

# Letter of Transmittal



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Miami, FL 33126  
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EAC Consulting, Inc.  
CA#7011

November 6, 2012

To: Wisler Pierre-Louis, P.E.

Project: Biscayne Boulevard 12-inch Force Main  
Extension Improvements

Project No: 10021.SD01-00

City Engineer  
City of North Miami  
Public Works  
1815 NE 150th Street  
North Miami, FL 33181

FM:  
SPN:  
WPI:

We are sending you:  Attached:  Under separate cover:  
 Shop Drawing  Prints  Plans  Samples  
 Copy of Letter  Change Order  Specifications  Other (see description)

Copies	Date	Description
1	11/06/2012	Geotechnical Engineering Report

For Approval  Approved as Submitted  Copies for Approval  
 For Your Use  Approved as Noted  Copies for Distribution  
 As Requested  Returned for Corrections  Corrected Prints  
 For Review and Comment  Other

Sent By: Huntley Higgins, P.E.

If enclosures listed are not received kindly notify us at once.

Please file this communication in your records.  
cc: File

RECEIVED: Mail: 11-8-12

**PRELIMINARY REPORT OF SUBSURFACE EXPLORATION &  
GEOTECHNICAL ENGINEERING EVALUATION  
OF SUBSURFACE CONDITIONS**

**BISCAYNE BOULEVARD -  
FORCE MAIN IMPROVEMENTS PROJECT  
Biscayne Boulevard from N.E. 105<sup>th</sup> to N.E. 119<sup>th</sup> Streets  
North Miami, Miami-Dade County, Florida**



**Issued:**

**OCTOBER 2012**

**Prepared For:**

**EAC CONSULTING, INC.  
815 N.W. 57<sup>th</sup> Avenue, Suite 402  
Miami, Florida 33126**

**WINGERT LABORATORIES, INC.  
1820 N.E. 144<sup>th</sup> Street  
North Miami, Florida 33181**



*Engineering Testing and Inspection Service*  
No. 2  
Established 1949

October 26, 2012

EAC Consulting, Inc.  
Attention:  
815 N.W. 57<sup>th</sup> Avenue, Suite 402  
Miami, Florida 33126

Reference: Preliminary Report of Subsurface Soil Exploration  
Project: Biscayne Boulevard - Force Main Improvements Project  
Locations: Biscayne Boulevard from N.E. 105<sup>th</sup> to N.E. 119<sup>th</sup> Streets  
North Miami, Miami-Dade County, Florida

WLI Order No. 12-1322

Gentlemen:

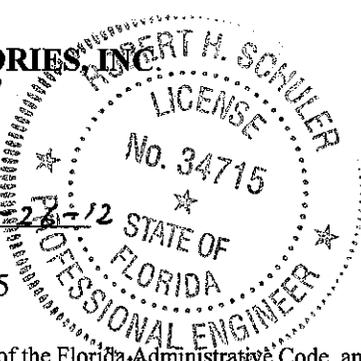
We are pleased to present this preliminary report of our subsurface soil exploration for the above referenced project. These services were performed in general accordance with the Professional Services Agreement dated October 1, 2012. This preliminary report presents the field data for the 15 standard penetration test locations. Evaluation of the subsurface data obtained from the available test boring logs, using accepted geotechnical engineering criteria, is provided. We will contact you for further information about the force main improvements project.

We appreciate this opportunity to be of service to you during this phase of the project. If you have any questions or comments regarding the information contained in this report, please contact the undersigned.

Respectfully submitted,

**WINGERTER LABORATORIES, INC.**

Robert H. Schuler, P.E., P.G.  
Florida Registration No. 34715



In accordance with Rule 61G15-23.001 of the Florida Administrative Code, an original signature is hereby provided for the owner (or owner's representative) and the building official.

1820 N.E. 144<sup>th</sup> Street • North Miami, FL 33181 • (305) 944-3401 • 1-800-345-SOIL • Fax: (305) 949-8698

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STEEL • CEMENT • CONCRETE • PAVEMENT INSPECTIONS • TEST BORINGS • SPECIFICATIONS • CONSULTATIONS

Florida Certificate # F-614

## TABLE OF CONTENTS

	<b>Page</b>
<b>LETTER OF TRANSMITTAL</b>	<b>1</b>
<b>TABLE OF CONTENTS</b>	<b>2</b>
<b>INTRODUCTION</b>	<b>3</b>
<b>PROJECT INFORMATION</b>	<b>3</b>
<b>INVESTIGATIVE PROCEDURES</b>	<b>4</b>
<b>TESTING PROGRAM AND CONDITIONS REVEALED</b>	<b>5</b>
<b>GEOTECHNICAL ENGINEERING EVALUATION</b>	<b>8</b>
<b>SPECIAL REMARKS &amp; ANNOTATIONS</b>	<b>9</b>
<b>APPENDIX</b>	
<b>A. TEST BORING LOGS</b>	
<b>B. TEST LOCATIONS MAPS</b>	

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## **INTRODUCTION**

**Wingerter Laboratories, Inc. (WLI)** is pleased to present this report of our subsurface soil exploration for the subject sites. The purpose of this investigation was to obtain specific subsurface data in order for an engineering evaluation of the subsurface conditions for support of the proposed force main improvements project to be developed.

Our subsurface exploration consisted of a total of 14 Standard Penetration Test Borings performed at locations in the northbound and southbound lanes of Biscayne Boulevard (U.S. Highway 1), from N.E. 105<sup>th</sup> Street northward to N.E. 119<sup>th</sup> Street, and one Standard Penetration Test Boring performed on N.E. 119<sup>th</sup> Street between Biscayne Boulevard and N.E. 16<sup>th</sup> Avenue. This project is for the City of North Miami, in northeastern Miami-Dade County, Florida. Boring locations are as shown in Appendix B of this report.

The following presents a review of the project information provided to us, a discussion of the subsurface conditions and our Reports of Test Boring Nos. B-1 through B-15 for this preliminary report.

## **PROJECT INFORMATION**

No site documents have been provided to us for our review. Our April 2012 proposal included a street map with the subject streets and avenues, and the proposed locations for the standard penetration test borings marked. Upon acceptance of our proposal, we conducted a site reconnaissance and marked out the proposed boring locations as sited in our proposal. Subsequently, in e-mail communication with your office, you provided us with our site map marked up to locate the borings approximately 1,000 feet apart, but staggered every 500 feet from one side of Biscayne Boulevard to the other. We conducted a second site reconnaissance and the proposed boring locations were remarked. Sunshine State One Call was contacted for utility clearances. Once the utility clearance personnel completed their work, the proposed boring locations were visually inspected for clearance. Almost all required relocation, generally from the outer lanes to the inner lanes. Utility clearances were again requested and received, and the work was scheduled to commence.

The test boring locations are described in the **TESTING PROGRAM AND CONDITIONS REVEALED** section of this report.

**INVESTIGATIVE PROCEDURES**

Field work was performed using standard truck-mounted drilling equipment. Soil samples (disturbed) were obtained in accordance with ASTM D-1586 utilizing a 2-foot long, 2-inch diameter split spoon sampler which is advanced by successive blows of a 140 pound hammer free-falling 30 inches. The number of blows for each 6 inches of penetration is recorded. The sum of the second and third blow counts for each 2-foot sampling interval constitutes the Standard Penetration Resistance in blows per foot, which is referred to as the "N" Value. The following tables may be used in interpreting the consistency of the materials based on the "N" Value:

<b>SOIL CONSISTENCY vs. "N VALUE"</b>					
<b>Cohesionless Soils</b>		<b>Cohesive Soils</b>		<b>Rock and Gravels</b>	
<b>"N Value" (blows/ft)</b>	<b>Consistency Designation</b>	<b>"N Value" (blows/ft)</b>	<b>Consistency Designation</b>	<b>"N Value" (blows/ft)</b>	<b>Consistency Designation</b>
0 to 4	Very Loose	0 to 2	Very Soft	0 to 25	Loose or Soft
5 to 10	Loose	3 to 4	Soft	26 to 50	Medium Dense
11 to 30	Medium Dense	5 to 8	Medium	51 to 90	Dense
31 to 50	Dense	9 to 15	Stiff	-	-
50 or More	Very Dense	16 to 30	Very Stiff	-	-
-	-	31 or More	Hard	-	-

The Standard Penetration Test, "N" value curve shown on the boring logs indicates the general variation of the "N" value throughout the depth of the boring. This curve is plotted in a straight line which connects each "N" value. However, it should not be assumed that the changes in the "N" value are a linear function. The graphical representations shown on the boring logs should not be substituted for the actual material descriptions included in the logs.

Soil samples will be retained by WLI for a period of 30 days only unless specifically requested otherwise by the client.

Test borings were marked in the field by **WLI**, using approximate methods. Borings were located by measured distances from existing recognizable landmarks. Boring locations are, therefore, generally as shown, but no degree of accuracy is stated or implied.

Elevations were not established for the test boring locations. Depths reported on the logs represent depths below ground surface as they existed on the date drilled. The client is cautioned that if subsequent filling or excavation of the site occurs, the reported depth must be so adjusted. **WLI** can not assume responsibility for the accuracy of reported depths if the site is disturbed subsequent to the date drilled.

### **TESTING PROGRAM AND CONDITIONS REVEALED**

Our subsurface investigation consisted of 15 Standard Penetration Test Borings advanced to ten feet below existing surfaces, conforming to the requirements of ASTM D 1586 that were performed at the various boring locations on October 21 & 23, 2012. Please refer to Appendix A for our Report of Test Boring Number B-1 through B-15 for detailed description of the materials encountered and the depth intervals at which they were encountered. Appendix B provides the maps of the test boring locations.

The number, location and depth of the test borings were determined by the client and **WLI**, taking into consideration the requirements of the project, site accessibility and the subsurface conditions revealed. The discussions contained in this report are based upon the conditions revealed in the referenced test borings.

Boring B-1, located at the northbound lanes @ N.E. 105<sup>th</sup> Street - south of intersection, was found to have a very dense surface layer of limesand with trace fragmented limestone, followed by medium dense layers of fragmented limestone and equal to trace amount limesand to the maximum explored depth of ten feet (10'-0") below the existing land surface. The ground water level at the time of our investigation was encountered at a depth of eight feet (8'-0") below the existing land surface.

Boring B-2, located at the northbound lanes @ N.E. 107<sup>th</sup> Street - in front of West Star service station, was found to have a very dense surface layer of fragmented limestone and silica sand, followed by a medium dense layer of limesand to about four feet below pavement surface. Followed were loose layers of silty sand, and fragmented limestone with trace limesand to the maximum explored depth of ten feet (10'-0") below the existing land surface. The ground water level at the time of our investigation was encountered at a depth of five feet, six inches (5'-6") below the existing land surface.

Boring B-3, located at the northbound lanes @ N.E. 109<sup>th</sup> Street, was found to have a very dense surface layer of fragmented limestone and limesand, followed by medium dense layers of the same material. Followed were loose layers of sandy silt with some fragmented limestone, and silt and fragmented limestone to the maximum explored depth of ten feet (10'-0") below the existing land surface. The ground water level at the time of our investigation was encountered at a depth of five feet, six inches (5'-6") below the existing land surface.

Boring B-4, located at the northbound lanes @ N.E. 110<sup>th</sup> Terrace - north of bus stop, was found to have a very dense surface layer of fragmented limestone with trace limesand, followed by a medium dense layer of the same material to four feet below pavement surface. Followed were loose layers of silty sand with trace fragmented limestone, fragmented limestone, and fragmented limestone and limesand to the maximum explored depth of ten feet (10'-0") below the existing land surface. The ground water level at the time of our investigation was encountered at a depth of five feet, six inches (5'-6") below the existing land surface.

Boring B-5, located at the northbound lanes @ north of N.E. 112nd Street - at bus stop, was found to have a very dense surface layer of fragmented limestone and limesand, followed by dense layers of limesand, and fragmented limestone and silty sand to six feet below pavement surface. Followed were medium dense layers of silt and limestone, and fragmented limestone to the maximum explored depth of ten feet (10'-0") below the existing land surface. The ground water level at the time of our investigation was encountered at a depth of five feet, six inches (5'-6") below the existing land surface.

Boring B-6, located at the northbound lanes @ N.E. 115<sup>th</sup> Street - in front of Public Storage, was found to have a very dense surface layer of fragmented limestone and limesand, followed by dense layers of silica sand to about four feet below pavement surface. Followed were dense to medium dense layers of limesand, silt and fragmented limestone, and fragmented limestone to the maximum explored depth of ten feet (10'-0") below the existing land surface. The ground water level at the time of our investigation was encountered at a depth of five feet, seven inches (5'-7") below the existing land surface.

Boring B-7, located at the northbound lanes @ south of San Souci - in front of vacant fenced buildings, was found to have a very dense surface layer of fragmented limestone with some limesand, followed by dense layers of fragmented limestone and limesand to about four feet below pavement surface. Followed were medium dense layers of fragmented limestone to the maximum explored depth of ten feet (10'-0") below the existing land surface. The ground water level at the time of our investigation was encountered at a depth of four feet, six inches (4'-6") below the existing land surface.

Boring B-8, located at the northbound lanes @ north of San Souci - in front of 7-Eleven, was found to have a very dense surface layer of fragmented limestone, followed by dense layers of fragmented limestone and limesand to about four feet below pavement surface. Followed were medium dense layers of limesand to six feet, then medium dense layers of fragmented limestone to the maximum explored depth of ten feet (10'-0") below the existing land surface. The ground water level at the time of our investigation was encountered at a depth of four feet, six inches (4'-6") below the existing land surface.

Boring B-9, located on the south side of N.E. 119<sup>th</sup> Street - north of CVS Pharmacy and its parking lot, was found to have a very dense surface layer of silica sand with some fragmented limestone, followed by medium dense layers of the same material to about four feet below pavement surface. Followed were medium dense layers of silica sand to about eight feet, then medium dense layers of fragmented limestone with some limesand to the maximum explored depth of ten feet (10'-0") below the existing land surface. The ground water level at the time of our investigation was encountered at a depth of six feet (6'-0") below the existing land surface.

Boring B-10, located at the southbound lanes @ N.E. 117<sup>th</sup> Street - at Fast Auto Service bays' driveway, was found to have a very dense surface layer of fragmented limestone and limesand, followed by medium dense layers of silica sand to about six feet below pavement surface. Followed was a loose silty sand layer to about eight feet, then medium dense layer of sandy silt to the maximum explored depth of ten feet (10'-0") below the existing land surface. The ground water level at the time of our investigation was encountered at a depth of eight feet (8'-0") below the existing land surface.

Boring B-11, located at the southbound lanes @ N.E. 114<sup>th</sup> Street - in front of Secrets (pink bldg), was found to have a very dense surface layer of fragmented limestone with some limesand, followed by a medium dense layer of limesand with trace fragmented limestone to about four feet below pavement surface. Followed were loose layers of silt with trace fragmented limestone, fragmented limestone and silt and fragmented limestone with trace limesand. The ground water level at the time of our investigation was encountered at a depth of six feet, three inches (6'-3") below the existing land surface.

Boring B-12, located at the southbound lanes @ north of N.E. 111<sup>th</sup> Street - at motel, was found to have a very dense surface layer of fragmented limestone and limesand, followed by a medium dense layer of the same material to about four feet below pavement surface. Followed were loose layers of silt with trace fragmented limestone, and fragmented limestone. The ground water level at the time of our investigation was encountered at a depth of six feet (6'-0") below the existing land surface.

Boring B-13, located at the southbound lanes @ N.E. 110<sup>th</sup> Street - front of Natural Wood Store, was

found to have a very dense surface layer of fragmented limestone and limesand, followed by a loose layer of limesand to about four feet below pavement surface. Followed were medium dense layers of fragmented limestone and silt, and fragmented limestone to the maximum explored depth of ten feet (10'-0") below the existing land surface. The ground water level at the time of our investigation was encountered at a depth of six feet, six inches (6'-6") below the existing land surface.

Boring B-14, located at the southbound lanes @ north of N.E. 108<sup>th</sup> Street - south of bus stop, was found to have a dense surface layer of fragmented limestone and limesand, followed by loose layers of fragmented limestone and limesand to about six feet below pavement surface. Followed were loose layers of silt and fragmented limestone and silt to the maximum explored depth of ten feet (10'-0") below the existing land surface. The ground water level at the time of our investigation was encountered at a depth of six feet, six inches (6'-6") below the existing land surface.

Boring B-15, located at the southbound lanes @ south of N.E. 107<sup>th</sup> Street - between bus stop & K-Mart's second driveway, was found to have a very dense surface layer of fragmented limestone with trace limesand, followed by medium dense/loose layers of sandy silt, fragmented limestone and silty sand, and fragmented limestone with trace limesand to the maximum explored depth of ten feet (10'-0") below the existing land surface. The ground water level at the time of our investigation was encountered at a depth of six feet, six inches (6'-6") below the existing land surface.

Fluctuations in the ground water level should be expected due to seasonal climatic changes, tidal action, rainfall variation, surface runoff, construction activity and other site specific factors.

## **GEOTECHNICAL ENGINEERING EVALUATION**

The upper four feet of the subsurface is very stable, and will maintain an open trench. However, the silty sand below this level, and all soils below the groundwater table, will not remain open unless grouted or if sheet piles are installed. All crossing utilities would need to be exposed and protected from damage. Due to the number of underground utilities under the traffic lanes, a trenching box would probably not work well for this project.

Further evaluation of the subsurface data obtained from the test boring logs, using accepted geotechnical engineering criteria, can be provided with additional information about the force main project.

**SPECIAL REMARKS & ANNOTATIONS**

In dealing with the unseen subsurface dimension, a prudent test boring program acts to identify the general range of conditions and to reduce, but not eliminate, the risks of unknown conditions. Therefore, **WLI** cannot offer a warranty, expressed or implied, that materials or conditions other than those revealed in the test borings will not be encountered, nor that the relative proportions and density of the materials will not vary from those reported.

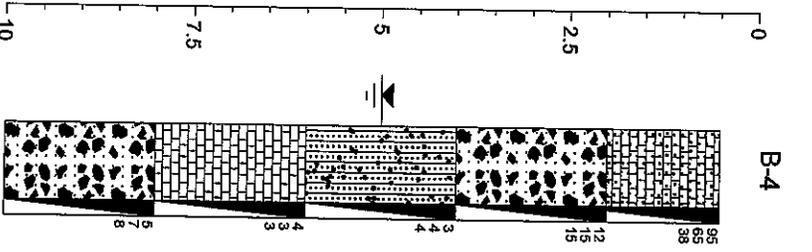
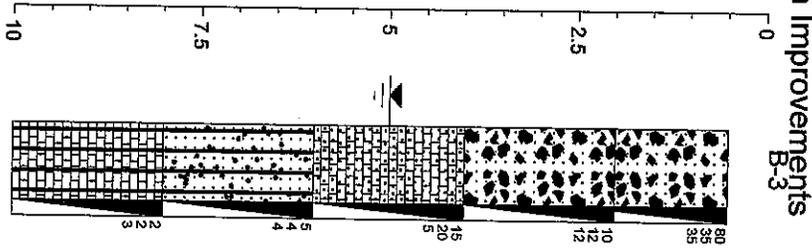
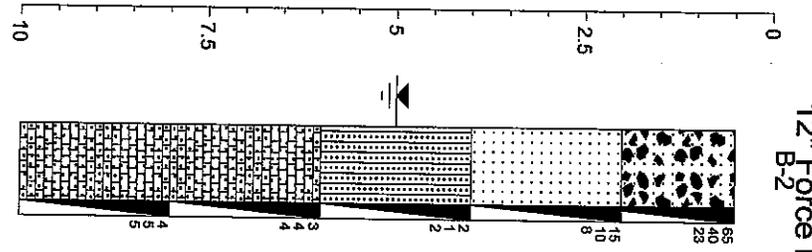
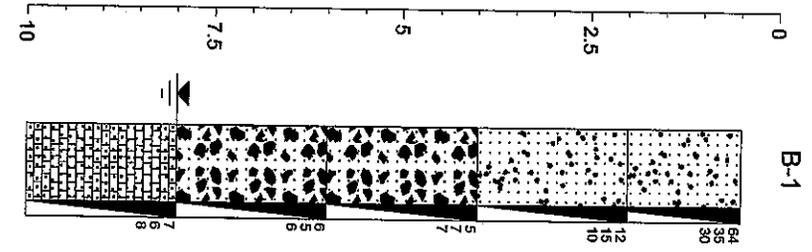
Furthermore, **WLI** assumes no responsibility for the accuracy of the reported depths should any excavation, filling or alteration of the site grade occur, subsequent to the date of the drilling operation, without surveying the existing conditions.

Also, since the criteria furnished to **WLI** constitutes our total knowledge and understanding of the project; inaccuracies, deviations or alterations of the criteria may invalidate these recommendations to the extent they impact the magnitude, distribution, and elevation of applied loads, or impact the nature of the construction.

**APPENDIX A**  
**TEST BORING LOGS**

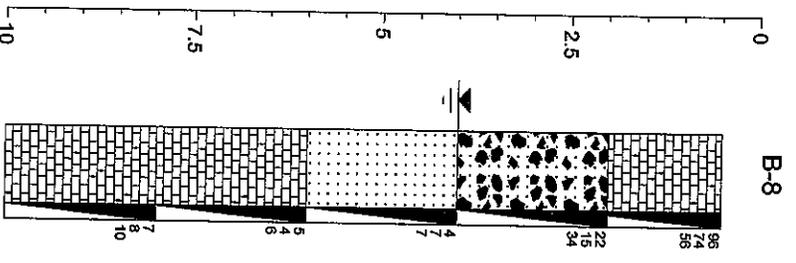
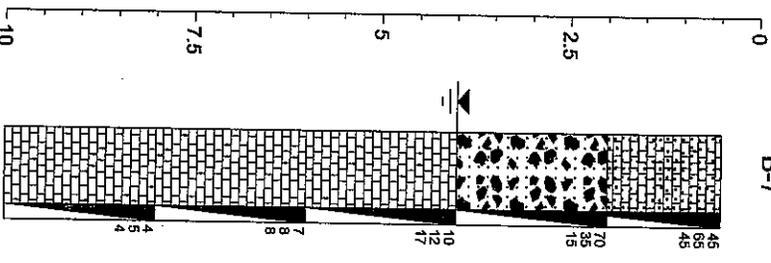
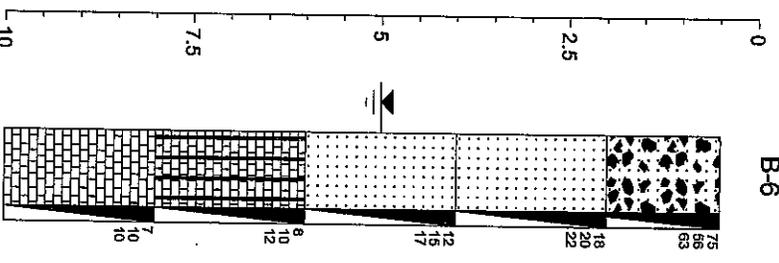
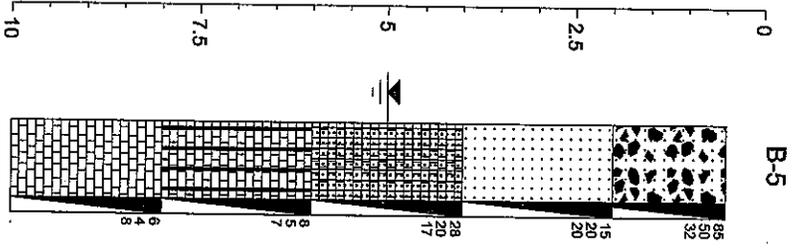
# LOG OF BORINGS

## 12" Force Main Extension Improvements

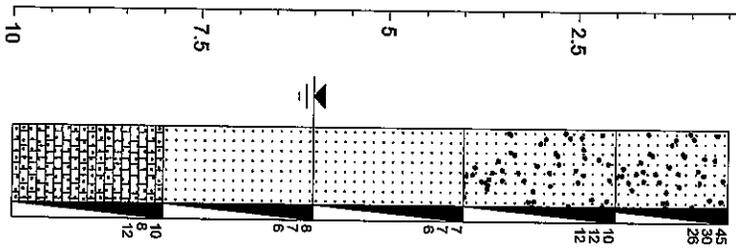


# LOG OF BORINGS

## 12" Force Main Extension Improvements



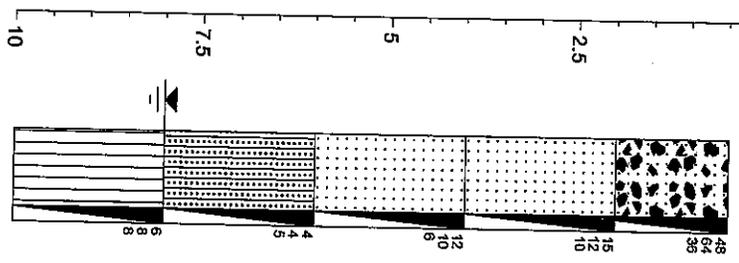
**LOG OF BORINGS**  
**12" Force Main Extension Improvements**  
**B-9**



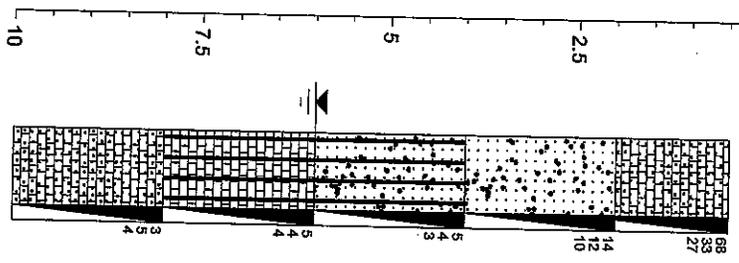
# LOG OF BORINGS

## 12" Force Main Extension Improvements

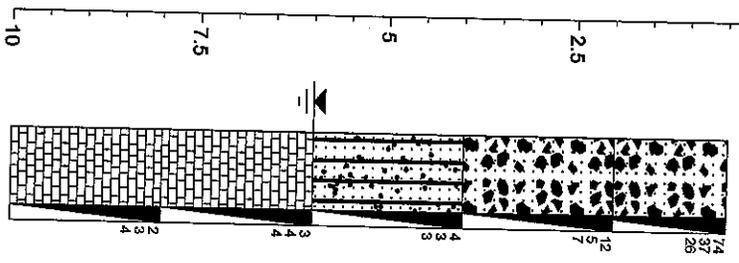
B-10



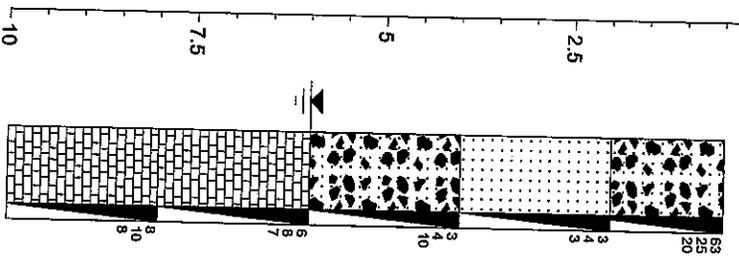
B-11



B-12



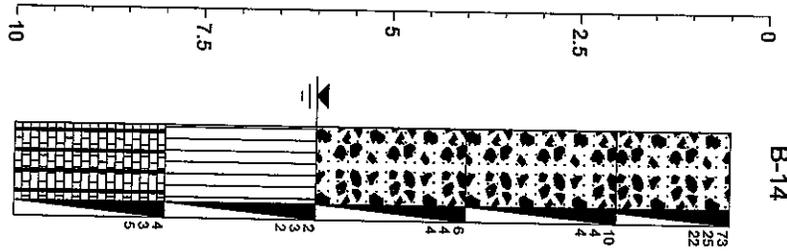
B-13



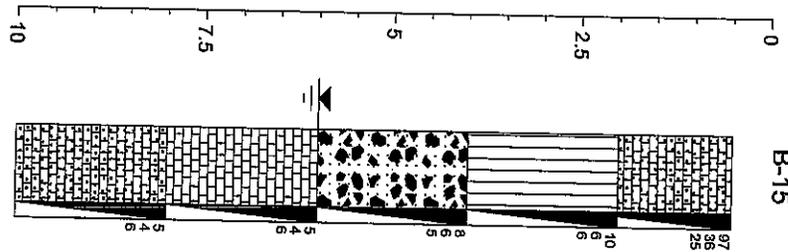
# LOG OF BORINGS

## 12" Force Main Extension Improvements

B-14



B-15



**PROJECT:** 12" Force Main Extension Improvements  
**CLIENT:** EAC Consulting, Inc.  
**LOCATION:** Biscayne Blvd - NE 105 to 119th Sts, North Miami FL  
**DRILLER:** JC/JC  
**DRILL RIG:** CMS  
**DEPTH TO WATER > INITIAL** 8'-0" : 8'-0"

**PROJECT NO.:** 12-1322  
**DATE DRILLED:** 10/23/2012  
**ELEVATION:** existing  
**LOGGED BY:**

ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	Description	STANDARD PENETRATION TEST			
			SAMPLE NO.	DEPTH	N	N-Value Curve 10 20 30 40 50 60
0		Asphalt pavement - 6 inches thick				
0.5-2.5	64 35 30 30	Tan LIMESAND with trace FRAGMENTED LIMESTONE	1	0.5-2.5	65	
2.5	12 15 10 10		2	2.0-4.0	25	
5	5 7 7 7	Tan FRAGMENTED LIMESTONE and LIMESAND	3	4.0-6.0	14	
7.5	6 5 6 6		4	6.0-8.0	11	
8.0-10.0	7 6 8 8	Tan FRAGMENTED LIMESTONE with trace LIMESAND	5	8.0-10.0	14	
10		Boring terminated at 10 feet below pavement surface.				
12.5						
15						

Boring B-1: Northbound @ N.E. 105th St.

This information pertains only to this boring and should not be interpreted as being indicative of the site.

**PROJECT:** 12" Force Main Extension Improvements  
**CLIENT:** EAC Consulting, Inc.  
**LOCATION:** Biscayne Blvd - NE 105 to 119th Sts, North Miami FL  
**DRILLER:** JC/JC  
**DRILL RIG:** CMS  
**DEPTH TO WATER > INITIAL** 5'-6" : 5'-6"

**PROJECT NO.:** 12-1322  
**DATE DRILLED:** 10/21/2012  
**ELEVATION:** existing  
**LOGGED BY:**

ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	Description	STANDARD PENETRATION TEST			
			SAMPLE NO.	DEPTH	N	N-Value Curve
0		Asphalt pavement - 6 inches thick				
0.5		Tan FRAGMENTED LIMESTONE and SILICA SAND	1	0.5-2.5	63	
1.5		Tan LIMESAND	2	2.0-4.0	18	
4.5		Dark Tan SILTY SAND	3	4.0-6.0	3	
6.5		Tan FRAGMENTED LIMESTONE with trace LIMESAND	4	6.0-8.0	8	
9.5		Boring terminated at 10 feet below pavement surface.	5	8.0-10.0	10	

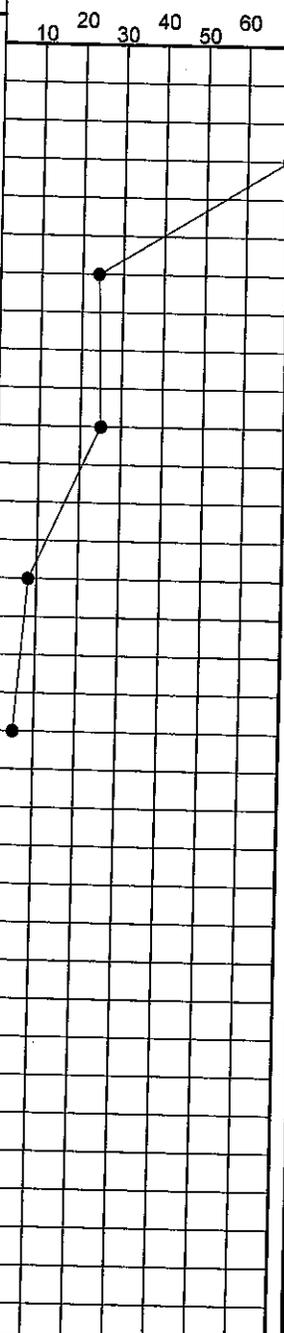
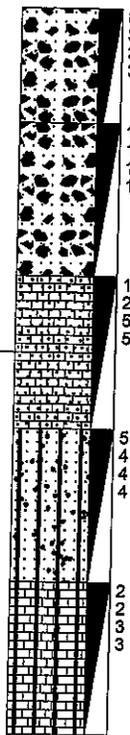
Boring B-2: Northbound @ NE 107th St - in front of West Star svc station

This information pertains only to this boring and should not be interpreted as being indicative of the site.

**PROJECT:** 12" Force Main Extension Improvements  
**CLIENT:** EAC Consulting, Inc.  
**LOCATION:** Biscayne Blvd - NE 105 to 119th Sts, North Miami FL  
**DRILLER:** JC/JC  
**DRILL RIG:** CMS  
**DEPTH TO WATER > INITIAL** 5'-6" : 5'-6"

**PROJECT NO.:** 12-1322  
**DATE DRILLED:** 10/21/2012  
**ELEVATION:** existing  
**LOGGED BY:**

ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	Description	STANDARD PENETRATION TEST			
			SAMPLE NO.	DEPTH	N	N-Value Curve
0		Asphalt pavement - 6 inches thick				
0.5 - 2.5		Tan FRAGMENTED LIMESTONE and LIMESAND	1	0.5-2.5	70	
2.0 - 4.0		Tan FRAGMENTED LIMESTONE with trace LIMESAND	2	2.0-4.0	24	
4.0 - 6.0		SANDY SILT with some FRAGMENTED LIMESTONE	3	4.0-6.0	25	
6.0 - 8.0		SILT and FRAGMENTED LIMESTONE	4	6.0-8.0	8	
8.0 - 10.0		Boring terminated at 10 feet below pavement surface.	5	8.0-10.0	5	



Boring B-3: Northbound @ NE 109th St

This information pertains only to this boring and should not be interpreted as being indicative of the site.

**PROJECT:** 12" Force Main Extension Improvements  
**CLIENT:** EAC Consulting, Inc.  
**LOCATION:** Biscayne Blvd - NE 105 to 119th Sts, North Miami FL  
**DRILLER:** JC/JC  
**DRILL RIG:** CMS  
**DEPTH TO WATER > INITIAL** 5'-6" : 5'-6"

**PROJECT NO.:** 12-1322  
**DATE DRILLED:** 10/21/2012  
**ELEVATION:** existing  
**LOGGED BY:**

ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	Description	STANDARD PENETRATION TEST			
			SAMPLE NO.	DEPTH	N	N-Value Curve
0		Asphalt pavement - 6 inches thick				
0.5	95 65 38 38	Tan FRAGMENTED LIMESTONE with trace LIMESAND	1	0.5-2.5	103	103
2.5	12 15 15	Tan FRAGMENTED LIMESTONE and LIMESAND	2	2.0-4.0	30	
5	3 4 4	Tan SILTY SAND with trace FRAGMENTED LIMESTONE	3	4.0-6.0	8	
7.5	4 3 3	Tan FRAGMENTED LIMESTONE	4	6.0-8.0	6	
10	5 7 8	Tan FRAGMENTED LIMESTONE and LIMESAND	5	8.0-10.0	15	
10		Boring terminated at 10 feet below pavement surface.				

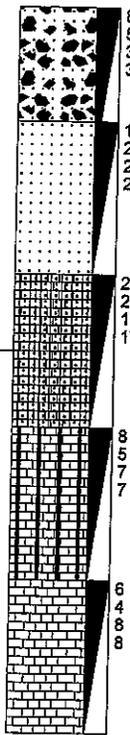
Boring B-4: Northbound @ NE 110th Terr., north of bus stop

This information pertains only to this boring and should not be interpreted as being indicative of the site.

**PROJECT:** 12" Force Main Extension Improvements  
**CLIENT:** EAC Consulting, Inc.  
**LOCATION:** Biscayne Blvd - NE 105 to 119th Sts, North Miami FL  
**DRILLER:** JC/JC  
**DRILL RIG:** CMS  
**DEPTH TO WATER > INITIAL** 5'-6" : 5'-6"

**PROJECT NO.:** 12-1322  
**DATE DRILLED:** 10/21/2012  
**ELEVATION:** existing  
**LOGGED BY:**

ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	Description	STANDARD PENETRATION TEST			
			SAMPLE NO.	DEPTH	N	N-Value Curve
0		Asphalt pavement - 6 inches thick				
		Tan FRAGMENTED LIMESTONE and LIMESAND	1	0.5-2.5	82	82
2.5		Tan LIMESAND	2	2.0-4.0	40	
5		Tan FRAGMENTED LIMESTONE and SILTY SAND	3	4.0-6.0	37	
7.5		SILT and LIMESTONE	4	6.0-8.0	12	
10		Tan FRAGMENTED LIMESTONE	5	8.0-10.0	12	
10		Boring terminated at 10 feet below pavement surface.				



Boring B-5: Northbound @ north of NE 112th St., at bus stop

This information pertains only to this boring and should not be interpreted as being indicative of the site.

**PROJECT:** 12" Force Main Extension Improvements  
**CLIENT:** EAC Consulting, Inc.  
**LOCATION:** Biscayne Blvd - NE 105 to 119th Sts, North Miami FL  
**DRILLER:** JC/JC  
**DRILL RIG:** CMS  
**DEPTH TO WATER > INITIAL** 5'-7" : 5'-7"

**PROJECT NO.:** 12-1322  
**DATE DRILLED:** 10/21/2012  
**ELEVATION:** existing  
**LOGGED BY:**

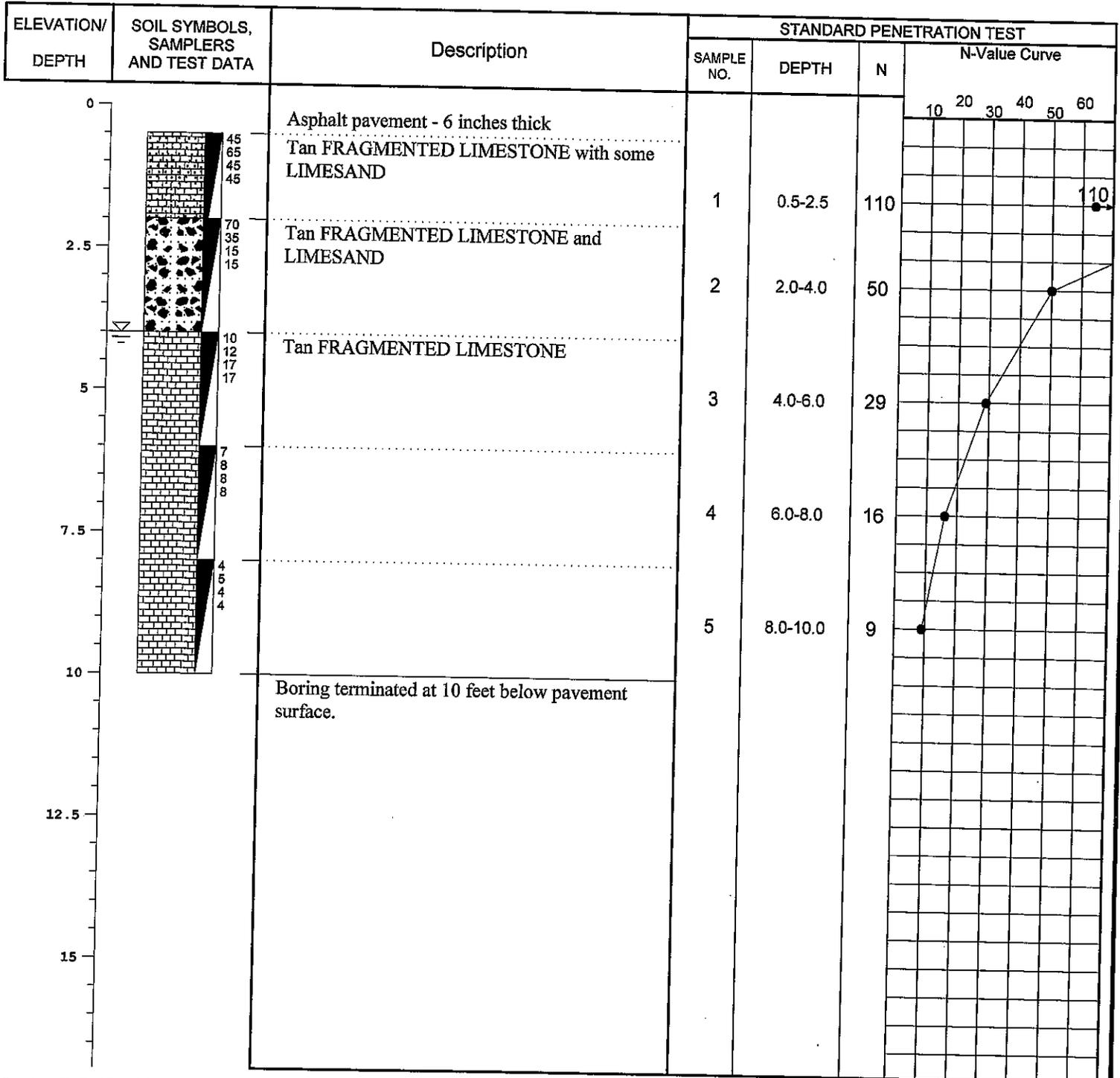
ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	Description	STANDARD PENETRATION TEST		
			SAMPLE NO.	DEPTH	N
0		Asphalt pavement - 6 inches thick			
0.5-2.5	75 56 63 63	Tan FRAGMENTED LIMESTONE and LIMESAND	1	0.5-2.5	119
2.0-4.0	18 20 22 22	Gray SILICA SAND	2	2.0-4.0	42
4.0-6.0	12 15 17 17	Dark tan LIMESAND	3	4.0-6.0	32
6.0-8.0	8 10 12 12	SILT and FRAGMENTED LIMESTONE	4	6.0-8.0	22
8.0-10.0	7 10 10 10	Tan FRAGMENTED LIMESTONE	5	8.0-10.0	20
10		Boring terminated at 10 feet below pavement surface.			

Boring B-6: Northbound @ NE 115th St., at bus stop/Public Storage

This information pertains only to this boring and should not be interpreted as being indicative of the site.

**PROJECT:** 12" Force Main Extension Improvements  
**CLIENT:** EAC Consulting, Inc.  
**LOCATION:** Biscayne Blvd - NE 105 to 119th Sts, North Miami FL  
**DRILLER:** JC/JC  
**DRILL RIG:** CMS  
**DEPTH TO WATER > INITIAL** 4'-6" : 4'-6"

**PROJECT NO.:** 12-1322  
**DATE DRILLED:** 10/21/2012  
**ELEVATION:** existing  
**LOGGED BY:**



Boring B-7: Northbound @ south of San Souci Dr.

This information pertains only to this boring and should not be interpreted as being indicative of the site.

**PROJECT:** 12" Force Main Extension Improvements  
**CLIENT:** EAC Consulting, Inc.  
**LOCATION:** Biscayne Blvd - NE 105 to 119th Sts, North Miami FL  
**DRILLER:** JC/JC  
**DRILL RIG:** CMS  
**DEPTH TO WATER > INITIAL** 4'-6" : 4'-6"

**PROJECT NO.:** 12-1322  
**DATE DRILLED:** 10/21/2012  
**ELEVATION:** existing  
**LOGGED BY:**

ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	Description	STANDARD PENETRATION TEST			
			SAMPLE NO.	DEPTH	N	N-Value Curve
0		Asphalt pavement - 6 inches thick				
		Tan FRAGMENTED LIMESTONE				
2.5		Tan FRAGMENTED LIMESTONE and LIMESAND	1	0.5-2.5	130	130
		Brown LIMESAND	2	2.0-4.0	49	
5		Tan FRAGMENTED LIMESTONE	3	4.0-6.0	14	
7.5		Boring terminated at 10 feet below pavement surface.	4	6.0-8.0	10	
10			5	8.0-10.0	18	

Boring B-8: Northbound @ north of San Souci Dr. - in front of 7-Eleven store

This information pertains only to this boring and should not be interpreted as being indicative of the site.

# KEY TO SYMBOLS

Symbol Description

Borings No. B-1 through B-8

## Strata symbols

 Sand with trace fragmented limestone

 Fragmented limestone and limesand

 Limestone with trace limesand

 Sand

 Silty sand

 Silt with trace fragmented limestone

 Fragmented limestone and silt

 Silty sand with trace fragmented limestone

 Limestone

 Fragmented limestone and silty sand

## Misc. Symbols

 Water table during drilling

## Soil Samplers

 Standard penetration test

**PROJECT:** 12" Force Main Extension Improvements  
**CLIENT:** EAC Consulting, Inc.  
**LOCATION:** NE 119th St - Biscayne Blvd to NE 16th Ave, North Miami  
**DRILLER:** JC/JC  
**DRILL RIG:** CMS  
**DEPTH TO WATER > INITIAL** 6'-0" : 6'-0"

**PROJECT NO.:** 12-1322  
**DATE DRILLED:** 10/21/2012  
**ELEVATION:** existing  
**LOGGED BY:**

ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	Description	STANDARD PENETRATION TEST			
			SAMPLE NO.	DEPTH	N	N-Value Curve
0		Asphalt pavement - 6 inches thick				
		Gray SILICA SAND with some FRAGMENTED LIMESTONE	1	0.5-2.5	56	
2.5		Brown SILICA SAND	2	2.0-4.0	24	
5			3	4.0-6.0	13	
7.5			4	6.0-8.0	13	
10		Tan FRAGMENTED LIMESTONE with some LIMESAND	5	8.0-10.0	20	
10		Boring terminated at 10 feet below pavement surface.				

Boring B-9: N.E. 119th St, between Biscayne Blvd & N.E. 16th Ave. - north of CVS and its parking lot

This information pertains only to this boring and should not be interpreted as being indicative of the site.

# KEY TO SYMBOLS

Symbol Description

Boring No. B-9

## Strata symbols



Sand with trace fragmented limestone



Sand



Limestone with trace limesand

## Misc. Symbols



Water table during  
drilling

## Soil Samplers



Standard penetration test

**PROJECT:** 12" Force Main Extension Improvements  
**CLIENT:** EAC Consulting, Inc.  
**LOCATION:** Biscayne Blvd - NE 105th to NE 119 Sts, North Miami FL  
**DRILLER:** JC/JC  
**DRILL RIG:** CMS  
**DEPTH TO WATER > INITIAL** 8'-0" : 8'-0"

**PROJECT NO.:** 12-1322  
**DATE DRILLED:** 10-23-2012  
**ELEVATION:** Existing  
**LOGGED BY:**

ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	Description	STANDARD PENETRATION TEST			
			SAMPLE NO.	DEPTH	N	N-Value Curve
0		Asphalt pavement - 6 inches thick				
		Tan fragmented LIMESTONE and LIMESAND				
2.5		Tan silica SAND	1	0.5-2.5	100	100
		Gray silica SAND	2	2.0-4.0	22	
5		Gray silty SAND	3	4.0-6.0	16	
7.5		Gray sandy SILT	4	6.0-8.0	9	
10		Boring terminated at 10 feet below pavement surface.	5	8.0-10.0	16	

Boring B-10: Southbound @ N.E. 117th St. - in front of Fast Auto Svc driveway

This information pertains only to this boring and should not be interpreted as being indicative of the site.

**PROJECT:** 12" Force Main Extension Improvements  
**CLIENT:** EAC Consulting, Inc.  
**LOCATION:** Biscayne Blvd. - NE 105th to NE 115 Sts, North Miami FL  
**DRILLER:** JC/JC  
**DRILL RIG:** CMS  
**DEPTH TO WATER > INITIAL** 6'-3" : 6'-3"

**PROJECT NO.:** 12-1322  
**DATE DRILLED:** 10-23-2012  
**ELEVATION:** Existing  
**LOGGED BY:**

ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	Description	STANDARD PENETRATION TEST			
			SAMPLE NO.	DEPTH	N	N-Value Curve
0		Asphalt pavement - 6 inches thick				10 20 30 40 50 60
		Tan fragmented LIMESTONE with some limesand	1	0.5-2.5	60	
2.5		Gray LIMESAND with trace fragmented limestone	2	2.0-4.0	22	
		Tan SILT with trace fragmented limestone	3	4.0-6.0	7	
		Tan fragmented LIMESTONE and SILT	4	6.0-8.0	8	
		Tan fragmented LIMESTONE with trace limesand	5	8.0-10.0	9	
10		Boring terminated at 10 feet below pavement surface.				

Boring B-11: Southbound @ N.E. 114th St.-in front of Secrets (pink bldg)

This information pertains only to this boring and should not be interpreted as being indicative of the site.

**PROJECT:** 12" Force Main Extension Improvements  
**CLIENT:** EAC Consulting, Inc.  
**LOCATION:** Biscayne Blvd. - NE 105th to NE 119 Sts, North Miami, FL  
**DRILLER:** JC/JC  
**DRILL RIG:** CMS  
**DEPTH TO WATER > INITIAL** 6'-0" : 6'-0"

**PROJECT NO.:** 12-1322  
**DATE DRILLED:** 10-23-2012  
**ELEVATION:** Existing  
**LOGGED BY:**

ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	Description	STANDARD PENETRATION TEST			
			SAMPLE NO.	DEPTH	N	N-Value Curve
0		Asphalt pavement - 6 inches thick				10 20 30 40 50 60
		Tan fragmented LIMESTONE and LIMESAND	1	0.5-2.5	63	
2.5			2	2.0-4.0	12	
		Tan SILT with trace fragmented LIMESTONE	3	4.0-6.0	6	
5			4	6.0-8.0	8	
		Tan fragmented LIMESTONE	5	8.0-10.0	7	
7.5						
10		Boring terminated at 10 feet below pavement surface.				
12.5						
15						

Boring B-12: Southbound @ North of N.E. 111th Street

This information pertains only to this boring and should not be interpreted as being indicative of the site.

**LOG OF TEST BORING**  
BORING NO.: B-13

**PROJECT:** 12" Force Main Extension Improvements  
**CLIENT:** EAC Consulting, Inc.  
**LOCATION:** Biscayne Blvd. - NE 105th to NE 115 Sts, North Miami FL  
**DRILLER:** JC/JC  
**DRILL RIG:** CMS  
**DEPTH TO WATER > INITIAL 6'-6" : 6'-6"**

**PROJECT NO.:** 12-1322  
**DATE DRILLED:** 10-23-2012  
**ELEVATION:** Existing  
**LOGGED BY:**

ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	Description	STANDARD PENETRATION TEST			
			SAMPLE NO.	DEPTH	N	N-Value Curve
0		Asphalt pavement - 6 inches thick				
		Tan fragmented LIMESTONE and LIMESAND				
2.5		Tan LIMESAND	1	0.5-2.5	45	
		Tan LIMESAND	2	2.0-4.0	7	
5		Tan fragmented LIMESTONE and SILT	3	4.0-6.0	14	
		Tan fragmented LIMESTONE	4	6.0-8.0	15	
10		Boring terminated at 10 feet below pavement surface.	5	8.0-10.0	18	

Boring B-13: Southbound @ N.E. 110th Street - in front of Natural Wood

This information pertains only to this boring and should not be interpreted as being indicative of the site.

**PROJECT:** 12" Force Main Extension Improvements  
**CLIENT:** EAC Consulting, Inc.  
**LOCATION:** Biscayne Blvd. - NE 105th to NE 115th Sts, North Miami FL  
**DRILLER:** JC/JC  
**DRILL RIG:** CMS  
**DEPTH TO WATER > INITIAL** 6'-6" : 6'-6"

**PROJECT NO.:** 12-1322  
**DATE DRILLED:** 10-23-2012  
**ELEVATION:** Existing  
**LOGGED BY:**

ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	Description	STANDARD PENETRATION TEST			
			SAMPLE NO.	DEPTH	N	N-Value Curve
0		Asphalt pavement - 6 inches thick				
		Tan fragmented LIMESTONE and LIMESAND				
2.5			1	0.5-2.5	47	
			2	2.0-4.0	8	
5			3	4.0-6.0	8	
		Tan SILT				
7.5			4	6.0-8.0	5	
		Tan fragmented LIMESTONE and SILT				
10			5	8.0-10.0	8	
12.5		Boring terminated at 10 feet below pavement surface.				
15						

Boring B-14: Southbound @ north of N.E. 108th St., south of bus stop

This information pertains only to this boring and should not be interpreted as being indicative of the site.

**PROJECT:** 12" Force Main Extension Improvements  
**CLIENT:** EAC Consulting, Inc.  
**LOCATION:** Biscayne Blvd. - NE 105th to NE 115th Sts, North Miami FL  
**DRILLER:** JC/JC  
**DRILL RIG:** CMS  
**DEPTH TO WATER > INITIAL** 6'-6" : 6'-6"

**PROJECT NO.:** 12-1322  
**DATE DRILLED:** 10-23-2012  
**ELEVATION:** Existing  
**LOGGED BY:**

ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	Description	STANDARD PENETRATION TEST			
			SAMPLE NO.	DEPTH	N	N-Value Curve
0		Asphalt pavement - 6 inches thick				
		Tan fragmented LIMESTONE with trace limesand	1	0.5-2.5	61	
2.5		Gray sandy SILT	2	2.0-4.0	12	
5		Dark tan fragmented LIMESTONE and silty SAND	3	4.0-6.0	11	
7.5		Tan fragmented LIMESTONE with trace LIMESAND	4	6.0-8.0	10	
10		Boring terminated at 10 feet below pavement surface.	5	8.0-10.0	10	

Boring B-15: Southbound @ south of N.E. 107th St., between bus stop and K-Mart 2nd driveway.

This information pertains only to this boring and should not be interpreted as being indicative of the site.

# KEY TO SYMBOLS

Symbol Description

**Borings No. B-10 through B-15**

Strata symbols



**Limestone with trace limesand**



**Silt**



**Fragmented limestone and limesand**



**Limestone**

Misc. Symbols



**Water table during  
drilling**

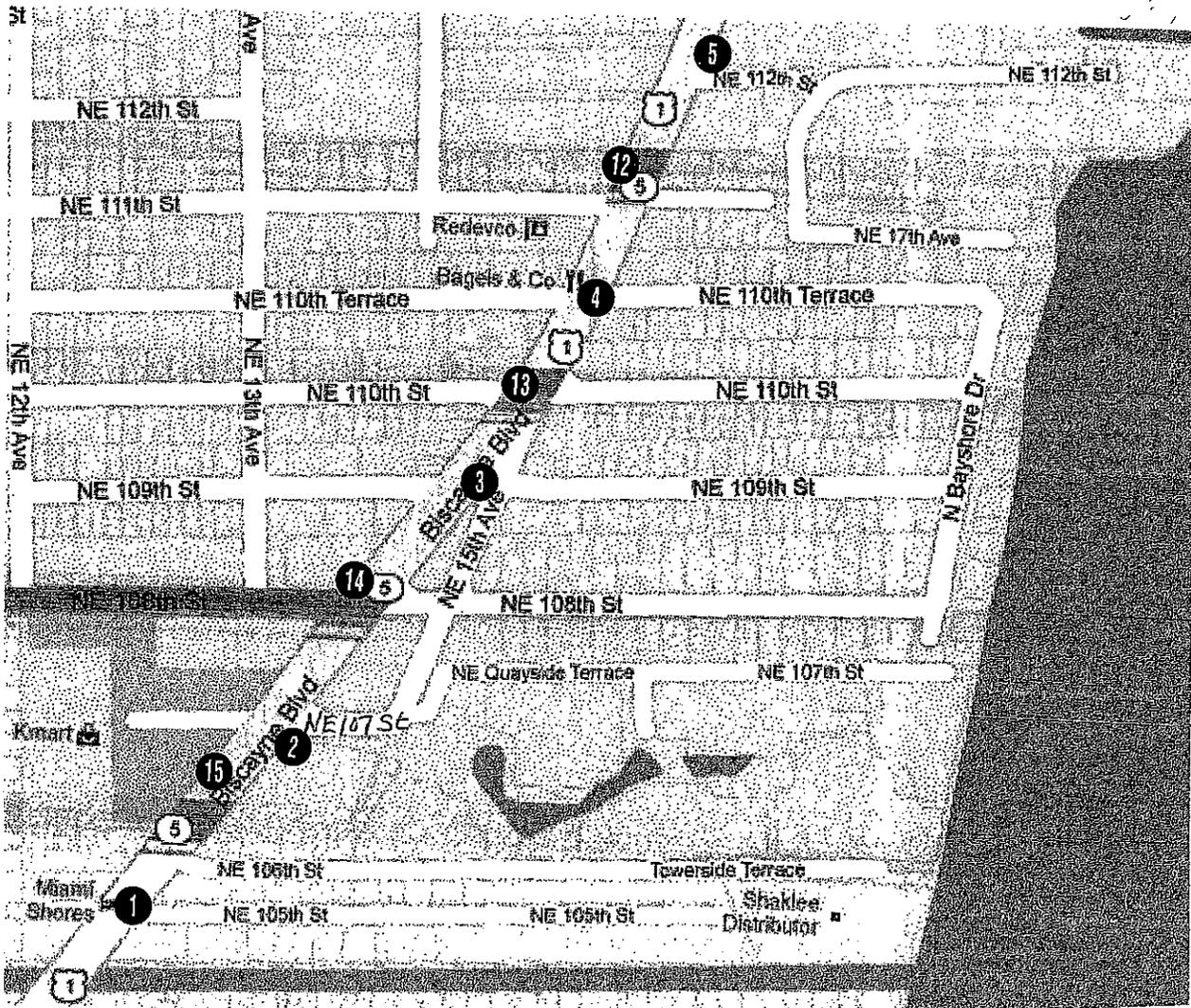
Soil Samplers



**Standard penetration test**

**APPENDIX B**  
**TEST BORING LOCATION MAP**

# TEST BORING LOCATION MAP



● Test Boring Location



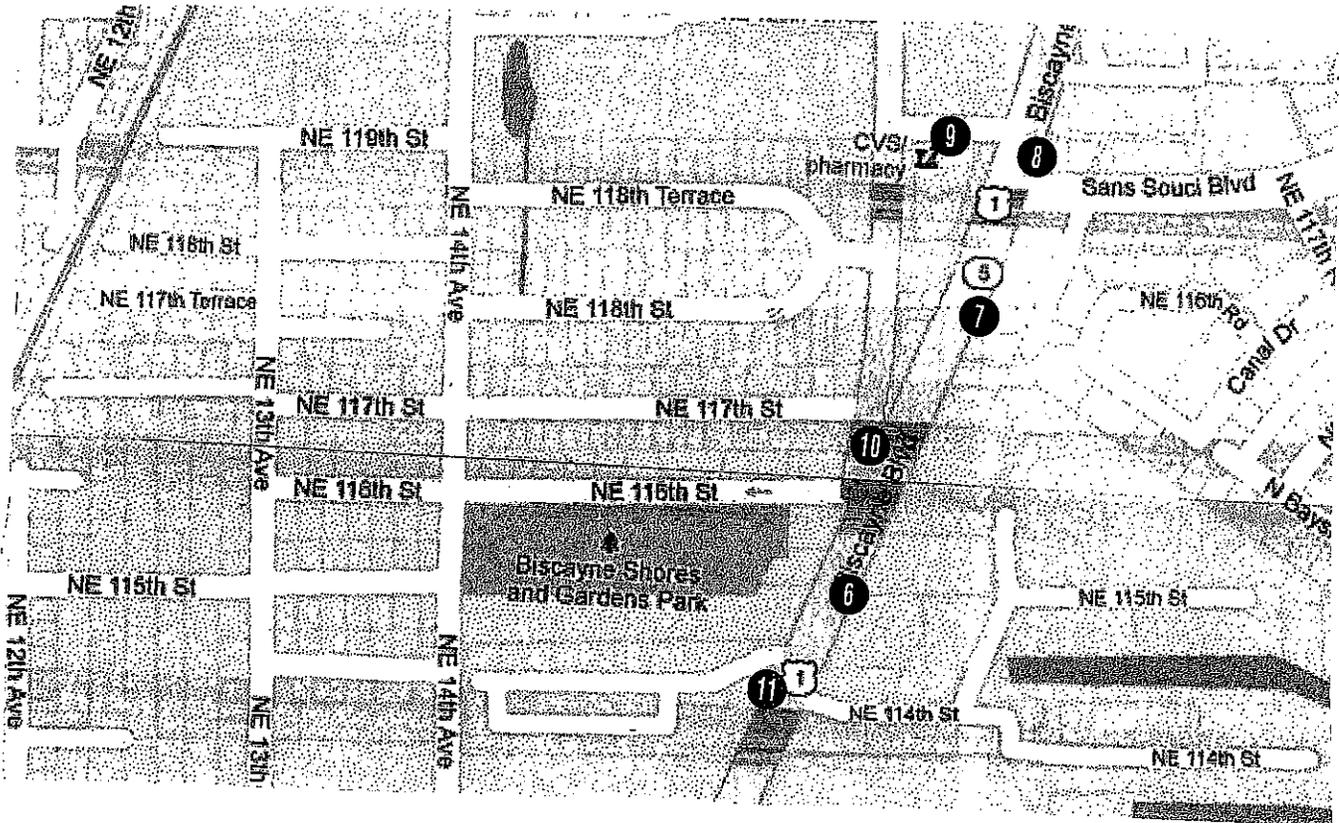
**Professional Engineering & Testing**

1820 N.E. 144<sup>th</sup> Street, North Miami, Florida 33181

Project: Force Main Improvements  
 Locations: Biscayne Boulevard, from  
 N.E. 105<sup>th</sup> to N.E. 119<sup>th</sup> Streets  
 North Miami, Florida

WLI W.O. #12-1322

# TEST BORING LOCATION MAP



● Test Boring Location



**WINGERTER**  
LABORATORIES INC.

Professional Engineering & Testing

1820 N.E. 144<sup>th</sup> Street, North Miami, Florida 33181

Project: Force Main Improvements  
Locations: Biscayne Boulevard, from  
N.E. 105<sup>th</sup> to N.E. 119<sup>th</sup> Streets  
North Miami, Florida

WLI W.O. #12-1322