	0.000	0.000

13	42.00	13.00	0.000	0.000	0.000
14	42.00	14.00	0.000	0.000	0.000
15	42.00	15.00	0.000	0.000	0.000
16	42.00	16.00	0.000	0.000	0.000
17	42.00	17.00	0.000	0.000	0.000
18	42.00	18.00	0.000	0.000	0.000
19	42.00	19.00	0.000	0.000	0.000
20	42.00	20.00	0.000	0.000	0.000
21	42.00	21.00	0.000	0.000	0.000
22	42.00	22.00	0.000	0.000	0.000
23	42.00	23.00	0.000	0.000	0.000
24	42.00	24.00	0.000	0.000	0.000
25	42.00	25.00	0.000	0.000	0.000
26	42.00	26.00	0.000	0.000	0.000
27	42.00	27.00	0.000	0.000	0.000
28	42.00	28.00	0.000	0.000	0.000
29	42.00	29.00	0.000	0.000	0.000
30	42.00	30.00	0.000	0.000	0.000
31	42.00	31.00	0.000	0.000	0.000
32	42.00	32.00	0.000	0.000	0.000
33	42.00	33.00	0.000	2910.251	2910.251
34	42.00	34.00	38.292	3226.895	3265.187
35	42.00	35.00	76.203	2028.125	2104.328
36	42.00	36.00	113.740	1545.660	1659.401
37	42.00	37.00	150.909	1274.692	1425.601
38	42.00	38.00	187.716	1097.679	1285.395
39	42.00	39.00	224.166	971.458	1195.624
40	42.00	40.00	260.265	876.132	1136.398
41	42.00	41.00	296.758	865.404	1162.162
42	42.00	42.00	333.103	853.883	1186.986
43	42.00	43.00	369.306	841.969	1211.275
44	42.00	44.00	405.373	829.908	1235.280
45	42.00	45.00	441.306	817.852	1259.158
46	42.00	46.00	477.109	805.900	1283.009
47	42.00	47.00	512.786	794.110	1306.896
48	42.00	48.00	548.340	782.521	1330.861
49	42.00	49.00	583.774	771.153	1354.927
50	42.00	50.00	619.090	760.020	1379.110
51	42.00	51.00	654.290	749.126	1403.416
52	42.00	52.00	689.377	738.470	1427.847
53	42.00	53.00	724.352	728.051	1452.404
54	42.00	54.00	759.218	717.864	1477.082
55	42.00	55.00	793.977	707.902	1501.879
56	42.00	56.00	828.630	698.159	1526.789
57	42.00	57.00	863.179	688.627	1551.805
58	42.00	58.00	897.625	679.298	1576.923
59	42.00	59.00	931.970	670.166	1602.137
60	42.00	60.00	966.216	661.223	1627.439
61	42.00	61.00	1000.364	652.461	1652.825
62	42.00	62.00	1034.414	643.874	1678.288
63	42.00	63.00	1068.370	635.454	1703.824
64	42.00	64.00	1102.231	627.195	1729.425
65	42.00	65.00	1135.998	619.090	1755.088
66	42.00	66.00	1169.674	611.133	1780.808
67	42.00	67.00	1203.259	603.319	1806.579
68	42.00	68.00	1236.755	595.643	1832.397
69	42.00	69.00	1270.161	588.097	1858.259
70	42.00	70.00	1303.480	580.679	1884.159

General Information:

Input file: Drive PDE_GANNETT FLEMING\FB-Deep\Drilled Shafts\BR-1 - DS.in
 Project number: 221126
 Job name: SR 997 Bridge Over Black Creek Canal (Bridge No. 870633)
 Engineer: Adnan Ismail, P.E.
 Units: English

Analysis Information:

Analysis Type: Drilled Shaft Analysis

Soil Information:

Boring date: 8/24/2021
 Boring number: BR-1
 Station number: Offset:
 Ground Elevation: 0.00(ft)
 Water table Elevation = -6.20(ft)

Rock side-friction is calculated using: McVay's method

ID	Depth (ft)	Elevation (ft)	SPT Blows (Blows/ft)	Unit Weight (pcf)	Soil Type
1	0.00	0.00	N/A	0.00	5- Cavity layer
2	1.00	-1.00	N/A	0.00	5- Cavity layer
3	3.00	-3.00	N/A	0.00	5- Cavity layer
4	5.00	-5.00	N/A	0.00	5- Cavity layer
5	7.00	-7.00	N/A	105.00	5- Cavity layer
6	9.00	-9.00	N/A	105.00	5- Cavity layer
7	12.00	-12.00	N/A	120.00	5- Cavity layer
8	15.00	-15.00	N/A	120.00	5- Cavity layer
9	18.00	-18.00	N/A	120.00	5- Cavity layer
10	21.00	-21.00	N/A	120.00	5- Cavity layer
11	24.00	-24.00	N/A	110.00	5- Cavity layer
12	27.00	-27.00	N/A	110.00	5- Cavity layer
13	30.00	-30.00	N/A	110.00	5- Cavity layer
14	33.00	-33.00	N/A	120.00	4- Lime Stone/Very shelly sand
15	36.00	-36.00	N/A	120.00	4- Lime Stone/Very shelly sand
16	39.00	-39.00	N/A	120.00	4- Lime Stone/Very shelly sand
17	42.00	-42.00	N/A	120.00	4- Lime Stone/Very shelly sand
18	45.00	-45.00	N/A	120.00	4- Lime Stone/Very shelly sand
19	48.00	-48.00	N/A	120.00	4- Lime Stone/Very shelly sand
20	51.00	-51.00	N/A	120.00	4- Lime Stone/Very shelly sand
21	54.00	-54.00	N/A	120.00	4- Lime Stone/Very shelly sand
22	57.00	-57.00	N/A	120.00	4- Lime Stone/Very shelly sand
23	60.00	-60.00	N/A	120.00	4- Lime Stone/Very shelly sand
24	63.00	-63.00	N/A	120.00	4- Lime Stone/Very shelly sand
25	66.00	-66.00	N/A	120.00	4- Lime Stone/Very shelly sand
26	69.00	-69.00	N/A	120.00	4- Lime Stone/Very shelly sand
27	72.00	-72.00	N/A	120.00	4- Lime Stone/Very shelly sand
28	75.00	-75.00	N/A	120.00	4- Lime Stone/Very shelly sand
29	77.00	-77.00	N/A	120.00	4- Lime Stone/Very shelly sand
30	79.00	-79.00	N/A	120.00	4- Lime Stone/Very shelly sand

ID	Cu-DIR (tsf)	qu (tsf)	qt (tsf)	Em (ksi)	qb (tsf)
1	N/A	N/A	N/A	N/A	N/A
2	N/A	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A	N/A
6	N/A	N/A	N/A	N/A	N/A
7	N/A	N/A	N/A	N/A	N/A
8	N/A	N/A	N/A	N/A	N/A
9	N/A	N/A	N/A	N/A	N/A
10	N/A	N/A	N/A	N/A	N/A
11	N/A	N/A	N/A	N/A	N/A
12	N/A	N/A	N/A	N/A	N/A

13	N/A	N/A	N/A	N/A	N/A
14	N/A	49.00	1.00	78.26	24.50
15	N/A	49.00	1.00	78.26	24.50
16	N/A	49.00	1.00	78.26	24.50
17	N/A	49.00	1.00	78.26	24.50
18	N/A	49.00	1.00	78.26	24.50
19	N/A	49.00	1.00	78.26	24.50
20	N/A	49.00	1.00	78.26	24.50
21	N/A	49.00	1.00	78.26	24.50
22	N/A	49.00	1.00	78.26	24.50
23	N/A	49.00	1.00	78.26	24.50
24	N/A	49.00	1.00	78.26	24.50
25	N/A	49.00	1.00	78.26	24.50
26	N/A	49.00	1.00	78.26	24.50
27	N/A	49.00	1.00	78.26	24.50
28	N/A	49.00	1.00	78.26	24.50
29	N/A	49.00	1.00	78.26	24.50
30	N/A	49.00	1.00	78.26	24.50

ID RQD F.M. S.R.I. Rock Recovery

1	N/A	N/A	N/A
2	N/A	N/A	N/A
3	N/A	N/A	N/A
4	N/A	N/A	N/A
5	N/A	N/A	N/A
6	N/A	N/A	N/A
7	N/A	N/A	N/A
8	N/A	N/A	N/A
9	N/A	N/A	N/A
10	N/A	N/A	N/A
11	N/A	N/A	N/A
12	N/A	N/A	N/A
13	N/A	N/A	N/A
14	1.00	ROUGH	1.000
15	1.00	ROUGH	1.000
16	1.00	ROUGH	1.000
17	1.00	ROUGH	1.000
18	1.00	ROUGH	1.000
19	1.00	ROUGH	1.000
20	1.00	ROUGH	1.000
21	1.00	ROUGH	1.000
22	1.00	ROUGH	1.000
23	1.00	ROUGH	1.000
24	1.00	ROUGH	1.000
25	1.00	ROUGH	1.000
26	1.00	ROUGH	1.000
27	1.00	ROUGH	1.000
28	1.00	ROUGH	1.000
29	1.00	ROUGH	1.000
30	1.00	ROUGH	1.000

Drilled Shaft Data:

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Unit weight of concrete = 150.00(pcf), Concrete Slump = 9.00(in)
Modulus of Elasticity of concrete = 4030.00(ksi)

Shaft Geometry:

ID	Length (ft)	Tip Elev. (ft)	Case Len. (ft)	Diameter (in)	Base Diam. (in)	Bell Len. (ft)
71	1.00	-1.00	5.00	48.00	48.00	0.00
72	2.00	-2.00	5.00	48.00	48.00	0.00
73	3.00	-3.00	5.00	48.00	48.00	0.00
74	4.00	-4.00	5.00	48.00	48.00	0.00
75	5.00	-5.00	5.00	48.00	48.00	0.00
76	6.00	-6.00	5.00	48.00	48.00	0.00
77	7.00	-7.00	5.00	48.00	48.00	0.00
78	8.00	-8.00	5.00	48.00	48.00	0.00
79	9.00	-9.00	5.00	48.00	48.00	0.00
80	10.00	-10.00	5.00	48.00	48.00	0.00
81	11.00	-11.00	5.00	48.00	48.00	0.00
82	12.00	-12.00	5.00	48.00	48.00	0.00
83	13.00	-13.00	5.00	48.00	48.00	0.00
84	14.00	-14.00	5.00	48.00	48.00	0.00
85	15.00	-15.00	5.00	48.00	48.00	0.00

86	16.00	-16.00	5.00	48.00	48.00	0.00
87	17.00	-17.00	5.00	48.00	48.00	0.00
88	18.00	-18.00	5.00	48.00	48.00	0.00
89	19.00	-19.00	5.00	48.00	48.00	0.00
90	20.00	-20.00	5.00	48.00	48.00	0.00
91	21.00	-21.00	5.00	48.00	48.00	0.00
92	22.00	-22.00	5.00	48.00	48.00	0.00
93	23.00	-23.00	5.00	48.00	48.00	0.00
94	24.00	-24.00	5.00	48.00	48.00	0.00
95	25.00	-25.00	5.00	48.00	48.00	0.00
96	26.00	-26.00	5.00	48.00	48.00	0.00
97	27.00	-27.00	5.00	48.00	48.00	0.00
98	28.00	-28.00	5.00	48.00	48.00	0.00
99	29.00	-29.00	5.00	48.00	48.00	0.00
100	30.00	-30.00	5.00	48.00	48.00	0.00
101	31.00	-31.00	5.00	48.00	48.00	0.00
102	32.00	-32.00	5.00	48.00	48.00	0.00
103	33.00	-33.00	5.00	48.00	48.00	0.00
104	34.00	-34.00	5.00	48.00	48.00	0.00
105	35.00	-35.00	5.00	48.00	48.00	0.00
106	36.00	-36.00	5.00	48.00	48.00	0.00
107	37.00	-37.00	5.00	48.00	48.00	0.00
108	38.00	-38.00	5.00	48.00	48.00	0.00
109	39.00	-39.00	5.00	48.00	48.00	0.00
110	40.00	-40.00	5.00	48.00	48.00	0.00
111	41.00	-41.00	5.00	48.00	48.00	0.00
112	42.00	-42.00	5.00	48.00	48.00	0.00
113	43.00	-43.00	5.00	48.00	48.00	0.00
114	44.00	-44.00	5.00	48.00	48.00	0.00
115	45.00	-45.00	5.00	48.00	48.00	0.00
116	46.00	-46.00	5.00	48.00	48.00	0.00
117	47.00	-47.00	5.00	48.00	48.00	0.00
118	48.00	-48.00	5.00	48.00	48.00	0.00
119	49.00	-49.00	5.00	48.00	48.00	0.00
120	50.00	-50.00	5.00	48.00	48.00	0.00
121	51.00	-51.00	5.00	48.00	48.00	0.00
122	52.00	-52.00	5.00	48.00	48.00	0.00
123	53.00	-53.00	5.00	48.00	48.00	0.00
124	54.00	-54.00	5.00	48.00	48.00	0.00
125	55.00	-55.00	5.00	48.00	48.00	0.00
126	56.00	-56.00	5.00	48.00	48.00	0.00
127	57.00	-57.00	5.00	48.00	48.00	0.00
128	58.00	-58.00	5.00	48.00	48.00	0.00
129	59.00	-59.00	5.00	48.00	48.00	0.00
130	60.00	-60.00	5.00	48.00	48.00	0.00
131	61.00	-61.00	5.00	48.00	48.00	0.00
132	62.00	-62.00	5.00	48.00	48.00	0.00
133	63.00	-63.00	5.00	48.00	48.00	0.00
134	64.00	-64.00	5.00	48.00	48.00	0.00
135	65.00	-65.00	5.00	48.00	48.00	0.00
136	66.00	-66.00	5.00	48.00	48.00	0.00
137	67.00	-67.00	5.00	48.00	48.00	0.00
138	68.00	-68.00	5.00	48.00	48.00	0.00
139	69.00	-69.00	5.00	48.00	48.00	0.00
140	70.00	-70.00	5.00	48.00	48.00	0.00

Drilled Shaft Capacity (sorted by shaft diameter):

=====
Strength reduction factors: Skin-friction = 1.00, End-bearing = 0.00

ID	Diameter (in)	Length (ft)	Skin Fric. (tons)	End Bearing (tons)	Capacity (tons)
1	48.00	1.00	0.000	0.000	0.000
2	48.00	2.00	0.000	0.000	0.000
3	48.00	3.00	0.000	0.000	0.000
4	48.00	4.00	0.000	0.000	0.000
5	48.00	5.00	0.000	0.000	0.000
6	48.00	6.00	0.000	0.000	0.000
7	48.00	7.00	0.000	0.000	0.000
8	48.00	8.00	0.000	0.000	0.000
9	48.00	9.00	0.000	0.000	0.000
10	48.00	10.00	0.000	0.000	0.000
11	48.00	11.00	0.000	0.000	0.000
12	48.00	12.00	0.000	0.000	0.000
13	48.00	13.00	0.000	0.000	0.000
14	48.00	14.00	0.000	0.000	0.000
15	48.00	15.00	0.000	0.000	0.000

16	48.00	16.00	0.000	0.000	0.000
17	48.00	17.00	0.000	0.000	0.000
18	48.00	18.00	0.000	0.000	0.000
19	48.00	19.00	0.000	0.000	0.000
20	48.00	20.00	0.000	0.000	0.000
21	48.00	21.00	0.000	0.000	0.000
22	48.00	22.00	0.000	0.000	0.000
23	48.00	23.00	0.000	0.000	0.000
24	48.00	24.00	0.000	0.000	0.000
25	48.00	25.00	0.000	0.000	0.000
26	48.00	26.00	0.000	0.000	0.000
27	48.00	27.00	0.000	0.000	0.000
28	48.00	28.00	0.000	0.000	0.000
29	48.00	29.00	0.000	0.000	0.000
30	48.00	30.00	0.000	0.000	0.000
31	48.00	31.00	0.000	0.000	0.000
32	48.00	32.00	0.000	0.000	0.000
33	48.00	33.00	0.000	0.000	0.000
34	48.00	34.00	43.982	0.000	43.982
35	48.00	35.00	87.965	0.000	87.965
36	48.00	36.00	131.947	0.000	131.947
37	48.00	37.00	175.929	0.000	175.929
38	48.00	38.00	219.911	0.000	219.911
39	48.00	39.00	263.894	0.000	263.894
40	48.00	40.00	307.876	0.000	307.876
41	48.00	41.00	351.858	0.000	351.858
42	48.00	42.00	395.841	0.000	395.841
43	48.00	43.00	439.823	0.000	439.823
44	48.00	44.00	483.805	0.000	483.805
45	48.00	45.00	527.788	0.000	527.788
46	48.00	46.00	571.770	0.000	571.770
47	48.00	47.00	615.752	0.000	615.752
48	48.00	48.00	659.734	0.000	659.734
49	48.00	49.00	703.717	0.000	703.717
50	48.00	50.00	747.699	0.000	747.699
51	48.00	51.00	791.681	0.000	791.681
52	48.00	52.00	835.664	0.000	835.664
53	48.00	53.00	879.646	0.000	879.646
54	48.00	54.00	923.628	0.000	923.628
55	48.00	55.00	967.611	0.000	967.611
56	48.00	56.00	1011.593	0.000	1011.593
57	48.00	57.00	1055.575	0.000	1055.575
58	48.00	58.00	1099.557	0.000	1099.557
59	48.00	59.00	1143.540	0.000	1143.540
60	48.00	60.00	1187.522	0.000	1187.522
61	48.00	61.00	1231.504	0.000	1231.504
62	48.00	62.00	1275.487	0.000	1275.487
63	48.00	63.00	1319.469	0.000	1319.469
64	48.00	64.00	1363.451	0.000	1363.451
65	48.00	65.00	1407.434	0.000	1407.434
66	48.00	66.00	1451.416	0.000	1451.416
67	48.00	67.00	1495.398	0.000	1495.398
68	48.00	68.00	1539.380	0.000	1539.380
69	48.00	69.00	1583.363	0.000	1583.363
70	48.00	70.00	1627.345	0.000	1627.345

Drilled Shaft Capacity at User-Defined Settlement (sorted by shaft diameter):

***** Capacity is NOT modified by the strength reduction factors *****

User-Defined Settlement = 5.00%

ID	Diameter (in)	Length (ft)	Skin Fric. (tons)	End Bearing (tons)	Capacity (tons)
1	48.00	1.00	0.000	0.000	0.000
2	48.00	2.00	0.000	0.000	0.000
3	48.00	3.00	0.000	0.000	0.000
4	48.00	4.00	0.000	0.000	0.000
5	48.00	5.00	0.000	0.000	0.000
6	48.00	6.00	0.000	0.000	0.000
7	48.00	7.00	0.000	0.000	0.000
8	48.00	8.00	0.000	0.000	0.000
9	48.00	9.00	0.000	0.000	0.000
10	48.00	10.00	0.000	0.000	0.000
11	48.00	11.00	0.000	0.000	0.000
12	48.00	12.00	0.000	0.000	0.000

13	48.00	13.00	0.000	0.000	0.000
14	48.00	14.00	0.000	0.000	0.000
15	48.00	15.00	0.000	0.000	0.000
16	48.00	16.00	0.000	0.000	0.000
17	48.00	17.00	0.000	0.000	0.000
18	48.00	18.00	0.000	0.000	0.000
19	48.00	19.00	0.000	0.000	0.000
20	48.00	20.00	0.000	0.000	0.000
21	48.00	21.00	0.000	0.000	0.000
22	48.00	22.00	0.000	0.000	0.000
23	48.00	23.00	0.000	0.000	0.000
24	48.00	24.00	0.000	0.000	0.000
25	48.00	25.00	0.000	0.000	0.000
26	48.00	26.00	0.000	0.000	0.000
27	48.00	27.00	0.000	0.000	0.000
28	48.00	28.00	0.000	0.000	0.000
29	48.00	29.00	0.000	0.000	0.000
30	48.00	30.00	0.000	0.000	0.000
31	48.00	31.00	0.000	0.000	0.000
32	48.00	32.00	0.000	0.000	0.000
33	48.00	33.00	0.000	3801.144	3801.144
34	48.00	34.00	43.790	4609.176	4652.966
35	48.00	35.00	87.198	2896.898	2984.096
36	48.00	36.00	130.231	2207.764	2337.994
37	48.00	37.00	172.893	1820.722	1993.615
38	48.00	38.00	215.190	1567.884	1783.074
39	48.00	39.00	257.128	1387.594	1644.722
40	48.00	40.00	298.711	1251.435	1550.146
41	48.00	41.00	339.946	1144.336	1484.282
42	48.00	42.00	381.665	1132.146	1513.811
43	48.00	43.00	423.237	1119.102	1542.339
44	48.00	44.00	464.667	1105.586	1570.253
45	48.00	45.00	505.958	1091.847	1597.805
46	48.00	46.00	547.115	1078.047	1625.162
47	48.00	47.00	588.141	1064.296	1652.437
48	48.00	48.00	629.039	1050.666	1679.705
49	48.00	49.00	669.812	1037.205	1707.017
50	48.00	50.00	710.463	1023.944	1734.407
51	48.00	51.00	750.994	1010.904	1761.898
52	48.00	52.00	791.407	998.096	1789.503
53	48.00	53.00	831.704	985.526	1817.230
54	48.00	54.00	871.889	973.195	1845.083
55	48.00	55.00	911.961	961.102	1873.063
56	48.00	56.00	951.924	949.245	1901.168
57	48.00	57.00	991.778	937.618	1929.397
58	48.00	58.00	1031.527	926.217	1957.744
59	48.00	59.00	1071.170	915.036	1986.206
60	48.00	60.00	1110.710	904.068	2014.777
61	48.00	61.00	1150.148	893.306	2043.454
62	48.00	62.00	1189.485	882.745	2072.229
63	48.00	63.00	1228.723	872.377	2101.099
64	48.00	64.00	1267.863	862.195	2130.058
65	48.00	65.00	1306.906	852.195	2159.100
66	48.00	66.00	1345.853	842.368	2188.221
67	48.00	67.00	1384.706	832.710	2217.416
68	48.00	68.00	1423.466	823.214	2246.680
69	48.00	69.00	1462.133	813.875	2276.009
70	48.00	70.00	1500.710	804.688	2305.397

General Information:

Input file: Drive PDE_GANNETT FLEMING\FB-Deep\Drilled Shafts\BR-1 - DS.in
 Project number: 221126
 Job name: SR 997 Bridge Over Black Creek Canal (Bridge No. 870633)
 Engineer: Adnan Ismail, P.E.
 Units: English

Analysis Information:

Analysis Type: Drilled Shaft Analysis

Soil Information:

Boring date: 8/24/2021
 Boring number: BR-1
 Station number: Offset:
 Ground Elevation: 0.00(ft)
 Water table Elevation = -6.20(ft)

Rock side-friction is calculated using: McVay's method

ID	Depth (ft)	Elevation (ft)	SPT Blows (Blows/ft)	Unit Weight (pcf)	Soil Type
1	0.00	0.00	N/A	0.00	5- Cavity layer
2	1.00	-1.00	N/A	0.00	5- Cavity layer
3	3.00	-3.00	N/A	0.00	5- Cavity layer
4	5.00	-5.00	N/A	0.00	5- Cavity layer
5	7.00	-7.00	N/A	105.00	5- Cavity layer
6	9.00	-9.00	N/A	105.00	5- Cavity layer
7	12.00	-12.00	N/A	120.00	5- Cavity layer
8	15.00	-15.00	N/A	120.00	5- Cavity layer
9	18.00	-18.00	N/A	120.00	5- Cavity layer
10	21.00	-21.00	N/A	120.00	5- Cavity layer
11	24.00	-24.00	N/A	110.00	5- Cavity layer
12	27.00	-27.00	N/A	110.00	5- Cavity layer
13	30.00	-30.00	N/A	110.00	5- Cavity layer
14	33.00	-33.00	N/A	120.00	4- Lime Stone/Very shelly sand
15	36.00	-36.00	N/A	120.00	4- Lime Stone/Very shelly sand
16	39.00	-39.00	N/A	120.00	4- Lime Stone/Very shelly sand
17	42.00	-42.00	N/A	120.00	4- Lime Stone/Very shelly sand
18	45.00	-45.00	N/A	120.00	4- Lime Stone/Very shelly sand
19	48.00	-48.00	N/A	120.00	4- Lime Stone/Very shelly sand
20	51.00	-51.00	N/A	120.00	4- Lime Stone/Very shelly sand
21	54.00	-54.00	N/A	120.00	4- Lime Stone/Very shelly sand
22	57.00	-57.00	N/A	120.00	4- Lime Stone/Very shelly sand
23	60.00	-60.00	N/A	120.00	4- Lime Stone/Very shelly sand
24	63.00	-63.00	N/A	120.00	4- Lime Stone/Very shelly sand
25	66.00	-66.00	N/A	120.00	4- Lime Stone/Very shelly sand
26	69.00	-69.00	N/A	120.00	4- Lime Stone/Very shelly sand
27	72.00	-72.00	N/A	120.00	4- Lime Stone/Very shelly sand
28	75.00	-75.00	N/A	120.00	4- Lime Stone/Very shelly sand
29	77.00	-77.00	N/A	120.00	4- Lime Stone/Very shelly sand
30	79.00	-79.00	N/A	120.00	4- Lime Stone/Very shelly sand

ID	Cu-DIR (tsf)	qu (tsf)	qt (tsf)	Em (ksi)	qb (tsf)
1	N/A	N/A	N/A	N/A	N/A
2	N/A	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A	N/A
6	N/A	N/A	N/A	N/A	N/A
7	N/A	N/A	N/A	N/A	N/A
8	N/A	N/A	N/A	N/A	N/A
9	N/A	N/A	N/A	N/A	N/A
10	N/A	N/A	N/A	N/A	N/A
11	N/A	N/A	N/A	N/A	N/A
12	N/A	N/A	N/A	N/A	N/A

13	N/A	N/A	N/A	N/A	N/A
14	N/A	49.00	1.00	78.26	24.50
15	N/A	49.00	1.00	78.26	24.50
16	N/A	49.00	1.00	78.26	24.50
17	N/A	49.00	1.00	78.26	24.50
18	N/A	49.00	1.00	78.26	24.50
19	N/A	49.00	1.00	78.26	24.50
20	N/A	49.00	1.00	78.26	24.50
21	N/A	49.00	1.00	78.26	24.50
22	N/A	49.00	1.00	78.26	24.50
23	N/A	49.00	1.00	78.26	24.50
24	N/A	49.00	1.00	78.26	24.50
25	N/A	49.00	1.00	78.26	24.50
26	N/A	49.00	1.00	78.26	24.50
27	N/A	49.00	1.00	78.26	24.50
28	N/A	49.00	1.00	78.26	24.50
29	N/A	49.00	1.00	78.26	24.50
30	N/A	49.00	1.00	78.26	24.50

ID RQD F.M. S.R.I. Rock Recovery

1	N/A	N/A	N/A
2	N/A	N/A	N/A
3	N/A	N/A	N/A
4	N/A	N/A	N/A
5	N/A	N/A	N/A
6	N/A	N/A	N/A
7	N/A	N/A	N/A
8	N/A	N/A	N/A
9	N/A	N/A	N/A
10	N/A	N/A	N/A
11	N/A	N/A	N/A
12	N/A	N/A	N/A
13	N/A	N/A	N/A
14	1.00	ROUGH	1.000
15	1.00	ROUGH	1.000
16	1.00	ROUGH	1.000
17	1.00	ROUGH	1.000
18	1.00	ROUGH	1.000
19	1.00	ROUGH	1.000
20	1.00	ROUGH	1.000
21	1.00	ROUGH	1.000
22	1.00	ROUGH	1.000
23	1.00	ROUGH	1.000
24	1.00	ROUGH	1.000
25	1.00	ROUGH	1.000
26	1.00	ROUGH	1.000
27	1.00	ROUGH	1.000
28	1.00	ROUGH	1.000
29	1.00	ROUGH	1.000
30	1.00	ROUGH	1.000

Drilled Shaft Data:

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Unit weight of concrete = 150.00(pcf), Concrete Slump = 9.00(in)
Modulus of Elasticity of concrete = 4030.00(ksi)

Shaft Geometry:

ID	Length (ft)	Tip Elev. (ft)	Case Len. (ft)	Diameter (in)	Base Diam. (in)	Bell Len. (ft)
141	1.00	-1.00	5.00	54.00	54.00	0.00
142	2.00	-2.00	5.00	54.00	54.00	0.00
143	3.00	-3.00	5.00	54.00	54.00	0.00
144	4.00	-4.00	5.00	54.00	54.00	0.00
145	5.00	-5.00	5.00	54.00	54.00	0.00
146	6.00	-6.00	5.00	54.00	54.00	0.00
147	7.00	-7.00	5.00	54.00	54.00	0.00
148	8.00	-8.00	5.00	54.00	54.00	0.00
149	9.00	-9.00	5.00	54.00	54.00	0.00
150	10.00	-10.00	5.00	54.00	54.00	0.00
151	11.00	-11.00	5.00	54.00	54.00	0.00
152	12.00	-12.00	5.00	54.00	54.00	0.00
153	13.00	-13.00	5.00	54.00	54.00	0.00
154	14.00	-14.00	5.00	54.00	54.00	0.00
155	15.00	-15.00	5.00	54.00	54.00	0.00

156	16.00	-16.00	5.00	54.00	54.00	0.00
157	17.00	-17.00	5.00	54.00	54.00	0.00
158	18.00	-18.00	5.00	54.00	54.00	0.00
159	19.00	-19.00	5.00	54.00	54.00	0.00
160	20.00	-20.00	5.00	54.00	54.00	0.00
161	21.00	-21.00	5.00	54.00	54.00	0.00
162	22.00	-22.00	5.00	54.00	54.00	0.00
163	23.00	-23.00	5.00	54.00	54.00	0.00
164	24.00	-24.00	5.00	54.00	54.00	0.00
165	25.00	-25.00	5.00	54.00	54.00	0.00
166	26.00	-26.00	5.00	54.00	54.00	0.00
167	27.00	-27.00	5.00	54.00	54.00	0.00
168	28.00	-28.00	5.00	54.00	54.00	0.00
169	29.00	-29.00	5.00	54.00	54.00	0.00
170	30.00	-30.00	5.00	54.00	54.00	0.00
171	31.00	-31.00	5.00	54.00	54.00	0.00
172	32.00	-32.00	5.00	54.00	54.00	0.00
173	33.00	-33.00	5.00	54.00	54.00	0.00
174	34.00	-34.00	5.00	54.00	54.00	0.00
175	35.00	-35.00	5.00	54.00	54.00	0.00
176	36.00	-36.00	5.00	54.00	54.00	0.00
177	37.00	-37.00	5.00	54.00	54.00	0.00
178	38.00	-38.00	5.00	54.00	54.00	0.00
179	39.00	-39.00	5.00	54.00	54.00	0.00
180	40.00	-40.00	5.00	54.00	54.00	0.00
181	41.00	-41.00	5.00	54.00	54.00	0.00
182	42.00	-42.00	5.00	54.00	54.00	0.00
183	43.00	-43.00	5.00	54.00	54.00	0.00
184	44.00	-44.00	5.00	54.00	54.00	0.00
185	45.00	-45.00	5.00	54.00	54.00	0.00
186	46.00	-46.00	5.00	54.00	54.00	0.00
187	47.00	-47.00	5.00	54.00	54.00	0.00
188	48.00	-48.00	5.00	54.00	54.00	0.00
189	49.00	-49.00	5.00	54.00	54.00	0.00
190	50.00	-50.00	5.00	54.00	54.00	0.00
191	51.00	-51.00	5.00	54.00	54.00	0.00
192	52.00	-52.00	5.00	54.00	54.00	0.00
193	53.00	-53.00	5.00	54.00	54.00	0.00
194	54.00	-54.00	5.00	54.00	54.00	0.00
195	55.00	-55.00	5.00	54.00	54.00	0.00
196	56.00	-56.00	5.00	54.00	54.00	0.00
197	57.00	-57.00	5.00	54.00	54.00	0.00
198	58.00	-58.00	5.00	54.00	54.00	0.00
199	59.00	-59.00	5.00	54.00	54.00	0.00
200	60.00	-60.00	5.00	54.00	54.00	0.00
201	61.00	-61.00	5.00	54.00	54.00	0.00
202	62.00	-62.00	5.00	54.00	54.00	0.00
203	63.00	-63.00	5.00	54.00	54.00	0.00
204	64.00	-64.00	5.00	54.00	54.00	0.00
205	65.00	-65.00	5.00	54.00	54.00	0.00
206	66.00	-66.00	5.00	54.00	54.00	0.00
207	67.00	-67.00	5.00	54.00	54.00	0.00
208	68.00	-68.00	5.00	54.00	54.00	0.00
209	69.00	-69.00	5.00	54.00	54.00	0.00
210	70.00	-70.00	5.00	54.00	54.00	0.00

Drilled Shaft Capacity (sorted by shaft diameter):

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Strength reduction factors: Skin-friction = 1.00, End-bearing = 0.00

ID	Diameter (in)	Length (ft)	Skin Fric. (tons)	End Bearing (tons)	Capacity (tons)
1	54.00	1.00	0.000	0.000	0.000
2	54.00	2.00	0.000	0.000	0.000
3	54.00	3.00	0.000	0.000	0.000
4	54.00	4.00	0.000	0.000	0.000
5	54.00	5.00	0.000	0.000	0.000
6	54.00	6.00	0.000	0.000	0.000
7	54.00	7.00	0.000	0.000	0.000
8	54.00	8.00	0.000	0.000	0.000
9	54.00	9.00	0.000	0.000	0.000
10	54.00	10.00	0.000	0.000	0.000
11	54.00	11.00	0.000	0.000	0.000
12	54.00	12.00	0.000	0.000	0.000
13	54.00	13.00	0.000	0.000	0.000
14	54.00	14.00	0.000	0.000	0.000
15	54.00	15.00	0.000	0.000	0.000

16	54.00	16.00	0.000	0.000	0.000
17	54.00	17.00	0.000	0.000	0.000
18	54.00	18.00	0.000	0.000	0.000
19	54.00	19.00	0.000	0.000	0.000
20	54.00	20.00	0.000	0.000	0.000
21	54.00	21.00	0.000	0.000	0.000
22	54.00	22.00	0.000	0.000	0.000
23	54.00	23.00	0.000	0.000	0.000
24	54.00	24.00	0.000	0.000	0.000
25	54.00	25.00	0.000	0.000	0.000
26	54.00	26.00	0.000	0.000	0.000
27	54.00	27.00	0.000	0.000	0.000
28	54.00	28.00	0.000	0.000	0.000
29	54.00	29.00	0.000	0.000	0.000
30	54.00	30.00	0.000	0.000	0.000
31	54.00	31.00	0.000	0.000	0.000
32	54.00	32.00	0.000	0.000	0.000
33	54.00	33.00	0.000	0.000	0.000
34	54.00	34.00	49.480	0.000	49.480
35	54.00	35.00	98.960	0.000	98.960
36	54.00	36.00	148.440	0.000	148.440
37	54.00	37.00	197.920	0.000	197.920
38	54.00	38.00	247.400	0.000	247.400
39	54.00	39.00	296.881	0.000	296.881
40	54.00	40.00	346.361	0.000	346.361
41	54.00	41.00	395.841	0.000	395.841
42	54.00	42.00	445.321	0.000	445.321
43	54.00	43.00	494.801	0.000	494.801
44	54.00	44.00	544.281	0.000	544.281
45	54.00	45.00	593.761	0.000	593.761
46	54.00	46.00	643.241	0.000	643.241
47	54.00	47.00	692.721	0.000	692.721
48	54.00	48.00	742.201	0.000	742.201
49	54.00	49.00	791.681	0.000	791.681
50	54.00	50.00	841.161	0.000	841.161
51	54.00	51.00	890.642	0.000	890.642
52	54.00	52.00	940.122	0.000	940.122
53	54.00	53.00	989.602	0.000	989.602
54	54.00	54.00	1039.082	0.000	1039.082
55	54.00	55.00	1088.562	0.000	1088.562
56	54.00	56.00	1138.042	0.000	1138.042
57	54.00	57.00	1187.522	0.000	1187.522
58	54.00	58.00	1237.002	0.000	1237.002
59	54.00	59.00	1286.482	0.000	1286.482
60	54.00	60.00	1335.962	0.000	1335.962
61	54.00	61.00	1385.442	0.000	1385.442
62	54.00	62.00	1434.922	0.000	1434.922
63	54.00	63.00	1484.403	0.000	1484.403
64	54.00	64.00	1533.883	0.000	1533.883
65	54.00	65.00	1583.363	0.000	1583.363
66	54.00	66.00	1632.843	0.000	1632.843
67	54.00	67.00	1682.323	0.000	1682.323
68	54.00	68.00	1731.803	0.000	1731.803
69	54.00	69.00	1781.283	0.000	1781.283
70	54.00	70.00	1830.763	0.000	1830.763

Drilled Shaft Capacity at User-Defined Settlement (sorted by shaft diameter):

***** Capacity is NOT modified by the strength reduction factors *****

User-Defined Settlement = 5.00%

ID	Diameter (in)	Length (ft)	Skin Fric. (tons)	End Bearing (tons)	Capacity (tons)
1	54.00	1.00	0.000	0.000	0.000
2	54.00	2.00	0.000	0.000	0.000
3	54.00	3.00	0.000	0.000	0.000
4	54.00	4.00	0.000	0.000	0.000
5	54.00	5.00	0.000	0.000	0.000
6	54.00	6.00	0.000	0.000	0.000
7	54.00	7.00	0.000	0.000	0.000
8	54.00	8.00	0.000	0.000	0.000
9	54.00	9.00	0.000	0.000	0.000
10	54.00	10.00	0.000	0.000	0.000
11	54.00	11.00	0.000	0.000	0.000
12	54.00	12.00	0.000	0.000	0.000

13	54.00	13.00	0.000	0.000	0.000
14	54.00	14.00	0.000	0.000	0.000
15	54.00	15.00	0.000	0.000	0.000
16	54.00	16.00	0.000	0.000	0.000
17	54.00	17.00	0.000	0.000	0.000
18	54.00	18.00	0.000	0.000	0.000
19	54.00	19.00	0.000	0.000	0.000
20	54.00	20.00	0.000	0.000	0.000
21	54.00	21.00	0.000	0.000	0.000
22	54.00	22.00	0.000	0.000	0.000
23	54.00	23.00	0.000	0.000	0.000
24	54.00	24.00	0.000	0.000	0.000
25	54.00	25.00	0.000	0.000	0.000
26	54.00	26.00	0.000	0.000	0.000
27	54.00	27.00	0.000	0.000	0.000
28	54.00	28.00	0.000	0.000	0.000
29	54.00	29.00	0.000	0.000	0.000
30	54.00	30.00	0.000	0.000	0.000
31	54.00	31.00	0.000	0.000	0.000
32	54.00	32.00	0.000	0.000	0.000
33	54.00	33.00	0.000	4810.823	4810.823
34	54.00	34.00	49.287	6312.487	6361.775
35	54.00	35.00	98.193	3967.441	4065.633
36	54.00	36.00	146.721	3023.638	3170.360
37	54.00	37.00	194.878	2493.566	2688.444
38	54.00	38.00	242.668	2147.292	2389.960
39	54.00	39.00	290.095	1900.377	2190.472
40	54.00	40.00	337.165	1713.900	2051.065
41	54.00	41.00	383.883	1567.223	1951.106
42	54.00	42.00	430.254	1448.300	1878.554
43	54.00	43.00	477.201	1434.651	1911.852
44	54.00	44.00	524.001	1420.097	1944.098
45	54.00	45.00	570.658	1405.004	1975.662
46	54.00	46.00	617.176	1389.617	2006.793
47	54.00	47.00	663.558	1374.107	2037.665
48	54.00	48.00	709.809	1358.590	2068.399
49	54.00	49.00	755.930	1343.150	2099.080
50	54.00	50.00	801.925	1327.845	2129.770
51	54.00	51.00	847.796	1312.712	2160.508
52	54.00	52.00	893.545	1297.781	2191.326
53	54.00	53.00	939.175	1283.068	2222.244
54	54.00	54.00	984.688	1268.586	2253.274
55	54.00	55.00	1030.086	1254.339	2284.425
56	54.00	56.00	1075.370	1240.332	2315.702
57	54.00	57.00	1120.542	1226.564	2347.107
58	54.00	58.00	1165.605	1213.034	2378.639
59	54.00	59.00	1210.559	1199.738	2410.297
60	54.00	60.00	1255.406	1186.673	2442.079
61	54.00	61.00	1300.147	1173.833	2473.980
62	54.00	62.00	1344.785	1161.213	2505.998
63	54.00	63.00	1389.320	1148.808	2538.128
64	54.00	64.00	1433.753	1136.612	2570.366
65	54.00	65.00	1478.087	1124.619	2602.706
66	54.00	66.00	1522.321	1112.823	2635.144
67	54.00	67.00	1566.458	1101.218	2667.676
68	54.00	68.00	1610.499	1089.798	2700.297
69	54.00	69.00	1654.444	1078.559	2733.002
70	54.00	70.00	1698.294	1067.493	2765.787

General Information:

Input file: Drive PDE_GANNETT FLEMING\FB-Deep\Drilled Shafts\BR-1 - DS.in
 Project number: 221126
 Job name: SR 997 Bridge Over Black Creek Canal (Bridge No. 870633)
 Engineer: Adnan Ismail, P.E.
 Units: English

Analysis Information:

Analysis Type: Drilled Shaft Analysis

Soil Information:

Boring date: 8/24/2021
 Boring number: BR-1
 Station number: Offset:
 Ground Elevation: 0.00(ft)
 Water table Elevation = -6.20(ft)

Rock side-friction is calculated using: McVay's method

ID	Depth (ft)	Elevation (ft)	SPT Blows (Blows/ft)	Unit Weight (pcf)	Soil Type
1	0.00	0.00	N/A	0.00	5- Cavity layer
2	1.00	-1.00	N/A	0.00	5- Cavity layer
3	3.00	-3.00	N/A	0.00	5- Cavity layer
4	5.00	-5.00	N/A	0.00	5- Cavity layer
5	7.00	-7.00	N/A	105.00	5- Cavity layer
6	9.00	-9.00	N/A	105.00	5- Cavity layer
7	12.00	-12.00	N/A	120.00	5- Cavity layer
8	15.00	-15.00	N/A	120.00	5- Cavity layer
9	18.00	-18.00	N/A	120.00	5- Cavity layer
10	21.00	-21.00	N/A	120.00	5- Cavity layer
11	24.00	-24.00	N/A	110.00	5- Cavity layer
12	27.00	-27.00	N/A	110.00	5- Cavity layer
13	30.00	-30.00	N/A	110.00	5- Cavity layer
14	33.00	-33.00	N/A	120.00	4- Lime Stone/Very shelly sand
15	36.00	-36.00	N/A	120.00	4- Lime Stone/Very shelly sand
16	39.00	-39.00	N/A	120.00	4- Lime Stone/Very shelly sand
17	42.00	-42.00	N/A	120.00	4- Lime Stone/Very shelly sand
18	45.00	-45.00	N/A	120.00	4- Lime Stone/Very shelly sand
19	48.00	-48.00	N/A	120.00	4- Lime Stone/Very shelly sand
20	51.00	-51.00	N/A	120.00	4- Lime Stone/Very shelly sand
21	54.00	-54.00	N/A	120.00	4- Lime Stone/Very shelly sand
22	57.00	-57.00	N/A	120.00	4- Lime Stone/Very shelly sand
23	60.00	-60.00	N/A	120.00	4- Lime Stone/Very shelly sand
24	63.00	-63.00	N/A	120.00	4- Lime Stone/Very shelly sand
25	66.00	-66.00	N/A	120.00	4- Lime Stone/Very shelly sand
26	69.00	-69.00	N/A	120.00	4- Lime Stone/Very shelly sand
27	72.00	-72.00	N/A	120.00	4- Lime Stone/Very shelly sand
28	75.00	-75.00	N/A	120.00	4- Lime Stone/Very shelly sand
29	77.00	-77.00	N/A	120.00	4- Lime Stone/Very shelly sand
30	79.00	-79.00	N/A	120.00	4- Lime Stone/Very shelly sand

ID	Cu-DIR (tsf)	qu (tsf)	qt (tsf)	Em (ksi)	qb (tsf)
1	N/A	N/A	N/A	N/A	N/A
2	N/A	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A	N/A
6	N/A	N/A	N/A	N/A	N/A
7	N/A	N/A	N/A	N/A	N/A
8	N/A	N/A	N/A	N/A	N/A
9	N/A	N/A	N/A	N/A	N/A
10	N/A	N/A	N/A	N/A	N/A
11	N/A	N/A	N/A	N/A	N/A
12	N/A	N/A	N/A	N/A	N/A

13	N/A	N/A	N/A	N/A	N/A
14	N/A	49.00	1.00	78.26	24.50
15	N/A	49.00	1.00	78.26	24.50
16	N/A	49.00	1.00	78.26	24.50
17	N/A	49.00	1.00	78.26	24.50
18	N/A	49.00	1.00	78.26	24.50
19	N/A	49.00	1.00	78.26	24.50
20	N/A	49.00	1.00	78.26	24.50
21	N/A	49.00	1.00	78.26	24.50
22	N/A	49.00	1.00	78.26	24.50
23	N/A	49.00	1.00	78.26	24.50
24	N/A	49.00	1.00	78.26	24.50
25	N/A	49.00	1.00	78.26	24.50
26	N/A	49.00	1.00	78.26	24.50
27	N/A	49.00	1.00	78.26	24.50
28	N/A	49.00	1.00	78.26	24.50
29	N/A	49.00	1.00	78.26	24.50
30	N/A	49.00	1.00	78.26	24.50

ID RQD F.M. S.R.I. Rock Recovery

1	N/A	N/A	N/A
2	N/A	N/A	N/A
3	N/A	N/A	N/A
4	N/A	N/A	N/A
5	N/A	N/A	N/A
6	N/A	N/A	N/A
7	N/A	N/A	N/A
8	N/A	N/A	N/A
9	N/A	N/A	N/A
10	N/A	N/A	N/A
11	N/A	N/A	N/A
12	N/A	N/A	N/A
13	N/A	N/A	N/A
14	1.00	ROUGH	1.000
15	1.00	ROUGH	1.000
16	1.00	ROUGH	1.000
17	1.00	ROUGH	1.000
18	1.00	ROUGH	1.000
19	1.00	ROUGH	1.000
20	1.00	ROUGH	1.000
21	1.00	ROUGH	1.000
22	1.00	ROUGH	1.000
23	1.00	ROUGH	1.000
24	1.00	ROUGH	1.000
25	1.00	ROUGH	1.000
26	1.00	ROUGH	1.000
27	1.00	ROUGH	1.000
28	1.00	ROUGH	1.000
29	1.00	ROUGH	1.000
30	1.00	ROUGH	1.000

Drilled Shaft Data:

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Unit weight of concrete = 150.00(pcf), Concrete Slump = 9.00(in)
Modulus of Elasticity of concrete = 4030.00(ksi)

Shaft Geometry:

ID	Length (ft)	Tip Elev. (ft)	Case Len. (ft)	Diameter (in)	Base Diam. (in)	Bell Len. (ft)
211	1.00	-1.00	5.00	60.00	60.00	0.00
212	2.00	-2.00	5.00	60.00	60.00	0.00
213	3.00	-3.00	5.00	60.00	60.00	0.00
214	4.00	-4.00	5.00	60.00	60.00	0.00
215	5.00	-5.00	5.00	60.00	60.00	0.00
216	6.00	-6.00	5.00	60.00	60.00	0.00
217	7.00	-7.00	5.00	60.00	60.00	0.00
218	8.00	-8.00	5.00	60.00	60.00	0.00
219	9.00	-9.00	5.00	60.00	60.00	0.00
220	10.00	-10.00	5.00	60.00	60.00	0.00
221	11.00	-11.00	5.00	60.00	60.00	0.00
222	12.00	-12.00	5.00	60.00	60.00	0.00
223	13.00	-13.00	5.00	60.00	60.00	0.00
224	14.00	-14.00	5.00	60.00	60.00	0.00
225	15.00	-15.00	5.00	60.00	60.00	0.00

226	16.00	-16.00	5.00	60.00	60.00	0.00
227	17.00	-17.00	5.00	60.00	60.00	0.00
228	18.00	-18.00	5.00	60.00	60.00	0.00
229	19.00	-19.00	5.00	60.00	60.00	0.00
230	20.00	-20.00	5.00	60.00	60.00	0.00
231	21.00	-21.00	5.00	60.00	60.00	0.00
232	22.00	-22.00	5.00	60.00	60.00	0.00
233	23.00	-23.00	5.00	60.00	60.00	0.00
234	24.00	-24.00	5.00	60.00	60.00	0.00
235	25.00	-25.00	5.00	60.00	60.00	0.00
236	26.00	-26.00	5.00	60.00	60.00	0.00
237	27.00	-27.00	5.00	60.00	60.00	0.00
238	28.00	-28.00	5.00	60.00	60.00	0.00
239	29.00	-29.00	5.00	60.00	60.00	0.00
240	30.00	-30.00	5.00	60.00	60.00	0.00
241	31.00	-31.00	5.00	60.00	60.00	0.00
242	32.00	-32.00	5.00	60.00	60.00	0.00
243	33.00	-33.00	5.00	60.00	60.00	0.00
244	34.00	-34.00	5.00	60.00	60.00	0.00
245	35.00	-35.00	5.00	60.00	60.00	0.00
246	36.00	-36.00	5.00	60.00	60.00	0.00
247	37.00	-37.00	5.00	60.00	60.00	0.00
248	38.00	-38.00	5.00	60.00	60.00	0.00
249	39.00	-39.00	5.00	60.00	60.00	0.00
250	40.00	-40.00	5.00	60.00	60.00	0.00
251	41.00	-41.00	5.00	60.00	60.00	0.00
252	42.00	-42.00	5.00	60.00	60.00	0.00
253	43.00	-43.00	5.00	60.00	60.00	0.00
254	44.00	-44.00	5.00	60.00	60.00	0.00
255	45.00	-45.00	5.00	60.00	60.00	0.00
256	46.00	-46.00	5.00	60.00	60.00	0.00
257	47.00	-47.00	5.00	60.00	60.00	0.00
258	48.00	-48.00	5.00	60.00	60.00	0.00
259	49.00	-49.00	5.00	60.00	60.00	0.00
260	50.00	-50.00	5.00	60.00	60.00	0.00
261	51.00	-51.00	5.00	60.00	60.00	0.00
262	52.00	-52.00	5.00	60.00	60.00	0.00
263	53.00	-53.00	5.00	60.00	60.00	0.00
264	54.00	-54.00	5.00	60.00	60.00	0.00
265	55.00	-55.00	5.00	60.00	60.00	0.00
266	56.00	-56.00	5.00	60.00	60.00	0.00
267	57.00	-57.00	5.00	60.00	60.00	0.00
268	58.00	-58.00	5.00	60.00	60.00	0.00
269	59.00	-59.00	5.00	60.00	60.00	0.00
270	60.00	-60.00	5.00	60.00	60.00	0.00
271	61.00	-61.00	5.00	60.00	60.00	0.00
272	62.00	-62.00	5.00	60.00	60.00	0.00
273	63.00	-63.00	5.00	60.00	60.00	0.00
274	64.00	-64.00	5.00	60.00	60.00	0.00
275	65.00	-65.00	5.00	60.00	60.00	0.00
276	66.00	-66.00	5.00	60.00	60.00	0.00
277	67.00	-67.00	5.00	60.00	60.00	0.00
278	68.00	-68.00	5.00	60.00	60.00	0.00
279	69.00	-69.00	5.00	60.00	60.00	0.00
280	70.00	-70.00	5.00	60.00	60.00	0.00

Drilled Shaft Capacity (sorted by shaft diameter):

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Strength reduction factors: Skin-friction = 1.00, End-bearing = 0.00

ID	Diameter (in)	Length (ft)	Skin Fric. (tons)	End Bearing (tons)	Capacity (tons)
1	60.00	1.00	0.000	0.000	0.000
2	60.00	2.00	0.000	0.000	0.000
3	60.00	3.00	0.000	0.000	0.000
4	60.00	4.00	0.000	0.000	0.000
5	60.00	5.00	0.000	0.000	0.000
6	60.00	6.00	0.000	0.000	0.000
7	60.00	7.00	0.000	0.000	0.000
8	60.00	8.00	0.000	0.000	0.000
9	60.00	9.00	0.000	0.000	0.000
10	60.00	10.00	0.000	0.000	0.000
11	60.00	11.00	0.000	0.000	0.000
12	60.00	12.00	0.000	0.000	0.000
13	60.00	13.00	0.000	0.000	0.000
14	60.00	14.00	0.000	0.000	0.000
15	60.00	15.00	0.000	0.000	0.000

16	60.00	16.00	0.000	0.000	0.000
17	60.00	17.00	0.000	0.000	0.000
18	60.00	18.00	0.000	0.000	0.000
19	60.00	19.00	0.000	0.000	0.000
20	60.00	20.00	0.000	0.000	0.000
21	60.00	21.00	0.000	0.000	0.000
22	60.00	22.00	0.000	0.000	0.000
23	60.00	23.00	0.000	0.000	0.000
24	60.00	24.00	0.000	0.000	0.000
25	60.00	25.00	0.000	0.000	0.000
26	60.00	26.00	0.000	0.000	0.000
27	60.00	27.00	0.000	0.000	0.000
28	60.00	28.00	0.000	0.000	0.000
29	60.00	29.00	0.000	0.000	0.000
30	60.00	30.00	0.000	0.000	0.000
31	60.00	31.00	0.000	0.000	0.000
32	60.00	32.00	0.000	0.000	0.000
33	60.00	33.00	0.000	0.000	0.000
34	60.00	34.00	54.978	0.000	54.978
35	60.00	35.00	109.956	0.000	109.956
36	60.00	36.00	164.934	0.000	164.934
37	60.00	37.00	219.911	0.000	219.911
38	60.00	38.00	274.889	0.000	274.889
39	60.00	39.00	329.867	0.000	329.867
40	60.00	40.00	384.845	0.000	384.845
41	60.00	41.00	439.823	0.000	439.823
42	60.00	42.00	494.801	0.000	494.801
43	60.00	43.00	549.779	0.000	549.779
44	60.00	44.00	604.757	0.000	604.757
45	60.00	45.00	659.734	0.000	659.734
46	60.00	46.00	714.712	0.000	714.712
47	60.00	47.00	769.690	0.000	769.690
48	60.00	48.00	824.668	0.000	824.668
49	60.00	49.00	879.646	0.000	879.646
50	60.00	50.00	934.624	0.000	934.624
51	60.00	51.00	989.602	0.000	989.602
52	60.00	52.00	1044.580	0.000	1044.580
53	60.00	53.00	1099.557	0.000	1099.557
54	60.00	54.00	1154.535	0.000	1154.535
55	60.00	55.00	1209.513	0.000	1209.513
56	60.00	56.00	1264.491	0.000	1264.491
57	60.00	57.00	1319.469	0.000	1319.469
58	60.00	58.00	1374.447	0.000	1374.447
59	60.00	59.00	1429.425	0.000	1429.425
60	60.00	60.00	1484.403	0.000	1484.403
61	60.00	61.00	1539.380	0.000	1539.380
62	60.00	62.00	1594.358	0.000	1594.358
63	60.00	63.00	1649.336	0.000	1649.336
64	60.00	64.00	1704.314	0.000	1704.314
65	60.00	65.00	1759.292	0.000	1759.292
66	60.00	66.00	1814.270	0.000	1814.270
67	60.00	67.00	1869.248	0.000	1869.248
68	60.00	68.00	1924.226	0.000	1924.226
69	60.00	69.00	1979.203	0.000	1979.203
70	60.00	70.00	2034.181	0.000	2034.181

Drilled Shaft Capacity at User-Defined Settlement (sorted by shaft diameter):

***** Capacity is NOT modified by the strength reduction factors *****

User-Defined Settlement = 5.00%

ID	Diameter (in)	Length (ft)	Skin Fric. (tons)	End Bearing (tons)	Capacity (tons)
1	60.00	1.00	0.000	0.000	0.000
2	60.00	2.00	0.000	0.000	0.000
3	60.00	3.00	0.000	0.000	0.000
4	60.00	4.00	0.000	0.000	0.000
5	60.00	5.00	0.000	0.000	0.000
6	60.00	6.00	0.000	0.000	0.000
7	60.00	7.00	0.000	0.000	0.000
8	60.00	8.00	0.000	0.000	0.000
9	60.00	9.00	0.000	0.000	0.000
10	60.00	10.00	0.000	0.000	0.000
11	60.00	11.00	0.000	0.000	0.000
12	60.00	12.00	0.000	0.000	0.000

13	60.00	13.00	0.000	0.000	0.000
14	60.00	14.00	0.000	0.000	0.000
15	60.00	15.00	0.000	0.000	0.000
16	60.00	16.00	0.000	0.000	0.000
17	60.00	17.00	0.000	0.000	0.000
18	60.00	18.00	0.000	0.000	0.000
19	60.00	19.00	0.000	0.000	0.000
20	60.00	20.00	0.000	0.000	0.000
21	60.00	21.00	0.000	0.000	0.000
22	60.00	22.00	0.000	0.000	0.000
23	60.00	23.00	0.000	0.000	0.000
24	60.00	24.00	0.000	0.000	0.000
25	60.00	25.00	0.000	0.000	0.000
26	60.00	26.00	0.000	0.000	0.000
27	60.00	27.00	0.000	0.000	0.000
28	60.00	28.00	0.000	0.000	0.000
29	60.00	29.00	0.000	0.000	0.000
30	60.00	30.00	0.000	0.000	0.000
31	60.00	31.00	0.000	0.000	0.000
32	60.00	32.00	0.000	0.000	0.000
33	60.00	33.00	0.000	5939.288	5939.288
34	60.00	34.00	54.785	8363.210	8417.996
35	60.00	35.00	109.188	5256.334	5365.521
36	60.00	36.00	163.213	4005.921	4169.133
37	60.00	37.00	216.865	3303.645	3520.510
38	60.00	38.00	270.148	2844.878	3115.026
39	60.00	39.00	323.067	2517.748	2840.814
40	60.00	40.00	375.625	2270.690	2646.315
41	60.00	41.00	427.829	2076.363	2504.192
42	60.00	42.00	479.683	1918.806	2398.489
43	60.00	43.00	531.190	1788.025	2319.215
44	60.00	44.00	583.366	1772.918	2356.284
45	60.00	45.00	635.394	1756.865	2392.260
46	60.00	46.00	687.279	1740.213	2427.492
47	60.00	47.00	739.025	1723.204	2462.229
48	60.00	48.00	790.635	1706.011	2496.646
49	60.00	49.00	842.112	1688.760	2530.872
50	60.00	50.00	893.459	1671.540	2564.998
51	60.00	51.00	944.678	1654.416	2599.094
52	60.00	52.00	995.771	1637.436	2633.207
53	60.00	53.00	1046.742	1620.633	2667.375
54	60.00	54.00	1097.593	1604.030	2701.623
55	60.00	55.00	1148.324	1587.645	2735.970
56	60.00	56.00	1198.939	1571.489	2770.428
57	60.00	57.00	1249.439	1555.567	2805.006
58	60.00	58.00	1299.825	1539.884	2839.709
59	60.00	59.00	1350.100	1524.440	2874.540
60	60.00	60.00	1400.265	1509.235	2909.500
61	60.00	61.00	1450.321	1494.267	2944.589
62	60.00	62.00	1500.271	1479.533	2979.803
63	60.00	63.00	1550.114	1465.028	3015.142
64	60.00	64.00	1599.853	1450.750	3050.603
65	60.00	65.00	1649.489	1436.691	3086.180
66	60.00	66.00	1699.023	1422.849	3121.872
67	60.00	67.00	1748.457	1409.217	3157.674
68	60.00	68.00	1797.790	1395.791	3193.581
69	60.00	69.00	1847.026	1382.564	3229.591
70	60.00	70.00	1896.164	1369.533	3265.697

General Information:

Input file: Drive PDE_GANNETT FLEMING\FB-Deep\Drilled Shafts\BR-1 - DS.in
 Project number: 221126
 Job name: SR 997 Bridge Over Black Creek Canal (Bridge No. 870633)
 Engineer: Adnan Ismail, P.E.
 Units: English

Analysis Information:

Analysis Type: Drilled Shaft Analysis

Soil Information:

Boring date: 8/24/2021
 Boring number: BR-1
 Station number: Offset:
 Ground Elevation: 0.00(ft)
 Water table Elevation = -6.20(ft)
 Rock side-friction is calculated using: McVay's method

ID	Depth (ft)	Elevation (ft)	SPT Blows (Blows/ft)	Unit Weight (pcf)	Soil Type
1	0.00	0.00	N/A	0.00	5- Cavity layer
2	1.00	-1.00	N/A	0.00	5- Cavity layer
3	3.00	-3.00	N/A	0.00	5- Cavity layer
4	5.00	-5.00	N/A	0.00	5- Cavity layer
5	7.00	-7.00	N/A	105.00	5- Cavity layer
6	9.00	-9.00	N/A	105.00	5- Cavity layer
7	12.00	-12.00	N/A	120.00	5- Cavity layer
8	15.00	-15.00	N/A	120.00	5- Cavity layer
9	18.00	-18.00	N/A	120.00	5- Cavity layer
10	21.00	-21.00	N/A	120.00	5- Cavity layer
11	24.00	-24.00	N/A	110.00	5- Cavity layer
12	27.00	-27.00	N/A	110.00	5- Cavity layer
13	30.00	-30.00	N/A	110.00	5- Cavity layer
14	33.00	-33.00	N/A	120.00	4- Lime Stone/Very shelly sand
15	36.00	-36.00	N/A	120.00	4- Lime Stone/Very shelly sand
16	39.00	-39.00	N/A	120.00	4- Lime Stone/Very shelly sand
17	42.00	-42.00	N/A	120.00	4- Lime Stone/Very shelly sand
18	45.00	-45.00	N/A	120.00	4- Lime Stone/Very shelly sand
19	48.00	-48.00	N/A	120.00	4- Lime Stone/Very shelly sand
20	51.00	-51.00	N/A	120.00	4- Lime Stone/Very shelly sand
21	54.00	-54.00	N/A	120.00	4- Lime Stone/Very shelly sand
22	57.00	-57.00	N/A	120.00	4- Lime Stone/Very shelly sand
23	60.00	-60.00	N/A	120.00	4- Lime Stone/Very shelly sand
24	63.00	-63.00	N/A	120.00	4- Lime Stone/Very shelly sand
25	66.00	-66.00	N/A	120.00	4- Lime Stone/Very shelly sand
26	69.00	-69.00	N/A	120.00	4- Lime Stone/Very shelly sand
27	72.00	-72.00	N/A	120.00	4- Lime Stone/Very shelly sand
28	75.00	-75.00	N/A	120.00	4- Lime Stone/Very shelly sand
29	77.00	-77.00	N/A	120.00	4- Lime Stone/Very shelly sand
30	79.00	-79.00	N/A	120.00	4- Lime Stone/Very shelly sand

ID	Cu-DIR (tsf)	qu (tsf)	qt (tsf)	Em (ksi)	qb (tsf)
1	N/A	N/A	N/A	N/A	N/A
2	N/A	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A	N/A
6	N/A	N/A	N/A	N/A	N/A
7	N/A	N/A	N/A	N/A	N/A
8	N/A	N/A	N/A	N/A	N/A
9	N/A	N/A	N/A	N/A	N/A
10	N/A	N/A	N/A	N/A	N/A
11	N/A	N/A	N/A	N/A	N/A
12	N/A	N/A	N/A	N/A	N/A

13	N/A	N/A	N/A	N/A	N/A
14	N/A	49.00	1.00	78.26	24.50
15	N/A	49.00	1.00	78.26	24.50
16	N/A	49.00	1.00	78.26	24.50
17	N/A	49.00	1.00	78.26	24.50
18	N/A	49.00	1.00	78.26	24.50
19	N/A	49.00	1.00	78.26	24.50
20	N/A	49.00	1.00	78.26	24.50
21	N/A	49.00	1.00	78.26	24.50
22	N/A	49.00	1.00	78.26	24.50
23	N/A	49.00	1.00	78.26	24.50
24	N/A	49.00	1.00	78.26	24.50
25	N/A	49.00	1.00	78.26	24.50
26	N/A	49.00	1.00	78.26	24.50
27	N/A	49.00	1.00	78.26	24.50
28	N/A	49.00	1.00	78.26	24.50
29	N/A	49.00	1.00	78.26	24.50
30	N/A	49.00	1.00	78.26	24.50

ID RQD F.M. S.R.I. Rock Recovery

1	N/A	N/A	N/A
2	N/A	N/A	N/A
3	N/A	N/A	N/A
4	N/A	N/A	N/A
5	N/A	N/A	N/A
6	N/A	N/A	N/A
7	N/A	N/A	N/A
8	N/A	N/A	N/A
9	N/A	N/A	N/A
10	N/A	N/A	N/A
11	N/A	N/A	N/A
12	N/A	N/A	N/A
13	N/A	N/A	N/A
14	1.00	ROUGH	1.000
15	1.00	ROUGH	1.000
16	1.00	ROUGH	1.000
17	1.00	ROUGH	1.000
18	1.00	ROUGH	1.000
19	1.00	ROUGH	1.000
20	1.00	ROUGH	1.000
21	1.00	ROUGH	1.000
22	1.00	ROUGH	1.000
23	1.00	ROUGH	1.000
24	1.00	ROUGH	1.000
25	1.00	ROUGH	1.000
26	1.00	ROUGH	1.000
27	1.00	ROUGH	1.000
28	1.00	ROUGH	1.000
29	1.00	ROUGH	1.000
30	1.00	ROUGH	1.000

Drilled Shaft Data:

Unit weight of concrete = 150.00(pcf), Concrete Slump = 9.00(in)
 Modulus of Elasticity of concrete = 4030.00(ksi)

Shaft Geometry:

ID	Length (ft)	Tip Elev. (ft)	Case Len. (ft)	Diameter (in)	Base Diam. (in)	Bell Len. (ft)
281	1.00	-1.00	5.00	72.00	72.00	0.00
282	2.00	-2.00	5.00	72.00	72.00	0.00
283	3.00	-3.00	5.00	72.00	72.00	0.00
284	4.00	-4.00	5.00	72.00	72.00	0.00
285	5.00	-5.00	5.00	72.00	72.00	0.00
286	6.00	-6.00	5.00	72.00	72.00	0.00
287	7.00	-7.00	5.00	72.00	72.00	0.00
288	8.00	-8.00	5.00	72.00	72.00	0.00
289	9.00	-9.00	5.00	72.00	72.00	0.00
290	10.00	-10.00	5.00	72.00	72.00	0.00
291	11.00	-11.00	5.00	72.00	72.00	0.00
292	12.00	-12.00	5.00	72.00	72.00	0.00
293	13.00	-13.00	5.00	72.00	72.00	0.00
294	14.00	-14.00	5.00	72.00	72.00	0.00
295	15.00	-15.00	5.00	72.00	72.00	0.00

296	16.00	-16.00	5.00	72.00	72.00	0.00
297	17.00	-17.00	5.00	72.00	72.00	0.00
298	18.00	-18.00	5.00	72.00	72.00	0.00
299	19.00	-19.00	5.00	72.00	72.00	0.00
300	20.00	-20.00	5.00	72.00	72.00	0.00
301	21.00	-21.00	5.00	72.00	72.00	0.00
302	22.00	-22.00	5.00	72.00	72.00	0.00
303	23.00	-23.00	5.00	72.00	72.00	0.00
304	24.00	-24.00	5.00	72.00	72.00	0.00
305	25.00	-25.00	5.00	72.00	72.00	0.00
306	26.00	-26.00	5.00	72.00	72.00	0.00
307	27.00	-27.00	5.00	72.00	72.00	0.00
308	28.00	-28.00	5.00	72.00	72.00	0.00
309	29.00	-29.00	5.00	72.00	72.00	0.00
310	30.00	-30.00	5.00	72.00	72.00	0.00
311	31.00	-31.00	5.00	72.00	72.00	0.00
312	32.00	-32.00	5.00	72.00	72.00	0.00
313	33.00	-33.00	5.00	72.00	72.00	0.00
314	34.00	-34.00	5.00	72.00	72.00	0.00
315	35.00	-35.00	5.00	72.00	72.00	0.00
316	36.00	-36.00	5.00	72.00	72.00	0.00
317	37.00	-37.00	5.00	72.00	72.00	0.00
318	38.00	-38.00	5.00	72.00	72.00	0.00
319	39.00	-39.00	5.00	72.00	72.00	0.00
320	40.00	-40.00	5.00	72.00	72.00	0.00
321	41.00	-41.00	5.00	72.00	72.00	0.00
322	42.00	-42.00	5.00	72.00	72.00	0.00
323	43.00	-43.00	5.00	72.00	72.00	0.00
324	44.00	-44.00	5.00	72.00	72.00	0.00
325	45.00	-45.00	5.00	72.00	72.00	0.00
326	46.00	-46.00	5.00	72.00	72.00	0.00
327	47.00	-47.00	5.00	72.00	72.00	0.00
328	48.00	-48.00	5.00	72.00	72.00	0.00
329	49.00	-49.00	5.00	72.00	72.00	0.00
330	50.00	-50.00	5.00	72.00	72.00	0.00
331	51.00	-51.00	5.00	72.00	72.00	0.00
332	52.00	-52.00	5.00	72.00	72.00	0.00
333	53.00	-53.00	5.00	72.00	72.00	0.00
334	54.00	-54.00	5.00	72.00	72.00	0.00
335	55.00	-55.00	5.00	72.00	72.00	0.00
336	56.00	-56.00	5.00	72.00	72.00	0.00
337	57.00	-57.00	5.00	72.00	72.00	0.00
338	58.00	-58.00	5.00	72.00	72.00	0.00
339	59.00	-59.00	5.00	72.00	72.00	0.00
340	60.00	-60.00	5.00	72.00	72.00	0.00
341	61.00	-61.00	5.00	72.00	72.00	0.00
342	62.00	-62.00	5.00	72.00	72.00	0.00
343	63.00	-63.00	5.00	72.00	72.00	0.00
344	64.00	-64.00	5.00	72.00	72.00	0.00
345	65.00	-65.00	5.00	72.00	72.00	0.00
346	66.00	-66.00	5.00	72.00	72.00	0.00
347	67.00	-67.00	5.00	72.00	72.00	0.00
348	68.00	-68.00	5.00	72.00	72.00	0.00
349	69.00	-69.00	5.00	72.00	72.00	0.00
350	70.00	-70.00	5.00	72.00	72.00	0.00

Drilled Shaft Capacity (sorted by shaft diameter):

=====
Strength reduction factors: Skin-friction = 1.00, End-bearing = 0.00

ID	Diameter (in)	Length (ft)	Skin Fric. (tons)	End Bearing (tons)	Capacity (tons)
1	72.00	1.00	0.000	0.000	0.000
2	72.00	2.00	0.000	0.000	0.000
3	72.00	3.00	0.000	0.000	0.000
4	72.00	4.00	0.000	0.000	0.000
5	72.00	5.00	0.000	0.000	0.000
6	72.00	6.00	0.000	0.000	0.000
7	72.00	7.00	0.000	0.000	0.000
8	72.00	8.00	0.000	0.000	0.000
9	72.00	9.00	0.000	0.000	0.000
10	72.00	10.00	0.000	0.000	0.000
11	72.00	11.00	0.000	0.000	0.000
12	72.00	12.00	0.000	0.000	0.000
13	72.00	13.00	0.000	0.000	0.000
14	72.00	14.00	0.000	0.000	0.000
15	72.00	15.00	0.000	0.000	0.000

16	72.00	16.00	0.000	0.000	0.000
17	72.00	17.00	0.000	0.000	0.000
18	72.00	18.00	0.000	0.000	0.000
19	72.00	19.00	0.000	0.000	0.000
20	72.00	20.00	0.000	0.000	0.000
21	72.00	21.00	0.000	0.000	0.000
22	72.00	22.00	0.000	0.000	0.000
23	72.00	23.00	0.000	0.000	0.000
24	72.00	24.00	0.000	0.000	0.000
25	72.00	25.00	0.000	0.000	0.000
26	72.00	26.00	0.000	0.000	0.000
27	72.00	27.00	0.000	0.000	0.000
28	72.00	28.00	0.000	0.000	0.000
29	72.00	29.00	0.000	0.000	0.000
30	72.00	30.00	0.000	0.000	0.000
31	72.00	31.00	0.000	0.000	0.000
32	72.00	32.00	0.000	0.000	0.000
33	72.00	33.00	0.000	0.000	0.000
34	72.00	34.00	65.973	0.000	65.973
35	72.00	35.00	131.947	0.000	131.947
36	72.00	36.00	197.920	0.000	197.920
37	72.00	37.00	263.894	0.000	263.894
38	72.00	38.00	329.867	0.000	329.867
39	72.00	39.00	395.841	0.000	395.841
40	72.00	40.00	461.814	0.000	461.814
41	72.00	41.00	527.788	0.000	527.788
42	72.00	42.00	593.761	0.000	593.761
43	72.00	43.00	659.734	0.000	659.734
44	72.00	44.00	725.708	0.000	725.708
45	72.00	45.00	791.681	0.000	791.681
46	72.00	46.00	857.655	0.000	857.655
47	72.00	47.00	923.628	0.000	923.628
48	72.00	48.00	989.602	0.000	989.602
49	72.00	49.00	1055.575	0.000	1055.575
50	72.00	50.00	1121.549	0.000	1121.549
51	72.00	51.00	1187.522	0.000	1187.522
52	72.00	52.00	1253.495	0.000	1253.495
53	72.00	53.00	1319.469	0.000	1319.469
54	72.00	54.00	1385.442	0.000	1385.442
55	72.00	55.00	1451.416	0.000	1451.416
56	72.00	56.00	1517.389	0.000	1517.389
57	72.00	57.00	1583.363	0.000	1583.363
58	72.00	58.00	1649.336	0.000	1649.336
59	72.00	59.00	1715.310	0.000	1715.310
60	72.00	60.00	1781.283	0.000	1781.283
61	72.00	61.00	1847.256	0.000	1847.256
62	72.00	62.00	1913.230	0.000	1913.230
63	72.00	63.00	1979.203	0.000	1979.203
64	72.00	64.00	2045.177	0.000	2045.177
65	72.00	65.00	2111.150	0.000	2111.150
66	72.00	66.00	2177.124	0.000	2177.124
67	72.00	67.00	2243.097	0.000	2243.097
68	72.00	68.00	2309.071	0.000	2309.071
69	72.00	69.00	2375.044	0.000	2375.044
70	72.00	70.00	2441.017	0.000	2441.017

Drilled Shaft Capacity at User-Defined Settlement (sorted by shaft diameter):

***** Capacity is NOT modified by the strength reduction factors *****

User-Defined Settlement = 5.00%

ID	Diameter (in)	Length (ft)	Skin Fric. (tons)	End Bearing (tons)	Capacity (tons)
1	72.00	1.00	0.000	0.000	0.000
2	72.00	2.00	0.000	0.000	0.000
3	72.00	3.00	0.000	0.000	0.000
4	72.00	4.00	0.000	0.000	0.000
5	72.00	5.00	0.000	0.000	0.000
6	72.00	6.00	0.000	0.000	0.000
7	72.00	7.00	0.000	0.000	0.000
8	72.00	8.00	0.000	0.000	0.000
9	72.00	9.00	0.000	0.000	0.000
10	72.00	10.00	0.000	0.000	0.000
11	72.00	11.00	0.000	0.000	0.000
12	72.00	12.00	0.000	0.000	0.000

13	72.00	13.00	0.000	0.000	0.000
14	72.00	14.00	0.000	0.000	0.000
15	72.00	15.00	0.000	0.000	0.000
16	72.00	16.00	0.000	0.000	0.000
17	72.00	17.00	0.000	0.000	0.000
18	72.00	18.00	0.000	0.000	0.000
19	72.00	19.00	0.000	0.000	0.000
20	72.00	20.00	0.000	0.000	0.000
21	72.00	21.00	0.000	0.000	0.000
22	72.00	22.00	0.000	0.000	0.000
23	72.00	23.00	0.000	0.000	0.000
24	72.00	24.00	0.000	0.000	0.000
25	72.00	25.00	0.000	0.000	0.000
26	72.00	26.00	0.000	0.000	0.000
27	72.00	27.00	0.000	0.000	0.000
28	72.00	28.00	0.000	0.000	0.000
29	72.00	29.00	0.000	0.000	0.000
30	72.00	30.00	0.000	0.000	0.000
31	72.00	31.00	0.000	0.000	0.000
32	72.00	32.00	0.000	0.000	0.000
33	72.00	33.00	0.000	8552.574	8552.574
34	72.00	34.00	65.781	13607.770	13673.550
35	72.00	35.00	131.178	8552.574	8683.752
36	72.00	36.00	196.197	6518.029	6714.225
37	72.00	37.00	260.840	5375.357	5636.197
38	72.00	38.00	325.112	4628.898	4954.010
39	72.00	39.00	389.017	4096.624	4485.641
40	72.00	40.00	452.557	3694.637	4147.195
41	72.00	41.00	515.739	3378.448	3894.187
42	72.00	42.00	578.565	3122.087	3700.652
43	72.00	43.00	641.041	2909.293	3550.334
44	72.00	44.00	703.168	2729.320	3432.488
45	72.00	45.00	764.952	2574.756	3339.708
46	72.00	46.00	827.587	2556.738	3384.325
47	72.00	47.00	890.075	2537.708	3427.783
48	72.00	48.00	952.420	2517.979	3470.399
49	72.00	49.00	1014.625	2497.785	3512.409
50	72.00	50.00	1076.692	2477.300	3553.992
51	72.00	51.00	1138.626	2456.656	3595.282
52	72.00	52.00	1200.428	2435.954	3636.383
53	72.00	53.00	1262.101	2415.271	3677.373
54	72.00	54.00	1323.647	2394.666	3718.313
55	72.00	55.00	1385.068	2374.183	3759.251
56	72.00	56.00	1446.367	2353.856	3800.222
57	72.00	57.00	1507.544	2333.711	3841.255
58	72.00	58.00	1568.602	2313.767	3882.369
59	72.00	59.00	1629.543	2294.038	3923.582
60	72.00	60.00	1690.369	2274.535	3964.903
61	72.00	61.00	1751.080	2255.263	4006.343
62	72.00	62.00	1811.678	2236.229	4047.907
63	72.00	63.00	1872.166	2217.433	4089.598
64	72.00	64.00	1932.543	2198.876	4131.419
65	72.00	65.00	1992.812	2180.559	4173.371
66	72.00	66.00	2052.974	2162.479	4215.454
67	72.00	67.00	2113.030	2144.635	4257.665
68	72.00	68.00	2172.982	2127.023	4300.005
69	72.00	69.00	2232.830	2109.641	4342.471
70	72.00	70.00	2292.576	2092.484	4385.060

General Information:

Input file: Drive PDE_GANNETT FLEMING\FB-Deep\Drilled Shafts\BR-2 - DS.in
 Project number: 221126
 Job name: SR 997 Bridge Over Black Creek Canal (Bridge No. 870633)
 Engineer: Adnan Ismail, P.E.
 Units: English

Analysis Information:

Analysis Type: Drilled Shaft Analysis

Soil Information:

Boring date: 8/20/2021
 Boring number: BR-2
 Station number: Offset:
 Ground Elevation: 0.00(ft)
 Water table Elevation = -6.20(ft)

Rock side-friction is calculated using: McVay's method

ID	Depth (ft)	Elevation (ft)	SPT Blows (Blows/ft)	Unit Weight (pcf)	Soil Type
1	0.00	0.00	N/A	0.00	5- Cavity layer
2	1.00	-1.00	N/A	0.00	5- Cavity layer
3	3.00	-3.00	N/A	0.00	5- Cavity layer
4	5.00	-5.00	N/A	0.00	5- Cavity layer
5	7.00	-7.00	N/A	105.00	5- Cavity layer
6	9.00	-9.00	N/A	105.00	5- Cavity layer
7	12.00	-12.00	N/A	120.00	5- Cavity layer
8	15.00	-15.00	N/A	120.00	5- Cavity layer
9	18.00	-18.00	N/A	120.00	5- Cavity layer
10	21.00	-21.00	N/A	120.00	5- Cavity layer
11	24.00	-24.00	N/A	110.00	5- Cavity layer
12	27.00	-27.00	N/A	110.00	5- Cavity layer
13	30.00	-30.00	N/A	110.00	5- Cavity layer
14	33.00	-33.00	N/A	120.00	4- Lime Stone/Very shelly sand
15	36.00	-36.00	N/A	120.00	4- Lime Stone/Very shelly sand
16	39.00	-39.00	N/A	120.00	4- Lime Stone/Very shelly sand
17	42.00	-42.00	N/A	120.00	4- Lime Stone/Very shelly sand
18	45.00	-45.00	N/A	120.00	4- Lime Stone/Very shelly sand
19	48.00	-48.00	N/A	120.00	4- Lime Stone/Very shelly sand
20	51.00	-51.00	N/A	120.00	4- Lime Stone/Very shelly sand
21	54.00	-54.00	N/A	120.00	4- Lime Stone/Very shelly sand
22	57.00	-57.00	N/A	120.00	4- Lime Stone/Very shelly sand
23	60.00	-60.00	N/A	120.00	4- Lime Stone/Very shelly sand
24	63.00	-63.00	N/A	120.00	4- Lime Stone/Very shelly sand
25	66.00	-66.00	N/A	120.00	4- Lime Stone/Very shelly sand
26	69.00	-69.00	N/A	120.00	4- Lime Stone/Very shelly sand
27	72.00	-72.00	N/A	120.00	4- Lime Stone/Very shelly sand
28	75.00	-75.00	N/A	120.00	4- Lime Stone/Very shelly sand
29	77.00	-77.00	N/A	120.00	4- Lime Stone/Very shelly sand
30	79.00	-79.00	N/A	120.00	4- Lime Stone/Very shelly sand

ID	Cu-DIR (tsf)	qu (tsf)	qt (tsf)	Em (ksi)	qb (tsf)
1	N/A	N/A	N/A	N/A	N/A
2	N/A	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A	N/A
6	N/A	N/A	N/A	N/A	N/A
7	N/A	N/A	N/A	N/A	N/A
8	N/A	N/A	N/A	N/A	N/A
9	N/A	N/A	N/A	N/A	N/A
10	N/A	N/A	N/A	N/A	N/A
11	N/A	N/A	N/A	N/A	N/A
12	N/A	N/A	N/A	N/A	N/A

13	N/A	N/A	N/A	N/A	N/A
14	N/A	49.00	1.00	78.26	24.50
15	N/A	49.00	1.00	78.26	24.50
16	N/A	49.00	1.00	78.26	24.50
17	N/A	49.00	1.00	78.26	24.50
18	N/A	49.00	1.00	78.26	24.50
19	N/A	49.00	1.00	78.26	24.50
20	N/A	49.00	1.00	78.26	24.50
21	N/A	49.00	1.00	78.26	24.50
22	N/A	49.00	1.00	78.26	24.50
23	N/A	49.00	1.00	78.26	24.50
24	N/A	49.00	1.00	78.26	24.50
25	N/A	49.00	1.00	78.26	24.50
26	N/A	49.00	1.00	78.26	24.50
27	N/A	49.00	1.00	78.26	24.50
28	N/A	49.00	1.00	78.26	24.50
29	N/A	49.00	1.00	78.26	24.50
30	N/A	49.00	1.00	78.26	24.50

ID RQD F.M. S.R.I. Rock Recovery

1	N/A	N/A	N/A
2	N/A	N/A	N/A
3	N/A	N/A	N/A
4	N/A	N/A	N/A
5	N/A	N/A	N/A
6	N/A	N/A	N/A
7	N/A	N/A	N/A
8	N/A	N/A	N/A
9	N/A	N/A	N/A
10	N/A	N/A	N/A
11	N/A	N/A	N/A
12	N/A	N/A	N/A
13	N/A	N/A	N/A
14	1.00	ROUGH	1.000
15	1.00	ROUGH	1.000
16	1.00	ROUGH	1.000
17	1.00	ROUGH	1.000
18	1.00	ROUGH	1.000
19	1.00	ROUGH	1.000
20	1.00	ROUGH	1.000
21	1.00	ROUGH	1.000
22	1.00	ROUGH	1.000
23	1.00	ROUGH	1.000
24	1.00	ROUGH	1.000
25	1.00	ROUGH	1.000
26	1.00	ROUGH	1.000
27	1.00	ROUGH	1.000
28	1.00	ROUGH	1.000
29	1.00	ROUGH	1.000
30	1.00	ROUGH	1.000

Drilled Shaft Data:

Unit weight of concrete = 150.00(pcf), Concrete Slump = 9.00(in)
 Modulus of Elasticity of concrete = 4030.00(ksi)

Shaft Geometry:

ID	Length (ft)	Tip Elev. (ft)	Case Len. (ft)	Diameter (in)	Base Diam. (in)	Bell Len. (ft)
1	1.00	-1.00	5.00	42.00	42.00	0.00
2	2.00	-2.00	5.00	42.00	42.00	0.00
3	3.00	-3.00	5.00	42.00	42.00	0.00
4	4.00	-4.00	5.00	42.00	42.00	0.00
5	5.00	-5.00	5.00	42.00	42.00	0.00
6	6.00	-6.00	5.00	42.00	42.00	0.00
7	7.00	-7.00	5.00	42.00	42.00	0.00
8	8.00	-8.00	5.00	42.00	42.00	0.00
9	9.00	-9.00	5.00	42.00	42.00	0.00
10	10.00	-10.00	5.00	42.00	42.00	0.00
11	11.00	-11.00	5.00	42.00	42.00	0.00
12	12.00	-12.00	5.00	42.00	42.00	0.00
13	13.00	-13.00	5.00	42.00	42.00	0.00
14	14.00	-14.00	5.00	42.00	42.00	0.00
15	15.00	-15.00	5.00	42.00	42.00	0.00

16	16.00	-16.00	5.00	42.00	42.00	0.00
17	17.00	-17.00	5.00	42.00	42.00	0.00
18	18.00	-18.00	5.00	42.00	42.00	0.00
19	19.00	-19.00	5.00	42.00	42.00	0.00
20	20.00	-20.00	5.00	42.00	42.00	0.00
21	21.00	-21.00	5.00	42.00	42.00	0.00
22	22.00	-22.00	5.00	42.00	42.00	0.00
23	23.00	-23.00	5.00	42.00	42.00	0.00
24	24.00	-24.00	5.00	42.00	42.00	0.00
25	25.00	-25.00	5.00	42.00	42.00	0.00
26	26.00	-26.00	5.00	42.00	42.00	0.00
27	27.00	-27.00	5.00	42.00	42.00	0.00
28	28.00	-28.00	5.00	42.00	42.00	0.00
29	29.00	-29.00	5.00	42.00	42.00	0.00
30	30.00	-30.00	5.00	42.00	42.00	0.00
31	31.00	-31.00	5.00	42.00	42.00	0.00
32	32.00	-32.00	5.00	42.00	42.00	0.00
33	33.00	-33.00	5.00	42.00	42.00	0.00
34	34.00	-34.00	5.00	42.00	42.00	0.00
35	35.00	-35.00	5.00	42.00	42.00	0.00
36	36.00	-36.00	5.00	42.00	42.00	0.00
37	37.00	-37.00	5.00	42.00	42.00	0.00
38	38.00	-38.00	5.00	42.00	42.00	0.00
39	39.00	-39.00	5.00	42.00	42.00	0.00
40	40.00	-40.00	5.00	42.00	42.00	0.00
41	41.00	-41.00	5.00	42.00	42.00	0.00
42	42.00	-42.00	5.00	42.00	42.00	0.00
43	43.00	-43.00	5.00	42.00	42.00	0.00
44	44.00	-44.00	5.00	42.00	42.00	0.00
45	45.00	-45.00	5.00	42.00	42.00	0.00
46	46.00	-46.00	5.00	42.00	42.00	0.00
47	47.00	-47.00	5.00	42.00	42.00	0.00
48	48.00	-48.00	5.00	42.00	42.00	0.00
49	49.00	-49.00	5.00	42.00	42.00	0.00
50	50.00	-50.00	5.00	42.00	42.00	0.00
51	51.00	-51.00	5.00	42.00	42.00	0.00
52	52.00	-52.00	5.00	42.00	42.00	0.00
53	53.00	-53.00	5.00	42.00	42.00	0.00
54	54.00	-54.00	5.00	42.00	42.00	0.00
55	55.00	-55.00	5.00	42.00	42.00	0.00
56	56.00	-56.00	5.00	42.00	42.00	0.00
57	57.00	-57.00	5.00	42.00	42.00	0.00
58	58.00	-58.00	5.00	42.00	42.00	0.00
59	59.00	-59.00	5.00	42.00	42.00	0.00
60	60.00	-60.00	5.00	42.00	42.00	0.00
61	61.00	-61.00	5.00	42.00	42.00	0.00
62	62.00	-62.00	5.00	42.00	42.00	0.00
63	63.00	-63.00	5.00	42.00	42.00	0.00
64	64.00	-64.00	5.00	42.00	42.00	0.00
65	65.00	-65.00	5.00	42.00	42.00	0.00
66	66.00	-66.00	5.00	42.00	42.00	0.00
67	67.00	-67.00	5.00	42.00	42.00	0.00
68	68.00	-68.00	5.00	42.00	42.00	0.00
69	69.00	-69.00	5.00	42.00	42.00	0.00
70	70.00	-70.00	5.00	42.00	42.00	0.00

Drilled Shaft Capacity (sorted by shaft diameter):

=====
Strength reduction factors: Skin-friction = 1.00, End-bearing = 0.00

ID	Diameter (in)	Length (ft)	Skin Fric. (tons)	End Bearing (tons)	Capacity (tons)
1	42.00	1.00	0.000	0.000	0.000
2	42.00	2.00	0.000	0.000	0.000
3	42.00	3.00	0.000	0.000	0.000
4	42.00	4.00	0.000	0.000	0.000
5	42.00	5.00	0.000	0.000	0.000
6	42.00	6.00	0.000	0.000	0.000
7	42.00	7.00	0.000	0.000	0.000
8	42.00	8.00	0.000	0.000	0.000
9	42.00	9.00	0.000	0.000	0.000
10	42.00	10.00	0.000	0.000	0.000
11	42.00	11.00	0.000	0.000	0.000
12	42.00	12.00	0.000	0.000	0.000
13	42.00	13.00	0.000	0.000	0.000
14	42.00	14.00	0.000	0.000	0.000
15	42.00	15.00	0.000	0.000	0.000

16	42.00	16.00	0.000	0.000	0.000
17	42.00	17.00	0.000	0.000	0.000
18	42.00	18.00	0.000	0.000	0.000
19	42.00	19.00	0.000	0.000	0.000
20	42.00	20.00	0.000	0.000	0.000
21	42.00	21.00	0.000	0.000	0.000
22	42.00	22.00	0.000	0.000	0.000
23	42.00	23.00	0.000	0.000	0.000
24	42.00	24.00	0.000	0.000	0.000
25	42.00	25.00	0.000	0.000	0.000
26	42.00	26.00	0.000	0.000	0.000
27	42.00	27.00	0.000	0.000	0.000
28	42.00	28.00	0.000	0.000	0.000
29	42.00	29.00	0.000	0.000	0.000
30	42.00	30.00	0.000	0.000	0.000
31	42.00	31.00	0.000	0.000	0.000
32	42.00	32.00	0.000	0.000	0.000
33	42.00	33.00	0.000	0.000	0.000
34	42.00	34.00	38.485	0.000	38.485
35	42.00	35.00	76.969	0.000	76.969
36	42.00	36.00	115.454	0.000	115.454
37	42.00	37.00	153.938	0.000	153.938
38	42.00	38.00	192.423	0.000	192.423
39	42.00	39.00	230.907	0.000	230.907
40	42.00	40.00	269.392	0.000	269.392
41	42.00	41.00	307.876	0.000	307.876
42	42.00	42.00	346.361	0.000	346.361
43	42.00	43.00	384.845	0.000	384.845
44	42.00	44.00	423.330	0.000	423.330
45	42.00	45.00	461.814	0.000	461.814
46	42.00	46.00	500.299	0.000	500.299
47	42.00	47.00	538.783	0.000	538.783
48	42.00	48.00	577.268	0.000	577.268
49	42.00	49.00	615.752	0.000	615.752
50	42.00	50.00	654.237	0.000	654.237
51	42.00	51.00	692.721	0.000	692.721
52	42.00	52.00	731.206	0.000	731.206
53	42.00	53.00	769.690	0.000	769.690
54	42.00	54.00	808.175	0.000	808.175
55	42.00	55.00	846.659	0.000	846.659
56	42.00	56.00	885.144	0.000	885.144
57	42.00	57.00	923.628	0.000	923.628
58	42.00	58.00	962.113	0.000	962.113
59	42.00	59.00	1000.597	0.000	1000.597
60	42.00	60.00	1039.082	0.000	1039.082
61	42.00	61.00	1077.566	0.000	1077.566
62	42.00	62.00	1116.051	0.000	1116.051
63	42.00	63.00	1154.535	0.000	1154.535
64	42.00	64.00	1193.020	0.000	1193.020
65	42.00	65.00	1231.504	0.000	1231.504
66	42.00	66.00	1269.989	0.000	1269.989
67	42.00	67.00	1308.473	0.000	1308.473
68	42.00	68.00	1346.958	0.000	1346.958
69	42.00	69.00	1385.442	0.000	1385.442
70	42.00	70.00	1423.927	0.000	1423.927

Drilled Shaft Capacity at User-Defined Settlement (sorted by shaft diameter):

***** Capacity is NOT modified by the strength reduction factors *****

User-Defined Settlement = 5.00%

ID	Diameter (in)	Length (ft)	Skin Fric. (tons)	End Bearing (tons)	Capacity (tons)
1	42.00	1.00	0.000	0.000	0.000
2	42.00	2.00	0.000	0.000	0.000
3	42.00	3.00	0.000	0.000	0.000
4	42.00	4.00	0.000	0.000	0.000
5	42.00	5.00	0.000	0.000	0.000
6	42.00	6.00	0.000	0.000	0.000
7	42.00	7.00	0.000	0.000	0.000
8	42.00	8.00	0.000	0.000	0.000
9	42.00	9.00	0.000	0.000	0.000
10	42.00	10.00	0.000	0.000	0.000
11	42.00	11.00	0.000	0.000	0.000
12	42.00	12.00	0.000	0.000	0.000

13	42.00	13.00	0.000	0.000	0.000
14	42.00	14.00	0.000	0.000	0.000
15	42.00	15.00	0.000	0.000	0.000
16	42.00	16.00	0.000	0.000	0.000
17	42.00	17.00	0.000	0.000	0.000
18	42.00	18.00	0.000	0.000	0.000
19	42.00	19.00	0.000	0.000	0.000
20	42.00	20.00	0.000	0.000	0.000
21	42.00	21.00	0.000	0.000	0.000
22	42.00	22.00	0.000	0.000	0.000
23	42.00	23.00	0.000	0.000	0.000
24	42.00	24.00	0.000	0.000	0.000
25	42.00	25.00	0.000	0.000	0.000
26	42.00	26.00	0.000	0.000	0.000
27	42.00	27.00	0.000	0.000	0.000
28	42.00	28.00	0.000	0.000	0.000
29	42.00	29.00	0.000	0.000	0.000
30	42.00	30.00	0.000	0.000	0.000
31	42.00	31.00	0.000	0.000	0.000
32	42.00	32.00	0.000	0.000	0.000
33	42.00	33.00	0.000	2910.251	2910.251
34	42.00	34.00	38.292	3226.895	3265.187
35	42.00	35.00	76.203	2028.125	2104.328
36	42.00	36.00	113.740	1545.660	1659.401
37	42.00	37.00	150.909	1274.692	1425.601
38	42.00	38.00	187.716	1097.679	1285.395
39	42.00	39.00	224.166	971.458	1195.624
40	42.00	40.00	260.265	876.132	1136.398
41	42.00	41.00	296.758	865.404	1162.162
42	42.00	42.00	333.103	853.883	1186.986
43	42.00	43.00	369.306	841.969	1211.275
44	42.00	44.00	405.373	829.908	1235.280
45	42.00	45.00	441.306	817.852	1259.158
46	42.00	46.00	477.109	805.900	1283.009
47	42.00	47.00	512.786	794.110	1306.896
48	42.00	48.00	548.340	782.521	1330.861
49	42.00	49.00	583.774	771.153	1354.927
50	42.00	50.00	619.090	760.020	1379.110
51	42.00	51.00	654.290	749.126	1403.416
52	42.00	52.00	689.377	738.470	1427.847
53	42.00	53.00	724.352	728.051	1452.404
54	42.00	54.00	759.218	717.864	1477.082
55	42.00	55.00	793.977	707.902	1501.879
56	42.00	56.00	828.630	698.159	1526.789
57	42.00	57.00	863.179	688.627	1551.805
58	42.00	58.00	897.625	679.298	1576.923
59	42.00	59.00	931.970	670.166	1602.137
60	42.00	60.00	966.216	661.223	1627.439
61	42.00	61.00	1000.364	652.461	1652.825
62	42.00	62.00	1034.414	643.874	1678.288
63	42.00	63.00	1068.370	635.454	1703.824
64	42.00	64.00	1102.231	627.195	1729.425
65	42.00	65.00	1135.998	619.090	1755.088
66	42.00	66.00	1169.674	611.133	1780.808
67	42.00	67.00	1203.259	603.319	1806.579
68	42.00	68.00	1236.755	595.643	1832.397
69	42.00	69.00	1270.161	588.097	1858.259
70	42.00	70.00	1303.480	580.679	1884.159

General Information:

Input file: Drive PDE_GANNETT FLEMING\FB-Deep\Drilled Shafts\BR-2 - DS.in
 Project number: 221126
 Job name: SR 997 Bridge Over Black Creek Canal (Bridge No. 870633)
 Engineer: Adnan Ismail, P.E.
 Units: English

Analysis Information:

Analysis Type: Drilled Shaft Analysis

Soil Information:

Boring date: 8/20/2021
 Boring number: BR-2
 Station number: Offset:
 Ground Elevation: 0.00(ft)
 Water table Elevation = -6.20(ft)

Rock side-friction is calculated using: McVay's method

ID	Depth (ft)	Elevation (ft)	SPT Blows (Blows/ft)	Unit Weight (pcf)	Soil Type
1	0.00	0.00	N/A	0.00	5- Cavity layer
2	1.00	-1.00	N/A	0.00	5- Cavity layer
3	3.00	-3.00	N/A	0.00	5- Cavity layer
4	5.00	-5.00	N/A	0.00	5- Cavity layer
5	7.00	-7.00	N/A	105.00	5- Cavity layer
6	9.00	-9.00	N/A	105.00	5- Cavity layer
7	12.00	-12.00	N/A	120.00	5- Cavity layer
8	15.00	-15.00	N/A	120.00	5- Cavity layer
9	18.00	-18.00	N/A	120.00	5- Cavity layer
10	21.00	-21.00	N/A	120.00	5- Cavity layer
11	24.00	-24.00	N/A	110.00	5- Cavity layer
12	27.00	-27.00	N/A	110.00	5- Cavity layer
13	30.00	-30.00	N/A	110.00	5- Cavity layer
14	33.00	-33.00	N/A	120.00	4- Lime Stone/Very shelly sand
15	36.00	-36.00	N/A	120.00	4- Lime Stone/Very shelly sand
16	39.00	-39.00	N/A	120.00	4- Lime Stone/Very shelly sand
17	42.00	-42.00	N/A	120.00	4- Lime Stone/Very shelly sand
18	45.00	-45.00	N/A	120.00	4- Lime Stone/Very shelly sand
19	48.00	-48.00	N/A	120.00	4- Lime Stone/Very shelly sand
20	51.00	-51.00	N/A	120.00	4- Lime Stone/Very shelly sand
21	54.00	-54.00	N/A	120.00	4- Lime Stone/Very shelly sand
22	57.00	-57.00	N/A	120.00	4- Lime Stone/Very shelly sand
23	60.00	-60.00	N/A	120.00	4- Lime Stone/Very shelly sand
24	63.00	-63.00	N/A	120.00	4- Lime Stone/Very shelly sand
25	66.00	-66.00	N/A	120.00	4- Lime Stone/Very shelly sand
26	69.00	-69.00	N/A	120.00	4- Lime Stone/Very shelly sand
27	72.00	-72.00	N/A	120.00	4- Lime Stone/Very shelly sand
28	75.00	-75.00	N/A	120.00	4- Lime Stone/Very shelly sand
29	77.00	-77.00	N/A	120.00	4- Lime Stone/Very shelly sand
30	79.00	-79.00	N/A	120.00	4- Lime Stone/Very shelly sand

ID	Cu-DIR (tsf)	qu (tsf)	qt (tsf)	Em (ksi)	qb (tsf)
1	N/A	N/A	N/A	N/A	N/A
2	N/A	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A	N/A
6	N/A	N/A	N/A	N/A	N/A
7	N/A	N/A	N/A	N/A	N/A
8	N/A	N/A	N/A	N/A	N/A
9	N/A	N/A	N/A	N/A	N/A
10	N/A	N/A	N/A	N/A	N/A
11	N/A	N/A	N/A	N/A	N/A
12	N/A	N/A	N/A	N/A	N/A

13	N/A	N/A	N/A	N/A	N/A
14	N/A	49.00	1.00	78.26	24.50
15	N/A	49.00	1.00	78.26	24.50
16	N/A	49.00	1.00	78.26	24.50
17	N/A	49.00	1.00	78.26	24.50
18	N/A	49.00	1.00	78.26	24.50
19	N/A	49.00	1.00	78.26	24.50
20	N/A	49.00	1.00	78.26	24.50
21	N/A	49.00	1.00	78.26	24.50
22	N/A	49.00	1.00	78.26	24.50
23	N/A	49.00	1.00	78.26	24.50
24	N/A	49.00	1.00	78.26	24.50
25	N/A	49.00	1.00	78.26	24.50
26	N/A	49.00	1.00	78.26	24.50
27	N/A	49.00	1.00	78.26	24.50
28	N/A	49.00	1.00	78.26	24.50
29	N/A	49.00	1.00	78.26	24.50
30	N/A	49.00	1.00	78.26	24.50

ID RQD F.M. S.R.I. Rock Recovery

1	N/A	N/A	N/A
2	N/A	N/A	N/A
3	N/A	N/A	N/A
4	N/A	N/A	N/A
5	N/A	N/A	N/A
6	N/A	N/A	N/A
7	N/A	N/A	N/A
8	N/A	N/A	N/A
9	N/A	N/A	N/A
10	N/A	N/A	N/A
11	N/A	N/A	N/A
12	N/A	N/A	N/A
13	N/A	N/A	N/A
14	1.00	ROUGH	1.000
15	1.00	ROUGH	1.000
16	1.00	ROUGH	1.000
17	1.00	ROUGH	1.000
18	1.00	ROUGH	1.000
19	1.00	ROUGH	1.000
20	1.00	ROUGH	1.000
21	1.00	ROUGH	1.000
22	1.00	ROUGH	1.000
23	1.00	ROUGH	1.000
24	1.00	ROUGH	1.000
25	1.00	ROUGH	1.000
26	1.00	ROUGH	1.000
27	1.00	ROUGH	1.000
28	1.00	ROUGH	1.000
29	1.00	ROUGH	1.000
30	1.00	ROUGH	1.000

Drilled Shaft Data:

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Unit weight of concrete = 150.00(pcf), Concrete Slump = 9.00(in)
Modulus of Elasticity of concrete = 4030.00(ksi)

Shaft Geometry:

ID	Length (ft)	Tip Elev. (ft)	Case Len. (ft)	Diameter (in)	Base Diam. (in)	Bell Len. (ft)
71	1.00	-1.00	5.00	48.00	48.00	0.00
72	2.00	-2.00	5.00	48.00	48.00	0.00
73	3.00	-3.00	5.00	48.00	48.00	0.00
74	4.00	-4.00	5.00	48.00	48.00	0.00
75	5.00	-5.00	5.00	48.00	48.00	0.00
76	6.00	-6.00	5.00	48.00	48.00	0.00
77	7.00	-7.00	5.00	48.00	48.00	0.00
78	8.00	-8.00	5.00	48.00	48.00	0.00
79	9.00	-9.00	5.00	48.00	48.00	0.00
80	10.00	-10.00	5.00	48.00	48.00	0.00
81	11.00	-11.00	5.00	48.00	48.00	0.00
82	12.00	-12.00	5.00	48.00	48.00	0.00
83	13.00	-13.00	5.00	48.00	48.00	0.00
84	14.00	-14.00	5.00	48.00	48.00	0.00
85	15.00	-15.00	5.00	48.00	48.00	0.00

86	16.00	-16.00	5.00	48.00	48.00	0.00
87	17.00	-17.00	5.00	48.00	48.00	0.00
88	18.00	-18.00	5.00	48.00	48.00	0.00
89	19.00	-19.00	5.00	48.00	48.00	0.00
90	20.00	-20.00	5.00	48.00	48.00	0.00
91	21.00	-21.00	5.00	48.00	48.00	0.00
92	22.00	-22.00	5.00	48.00	48.00	0.00
93	23.00	-23.00	5.00	48.00	48.00	0.00
94	24.00	-24.00	5.00	48.00	48.00	0.00
95	25.00	-25.00	5.00	48.00	48.00	0.00
96	26.00	-26.00	5.00	48.00	48.00	0.00
97	27.00	-27.00	5.00	48.00	48.00	0.00
98	28.00	-28.00	5.00	48.00	48.00	0.00
99	29.00	-29.00	5.00	48.00	48.00	0.00
100	30.00	-30.00	5.00	48.00	48.00	0.00
101	31.00	-31.00	5.00	48.00	48.00	0.00
102	32.00	-32.00	5.00	48.00	48.00	0.00
103	33.00	-33.00	5.00	48.00	48.00	0.00
104	34.00	-34.00	5.00	48.00	48.00	0.00
105	35.00	-35.00	5.00	48.00	48.00	0.00
106	36.00	-36.00	5.00	48.00	48.00	0.00
107	37.00	-37.00	5.00	48.00	48.00	0.00
108	38.00	-38.00	5.00	48.00	48.00	0.00
109	39.00	-39.00	5.00	48.00	48.00	0.00
110	40.00	-40.00	5.00	48.00	48.00	0.00
111	41.00	-41.00	5.00	48.00	48.00	0.00
112	42.00	-42.00	5.00	48.00	48.00	0.00
113	43.00	-43.00	5.00	48.00	48.00	0.00
114	44.00	-44.00	5.00	48.00	48.00	0.00
115	45.00	-45.00	5.00	48.00	48.00	0.00
116	46.00	-46.00	5.00	48.00	48.00	0.00
117	47.00	-47.00	5.00	48.00	48.00	0.00
118	48.00	-48.00	5.00	48.00	48.00	0.00
119	49.00	-49.00	5.00	48.00	48.00	0.00
120	50.00	-50.00	5.00	48.00	48.00	0.00
121	51.00	-51.00	5.00	48.00	48.00	0.00
122	52.00	-52.00	5.00	48.00	48.00	0.00
123	53.00	-53.00	5.00	48.00	48.00	0.00
124	54.00	-54.00	5.00	48.00	48.00	0.00
125	55.00	-55.00	5.00	48.00	48.00	0.00
126	56.00	-56.00	5.00	48.00	48.00	0.00
127	57.00	-57.00	5.00	48.00	48.00	0.00
128	58.00	-58.00	5.00	48.00	48.00	0.00
129	59.00	-59.00	5.00	48.00	48.00	0.00
130	60.00	-60.00	5.00	48.00	48.00	0.00
131	61.00	-61.00	5.00	48.00	48.00	0.00
132	62.00	-62.00	5.00	48.00	48.00	0.00
133	63.00	-63.00	5.00	48.00	48.00	0.00
134	64.00	-64.00	5.00	48.00	48.00	0.00
135	65.00	-65.00	5.00	48.00	48.00	0.00
136	66.00	-66.00	5.00	48.00	48.00	0.00
137	67.00	-67.00	5.00	48.00	48.00	0.00
138	68.00	-68.00	5.00	48.00	48.00	0.00
139	69.00	-69.00	5.00	48.00	48.00	0.00
140	70.00	-70.00	5.00	48.00	48.00	0.00

Drilled Shaft Capacity (sorted by shaft diameter):

=====
Strength reduction factors: Skin-friction = 1.00, End-bearing = 0.00

ID	Diameter (in)	Length (ft)	Skin Fric. (tons)	End Bearing (tons)	Capacity (tons)
1	48.00	1.00	0.000	0.000	0.000
2	48.00	2.00	0.000	0.000	0.000
3	48.00	3.00	0.000	0.000	0.000
4	48.00	4.00	0.000	0.000	0.000
5	48.00	5.00	0.000	0.000	0.000
6	48.00	6.00	0.000	0.000	0.000
7	48.00	7.00	0.000	0.000	0.000
8	48.00	8.00	0.000	0.000	0.000
9	48.00	9.00	0.000	0.000	0.000
10	48.00	10.00	0.000	0.000	0.000
11	48.00	11.00	0.000	0.000	0.000
12	48.00	12.00	0.000	0.000	0.000
13	48.00	13.00	0.000	0.000	0.000
14	48.00	14.00	0.000	0.000	0.000
15	48.00	15.00	0.000	0.000	0.000

16	48.00	16.00	0.000	0.000	0.000
17	48.00	17.00	0.000	0.000	0.000
18	48.00	18.00	0.000	0.000	0.000
19	48.00	19.00	0.000	0.000	0.000
20	48.00	20.00	0.000	0.000	0.000
21	48.00	21.00	0.000	0.000	0.000
22	48.00	22.00	0.000	0.000	0.000
23	48.00	23.00	0.000	0.000	0.000
24	48.00	24.00	0.000	0.000	0.000
25	48.00	25.00	0.000	0.000	0.000
26	48.00	26.00	0.000	0.000	0.000
27	48.00	27.00	0.000	0.000	0.000
28	48.00	28.00	0.000	0.000	0.000
29	48.00	29.00	0.000	0.000	0.000
30	48.00	30.00	0.000	0.000	0.000
31	48.00	31.00	0.000	0.000	0.000
32	48.00	32.00	0.000	0.000	0.000
33	48.00	33.00	0.000	0.000	0.000
34	48.00	34.00	43.982	0.000	43.982
35	48.00	35.00	87.965	0.000	87.965
36	48.00	36.00	131.947	0.000	131.947
37	48.00	37.00	175.929	0.000	175.929
38	48.00	38.00	219.911	0.000	219.911
39	48.00	39.00	263.894	0.000	263.894
40	48.00	40.00	307.876	0.000	307.876
41	48.00	41.00	351.858	0.000	351.858
42	48.00	42.00	395.841	0.000	395.841
43	48.00	43.00	439.823	0.000	439.823
44	48.00	44.00	483.805	0.000	483.805
45	48.00	45.00	527.788	0.000	527.788
46	48.00	46.00	571.770	0.000	571.770
47	48.00	47.00	615.752	0.000	615.752
48	48.00	48.00	659.734	0.000	659.734
49	48.00	49.00	703.717	0.000	703.717
50	48.00	50.00	747.699	0.000	747.699
51	48.00	51.00	791.681	0.000	791.681
52	48.00	52.00	835.664	0.000	835.664
53	48.00	53.00	879.646	0.000	879.646
54	48.00	54.00	923.628	0.000	923.628
55	48.00	55.00	967.611	0.000	967.611
56	48.00	56.00	1011.593	0.000	1011.593
57	48.00	57.00	1055.575	0.000	1055.575
58	48.00	58.00	1099.557	0.000	1099.557
59	48.00	59.00	1143.540	0.000	1143.540
60	48.00	60.00	1187.522	0.000	1187.522
61	48.00	61.00	1231.504	0.000	1231.504
62	48.00	62.00	1275.487	0.000	1275.487
63	48.00	63.00	1319.469	0.000	1319.469
64	48.00	64.00	1363.451	0.000	1363.451
65	48.00	65.00	1407.434	0.000	1407.434
66	48.00	66.00	1451.416	0.000	1451.416
67	48.00	67.00	1495.398	0.000	1495.398
68	48.00	68.00	1539.380	0.000	1539.380
69	48.00	69.00	1583.363	0.000	1583.363
70	48.00	70.00	1627.345	0.000	1627.345

Drilled Shaft Capacity at User-Defined Settlement (sorted by shaft diameter):

***** Capacity is NOT modified by the strength reduction factors *****

User-Defined Settlement = 5.00%

ID	Diameter (in)	Length (ft)	Skin Fric. (tons)	End Bearing (tons)	Capacity (tons)
1	48.00	1.00	0.000	0.000	0.000
2	48.00	2.00	0.000	0.000	0.000
3	48.00	3.00	0.000	0.000	0.000
4	48.00	4.00	0.000	0.000	0.000
5	48.00	5.00	0.000	0.000	0.000
6	48.00	6.00	0.000	0.000	0.000
7	48.00	7.00	0.000	0.000	0.000
8	48.00	8.00	0.000	0.000	0.000
9	48.00	9.00	0.000	0.000	0.000
10	48.00	10.00	0.000	0.000	0.000
11	48.00	11.00	0.000	0.000	0.000
12	48.00	12.00	0.000	0.000	0.000

13	48.00	13.00	0.000	0.000	0.000
14	48.00	14.00	0.000	0.000	0.000
15	48.00	15.00	0.000	0.000	0.000
16	48.00	16.00	0.000	0.000	0.000
17	48.00	17.00	0.000	0.000	0.000
18	48.00	18.00	0.000	0.000	0.000
19	48.00	19.00	0.000	0.000	0.000
20	48.00	20.00	0.000	0.000	0.000
21	48.00	21.00	0.000	0.000	0.000
22	48.00	22.00	0.000	0.000	0.000
23	48.00	23.00	0.000	0.000	0.000
24	48.00	24.00	0.000	0.000	0.000
25	48.00	25.00	0.000	0.000	0.000
26	48.00	26.00	0.000	0.000	0.000
27	48.00	27.00	0.000	0.000	0.000
28	48.00	28.00	0.000	0.000	0.000
29	48.00	29.00	0.000	0.000	0.000
30	48.00	30.00	0.000	0.000	0.000
31	48.00	31.00	0.000	0.000	0.000
32	48.00	32.00	0.000	0.000	0.000
33	48.00	33.00	0.000	3801.144	3801.144
34	48.00	34.00	43.790	4609.176	4652.966
35	48.00	35.00	87.198	2896.898	2984.096
36	48.00	36.00	130.231	2207.764	2337.994
37	48.00	37.00	172.893	1820.722	1993.615
38	48.00	38.00	215.190	1567.884	1783.074
39	48.00	39.00	257.128	1387.594	1644.722
40	48.00	40.00	298.711	1251.435	1550.146
41	48.00	41.00	339.946	1144.336	1484.282
42	48.00	42.00	381.665	1132.146	1513.811
43	48.00	43.00	423.237	1119.102	1542.339
44	48.00	44.00	464.667	1105.586	1570.253
45	48.00	45.00	505.958	1091.847	1597.805
46	48.00	46.00	547.115	1078.047	1625.162
47	48.00	47.00	588.141	1064.296	1652.437
48	48.00	48.00	629.039	1050.666	1679.705
49	48.00	49.00	669.812	1037.205	1707.017
50	48.00	50.00	710.463	1023.944	1734.407
51	48.00	51.00	750.994	1010.904	1761.898
52	48.00	52.00	791.407	998.096	1789.503
53	48.00	53.00	831.704	985.526	1817.230
54	48.00	54.00	871.889	973.195	1845.083
55	48.00	55.00	911.961	961.102	1873.063
56	48.00	56.00	951.924	949.245	1901.168
57	48.00	57.00	991.778	937.618	1929.397
58	48.00	58.00	1031.527	926.217	1957.744
59	48.00	59.00	1071.170	915.036	1986.206
60	48.00	60.00	1110.710	904.068	2014.777
61	48.00	61.00	1150.148	893.306	2043.454
62	48.00	62.00	1189.485	882.745	2072.229
63	48.00	63.00	1228.723	872.377	2101.099
64	48.00	64.00	1267.863	862.195	2130.058
65	48.00	65.00	1306.906	852.195	2159.100
66	48.00	66.00	1345.853	842.368	2188.221
67	48.00	67.00	1384.706	832.710	2217.416
68	48.00	68.00	1423.466	823.214	2246.680
69	48.00	69.00	1462.133	813.875	2276.009
70	48.00	70.00	1500.710	804.688	2305.397

General Information:

Input file: Drive PDE_GANNETT FLEMING\FB-Deep\Drilled Shafts\BR-2 - DS.in
 Project number: 221126
 Job name: SR 997 Bridge Over Black Creek Canal (Bridge No. 870633)
 Engineer: Adnan Ismail, P.E.
 Units: English

Analysis Information:

Analysis Type: Drilled Shaft Analysis

Soil Information:

Boring date: 8/20/2021
 Boring number: BR-2
 Station number: Offset:
 Ground Elevation: 0.00(ft)
 Water table Elevation = -6.20(ft)

Rock side-friction is calculated using: McVay's method

ID	Depth (ft)	Elevation (ft)	SPT Blows (Blows/ft)	Unit Weight (pcf)	Soil Type
1	0.00	0.00	N/A	0.00	5- Cavity layer
2	1.00	-1.00	N/A	0.00	5- Cavity layer
3	3.00	-3.00	N/A	0.00	5- Cavity layer
4	5.00	-5.00	N/A	0.00	5- Cavity layer
5	7.00	-7.00	N/A	105.00	5- Cavity layer
6	9.00	-9.00	N/A	105.00	5- Cavity layer
7	12.00	-12.00	N/A	120.00	5- Cavity layer
8	15.00	-15.00	N/A	120.00	5- Cavity layer
9	18.00	-18.00	N/A	120.00	5- Cavity layer
10	21.00	-21.00	N/A	120.00	5- Cavity layer
11	24.00	-24.00	N/A	110.00	5- Cavity layer
12	27.00	-27.00	N/A	110.00	5- Cavity layer
13	30.00	-30.00	N/A	110.00	5- Cavity layer
14	33.00	-33.00	N/A	120.00	4- Lime Stone/Very shelly sand
15	36.00	-36.00	N/A	120.00	4- Lime Stone/Very shelly sand
16	39.00	-39.00	N/A	120.00	4- Lime Stone/Very shelly sand
17	42.00	-42.00	N/A	120.00	4- Lime Stone/Very shelly sand
18	45.00	-45.00	N/A	120.00	4- Lime Stone/Very shelly sand
19	48.00	-48.00	N/A	120.00	4- Lime Stone/Very shelly sand
20	51.00	-51.00	N/A	120.00	4- Lime Stone/Very shelly sand
21	54.00	-54.00	N/A	120.00	4- Lime Stone/Very shelly sand
22	57.00	-57.00	N/A	120.00	4- Lime Stone/Very shelly sand
23	60.00	-60.00	N/A	120.00	4- Lime Stone/Very shelly sand
24	63.00	-63.00	N/A	120.00	4- Lime Stone/Very shelly sand
25	66.00	-66.00	N/A	120.00	4- Lime Stone/Very shelly sand
26	69.00	-69.00	N/A	120.00	4- Lime Stone/Very shelly sand
27	72.00	-72.00	N/A	120.00	4- Lime Stone/Very shelly sand
28	75.00	-75.00	N/A	120.00	4- Lime Stone/Very shelly sand
29	77.00	-77.00	N/A	120.00	4- Lime Stone/Very shelly sand
30	79.00	-79.00	N/A	120.00	4- Lime Stone/Very shelly sand

ID	Cu-DIR (tsf)	qu (tsf)	qt (tsf)	Em (ksi)	qb (tsf)
1	N/A	N/A	N/A	N/A	N/A
2	N/A	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A	N/A
6	N/A	N/A	N/A	N/A	N/A
7	N/A	N/A	N/A	N/A	N/A
8	N/A	N/A	N/A	N/A	N/A
9	N/A	N/A	N/A	N/A	N/A
10	N/A	N/A	N/A	N/A	N/A
11	N/A	N/A	N/A	N/A	N/A
12	N/A	N/A	N/A	N/A	N/A

13	N/A	N/A	N/A	N/A	N/A
14	N/A	49.00	1.00	78.26	24.50
15	N/A	49.00	1.00	78.26	24.50
16	N/A	49.00	1.00	78.26	24.50
17	N/A	49.00	1.00	78.26	24.50
18	N/A	49.00	1.00	78.26	24.50
19	N/A	49.00	1.00	78.26	24.50
20	N/A	49.00	1.00	78.26	24.50
21	N/A	49.00	1.00	78.26	24.50
22	N/A	49.00	1.00	78.26	24.50
23	N/A	49.00	1.00	78.26	24.50
24	N/A	49.00	1.00	78.26	24.50
25	N/A	49.00	1.00	78.26	24.50
26	N/A	49.00	1.00	78.26	24.50
27	N/A	49.00	1.00	78.26	24.50
28	N/A	49.00	1.00	78.26	24.50
29	N/A	49.00	1.00	78.26	24.50
30	N/A	49.00	1.00	78.26	24.50

ID RQD F.M. S.R.I. Rock Recovery

1	N/A	N/A	N/A
2	N/A	N/A	N/A
3	N/A	N/A	N/A
4	N/A	N/A	N/A
5	N/A	N/A	N/A
6	N/A	N/A	N/A
7	N/A	N/A	N/A
8	N/A	N/A	N/A
9	N/A	N/A	N/A
10	N/A	N/A	N/A
11	N/A	N/A	N/A
12	N/A	N/A	N/A
13	N/A	N/A	N/A
14	1.00	ROUGH	1.000
15	1.00	ROUGH	1.000
16	1.00	ROUGH	1.000
17	1.00	ROUGH	1.000
18	1.00	ROUGH	1.000
19	1.00	ROUGH	1.000
20	1.00	ROUGH	1.000
21	1.00	ROUGH	1.000
22	1.00	ROUGH	1.000
23	1.00	ROUGH	1.000
24	1.00	ROUGH	1.000
25	1.00	ROUGH	1.000
26	1.00	ROUGH	1.000
27	1.00	ROUGH	1.000
28	1.00	ROUGH	1.000
29	1.00	ROUGH	1.000
30	1.00	ROUGH	1.000

Drilled Shaft Data:

Unit weight of concrete = 150.00(pcf), Concrete Slump = 9.00(in)
 Modulus of Elasticity of concrete = 4030.00(ksi)

Shaft Geometry:

ID	Length (ft)	Tip Elev. (ft)	Case Len. (ft)	Diameter (in)	Base Diam. (in)	Bell Len. (ft)
141	1.00	-1.00	5.00	54.00	54.00	0.00
142	2.00	-2.00	5.00	54.00	54.00	0.00
143	3.00	-3.00	5.00	54.00	54.00	0.00
144	4.00	-4.00	5.00	54.00	54.00	0.00
145	5.00	-5.00	5.00	54.00	54.00	0.00
146	6.00	-6.00	5.00	54.00	54.00	0.00
147	7.00	-7.00	5.00	54.00	54.00	0.00
148	8.00	-8.00	5.00	54.00	54.00	0.00
149	9.00	-9.00	5.00	54.00	54.00	0.00
150	10.00	-10.00	5.00	54.00	54.00	0.00
151	11.00	-11.00	5.00	54.00	54.00	0.00
152	12.00	-12.00	5.00	54.00	54.00	0.00
153	13.00	-13.00	5.00	54.00	54.00	0.00
154	14.00	-14.00	5.00	54.00	54.00	0.00
155	15.00	-15.00	5.00	54.00	54.00	0.00

156	16.00	-16.00	5.00	54.00	54.00	0.00
157	17.00	-17.00	5.00	54.00	54.00	0.00
158	18.00	-18.00	5.00	54.00	54.00	0.00
159	19.00	-19.00	5.00	54.00	54.00	0.00
160	20.00	-20.00	5.00	54.00	54.00	0.00
161	21.00	-21.00	5.00	54.00	54.00	0.00
162	22.00	-22.00	5.00	54.00	54.00	0.00
163	23.00	-23.00	5.00	54.00	54.00	0.00
164	24.00	-24.00	5.00	54.00	54.00	0.00
165	25.00	-25.00	5.00	54.00	54.00	0.00
166	26.00	-26.00	5.00	54.00	54.00	0.00
167	27.00	-27.00	5.00	54.00	54.00	0.00
168	28.00	-28.00	5.00	54.00	54.00	0.00
169	29.00	-29.00	5.00	54.00	54.00	0.00
170	30.00	-30.00	5.00	54.00	54.00	0.00
171	31.00	-31.00	5.00	54.00	54.00	0.00
172	32.00	-32.00	5.00	54.00	54.00	0.00
173	33.00	-33.00	5.00	54.00	54.00	0.00
174	34.00	-34.00	5.00	54.00	54.00	0.00
175	35.00	-35.00	5.00	54.00	54.00	0.00
176	36.00	-36.00	5.00	54.00	54.00	0.00
177	37.00	-37.00	5.00	54.00	54.00	0.00
178	38.00	-38.00	5.00	54.00	54.00	0.00
179	39.00	-39.00	5.00	54.00	54.00	0.00
180	40.00	-40.00	5.00	54.00	54.00	0.00
181	41.00	-41.00	5.00	54.00	54.00	0.00
182	42.00	-42.00	5.00	54.00	54.00	0.00
183	43.00	-43.00	5.00	54.00	54.00	0.00
184	44.00	-44.00	5.00	54.00	54.00	0.00
185	45.00	-45.00	5.00	54.00	54.00	0.00
186	46.00	-46.00	5.00	54.00	54.00	0.00
187	47.00	-47.00	5.00	54.00	54.00	0.00
188	48.00	-48.00	5.00	54.00	54.00	0.00
189	49.00	-49.00	5.00	54.00	54.00	0.00
190	50.00	-50.00	5.00	54.00	54.00	0.00
191	51.00	-51.00	5.00	54.00	54.00	0.00
192	52.00	-52.00	5.00	54.00	54.00	0.00
193	53.00	-53.00	5.00	54.00	54.00	0.00
194	54.00	-54.00	5.00	54.00	54.00	0.00
195	55.00	-55.00	5.00	54.00	54.00	0.00
196	56.00	-56.00	5.00	54.00	54.00	0.00
197	57.00	-57.00	5.00	54.00	54.00	0.00
198	58.00	-58.00	5.00	54.00	54.00	0.00
199	59.00	-59.00	5.00	54.00	54.00	0.00
200	60.00	-60.00	5.00	54.00	54.00	0.00
201	61.00	-61.00	5.00	54.00	54.00	0.00
202	62.00	-62.00	5.00	54.00	54.00	0.00
203	63.00	-63.00	5.00	54.00	54.00	0.00
204	64.00	-64.00	5.00	54.00	54.00	0.00
205	65.00	-65.00	5.00	54.00	54.00	0.00
206	66.00	-66.00	5.00	54.00	54.00	0.00
207	67.00	-67.00	5.00	54.00	54.00	0.00
208	68.00	-68.00	5.00	54.00	54.00	0.00
209	69.00	-69.00	5.00	54.00	54.00	0.00
210	70.00	-70.00	5.00	54.00	54.00	0.00

Drilled Shaft Capacity (sorted by shaft diameter):

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Strength reduction factors: Skin-friction = 1.00, End-bearing = 0.00

ID	Diameter (in)	Length (ft)	Skin Fric. (tons)	End Bearing (tons)	Capacity (tons)
1	54.00	1.00	0.000	0.000	0.000
2	54.00	2.00	0.000	0.000	0.000
3	54.00	3.00	0.000	0.000	0.000
4	54.00	4.00	0.000	0.000	0.000
5	54.00	5.00	0.000	0.000	0.000
6	54.00	6.00	0.000	0.000	0.000
7	54.00	7.00	0.000	0.000	0.000
8	54.00	8.00	0.000	0.000	0.000
9	54.00	9.00	0.000	0.000	0.000
10	54.00	10.00	0.000	0.000	0.000
11	54.00	11.00	0.000	0.000	0.000
12	54.00	12.00	0.000	0.000	0.000
13	54.00	13.00	0.000	0.000	0.000
14	54.00	14.00	0.000	0.000	0.000
15	54.00	15.00	0.000	0.000	0.000

16	54.00	16.00	0.000	0.000	0.000
17	54.00	17.00	0.000	0.000	0.000
18	54.00	18.00	0.000	0.000	0.000
19	54.00	19.00	0.000	0.000	0.000
20	54.00	20.00	0.000	0.000	0.000
21	54.00	21.00	0.000	0.000	0.000
22	54.00	22.00	0.000	0.000	0.000
23	54.00	23.00	0.000	0.000	0.000
24	54.00	24.00	0.000	0.000	0.000
25	54.00	25.00	0.000	0.000	0.000
26	54.00	26.00	0.000	0.000	0.000
27	54.00	27.00	0.000	0.000	0.000
28	54.00	28.00	0.000	0.000	0.000
29	54.00	29.00	0.000	0.000	0.000
30	54.00	30.00	0.000	0.000	0.000
31	54.00	31.00	0.000	0.000	0.000
32	54.00	32.00	0.000	0.000	0.000
33	54.00	33.00	0.000	0.000	0.000
34	54.00	34.00	49.480	0.000	49.480
35	54.00	35.00	98.960	0.000	98.960
36	54.00	36.00	148.440	0.000	148.440
37	54.00	37.00	197.920	0.000	197.920
38	54.00	38.00	247.400	0.000	247.400
39	54.00	39.00	296.881	0.000	296.881
40	54.00	40.00	346.361	0.000	346.361
41	54.00	41.00	395.841	0.000	395.841
42	54.00	42.00	445.321	0.000	445.321
43	54.00	43.00	494.801	0.000	494.801
44	54.00	44.00	544.281	0.000	544.281
45	54.00	45.00	593.761	0.000	593.761
46	54.00	46.00	643.241	0.000	643.241
47	54.00	47.00	692.721	0.000	692.721
48	54.00	48.00	742.201	0.000	742.201
49	54.00	49.00	791.681	0.000	791.681
50	54.00	50.00	841.161	0.000	841.161
51	54.00	51.00	890.642	0.000	890.642
52	54.00	52.00	940.122	0.000	940.122
53	54.00	53.00	989.602	0.000	989.602
54	54.00	54.00	1039.082	0.000	1039.082
55	54.00	55.00	1088.562	0.000	1088.562
56	54.00	56.00	1138.042	0.000	1138.042
57	54.00	57.00	1187.522	0.000	1187.522
58	54.00	58.00	1237.002	0.000	1237.002
59	54.00	59.00	1286.482	0.000	1286.482
60	54.00	60.00	1335.962	0.000	1335.962
61	54.00	61.00	1385.442	0.000	1385.442
62	54.00	62.00	1434.922	0.000	1434.922
63	54.00	63.00	1484.403	0.000	1484.403
64	54.00	64.00	1533.883	0.000	1533.883
65	54.00	65.00	1583.363	0.000	1583.363
66	54.00	66.00	1632.843	0.000	1632.843
67	54.00	67.00	1682.323	0.000	1682.323
68	54.00	68.00	1731.803	0.000	1731.803
69	54.00	69.00	1781.283	0.000	1781.283
70	54.00	70.00	1830.763	0.000	1830.763

Drilled Shaft Capacity at User-Defined Settlement (sorted by shaft diameter):

***** Capacity is NOT modified by the strength reduction factors *****

User-Defined Settlement = 5.00%

ID	Diameter (in)	Length (ft)	Skin Fric. (tons)	End Bearing (tons)	Capacity (tons)
1	54.00	1.00	0.000	0.000	0.000
2	54.00	2.00	0.000	0.000	0.000
3	54.00	3.00	0.000	0.000	0.000
4	54.00	4.00	0.000	0.000	0.000
5	54.00	5.00	0.000	0.000	0.000
6	54.00	6.00	0.000	0.000	0.000
7	54.00	7.00	0.000	0.000	0.000
8	54.00	8.00	0.000	0.000	0.000
9	54.00	9.00	0.000	0.000	0.000
10	54.00	10.00	0.000	0.000	0.000
11	54.00	11.00	0.000	0.000	0.000
12	54.00	12.00	0.000	0.000	0.000

13	54.00	13.00	0.000	0.000	0.000
14	54.00	14.00	0.000	0.000	0.000
15	54.00	15.00	0.000	0.000	0.000
16	54.00	16.00	0.000	0.000	0.000
17	54.00	17.00	0.000	0.000	0.000
18	54.00	18.00	0.000	0.000	0.000
19	54.00	19.00	0.000	0.000	0.000
20	54.00	20.00	0.000	0.000	0.000
21	54.00	21.00	0.000	0.000	0.000
22	54.00	22.00	0.000	0.000	0.000
23	54.00	23.00	0.000	0.000	0.000
24	54.00	24.00	0.000	0.000	0.000
25	54.00	25.00	0.000	0.000	0.000
26	54.00	26.00	0.000	0.000	0.000
27	54.00	27.00	0.000	0.000	0.000
28	54.00	28.00	0.000	0.000	0.000
29	54.00	29.00	0.000	0.000	0.000
30	54.00	30.00	0.000	0.000	0.000
31	54.00	31.00	0.000	0.000	0.000
32	54.00	32.00	0.000	0.000	0.000
33	54.00	33.00	0.000	4810.823	4810.823
34	54.00	34.00	49.287	6312.487	6361.775
35	54.00	35.00	98.193	3967.441	4065.633
36	54.00	36.00	146.721	3023.638	3170.360
37	54.00	37.00	194.878	2493.566	2688.444
38	54.00	38.00	242.668	2147.292	2389.960
39	54.00	39.00	290.095	1900.377	2190.472
40	54.00	40.00	337.165	1713.900	2051.065
41	54.00	41.00	383.883	1567.223	1951.106
42	54.00	42.00	430.254	1448.300	1878.554
43	54.00	43.00	477.201	1434.651	1911.852
44	54.00	44.00	524.001	1420.097	1944.098
45	54.00	45.00	570.658	1405.004	1975.662
46	54.00	46.00	617.176	1389.617	2006.793
47	54.00	47.00	663.558	1374.107	2037.665
48	54.00	48.00	709.809	1358.590	2068.399
49	54.00	49.00	755.930	1343.150	2099.080
50	54.00	50.00	801.925	1327.845	2129.770
51	54.00	51.00	847.796	1312.712	2160.508
52	54.00	52.00	893.545	1297.781	2191.326
53	54.00	53.00	939.175	1283.068	2222.244
54	54.00	54.00	984.688	1268.586	2253.274
55	54.00	55.00	1030.086	1254.339	2284.425
56	54.00	56.00	1075.370	1240.332	2315.702
57	54.00	57.00	1120.542	1226.564	2347.107
58	54.00	58.00	1165.605	1213.034	2378.639
59	54.00	59.00	1210.559	1199.738	2410.297
60	54.00	60.00	1255.406	1186.673	2442.079
61	54.00	61.00	1300.147	1173.833	2473.980
62	54.00	62.00	1344.785	1161.213	2505.998
63	54.00	63.00	1389.320	1148.808	2538.128
64	54.00	64.00	1433.753	1136.612	2570.366
65	54.00	65.00	1478.087	1124.619	2602.706
66	54.00	66.00	1522.321	1112.823	2635.144
67	54.00	67.00	1566.458	1101.218	2667.676
68	54.00	68.00	1610.499	1089.798	2700.297
69	54.00	69.00	1654.444	1078.559	2733.002
70	54.00	70.00	1698.294	1067.493	2765.787

General Information:

Input file: Drive PDE_GANNETT FLEMING\FB-Deep\Drilled Shafts\BR-2 - DS.in
 Project number: 221126
 Job name: SR 997 Bridge Over Black Creek Canal (Bridge No. 870633)
 Engineer: Adnan Ismail, P.E.
 Units: English

Analysis Information:

Analysis Type: Drilled Shaft Analysis

Soil Information:

Boring date: 8/20/2021
 Boring number: BR-2
 Station number: Offset:
 Ground Elevation: 0.00(ft)
 Water table Elevation = -6.20(ft)

Rock side-friction is calculated using: McVay's method

ID	Depth (ft)	Elevation (ft)	SPT Blows (Blows/ft)	Unit Weight (pcf)	Soil Type
1	0.00	0.00	N/A	0.00	5- Cavity layer
2	1.00	-1.00	N/A	0.00	5- Cavity layer
3	3.00	-3.00	N/A	0.00	5- Cavity layer
4	5.00	-5.00	N/A	0.00	5- Cavity layer
5	7.00	-7.00	N/A	105.00	5- Cavity layer
6	9.00	-9.00	N/A	105.00	5- Cavity layer
7	12.00	-12.00	N/A	120.00	5- Cavity layer
8	15.00	-15.00	N/A	120.00	5- Cavity layer
9	18.00	-18.00	N/A	120.00	5- Cavity layer
10	21.00	-21.00	N/A	120.00	5- Cavity layer
11	24.00	-24.00	N/A	110.00	5- Cavity layer
12	27.00	-27.00	N/A	110.00	5- Cavity layer
13	30.00	-30.00	N/A	110.00	5- Cavity layer
14	33.00	-33.00	N/A	120.00	4- Lime Stone/Very shelly sand
15	36.00	-36.00	N/A	120.00	4- Lime Stone/Very shelly sand
16	39.00	-39.00	N/A	120.00	4- Lime Stone/Very shelly sand
17	42.00	-42.00	N/A	120.00	4- Lime Stone/Very shelly sand
18	45.00	-45.00	N/A	120.00	4- Lime Stone/Very shelly sand
19	48.00	-48.00	N/A	120.00	4- Lime Stone/Very shelly sand
20	51.00	-51.00	N/A	120.00	4- Lime Stone/Very shelly sand
21	54.00	-54.00	N/A	120.00	4- Lime Stone/Very shelly sand
22	57.00	-57.00	N/A	120.00	4- Lime Stone/Very shelly sand
23	60.00	-60.00	N/A	120.00	4- Lime Stone/Very shelly sand
24	63.00	-63.00	N/A	120.00	4- Lime Stone/Very shelly sand
25	66.00	-66.00	N/A	120.00	4- Lime Stone/Very shelly sand
26	69.00	-69.00	N/A	120.00	4- Lime Stone/Very shelly sand
27	72.00	-72.00	N/A	120.00	4- Lime Stone/Very shelly sand
28	75.00	-75.00	N/A	120.00	4- Lime Stone/Very shelly sand
29	77.00	-77.00	N/A	120.00	4- Lime Stone/Very shelly sand
30	79.00	-79.00	N/A	120.00	4- Lime Stone/Very shelly sand

ID	Cu-DIR (tsf)	qu (tsf)	qt (tsf)	Em (ksi)	qb (tsf)
1	N/A	N/A	N/A	N/A	N/A
2	N/A	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A	N/A
6	N/A	N/A	N/A	N/A	N/A
7	N/A	N/A	N/A	N/A	N/A
8	N/A	N/A	N/A	N/A	N/A
9	N/A	N/A	N/A	N/A	N/A
10	N/A	N/A	N/A	N/A	N/A
11	N/A	N/A	N/A	N/A	N/A
12	N/A	N/A	N/A	N/A	N/A

13	N/A	N/A	N/A	N/A	N/A
14	N/A	49.00	1.00	78.26	24.50
15	N/A	49.00	1.00	78.26	24.50
16	N/A	49.00	1.00	78.26	24.50
17	N/A	49.00	1.00	78.26	24.50
18	N/A	49.00	1.00	78.26	24.50
19	N/A	49.00	1.00	78.26	24.50
20	N/A	49.00	1.00	78.26	24.50
21	N/A	49.00	1.00	78.26	24.50
22	N/A	49.00	1.00	78.26	24.50
23	N/A	49.00	1.00	78.26	24.50
24	N/A	49.00	1.00	78.26	24.50
25	N/A	49.00	1.00	78.26	24.50
26	N/A	49.00	1.00	78.26	24.50
27	N/A	49.00	1.00	78.26	24.50
28	N/A	49.00	1.00	78.26	24.50
29	N/A	49.00	1.00	78.26	24.50
30	N/A	49.00	1.00	78.26	24.50

ID RQD F.M. S.R.I. Rock Recovery

1	N/A	N/A	N/A
2	N/A	N/A	N/A
3	N/A	N/A	N/A
4	N/A	N/A	N/A
5	N/A	N/A	N/A
6	N/A	N/A	N/A
7	N/A	N/A	N/A
8	N/A	N/A	N/A
9	N/A	N/A	N/A
10	N/A	N/A	N/A
11	N/A	N/A	N/A
12	N/A	N/A	N/A
13	N/A	N/A	N/A
14	1.00	ROUGH	1.000
15	1.00	ROUGH	1.000
16	1.00	ROUGH	1.000
17	1.00	ROUGH	1.000
18	1.00	ROUGH	1.000
19	1.00	ROUGH	1.000
20	1.00	ROUGH	1.000
21	1.00	ROUGH	1.000
22	1.00	ROUGH	1.000
23	1.00	ROUGH	1.000
24	1.00	ROUGH	1.000
25	1.00	ROUGH	1.000
26	1.00	ROUGH	1.000
27	1.00	ROUGH	1.000
28	1.00	ROUGH	1.000
29	1.00	ROUGH	1.000
30	1.00	ROUGH	1.000

Drilled Shaft Data:

=====
Unit weight of concrete = 150.00(pcf), Concrete Slump = 9.00(in)
Modulus of Elasticity of concrete = 4030.00(ksi)

Shaft Geometry:

ID	Length (ft)	Tip Elev. (ft)	Case Len. (ft)	Diameter (in)	Base Diam. (in)	Bell Len. (ft)
211	1.00	-1.00	5.00	60.00	60.00	0.00
212	2.00	-2.00	5.00	60.00	60.00	0.00
213	3.00	-3.00	5.00	60.00	60.00	0.00
214	4.00	-4.00	5.00	60.00	60.00	0.00
215	5.00	-5.00	5.00	60.00	60.00	0.00
216	6.00	-6.00	5.00	60.00	60.00	0.00
217	7.00	-7.00	5.00	60.00	60.00	0.00
218	8.00	-8.00	5.00	60.00	60.00	0.00
219	9.00	-9.00	5.00	60.00	60.00	0.00
220	10.00	-10.00	5.00	60.00	60.00	0.00
221	11.00	-11.00	5.00	60.00	60.00	0.00
222	12.00	-12.00	5.00	60.00	60.00	0.00
223	13.00	-13.00	5.00	60.00	60.00	0.00
224	14.00	-14.00	5.00	60.00	60.00	0.00
225	15.00	-15.00	5.00	60.00	60.00	0.00

226	16.00	-16.00	5.00	60.00	60.00	0.00
227	17.00	-17.00	5.00	60.00	60.00	0.00
228	18.00	-18.00	5.00	60.00	60.00	0.00
229	19.00	-19.00	5.00	60.00	60.00	0.00
230	20.00	-20.00	5.00	60.00	60.00	0.00
231	21.00	-21.00	5.00	60.00	60.00	0.00
232	22.00	-22.00	5.00	60.00	60.00	0.00
233	23.00	-23.00	5.00	60.00	60.00	0.00
234	24.00	-24.00	5.00	60.00	60.00	0.00
235	25.00	-25.00	5.00	60.00	60.00	0.00
236	26.00	-26.00	5.00	60.00	60.00	0.00
237	27.00	-27.00	5.00	60.00	60.00	0.00
238	28.00	-28.00	5.00	60.00	60.00	0.00
239	29.00	-29.00	5.00	60.00	60.00	0.00
240	30.00	-30.00	5.00	60.00	60.00	0.00
241	31.00	-31.00	5.00	60.00	60.00	0.00
242	32.00	-32.00	5.00	60.00	60.00	0.00
243	33.00	-33.00	5.00	60.00	60.00	0.00
244	34.00	-34.00	5.00	60.00	60.00	0.00
245	35.00	-35.00	5.00	60.00	60.00	0.00
246	36.00	-36.00	5.00	60.00	60.00	0.00
247	37.00	-37.00	5.00	60.00	60.00	0.00
248	38.00	-38.00	5.00	60.00	60.00	0.00
249	39.00	-39.00	5.00	60.00	60.00	0.00
250	40.00	-40.00	5.00	60.00	60.00	0.00
251	41.00	-41.00	5.00	60.00	60.00	0.00
252	42.00	-42.00	5.00	60.00	60.00	0.00
253	43.00	-43.00	5.00	60.00	60.00	0.00
254	44.00	-44.00	5.00	60.00	60.00	0.00
255	45.00	-45.00	5.00	60.00	60.00	0.00
256	46.00	-46.00	5.00	60.00	60.00	0.00
257	47.00	-47.00	5.00	60.00	60.00	0.00
258	48.00	-48.00	5.00	60.00	60.00	0.00
259	49.00	-49.00	5.00	60.00	60.00	0.00
260	50.00	-50.00	5.00	60.00	60.00	0.00
261	51.00	-51.00	5.00	60.00	60.00	0.00
262	52.00	-52.00	5.00	60.00	60.00	0.00
263	53.00	-53.00	5.00	60.00	60.00	0.00
264	54.00	-54.00	5.00	60.00	60.00	0.00
265	55.00	-55.00	5.00	60.00	60.00	0.00
266	56.00	-56.00	5.00	60.00	60.00	0.00
267	57.00	-57.00	5.00	60.00	60.00	0.00
268	58.00	-58.00	5.00	60.00	60.00	0.00
269	59.00	-59.00	5.00	60.00	60.00	0.00
270	60.00	-60.00	5.00	60.00	60.00	0.00
271	61.00	-61.00	5.00	60.00	60.00	0.00
272	62.00	-62.00	5.00	60.00	60.00	0.00
273	63.00	-63.00	5.00	60.00	60.00	0.00
274	64.00	-64.00	5.00	60.00	60.00	0.00
275	65.00	-65.00	5.00	60.00	60.00	0.00
276	66.00	-66.00	5.00	60.00	60.00	0.00
277	67.00	-67.00	5.00	60.00	60.00	0.00
278	68.00	-68.00	5.00	60.00	60.00	0.00
279	69.00	-69.00	5.00	60.00	60.00	0.00
280	70.00	-70.00	5.00	60.00	60.00	0.00

Drilled Shaft Capacity (sorted by shaft diameter):

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Strength reduction factors: Skin-friction = 1.00, End-bearing = 0.00

ID	Diameter (in)	Length (ft)	Skin Fric. (tons)	End Bearing (tons)	Capacity (tons)
1	60.00	1.00	0.000	0.000	0.000
2	60.00	2.00	0.000	0.000	0.000
3	60.00	3.00	0.000	0.000	0.000
4	60.00	4.00	0.000	0.000	0.000
5	60.00	5.00	0.000	0.000	0.000
6	60.00	6.00	0.000	0.000	0.000
7	60.00	7.00	0.000	0.000	0.000
8	60.00	8.00	0.000	0.000	0.000
9	60.00	9.00	0.000	0.000	0.000
10	60.00	10.00	0.000	0.000	0.000
11	60.00	11.00	0.000	0.000	0.000
12	60.00	12.00	0.000	0.000	0.000
13	60.00	13.00	0.000	0.000	0.000
14	60.00	14.00	0.000	0.000	0.000
15	60.00	15.00	0.000	0.000	0.000

16	60.00	16.00	0.000	0.000	0.000
17	60.00	17.00	0.000	0.000	0.000
18	60.00	18.00	0.000	0.000	0.000
19	60.00	19.00	0.000	0.000	0.000
20	60.00	20.00	0.000	0.000	0.000
21	60.00	21.00	0.000	0.000	0.000
22	60.00	22.00	0.000	0.000	0.000
23	60.00	23.00	0.000	0.000	0.000
24	60.00	24.00	0.000	0.000	0.000
25	60.00	25.00	0.000	0.000	0.000
26	60.00	26.00	0.000	0.000	0.000
27	60.00	27.00	0.000	0.000	0.000
28	60.00	28.00	0.000	0.000	0.000
29	60.00	29.00	0.000	0.000	0.000
30	60.00	30.00	0.000	0.000	0.000
31	60.00	31.00	0.000	0.000	0.000
32	60.00	32.00	0.000	0.000	0.000
33	60.00	33.00	0.000	0.000	0.000
34	60.00	34.00	54.978	0.000	54.978
35	60.00	35.00	109.956	0.000	109.956
36	60.00	36.00	164.934	0.000	164.934
37	60.00	37.00	219.911	0.000	219.911
38	60.00	38.00	274.889	0.000	274.889
39	60.00	39.00	329.867	0.000	329.867
40	60.00	40.00	384.845	0.000	384.845
41	60.00	41.00	439.823	0.000	439.823
42	60.00	42.00	494.801	0.000	494.801
43	60.00	43.00	549.779	0.000	549.779
44	60.00	44.00	604.757	0.000	604.757
45	60.00	45.00	659.734	0.000	659.734
46	60.00	46.00	714.712	0.000	714.712
47	60.00	47.00	769.690	0.000	769.690
48	60.00	48.00	824.668	0.000	824.668
49	60.00	49.00	879.646	0.000	879.646
50	60.00	50.00	934.624	0.000	934.624
51	60.00	51.00	989.602	0.000	989.602
52	60.00	52.00	1044.580	0.000	1044.580
53	60.00	53.00	1099.557	0.000	1099.557
54	60.00	54.00	1154.535	0.000	1154.535
55	60.00	55.00	1209.513	0.000	1209.513
56	60.00	56.00	1264.491	0.000	1264.491
57	60.00	57.00	1319.469	0.000	1319.469
58	60.00	58.00	1374.447	0.000	1374.447
59	60.00	59.00	1429.425	0.000	1429.425
60	60.00	60.00	1484.403	0.000	1484.403
61	60.00	61.00	1539.380	0.000	1539.380
62	60.00	62.00	1594.358	0.000	1594.358
63	60.00	63.00	1649.336	0.000	1649.336
64	60.00	64.00	1704.314	0.000	1704.314
65	60.00	65.00	1759.292	0.000	1759.292
66	60.00	66.00	1814.270	0.000	1814.270
67	60.00	67.00	1869.248	0.000	1869.248
68	60.00	68.00	1924.226	0.000	1924.226
69	60.00	69.00	1979.203	0.000	1979.203
70	60.00	70.00	2034.181	0.000	2034.181

Drilled Shaft Capacity at User-Defined Settlement (sorted by shaft diameter):

***** Capacity is NOT modified by the strength reduction factors *****

User-Defined Settlement = 5.00%

ID	Diameter (in)	Length (ft)	Skin Fric. (tons)	End Bearing (tons)	Capacity (tons)
1	60.00	1.00	0.000	0.000	0.000
2	60.00	2.00	0.000	0.000	0.000
3	60.00	3.00	0.000	0.000	0.000
4	60.00	4.00	0.000	0.000	0.000
5	60.00	5.00	0.000	0.000	0.000
6	60.00	6.00	0.000	0.000	0.000
7	60.00	7.00	0.000	0.000	0.000
8	60.00	8.00	0.000	0.000	0.000
9	60.00	9.00	0.000	0.000	0.000
10	60.00	10.00	0.000	0.000	0.000
11	60.00	11.00	0.000	0.000	0.000
12	60.00	12.00	0.000	0.000	0.000

13	60.00	13.00	0.000	0.000	0.000
14	60.00	14.00	0.000	0.000	0.000
15	60.00	15.00	0.000	0.000	0.000
16	60.00	16.00	0.000	0.000	0.000
17	60.00	17.00	0.000	0.000	0.000
18	60.00	18.00	0.000	0.000	0.000
19	60.00	19.00	0.000	0.000	0.000
20	60.00	20.00	0.000	0.000	0.000
21	60.00	21.00	0.000	0.000	0.000
22	60.00	22.00	0.000	0.000	0.000
23	60.00	23.00	0.000	0.000	0.000
24	60.00	24.00	0.000	0.000	0.000
25	60.00	25.00	0.000	0.000	0.000
26	60.00	26.00	0.000	0.000	0.000
27	60.00	27.00	0.000	0.000	0.000
28	60.00	28.00	0.000	0.000	0.000
29	60.00	29.00	0.000	0.000	0.000
30	60.00	30.00	0.000	0.000	0.000
31	60.00	31.00	0.000	0.000	0.000
32	60.00	32.00	0.000	0.000	0.000
33	60.00	33.00	0.000	5939.288	5939.288
34	60.00	34.00	54.785	8363.210	8417.996
35	60.00	35.00	109.188	5256.334	5365.521
36	60.00	36.00	163.213	4005.921	4169.133
37	60.00	37.00	216.865	3303.645	3520.510
38	60.00	38.00	270.148	2844.878	3115.026
39	60.00	39.00	323.067	2517.748	2840.814
40	60.00	40.00	375.625	2270.690	2646.315
41	60.00	41.00	427.829	2076.363	2504.192
42	60.00	42.00	479.683	1918.806	2398.489
43	60.00	43.00	531.190	1788.025	2319.215
44	60.00	44.00	583.366	1772.918	2356.284
45	60.00	45.00	635.394	1756.865	2392.260
46	60.00	46.00	687.279	1740.213	2427.492
47	60.00	47.00	739.025	1723.204	2462.229
48	60.00	48.00	790.635	1706.011	2496.646
49	60.00	49.00	842.112	1688.760	2530.872
50	60.00	50.00	893.459	1671.540	2564.998
51	60.00	51.00	944.678	1654.416	2599.094
52	60.00	52.00	995.771	1637.436	2633.207
53	60.00	53.00	1046.742	1620.633	2667.375
54	60.00	54.00	1097.593	1604.030	2701.623
55	60.00	55.00	1148.324	1587.645	2735.970
56	60.00	56.00	1198.939	1571.489	2770.428
57	60.00	57.00	1249.439	1555.567	2805.006
58	60.00	58.00	1299.825	1539.884	2839.709
59	60.00	59.00	1350.100	1524.440	2874.540
60	60.00	60.00	1400.265	1509.235	2909.500
61	60.00	61.00	1450.321	1494.267	2944.589
62	60.00	62.00	1500.271	1479.533	2979.803
63	60.00	63.00	1550.114	1465.028	3015.142
64	60.00	64.00	1599.853	1450.750	3050.603
65	60.00	65.00	1649.489	1436.691	3086.180
66	60.00	66.00	1699.023	1422.849	3121.872
67	60.00	67.00	1748.457	1409.217	3157.674
68	60.00	68.00	1797.790	1395.791	3193.581
69	60.00	69.00	1847.026	1382.564	3229.591
70	60.00	70.00	1896.164	1369.533	3265.697

General Information:

Input file: Drive PDE_GANNETT FLEMING\FB-Deep\Drilled Shafts\BR-2 - DS.in
 Project number: 221126
 Job name: SR 997 Bridge Over Black Creek Canal (Bridge No. 870633)
 Engineer: Adnan Ismail, P.E.
 Units: English

Analysis Information:

Analysis Type: Drilled Shaft Analysis

Soil Information:

Boring date: 8/20/2021
 Boring number: BR-2
 Station number: Offset:
 Ground Elevation: 0.00(ft)
 Water table Elevation = -6.20(ft)

Rock side-friction is calculated using: McVay's method

ID	Depth (ft)	Elevation (ft)	SPT Blows (Blows/ft)	Unit Weight (pcf)	Soil Type
1	0.00	0.00	N/A	0.00	5- Cavity layer
2	1.00	-1.00	N/A	0.00	5- Cavity layer
3	3.00	-3.00	N/A	0.00	5- Cavity layer
4	5.00	-5.00	N/A	0.00	5- Cavity layer
5	7.00	-7.00	N/A	105.00	5- Cavity layer
6	9.00	-9.00	N/A	105.00	5- Cavity layer
7	12.00	-12.00	N/A	120.00	5- Cavity layer
8	15.00	-15.00	N/A	120.00	5- Cavity layer
9	18.00	-18.00	N/A	120.00	5- Cavity layer
10	21.00	-21.00	N/A	120.00	5- Cavity layer
11	24.00	-24.00	N/A	110.00	5- Cavity layer
12	27.00	-27.00	N/A	110.00	5- Cavity layer
13	30.00	-30.00	N/A	110.00	5- Cavity layer
14	33.00	-33.00	N/A	120.00	4- Lime Stone/Very shelly sand
15	36.00	-36.00	N/A	120.00	4- Lime Stone/Very shelly sand
16	39.00	-39.00	N/A	120.00	4- Lime Stone/Very shelly sand
17	42.00	-42.00	N/A	120.00	4- Lime Stone/Very shelly sand
18	45.00	-45.00	N/A	120.00	4- Lime Stone/Very shelly sand
19	48.00	-48.00	N/A	120.00	4- Lime Stone/Very shelly sand
20	51.00	-51.00	N/A	120.00	4- Lime Stone/Very shelly sand
21	54.00	-54.00	N/A	120.00	4- Lime Stone/Very shelly sand
22	57.00	-57.00	N/A	120.00	4- Lime Stone/Very shelly sand
23	60.00	-60.00	N/A	120.00	4- Lime Stone/Very shelly sand
24	63.00	-63.00	N/A	120.00	4- Lime Stone/Very shelly sand
25	66.00	-66.00	N/A	120.00	4- Lime Stone/Very shelly sand
26	69.00	-69.00	N/A	120.00	4- Lime Stone/Very shelly sand
27	72.00	-72.00	N/A	120.00	4- Lime Stone/Very shelly sand
28	75.00	-75.00	N/A	120.00	4- Lime Stone/Very shelly sand
29	77.00	-77.00	N/A	120.00	4- Lime Stone/Very shelly sand
30	79.00	-79.00	N/A	120.00	4- Lime Stone/Very shelly sand

ID	Cu-DIR (tsf)	qu (tsf)	qt (tsf)	Em (ksi)	qb (tsf)
1	N/A	N/A	N/A	N/A	N/A
2	N/A	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A	N/A
6	N/A	N/A	N/A	N/A	N/A
7	N/A	N/A	N/A	N/A	N/A
8	N/A	N/A	N/A	N/A	N/A
9	N/A	N/A	N/A	N/A	N/A
10	N/A	N/A	N/A	N/A	N/A
11	N/A	N/A	N/A	N/A	N/A
12	N/A	N/A	N/A	N/A	N/A

13	N/A	N/A	N/A	N/A	N/A
14	N/A	49.00	1.00	78.26	24.50
15	N/A	49.00	1.00	78.26	24.50
16	N/A	49.00	1.00	78.26	24.50
17	N/A	49.00	1.00	78.26	24.50
18	N/A	49.00	1.00	78.26	24.50
19	N/A	49.00	1.00	78.26	24.50
20	N/A	49.00	1.00	78.26	24.50
21	N/A	49.00	1.00	78.26	24.50
22	N/A	49.00	1.00	78.26	24.50
23	N/A	49.00	1.00	78.26	24.50
24	N/A	49.00	1.00	78.26	24.50
25	N/A	49.00	1.00	78.26	24.50
26	N/A	49.00	1.00	78.26	24.50
27	N/A	49.00	1.00	78.26	24.50
28	N/A	49.00	1.00	78.26	24.50
29	N/A	49.00	1.00	78.26	24.50
30	N/A	49.00	1.00	78.26	24.50

ID RQD F.M. S.R.I. Rock Recovery

1	N/A	N/A	N/A
2	N/A	N/A	N/A
3	N/A	N/A	N/A
4	N/A	N/A	N/A
5	N/A	N/A	N/A
6	N/A	N/A	N/A
7	N/A	N/A	N/A
8	N/A	N/A	N/A
9	N/A	N/A	N/A
10	N/A	N/A	N/A
11	N/A	N/A	N/A
12	N/A	N/A	N/A
13	N/A	N/A	N/A
14	1.00	ROUGH	1.000
15	1.00	ROUGH	1.000
16	1.00	ROUGH	1.000
17	1.00	ROUGH	1.000
18	1.00	ROUGH	1.000
19	1.00	ROUGH	1.000
20	1.00	ROUGH	1.000
21	1.00	ROUGH	1.000
22	1.00	ROUGH	1.000
23	1.00	ROUGH	1.000
24	1.00	ROUGH	1.000
25	1.00	ROUGH	1.000
26	1.00	ROUGH	1.000
27	1.00	ROUGH	1.000
28	1.00	ROUGH	1.000
29	1.00	ROUGH	1.000
30	1.00	ROUGH	1.000

Drilled Shaft Data:

Unit weight of concrete = 150.00(pcf), Concrete Slump = 9.00(in)
 Modulus of Elasticity of concrete = 4030.00(ksi)

Shaft Geometry:

ID	Length (ft)	Tip Elev. (ft)	Case Len. (ft)	Diameter (in)	Base Diam. (in)	Bell Len. (ft)
281	1.00	-1.00	5.00	72.00	72.00	0.00
282	2.00	-2.00	5.00	72.00	72.00	0.00
283	3.00	-3.00	5.00	72.00	72.00	0.00
284	4.00	-4.00	5.00	72.00	72.00	0.00
285	5.00	-5.00	5.00	72.00	72.00	0.00
286	6.00	-6.00	5.00	72.00	72.00	0.00
287	7.00	-7.00	5.00	72.00	72.00	0.00
288	8.00	-8.00	5.00	72.00	72.00	0.00
289	9.00	-9.00	5.00	72.00	72.00	0.00
290	10.00	-10.00	5.00	72.00	72.00	0.00
291	11.00	-11.00	5.00	72.00	72.00	0.00
292	12.00	-12.00	5.00	72.00	72.00	0.00
293	13.00	-13.00	5.00	72.00	72.00	0.00
294	14.00	-14.00	5.00	72.00	72.00	0.00
295	15.00	-15.00	5.00	72.00	72.00	0.00

296	16.00	-16.00	5.00	72.00	72.00	0.00
297	17.00	-17.00	5.00	72.00	72.00	0.00
298	18.00	-18.00	5.00	72.00	72.00	0.00
299	19.00	-19.00	5.00	72.00	72.00	0.00
300	20.00	-20.00	5.00	72.00	72.00	0.00
301	21.00	-21.00	5.00	72.00	72.00	0.00
302	22.00	-22.00	5.00	72.00	72.00	0.00
303	23.00	-23.00	5.00	72.00	72.00	0.00
304	24.00	-24.00	5.00	72.00	72.00	0.00
305	25.00	-25.00	5.00	72.00	72.00	0.00
306	26.00	-26.00	5.00	72.00	72.00	0.00
307	27.00	-27.00	5.00	72.00	72.00	0.00
308	28.00	-28.00	5.00	72.00	72.00	0.00
309	29.00	-29.00	5.00	72.00	72.00	0.00
310	30.00	-30.00	5.00	72.00	72.00	0.00
311	31.00	-31.00	5.00	72.00	72.00	0.00
312	32.00	-32.00	5.00	72.00	72.00	0.00
313	33.00	-33.00	5.00	72.00	72.00	0.00
314	34.00	-34.00	5.00	72.00	72.00	0.00
315	35.00	-35.00	5.00	72.00	72.00	0.00
316	36.00	-36.00	5.00	72.00	72.00	0.00
317	37.00	-37.00	5.00	72.00	72.00	0.00
318	38.00	-38.00	5.00	72.00	72.00	0.00
319	39.00	-39.00	5.00	72.00	72.00	0.00
320	40.00	-40.00	5.00	72.00	72.00	0.00
321	41.00	-41.00	5.00	72.00	72.00	0.00
322	42.00	-42.00	5.00	72.00	72.00	0.00
323	43.00	-43.00	5.00	72.00	72.00	0.00
324	44.00	-44.00	5.00	72.00	72.00	0.00
325	45.00	-45.00	5.00	72.00	72.00	0.00
326	46.00	-46.00	5.00	72.00	72.00	0.00
327	47.00	-47.00	5.00	72.00	72.00	0.00
328	48.00	-48.00	5.00	72.00	72.00	0.00
329	49.00	-49.00	5.00	72.00	72.00	0.00
330	50.00	-50.00	5.00	72.00	72.00	0.00
331	51.00	-51.00	5.00	72.00	72.00	0.00
332	52.00	-52.00	5.00	72.00	72.00	0.00
333	53.00	-53.00	5.00	72.00	72.00	0.00
334	54.00	-54.00	5.00	72.00	72.00	0.00
335	55.00	-55.00	5.00	72.00	72.00	0.00
336	56.00	-56.00	5.00	72.00	72.00	0.00
337	57.00	-57.00	5.00	72.00	72.00	0.00
338	58.00	-58.00	5.00	72.00	72.00	0.00
339	59.00	-59.00	5.00	72.00	72.00	0.00
340	60.00	-60.00	5.00	72.00	72.00	0.00
341	61.00	-61.00	5.00	72.00	72.00	0.00
342	62.00	-62.00	5.00	72.00	72.00	0.00
343	63.00	-63.00	5.00	72.00	72.00	0.00
344	64.00	-64.00	5.00	72.00	72.00	0.00
345	65.00	-65.00	5.00	72.00	72.00	0.00
346	66.00	-66.00	5.00	72.00	72.00	0.00
347	67.00	-67.00	5.00	72.00	72.00	0.00
348	68.00	-68.00	5.00	72.00	72.00	0.00
349	69.00	-69.00	5.00	72.00	72.00	0.00
350	70.00	-70.00	5.00	72.00	72.00	0.00

Drilled Shaft Capacity (sorted by shaft diameter):

=====
Strength reduction factors: Skin-friction = 1.00, End-bearing = 0.00

ID	Diameter (in)	Length (ft)	Skin Fric. (tons)	End Bearing (tons)	Capacity (tons)
1	72.00	1.00	0.000	0.000	0.000
2	72.00	2.00	0.000	0.000	0.000
3	72.00	3.00	0.000	0.000	0.000
4	72.00	4.00	0.000	0.000	0.000
5	72.00	5.00	0.000	0.000	0.000
6	72.00	6.00	0.000	0.000	0.000
7	72.00	7.00	0.000	0.000	0.000
8	72.00	8.00	0.000	0.000	0.000
9	72.00	9.00	0.000	0.000	0.000
10	72.00	10.00	0.000	0.000	0.000
11	72.00	11.00	0.000	0.000	0.000
12	72.00	12.00	0.000	0.000	0.000
13	72.00	13.00	0.000	0.000	0.000
14	72.00	14.00	0.000	0.000	0.000
15	72.00	15.00	0.000	0.000	0.000

16	72.00	16.00	0.000	0.000	0.000
17	72.00	17.00	0.000	0.000	0.000
18	72.00	18.00	0.000	0.000	0.000
19	72.00	19.00	0.000	0.000	0.000
20	72.00	20.00	0.000	0.000	0.000
21	72.00	21.00	0.000	0.000	0.000
22	72.00	22.00	0.000	0.000	0.000
23	72.00	23.00	0.000	0.000	0.000
24	72.00	24.00	0.000	0.000	0.000
25	72.00	25.00	0.000	0.000	0.000
26	72.00	26.00	0.000	0.000	0.000
27	72.00	27.00	0.000	0.000	0.000
28	72.00	28.00	0.000	0.000	0.000
29	72.00	29.00	0.000	0.000	0.000
30	72.00	30.00	0.000	0.000	0.000
31	72.00	31.00	0.000	0.000	0.000
32	72.00	32.00	0.000	0.000	0.000
33	72.00	33.00	0.000	0.000	0.000
34	72.00	34.00	65.973	0.000	65.973
35	72.00	35.00	131.947	0.000	131.947
36	72.00	36.00	197.920	0.000	197.920
37	72.00	37.00	263.894	0.000	263.894
38	72.00	38.00	329.867	0.000	329.867
39	72.00	39.00	395.841	0.000	395.841
40	72.00	40.00	461.814	0.000	461.814
41	72.00	41.00	527.788	0.000	527.788
42	72.00	42.00	593.761	0.000	593.761
43	72.00	43.00	659.734	0.000	659.734
44	72.00	44.00	725.708	0.000	725.708
45	72.00	45.00	791.681	0.000	791.681
46	72.00	46.00	857.655	0.000	857.655
47	72.00	47.00	923.628	0.000	923.628
48	72.00	48.00	989.602	0.000	989.602
49	72.00	49.00	1055.575	0.000	1055.575
50	72.00	50.00	1121.549	0.000	1121.549
51	72.00	51.00	1187.522	0.000	1187.522
52	72.00	52.00	1253.495	0.000	1253.495
53	72.00	53.00	1319.469	0.000	1319.469
54	72.00	54.00	1385.442	0.000	1385.442
55	72.00	55.00	1451.416	0.000	1451.416
56	72.00	56.00	1517.389	0.000	1517.389
57	72.00	57.00	1583.363	0.000	1583.363
58	72.00	58.00	1649.336	0.000	1649.336
59	72.00	59.00	1715.310	0.000	1715.310
60	72.00	60.00	1781.283	0.000	1781.283
61	72.00	61.00	1847.256	0.000	1847.256
62	72.00	62.00	1913.230	0.000	1913.230
63	72.00	63.00	1979.203	0.000	1979.203
64	72.00	64.00	2045.177	0.000	2045.177
65	72.00	65.00	2111.150	0.000	2111.150
66	72.00	66.00	2177.124	0.000	2177.124
67	72.00	67.00	2243.097	0.000	2243.097
68	72.00	68.00	2309.071	0.000	2309.071
69	72.00	69.00	2375.044	0.000	2375.044
70	72.00	70.00	2441.017	0.000	2441.017

Drilled Shaft Capacity at User-Defined Settlement (sorted by shaft diameter):

***** Capacity is NOT modified by the strength reduction factors *****

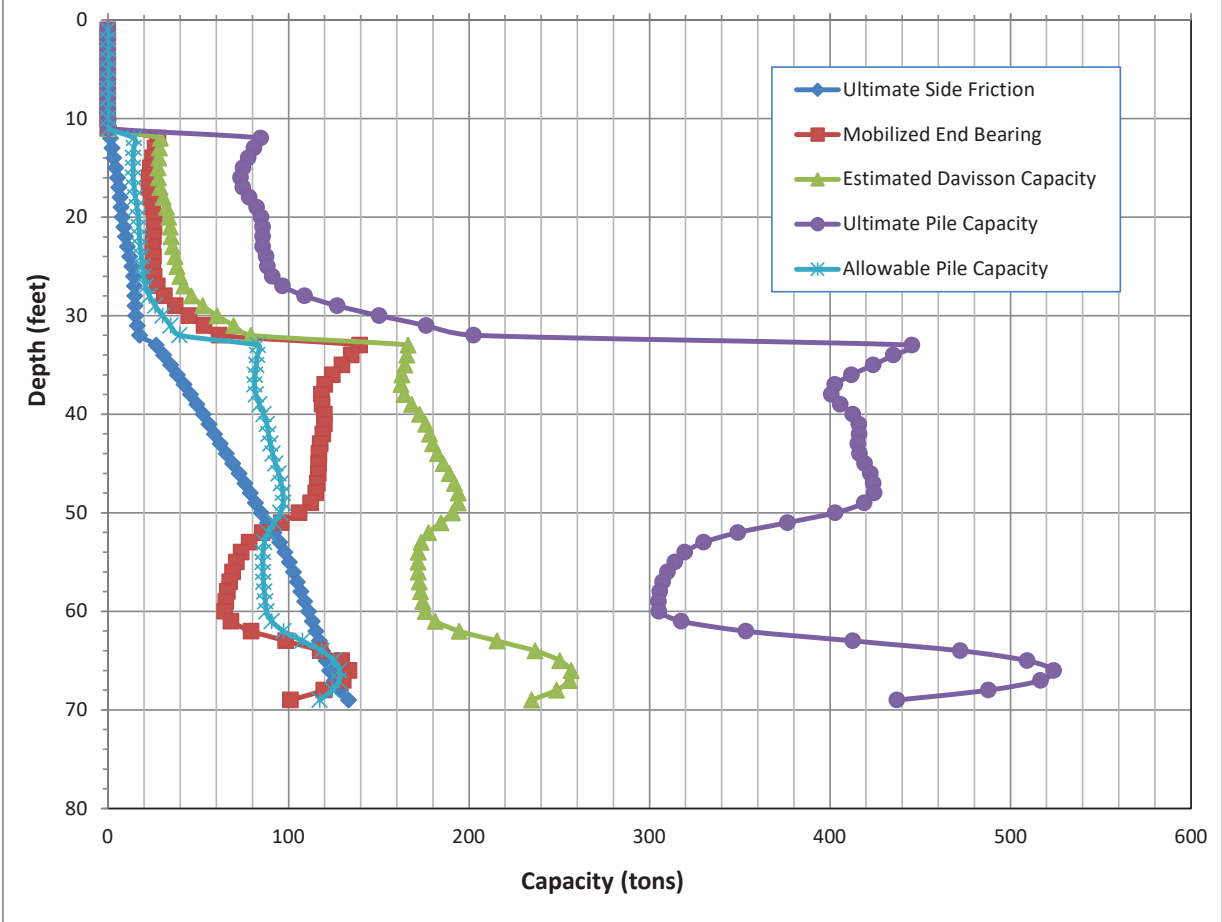
User-Defined Settlement = 5.00%

ID	Diameter (in)	Length (ft)	Skin Fric. (tons)	End Bearing (tons)	Capacity (tons)
1	72.00	1.00	0.000	0.000	0.000
2	72.00	2.00	0.000	0.000	0.000
3	72.00	3.00	0.000	0.000	0.000
4	72.00	4.00	0.000	0.000	0.000
5	72.00	5.00	0.000	0.000	0.000
6	72.00	6.00	0.000	0.000	0.000
7	72.00	7.00	0.000	0.000	0.000
8	72.00	8.00	0.000	0.000	0.000
9	72.00	9.00	0.000	0.000	0.000
10	72.00	10.00	0.000	0.000	0.000
11	72.00	11.00	0.000	0.000	0.000
12	72.00	12.00	0.000	0.000	0.000

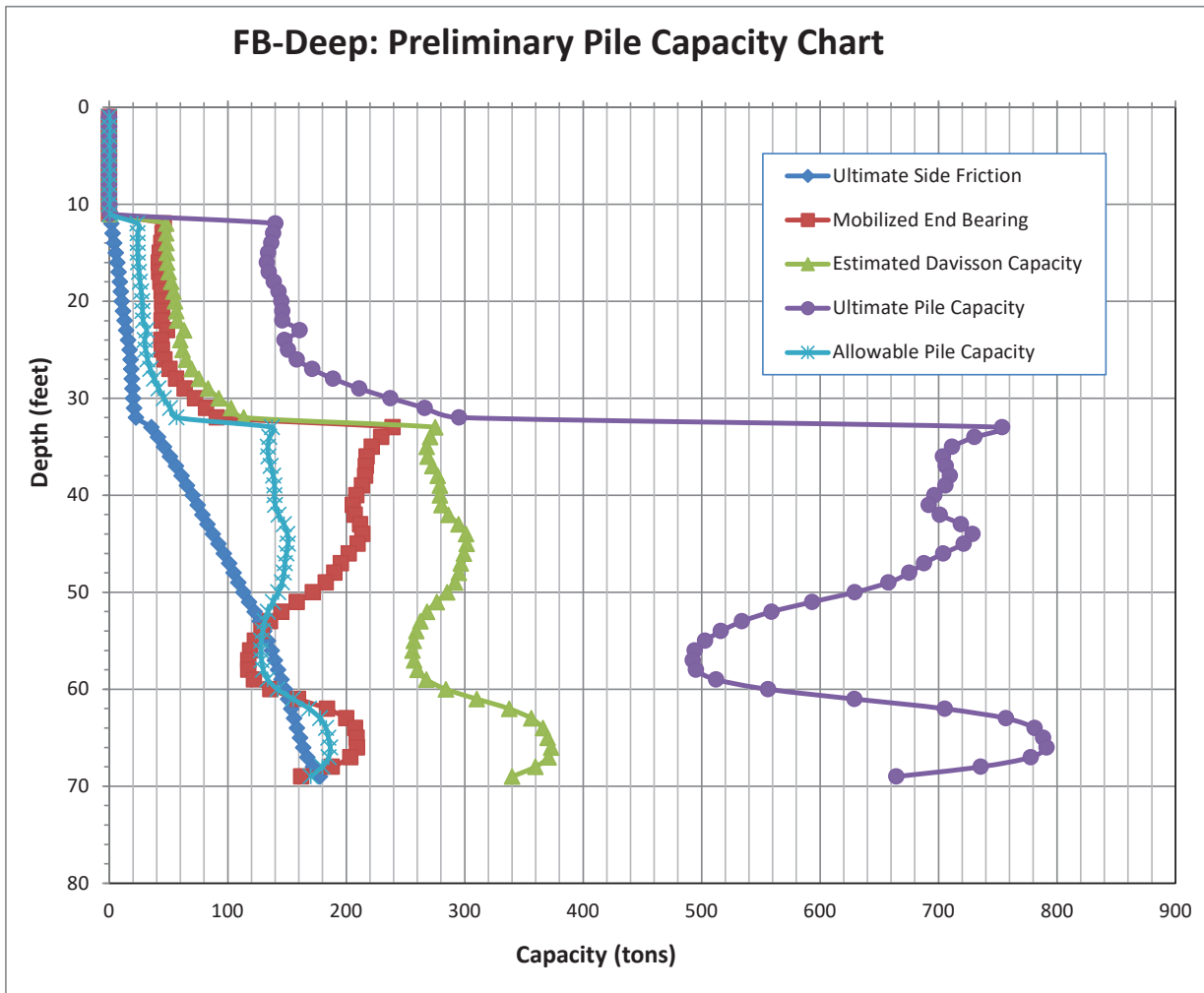
13	72.00	13.00	0.000	0.000	0.000
14	72.00	14.00	0.000	0.000	0.000
15	72.00	15.00	0.000	0.000	0.000
16	72.00	16.00	0.000	0.000	0.000
17	72.00	17.00	0.000	0.000	0.000
18	72.00	18.00	0.000	0.000	0.000
19	72.00	19.00	0.000	0.000	0.000
20	72.00	20.00	0.000	0.000	0.000
21	72.00	21.00	0.000	0.000	0.000
22	72.00	22.00	0.000	0.000	0.000
23	72.00	23.00	0.000	0.000	0.000
24	72.00	24.00	0.000	0.000	0.000
25	72.00	25.00	0.000	0.000	0.000
26	72.00	26.00	0.000	0.000	0.000
27	72.00	27.00	0.000	0.000	0.000
28	72.00	28.00	0.000	0.000	0.000
29	72.00	29.00	0.000	0.000	0.000
30	72.00	30.00	0.000	0.000	0.000
31	72.00	31.00	0.000	0.000	0.000
32	72.00	32.00	0.000	0.000	0.000
33	72.00	33.00	0.000	8552.574	8552.574
34	72.00	34.00	65.781	13607.770	13673.550
35	72.00	35.00	131.178	8552.574	8683.752
36	72.00	36.00	196.197	6518.029	6714.225
37	72.00	37.00	260.840	5375.357	5636.197
38	72.00	38.00	325.112	4628.898	4954.010
39	72.00	39.00	389.017	4096.624	4485.641
40	72.00	40.00	452.557	3694.637	4147.195
41	72.00	41.00	515.739	3378.448	3894.187
42	72.00	42.00	578.565	3122.087	3700.652
43	72.00	43.00	641.041	2909.293	3550.334
44	72.00	44.00	703.168	2729.320	3432.488
45	72.00	45.00	764.952	2574.756	3339.708
46	72.00	46.00	827.587	2556.738	3384.325
47	72.00	47.00	890.075	2537.708	3427.783
48	72.00	48.00	952.420	2517.979	3470.399
49	72.00	49.00	1014.625	2497.785	3512.409
50	72.00	50.00	1076.692	2477.300	3553.992
51	72.00	51.00	1138.626	2456.656	3595.282
52	72.00	52.00	1200.428	2435.954	3636.383
53	72.00	53.00	1262.101	2415.271	3677.373
54	72.00	54.00	1323.647	2394.666	3718.313
55	72.00	55.00	1385.068	2374.183	3759.251
56	72.00	56.00	1446.367	2353.856	3800.222
57	72.00	57.00	1507.544	2333.711	3841.255
58	72.00	58.00	1568.602	2313.767	3882.369
59	72.00	59.00	1629.543	2294.038	3923.582
60	72.00	60.00	1690.369	2274.535	3964.903
61	72.00	61.00	1751.080	2255.263	4006.343
62	72.00	62.00	1811.678	2236.229	4047.907
63	72.00	63.00	1872.166	2217.433	4089.598
64	72.00	64.00	1932.543	2198.876	4131.419
65	72.00	65.00	1992.812	2180.559	4173.371
66	72.00	66.00	2052.974	2162.479	4215.454
67	72.00	67.00	2113.030	2144.635	4257.665
68	72.00	68.00	2172.982	2127.023	4300.005
69	72.00	69.00	2232.830	2109.641	4342.471
70	72.00	70.00	2292.576	2092.484	4385.060

Project: SR 994/Quail Roost Drive From West of SW 137th Avenue to East of SW 127th Avenue
FPID No. 445804-1-22-01
Location: Miami-Dade County, Florida
Boring No.: BR-1 - 18-inch Concrete Driven Piles - End Bents

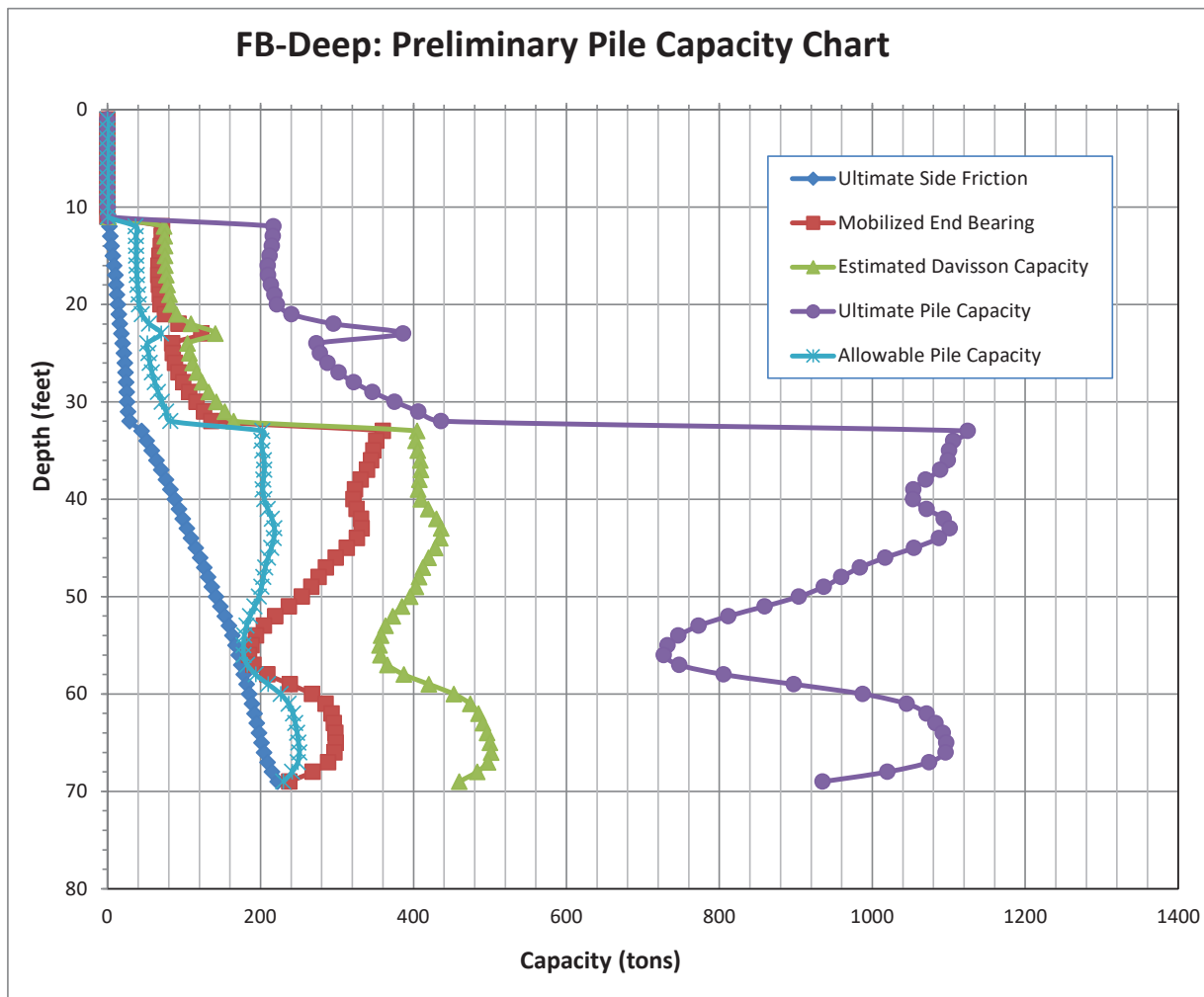
FB-Deep: Preliminary Pile Capacity Chart



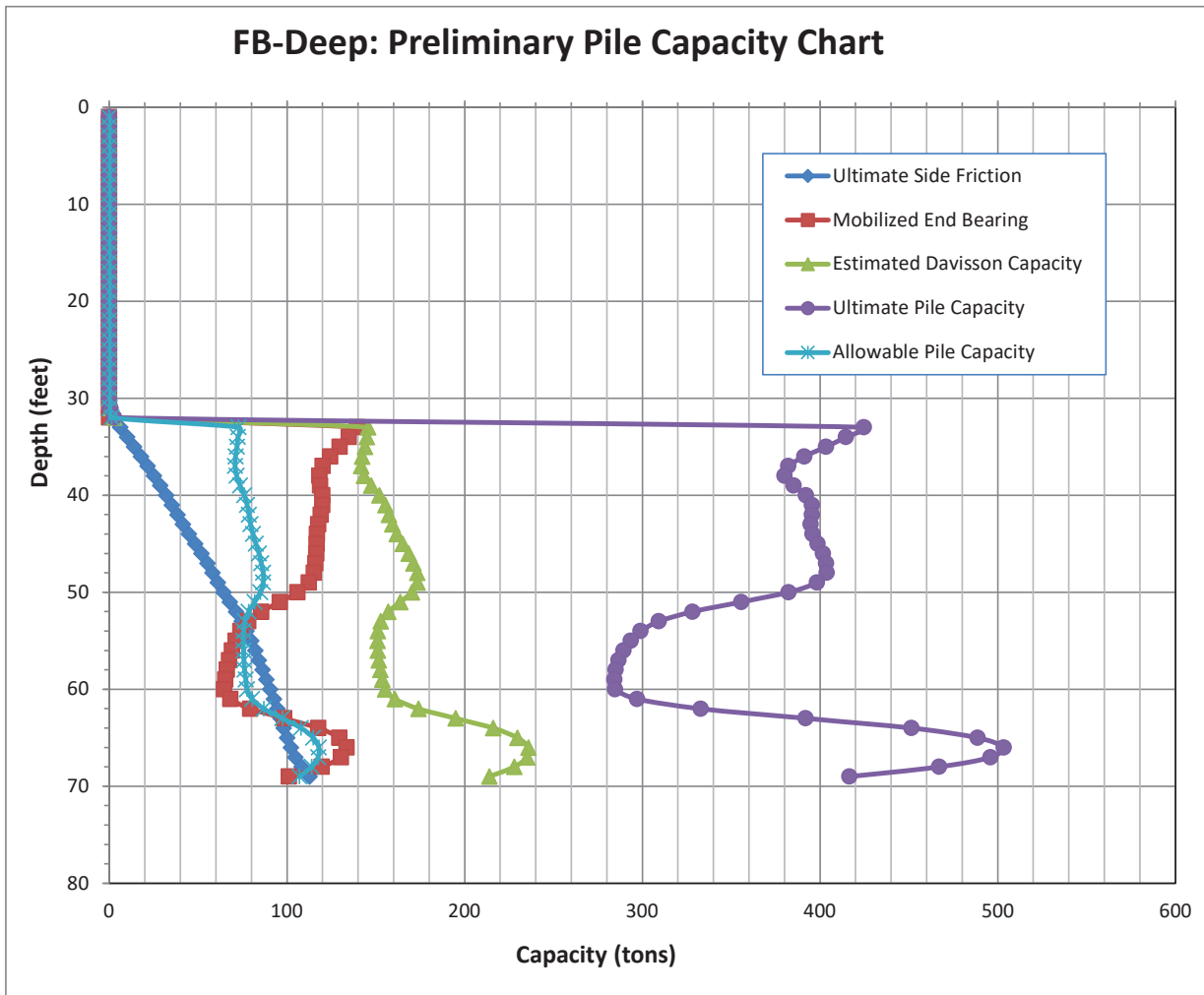
Project: SR 994/Quail Roost Drive From West of SW 137th Avenue to East of SW 127th Avenue
FPID No. 445804-1-22-01
Location: Miami-Dade County, Florida
Boring No.: BR-1 - 24-inch Concrete Driven Piles - End Bents



Project: SR 994/Quail Roost Drive From West of SW 137th Avenue to East of SW 127th Avenue
FPID No. 445804-1-22-01
Location: Miami-Dade County, Florida
Boring No.: BR-1 - 30-inch Concrete Driven Piles - End Bents

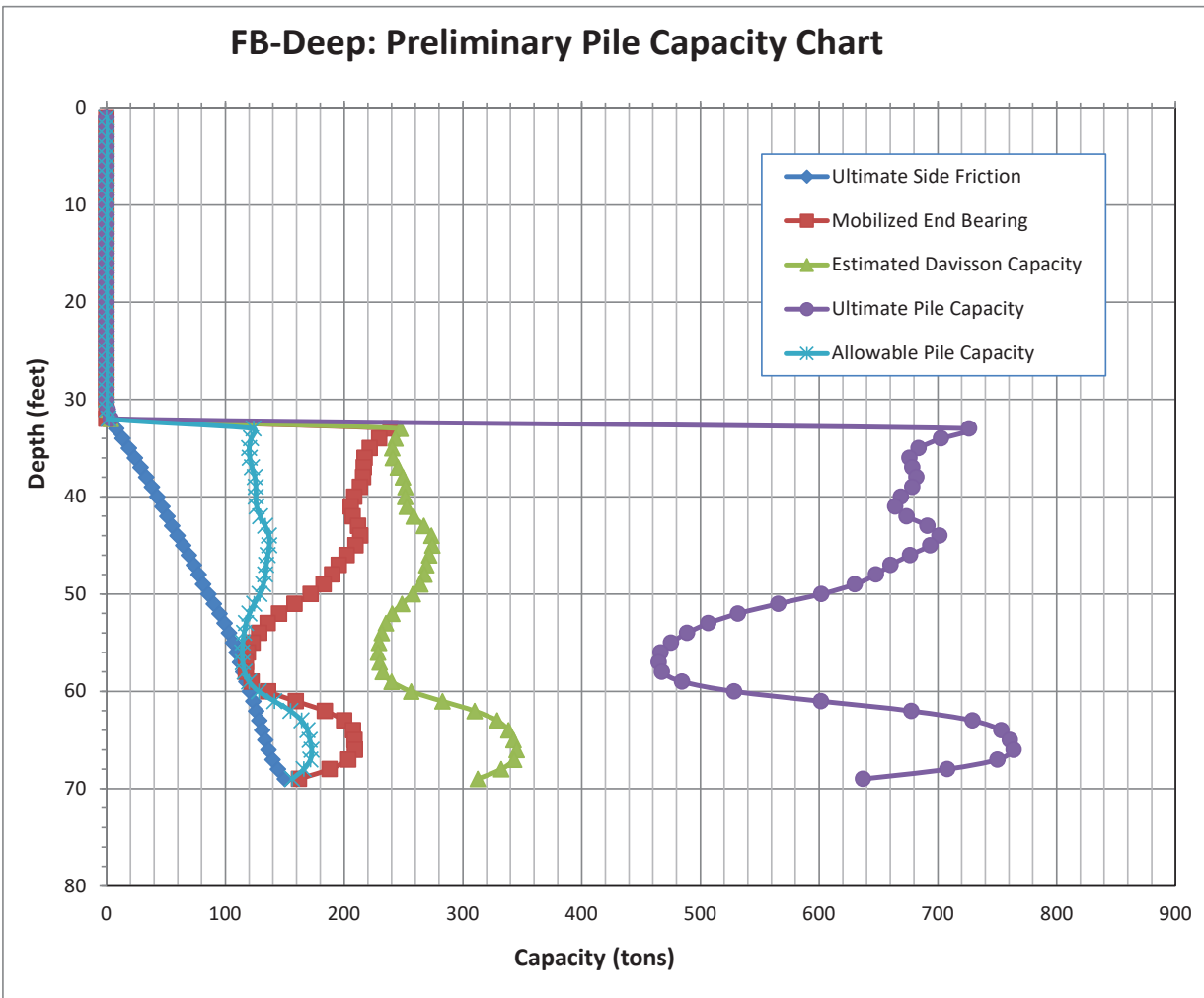


Project: SR 994/Quail Roost Drive From West of SW 137th Avenue to East of SW 127th Avenue
FPID No. 445804-1-22-01
Location: Miami-Dade County, Florida
Boring No.: BR-1 - 18-inch Concrete Driven Piles - Interior Piers

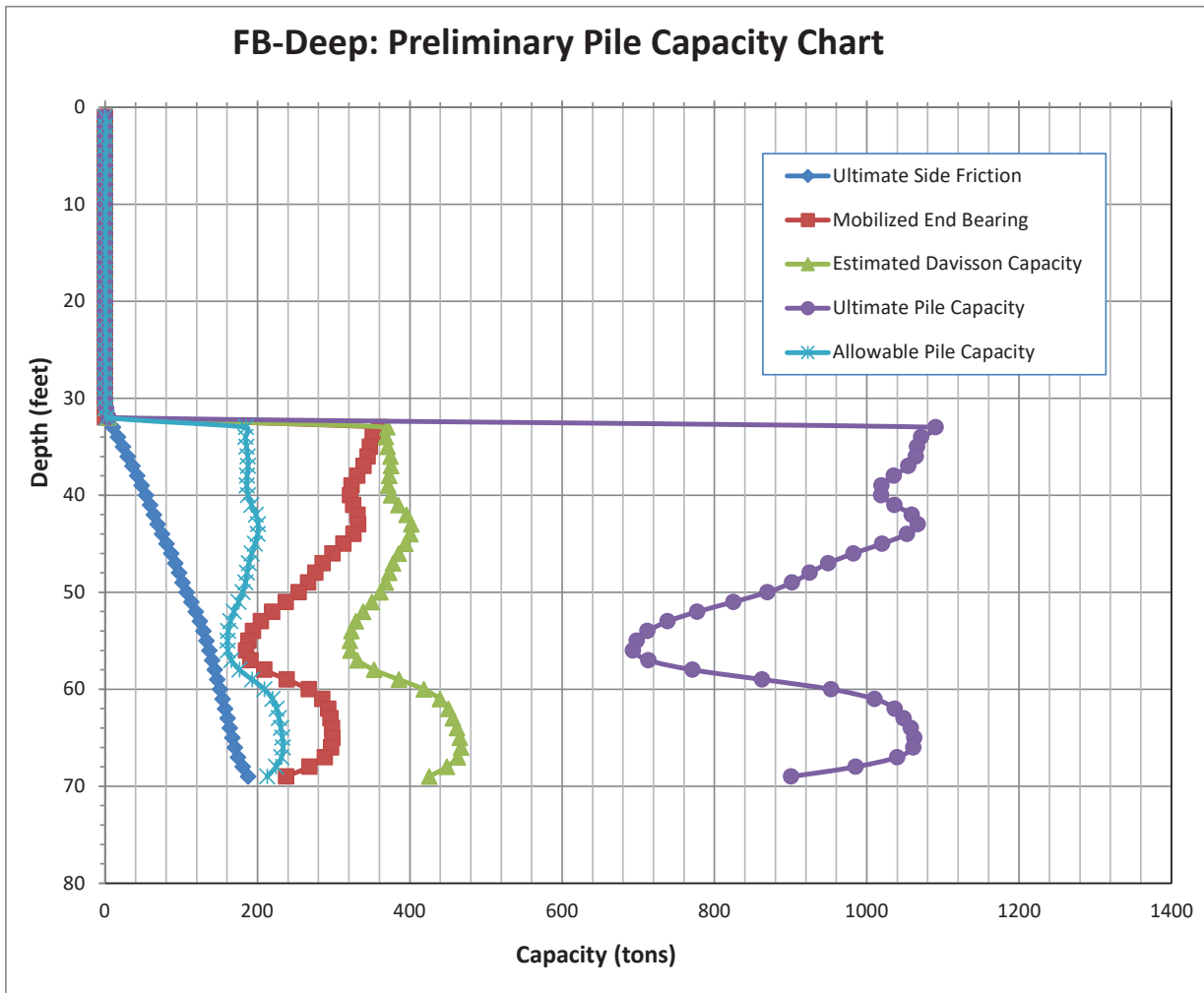


Project: SR 994/Quail Roost Drive From West of SW 137th Avenue to East of SW 127th Avenue
FPID No. 445804-1-22-01
Location: Miami-Dade County, Florida
Boring No.: BR-1 - 24-inch Concrete Driven Piles - Interior Piers

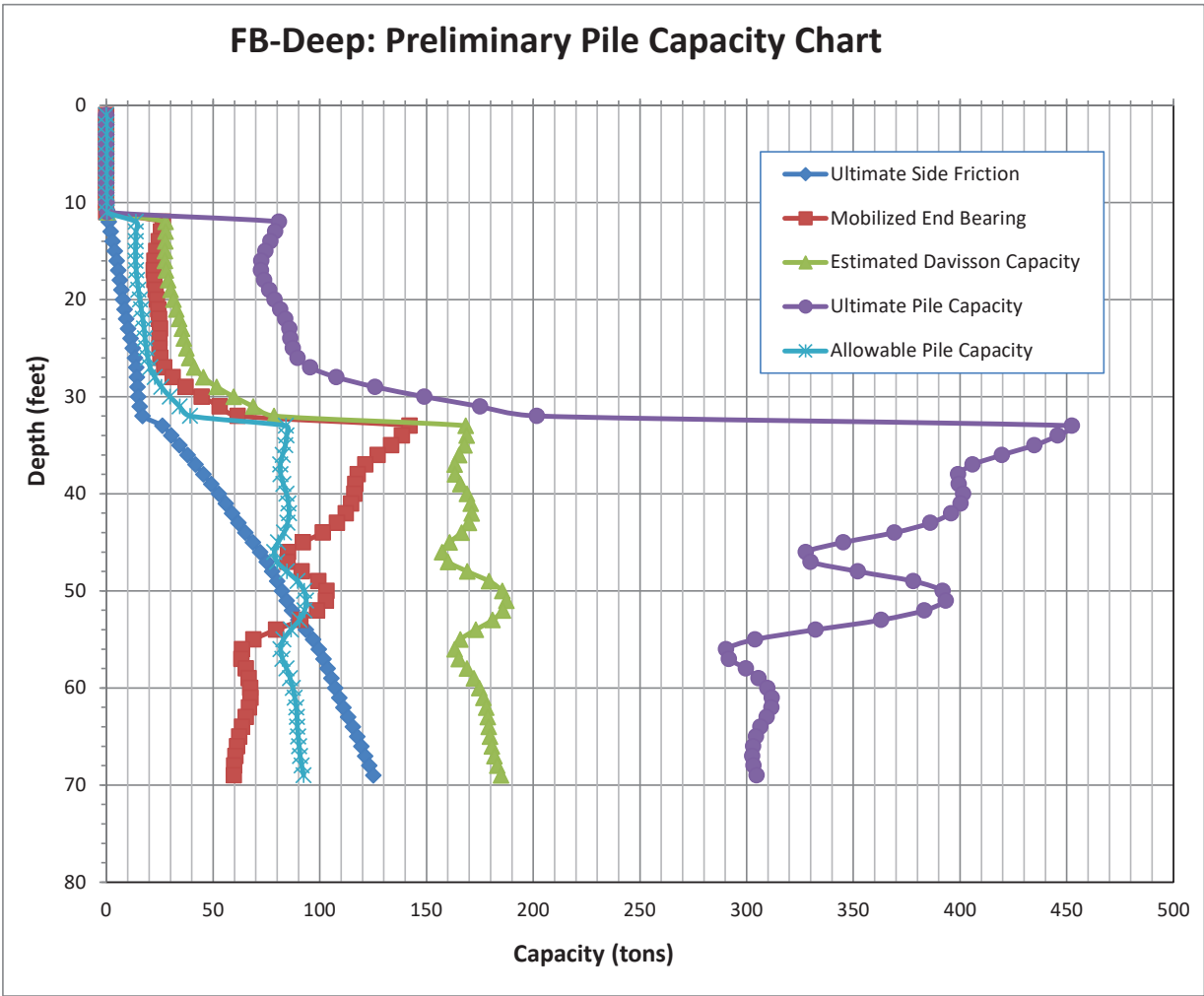
FB-Deep: Preliminary Pile Capacity Chart



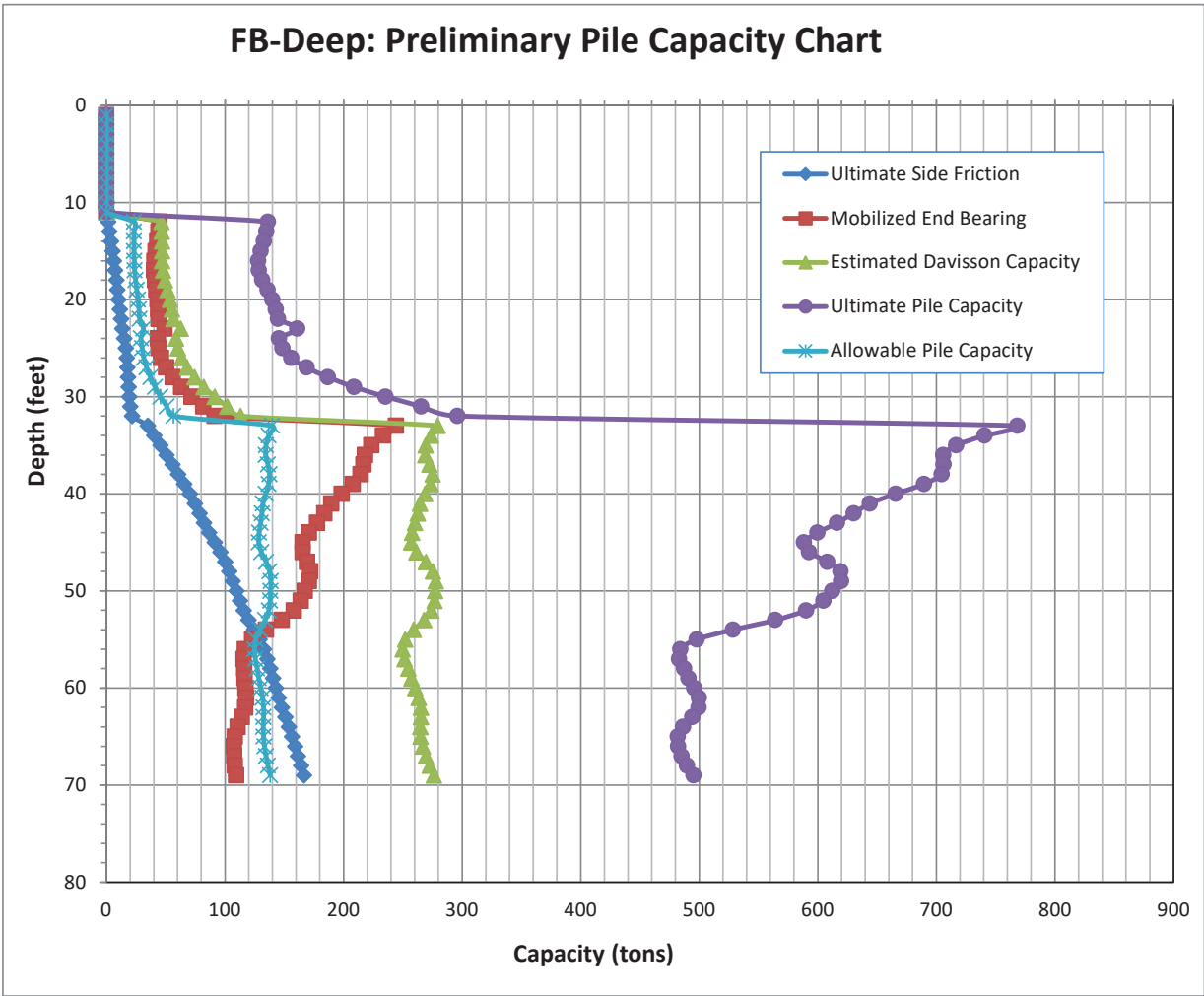
Project: SR 994/Quail Roost Drive From West of SW 137th Avenue to East of SW 127th Avenue
FPID No. 445804-1-22-01
Location: Miami-Dade County, Florida
Boring No.: BR-1 - 30-inch Concrete Driven Piles - Interior Piers



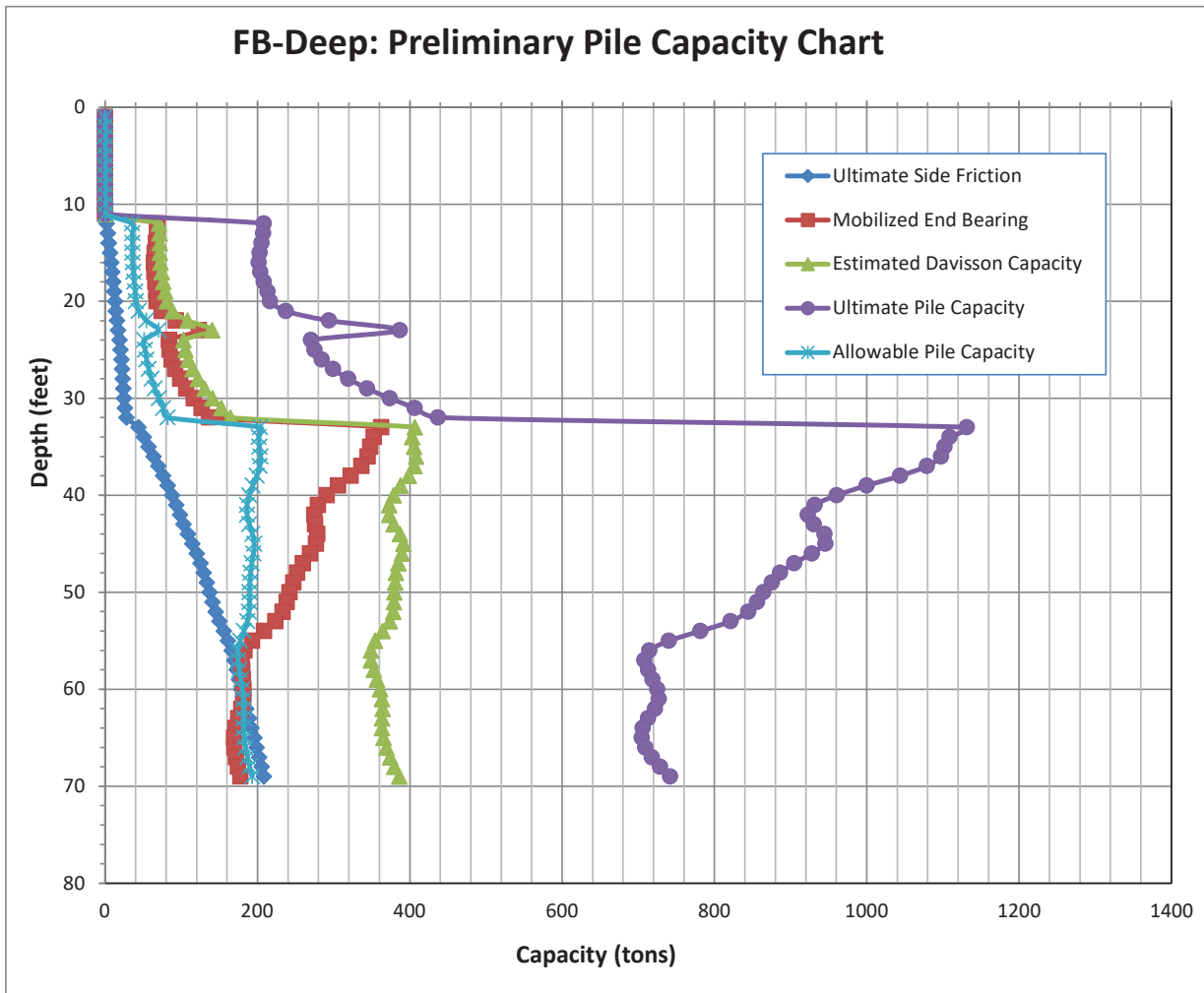
Project: SR 994/Quail Roost Drive From West of SW 137th Avenue to East of SW 127th Avenue
FPID No. 445804-1-22-01
Location: Miami-Dade County, Florida
Boring No.: BR-2 - 18-inch Concrete Driven Piles - End Bents



Project: SR 994/Quail Roost Drive From West of SW 137th Avenue to East of SW 127th Avenue
FPID No. 445804-1-22-01
Location: Miami-Dade County, Florida
Boring No.: BR-2 - 24-inch Concrete Driven Piles - End Bents

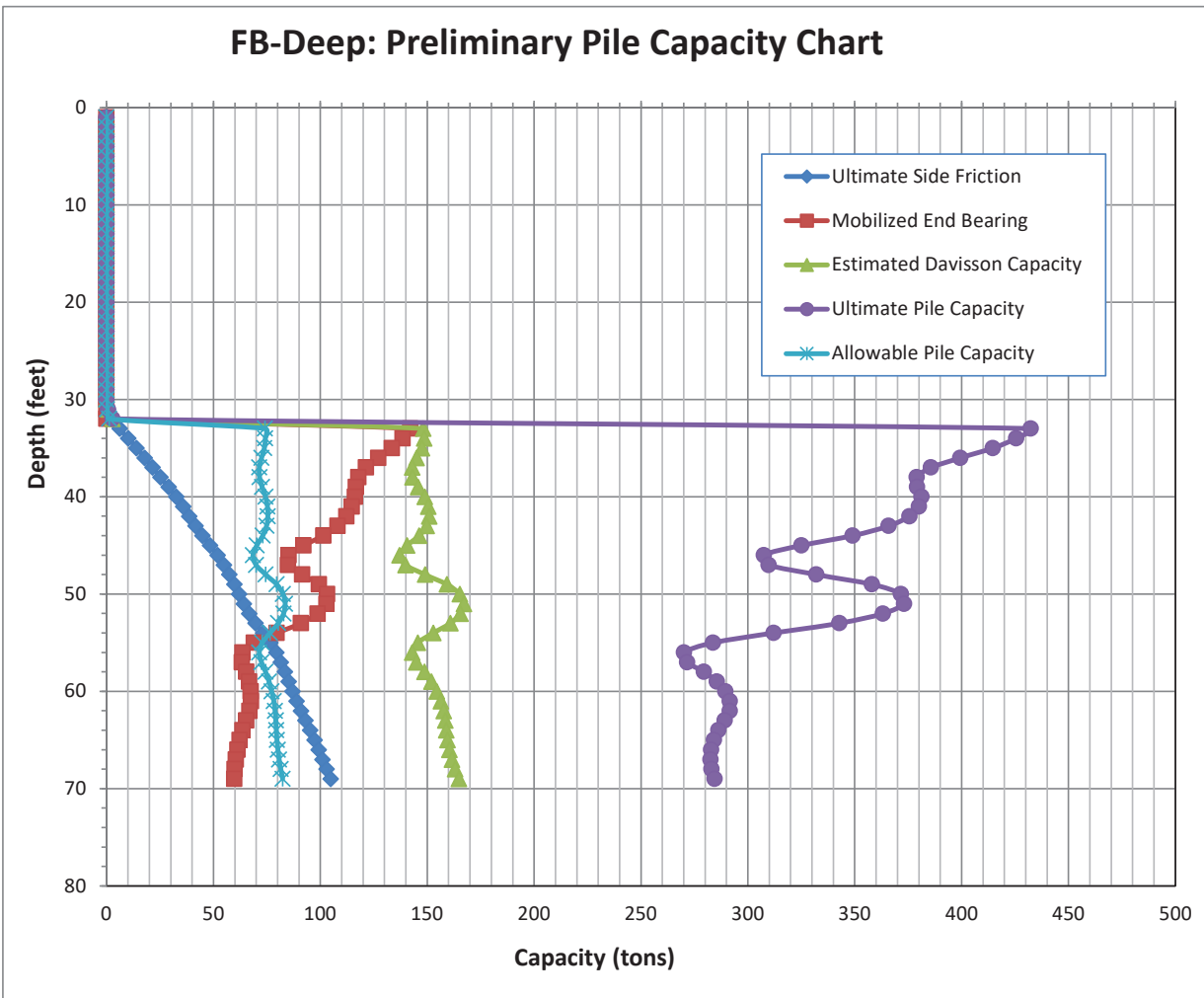


Project: SR 994/Quail Roost Drive From West of SW 137th Avenue to East of SW 127th Avenue
FPID No. 445804-1-22-01
Location: Miami-Dade County, Florida
Boring No.: BR-2 - 30-inch Concrete Driven Piles - End Bents

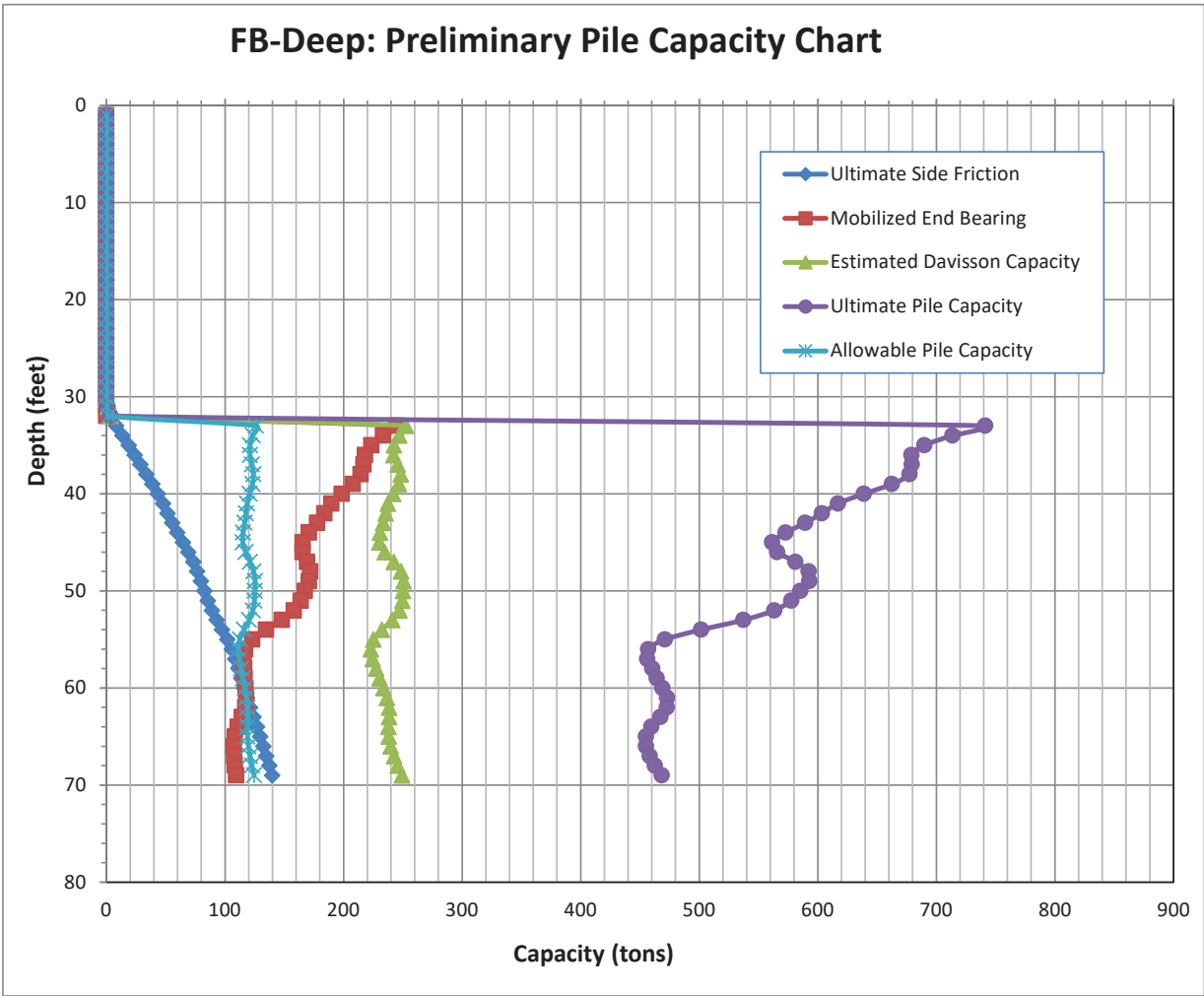


Project: SR 994/Quail Roost Drive From West of SW 137th Avenue to East of SW 127th Avenue
FPID No. 445804-1-22-01
Location: Miami-Dade County, Florida
Boring No.: BR-2 - 18-inch Concrete Driven Piles - Interior Piers

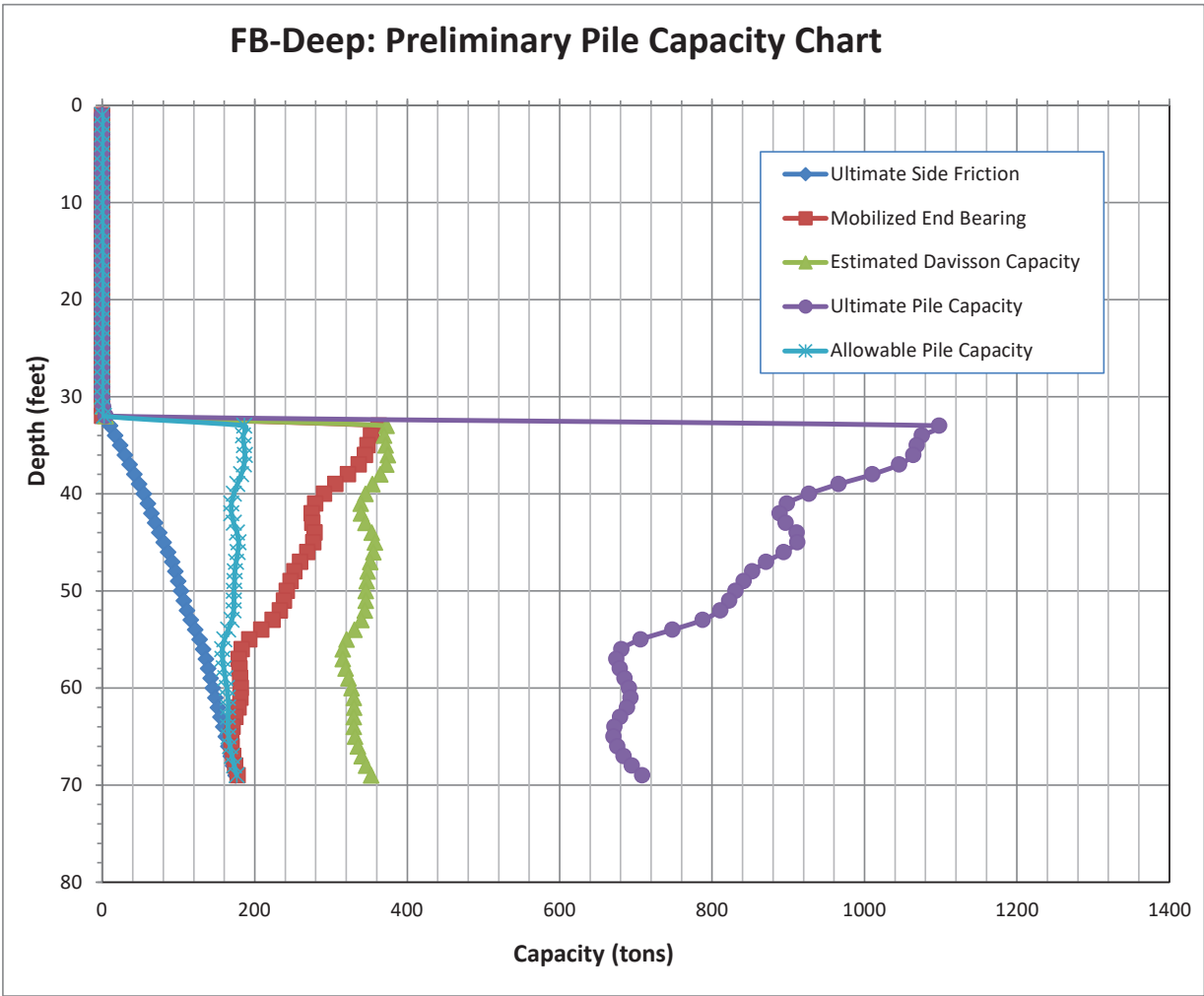
FB-Deep: Preliminary Pile Capacity Chart



Project: SR 994/Quail Roost Drive From West of SW 137th Avenue to East of SW 127th Avenue
FPID No. 445804-1-22-01
Location: Miami-Dade County, Florida
Boring No.: BR-2 - 24-inch Concrete Driven Piles - Interior Piers



Project: SR 994/Quail Roost Drive From West of SW 137th Avenue to East of SW 127th Avenue
FPID No. 445804-1-22-01
Location: Miami-Dade County, Florida
Boring No.: BR-2 - 30-inch Concrete Driven Piles - Interior Piers



General Information:

Input file:e PDE_GANNETT FLEMING\FB-Deep\Driven Piles\BR-1 - End Bents.in
 Project number: 221126
 Job name: SR 997 Bridge Over Black Creek Canal (Bridge No. 870633)
 Engineer: Adnan Ismail, P.E.
 Units: English

Analysis Information:

Analysis Type: SPT

Soil Information:

Boring date: 8/24/2021, Boring Number: BR-1
 Station number: Offset:

Ground Elevation: 0.000(ft)

Hammer type: Automatic Hammer, Correction factor = 1.24

ID	Depth (ft)	No. of Blows (Blows/ft)	Soil Type
1	0.00	0.00	5- Cavity layer
2	1.00	19.00	5- Cavity layer
3	3.00	9.00	5- Cavity layer
4	5.00	7.00	5- Cavity layer
5	7.00	8.00	5- Cavity layer
6	9.00	8.00	5- Cavity layer
7	12.00	12.00	4- Lime Stone/Very shelly sand
8	15.00	14.00	4- Lime Stone/Very shelly sand
9	18.00	8.00	4- Lime Stone/Very shelly sand
10	21.00	11.00	4- Lime Stone/Very shelly sand
11	24.00	9.00	3- Clean sand
12	27.00	8.00	3- Clean sand
13	30.00	8.00	3- Clean sand
14	33.00	55.00	4- Lime Stone/Very shelly sand
15	36.00	50.00	4- Lime Stone/Very shelly sand
16	39.00	47.00	4- Lime Stone/Very shelly sand
17	42.00	40.00	4- Lime Stone/Very shelly sand
18	45.00	50.00	4- Lime Stone/Very shelly sand
19	48.00	37.00	4- Lime Stone/Very shelly sand
20	51.00	50.00	4- Lime Stone/Very shelly sand
21	54.00	35.00	4- Lime Stone/Very shelly sand
22	57.00	27.00	4- Lime Stone/Very shelly sand
23	60.00	29.00	4- Lime Stone/Very shelly sand
24	63.00	24.00	4- Lime Stone/Very shelly sand
25	66.00	28.00	4- Lime Stone/Very shelly sand
26	69.00	66.00	4- Lime Stone/Very shelly sand
27	72.00	29.00	4- Lime Stone/Very shelly sand
28	75.00	26.00	4- Lime Stone/Very shelly sand
29	77.00	24.00	4- Lime Stone/Very shelly sand
30	79.00	27.00	4- Lime Stone/Very shelly sand

Blowcount Average Per Soil Layer

Layer Num.	Starting Elevation (ft)	Bottom Elevation (ft)	Thickness (ft)	Average Blowcount (Blows/ft)	Soil Type
1	0.00	-12.00	12.00	9.17	5-Void
2	-12.00	-24.00	12.00	11.25	4-Limestone, Very Shelly Sand
3	-24.00	-33.00	9.00	8.33	3-Clean Sand
4	-33.00	-79.00	46.00	39.15	4-Limestone, Very Shelly Sand

Driven Pile Data:

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Pile unit weight = 150.00(pcf), Section Type: Square

Pile Geometry:

Width (in)	Length (ft)	Tip Elev. (ft)
18.00	1.00	-1.00
18.00	2.00	-2.00
18.00	3.00	-3.00
18.00	4.00	-4.00
18.00	5.00	-5.00
18.00	6.00	-6.00
18.00	7.00	-7.00
18.00	8.00	-8.00
18.00	9.00	-9.00
18.00	10.00	-10.00
18.00	11.00	-11.00
18.00	12.00	-12.00
18.00	13.00	-13.00
18.00	14.00	-14.00
18.00	15.00	-15.00
18.00	16.00	-16.00
18.00	17.00	-17.00
18.00	18.00	-18.00
18.00	19.00	-19.00
18.00	20.00	-20.00
18.00	21.00	-21.00
18.00	22.00	-22.00
18.00	23.00	-23.00
18.00	24.00	-24.00
18.00	25.00	-25.00
18.00	26.00	-26.00
18.00	27.00	-27.00
18.00	28.00	-28.00
18.00	29.00	-29.00
18.00	30.00	-30.00
18.00	31.00	-31.00
18.00	32.00	-32.00
18.00	33.00	-33.00
18.00	34.00	-34.00
18.00	35.00	-35.00
18.00	36.00	-36.00
18.00	37.00	-37.00
18.00	38.00	-38.00
18.00	39.00	-39.00
18.00	40.00	-40.00
18.00	41.00	-41.00
18.00	42.00	-42.00
18.00	43.00	-43.00
18.00	44.00	-44.00
18.00	45.00	-45.00
18.00	46.00	-46.00
18.00	47.00	-47.00
18.00	48.00	-48.00
18.00	49.00	-49.00
18.00	50.00	-50.00
18.00	51.00	-51.00
18.00	52.00	-52.00
18.00	53.00	-53.00
18.00	54.00	-54.00
18.00	55.00	-55.00
18.00	56.00	-56.00
18.00	57.00	-57.00
18.00	58.00	-58.00
18.00	59.00	-59.00
18.00	60.00	-60.00
18.00	61.00	-61.00
18.00	62.00	-62.00
18.00	63.00	-63.00
18.00	64.00	-64.00
18.00	65.00	-65.00
18.00	66.00	-66.00
18.00	67.00	-67.00
18.00	68.00	-68.00
18.00	69.00	-69.00

Driven Pile Capacity:

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Test Pile Length (ft)	Pile Width (in)	Ultimate Side Friction (tons)	Mobilized End Bearing (tons)	Estimated Davisson Capacity (tons)	Allowable Pile Capacity (tons)	Ultimate Pile Capacity (tons)
1.00	18.0	0.00	0.00	0.00	0.00	0.00
2.00	18.0	0.00	0.00	0.00	0.00	0.00
3.00	18.0	0.00	0.00	0.00	0.00	0.00
4.00	18.0	0.00	0.00	0.00	0.00	0.00
5.00	18.0	0.00	0.00	0.00	0.00	0.00
6.00	18.0	0.00	0.00	0.00	0.00	0.00
7.00	18.0	0.00	0.00	0.00	0.00	0.00
8.00	18.0	0.00	0.00	0.00	0.00	0.00
9.00	18.0	0.00	0.00	0.00	0.00	0.00
10.00	18.0	0.15	0.00	0.15	0.07	0.15
11.00	18.0	0.60	0.00	0.60	0.30	0.60
12.00	18.0	1.34	27.79	29.13	14.57	84.71
13.00	18.0	2.26	26.26	28.52	14.26	81.04
14.00	18.0	3.22	24.85	28.08	14.04	77.78
15.00	18.0	4.24	23.57	27.81	13.91	74.95
16.00	18.0	5.21	22.79	28.00	14.00	73.58
17.00	18.0	6.03	22.90	28.93	14.46	74.72
18.00	18.0	6.70	23.89	30.59	15.29	78.37
19.00	18.0	7.33	25.05	32.38	16.19	82.47
20.00	18.0	8.04	25.64	33.68	16.84	84.96
21.00	18.0	8.82	25.67	34.49	17.24	85.83
22.00	18.0	9.71	25.38	35.09	17.55	85.85
23.00	18.0	10.76	25.01	35.76	17.88	85.78
24.00	18.0	11.95	25.25	37.20	18.60	87.70
25.00	18.0	13.20	25.05	38.25	19.13	88.35
26.00	18.0	14.19	25.63	39.82	19.91	91.09
27.00	18.0	14.68	27.37	42.05	21.02	96.78
28.00	18.0	14.88	31.35	46.22	23.11	108.91
29.00	18.0	15.13	37.32	52.45	26.22	127.10
30.00	18.0	15.48	44.93	60.41	30.21	150.26
31.00	18.0	16.22	53.39	69.61	34.80	176.39
32.00	18.0	17.58	61.66	79.25	39.62	202.57
33.00	18.0	26.78	139.52	166.30	83.15	445.34
34.00	18.0	30.81	134.78	165.59	82.80	435.15
35.00	18.0	34.72	129.76	164.48	82.24	423.99
36.00	18.0	38.50	124.45	162.95	81.48	411.85
37.00	18.0	42.18	120.19	162.38	81.19	402.76
38.00	18.0	45.79	118.31	164.11	82.05	400.73
39.00	18.0	49.33	118.81	168.14	84.07	405.76
40.00	18.0	52.74	119.96	172.70	86.35	412.61
41.00	18.0	55.97	120.03	176.01	88.00	416.07
42.00	18.0	59.04	119.03	178.07	89.03	416.12
43.00	18.0	62.14	117.75	179.88	89.94	415.37
44.00	18.0	65.48	116.98	182.46	91.23	416.41
45.00	18.0	69.08	116.72	185.80	92.90	419.24
46.00	18.0	72.64	116.55	189.19	94.60	422.29
47.00	18.0	75.88	116.05	191.93	95.96	424.03
48.00	18.0	78.79	115.21	194.00	97.00	424.43
49.00	18.0	81.70	112.41	194.11	97.05	418.92
50.00	18.0	84.94	105.99	190.93	95.46	402.91
51.00	18.0	88.50	95.97	184.46	92.23	376.40
52.00	18.0	92.03	85.62	177.66	88.83	348.91
53.00	18.0	95.19	78.26	173.45	86.73	329.97
54.00	18.0	97.98	73.87	171.85	85.93	319.59
55.00	18.0	100.49	71.22	171.71	85.85	314.14
56.00	18.0	102.80	69.08	171.88	85.94	310.04
57.00	18.0	104.90	67.46	172.36	86.18	307.27
58.00	18.0	106.94	66.24	173.17	86.59	305.65
59.00	18.0	109.02	65.32	174.34	87.17	304.97
60.00	18.0	111.15	64.70	175.85	87.93	305.25
61.00	18.0	113.25	68.14	181.39	90.69	317.67
62.00	18.0	115.22	79.41	194.63	97.31	353.44
63.00	18.0	117.07	98.49	215.56	107.78	412.55
64.00	18.0	118.90	117.74	236.64	118.32	472.12
65.00	18.0	120.84	129.47	250.31	125.16	509.26
66.00	18.0	122.87	133.70	256.57	128.28	523.96
67.00	18.0	125.43	130.41	255.83	127.92	516.64
68.00	18.0	128.92	119.59	248.52	124.26	487.71
69.00	18.0	133.36	101.26	234.63	117.31	437.15

NOTES

1. MOBILIZED END BEARING IS 1/3 OF THE ORIGINAL RB-121 VALUES.
2. DAVISSON PILE CAPACITY IS AN ESTIMATE BASED ON FAILURE CRITERIA, AND EQUALS ULTIMATE SIDE FRICTION PLUS MOBILIZED END BEARING.
3. ALLOWABLE PILE CAPACITY IS 1/2 THE DAVISSON PILE CAPACITY.
4. ULTIMATE PILE CAPACITY IS ULTIMATE SIDE FRICTION PLUS 3 x THE MOBILIZED END BEARING.
EXCEPTION: FOR H-PILES TIPPED IN SAND OR LIMESTONE, THE ULTIMATE PILE CAPACITY IS ULTIMATE SIDE FRICTION PLUS 2 x THE MOBILIZED END BEARING.

General Information:

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 Input file:e PDE_GANNETT FLEMING\FB-Deep\Driven Piles\BR-1 - End Bents.in
 Project number: 221126
 Job name: SR 997 Bridge Over Black Creek Canal (Bridge No. 870633)
 Engineer: Adnan Ismail, P.E.
 Units: English

Analysis Information:

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 Analysis Type: SPT

Soil Information:

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 Boring date: 8/24/2021, Boring Number: BR-1
 Station number: Offset:
 Ground Elevation: 0.000(ft)
 Hammer type: Automatic Hammer, Correction factor = 1.24

ID	Depth (ft)	No. of Blows (Blows/ft)	Soil Type
1	0.00	0.00	5- Cavity layer
2	1.00	19.00	5- Cavity layer
3	3.00	9.00	5- Cavity layer
4	5.00	7.00	5- Cavity layer
5	7.00	8.00	5- Cavity layer
6	9.00	8.00	5- Cavity layer
7	12.00	12.00	4- Lime Stone/Very shelly sand
8	15.00	14.00	4- Lime Stone/Very shelly sand
9	18.00	8.00	4- Lime Stone/Very shelly sand
10	21.00	11.00	4- Lime Stone/Very shelly sand
11	24.00	9.00	3- Clean sand
12	27.00	8.00	3- Clean sand
13	30.00	8.00	3- Clean sand
14	33.00	55.00	4- Lime Stone/Very shelly sand
15	36.00	50.00	4- Lime Stone/Very shelly sand
16	39.00	47.00	4- Lime Stone/Very shelly sand
17	42.00	40.00	4- Lime Stone/Very shelly sand
18	45.00	50.00	4- Lime Stone/Very shelly sand
19	48.00	37.00	4- Lime Stone/Very shelly sand
20	51.00	50.00	4- Lime Stone/Very shelly sand
21	54.00	35.00	4- Lime Stone/Very shelly sand
22	57.00	27.00	4- Lime Stone/Very shelly sand
23	60.00	29.00	4- Lime Stone/Very shelly sand
24	63.00	24.00	4- Lime Stone/Very shelly sand
25	66.00	28.00	4- Lime Stone/Very shelly sand
26	69.00	66.00	4- Lime Stone/Very shelly sand
27	72.00	29.00	4- Lime Stone/Very shelly sand
28	75.00	26.00	4- Lime Stone/Very shelly sand
29	77.00	24.00	4- Lime Stone/Very shelly sand
30	79.00	27.00	4- Lime Stone/Very shelly sand

Blowcount Average Per Soil Layer

Layer Num.	Starting Elevation (ft)	Bottom Elevation (ft)	Thickness (ft)	Average Blowcount (Blows/ft)	Soil Type
1	0.00	-12.00	12.00	9.17	5-Void
2	-12.00	-24.00	12.00	11.25	4-Limestone, Very Shelly Sand
3	-24.00	-33.00	9.00	8.33	3-Clean Sand
4	-33.00	-79.00	46.00	39.15	4-Limestone, Very Shelly Sand

Driven Pile Data:

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Pile unit weight = 150.00(pcf), Section Type: Square

Pile Geometry:

Width (in)	Length (ft)	Tip Elev. (ft)
24.00	1.00	-1.00
24.00	2.00	-2.00
24.00	3.00	-3.00
24.00	4.00	-4.00
24.00	5.00	-5.00
24.00	6.00	-6.00
24.00	7.00	-7.00
24.00	8.00	-8.00
24.00	9.00	-9.00
24.00	10.00	-10.00
24.00	11.00	-11.00
24.00	12.00	-12.00
24.00	13.00	-13.00
24.00	14.00	-14.00
24.00	15.00	-15.00
24.00	16.00	-16.00
24.00	17.00	-17.00
24.00	18.00	-18.00
24.00	19.00	-19.00
24.00	20.00	-20.00
24.00	21.00	-21.00
24.00	22.00	-22.00
24.00	23.00	-23.00
24.00	24.00	-24.00
24.00	25.00	-25.00
24.00	26.00	-26.00
24.00	27.00	-27.00
24.00	28.00	-28.00
24.00	29.00	-29.00
24.00	30.00	-30.00
24.00	31.00	-31.00
24.00	32.00	-32.00
24.00	33.00	-33.00
24.00	34.00	-34.00
24.00	35.00	-35.00
24.00	36.00	-36.00
24.00	37.00	-37.00
24.00	38.00	-38.00
24.00	39.00	-39.00
24.00	40.00	-40.00
24.00	41.00	-41.00
24.00	42.00	-42.00
24.00	43.00	-43.00
24.00	44.00	-44.00
24.00	45.00	-45.00
24.00	46.00	-46.00
24.00	47.00	-47.00
24.00	48.00	-48.00
24.00	49.00	-49.00
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24.00	51.00	-51.00
24.00	52.00	-52.00
24.00	53.00	-53.00
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24.00	63.00	-63.00
24.00	64.00	-64.00
24.00	65.00	-65.00
24.00	66.00	-66.00
24.00	67.00	-67.00
24.00	68.00	-68.00
24.00	69.00	-69.00

Driven Pile Capacity:

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Test Pile Length (ft)	Pile Width (in)	Ultimate Side Friction (tons)	Mobilized End Bearing (tons)	Estimated Davisson Capacity (tons)	Allowable Pile Capacity (tons)	Ultimate Pile Capacity (tons)
1.00	24.0	0.00	0.00	0.00	0.00	0.00
2.00	24.0	0.00	0.00	0.00	0.00	0.00
3.00	24.0	0.00	0.00	0.00	0.00	0.00
4.00	24.0	0.00	0.00	0.00	0.00	0.00
5.00	24.0	0.00	0.00	0.00	0.00	0.00
6.00	24.0	0.00	0.00	0.00	0.00	0.00
7.00	24.0	0.00	0.00	0.00	0.00	0.00
8.00	24.0	0.00	0.00	0.00	0.00	0.00
9.00	24.0	0.00	0.00	0.00	0.00	0.00
10.00	24.0	0.20	0.00	0.20	0.10	0.20
11.00	24.0	0.79	0.00	0.79	0.40	0.79
12.00	24.0	1.79	46.19	47.97	23.99	140.35
13.00	24.0	3.01	45.20	48.21	24.11	138.62
14.00	24.0	4.30	44.18	48.47	24.24	136.83
15.00	24.0	5.65	42.89	48.55	24.27	134.33
16.00	24.0	6.94	42.07	49.02	24.51	133.17
17.00	24.0	8.04	42.27	50.31	25.15	134.85
18.00	24.0	8.93	43.32	52.25	26.12	138.89
19.00	24.0	9.77	44.42	54.19	27.09	143.03
20.00	24.0	10.71	44.88	55.59	27.80	145.35
21.00	24.0	11.76	44.81	56.56	28.28	146.18
22.00	24.0	12.95	44.42	57.37	28.68	146.21
23.00	24.0	14.34	48.79	63.13	31.56	160.71
24.00	24.0	15.94	44.05	59.98	29.99	148.08
25.00	24.0	17.31	44.57	61.89	30.94	151.04
26.00	24.0	18.11	46.75	64.86	32.43	158.36
27.00	24.0	18.61	50.91	69.52	34.76	171.34
28.00	24.0	19.09	56.67	75.76	37.88	189.09
29.00	24.0	19.59	63.87	83.46	41.73	211.19
30.00	24.0	20.14	72.46	92.60	46.30	237.52
31.00	24.0	21.06	81.79	102.85	51.43	266.43
32.00	24.0	22.70	90.89	113.59	56.79	295.36
33.00	24.0	35.71	239.38	275.09	137.54	753.84
34.00	24.0	41.09	229.71	270.80	135.40	730.23
35.00	24.0	46.29	221.72	268.01	134.01	711.46
36.00	24.0	51.34	217.44	268.78	134.39	703.66
37.00	24.0	56.25	216.61	272.85	136.43	706.07
38.00	24.0	61.06	216.18	277.24	138.62	709.59
39.00	24.0	65.77	213.39	279.16	139.58	705.95
40.00	24.0	70.32	208.71	279.03	139.52	696.46
41.00	24.0	74.63	205.71	280.34	140.17	691.75
42.00	24.0	78.72	207.48	286.19	143.10	701.14
43.00	24.0	82.85	211.97	294.82	147.41	718.77
44.00	24.0	87.31	213.83	301.14	150.57	728.80
45.00	24.0	92.11	209.71	301.82	150.91	721.25
46.00	24.0	96.85	202.39	299.24	149.62	704.02
47.00	24.0	101.17	195.54	296.71	148.35	687.79
48.00	24.0	105.05	190.09	295.14	147.57	675.32
49.00	24.0	108.94	182.93	291.87	145.94	657.74
50.00	24.0	113.25	172.03	285.28	142.64	629.34
51.00	24.0	118.00	158.43	276.43	138.22	593.30
52.00	24.0	122.71	145.47	268.19	134.09	559.14
53.00	24.0	126.93	135.76	262.69	131.35	534.22
54.00	24.0	130.65	128.58	259.23	129.61	516.39
55.00	24.0	133.99	123.00	256.99	128.49	502.99
56.00	24.0	137.06	119.02	256.09	128.04	494.13
57.00	24.0	139.87	117.57	257.44	128.72	492.58
58.00	24.0	142.58	117.57	260.16	130.08	495.30
59.00	24.0	145.36	122.27	267.63	133.82	512.18
60.00	24.0	148.20	135.97	284.17	142.09	556.10
61.00	24.0	151.00	159.37	310.37	155.18	629.11
62.00	24.0	153.63	183.90	337.53	168.76	705.33
63.00	24.0	156.09	200.26	356.35	178.17	756.86
64.00	24.0	158.54	207.52	366.06	183.03	781.10
65.00	24.0	161.12	209.06	370.18	185.09	788.29
66.00	24.0	163.83	209.16	372.99	186.50	791.31
67.00	24.0	167.23	203.53	370.77	185.38	777.84
68.00	24.0	171.90	187.89	359.78	179.89	735.56
69.00	24.0	177.82	162.23	340.04	170.02	664.50

NOTES

1. MOBILIZED END BEARING IS 1/3 OF THE ORIGINAL RB-121 VALUES.
2. DAVISSON PILE CAPACITY IS AN ESTIMATE BASED ON FAILURE CRITERIA, AND EQUALS ULTIMATE SIDE FRICTION PLUS MOBILIZED END BEARING.
3. ALLOWABLE PILE CAPACITY IS 1/2 THE DAVISSON PILE CAPACITY.
4. ULTIMATE PILE CAPACITY IS ULTIMATE SIDE FRICTION PLUS 3 x THE MOBILIZED END BEARING.
EXCEPTION: FOR H-PILES TIPPED IN SAND OR LIMESTONE, THE ULTIMATE PILE CAPACITY IS ULTIMATE SIDE FRICTION PLUS 2 x THE MOBILIZED END BEARING.

General Information:

Input file:e PDE_GANNETT FLEMING\FB-Deep\Driven Piles\BR-1 - End Bents.in
 Project number: 221126
 Job name: SR 997 Bridge Over Black Creek Canal (Bridge No. 870633)
 Engineer: Adnan Ismail, P.E.
 Units: English

Analysis Information:

Analysis Type: SPT

Soil Information:

Boring date: 8/24/2021, Boring Number: BR-1
 Station number: Offset:

Ground Elevation: 0.000(ft)

Hammer type: Automatic Hammer, Correction factor = 1.24

ID	Depth (ft)	No. of Blows (Blows/ft)	Soil Type
1	0.00	0.00	5- Cavity layer
2	1.00	19.00	5- Cavity layer
3	3.00	9.00	5- Cavity layer
4	5.00	7.00	5- Cavity layer
5	7.00	8.00	5- Cavity layer
6	9.00	8.00	5- Cavity layer
7	12.00	12.00	4- Lime Stone/Very shelly sand
8	15.00	14.00	4- Lime Stone/Very shelly sand
9	18.00	8.00	4- Lime Stone/Very shelly sand
10	21.00	11.00	4- Lime Stone/Very shelly sand
11	24.00	9.00	3- Clean sand
12	27.00	8.00	3- Clean sand
13	30.00	8.00	3- Clean sand
14	33.00	55.00	4- Lime Stone/Very shelly sand
15	36.00	50.00	4- Lime Stone/Very shelly sand
16	39.00	47.00	4- Lime Stone/Very shelly sand
17	42.00	40.00	4- Lime Stone/Very shelly sand
18	45.00	50.00	4- Lime Stone/Very shelly sand
19	48.00	37.00	4- Lime Stone/Very shelly sand
20	51.00	50.00	4- Lime Stone/Very shelly sand
21	54.00	35.00	4- Lime Stone/Very shelly sand
22	57.00	27.00	4- Lime Stone/Very shelly sand
23	60.00	29.00	4- Lime Stone/Very shelly sand
24	63.00	24.00	4- Lime Stone/Very shelly sand
25	66.00	28.00	4- Lime Stone/Very shelly sand
26	69.00	66.00	4- Lime Stone/Very shelly sand
27	72.00	29.00	4- Lime Stone/Very shelly sand
28	75.00	26.00	4- Lime Stone/Very shelly sand
29	77.00	24.00	4- Lime Stone/Very shelly sand
30	79.00	27.00	4- Lime Stone/Very shelly sand

Blowcount Average Per Soil Layer

Layer Num.	Starting Elevation (ft)	Bottom Elevation (ft)	Thickness (ft)	Average Blowcount (Blows/ft)	Soil Type
1	0.00	-12.00	12.00	9.17	5-Void
2	-12.00	-24.00	12.00	11.25	4-Limestone, Very Shelly Sand
3	-24.00	-33.00	9.00	8.33	3-Clean Sand
4	-33.00	-79.00	46.00	39.15	4-Limestone, Very Shelly Sand

Driven Pile Data:

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Pile unit weight = 150.00(pcf), Section Type: Square

Pile Geometry:

Width (in)	Length (ft)	Tip Elev. (ft)
30.00	1.00	-1.00
30.00	2.00	-2.00
30.00	3.00	-3.00
30.00	4.00	-4.00
30.00	5.00	-5.00
30.00	6.00	-6.00
30.00	7.00	-7.00
30.00	8.00	-8.00
30.00	9.00	-9.00
30.00	10.00	-10.00
30.00	11.00	-11.00
30.00	12.00	-12.00
30.00	13.00	-13.00
30.00	14.00	-14.00
30.00	15.00	-15.00
30.00	16.00	-16.00
30.00	17.00	-17.00
30.00	18.00	-18.00
30.00	19.00	-19.00
30.00	20.00	-20.00
30.00	21.00	-21.00
30.00	22.00	-22.00
30.00	23.00	-23.00
30.00	24.00	-24.00
30.00	25.00	-25.00
30.00	26.00	-26.00
30.00	27.00	-27.00
30.00	28.00	-28.00
30.00	29.00	-29.00
30.00	30.00	-30.00
30.00	31.00	-31.00
30.00	32.00	-32.00
30.00	33.00	-33.00
30.00	34.00	-34.00
30.00	35.00	-35.00
30.00	36.00	-36.00
30.00	37.00	-37.00
30.00	38.00	-38.00
30.00	39.00	-39.00
30.00	40.00	-40.00
30.00	41.00	-41.00
30.00	42.00	-42.00
30.00	43.00	-43.00
30.00	44.00	-44.00
30.00	45.00	-45.00
30.00	46.00	-46.00
30.00	47.00	-47.00
30.00	48.00	-48.00
30.00	49.00	-49.00
30.00	50.00	-50.00
30.00	51.00	-51.00
30.00	52.00	-52.00
30.00	53.00	-53.00
30.00	54.00	-54.00
30.00	55.00	-55.00
30.00	56.00	-56.00
30.00	57.00	-57.00
30.00	58.00	-58.00
30.00	59.00	-59.00
30.00	60.00	-60.00
30.00	61.00	-61.00
30.00	62.00	-62.00
30.00	63.00	-63.00
30.00	64.00	-64.00
30.00	65.00	-65.00
30.00	66.00	-66.00
30.00	67.00	-67.00
30.00	68.00	-68.00
30.00	69.00	-69.00

Driven Pile Capacity:

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Test Pile Length (ft)	Pile Width (in)	Ultimate Side Friction (tons)	Mobilized End Bearing (tons)	Estimated Davisson Capacity (tons)	Allowable Pile Capacity (tons)	Ultimate Pile Capacity (tons)
1.00	30.0	0.00	0.00	0.00	0.00	0.00
2.00	30.0	0.00	0.00	0.00	0.00	0.00
3.00	30.0	0.00	0.00	0.00	0.00	0.00
4.00	30.0	0.00	0.00	0.00	0.00	0.00
5.00	30.0	0.00	0.00	0.00	0.00	0.00
6.00	30.0	0.00	0.00	0.00	0.00	0.00
7.00	30.0	0.00	0.00	0.00	0.00	0.00
8.00	30.0	0.00	0.00	0.00	0.00	0.00
9.00	30.0	0.00	0.00	0.00	0.00	0.00
10.00	30.0	0.25	0.00	0.25	0.12	0.25
11.00	30.0	0.99	0.00	0.99	0.50	0.99
12.00	30.0	2.23	71.53	73.76	36.88	216.83
13.00	30.0	3.76	70.84	74.60	37.30	216.28
14.00	30.0	5.37	69.83	75.20	37.60	214.85
15.00	30.0	7.07	68.29	75.36	37.68	211.94
16.00	30.0	8.68	66.92	75.60	37.80	209.45
17.00	30.0	10.04	66.62	76.66	38.33	209.90
18.00	30.0	11.16	67.51	78.67	39.34	213.70
19.00	30.0	12.21	68.75	80.96	40.48	218.46
20.00	30.0	13.39	69.32	82.72	41.36	221.37
21.00	30.0	14.69	75.32	90.01	45.01	240.65
22.00	30.0	16.18	93.08	109.26	54.63	295.42
23.00	30.0	17.93	122.86	140.79	70.39	386.51
24.00	30.0	19.92	84.48	104.40	52.20	273.35
25.00	30.0	21.58	85.45	107.03	53.52	277.92
26.00	30.0	22.69	88.30	110.99	55.49	287.59
27.00	30.0	23.52	92.93	116.45	58.23	302.31
28.00	30.0	24.25	99.23	123.48	61.74	321.95
29.00	30.0	24.94	107.16	132.10	66.05	346.41
30.00	30.0	25.65	116.55	142.19	71.10	375.29
31.00	30.0	26.82	126.52	153.35	76.67	406.39
32.00	30.0	28.93	135.79	164.72	82.36	436.30
33.00	30.0	44.64	360.11	404.75	202.38	1124.98
34.00	30.0	51.36	351.53	402.88	201.44	1105.94
35.00	30.0	57.87	347.59	405.45	202.73	1100.63
36.00	30.0	64.17	344.84	409.01	204.50	1098.68
37.00	30.0	70.31	339.48	409.79	204.90	1088.76
38.00	30.0	76.32	331.19	407.51	203.75	1069.88
39.00	30.0	82.21	323.82	406.04	203.02	1053.68
40.00	30.0	87.90	321.86	409.75	204.88	1053.46
41.00	30.0	93.29	325.86	419.15	209.57	1070.87
42.00	30.0	98.39	331.67	430.07	215.03	1093.41
43.00	30.0	103.56	332.58	436.14	218.07	1101.30
44.00	30.0	109.14	326.02	435.16	217.58	1087.20
45.00	30.0	115.13	313.15	428.28	214.14	1054.58
46.00	30.0	121.07	298.58	419.64	209.82	1016.79
47.00	30.0	126.46	285.75	412.21	206.10	983.71
48.00	30.0	131.32	276.00	407.31	203.66	959.31
49.00	30.0	136.17	266.77	402.94	201.47	936.47
50.00	30.0	141.57	254.17	395.74	197.87	904.08
51.00	30.0	147.50	237.31	384.81	192.41	859.44
52.00	30.0	153.39	219.46	372.85	186.42	811.76
53.00	30.0	158.66	204.76	363.42	181.71	772.94
54.00	30.0	163.31	194.37	357.68	178.84	746.42
55.00	30.0	167.48	188.29	355.77	177.88	732.34
56.00	30.0	171.33	185.35	356.68	178.34	727.38
57.00	30.0	174.84	190.94	365.78	182.89	747.66
58.00	30.0	178.23	209.09	387.32	193.66	805.51
59.00	30.0	181.70	238.49	420.19	210.09	897.16
60.00	30.0	185.26	267.49	452.75	226.37	987.72
61.00	30.0	188.75	285.38	474.12	237.06	1044.88
62.00	30.0	192.03	293.04	485.08	242.54	1071.17
63.00	30.0	195.11	295.86	490.97	245.48	1082.68
64.00	30.0	198.17	298.02	496.20	248.10	1092.24
65.00	30.0	201.40	298.40	499.79	249.90	1096.59
66.00	30.0	204.79	296.99	501.77	250.89	1095.74
67.00	30.0	209.04	288.43	497.47	248.74	1074.33
68.00	30.0	214.87	268.30	483.17	241.59	1019.78
69.00	30.0	222.27	237.56	459.83	229.92	934.96

NOTES

1. MOBILIZED END BEARING IS 1/3 OF THE ORIGINAL RB-121 VALUES.
2. DAVISSON PILE CAPACITY IS AN ESTIMATE BASED ON FAILURE CRITERIA,
AND EQUALS ULTIMATE SIDE FRICTION PLUS MOBILIZED END BEARING.
3. ALLOWABLE PILE CAPACITY IS 1/2 THE DAVISSON PILE CAPACITY.
4. ULTIMATE PILE CAPACITY IS ULTIMATE SIDE FRICTION PLUS
3 x THE MOBILIZED END BEARING.
EXCEPTION: FOR H-PILES TIPPED IN SAND OR LIMESTONE, THE
ULTIMATE PILE CAPACITY IS ULTIMATE SIDE FRICTION PLUS
2 x THE MOBILIZED END BEARING.

General Information:

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 Input file:ve PDE_GANNETT FLEMING\FB-Deep\Driven Piles\BR-1 - Int Pier.in
 Project number: 221126
 Job name: SR 997 Bridge Over Black Creek Canal (Bridge No. 870633)
 Engineer: Adnan Ismail, P.E.
 Units: English

Analysis Information:

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 Analysis Type: SPT

Soil Information:

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 Boring date: 8/24/2021, Boring Number: BR-1
 Station number: Offset:
 Ground Elevation: 0.000(ft)
 Hammer type: Automatic Hammer, Correction factor = 1.24

ID	Depth (ft)	No. of Blows (Blows/ft)	Soil Type
1	0.00	0.00	5- Cavity layer
2	1.00	19.00	5- Cavity layer
3	3.00	9.00	5- Cavity layer
4	5.00	7.00	5- Cavity layer
5	7.00	8.00	5- Cavity layer
6	9.00	8.00	5- Cavity layer
7	12.00	12.00	5- Cavity layer
8	15.00	14.00	5- Cavity layer
9	18.00	8.00	5- Cavity layer
10	21.00	11.00	5- Cavity layer
11	24.00	9.00	5- Cavity layer
12	27.00	8.00	5- Cavity layer
13	30.00	8.00	5- Cavity layer
14	33.00	55.00	4- Lime Stone/Very shelly sand
15	36.00	50.00	4- Lime Stone/Very shelly sand
16	39.00	47.00	4- Lime Stone/Very shelly sand
17	42.00	40.00	4- Lime Stone/Very shelly sand
18	45.00	50.00	4- Lime Stone/Very shelly sand
19	48.00	37.00	4- Lime Stone/Very shelly sand
20	51.00	50.00	4- Lime Stone/Very shelly sand
21	54.00	35.00	4- Lime Stone/Very shelly sand
22	57.00	27.00	4- Lime Stone/Very shelly sand
23	60.00	29.00	4- Lime Stone/Very shelly sand
24	63.00	24.00	4- Lime Stone/Very shelly sand
25	66.00	28.00	4- Lime Stone/Very shelly sand
26	69.00	66.00	4- Lime Stone/Very shelly sand
27	72.00	29.00	4- Lime Stone/Very shelly sand
28	75.00	26.00	4- Lime Stone/Very shelly sand
29	77.00	24.00	4- Lime Stone/Very shelly sand
30	79.00	27.00	4- Lime Stone/Very shelly sand

Blowcount Average Per Soil Layer

Layer Num.	Starting Elevation (ft)	Bottom Elevation (ft)	Thickness (ft)	Average Blowcount (Blows/ft)	Soil Type
1	0.00	-33.00	33.00	9.70	5-Void
2	-33.00	-79.00	46.00	39.15	4-Limestone, Very Shelly Sand

Driven Pile Data:

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 Pile unit weight = 150.00(pcf), Section Type: Square

Pile Geometry:

Width (in)	Length (ft)	Tip Elev. (ft)
18.00	1.00	-1.00
18.00	2.00	-2.00
18.00	3.00	-3.00
18.00	4.00	-4.00
18.00	5.00	-5.00
18.00	6.00	-6.00
18.00	7.00	-7.00
18.00	8.00	-8.00
18.00	9.00	-9.00
18.00	10.00	-10.00
18.00	11.00	-11.00
18.00	12.00	-12.00
18.00	13.00	-13.00
18.00	14.00	-14.00
18.00	15.00	-15.00
18.00	16.00	-16.00
18.00	17.00	-17.00
18.00	18.00	-18.00
18.00	19.00	-19.00
18.00	20.00	-20.00
18.00	21.00	-21.00
18.00	22.00	-22.00
18.00	23.00	-23.00
18.00	24.00	-24.00
18.00	25.00	-25.00
18.00	26.00	-26.00
18.00	27.00	-27.00
18.00	28.00	-28.00
18.00	29.00	-29.00
18.00	30.00	-30.00
18.00	31.00	-31.00
18.00	32.00	-32.00
18.00	33.00	-33.00
18.00	34.00	-34.00
18.00	35.00	-35.00
18.00	36.00	-36.00
18.00	37.00	-37.00
18.00	38.00	-38.00
18.00	39.00	-39.00
18.00	40.00	-40.00
18.00	41.00	-41.00
18.00	42.00	-42.00
18.00	43.00	-43.00
18.00	44.00	-44.00
18.00	45.00	-45.00
18.00	46.00	-46.00
18.00	47.00	-47.00
18.00	48.00	-48.00
18.00	49.00	-49.00
18.00	50.00	-50.00
18.00	51.00	-51.00
18.00	52.00	-52.00
18.00	53.00	-53.00
18.00	54.00	-54.00
18.00	55.00	-55.00
18.00	56.00	-56.00
18.00	57.00	-57.00
18.00	58.00	-58.00
18.00	59.00	-59.00
18.00	60.00	-60.00
18.00	61.00	-61.00
18.00	62.00	-62.00
18.00	63.00	-63.00
18.00	64.00	-64.00
18.00	65.00	-65.00
18.00	66.00	-66.00
18.00	67.00	-67.00
18.00	68.00	-68.00
18.00	69.00	-69.00

Driven Pile Capacity:

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Test Pile Length (ft)	Pile Width (in)	Ultimate Side Friction (tons)	Mobilized End Bearing (tons)	Estimated Davisson Capacity (tons)	Allowable Pile Capacity (tons)	Ultimate Pile Capacity (tons)
1.00	18.0	0.00	0.00	0.00	0.00	0.00
2.00	18.0	0.00	0.00	0.00	0.00	0.00
3.00	18.0	0.00	0.00	0.00	0.00	0.00
4.00	18.0	0.00	0.00	0.00	0.00	0.00
5.00	18.0	0.00	0.00	0.00	0.00	0.00
6.00	18.0	0.00	0.00	0.00	0.00	0.00
7.00	18.0	0.00	0.00	0.00	0.00	0.00
8.00	18.0	0.00	0.00	0.00	0.00	0.00
9.00	18.0	0.00	0.00	0.00	0.00	0.00
10.00	18.0	0.00	0.00	0.00	0.00	0.00
11.00	18.0	0.00	0.00	0.00	0.00	0.00
12.00	18.0	0.00	0.00	0.00	0.00	0.00
13.00	18.0	0.00	0.00	0.00	0.00	0.00
14.00	18.0	0.00	0.00	0.00	0.00	0.00
15.00	18.0	0.00	0.00	0.00	0.00	0.00
16.00	18.0	0.00	0.00	0.00	0.00	0.00
17.00	18.0	0.00	0.00	0.00	0.00	0.00
18.00	18.0	0.00	0.00	0.00	0.00	0.00
19.00	18.0	0.00	0.00	0.00	0.00	0.00
20.00	18.0	0.00	0.00	0.00	0.00	0.00
21.00	18.0	0.00	0.00	0.00	0.00	0.00
22.00	18.0	0.00	0.00	0.00	0.00	0.00
23.00	18.0	0.00	0.00	0.00	0.00	0.00
24.00	18.0	0.00	0.00	0.00	0.00	0.00
25.00	18.0	0.00	0.00	0.00	0.00	0.00
26.00	18.0	0.00	0.00	0.00	0.00	0.00
27.00	18.0	0.00	0.00	0.00	0.00	0.00
28.00	18.0	0.00	0.00	0.00	0.00	0.00
29.00	18.0	0.00	0.00	0.00	0.00	0.00
30.00	18.0	0.00	0.00	0.00	0.00	0.00
31.00	18.0	0.68	0.00	0.68	0.34	0.68
32.00	18.0	2.73	0.00	2.73	1.36	2.73
33.00	18.0	6.14	139.52	145.66	72.83	424.70
34.00	18.0	10.17	134.78	144.95	72.47	414.50
35.00	18.0	14.07	129.76	143.83	71.91	403.34
36.00	18.0	17.86	124.45	142.31	71.15	391.21
37.00	18.0	21.54	120.19	141.73	70.87	382.12
38.00	18.0	25.15	118.31	143.46	71.73	380.09
39.00	18.0	28.68	118.81	147.49	73.75	385.11
40.00	18.0	32.09	119.96	152.05	76.02	391.97
41.00	18.0	35.33	120.03	155.36	77.68	395.42
42.00	18.0	38.39	119.03	157.42	78.71	395.48
43.00	18.0	41.49	117.75	159.24	79.62	394.73
44.00	18.0	44.84	116.98	161.81	80.91	395.77
45.00	18.0	48.43	116.72	165.15	82.58	398.59
46.00	18.0	51.99	116.55	168.55	84.27	401.65
47.00	18.0	55.23	116.05	171.28	85.64	403.38
48.00	18.0	58.14	115.21	173.36	86.68	403.78
49.00	18.0	61.06	112.41	173.46	86.73	398.28
50.00	18.0	64.29	105.99	170.28	85.14	382.26
51.00	18.0	67.85	95.97	163.82	81.91	355.75
52.00	18.0	71.39	85.62	157.01	78.51	328.26
53.00	18.0	74.55	78.26	152.81	76.40	309.32
54.00	18.0	77.34	73.87	151.21	75.60	298.94
55.00	18.0	79.84	71.22	151.06	75.53	293.50
56.00	18.0	82.15	69.08	151.23	75.62	289.39
57.00	18.0	84.26	67.46	151.71	75.86	286.63
58.00	18.0	86.29	66.24	152.53	76.26	285.00
59.00	18.0	88.37	65.32	153.69	76.85	284.33
60.00	18.0	90.51	64.70	155.21	77.60	284.60
61.00	18.0	92.60	68.14	160.74	80.37	297.02
62.00	18.0	94.57	79.41	173.98	86.99	332.79
63.00	18.0	96.42	98.49	194.92	97.46	391.90
64.00	18.0	98.26	117.74	216.00	108.00	451.47
65.00	18.0	100.19	129.47	229.66	114.83	488.61
66.00	18.0	102.23	133.70	235.92	117.96	503.32
67.00	18.0	104.78	130.41	235.19	117.59	496.00
68.00	18.0	108.28	119.59	227.87	113.94	467.06
69.00	18.0	112.72	101.26	213.98	106.99	416.51

NOTES

1. MOBILIZED END BEARING IS 1/3 OF THE ORIGINAL RB-121 VALUES.
2. DAVISSON PILE CAPACITY IS AN ESTIMATE BASED ON FAILURE CRITERIA, AND EQUALS ULTIMATE SIDE FRICTION PLUS MOBILIZED END BEARING.
3. ALLOWABLE PILE CAPACITY IS 1/2 THE DAVISSON PILE CAPACITY.
4. ULTIMATE PILE CAPACITY IS ULTIMATE SIDE FRICTION PLUS 3 x THE MOBILIZED END BEARING.
EXCEPTION: FOR H-PILES TIPPED IN SAND OR LIMESTONE, THE ULTIMATE PILE CAPACITY IS ULTIMATE SIDE FRICTION PLUS 2 x THE MOBILIZED END BEARING.

General Information:

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Input file:ve PDE_GANNETT FLEMING\FB-Deep\Driven Piles\BR-1 - Int Pier.in
 Project number: 221126
 Job name: SR 997 Bridge Over Black Creek Canal (Bridge No. 870633)
 Engineer: Adnan Ismail, P.E.
 Units: English

Analysis Information:

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Analysis Type: SPT

Soil Information:

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Boring date: 8/24/2021, Boring Number: BR-1
 Station number: Offset:
 Ground Elevation: 0.000(ft)
 Hammer type: Automatic Hammer, Correction factor = 1.24

ID	Depth (ft)	No. of Blows (Blows/ft)	Soil Type
1	0.00	0.00	5- Cavity layer
2	1.00	19.00	5- Cavity layer
3	3.00	9.00	5- Cavity layer
4	5.00	7.00	5- Cavity layer
5	7.00	8.00	5- Cavity layer
6	9.00	8.00	5- Cavity layer
7	12.00	12.00	5- Cavity layer
8	15.00	14.00	5- Cavity layer
9	18.00	8.00	5- Cavity layer
10	21.00	11.00	5- Cavity layer
11	24.00	9.00	5- Cavity layer
12	27.00	8.00	5- Cavity layer
13	30.00	8.00	5- Cavity layer
14	33.00	55.00	4- Lime Stone/Very shelly sand
15	36.00	50.00	4- Lime Stone/Very shelly sand
16	39.00	47.00	4- Lime Stone/Very shelly sand
17	42.00	40.00	4- Lime Stone/Very shelly sand
18	45.00	50.00	4- Lime Stone/Very shelly sand
19	48.00	37.00	4- Lime Stone/Very shelly sand
20	51.00	50.00	4- Lime Stone/Very shelly sand
21	54.00	35.00	4- Lime Stone/Very shelly sand
22	57.00	27.00	4- Lime Stone/Very shelly sand
23	60.00	29.00	4- Lime Stone/Very shelly sand
24	63.00	24.00	4- Lime Stone/Very shelly sand
25	66.00	28.00	4- Lime Stone/Very shelly sand
26	69.00	66.00	4- Lime Stone/Very shelly sand
27	72.00	29.00	4- Lime Stone/Very shelly sand
28	75.00	26.00	4- Lime Stone/Very shelly sand
29	77.00	24.00	4- Lime Stone/Very shelly sand
30	79.00	27.00	4- Lime Stone/Very shelly sand

Blowcount Average Per Soil Layer

Layer Num.	Starting Elevation (ft)	Bottom Elevation (ft)	Thickness (ft)	Average Blowcount (Blows/ft)	Soil Type
1	0.00	-33.00	33.00	9.70	5-Void
2	-33.00	-79.00	46.00	39.15	4-Limestone, Very Shelly Sand

Driven Pile Data:

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Pile unit weight = 150.00(pcf), Section Type: Square

Pile Geometry:

Width (in)	Length (ft)	Tip Elev. (ft)
24.00	1.00	-1.00
24.00	2.00	-2.00
24.00	3.00	-3.00
24.00	4.00	-4.00
24.00	5.00	-5.00
24.00	6.00	-6.00
24.00	7.00	-7.00
24.00	8.00	-8.00
24.00	9.00	-9.00
24.00	10.00	-10.00
24.00	11.00	-11.00
24.00	12.00	-12.00
24.00	13.00	-13.00
24.00	14.00	-14.00
24.00	15.00	-15.00
24.00	16.00	-16.00
24.00	17.00	-17.00
24.00	18.00	-18.00
24.00	19.00	-19.00
24.00	20.00	-20.00
24.00	21.00	-21.00
24.00	22.00	-22.00
24.00	23.00	-23.00
24.00	24.00	-24.00
24.00	25.00	-25.00
24.00	26.00	-26.00
24.00	27.00	-27.00
24.00	28.00	-28.00
24.00	29.00	-29.00
24.00	30.00	-30.00
24.00	31.00	-31.00
24.00	32.00	-32.00
24.00	33.00	-33.00
24.00	34.00	-34.00
24.00	35.00	-35.00
24.00	36.00	-36.00
24.00	37.00	-37.00
24.00	38.00	-38.00
24.00	39.00	-39.00
24.00	40.00	-40.00
24.00	41.00	-41.00
24.00	42.00	-42.00
24.00	43.00	-43.00
24.00	44.00	-44.00
24.00	45.00	-45.00
24.00	46.00	-46.00
24.00	47.00	-47.00
24.00	48.00	-48.00
24.00	49.00	-49.00
24.00	50.00	-50.00
24.00	51.00	-51.00
24.00	52.00	-52.00
24.00	53.00	-53.00
24.00	54.00	-54.00
24.00	55.00	-55.00
24.00	56.00	-56.00
24.00	57.00	-57.00
24.00	58.00	-58.00
24.00	59.00	-59.00
24.00	60.00	-60.00
24.00	61.00	-61.00
24.00	62.00	-62.00
24.00	63.00	-63.00
24.00	64.00	-64.00
24.00	65.00	-65.00
24.00	66.00	-66.00
24.00	67.00	-67.00
24.00	68.00	-68.00
24.00	69.00	-69.00

Driven Pile Capacity:

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Test Pile Length (ft)	Pile Width (in)	Ultimate Side Friction (tons)	Mobilized End Bearing (tons)	Estimated Davisson Capacity (tons)	Allowable Pile Capacity (tons)	Ultimate Pile Capacity (tons)
1.00	24.0	0.00	0.00	0.00	0.00	0.00
2.00	24.0	0.00	0.00	0.00	0.00	0.00
3.00	24.0	0.00	0.00	0.00	0.00	0.00
4.00	24.0	0.00	0.00	0.00	0.00	0.00
5.00	24.0	0.00	0.00	0.00	0.00	0.00
6.00	24.0	0.00	0.00	0.00	0.00	0.00
7.00	24.0	0.00	0.00	0.00	0.00	0.00
8.00	24.0	0.00	0.00	0.00	0.00	0.00
9.00	24.0	0.00	0.00	0.00	0.00	0.00
10.00	24.0	0.00	0.00	0.00	0.00	0.00
11.00	24.0	0.00	0.00	0.00	0.00	0.00
12.00	24.0	0.00	0.00	0.00	0.00	0.00
13.00	24.0	0.00	0.00	0.00	0.00	0.00
14.00	24.0	0.00	0.00	0.00	0.00	0.00
15.00	24.0	0.00	0.00	0.00	0.00	0.00
16.00	24.0	0.00	0.00	0.00	0.00	0.00
17.00	24.0	0.00	0.00	0.00	0.00	0.00
18.00	24.0	0.00	0.00	0.00	0.00	0.00
19.00	24.0	0.00	0.00	0.00	0.00	0.00
20.00	24.0	0.00	0.00	0.00	0.00	0.00
21.00	24.0	0.00	0.00	0.00	0.00	0.00
22.00	24.0	0.00	0.00	0.00	0.00	0.00
23.00	24.0	0.00	0.00	0.00	0.00	0.00
24.00	24.0	0.00	0.00	0.00	0.00	0.00
25.00	24.0	0.00	0.00	0.00	0.00	0.00
26.00	24.0	0.00	0.00	0.00	0.00	0.00
27.00	24.0	0.00	0.00	0.00	0.00	0.00
28.00	24.0	0.00	0.00	0.00	0.00	0.00
29.00	24.0	0.00	0.00	0.00	0.00	0.00
30.00	24.0	0.00	0.00	0.00	0.00	0.00
31.00	24.0	0.91	0.00	0.91	0.45	0.91
32.00	24.0	3.64	0.00	3.64	1.82	3.64
33.00	24.0	8.18	239.38	247.56	123.78	726.32
34.00	24.0	13.56	229.71	243.27	121.64	702.70
35.00	24.0	18.77	221.72	240.49	120.24	683.93
36.00	24.0	23.81	217.44	241.25	120.63	676.13
37.00	24.0	28.72	216.61	245.33	122.66	678.54
38.00	24.0	33.53	216.18	249.71	124.85	682.06
39.00	24.0	38.24	213.39	251.64	125.82	678.42
40.00	24.0	42.79	208.71	251.50	125.75	668.93
41.00	24.0	47.10	205.71	252.81	126.41	664.22
42.00	24.0	51.19	207.48	258.66	129.33	673.61
43.00	24.0	55.32	211.97	267.30	133.65	691.24
44.00	24.0	59.78	213.83	273.61	136.81	701.27
45.00	24.0	64.58	209.71	274.29	137.15	693.72
46.00	24.0	69.32	202.39	271.71	135.86	676.49
47.00	24.0	73.64	195.54	269.18	134.59	660.26
48.00	24.0	77.52	190.09	267.61	133.81	647.79
49.00	24.0	81.41	182.93	264.34	132.17	630.21
50.00	24.0	85.73	172.03	257.75	128.88	601.81
51.00	24.0	90.47	158.43	248.90	124.45	565.77
52.00	24.0	95.18	145.47	240.66	120.33	531.61
53.00	24.0	99.40	135.76	235.16	117.58	506.69
54.00	24.0	103.12	128.58	231.70	115.85	488.86
55.00	24.0	106.46	123.00	229.46	114.73	475.46
56.00	24.0	109.53	119.02	228.56	114.28	466.61
57.00	24.0	112.34	117.57	229.91	114.96	465.05
58.00	24.0	115.06	117.57	232.63	116.31	467.77
59.00	24.0	117.83	122.27	240.11	120.05	484.65
60.00	24.0	120.68	135.97	256.64	128.32	528.57
61.00	24.0	123.47	159.37	282.84	141.42	601.58
62.00	24.0	126.10	183.90	310.00	155.00	677.80
63.00	24.0	128.56	200.26	328.82	164.41	729.33
64.00	24.0	131.01	207.52	338.53	169.26	753.57
65.00	24.0	133.59	209.06	342.65	171.32	760.76
66.00	24.0	136.30	209.16	345.46	172.73	763.78
67.00	24.0	139.71	203.53	343.24	171.62	750.31
68.00	24.0	144.37	187.89	332.26	166.13	708.03
69.00	24.0	150.29	162.23	312.52	156.26	636.97

NOTES

1. MOBILIZED END BEARING IS 1/3 OF THE ORIGINAL RB-121 VALUES.
2. DAVISSON PILE CAPACITY IS AN ESTIMATE BASED ON FAILURE CRITERIA, AND EQUALS ULTIMATE SIDE FRICTION PLUS MOBILIZED END BEARING.
3. ALLOWABLE PILE CAPACITY IS 1/2 THE DAVISSON PILE CAPACITY.
4. ULTIMATE PILE CAPACITY IS ULTIMATE SIDE FRICTION PLUS
3 x THE MOBILIZED END BEARING.
EXCEPTION: FOR H-PILES TIPPED IN SAND OR LIMESTONE, THE
ULTIMATE PILE CAPACITY IS ULTIMATE SIDE FRICTION PLUS
2 x THE MOBILIZED END BEARING.

General Information:

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Input file:ve PDE_GANNETT FLEMING\FB-Deep\Driven Piles\BR-1 - Int Pier.in
 Project number: 221126
 Job name: SR 997 Bridge Over Black Creek Canal (Bridge No. 870633)
 Engineer: Adnan Ismail, P.E.
 Units: English

Analysis Information:

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Analysis Type: SPT

Soil Information:

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Boring date: 8/24/2021, Boring Number: BR-1
 Station number: Offset:
 Ground Elevation: 0.000(ft)
 Hammer type: Automatic Hammer, Correction factor = 1.24

ID	Depth (ft)	No. of Blows (Blows/ft)	Soil Type
1	0.00	0.00	5- Cavity layer
2	1.00	19.00	5- Cavity layer
3	3.00	9.00	5- Cavity layer
4	5.00	7.00	5- Cavity layer
5	7.00	8.00	5- Cavity layer
6	9.00	8.00	5- Cavity layer
7	12.00	12.00	5- Cavity layer
8	15.00	14.00	5- Cavity layer
9	18.00	8.00	5- Cavity layer
10	21.00	11.00	5- Cavity layer
11	24.00	9.00	5- Cavity layer
12	27.00	8.00	5- Cavity layer
13	30.00	8.00	5- Cavity layer
14	33.00	55.00	4- Lime Stone/Very shelly sand
15	36.00	50.00	4- Lime Stone/Very shelly sand
16	39.00	47.00	4- Lime Stone/Very shelly sand
17	42.00	40.00	4- Lime Stone/Very shelly sand
18	45.00	50.00	4- Lime Stone/Very shelly sand
19	48.00	37.00	4- Lime Stone/Very shelly sand
20	51.00	50.00	4- Lime Stone/Very shelly sand
21	54.00	35.00	4- Lime Stone/Very shelly sand
22	57.00	27.00	4- Lime Stone/Very shelly sand
23	60.00	29.00	4- Lime Stone/Very shelly sand
24	63.00	24.00	4- Lime Stone/Very shelly sand
25	66.00	28.00	4- Lime Stone/Very shelly sand
26	69.00	66.00	4- Lime Stone/Very shelly sand
27	72.00	29.00	4- Lime Stone/Very shelly sand
28	75.00	26.00	4- Lime Stone/Very shelly sand
29	77.00	24.00	4- Lime Stone/Very shelly sand
30	79.00	27.00	4- Lime Stone/Very shelly sand

Blowcount Average Per Soil Layer

Layer Num.	Starting Elevation (ft)	Bottom Elevation (ft)	Thickness (ft)	Average Blowcount (Blows/ft)	Soil Type
1	0.00	-33.00	33.00	9.70	5-Void
2	-33.00	-79.00	46.00	39.15	4-Limestone, Very Shelly Sand

Driven Pile Data:

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Pile unit weight = 150.00(pcf), Section Type: Square

Pile Geometry:

Width (in)	Length (ft)	Tip Elev. (ft)
30.00	1.00	-1.00
30.00	2.00	-2.00
30.00	3.00	-3.00
30.00	4.00	-4.00
30.00	5.00	-5.00
30.00	6.00	-6.00
30.00	7.00	-7.00
30.00	8.00	-8.00
30.00	9.00	-9.00
30.00	10.00	-10.00
30.00	11.00	-11.00
30.00	12.00	-12.00
30.00	13.00	-13.00
30.00	14.00	-14.00
30.00	15.00	-15.00
30.00	16.00	-16.00
30.00	17.00	-17.00
30.00	18.00	-18.00
30.00	19.00	-19.00
30.00	20.00	-20.00
30.00	21.00	-21.00
30.00	22.00	-22.00
30.00	23.00	-23.00
30.00	24.00	-24.00
30.00	25.00	-25.00
30.00	26.00	-26.00
30.00	27.00	-27.00
30.00	28.00	-28.00
30.00	29.00	-29.00
30.00	30.00	-30.00
30.00	31.00	-31.00
30.00	32.00	-32.00
30.00	33.00	-33.00
30.00	34.00	-34.00
30.00	35.00	-35.00
30.00	36.00	-36.00
30.00	37.00	-37.00
30.00	38.00	-38.00
30.00	39.00	-39.00
30.00	40.00	-40.00
30.00	41.00	-41.00
30.00	42.00	-42.00
30.00	43.00	-43.00
30.00	44.00	-44.00
30.00	45.00	-45.00
30.00	46.00	-46.00
30.00	47.00	-47.00
30.00	48.00	-48.00
30.00	49.00	-49.00
30.00	50.00	-50.00
30.00	51.00	-51.00
30.00	52.00	-52.00
30.00	53.00	-53.00
30.00	54.00	-54.00
30.00	55.00	-55.00
30.00	56.00	-56.00
30.00	57.00	-57.00
30.00	58.00	-58.00
30.00	59.00	-59.00
30.00	60.00	-60.00
30.00	61.00	-61.00
30.00	62.00	-62.00
30.00	63.00	-63.00
30.00	64.00	-64.00
30.00	65.00	-65.00
30.00	66.00	-66.00
30.00	67.00	-67.00
30.00	68.00	-68.00
30.00	69.00	-69.00

Driven Pile Capacity:

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Test Pile Length (ft)	Pile Width (in)	Ultimate Side Friction (tons)	Mobilized End Bearing (tons)	Estimated Davisson Capacity (tons)	Allowable Pile Capacity (tons)	Ultimate Pile Capacity (tons)
1.00	30.0	0.00	0.00	0.00	0.00	0.00
2.00	30.0	0.00	0.00	0.00	0.00	0.00
3.00	30.0	0.00	0.00	0.00	0.00	0.00
4.00	30.0	0.00	0.00	0.00	0.00	0.00
5.00	30.0	0.00	0.00	0.00	0.00	0.00
6.00	30.0	0.00	0.00	0.00	0.00	0.00
7.00	30.0	0.00	0.00	0.00	0.00	0.00
8.00	30.0	0.00	0.00	0.00	0.00	0.00
9.00	30.0	0.00	0.00	0.00	0.00	0.00
10.00	30.0	0.00	0.00	0.00	0.00	0.00
11.00	30.0	0.00	0.00	0.00	0.00	0.00
12.00	30.0	0.00	0.00	0.00	0.00	0.00
13.00	30.0	0.00	0.00	0.00	0.00	0.00
14.00	30.0	0.00	0.00	0.00	0.00	0.00
15.00	30.0	0.00	0.00	0.00	0.00	0.00
16.00	30.0	0.00	0.00	0.00	0.00	0.00
17.00	30.0	0.00	0.00	0.00	0.00	0.00
18.00	30.0	0.00	0.00	0.00	0.00	0.00
19.00	30.0	0.00	0.00	0.00	0.00	0.00
20.00	30.0	0.00	0.00	0.00	0.00	0.00
21.00	30.0	0.00	0.00	0.00	0.00	0.00
22.00	30.0	0.00	0.00	0.00	0.00	0.00
23.00	30.0	0.00	0.00	0.00	0.00	0.00
24.00	30.0	0.00	0.00	0.00	0.00	0.00
25.00	30.0	0.00	0.00	0.00	0.00	0.00
26.00	30.0	0.00	0.00	0.00	0.00	0.00
27.00	30.0	0.00	0.00	0.00	0.00	0.00
28.00	30.0	0.00	0.00	0.00	0.00	0.00
29.00	30.0	0.00	0.00	0.00	0.00	0.00
30.00	30.0	0.00	0.00	0.00	0.00	0.00
31.00	30.0	1.14	0.00	1.14	0.57	1.14
32.00	30.0	4.55	0.00	4.55	2.27	4.55
33.00	30.0	10.23	360.11	370.34	185.17	1090.57
34.00	30.0	16.95	351.53	368.47	184.24	1071.53
35.00	30.0	23.46	347.59	371.04	185.52	1066.22
36.00	30.0	29.76	344.84	374.60	187.30	1064.27
37.00	30.0	35.90	339.48	375.38	187.69	1054.35
38.00	30.0	41.91	331.19	373.10	186.55	1035.47
39.00	30.0	47.80	323.82	371.63	185.81	1019.27
40.00	30.0	53.49	321.86	375.34	187.67	1019.05
41.00	30.0	58.88	325.86	384.74	192.37	1036.46
42.00	30.0	63.98	331.67	395.66	197.83	1059.00
43.00	30.0	69.15	332.58	401.73	200.86	1066.89
44.00	30.0	74.73	326.02	400.75	200.38	1052.79
45.00	30.0	80.72	313.15	393.87	196.94	1020.17
46.00	30.0	86.66	298.58	385.23	192.62	982.38
47.00	30.0	92.05	285.75	377.80	188.90	949.30
48.00	30.0	96.91	276.00	372.90	186.45	924.90
49.00	30.0	101.76	266.77	368.53	184.26	902.06
50.00	30.0	107.16	254.17	361.33	180.66	869.67
51.00	30.0	113.09	237.31	350.40	175.20	825.03
52.00	30.0	118.98	219.46	338.44	169.22	777.35
53.00	30.0	124.25	204.76	329.01	164.50	738.53
54.00	30.0	128.90	194.37	323.27	161.63	712.01
55.00	30.0	133.07	188.29	321.36	160.68	697.93
56.00	30.0	136.92	185.35	322.27	161.13	692.97
57.00	30.0	140.43	190.94	331.37	165.68	713.25
58.00	30.0	143.82	209.09	352.91	176.46	771.10
59.00	30.0	147.29	238.49	385.78	192.89	862.75
60.00	30.0	150.85	267.49	418.34	209.17	953.31
61.00	30.0	154.34	285.38	439.71	219.86	1010.47
62.00	30.0	157.62	293.04	450.67	225.33	1036.76
63.00	30.0	160.70	295.86	456.56	228.28	1048.27
64.00	30.0	163.76	298.02	461.79	230.89	1057.83
65.00	30.0	166.99	298.40	465.38	232.69	1062.18
66.00	30.0	170.38	296.99	467.36	233.68	1061.33
67.00	30.0	174.63	288.43	463.06	231.53	1039.92
68.00	30.0	180.46	268.30	448.76	224.38	985.37
69.00	30.0	187.86	237.56	425.42	212.71	900.55

NOTES

1. MOBILIZED END BEARING IS 1/3 OF THE ORIGINAL RB-121 VALUES.
2. DAVISSON PILE CAPACITY IS AN ESTIMATE BASED ON FAILURE CRITERIA, AND EQUALS ULTIMATE SIDE FRICTION PLUS MOBILIZED END BEARING.
3. ALLOWABLE PILE CAPACITY IS 1/2 THE DAVISSON PILE CAPACITY.
4. ULTIMATE PILE CAPACITY IS ULTIMATE SIDE FRICTION PLUS 3 x THE MOBILIZED END BEARING.
EXCEPTION: FOR H-PILES TIPPED IN SAND OR LIMESTONE, THE ULTIMATE PILE CAPACITY IS ULTIMATE SIDE FRICTION PLUS 2 x THE MOBILIZED END BEARING.

General Information:

Input file:e PDE_GANNETT FLEMING\FB-Deep\Driven Piles\BR-2 - End Bents.in
 Project number: 221126
 Job name: SR 997 Bridge Over Black Creek Canal (Bridge No. 870633)
 Engineer: Adnan Ismail, P.E.
 Units: English

Analysis Information:

Analysis Type: SPT

Soil Information:

Boring date: 8/20/2021, Boring Number: BR-2
 Station number: Offset:
 Ground Elevation: 0.000(ft)
 Hammer type: Automatic Hammer, Correction factor = 1.24

ID	Depth (ft)	No. of Blows (Blows/ft)	Soil Type
1	0.00	0.00	5- Cavity layer
2	1.00	21.00	5- Cavity layer
3	3.00	17.00	5- Cavity layer
4	5.00	8.00	5- Cavity layer
5	7.00	7.00	5- Cavity layer
6	9.00	9.00	5- Cavity layer
7	12.00	11.00	4- Lime Stone/Very shelly sand
8	15.00	13.00	4- Lime Stone/Very shelly sand
9	18.00	9.00	4- Lime Stone/Very shelly sand
10	21.00	10.00	4- Lime Stone/Very shelly sand
11	24.00	8.00	3- Clean sand
12	27.00	9.00	3- Clean sand
13	30.00	8.00	3- Clean sand
14	33.00	55.00	4- Lime Stone/Very shelly sand
15	36.00	50.00	4- Lime Stone/Very shelly sand
16	39.00	50.00	4- Lime Stone/Very shelly sand
17	42.00	37.00	4- Lime Stone/Very shelly sand
18	45.00	50.00	4- Lime Stone/Very shelly sand
19	48.00	31.00	4- Lime Stone/Very shelly sand
20	51.00	30.00	4- Lime Stone/Very shelly sand
21	54.00	50.00	4- Lime Stone/Very shelly sand
22	57.00	25.00	4- Lime Stone/Very shelly sand
23	60.00	24.00	4- Lime Stone/Very shelly sand
24	63.00	30.00	4- Lime Stone/Very shelly sand
25	66.00	25.00	4- Lime Stone/Very shelly sand
26	69.00	26.00	4- Lime Stone/Very shelly sand
27	72.00	23.00	4- Lime Stone/Very shelly sand
28	75.00	26.00	4- Lime Stone/Very shelly sand
29	77.00	28.00	4- Lime Stone/Very shelly sand
30	79.00	31.00	4- Lime Stone/Very shelly sand

Blowcount Average Per Soil Layer

Layer Num.	Starting Elevation (ft)	Bottom Elevation (ft)	Thickness (ft)	Average Blowcount (Blows/ft)	Soil Type
1	0.00	-12.00	12.00	11.08	5-Void
2	-12.00	-24.00	12.00	10.75	4-Limestone, Very Shelly Sand
3	-24.00	-33.00	9.00	8.33	3-Clean Sand
4	-33.00	-79.00	46.00	35.35	4-Limestone, Very Shelly Sand

Driven Pile Data:

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Pile unit weight = 150.00(pcf), Section Type: Square

Pile Geometry:

Width (in)	Length (ft)	Tip Elev. (ft)
18.00	1.00	-1.00
18.00	2.00	-2.00
18.00	3.00	-3.00
18.00	4.00	-4.00
18.00	5.00	-5.00
18.00	6.00	-6.00
18.00	7.00	-7.00
18.00	8.00	-8.00
18.00	9.00	-9.00
18.00	10.00	-10.00
18.00	11.00	-11.00
18.00	12.00	-12.00
18.00	13.00	-13.00
18.00	14.00	-14.00
18.00	15.00	-15.00
18.00	16.00	-16.00
18.00	17.00	-17.00
18.00	18.00	-18.00
18.00	19.00	-19.00
18.00	20.00	-20.00
18.00	21.00	-21.00
18.00	22.00	-22.00
18.00	23.00	-23.00
18.00	24.00	-24.00
18.00	25.00	-25.00
18.00	26.00	-26.00
18.00	27.00	-27.00
18.00	28.00	-28.00
18.00	29.00	-29.00
18.00	30.00	-30.00
18.00	31.00	-31.00
18.00	32.00	-32.00
18.00	33.00	-33.00
18.00	34.00	-34.00
18.00	35.00	-35.00
18.00	36.00	-36.00
18.00	37.00	-37.00
18.00	38.00	-38.00
18.00	39.00	-39.00
18.00	40.00	-40.00
18.00	41.00	-41.00
18.00	42.00	-42.00
18.00	43.00	-43.00
18.00	44.00	-44.00
18.00	45.00	-45.00
18.00	46.00	-46.00
18.00	47.00	-47.00
18.00	48.00	-48.00
18.00	49.00	-49.00
18.00	50.00	-50.00
18.00	51.00	-51.00
18.00	52.00	-52.00
18.00	53.00	-53.00
18.00	54.00	-54.00
18.00	55.00	-55.00
18.00	56.00	-56.00
18.00	57.00	-57.00
18.00	58.00	-58.00
18.00	59.00	-59.00
18.00	60.00	-60.00
18.00	61.00	-61.00
18.00	62.00	-62.00
18.00	63.00	-63.00
18.00	64.00	-64.00
18.00	65.00	-65.00
18.00	66.00	-66.00
18.00	67.00	-67.00
18.00	68.00	-68.00
18.00	69.00	-69.00

Driven Pile Capacity:

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Test Pile Length (ft)	Pile Width (in)	Ultimate Side Friction (tons)	Mobilized End Bearing (tons)	Estimated Davisson Capacity (tons)	Allowable Pile Capacity (tons)	Ultimate Pile Capacity (tons)
1.00	18.0	0.00	0.00	0.00	0.00	0.00
2.00	18.0	0.00	0.00	0.00	0.00	0.00
3.00	18.0	0.00	0.00	0.00	0.00	0.00
4.00	18.0	0.00	0.00	0.00	0.00	0.00
5.00	18.0	0.00	0.00	0.00	0.00	0.00
6.00	18.0	0.00	0.00	0.00	0.00	0.00
7.00	18.0	0.00	0.00	0.00	0.00	0.00
8.00	18.0	0.00	0.00	0.00	0.00	0.00
9.00	18.0	0.00	0.00	0.00	0.00	0.00
10.00	18.0	0.14	0.00	0.14	0.07	0.14
11.00	18.0	0.55	0.00	0.55	0.27	0.55
12.00	18.0	1.23	26.54	27.77	13.89	80.86
13.00	18.0	2.07	25.68	27.75	13.87	79.11
14.00	18.0	2.96	24.68	27.64	13.82	76.99
15.00	18.0	3.91	23.53	27.44	13.72	74.51
16.00	18.0	4.82	22.62	27.44	13.72	72.67
17.00	18.0	5.64	22.28	27.93	13.96	72.50
18.00	18.0	6.36	22.54	28.90	14.45	73.98
19.00	18.0	7.04	23.10	30.14	15.07	76.35
20.00	18.0	7.75	23.70	31.45	15.72	78.84
21.00	18.0	8.48	24.33	32.81	16.40	81.46
22.00	18.0	9.29	24.87	34.16	17.08	83.89
23.00	18.0	10.23	25.19	35.42	17.71	85.79
24.00	18.0	11.29	25.00	36.29	18.15	86.29
25.00	18.0	12.45	25.00	37.45	18.72	87.45
26.00	18.0	13.42	25.43	38.85	19.43	89.71
27.00	18.0	13.99	27.19	41.18	20.59	95.56
28.00	18.0	14.27	31.17	45.44	22.72	107.79
29.00	18.0	14.55	37.14	51.69	25.85	125.98
30.00	18.0	14.92	44.72	59.64	29.82	149.07
31.00	18.0	15.65	53.16	68.81	34.40	175.14
32.00	18.0	17.01	61.58	78.59	39.29	201.75
33.00	18.0	26.34	142.05	168.39	84.19	452.48
34.00	18.0	30.37	138.46	168.82	84.41	445.74
35.00	18.0	34.27	133.51	167.78	83.89	434.79
36.00	18.0	38.06	127.20	165.25	82.63	419.65
37.00	18.0	41.78	121.38	163.15	81.58	405.91
38.00	18.0	45.50	117.88	163.38	81.69	399.15
39.00	18.0	49.22	116.72	165.93	82.97	399.37
40.00	18.0	52.77	116.23	169.00	84.50	401.45
41.00	18.0	56.01	114.75	170.76	85.38	400.25
42.00	18.0	58.92	112.28	171.21	85.60	395.77
43.00	18.0	61.84	108.08	169.92	84.96	386.08
44.00	18.0	65.08	101.39	166.47	83.23	369.25
45.00	18.0	68.63	92.22	160.85	80.42	345.28
46.00	18.0	72.12	85.19	157.31	78.65	327.68
47.00	18.0	75.13	84.95	160.08	80.04	329.98
48.00	18.0	77.67	91.50	169.17	84.59	352.17
49.00	18.0	79.97	99.40	179.37	89.68	378.16
50.00	18.0	82.24	103.21	185.44	92.72	391.86
51.00	18.0	84.48	102.93	187.41	93.70	393.27
52.00	18.0	86.96	98.79	185.75	92.88	383.34
53.00	18.0	89.94	91.03	180.97	90.48	363.03
54.00	18.0	93.41	79.65	173.05	86.53	332.35
55.00	18.0	96.82	69.03	165.85	82.93	303.92
56.00	18.0	99.61	63.60	163.21	81.60	290.40
57.00	18.0	101.78	63.34	165.11	82.56	291.78
58.00	18.0	103.63	65.35	168.97	84.49	299.67
59.00	18.0	105.45	66.74	172.19	86.09	305.66
60.00	18.0	107.25	67.50	174.75	87.37	309.75
61.00	18.0	109.11	67.57	176.67	88.34	311.80
62.00	18.0	111.12	66.86	177.97	88.99	311.69
63.00	18.0	113.27	65.38	178.65	89.33	309.41
64.00	18.0	115.44	63.67	179.11	89.56	306.46
65.00	18.0	117.49	62.29	179.78	89.89	304.35
66.00	18.0	119.41	61.22	180.64	90.32	303.09
67.00	18.0	121.28	60.47	181.76	90.88	302.71
68.00	18.0	123.18	60.02	183.21	91.60	303.25
69.00	18.0	125.10	59.87	184.98	92.49	304.72

NOTES

1. MOBILIZED END BEARING IS 1/3 OF THE ORIGINAL RB-121 VALUES.
2. DAVISSON PILE CAPACITY IS AN ESTIMATE BASED ON FAILURE CRITERIA,
AND EQUALS ULTIMATE SIDE FRICTION PLUS MOBILIZED END BEARING.
3. ALLOWABLE PILE CAPACITY IS 1/2 THE DAVISSON PILE CAPACITY.
4. ULTIMATE PILE CAPACITY IS ULTIMATE SIDE FRICTION PLUS
3 x THE MOBILIZED END BEARING.
EXCEPTION: FOR H-PILES TIPPED IN SAND OR LIMESTONE, THE
ULTIMATE PILE CAPACITY IS ULTIMATE SIDE FRICTION PLUS
2 x THE MOBILIZED END BEARING.

General Information:

Input file:e PDE_GANNETT FLEMING\FB-Deep\Driven Piles\BR-2 - End Bents.in
 Project number: 221126
 Job name: SR 997 Bridge Over Black Creek Canal (Bridge No. 870633)
 Engineer: Adnan Ismail, P.E.
 Units: English

Analysis Information:

Analysis Type: SPT

Soil Information:

Boring date: 8/20/2021, Boring Number: BR-2
 Station number: Offset:

Ground Elevation: 0.000(ft)

Hammer type: Automatic Hammer, Correction factor = 1.24

ID	Depth (ft)	No. of Blows (Blows/ft)	Soil Type
1	0.00	0.00	5- Cavity layer
2	1.00	21.00	5- Cavity layer
3	3.00	17.00	5- Cavity layer
4	5.00	8.00	5- Cavity layer
5	7.00	7.00	5- Cavity layer
6	9.00	9.00	5- Cavity layer
7	12.00	11.00	4- Lime Stone/Very shelly sand
8	15.00	13.00	4- Lime Stone/Very shelly sand
9	18.00	9.00	4- Lime Stone/Very shelly sand
10	21.00	10.00	4- Lime Stone/Very shelly sand
11	24.00	8.00	3- Clean sand
12	27.00	9.00	3- Clean sand
13	30.00	8.00	3- Clean sand
14	33.00	55.00	4- Lime Stone/Very shelly sand
15	36.00	50.00	4- Lime Stone/Very shelly sand
16	39.00	50.00	4- Lime Stone/Very shelly sand
17	42.00	37.00	4- Lime Stone/Very shelly sand
18	45.00	50.00	4- Lime Stone/Very shelly sand
19	48.00	31.00	4- Lime Stone/Very shelly sand
20	51.00	30.00	4- Lime Stone/Very shelly sand
21	54.00	50.00	4- Lime Stone/Very shelly sand
22	57.00	25.00	4- Lime Stone/Very shelly sand
23	60.00	24.00	4- Lime Stone/Very shelly sand
24	63.00	30.00	4- Lime Stone/Very shelly sand
25	66.00	25.00	4- Lime Stone/Very shelly sand
26	69.00	26.00	4- Lime Stone/Very shelly sand
27	72.00	23.00	4- Lime Stone/Very shelly sand
28	75.00	26.00	4- Lime Stone/Very shelly sand
29	77.00	28.00	4- Lime Stone/Very shelly sand
30	79.00	31.00	4- Lime Stone/Very shelly sand

Blowcount Average Per Soil Layer

Layer Num.	Starting Elevation (ft)	Bottom Elevation (ft)	Thickness (ft)	Average Blowcount (Blows/ft)	Soil Type
1	0.00	-12.00	12.00	11.08	5-Void
2	-12.00	-24.00	12.00	10.75	4-Limestone, Very Shelly Sand
3	-24.00	-33.00	9.00	8.33	3-Clean Sand
4	-33.00	-79.00	46.00	35.35	4-Limestone, Very Shelly Sand

Driven Pile Data:

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Pile unit weight = 150.00(pcf), Section Type: Square

Pile Geometry:

Width (in)	Length (ft)	Tip Elev. (ft)
24.00	1.00	-1.00
24.00	2.00	-2.00
24.00	3.00	-3.00
24.00	4.00	-4.00
24.00	5.00	-5.00
24.00	6.00	-6.00
24.00	7.00	-7.00
24.00	8.00	-8.00
24.00	9.00	-9.00
24.00	10.00	-10.00
24.00	11.00	-11.00
24.00	12.00	-12.00
24.00	13.00	-13.00
24.00	14.00	-14.00
24.00	15.00	-15.00
24.00	16.00	-16.00
24.00	17.00	-17.00
24.00	18.00	-18.00
24.00	19.00	-19.00
24.00	20.00	-20.00
24.00	21.00	-21.00
24.00	22.00	-22.00
24.00	23.00	-23.00
24.00	24.00	-24.00
24.00	25.00	-25.00
24.00	26.00	-26.00
24.00	27.00	-27.00
24.00	28.00	-28.00
24.00	29.00	-29.00
24.00	30.00	-30.00
24.00	31.00	-31.00
24.00	32.00	-32.00
24.00	33.00	-33.00
24.00	34.00	-34.00
24.00	35.00	-35.00
24.00	36.00	-36.00
24.00	37.00	-37.00
24.00	38.00	-38.00
24.00	39.00	-39.00
24.00	40.00	-40.00
24.00	41.00	-41.00
24.00	42.00	-42.00
24.00	43.00	-43.00
24.00	44.00	-44.00
24.00	45.00	-45.00
24.00	46.00	-46.00
24.00	47.00	-47.00
24.00	48.00	-48.00
24.00	49.00	-49.00
24.00	50.00	-50.00
24.00	51.00	-51.00
24.00	52.00	-52.00
24.00	53.00	-53.00
24.00	54.00	-54.00
24.00	55.00	-55.00
24.00	56.00	-56.00
24.00	57.00	-57.00
24.00	58.00	-58.00
24.00	59.00	-59.00
24.00	60.00	-60.00
24.00	61.00	-61.00
24.00	62.00	-62.00
24.00	63.00	-63.00
24.00	64.00	-64.00
24.00	65.00	-65.00
24.00	66.00	-66.00
24.00	67.00	-67.00
24.00	68.00	-68.00
24.00	69.00	-69.00

Driven Pile Capacity:

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Test Pile Length (ft)	Pile Width (in)	Ultimate Side Friction (tons)	Mobilized End Bearing (tons)	Estimated Davisson Capacity (tons)	Allowable Pile Capacity (tons)	Ultimate Pile Capacity (tons)
1.00	24.0	0.00	0.00	0.00	0.00	0.00
2.00	24.0	0.00	0.00	0.00	0.00	0.00
3.00	24.0	0.00	0.00	0.00	0.00	0.00
4.00	24.0	0.00	0.00	0.00	0.00	0.00
5.00	24.0	0.00	0.00	0.00	0.00	0.00
6.00	24.0	0.00	0.00	0.00	0.00	0.00
7.00	24.0	0.00	0.00	0.00	0.00	0.00
8.00	24.0	0.00	0.00	0.00	0.00	0.00
9.00	24.0	0.00	0.00	0.00	0.00	0.00
10.00	24.0	0.18	0.00	0.18	0.09	0.18
11.00	24.0	0.73	0.00	0.73	0.36	0.73
12.00	24.0	1.64	44.87	46.51	23.25	136.24
13.00	24.0	2.76	44.07	46.83	23.41	134.96
14.00	24.0	3.95	43.03	46.98	23.49	133.03
15.00	24.0	5.21	41.69	46.90	23.45	130.29
16.00	24.0	6.43	40.60	47.03	23.52	128.24
17.00	24.0	7.52	40.37	47.89	23.95	128.64
18.00	24.0	8.48	41.07	49.55	24.78	131.70
19.00	24.0	9.39	42.26	51.66	25.83	136.19
20.00	24.0	10.33	43.28	53.61	26.81	140.17
21.00	24.0	11.31	43.90	55.21	27.60	143.01
22.00	24.0	12.39	44.18	56.56	28.28	144.91
23.00	24.0	13.64	49.14	62.78	31.39	161.06
24.00	24.0	15.06	43.55	58.60	29.30	145.70
25.00	24.0	16.33	44.08	60.41	30.20	148.57
26.00	24.0	17.13	46.27	63.40	31.70	155.94
27.00	24.0	17.72	50.42	68.14	34.07	168.99
28.00	24.0	18.27	56.17	74.44	37.22	186.78
29.00	24.0	18.81	63.38	82.19	41.10	208.95
30.00	24.0	19.36	72.08	91.44	45.72	235.60
31.00	24.0	20.26	81.73	102.00	51.00	265.46
32.00	24.0	21.87	91.41	113.28	56.64	296.10
33.00	24.0	35.12	244.38	279.49	139.75	768.25
34.00	24.0	40.49	233.38	273.87	136.93	740.62
35.00	24.0	45.70	223.67	269.37	134.69	716.72
36.00	24.0	50.74	218.37	269.11	134.55	705.85
37.00	24.0	55.70	216.82	272.52	136.26	706.15
38.00	24.0	60.66	214.61	275.27	137.63	704.48
39.00	24.0	65.62	207.98	273.60	136.80	689.55
40.00	24.0	70.37	198.48	268.85	134.42	665.81
41.00	24.0	74.68	189.77	264.46	132.23	644.00
42.00	24.0	78.57	183.96	262.53	131.26	630.45
43.00	24.0	82.45	177.93	260.39	130.19	616.25
44.00	24.0	86.77	171.01	257.78	128.89	599.80
45.00	24.0	91.51	165.62	257.13	128.56	588.36
46.00	24.0	96.16	165.51	261.67	130.83	592.69
47.00	24.0	100.18	169.31	269.48	134.74	608.10
48.00	24.0	103.56	171.86	275.42	137.71	619.14
49.00	24.0	106.62	171.06	277.69	138.84	619.81
50.00	24.0	109.65	167.54	277.19	138.60	612.28
51.00	24.0	112.64	164.04	276.68	138.34	604.76
52.00	24.0	115.95	158.12	274.07	137.03	590.31
53.00	24.0	119.92	148.09	268.00	134.00	564.18
54.00	24.0	124.55	134.66	259.20	129.60	528.52
55.00	24.0	129.09	122.98	252.07	126.04	498.03
56.00	24.0	132.81	117.06	249.88	124.94	484.01
57.00	24.0	135.71	115.78	251.49	125.74	483.05
58.00	24.0	138.17	116.40	254.57	127.28	487.36
59.00	24.0	140.60	116.80	257.40	128.70	491.00
60.00	24.0	143.00	117.61	260.61	130.30	495.82
61.00	24.0	145.48	118.10	263.58	131.79	499.78
62.00	24.0	148.16	117.16	265.32	132.66	499.64
63.00	24.0	151.03	114.38	265.42	132.71	494.18
64.00	24.0	153.93	110.90	264.83	132.41	486.63
65.00	24.0	156.65	108.45	265.11	132.55	482.01
66.00	24.0	159.22	107.64	266.86	133.43	482.14
67.00	24.0	161.71	107.85	269.56	134.78	485.25
68.00	24.0	164.24	108.46	272.70	136.35	489.62
69.00	24.0	166.80	109.49	276.29	138.14	495.26

NOTES

1. MOBILIZED END BEARING IS 1/3 OF THE ORIGINAL RB-121 VALUES.
2. DAVISSON PILE CAPACITY IS AN ESTIMATE BASED ON FAILURE CRITERIA,
AND EQUALS ULTIMATE SIDE FRICTION PLUS MOBILIZED END BEARING.
3. ALLOWABLE PILE CAPACITY IS 1/2 THE DAVISSON PILE CAPACITY.
4. ULTIMATE PILE CAPACITY IS ULTIMATE SIDE FRICTION PLUS
3 x THE MOBILIZED END BEARING.
EXCEPTION: FOR H-PILES TIPPED IN SAND OR LIMESTONE, THE
ULTIMATE PILE CAPACITY IS ULTIMATE SIDE FRICTION PLUS
2 x THE MOBILIZED END BEARING.

General Information:

Input file:e PDE_GANNETT FLEMING\FB-Deep\Driven Piles\BR-2 - End Bents.in
 Project number: 221126
 Job name: SR 997 Bridge Over Black Creek Canal (Bridge No. 870633)
 Engineer: Adnan Ismail, P.E.
 Units: English

Analysis Information:

Analysis Type: SPT

Soil Information:

Boring date: 8/20/2021, Boring Number: BR-2
 Station number: Offset:

Ground Elevation: 0.000(ft)

Hammer type: Automatic Hammer, Correction factor = 1.24

ID	Depth (ft)	No. of Blows (Blows/ft)	Soil Type
1	0.00	0.00	5- Cavity layer
2	1.00	21.00	5- Cavity layer
3	3.00	17.00	5- Cavity layer
4	5.00	8.00	5- Cavity layer
5	7.00	7.00	5- Cavity layer
6	9.00	9.00	5- Cavity layer
7	12.00	11.00	4- Lime Stone/Very shelly sand
8	15.00	13.00	4- Lime Stone/Very shelly sand
9	18.00	9.00	4- Lime Stone/Very shelly sand
10	21.00	10.00	4- Lime Stone/Very shelly sand
11	24.00	8.00	3- Clean sand
12	27.00	9.00	3- Clean sand
13	30.00	8.00	3- Clean sand
14	33.00	55.00	4- Lime Stone/Very shelly sand
15	36.00	50.00	4- Lime Stone/Very shelly sand
16	39.00	50.00	4- Lime Stone/Very shelly sand
17	42.00	37.00	4- Lime Stone/Very shelly sand
18	45.00	50.00	4- Lime Stone/Very shelly sand
19	48.00	31.00	4- Lime Stone/Very shelly sand
20	51.00	30.00	4- Lime Stone/Very shelly sand
21	54.00	50.00	4- Lime Stone/Very shelly sand
22	57.00	25.00	4- Lime Stone/Very shelly sand
23	60.00	24.00	4- Lime Stone/Very shelly sand
24	63.00	30.00	4- Lime Stone/Very shelly sand
25	66.00	25.00	4- Lime Stone/Very shelly sand
26	69.00	26.00	4- Lime Stone/Very shelly sand
27	72.00	23.00	4- Lime Stone/Very shelly sand
28	75.00	26.00	4- Lime Stone/Very shelly sand
29	77.00	28.00	4- Lime Stone/Very shelly sand
30	79.00	31.00	4- Lime Stone/Very shelly sand

Blowcount Average Per Soil Layer

Layer Num.	Starting Elevation (ft)	Bottom Elevation (ft)	Thickness (ft)	Average Blowcount (Blows/ft)	Soil Type
1	0.00	-12.00	12.00	11.08	5-Void
2	-12.00	-24.00	12.00	10.75	4-Limestone, Very Shelly Sand
3	-24.00	-33.00	9.00	8.33	3-Clean Sand
4	-33.00	-79.00	46.00	35.35	4-Limestone, Very Shelly Sand

Driven Pile Data:

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Pile unit weight = 150.00(pcf), Section Type: Square

Pile Geometry:

Width (in)	Length (ft)	Tip Elev. (ft)
30.00	1.00	-1.00
30.00	2.00	-2.00
30.00	3.00	-3.00
30.00	4.00	-4.00
30.00	5.00	-5.00
30.00	6.00	-6.00
30.00	7.00	-7.00
30.00	8.00	-8.00
30.00	9.00	-9.00
30.00	10.00	-10.00
30.00	11.00	-11.00
30.00	12.00	-12.00
30.00	13.00	-13.00
30.00	14.00	-14.00
30.00	15.00	-15.00
30.00	16.00	-16.00
30.00	17.00	-17.00
30.00	18.00	-18.00
30.00	19.00	-19.00
30.00	20.00	-20.00
30.00	21.00	-21.00
30.00	22.00	-22.00
30.00	23.00	-23.00
30.00	24.00	-24.00
30.00	25.00	-25.00
30.00	26.00	-26.00
30.00	27.00	-27.00
30.00	28.00	-28.00
30.00	29.00	-29.00
30.00	30.00	-30.00
30.00	31.00	-31.00
30.00	32.00	-32.00
30.00	33.00	-33.00
30.00	34.00	-34.00
30.00	35.00	-35.00
30.00	36.00	-36.00
30.00	37.00	-37.00
30.00	38.00	-38.00
30.00	39.00	-39.00
30.00	40.00	-40.00
30.00	41.00	-41.00
30.00	42.00	-42.00
30.00	43.00	-43.00
30.00	44.00	-44.00
30.00	45.00	-45.00
30.00	46.00	-46.00
30.00	47.00	-47.00
30.00	48.00	-48.00
30.00	49.00	-49.00
30.00	50.00	-50.00
30.00	51.00	-51.00
30.00	52.00	-52.00
30.00	53.00	-53.00
30.00	54.00	-54.00
30.00	55.00	-55.00
30.00	56.00	-56.00
30.00	57.00	-57.00
30.00	58.00	-58.00
30.00	59.00	-59.00
30.00	60.00	-60.00
30.00	61.00	-61.00
30.00	62.00	-62.00
30.00	63.00	-63.00
30.00	64.00	-64.00
30.00	65.00	-65.00
30.00	66.00	-66.00
30.00	67.00	-67.00
30.00	68.00	-68.00
30.00	69.00	-69.00

Driven Pile Capacity:

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Test Pile Length (ft)	Pile Width (in)	Ultimate Side Friction (tons)	Mobilized End Bearing (tons)	Estimated Davisson Capacity (tons)	Allowable Pile Capacity (tons)	Ultimate Pile Capacity (tons)
1.00	30.0	0.00	0.00	0.00	0.00	0.00
2.00	30.0	0.00	0.00	0.00	0.00	0.00
3.00	30.0	0.00	0.00	0.00	0.00	0.00
4.00	30.0	0.00	0.00	0.00	0.00	0.00
5.00	30.0	0.00	0.00	0.00	0.00	0.00
6.00	30.0	0.00	0.00	0.00	0.00	0.00
7.00	30.0	0.00	0.00	0.00	0.00	0.00
8.00	30.0	0.00	0.00	0.00	0.00	0.00
9.00	30.0	0.00	0.00	0.00	0.00	0.00
10.00	30.0	0.23	0.00	0.23	0.11	0.23
11.00	30.0	0.91	0.00	0.91	0.45	0.91
12.00	30.0	2.05	68.74	70.79	35.39	208.28
13.00	30.0	3.45	67.98	71.43	35.71	207.38
14.00	30.0	4.94	66.84	71.78	35.89	205.47
15.00	30.0	6.51	65.44	71.95	35.97	202.83
16.00	30.0	8.04	64.53	72.57	36.29	201.63
17.00	30.0	9.40	64.79	74.20	37.10	203.78
18.00	30.0	10.60	65.95	76.55	38.27	208.44
19.00	30.0	11.74	67.16	78.90	39.45	213.22
20.00	30.0	12.92	67.88	80.79	40.40	216.55
21.00	30.0	14.14	74.32	88.46	44.23	237.09
22.00	30.0	15.48	92.77	108.25	54.13	293.80
23.00	30.0	17.05	123.30	140.35	70.17	386.95
24.00	30.0	18.82	83.85	102.67	51.34	270.37
25.00	30.0	20.36	84.83	105.18	52.59	274.84
26.00	30.0	21.47	87.69	109.16	54.58	284.54
27.00	30.0	22.42	92.30	114.72	57.36	299.32
28.00	30.0	23.25	98.59	121.84	60.92	319.03
29.00	30.0	23.98	106.63	130.61	65.31	343.88
30.00	30.0	24.67	116.36	141.03	70.51	373.75
31.00	30.0	25.81	126.84	152.65	76.32	406.33
32.00	30.0	27.89	136.41	164.30	82.15	437.11
33.00	30.0	43.90	362.55	406.45	203.22	1131.56
34.00	30.0	50.61	352.69	403.30	201.65	1108.67
35.00	30.0	57.12	348.32	405.44	202.72	1102.07
36.00	30.0	63.43	344.75	408.17	204.09	1097.66
37.00	30.0	69.63	336.46	406.08	203.04	1079.00
38.00	30.0	75.83	322.65	398.47	199.24	1043.77
39.00	30.0	82.03	305.94	387.97	193.98	999.85
40.00	30.0	87.96	290.91	378.87	189.43	960.69
41.00	30.0	93.35	279.50	372.85	186.42	931.85
42.00	30.0	98.21	274.73	372.94	186.47	922.39
43.00	30.0	103.06	275.75	378.81	189.41	930.30
44.00	30.0	108.46	278.67	387.13	193.57	944.48
45.00	30.0	114.39	277.07	391.46	195.73	945.61
46.00	30.0	120.20	269.22	389.41	194.71	927.84
47.00	30.0	125.22	259.80	385.02	192.51	904.62
48.00	30.0	129.46	252.24	381.70	190.85	886.18
49.00	30.0	133.28	247.33	380.61	190.30	875.27
50.00	30.0	137.06	242.43	379.49	189.75	864.35
51.00	30.0	140.80	238.44	379.24	189.62	856.12
52.00	30.0	144.94	233.23	378.17	189.08	844.63
53.00	30.0	149.90	223.78	373.67	186.84	821.22
54.00	30.0	155.68	208.66	364.34	182.17	781.65
55.00	30.0	161.37	192.89	354.26	177.13	740.04
56.00	30.0	166.02	182.92	348.93	174.47	714.76
57.00	30.0	169.63	179.50	349.13	174.57	708.14
58.00	30.0	172.71	180.01	352.72	176.36	712.74
59.00	30.0	175.75	181.02	356.77	178.38	718.81
60.00	30.0	178.75	182.03	360.78	180.39	724.84
61.00	30.0	181.85	181.64	363.49	181.75	726.78
62.00	30.0	185.19	178.96	364.15	182.08	722.08
63.00	30.0	188.79	174.73	363.52	181.76	712.99
64.00	30.0	192.41	171.14	363.54	181.77	705.81
65.00	30.0	195.82	169.58	365.40	182.70	704.56
66.00	30.0	199.02	170.08	369.10	184.55	709.27
67.00	30.0	202.14	171.87	374.02	187.01	717.76
68.00	30.0	205.30	174.39	379.69	189.85	728.47
69.00	30.0	208.51	177.83	386.34	193.17	742.00

NOTES

1. MOBILIZED END BEARING IS 1/3 OF THE ORIGINAL RB-121 VALUES.
2. DAVISSON PILE CAPACITY IS AN ESTIMATE BASED ON FAILURE CRITERIA, AND EQUALS ULTIMATE SIDE FRICTION PLUS MOBILIZED END BEARING.
3. ALLOWABLE PILE CAPACITY IS 1/2 THE DAVISSON PILE CAPACITY.
4. ULTIMATE PILE CAPACITY IS ULTIMATE SIDE FRICTION PLUS 3 x THE MOBILIZED END BEARING.
EXCEPTION: FOR H-PILES TIPPED IN SAND OR LIMESTONE, THE ULTIMATE PILE CAPACITY IS ULTIMATE SIDE FRICTION PLUS 2 x THE MOBILIZED END BEARING.

General Information:

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Input file:ve PDE_GANNETT FLEMING\FB-Deep\Driven Piles\BR-2 - Int Pier.in
 Project number: 221126
 Job name: SR 997 Bridge Over Black Creek Canal (Bridge No. 870633)
 Engineer: Adnan Ismail, P.E.
 Units: English

Analysis Information:

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Analysis Type: SPT

Soil Information:

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Boring date: 8/20/2021, Boring Number: BR-2
 Station number: Offset:
 Ground Elevation: 0.000(ft)
 Hammer type: Automatic Hammer, Correction factor = 1.24

ID	Depth (ft)	No. of Blows (Blows/ft)	Soil Type
1	0.00	0.00	5- Cavity layer
2	1.00	21.00	5- Cavity layer
3	3.00	17.00	5- Cavity layer
4	5.00	8.00	5- Cavity layer
5	7.00	7.00	5- Cavity layer
6	9.00	9.00	5- Cavity layer
7	12.00	11.00	5- Cavity layer
8	15.00	13.00	5- Cavity layer
9	18.00	9.00	5- Cavity layer
10	21.00	10.00	5- Cavity layer
11	24.00	8.00	5- Cavity layer
12	27.00	9.00	5- Cavity layer
13	30.00	8.00	5- Cavity layer
14	33.00	55.00	4- Lime Stone/Very shelly sand
15	36.00	50.00	4- Lime Stone/Very shelly sand
16	39.00	50.00	4- Lime Stone/Very shelly sand
17	42.00	37.00	4- Lime Stone/Very shelly sand
18	45.00	50.00	4- Lime Stone/Very shelly sand
19	48.00	31.00	4- Lime Stone/Very shelly sand
20	51.00	30.00	4- Lime Stone/Very shelly sand
21	54.00	50.00	4- Lime Stone/Very shelly sand
22	57.00	25.00	4- Lime Stone/Very shelly sand
23	60.00	24.00	4- Lime Stone/Very shelly sand
24	63.00	30.00	4- Lime Stone/Very shelly sand
25	66.00	25.00	4- Lime Stone/Very shelly sand
26	69.00	26.00	4- Lime Stone/Very shelly sand
27	72.00	23.00	4- Lime Stone/Very shelly sand
28	75.00	26.00	4- Lime Stone/Very shelly sand
29	77.00	28.00	4- Lime Stone/Very shelly sand
30	79.00	31.00	4- Lime Stone/Very shelly sand

Blowcount Average Per Soil Layer

Layer Num.	Starting Elevation (ft)	Bottom Elevation (ft)	Thickness (ft)	Average Blowcount (Blows/ft)	Soil Type
1	0.00	-33.00	33.00	10.21	5-Void
2	-33.00	-79.00	46.00	35.35	4-Limestone, Very Shelly Sand

Driven Pile Data:

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Pile unit weight = 150.00(pcf), Section Type: Square

Pile Geometry:

Width (in)	Length (ft)	Tip Elev. (ft)
18.00	1.00	-1.00
18.00	2.00	-2.00
18.00	3.00	-3.00
18.00	4.00	-4.00
18.00	5.00	-5.00
18.00	6.00	-6.00
18.00	7.00	-7.00
18.00	8.00	-8.00
18.00	9.00	-9.00
18.00	10.00	-10.00
18.00	11.00	-11.00
18.00	12.00	-12.00
18.00	13.00	-13.00
18.00	14.00	-14.00
18.00	15.00	-15.00
18.00	16.00	-16.00
18.00	17.00	-17.00
18.00	18.00	-18.00
18.00	19.00	-19.00
18.00	20.00	-20.00
18.00	21.00	-21.00
18.00	22.00	-22.00
18.00	23.00	-23.00
18.00	24.00	-24.00
18.00	25.00	-25.00
18.00	26.00	-26.00
18.00	27.00	-27.00
18.00	28.00	-28.00
18.00	29.00	-29.00
18.00	30.00	-30.00
18.00	31.00	-31.00
18.00	32.00	-32.00
18.00	33.00	-33.00
18.00	34.00	-34.00
18.00	35.00	-35.00
18.00	36.00	-36.00
18.00	37.00	-37.00
18.00	38.00	-38.00
18.00	39.00	-39.00
18.00	40.00	-40.00
18.00	41.00	-41.00
18.00	42.00	-42.00
18.00	43.00	-43.00
18.00	44.00	-44.00
18.00	45.00	-45.00
18.00	46.00	-46.00
18.00	47.00	-47.00
18.00	48.00	-48.00
18.00	49.00	-49.00
18.00	50.00	-50.00
18.00	51.00	-51.00
18.00	52.00	-52.00
18.00	53.00	-53.00
18.00	54.00	-54.00
18.00	55.00	-55.00
18.00	56.00	-56.00
18.00	57.00	-57.00
18.00	58.00	-58.00
18.00	59.00	-59.00
18.00	60.00	-60.00
18.00	61.00	-61.00
18.00	62.00	-62.00
18.00	63.00	-63.00
18.00	64.00	-64.00
18.00	65.00	-65.00
18.00	66.00	-66.00
18.00	67.00	-67.00
18.00	68.00	-68.00
18.00	69.00	-69.00

Driven Pile Capacity:

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Test Pile Length (ft)	Pile Width (in)	Ultimate Side Friction (tons)	Mobilized End Bearing (tons)	Estimated Davisson Capacity (tons)	Allowable Pile Capacity (tons)	Ultimate Pile Capacity (tons)
1.00	18.0	0.00	0.00	0.00	0.00	0.00
2.00	18.0	0.00	0.00	0.00	0.00	0.00
3.00	18.0	0.00	0.00	0.00	0.00	0.00
4.00	18.0	0.00	0.00	0.00	0.00	0.00
5.00	18.0	0.00	0.00	0.00	0.00	0.00
6.00	18.0	0.00	0.00	0.00	0.00	0.00
7.00	18.0	0.00	0.00	0.00	0.00	0.00
8.00	18.0	0.00	0.00	0.00	0.00	0.00
9.00	18.0	0.00	0.00	0.00	0.00	0.00
10.00	18.0	0.00	0.00	0.00	0.00	0.00
11.00	18.0	0.00	0.00	0.00	0.00	0.00
12.00	18.0	0.00	0.00	0.00	0.00	0.00
13.00	18.0	0.00	0.00	0.00	0.00	0.00
14.00	18.0	0.00	0.00	0.00	0.00	0.00
15.00	18.0	0.00	0.00	0.00	0.00	0.00
16.00	18.0	0.00	0.00	0.00	0.00	0.00
17.00	18.0	0.00	0.00	0.00	0.00	0.00
18.00	18.0	0.00	0.00	0.00	0.00	0.00
19.00	18.0	0.00	0.00	0.00	0.00	0.00
20.00	18.0	0.00	0.00	0.00	0.00	0.00
21.00	18.0	0.00	0.00	0.00	0.00	0.00
22.00	18.0	0.00	0.00	0.00	0.00	0.00
23.00	18.0	0.00	0.00	0.00	0.00	0.00
24.00	18.0	0.00	0.00	0.00	0.00	0.00
25.00	18.0	0.00	0.00	0.00	0.00	0.00
26.00	18.0	0.00	0.00	0.00	0.00	0.00
27.00	18.0	0.00	0.00	0.00	0.00	0.00
28.00	18.0	0.00	0.00	0.00	0.00	0.00
29.00	18.0	0.00	0.00	0.00	0.00	0.00
30.00	18.0	0.00	0.00	0.00	0.00	0.00
31.00	18.0	0.68	0.00	0.68	0.34	0.68
32.00	18.0	2.73	0.00	2.73	1.36	2.73
33.00	18.0	6.14	142.05	148.19	74.09	432.28
34.00	18.0	10.17	138.46	148.62	74.31	425.54
35.00	18.0	14.07	133.51	147.58	73.79	414.59
36.00	18.0	17.86	127.20	145.05	72.53	399.45
37.00	18.0	21.58	121.38	142.95	71.48	385.71
38.00	18.0	25.30	117.88	143.18	71.59	378.95
39.00	18.0	29.02	116.72	145.74	72.87	379.17
40.00	18.0	32.57	116.23	148.80	74.40	381.25
41.00	18.0	35.81	114.75	150.56	75.28	380.05
42.00	18.0	38.73	112.28	151.01	75.50	375.57
43.00	18.0	41.64	108.08	149.72	74.86	365.88
44.00	18.0	44.88	101.39	146.27	73.13	349.05
45.00	18.0	48.43	92.22	140.65	70.32	325.08
46.00	18.0	51.92	85.19	137.11	68.55	307.48
47.00	18.0	54.93	84.95	139.88	69.94	309.78
48.00	18.0	57.47	91.50	148.97	74.49	331.97
49.00	18.0	59.77	99.40	159.17	79.58	357.96
50.00	18.0	62.04	103.21	165.24	82.62	371.66
51.00	18.0	64.28	102.93	167.21	83.60	373.07
52.00	18.0	66.76	98.79	165.55	82.78	363.14
53.00	18.0	69.74	91.03	160.77	80.38	342.83
54.00	18.0	73.21	79.65	152.86	76.43	312.15
55.00	18.0	76.62	69.03	145.65	72.83	283.72
56.00	18.0	79.41	63.60	143.01	71.50	270.20
57.00	18.0	81.58	63.34	144.91	72.46	271.59
58.00	18.0	83.43	65.35	148.77	74.39	279.47
59.00	18.0	85.25	66.74	151.99	75.99	285.46
60.00	18.0	87.05	67.50	154.55	77.27	289.55
61.00	18.0	88.91	67.57	156.47	78.24	291.60
62.00	18.0	90.92	66.86	157.77	78.89	291.49
63.00	18.0	93.07	65.38	158.45	79.23	289.21
64.00	18.0	95.24	63.67	158.92	79.46	286.26
65.00	18.0	97.29	62.29	159.58	79.79	284.15
66.00	18.0	99.21	61.22	160.44	80.22	282.89
67.00	18.0	101.08	60.47	161.56	80.78	282.51
68.00	18.0	102.98	60.02	163.01	81.50	283.05
69.00	18.0	104.90	59.87	164.78	82.39	284.52

NOTES

1. MOBILIZED END BEARING IS 1/3 OF THE ORIGINAL RB-121 VALUES.
2. DAVISSON PILE CAPACITY IS AN ESTIMATE BASED ON FAILURE CRITERIA, AND EQUALS ULTIMATE SIDE FRICTION PLUS MOBILIZED END BEARING.
3. ALLOWABLE PILE CAPACITY IS 1/2 THE DAVISSON PILE CAPACITY.
4. ULTIMATE PILE CAPACITY IS ULTIMATE SIDE FRICTION PLUS 3 x THE MOBILIZED END BEARING.
EXCEPTION: FOR H-PILES TIPPED IN SAND OR LIMESTONE, THE ULTIMATE PILE CAPACITY IS ULTIMATE SIDE FRICTION PLUS 2 x THE MOBILIZED END BEARING.

General Information:

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Input file:ve PDE_GANNETT FLEMING\FB-Deep\Driven Piles\BR-2 - Int Pier.in
 Project number: 221126
 Job name: SR 997 Bridge Over Black Creek Canal (Bridge No. 870633)
 Engineer: Adnan Ismail, P.E.
 Units: English

Analysis Information:

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Analysis Type: SPT

Soil Information:

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Boring date: 8/20/2021, Boring Number: BR-2
 Station number: Offset:
 Ground Elevation: 0.000(ft)
 Hammer type: Automatic Hammer, Correction factor = 1.24

ID	Depth (ft)	No. of Blows (Blows/ft)	Soil Type
1	0.00	0.00	5- Cavity layer
2	1.00	21.00	5- Cavity layer
3	3.00	17.00	5- Cavity layer
4	5.00	8.00	5- Cavity layer
5	7.00	7.00	5- Cavity layer
6	9.00	9.00	5- Cavity layer
7	12.00	11.00	5- Cavity layer
8	15.00	13.00	5- Cavity layer
9	18.00	9.00	5- Cavity layer
10	21.00	10.00	5- Cavity layer
11	24.00	8.00	5- Cavity layer
12	27.00	9.00	5- Cavity layer
13	30.00	8.00	5- Cavity layer
14	33.00	55.00	4- Lime Stone/Very shelly sand
15	36.00	50.00	4- Lime Stone/Very shelly sand
16	39.00	50.00	4- Lime Stone/Very shelly sand
17	42.00	37.00	4- Lime Stone/Very shelly sand
18	45.00	50.00	4- Lime Stone/Very shelly sand
19	48.00	31.00	4- Lime Stone/Very shelly sand
20	51.00	30.00	4- Lime Stone/Very shelly sand
21	54.00	50.00	4- Lime Stone/Very shelly sand
22	57.00	25.00	4- Lime Stone/Very shelly sand
23	60.00	24.00	4- Lime Stone/Very shelly sand
24	63.00	30.00	4- Lime Stone/Very shelly sand
25	66.00	25.00	4- Lime Stone/Very shelly sand
26	69.00	26.00	4- Lime Stone/Very shelly sand
27	72.00	23.00	4- Lime Stone/Very shelly sand
28	75.00	26.00	4- Lime Stone/Very shelly sand
29	77.00	28.00	4- Lime Stone/Very shelly sand
30	79.00	31.00	4- Lime Stone/Very shelly sand

Blowcount Average Per Soil Layer

Layer Num.	Starting Elevation (ft)	Bottom Elevation (ft)	Thickness (ft)	Average Blowcount (Blows/ft)	Soil Type
1	0.00	-33.00	33.00	10.21	5-Void
2	-33.00	-79.00	46.00	35.35	4-Limestone, Very Shelly Sand

Driven Pile Data:

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Pile unit weight = 150.00(pcf), Section Type: Square

Pile Geometry:

Width (in)	Length (ft)	Tip Elev. (ft)
24.00	1.00	-1.00
24.00	2.00	-2.00
24.00	3.00	-3.00
24.00	4.00	-4.00
24.00	5.00	-5.00
24.00	6.00	-6.00
24.00	7.00	-7.00
24.00	8.00	-8.00
24.00	9.00	-9.00
24.00	10.00	-10.00
24.00	11.00	-11.00
24.00	12.00	-12.00
24.00	13.00	-13.00
24.00	14.00	-14.00
24.00	15.00	-15.00
24.00	16.00	-16.00
24.00	17.00	-17.00
24.00	18.00	-18.00
24.00	19.00	-19.00
24.00	20.00	-20.00
24.00	21.00	-21.00
24.00	22.00	-22.00
24.00	23.00	-23.00
24.00	24.00	-24.00
24.00	25.00	-25.00
24.00	26.00	-26.00
24.00	27.00	-27.00
24.00	28.00	-28.00
24.00	29.00	-29.00
24.00	30.00	-30.00
24.00	31.00	-31.00
24.00	32.00	-32.00
24.00	33.00	-33.00
24.00	34.00	-34.00
24.00	35.00	-35.00
24.00	36.00	-36.00
24.00	37.00	-37.00
24.00	38.00	-38.00
24.00	39.00	-39.00
24.00	40.00	-40.00
24.00	41.00	-41.00
24.00	42.00	-42.00
24.00	43.00	-43.00
24.00	44.00	-44.00
24.00	45.00	-45.00
24.00	46.00	-46.00
24.00	47.00	-47.00
24.00	48.00	-48.00
24.00	49.00	-49.00
24.00	50.00	-50.00
24.00	51.00	-51.00
24.00	52.00	-52.00
24.00	53.00	-53.00
24.00	54.00	-54.00
24.00	55.00	-55.00
24.00	56.00	-56.00
24.00	57.00	-57.00
24.00	58.00	-58.00
24.00	59.00	-59.00
24.00	60.00	-60.00
24.00	61.00	-61.00
24.00	62.00	-62.00
24.00	63.00	-63.00
24.00	64.00	-64.00
24.00	65.00	-65.00
24.00	66.00	-66.00
24.00	67.00	-67.00
24.00	68.00	-68.00
24.00	69.00	-69.00

Driven Pile Capacity:

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Test Pile Length (ft)	Pile Width (in)	Ultimate Side Friction (tons)	Mobilized End Bearing (tons)	Estimated Davisson Capacity (tons)	Allowable Pile Capacity (tons)	Ultimate Pile Capacity (tons)
1.00	24.0	0.00	0.00	0.00	0.00	0.00
2.00	24.0	0.00	0.00	0.00	0.00	0.00
3.00	24.0	0.00	0.00	0.00	0.00	0.00
4.00	24.0	0.00	0.00	0.00	0.00	0.00
5.00	24.0	0.00	0.00	0.00	0.00	0.00
6.00	24.0	0.00	0.00	0.00	0.00	0.00
7.00	24.0	0.00	0.00	0.00	0.00	0.00
8.00	24.0	0.00	0.00	0.00	0.00	0.00
9.00	24.0	0.00	0.00	0.00	0.00	0.00
10.00	24.0	0.00	0.00	0.00	0.00	0.00
11.00	24.0	0.00	0.00	0.00	0.00	0.00
12.00	24.0	0.00	0.00	0.00	0.00	0.00
13.00	24.0	0.00	0.00	0.00	0.00	0.00
14.00	24.0	0.00	0.00	0.00	0.00	0.00
15.00	24.0	0.00	0.00	0.00	0.00	0.00
16.00	24.0	0.00	0.00	0.00	0.00	0.00
17.00	24.0	0.00	0.00	0.00	0.00	0.00
18.00	24.0	0.00	0.00	0.00	0.00	0.00
19.00	24.0	0.00	0.00	0.00	0.00	0.00
20.00	24.0	0.00	0.00	0.00	0.00	0.00
21.00	24.0	0.00	0.00	0.00	0.00	0.00
22.00	24.0	0.00	0.00	0.00	0.00	0.00
23.00	24.0	0.00	0.00	0.00	0.00	0.00
24.00	24.0	0.00	0.00	0.00	0.00	0.00
25.00	24.0	0.00	0.00	0.00	0.00	0.00
26.00	24.0	0.00	0.00	0.00	0.00	0.00
27.00	24.0	0.00	0.00	0.00	0.00	0.00
28.00	24.0	0.00	0.00	0.00	0.00	0.00
29.00	24.0	0.00	0.00	0.00	0.00	0.00
30.00	24.0	0.00	0.00	0.00	0.00	0.00
31.00	24.0	0.91	0.00	0.91	0.45	0.91
32.00	24.0	3.64	0.00	3.64	1.82	3.64
33.00	24.0	8.18	244.38	252.56	126.28	741.32
34.00	24.0	13.56	233.38	246.94	123.47	713.69
35.00	24.0	18.77	223.67	242.44	121.22	689.79
36.00	24.0	23.81	218.37	242.18	121.09	678.91
37.00	24.0	28.77	216.82	245.58	122.79	679.22
38.00	24.0	33.73	214.61	248.33	124.17	677.55
39.00	24.0	38.69	207.98	246.66	123.33	662.62
40.00	24.0	43.43	198.48	241.91	120.96	638.88
41.00	24.0	47.75	189.77	237.52	118.76	617.07
42.00	24.0	51.63	183.96	235.59	117.80	603.51
43.00	24.0	55.52	177.93	233.45	116.73	589.32
44.00	24.0	59.83	171.01	230.85	115.42	572.87
45.00	24.0	64.58	165.62	230.20	115.10	561.43
46.00	24.0	69.23	165.51	234.74	117.37	565.76
47.00	24.0	73.24	169.31	242.55	121.28	581.17
48.00	24.0	76.63	171.86	248.49	124.25	592.21
49.00	24.0	79.69	171.06	250.75	125.38	592.88
50.00	24.0	82.72	167.54	250.26	125.13	585.35
51.00	24.0	85.71	164.04	249.75	124.87	577.82
52.00	24.0	89.02	158.12	247.14	123.57	563.38
53.00	24.0	92.98	148.09	241.07	120.54	537.25
54.00	24.0	97.61	134.66	232.27	116.14	501.59
55.00	24.0	102.16	122.98	225.14	112.57	471.10
56.00	24.0	105.88	117.06	222.94	111.47	457.07
57.00	24.0	108.77	115.78	224.55	112.28	456.12
58.00	24.0	111.24	116.40	227.63	113.82	460.43
59.00	24.0	113.67	116.80	230.47	115.23	464.07
60.00	24.0	116.06	117.61	233.67	116.84	468.89
61.00	24.0	118.54	118.10	236.65	118.32	472.85
62.00	24.0	121.22	117.16	238.38	119.19	472.71
63.00	24.0	124.10	114.38	238.48	119.24	467.25
64.00	24.0	126.99	110.90	237.89	118.95	459.70
65.00	24.0	129.72	108.45	238.17	119.09	455.08
66.00	24.0	132.28	107.64	239.92	119.96	455.20
67.00	24.0	134.78	107.85	242.63	121.31	458.32
68.00	24.0	137.31	108.46	245.77	122.88	462.68
69.00	24.0	139.87	109.49	249.36	124.68	468.33

NOTES

1. MOBILIZED END BEARING IS 1/3 OF THE ORIGINAL RB-121 VALUES.
2. DAVISSON PILE CAPACITY IS AN ESTIMATE BASED ON FAILURE CRITERIA, AND EQUALS ULTIMATE SIDE FRICTION PLUS MOBILIZED END BEARING.
3. ALLOWABLE PILE CAPACITY IS 1/2 THE DAVISSON PILE CAPACITY.
4. ULTIMATE PILE CAPACITY IS ULTIMATE SIDE FRICTION PLUS
3 x THE MOBILIZED END BEARING.
EXCEPTION: FOR H-PILES TIPPED IN SAND OR LIMESTONE, THE
ULTIMATE PILE CAPACITY IS ULTIMATE SIDE FRICTION PLUS
2 x THE MOBILIZED END BEARING.

General Information:

Input file:ve PDE_GANNETT FLEMING\FB-Deep\Driven Piles\BR-2 - Int Pier.in
 Project number: 221126
 Job name: SR 997 Bridge Over Black Creek Canal (Bridge No. 870633)
 Engineer: Adnan Ismail, P.E.
 Units: English

Analysis Information:

Analysis Type: SPT

Soil Information:

Boring date: 8/20/2021, Boring Number: BR-2
 Station number: Offset:
 Ground Elevation: 0.000(ft)
 Hammer type: Automatic Hammer, Correction factor = 1.24

ID	Depth (ft)	No. of Blows (Blows/ft)	Soil Type
1	0.00	0.00	5- Cavity layer
2	1.00	21.00	5- Cavity layer
3	3.00	17.00	5- Cavity layer
4	5.00	8.00	5- Cavity layer
5	7.00	7.00	5- Cavity layer
6	9.00	9.00	5- Cavity layer
7	12.00	11.00	5- Cavity layer
8	15.00	13.00	5- Cavity layer
9	18.00	9.00	5- Cavity layer
10	21.00	10.00	5- Cavity layer
11	24.00	8.00	5- Cavity layer
12	27.00	9.00	5- Cavity layer
13	30.00	8.00	5- Cavity layer
14	33.00	55.00	4- Lime Stone/Very shelly sand
15	36.00	50.00	4- Lime Stone/Very shelly sand
16	39.00	50.00	4- Lime Stone/Very shelly sand
17	42.00	37.00	4- Lime Stone/Very shelly sand
18	45.00	50.00	4- Lime Stone/Very shelly sand
19	48.00	31.00	4- Lime Stone/Very shelly sand
20	51.00	30.00	4- Lime Stone/Very shelly sand
21	54.00	50.00	4- Lime Stone/Very shelly sand
22	57.00	25.00	4- Lime Stone/Very shelly sand
23	60.00	24.00	4- Lime Stone/Very shelly sand
24	63.00	30.00	4- Lime Stone/Very shelly sand
25	66.00	25.00	4- Lime Stone/Very shelly sand
26	69.00	26.00	4- Lime Stone/Very shelly sand
27	72.00	23.00	4- Lime Stone/Very shelly sand
28	75.00	26.00	4- Lime Stone/Very shelly sand
29	77.00	28.00	4- Lime Stone/Very shelly sand
30	79.00	31.00	4- Lime Stone/Very shelly sand

Blowcount Average Per Soil Layer

Layer Num.	Starting Elevation (ft)	Bottom Elevation (ft)	Thickness (ft)	Average Blowcount (Blows/ft)	Soil Type
1	0.00	-33.00	33.00	10.21	5-Void
2	-33.00	-79.00	46.00	35.35	4-Limestone, Very Shelly Sand

Driven Pile Data:

Pile unit weight = 150.00(pcf), Section Type: Square

Pile Geometry:

Width (in)	Length (ft)	Tip Elev. (ft)
30.00	1.00	-1.00
30.00	2.00	-2.00
30.00	3.00	-3.00
30.00	4.00	-4.00
30.00	5.00	-5.00
30.00	6.00	-6.00
30.00	7.00	-7.00
30.00	8.00	-8.00
30.00	9.00	-9.00
30.00	10.00	-10.00
30.00	11.00	-11.00
30.00	12.00	-12.00
30.00	13.00	-13.00
30.00	14.00	-14.00
30.00	15.00	-15.00
30.00	16.00	-16.00
30.00	17.00	-17.00
30.00	18.00	-18.00
30.00	19.00	-19.00
30.00	20.00	-20.00
30.00	21.00	-21.00
30.00	22.00	-22.00
30.00	23.00	-23.00
30.00	24.00	-24.00
30.00	25.00	-25.00
30.00	26.00	-26.00
30.00	27.00	-27.00
30.00	28.00	-28.00
30.00	29.00	-29.00
30.00	30.00	-30.00
30.00	31.00	-31.00
30.00	32.00	-32.00
30.00	33.00	-33.00
30.00	34.00	-34.00
30.00	35.00	-35.00
30.00	36.00	-36.00
30.00	37.00	-37.00
30.00	38.00	-38.00
30.00	39.00	-39.00
30.00	40.00	-40.00
30.00	41.00	-41.00
30.00	42.00	-42.00
30.00	43.00	-43.00
30.00	44.00	-44.00
30.00	45.00	-45.00
30.00	46.00	-46.00
30.00	47.00	-47.00
30.00	48.00	-48.00
30.00	49.00	-49.00
30.00	50.00	-50.00
30.00	51.00	-51.00
30.00	52.00	-52.00
30.00	53.00	-53.00
30.00	54.00	-54.00
30.00	55.00	-55.00
30.00	56.00	-56.00
30.00	57.00	-57.00
30.00	58.00	-58.00
30.00	59.00	-59.00
30.00	60.00	-60.00
30.00	61.00	-61.00
30.00	62.00	-62.00
30.00	63.00	-63.00
30.00	64.00	-64.00
30.00	65.00	-65.00
30.00	66.00	-66.00
30.00	67.00	-67.00
30.00	68.00	-68.00
30.00	69.00	-69.00

Driven Pile Capacity:

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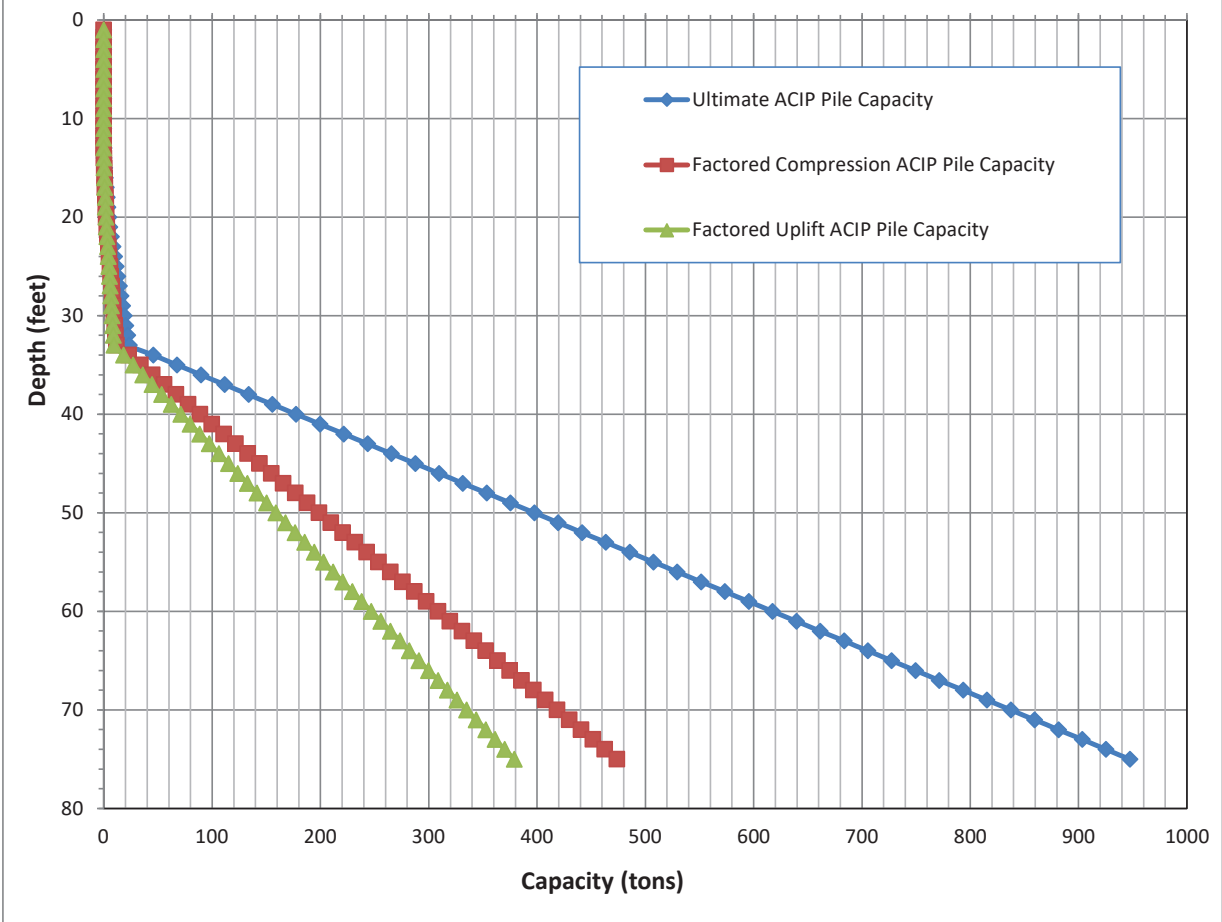
Test Pile Length (ft)	Pile Width (in)	Ultimate Side Friction (tons)	Mobilized End Bearing (tons)	Estimated Davisson Capacity (tons)	Allowable Pile Capacity (tons)	Ultimate Pile Capacity (tons)
1.00	30.0	0.00	0.00	0.00	0.00	0.00
2.00	30.0	0.00	0.00	0.00	0.00	0.00
3.00	30.0	0.00	0.00	0.00	0.00	0.00
4.00	30.0	0.00	0.00	0.00	0.00	0.00
5.00	30.0	0.00	0.00	0.00	0.00	0.00
6.00	30.0	0.00	0.00	0.00	0.00	0.00
7.00	30.0	0.00	0.00	0.00	0.00	0.00
8.00	30.0	0.00	0.00	0.00	0.00	0.00
9.00	30.0	0.00	0.00	0.00	0.00	0.00
10.00	30.0	0.00	0.00	0.00	0.00	0.00
11.00	30.0	0.00	0.00	0.00	0.00	0.00
12.00	30.0	0.00	0.00	0.00	0.00	0.00
13.00	30.0	0.00	0.00	0.00	0.00	0.00
14.00	30.0	0.00	0.00	0.00	0.00	0.00
15.00	30.0	0.00	0.00	0.00	0.00	0.00
16.00	30.0	0.00	0.00	0.00	0.00	0.00
17.00	30.0	0.00	0.00	0.00	0.00	0.00
18.00	30.0	0.00	0.00	0.00	0.00	0.00
19.00	30.0	0.00	0.00	0.00	0.00	0.00
20.00	30.0	0.00	0.00	0.00	0.00	0.00
21.00	30.0	0.00	0.00	0.00	0.00	0.00
22.00	30.0	0.00	0.00	0.00	0.00	0.00
23.00	30.0	0.00	0.00	0.00	0.00	0.00
24.00	30.0	0.00	0.00	0.00	0.00	0.00
25.00	30.0	0.00	0.00	0.00	0.00	0.00
26.00	30.0	0.00	0.00	0.00	0.00	0.00
27.00	30.0	0.00	0.00	0.00	0.00	0.00
28.00	30.0	0.00	0.00	0.00	0.00	0.00
29.00	30.0	0.00	0.00	0.00	0.00	0.00
30.00	30.0	0.00	0.00	0.00	0.00	0.00
31.00	30.0	1.14	0.00	1.14	0.57	1.14
32.00	30.0	4.55	0.00	4.55	2.27	4.55
33.00	30.0	10.23	362.55	372.78	186.39	1097.89
34.00	30.0	16.95	352.69	369.63	184.82	1075.00
35.00	30.0	23.46	348.32	371.77	185.89	1068.41
36.00	30.0	29.76	344.75	374.51	187.25	1064.00
37.00	30.0	35.96	336.46	372.42	186.21	1045.34
38.00	30.0	42.16	322.65	364.81	182.40	1010.10
39.00	30.0	48.36	305.94	354.30	177.15	966.19
40.00	30.0	54.29	290.91	345.20	172.60	927.03
41.00	30.0	59.69	279.50	339.18	169.59	898.18
42.00	30.0	64.54	274.73	339.27	169.63	888.73
43.00	30.0	69.40	275.75	345.15	172.57	896.64
44.00	30.0	74.79	278.67	353.47	176.73	910.81
45.00	30.0	80.72	277.07	357.80	178.90	911.95
46.00	30.0	86.53	269.22	355.75	177.87	894.18
47.00	30.0	91.55	259.80	351.35	175.68	870.95
48.00	30.0	95.79	252.24	348.03	174.02	852.52
49.00	30.0	99.61	247.33	346.94	173.47	841.60
50.00	30.0	103.40	242.43	345.82	172.91	830.68
51.00	30.0	107.14	238.44	345.58	172.79	822.46
52.00	30.0	111.27	233.23	344.50	172.25	810.96
53.00	30.0	116.23	223.78	340.01	170.00	787.56
54.00	30.0	122.02	208.66	330.67	165.34	747.99
55.00	30.0	127.70	192.89	320.59	160.30	706.37
56.00	30.0	132.35	182.92	315.27	157.63	681.10
57.00	30.0	135.97	179.50	315.47	157.73	674.47
58.00	30.0	139.05	180.01	319.05	159.53	679.07
59.00	30.0	142.08	181.02	323.10	161.55	685.14
60.00	30.0	145.08	182.03	327.11	163.56	691.18
61.00	30.0	148.18	181.64	329.82	164.91	693.11
62.00	30.0	151.53	178.96	330.49	165.24	688.41
63.00	30.0	155.12	174.73	329.86	164.93	679.33
64.00	30.0	158.74	171.14	329.88	164.94	672.15
65.00	30.0	162.15	169.58	331.73	165.87	670.90
66.00	30.0	165.35	170.08	335.44	167.72	675.60
67.00	30.0	168.47	171.87	340.35	170.17	684.10
68.00	30.0	171.64	174.39	346.03	173.01	694.80
69.00	30.0	174.84	177.83	352.67	176.34	708.34

NOTES

1. MOBILIZED END BEARING IS 1/3 OF THE ORIGINAL RB-121 VALUES.
2. DAVISSON PILE CAPACITY IS AN ESTIMATE BASED ON FAILURE CRITERIA, AND EQUALS ULTIMATE SIDE FRICTION PLUS MOBILIZED END BEARING.
3. ALLOWABLE PILE CAPACITY IS 1/2 THE DAVISSON PILE CAPACITY.
4. ULTIMATE PILE CAPACITY IS ULTIMATE SIDE FRICTION PLUS 3 x THE MOBILIZED END BEARING.
EXCEPTION: FOR H-PILES TIPPED IN SAND OR LIMESTONE, THE ULTIMATE PILE CAPACITY IS ULTIMATE SIDE FRICTION PLUS 2 x THE MOBILIZED END BEARING.

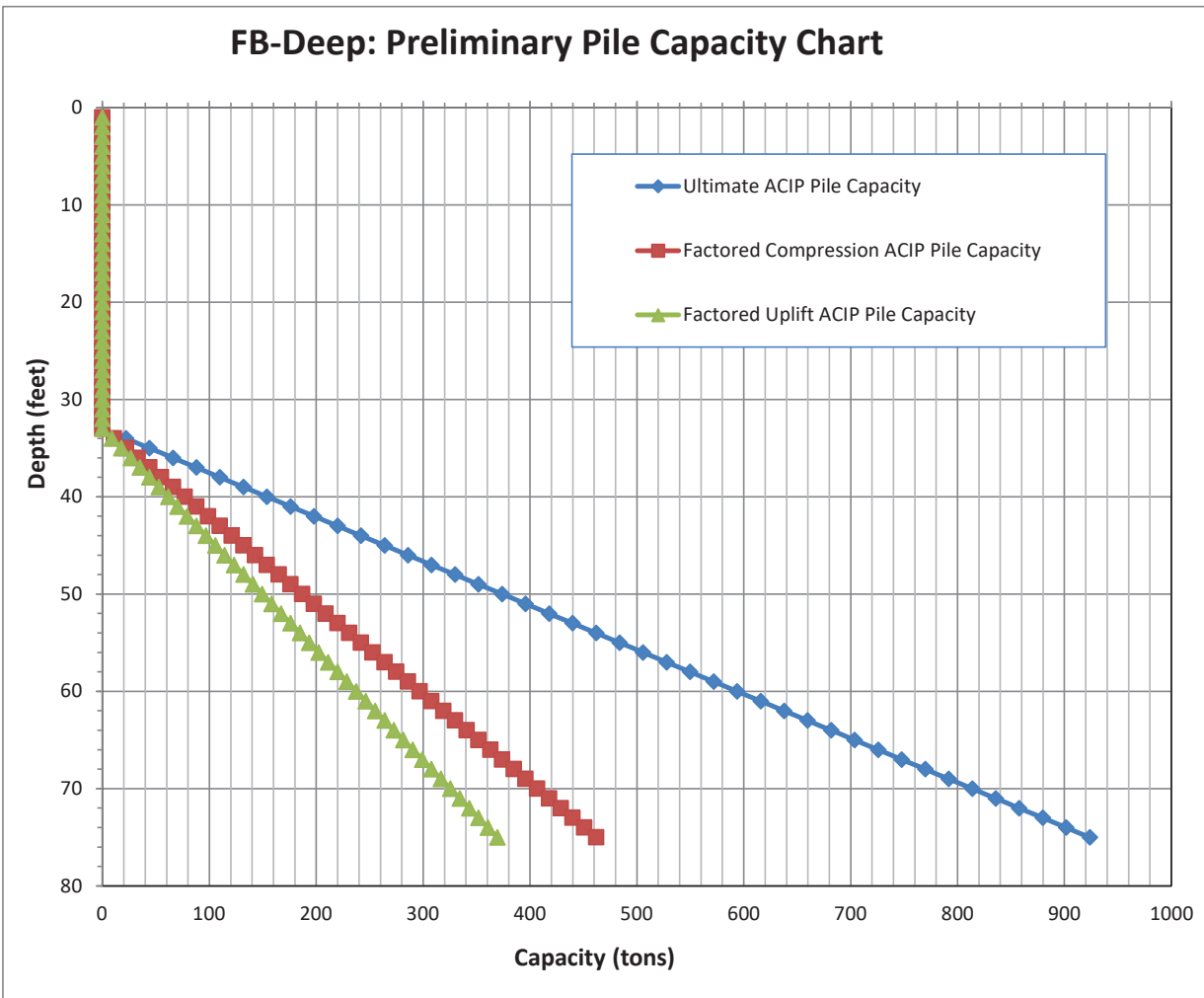
Project: SR 994/Quail Roost Drive From West of SW 137th Avenue to East of SW 127th Avenue
FPID No. 445804-1-22-01
Location: Miami-Dade County, Florida
Boring No.: BR-1 - 24-inch Diameter ACIP Pile - End Bents

FB-Deep: Preliminary Pile Capacity Chart



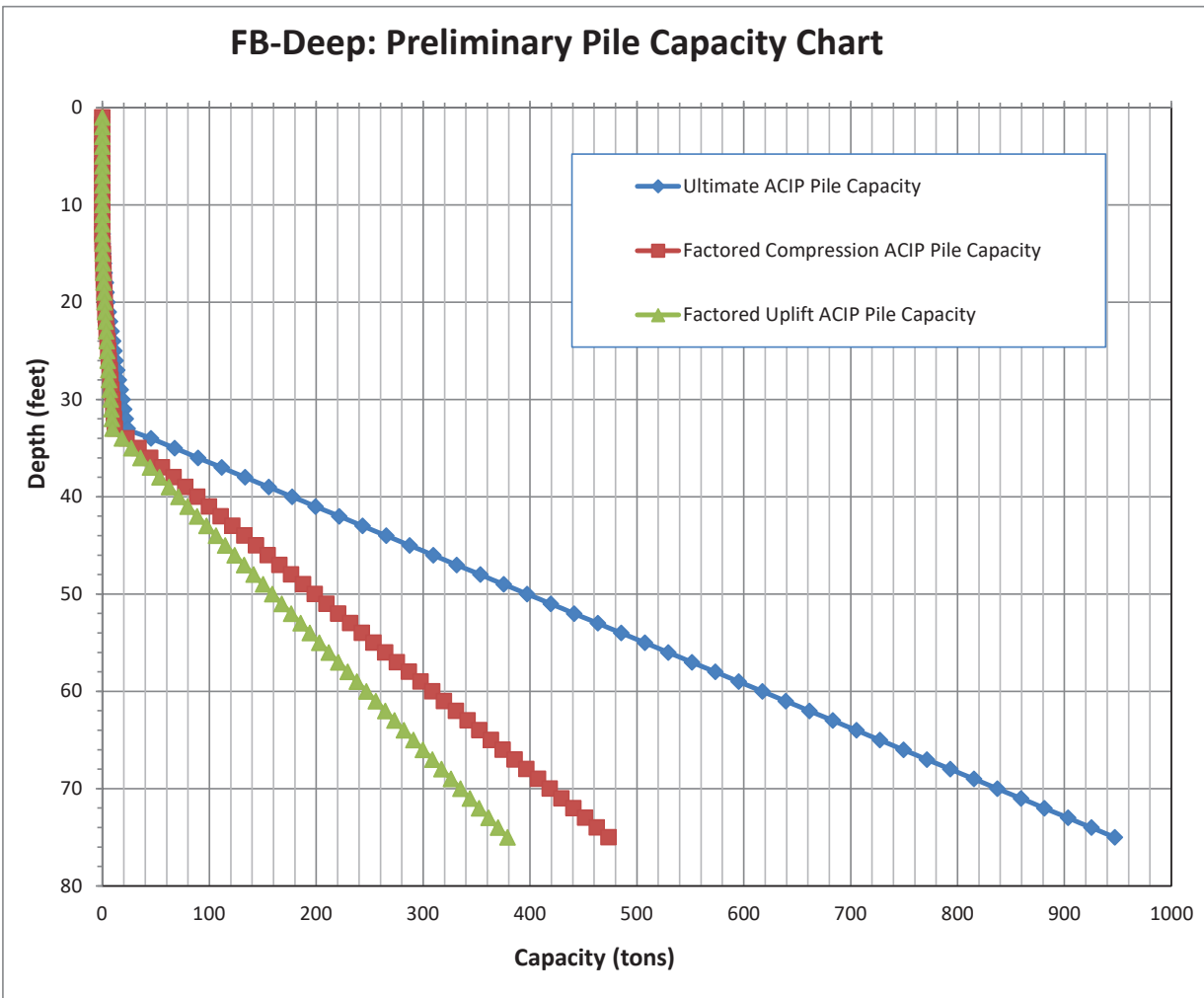
Project: SR 994/Quail Roost Drive From West of SW 137th Avenue to East of SW 127th Avenue
FPID No.: 445804-1-22-01
Location: Miami-Dade County, Florida
Boring No.: BR-1 - 24-inch Diameter ACIP Pile - Interior Piers

FB-Deep: Preliminary Pile Capacity Chart



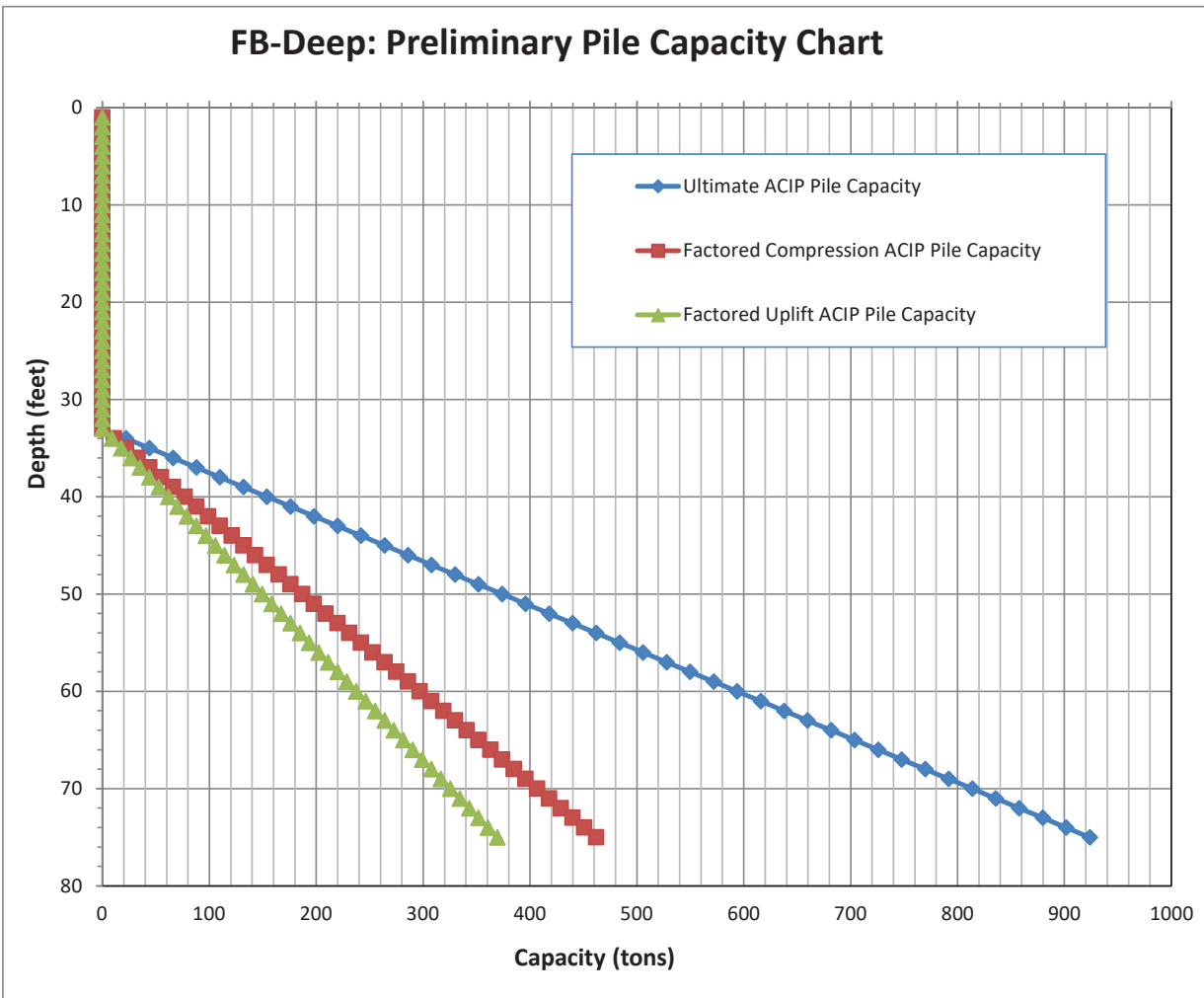
Project: SR 994/Quail Roost Drive From West of SW 137th Avenue to East of SW 127th Avenue
FPID No. 445804-1-22-01
Location: Miami-Dade County, Florida
Boring No.: BR-2 - 24-inch Diameter ACIP Pile - End Bents

FB-Deep: Preliminary Pile Capacity Chart



Project: SR 994/Quail Roost Drive From West of SW 137th Avenue to East of SW 127th Avenue
FPID No. 445804-1-22-01
Location: Miami-Dade County, Florida
Boring No.: BR-2 - 24-inch Diameter ACIP Pile - Interior Piers

FB-Deep: Preliminary Pile Capacity Chart



General Information:

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 Input file:ost Drive PDE_GANNETT FLEMING\FB-Deep\ACIP\BR-1 - End Bents.in
 Project number: 221126
 Job name: SR 997 Bridge Over Black Creek Canal (Bridge No. 870633)
 Engineer: Adnan Ismail, P.E.
 Units: English

Analysis Information:

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 Analysis Type: Drilled Shaft Analysis

Soil Information:

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 Boring date: 8/24/2021
 Boring number: BR-1
 Station number: Offset:

 Ground Elevation: 0.00(ft)
 Water table Elevation = -6.20(ft)

 Rock side-friction is calculated using: McVay's method
 Hammer type: Automatic Hammer, Correction factor = 1.24

ID	Depth (ft)	Elevation (ft)	SPT Blows (Blows/ft)	Unit Weight (pcf)	Soil Type
1	0.00	0.00	N/A	0.00	5- Cavity layer
2	1.00	-1.00	N/A	0.00	5- Cavity layer
3	3.00	-3.00	N/A	0.00	5- Cavity layer
4	5.00	-5.00	N/A	0.00	5- Cavity layer
5	7.00	-7.00	N/A	105.00	5- Cavity layer
6	9.00	-9.00	N/A	105.00	5- Cavity layer
7	12.00	-12.00	12.00	120.00	3- Clean sand
8	15.00	-15.00	14.00	120.00	3- Clean sand
9	18.00	-18.00	8.00	120.00	3- Clean sand
10	21.00	-21.00	11.00	120.00	3- Clean sand
11	24.00	-24.00	9.00	110.00	3- Clean sand
12	27.00	-27.00	8.00	110.00	3- Clean sand
13	30.00	-30.00	8.00	110.00	3- Clean sand
14	33.00	-33.00	N/A	120.00	4- Lime Stone/Very shelly sand
15	36.00	-36.00	N/A	120.00	4- Lime Stone/Very shelly sand
16	39.00	-39.00	N/A	120.00	4- Lime Stone/Very shelly sand
17	42.00	-42.00	N/A	120.00	4- Lime Stone/Very shelly sand
18	45.00	-45.00	N/A	120.00	4- Lime Stone/Very shelly sand
19	48.00	-48.00	N/A	120.00	4- Lime Stone/Very shelly sand
20	51.00	-51.00	N/A	120.00	4- Lime Stone/Very shelly sand
21	54.00	-54.00	N/A	120.00	4- Lime Stone/Very shelly sand
22	57.00	-57.00	N/A	120.00	4- Lime Stone/Very shelly sand
23	60.00	-60.00	N/A	120.00	4- Lime Stone/Very shelly sand
24	63.00	-63.00	N/A	120.00	4- Lime Stone/Very shelly sand
25	66.00	-66.00	N/A	120.00	4- Lime Stone/Very shelly sand
26	69.00	-69.00	N/A	120.00	4- Lime Stone/Very shelly sand
27	72.00	-72.00	N/A	120.00	4- Lime Stone/Very shelly sand
28	75.00	-75.00	N/A	120.00	4- Lime Stone/Very shelly sand
29	77.00	-77.00	N/A	120.00	4- Lime Stone/Very shelly sand
30	79.00	-79.00	N/A	120.00	4- Lime Stone/Very shelly sand

ID	Cu-DIR (tsf)	qu (tsf)	qt (tsf)	Em (ksi)	qb (tsf)
1	N/A	N/A	N/A	N/A	N/A
2	N/A	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A	N/A
6	N/A	N/A	N/A	N/A	N/A
7	N/A	N/A	N/A	N/A	N/A
8	N/A	N/A	N/A	N/A	N/A
9	N/A	N/A	N/A	N/A	N/A
10	N/A	N/A	N/A	N/A	N/A
11	N/A	N/A	N/A	N/A	N/A

12	N/A	N/A	N/A	N/A	N/A
13	N/A	N/A	N/A	N/A	N/A
14	N/A	49.00	1.00	78.26	24.50
15	N/A	49.00	1.00	78.26	24.50
16	N/A	49.00	1.00	78.26	24.50
17	N/A	49.00	1.00	78.26	24.50
18	N/A	49.00	1.00	78.26	24.50
19	N/A	49.00	1.00	78.26	24.50
20	N/A	49.00	1.00	78.26	24.50
21	N/A	49.00	1.00	78.26	24.50
22	N/A	49.00	1.00	78.26	24.50
23	N/A	49.00	1.00	78.26	24.50
24	N/A	49.00	1.00	78.26	24.50
25	N/A	49.00	1.00	78.26	24.50
26	N/A	49.00	1.00	78.26	24.50
27	N/A	49.00	1.00	78.26	24.50
28	N/A	49.00	1.00	78.26	24.50
29	N/A	49.00	1.00	78.26	24.50
30	N/A	49.00	1.00	78.26	24.50

ID RQD F.M. S.R.I. Rock Recovery

1	N/A	N/A	N/A
2	N/A	N/A	N/A
3	N/A	N/A	N/A
4	N/A	N/A	N/A
5	N/A	N/A	N/A
6	N/A	N/A	N/A
7	N/A	N/A	N/A
8	N/A	N/A	N/A
9	N/A	N/A	N/A
10	N/A	N/A	N/A
11	N/A	N/A	N/A
12	N/A	N/A	N/A
13	N/A	N/A	N/A
14	1.00	ROUGH	1.000
15	1.00	ROUGH	1.000
16	1.00	ROUGH	1.000
17	1.00	ROUGH	1.000
18	1.00	ROUGH	1.000
19	1.00	ROUGH	1.000
20	1.00	ROUGH	1.000
21	1.00	ROUGH	1.000
22	1.00	ROUGH	1.000
23	1.00	ROUGH	1.000
24	1.00	ROUGH	1.000
25	1.00	ROUGH	1.000
26	1.00	ROUGH	1.000
27	1.00	ROUGH	1.000
28	1.00	ROUGH	1.000
29	1.00	ROUGH	1.000
30	1.00	ROUGH	1.000

Drilled Shaft Data:

Unit weight of concrete = 150.00(pcf), Concrete Slump = 9.00(in)
 Modulus of Elasticity of concrete = 4030.00(ksi)

Shaft Geometry:

ID	Length (ft)	Tip Elev. (ft)	Case Len. (ft)	Diameter (in)	Base Diam. (in)	Bell Len. (ft)
1	1.00	-1.00	0.00	24.00	24.00	0.00
2	2.00	-2.00	0.00	24.00	24.00	0.00
3	3.00	-3.00	0.00	24.00	24.00	0.00
4	4.00	-4.00	0.00	24.00	24.00	0.00
5	5.00	-5.00	0.00	24.00	24.00	0.00
6	6.00	-6.00	0.00	24.00	24.00	0.00
7	7.00	-7.00	0.00	24.00	24.00	0.00
8	8.00	-8.00	0.00	24.00	24.00	0.00
9	9.00	-9.00	0.00	24.00	24.00	0.00
10	10.00	-10.00	0.00	24.00	24.00	0.00
11	11.00	-11.00	0.00	24.00	24.00	0.00
12	12.00	-12.00	0.00	24.00	24.00	0.00
13	13.00	-13.00	0.00	24.00	24.00	0.00
14	14.00	-14.00	0.00	24.00	24.00	0.00

15	15.00	-15.00	0.00	24.00	24.00	0.00
16	16.00	-16.00	0.00	24.00	24.00	0.00
17	17.00	-17.00	0.00	24.00	24.00	0.00
18	18.00	-18.00	0.00	24.00	24.00	0.00
19	19.00	-19.00	0.00	24.00	24.00	0.00
20	20.00	-20.00	0.00	24.00	24.00	0.00
21	21.00	-21.00	0.00	24.00	24.00	0.00
22	22.00	-22.00	0.00	24.00	24.00	0.00
23	23.00	-23.00	0.00	24.00	24.00	0.00
24	24.00	-24.00	0.00	24.00	24.00	0.00
25	25.00	-25.00	0.00	24.00	24.00	0.00
26	26.00	-26.00	0.00	24.00	24.00	0.00
27	27.00	-27.00	0.00	24.00	24.00	0.00
28	28.00	-28.00	0.00	24.00	24.00	0.00
29	29.00	-29.00	0.00	24.00	24.00	0.00
30	30.00	-30.00	0.00	24.00	24.00	0.00
31	31.00	-31.00	0.00	24.00	24.00	0.00
32	32.00	-32.00	0.00	24.00	24.00	0.00
33	33.00	-33.00	0.00	24.00	24.00	0.00
34	34.00	-34.00	0.00	24.00	24.00	0.00
35	35.00	-35.00	0.00	24.00	24.00	0.00
36	36.00	-36.00	0.00	24.00	24.00	0.00
37	37.00	-37.00	0.00	24.00	24.00	0.00
38	38.00	-38.00	0.00	24.00	24.00	0.00
39	39.00	-39.00	0.00	24.00	24.00	0.00
40	40.00	-40.00	0.00	24.00	24.00	0.00
41	41.00	-41.00	0.00	24.00	24.00	0.00
42	42.00	-42.00	0.00	24.00	24.00	0.00
43	43.00	-43.00	0.00	24.00	24.00	0.00
44	44.00	-44.00	0.00	24.00	24.00	0.00
45	45.00	-45.00	0.00	24.00	24.00	0.00
46	46.00	-46.00	0.00	24.00	24.00	0.00
47	47.00	-47.00	0.00	24.00	24.00	0.00
48	48.00	-48.00	0.00	24.00	24.00	0.00
49	49.00	-49.00	0.00	24.00	24.00	0.00
50	50.00	-50.00	0.00	24.00	24.00	0.00
51	51.00	-51.00	0.00	24.00	24.00	0.00
52	52.00	-52.00	0.00	24.00	24.00	0.00
53	53.00	-53.00	0.00	24.00	24.00	0.00
54	54.00	-54.00	0.00	24.00	24.00	0.00
55	55.00	-55.00	0.00	24.00	24.00	0.00
56	56.00	-56.00	0.00	24.00	24.00	0.00
57	57.00	-57.00	0.00	24.00	24.00	0.00
58	58.00	-58.00	0.00	24.00	24.00	0.00
59	59.00	-59.00	0.00	24.00	24.00	0.00
60	60.00	-60.00	0.00	24.00	24.00	0.00
61	61.00	-61.00	0.00	24.00	24.00	0.00
62	62.00	-62.00	0.00	24.00	24.00	0.00
63	63.00	-63.00	0.00	24.00	24.00	0.00
64	64.00	-64.00	0.00	24.00	24.00	0.00
65	65.00	-65.00	0.00	24.00	24.00	0.00
66	66.00	-66.00	0.00	24.00	24.00	0.00
67	67.00	-67.00	0.00	24.00	24.00	0.00
68	68.00	-68.00	0.00	24.00	24.00	0.00
69	69.00	-69.00	0.00	24.00	24.00	0.00
70	70.00	-70.00	0.00	24.00	24.00	0.00
71	71.00	-71.00	0.00	24.00	24.00	0.00
72	72.00	-72.00	0.00	24.00	24.00	0.00
73	73.00	-73.00	0.00	24.00	24.00	0.00
74	74.00	-74.00	0.00	24.00	24.00	0.00
75	75.00	-75.00	0.00	24.00	24.00	0.00

Drilled Shaft Capacity (sorted by shaft diameter):

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Strength reduction factors: Skin-friction = 1.00, End-bearing = 0.00

ID	Diameter (in)	Length (ft)	Skin Fric. (tons)	End Bearing (tons)	Capacity (tons)
1	24.00	1.00	0.000	0.000	0.000
2	24.00	2.00	0.000	0.000	0.000
3	24.00	3.00	0.000	0.000	0.000
4	24.00	4.00	0.000	0.000	0.000
5	24.00	5.00	0.000	0.000	0.000
6	24.00	6.00	0.000	0.000	0.000
7	24.00	7.00	0.000	0.000	0.000
8	24.00	8.00	0.000	0.000	0.000
9	24.00	9.00	0.000	0.000	0.000

10	24.00	10.00	0.000	0.000	0.000
11	24.00	11.00	0.000	0.000	0.000
12	24.00	12.00	0.000	0.000	0.000
13	24.00	13.00	0.092	0.000	0.092
14	24.00	14.00	0.364	0.000	0.364
15	24.00	15.00	0.811	0.000	0.811
16	24.00	16.00	1.424	0.000	1.424
17	24.00	17.00	2.201	0.000	2.201
18	24.00	18.00	3.136	0.000	3.136
19	24.00	19.00	3.851	0.000	3.851
20	24.00	20.00	4.663	0.000	4.663
21	24.00	21.00	5.569	0.000	5.569
22	24.00	22.00	6.936	0.000	6.936
23	24.00	23.00	8.422	0.000	8.422
24	24.00	24.00	10.025	0.000	10.025
25	24.00	25.00	11.415	0.000	11.415
26	24.00	26.00	12.875	0.000	12.875
27	24.00	27.00	14.401	0.000	14.401
28	24.00	28.00	15.813	0.000	15.813
29	24.00	29.00	17.279	0.000	17.279
30	24.00	30.00	18.799	0.000	18.799
31	24.00	31.00	20.367	0.000	20.367
32	24.00	32.00	21.984	0.000	21.984
33	24.00	33.00	23.649	0.000	23.649
34	24.00	34.00	45.640	0.000	45.640
35	24.00	35.00	67.631	0.000	67.631
36	24.00	36.00	89.622	0.000	89.622
37	24.00	37.00	111.613	0.000	111.613
38	24.00	38.00	133.604	0.000	133.604
39	24.00	39.00	155.595	0.000	155.595
40	24.00	40.00	177.587	0.000	177.587
41	24.00	41.00	199.578	0.000	199.578
42	24.00	42.00	221.569	0.000	221.569
43	24.00	43.00	243.560	0.000	243.560
44	24.00	44.00	265.551	0.000	265.551
45	24.00	45.00	287.542	0.000	287.542
46	24.00	46.00	309.533	0.000	309.533
47	24.00	47.00	331.525	0.000	331.525
48	24.00	48.00	353.516	0.000	353.516
49	24.00	49.00	375.507	0.000	375.507
50	24.00	50.00	397.498	0.000	397.498
51	24.00	51.00	419.489	0.000	419.489
52	24.00	52.00	441.480	0.000	441.480
53	24.00	53.00	463.471	0.000	463.471
54	24.00	54.00	485.463	0.000	485.463
55	24.00	55.00	507.454	0.000	507.454
56	24.00	56.00	529.445	0.000	529.445
57	24.00	57.00	551.436	0.000	551.436
58	24.00	58.00	573.427	0.000	573.427
59	24.00	59.00	595.418	0.000	595.418
60	24.00	60.00	617.410	0.000	617.410
61	24.00	61.00	639.401	0.000	639.401
62	24.00	62.00	661.392	0.000	661.392
63	24.00	63.00	683.383	0.000	683.383
64	24.00	64.00	705.374	0.000	705.374
65	24.00	65.00	727.365	0.000	727.365
66	24.00	66.00	749.356	0.000	749.356
67	24.00	67.00	771.348	0.000	771.348
68	24.00	68.00	793.339	0.000	793.339
69	24.00	69.00	815.330	0.000	815.330
70	24.00	70.00	837.321	0.000	837.321
71	24.00	71.00	859.312	0.000	859.312
72	24.00	72.00	881.303	0.000	881.303
73	24.00	73.00	903.294	0.000	903.294
74	24.00	74.00	925.286	0.000	925.286
75	24.00	75.00	947.277	0.000	947.277

Drilled Shaft Capacity at User-Defined Settlement (sorted by shaft diameter):

***** Capacity is NOT modified by the strength reduction factors *****

User-Defined Settlement = 5.00%

ID	Diameter (in)	Length (ft)	Skin Fric. (tons)	End Bearing (tons)	Capacity (tons)
1	24.00	1.00	0.000	0.000	0.000

2	24.00	2.00	0.000	0.000	0.000
3	24.00	3.00	0.000	0.000	0.000
4	24.00	4.00	0.000	0.000	0.000
5	24.00	5.00	0.000	0.000	0.000
6	24.00	6.00	0.000	0.000	0.000
7	24.00	7.00	0.000	0.000	0.000
8	24.00	8.00	0.000	0.000	0.000
9	24.00	9.00	0.000	0.000	0.000
10	24.00	10.00	0.000	0.000	0.000
11	24.00	11.00	0.000	0.000	0.000
12	24.00	12.00	0.000	15.079	15.079
13	24.00	13.00	0.090	14.693	14.782
14	24.00	14.00	0.356	13.533	13.889
15	24.00	15.00	0.793	27.114	27.907
16	24.00	16.00	1.393	26.357	27.750
17	24.00	17.00	2.153	25.438	27.591
18	24.00	18.00	3.067	24.117	27.184
19	24.00	19.00	3.767	22.812	26.579
20	24.00	20.00	4.561	22.184	26.745
21	24.00	21.00	5.448	22.281	27.728
22	24.00	22.00	6.784	22.490	29.274
23	24.00	23.00	8.238	22.152	30.390
24	24.00	24.00	9.806	21.314	31.120
25	24.00	25.00	11.165	20.364	31.529
26	24.00	26.00	12.593	19.639	32.231
27	24.00	27.00	14.086	20.344	34.430
28	24.00	28.00	15.466	23.637	39.103
29	24.00	29.00	16.901	29.468	46.369
30	24.00	30.00	18.387	33.018	51.405
31	24.00	31.00	19.921	39.444	59.366
32	24.00	32.00	21.503	49.083	70.586
33	24.00	33.00	23.131	950.286	973.417
34	24.00	34.00	44.930	724.224	769.155
35	24.00	35.00	66.353	455.180	521.533
36	24.00	36.00	87.410	346.899	434.309
37	24.00	37.00	108.111	286.084	394.195
38	24.00	38.00	128.928	279.776	408.703
39	24.00	39.00	149.599	272.962	422.561
40	24.00	40.00	170.133	266.074	436.207
41	24.00	41.00	190.536	259.301	449.837
42	24.00	42.00	210.813	252.726	463.539
43	24.00	43.00	230.969	246.381	477.350
44	24.00	44.00	251.007	240.275	491.283
45	24.00	45.00	270.932	234.405	505.337
46	24.00	46.00	290.746	228.759	519.505
47	24.00	47.00	310.452	223.327	533.779
48	24.00	48.00	330.054	218.094	548.148
49	24.00	49.00	349.552	213.049	562.601
50	24.00	50.00	368.950	208.178	577.127
51	24.00	51.00	388.249	203.469	591.718
52	24.00	52.00	407.452	198.912	606.364
53	24.00	53.00	426.561	194.496	621.056
54	24.00	54.00	445.576	190.211	635.788
55	24.00	55.00	464.501	186.050	650.551
56	24.00	56.00	483.336	182.004	665.339
57	24.00	57.00	502.082	178.066	680.148
58	24.00	58.00	520.742	174.228	694.971
59	24.00	59.00	539.317	170.486	709.803
60	24.00	60.00	557.808	166.832	724.640
61	24.00	61.00	576.217	163.262	739.479
62	24.00	62.00	594.544	159.771	754.315
63	24.00	63.00	612.791	156.354	769.145
64	24.00	64.00	630.959	153.007	783.966
65	24.00	65.00	649.049	149.726	798.775
66	24.00	66.00	667.062	146.507	813.569
67	24.00	67.00	684.999	143.348	828.347
68	24.00	68.00	702.862	140.243	843.105
69	24.00	69.00	720.651	137.192	857.842
70	24.00	70.00	738.367	134.190	872.556
71	24.00	71.00	756.011	131.235	887.246
72	24.00	72.00	773.584	128.324	901.908
73	24.00	73.00	791.087	125.456	916.543
74	24.00	74.00	808.521	122.627	931.148
75	24.00	75.00	825.887	119.835	945.722

General Information:

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 Input file:ost Drive PDE_GANNETT FLEMING\FB-Deep\ACIP\BR-1 - Int. Pier.in
 Project number: 221126
 Job name: SR 997 Bridge Over Black Creek Canal (Bridge No. 870633)
 Engineer: Adnan Ismail, P.E.
 Units: English

Analysis Information:

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 Analysis Type: Drilled Shaft Analysis

Soil Information:

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 Boring date: 8/24/2021
 Boring number: BR-1
 Station number: Offset:

 Ground Elevation: 0.00(ft)
 Water table Elevation = -6.20(ft)

 Rock side-friction is calculated using: McVay's method

ID	Depth (ft)	Elevation (ft)	SPT Blows (Blows/ft)	Unit Weight (pcf)	Soil Type
1	0.00	0.00	N/A	0.00	5- Cavity layer
2	1.00	-1.00	N/A	0.00	5- Cavity layer
3	3.00	-3.00	N/A	0.00	5- Cavity layer
4	5.00	-5.00	N/A	0.00	5- Cavity layer
5	7.00	-7.00	N/A	105.00	5- Cavity layer
6	9.00	-9.00	N/A	105.00	5- Cavity layer
7	12.00	-12.00	N/A	120.00	5- Cavity layer
8	15.00	-15.00	N/A	120.00	5- Cavity layer
9	18.00	-18.00	N/A	120.00	5- Cavity layer
10	21.00	-21.00	N/A	120.00	5- Cavity layer
11	24.00	-24.00	N/A	110.00	5- Cavity layer
12	27.00	-27.00	N/A	110.00	5- Cavity layer
13	30.00	-30.00	N/A	110.00	5- Cavity layer
14	33.00	-33.00	N/A	120.00	4- Lime Stone/Very shelly sand
15	36.00	-36.00	N/A	120.00	4- Lime Stone/Very shelly sand
16	39.00	-39.00	N/A	120.00	4- Lime Stone/Very shelly sand
17	42.00	-42.00	N/A	120.00	4- Lime Stone/Very shelly sand
18	45.00	-45.00	N/A	120.00	4- Lime Stone/Very shelly sand
19	48.00	-48.00	N/A	120.00	4- Lime Stone/Very shelly sand
20	51.00	-51.00	N/A	120.00	4- Lime Stone/Very shelly sand
21	54.00	-54.00	N/A	120.00	4- Lime Stone/Very shelly sand
22	57.00	-57.00	N/A	120.00	4- Lime Stone/Very shelly sand
23	60.00	-60.00	N/A	120.00	4- Lime Stone/Very shelly sand
24	63.00	-63.00	N/A	120.00	4- Lime Stone/Very shelly sand
25	66.00	-66.00	N/A	120.00	4- Lime Stone/Very shelly sand
26	69.00	-69.00	N/A	120.00	4- Lime Stone/Very shelly sand
27	72.00	-72.00	N/A	120.00	4- Lime Stone/Very shelly sand
28	75.00	-75.00	N/A	120.00	4- Lime Stone/Very shelly sand
29	77.00	-77.00	N/A	120.00	4- Lime Stone/Very shelly sand
30	79.00	-79.00	N/A	120.00	4- Lime Stone/Very shelly sand

ID	Cu-DIR (tsf)	qu (tsf)	qt (tsf)	Em (ksi)	qb (tsf)
1	N/A	N/A	N/A	N/A	N/A
2	N/A	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A	N/A
6	N/A	N/A	N/A	N/A	N/A
7	N/A	N/A	N/A	N/A	N/A
8	N/A	N/A	N/A	N/A	N/A
9	N/A	N/A	N/A	N/A	N/A
10	N/A	N/A	N/A	N/A	N/A
11	N/A	N/A	N/A	N/A	N/A
12	N/A	N/A	N/A	N/A	N/A

13	N/A	N/A	N/A	N/A	N/A
14	N/A	49.00	1.00	78.26	24.50
15	N/A	49.00	1.00	78.26	24.50
16	N/A	49.00	1.00	78.26	24.50
17	N/A	49.00	1.00	78.26	24.50
18	N/A	49.00	1.00	78.26	24.50
19	N/A	49.00	1.00	78.26	24.50
20	N/A	49.00	1.00	78.26	24.50
21	N/A	49.00	1.00	78.26	24.50
22	N/A	49.00	1.00	78.26	24.50
23	N/A	49.00	1.00	78.26	24.50
24	N/A	49.00	1.00	78.26	24.50
25	N/A	49.00	1.00	78.26	24.50
26	N/A	49.00	1.00	78.26	24.50
27	N/A	49.00	1.00	78.26	24.50
28	N/A	49.00	1.00	78.26	24.50
29	N/A	49.00	1.00	78.26	24.50
30	N/A	49.00	1.00	78.26	24.50

ID RQD F.M. S.R.I. Rock Recovery

1	N/A	N/A	N/A
2	N/A	N/A	N/A
3	N/A	N/A	N/A
4	N/A	N/A	N/A
5	N/A	N/A	N/A
6	N/A	N/A	N/A
7	N/A	N/A	N/A
8	N/A	N/A	N/A
9	N/A	N/A	N/A
10	N/A	N/A	N/A
11	N/A	N/A	N/A
12	N/A	N/A	N/A
13	N/A	N/A	N/A
14	1.00	ROUGH	1.000
15	1.00	ROUGH	1.000
16	1.00	ROUGH	1.000
17	1.00	ROUGH	1.000
18	1.00	ROUGH	1.000
19	1.00	ROUGH	1.000
20	1.00	ROUGH	1.000
21	1.00	ROUGH	1.000
22	1.00	ROUGH	1.000
23	1.00	ROUGH	1.000
24	1.00	ROUGH	1.000
25	1.00	ROUGH	1.000
26	1.00	ROUGH	1.000
27	1.00	ROUGH	1.000
28	1.00	ROUGH	1.000
29	1.00	ROUGH	1.000
30	1.00	ROUGH	1.000

Drilled Shaft Data:

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Unit weight of concrete = 150.00(pcf), Concrete Slump = 9.00(in)
Modulus of Elasticity of concrete = 4030.00(ksi)

Shaft Geometry:

ID	Length (ft)	Tip Elev. (ft)	Case Len. (ft)	Diameter (in)	Base Diam. (in)	Bell Len. (ft)
1	1.00	-1.00	0.00	24.00	24.00	0.00
2	2.00	-2.00	0.00	24.00	24.00	0.00
3	3.00	-3.00	0.00	24.00	24.00	0.00
4	4.00	-4.00	0.00	24.00	24.00	0.00
5	5.00	-5.00	0.00	24.00	24.00	0.00
6	6.00	-6.00	0.00	24.00	24.00	0.00
7	7.00	-7.00	0.00	24.00	24.00	0.00
8	8.00	-8.00	0.00	24.00	24.00	0.00
9	9.00	-9.00	0.00	24.00	24.00	0.00
10	10.00	-10.00	0.00	24.00	24.00	0.00
11	11.00	-11.00	0.00	24.00	24.00	0.00
12	12.00	-12.00	0.00	24.00	24.00	0.00
13	13.00	-13.00	0.00	24.00	24.00	0.00
14	14.00	-14.00	0.00	24.00	24.00	0.00
15	15.00	-15.00	0.00	24.00	24.00	0.00

16	16.00	-16.00	0.00	24.00	24.00	0.00
17	17.00	-17.00	0.00	24.00	24.00	0.00
18	18.00	-18.00	0.00	24.00	24.00	0.00
19	19.00	-19.00	0.00	24.00	24.00	0.00
20	20.00	-20.00	0.00	24.00	24.00	0.00
21	21.00	-21.00	0.00	24.00	24.00	0.00
22	22.00	-22.00	0.00	24.00	24.00	0.00
23	23.00	-23.00	0.00	24.00	24.00	0.00
24	24.00	-24.00	0.00	24.00	24.00	0.00
25	25.00	-25.00	0.00	24.00	24.00	0.00
26	26.00	-26.00	0.00	24.00	24.00	0.00
27	27.00	-27.00	0.00	24.00	24.00	0.00
28	28.00	-28.00	0.00	24.00	24.00	0.00
29	29.00	-29.00	0.00	24.00	24.00	0.00
30	30.00	-30.00	0.00	24.00	24.00	0.00
31	31.00	-31.00	0.00	24.00	24.00	0.00
32	32.00	-32.00	0.00	24.00	24.00	0.00
33	33.00	-33.00	0.00	24.00	24.00	0.00
34	34.00	-34.00	0.00	24.00	24.00	0.00
35	35.00	-35.00	0.00	24.00	24.00	0.00
36	36.00	-36.00	0.00	24.00	24.00	0.00
37	37.00	-37.00	0.00	24.00	24.00	0.00
38	38.00	-38.00	0.00	24.00	24.00	0.00
39	39.00	-39.00	0.00	24.00	24.00	0.00
40	40.00	-40.00	0.00	24.00	24.00	0.00
41	41.00	-41.00	0.00	24.00	24.00	0.00
42	42.00	-42.00	0.00	24.00	24.00	0.00
43	43.00	-43.00	0.00	24.00	24.00	0.00
44	44.00	-44.00	0.00	24.00	24.00	0.00
45	45.00	-45.00	0.00	24.00	24.00	0.00
46	46.00	-46.00	0.00	24.00	24.00	0.00
47	47.00	-47.00	0.00	24.00	24.00	0.00
48	48.00	-48.00	0.00	24.00	24.00	0.00
49	49.00	-49.00	0.00	24.00	24.00	0.00
50	50.00	-50.00	0.00	24.00	24.00	0.00
51	51.00	-51.00	0.00	24.00	24.00	0.00
52	52.00	-52.00	0.00	24.00	24.00	0.00
53	53.00	-53.00	0.00	24.00	24.00	0.00
54	54.00	-54.00	0.00	24.00	24.00	0.00
55	55.00	-55.00	0.00	24.00	24.00	0.00
56	56.00	-56.00	0.00	24.00	24.00	0.00
57	57.00	-57.00	0.00	24.00	24.00	0.00
58	58.00	-58.00	0.00	24.00	24.00	0.00
59	59.00	-59.00	0.00	24.00	24.00	0.00
60	60.00	-60.00	0.00	24.00	24.00	0.00
61	61.00	-61.00	0.00	24.00	24.00	0.00
62	62.00	-62.00	0.00	24.00	24.00	0.00
63	63.00	-63.00	0.00	24.00	24.00	0.00
64	64.00	-64.00	0.00	24.00	24.00	0.00
65	65.00	-65.00	0.00	24.00	24.00	0.00
66	66.00	-66.00	0.00	24.00	24.00	0.00
67	67.00	-67.00	0.00	24.00	24.00	0.00
68	68.00	-68.00	0.00	24.00	24.00	0.00
69	69.00	-69.00	0.00	24.00	24.00	0.00
70	70.00	-70.00	0.00	24.00	24.00	0.00
71	71.00	-71.00	0.00	24.00	24.00	0.00
72	72.00	-72.00	0.00	24.00	24.00	0.00
73	73.00	-73.00	0.00	24.00	24.00	0.00
74	74.00	-74.00	0.00	24.00	24.00	0.00
75	75.00	-75.00	0.00	24.00	24.00	0.00

Drilled Shaft Capacity (sorted by shaft diameter):

=====
Strength reduction factors: Skin-friction = 1.00, End-bearing = 0.00

ID	Diameter (in)	Length (ft)	Skin Fric. (tons)	End Bearing (tons)	Capacity (tons)
1	24.00	1.00	0.000	0.000	0.000
2	24.00	2.00	0.000	0.000	0.000
3	24.00	3.00	0.000	0.000	0.000
4	24.00	4.00	0.000	0.000	0.000
5	24.00	5.00	0.000	0.000	0.000
6	24.00	6.00	0.000	0.000	0.000
7	24.00	7.00	0.000	0.000	0.000
8	24.00	8.00	0.000	0.000	0.000
9	24.00	9.00	0.000	0.000	0.000
10	24.00	10.00	0.000	0.000	0.000

11	24.00	11.00	0.000	0.000	0.000
12	24.00	12.00	0.000	0.000	0.000
13	24.00	13.00	0.000	0.000	0.000
14	24.00	14.00	0.000	0.000	0.000
15	24.00	15.00	0.000	0.000	0.000
16	24.00	16.00	0.000	0.000	0.000
17	24.00	17.00	0.000	0.000	0.000
18	24.00	18.00	0.000	0.000	0.000
19	24.00	19.00	0.000	0.000	0.000
20	24.00	20.00	0.000	0.000	0.000
21	24.00	21.00	0.000	0.000	0.000
22	24.00	22.00	0.000	0.000	0.000
23	24.00	23.00	0.000	0.000	0.000
24	24.00	24.00	0.000	0.000	0.000
25	24.00	25.00	0.000	0.000	0.000
26	24.00	26.00	0.000	0.000	0.000
27	24.00	27.00	0.000	0.000	0.000
28	24.00	28.00	0.000	0.000	0.000
29	24.00	29.00	0.000	0.000	0.000
30	24.00	30.00	0.000	0.000	0.000
31	24.00	31.00	0.000	0.000	0.000
32	24.00	32.00	0.000	0.000	0.000
33	24.00	33.00	0.000	0.000	0.000
34	24.00	34.00	21.991	0.000	21.991
35	24.00	35.00	43.982	0.000	43.982
36	24.00	36.00	65.973	0.000	65.973
37	24.00	37.00	87.965	0.000	87.965
38	24.00	38.00	109.956	0.000	109.956
39	24.00	39.00	131.947	0.000	131.947
40	24.00	40.00	153.938	0.000	153.938
41	24.00	41.00	175.929	0.000	175.929
42	24.00	42.00	197.920	0.000	197.920
43	24.00	43.00	219.911	0.000	219.911
44	24.00	44.00	241.903	0.000	241.903
45	24.00	45.00	263.894	0.000	263.894
46	24.00	46.00	285.885	0.000	285.885
47	24.00	47.00	307.876	0.000	307.876
48	24.00	48.00	329.867	0.000	329.867
49	24.00	49.00	351.858	0.000	351.858
50	24.00	50.00	373.850	0.000	373.850
51	24.00	51.00	395.841	0.000	395.841
52	24.00	52.00	417.832	0.000	417.832
53	24.00	53.00	439.823	0.000	439.823
54	24.00	54.00	461.814	0.000	461.814
55	24.00	55.00	483.805	0.000	483.805
56	24.00	56.00	505.796	0.000	505.796
57	24.00	57.00	527.788	0.000	527.788
58	24.00	58.00	549.779	0.000	549.779
59	24.00	59.00	571.770	0.000	571.770
60	24.00	60.00	593.761	0.000	593.761
61	24.00	61.00	615.752	0.000	615.752
62	24.00	62.00	637.743	0.000	637.743
63	24.00	63.00	659.734	0.000	659.734
64	24.00	64.00	681.726	0.000	681.726
65	24.00	65.00	703.717	0.000	703.717
66	24.00	66.00	725.708	0.000	725.708
67	24.00	67.00	747.699	0.000	747.699
68	24.00	68.00	769.690	0.000	769.690
69	24.00	69.00	791.681	0.000	791.681
70	24.00	70.00	813.672	0.000	813.672
71	24.00	71.00	835.664	0.000	835.664
72	24.00	72.00	857.655	0.000	857.655
73	24.00	73.00	879.646	0.000	879.646
74	24.00	74.00	901.637	0.000	901.637
75	24.00	75.00	923.628	0.000	923.628

Drilled Shaft Capacity at User-Defined Settlement (sorted by shaft diameter):

***** Capacity is NOT modified by the strength reduction factors *****

User-Defined Settlement = 5.00%

ID	Diameter (in)	Length (ft)	Skin Fric. (tons)	End Bearing (tons)	Capacity (tons)
1	24.00	1.00	0.000	0.000	0.000
2	24.00	2.00	0.000	0.000	0.000

3	24.00	3.00	0.000	0.000	0.000
4	24.00	4.00	0.000	0.000	0.000
5	24.00	5.00	0.000	0.000	0.000
6	24.00	6.00	0.000	0.000	0.000
7	24.00	7.00	0.000	0.000	0.000
8	24.00	8.00	0.000	0.000	0.000
9	24.00	9.00	0.000	0.000	0.000
10	24.00	10.00	0.000	0.000	0.000
11	24.00	11.00	0.000	0.000	0.000
12	24.00	12.00	0.000	0.000	0.000
13	24.00	13.00	0.000	0.000	0.000
14	24.00	14.00	0.000	0.000	0.000
15	24.00	15.00	0.000	0.000	0.000
16	24.00	16.00	0.000	0.000	0.000
17	24.00	17.00	0.000	0.000	0.000
18	24.00	18.00	0.000	0.000	0.000
19	24.00	19.00	0.000	0.000	0.000
20	24.00	20.00	0.000	0.000	0.000
21	24.00	21.00	0.000	0.000	0.000
22	24.00	22.00	0.000	0.000	0.000
23	24.00	23.00	0.000	0.000	0.000
24	24.00	24.00	0.000	0.000	0.000
25	24.00	25.00	0.000	0.000	0.000
26	24.00	26.00	0.000	0.000	0.000
27	24.00	27.00	0.000	0.000	0.000
28	24.00	28.00	0.000	0.000	0.000
29	24.00	29.00	0.000	0.000	0.000
30	24.00	30.00	0.000	0.000	0.000
31	24.00	31.00	0.000	0.000	0.000
32	24.00	32.00	0.000	0.000	0.000
33	24.00	33.00	0.000	950.286	950.286
34	24.00	34.00	21.799	724.224	746.024
35	24.00	35.00	43.222	455.180	498.402
36	24.00	36.00	64.279	346.899	411.178
37	24.00	37.00	84.980	286.084	371.064
38	24.00	38.00	105.797	279.776	385.572
39	24.00	39.00	126.468	272.962	399.430
40	24.00	40.00	147.002	266.074	413.076
41	24.00	41.00	167.405	259.301	426.706
42	24.00	42.00	187.682	252.726	440.408
43	24.00	43.00	207.838	246.381	454.219
44	24.00	44.00	227.876	240.275	468.152
45	24.00	45.00	247.801	234.405	482.206
46	24.00	46.00	267.615	228.759	496.374
47	24.00	47.00	287.322	223.327	510.648
48	24.00	48.00	306.923	218.094	525.017
49	24.00	49.00	326.421	213.049	539.470
50	24.00	50.00	345.819	208.178	553.997
51	24.00	51.00	365.118	203.469	568.587
52	24.00	52.00	384.321	198.912	583.233
53	24.00	53.00	403.430	194.496	597.925
54	24.00	54.00	422.445	190.211	612.657
55	24.00	55.00	441.370	186.050	627.420
56	24.00	56.00	460.205	182.004	642.209
57	24.00	57.00	478.951	178.066	657.017
58	24.00	58.00	497.612	174.228	671.840
59	24.00	59.00	516.187	170.486	686.672
60	24.00	60.00	534.678	166.832	701.509
61	24.00	61.00	553.086	163.262	716.348
62	24.00	62.00	571.413	159.771	731.184
63	24.00	63.00	589.660	156.354	746.014
64	24.00	64.00	607.828	153.007	760.835
65	24.00	65.00	625.918	149.726	775.644
66	24.00	66.00	643.931	146.507	790.438
67	24.00	67.00	661.868	143.348	805.216
68	24.00	68.00	679.731	140.243	819.974
69	24.00	69.00	697.520	137.192	834.711
70	24.00	70.00	715.236	134.190	849.425
71	24.00	71.00	732.880	131.235	864.115
72	24.00	72.00	750.453	128.324	878.777
73	24.00	73.00	767.956	125.456	893.412
74	24.00	74.00	785.390	122.627	908.017
75	24.00	75.00	802.756	119.835	922.591

General Information:

Input file:ost Drive PDE_GANNETT FLEMING\FB-Deep\ACIP\BR-2 - End Bents.in
 Project number: 221126
 Job name: SR 997 Bridge Over Black Creek Canal (Bridge No. 870633)
 Engineer: Adnan Ismail, P.E.
 Units: English

Analysis Information:

Analysis Type: Drilled Shaft Analysis

Soil Information:

Boring date: 8/20/2021
 Boring number: BR-2
 Station number: Offset:

Ground Elevation: 0.00(ft)
 Water table Elevation = -6.20(ft)

Rock side-friction is calculated using: McVay's method
 Hammer type: Automatic Hammer, Correction factor = 1.24

ID	Depth (ft)	Elevation (ft)	SPT Blows (Blows/ft)	Unit Weight (pcf)	Soil Type
1	0.00	0.00	N/A	0.00	5- Cavity layer
2	1.00	-1.00	N/A	0.00	5- Cavity layer
3	3.00	-3.00	N/A	0.00	5- Cavity layer
4	5.00	-5.00	N/A	0.00	5- Cavity layer
5	7.00	-7.00	N/A	105.00	5- Cavity layer
6	9.00	-9.00	N/A	105.00	5- Cavity layer
7	12.00	-12.00	11.00	120.00	3- Clean sand
8	15.00	-15.00	13.00	120.00	3- Clean sand
9	18.00	-18.00	9.00	120.00	3- Clean sand
10	21.00	-21.00	10.00	120.00	3- Clean sand
11	24.00	-24.00	8.00	110.00	3- Clean sand
12	27.00	-27.00	9.00	110.00	3- Clean sand
13	30.00	-30.00	8.00	110.00	3- Clean sand
14	33.00	-33.00	N/A	120.00	4- Lime Stone/Very shelly sand
15	36.00	-36.00	N/A	120.00	4- Lime Stone/Very shelly sand
16	39.00	-39.00	N/A	120.00	4- Lime Stone/Very shelly sand
17	42.00	-42.00	N/A	120.00	4- Lime Stone/Very shelly sand
18	45.00	-45.00	N/A	120.00	4- Lime Stone/Very shelly sand
19	48.00	-48.00	N/A	120.00	4- Lime Stone/Very shelly sand
20	51.00	-51.00	N/A	120.00	4- Lime Stone/Very shelly sand
21	54.00	-54.00	N/A	120.00	4- Lime Stone/Very shelly sand
22	57.00	-57.00	N/A	120.00	4- Lime Stone/Very shelly sand
23	60.00	-60.00	N/A	120.00	4- Lime Stone/Very shelly sand
24	63.00	-63.00	N/A	120.00	4- Lime Stone/Very shelly sand
25	66.00	-66.00	N/A	120.00	4- Lime Stone/Very shelly sand
26	69.00	-69.00	N/A	120.00	4- Lime Stone/Very shelly sand
27	72.00	-72.00	N/A	120.00	4- Lime Stone/Very shelly sand
28	75.00	-75.00	N/A	120.00	4- Lime Stone/Very shelly sand
29	77.00	-77.00	N/A	120.00	4- Lime Stone/Very shelly sand
30	79.00	-79.00	N/A	120.00	4- Lime Stone/Very shelly sand

ID	Cu-DIR (tsf)	qu (tsf)	qt (tsf)	Em (ksi)	qb (tsf)
1	N/A	N/A	N/A	N/A	N/A
2	N/A	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A	N/A
6	N/A	N/A	N/A	N/A	N/A
7	N/A	N/A	N/A	N/A	N/A
8	N/A	N/A	N/A	N/A	N/A
9	N/A	N/A	N/A	N/A	N/A
10	N/A	N/A	N/A	N/A	N/A
11	N/A	N/A	N/A	N/A	N/A

12	N/A	N/A	N/A	N/A	N/A
13	N/A	N/A	N/A	N/A	N/A
14	N/A	49.00	1.00	78.26	24.50
15	N/A	49.00	1.00	78.26	24.50
16	N/A	49.00	1.00	78.26	24.50
17	N/A	49.00	1.00	78.26	24.50
18	N/A	49.00	1.00	78.26	24.50
19	N/A	49.00	1.00	78.26	24.50
20	N/A	49.00	1.00	78.26	24.50
21	N/A	49.00	1.00	78.26	24.50
22	N/A	49.00	1.00	78.26	24.50
23	N/A	49.00	1.00	78.26	24.50
24	N/A	49.00	1.00	78.26	24.50
25	N/A	49.00	1.00	78.26	24.50
26	N/A	49.00	1.00	78.26	24.50
27	N/A	49.00	1.00	78.26	24.50
28	N/A	49.00	1.00	78.26	24.50
29	N/A	49.00	1.00	78.26	24.50
30	N/A	49.00	1.00	78.26	24.50

ID RQD F.M. S.R.I. Rock Recovery

1	N/A	N/A	N/A
2	N/A	N/A	N/A
3	N/A	N/A	N/A
4	N/A	N/A	N/A
5	N/A	N/A	N/A
6	N/A	N/A	N/A
7	N/A	N/A	N/A
8	N/A	N/A	N/A
9	N/A	N/A	N/A
10	N/A	N/A	N/A
11	N/A	N/A	N/A
12	N/A	N/A	N/A
13	N/A	N/A	N/A
14	1.00	ROUGH	1.000
15	1.00	ROUGH	1.000
16	1.00	ROUGH	1.000
17	1.00	ROUGH	1.000
18	1.00	ROUGH	1.000
19	1.00	ROUGH	1.000
20	1.00	ROUGH	1.000
21	1.00	ROUGH	1.000
22	1.00	ROUGH	1.000
23	1.00	ROUGH	1.000
24	1.00	ROUGH	1.000
25	1.00	ROUGH	1.000
26	1.00	ROUGH	1.000
27	1.00	ROUGH	1.000
28	1.00	ROUGH	1.000
29	1.00	ROUGH	1.000
30	1.00	ROUGH	1.000

Drilled Shaft Data:

Unit weight of concrete = 150.00(pcf), Concrete Slump = 9.00(in)
 Modulus of Elasticity of concrete = 4030.00(ksi)

Shaft Geometry:

ID	Length (ft)	Tip Elev. (ft)	Case Len. (ft)	Diameter (in)	Base Diam. (in)	Bell Len. (ft)
1	1.00	-1.00	0.00	24.00	24.00	0.00
2	2.00	-2.00	0.00	24.00	24.00	0.00
3	3.00	-3.00	0.00	24.00	24.00	0.00
4	4.00	-4.00	0.00	24.00	24.00	0.00
5	5.00	-5.00	0.00	24.00	24.00	0.00
6	6.00	-6.00	0.00	24.00	24.00	0.00
7	7.00	-7.00	0.00	24.00	24.00	0.00
8	8.00	-8.00	0.00	24.00	24.00	0.00
9	9.00	-9.00	0.00	24.00	24.00	0.00
10	10.00	-10.00	0.00	24.00	24.00	0.00
11	11.00	-11.00	0.00	24.00	24.00	0.00
12	12.00	-12.00	0.00	24.00	24.00	0.00
13	13.00	-13.00	0.00	24.00	24.00	0.00
14	14.00	-14.00	0.00	24.00	24.00	0.00

15	15.00	-15.00	0.00	24.00	24.00	0.00
16	16.00	-16.00	0.00	24.00	24.00	0.00
17	17.00	-17.00	0.00	24.00	24.00	0.00
18	18.00	-18.00	0.00	24.00	24.00	0.00
19	19.00	-19.00	0.00	24.00	24.00	0.00
20	20.00	-20.00	0.00	24.00	24.00	0.00
21	21.00	-21.00	0.00	24.00	24.00	0.00
22	22.00	-22.00	0.00	24.00	24.00	0.00
23	23.00	-23.00	0.00	24.00	24.00	0.00
24	24.00	-24.00	0.00	24.00	24.00	0.00
25	25.00	-25.00	0.00	24.00	24.00	0.00
26	26.00	-26.00	0.00	24.00	24.00	0.00
27	27.00	-27.00	0.00	24.00	24.00	0.00
28	28.00	-28.00	0.00	24.00	24.00	0.00
29	29.00	-29.00	0.00	24.00	24.00	0.00
30	30.00	-30.00	0.00	24.00	24.00	0.00
31	31.00	-31.00	0.00	24.00	24.00	0.00
32	32.00	-32.00	0.00	24.00	24.00	0.00
33	33.00	-33.00	0.00	24.00	24.00	0.00
34	34.00	-34.00	0.00	24.00	24.00	0.00
35	35.00	-35.00	0.00	24.00	24.00	0.00
36	36.00	-36.00	0.00	24.00	24.00	0.00
37	37.00	-37.00	0.00	24.00	24.00	0.00
38	38.00	-38.00	0.00	24.00	24.00	0.00
39	39.00	-39.00	0.00	24.00	24.00	0.00
40	40.00	-40.00	0.00	24.00	24.00	0.00
41	41.00	-41.00	0.00	24.00	24.00	0.00
42	42.00	-42.00	0.00	24.00	24.00	0.00
43	43.00	-43.00	0.00	24.00	24.00	0.00
44	44.00	-44.00	0.00	24.00	24.00	0.00
45	45.00	-45.00	0.00	24.00	24.00	0.00
46	46.00	-46.00	0.00	24.00	24.00	0.00
47	47.00	-47.00	0.00	24.00	24.00	0.00
48	48.00	-48.00	0.00	24.00	24.00	0.00
49	49.00	-49.00	0.00	24.00	24.00	0.00
50	50.00	-50.00	0.00	24.00	24.00	0.00
51	51.00	-51.00	0.00	24.00	24.00	0.00
52	52.00	-52.00	0.00	24.00	24.00	0.00
53	53.00	-53.00	0.00	24.00	24.00	0.00
54	54.00	-54.00	0.00	24.00	24.00	0.00
55	55.00	-55.00	0.00	24.00	24.00	0.00
56	56.00	-56.00	0.00	24.00	24.00	0.00
57	57.00	-57.00	0.00	24.00	24.00	0.00
58	58.00	-58.00	0.00	24.00	24.00	0.00
59	59.00	-59.00	0.00	24.00	24.00	0.00
60	60.00	-60.00	0.00	24.00	24.00	0.00
61	61.00	-61.00	0.00	24.00	24.00	0.00
62	62.00	-62.00	0.00	24.00	24.00	0.00
63	63.00	-63.00	0.00	24.00	24.00	0.00
64	64.00	-64.00	0.00	24.00	24.00	0.00
65	65.00	-65.00	0.00	24.00	24.00	0.00
66	66.00	-66.00	0.00	24.00	24.00	0.00
67	67.00	-67.00	0.00	24.00	24.00	0.00
68	68.00	-68.00	0.00	24.00	24.00	0.00
69	69.00	-69.00	0.00	24.00	24.00	0.00
70	70.00	-70.00	0.00	24.00	24.00	0.00
71	71.00	-71.00	0.00	24.00	24.00	0.00
72	72.00	-72.00	0.00	24.00	24.00	0.00
73	73.00	-73.00	0.00	24.00	24.00	0.00
74	74.00	-74.00	0.00	24.00	24.00	0.00
75	75.00	-75.00	0.00	24.00	24.00	0.00

Drilled Shaft Capacity (sorted by shaft diameter):

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Strength reduction factors: Skin-friction = 1.00, End-bearing = 0.00

ID	Diameter (in)	Length (ft)	Skin Fric. (tons)	End Bearing (tons)	Capacity (tons)
1	24.00	1.00	0.000	0.000	0.000
2	24.00	2.00	0.000	0.000	0.000
3	24.00	3.00	0.000	0.000	0.000
4	24.00	4.00	0.000	0.000	0.000
5	24.00	5.00	0.000	0.000	0.000
6	24.00	6.00	0.000	0.000	0.000
7	24.00	7.00	0.000	0.000	0.000
8	24.00	8.00	0.000	0.000	0.000
9	24.00	9.00	0.000	0.000	0.000

10	24.00	10.00	0.000	0.000	0.000
11	24.00	11.00	0.000	0.000	0.000
12	24.00	12.00	0.000	0.000	0.000
13	24.00	13.00	0.084	0.000	0.084
14	24.00	14.00	0.333	0.000	0.333
15	24.00	15.00	0.743	0.000	0.743
16	24.00	16.00	1.357	0.000	1.357
17	24.00	17.00	2.133	0.000	2.133
18	24.00	18.00	3.068	0.000	3.068
19	24.00	19.00	3.873	0.000	3.873
20	24.00	20.00	4.786	0.000	4.786
21	24.00	21.00	5.806	0.000	5.806
22	24.00	22.00	7.048	0.000	7.048
23	24.00	23.00	8.399	0.000	8.399
24	24.00	24.00	9.857	0.000	9.857
25	24.00	25.00	11.092	0.000	11.092
26	24.00	26.00	12.389	0.000	12.389
27	24.00	27.00	13.746	0.000	13.746
28	24.00	28.00	15.334	0.000	15.334
29	24.00	29.00	16.984	0.000	16.984
30	24.00	30.00	18.694	0.000	18.694
31	24.00	31.00	20.262	0.000	20.262
32	24.00	32.00	21.879	0.000	21.879
33	24.00	33.00	23.544	0.000	23.544
34	24.00	34.00	45.535	0.000	45.535
35	24.00	35.00	67.526	0.000	67.526
36	24.00	36.00	89.517	0.000	89.517
37	24.00	37.00	111.508	0.000	111.508
38	24.00	38.00	133.499	0.000	133.499
39	24.00	39.00	155.490	0.000	155.490
40	24.00	40.00	177.482	0.000	177.482
41	24.00	41.00	199.473	0.000	199.473
42	24.00	42.00	221.464	0.000	221.464
43	24.00	43.00	243.455	0.000	243.455
44	24.00	44.00	265.446	0.000	265.446
45	24.00	45.00	287.437	0.000	287.437
46	24.00	46.00	309.429	0.000	309.429
47	24.00	47.00	331.420	0.000	331.420
48	24.00	48.00	353.411	0.000	353.411
49	24.00	49.00	375.402	0.000	375.402
50	24.00	50.00	397.393	0.000	397.393
51	24.00	51.00	419.384	0.000	419.384
52	24.00	52.00	441.375	0.000	441.375
53	24.00	53.00	463.367	0.000	463.367
54	24.00	54.00	485.358	0.000	485.358
55	24.00	55.00	507.349	0.000	507.349
56	24.00	56.00	529.340	0.000	529.340
57	24.00	57.00	551.331	0.000	551.331
58	24.00	58.00	573.322	0.000	573.322
59	24.00	59.00	595.313	0.000	595.313
60	24.00	60.00	617.305	0.000	617.305
61	24.00	61.00	639.296	0.000	639.296
62	24.00	62.00	661.287	0.000	661.287
63	24.00	63.00	683.278	0.000	683.278
64	24.00	64.00	705.269	0.000	705.269
65	24.00	65.00	727.260	0.000	727.260
66	24.00	66.00	749.252	0.000	749.252
67	24.00	67.00	771.243	0.000	771.243
68	24.00	68.00	793.234	0.000	793.234
69	24.00	69.00	815.225	0.000	815.225
70	24.00	70.00	837.216	0.000	837.216
71	24.00	71.00	859.207	0.000	859.207
72	24.00	72.00	881.198	0.000	881.198
73	24.00	73.00	903.190	0.000	903.190
74	24.00	74.00	925.181	0.000	925.181
75	24.00	75.00	947.172	0.000	947.172

Drilled Shaft Capacity at User-Defined Settlement (sorted by shaft diameter):

***** Capacity is NOT modified by the strength reduction factors *****

User-Defined Settlement = 5.00%

ID	Diameter (in)	Length (ft)	Skin Fric. (tons)	End Bearing (tons)	Capacity (tons)
1	24.00	1.00	0.000	0.000	0.000

2	24.00	2.00	0.000	0.000	0.000
3	24.00	3.00	0.000	0.000	0.000
4	24.00	4.00	0.000	0.000	0.000
5	24.00	5.00	0.000	0.000	0.000
6	24.00	6.00	0.000	0.000	0.000
7	24.00	7.00	0.000	0.000	0.000
8	24.00	8.00	0.000	0.000	0.000
9	24.00	9.00	0.000	0.000	0.000
10	24.00	10.00	0.000	0.000	0.000
11	24.00	11.00	0.000	0.000	0.000
12	24.00	12.00	0.000	14.016	14.016
13	24.00	13.00	0.082	13.919	14.002
14	24.00	14.00	0.326	13.243	13.569
15	24.00	15.00	0.727	26.147	26.874
16	24.00	16.00	1.327	25.712	27.039
17	24.00	17.00	2.086	24.987	27.074
18	24.00	18.00	3.001	23.827	26.828
19	24.00	19.00	3.788	22.555	26.343
20	24.00	20.00	4.682	21.636	26.318
21	24.00	21.00	5.679	21.217	26.896
22	24.00	22.00	6.894	21.072	27.966
23	24.00	23.00	8.216	20.831	29.046
24	24.00	24.00	9.641	20.396	30.037
25	24.00	25.00	10.850	19.912	30.762
26	24.00	26.00	12.118	19.623	31.741
27	24.00	27.00	13.445	20.779	34.224
28	24.00	28.00	14.999	24.410	39.409
29	24.00	29.00	16.612	30.289	46.902
30	24.00	30.00	18.285	33.598	51.883
31	24.00	31.00	19.819	39.702	59.521
32	24.00	32.00	21.400	49.148	70.548
33	24.00	33.00	23.028	950.286	973.314
34	24.00	34.00	44.828	724.224	769.052
35	24.00	35.00	66.251	455.180	521.431
36	24.00	36.00	87.307	346.899	434.206
37	24.00	37.00	108.008	286.084	394.092
38	24.00	38.00	128.825	279.776	408.601
39	24.00	39.00	149.497	272.962	422.458
40	24.00	40.00	170.030	266.074	436.104
41	24.00	41.00	190.433	259.301	449.734
42	24.00	42.00	210.710	252.726	463.436
43	24.00	43.00	230.866	246.381	477.247
44	24.00	44.00	250.905	240.275	491.180
45	24.00	45.00	270.829	234.405	505.234
46	24.00	46.00	290.644	228.759	519.403
47	24.00	47.00	310.350	223.327	533.676
48	24.00	48.00	329.951	218.094	548.045
49	24.00	49.00	349.449	213.049	562.498
50	24.00	50.00	368.847	208.178	577.025
51	24.00	51.00	388.147	203.469	591.616
52	24.00	52.00	407.350	198.912	606.261
53	24.00	53.00	426.458	194.496	620.954
54	24.00	54.00	445.474	190.211	635.685
55	24.00	55.00	464.398	186.050	650.448
56	24.00	56.00	483.233	182.004	665.237
57	24.00	57.00	501.980	178.066	680.045
58	24.00	58.00	520.640	174.228	694.868
59	24.00	59.00	539.215	170.486	709.700
60	24.00	60.00	557.706	166.832	724.538
61	24.00	61.00	576.114	163.262	739.376
62	24.00	62.00	594.441	159.771	754.212
63	24.00	63.00	612.688	156.354	769.042
64	24.00	64.00	630.856	153.007	783.863
65	24.00	65.00	648.946	149.726	798.672
66	24.00	66.00	666.959	146.507	813.467
67	24.00	67.00	684.896	143.348	828.244
68	24.00	68.00	702.759	140.243	843.002
69	24.00	69.00	720.548	137.192	857.740
70	24.00	70.00	738.264	134.190	872.454
71	24.00	71.00	755.908	131.235	887.143
72	24.00	72.00	773.481	128.324	901.806
73	24.00	73.00	790.984	125.456	916.440
74	24.00	74.00	808.418	122.627	931.045
75	24.00	75.00	825.784	119.835	945.619

General Information:

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 Input file:ost Drive PDE_GANNETT FLEMING\FB-Deep\ACIP\BR-2 - Int. Pier.in
 Project number: 221126
 Job name: SR 997 Bridge Over Black Creek Canal (Bridge No. 870633)
 Engineer: Adnan Ismail, P.E.
 Units: English

Analysis Information:

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 Analysis Type: Drilled Shaft Analysis

Soil Information:

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 Boring date: 8/20/2021
 Boring number: BR-2
 Station number: Offset:

 Ground Elevation: 0.00(ft)
 Water table Elevation = -6.20(ft)

 Rock side-friction is calculated using: McVay's method

ID	Depth (ft)	Elevation (ft)	SPT Blows (Blows/ft)	Unit Weight (pcf)	Soil Type
1	0.00	0.00	N/A	0.00	5- Cavity layer
2	1.00	-1.00	N/A	0.00	5- Cavity layer
3	3.00	-3.00	N/A	0.00	5- Cavity layer
4	5.00	-5.00	N/A	0.00	5- Cavity layer
5	7.00	-7.00	N/A	105.00	5- Cavity layer
6	9.00	-9.00	N/A	105.00	5- Cavity layer
7	12.00	-12.00	N/A	120.00	5- Cavity layer
8	15.00	-15.00	N/A	120.00	5- Cavity layer
9	18.00	-18.00	N/A	120.00	5- Cavity layer
10	21.00	-21.00	N/A	120.00	5- Cavity layer
11	24.00	-24.00	N/A	110.00	5- Cavity layer
12	27.00	-27.00	N/A	110.00	5- Cavity layer
13	30.00	-30.00	N/A	110.00	5- Cavity layer
14	33.00	-33.00	N/A	120.00	4- Lime Stone/Very shelly sand
15	36.00	-36.00	N/A	120.00	4- Lime Stone/Very shelly sand
16	39.00	-39.00	N/A	120.00	4- Lime Stone/Very shelly sand
17	42.00	-42.00	N/A	120.00	4- Lime Stone/Very shelly sand
18	45.00	-45.00	N/A	120.00	4- Lime Stone/Very shelly sand
19	48.00	-48.00	N/A	120.00	4- Lime Stone/Very shelly sand
20	51.00	-51.00	N/A	120.00	4- Lime Stone/Very shelly sand
21	54.00	-54.00	N/A	120.00	4- Lime Stone/Very shelly sand
22	57.00	-57.00	N/A	120.00	4- Lime Stone/Very shelly sand
23	60.00	-60.00	N/A	120.00	4- Lime Stone/Very shelly sand
24	63.00	-63.00	N/A	120.00	4- Lime Stone/Very shelly sand
25	66.00	-66.00	N/A	120.00	4- Lime Stone/Very shelly sand
26	69.00	-69.00	N/A	120.00	4- Lime Stone/Very shelly sand
27	72.00	-72.00	N/A	120.00	4- Lime Stone/Very shelly sand
28	75.00	-75.00	N/A	120.00	4- Lime Stone/Very shelly sand
29	77.00	-77.00	N/A	120.00	4- Lime Stone/Very shelly sand
30	79.00	-79.00	N/A	120.00	4- Lime Stone/Very shelly sand

ID	Cu-DIR (tsf)	qu (tsf)	qt (tsf)	Em (ksi)	qb (tsf)
1	N/A	N/A	N/A	N/A	N/A
2	N/A	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A	N/A
6	N/A	N/A	N/A	N/A	N/A
7	N/A	N/A	N/A	N/A	N/A
8	N/A	N/A	N/A	N/A	N/A
9	N/A	N/A	N/A	N/A	N/A
10	N/A	N/A	N/A	N/A	N/A
11	N/A	N/A	N/A	N/A	N/A
12	N/A	N/A	N/A	N/A	N/A

13	N/A	N/A	N/A	N/A	N/A
14	N/A	49.00	1.00	78.26	24.50
15	N/A	49.00	1.00	78.26	24.50
16	N/A	49.00	1.00	78.26	24.50
17	N/A	49.00	1.00	78.26	24.50
18	N/A	49.00	1.00	78.26	24.50
19	N/A	49.00	1.00	78.26	24.50
20	N/A	49.00	1.00	78.26	24.50
21	N/A	49.00	1.00	78.26	24.50
22	N/A	49.00	1.00	78.26	24.50
23	N/A	49.00	1.00	78.26	24.50
24	N/A	49.00	1.00	78.26	24.50
25	N/A	49.00	1.00	78.26	24.50
26	N/A	49.00	1.00	78.26	24.50
27	N/A	49.00	1.00	78.26	24.50
28	N/A	49.00	1.00	78.26	24.50
29	N/A	49.00	1.00	78.26	24.50
30	N/A	49.00	1.00	78.26	24.50

ID RQD F.M. S.R.I. Rock Recovery

1	N/A	N/A	N/A
2	N/A	N/A	N/A
3	N/A	N/A	N/A
4	N/A	N/A	N/A
5	N/A	N/A	N/A
6	N/A	N/A	N/A
7	N/A	N/A	N/A
8	N/A	N/A	N/A
9	N/A	N/A	N/A
10	N/A	N/A	N/A
11	N/A	N/A	N/A
12	N/A	N/A	N/A
13	N/A	N/A	N/A
14	1.00	ROUGH	1.000
15	1.00	ROUGH	1.000
16	1.00	ROUGH	1.000
17	1.00	ROUGH	1.000
18	1.00	ROUGH	1.000
19	1.00	ROUGH	1.000
20	1.00	ROUGH	1.000
21	1.00	ROUGH	1.000
22	1.00	ROUGH	1.000
23	1.00	ROUGH	1.000
24	1.00	ROUGH	1.000
25	1.00	ROUGH	1.000
26	1.00	ROUGH	1.000
27	1.00	ROUGH	1.000
28	1.00	ROUGH	1.000
29	1.00	ROUGH	1.000
30	1.00	ROUGH	1.000

Drilled Shaft Data:

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Unit weight of concrete = 150.00(pcf), Concrete Slump = 9.00(in)
Modulus of Elasticity of concrete = 4030.00(ksi)

Shaft Geometry:

ID	Length (ft)	Tip Elev. (ft)	Case Len. (ft)	Diameter (in)	Base Diam. (in)	Bell Len. (ft)
1	1.00	-1.00	0.00	24.00	24.00	0.00
2	2.00	-2.00	0.00	24.00	24.00	0.00
3	3.00	-3.00	0.00	24.00	24.00	0.00
4	4.00	-4.00	0.00	24.00	24.00	0.00
5	5.00	-5.00	0.00	24.00	24.00	0.00
6	6.00	-6.00	0.00	24.00	24.00	0.00
7	7.00	-7.00	0.00	24.00	24.00	0.00
8	8.00	-8.00	0.00	24.00	24.00	0.00
9	9.00	-9.00	0.00	24.00	24.00	0.00
10	10.00	-10.00	0.00	24.00	24.00	0.00
11	11.00	-11.00	0.00	24.00	24.00	0.00
12	12.00	-12.00	0.00	24.00	24.00	0.00
13	13.00	-13.00	0.00	24.00	24.00	0.00
14	14.00	-14.00	0.00	24.00	24.00	0.00
15	15.00	-15.00	0.00	24.00	24.00	0.00

16	16.00	-16.00	0.00	24.00	24.00	0.00
17	17.00	-17.00	0.00	24.00	24.00	0.00
18	18.00	-18.00	0.00	24.00	24.00	0.00
19	19.00	-19.00	0.00	24.00	24.00	0.00
20	20.00	-20.00	0.00	24.00	24.00	0.00
21	21.00	-21.00	0.00	24.00	24.00	0.00
22	22.00	-22.00	0.00	24.00	24.00	0.00
23	23.00	-23.00	0.00	24.00	24.00	0.00
24	24.00	-24.00	0.00	24.00	24.00	0.00
25	25.00	-25.00	0.00	24.00	24.00	0.00
26	26.00	-26.00	0.00	24.00	24.00	0.00
27	27.00	-27.00	0.00	24.00	24.00	0.00
28	28.00	-28.00	0.00	24.00	24.00	0.00
29	29.00	-29.00	0.00	24.00	24.00	0.00
30	30.00	-30.00	0.00	24.00	24.00	0.00
31	31.00	-31.00	0.00	24.00	24.00	0.00
32	32.00	-32.00	0.00	24.00	24.00	0.00
33	33.00	-33.00	0.00	24.00	24.00	0.00
34	34.00	-34.00	0.00	24.00	24.00	0.00
35	35.00	-35.00	0.00	24.00	24.00	0.00
36	36.00	-36.00	0.00	24.00	24.00	0.00
37	37.00	-37.00	0.00	24.00	24.00	0.00
38	38.00	-38.00	0.00	24.00	24.00	0.00
39	39.00	-39.00	0.00	24.00	24.00	0.00
40	40.00	-40.00	0.00	24.00	24.00	0.00
41	41.00	-41.00	0.00	24.00	24.00	0.00
42	42.00	-42.00	0.00	24.00	24.00	0.00
43	43.00	-43.00	0.00	24.00	24.00	0.00
44	44.00	-44.00	0.00	24.00	24.00	0.00
45	45.00	-45.00	0.00	24.00	24.00	0.00
46	46.00	-46.00	0.00	24.00	24.00	0.00
47	47.00	-47.00	0.00	24.00	24.00	0.00
48	48.00	-48.00	0.00	24.00	24.00	0.00
49	49.00	-49.00	0.00	24.00	24.00	0.00
50	50.00	-50.00	0.00	24.00	24.00	0.00
51	51.00	-51.00	0.00	24.00	24.00	0.00
52	52.00	-52.00	0.00	24.00	24.00	0.00
53	53.00	-53.00	0.00	24.00	24.00	0.00
54	54.00	-54.00	0.00	24.00	24.00	0.00
55	55.00	-55.00	0.00	24.00	24.00	0.00
56	56.00	-56.00	0.00	24.00	24.00	0.00
57	57.00	-57.00	0.00	24.00	24.00	0.00
58	58.00	-58.00	0.00	24.00	24.00	0.00
59	59.00	-59.00	0.00	24.00	24.00	0.00
60	60.00	-60.00	0.00	24.00	24.00	0.00
61	61.00	-61.00	0.00	24.00	24.00	0.00
62	62.00	-62.00	0.00	24.00	24.00	0.00
63	63.00	-63.00	0.00	24.00	24.00	0.00
64	64.00	-64.00	0.00	24.00	24.00	0.00
65	65.00	-65.00	0.00	24.00	24.00	0.00
66	66.00	-66.00	0.00	24.00	24.00	0.00
67	67.00	-67.00	0.00	24.00	24.00	0.00
68	68.00	-68.00	0.00	24.00	24.00	0.00
69	69.00	-69.00	0.00	24.00	24.00	0.00
70	70.00	-70.00	0.00	24.00	24.00	0.00
71	71.00	-71.00	0.00	24.00	24.00	0.00
72	72.00	-72.00	0.00	24.00	24.00	0.00
73	73.00	-73.00	0.00	24.00	24.00	0.00
74	74.00	-74.00	0.00	24.00	24.00	0.00
75	75.00	-75.00	0.00	24.00	24.00	0.00

Drilled Shaft Capacity (sorted by shaft diameter):

=====
Strength reduction factors: Skin-friction = 1.00, End-bearing = 0.00

ID	Diameter (in)	Length (ft)	Skin Fric. (tons)	End Bearing (tons)	Capacity (tons)
1	24.00	1.00	0.000	0.000	0.000
2	24.00	2.00	0.000	0.000	0.000
3	24.00	3.00	0.000	0.000	0.000
4	24.00	4.00	0.000	0.000	0.000
5	24.00	5.00	0.000	0.000	0.000
6	24.00	6.00	0.000	0.000	0.000
7	24.00	7.00	0.000	0.000	0.000
8	24.00	8.00	0.000	0.000	0.000
9	24.00	9.00	0.000	0.000	0.000
10	24.00	10.00	0.000	0.000	0.000

11	24.00	11.00	0.000	0.000	0.000
12	24.00	12.00	0.000	0.000	0.000
13	24.00	13.00	0.000	0.000	0.000
14	24.00	14.00	0.000	0.000	0.000
15	24.00	15.00	0.000	0.000	0.000
16	24.00	16.00	0.000	0.000	0.000
17	24.00	17.00	0.000	0.000	0.000
18	24.00	18.00	0.000	0.000	0.000
19	24.00	19.00	0.000	0.000	0.000
20	24.00	20.00	0.000	0.000	0.000
21	24.00	21.00	0.000	0.000	0.000
22	24.00	22.00	0.000	0.000	0.000
23	24.00	23.00	0.000	0.000	0.000
24	24.00	24.00	0.000	0.000	0.000
25	24.00	25.00	0.000	0.000	0.000
26	24.00	26.00	0.000	0.000	0.000
27	24.00	27.00	0.000	0.000	0.000
28	24.00	28.00	0.000	0.000	0.000
29	24.00	29.00	0.000	0.000	0.000
30	24.00	30.00	0.000	0.000	0.000
31	24.00	31.00	0.000	0.000	0.000
32	24.00	32.00	0.000	0.000	0.000
33	24.00	33.00	0.000	0.000	0.000
34	24.00	34.00	21.991	0.000	21.991
35	24.00	35.00	43.982	0.000	43.982
36	24.00	36.00	65.973	0.000	65.973
37	24.00	37.00	87.965	0.000	87.965
38	24.00	38.00	109.956	0.000	109.956
39	24.00	39.00	131.947	0.000	131.947
40	24.00	40.00	153.938	0.000	153.938
41	24.00	41.00	175.929	0.000	175.929
42	24.00	42.00	197.920	0.000	197.920
43	24.00	43.00	219.911	0.000	219.911
44	24.00	44.00	241.903	0.000	241.903
45	24.00	45.00	263.894	0.000	263.894
46	24.00	46.00	285.885	0.000	285.885
47	24.00	47.00	307.876	0.000	307.876
48	24.00	48.00	329.867	0.000	329.867
49	24.00	49.00	351.858	0.000	351.858
50	24.00	50.00	373.850	0.000	373.850
51	24.00	51.00	395.841	0.000	395.841
52	24.00	52.00	417.832	0.000	417.832
53	24.00	53.00	439.823	0.000	439.823
54	24.00	54.00	461.814	0.000	461.814
55	24.00	55.00	483.805	0.000	483.805
56	24.00	56.00	505.796	0.000	505.796
57	24.00	57.00	527.788	0.000	527.788
58	24.00	58.00	549.779	0.000	549.779
59	24.00	59.00	571.770	0.000	571.770
60	24.00	60.00	593.761	0.000	593.761
61	24.00	61.00	615.752	0.000	615.752
62	24.00	62.00	637.743	0.000	637.743
63	24.00	63.00	659.734	0.000	659.734
64	24.00	64.00	681.726	0.000	681.726
65	24.00	65.00	703.717	0.000	703.717
66	24.00	66.00	725.708	0.000	725.708
67	24.00	67.00	747.699	0.000	747.699
68	24.00	68.00	769.690	0.000	769.690
69	24.00	69.00	791.681	0.000	791.681
70	24.00	70.00	813.672	0.000	813.672
71	24.00	71.00	835.664	0.000	835.664
72	24.00	72.00	857.655	0.000	857.655
73	24.00	73.00	879.646	0.000	879.646
74	24.00	74.00	901.637	0.000	901.637
75	24.00	75.00	923.628	0.000	923.628

Drilled Shaft Capacity at User-Defined Settlement (sorted by shaft diameter):

***** Capacity is NOT modified by the strength reduction factors *****

User-Defined Settlement = 5.00%

ID	Diameter (in)	Length (ft)	Skin Fric. (tons)	End Bearing (tons)	Capacity (tons)
1	24.00	1.00	0.000	0.000	0.000
2	24.00	2.00	0.000	0.000	0.000

3	24.00	3.00	0.000	0.000	0.000
4	24.00	4.00	0.000	0.000	0.000
5	24.00	5.00	0.000	0.000	0.000
6	24.00	6.00	0.000	0.000	0.000
7	24.00	7.00	0.000	0.000	0.000
8	24.00	8.00	0.000	0.000	0.000
9	24.00	9.00	0.000	0.000	0.000
10	24.00	10.00	0.000	0.000	0.000
11	24.00	11.00	0.000	0.000	0.000
12	24.00	12.00	0.000	0.000	0.000
13	24.00	13.00	0.000	0.000	0.000
14	24.00	14.00	0.000	0.000	0.000
15	24.00	15.00	0.000	0.000	0.000
16	24.00	16.00	0.000	0.000	0.000
17	24.00	17.00	0.000	0.000	0.000
18	24.00	18.00	0.000	0.000	0.000
19	24.00	19.00	0.000	0.000	0.000
20	24.00	20.00	0.000	0.000	0.000
21	24.00	21.00	0.000	0.000	0.000
22	24.00	22.00	0.000	0.000	0.000
23	24.00	23.00	0.000	0.000	0.000
24	24.00	24.00	0.000	0.000	0.000
25	24.00	25.00	0.000	0.000	0.000
26	24.00	26.00	0.000	0.000	0.000
27	24.00	27.00	0.000	0.000	0.000
28	24.00	28.00	0.000	0.000	0.000
29	24.00	29.00	0.000	0.000	0.000
30	24.00	30.00	0.000	0.000	0.000
31	24.00	31.00	0.000	0.000	0.000
32	24.00	32.00	0.000	0.000	0.000
33	24.00	33.00	0.000	950.286	950.286
34	24.00	34.00	21.799	724.224	746.024
35	24.00	35.00	43.222	455.180	498.402
36	24.00	36.00	64.279	346.899	411.178
37	24.00	37.00	84.980	286.084	371.064
38	24.00	38.00	105.797	279.776	385.572
39	24.00	39.00	126.468	272.962	399.430
40	24.00	40.00	147.002	266.074	413.076
41	24.00	41.00	167.405	259.301	426.706
42	24.00	42.00	187.682	252.726	440.408
43	24.00	43.00	207.838	246.381	454.219
44	24.00	44.00	227.876	240.275	468.152
45	24.00	45.00	247.801	234.405	482.206
46	24.00	46.00	267.615	228.759	496.374
47	24.00	47.00	287.322	223.327	510.648
48	24.00	48.00	306.923	218.094	525.017
49	24.00	49.00	326.421	213.049	539.470
50	24.00	50.00	345.819	208.178	553.997
51	24.00	51.00	365.118	203.469	568.587
52	24.00	52.00	384.321	198.912	583.233
53	24.00	53.00	403.430	194.496	597.925
54	24.00	54.00	422.445	190.211	612.657
55	24.00	55.00	441.370	186.050	627.420
56	24.00	56.00	460.205	182.004	642.209
57	24.00	57.00	478.951	178.066	657.017
58	24.00	58.00	497.612	174.228	671.840
59	24.00	59.00	516.187	170.486	686.672
60	24.00	60.00	534.678	166.832	701.509
61	24.00	61.00	553.086	163.262	716.348
62	24.00	62.00	571.413	159.771	731.184
63	24.00	63.00	589.660	156.354	746.014
64	24.00	64.00	607.828	153.007	760.835
65	24.00	65.00	625.918	149.726	775.644
66	24.00	66.00	643.931	146.507	790.438
67	24.00	67.00	661.868	143.348	805.216
68	24.00	68.00	679.731	140.243	819.974
69	24.00	69.00	697.520	137.192	834.711
70	24.00	70.00	715.236	134.190	849.425
71	24.00	71.00	732.880	131.235	864.115
72	24.00	72.00	750.453	128.324	878.777
73	24.00	73.00	767.956	125.456	893.412
74	24.00	74.00	785.390	122.627	908.017
75	24.00	75.00	802.756	119.835	922.591

**SR 994/SW 200th Street/Quail Roost Drive
 From West of SW 137th Avenue to
 East of SW 127th Avenue
 Miami-Dade County, Florida
GEOSOL Project No. 221126**

SUMMARY OF N-VALUES AND REDUCTION OF SHEAR STRENGTH VALUES

GRANULAR FILL
 SANDY SILT
 NATURAL SAND
 UPPER LIMESTONE
 LOWER LIMESTONE

STATISTICAL ANALYSES OF DATA

1. FOR SPT "N" VALUE DATA, CALCULATE MEAN AND STANDARD DEVIATION.
2. NORMALIZE DATA BY EXCLUDING ALL TEST RESULTS WHICH ARE LESS THAN (MEAN - STANDARD DEVIATION) AND WHICH ARE GREATER THAN (MEAN + STANDARD DEVIATION).
3. RECALCULATE THE MEAN OF THE DATA WHICH REMAINS.

STATISTICS OF VALUES

BORING No.	STRATA	N VALUE AUTO. (BPF)	N VALUE SAFETY (BPF)	PHI (DEGREES) PHI = 28+N/4
BR-1	Granular Fill	19	24	34
BR-2	Granular Fill	21	26	35
	Granular Fill	17	21	33

N VALUE SAFETY (BPF)	PHI (DEGREES) PHI = 28+N/4
24	34

MINIMUM	17.0	21	33	MINIMUM	24	34
MAXIMUM	21.0	26	35	MAXIMUM	24	34
AVERAGE	19.0	24	34	AVERAGE	24	34
STA. DEV.	1.6	2	1	STA. DEV.	0	0
AVE-STA. DEV.	17.4	22	33	AVE-STA. DEV.	24	34
AVE+STA. DEV.	20.6	26	34	AVE+STA. DEV.	24	34

FOR PRELIMINARY DESIGN USE PHI = 34 DEGREES FOR GRANULAR FILL.

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 SANDY SILT
 NATURAL SAND
 UPPER LIMESTONE
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STATISTICAL ANALYSES OF DATA

1. FOR SPT "N" VALUE DATA, CALCULATE MEAN AND STANDARD DEVIATION.
2. NORMALIZE DATA BY EXCLUDING ALL TEST RESULTS WHICH ARE LESS THAN (MEAN - STANDARD DEVIATION) AND WHICH ARE GREATER THAN (MEAN + STANDARD DEVIATION).
3. RECALCULATE THE MEAN OF THE DATA WHICH REMAINS.

STATISTICS OF VALUES

BORING No.	STRATUM	N VALUE AUTO. (BPF)	N VALUE SAFETY (BPF)	PHI(DEGREES) PHI = 20+N/4
BR-1	Sandy Silt	9	11	23
	Sandy Silt	7	9	22
	Sandy Silt	8	10	23
BR-2	Sandy Silt	8	10	23
	Sandy Silt	7	9	22
	Sandy Silt	9	11	23

N VALUE SAFETY (BPF)	PHI(DEGREES) PHI = 20+N/4
10	23
10	23

MINIMUM	7.0	9	22	MINIMUM	10	23
MAXIMUM	9.0	11	23	MAXIMUM	10	23
AVERAGE	8.0	10	23	AVERAGE	10	23
STA. DEV.	0.8	1	0	STA. DEV.	0	0
AVE-STA. DEV.	7.2	9	22	AVE-STA. DEV.	10	23
AVE+STA. DEV.	8.8	11	23	AVE+STA. DEV.	10	23

FOR PRELIMINARY DESIGN LIMIT AND USE PHI = 23 DEGREES FOR SANDY SILT

**SR 994/SW 200th Street/Quail Roost Drive
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SUMMARY OF N-VALUES AND REDUCTION OF SHEAR STRENGTH VALUES

GRANULAR FILL
 SANDY SILT
 NATURAL SAND
 UPPER LIMESTONE
 LOWER LIMESTONE

STATISTICAL ANALYSES OF DATA

1. FOR SPT "N" VALUE DATA, CALCULATE MEAN AND STANDARD DEVIATION.
2. NORMALIZE DATA BY EXCLUDING ALL TEST RESULTS WHICH ARE LESS THAN (MEAN - STANDARD DEVIATION) AND WHICH ARE GREATER THAN (MEAN + STANDARD DEVIATION).
3. RECALCULATE THE MEAN OF THE DATA WHICH REMAINS.

STATISTICS OF VALUES

BORING No.	STRATUM	N VALUE AUTO. (BPF)	N VALUE SAFETY (BPF)	PHI(DEGREES) PHI = 28+N/4
BR-1	Granular Sand	8	10	31
	Granular Sand	9	11	31
	Granular Sand	8	10	31
	Granular Sand	8	10	31
BR-2	Granular Sand	8	10	31
	Granular Sand	9	11	31
	Granular Sand	8	10	31

N VALUE SAFETY (BPF)	PHI(DEGREES) PHI = 28+N/4
10	31
10	31
10	31
10	31
10	31
11	31
11	31

MINIMUM	8.0	10	31	MINIMUM	10	31
MAXIMUM	9.0	11	31	MAXIMUM	11	31
AVERAGE	8.3	10	31	AVERAGE	10	31
STA. DEV.	0.5	0	0	STA. DEV.	0	0
AVE-STA. DEV.	7.8	10	30	AVE-STA. DEV.	10	30
AVE+STA. DEV.	8.7	11	31	AVE+STA. DEV.	11	31

FOR PRELIMINARY DESIGN USE PHI = 31 DEGREES FOR NATURAL SAND.

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SUMMARY OF N-VALUES AND REDUCTION OF SHEAR STRENGTH VALUES

GRANULAR FILL
 SANDY SILT
 NATURAL SAND
 UPPER LIMESTONE
 LOWER LIMESTONE

STATISTICAL ANALYSES OF DATA

1. FOR SPT "N" VALUE DATA, CALCULATE MEAN AND STANDARD DEVIATION.
2. NORMALIZE DATA BY EXCLUDING ALL TEST RESULTS WHICH ARE LESS THAN (MEAN - STANDARD DEVIATION) AND WHICH ARE GREATER THAN (MEAN + STANDARD DEVIATION).
3. RECALCULATE THE MEAN OF THE DATA WHICH REMAINS.

STATISTICS OF VALUES

BORING No.	STRATUM	N VALUE AUTO. (BPF)	N VALUE SAFETY (BPF)	PHI(DEGREES) PHI = 33+N/4
BR-1	Upper Limestone	12	15	37
	Upper Limestone	14	17	37
	Upper Limestone	8	10	36
BR-2	Upper Limestone	11	14	37
	Upper Limestone	11	14	37
	Upper Limestone	13	16	37
	Upper Limestone	9	11	36
	Upper Limestone	10	12	36

N VALUE SAFETY (BPF)	PHI(DEGREES) PHI = 28+N/4
11	36
12	36
14	37
14	37
15	37
16	37

MINIMUM	8.0	10	36	MINIMUM	11	36
MAXIMUM	14.0	17	37	MAXIMUM	16	37
AVERAGE	11.0	14	36	AVERAGE	14	36
STA. DEV.	1.9	2	1	STA. DEV.	2	0
AVE-STA. DEV.	9.1	11	36	AVE-STA. DEV.	12	36
AVE+STA. DEV.	12.9	16	37	AVE+STA. DEV.	15	37

FOR PRELIMINARY DESIGN USE PHI = 35 DEGREES FOR UPPER LIMESTONE.

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GRANULAR FILL
SANDY SILT
NATURAL SAND
UPPER LIMESTONE
LOWER LIMESTONE

STATISTICAL ANALYSES OF DATA

1. FOR SPT "N" VALUE DATA, CALCULATE MEAN AND STANDARD DEVIATION.
2. NORMALIZE DATA BY EXCLUDING ALL TEST RESULTS WHICH ARE LESS THAN (MEAN - STANDARD DEVIATION) AND WHICH ARE GREATER THAN (MEAN + STANDARD DEVIATION).
3. RECALCULATE THE MEAN OF THE DATA WHICH REMAINS.

STATISTICS OF VALUES

BORING No.	STRATUM	N VALUE AUTO. (BPF)	N VALUE SAFETY (BPF)	Fsu (TSF) = 0.1N
BR-1	Lower Limestone	55	68	6.8
	Lower Limestone	50	62	6.2
	Lower Limestone	47	58	5.8
	Lower Limestone	40	50	5.0
	Lower Limestone	50	62	6.2
	Lower Limestone	37	46	4.6
	Lower Limestone	50	62	6.2
	Lower Limestone	35	43	4.3
	Lower Limestone	27	33	3.3
	Lower Limestone	29	36	3.6
	Lower Limestone	24	30	3.0
	Lower Limestone	28	35	3.5
	Lower Limestone	66	82	8.2
	Lower Limestone	29	36	3.6
	Lower Limestone	26	32	3.2
	Lower Limestone	24	30	3.0
	Lower Limestone	27	33	3.3
BR-2	Lower Limestone	55	68	6.8
	Lower Limestone	50	62	6.2
	Lower Limestone	50	62	6.2
	Lower Limestone	37	46	4.6
	Lower Limestone	50	62	6.2
	Lower Limestone	31	38	3.8
	Lower Limestone	30	37	3.7
	Lower Limestone	50	62	6.2
	Lower Limestone	25	31	3.1
	Lower Limestone	24	30	3.0
	Lower Limestone	30	37	3.7
	Lower Limestone	25	31	3.1
	Lower Limestone	26	32	3.2
	Lower Limestone	23	29	2.9
	Lower Limestone	26	32	3.2
	Lower Limestone	28	35	3.5
	Lower Limestone	31	38	3.8

N VALUE SAFETY (BPF)	Fsu (TSF) = 0.1N
31	3.1
31	3.1
32	3.2
32	3.2
32	3.2
33	3.3
33	3.3
35	3.5
35	3.5
36	3.6
36	3.6
37	3.7
37	3.7
38	3.8
38	3.8
43	4.3
46	4.6
46	4.6
50	5.0
58	5.8

MINIMUM	23.0	29	3	MINIMUM	31	3
MAXIMUM	66.0	82	8	MAXIMUM	58	6
AVERAGE	36.3	45	5	AVERAGE	38	3.8
STA. DEV.	11.9	15	1	STA. DEV.	7	1
AVE-STA. DEV.	24.5	30	3	AVE-STA. DEV.	31	3
AVE+STA. DEV.	48.2	60	6	AVE+STA. DEV.	45	4

FOR PRELIMINARY DEEP FOUNDATION DESIGN LIMIT AND USE UNIT SKIN FRICTION (fsu) VALUE OF = 3.5 TSF, AND A COHESION VALUE OF 5.0 KSF.

SR 994/Quail Roost Drive From West of SW 137th Avenue to East of SW 127th Avenue
 445804-1-22-01
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PRELIMINARY SOIL/ROCK PARAMETERS FOR FB-MULTIPIER INPUT

Reference Boring	BR-1 and BR-2
Foundation Location	SR 997 Bridge
Ground Water Depth(ft)	6.2 to 6.9

Foundation Type	Drilled Shafts
Size (inch)	42, 48, 54, 60, 72

Layer No.	1	2	3	4	5
Soil Description	Sand	Sand	Sand	Sand	Limestone
Soil Type	COHESIONLESS	COHESIONLESS	COHESIONLESS	COHESIONLESS	ROCK
Top Boundary Depth (ft)	0.00	2.00	11.00	23.00	33.00
Bottom Boundary Elevation (ft)	2.00	11.00	23.00	33.00	-63.90
Average SPT N60-Value (Blows/ft)	24	10	14	10	38

LATERAL	Soil Model	Sand (O'Neill)	Sand (O'Neill)	Sand (O'Neill)	Sand (O'Neill)	Limestone (McVay)
	Internal Friction Angle, ϕ	34	23	35	31	-
	Total Unit Weight (pcf), γ_t	105	90	120	110	120
	Subgrade Modulus (pci), k	62	5	32	20	-
	Undrained Shear Strength (psf), C_u	-	-	-	-	-
	Major Principal Strain @ ϵ_{50}	-	-	-	-	-
	Major Principal Strain @ ϵ_{100}	-	-	-	-	-
	Average Undrained Shear Strength (psf)	-	-	-	-	-
AXIAL	Soil Model	Drilled Shaft	Drilled Shaft	Drilled Shaft	Drilled Shaft	Drilled Shaft
	Total Unit Weight (pcf), γ_t	105	90	120	110	120
	Shear Modulus (ksi), G	2.1	1.2	1.5	1.2	19.0
	Poisson's ratio, ν	0.3	0.3	0.3	0.3	0.23
	Vertical Failure Shear Stress (psf)	-	-	-	-	-
	Undrained Shear Strength (psf), C_u	-	-	-	-	5000
	Ultimate Unit Skin Friction (psf)	58	207	924	1047	7600
	Mass Modulus (ksi)	-	-	-	-	-
	Modulus Ratio	-	-	-	-	-
	Surface (Rough/Smooth)					
	Unconfined Compressive Strength (psf)	-	-	-	-	10000
	Split Tensile Strength (psf)	-	-	-	-	-
	Concrete Unit Weight (pcf)	150	150	150	150	150
	Slump (in)	-	-	-	-	-
TORSIONAL	Soil Model	Hyperbolic	Hyperbolic	Hyperbolic	Hyperbolic	Hyperbolic
	Total Unit Weight (pcf), γ_t	105	120	120	120	120
	Internal Friction Angle, f	34	23	35	31	-
	Undrained Shear Strength (psf), C_u	-	-	-	-	5000
	Shear Modulus (ksi), G	2.1	1.2	1.5	1.2	19.0
	Torsional Shear Stress (psf)	58	207	924	1047	7600
TIP	Soil Model	Drilled Shaft	Drilled Shaft	Drilled Shaft	Drilled Shaft	Drilled Shaft
	Shear Modulus (ksi), G	2.1	1.2	1.5	1.2	19.0
	Poisson's ratio, n	0.3	0.3	0.3	0.3	0.2
	Axial Bearing Failure, kips	-	-	-	-	-
	Uncorrected SPT-N Value (blows/ft)	24	10	14	10	38
	Undrained Shear Strength (psf), C_u	-	-	-	-	5000
	Ultimate Unit End Bearing (ksi)	-	-	-	-	-
IGM Mass Modulus (ksi), E_m	-	-	-	-	-	

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PRELIMINARY SOIL/ROCK PARAMETERS FOR FB-MULTIPIER INPUT

Reference Boring	BR-1 and BR-2
Foundation Location	SR 997 Bridge - End Bent
Ground Surface Elevation (ft)	N/A
Ground Water Depth(ft)	6.2 to 6.9

Foundation Type	Driven Pile
Size (inch)	18.00
Base Area (ft ²)	2.25

Layer No.	1	2	3	4	5
Soil Description	Sand	Sand	Sand	Sand	Limestone
Soil Type	COHESIONLESS	COHESIONLESS	COHESIONLESS	COHESIONLESS	ROCK
Top Boundary Depth (ft)	0.00	2.00	11.00	23.00	33.00
Bottom Boundary Depth (ft)	2.00	11.00	23.00	33.00	80.00
Average SPT N60-Value (Blows/ft)	8	10	14	10	27

LATERAL	Soil Model	Sand (O'Neill)	Sand (O'Neill)	Sand (O'Neill)	Sand (O'Neill)	Limestone (McVay)
	Internal Friction Angle, ϕ	30	23	35	31	-
	Total Unit Weight (pcf), γ_t	105	90	115	110	120
	Subgrade Modulus (pci), k	14	5	32	20	-
	Undrained Shear Strength (psf), C_u	-	-	-	-	-
	Major Principal Strain @ ϵ_{s0}	-	-	-	-	-
	Major Principal Strain @ ϵ_{100}	-	-	-	-	-
	Average Undrained Shear Strength (psf)	-	-	-	-	-
AXIAL	Soil Model	Driven Pile	Driven Pile	Driven Pile	Driven Pile	Driven Pile
	Total Unit Weight (pcf), γ_t	105	90	115	110	120
	Shear Modulus (ksi), G	1.0	1.2	1.5	1.2	13.5
	Poisson's ratio, ν	0.3	0.3	0.3	0.3	0.23
	Vertical Failure Shear Stress (psf)	-	-	-	-	-
	Undrained Shear Strength (psf), C_u	-	-	-	-	1800
	Ultimate Unit Skin Friction (psf)	304	380	532	380	540
	Mass Modulus (ksi)	-	-	-	-	-
	Modulus Ratio	-	-	-	-	-
	Surface (Rough/Smooth)					
	Unconfined Compressive Strength (psf)	-	-	-	-	3600
	Split Tensile Strength (psf)	-	-	-	-	-
	Concrete Unit Weight (pcf)	150	150	150	150	150
	Slump (in)	-	-	-	-	-
TORSIONAL	Soil Model	Hyperbolic	Hyperbolic	Hyperbolic	Hyperbolic	Hyperbolic
	Total Unit Weight (pcf), γ_t	105	120	120	120	120
	Internal Friction Angle, f	30	23	35	31	-
	Undrained Shear Strength (psf), C_u	-	-	-	-	1800
	Shear Modulus (ksi), G	1.0	1.2	1.5	1.2	13.5
	Torsional Shear Stress (psf)	304	380	532	380	540
TIP	Soil Model	Driven Pile	Driven Pile	Driven Pile	Driven Pile	Driven Pile
	Shear Modulus (ksi), G	1.0	1.2	1.5	1.2	13.5
	Poisson's ratio, ν	0.3	0.3	0.3	0.3	0.2
	Axial Bearing Failure, kips	115	144	202	144	437
	Uncorrected SPT-N Value (blows/ft)	8	10	14	10	27
	Undrained Shear Strength (psf), C_u	-	-	-	-	1800
	Ultimate Unit End Bearing (ksi)	0.4	0.4	0.6	0.4	1.4
	IGM Mass Modulus (ksi), E_m	-	-	-	-	-

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Reference Boring	BR-1 and BR-2
Foundation Location	SR 997 Bridge - End Bent
Ground Surface Elevation (ft)	N/A
Ground Water Depth(ft)	6.2 to 6.9

Foundation Type	Driven Pile
Size (inch)	24.00
Base Area (ft ²)	4

Layer No.	1	2	3	4	5
Soil Description	Sand	Sand	Sand	Sand	Limestone
Soil Type	COHESIONLESS	COHESIONLESS	COHESIONLESS	COHESIONLESS	ROCK
Top Boundary Depth (ft)	0.00	2.00	11.00	23.00	33.00
Bottom Boundary Depth (ft)	2.00	11.00	23.00	33.00	80.00
Average SPT N60-Value (Blows/ft)	8	10	14	10	27

LATERAL	Soil Model	Sand (O'Neill)	Sand (O'Neill)	Sand (O'Neill)	Sand (O'Neill)	Limestone (McVay)
	Internal Friction Angle, ϕ	30	23	35	31	-
	Total Unit Weight (pcf), γ_t	105	90	115	110	120
	Subgrade Modulus (pci), k	14	5	32	20	-
	Undrained Shear Strength (psf), C_u	-	-	-	-	-
	Major Principal Strain @ ϵ_{s0}	-	-	-	-	-
	Major Principal Strain @ ϵ_{100}	-	-	-	-	-
	Average Undrained Shear Strength (psf)	-	-	-	-	-
Unconfined Compressive Strength (psf)	-	-	-	-	3600	
AXIAL	Soil Model	Driven Pile	Driven Pile	Driven Pile	Driven Pile	Driven Pile
	Total Unit Weight (pcf), γ_t	105	90	115	110	120
	Shear Modulus (ksi), G	1.0	1.2	1.5	1.2	13.5
	Poisson's ratio, ν	0.3	0.3	0.3	0.3	0.23
	Vertical Failure Shear Stress (psf)	-	-	-	-	-
	Undrained Shear Strength (psf), C_u	-	-	-	-	1800
	Ultimate Unit Skin Friction (psf)	304	380	532	380	540
	Mass Modulus (ksi)	-	-	-	-	-
	Modulus Ratio	-	-	-	-	-
	Surface (Rough/Smooth)					
	Unconfined Compressive Strength (psf)	-	-	-	-	3600
	Split Tensile Strength (psf)	-	-	-	-	-
	Concrete Unit Weight (pcf)	150	150	150	150	150
	Slump (in)	-	-	-	-	-
TORSIONAL	Soil Model	Hyperbolic	Hyperbolic	Hyperbolic	Hyperbolic	Hyperbolic
	Total Unit Weight (pcf), γ_t	105	120	120	120	120
	Internal Friction Angle, f	30	23	35	31	-
	Undrained Shear Strength (psf), C_u	-	-	-	-	1800
	Shear Modulus (ksi), G	1.0	1.2	1.5	1.2	13.5
	Torsional Shear Stress (psf)	304	380	532	380	540
TIP	Soil Model	Driven Pile	Driven Pile	Driven Pile	Driven Pile	Driven Pile
	Shear Modulus (ksi), G	1.0	1.2	1.5	1.2	13.5
	Poisson's ratio, ν	0.3	0.3	0.3	0.3	0.2
	Axial Bearing Failure, kips	205	256	358	256	778
	Uncorrected SPT-N Value (blows/ft)	8	10	14	10	27
	Undrained Shear Strength (psf), C_u	-	-	-	-	1800
	Ultimate Unit End Bearing (ksi)	0.4	0.4	0.6	0.4	1.4
	IGM Mass Modulus (ksi), E_m	-	-	-	-	-

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PRELIMINARY SOIL/ROCK PARAMETERS FOR FB-MULTIPIER INPUT

Reference Boring	BR-1 and BR-2
Foundation Location	SR 997 Bridge - End Bent
Ground Surface Elevation (ft)	N/A
Ground Water Depth(ft)	6.2 to 6.9

Foundation Type	Driven Pile
Size (inch)	30.00
Base Area (ft ²)	6.25

Layer No.	1	2	3	4	5
Soil Description	Sand	Sand	Sand	Sand	Limestone
Soil Type	COHESIONLESS	COHESIONLESS	COHESIONLESS	COHESIONLESS	ROCK
Top Boundary Depth (ft)	0.00	2.00	11.00	23.00	33.00
Bottom Boundary Depth (ft)	2.00	11.00	23.00	33.00	80.00
Average SPT N60-Value (Blows/ft)	8	10	14	10	38

LATERAL	Soil Model	Sand (O'Neill)	Sand (O'Neill)	Sand (O'Neill)	Sand (O'Neill)	Limestone (McVay)
	Internal Friction Angle, ϕ	30	23	35	31	-
	Total Unit Weight (pcf), γ_t	105	90	115	110	120
	Subgrade Modulus (pci), k	14	5	32	20	-
	Undrained Shear Strength (psf), C_u	-	-	-	-	-
	Major Principal Strain @ ϵ_{s0}	-	-	-	-	-
	Major Principal Strain @ ϵ_{100}	-	-	-	-	-
	Average Undrained Shear Strength (psf)	-	-	-	-	-
Unconfined Compressive Strength (psf)	-	-	-	-	5067	
AXIAL	Soil Model	Driven Pile	Driven Pile	Driven Pile	Driven Pile	Driven Pile
	Total Unit Weight (pcf), γ_t	105	90	115	110	120
	Shear Modulus (ksi), G	1.0	1.2	1.5	1.2	19.0
	Poisson's ratio, ν	0.3	0.3	0.3	0.3	0.23
	Vertical Failure Shear Stress (psf)	-	-	-	-	-
	Undrained Shear Strength (psf), C_u	-	-	-	-	2533
	Ultimate Unit Skin Friction (psf)	304	380	532	380	760
	Mass Modulus (ksi)	-	-	-	-	-
	Modulus Ratio	-	-	-	-	-
	Surface (Rough/Smooth)					
	Unconfined Compressive Strength (psf)	-	-	-	-	5067
	Split Tensile Strength (psf)	-	-	-	-	-
	Concrete Unit Weight (pcf)	150	150	150	150	150
	Slump (in)	-	-	-	-	-
TORSIONAL	Soil Model	Hyperbolic	Hyperbolic	Hyperbolic	Hyperbolic	Hyperbolic
	Total Unit Weight (pcf), γ_t	105	120	120	120	120
	Internal Friction Angle, f	30	23	35	31	-
	Undrained Shear Strength (psf), C_u	-	-	-	-	2533
	Shear Modulus (ksi), G	1.0	1.2	1.5	1.2	19.0
	Torsional Shear Stress (psf)	304	380	532	380	760
TIP	Soil Model	Driven Pile	Driven Pile	Driven Pile	Driven Pile	Driven Pile
	Shear Modulus (ksi), G	1.0	1.2	1.5	1.2	19.0
	Poisson's ratio, ν	0.3	0.3	0.3	0.3	0.2
	Axial Bearing Failure, kips	320	400	560	400	1710
	Uncorrected SPT-N Value (blows/ft)	8	10	14	10	38
	Undrained Shear Strength (psf), C_u	-	-	-	-	2533
	Ultimate Unit End Bearing (ksi)	0.4	0.4	0.6	0.4	1.9
	IGM Mass Modulus (ksi), E_m	-	-	-	-	-

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PRELIMINARY SOIL/ROCK PARAMETERS FOR FB-MULTIPIER INPUT

Reference Boring	BR-1 and BR-2
Foundation Location	SR 997 Bridge - Interior Bent
Ground Surface Elevation (ft)	N/A
Ground Water Depth(ft)	6.2 to 6.9

Foundation Type	Driven Pile
Size (inch)	18.00
Base Area (ft ²)	2.25

Layer No.	1	2
Soil Description	Sand	Limestone
Soil Type	COHESIONLESS	ROCK
Top Boundary Depth (ft)	23.00	33.00
Bottom Boundary Depth (ft)	33.00	80.00
Average SPT N60-Value (Blows/ft)	10	38

	Soil Model	Sand (O'Neill)	Limestone (McVay)
LATERAL	Internal Friction Angle, ϕ	31	-
	Total Unit Weight (pcf), γ_t	110	120
	Subgrade Modulus (pci), k	20	-
	Undrained Shear Strength (psf), C_u	-	-
	Major Principal Strain @ ϵ_{50}	-	-
	Major Principal Strain @ ϵ_{100}	-	-
	Average Undrained Shear Strength (psf)	-	-
	Unconfined Compressive Strength (psf)	-	5067
AXIAL	Soil Model	Driven Pile	Driven Pile
	Total Unit Weight (pcf), γ_t	110	120
	Shear Modulus (ksi), G	1.2	19.0
	Poisson's ratio, ν	0.3	4
	Vertical Failure Shear Stress (psf)	-	-
	Undrained Shear Strength (psf), C_u	-	2533
	Ultimate Unit Skin Friction (psf)	380	760
	Mass Modulus (ksi)	-	-
	Modulus Ratio	-	-
	Surface (Rough/Smooth)	-	-
	Unconfined Compressive Strength (psf)	-	5067
	Split Tensile Strength (psf)	-	-
	Concrete Unit Weight (pcf)	150	150
Slump (in)	-	-	
TORSIONAL	Soil Model	Hyperbolic	Hyperbolic
	Total Unit Weight (pcf), γ_t	110	120
	Internal Friction Angle, f	31	-
	Undrained Shear Strength (psf), C_u	-	2533
	Shear Modulus (ksi), G	1.2	19.0
	Torsional Shear Stress (psf)	380	760
TIP	Soil Model	Driven Pile	Driven Pile
	Shear Modulus (ksi), G	1.2	19.0
	Poisson's ratio, ν	0.3	4.0
	Axial Bearing Failure, kips	144	616
	Uncorrected SPT-N Value (blows/ft)	10	38
	Undrained Shear Strength (psf), C_u	-	2533
	Ultimate Unit End Bearing (ksi)	0.4	1.9
	IGM Mass Modulus (ksi), E_m	-	-

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PRELIMINARY SOIL/ROCK PARAMETERS FOR FB-MULTIPIER INPUT

Reference Boring	BR-1 and BR-2
Foundation Location	SR 997 Bridge - Interior Bent
Ground Surface Elevation (ft)	N/A
Ground Water Depth(ft)	6.2 to 6.9

Foundation Type	Driven Pile
Size (inch)	24.00
Base Area (ft ²)	4

Layer No.	1	2
Soil Description	Sand	Limestone
Soil Type	COHESIONLESS	ROCK
Top Boundary Depth (ft)	23.00	33.00
Bottom Boundary Depth (ft)	33.00	80.00
Average SPT N60-Value (Blows/ft)	10	38

	Soil Model	Sand (O'Neill)	Limestone (McVay)
LATERAL	Internal Friction Angle, ϕ	31	-
	Total Unit Weight (pcf), γ_t	110	120
	Subgrade Modulus (pci), k	20	-
	Undrained Shear Strength (psf), C_u	-	-
	Major Principal Strain @ ϵ_{s0}	-	-
	Major Principal Strain @ ϵ_{100}	-	-
	Average Undrained Shear Strength (psf)	-	-
	Unconfined Compressive Strength (psf)	-	5067
AXIAL	Soil Model	Driven Pile	Driven Pile
	Total Unit Weight (pcf), γ_t	110	120
	Shear Modulus (ksi), G	1.2	19.0
	Poisson's ratio, ν	0.3	4
	Vertical Failure Shear Stress (psf)	-	-
	Undrained Shear Strength (psf), C_u	-	2533
	Ultimate Unit Skin Friction (psf)	380	760
	Mass Modulus (ksi)	-	-
	Modulus Ratio	-	-
	Surface (Rough/Smooth)	-	-
	Unconfined Compressive Strength (psf)	-	5067
	Split Tensile Strength (psf)	-	-
	Concrete Unit Weight (pcf)	150	150
Slump (in)	-	-	
TORSIONAL	Soil Model	Hyperbolic	Hyperbolic
	Total Unit Weight (pcf), γ_t	110	120
	Internal Friction Angle, f	31	-
	Undrained Shear Strength (psf), C_u	-	2533
	Shear Modulus (ksi), G	1.2	19.0
	Torsional Shear Stress (psf)	380	760
TIP	Soil Model	Driven Pile	Driven Pile
	Shear Modulus (ksi), G	1.2	19.0
	Poisson's ratio, ν	0.3	4.0
	Axial Bearing Failure, kips	256	1094
	Uncorrected SPT-N Value (blows/ft)	10	38
	Undrained Shear Strength (psf), C_u	-	2533
	Ultimate Unit End Bearing (ksi)	0.4	1.9
	IGM Mass Modulus (ksi), E_m	-	-

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PRELIMINARY SOIL/ROCK PARAMETERS FOR FB-MULTIPIER INPUT

Reference Boring	BR-1 and BR-2
Foundation Location	SR 997 Bridge - Interior Bent
Ground Surface Elevation (ft)	N/A
Ground Water Depth(ft)	6.2 to 6.9

Foundation Type	Driven Pile
Size (inch)	30.00
Base Area (ft ²)	6.25

Layer No.	1	2
Soil Description	Sand	Limestone
Soil Type	COHESIONLESS	ROCK
Top Boundary Depth (ft)	23.00	33.00
Bottom Boundary Depth (ft)	33.00	80.00
Average SPT N60-Value (Blows/ft)	10	38

	Soil Model	Sand (O'Neill)	Limestone (McVay)
LATERAL	Internal Friction Angle, ϕ	31	-
	Total Unit Weight (pcf), γ_t	110	120
	Subgrade Modulus (pci), k	20	-
	Undrained Shear Strength (psf), C_u	-	-
	Major Principal Strain @ ϵ_{50}	-	-
	Major Principal Strain @ ϵ_{100}	-	-
	Average Undrained Shear Strength (psf)	-	-
	Unconfined Compressive Strength (psf)	-	5067
AXIAL	Soil Model	Driven Pile	Driven Pile
	Total Unit Weight (pcf), γ_t	110	120
	Shear Modulus (ksi), G	1.2	19.0
	Poisson's ratio, ν	0.3	0.23
	Vertical Failure Shear Stress (psf)	-	-
	Undrained Shear Strength (psf), C_u	-	2533
	Ultimate Unit Skin Friction (psf)	380	760
	Mass Modulus (ksi)	-	-
	Modulus Ratio	-	-
	Surface (Rough/Smooth)	-	-
	Unconfined Compressive Strength (psf)	-	5067
	Split Tensile Strength (psf)	-	-
	Concrete Unit Weight (pcf)	150	150
Slump (in)	-	-	
TORSIONAL	Soil Model	Hyperbolic	Hyperbolic
	Total Unit Weight (pcf), γ_t	110	120
	Internal Friction Angle, f	31	-
	Undrained Shear Strength (psf), C_u	-	2533
	Shear Modulus (ksi), G	1.2	19.0
	Torsional Shear Stress (psf)	380	760
TIP	Soil Model	Driven Pile	Driven Pile
	Shear Modulus (ksi), G	1.2	19.0
	Poisson's ratio, ν	0.3	0.2
	Axial Bearing Failure, kips	400	1710
	Uncorrected SPT-N Value (blows/ft)	10	38
	Undrained Shear Strength (psf), C_u	-	2533
	Ultimate Unit End Bearing (ksi)	0.4	1.9
	IGM Mass Modulus (ksi), E_m	-	-

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Reference Boring	BR-1 and BR-2	Foundation Type	ACIP
Foundation Location	SR 997 Bridge	Size (inch)	24.00
Ground Water Depth(ft)	6.2 to 6.9		

Layer No.	1	2	3	4	5
Soil Description	Sand	Sand	Sand	Sand	Limestone
Soil Type	COHESIONLESS	COHESIONLESS	COHESIONLESS	COHESIONLESS	ROCK
Top Boundary Depth (ft)	0.00	2.00	11.00	23.00	33.00
Bottom Boundary Depth (ft)	2.00	11.00	23.00	33.00	-63.90
Average SPT N60-Value (Blows/ft)	24	10	14	10	38

LATERAL	Soil Model	Sand (O'Neill)	Sand (O'Neill)	Sand (O'Neill)	Sand (O'Neill)	Limestone (McVay)
	Internal Friction Angle, ϕ	34	23	35	31	-
	Total Unit Weight (pcf), γ_t	115	90	120	110	120
	Subgrade Modulus (pci), k	62	5	32	20	-
	Undrained Shear Strength (psf), C_u	-	-	-	-	-
	Major Principal Strain @ ϵ_{50}	-	-	-	-	-
	Major Principal Strain @ ϵ_{100}	-	-	-	-	-
	Average Undrained Shear Strength (psf)	-	-	-	-	-
Unconfined Compressive Strength (psf)	-	-	-	-	10000	
AXIAL	Soil Model	Drilled Shaft	Drilled Shaft	Drilled Shaft	Drilled Shaft	Drilled Shaft
	Total Unit Weight (pcf), γ_t	115	90	120	110	120
	Shear Modulus (ksi), G	2.1	1.2	1.5	1.2	19.0
	Poisson's ratio, ν	0.3	0.3	0.3	0.3	0.23
	Vertical Failure Shear Stress (psf)	-	-	-	-	-
	Undrained Shear Strength (psf), C_u	-	-	-	-	5000
	Ultimate Unit Skin Friction (psf)	72	207	924	1047	7600
	Mass Modulus (ksi)	-	-	-	-	-
	Modulus Ratio	-	-	-	-	-
	Surface (Rough/Smooth)					
	Unconfined Compressive Strength (psf)	-	-	-	-	10000
	Split Tensile Strength (psf)	-	-	-	-	-
	Concrete Unit Weight (pcf)	150	150	150	150	150
Slump (in)	-	-	-	-	-	
TORSIONAL	Soil Model	Hyperbolic	Hyperbolic	Hyperbolic	Hyperbolic	Hyperbolic
	Total Unit Weight (pcf), γ_t	115	120	120	120	120
	Internal Friction Angle, f	34	23	35	31	-
	Undrained Shear Strength (psf), C_u	-	-	-	-	5000
	Shear Modulus (ksi), G	2.1	1.2	1.5	1.2	19.0
	Torsional Shear Stress (psf)	72	207	924	1047	7600
TIP	Soil Model	Drilled Shaft	Drilled Shaft	Drilled Shaft	Drilled Shaft	Drilled Shaft
	Shear Modulus (ksi), G	2.1	1.2	1.5	1.2	19.0
	Poisson's ratio, ν	0.3	0.3	0.3	0.3	0.2
	Axial Bearing Failure, kips	-	-	-	-	-
	Uncorrected SPT-N Value (blows/ft)	24	10	14	10	38
	Undrained Shear Strength (psf), C_u	-	-	-	-	5000
	Ultimate Unit End Bearing (ksi)	-	-	-	-	-
IGM Mass Modulus (ksi), E_m	-	-	-	-	-	

APPENDIX “D”

FHWA Geotechnical Report Checklist



GEOTECHNICAL REPORT REVIEW CHECKLISTS

The following checklists cover the major information and recommendations which should be addressed in project geotechnical reports.

Section A covers site investigation information which will be common to all geotechnical reports for any type of geotechnical feature.

Sections B through I cover the basic information and recommendations which should be presented in geotechnical reports for specific geotechnical features: centerline cuts and embankments, embankments over soft ground, landslides, retaining walls, structure foundations and material sites.

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In most sections and subsections, the user has been provided supplemental page references to the Soils and Foundations Workshop Manual. These page numbers appear in parentheses () immediately adjacent to the section or subsection topic. Generalist engineers are particularly encouraged to read these references. Additional reference information on these topics is available in the Geotechnical Notebook, a copy of which is kept in all Division Offices by either the Bridge Engineer or the engineer with the soils responsibility.

Certain checklist items are of vital importance to have been included in the geotechnical report. These checklist items have been marked with an asterisk (*). A negative response to any of these asterisked items is cause to contact the geotechnical engineer for clarification of this omission.

"GTR REVIEW CHECKLIST" (SITE INVESTIGATION)

A. Site Investigation Information

Since the most important step in the geotechnical design process is the conduct of an adequate site investigation, presentation of the subsurface information in the geotechnical report and on the plans deserves careful attention.

Geotechnical Report Text (Introduction)
(Pages 322-325)

	<u>Yes</u>	<u>No</u>	<u>Unknown or N/A</u>
1. Is the general location of the investigation described and/or vicinity map included?	<u>X</u>		
2. Is scope and purpose of the investigation summarized?	<u>X</u>		
3. Is concise description given of geologic setting and topography of area?	<u>X</u>		
4. Are the field explorations and laboratory tests on which the report is based listed?	<u>X</u>		
5. Is general description of subsurface soil, rock, and groundwater conditions given?	<u>X</u>		
*6. Is the following information included with the geotechnical report (typically included in report appendices):			
a. Test hole logs? (Pages 25-33)	<u>X</u>		
b. Field test data?	<u>X</u>		
c. Laboratory test data? (Pages 74-75)	<u>X</u>		
d. Photographs (if pertinent)?	<u>X</u>		

Plan and Subsurface Profile (Pages 24, 47-49, 335)

*7. Is a plan and subsurface profile of the investigation site provided?	<u>X</u>		
--	----------	--	--

* A response other than (yes) or (N/A) for any of these checklist questions is cause to contact the appropriate geotechnical engineer for a clarification and/or to discuss the project.

A.	<u>Site Investigation Information (Cont.)</u>	<u>Yes</u>	<u>No</u>	<u>Unknown or N/A</u>
	8. Are the field explorations located on the plan view?	<u>X</u>		
	*9. Does the conducted site investigation meet minimum criteria outlined in Table 2?	<u>X</u>		
	10. Are the explorations plotted and correctly numbered on the profile at their true elevation and location?	<u>X</u>		
	11. Does the subsurface profile contain a word description and/or graphic depiction of soil and rock types?	<u>X</u>		
	12. Are groundwater levels and data measured shown on the subsurface profile?	<u>X</u>		
	<u>Subsurface Profile or Field Boring Log</u> (Pages 16-17, 25-29)			
	13. Are sample types and depths noted?	<u>X</u>		
	*14. Are SPT blow counts, percent core recovery, and RQD values shown?	<u>X</u>		
	15. If cone penetration tests were made, are plots of cone resistance and friction ratio shown with depth?	---	---	<u>X</u>
	<u>Laboratory Test Data (Pages 60, 74-75)</u>			
	*16. Were lab soil classification tests such as natural moisture content, gradation, Atterberg limits, performed on selected representative samples to verify field visual soil identifications?	<u>X</u>		
	17. Are laboratory test results such as shear strength (Page 62), consolidation (Page 68), etc., included and/or summarized?	---	---	<u>X</u>

* A response other than (yes) or (N/A) for any of these checklist questions is cause to contact the appropriate geotechnical engineer for a clarification and/or to discuss the project.

"GTR REVIEW CHECKLIST" (CENTERLINE CUTS AND EMBANKMENTS)

B. Centerline Cuts and Embankments (Pages 6-9)

In addition to the basic information listed in Section A, is the following information provided in the project geotechnical report?

Are station to station descriptions included for:	<u>Yes</u>	<u>No</u>	<u>Unknown or N/A</u>
1. Existing surface and subsurface drainage?	___	___	<u>X</u>
2. Evidence of springs and excessively wet areas?	___	___	<u>X</u>
3. Slides, slumps, and faults noted along the alignment?	___	___	<u>X</u>
Are station to station <u>recommendations</u> included for the following:			
<u>General Soil Cut or Fill</u>			
4. Specific surface/subsurface drainage recommendations.	___	___	<u>X</u>
5. Excavation limits of unsuitable materials?	___	___	<u>X</u>
*6. Erosion protection measures for backslopes, side slopes, and ditches, including riprap recommendations or special slope treatments?	___	___	<u>X</u>
<u>Soil Cuts</u> (Pages 101-102)			
*7. Recommended cut slope design?	___	___	<u>X</u>
8. Are clay cut slopes designed for minimum F.S. = 1.50?	___	___	<u>X</u>
9. Special usage of excavated soils?	___	___	<u>X</u>
10. Estimated shrink-swell factors for excavated materials?	___	___	<u>X</u>
11. If answer to 3 is <u>yes</u> , are recommendations	___	___	<u>X</u>

* A response other than (yes) or (N/A) for any of these checklist questions is cause to contact the appropriate geotechnical engineer for a clarification and/or to discuss the project.

B. <u>Centerline Cuts and Embankments (Cont.)</u>	<u>Yes</u>	<u>No</u>	<u>Unknown or N/A</u>
<u>Fills (Pages 77-79)</u>			
11. Recommended fill slope design?	___	___	<u>X</u>
12. Will fill slope design provide minimum F.S. = 1.25?	___	___	<u>X</u>
<u>Rock Slopes</u>			
*13. Are recommended slope designs and blasting specifications provided?	___	___	<u>X</u>
*14. Is the need for special rock slope stabilization measures, e.g., rockfall catch ditch, wire mesh slope protection, shotcrete, rock bolts, addressed?	___	___	<u>X</u>
15. Has the use of "template" designs been avoided (such as designing all rock slopes on 1/4 to 1 rather than designing based on orientation of major rock jointing)?	___	___	<u>X</u>
*16. Have effects of blast induced vibrations on adjacent structures been evaluated?	___	___	<u>X</u>

* A response other than (yes) or (N/A) for any of these checklist questions is cause to contact the appropriate geotechnical engineer for a clarification and/or to discuss the project.

THIS SECTION IS NOT APPLICABLE TO THE PROJECT
"GTR REVIEW CHECKLIST" (EMBANKMENTS OVER SOFT GROUND)

C. Embankments over Soft Ground

Where embankments must be built over soft ground (such as soft clays, organic silts, or peat), stability and settlement of the fill should be carefully evaluated. In addition to the basic information listed in Section A, is the following information provided in the project geotechnical report?

Embankment Stability (Pages 77-79, 95-97)

Yes No Unknown
or N/A

- *1. Has the stability of the embankment been evaluated for minimum safety factors of 1.25 for side slope stability and 1.30 for end slope stability of bridge approach embankments?
- *2. Has the shear strength of the foundation soil been determined from lab testing and/or field vane shear or static cone penetrometer tests?
- *3. If the proposed embankment does not provide minimum factors of safety given above, are recommendations given for feasible treatment alternates which will increase factor of safety to minimum acceptable (such as change alignment, lower grade, use stabilizing counterberms, excavate and replace weak subsoil, fill stage construction, lightweight fill, geotextile fabric reinforcement, etc.)?
- *4. Are cost comparisons of treatment alternates given and a specific alternate recommended?

Settlement of Subsoil (Pages 146-160)

- 5. Have consolidation properties of fine grained soils been determined from laboratory consolidation tests?
- *6. Have settlement amount and settlement time been estimated?
- 7. For bridge approach embankments, are recommendations made to get the settlement out before the bridge abutment is constructed (waiting period, surcharge, or wick drains)?

* A response other than (yes) or (N/A) for any of these checklist questions is cause to contact the appropriate geotechnical engineer for a clarification and/or to discuss the project.

THIS SECTION IS NOT APPLICABLE TO THE PROJECT

- | | <u>Yes</u> | <u>No</u> | <u>Unknown
or N/A</u> |
|---|------------|-----------|---------------------------|
| C. <u>Embankments Over Soft Ground (Cont.)</u> | | | |
| 8. If geotechnical instrumentation is proposed to monitor fill stability and settlement, are detailed recommendations provided on the number, type, and specific locations of the proposed instruments? | | | |
| 9. <u>Construction Considerations (Pages 183, 331-334)</u> | | | |
| a. If excavation and replacement of unsuitable shallow surface deposits (peat, muck, topsoil) is recommended. Are vertical and lateral limits of recommended excavation provided? | | | |
| b. Where a surcharge treatment is recommended, are plan and cross-section of surcharge treatment provided in geotechnical report for benefit of the roadway designer? | | | |
| c. Are instructions or specifications providing concerning instrumentation, fill placement rates and estimated delay times for the contractor? | | | |
| d. Are recommendations provided for disposal of surcharge material after the settlement period is complete? | | | |

* A response other than (yes) or (N/A) for any of these checklist questions is cause to contact the appropriate geotechnical engineer for a clarification and/or to discuss the project.

THIS SECTION IS NOT APPLICABLE TO THE PROJECT
GTR REVIEW CHECKLIST" (LANDSLIDE CORRECTIONS)

D. Landslide Corrections (Pages 77-80, 103-105)

In addition to the basic information listed in Section A, is the following information provided in the landslide study geotechnical report? (Refer to Table 4 for guidance on the necessary technical support data for correction of slope instabilities)

Yes No Unknown
or N/A

- *1. Is a site plan and scaled cross-section provided showing ground surface conditions both before and after failure?
- *2. Is the past history of the slide area summarized - including movement history, summary of maintenance work and costs, and previous corrective measures taken (if any)?
- *3. Is a summary given of results of site investigation, field and lab testing, and stability analysis, including cause(s) of the slide?

Plan

- 4. Are detailed slide features - including locations of ground surface cracks, head scarp, and toe bulge - shown on the site plan?

Cross Section

- *5. Are the cross sections used for stability analysis included with the soil profile, water table, soil unit weights, soil shear strengths, and failure plane shown as it exists?
- 6. Is slide failure plane location determined from slope indicators?
- *7. For an active slide, was soil strength along the slide failure plane backfigured using a safety factor equal to 1.0 at the time of failure?

* A response other than (yes) or (N/A) for any of these checklist questions is cause to contact the appropriate geotechnical engineer for a clarification and/or to discuss the project.

D. Landslide Corrections (Cont.)

Yes No Unknown
or N/A

Text

- *8. Is the following information presented for each proposed correction alternate: (typical correction methods include buttress, shear key, rebuild slope, surface drainage, subsurface drainage-interceptor, drain trenches or horizontal drains and retaining structures)?
 - a. Cross-section of proposed alternate?
 - b. Estimated safety factor?
 - c. Estimated cost?
 - d. Advantages and disadvantages?
9. Is a recommended correction alternate(s) given which provide a minimum F.S. = 1.25?
10. If horizontal drains are proposed as part of slide correction, has subsurface investigation located definite water bearing strata that can be tapped with horizontal drains?
11. If a toe counterberm is proposed to stabilize an active slide, has field investigation confirmed that the toe of the existing slide does not extend beyond the toe of the proposed counterberm?
12. Construction Considerations
 - a. Where proposed correction will require excavation into the toe of an active slide (such as for buttress or shear key), has the "during construction backslope F.S." with open excavation been determined?
 - b. If open excavation F.S. is near 1.0, has excavation stage construction been proposed?
 - c. Has seasonal fluctuation of groundwater table been considered?
 - d. Are special construction features, techniques and materials described and specified?

* A response other than (yes) or (N/A) for any of these checklist questions is cause to contact the appropriate geotechnical engineer for a clarification and/or to discuss the project.

THIS SECTION IS NOT APPLICABLE TO THE PROJECT
"GTR REVIEW CHECKLIST" (RETAINING WALLS)

E. Retaining Walls (See Section 5 of "Geotechnical Engineering Notebook")

In addition to the basic information listed in Section A, is the following information provided in the project geotechnical report?

Yes No Unknown
or N/A

- *1. Does the geotechnical report include recommended soil strength parameters and groundwater elevation for use in computing wall design lateral earth pressures and factor of safety for overturning, sliding, and external slope stability?
- 2. Is it proposed to bid alternate wall designs?
- *3. Are acceptable reasons given for the choice and/or exclusion of certain wall types (gravity, reinforced soil, tieback, cantilever, etc.)?
- *4. Is an analysis of the wall stability included with minimum acceptable factors of safety against overturning (F.S. = 2.0), sliding (F.S. = 1.5), and external slope stability (F.S. = 1.5)?
- 5. If wall will be placed on compressible foundation soils, is estimated total settlement, differential settlement, and time rate of settlement given?
- 6. Will wall types selected for compressible foundation soils allow differential movement without distress?
- 7. Are wall drainage details including materials and compaction provided?
- 8. Construction Considerations:
 - a. Are excavation requirements covered - safe slopes for open excavations, need for sheeting or shoring?
 - b. Fluctuation of groundwater table?

* A response other than (yes) or (N/A) for any of these checklist questions is cause to contact the appropriate geotechnical engineer for a clarification and/or to discuss the project.

THIS SECTION IS NOT APPLICABLE TO THE PROJECT

"GTR REVIEW CHECKLIST" (SPREAD FOOTINGS)

F. Structure Foundations - Spread Footings (Pages 191-205)

In addition to the basic information listed in Section A, is the following information provided in the project foundation report?

- | | <u>Yes</u> | <u>No</u> | <u>Unknown
or N/A</u> |
|---|------------|-----------|---------------------------|
| *1. Are spread footings recommended for foundation support? If not, are reasons for not using them discussed. | | | |
| *2. Is recommended bottom of footing elevation and reason for recommendation (e.g., based on frost depth, estimated scour depth, or depth to competent bearing material) given? | | | |
| *3. Is recommended allowable soil or rock bearing pressure given? | | | |
| *4. Is estimated footing settlement and time given? | | | |
| *5. Where spread footings are recommended to support abutments placed in the bridge end fills, are special gradation and compaction requirements provided for select end fill and backwall drainage material? (Pages 137-141) | | | |
| 6. <u>Construction Considerations:</u> | | | |
| a. Have the materials been adequately described on which the footing is to be placed so the project inspector can verify that material is as expected? | | | |
| b. Have excavation requirements been included for safe slopes in open excavations, need for sheeting or shoring, etc.? | | | |
| c. Has fluctuations of the groundwater table been addressed? | | | |

* A response other than (yes) or (N/A) for any of these checklist questions is cause to contact the appropriate geotechnical engineer for a clarification and/or to discuss the project.

THIS SECTION IS NOT APPLICABLE TO THE PROJECT
"GTR REVIEW CHECKLIST" (PILE FOUNDATIONS)

G. Structure Foundations - Piles (Pages 224-311)

In addition to the basic information listed in Section A, if pile support is recommended or given as an alternate, conclusions/recommendations should be provided in the project geotechnical report for the following:

- | | <u>Yes</u> | <u>No</u> | <u>Unknown
or N/A</u> |
|--|------------|-----------|---------------------------|
| *1. Is the recommended pile type given (displacement, nondisplacement, pipe pile, concrete pile, H-pile, etc.) with valid reasons given for choice and/or exclusion? (Pages 224-226) | | | |
| 2. Do you consider the recommended pile type(s) to be the most suitable and economical? | | | |
| *3. Are estimated pile lengths and estimated tip elevations given for the recommended allowable pile design loads? | | | |
| 4. Do you consider the recommended design loads to be reasonable? | | | |
| 5. Has pile group settlement been estimated (only of practical significance for friction pile groups ending in cohesive soil)? (Pages 245-247) | | | |
| 6. If a specified or minimum pile tip elevation is recommended, is a clear reason given for the required tip elevation, such as underlying soft layers, scour, downdrag, piles uneconomically long, etc.? | | | |
| *7. Has design analysis (wave equation analysis) verified that the recommended pile section can be driven to the estimated or specified tip elevation without damage (especially applicable where dense gravel-cobble-boulder layers or other obstructions have to be penetrated)? | | | |
| 8. Where scour piles are required, have pile design and driving criteria been established based on mobilizing the full pile design capacity below the scour zone? | | | |

* A response other than (yes) or (N/A) for any of these checklist questions is cause to contact the appropriate geotechnical engineer for a clarification and/or to discuss the project.

- | G. <u>Pile Foundations (Cont.)</u> | <u>Yes</u> | <u>No</u> | <u>Unknown
or N/A</u> |
|---|------------|-----------|---------------------------|
| 9. | | | |
| Where lateral load capacity of large diameter piles is an important design consideration, are p-y curves (load vs. deflection) or soil parameters given in the geotechnical report to allow the structural engineer to evaluate lateral load capacity of all piles? | | | |
| *10. | | | |
| For pile supported bridge abutments over soft ground: | | | |
| a. | | | |
| Has abutment pile downdrag load been estimated and solutions such as bitumen coating considered in design? Not generally required if surcharging of the fill is being performed. (Pages 248-251) | | | |
| b. | | | |
| Is bridge approach slab recommended to moderate differential settlement between bridge ends and fill? | | | |
| c. | | | |
| If the majority of subsoil settlement will not be removed prior to abutment construction (by surcharging), has estimate been made of the amount of abutment rotation that can occur due to lateral squeeze of soft subsoil? (Pages 114-115) | | | |
| d. | | | |
| Does the geotechnical report specifically alert the structural designer to the estimated horizontal abutment movement? | | | |
| 11. | | | |
| If bridge project is large, has pile load test program been recommended? (Pages 229-302) | | | |
| 12. | | | |
| For a major structure in high seismic risk area, has assessment been made of liquefaction potential of foundation soil during design earthquake (note: only loose saturated sands and silts are "susceptible" to liquefaction)? | | | |

*A response other than (yes) or (N/A) for any of these checklist questions is cause to contact the appropriate geotechnical engineer for clarification and/or to discuss the project.

G. Pile Foundations (Cont.)

Yes No Unknown
or N/A

13. Construction Considerations: (Pages 279-311)

Have the following important construction considerations been adequately addressed?

- a. Pile driving details such as: boulders, or obstructions which may be encountered during driving - need for preaugering, jetting, spudding, need for pile tip reinforcement, driving shoes, etc.?
- b. Excavation requirements - safe slope for open excavations, need for sheeting or shoring? Fluctuation of groundwater table?
- c. Have effects of pile driving operation on adjacent structures been evaluated such as protection against damage caused by footing excavations or pile driving vibrations?
- d. Is preconstruction condition survey to be made of adjacent structures to prevent unwarranted damage claims?
- e. On large pile driving projects have other methods of pile driving control been considered such as dynamic testing or wave equation analysis?

THIS SECTION IS NOT APPLICABLE TO THE PROJECT

"GTR REVIEW CHECKLIST" (DRILLED SHAFTS)

H. Structure Foundations - Drilled Shafts (Pages 252-260)

In addition to the basic information listed in Section A, if drilled shaft support is recommended or given as an alternate, are conclusions/recommendations provided in the project foundation report for the following:

Yes No Unknown
or N/A

- *1. Are recommended shaft diameter(s) and length(s) for allowable design loads based on an analysis using soil parameters for side friction and end bearing?
- *2. Settlement estimated for recommended design load?
- *3. Where lateral load capacity of shaft is an important design consideration, are P-Y (load vs. deflection) curves or soils data provided in geotechnical report which will allow structural engineer to evaluate lateral load capacity of shaft?
- 4. Is static load test (to plunging failure) recommended?
- 5. Construction Considerations:
 - a. Have construction methods been evaluated, i.e., can less expensive dry method or slurry method be used or will casing be required?
 - b. If casing will be required, can casing be pulled as shaft is concreted (this can result in significant cost savings or very large diameter shafts)?
 - c. If artesian water was encountered in explorations, have design provisions been included to handle it (such as by requiring casing and tremie seal)?
 - d. Will boulders be encountered? (Note: If boulders will be encountered, then the use of shafts should be seriously questioned due to construction installation difficulties and resultant higher cost the boulders can cause.)

* A response other than (yes) or (N/A) for any of these checklist questions is cause to contact the appropriate geotechnical engineer for a clarification and/or to discuss the project.

THIS SECTION IS NOT APPLICABLE TO THE PROJECT

"GTR REVIEW CHECKLIST" (MATERIAL SITES)

I. Material Sites

In addition to the basic information listed in Section A, is the following information provided in the project Material Site Report?:

Yes No Unknown
or N/A

1. Material site location, including description of existing or proposed access routes and bridge load limits (if any)?
- *2. Have soil samples representative of all materials encountered during the pit investigation been submitted and tested?
- *3. Are laboratory quality test results included in the report?
4. For aggregate sources, do the laboratory quality test results (such as L.A. abrasion, sodium sulfate, degradation, absorption, reactive aggregate, etc.) indicate if specification materials can be obtained from the deposit using normal processing methods?
5. If the lab quality test results indicate that specification material cannot be obtained from the pit materials as they exist naturally - has the source been rejected or are detailed recommendations provided for processing or controlling production so as to ensure a satisfactory product.
- *6. For soil borrow sources, have possible difficulties been noted - such as above optimum moisture content clay-silt soils, waste due to high PI, boulders, etc?
- *7. Where high moisture content clay-silt soils must be used, are recommendations provided on the need for aeration to allow the materials to dry out sufficiently to meet compaction requirements?
8. Are estimated shrink-swell factors provided?

* A response other than (yes) or (N/A) for any of these checklist questions is cause to contact the appropriate geotechnical engineer for a clarification and/or to discuss the project,

I. Material Sites (Cont.)

Yes

No

Unknown
or N/A

- *9. Do the proven material site quantities satisfy the estimated project quantity needs?
10. Where materials will be excavated from below the water table, has seasonal fluctuation of the water table been determined?
11. Are special permit requirements covered?
12. Have pit reclamation requirements been covered adequately?
13. Has a material site sketch (plan and profile) been provided for inclusion in the plans, which contains:
- Material site number?
 - North arrow and legal subdivision?
 - Test hole or test pit logs, location, number and date?
 - Water table elevation and date?
 - Depth of unsuitable overburden which will have to be stripped?
 - Suggested overburden disposal area?
 - Proposed mining area and previously mined areas?
 - Existing stockpile locations?
 - Existing or suggested access roads?
 - Bridge load limits?
 - Reclamation details?
14. Are recommended special provisions provided?

* A response other than (yes) or (N/A) for any of these checklist questions is cause to contact the appropriate geotechnical engineer for a clarification and/or to discuss the project.

APPENDIX C

Bridge Inspection Report



Submittal Date: **4/26/2021**
 Days since Inspection: **5**
 Expected Date: **6/5/2021**

Structure ID: **870633**

Insp. Date: **4/21/2021**

Distric Six Structures Maintenance Office

Insp. Type(s): **Routine**

QA/QC Inspection Report Sheet

NBI Ratings:	Deck	Super	Sub	Channel	WW
New:	7	6	8	7	7
Previous:	7	6	8	7	7

T/L CBI Name: **Josue Sanchez**

Date: **4/26/2021**

Initials: *JS*

Senior CBI Name: **Martha Trujillo**

Date:

04/26/2021

INSP. RECOMMENDATION section is missing. There are elements with CS3 and CS4 deficiencies. Please review and correct.

Daniel Burgos Initials are missing. *Daniel is a diver that works for Marlin, he was sent to help us dive.* **-Corrected**

Add Insp. Recomm. for photo #7. **Corrected**

Initials: **MT**

Load Rating Verified: **Giuseppe Noto**

Load Rating Summary is correct.

Date: 06/01/2021

Initials: *G.N.*

Previous NBI Lead Inspector	Cover sheet	Validation	NBI Ratings updated (Y or N)	Element Quantities	Element Environment	Work Order Recommendations	Structure Notes	Inspection Notes	Photo Deficiencies	Inventory Pictures (PBS)	Comprehensive Inv. (CIDR)	Bridge Group: N/A	LRS Inventory Route (13)	Kilometer / Mile Point (11)	Future ADT Year (115)	Latitude (16) & Longitude (17)	Channel Profile	Next Inspection Date (Page)	Underwater (BRM)	Load Ratings Data Verified	Items (58,59,60,61 & 71) ≥ 5	Posting (Item 70) => 5	Schedule F	FC or Other Addendums	Sufficiency Rating (> 50)	Prior Sufficiency Rating	Sufficiency Rating Difference	Flag ¹	COMMENTS:
DM	✓	✓	N	✓	✓	✓	✓	✓	✓	✓	✓	N/A	✓	✓	✓	✓	Y	✓	Y	✓	✓	✓	✓	N/A	75.2	75.3	-0.10	N/A	

Report Generated by:
David Madera

Final Approval by: Pablo Orozco

Supervisor Name: **Pablo Orozco**

Date: **6/3/2021**

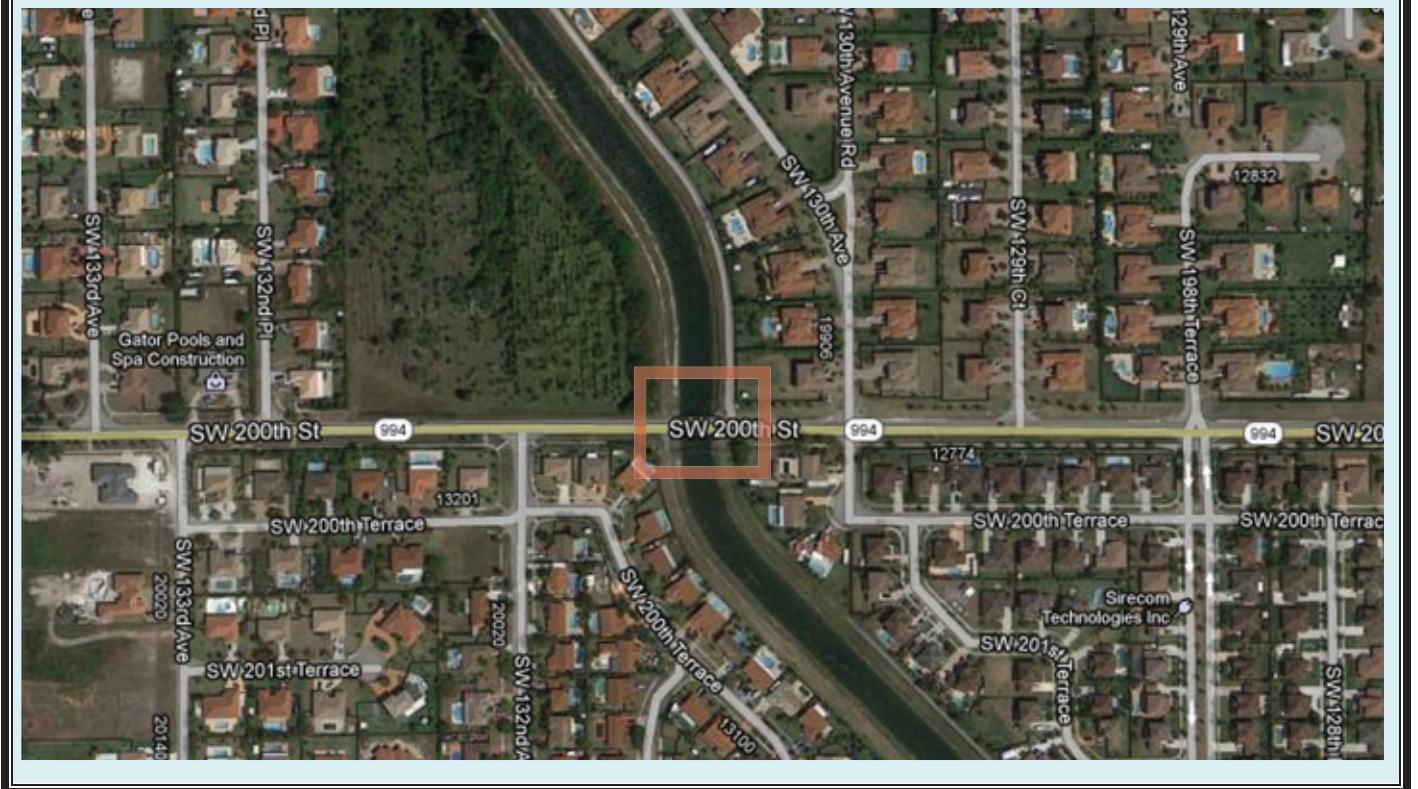
- No comments.

Initials: *PO*

Notes 1: for S. Ratings <= 50 or S. Rating difference >= 10.



STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE RECORD



BRIDGE #: **870633**

BRIDGE LOCATION: **SR 994 (SW 200st) OVER BLACK CREEK CANAL C-1-W**

**FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Inspection**

Structure ID: 870633

DISTRICT: D6 - Miami

INSPECTION DATE: 4/21/2021 USWM

BY: FDOT	STRUCTURE NAME: SW 200 ST OVER BLACK CK
OWNER: 1 State Highway Agency	YEAR BUILT: 1962
MAINTAINED BY: 1 State Highway Agency	SECTION NO.: 87 091 000
STRUCTURE TYPE: 5 Prestressed Concrete - 01 Slab	MP: 4.645
LOCATION: SW 130 Ave / SW 200 St	ROUTE: 00994
SERV. TYPE ON: 5 Highway-pedestrian	FACILITY CARRIED: SR-994 (SW 200 St)
SERV. TYPE UNDER: 5 Waterway	FEATURE INTERSECTED: BLACK CREEK CANAL C-1-W

 FUNCTIONALLY OBSOLETE STRUCTURALLY DEFICIENT

TYPE OF INSPECTION: Regular NBI

DATE FIELD INSPECTION WAS PERFORMED: ABOVE WATER: 4/21/2021 UNDERWATER: 4/21/2021

SUFFICIENCY RATING: 75.2
HEALTH INDEX: 99.91

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Inspection

Structure ID: 870633

DISTRICT: D6 - Miami

INSPECTION DATE: 4/21/2021 USWM

BY: FDOT	STRUCTURE NAME: SW 200 ST OVER BLACK CK
OWNER: 1 State Highway Agency	YEAR BUILT: 1962
MAINTAINED BY: 1 State Highway Agency	SECTION NO.: 87 091 000
STRUCTURE TYPE: 5 Prestressed Concrete - 01 Slab	MP: 4.645
LOCATION: SW 130 Ave / SW 200 St	ROUTE: 00994
SERV. TYPE ON: 5 Highway-pedestrian	FACILITY CARRIED: SR-994 (SW 200 St)
SERV. TYPE UNDER: 5 Waterway	FEATURE INTERSECTED: BLACK CREEK CANAL C-1-W

- THIS BRIDGE CONTAINS FRACTURE CRITICAL COMPONENTS
- THIS BRIDGE IS SCOUR CRITICAL
- THIS REPORT IDENTIFIES DEFICIENCIES WHICH REQUIRE PROMPT CORRECTIVE ACTION
- FUNCTIONALLY OBSOLETE
- STRUCTURALLY DEFICIENT

TYPE OF INSPECTION: Regular NBI

DATE FIELD INSPECTION WAS PERFORMED: ABOVE WATER: 4/21/2021 UNDERWATER: 4/21/2021

OVERALL NBI RATINGS:

DECK: 7 Good	CHANNEL: 7 Minor Damage
SUPERSTRUCTURE: 6 Satisfactory	CULVERT: N N/A (NBI)
SUBSTRUCTURE: 8 Very Good	SUFF. RATING: 75.2
PERF. RATING: Good	HEALTH INDEX: 99.91

FIELD PERSONNEL / TITLE / NUMBER:

INITIALS

Sanchez, Josue - Underwater Bridge Inspector (CBI#0494) (lead)

J

Madera, David - Bridge Inspector (CBI#0390)

DM

Yebra, Xavier - Assist Underwater Bridge Insp Trainee

xy

Burgos Daniel - Assist Underwater Bridge Ins Trainee

REVIEWING BRIDGE INSPECTION SUPERVISOR:

Trujillo, Martha - Bridge Inspector (CBI#00567)

MT

CONFIRMING REGISTERED PROFESSIONAL ENGINEER:

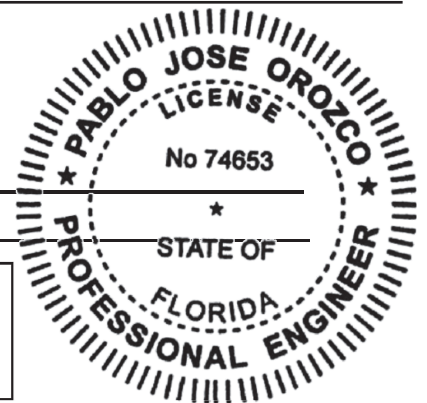
Orozco, Pablo - Project Manager (P.E. 74653) FDOT
1000 NW 111 Avenue

Miami FL 33172

SIGNATURE: _____

DATE: _____

The official record of this package has been electronically signed and sealed by Pablo J. Orozco, P.E. on the date adjacent to the seal as required by Rule 61G15-23.004, F.A.C.. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.



This report contains information relating to the physical security of a structure and depictions of the structure. This information is confidential and exempt from public inspection pursuant to sections 119.071(3)(a) and 119.071(3)(b), Florida Statutes. Only the cover page of this report may be inspected and copied.

**FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Inspection**

Structure ID: 870633

DISTRICT: D6 - Miami

INSPECTION DATE: 4/21/2021 USWM

All Elements

DECKS : Decks/Slabs

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8099 / 2	PS Conc Slab (Sonovoid)	3346.91	99.98	0.67	0.02	0	.	0	.	3347.58 (SF)
0	1080 / 2	Delamination/Spall/Patched Area	0.33	33.3	0.67	66.7	0	.	0	.	1 (SF)
0	510 / 2	Wearing Surfaces	2403	100	0	.	0	.	0	.	2403 sq.ft

Element Inspection Notes:

8099/2 NOTE:

There are no sign of movement between any of the sonovoid panels.

CS1:

There is vegetation growth between panels 7 and 8 at span 3. NEW (See Photo 1)

1080/2 UNDER SIDE:

CS2:

There is a delamination along panel 3-8 measuring (16 in. x 6 in.). SAME (See Photo 2)

510/2 Refer to Parent Element

DECKS : Joints

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	301 / 2	Pourable Joint Seal	104	92.86	8	7.14	0	.	0	.	112 ft
0	2350 / 2	Debris Impaction	0	.	8	100	0	.	0	.	8 ft

Element Inspection Notes:

301/2 Refer to defect element 2350.

2350/2 CS2:

There is dirt and debris accumulation along both shoulders. NEW (See Photo 3)

MISCELLANEOUS : Channel

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8290 / 2	Channel	1	100	0	.	0	.	0	.	1 (EA)

Element Inspection Notes:

8290/2 UNDERWATER INSPECTION 2017:

No deficiencies found.

MISCELLANEOUS : Other Elements

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	321 / 2	Re Conc Approach Slab	2192	97.86	24	1.07	0	.	24	1.07	2240 sq.ft
0	4000 / 2	Settlement	0	.	0	.	0	.	24	100	24 sq.ft
0	510 / 2	Wearing Surfaces	2216	98.93	24	1.07	0	.	0	.	2240 sq.ft

Element Inspection Notes:

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FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Inspection

Structure ID: 870633

DISTRICT: D6 - Miami

INSPECTION DATE: 4/21/2021 USWM

321/2 Refer to defect Element 4000.

4000/2 CS4:

Approach 1 right sidewalk is missing asphalt material measuring (8 ft. x 3 ft. x 2 in.),
 It's tripping hazardous. NEW (See Photo 4)

510/2 Refer to Parent Element

MISCELLANEOUS : Other Elements

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8475 / 2	R/Conc Walls	19	95	0	.	1	5	0	.	20 ft
0	1080 / 2	Delamination/Spall/Patched Area	0	.	0	.	1	100	0	.	1 ft

Element Inspection Notes:

8475/2 Refer to defect Element 1080.

1080/2 CS3:

The SE wingwall has a spall 8 in. x 6 in. x 2 in. along the top outer edge. NEW (See Photo 5)

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	215 / 2	Re Conc Abutment	75.46	100	0	.	0	.	0	.	75.46 ft

Element Inspection Notes:

215/2 _No deficiencies found.

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	226 / 2	Pre Conc Pile	12	100	0	.	0	.	0	.	12 (EA)

Element Inspection Notes:

226/2 UNDERWATER INSPECTION 2017:

No deficiencies found.

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	234 / 2	Re Conc Pier Cap	68.9	100	0	.	0	.	0	.	68.9 ft

Element Inspection Notes:

234/2 CS1:

Both bent caps have vegetation growth at the ends. SAME (See Photo 6)

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8396 / 2	Other Abutment Slope Protection	495.14	100	0	.	0	.	0	.	495.14 (SF)

Element Inspection Notes:

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**FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Inspection**

Structure ID: 870633

DISTRICT: D6 - Miami

INSPECTION DATE: 4/21/2021 USWM

8396/2 Note: This element refers to sand and cement bags.

UNDERWATER INSPECTION 2017:

No deficiencies found.

SUPERSTRUCTURE : Bearings

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	310 / 2	Elastomeric Bearing	6	100	0	.	0	.	0	.	6 each

Element Inspection Notes:

310/2 _No deficiencies noted.

SUPERSTRUCTURE : Superstructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	333 / 2	Other Bridge Railing	193	97.97	3	1.52	1	0.51	0	.	197 ft
0	1080 / 2	Delamination/Spall/Patched Area	0	.	3	75	1	25	0	.	4 ft

Element Inspection Notes:

333/2 CS1:

The left barrier wall has an impact scrape mark measuring (40 in. x 6 in.). SAME

1080/2 CS3:

There's a spall 12 in. x 7 in. x 2 in. with exposed corroded steel along out edge of the barrier wall on span 3, adjacent to abutment 4. NEW (See photo 7)

The right barrier wall on span 3, has a delamination 36 in. x 12 in., along the traffic side. NEW (See photo 8)

Total Number of Elements*: 11

*excluding defects/protective systems

**FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Inspection**

Structure ID: 870633

DISTRICT: D6 - Miami

INSPECTION DATE: 4/21/2021 USWM

Inspector Recommendations

UNIT: 0 DECKS**ELEMENT/ENV: 8099 / 2 PS Conc Slab (Sonovoid)****ELEM CATEGORY: Decks/Slabs**

CONDITION STATE		PRIORITY
1, 2	MMS Quantity: 4 sf Element Estimated Quantity: 8 (SF)	3
WORK ORDER RECOMMENDATION: Clean or Remove all dirt and debris accumulation along both shoulders. (See Photo 3)		
1, 2	MMS Quantity: 2 sf Element Estimated Quantity: 1 (SF)	3
WORK ORDER RECOMMENDATION: Remove vegetation growth between panels 7 and 8 at span 3. (See Photo 1)		

UNIT: 0 MISCELLANEOUS**ELEMENT/ENV: 321 / 2 Re Conc Approach Slab****ELEM CATEGORY: Other Elements**

CONDITION STATE		PRIORITY
1, 2, 4	MMS Quantity: 8 sf Element Estimated Quantity: 24 sq.ft	1
WORK ORDER RECOMMENDATION: Repair missing asphalt material measuring 8 ft. x 3 ft. x 2 in., on Approach 1 right sidewalk. (See Photo 4) It's a tripping hazardous.		

ELEMENT/ENV: 8475 / 2 R/Conc Walls**ELEM CATEGORY: Other Elements**

CONDITION STATE		PRIORITY
1, 3	MMS Quantity: 2 mh Element Estimated Quantity: 1 ft	3
WORK ORDER RECOMMENDATION: Repair spall 8 in. x 6 in. x 2 in. on SE wingwall, top outer edge.(See Photo 5)		

UNIT: 0 SUBSTRUCTURE**ELEMENT/ENV: 234 / 2 Re Conc Pier Cap****ELEM CATEGORY: Substructure**

CONDITION STATE		PRIORITY
1	MMS Quantity: 2 mh Element Estimated Quantity: 4 ft	3
WORK ORDER RECOMMENDATION: Remove all vegetation growth along both bent caps ends. (See Photo 6)		

**FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Inspection**

Structure ID: 870633

DISTRICT: D6 - Miami

INSPECTION DATE: 4/21/2021 USWM

Inspector Recommendations

UNIT: 0 SUPERSTRUCTURE
ELEMENT/ENV: 333 / 2 Other Bridge Railing ELEM CATEGORY: Superstructure

CONDITION STATE		PRIORITY
1, 2, 3	MMS Quantity: 4 lf Element Estimated Quantity: 4 ft	3

WORK ORDER RECOMMENDATION:

There's a spall 12 in. x 7 in. x 2 in. with exposed corroded steel along out edge of the barrier wall on span 3, adjacent to abutment 4. and it should be patched (See photo 7)

Repair delamination 36 in. x 12 in., the right barrier wall on span 3 traffic side. (See photo 8)

Structure Notes

PRIOR BRIDGE# = 874339 guardrails not used on this structure due to S.F.W.M. access road on both side.

The bridge was inventoried from West to East

Traffic Restrictions: Based on the current load rating analysis dated 7/06/2011, posting is not required. The structure is currently not posted.

Load rating data verified by Giuseppe Noto on 06 / 01 / 2021 ^{G.N.}

On September 3, 2015 at 8:50 AM the structure was hit by a vehicle accident traveling Westbound on SR 994 (Quail Roost), causing significant damaged to several elements of the structure.

Crash Report Number: FHPE150FF050328, The officer name: Corporal D.A. Luciano, ID.: 1935.

INSPECTION NOTES: USWM 4/21/2021

Sufficiency Rating Calculation Accepted by knatial at 4/14/2017 11:29:23 AM

NCAR: NO CORRECTIVE ACTION RECOMMENDED. Sufficiency Rating Calculation Accepted by 40F3BD0C6D1D4290B567FBF8E2E5E1F9 at 4/16/2019 3:12:37 PM Sufficiency Rating Calculation Accepted by F06A3070954247988A078F7F6E193065 at 4/26/2021 10:46:03 AM

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Inspection

Structure ID: 870633

DISTRICT: D6 - Miami

INSPECTION DATE: 4/21/2021 USWM



Bridge Number - 4/21/2021

**FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Inspection**

Structure ID: 870633
DISTRICT: D6 - Miami

INSPECTION DATE: 4/21/2021 USWM



Bridge Profile- 4/21/2021

North Elevation.

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Inspection

Structure ID: 870633

DISTRICT: D6 - Miami

INSPECTION DATE: 4/21/2021 USWM



Element 8099 / Photo 1

There is vegetation growth between panels 7 and 8 at span 3.

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Inspection

Structure ID: 870633

DISTRICT: D6 - Miami

INSPECTION DATE: 4/21/2021 USWM



Element 8099 / Photo 2

There is a delamination along panel 3-8 measuring (16 in. x 6 in.).

**FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Inspection**

Structure ID: 870633

DISTRICT: D6 - Miami

INSPECTION DATE: 4/21/2021 USWM



Element 301 / Photo 3

There is dirt and debris accumulation along both shoulders.

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Inspection

Structure ID: 870633

DISTRICT: D6 - Miami

INSPECTION DATE: 4/21/2021 USWM



Element 321 / Photo 4

Approach 1 right sidewalk is missing asphalt material measuring (8 ft. x 3 ft. x 2 in.). It's a tripping hazardous.

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Inspection

Structure ID: 870633

DISTRICT: D6 - Miami

INSPECTION DATE: 4/21/2021 USWM



Element 8475 / Photo 5

The SE wingwall has a spall 8 in. x 6 in. x 2 in. along the top outer edge.

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Inspection

Structure ID: 870633

DISTRICT: D6 - Miami

INSPECTION DATE: 4/21/2021 USWM



Element 234 / Photo 6

Both bent caps have vegetation growth at the ends.

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Inspection

Structure ID: 870633

DISTRICT: D6 - Miami

INSPECTION DATE: 4/21/2021 USWM



Element 333 / Photo 7

There's a spall 12 in. x 7 in. x 2 in. with exposed corroded steel along out edge of the barrier wall on span 3, adjacent to abutment 4.

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Inspection

Structure ID: 870633

DISTRICT: D6 - Miami

INSPECTION DATE: 4/21/2021 USWM



Element 333 / Photo 8

The right barrier wall on span 3, has a delamination 36 in. x 12 in., along the traffic side.

**FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM**

**Inspection/CIDR/Bridge Profile Report
CIDR**

REPORT ID: INSP005

Structure ID: 870633

DATE PRINTED: 4/26/2021

Description

Structure Unit Identification

Bridge/Unit Key: 870633 0
 Structure Name: SW 200 ST OVER BLACK CK
 Description: Slab Cast in Place Bridge
 Type: M - Main

Roadway Identification

NBI Structure No (8): 870633
 Position/Prefix (5): 1 - Route On Structure
 Kind Hwy (Rte Prefix): 3 State Hwy
 Design Level of Service: 1 Mainline
 Route Number/Suffix: 00994 / 0 N/A (NBI)
 Feature Intersect (6): BLACK CREEK CANAL C-1-W
 Critical Facility: Not Defense-crit
 Facility Carried (7): SR-994 (SW 200 St)
 Mile Point (11): 4.645
 Latitude (16): 025d34'51.0" Long (17): 080d24'14.4"

Roadway Traffic and Accidents

Lanes (28): 2 Medians: 0 Speed: 40 mph
 ADT Class: 3 ADT Class 3
 Recent ADT (29): 19200 Year (30): 2019
 Future ADT (114): 33312 Year (115): 2041
 Truck % ADT (109): 4
 Detour Length (19): 1.5 mi
 Detour Speed: 0 mph
 Accident Count: 0 Rate: 0

Roadway Classification

Nat. Hwy Sys (104): 0 Not on NHS
 National base Net (12): 0 - Not on Base Network
 LRS Inventory Rte (13a): 87 091 000 Sub Rte (13b): 00
 Functional Class (26): 06 Rural Minor Arterial
 Federal Aid System: ON
 Defense Hwy (100): 0 Not a STRAHNET hwy
 Direction of Traffic (102): 2 2-way traffic
 Emergency:

Roadway Clearances

Vertical (10): 99.99 ft Appr. Road (32): 24.41 ft
 Horiz. (47): 36.31 ft Roadway (51): 28.31 ft
 Truck Network (110): 0 Not part of natl netwo
 Toll Facility (20): 3 On free road
 Fed. Lands Hwy (105): 0 N/A (NBI)
 School Bus Route:
 Transit Route:

NBI Project Data

Proposed Work (075A): Not Applicable (P)
 Work To Be Done By (075B): Not Applicable (P)
 Improvement Length (076): 0 ft

Improvement Cost (094): \$ 0.00
 Roadway Improvement Cost (095): \$ 0.00
 Total Cost (096): \$ 0.00
 Year of Estimate (097):

NBI Rating

Channel (61): 7 Minor Damage
 Deck (58): 7 Good
 Superstructure (59): 6 Satisfactory
 Substructure (60): 8 Very Good

Culvert (62): N N/A (NBI)
 Waterway (71): 7 Above Minimum
 Unrepaired Spalls: -1 sq.ft.
 Review Required:

FLORIDA DEPARTMENT OF TRANSPORTATION BRIDGE MANAGEMENT SYSTEM

Inspection/CIDR/Bridge Profile Report

REPORT ID: INSP005

Structure ID: 870633

CIDR

DATE PRINTED: 4/26/2021

Structure Identification

Admin Area: Miami-Dade
 District (2): D6 - Miami
 County (3): (87)Miami-Dade
 Place Code (4): Miami
 Location (9): SW 130 Ave / SW 200 St
 Border Br St/Reg (98): Not Applicable (P) Share: 0 %
 Border Struct No (99):
 FIPS State/Region (1): 12 Florida Region 4-Atlanta
 NBIS Bridge Len (112): Y - Meets NBI Length
 Parallel Structure (101): No || bridge exists
 Temp. Structure (103): Not Applicable (P)
 Maint. Resp. (21): 1 State Highway Agency
 Owner (22): 1 State Highway Agency
 Historic Signif. (37): 5 Not eligible for NRHP

Structure Type and Material

Curb/Sidewalk (50): Left: 3.94 ft Right: 3.94 ft
 Bridge Median (33): 0 No median
 Main Span Material (43A): 5 Prestressed Concrete
 Appr Span Material (44A): Not Applicable
 Main Span Design (43B): 01 Slab
 Appr Span Design (44B): Not Applicable

Appraisal

Structure Appraisal

Open/Posted/Closed (41): A Open, no restriction
 Deck Geometry (68): 2 Intolerable - Replace
 Underclearances (69): N Not applicable (NBI)
 Approach Alignment (72): 8-No Speed Red thru Curv
 Bridge Railings (36a): 0 Substandard
 Transitions (36b): 0 Substandard
 Approach Guardrail (36c): 0 Substandard
 Approach Guardrail Ends (36d): 0 Substandard
 Scour Critical (113): U Unknown Foundation

Minimum Vertical Clearance

Over Structure (53): 99.99 ft
 Under (reference) (54a): N Feature not hwy or RR
 Under (54b): 0 ft

Schedule

Current Inspection

Inspection Date: 04/21/2021
 Inspector: MT638SJ - Josue Sanchez
 Bridge Group: N/A
 Alt. Bridge Group:
 Primary Type: Regular NBI
 Review Required:

Geometrics

Spans in Main Unit (45): 3
 Approach Spans (46): 0
 Length of Max Span (48): 29.33 ft
 Structure Length (49): 87.99 ft
 Total Length: 127.99 ft
 Deck Area: 3347.58 sqft
 Structure Flared (35): 0 No flare

Age and Service

Year Built (27): 1962
 Year Reconstructed (106): 0
 Type of Service On (42a): 5 Highway-pedestrian
 Under (42b): 5 Waterway
 Fracture Critical Details: Not Applicable

Deck Type and Material

Deck Width (52): 37.99 ft
 Skew (34): 0 deg
 Deck Type (107): 2 Concrete Precast Panel
 Surface (108): 6 Bituminous
 Membrane: 0 None
 Deck Protection: None

Navigation Data

Navigation Control (38): Permit Not Required
 Nav Vertical Clr (39): 0 ft
 Nav Horizontal Clr (40): 0 ft
 Min Vert Lift Clr (116): 0 ft
 Pier Protection (111): Not Applicable (P)

NBI Condition Rating

Sufficiency Rating: 75.2
 Health Index: 99.91
 Structural Eval (67): 6 Equal Min Criteria
 Deficiency: Functionally Obsolete

Minimum Lateral Underclearance

Reference (55a): N Feature not hwy or RR
 Right Side (55b): 0 ft
 Left Side (56): 0 ft

Next Inspection Date Scheduled

NBI: 04/21/2023
 Element: 04/21/2023
 Fracture Critical:
 Underwater: 04/21/2023
 Other/Special:
 Inventory Photo Update Due: 04/15/2023

**FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM**

**Inspection/CIDR/Bridge Profile Report
CIDR**

REPORT ID: INSP005

Structure ID: 870633

DATE PRINTED: 4/26/2021

Schedule Cont.

Inspection Types Performed

NBI Element Fracture Critical Underwater Other Special

Inspection Intervals Required (92) Frequency (92) Last Date (93) Inspection Resources

Fracture Critical	<input type="checkbox"/>	mos			Crew Hours: 10
Underwater	<input checked="" type="checkbox"/>	24 mos	04/21/2021		Flagger Hours: 0
Other Special	<input type="checkbox"/>	mos			Helper Hours: 0
NBI		24 mos	(91) 04/21/2021	(90)	Snooper Hours: 0
					Special Crew Hours: 4
					Special Equip Hours: 0

Bridge Related

General Bridge Information

Parallel Bridge Seq:	Bridge Rail 1: Conc parapet-alum-rail
Channel Depth: 17.2 ft	Bridge Rail 2: Not applicable-No rail
Radio Frequency: -1	Electrical Devices: No electric service
Phone Number:	Culvert Type: Not applicable
Exception Date:	Maintenance Yard: 690-South Dade
Exception Type: Unknown	FIHS ON / OFF:
Accepted By Maint: 01/01/1962	Previous Structure:
Warranty Expiration: 00/00/0000	2nd Previous Structure:
Performance Rating: Good	Replacement Structure:

Permitted Utilities: Power Water Gas Fiber Optic Sewage Other

Bridge Load Rating Information

Inventory Type (065): 1 LF Load Factor	Inventory Rating (066): 50.4 tons
Operating Type (063): 1 LF Load Factor	Operating Rating (064): 83.9 tons
Original Design Load (031): 5 MS 18 (HS 20)	FL120 Permit Rating: -1.0 tons
Date: 07/06/2011	HS20/FL120 Max Span Rating: 83.9 tons
Initials: MPC	Dynamic Impact in Percent: 30 %
Load Rating Rev. Recom.: No	Governing Span Length: 27.9 ft
Load Rating Plans Status: Design or Construction	Minimum Span Length:
	Distribution Method: AASHTO formula

Load Rating Notes:

LEGAL LOADS

SU2: 55.7 tons
 SU3: 58.6 tons
 SU4: 57.4 tons
 C3: 82.4 tons
 C4: 73.0 tons
 C5: 79.8 tons
 ST5: 89.7 tons
 Posting (070): 5 At/Above Legal Loads
 Open/Posted/Closed (041): A Open, no restriction

POSTING

Recom. SU Posting: 99 tons
 Recom. C Posting: 99 tons
 Recom. ST5 Posting: 99 tons
 Actual SU Posting: 99 tons
 Actual C Posting: 99 tons
 Actual ST5 Posting: 99 tons
 Actual Blanket Posting: 99 tons
 Emergency Vehicle: 1 EV inapplicable

FLOOR BEAM (FB)

FB Present: No
 FB Span Length, Gov:
 FB Spacing, Gov:
 FB OPR Rating: 0.0 tons
 FB SU4 OPR Rating:
 FB FL120 Rating:

SEGMENTAL (SEG)

SEG Wing-Span: -1.0 ft
 SEG Web-to-Web Span: -1.0 ft
 SEG Transverse HL93 Operating: -1.00 RF

Bridge Scour and Storm Information

Pile Driving Record: No pile driving records	Scour Recommended I: Perform Phase II
Foundation Type: Unknown	Scour Recommended II: Unknown
Mode of Flow: Unknown	Scour Recommended III: Unknown
Rating Scour Eval: Scour Susceptible - Low	Scour Elevation: -1 ft
Highest Scour Eval: Phase I completed	Action Elevation: -1 ft
Scour Evaluation Method:	Storm Frequency: -1

**FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM**

**Inspection/CIDR/Bridge Profile Report
CIDR**

REPORT ID: INSP005

Structure ID: 870633

DATE PRINTED: 4/26/2021

Elements

Inspection Date: 04/21/2021 USWM

DECKS : Decks/Slabs

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8099 / 2	PS Conc Slab (Sonovoid)	3346.91	99.98	0.67	0.02	0	.	0	.	3347.58 (SF)
0	1080 / 2	Delamination/Spall/Patched Area	0.33	33.3	0.67	66.7	0	.	0	.	1 (SF)
0	510 / 2	Wearing Surfaces	2403	100	0	.	0	.	0	.	2403 sq.ft

DECKS : Joints

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	301 / 2	Pourable Joint Seal	104	92.86	8	7.14	0	.	0	.	112 ft
0	2350 / 2	Debris Impaction	0	.	8	100	0	.	0	.	8 ft

MISCELLANEOUS : Channel

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8290 / 2	Channel	1	100	0	.	0	.	0	.	1 (EA)

MISCELLANEOUS : Other Elements

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	321 / 2	Re Conc Approach Slab	2192	97.86	24	1.07	0	.	24	1.07	2240 sq.ft
0	4000 / 2	Settlement	0	.	0	.	0	.	24	100	24 sq.ft
0	510 / 2	Wearing Surfaces	2216	98.93	24	1.07	0	.	0	.	2240 sq.ft

MISCELLANEOUS : Other Elements

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8475 / 2	R/Conc Walls	19	95	0	.	1	5	0	.	20 ft
0	1080 / 2	Delamination/Spall/Patched Area	0	.	0	.	1	100	0	.	1 ft

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	215 / 2	Re Conc Abutment	75.46	100	0	.	0	.	0	.	75.46 ft

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	226 / 2	Pre Conc Pile	12	100	0	.	0	.	0	.	12 (EA)

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	234 / 2	Re Conc Pier Cap	68.9	100	0	.	0	.	0	.	68.9 ft

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8396 / 2	Other Abutment Slope Protection	495.14	100	0	.	0	.	0	.	495.14 (SF)

SUPERSTRUCTURE : Bearings

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	310 / 2	Elastomeric Bearing	6	100	0	.	0	.	0	.	6 each

**FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM**

**Inspection/CIDR/Bridge Profile Report
CIDR**

REPORT ID: INSP005

Structure ID: 870633

DATE PRINTED: 4/26/2021

SUPERSTRUCTURE : Superstructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	333 / 2	Other Bridge Railing	193	97.97	3	1.52	1	0.51	0	.	197 ft
0	1080 / 2	Delamination/Spall/Patched Area	0	.	3	75	1	25	0	.	4 ft

Total Number of Elements*: 11

*excluding defects/protective systems

Inspection Information**Inspection Date:** 04/21/2021**Type:** Regular NBI**Inspector:** MT638SJ - Josue Sanchez**Inspection Notes:** Sufficiency Rating Calculation Accepted by knatial at 4/14/2017 11:29:23 AM

NCAR: NO CORRECTIVE ACTION RECOMMENDED. Sufficiency Rating Calculation Accepted by 40F3BD0C6D1D4290B567FBF8E2E5E1F9 at 4/16/2019 3:12:37 PM Sufficiency Rating Calculation Accepted by F06A3070954247988A078F7F6E193065 at 4/26/2021 10:46:03 AM

Structure Notes

PRIOR BRIDGE# = 874339 guardrails not used on this structure due to S.F.W.M. access road on both side.

The bridge was inventoried from West to East

Traffic Restrictions: Based on the current load rating analysis dated 7/06/2011, posting is not required. The structure is currently not posted.

Load rating data verified by Giuseppe Noto on 06 / 01 / 2021^{G.N.}

_ On September 3, 2015 at 8:50 AM the structure was hit by a vehicle accident traveling Westbound on SR 994 (Quail Roost), causing significant damaged to several elements of the structure.

Crash Report Number: FHPE150FF050328, The officer name: Corporal D.A. Luciano, ID.: 1935.

Schedule Notes

FLORIDA DEPARTMENT OF TRANSPORTATION BRIDGE MANAGEMENT SYSTEM

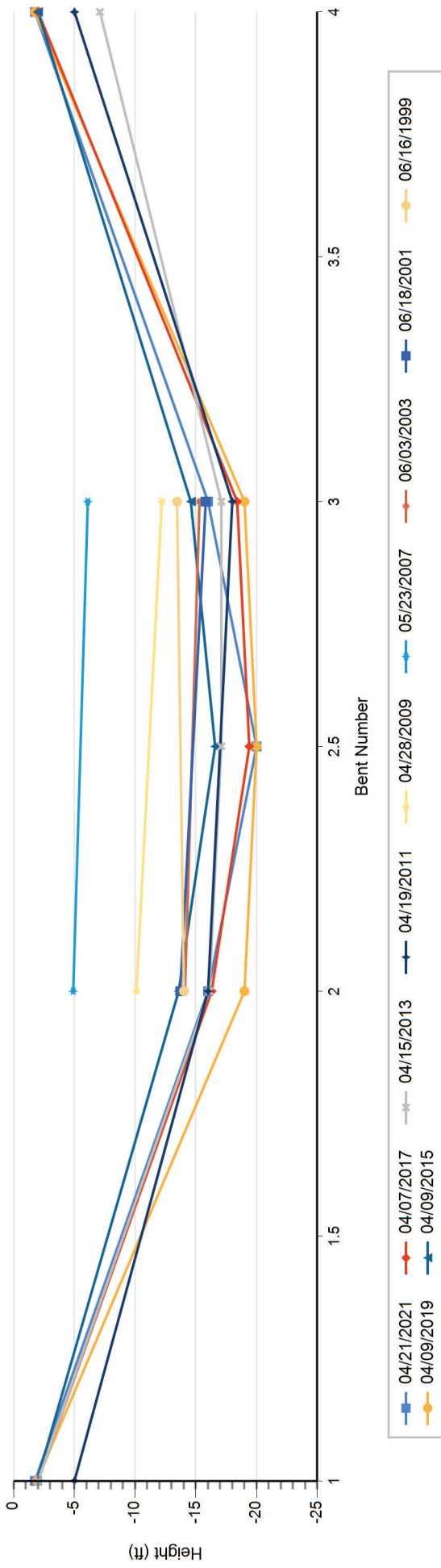
Inspection/CIDR/Bridge Profile Report

Bridge Profile

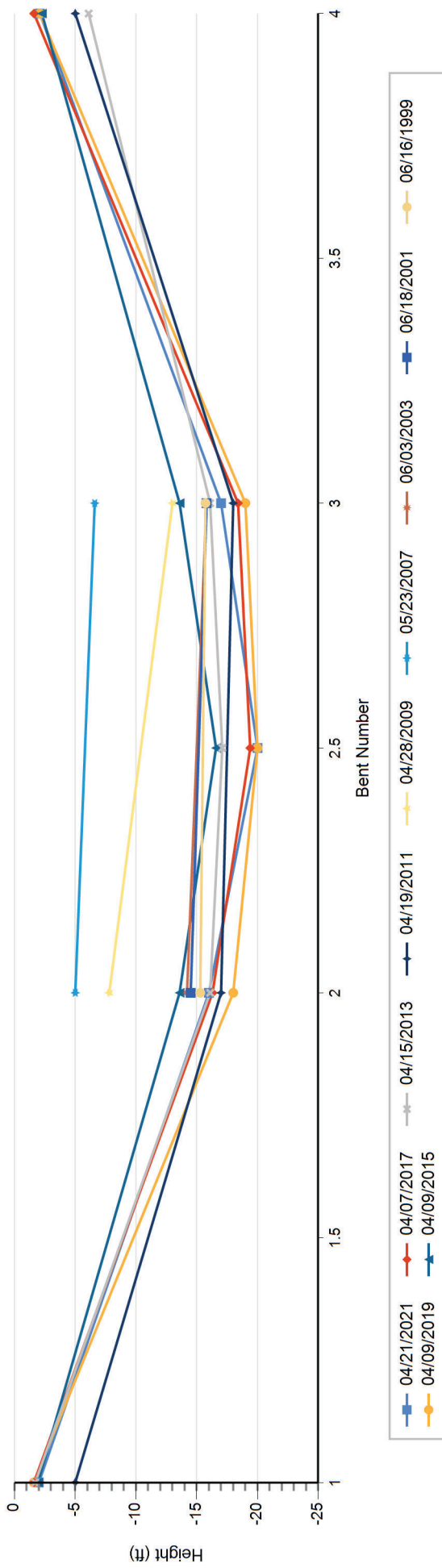
REPORT ID : INSP005
Structure ID : 870633

DATE PRINTED: 4/26/2021 4:21:03 PM

Left Profile by Inspection



Right Profile by Inspection



This report contains information relating to the physical security of a structure and depictions of the structure. This information is confidential and exempt from public inspection pursuant to sections 119.071(3)(a) and 119.071(3)(b), Florida Statutes. Only the cover page of this report may be inspected and copied.

FLORIDA DEPARTMENT OF TRANSPORTATION BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Bridge Profile

REPORT ID : INSP005
Structure ID : 870633

DATE PRINTED: 4/26/2021 4:21:03 PM

Profile Data - Numerical Summary

(All Heights are in Feet)

Inspection Date and Key:	Bent #	Left Height	Right Height
4/21/2021	1	1.75	2.00
	2	16.00	16.00
	2.5	20.00	20.00
	3	16.00	17.00
	4	1.75	2.08

USWM

Air Temp: 81

Profile Notes:

Measurements were taken during inspection dive.

W/L = 5.0 ft

Channel = 15 ft

Bottom condition was mud and limestone.

Visibility underwater was +/- 5 ft.

Inspection Date and Key: 4/9/2019

TWVN

	1	1.90	1.58
	2	19.00	18.00
	2.5	20.00	20.00
	3	19.00	19.00
	4	1.75	2.08

Air Temp: 82

Profile Notes:

Measurements were taken during inspection dive.

W/L = 5.0 ft

Channel = 15 ft

Bottom condition was mud and limestone.

Visibility underwater was +/- 5 ft.

FLORIDA DEPARTMENT OF TRANSPORTATION BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Bridge Profile

REPORT ID : INSP005
Structure ID : 870633

DATE PRINTED: 4/26/2021 4:21:03 PM

Profile Data - Numerical Summary

Bent #	Left Height	Right Height	(All Heights are in Feet)
1	2.00	1.60	
2	16.30	16.30	
2.5	19.40	19.40	
3	18.40	18.40	
4	2.00	1.60	

PECG

Inspection Date and Key: 4/7/2017

Air Temp:

Profile Notes:

Measurements were taken during inspection dive.
W/L = 5.3 ft
Channel : Left = 14.1 ft Right = 14.1 ft
Bottom condition was mud and limestone.
Visibility underwater was +/- 15 ft.

Inspection Date and Key: 4/9/2015

EQEK

1	1.92	1.92
2	13.58	13.58
2.5	16.58	16.58
3	14.58	13.58
4	2.00	2.25

Air Temp: 81

Profile Notes:

Measurements were taken during inspection dive.
W/L = 5.6 ft
Channel : Left = 15.0 ft Right = 15.0 ft
Bottom condition was mud and limestone.
Visibility underwater was 10 ft.

FLORIDA DEPARTMENT OF TRANSPORTATION BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Bridge Profile

REPORT ID : INSP005
Structure ID : 870633

DATE PRINTED: 4/26/2021 4:21:03 PM

Profile Data - Numerical Summary

(All Heights are in Feet)

Bent #	Left Height	Right Height
1	2.00	1.70
2	16.10	16.10
2.5	17.10	17.10
3	17.10	16.10
4	7.10	6.10

Inspection Date and Key: 4/15/2013 MFPZ

Air Temp: 80

Profile Notes:

Measurements were taken during inspection dive.

W/L = 5.1ft

Channel : Left = 12.0ft Right = 12.0ft

Bottom condition was mud and limestone.

Visibility underwater was 5ft.

Inspection Date and Key: 4/19/2011 AOBZ

1	5.00	5.00
2	16.00	17.00
3	18.00	18.00
4	5.00	5.00

Air Temp: 84

Profile Notes:

Depths were taken during the inspection dive.

W/L numbers taken from the top of concrete railing = 7 ft

Channel = 14 ft

Bottom condition is mud and rock. Visibility was 3 ft.

FLORIDA DEPARTMENT OF TRANSPORTATION BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Bridge Profile

REPORT ID : INSP005
Structure ID : 870633

DATE PRINTED: 4/26/2021 4:21:03 PM

Profile Data - Numerical Summary

Bent #	Left Height	Right Height	(All Heights are in Feet)
2	10.10	7.80	
3	12.20	13.00	

ALUG

Inspection Date and Key: 4/28/2009

Air Temp: 83

Profile Notes:

Measurements were taken from top of metal guard rail.
W/L = 10.6ft
Channel : Left = 14.9ft Right = 14.8ft
Bottom condition was mud and limestone.
Visibility underwater was 3ft.

Inspection Date and Key: 5/23/2007

LSGL

Air Temp: 85

Profile Notes:

MEASUREMENTS TAKEN FROM TOP OF RAILING.
Waterline : 9.2
Channel : 8ft
Visibility : 4ft
Bottom has natural debris.

FLORIDA DEPARTMENT OF TRANSPORTATION BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Bridge Profile

REPORT ID : INSP005
 Structure ID : 870633

DATE PRINTED: 4/26/2021 4:21:03 PM

Profile Data - Numerical Summary

Bent #	Left Height	Right Height	(All Heights are in Feet)
2	14.10	14.20	
3	15.30	15.80	

Inspection Date and Key: 6/3/2003 EYCV

Air Temp: 85
Profile Notes:

Intermediate Bents 2 & 3 were Inspected from Mean High Waterline to Groundline. Waterline = 9' 2". Channel Depth = 17' 2". No new deficiencies were noted during this inspection cycle. Previous deficiencies are as follows: Bent 3 Pile 4 NEC Spall 4" x 1" x 1/2" below W/L 10". B-2 P-3 SEC spall 10" x 4" x 1" BWL 3'. P-5 NWC spall 1' x 6" x 2" up from G/L
 2'. P 1 NWC spall 1' x 6" x 2" BWL 2'. Due to injured back, Ana Gonzalez prepared U/W Inspection/Profile report while Omar Porras assisted by David Madera performed the field inspection.

Inspection Date and Key: 6/18/2001

OFDM

Air Temp: 88
Profile Notes:

Intermediate Bents 2 & 3 were Inspected from Mean High Waterline to Groundline. Waterline = 2.65m. Deficiencies as follows: Bent 3 Pile 4 NEC spall 10.16cm x 2.54cm x 1.52cm BWL 25.4cm. Bent 2 Pile 3 SEC spall 25.4cm x 10.16cm x 2.54cm BWL .91m. Pile 5 NWC spall .31m x 15.24cm x 5.08cm coming up from G.L. .61m. Pile 1 NWC spall .31m x 15.24cm x 5.08cm BWL .61m.

Inspection Date and Key: 6/16/1999

GBST

Air Temp:
Profile Notes:

INTERMEDIATE BENTS' 2 & 3 WERE INSPECTED FROM MEAN HIGH WATERLINE TO GROUNDLINE.
 NO DEFICIENCIES NOTED AT THIS TIME.

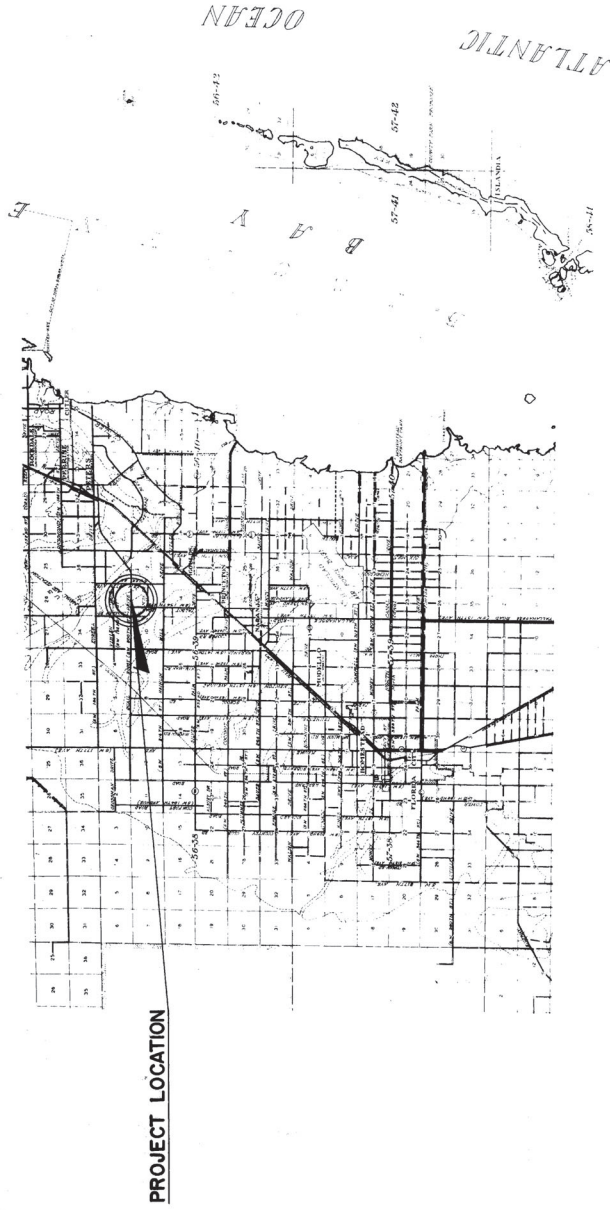
APPENDIX D

Existing Bridge Plans

PLANS FOR PROPOSED QUAIL ROOST DRIVE BRIDGE OVER BLACK CREEK

PROJECT NO. 8153

- INDEX OF SHEETS**
- 1. SHEET NO. 1 - SUMMARY OF QUANTITIES
 - 2. PLAN AND PROFILE
 - 3. ROADWAY CROSS SECTIONS
 - 4. APPROACH SLAB
 - 5. APPROACH SLAB
 - 6. APPROACH SLAB
 - 7-9. CANAL CROSS SECTIONS
 - 10. PILING PLAN AND DETAILS
 - 11. INTERMEDIATE AND END BENT
 - 12. INTERMEDIATE AND END BENT
 - 13. PRESTRESSED SLAB UNITS
 - 14. HANDRAIL DETAILS



PREPARED BY
DADE COUNTY PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
IN COOPERATION WITH
CENTRAL AND SOUTHERN FLORIDA FLOOD CONTROL DISTRICT

APPROVED _____
DIVISION OF PUBLIC WORKS

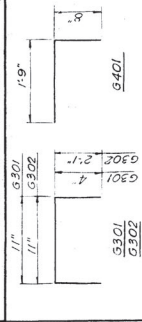
RECOMMENDED _____
DATE _____

SUBMITTED _____
DATE _____

PROPOSED BY: *John J. ...* CHIEF ENGINEER
D. J. ...
DATE: *May 1962*

SCALE: _____
SHEET _____ OF _____

BENDING DIAGRAM



BILL OF REINFORCING STEEL FOR ONE PRESTRESSED SLAB UNIT

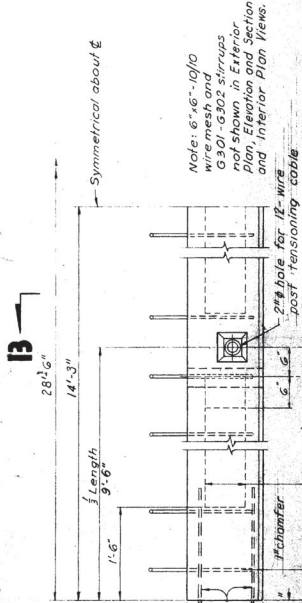
Mark	Length	NO. REQUIRED	Interior	Exterior
G301	1'-5"	58	58	58
G302	4'-11"	58	58	58
G401	2'-4"	8	8	8

- Notes:** (Unless otherwise noted)
- For General Notes, see Plan and Elevation Sheet.
 - Tops of prestressed units are to be rough finished. All approximate dimensions are for reference only. Prestressed units shall be scrubbed transversely with a coarse wire brush to remove all laitance and to produce a rough surface.
 - Prestressed concrete shall be Class "C" 5000 psi, prestressed units, they must be maintained in an upright position at all times and must be picked up at ends to prevent damage. The contractor shall be responsible for damage due to improper handling.
 - At transfer of the tensioning load, the cylinder strength of concrete shall be at least 4000 psi and the concrete shall be at least 20 hrs old.
 - Concrete cover over reinforcing steel.
 - The use of steel forms on concrete founded casting beds is preferred.
 - All reinforcement shall be new. Bars shall be deformed in accordance with ASTM A 601, steel in accordance with ASTM A 75, or rail steel in accordance with ASTM A 16.
 - All stirrups shall extend 23" beyond ends of slab units.
 - When the casting of slab units, they shall be covered with Class 1 Surface Finish in the casting yard within 12 hrs. after casting.
 - The contractor shall provide cement grout under each slab unit, if required by the Engineer, to provide a uniform top surface and to provide a uniform bearing surface for the slab units.

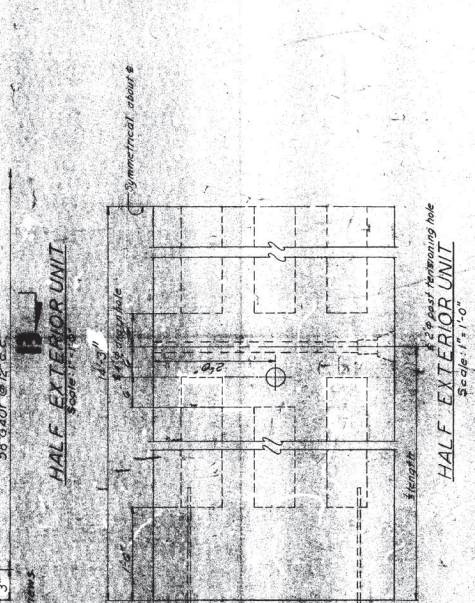
DADE COUNTY PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

PRESTRESSED SLAB UNITS
QUAIL ROOST DRIVE BRIDGE
OVER
BLACK CREEK CANAL

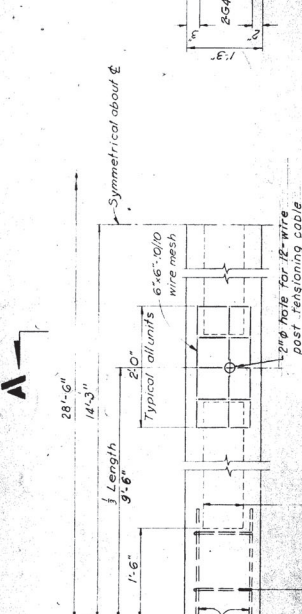
DATE: May 1962
FILE: 81229
SHEET: 13 OF 14



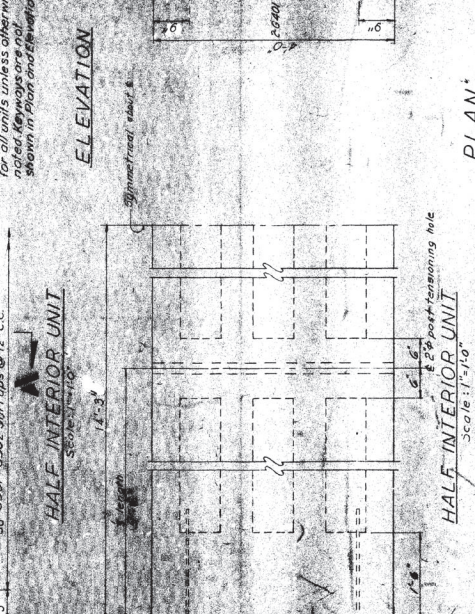
Note: Details shown on this elevation for all units unless otherwise noted. Keyways and all shown in Plan and Elevation views.



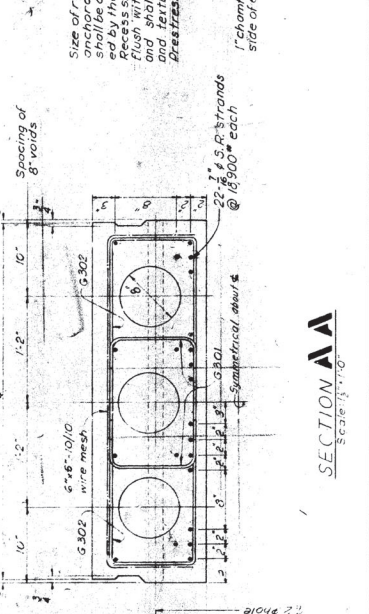
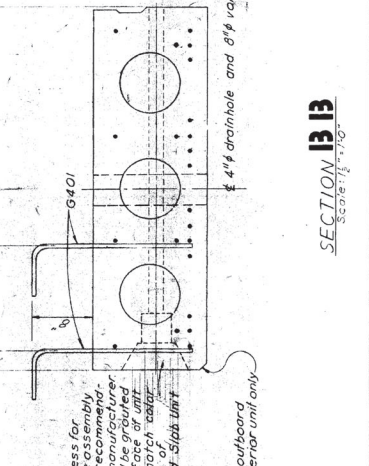
Note: Details shown on this elevation for all units unless otherwise noted. Keyways and all shown in Plan and Elevation views.



Note: Details shown on this elevation for all units unless otherwise noted. Keyways and all shown in Plan and Elevation views.



Note: Details shown on this elevation for all units unless otherwise noted. Keyways and all shown in Plan and Elevation views.

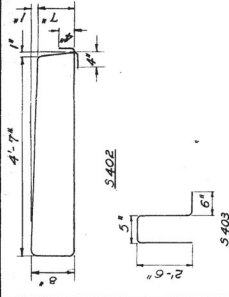


SECTION B-B
Scale: 1/4" = 1'-0"

SECTION A-A
Scale: 1/4" = 1'-0"

REVISION	DATE	DESCRIPTION

BENDING DIAGRAM



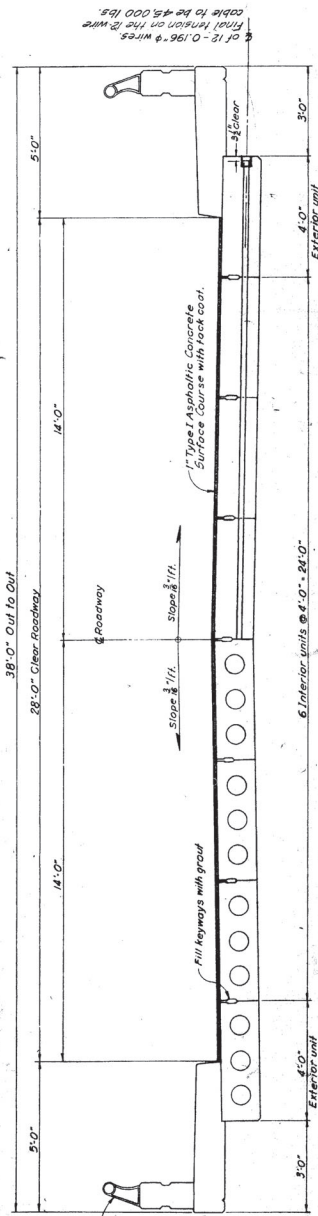
BILL OF REINFORCING STEEL FOR ONE SPAN

Mark	No. Reqd	Length	Mark	No. Reqd	Length
S-401	26	25-7'			
S-402	70	10-7'			
S-403	60	5-7'			
D-401	4	31-8"			
D-402	44	31-8"			
D-601	75	1-8"			

ESTIMATED QUANTITIES FOR ONE SPAN

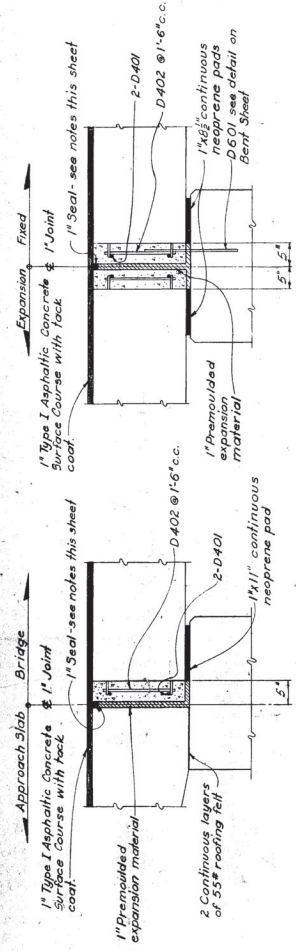
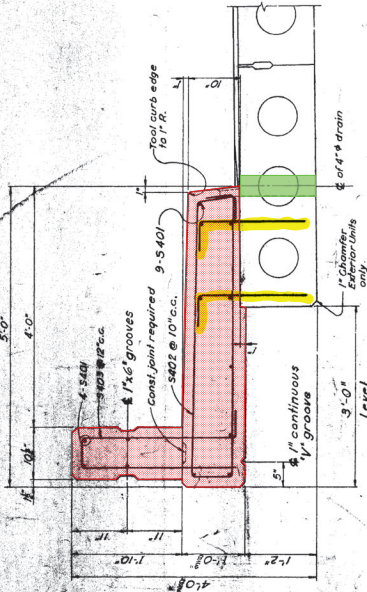
No.	Quantity	Unit	Est.	92.0
100-1	Concrete	cu. yd.		
100-2	Reinforcing Steel	lb.		
401-4	Prestressed Slab Units	sq. ft.		

- Notes: (Unless otherwise noted)
- Minimum cover on all reinforcement shall be 2"
 - Lateral post-tensioning cables shall be grouted after final stressing.
 - Exposed edges shall be finished with an air-entraining agent shall be approved by the Engineer.
 - All joints that will be covered with an asphaltic sealant shall be covered with an asphaltic sealant compound, or approved equal.
 - Exposed faces of curbs, sidewalks and parapets shall be finished with a broom finish.



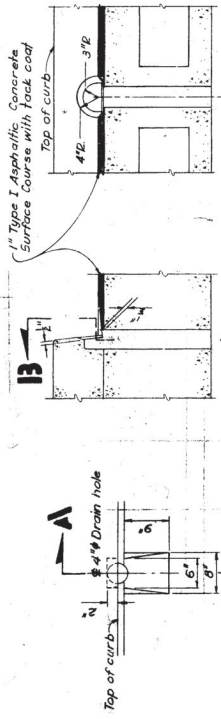
HALF SECTION THRU DIAPHRAGMS

TYPICAL HALF SECTION



SECTION THRU JOINT AT END BENT

SECTION THRU JOINT AT INTERMEDIATE BENT



SECTION THRU SIDEWALK

- CONSTRUCTION SCHEDULE**
- After pile caps have been properly cured, the prestressed slab units shall be set in place on an approved bearing.
 - Final tensioning cable shall be initially tensioned to 25,000 lbs.
 - Keyways shall be grouted.
 - Final tensioning cable shall be applied to the 12-wire lateral post-tensioning cable within 48 hours after grouting keyways.
 - Diaphragms at ends of precast slab units shall be poured.
 - Shoulders on pile cap ends shall be poured.
 - Sidewalks and parapets shall be poured.
 - Asphaltic concrete surface course shall be applied with tack coat.

SECTION 13 B3

SECTION A A1

DRAIN DETAIL

PLAN

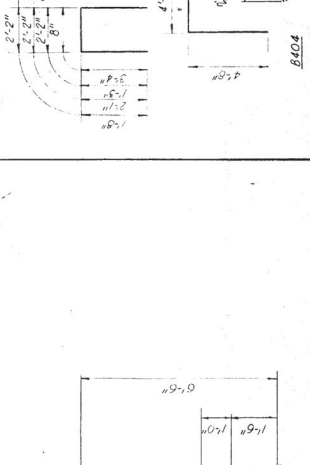
DADE COUNTY PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

SUPERSTRUCTURE

QUAIL ROOST DRIVE BRIDGE
 OVER
 BLACK CREEK CANAL

DATE: May 1962
 FILE: 81/53
 SHEET 12 OF 14

BENDING DIAGRAM



BILL OF REINFORCING STEEL FOR ONE END BENT

Mark	No. Req'd	Length	Mark	No. Req'd	Length
B401	6	3'-3"	B411	4	4'-3"
B402	6	6'-1"	B412	4	6'-6"
B403	12	3'-0"	B413	4	3'-11"
B404	8	5'-1"	B414	12	4'-8"
B405	4	3'-9"	B415	4	4'-8"
B406	4	4'-11"	B416	4	4'-9"
B407	4	3'-9"	B417	12	7'-1"
B408	4	3'-9"	B418	7	3'-8"
B409	8	3'-9"	B419	2	4'-5"
B410	4	3'-3"	B420	7	3'-11"
B411	4	3'-3"	B421	2	4'-5"
B412	6	6'-1"	B422	7	3'-11"

FOR ONE INTERMEDIATE BENT

No.	Class	Quantity	Unit
300-1	Class A Concrete	11.70	C.Y.
310-1	Reinforcing Steel	2300	Lb.

ESTIMATED QUANTITIES FOR ONE END BENT

No.	Class	Quantity	Unit
300-1	Class A Concrete	8.10	C.Y.
310-1	Reinforcing Steel	852	Lb.

FOR ONE INTERMEDIATE BENT

Notes: (Unless otherwise noted)

- For General Notes see Plan and Elevation Sheet.
- Minimum cover on all reinforcing steel shall be 2".
- All exposed ends and corners to be chamfered 1".
- Slab shall be brought to final elevation.
- Markers recording the elevation shall be placed at the approach 1/4 of the end bent at sidewalk level. The marker shall be placed at each end and the elevation shall be furnished by local County and shall be installed by the Contractor.
- Registration shall be included in the contract. See plan sheet for location of fixed and expansion ends.
- Quantity of concrete and steel shown on Superintendence sheet.
- All exposed surfaces of the beams shall begin a Class I surface finish.

DADE COUNTY PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION

INTERMEDIATE & END BENT

QUAL ROOST DRIVE BRIDGE

BLACK CREEK CANAL

APPROVED: [Signature] DATE: May 1962

RECOMMENDED: [Signature] DATE: []

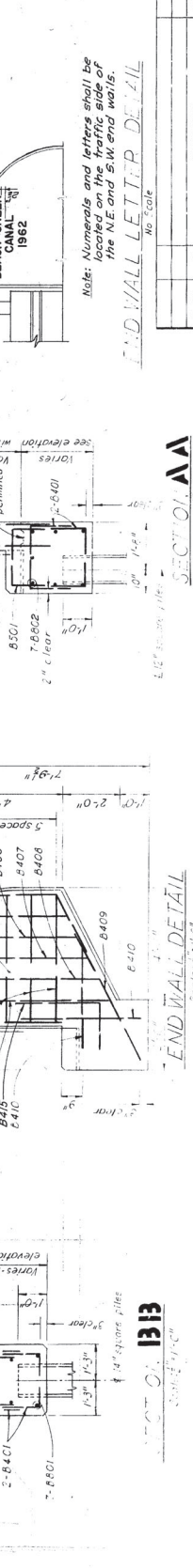
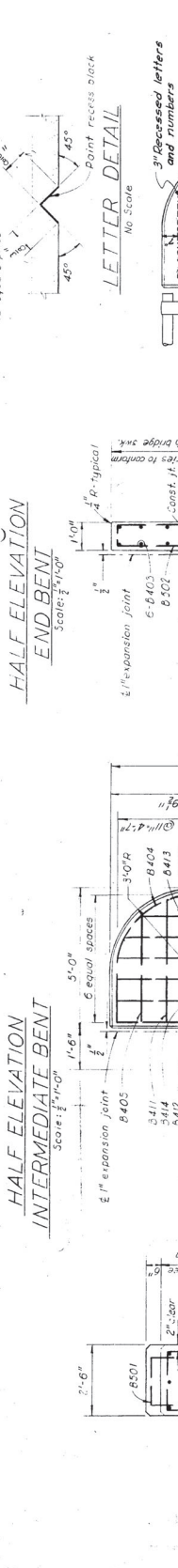
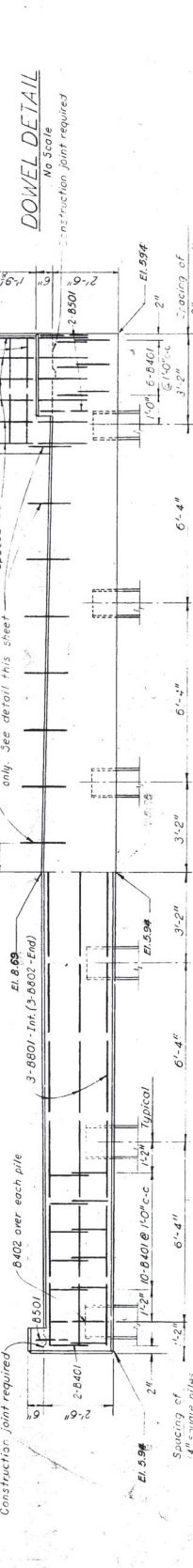
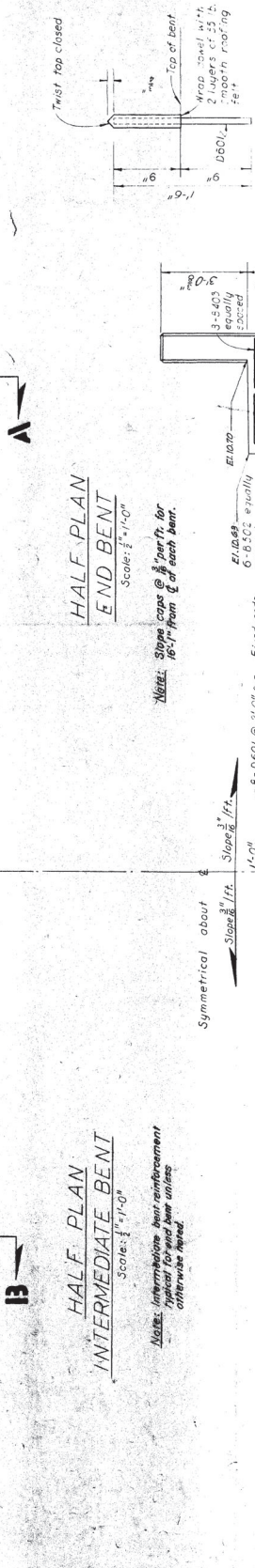
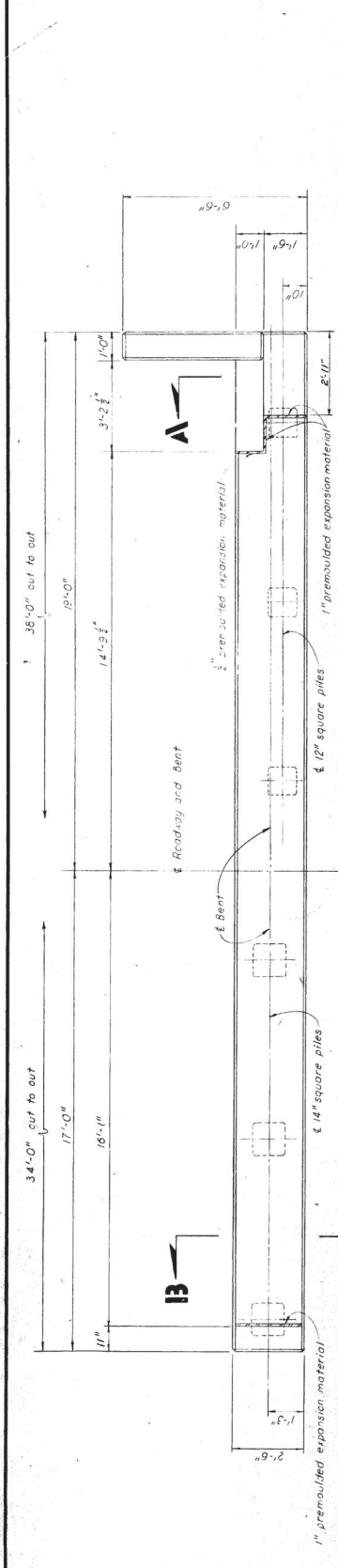
DESIGNED BY: [Signature] CHECKED BY: [Signature] SUPERVISOR: [Signature]

PROJECT NO. 6-62-11-10

DATE: May 1962

FILE: 6153

SHEET: 11 OF 14



SECTION A-A

END WALL DETAIL

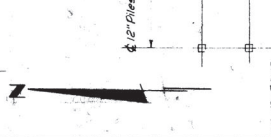
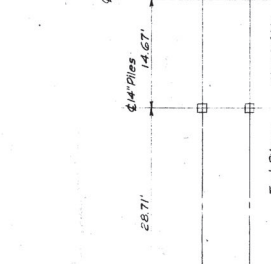
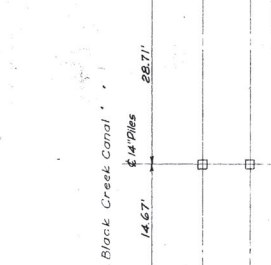
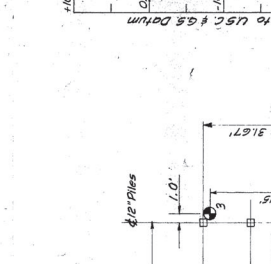
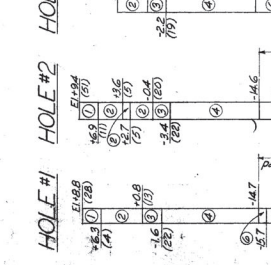
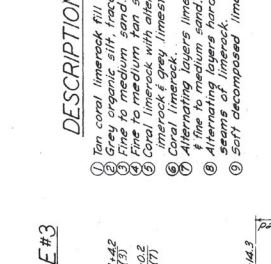
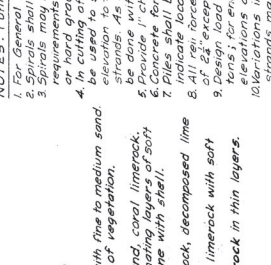
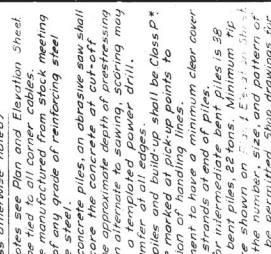
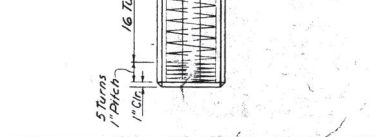
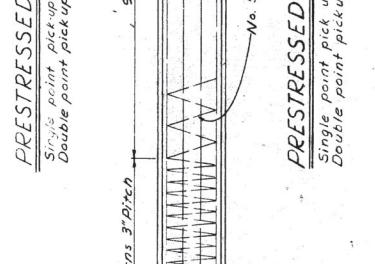
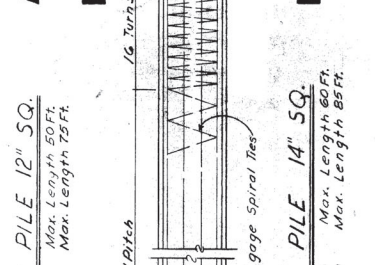
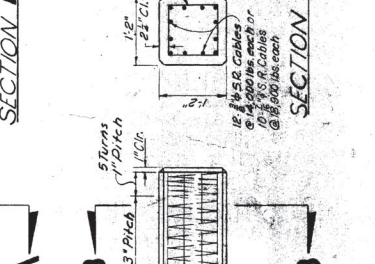
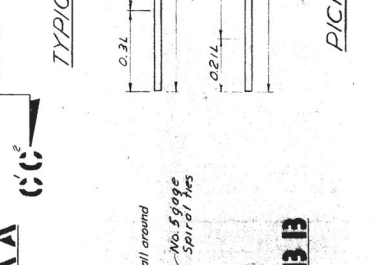
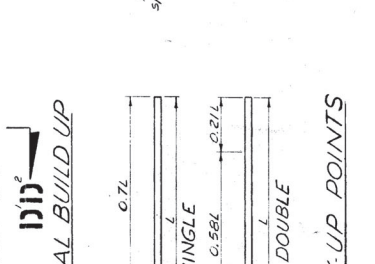
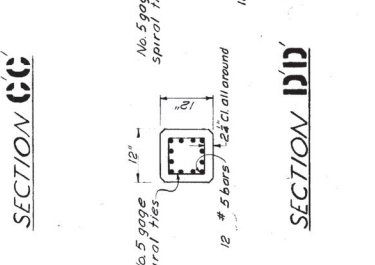
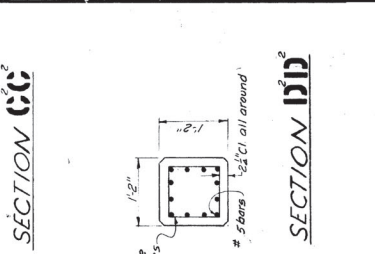
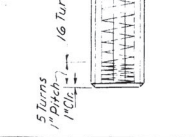
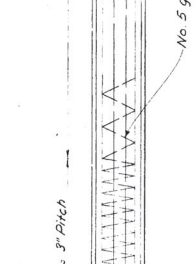
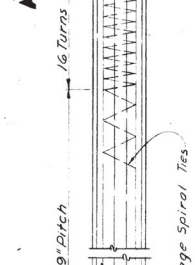
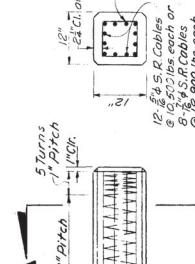
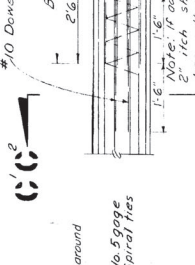
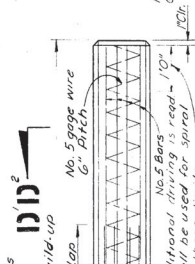
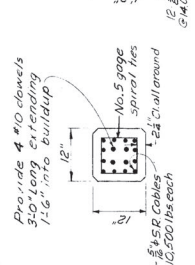
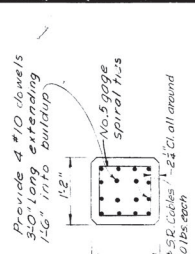
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DESCRIPTION

DATE: May 1962

FILE: 6153

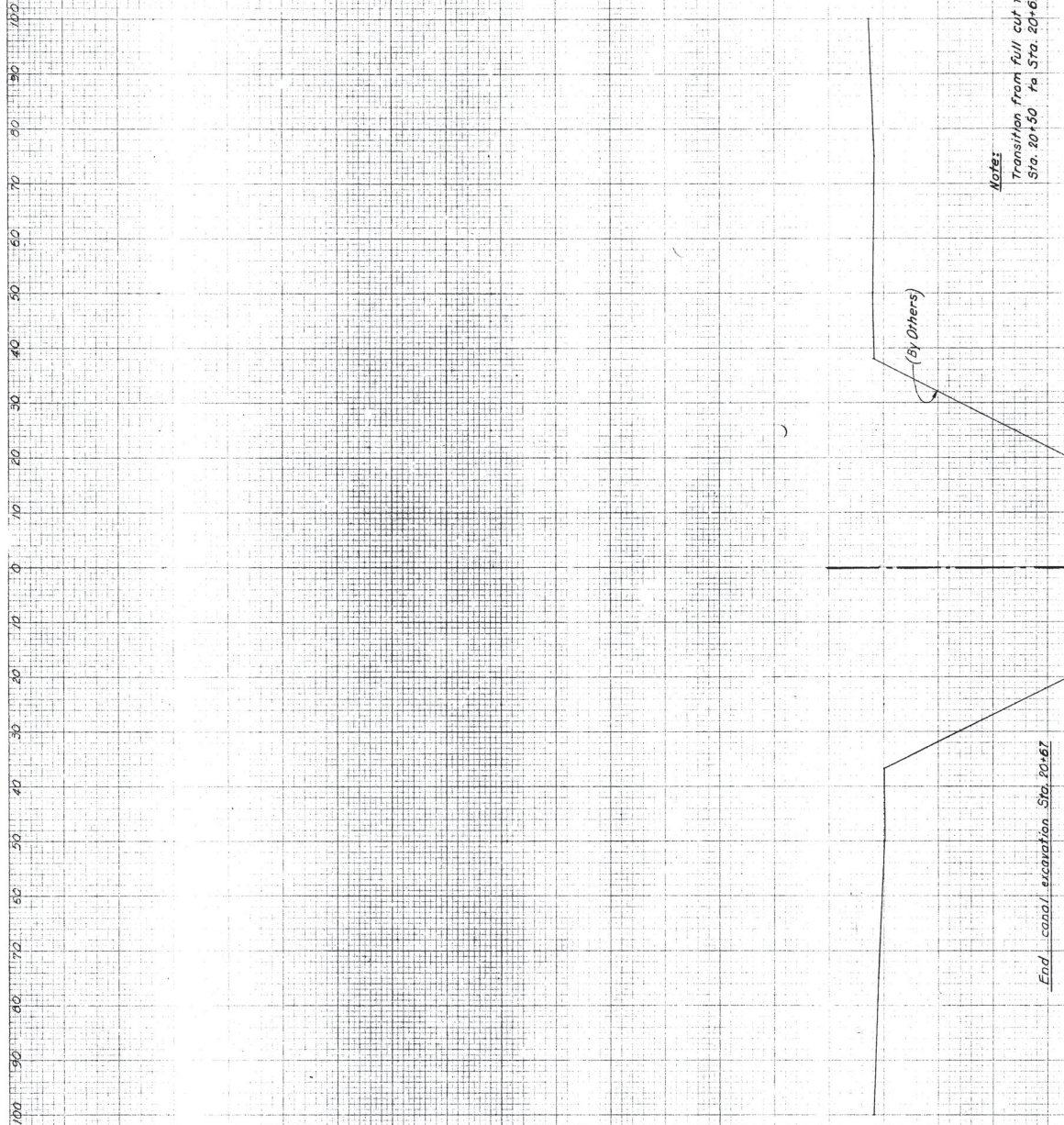
SHEET: 11 OF 14



QUAL ROOST DR. BRIDGE
OVER
BLACK CREEK CANAL

Scale: Horizontal - 1" = 100'
Vertical - 1" = 5.0'

VOLUME
CUT
FILL



TOTAL 4679

Note:
Transition from fill cut to 0 cut
Sta. 20+50 to Sta. 20+67

End canal excavation Sta. 20+67

Canal F 6

20+67

3/2

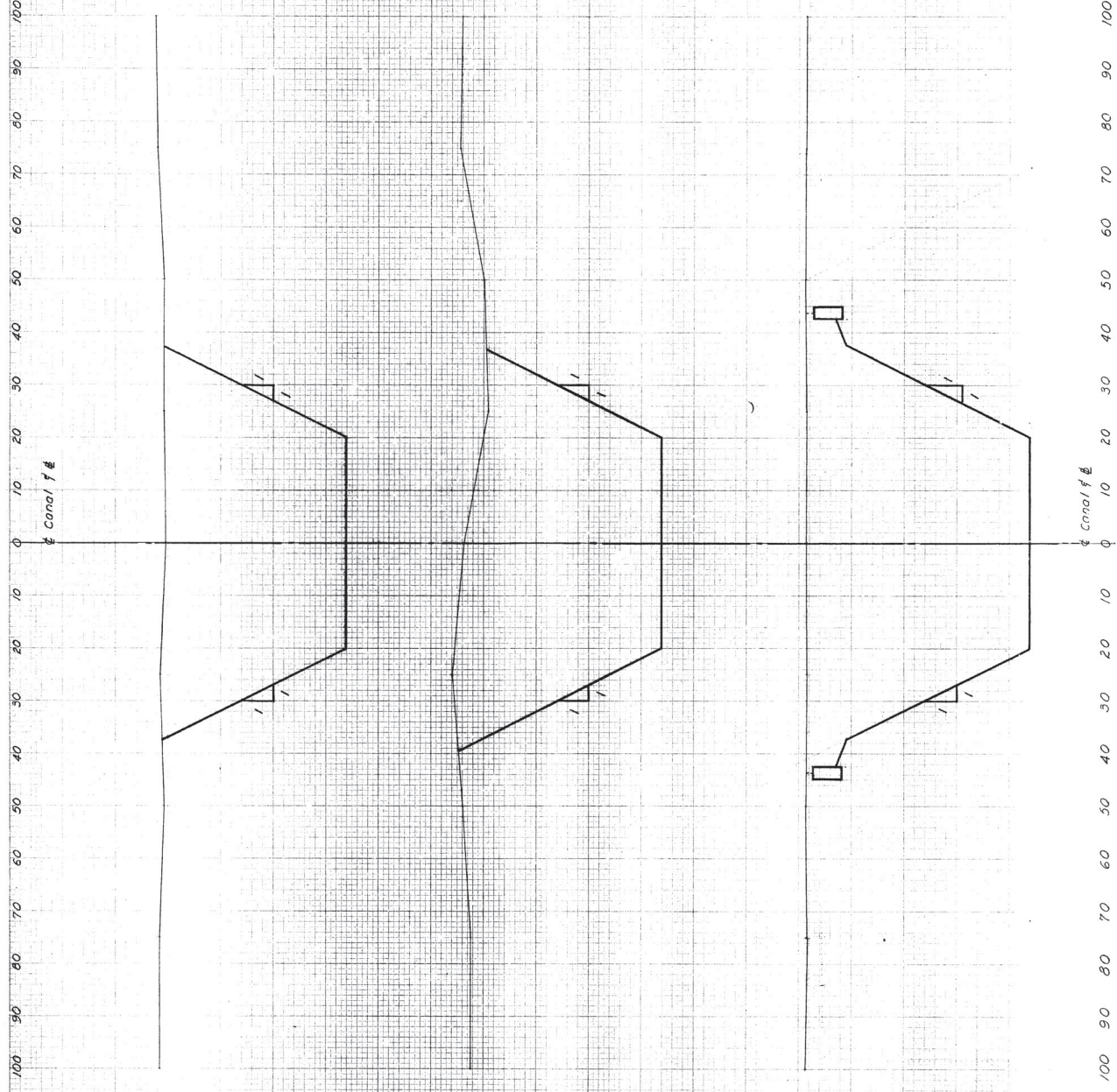
FINAL SURVEY BOOK NO. 606
DATE 12-67
BY J. S. GARDNER
CHECKED

ORIGINAL SURVEY BOOK NO. 606
DATE 12-67
BY J. S. GARDNER
CHECKED

QUAIL ROOST DR. BRIDGE
OVER
BLACK CREEK CANAL

VOLUME
CUT FILL

Scale: Horizontal - 1"=10'-0"
Vertical - 1"=5'-0"



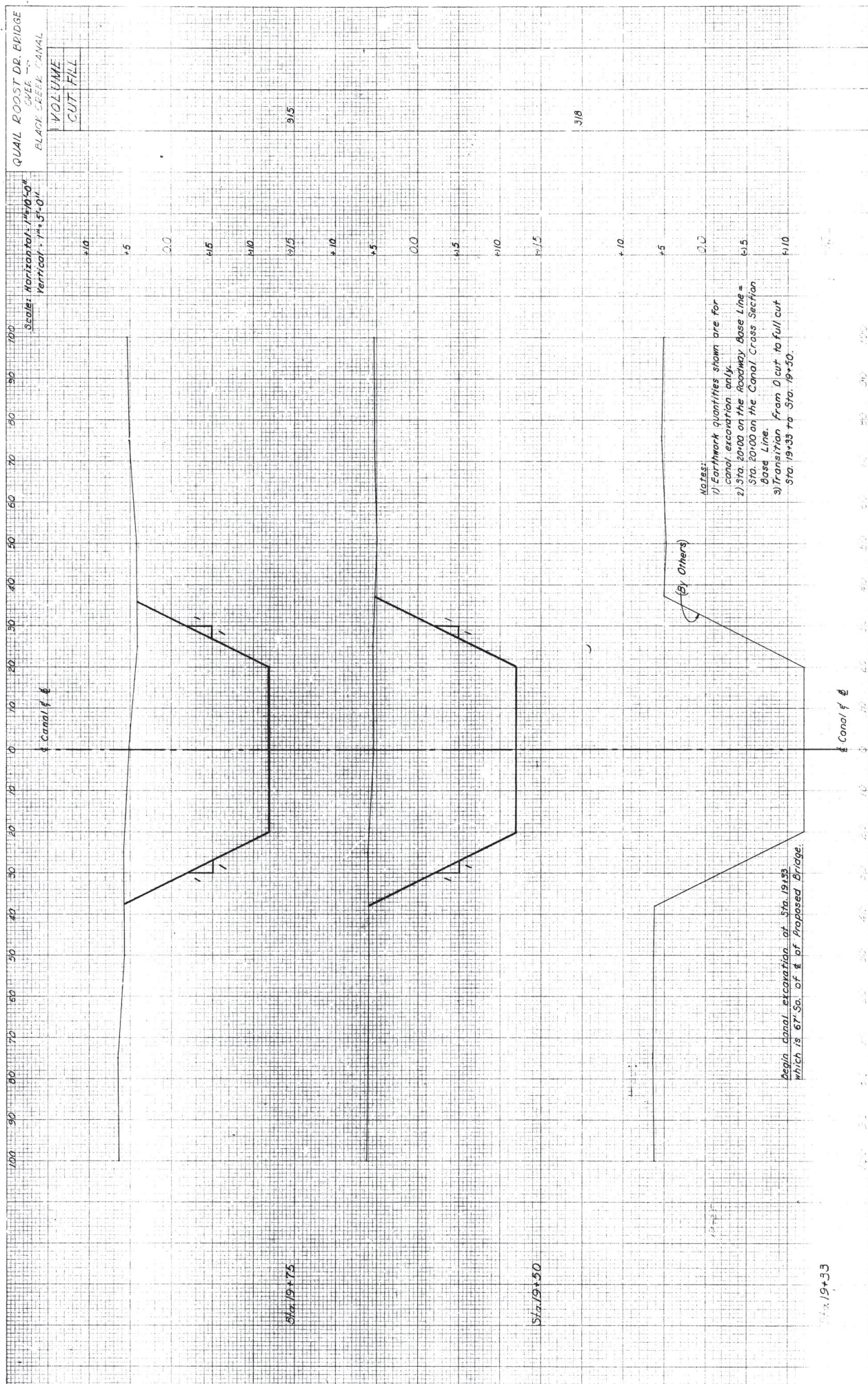
1114	956	1064
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Sta. 20+50
Sta. 20+25
Sta. 20+00 = \pm Bridge

FINAL SURVEY PLANS
DATE: 12-14-19-21
NO. 606
NOTE BOOK
CHECKS
AREAS CHECKED

U. S. SANITARY ENGINEERS
J. S. SANZONI
19-21
12-14

606
19-21
12-14



FINAL SURVEY PLOT
 CHECKED BY: [Signature]
 DATE: 12-21-61
 PROJECT: [Project Name]

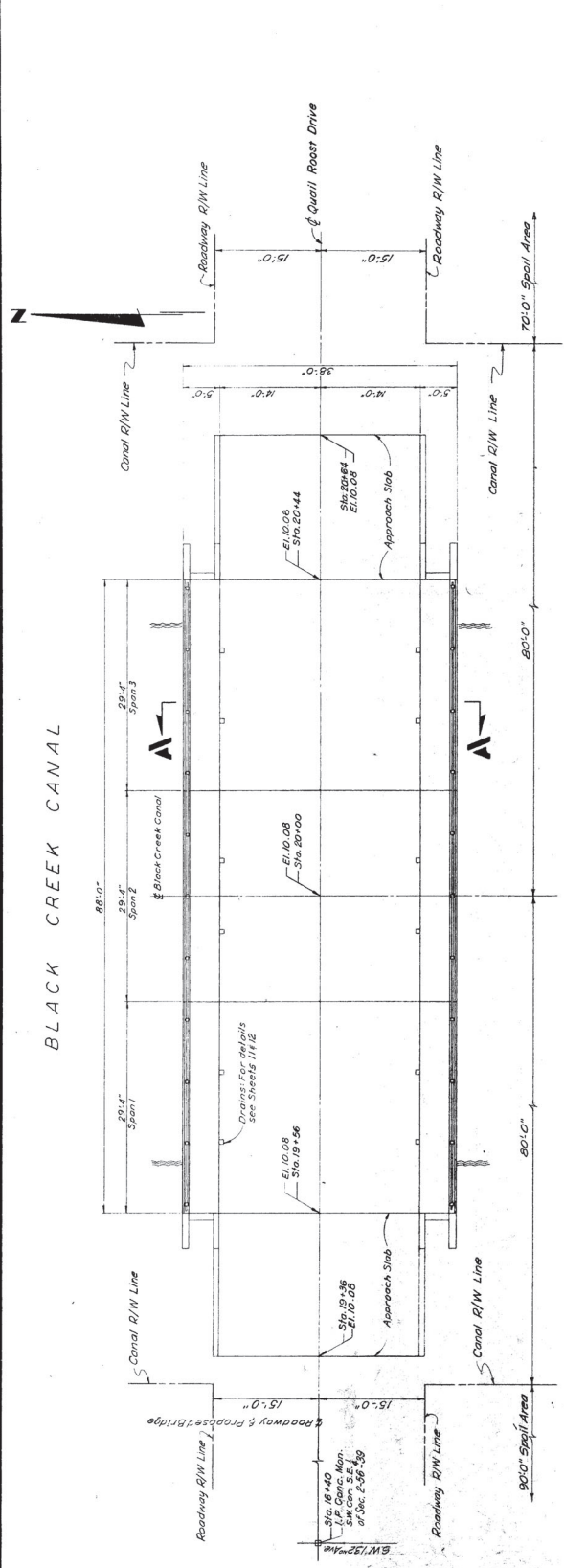
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 DATE: 12-21-61
 PROJECT: [Project Name]

ESTIMATED BRIDGE QUANTITIES

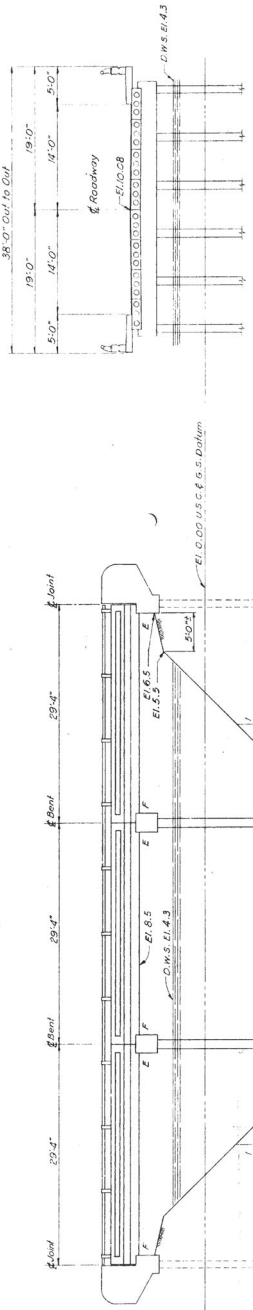
No.	Item	Unit	Quantity
57-A	Regular Excavation (Canal Only)	L.S.	1
300-1	Class A Concrete	C.Y.	86.7
310-1	Reinforcing Steel	LBS	8,400
401-A	Prestressed Tied Units	S.F.	2736
403-3A	Precast Concrete Piling (12")	L.F.	242
403-3B	Precast Concrete Piling (14")	L.F.	562
403-3C	Precast Concrete Piling (16")	L.F.	242
403-3D	Precast Concrete Piling (18")	L.F.	152
403-3E	Unbored Test Piles (12")	L.F.	32
403-3F	Unbored Test Piles (14")	L.F.	42
403-3G	Test Loads	EO	2
403-3H	Punching	EO	22
407-1	Aluminum Handrail	L.F.	176

GENERAL NOTES: (Unless otherwise noted)

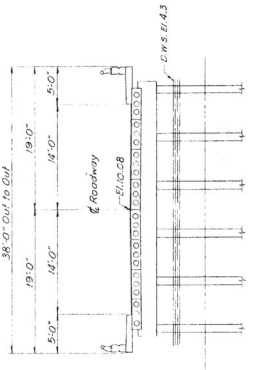
- The design specifications used are as follows:
 1. Report 1373
 2. The bridge design loading is H20-S16-44.
 3. All elevations are referred to U.S.C. & G.S. datum.
 4. Elevations shown at piles are minimum pile elevations.
 5. All other structural concrete shall be Class A, 6-5000psi.
 6. In all bills of reinforcement, the first number of the bar designation indicates the size of the bar.
 7. All reinforcing steel shall be new deformed bars in accordance with A.S.T.M. A 305 and shall be either intermediate grade Billet Steel in accordance with A.S.T.M. A 15, or Rail steel in accordance with A.S.T.M. A 15, or Rail steel in accordance with A.S.T.M. A 15.
 8. All other structural concrete shall be Class A, 6-5000psi.
 9. In Bending Diagrams all dimensions are out to out.
 10. All exposed surfaces of bents and all surfaces of Class I Surface Finish.
 11. For survey data refer to Field Book # 606.
 12. Reinforcing steel placement shall comply with recommended practice for placing reinforcing bars; C.E.S.T. Metal chairs shall not be used.



PLAN
Scale: 1/8" = 1'-0"



ELEVATION
Scale: 1/8" = 1'-0"



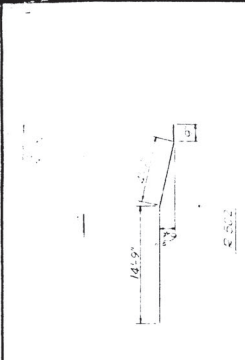
SECTION
Scale: 1/8" = 1'-0"

DADE COUNTY PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	
DESIGN Block Murray/S	PLAN & ELEVATION
CHECK J. Brown	QUAIL ROOST DRIVE BRIDGE OVER BLACK CREEK CANAL
DATE May 1962	FILE 8153
DATE May 1962	FILE 8153

REVISION	DATE	DESCRIPTION

BY: [Signature]
 DATE: May 1962
 FILE: 8153

BENDING DIAGRAM



BILL OF REINFORCING STEEL FOR ONE APPROACH SLAB

Mark	No. Reqd	Length	Mark	No. Reqd	Length
R 401	21	28'-0"	R 502	59	18'-6"

ESTIMATED QUANTITIES FOR ONE APPROACH SLAB

No.	Item	Unit	Quantity
300-1	Class A Concrete	CY	18.8
300-1	Reinforcing Steel	LB	1,607

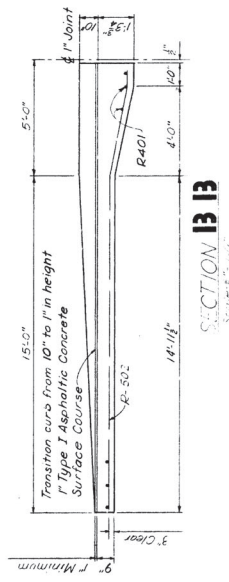
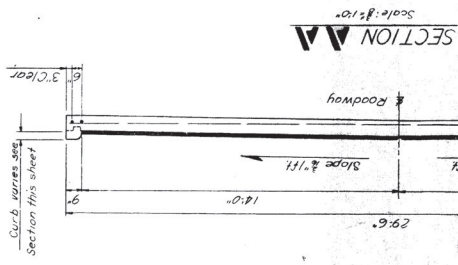
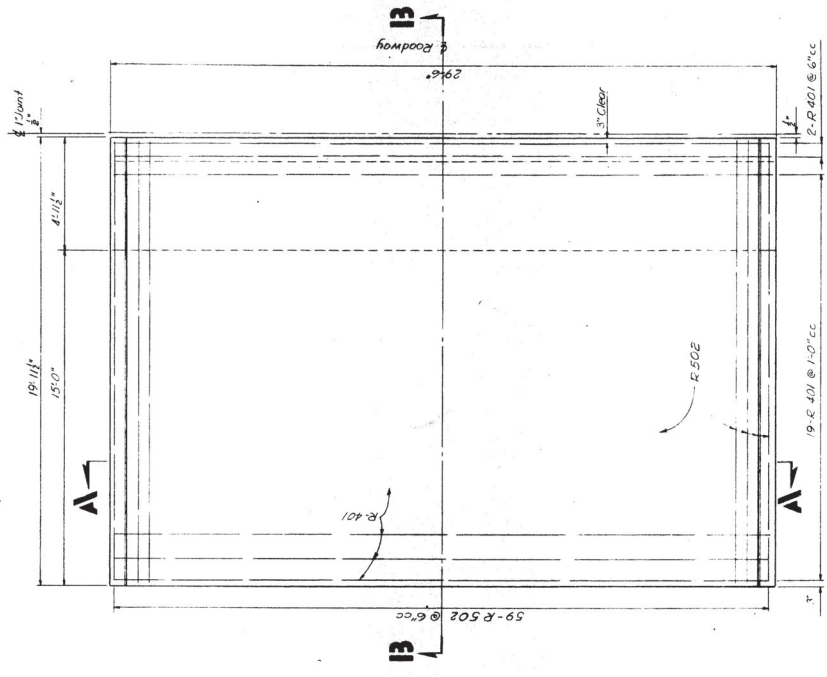
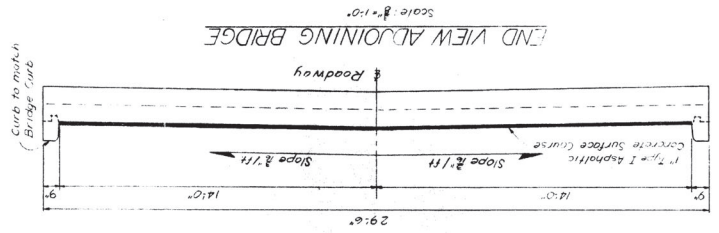
- NOTES: (Unless otherwise noted.)**
- For General Notes see Plan and Elevation Sheet.
 - Round all existing edges of concrete to 1/4" Radius.
 - Concrete shall be Class A.
 - Reinforcing steel shall be 60,000 psi yield strength.
 - For joint details between Approach Slab and Bridge see Structure Sheet.
 - Reinforcing steel shall be covered on all reinforcing steel shall be 1 1/2" minimum, 9" shall be required.
 - The quantities shown are for the Contractor's information only. Payment shall be made under Item No. 190-2.

DADE COUNTY PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

APPROACH SLAB

QUAIL ROCK DRIVE BRIDGE OVER BLACK CREEK CANAL

DESIGN: T. B. BARKER
CHECKED: J. B. BARKER
APPROVED: J. B. BARKER
DATE: May 1962
BY: J. B. BARKER
DATE: 5/14/62



REVISION	DATE	DESCRIPTION

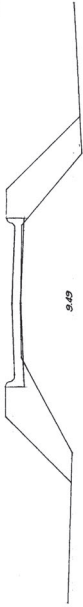
SCALE: HORIZ. 1"=100'
VERT. 1"=10'

VOLUME
CUT FILL

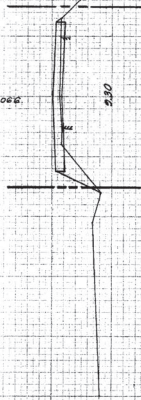
DAVE COUNTY PUBLIC WORKS DEPT.
QUAIL BOOST DRIVE BRIDGE
PROJECT NO. 8153 SHEET 2 OF 25

VOLUME
CUT FILL

BEGIN BRIDGE
STA. 19+36



19+00



BEGIN CONSTRUCTION STA. 18+25

18+00



17+00

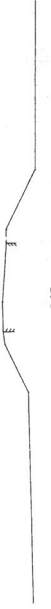


16+00

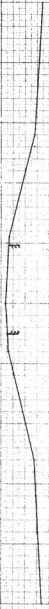


50 40 30 20 10 0 10 20 30 40 50

24+00



23+00

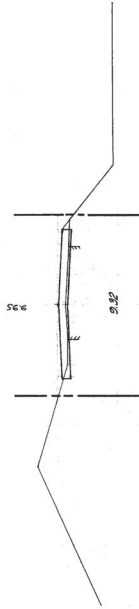


22+00



END CONSTRUCTION STA. 21+75

21+00



END BRIDGE
STA. 20+44



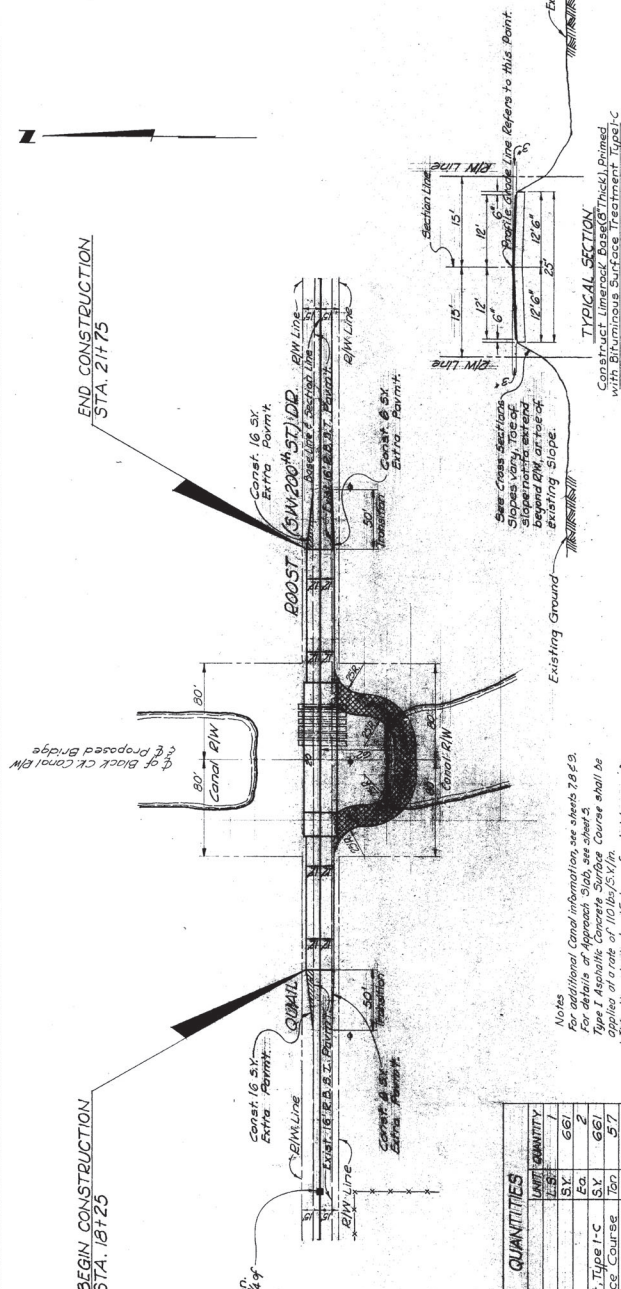
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FINAL
DESIGNED BY
CHECKED BY
DATE

8-9-04

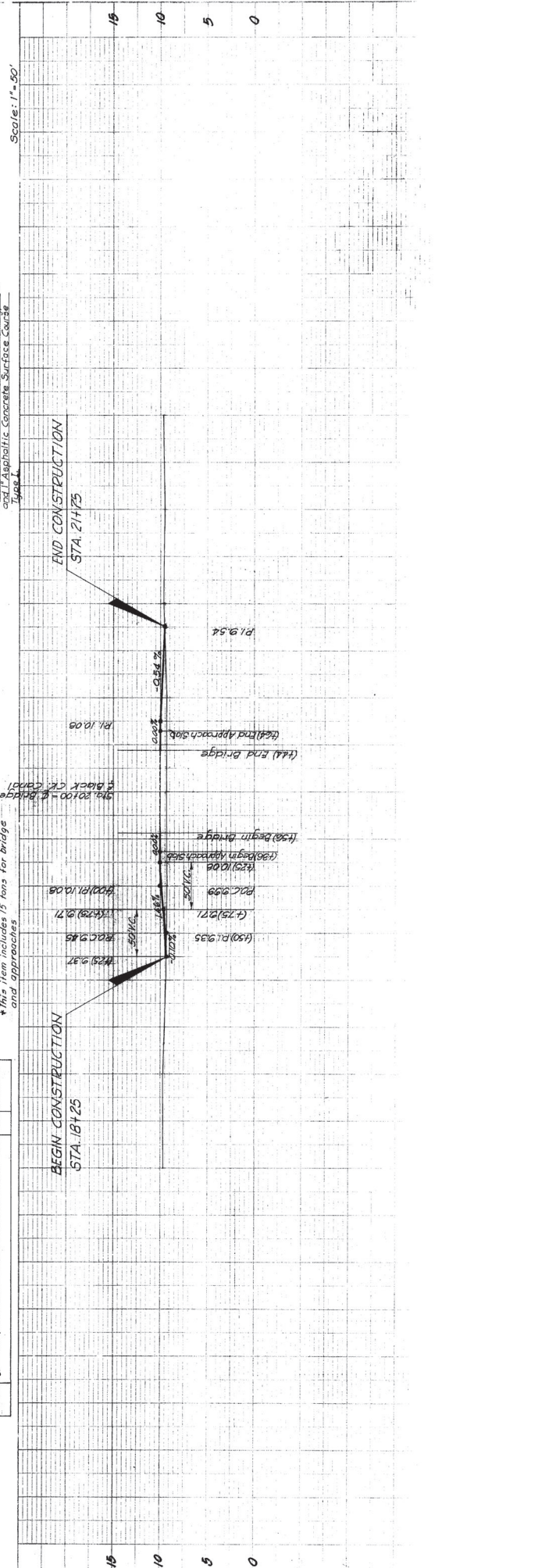
Springer

806



ITEM	DESCRIPTION	QUANTITY
25-3	Grading (including borrow)	661
100-1	Limerock Base (8" Thick)	661
190-2	Concrete Approach Slabs	661
210-2	Bituminous Surface Treatment, Type 1-C	661
233-3	Type 1 Asphaltic Concrete Surface Course	57

Notes:
 1. All proposed concrete information see sheets 7 & 8.
 2. For details of Approach Slab, see sheet 5.
 3. Type 1 Asphaltic Concrete Surface Course shall be applied at a rate of 110 lbs./SQ. Ft.
 4. This item includes 15 tons for bridge and approaches.



Scale: 1" = 50'

ITEM NO.	ITEM	UNIT	QUANTITIES	
			ROADWAY	BRIDGE TOTAL
50-1	Maintenance of Traffic	L.S.	1	1
57-4	Regular Excavation (Canal Only)	L.S.	1	1
58-3	Grading (Including Borrow)	L.S.	1	1
100-7	Limerock Base (8" Thick)	S.Y.	661	661
190-2	Concrete Approach Slab	Ea.	2	2
210-2	Bituminous Surface Treatment, Type 1-C	S.Y.	661	661
235-1	Type I Asphaltic Concrete Surface Course	Ton	13	13
300-1	Class A Concrete	C.Y.	42	42
310-1	Reinforcing Steel	Lb.	8400	8400
401-4	Prestressed Slab Units	S.F.	2736	2736
403-3A	Precast Concrete Piling Furnished (18')	L.F.	242	242
403-3B	Precast Concrete Piling Furnished (18')	L.F.	352	352
403-3C	Precast Concrete Piling Driven (18')	L.F.	242	242
403-3D	Precast Concrete Piling Driven (18')	L.F.	352	352
403-3E	Unloaded Test Piles (18')	L.F.	32	32
403-3F	Unloaded Test Piles (18')	L.F.	42	42
403-10	Test Loads	Ea.	2	2
403-14	Punching	Ea.	22	22
407-1	Aluminum Handrail	L.F.	176	176

870633

PK# 870633

APPENDIX E

Relevant Project Correspondence



Date and Time: July 8, 2021 – 9:00 AM
Meeting location: Microsoft Teams Meeting
Project: SR 994/Quail Roost Drive PD&E Study
 From SW 137th Avenue to SW 127th Avenue, Miami-Dade, Florida
FM Number: 445804-1-22-01
Contract Number: CAE32

Project Kick-Off Meeting

Attendee	Agency/Company	Phone	E-mail
Alejandro Casals	D6 ROW Administration	305-470-5473	alejandro.casals@dot.state.fl.us
Alejandro Uribe	Gannett Fleming	305-908-3935	auribe@gfnet.com
Alicia Trujillo	D6 Legal	305-470-5374	alicia.trujillo@dot.state.fl.us
Alina Fernandez	Gannett Fleming	305-908-3937	afernandez@gfnet.com
Amanda Montgomery	D6 Production Services (Consultant)	561-687-2220	amanda.montgomery@dot.state.fl.us
Amy Streeleman	Janus Research	813-636-8200	amy_streeleman@janus-research.com
Ana Sandoval	Gannett Fleming	305-908-3709	ansandoval@gfnet.com
Courtney Arena	Gannett Fleming	561-328-2397	carena@gfnet.com
Diego Rivadeneira	D6 ROW Production	305-470-5161	diego.rivadeneira@dot.state.fl.us
Elizabeth Correal	Choice Engineering	786-250-5526	ecorreal@choiceeng.com
Elsa Riverol	D6 Consultant Management	305-470-5105	elsa.riverol@dot.state.fl.us
Eugenio Lopez	Choice Engineering	786-250-5526	elopez@choiceeng.com
Jim Mykytka	D6 PLEMO (Consultant)	813-636-2624	jim.mykytka@rsandh.com
Judy Solaun-Gonzalez	D6 Consultant Management	305-470-5343	judy.solaun@dot.state.fl.us
Karina Fuentes	D6 Design	305-470-5310	karina.fuentes@dot.state.fl.us
Lydia Santiago	M.G. Vera & Associates	561-203-2704	lsantiago@mgvera.com
Mark Clark	Cyriacks Environmental	305-509-6550	mc@cecosenvironmental.com
Marta Flores	D6 ROW Administration	305-470-5123	marta.flores@dot.state.fl.us
Mauricio Gomez	D6 PLEMO	305-470-5228	mauricio.gomez@dot.state.fl.us
Misleidys Leon	D6 Traffic Operations	305-470-5345	misleidys.leon@dot.state.fl.us
Monica Diaz	Infinite Source Communications	305-984-2715	monica@iscprgroup.com
Nilia Cartaya	D6 Modal Development Office	305-640-7557	nilia.cartaya@dot.state.fl.us
Pablo Orozco	D6 D/W Bridge Inspection	305-470-5370	pablo.orozco@dot.state.fl.us
Richard Glass	Glass Land Acquisition Service	305-270-8980	richard.glass@glasslandacq.com
Robert McMullen	D6 PLEMO	305-470-5149	robert.mcmullen@dot.state.fl.us
Rodrigo Ley	D6 Production Services	305-470-5263	rodrigo.ley@dot.state.fl.us
Tania Shagoury	D6 ROW Production	305-470-5193	tania.shagoury@dot.state.fl.us
Victor Marrero	D6 Surveying and Mapping	305-470-5194	victorm.marrero@dot.state.fl.us
X Negrin	D6 Surveying and Mapping	305-470-5242	x.negrin@dot.state.fl.us

1. GF Team Introduction

Consultant Team Leads presented by Alina. See attached org chart.

2. Project Overview

Project overview presented by Alina. See attached slides for details.

3. Project Tasks

3.1. Public Involvement

- *PIP due on 7/28/2021.*
- *Public Kick Off Meeting: Tentative Date 11/1/2021.*
- *Monica will coordinate with Tish on the upcoming activities.*

3.2. Engineering

3.2.1. Survey:

- *Survey completed by FDOT in April 2021. Files provided to GF.*
- *Supplemental Survey needed (see attached exhibit):*
 - *Existing Drainage*
 - *Topo/DTM for Black Creek Trail and side streets and missing parcel lines*
- *For proposed alternative/Design Phase need topo/DTM of:*
 - *impacted areas beyond existing R/W*
 - *SW 137th Avenue and SW 127th Avenue after ongoing projects are complete*
- *Formal supplemental survey request to be submitted in PSEE.*

3.2.2. Geotechnical

- *Data Collection to start on 7/9/2021*

3.2.3. Traffic and Safety

- *Traffic Methodology Meeting to be scheduled as soon as possible.*
- *Traffic Methodology Memorandum due two weeks after Methodology Meeting*
 - *Travel Demand Forecast Reviewer: Ken Jeffries (Planning)*
 - *Traffic Operations and Safety Reviewer: Misleidys Leon (Traffic Ops)*
- *Data collection to start after summer break. Scheduled for end of August.*
- *Data collection activities to be coordinated with adjacent project to the east (scheduled to start construction soon). Construction activities and/or detours will impact traffic patterns.*
- *Traffic Operations Office has received requests to advance improvements at the intersection of Quail Roost Dr and SW 134th Avenue. Ramon Sierra will be advancing improvements at this intersection under a separate project. The PD&E study should be coordinated with Ramon's project to avoid/minimize throwaway.*
- *Increased bicycle and pedestrian activities have been observed in the corridor recently.*
- *Bicycle and pedestrian data will be provided by the Planning office. Elsa will send the request and share the information with the team.*

3.2.4. Utilities

- *6 UAOs: Comcast Cable, MDTPW Traffic, FP&L, Crown Castle Fiber, Miami-Dade Water Sewer, AT&T Distribution*

- *Initial contact after concept development*
- *WASD has earmarked this project as a Potential Collaboration Project – further coordination needed*
- *Elsa will reach out to Xenia to confirm if a separate kickoff meeting is needed.*

3.2.5. Structures

- *Bridge over Black Creek Canal – new bridge alternative to consider accommodating trail crossing.*
- *Existing bridge is substandard for vertical clearance. Bridge replacement will be considered in the study.*
- *Pablo indicated that bridge replacement is a good approach for sonovoid bridges.*
- *For asbestos testing coordination, the contact person is Geidy Coello. The turnaround time is approximately three months.*

3.2.6. Drainage

- *2 Basins (east and west of canal). System will be self-contained, with French Drains. No new outfalls.*

3.2.7. Landscaping Analysis

- *Analysis of impacts and pros/cons of alternatives with respect to landscaping. This evaluation will be included in PER and evaluation matrix.*
- *PD&E study will identify opportunities to add landscaping but Landscape Opportunity Plans will not be developed at this stage.*

3.2.8. Construction Cost Estimates

- *Update LRE to reflect Scoping Report typical section. Not immediately. To be done once concepts or typicals have been developed.*
- *LRE to be created/updated before next gaming (end of year) in order to check if additional funds need to be programmed for the project.*

3.2.9. Right of Way

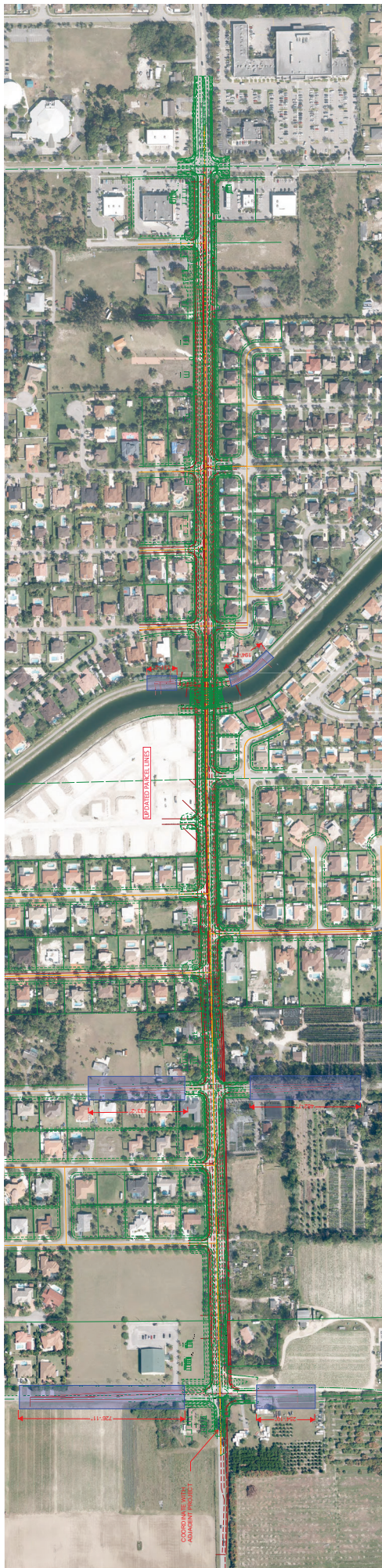
- *R/W Acquisition and Relocation is anticipated.*
- *R/W Analysis to start after the alternatives concept plans are developed.*
- *Potential impacts to three historic resources were identified during the proposal stage and will need to be evaluated in further detail.*
- *A three-lane typical will be evaluated as part of the PD&E study to minimize ROW takes.*
- *Project presentation to be sent to Diego Rivadeneira.*

3.3. Environment

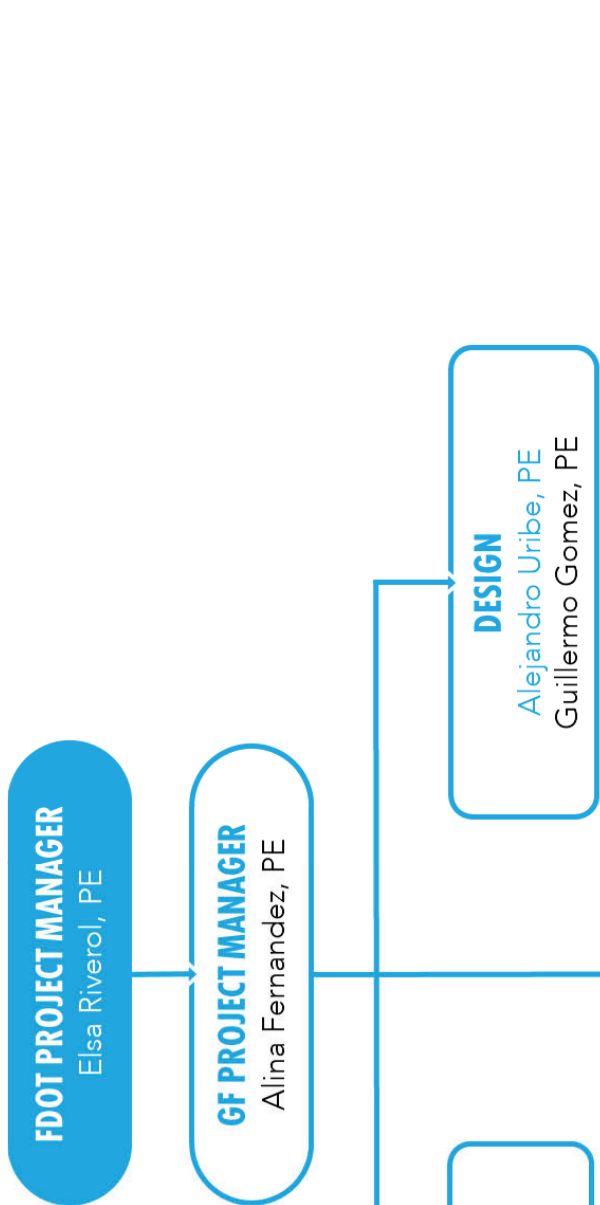
- *Data collection can begin during the alternative selection process.*
- *Analysis and Report Preparation will start once the preferred alternative has been selected.*
- *Craig James and Mauricio Gomez will be invited to progress meetings.*
- *Barbara Culhane and Amy Streelman will be invited to meetings that include Cultural Resources coordination.*

4. Action Items

- *Distribute project schedule to meeting attendees for review and input – Alina*
- *Send calendar invite for progress meetings – Elsa/Alina*
- *Coordinate upcoming Public Involvement activities with Tish – Monica*
- *Submit formal supplemental survey request in PSEE – Elsa/Alina*
- *Schedule Traffic Methodology Meeting – Eugenio*
- *Send request for bicycle/pedestrian data to Planning Office – Elsa*
- *Confirm with Xenia if separate kickoff meeting is needed for utilities – Elsa*
- *Send project presentation to Diego Rivadeneira – Alina*



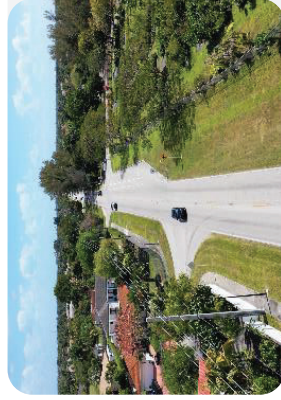
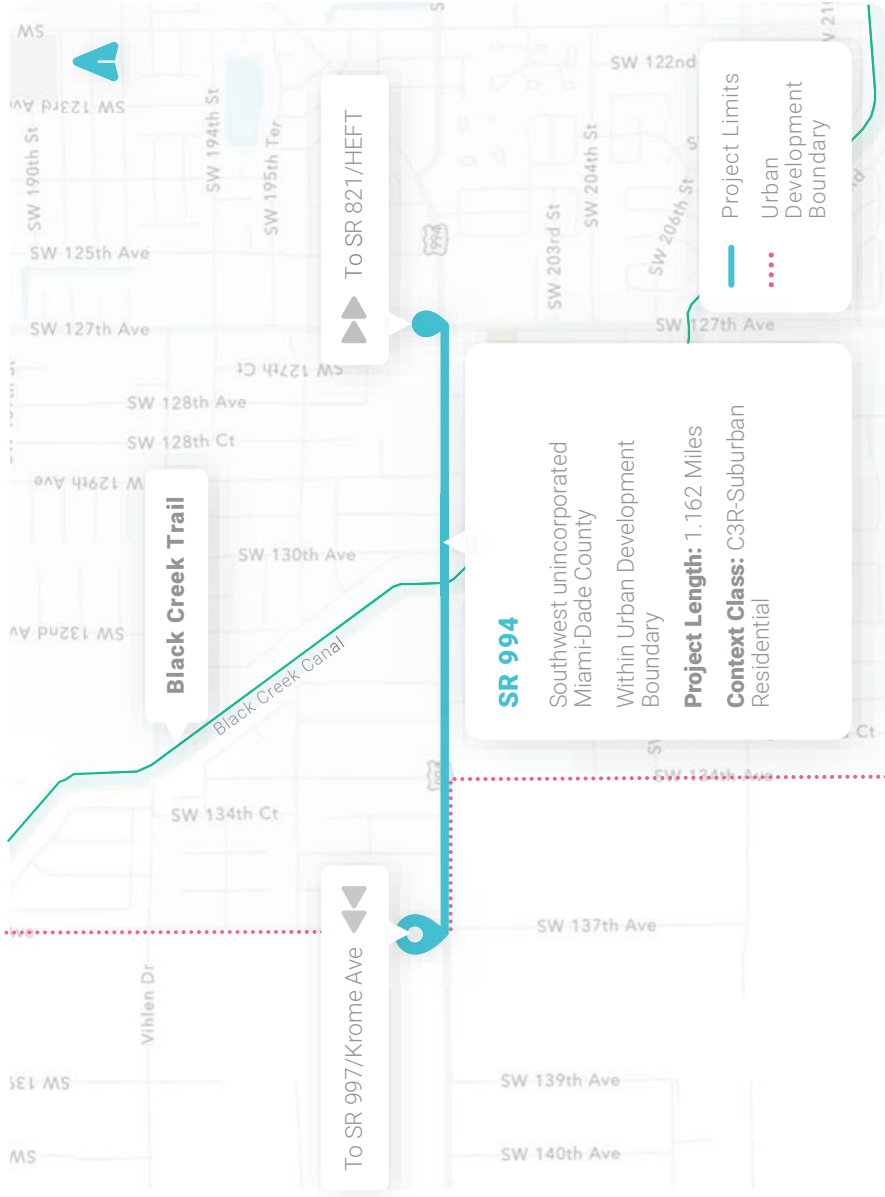
: Organizational Chart



	ENVIRONMENT	TRAFFIC/SAFETY	STRUCTURES	DRAINAGE
PUBLIC INVOLVEMENT	<ul style="list-style-type: none"> Courtney Arena - GF Mark Clark - CECOS Amy Strelman - Janus 	<ul style="list-style-type: none"> Carlos Francis, PE – Choice Jeannette Berk - GF 	Doug Hershey, PE - H.W.L	Carlos Ribbeck, PE - Ribbeck Engineering
LANDSCAPE	UTILITY COORDINATION	SURVEY/SUEs	GEOTECHNICAL	ROW ACQUISITION
Brian Shore, RLA - Miller Legg	Lydia Santiago – Manuel G. Vera & Associates	Manny Vera Jr., PSM – Manuel G. Vera & Associates	Oracio Riccobono, PE - Geosol	Richard Glass – Glass Land Acquisition

: Project Location

SR 994 • SW 200th St • Quail Roost Drive
 from West of SW 137 Ave (MP 4.000) to East of SW 127 Ave (MP 5.162)



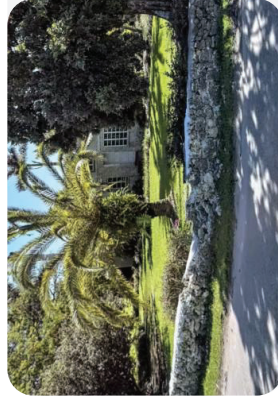
Land Use

Agricultural & Single-Family
 Limits go beyond Urban
 Development Boundary Line



Key Features

Bridge over Black Creek Canal
 Black Creek Trail Crossing



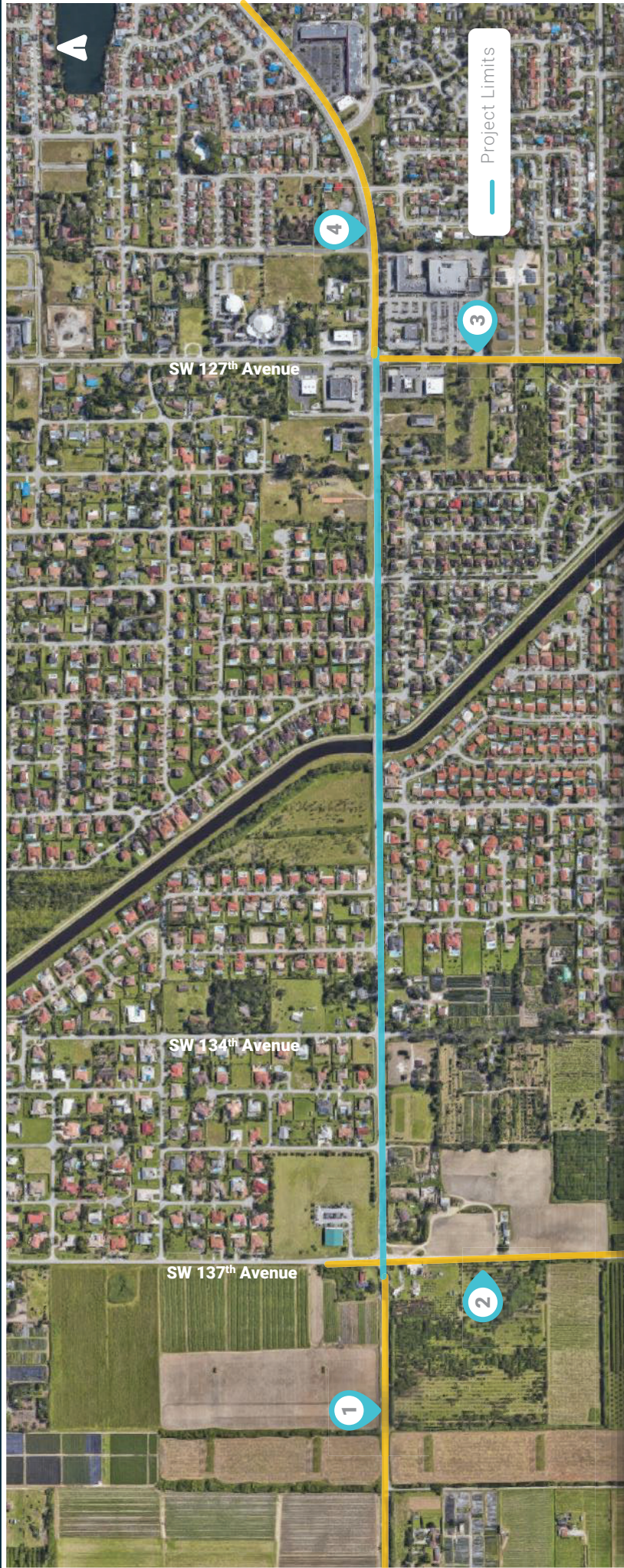
Historic Resources

Historic walls and homes:
 NW corner of SW 137th Ave
 SW corner of SW 137th Ave
 SE corner of SW 134th Ave

: Existing Typical Section



: Adjacent Projects



1

FM 443907-1
 SR 994/Quail Roost Dr RRR from
 Krome Ave to SW 137th Ave
 Letting 03/2023
 Designed by Choice

2

MDC Project No. 20040343
 SW 137th Ave widening from
 US-1 to Quail Roost Dr
 Under construction
 Completed by 10/2022

3

MDC Project No. 20180004
 SW 127th Ave & SW 200th St
 Intersection improvements
 Design completed 11/2020
 Construction starts 07/2021

4

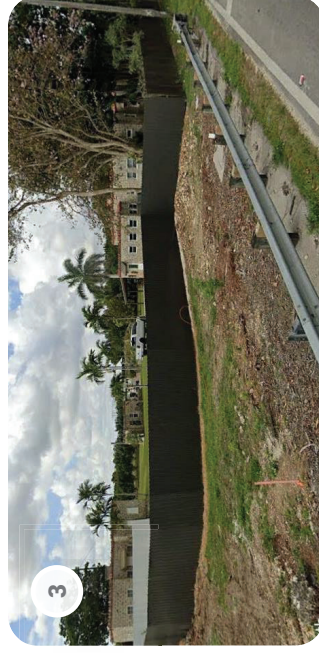
FM 429341-3
 SR 994/Quail Roost Dr 3R from
 SW 127th Ave to SW 113th Ave
 Letting 03/2022
 Designed by Gannett Fleming

Project Limits

Historic, Archeological, Recreational, Section 4(f)

Three historic resources that may be eligible for inclusion in the National Register (NRHP) are likely within APE-require more research and documentation:

- ① Talbott Estate/20101 SW 134th Avenue/13390 SW 200 St (County designated)
- ② MacDonell House and Walls/ 13701 Quail Roost Road (County designated)
- ③ 20000 SW 137th Avenue – potentially significant



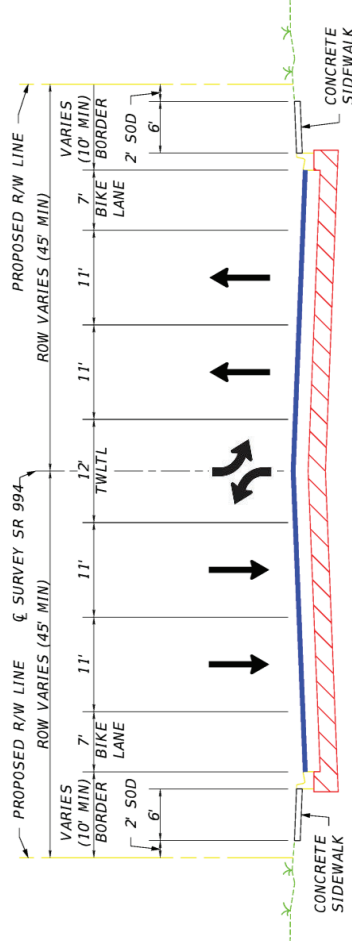
Recommendations

- Early documentation and determination of eligibility
- Early Consultation with agencies
- Conduct Section 106 and Section 4(f) concurrently
- Potential additional tasks under Section 106 – optional services
- Effects Determination Case Study, DHR/SHPO Consultation, Memorandum of Agreement (MOA)
- Advanced ROW acquisition
- Widening or reconstruction of the existing C-1W Canal bridge should provide trail for access and connectivity.
- Avoidance Alternatives must be considered: Prudent and Feasible test

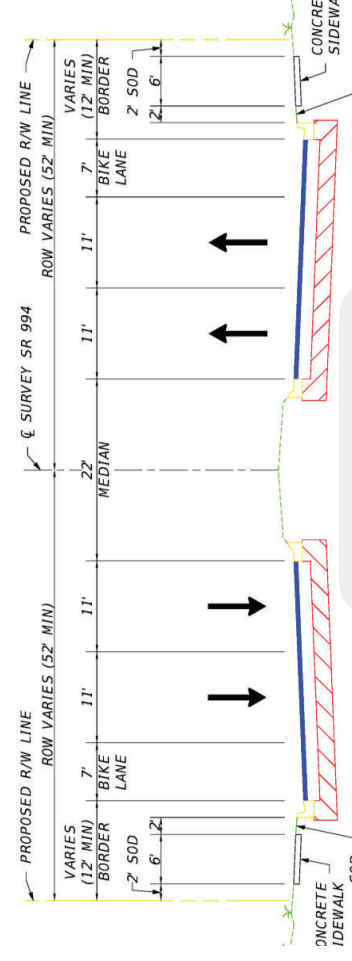
Typical Section Evaluation



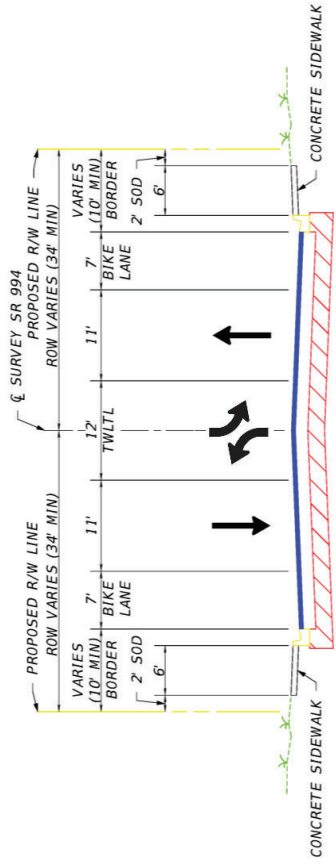
Existing ROW



Typical 1
4 lanes - TWLTL
90' ROW



Typical 2
4 lanes - Divided
100' ROW

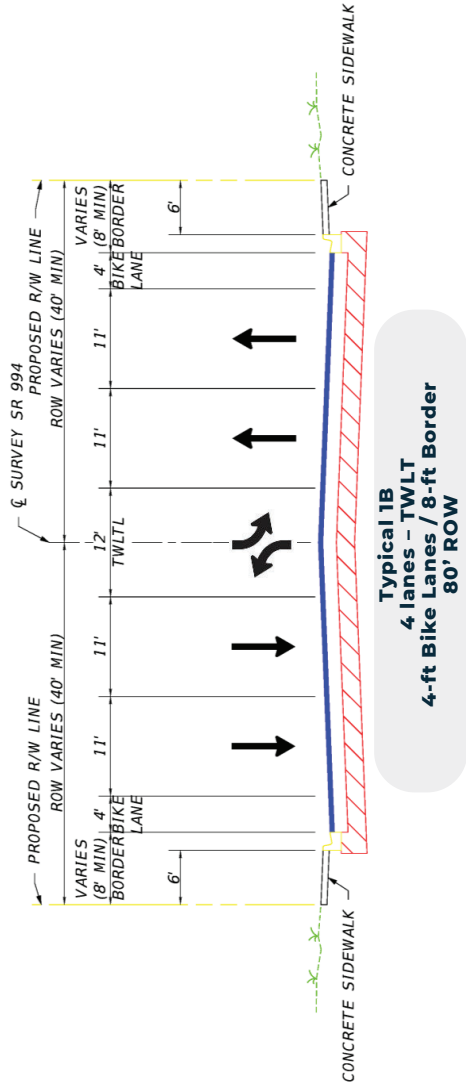
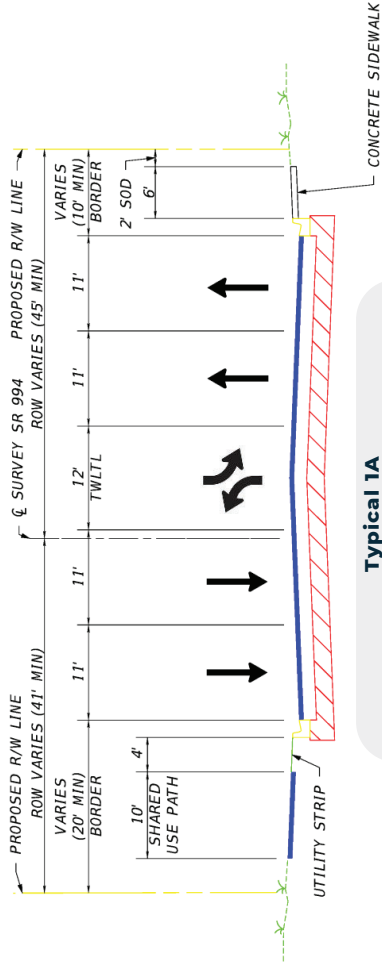


Typical 3
2 lanes - TWLTL
68' ROW

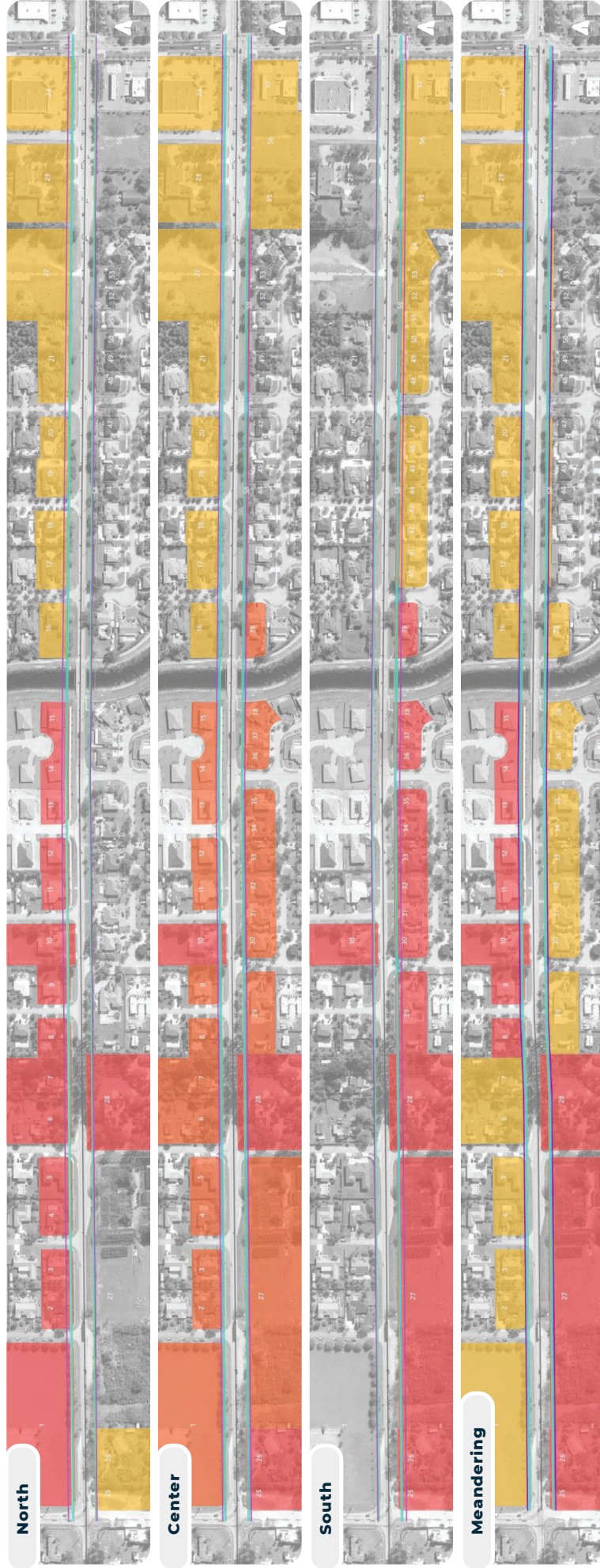
Typical Sections – Example of Variations



Existing ROW



: Alignment Optimization & ROW Impacts



Alignments	North		Center		South		Meandering		* Centered Aligned only		
	100'	90'	100'	90'	100'	90'	100'	90'	*	*	
Widths / Map Legend	27	18	16	80'	36	18	18	51	12	68'	58'
Parcels Impacted	27	18	16	4	36	18	18	51	12	2	1
Relocations	11	0	0	0	19	9	0	17	5	0	0

Map Legend
■ Parcels Impacted by 100' ROW
■ Parcels Impacted by 90' & 100' ROW

Least impactful overall (East & West)
Requires width variations

Least impactful without width variations
0 Impacts East of Bridge

: Horizontal Alignment Evaluation

Avoidance Approach

Shift alignment to minimize the number of parcels impacted
 Minimize the number of shifts to **avoid excessive meandering** that could pose safety concerns

Avoid impacts to buildings and structures (pools, gazebos, etc.)
Minimize overhead pole relocation by matching existing R/W line on one side of the road



: Existing Bridge 870633 - Over Black Creek Canal

3-span structure **built in 1962 -SHPO Coordination Required**

Sonovoid slab superstructure (8 slabs) with transverse post-tensioning and 1" thick asphalt overlay

75.3 Sufficiency Rating

Functionally Obsolete

Utilities on south side: overhead electric and water line

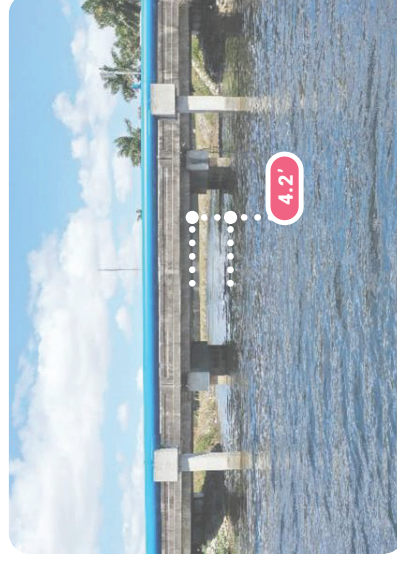
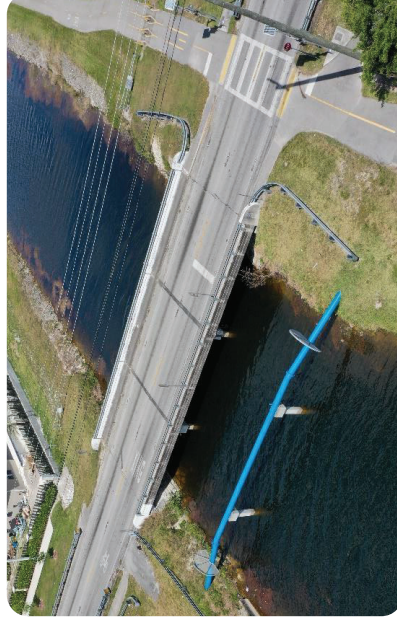
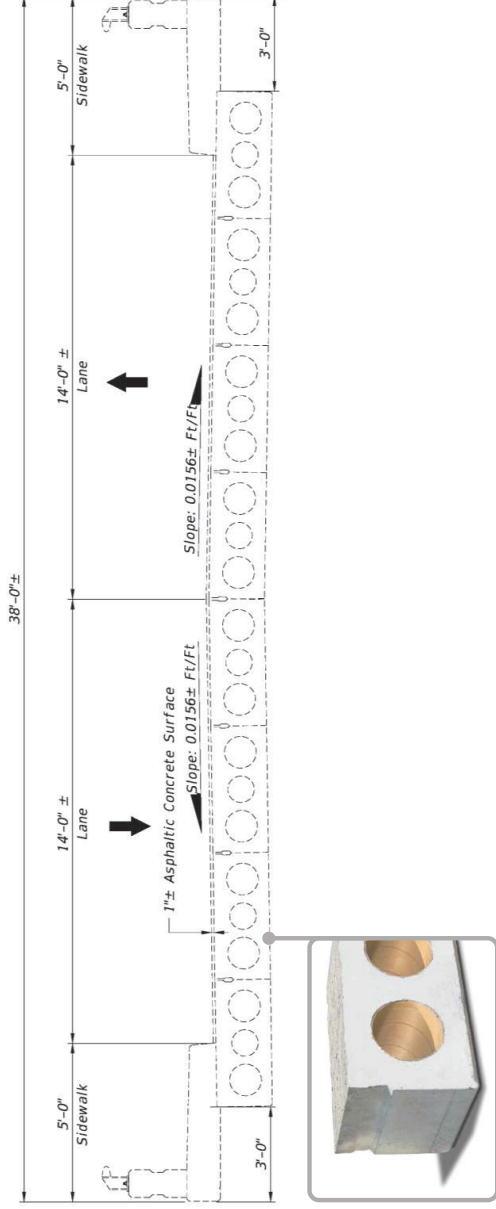
Trail crossing on east end

Substandard Vertical Clearance

Required VC = 4.5 ft over Optimum Water Control (OWC) Elev.
 Black Creek Canal OWC Elev. = 4.3 ft (Coordinated with SFWMD)
 Existing Bridge Low Member EL. = 8.5 ft
Existing VC = 4.2 ft < 4.5 ft Required

Widening may not be feasible

60-year-old bridge with new widened portion creates risks
 Vertical Clearance further reduced: **Widened Bridge VC = 2.83 ft.**
 Differential beam camber challenges



Option 1

Relocate trail under proposed bridge

Pros

- No bike ped conflicts – **Improves Safety!**
- Eliminates delays for vehicles due to potential signalized crossing – **Improves Operations!**
- Improved Overall Bridge Vertical Clearance

Cons

- Higher profile
- Impacts to Adjacent properties, utilities, SFWMD access driveways
- More complex TCP



Option 2

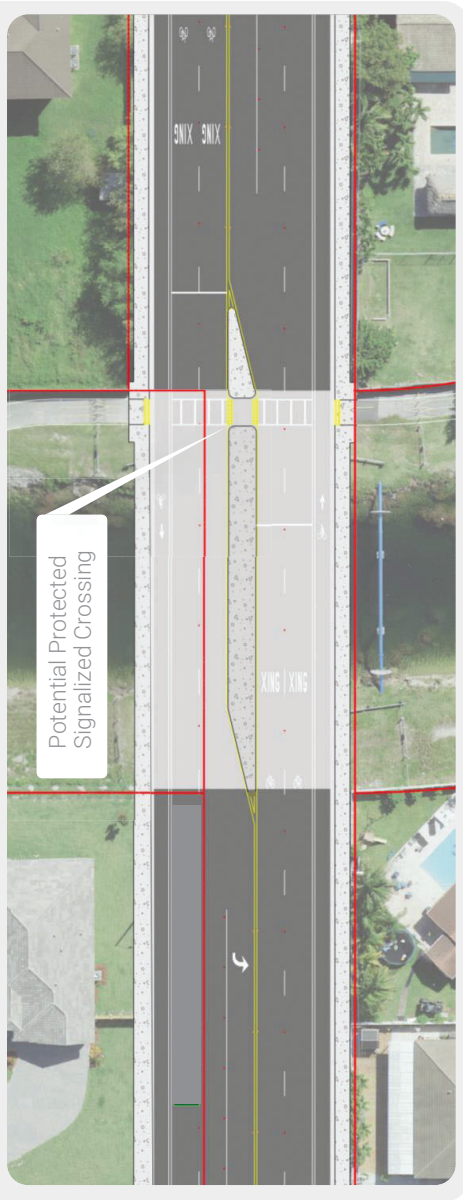
Maintain at-grade crossing

Pros

- Lower profile
- Minimizes impacts SFWMD access Adjacent Properties TCP
- Water Main Crossing

Cons

- Conflicts with peds and bikes
- Increases delay on Quail Roost (Vehicles stopped for peds/bikes)



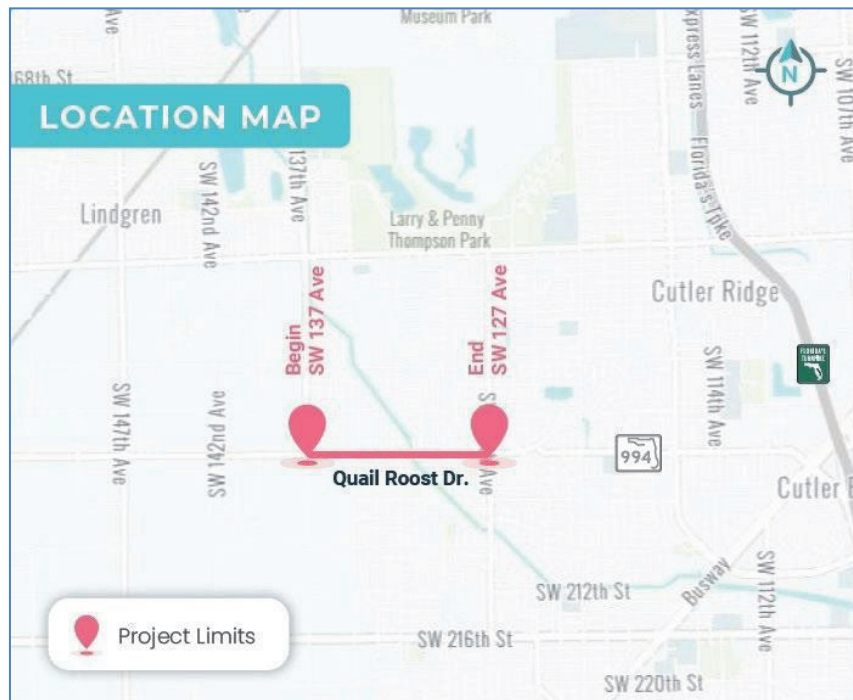
FLORIDA DEPARTMENT OF TRANSPORTATION INTERAGENCY MEETING MINUTES

9:00 – 9:30 am: (D6) SW 200th Street/Quail Roost Dr from W of SW 137th Ave to E of SW 127th Ave

AGENDA SUMMARY:

PROJECT INFO

1. FPID/FM Number: 445804-1-22-01
2. FDOT Project Name: SR 994/SW 200th Street/Quail Roost Drive from W of SW 137th Ave to E of SW 127th Ave
3. FDOT Project Manager: Elsa Riverol
FDOT Drainage Liaison: Nathan Pulido
FDOT PLEMO Liaison: Steven Craig James, Robert McMullen
4. Consultant/Company Name and Contact information: Gannett Fleming; Project Manager: Alina Fernandez, afernandez@gfnet.com, 305.519.2987; Courtney Arena, carena@gfnet.com, 954.649.9450.
5. SR/Local Name: SR 994/SW 200th Street/Quail Roost Drive
6. County: Miami-Dade
7. Project Limits (provide location map and figures): SR 994/SW 200th Street/Quail Roost Drive from W of SW 137th Ave to E of SW 127th Ave



8. General Project Scope (include stage of project - PD&E, Design, Design/Build, Construction, etc.):
Current Stage: PD&E
General Scope: The proposed roadway widening is intended to improve Safety, Operational Conditions, Enhance Mobility Options. The project also replaces the existing bridge over Black Creek Canal (C-1W), and relocates the Black Creek Trail crossing under the new bridge.

The purpose of this project is to address traffic operations and capacity constraints on SR 994 from west of SW 137th Street to east of SW 127th Avenue in unincorporated Miami-Dade County in order to accommodate future travel demand projected as a result of population and employment growth along the corridor. Other goals of the project are to 1) improve safety conditions along the corridor, including emergency evacuation and response times, and 2) enhance mobility options and multimodal access.

9. Anticipated Permits: The project is currently in the PD&E Phase. Section 408 Review (USACE) - *Black Creek Canal (C-1W) is part of a federal flood control project, and a 408 review may be required for proposed bridge improvements.* SFWMD Environmental Resource Permit, Right-of-Way Occupancy Permit (SFWMD); Water Use Permit (obtained by construction contractor), National Pollutant Discharge Eliminated System (FDEP, obtained by construction contractor).
10. Provide specific agenda discussion topics (i.e., goal of meeting): Discuss bridge replacement and Black Creek Trail relocation passing under the bridge versus the existing at grade crossing. Refer to PowerPoint presentation.
11. Requested Attendees (SFWMD - Environmental Resources, Surface Water Management, Water Use, ROW; USACE; USFWS; NMFS, etc.): SFWMD- Environmental Resources including roadway drainage treatment; ROW for the Black Creek Trail (Section 4f) crossing along the C-1W Canal.
12. Does your project include impacts to any environmental resources? If yes, please answer Questions a- d:
- a. Have wetland and/or protected species impacts been identified? If so define the impact amount and type: No wetland impacts are anticipated. A minor amount of surface water impacts may occur as a result of the proposed bridge replacement.

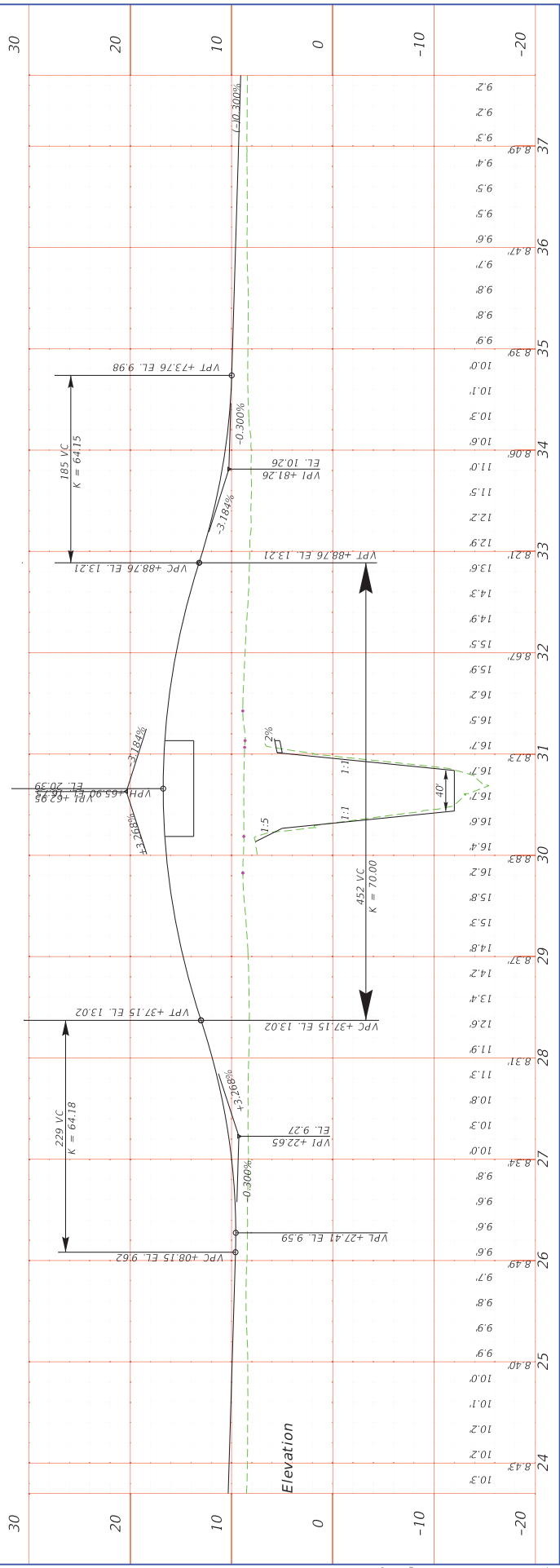
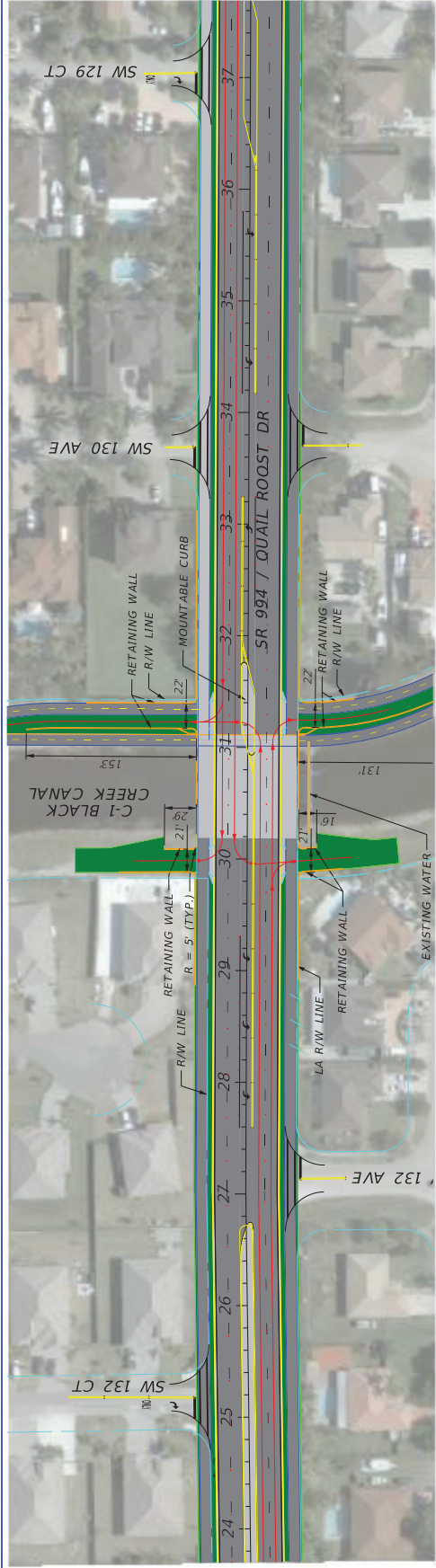
Based on range and preferred habitat type the following species listed by the Federal Endangered Species Act and the State of Florida as Federally Endangered (FE), Federally Threatened (FT), or State-Threatened (ST) have the potential to occur in the project area: American alligator (FT based on similarity of appearance to American crocodile), eastern indigo snake (FT), Florida bonneted bat (FE), wood stork (FT), little blue heron (ST), roseate spoonbill (ST), and tricolored heron (ST). All the aquatic and wetland species either likely or potentially utilize appropriate habitats in the vicinity of the bridge. Given that the area surrounding the project corridor is predominantly urban in nature, field reviews did not identify any suitable habitat for these species.



- b. Have the project representatives discussed the wetland and/or protected species impacts with PL&EM? (List the PL&EM person who you discussed with and the date of the meeting/discussion): [In Progress with FDOT District 6 PL&EM, Robert McMullen.](#)
- c. During the meeting/discussion with PL&EM did project representatives discuss avoidance and minimization criteria? Has PL&EM concurred these criteria were applied? (For District IV projects, participation in this interagency meeting is not permitted if elimination and reduction has not been explored with PL&EM): [N/A](#)
- d. Have mitigation options for unavoidable impacts been discussed with PL&EM, and concurrence on the amount and type been achieved? (For District IV projects, participation in this interagency meeting is not permitted if options for unavoidable impacts been discussed with PL&EM): [N/A](#)

PRIOR COORDINATION

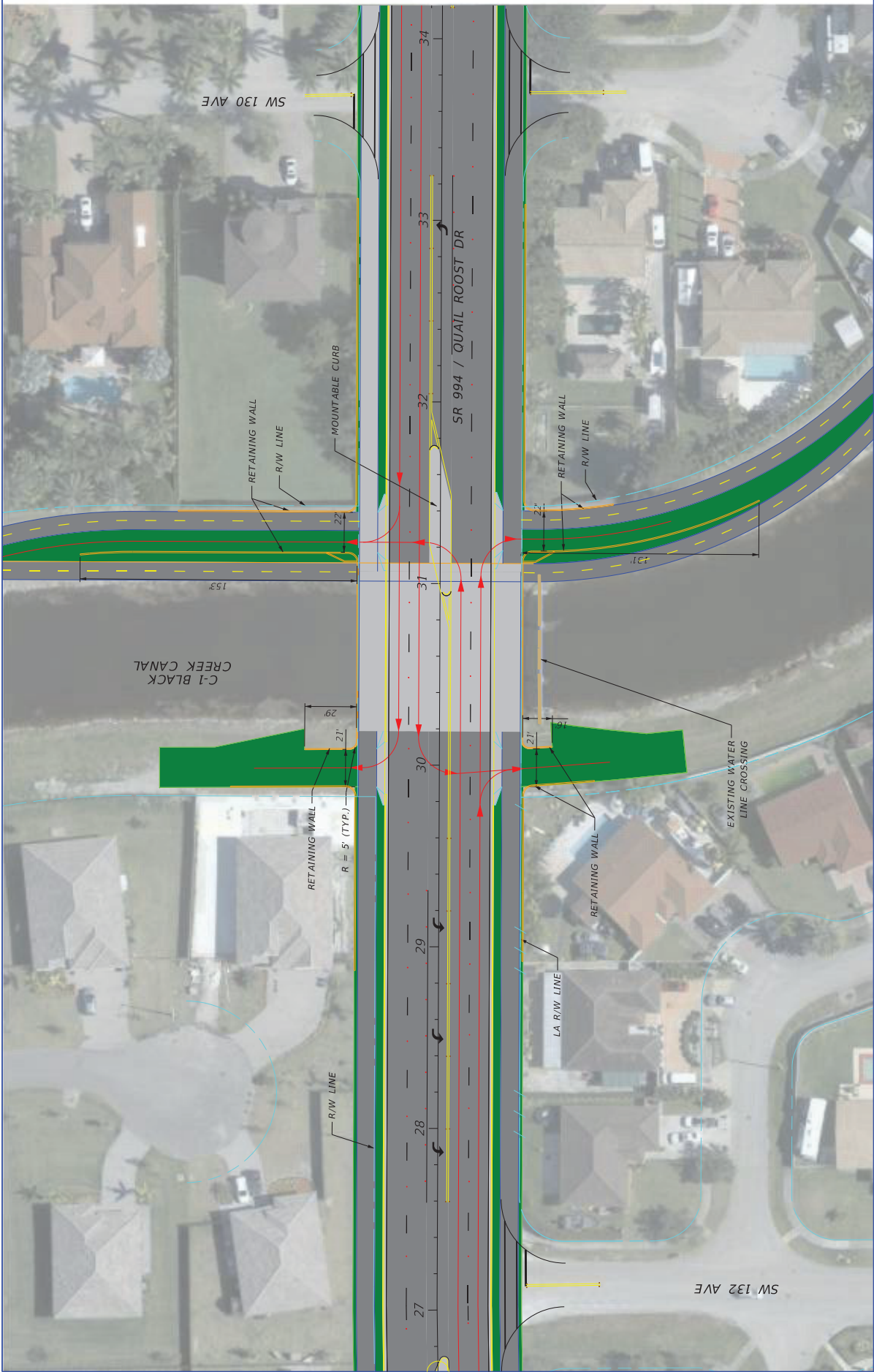
- 13. Has the project approach been discussed with:
 - a. FDOT Drainage Liaison? [Yes](#)
 - b. PLEMO Liaison? [Yes](#)
 - 14. Have you coordinated with Cultural Resource Manager to determine if a SHPO concurrence letter has been received and can be included in the application? [The project is in the PD&E phase and coordination with SHPO is on-going. We do not anticipate submitting a permit application at this time.](#)
 - 15. Have you coordinated with the Contamination Coordinator to determine if there are contamination concerns in the event a dewatering permit is required? [A Contamination Screening is in progress.](#)
 - 16. Have you coordinated with Natural Resource Manager to determine if a USFWS concurrence letter has been received and can be included in the application? [Coordination with USFWS is anticipated to occur later on in the PD&E phase.](#)
 - 17. For projects going into the permitting phase: Has a pre-application meeting been held or any preliminary correspondence been made by FDOT PM or Consultant with the regulatory agencies/reviewers? Specify the agencies and dates when meetings were held: [N/A](#)
 - 18. For project in the permitting phase, please provide any application numbers and the reviewer's name: [N/A](#)
 - 19. Anticipated Permits (or, if you already applied for or received any permits, please include the application/permit numbers): [N/A](#)
-



DATE	DESCRIPTION	REVISIONS	DATE	DESCRIPTION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		FINANCIAL PROJECT ID 4458042201	
ROAD NO. 994	COUNTY MIAMI-DADE		

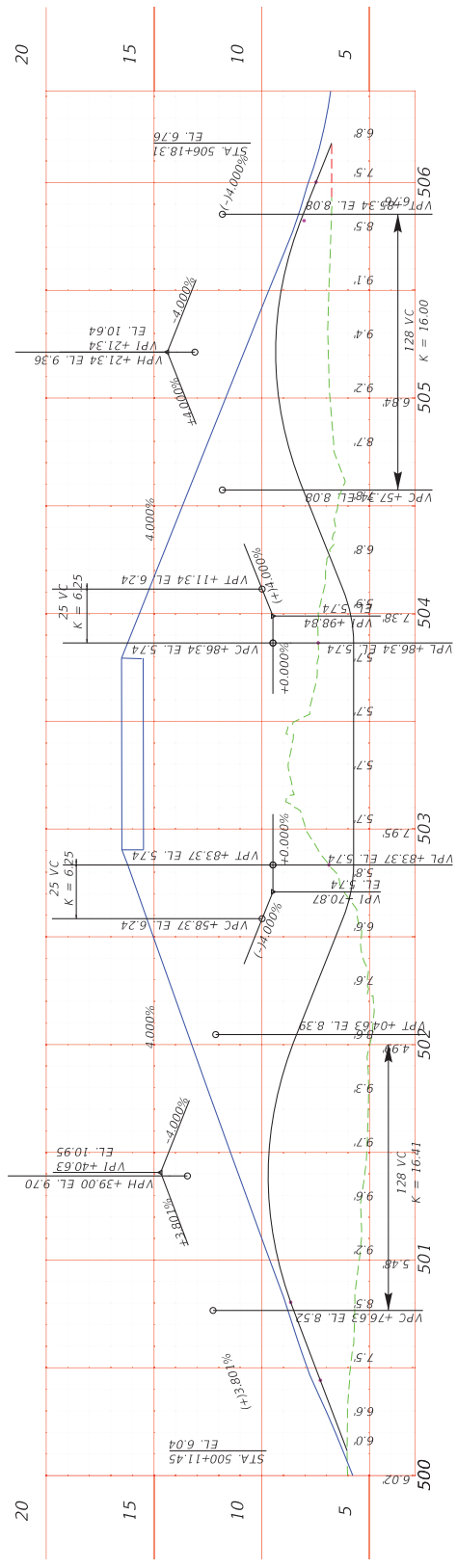
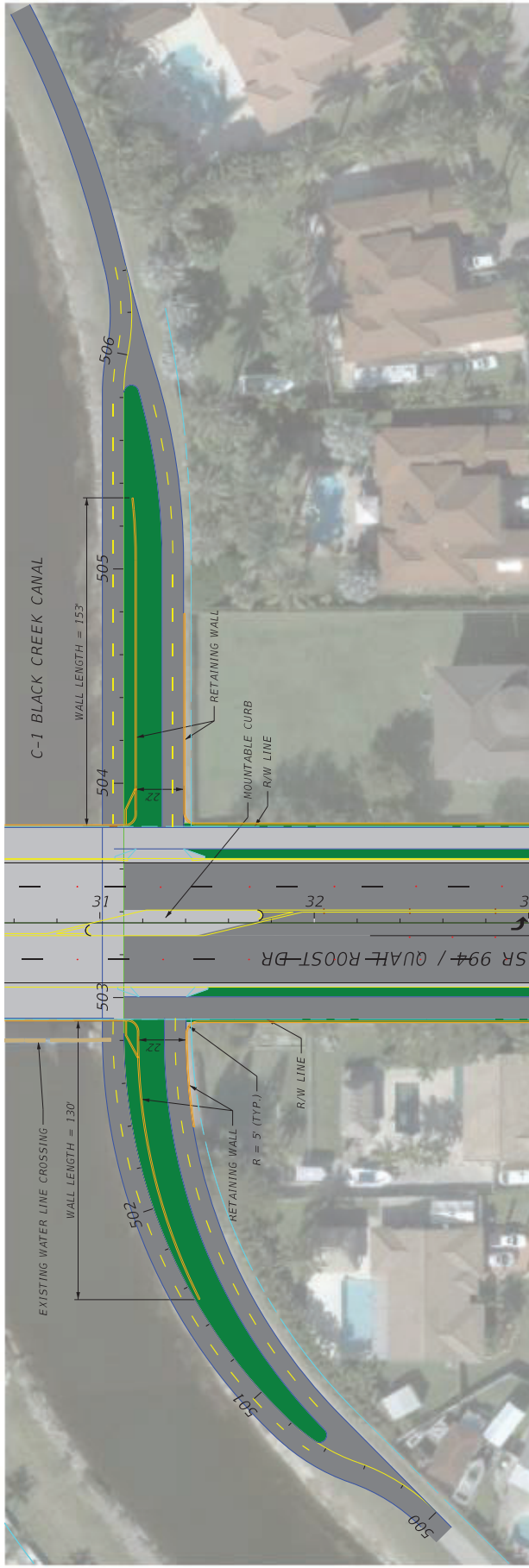
PLAN PROFILE	
SHEET NO.	01



DATE	DESCRIPTION	REVISIONS	DATE	DESCRIPTION

STATE OF FLORIDA		DEPARTMENT OF TRANSPORTATION	
ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
994	MIAMI-DADE	4458041201	

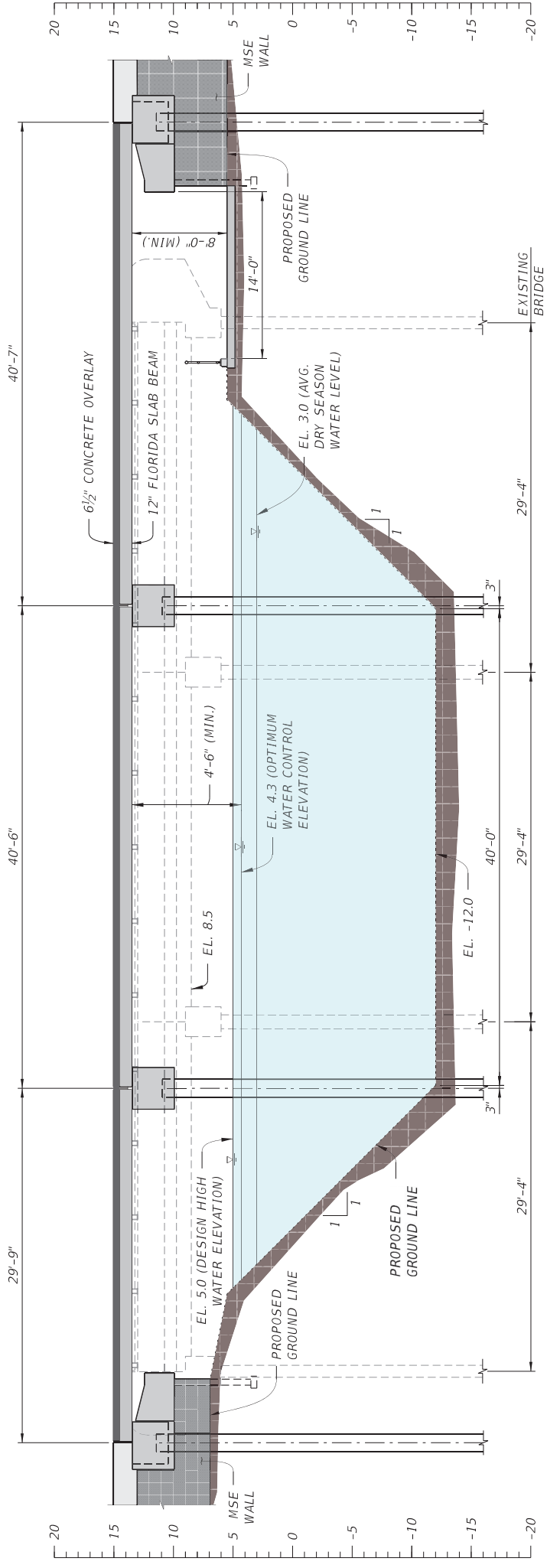
PLAN PROFILE	
SHEET NO.	02



REVISIONS		DESCRIPTION	
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		FINANCIAL PROJECT ID 4458042201	
ROAD NO. 994	COUNTY MIAMI-DADE		

PLAN-PROFILE	
SHEET NO. PLAN 1	





PROJECT MEETING SUMMARY:

ATTENDEES:

Name	Organization	Email Address
Dustin Wood	SFWMD	duwood@sfwmd.gov
Barb Conmy	SFWMD - ERP	bconmy@sfwmd.gov
Caitlin Westerfield	SFWMD - ERP	cwesterf@sfwmd.gov
John Hixenbaugh	SFWMD - ROW	jhixenba@sfwmd.gov
Teri Swartz	SFWMD - 408	tswartz@sfwmd.gov
Michelle Gilbert	USACE	michelle.l.gilbert@usace.army.mil
Elsa Riverol	FDOT - PM	elsa.riverol@dot.state.fl.us
Daniel ChominViriden	FDOT	daniel.chomin-viriden@dot.state.fl.us
Alina Ferndandez	Gannett Fleming	afernandez@gfnet.com
Carlos Cejas	Gannett Fleming	ccejas@gfnet.com
Courtney Arena	Gannett Fleming	carena@gfnet.com
Alejandro Uribe	Gannett Fleming	auribe@gfnet.com
Amanda De Cun	Gannett Fleming	adecun@gfnet.com
Vinicius Pranckevicius	Gannett Fleming	vpranckevicius@gfnet.com
Carlos Ribbeck	Ribbeck Engineering	cribbeck@gmail.com
Francis Mitchell	Ribbeck Engineering	f-mitchell@att.net

The Project meeting started around 9:00 am and was completed by 9:40 am. After roll call of attendees, the overall project scope, limits, and approach were reviewed and presented by representatives of Gannett Fleming. The Project was described as a PD&E project for a 1.5-mile-long roadway improvement with bridge replacement including pedestrian mobility improvements. It is currently a two-lane undivided roadway and bridge that has substandard vertical clearance. There are two options being proposed: Option 1) Keep it as a two-lane bridge but add a turning lane and shared use path with lighting. This would increase the bridge footprint. Option 2) add two lanes to be a 4-lane roadway/bridge with median and shared use path. In either Option, the bridge would be replaced. It is a SFWMD canal and the shared use path and work is within the SFWMD ROW. The purpose of this meeting is to confirm the design considerations for the bridge and shared use path which is being proposed under the east side of the bridge. Proposed would be adding two piles at 40' separation at bottom of canal with 1:1 slope up to grade. North would accommodate a 14' wide paved shared use path under the bridge with 8' clearance. West top of bank would be like existing with no path/access. At grade SFWMD access at top of bridge/roadway would be maintained.

Agency Discussion:

ROW:

- John of SFWMD confirmed maintenance access will need to be maintained at all four corners to accommodate drive and turning lane for trailers and cranes. Consultant indicated at grade access will remain as existing.

- Consultant inquired how much of “underpass” of shared use path will need to be paved. Proposing 10’ paved with 22’ of clear width (grass is drivable).
 - SFWMD indicated 14’ wide paved driveway at the quadrant and aprons need to accommodate a vehicle 75 feet in length.
- SFWMD indicated they will need more detailed cross-sections to share with the maintenance team to confirm if proposed widths, lengths, gates, and guard rails are appropriate. Can e-mail him (John) the plans to coordinate with his team. Two (2) Cross-sections will be needed.
 - One cross-section to show the overall proposed profile of the driveways, underpass, guardrail locations, gates pave widths etc which will be shared with the maintenance group.
 - The second cross-section is set of cross-sectional surveys of the existing canal and right-of-way profiles to determine if dredging will be required. At a minimum, this set consists of five (5) surveys: one at the centerline, one at each proposed bridge face, one 25-foot upstream and one 25-foot downstream of the proposed bridge. (See SFWMD Bridge Application Checklist).
- SFWMD indicated more info on the slopes will be required for mowing considerations etc. If it is greater than 3:1, will need to be stabilized. A hardened slope will be required with 1:1 slope as follows:
 - 1:1 Articulated Block (Not riprap) from top of bank to toe of slope. Top of bank landward can be riprap (stabilization needs to be 25’ from bridge face in each direction and can be articulated block)
 - 1.5:1 and shallower – riprap is allowed
 - 1.5:1 and steeper – a slope stability analysis would be required by USACE (per Teri)
- Consultant briefly shared a letter they received from Beverly Miller in 2021 with canal design requirements.
 - John indicated they looked to be current, so should still apply.
- Consultant inquired on canal depth. Proposing -12.0. Where it is greater depth than that, do they need to fill?
- SFWMD indicated it is what ever you need to fulfill the hydraulic needs, but no, they don’t required to fill to be all uniform if existing is greater depth.

ERP

- Consultant indicated they do not anticipate any impacts to wetlands and drainage is anticipated to be self-contained with no new outfalls or modifications to existing systems.
- SFWMD stormwater indicated an ERP would be required for the work activity and would be a new permit.
- SFWMD environmental group would expect the following to be shown/discussed in permit application: acres of wetlands or other surface waters as their jurisdiction is to top of bank, riprap and any other dredge or fill required as part of the project. Plans need to show erosion control. A manatee protection plan during work activities would be required if appropriate for the location. If dewatering will be necessary this needs to be indicated in the application.

USACE

- Michelle confirmed a 408 authorization will be required for this project

ELSA RIVEROL	IN-HOUSE PROJECT MANAGER	3/17/2023	ACTIVE	0
Name	Assignment	Due Date	Status	Comments
Eugenio Lopez	DESIGNER	3/28/2023	ACTIVE	0
Name	Assignment	Due Date	Status	Comments
Hailing Zhang	LEAD REVIEWER	3/17/2023	ACTIVE	0
Name	Assignment	Due Date	Status	Comments
Haynel Negueruela	REVIEWER	3/17/2023	ACTIVE	0
Name	Assignment	Due Date	Status	Comments
Heidi Solau	LEAD REVIEWER	3/17/2023	ACTIVE	0
Name	Assignment	Due Date	Status	Comments
JACQUES DEFRANT	REVIEWER	3/17/2023	ACTIVE	0
Name	Assignment	Due Date	Status	Comments
JAMES MYKYTKA	REVIEWER	3/17/2023	ACTIVE	4

No	Status	Current Holder	Reference	Categories
54	RESPONSE ACCEPTED		Section 6.2.3 Cultural Resources	ENVIRONMENTAL MANAGEMENT OFF.

Created By	Created On	Version	Delegate For
JAMES MYKYTKA	3/17/2023	1	

Discuss any avoidance and minimization measures considered including the avoidance alternatives that are being developed or considered to avoid impacts to the three NRHP-eligible resources.

Alina Fernandez	3/20/2023	1	Ana Sandoval
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Text will be added in the PER to indicate that avoidance/minimization alternatives will be analyzed as part of the Individual Section 4(f) Statement currently under development. This section of the report will be updated after completion of the Individual Section 4(f) Statement.

JAMES MYKYTKA	3/21/2023	1	
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Response Accepted & Comment Closed

No	Status	Current Holder	Reference	Categories
55	RESPONSE ACCEPTED		Section 6.1.2.4 Foundation Alternatives	ENVIRONMENTAL MANAGEMENT OFF.

Created By	Created On	Version	Delegate For
JAMES MYKYTKA	3/17/2023	1	

Section 6.1.2.4 Foundation Alternatives does not discuss the possible effects of vibration on nearby residences due to the proposed use of precast prestressed concrete piles. These piles require the use of a hydraulic hammer to be driven. Pre-drilling should be considered if the precast prestressed concrete piles are used. Auger cast in place concrete piles and drilled shafts will cause less vibration and will not have the noisy pile driving operation using the hydraulic hammer.

Doug Hershey	3/24/2023	1	
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Section 9.2.4 of the Geotechnical Report located in Appendix F addresses the need for preforming relative to the use of precast prestressed concrete piles. The following sentences will be added to the last paragraph in order to address vibration concerns:

“Due to the proximity of the proposed bridge to the existing bridge, existing utilities and nearby residences, predrilled pile holes in accordance with Specification Section 455 will be utilized in order to prevent refusal conditions and pile damage and to mitigate vibration to the aforementioned existing facilities. Vibration and settlement monitoring shall be carried out in accordance with Specification Section 108.”

JAMES MYKYTKA	3/28/2023	1	
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Also, add similar text to the Noise Study Report and Type 2 CE to address potential vibration concerns associated with construction activities.

THIS IS THE ONLY COMMENT RECEIVED AS PART OF THE DRAFT PER / DRAFT BRIDGE ANALYSIS REPORT SUBMITTAL.

Submittal Report

Financial Project:	445804-1-52-01	Submittal Type:	REPORT
Submittal Phase:	PD&E	Submittal Staff Type:	CONSULTANT
Received Date:	4/2/2024	Response Due Date:	4/30/2024
Grace Period:	0	District:	SIXTH
Status:	OPEN	Create Date:	4/2/2024
Create User Id:	RD652LN	Last Update:	4/29/2024
		Last Update User Id:	RD652LN

Description:

445804-1: SR 994 at SW 200 ST and QUAIL ROOST DR FR W OF SW 137 AVE TO E OF SW 127 AVE - Preliminary Engineering Report
 Group: PD & E
 Phase Review Type: Preliminary Engineering Report
 Status: Submitted
 Phase Initiation Date: 4/1/2024
 Comments Due Date: 4/22/2024
 Days Allowed for Review: 21
 Review Meeting: 4/30/2024 11:00 AM to 12:00 PM @ Teams Meeting
 Plans Received Date: 4/1/2024.
 Plans Format: Electronic
 Comments: •Phase Initiation Date: 4/1/2024
 •Comments Due Date: 4/22/2024
 •Responses Due Date: 4/29/2024
 •Review Meeting Date: 4/30/2024 @ 11:00 AM
 •Teams Meeting Link: https://teams.microsoft.com//meetup-join/19%3ameeting_M2MyZmMzZWYtMWFjMy00MWEzLWE3NDAtNGUxYTcwNjAyNTFj%40thread.v2/0?context=%7b%22Tid%22%3a%227ec50e16-3787-4697-b086-795dd54b8c9a%22%2c%22Oid%22%3a%226834683c-4f63-4624-855e-fe9dd494a9e1%22%7d

Threads:

No	Status	Current Holder	Reference	Categories
135	RESPONSE ACCEPTED			STRUCTURES
		Created By	Created On	Version
		Kuo-ting Lin	4/22/2024	1
		Draft Final Bridge Analysis Report, Appendix B, B1-2: For the Black Creek Trail at End Bent 4, a trail width of 14 feet is proposed. Per FDM 224.7, a 2 feet wide graded area adjacent to both sides of the path should be maintained. Please clarify if the proposed path meets this requirement.		
		Doug Hershey	4/26/2024	1
		The 14-foot width shown includes a 10-foot shared use path plus 2-foot clear on each side for a total of 14-feet. The width provided meets the requirements of FDM 224.7.		
		Kuo-ting Lin	5/6/2024	1
		Response Accepted & Comment Closed		

No	Status	Current Holder	Reference	Categories
136	RESPONSE ACCEPTED			STRUCTURES
	Created By	Created On	Version	Delegate For
	Kuo-ting Lin	4/22/2024	1	
	Draft Final Bridge Analysis Report, Appendix B, B1-1: The proposed typical section shows shared use paths on both sides of the bridge. The northern and southern portions of the bridge will be built in Phase I, while maintaining the traffic on the existing bridge. In Phase 2, the traffic will be maintained on the newly constructed bridge portions. It appears that the shared use paths and railing cannot be built in Phase 1 due to the MOT requirements in Phase 2. Please clarify if the pedestrian uses on the bridge can be maintained in Phase 2. Suggest showing a bridge construction sequence section to demonstrate how both vehicular and pedestrian traffics can be maintained.			
	Doug Hershey	4/26/2024	1	
	Providing construction sequence drawings was not in the scope of deliverables for the Bridge Analysis Report. Pedestrians will be able to use the bridge during all phases of construction. The full 17'-2" width of the shared use path will not be constructed during Phase 1. The narrowest portion being built during Phase 1 is 21'-10.125" with a distance of 20'-9.125" from the inside face of the 32" vertical shape traffic railing to the concrete overlay construction joint. If 5-foot is allocated for the sidewalk then this leaves 15'-9.125" for the travel lane and temporary barrier(s). If additional width is needed, wider Florida Slab Beams could be used in Phase 1 to increase the footprint. This will all be coordinated with the traffic control EOR during final design.			
	Kuo-ting Lin	4/29/2024	1	
	Response Accepted & Comment Closed			

No	Status	Current Holder	Reference	Categories
137	RESPONSE ACCEPTED			STRUCTURES
	Created By	Created On	Version	Delegate For
	Kuo-ting Lin	4/22/2024	1	
	Draft Final Bridge Analysis Report, Appendix B, B1-2: Articulating concrete blocks are shown at the end bent slopes. Are these existing to remain or existing to be modified to fit the proposed geometry? Please clarify.			
	Doug Hershey	4/26/2024	1	
	The articulating concrete block is a proposed item. ACB's were specifically requested by SFWMD as highlighted in the 6/16/2022 meeting minutes provided in Appendix E of the Bridge Analysis Report. The callout in the elevation view will be revised to "PROPOSED ARTICULATING CONCRETE BLOCK".			
	Kuo-ting Lin	4/29/2024	1	
	Response Accepted & Comment Closed			

No	Status	Current Holder	Reference	Categories
138	RESPONSE ACCEPTED			STRUCTURES
	Created By	Created On	Version	Delegate For
	Kuo-ting Lin	4/22/2024	1	
	Draft Final Bridge Analysis Report, Section 2.3 Utilities, Page 3: Existing utilities are described. Please clarify if there is any utility relocation required and any utility to be carried on the bridge.			
	Doug Hershey	4/26/2024	1	
	Section 2.3 will be expanded to reference the "Utility Assessment Package". This is Attachment H to the PER. Additionally, as shown in Exhibit A, both the existing water main and overhead electric facilities located on the southern side of the bridge are noted as being relocated. Section 2.3 will note the expected relocation of these two utilities along with a statement that no utilities are expected to be placed on the bridge. This is consistent with Section 3.3.5 where there is no utility dead load shown.			
	Kuo-ting Lin	4/29/2024	1	
	Response Accepted & Comment Closed			

No	Status	Current Holder	Reference	Categories
139	RESPONSE ACCEPTED			STRUCTURES
	Created By	Created On	Version	Delegate For
	Kuo-ting Lin	4/22/2024	1	
	Draft Final Bridge Analysis Report, Section 5.0 Construction Cost, Page 10 : SDG 2024 edition shows the construction cost for FSB bridges is estimated between \$180 (low) and \$300 (high). Please verify if the cost estimate should be updated.			
	Doug Hershey	4/26/2024	1	

Agree. The cost/unit value will be updated to reflect the 2024 SDG ranges. Using the same logic as discussed in Section 5.0, the low end estimate is \$180/SF and the high end estimate is \$300/SF so the mid-range is \$240/SF. When the 23% premium is added this results in a bridge cost estimate of approximately \$295/SF. Applying the bridge area of 11,038 SF results in a total bridge cost of \$3,256,210. The Table 2 total cost will be updated to reflect the revised bridge cost.

Kuo-ting Lin

4/29/2024

1

Response Accepted & Comment Closed

Hershey, Doug

From: Fernandez, Alina <afernandez@gfnet.com>
Sent: Monday, June 3, 2024 4:21 PM
To: Hershey, Doug; Uribe, Alejandro
Cc: Sandoval, Ana
Subject: RE: Quail Roost Bridge Typical Section

[EXTERNAL EMAIL] This is an external email. ****NEVER CLICK or OPEN**** unexpected links or attachments. ****NEVER**** provide User ID or Password. If this email seems suspicious, forward the email to spam for inspection.

Hi Doug,

After some back and forth coordination, **D6 has decided to remove the underpass option for the trail and go with an at grade crossing.** We had a meeting last week with R/W, Legal, Maintenance, Design and the critical factor in their decision was the need for retaining walls and therefore the need for a maintenance easement on 5 properties adjacent to the canals.

Do you have some time tomorrow for a quick meeting to discuss?

Regards,

Alina Fernandez, P.E. | Vice President
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