APPENDIX H

REPORT OF SUBSURFACE SOIL EXPLORATION
GEOTECHNICAL EVALUATION AND RECOMMENDATIONS

BAYWALK PLAZAS PROJECT:
NE 79th STREET & BAYSHORE COURT
MIAMI, FLORIDA

JULY 2015

Prepared for:

KIMLEY HORN
1221 BRICKELL AVENUE, SUITE 400
MIAMI, FLORIDA 33131

NELCO TESTING AND ENGINEERING SERVICES, INC.
13370 SW 131st Street, Suite 105
Miami, Florida 33186

NELCO
TESTING & ENGINEERING SERVICES, INC.

July 14th, 2015

Kimley Horn
1221 Brickell Avenue, Suite 400
Miami, Florida 33131

Reference: Report of Subsurface Soil Exploration and Recommendations
Evaluation of Subsurface Conditions
For the Proposed Construction:

Baywalk Plazas Project
NE 79th Street & Bayshore Court
Miami, Florida

NTES Project Number: B-150780

Dear Sirs,

Following please find the report of subsurface soil explorations and geotechnical evaluation for the above referenced property. Test Borings and soil sampling took place on July 1st, 2015 using procedures in general accordance with ASTM D-1586, the Standard Penetration Test. This report presents our findings, data, and recommendations.

We appreciate this opportunity to assist you in this project. If you have any questions or comments, please call us at (305) 259-9779.

Respectfully Submitted,
NELCO Testing and Engineering Services, Inc.

VMB Venkatesan 7/14/15
V.M.B Venkatesan
Professional Engineer No. 63107
State of Florida

NELCO
TESTING AND ENGINEERING SERVICES

TABLE OF CONTENTS

Page

Introduction 2
Project Information 2
Testing Program and Subsurface Conditions.....2

Evaluations and Recommendations

Foundation Support & Recommendations
- Foundation Recommendations.....3
- Soil Bearing Capacity for Foundations 4
- Anticipated Settlement 4
- Soil Erosion 4

REPORT LIMITATIONS..... 5

APPENDICES

Appendix

Project Location Map .....A
Test Boring Location Sketch .....A

Standard Penetration Test Boring Logs..... B

NELCO
TESTING AND ENGINEERING SERVICES

Subsurface Soil Exploration and Recommendations
For
Baywalk Plazas Project
NE 79th Street & Bayshore Court
Miami, Florida

INTRODUCTION

The purpose of this sub-surface exploration was to obtain data in order to provide an evaluation of the sub-surface conditions and recommendations for foundation design for support of the proposed construction.

PROJECT INFORMATION

Site plan and construction information was provided by Mr. George Puig of Kimley Horn.

At the time of testing, the project area was observed to be vacant. Proposed construction consists of a boardwalk and associated park structures.

SUB-SURFACE CONDITIONS

Sub-surface exploration consisted of two (2) Standard Penetration Test Boring conducted conforming to the guidelines as set forth in ASTM D-1586.

Testing was performed July 1st, 2015. A review of the Test Boring Reports generally indicates that the site is consists of various layers of sand, sand with gravel and sand with shells throughout the maximum explored depth of fifteen (15) feet below existing grade.

Please note that soft soils have been encountered at approximate depths of 5.0 to 8.0 feet below existing grades. As a result these soils will need to be removed and replaced with controlled/engineered fill material as specified herein.

Groundwater at the time of testing was encountered at approximate depths of 9.0 feet below existing grade.

Please refer to the enclosed appendices for location, classification, and stratification information.

NELCO
TESTING AND ENGINEERING SERVICES

FOUNDATION RECOMMENDATIONS

1. Remove any vegetation, organic material and soil within building areas plus five (5) feet outside the building footprint, down to an approximate depth of 8.0 feet below existing grade. The area under footings, foundations, and concrete slabs on grade shall have all vegetation, stumps, roots, and foreign materials removed prior to placement of fill.

2. Compact the cleared area to a minimum compaction of 95 percent of the dry soil density as determined by the Modified Proctor Test – ASTM D-1557.

3. Fill and compact the cleared areas in lifts not greater than 12 inches of compacted thickness to elevate to the required grade. Fill material for areas in support of footings is to be a mixture of limerock (minimum LBR Value 40) and sand, free of vegetation, organic material, construction debris, and large rocks. Fill material for slab on grade areas may be clean sand, filled and compacted in lifts not greater than 12 inches of loose material. The maximum size of fill material (rocks) within 12 inches below the floor slab shall be no more than 3 inches in diameter.

4. All fill material shall be inorganic containing no more than 5% by weight organic material. Silt-size fine particulates (material passing the No. 200 Sieve) in fill material shall be limited to less than 10% by weight.

5. Compact each lift of fill material and excavated footings to a minimum compaction of 95 percent of the dry soil density as determined by the Modified Proctor Test – ASTM D-1557 prior to placement of any additional fill required.
   Prior to compaction, the moisture content of each lift of fill material shall be adjusted to within plus/minus 2 percent of the optimum moisture as determined by the Modified Proctor Test – ASTM D-1557.

6. Compaction of building site shall be verified by means of one Field Density Test for each 2500 square feet or fraction thereof for each lift of compacted soil for building pad or slab area. One Field Density Test will also be required for every 50 linear feet of excavated spread footings, and every isolated footing excavation. Field density tests shall be performed as per ASTM D-2922.

7. All Geotechnical work must be performed under the supervision of our geotechnical engineer or one of his representatives, in order to verify compliance with our specifications.

SOIL BEARING CAPACITY FOR FOUNDATIONS

Our observations, exploration, and evaluation, supplemented by a review of sub-soil profile developed from the soil engineering Standard Penetration Test, indicate that the soils found, after improvements as specified, will be suitable for supporting foundations proportioned for a maximum allowable bearing stress of 3000 pounds per square foot, based on total load.

ANTICIPATED SETTLEMENT

Provided that foundations and soils (existing and fill material), are engineered and constructed in accordance with our recommendations and specifications the maximum total foundation settlement is expected to be less than 1 inch. Differential settlement between adjacent foundations is expected to be ½ of total settlement.

SOIL EROSION

The possibility exists for erosion to occur on soils providing structural support for any proposed or existing footings/foundations. This should be considered and addressed during the design and construction process for both existing soil and structurally placed fill material in support of any footings/foundations. This geotechnical report does not address this condition, its possibility of occurring, or its prevention.

REPORT LIMITATIONS

The recommendations submitted are based on the available subsurface information obtained by Nelco Testing and Engineering Services, Inc. (NTES) and design details provided by Kimley Horn for the proposed project. If there are any revisions to the nature, design or location of proposed structures, NTES should be notified immediately to determine if changes in recommendations are required. If NTES is not retained to perform these functions, NTES will not be responsible for the impact of those conditions of the project.

The geotechnical engineer warrants that the findings, recommendations, specifications, or professional advice contained herein have been made in accordance with ASTM specifications, and generally accepted professional geotechnical engineering practices in the local area. No other warranties are implied or expressed. Evaluations expressed in this report are based on field observations and data collected during exploration. Variations throughout the sub-surface profile may exist between designated boring locations, and in inaccessible areas with existing structures. These may not become evident until construction operations have commenced. Should any variations become evident, NELCO Testing and Engineering Services, Inc. must be notified. A reevaluation of the information and professional opinions expressed in this report may be necessary.

Please note analysis and recommendations mentioned in this report are obtained from the borings performed at the indicated locations on the "Soil Boring Test Location Sketch" included in this report. Local variations outside of the vertical reach of the boring locations may be encountered. Descriptions represent our interpretation of the subsurface data and observations at the specific boring locations, on the date tested.

This geotechnical report has been prepared by NTES for the intended use of Kimley Horn and the specific application to the named project as described. Any third party use of this report should be conducted with the expressed written permission of NTES.

APPENDIX A

- Project Location Map
- Standard Penetration Test Boring Location Sketch

PROJECT LOCATION MAP

BAY WALK PLAZAS PROJECT

NE 79th STREET & BAYSHORE COURT, MIAMI, FLORIDA

NELCO

TESTING & ENGINEERING SERVICES, INC.

NELCO
TESTING AND ENGINEERING SERVICES

Soil Boring Test Location Sketch

VMB Venkatesan 7/16/15

Soil Boring Test Location

13370 S.W. 131 Street, Suite 105, Miami, Fl 33186 (305) 259-9779

APPENDIX B

- Standard Penetration Test Boring Logs

TEST BORING LOG

Client: Kimley Horn

Project: Baywalk Plazas Project

Project Location: NE 79 Street & Bayshore Court, Miami, Florida

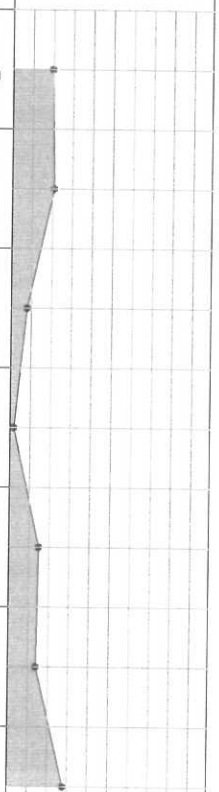
Date: July 1, 2015

Job Number: B-150780

Test Boring Number: 1

Depth	Water Level	Symbol	Strata Name	Description	SAMPLE Number	Blow Count 6"	Blow Count 6"	N-Value
0								
1			Sand with some gravel	*Brown (with some limestone gravel)*	1	X	11	20
2						9	5	
3					2	6	9	21
4						12	10	
5					3	7	4	8
6						4	2	
7					4	0	0	2
8	▼ July 1, 2015					2	6	
9			Sand	*Tan*	5	8	9	15
10						6	5	
11					6	11	10	14
12						4	2	
13					7	8	16	28
14						12	19	
15					8	11	14	X
16			End of Boring					
17								
18								
19								
20								

Standard Penetration Test N-value Blows/ft: 10 30 50 70 90



Per ASTM - D 1586, Standard Penetration Test

TEST BORING LOG

Client: Kimley Horn

Project: Baywalk Plazas Project

Project Location: NE 79 Street & Bayshore Court, Miami, Florida

Date: July 1, 2015

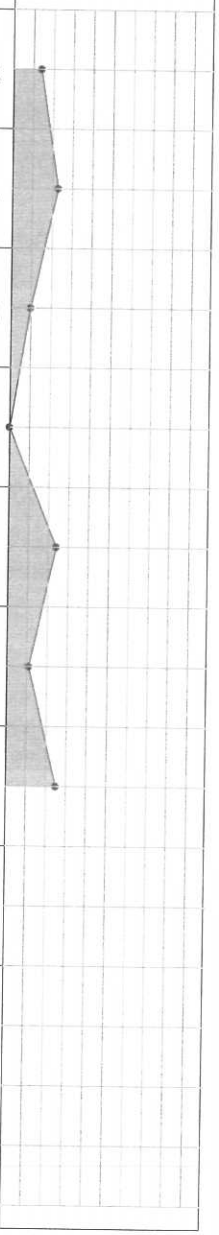
Job Number: B-150780

Test Boring Number: 2

Depth	Strata Name	Description	SAMPLE Number	Blow Count 6"	Blow Count 6"	N-Value
0	Sand	*Brown*	1	X	9	14
1	Sand with trace gravel	*Brown (with trace limestone gravel)*		5	11	
2			2	18	13	23
3				10	9	
4			3	5	7	10
5				3	0	
6			4	0	0	0
7				0	3	
8	Sand with some shells	*Tan (with some shells)*	5	9	14	24
9				10	8	
10	Sand	*Tan*	6	6	5	11
11				6	4	
12			7	2	11	25
13				14	10	
14						
15	End of Boring		8	8	6	X
16						
17						
18						
19						
20						

Water Level: ▼ July 1, 2015

Standard Penetration Test N-value Blows/ft: 10 30 50 70 90



Per ASTM - D 1586, Standard Penetration Test

NELCO

TESTING AND ENGINEERING SERVICES

PERCOLATION TEST REPORT

CLIENT: **Kimley Horn**
1221 Brickell Avenue, Suite 400
Miami, Florida 33131

DATE: July 1, 2015
JOB No.: P-150780

Project:	Baywalk Plazas Project
Location:	NE 79 Street and Bayshore Drive, Miami, Florida

PERCOLATION TEST RESULTS		
Test Number (No) (u)	1	**SOIL CONDITIONS**
Test Hole Diameter (d) (ft)	0.5	0.0' - 8.0': Sand with gravel
Depth to Water Table (H_2) (ft)	9.5	8.0' - 15.0': Sand
Saturated Depth (Ds) (ft)	5.5	
"Stabilized" Flow Rate (Q) (c.f.s.)	**6.67E-02**	
Hydraulic Conductivity (K)	**4.31E-04**	

$$K = \frac{4Q}{\pi d (2H_2^2 + 4H_2Ds + H_2d)}$$

Per S.F.W.M.D. Permitting Information Manual (Vol IV - May, 2004)" Usual Open-Hole Test"

Comments: **Please note:** "Soil Conditions" listed above are representative of material encountered in test hole only. In no way whatsoever shall any assumptions of soil conditions outside the test hole area be made based on the soil conditions outlined in this report.

VHB Venkatesan 7/16/15

V.M.B. Venkatesan
Professional Engineer No. 63107
State of Florida

NELCO

TESTING AND ENGINEERING SERVICES

PERCOLATION TEST REPORT

CLIENT: **Kimley Horn**
1221 Brickell Avenue, Suite 400
Miami, Florida 33131

DATE: July 1, 2015
JOB No.: P-150780

Project:	Baywalk Plazas Project
Location:	NE 79 Street and Bayshore Drive, Miami, Florida

PERCOLATION TEST RESULTS		
Test Number (No) (u)	2	**SOIL CONDITIONS**
Test Hole Diameter (d) (ft)	0.5	0.0' - 8.0': Sand with gravel, some shells
Depth to Water Table (H_2) (ft)	8.75	8.0' - 15.0': Sand
Saturated Depth (Ds) (ft)	6.25	
"Stabilized" Flow Rate (Q) (c.f.s.)	**6.40E-02**	
Hydraulic Conductivity (K)	**4.33E-04**	

$$K = \frac{4Q}{\pi d (2H_{2}^{2} + 4H_2Ds + H_2d)}$$

Per S.F.W.M.D. Permitting Information Manual (Vol IV - May, 2004)" Usual Open-Hole Test"

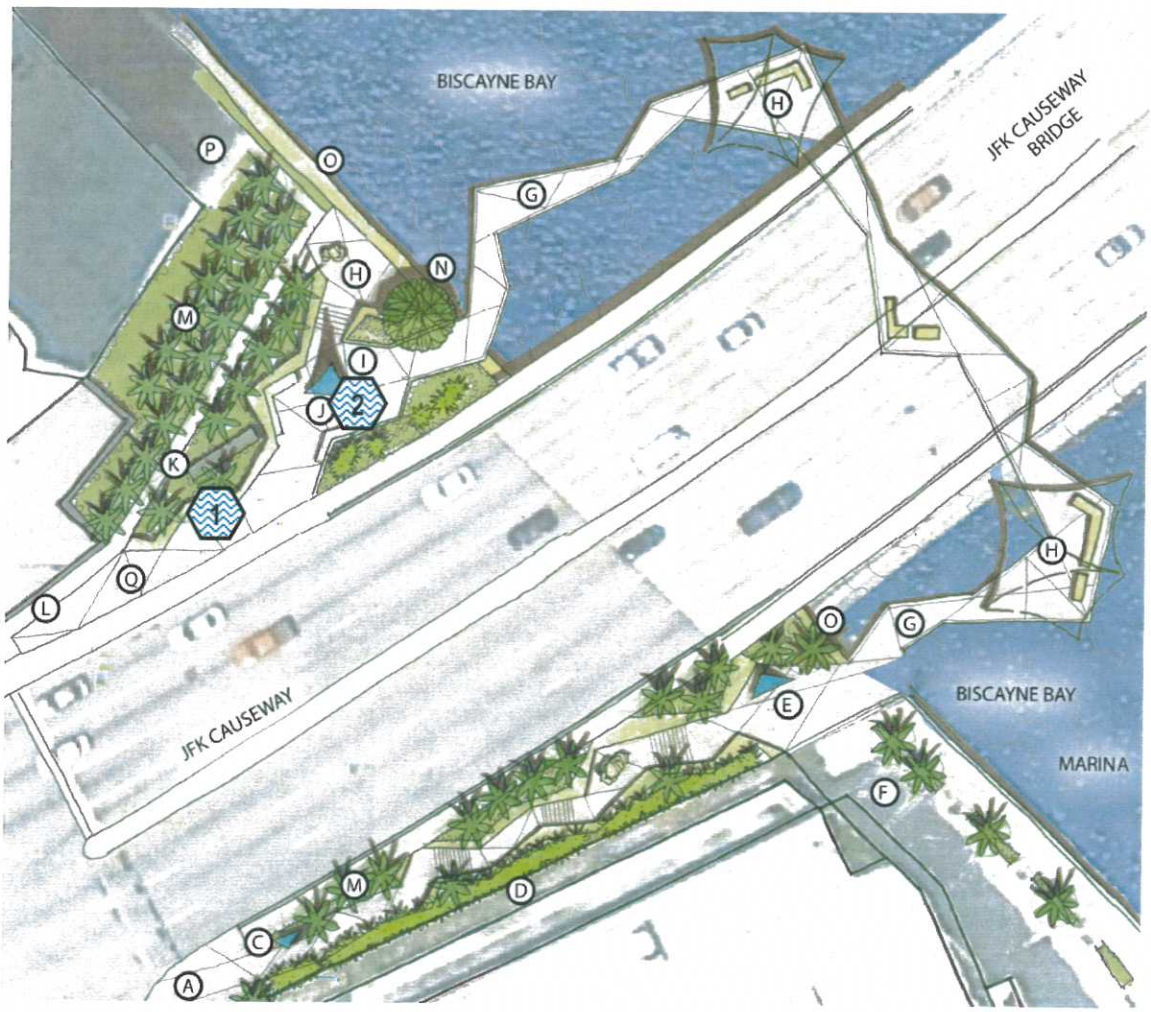
Comments: **Please note:** "Soil Conditions" listed above are representative of material encountered in test hole only. In no way whatsoever shall any assumptions of soil conditions outside the test hole area be made based on the soil conditions outlined in this report.

VMB Venkatesan 7/16/15

V.M.B. Venkatesan
Professional Engineer No. 63107
State of Florida

NELCO
TESTING AND ENGINEERING SERVICES

Soil Percolation Test Location Sketch



Percolation Test Locations

13370 S.W. 131 Street, Suite 105, Miami, Fl 33186 (305) 259-9779

ATTACHMENT B

REPORT OF SUBSURFACE SOIL EXPLORATION
GEOTECHNICAL EVALUATION AND RECOMMENDATIONS

BAYWALK PLAZAS PROJECT
KENNEDY CAUSEWAY & NE BAYSHORE COURT
MIAMI, FLORIDA

SEPTEMBER 2017

Prepared for:

KIMLEY-HORN
355 ALHAMBRA CIRCLE, SUITE 1400
CORAL GABLES, FLORIDA 33134

NELCO TESTING AND ENGINEERING SERVICES, INC.
13370 SW 131st Street, Suite 105
Miami, Florida 33186

NELCO
TESTING & ENGINEERING SERVICES, INC.

September 22nd, 2017

Kimley-Horn
355 Alhambra Circle, Suite 1400
Coral Gables, Florida 33134

Reference: Report of Subsurface Soil Exploration and Recommendations
Evaluation of Subsurface Conditions
For the Proposed Construction:

Baywalk Plazas Project
Kennedy Causeway & NE Bayshore Court
Miami, Florida

NTES Project Number: B-170957

Dear Sirs,

Following please find the report of subsurface soil explorations and geotechnical evaluation for the above referenced property. Test Borings and soil sampling took place on August 14th, 2017 using procedures in general accordance with ASTM D-1586, the Standard Penetration Test. This report presents our findings, data, and recommendations.

We appreciate this opportunity to assist you in this project. If you have any questions or comments, please call us at (305) 259-9779.

Respectfully Submitted,
NELCO Testing and Engineering Services, Inc.

VMB Venkatesan 9/26/17
V.M.B Venkatesan
Professional Engineer No. 63107
State of Florida

NELCO
TESTING AND ENGINEERING SERVICES

TABLE OF CONTENTS

Page

Introduction 2
Project Information 2
Testing Program and Subsurface Conditions.....2

Evaluations and Recommendations

Foundation Support & Recommendations
- Foundation Recommendations.....3
  - Helical Piles 3
  - Installation Guidelines.....3
  - Notes.....4

Soil Design Parameters.....5

REPORT LIMITATIONS.....6

APPENDICES

Appendix

Project Location Map .....A
Test Boring Location Sketch .....A

Standard Penetration Test Boring Logs.....B

NELCO
TESTING AND ENGINEERING SERVICES

Subsurface Soil Exploration and Recommendations
For
Baywalk Plazas Project
Kennedy Causeway & East Treasure Drive
North Bay Village, Florida

INTRODUCTION

The purpose of this sub-surface exploration was to obtain data in order to provide an evaluation of the sub-surface conditions and recommendations for foundation design for support of the proposed construction.

PROJECT INFORMATION

Site survey, plans, location and construction information was provided by Mr. George Puig of Kimley-Horn.

At the time of testing, the test and proposed construction areas were observed to be vacant. Proposed construction consists of a retaining wall on the north side of the property.

TESTING PROGRAM/SUB-SURFACE CONDITIONS

Sub-surface exploration consisted of two (2) Standard Penetration Test Borings conducted conforming to the guidelines as set forth in ASTM D-1586.

Testing was performed on August 14th, 2017. A review of the Test Boring Reports generally indicates that the site is mantled by approximately 18.0 feet of sand and sand with gravel. Beneath, soft to medium dense sandy limestone was encountered throughout the maximum explored depth of thirty (30) feet below existing grade.

Groundwater at the time of testing was encountered at approximate depths of 6.5 feet below existing grade.

Please refer to the enclosed appendices for location, classification, and stratification information.

FOUNDATION RECOMMENDATIONS

Our observations, exploration, and evaluation, supplemented by a review of sub-surface profile developed from the soil engineering Standard Penetration Test, indicate that the sub-surface conditions at the site are not capable of providing support with shallow spread footings. We hereby recommend the following foundation system option for support of the proposed new residential addition.

Helical Pile System

The helical piles should be drilled to the depths and specifications as outlined in the table below:

Pile Type	Helical
Pile Diameter	• 3-inches
Design Compressive Capacity (ALLOWABLE)	• 15-tons
Design Tensile Capacity (ALLOWABLE)	• 6-tons
Lateral Resistance	• N/A
Minimum Helix Diameter	• 12-inches
Minimum Helix Thickness	• 0.375-inches
Approximate Depth Below Grade	• Approx. 25 feet **or until required torque is achieved.**

Installation Guidelines:

1. Constant downward pressure shall be applied while screwing helical piles into the ground. Pressure applied shall be sufficient to ensure that the downward pile progression is equal to the blade pitch.
2. Rate of helical pile rotation shall not exceed 20 revolutions per minute.
3. Helical piles shall be advanced until the minimum required torque is achieved to accommodate the required ultimate bearing capacity.
4. Piles shall be installed as close to vertical as possible.
5. Required torque shall be maintained (or exceeded) while advancing the pile a minimum of three (3) times the diameter of the helix in order for the pile to be considered acceptable.
6. Helical piles shall be protected from corrosion by galvanizing or other suitable means.
7. Design Capacities provided are service load specifications. A factor of safety of at least 2.0 shall be utilized for ultimate capacity values and installation purposes.

Notes:

- Lateral load capacities are estimated for a top deflection of ¼ inch.
- In order to determine production pile length, it is recommended that test piles be driven. Final pile installation depth to be determined in field by specialty contractor. All work shall be performed in accordance with applicable building codes.
- Proposed pile lengths are based on existing ground surface elevation. Pile installation lengths may vary depending on final grade beam elevation and soil conditions. Once the required torque is achieved (and maintained per specifications, above) prior to the recommended approximate depth of installation, and be in acceptable soil conditions, the pile should be considered acceptable.
- Minimum center-to-center distances of helical piles shall be no less than twice the average diameter of the proposed production piles (in no case less than 30-inches).
- Existing structures in the vicinity of the proposed construction must be taken into consideration during pile installation procedures. Caution shall be exercised to avoid excessive vibration, and levels shall be monitored to verify compliance with regulations. Care must be taken in order to prevent excessive vibration.

Soil Design Parameters

Based on the results of the subsurface exploration program and our experience with similar soil conditions, the recommended soil parameters and design considerations are presented below (if so required):

Soil Type	Internal Angle of Friction (Degrees)	Cohesion (psf)	Moist Unit Weight (pcf)	Subgrade Modulus (pci)	E_{50} 50% Strain Value
SANDS AND GRAVELLY SANDS	31	0	110	100	----
SANDY LIMESTONE	35	2500	130	350	0.005

Angle of External Friction, Coefficient of Earth Pressure:

Please refer to the following table for δ, K_o, K_a, and K_p values.

	δ, Angle of External Friction	@ Rest, K_o	Active, K_a	Passive, K_p
Sands and Gravelly Sands	20.67°	0.485	0.320	3.124
Sandy Limestone	23.33°	0.426	0.271	3.690

REPORT LIMITATIONS

The recommendations submitted are based on the available subsurface information obtained by Nelco Testing and Engineering Services, Inc. (NTES) and design details provided by Kimley-Horn for the proposed project. If there are any revisions to the nature, design or location of proposed structures, NTES should be notified immediately to determine if changes in recommendations are required. If NTES is not retained to perform these functions, NTES will not be responsible for the impact of those conditions of the project.

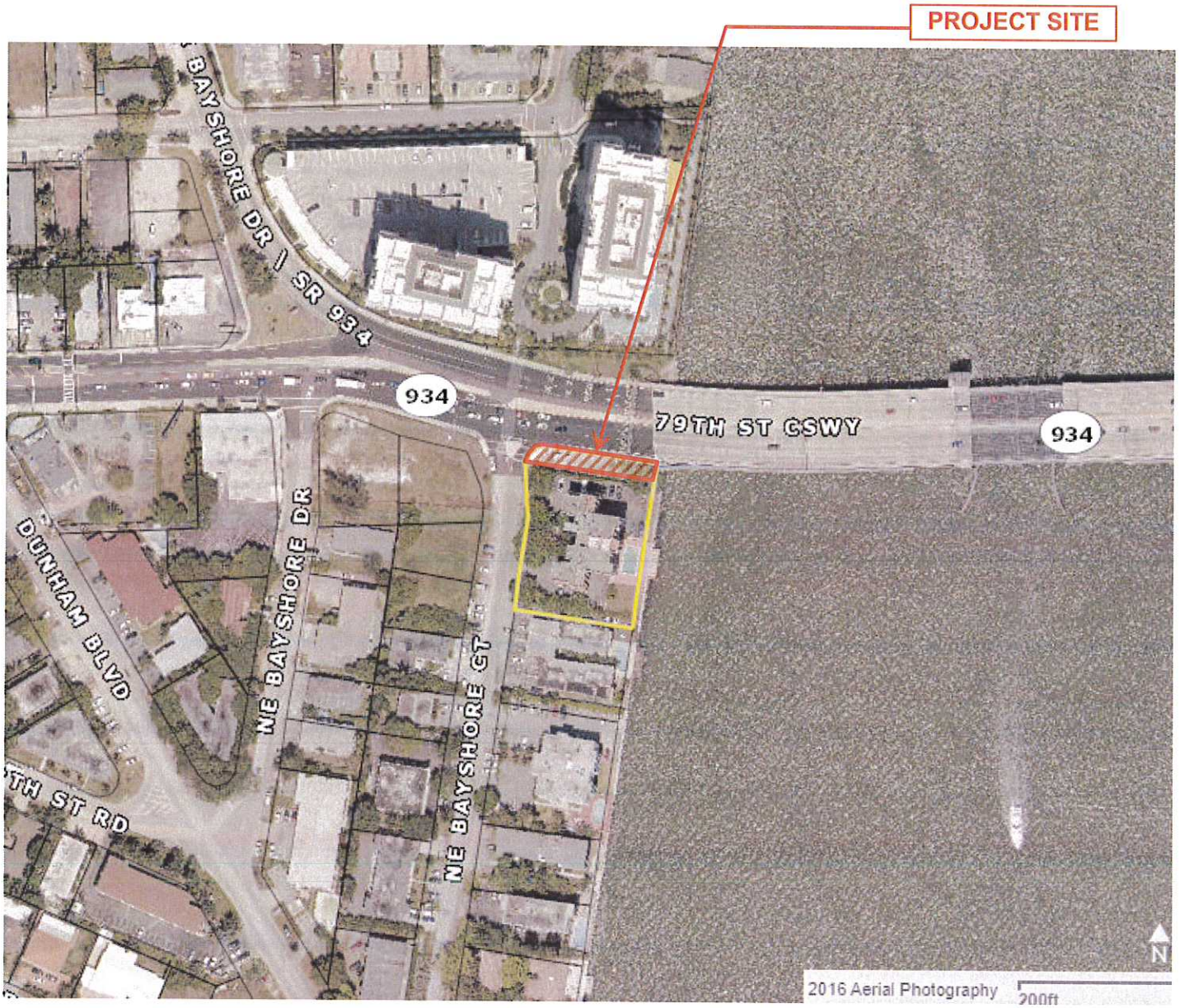
The geotechnical engineer warrants that the findings, recommendations, specifications, or professional advice contained herein have been made in accordance with ASTM specifications, and generally accepted professional geotechnical engineering practices in the local area. No other warranties are implied or expressed. Evaluations expressed in this report are based on field observations and data collected during exploration. Variations throughout the sub-surface profile may exist between designated boring locations, and in inaccessible areas with existing structures. These may not become evident until construction operations have commenced. Should any variations become evident, NELCO Testing and Engineering Services, Inc. must be notified. A reevaluation of the information and professional opinions expressed in this report may be necessary. NELCO Testing and Engineering Services, Inc. does not guarantee any existing subsurface condition between test locations.

Please note analysis and recommendations mentioned in this report are obtained from the borings performed at the indicated locations on the "Soil Boring Test Location Sketch" included in this report. Local variations outside of the vertical reach of the boring locations may be encountered. Descriptions represent our interpretation of the subsurface data and observations at the specific boring locations, on the date tested.

This geotechnical report has been prepared by NTES for the intended use of Kimley-Horn and the specific application to the named project as described. This report does not evaluate or address any environmental criteria – this information should be obtained through a Phase I Environmental Site Assessment (ESA) if so required. Any third party use of this report should be conducted with the expressed written permission of NTES.

APPENDIX A

- Project Location Map
- Standard Penetration Test Location Sketch



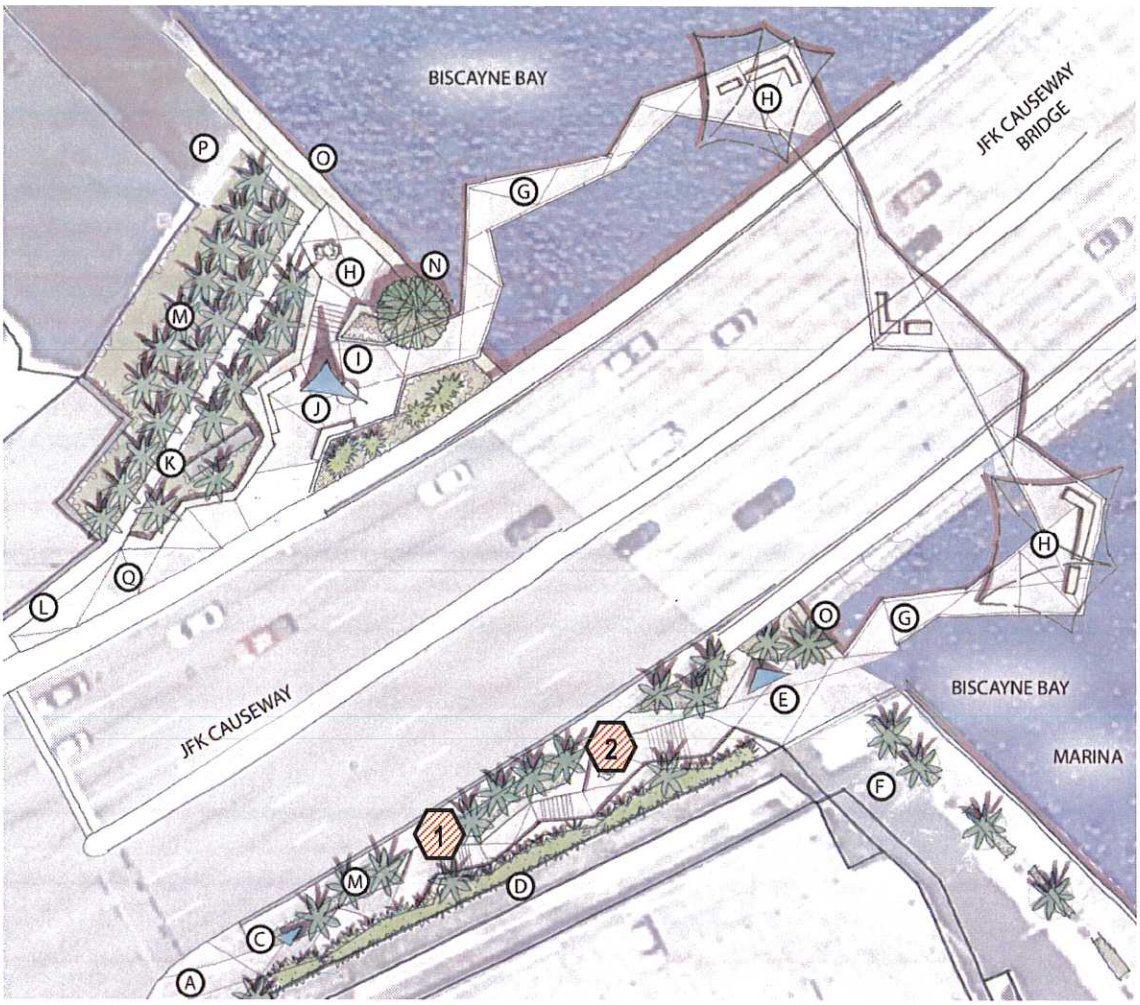
PROJECT LOCATION MAP
BAYWALK PLAZAS PROJECT
KENNEDY CAUSEWAY & NE BAYSHORE COURT
MIAMI FLORIDA

N

NELCO
TESTING & ENGINEERING SERVICES, INC.

NELCO
TESTING AND ENGINEERING SERVICES

Soil Boring Test Location Sketch



Soil Boring Test Location

VLB Venkateson
9/26/17

APPENDIX B

- Standard Penetration Test Boring Logs

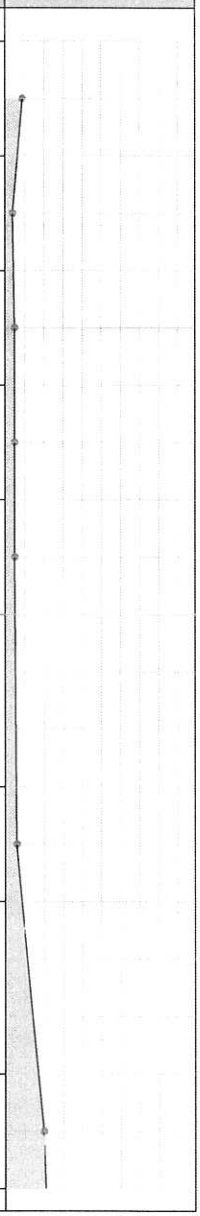
STANDARD PENETRATION TEST BORING LOG

Nelco Testing & Engineering Services, Inc.
13370 SW 131 Street, Suite 105
Miami, Florida 33186

Client: Kimley-Horn	**Date: August 14, 2017**
Project: Baywalk Plazas Project	**Job Number: B-170957**
Project Location: Kennedy Causeway & NE Bayshore Court, Miami, Florida	**Test Boring Number: 1**

Depth	Water Level	Symbol	Strata Name	Description	SAMPLE Number	Blow Count 6"	Blow Count 6"	N-Value
0								
1	August 14, 2017		Sand with some gravel	*Brown (with some limestone gravel)*	1	2 4	5 2	9
2								
3					2	2 3	1 4	4
4								
5					3	3 2	3 2	5
6				*Tan (with some limestone gravel)*				
7					4	3 3	2 3	5
8								
9			Sand	*Tan*	5	1 3	2 2	5
10								
11								
12								
13					6	4 3	3 3	6
14								
15								
16								
17								
18			Sandy limestone	*Tan, sandy, soft to medium dense*	7	20 12	8 9	20
19								
20								

Standard Penetration Test N-value Blows/ft: 10 30 50 70 90



Per ASTM - D 1586, Standard Penetration Test

NELCO
TESTING & ENGINEERING SERVICES, INC.

STANDARD PENETRATION TEST BORING LOG

Nelco Testing & Engineering Services, Inc.
13370 SW 131 Street, Suite 105
Miami, Florida 33186

Client: Kimley-Horn	**Date: August 14, 2017**
Project: Baywalk Plazas Project	**Job Number: B-170957**
Project Location: Kennedy Causeway & NE Bayshore Court, Miami, Florida	**Test Boring Number: 1**

Depth	Water Level	Symbol	Strata Name	Description	SAMPLE Number	Blow Count 6"	Blow Count 6"	N-Value	Standard Penetration Test N-value Blows/ft 10 30 50 70 90
21			Sandy limestone - continued						
22									
23									
24					8	13 14	11 10	25	
25									
26									
27									
28									
29					9	11 16	18 12	30	
30			End of Boring						
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									

Per ASTM - D 1586, Standard Penetration Test

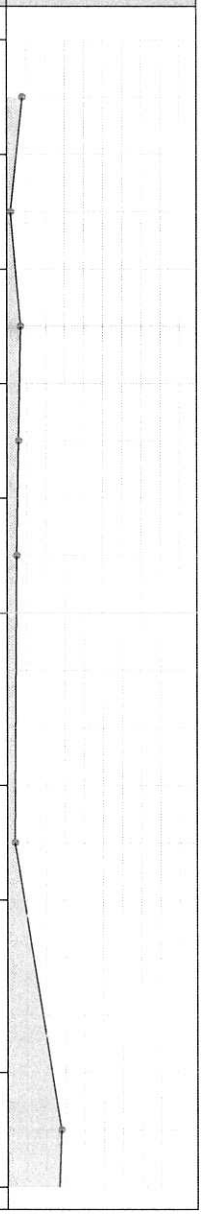
STANDARD PENETRATION TEST BORING LOG

Nelco Testing & Engineering Services, Inc.
13370 SW 131 Street, Suite 105
Miami, Florida 33186

Client: Kimley-Horn	**Date: August 14, 2017**
Project: Baywalk Plazas Project	**Job Number: B-170957**
Project Location: Kennedy Causeway & NE Bayshore Court, Miami, Florida	**Test Boring Number: 2**

Depth	Water Level	Symbol	Strata Name	Description	SAMPLE Number	Blow Count 6"	Blow Count 6"	N-Value
0								
1			Sand with some gravel	*Brown (with some limestone gravel)*	1	1 4	4 3	8
2					2	3 1	1 1	2
3								
4								
5	August 14, 2017			*Tan (with some limestone gravel)*	3	3 4	3 1	7
6					4	2 3	3 2	6
7								
8								
9					5	1 3	2 2	5
10								
11								
12								
13			Sand	*Tan*	6	3 2	2 2	4
14								
15								
16								
17								
18			Sandy limestone	*Tan, sandy, soft to medium dense*	7	11 20	8 14	28
19								
20								

Standard Penetration Test N-value Blows/ft: 10 30 50 70 90



Per ASTM - D 1586, Standard Penetration Test

STANDARD PENETRATION TEST BORING LOG

Nelco Testing & Engineering Services, Inc.
13370 SW 131 Street, Suite 105
Miami, Florida 33186

Client: Kimley-Horn	**Date: August 14, 2017**
Project: Baywalk Plazas Project	**Job Number: B-170957**
Project Location: Kennedy Causeway & NE Bayshore Court, Miami, Florida	**Test Boring Number: 2**

Depth	Water Level	Symbol	Strata Name	Description	SAMPLE Number	Blow Count 6"	Blow Count 6"	N-Value	Standard Penetration Test N-value Blows/ft (10 30 50 70 90)
21			Sandy limestone - continued						
22									
23									
24					8	14	10	23	
25						13	11		
26									
27									
28									
29					9	14	10	19	
30						9	16		
31			End of Boring						
32									
33									
34									
35									
36									
37									
38									
39									
40									

Per ASTM - D 1586, Standard Penetration Test

ATTACHMENT C

NELCO
TESTING & ENGINEERING SERVICES, INC.

January 4th, 2018

Kimley-Horn
355 Alhambra Circle, Suite 1400
Coral Gables, Florida 33134

Reference: Revision to Report of Subsurface Soil Exploration and Recommendations
Evaluation of Subsurface Conditions
For the Proposed Construction:

Baywalk Plazas Project
Kennedy Causeway & NE Bayshore Court
Miami, Florida

NTES Project Number: B-170957-A

Dear Sirs,

At the request of the Kimley-Horn we have reviewed our initial geotechnical report (NTES Project # B-170957, dated September 22nd, 2017). We are hereby providing recommendations and capacity specifications for auger cast pile foundations for the above referenced project. The following information was requested in order to obtain additional pertinent information that will be necessary to continue the design process. Auger cast piles may be installed according to the specifications provided below, and the installation guidelines and specifications attached herein:

- Auger cast pile foundations may be designed utilizing an allowable design compressive capacity of twenty (20) tons and an allowable tensile capacity of ten (10) tons. Auger cast piles may be designed with an allowable lateral capacity of three and one-half (3.5) tons.
- Installation depth of auger cast piles shall be twenty-three (23) feet below existing grade.
- All other information and specifications provided in the original geotechnical report shall remain valid and applicable.
- Please find enclosed the above recommendations as an attachment to this letter herein.

We appreciate this opportunity to assist you in this project. If you have any questions or comments, please call us at (305) 259-9779.

Respectfully Submitted,
NELCO Testing and Engineering Services, Inc.

VINAYAGAM M. BALAKRISHNAN V. LICENSE No 63107 STATE OF FLORIDA PROFESSIONAL ENGINEER

VMB Venkatesan

V.M.B.Venkatesan
Professional Engineer No. 63107
State of Florida

Attachments: Auger Cast Pile Recommendations (3 Pages)
Report Limitations (1 Page)

AUGER CAST PILE FOUNDATION RECOMMENDATIONS

Our observations, exploration, and evaluation, supplemented by a review of sub-surface profile developed from the soil engineering Standard Penetration Test, indicate that although the sub-surface conditions at the site may be capable of providing support with shallow spread footings, deep foundations (i.e. auger cast piling) installation and capacity specifications have been requested. We hereby recommend the following foundation system option for support of the proposed retaining wall.

Auger Cast Pile

Auger cast piles shall be 14-inches in diameter, drilled to the depths and specifications as outlined in Table 1, below. Full length reinforcing steel will be required for compressive/tensile loads, and partial reinforcement will be required for any lateral loads. Structural engineer should check the steel requirements. Distance between piles should be no less than 36-inches, center to center.

All floor slabs shall be designed as structural slabs supported by grade beams on piling foundation elements.

Table 1: Pile Details

Pile Diameter	• 14-inches
Design (Allowable) Compression Capacity	• 20-tons
Design (Allowable) Tension Capacity	• 10-tons
Design (Allowable) Lateral Resistance	• 3.5-ton
Depth Below Grade	• 23-feet
Minimum Pile Spacing	• 36-inches OC
Minimum Reinforcement	• A minimum of 6 #6 bars full length with # 3 ties at 12-inches on center.
Minimum Grout Strength	• 5,000 psi in 28 days

Bending Moments:

14-inch Piles (3.5-ton lateral load):

	Maximum Bending Moment (kip-ft)	Depth to Maximum Bending Moment (ft.)	Depth to Zero (0) Moment (ft.)
Free Head Condition	51.1	4.2	22.0

Auger Cast Pile Installation

We recommend that the piles be spaced at least 36-inches center-to-center to minimize pile capacity reduction caused by group effects. A placement tolerance with respect to the design center of 3 inches should be specified for group piles and 1 inch for isolated piles unless more stringent construction positioning is required. Out-of-plumbness for the piling should be limited to 2 percent maximum.
In order to provide some assurance that the piles have been constructed with a continuous cross section, a full-length steel reinforcing bar should be installed at the center of each pile immediately after grouting. Piles must be adequately reinforced to satisfy the load requirements of the proposed structure.

Drilling and Grouting

Auger Cast piles are constructed by rotating a hollow-stem continuous flight auger into the ground until the planned tip depth or termination criterion is achieved. At the termination depth, a grout with high fluidity is pumped under pressure into the hole through the hollow stem auger. As long as pressure is observed in the line, the auger is slowly withdrawn up the hole and the auger cast shaft is constructed.

Grout volumes, possibly up to 1-1/2 times the theoretical pile volume, may be required for proper pile installation. A grout factor equal to or greater than that of the successful test piles should be obtained. The grout factor is defined as the actual volume of grout pumped into the pile divided by the theoretical volume of the drilled hole.

After achieving the desired depth, a positive grout pressure should be observed prior to initiating withdrawal of the auger. A continuous fluid return consisting of slurry and then grout at the top of the hole is the best indication that the desired pressure head is being achieved.

The auger should be withdrawn slowly so that a positive grout pressure is maintained in the hole at all times during auger withdrawal. If the withdrawal of the auger becomes erratic, grout pressure suddenly drops, or if the grout is interrupted, the auger tip should be reinserted at least 5 feet below the level where the grouting operation was disrupted prior to resuming withdrawal of the auger.

The installation of adjacent piles located within 4 feet of each other on the same working day is not recommended at this site. We recommend that adjacent piles located within 4 feet not be installed until the initial grouted pile has set overnight.

Some subsidence of fresh grout may occur in the top of the piles. This subsidence is in-part a result of the weight of the grout column "pushing" laterally into pores/voids in the subsoil layer. We anticipate that subsidence will occur within a period of approximately two hours following the grouting operation. If subsidence occurs while the pile grout is in a fluid state, we recommend that the pile be immediately filled with fresh grout to the proper cutoff elevation. We recommend that a pile grout subsidence of up to 8 inches be considered acceptable. Grout should not be pumped into the piles when it is older than 90 minutes from the time it was batched.

Auger Cast Pile Monitoring

The successful augured cast-in-place pile installation will in large part depend upon the expertise of the contractor and the techniques he uses. Because of the possibility of soil intrusions during auger withdrawal and non-vertical or "dog-leg" piles, the job specifications must be carefully prepared and continuous inspections made of the installation. Full-time inspection must be maintained during installation to monitor depths and the amount of grout pumped versus the rate of auger withdrawal. The full-time monitoring of pile installation will provide a degree of assurance that continuous piles of the proper cross-section are being constructed. We recommend that the grout pump be calibrated prior to initiation of production pile installation. At least one set of six 2-inch cubes or 3-inch diameter x 6-inch high grout cylinders should be made for each day of pile installation.

REPORT LIMITATIONS

The recommendations submitted are based on the available subsurface information obtained by Nelco Testing and Engineering Services, Inc. (NTES) and design details provided by Kimley-Horn for the proposed project. If there are any revisions to the nature, design or location of proposed structures, NTES should be notified immediately to determine if changes in recommendations are required. If NTES is not retained to perform these functions, NTES will not be responsible for the impact of those conditions of the project.

The geotechnical engineer warrants that the findings, recommendations, specifications, or professional advice contained herein have been made in accordance with ASTM specifications, and generally accepted professional geotechnical engineering practices in the local area. No other warranties are implied or expressed. Evaluations expressed in this report are based on field observations and data collected during exploration. Variations throughout the sub-surface profile may exist between designated boring locations, and in inaccessible areas with existing structures. These may not become evident until construction operations have commenced. Should any variations become evident, NELCO Testing and Engineering Services, Inc. must be notified. A reevaluation of the information and professional opinions expressed in this report may be necessary. NELCO Testing and Engineering Services, Inc. does not guarantee any existing subsurface condition between test locations.

Please note analysis and recommendations mentioned in this report are obtained from the borings performed at the indicated locations on the "Soil Boring Test Location Sketch" included in this report. Local variations outside of the vertical reach of the boring locations may be encountered. Descriptions represent our interpretation of the subsurface data and observations at the specific boring locations, on the date tested.

This geotechnical report has been prepared by NTES for the intended use of Kimley-Horn and the specific application to the named project as described. This report does not evaluate or address any environmental criteria – this information should be obtained through a Phase I Environmental Site Assessment (ESA) if so required. Any third party use of this report should be conducted with the expressed written permission of NTES.