Roadway Soil Survey

66th Avenue Roadway Widening
500 feet North of 57th Street to Barber Street
Indian River County, Florida

DET Project No. 06-11-2352

Prepared For:
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Prepared By:

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Port St. Lucie, Florida 34986

Date: April 25, 2007

DUNKELBERGER ENGINEERING & TESTING, INC.
Geotechnical • Materials Testing/Inspection • Environmental

Kimley-Horn & Associates, Inc.
1901 19th Place, Suite B-100
Vero Beach, Florida 32906

April 25, 2007
Project No. 06-11-2352

Attention: Mr. Brian Good, P.E...*via e-mail and US Mail*

Subject: ***Roadway Soil Survey***
66th Avenue Roadway Widening
500 feet North of 57th Street to Barber Street
Indian River County, Florida

Dear Mr. Good:

INTRODUCTION

Dunkelberger Engineering & Testing, Inc. (DE&T) has completed the roadway soil survey for the above referenced project. Generally, our services included performing exploratory borings along the planned roadway alignment, at planned mast arm locations and near the end bents of proposed bridge locations. Field and laboratory data were evaluated and geotechnical recommendations were developed with respect to the proposed construction. Our findings and recommendations for the roadway soil survey and mast arms are discussed herein. Our findings and recommendations for the proposed bridges are presented under separate cover in a Structures Investigation report.

PROJECT INFORMATION

The project will involve the widening and relocation of 66th Avenue in Indian River County, Florida. The project begins at Station 351+30.23 (500 feet north of 57th Street) and ends at Station 569+90.74 (Barber Street). A *Vicinity Map* of the project area with respect to existing streets is included on Sheet 1.

Review of the provided "Roadway Contract Plans" for Indian River County Project No. 0370 (66th Avenue Roadway Widening, August 2006; Kimley-Horn and Associates, Inc.) shows that a flexible pavement section is being proposed for the roadway travelways.

The "Typical Sections" show that the roadway for this project will be built with a configuration as follows:

- The existing 2-lane roadway will be widened to a 4-lane (2, 12-foot wide lanes each direction) travelway, divided by a sod or landscaped median. An 8-foot wide concrete sidewalk will be located adjacent to the northbound and/or southbound outer lanes.

Improvements are also planned for portions of several side streets crossing 66th Avenue. The side street improvements include:

Side Street	Station to Station
61st Street	184+47.81 to 219+51.14
65th Street	181+48.04 to 217+50.84
69th Street	185+49.42 to 214+01.01
81st Street	200+00.00 to 213+90.00

Improvements to the side streets will typically incorporate the addition of a center turn lane and the construction of sidewalks adjacent to the roadway.

From the profiles and cross sections provided, grading for the roadway improvements will typically entail between 1 foot of cut and 4 feet of fill placement. Thicker fills will be required where the proposed alignment crosses existing ditches and canals.

Mast arms are proposed for signalization of the intersections of 66th Avenue with 69th Street and CR 510.

Detention ponds will be required for stormwater management. The locations for the ponds were not determined at the time of this exploration, and therefore, were not included in the scope of this study.

SITE CONDITIONS

The proposed roadway alignment passes predominantly through active and fallow citrus groves, and to lesser extents through undeveloped wooded areas and residential properties. The existing 66th Avenue and cross streets consist of undivided two lanes roadways with small shoulders on both sides. Additional turn lanes are present at the intersections of 81st Street, CR 510 and Barber Street. The existing road elevation along 66th Avenue and the cross streets generally varies between elevation +20 feet and +24 feet with respect to the National Geodetic Vertical Datum (NGVD) of 1929.

A canal exists on the east side of 66th Avenue which is about 50 to 60 feet wide in the initial portions of the project and becomes narrower near 77th Street, where it turns to the east and runs along the 77th Street. North of 77th Street, drainage ditches with grass cover exist along both sides of 66th Avenue. Many of the east-west cross streets to 66th Avenue are bordered by canals which cross the new alignment.

SOIL SURVEY INFORMATION

Information available from the U.S. Department of Agriculture Soil Conservation Service (Soil Survey of Indian River County Area, Florida [1980]) (SCS) shows that the project area lies within an area mapped with the soils units given in the following table.

Soil Unit	Found In	Stratification	Water Table
EauGallie Fine Sand	Broad flatwoods	0 - 5" - Fine Sand (A-3) 5" - 47"- Sand, Fine Sand (A-3, A-2-4) 47"-62"- Sandy Loam, Fine Sandy Loam, Sandy Clay Loam (A-2-4, A-2-6) 62"-80"- Sand, Loamy Sand, Loamy Fine Sand (A-3, A-2-4)	For most years, water table is less than 10 inches of the surface for 2 to 4 months in wet season and within 40 inches for more than 6 months. (0 to1 feet, Apparent water table between June and October)
Oldsmar Fine Sand	Broad flatwoods	0-32"- Fine Sand (A-3) 32"-50"- Fine Sand, Sand, Loamy Fine Sand (A-2-4, A-3) 50"-62"- Fine Sandy Loan, Sandy Loam, Sandy Clay Loam (A-2-4, A-2-6)	For most years, water table is less than 10 inches of the surface for 2 to 4 months in wet season and within 40 inches for more than 6 months. (0 to1 feet, Apparent water table between June and February)
Riviera Fine Sand	Low Hammocks, poorly defined drainage ways and broad, low sloughs	0-26" - Fine Sand (A-3) 26"- 40"- Sandy Loam, Sandy Clay Loam (A-2-4, A-2-6) 40"- 80"- Sand, Fine Sand, Loamy Sand (A-3, A-2-4)	Water table is within 10 inches of the surface for 1 to 6 months and between 10 and 40 inches for more than 6 months. Water table is above the surface during heavy rainy season. (0 to1 feet, Apparent water table between June and December)
Wabasso Fine Sand	Broad flatwoods	0-24"- Fine Sand (A-3) 24"-35"- Sand, Fine Sand, Loamy Sand (A-3, A-2-4) 35"-48"- Sandy Loam, Fine Sandy Loam,Sandy Clay Loam (A-2-4, A-2-6) 48"-80"- Sand, Fine Sand, Loamy Sand (A-3, A-2-4)	Water table depth is between 10 and 40 inches from the surface for more than 6 months in most years and less than 10 inches for 1 to 2 months. (0 to1 feet, Apparent water table between June and October)
Pineda Fine Sand	Low hammocks and poorly defined sloughs	0-23"- Fine Sand (A-3) 23"-40"- Sandy Loam, Fine Sandy Loam, Sandy Clay Loam (A-2-4, A-2-6) 40" - 80"- Sand, Loamy Sand, Fine Sand (A-3, A-2-4)	Water table is above the surface after heavy rainfall for short periods. It is within 10 inches of the surface for 1 to 6 months and between 10 and 40 inches for more than 6 months. (0 to1 feet, Apparent water table between June and November)

SUBSURFACE EXPLORATION

One-hundred fifty-five (155) auger borings were drilled at a spacing of approximately 200 feet apart along the roadway alignment. The auger borings were drilled to depths ranging from 6 to 10 feet below the existing ground surface using a truck mounted Mobile (B-47) drill rig and hand-turned augering equipment. Four (4) Standard Penetration Test (SPT) borings were drilled to depths of 30 to 40 feet below the existing ground surface at proposed mastarm locations. In addition, six (6) SPT borings were drilled to depths of 75 feet below the ground surface near proposed bridge replacement locations. The approximate locations of the borings are depicted on attached sheets 2-1 through 2-65, *Boring Location Plan.*

Representative samples of the recovered soils were collected from the borings, placed in moisture proof containers, and taken to our laboratory where an engineer assigned them an AASHTO classification following visual examination. Five bulk samples were collected from the selected locations to perform LBR testing. Corrosion samples were collected generally in the low accessible areas to measure the parameters to estimate the corrosion potential for flood control culverts.

Subsurface Conditions

Detailed graphical profiles of the subsoils are provided on attached Sheets 3A through 3L, *Subsurface Profiles.*

The Strata 1, 2 and 3 soils consist of clean sands and sands with slight amounts of silt or clay, and are classified as AASHTO A-3 soils. The Strata 4 and 5 soils consist of sands with moderate amounts of silt or clay, and are classified as A-2-4. The Stratum 6 soils consist of sandy clays and are classified as A-6, while the Stratum 7 soils consist of sandy silt and are classified as A-4. Stratum 8 soils consist of sands with slight to moderate amounts of silt, are deemed to be Hardpan, and are classified as A-3 to A-2-4.

The Strata 1, 2 and 3 soils are considered as "select" materials per FDOT's Standard Index No. 505 (*Embankment Utilization*) and may be utilized as such. Technically, the Stratum 5 clayey sands and the Stratum 4 silty sands, both classified as A-2-4, are also considered to be "select" materials per FDOT's Standard Index No. 505. However, the Stratum 5 soils are expected to behave like AASHTO A-2-6 materials in the field and should be called out as "plastic" materials per FDOT Standard Index No. 505 if the percentage passing the U.S. Standard No. 200 sieve (fines content) is greater than 12%. The Stratum 6 and 7 soils should be called out as "plastic" materials per FDOT Standard Index No. 505. The Stratum 4 soils are expected to be moisture sensitive, and may exhibit instability under loads or difficulty in achieving compaction when the fines content is greater than 12% and moisture content is above the optimum value.

Clayey and silty sands, sandy silts and sandy clays are considered to be suitable, with restrictions, for the planned construction and it is the Contractor's responsibility to reuse them in a proper and efficient manner. These soils may be uniformly placed in the lower portions (below 4 feet of the

bottom of the base) of the higher embankment sections; within the roadway, in pipe cuts from 12 inches above the pipe to 4 feet below the bottom of base if the fines content is greater than 12% or to the bottom of the subgrade if the fines content is less than 12%; outside of the roadway, in pipe cuts from 12 inches above the pipe to 1 foot below the ground surface if the fines content is greater than 12% or to the ground surface if the fines content is less than 12%; or, these soils could be uniformly blended with the cleaner sands to reduce their fines content to below the 12% threshold.

It is the Contractor's responsibility to manage the soils during the construction to ensure that they are properly and efficiently utilized. As such, the Contractor shall prepare and submit to the Project Engineer, prior to the start of construction, an *Earthwork Management Plan (EMP)* describing the means and methods that will be utilized for digging, stockpiling, mixing, moisture conditioning, and aerating the sub-soils from the roadway, pond and utility excavations. The *EMP* shall include, as a minimum, descriptions of the excavation process (i.e., how the soils shall be "vertically blended" during excavation or segregated by layer/type); if and how excavations will be dewatered; how and where the soils will be dried following excavation to achieve the optimum compaction moisture; and, stockpile locations, heights and widths.

The management, placement and compaction of the subsoils are expected to require extra handling and working (drying). The Contractor should sequence and schedule the work accordingly. It is the Contractor's responsibility to include such costs in the appropriate bid items.

Muck Probes

Muck probing was performed within the existing ditches and canals at their crossings with the proposed roadway alignment. The muck probes were conducted by vertically pressing a hand probe into the bottom of the drainage features. The locations of the muck probes are depicted as MP-1 through MP-37 on attached Sheets 2-1 through 2-65, *Boring Location Plan.* The muck thicknesses identified by the probings are presented on attached Sheet 4, *Muck Probe Results.* In general, muck was identified in thicknesses ranging up to 24 inches at the outside edges of the drainage features and up to 36 inches in the middle.

Groundwater

Groundwater levels were measured in the open boreholes when the free water surface was first encountered. The depth to the water table in the auger borings at the time of our fieldwork (Between October 23, 2006 and December 19, 2006) ranged from 4.0 to 6.0 feet below the ground surface. Many auger borings did not encounter groundwater. The differences in the water table levels are believed to be due to differences in the ground level (elevation), lack of hydraulic equilibration (i.e., water table not stabilized), and/or effects of the in-place drainage improvements. In addition, groundwater levels on the site are expected to fluctuate in response to a variety of factors, including rainfall and drainage patterns.

In light of the data collected during this study, which included the majority of the field work being conducted at the end of the wet season, we estimate that the groundwater levels measured in the borings along the alignment are generally representative of or slightly below the normal seasonal high water levels.

The SCS information and our local experience lead us to believe that a shallow perched water table will develop within the project alignment. The perched groundwater will tend to mound on top of the Strata 4, 5, 6, 7 and 8 soils which are low in permeability. We expect that the perched water levels could develop within 1 foot of the existing ground surface in portions of the alignment; however, suitable proximity to and depth of drainage swales and canals will effectively mitigate the mounding of perched groundwater.

The measured groundwater levels are based on existing conditions at the time of measurement. Projecting the post-production water table levels would require specific information regarding the site layout (pervious and impervious areas), stormwater management, and landscape irrigation for use in a detailed hydrogeologic model. Such as effort is beyond the scope of this study.

LABORATORY TESTING

Soil samples collected in the field were visually examined and classified in general accordance with the USCS classification system by a geotechnical engineer. Representative samples were selectively tested to aid in soil classification and to further define the engineering properties of the soils. Selected samples of the soils collected from the borings were tested in our laboratory to determine their percent fines (ASTM D 1140), moisture content (ASTM D 2216), Atterberg liquid and plastic limits (ASTM D 4318), organic content (ASTM D 4427). Limerock Bearing Ratio (FDOT FM 5-515) tests were conducted on the collected bulk samples. Corrosion series tests were performed on collected soils samples at selected locations. The collected data were used to aid in the classification of the soils and to further define their engineering properties. The soil classification test results are provided on the attached *Cross Section Soil Survey* (Sheet 5) and *Subsurface Profiles* (Sheets 3A through 3L). The LBR tests results are attached in the Appendix A and are summarized in the following table.

Sample No.	Location	Depth (feet)	Percent Fines (%)	AASHTO Class	Depth (feet)	Maximum LBR Value	Optimum Moisture content (%)	Maximum Dry Density (pcf) (T-180)
8002	452+50, 33' RT.	0'- 3'	4.0	A-3	0'- 3'	46	13	104
8003	472+30, 25' LT.	0'- 3'	3.0	A-3	0'- 3'	44	11	107
8004	524+40, 30' LT.	0'- 3'	5.0	A-3	0'- 3'	38	15	104
8005	541+30, 20' RT.	0'- 3'	5.0	A-3	0'- 3'	28	8	109
8006	561+00, 20' RT.	0'- 3'	2.0	A-3	0'- 3'	41	14	103

The corrosions series tests are summarized in the following table.

Sample #	Location	Depth (feet)	pH	Chloride Content (PPM)	Suphate Content (PPM)	Resistivity (ohm-cm)
1	356+00, 43' RT.	0'-2'	8.50	10	†	170
2	408+00, 80' RT.	0'-2'	8.05	†	†	150
3	459+90, 90' LT.	0'-2'	7.55	†	†	42
4	512+00, 35' LT.	0'-2'	7.93	†	†	110
5	560+00, 60' LT.	0'-2'	7.25	15	†	57

Resistivity of all soil samples was measured using EPA 120.1 method.
Sulphate and chloride contents of all soil samples were measured using SW-848-9066 method.
pH of all soil samples and water was measured using EPA 9045 and EPA 150.1 methods, respectively.
Sulphate content of the water sample was measured using EPA 375.4 method.
Chloride content of the water sample was measured using EPZ 325.2 method.

† - *Undetectable due to the amounts below the report limits.*

Based on the corrosion series test results, according to the environmental classification chart for Bridge Substructures of FDOT, the environmental classification for steel and concrete is extremely aggressive.

ROADWAY EVALUATION

Our geotechnical recommendations related to design and construction of the roadway are presented hereafter.

Clearing, Grubbing and Stripping

At the outset of construction, the alignment should be cleared, stripped and grubbed as specified in Section 110 of the Florida Department of Transportation (FDOT) Standard Specifications for

Road and Bridge Construction (2004) (Standard Specifications). Clearing and grubbing should include the complete removal and disposal of timber, bushes, stumps, roots, debris and all other obstructions resting on or protruding through the surface of the ground. Organic soils should be removed and replaced in accordance with FDOT Standard Index No. 500 (January 2002).

Drainage Feature Reclamation

All existing canals, which are to be filled, should be thoroughly stripped and grubbed prior to backfill placement. Some over-excavation and/or de-mucking of the sections may be necessary to accommodate large-scale earthwork equipment required for spreading and compacting fills and to completely remove loose, soft, and/or deleterious accumulations from the bottoms. Reclamation backfill should satisfy the requirements of FDOT Index No. 505. The fill should be placed in level lifts not more than 12 inches in uncompacted thickness. Each lift of fill should be uniformly compacted to at least 100% of the AASHTO T-99 maximum dry density.

The reclamation should be conducted in the dry in order to verify the removal of unsuitable materials, and to facilitate construction of strong and minimally compressible fill. We envision that dewatering required for this purpose can be accomplished using surface (sump) pumps or well points.

Embankment Construction

We recommend that the roadway embankment design and construction adhere to the requirements of FDOT Standard Index No. 505 (Embankment Utilization) and Section 120 of FDOT's Standard Specifications. The existing road, including the base, should be completely removed or broken-up over its full width, unless overlain. This is also required under proposed landscape areas (e.g., medians). The presence of the old road under landscaped areas will prevent the downward percolation of water through the embankment and into the cleaner, natural surface soils.

Fill required for embankment construction should consist of sands meeting the requirements of FDOT Standard Index No. 505. The embankment fill should be compacted to at least 100% of the maximum dry density as determined by AASHTO T-99. Based on the results of our borings, Strata 1, 2 and 3 are considered "select" materials with respect to the FDOT Standard Index No. 505. For pavement design, a limiting Limerock Bearing Ratio (LBR) value of 30 should be considered for these soils.

Although Stratum 4 and 5 soils are not considered "plastic" per strict interpretation of the FDOT Standard Index No. 505, our local experience is that they can become unstable ("pump") under repeated passes of heavy construction equipment. Stratum 6 soils are considered "plastic" per FDOT Standard Index No. 505. Stratum 7 soils are also considered "plastic" per FDOT Standard Index No. 505, but were only encountered deeper in the soil profile of the bridge borings. As described in Index No. 505, the bottom of the roadway base course should be at least 24 inches (for a cut section) above the top of the plastic or organic soils. Based on our boring results and

the roadway cross sections provided, the over excavation in silty/clayey sands and sandy silts/clays should be anticipated to accommodate this separation along the following sections of alignment:

ROAD SECTION	STATION	
	FROM	TO
66th Avenue	352+00	362+00
66th Avenue	368+00	372+00
66th Avenue	380+00	382+00
66th Avenue	408+00	412+00
66th Avenue	428+00	430+00
66th Avenue	436+00	438+00
66th Avenue	450+00	452+00
66th Avenue	460+00	462+00
66th Avenue	471+50	472+50
66th Avenue	478+00	480+00
66th Avenue	490+00	496+00
66th Avenue	508+00	516+00
66th Avenue	556+00	558+00

These limits have been estimated to help estimate a bid quantity for possible plastic soil removal. The actual extent of removal, if any, will be determined based on visual inspection during the construction. Subgrades should be closely monitored for signs of instability during proof-rolling operations. In the event instability is observed, the unstable area should be undercut a minimum of 24 inches and backfilled with an AASHTO A-3 soil. In addition, consideration should be given to leave areas with "hardpan" (Stratum 8) soils in place where hardpan overlies the plastic soils. The "stiffer" hardpan layer may provide bridging over the plastic soils and thereby reduce potential undercutting. However, it should be realized that the "hardpan" is hydraulically restrictive and measures should be taken to prevent water intrusion.

Pavement Section

We recommend that the design and construction methodologies advocated by the FDOT be used for the roadbed section (i.e., subgrade, base and asphalt) of the roadway. We recommend a minimum separation of 12 inches between the bottom of the subgrade and the wet season water level due to constructability issues in the wetter months when working near the seasonal high water level.

Raised, landscaped medians will require special considerations with respect to perched water conditions. Within zones or layers of subsoils of restricted permeability, due to compaction and/or a fine grained texture, the infiltration would tend to migrate laterally as much as it does vertically. Lateral migration of this water into the pavement section could saturate and weaken the edges of the granular base and subgrade along the travel lanes that border the median. This potential problem could be remedied by installation of a strip drain (geo-composite edge) along the backside of the curbs. The strip drain would need to be connected, via lateral, into the stormwater structures for outfall. In our opinion, the use of full-depth asphalt base will reduce the

risk of these impacts. Nevertheless, to further reduce this risk, strip drains or some other type of water interceptor should be used.

Positive drainage must be maintained throughout the course of the construction. Stormwater should not be allowed to pond within or adjacent to the travel way construction limits.

Storm Sewer Piping and Appurtenant Construction

We recommend that the construction related to the storm sewer piping and associated structures adhere to Sections 125 and 430 of FDOT's Standard Specifications. Construction activities should be accomplished in the "dry" with groundwater levels maintained at least 2 feet below the deepest portion of any excavation. We expect that engineered well-pointing dewatering systems will be needed for this work. Actual dewatering means and methods should be the responsibility of the contractor.

We recommend that soils used as pipe backfill consist of AASHTO A-3 soil types with an organic content of 3% or less. Pipe backfill within 3 feet of the roadway base course should be an AASHTO A-3 soil type. The Strata 1, 2 and 3 soils are considered suitable for this purpose. The Strata 4, 5, 6 and 7 soils may be used below this depth. The excavated soils will need to be dried following excavation to achieve a moisture content within about 2% of the optimum required for compaction. We anticipate that the soils which are removed during excavation operations will be suitable for reuse. The fines (clay and silt) contents of the Strata 4, 5, 6 and 7 soils will make these soils difficult to dry and reuse.

All excavations should be made in accordance with all applicable State and Federal requirements. More specifically, OSHA 29 CFR Part 1926 (Subpart P, Excavations) defines the subsurface profile, within the upper 15 feet, as a sand (Type C soil). As such, temporary side slopes in fully dewatered excavations could be made at 1-1/2:1 (horizontal:vertical) inclination or flatter in the sand. If the prescribed minimum sloping requirements cannot be met in the sands because of space limitations or other restrictions, then an engineered sheeting or shoring system would be necessary.

Mast Arms

Results of the field exploration show the subsoils at mast arm locations to consist of very loose to medium dense sands from the ground surface to depths of 30 to 40 feet (maximum depths drilled). These soil conditions are considered to be suitable for the proposed mast arm construction. Foundation design criteria including total and buoyant unit weights, angle of internal friction, cohesion and lateral earth pressure coefficients are presented in the following tables.

69th Street Intersection Mast Arm Foundations

Depth (feet)	Range of SPT N-Values	Soil Unit Weight (pcf)		Angle of Internal Friction (degrees)	Effective Cohesion (psf)	Rankine Earth Pressure Coefficients	
		Total (saturated)	Buoyant (submerged)			Ka (Active)	Kp (Passive)
0-15	3-17	115	55	32	0	0.30	3.25
15-35	1-7	110	50	30	0	0.33	3.00
35-40	22	115	55	32	0	0.30	3.25

CR510 Intersection Mast Arm Foundations

Depth (feet)	Range of SPT N-Values	Soil Unit Weight (pcf)		Angle of Internal Friction (degrees)	Effective Cohesion (psf)	Rankine Earth Pressure Coefficients	
		Total (saturated)	Buoyant (submerged)			Ka (Active)	Kp (Passive)
0-30	4-24	115	55	32	0	0.30	3.25

Groundwater levels measured in the open boreholes at the time of drilling ranged from 4.3 feet to 8.3 feet below the ground surface.

We recommend that the drilled shaft construction be performed as specified in Section 455 of FDOT's Standard Specifications for Road and Bridge Construction (2004). We anticipate that the wet construction method, possibly combined with the use of temporary casing, will be required due to very loose sand layers as they may "run" or slough during the drilling process.

LIMITATIONS

DE&T has completed a Roadway Soil Survey for the widening of 66th Avenue from about 500 feet north of 57th Street to Barber Street in Indian River County, Florida. The purpose of the study was to explore the shallow subsurface conditions of the site and provide geotechnical criteria for the design and construction of the project. DE&T warrants that the recommendations and professional advice presented in this report were developed based on recognized practice in the disciplines of soil mechanics, foundation engineering, and engineering geology. No other warranties are expressed or implied.

_____oOo_____

We trust that this information is sufficient for continued development of the project. Please contact us if you have any questions, or need any additional information.

Sincerely,

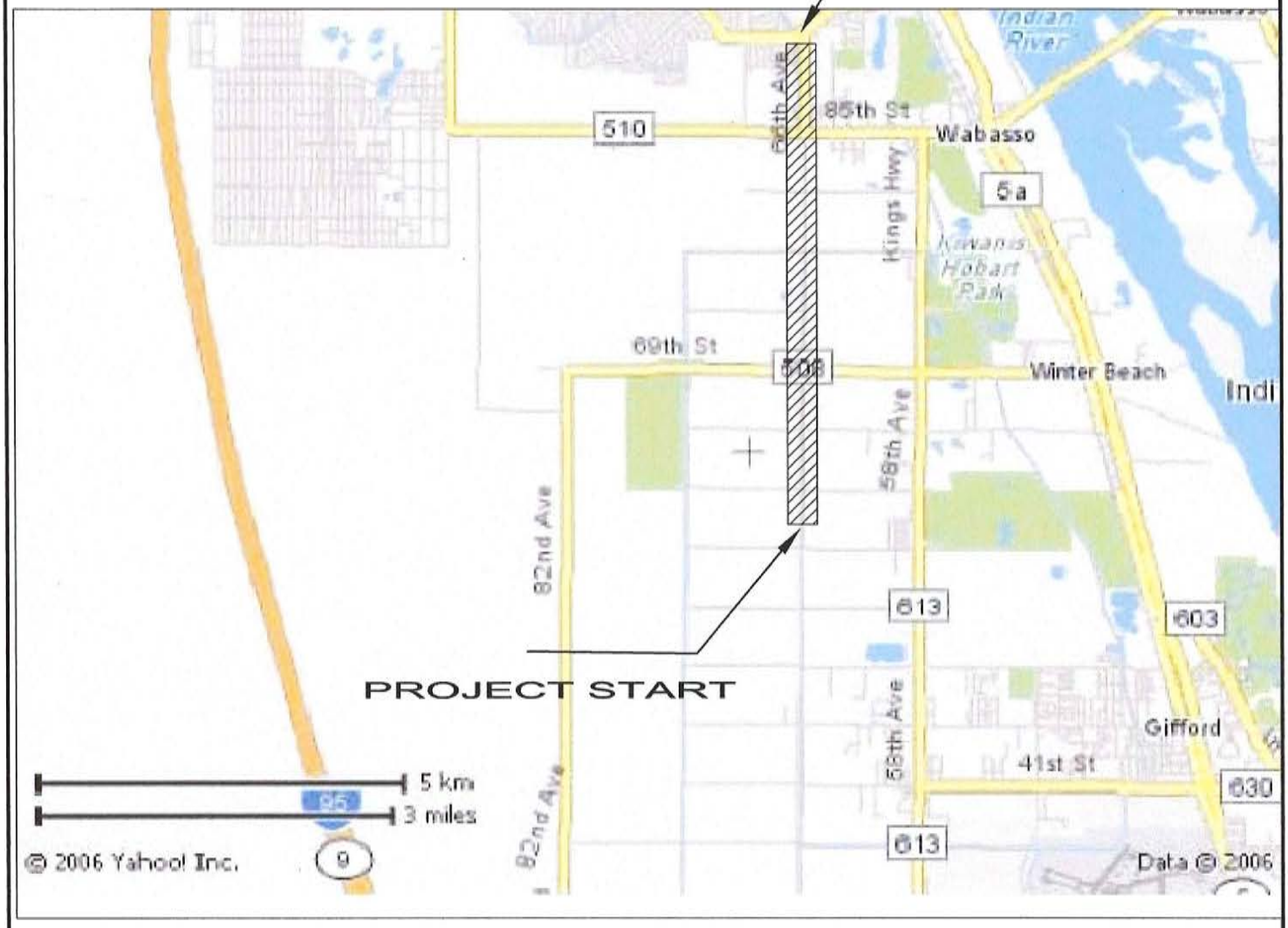
DUNKELBERGER ENGINEERING & TESTING, INC.

M. Bahiradhan
Project Engineer

Chris L. Mings, P.E. 4/30/07
Manager, Geotechnical Services
FL Registration No. 61556

MB/CLM/mb
2352-RPT

Attachments: Sheet 1 – Vicinity Map
Sheets 2-1 through 2-65 – Boring Location Plan
Sheets 3A through 3L – Subsurface Profiles
Sheet 4 – Muck Probe Results
Sheet 5 – Cross Section Soil Survey
Appendix A – LBR Tests Results
Appendix B – Corrosion Series Tests Results



SOURCE: YAHOO INC. (2006)

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	AS SHOWN
REVISED	

VICINITY MAP

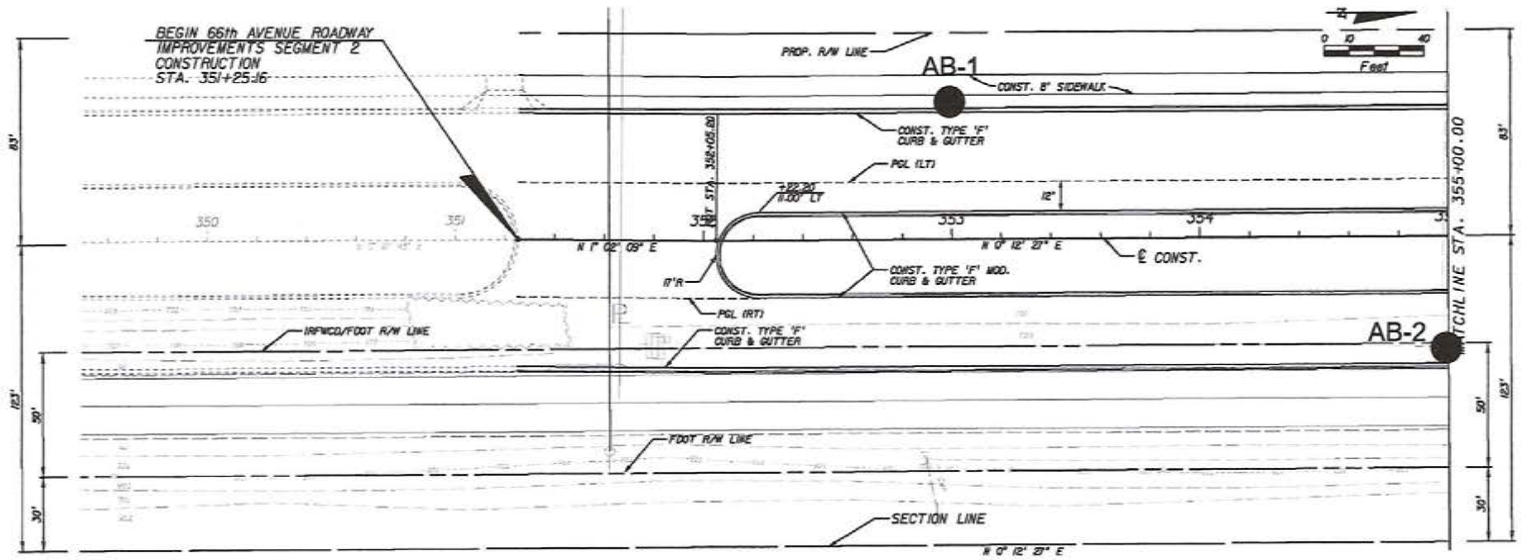
66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.

Geotechnical • Materials Testing/Inspection • Environmental

DATE	PROJ. NO.	SHEET
01-19-06	06-11-2352	1



0' 25' 50' 100'

Scale: 1" = 50'

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

LEGEND

AB-1 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

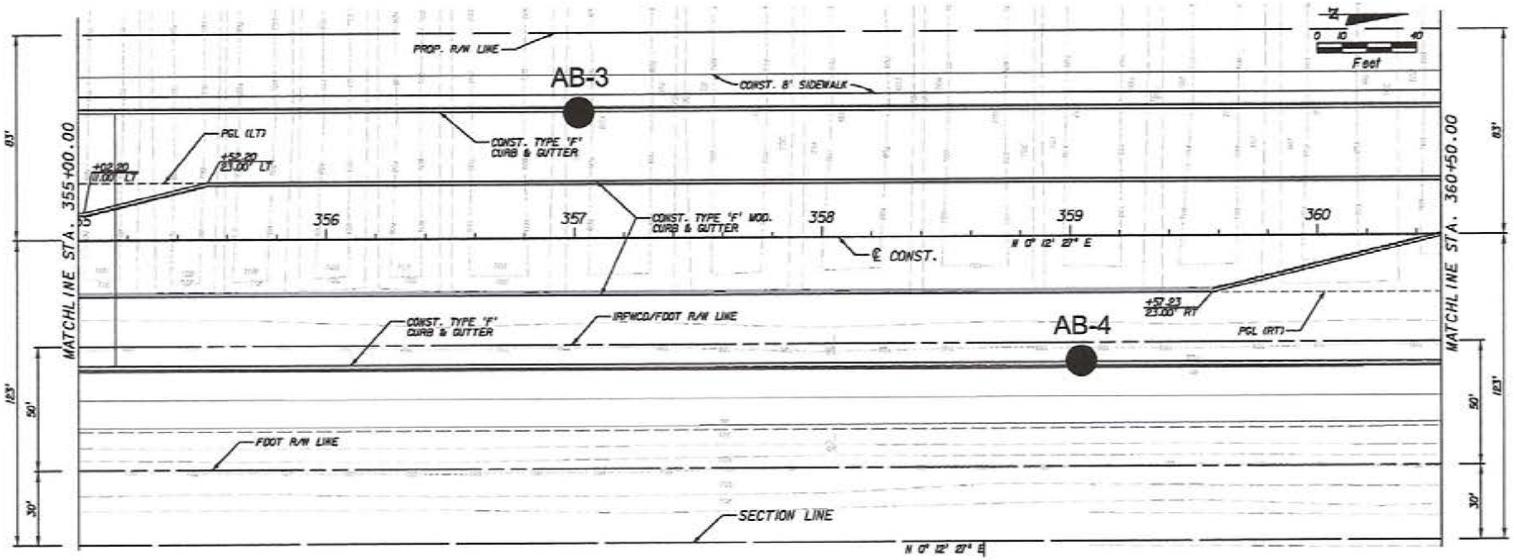
66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.

Geotechnical • Materials Testing/Inspection • Environmental

DATE	PROJ. NO.	SHEET
11-27-06	06-11-2352	2-1



0' 25' 50' 100'

Scale: 1" = 50'

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

LEGEND

AB-3 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

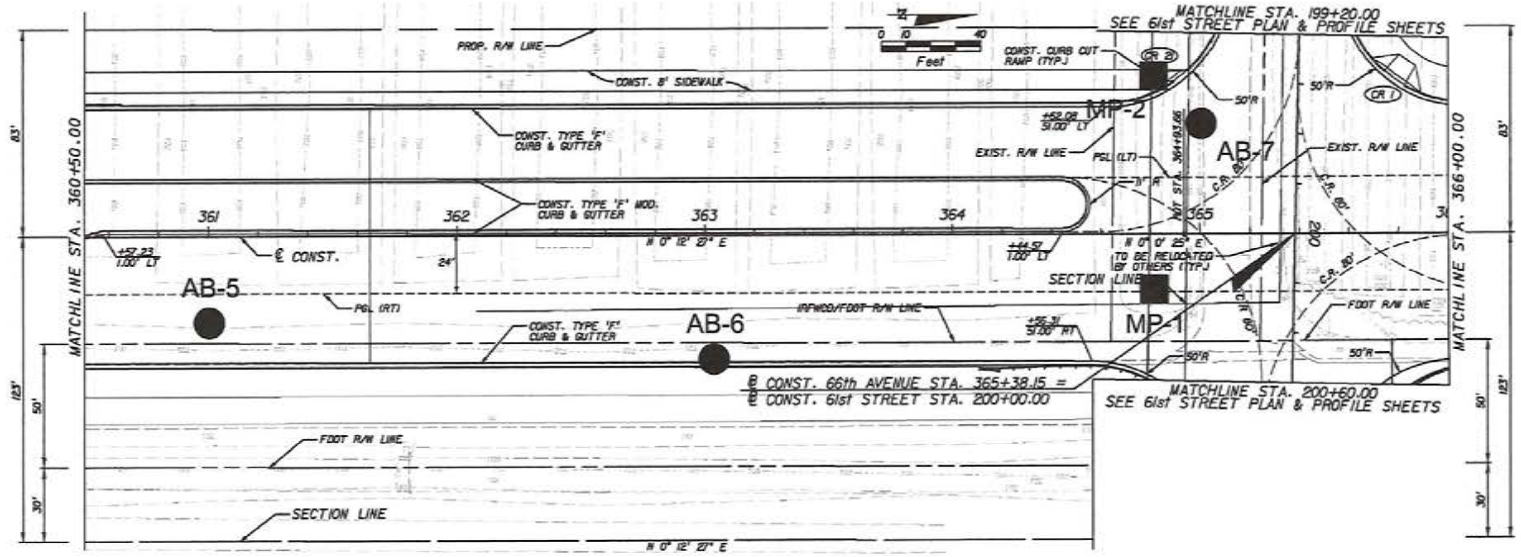
66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.

Geotechnical • Materials Testing/Inspection • Environmental

DATE	PROJ. NO.	SHEET
11-27-06	06-11-2352	2-2



SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

0' 25' 50' 100'

Scale: 1" = 50'

LEGEND

AB-5 - AUGER BORING LOCATION AND NUMBER

MP-1 - MUCK PROBE LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

LOCATION PLAN

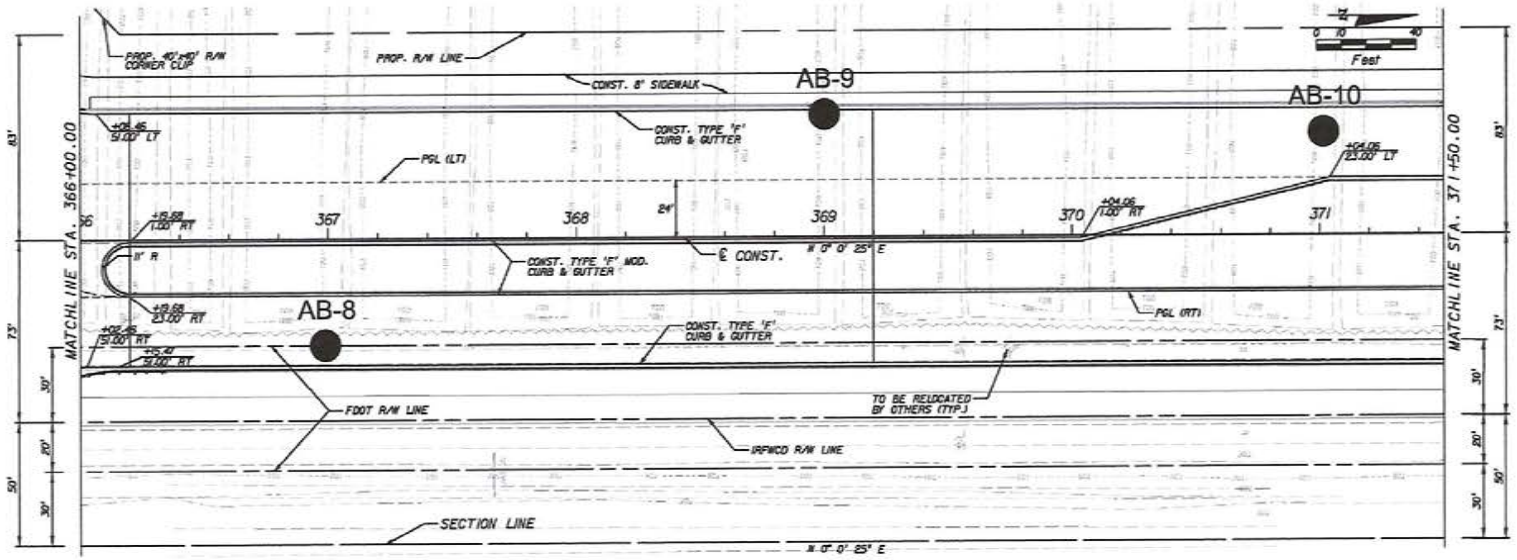
66TH AVENUE WIDENING

INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.

Geotechnical • Materials Testing/Inspection • Environmental

DATE	PROJ. NO.	SHEET
11-27-06	06-11-2352	2-3



0' 25' 50' 100'

Scale: 1" = 50'

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

LEGEND

AB-6 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.

Geotechnical • Materials Testing/Inspection • Environmental

DATE	PROJ. NO.	SHEET
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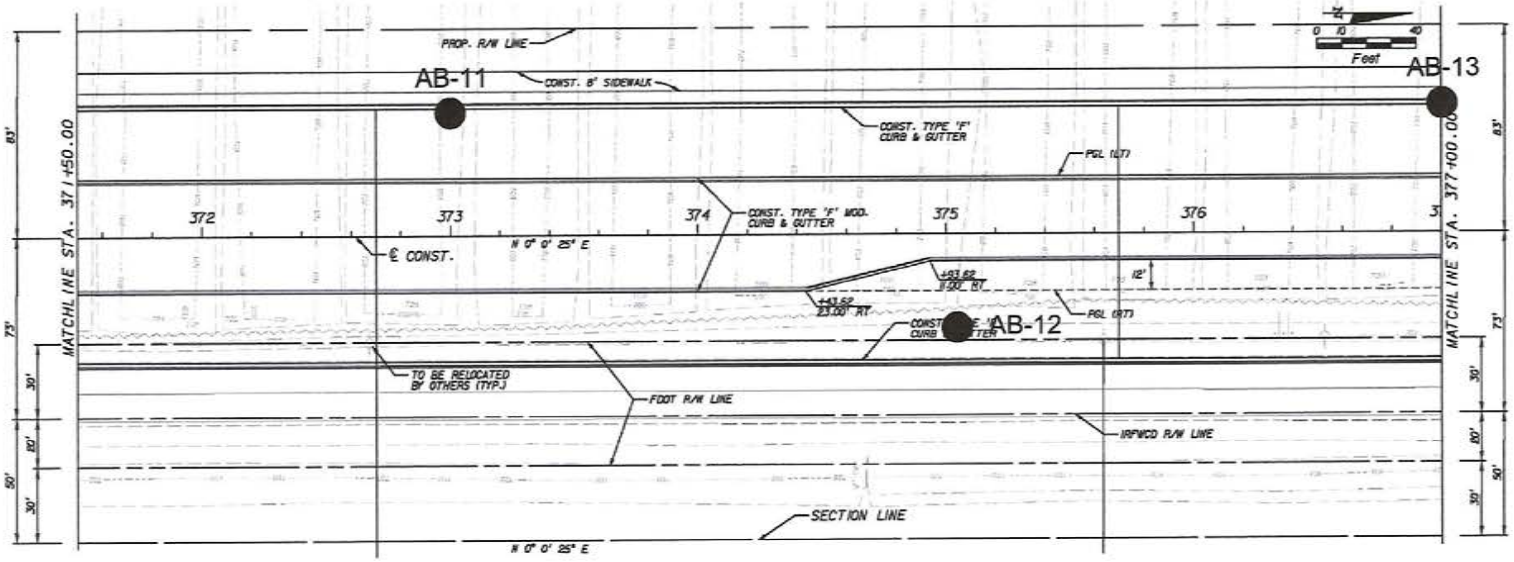

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

0' 25' 50' 100'

Scale: 1" = 50'

LEGEND

AB-11 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.
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DATE	PROJ. NO.	SHEET
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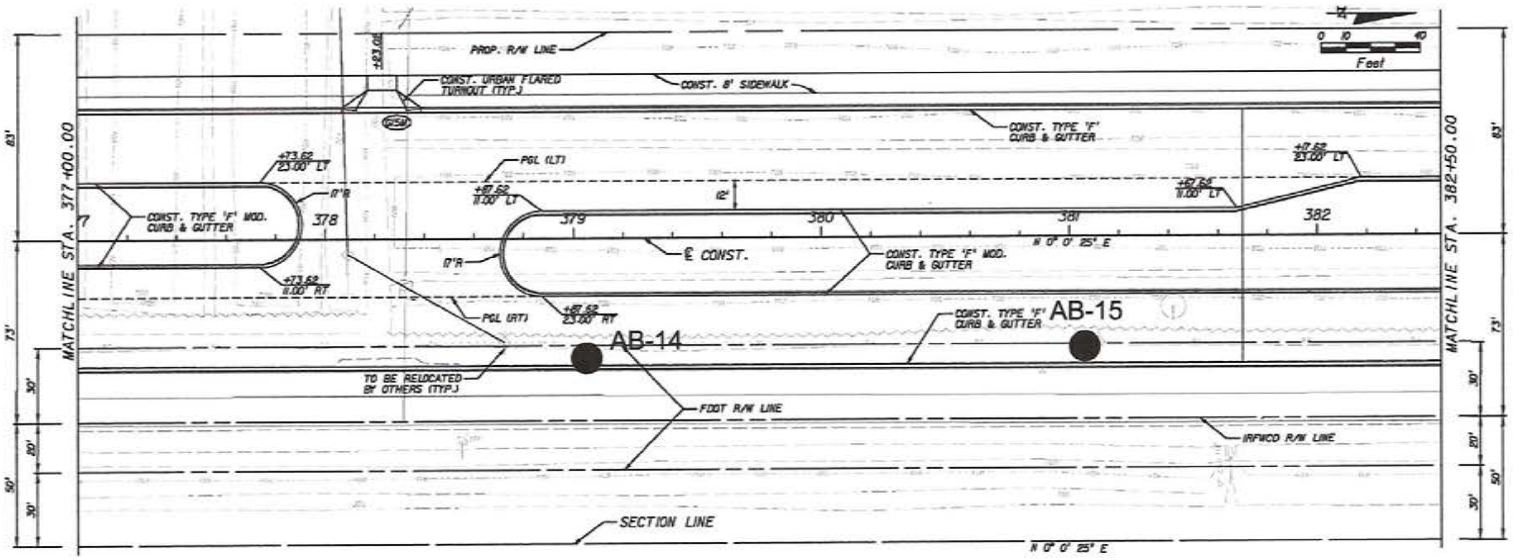

LEGEND

AB-14 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

0' 25' 50' 100'

Scale: 1" = 50'

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.

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DATE	PROJ. NO.	SHEET
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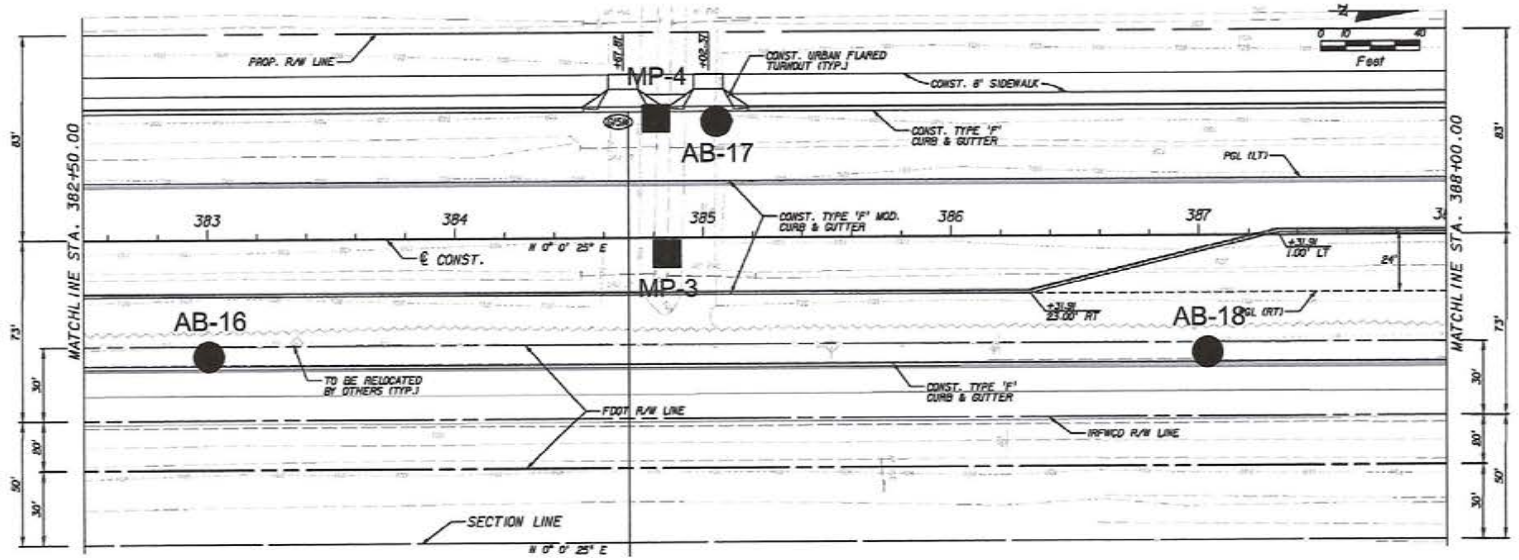

0' 25' 50' 100'

Scale: 1" = 50'

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

LEGEND

AB-16 - AUGER BORING LOCATION AND NUMBER

MP-3 - MUCK PROBE LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE WIDENING

INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.

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DATE	PROJ. NO.	SHEET
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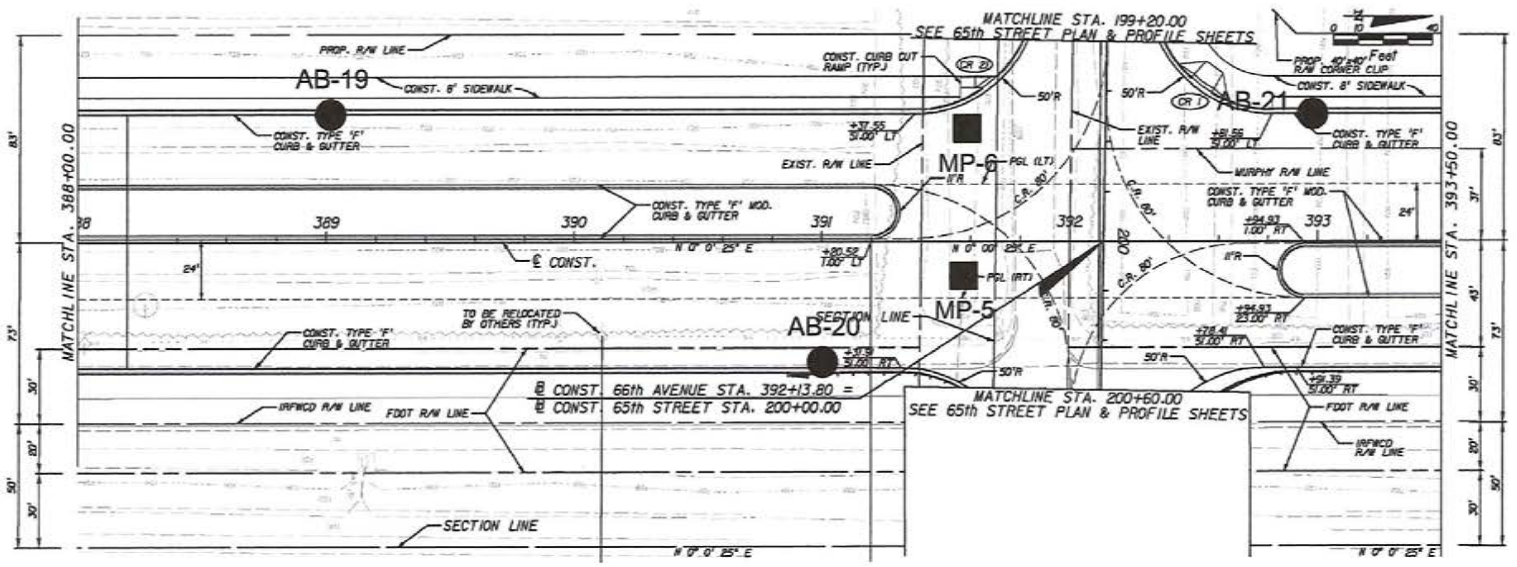

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

0' 25' 50' 100'

Scale: 1" = 50'

LEGEND

AB-19 - AUGER BORING LOCATION AND NUMBER

MP-5 - MUCK PROBE LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.

Geotechnical • Materials Testing/Inspection • Environmental

DATE	PROJ. NO.	SHEET
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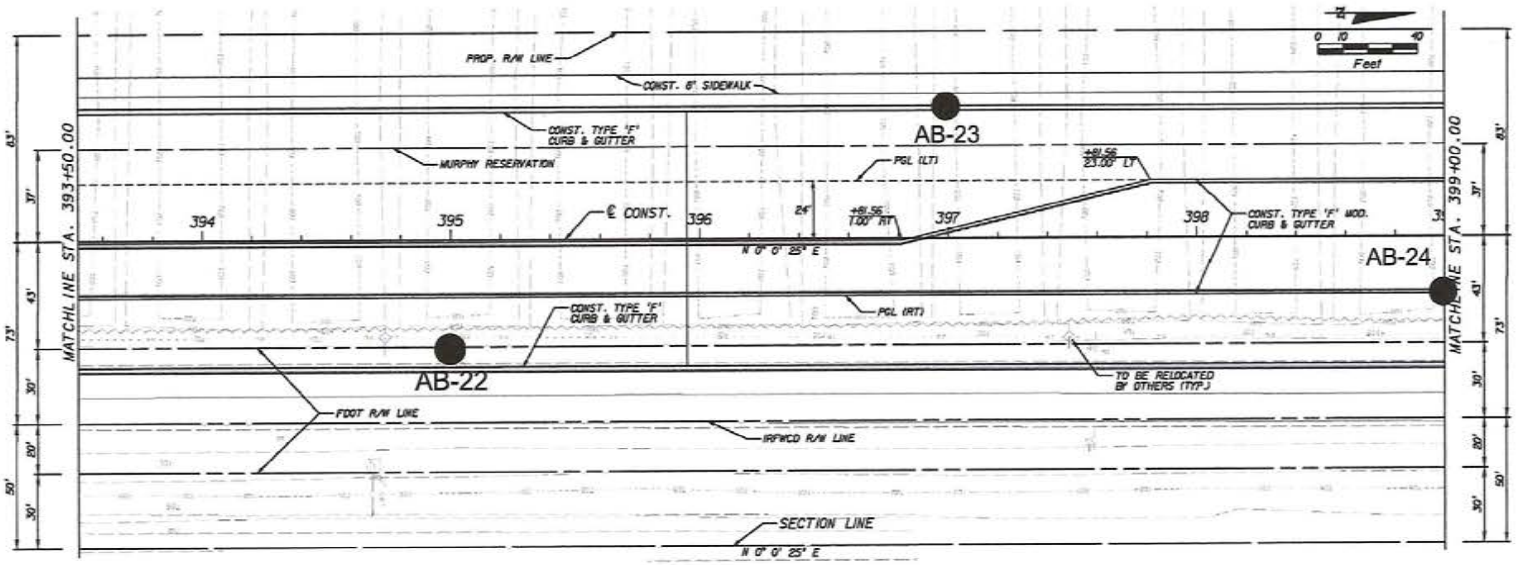

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

0' 25' 50' 100'

Scale: 1" = 50'

LEGEND

AB-22 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

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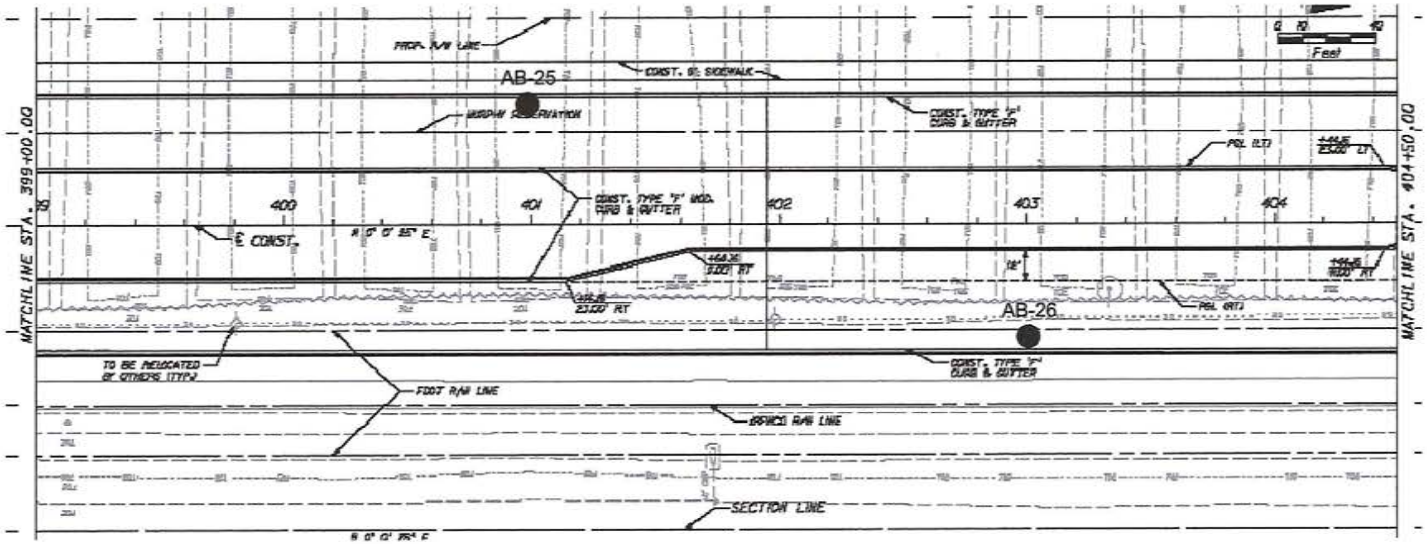

LEGEND

AB-25 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

0' 25' 50' 100'

Scale: 1" = 50'

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

DRAWN	GD
CHECKED	MB
APPROVED	CED
SCALE	1"= 50'
REVISED	

LOCATION PLAN

66TH AVENUE WIDENING

INDIAN RIVER COUNTY, FLORIDA

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DATE	PROJ. NO.	SHEET
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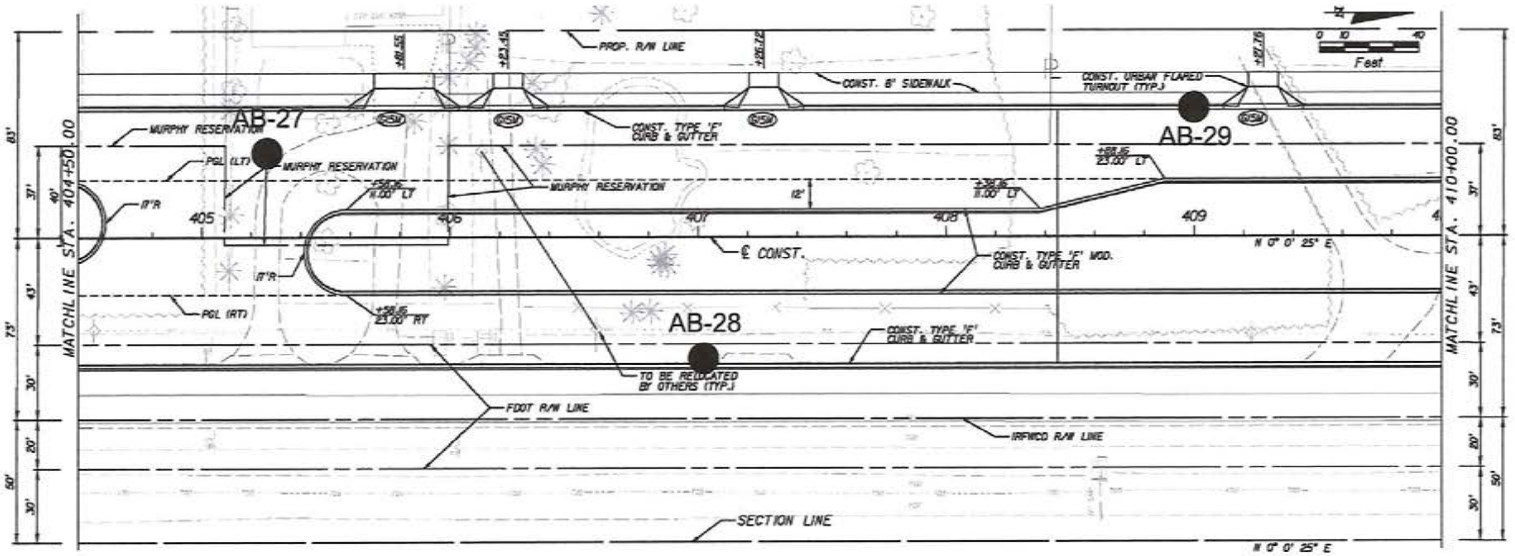

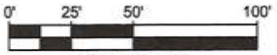

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

LEGEND

AB-27 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

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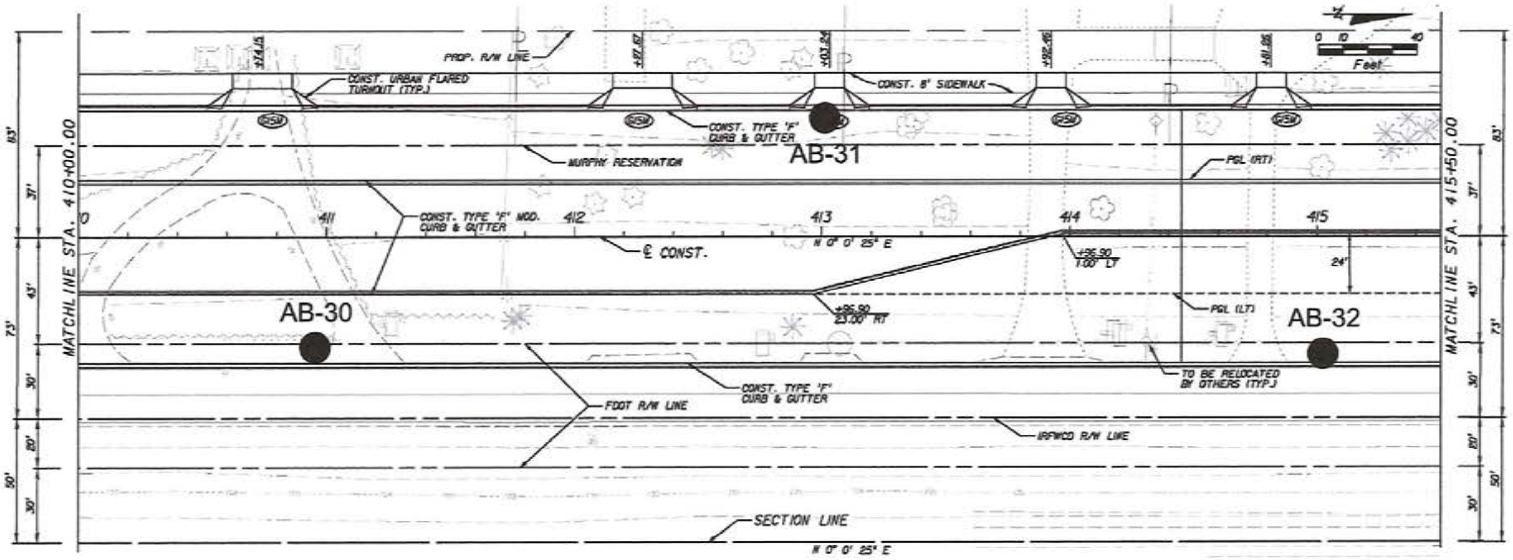

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

0' 25' 50' 100'

Scale: 1" = 50'

LEGEND

AB-30 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

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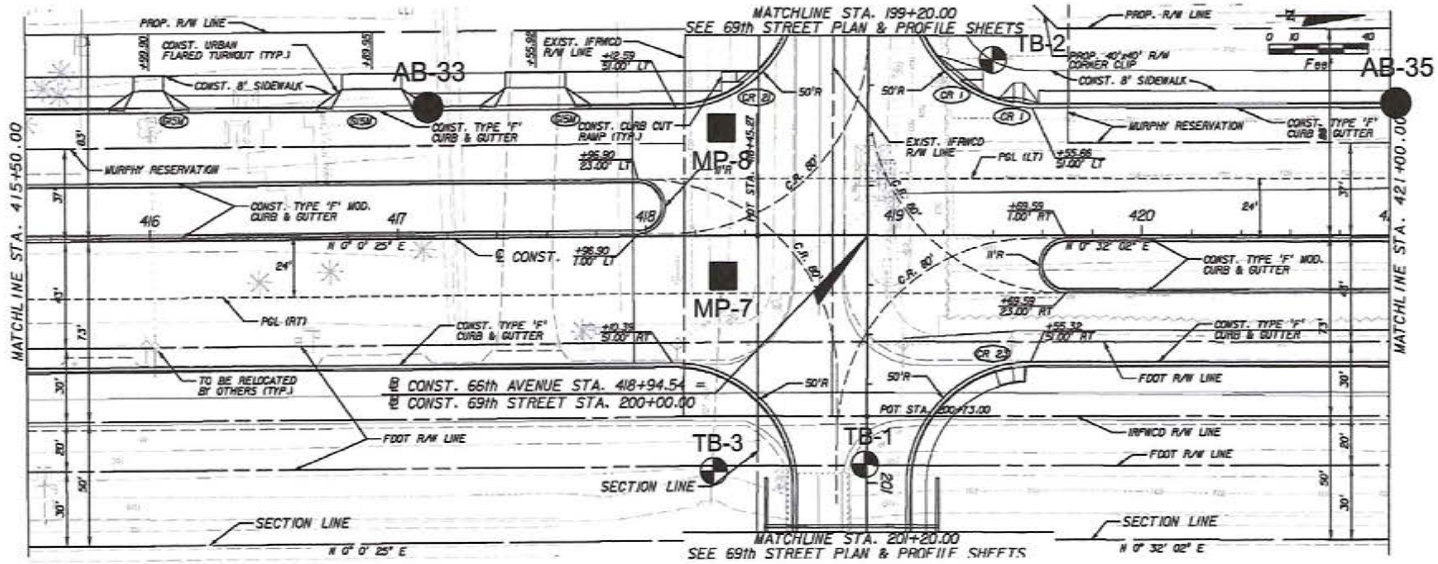

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

0' 25' 50' 100'

Scale: 1" = 50'

LEGEND

TB-3 - STANDARD PENETRATION TEST (SPT) BORING LOCATION AND NUMBER

AB-33 - AUGER BORING LOCATION AND NUMBER

MP-7 - MUCK PROBE LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

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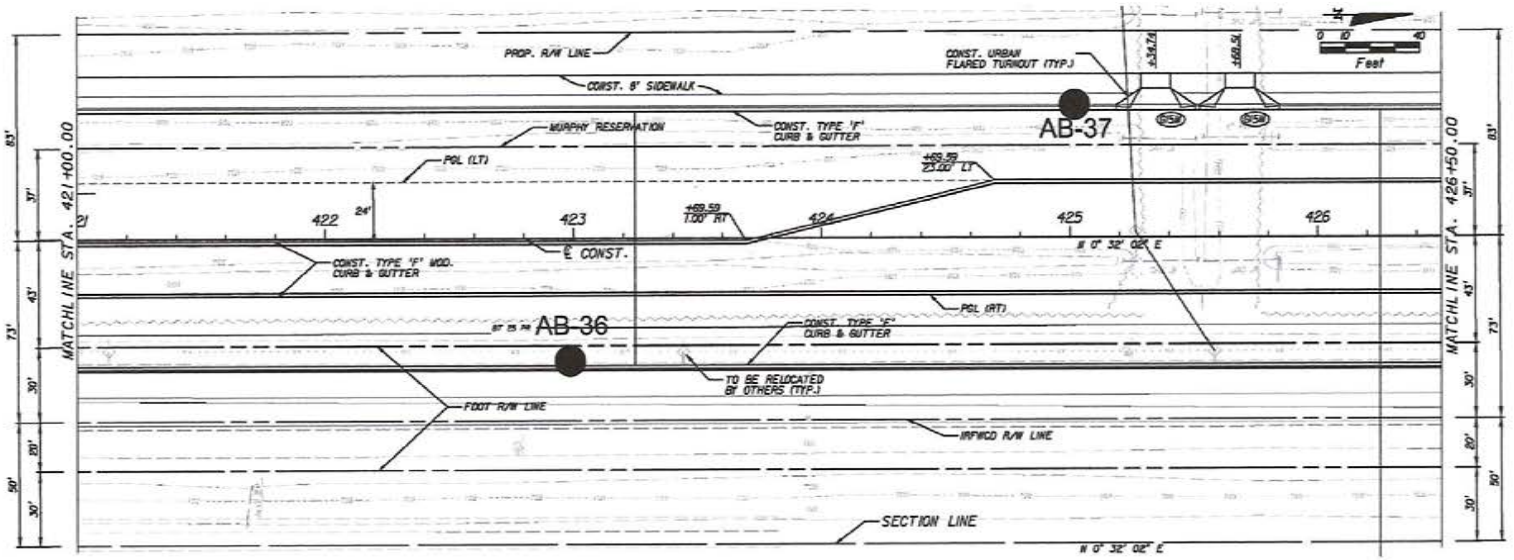

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

0' 25' 50' 100'

Scale: 1" = 50'

LEGEND

AB-36 - AUGER BORING LOCATION AND NUMBER

MP-1 - MUCK PROBE LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

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DATE	PROJ. NO.	SHEET
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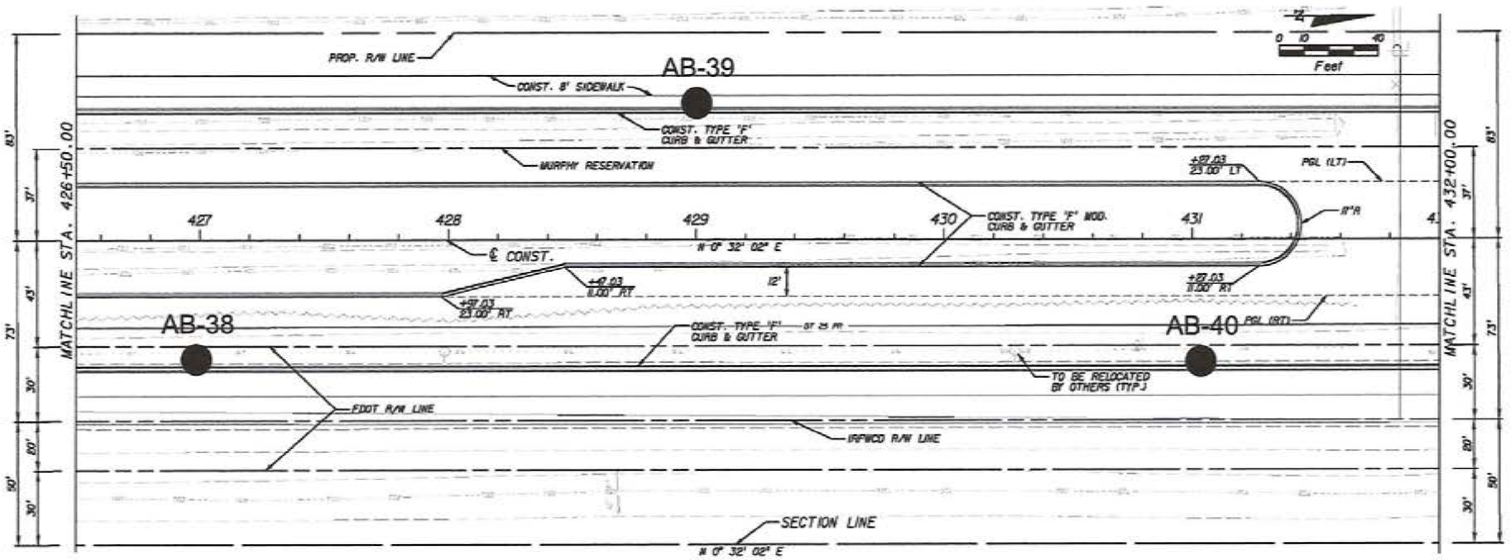

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

0' 25' 50' 100'

Scale: 1" = 50'

LEGEND

AB-39 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

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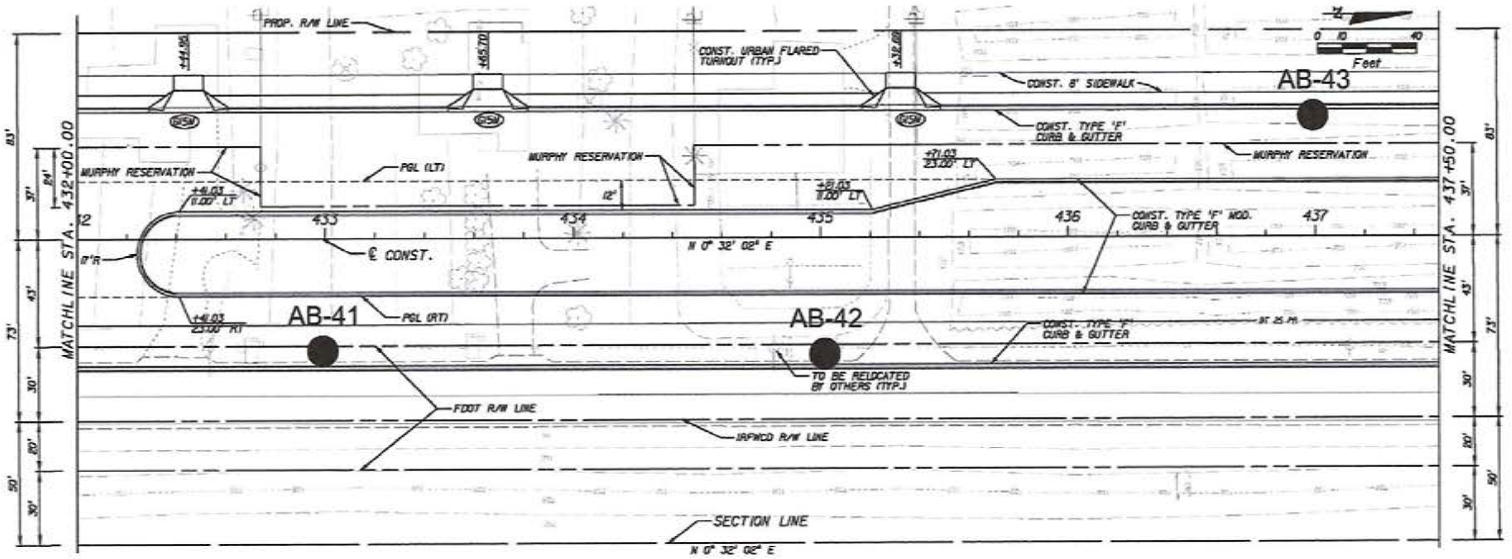

0' 25' 50' 100'

Scale: 1" = 50'

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

LEGEND

AB-41 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

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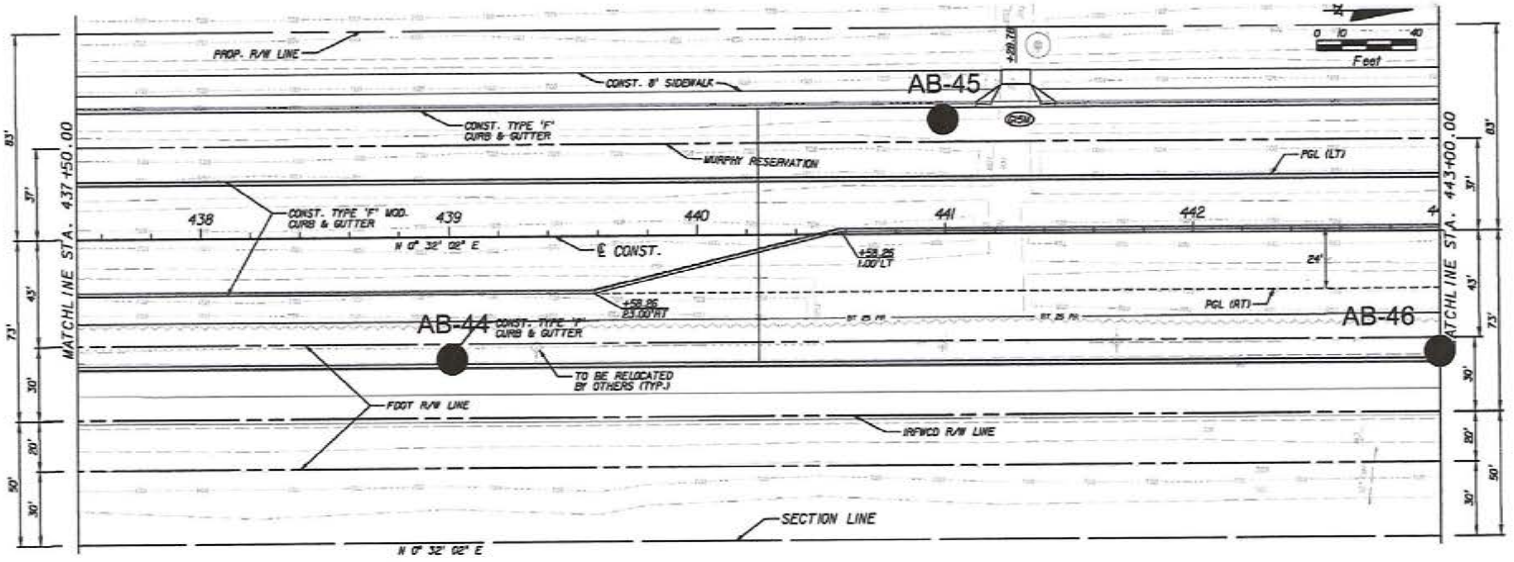

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

0' 25' 50' 100'

Scale: 1" = 50'

LEGEND

AB-44 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

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DATE	PROJ. NO.	SHEET
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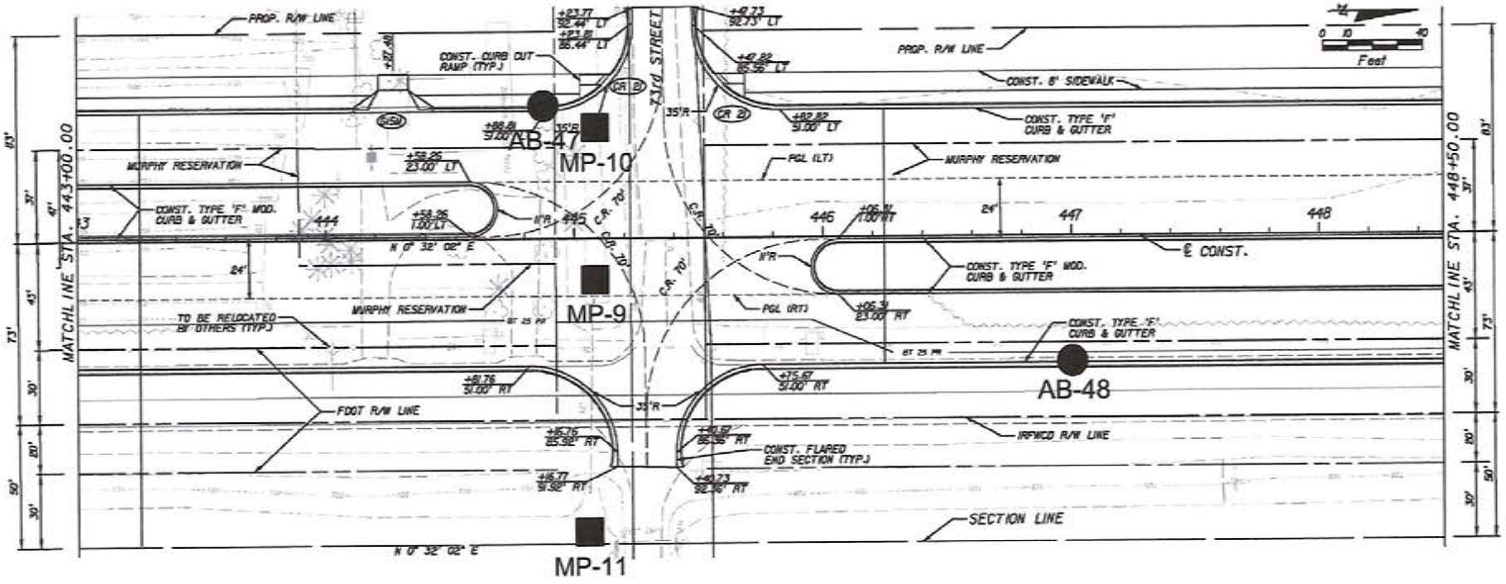

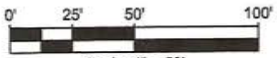

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

LEGEND

AB-47 - AUGER BORING LOCATION AND NUMBER

MP-9 - MUCK PROBE LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

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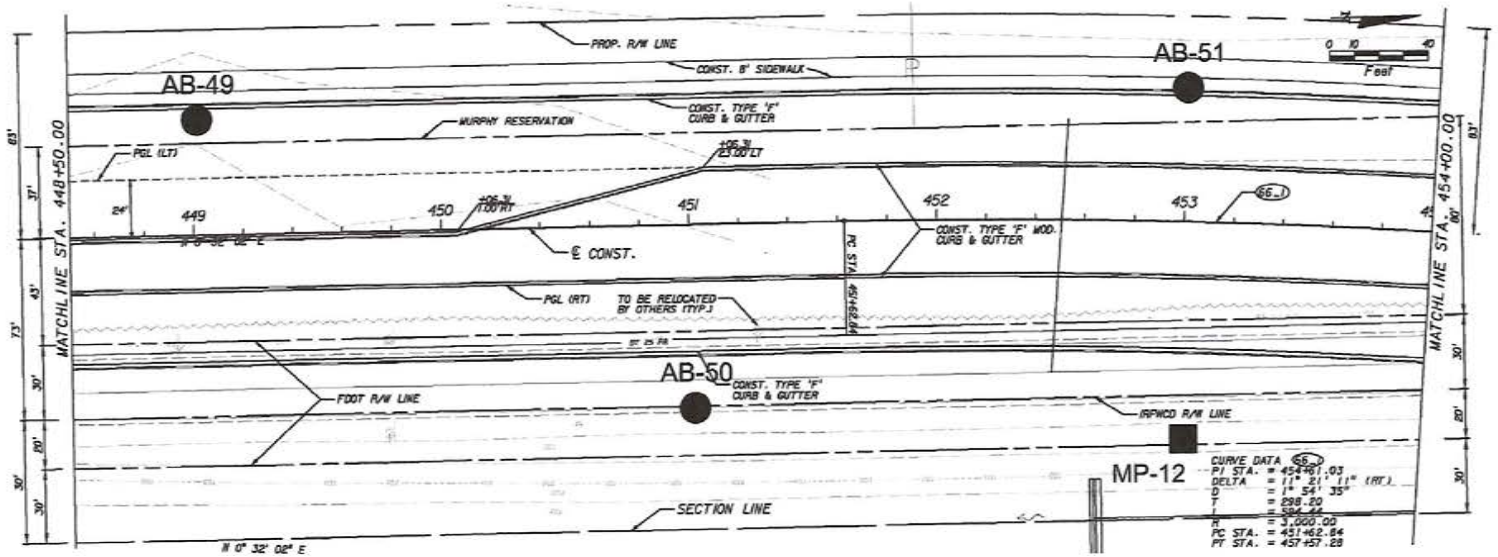

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

0' 25' 50' 100'

Scale: 1" = 50'

LEGEND

AB-49 - AUGER BORING LOCATION AND NUMBER

MP-12 - MUCK PROBE LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

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DATE	PROJ. NO.	SHEET
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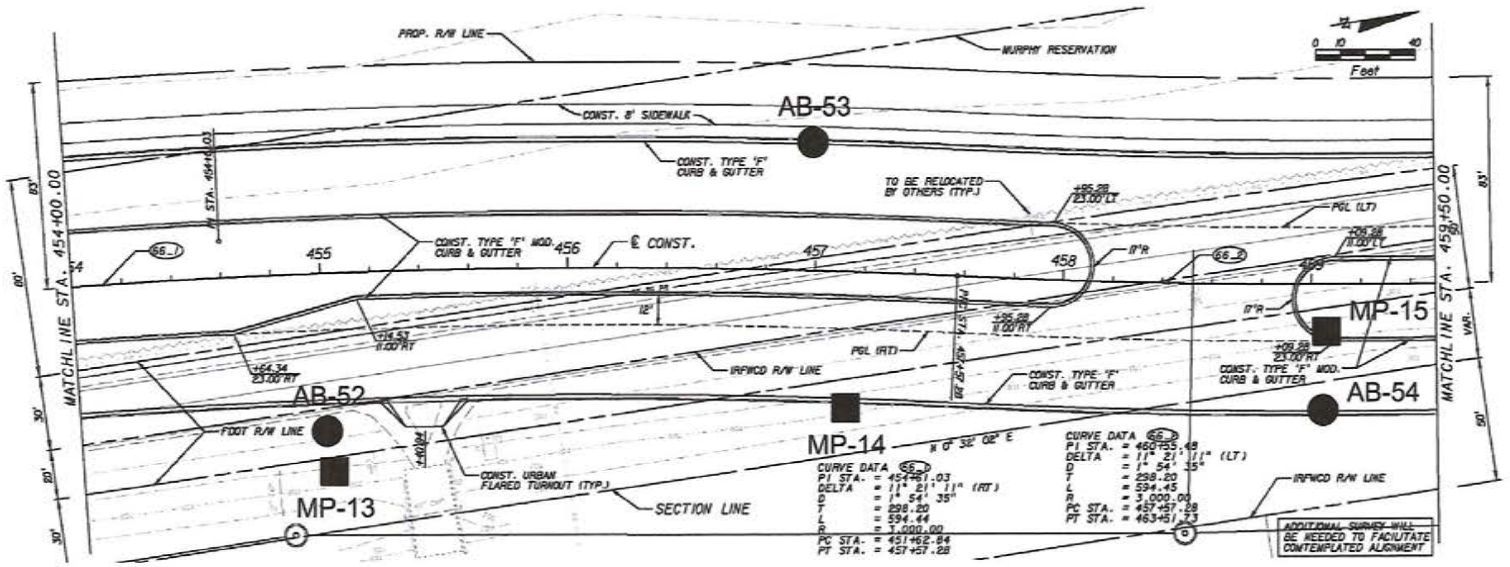

0' 25' 50' 100'

Scale: 1" = 50'

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

LEGEND

AB-52 - AUGER BORING LOCATION AND NUMBER

MP-13 - MUCK PROBE LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

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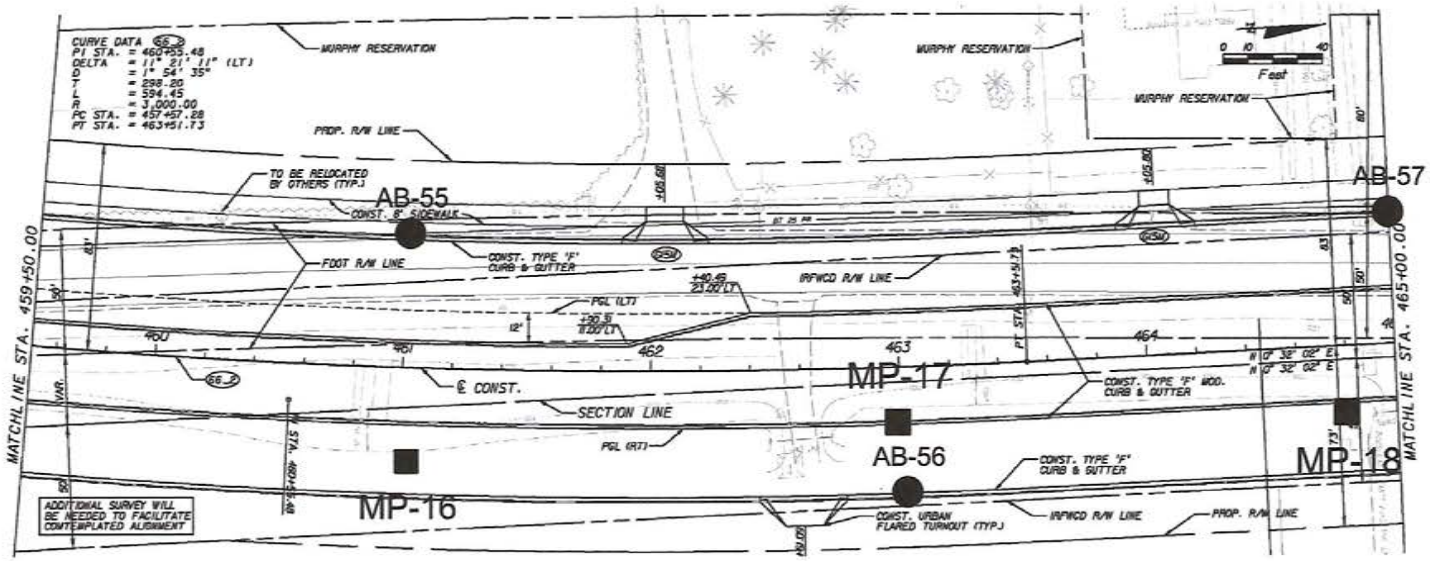

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

0' 25' 50' 100'

Scale: 1" = 50'

LEGEND

AB-55 - AUGER BORING LOCATION AND NUMBER

MP-16 - MUCK PROBE LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

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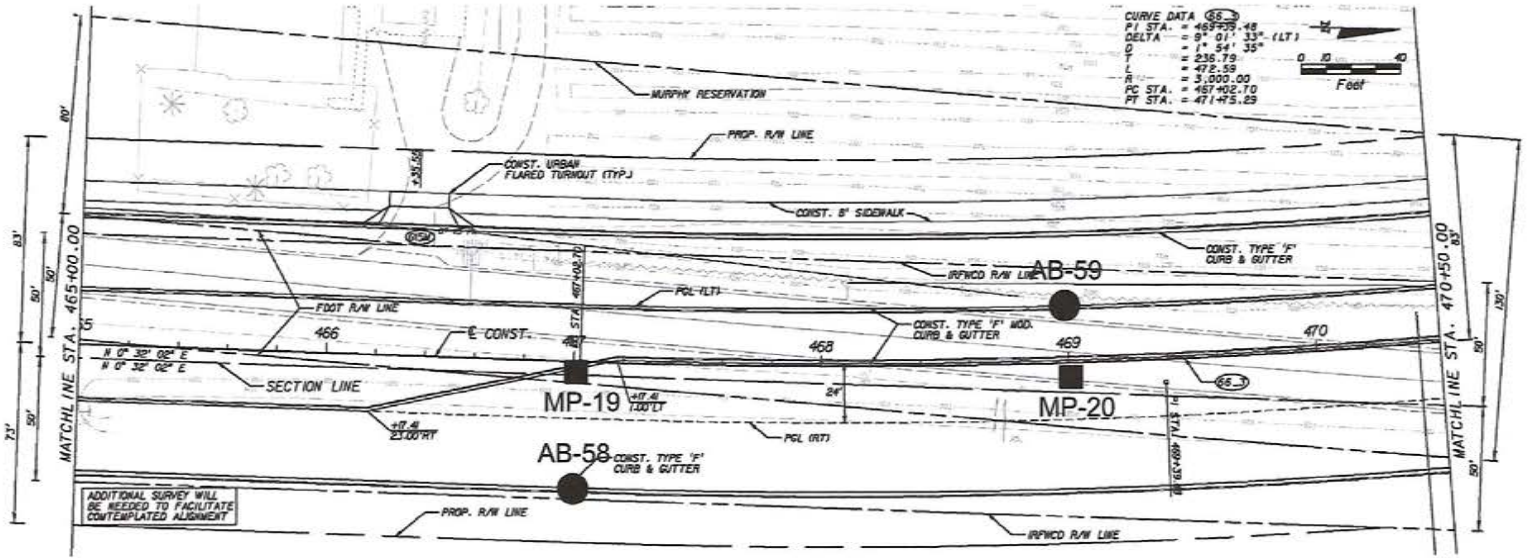

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

0' 25' 50' 100'

Scale: 1" = 50'

LEGEND

AB-56 - AUGER BORING LOCATION AND NUMBER

MP-19 - MUCK PROBE LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

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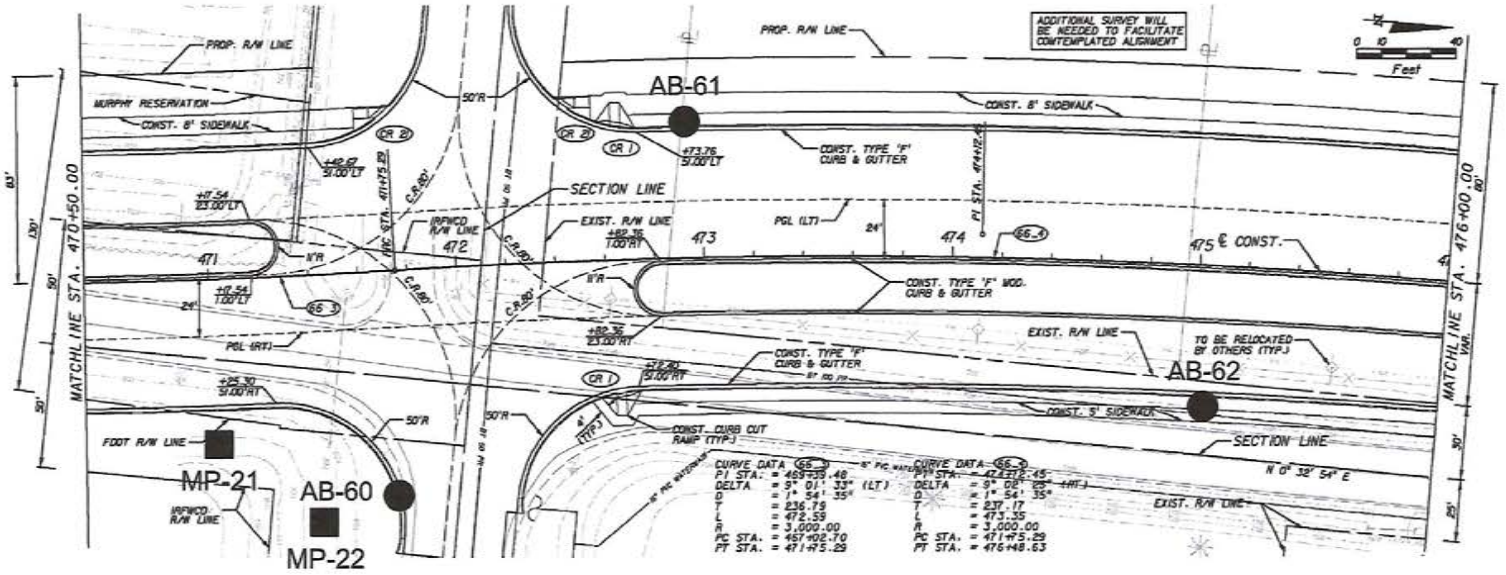

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

0' 25' 50' 100'

Scale: 1" = 50'

LEGEND

AB-60 - AUGER BORING LOCATION AND NUMBER

MP-21 - MUCK PROBE LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

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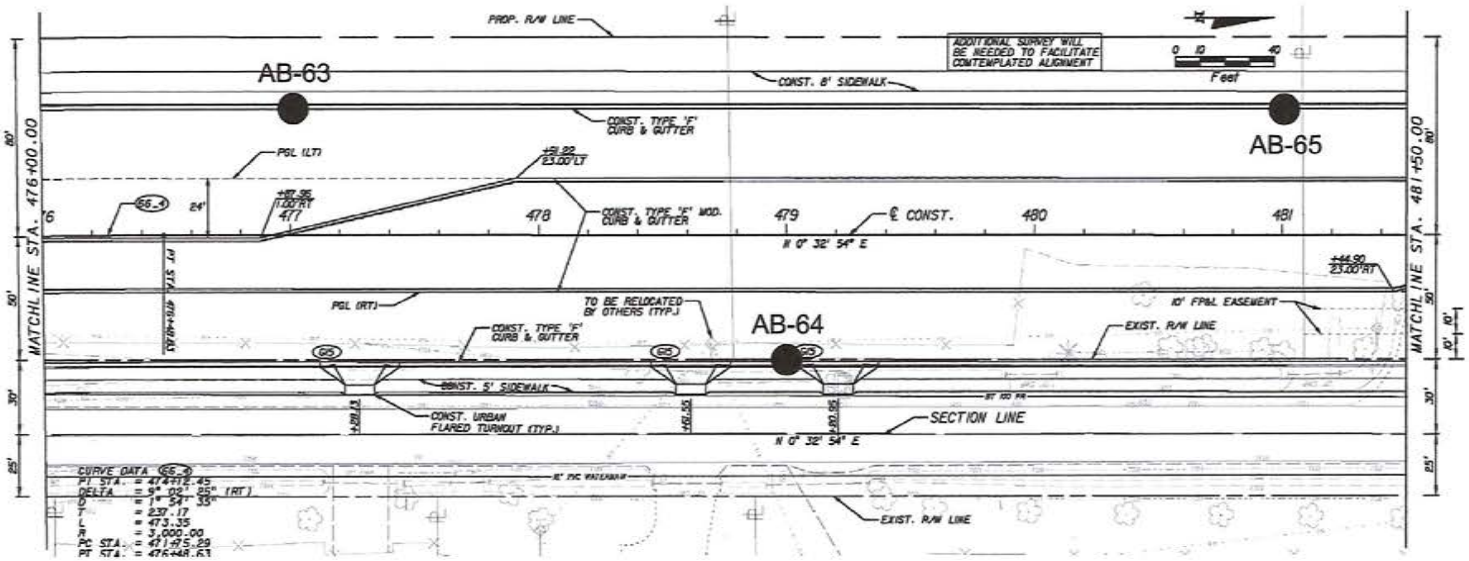

0' 25' 50' 100'

Scale: 1" = 50'

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

LEGEND

AB-63 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

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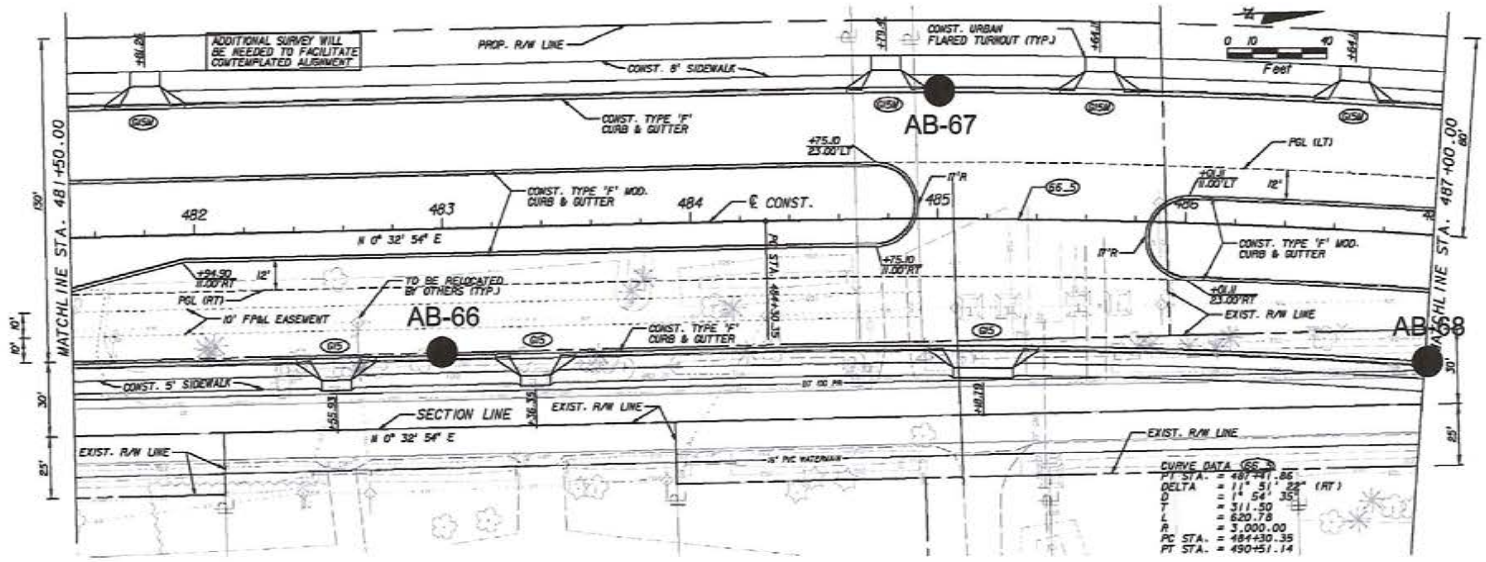

0' 25' 50' 100'

Scale: 1" = 50'

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

LEGEND

AB-67 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

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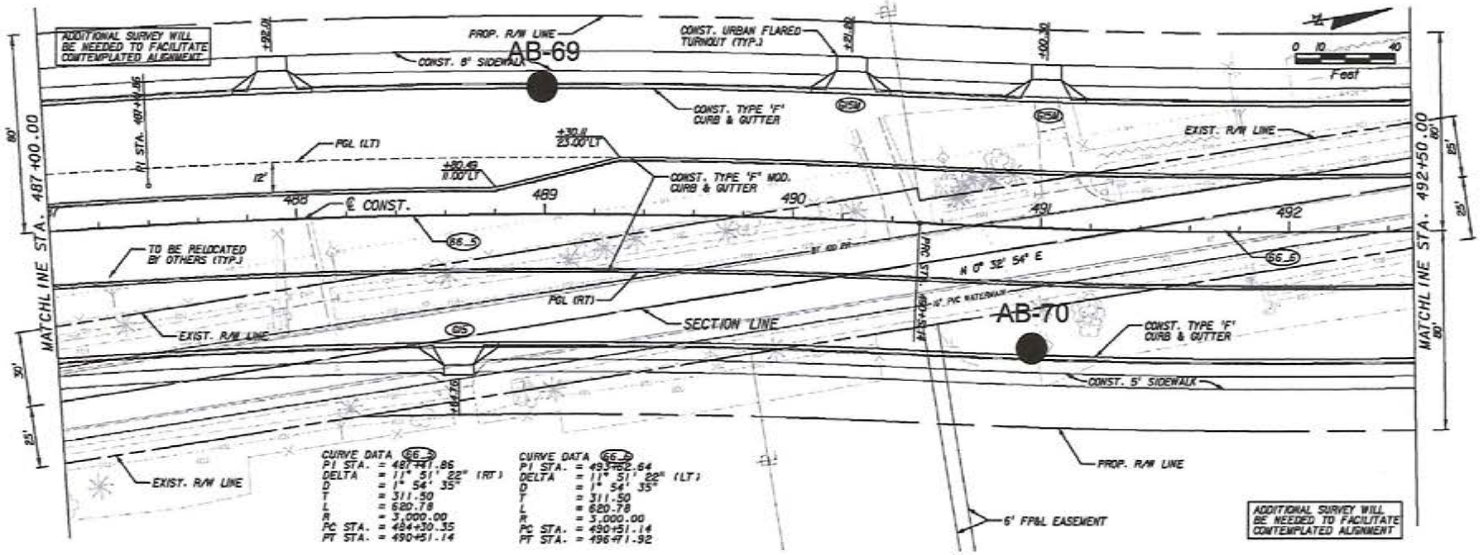
DATE	PROJ. NO.	SHEET
11-27-06	06-11-2363	2-25



0' 25' 50' 100'

Scale: 1" = 50'

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

LEGEND

AB-69 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

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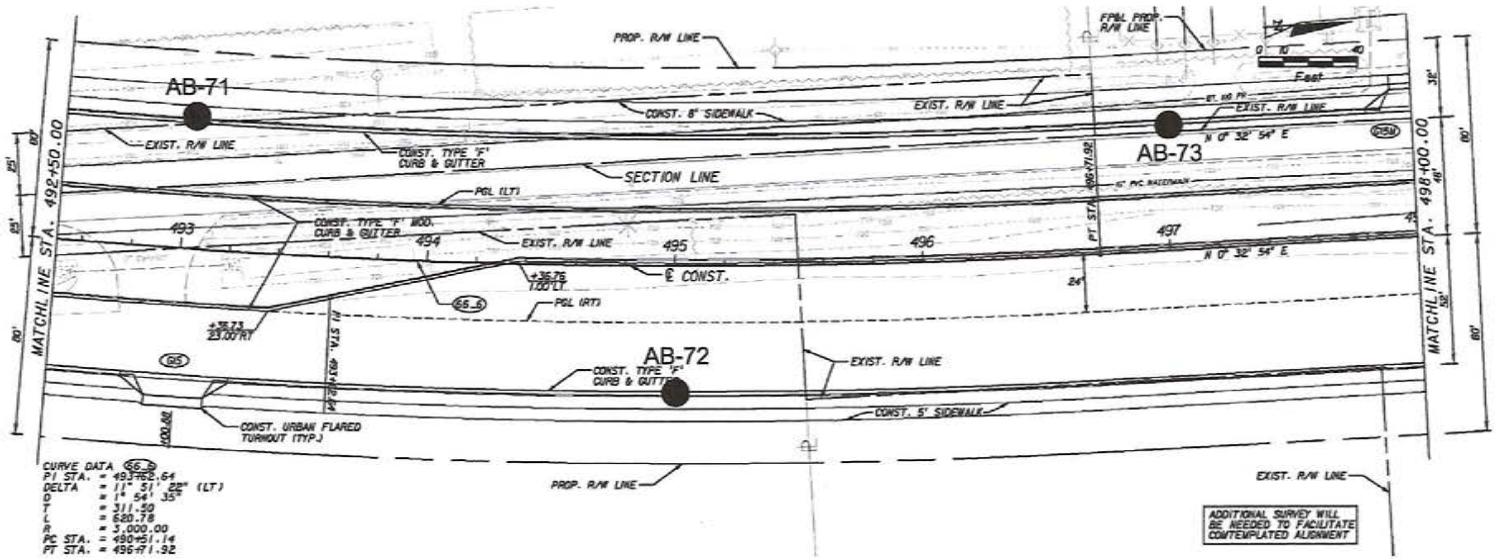
DATE	PROJ. NO.	SHEET
11-27-06	06-11-2352	2-26



0' 25' 50' 100'

Scale: 1" = 50'

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

LEGEND

AB-71 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

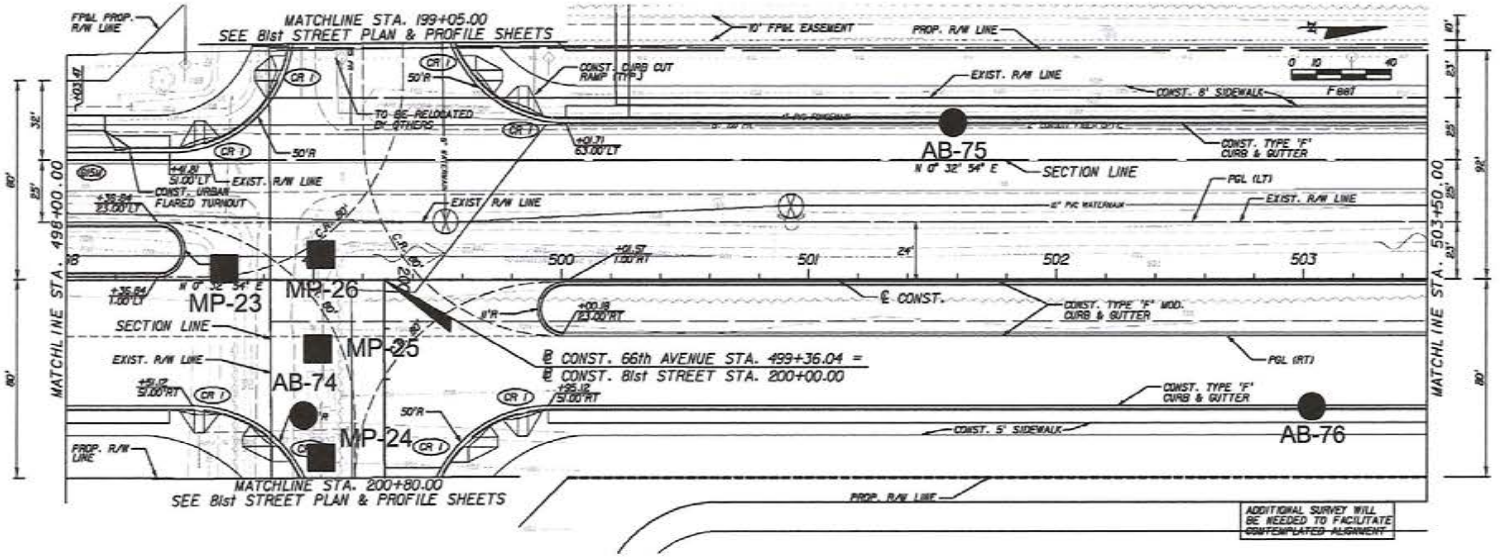
66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.

Geotechnical • Materials Testing/Inspection • Environmental

DATE	PROJ. NO.	SHEET
11-27-06	06-11-2352	2-27



SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

0' 25' 50' 100'

Scale: 1" = 50'

LEGEND

AB-74 - AUGER BORING LOCATION AND NUMBER

MP-24 - MUCK PROBE LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.

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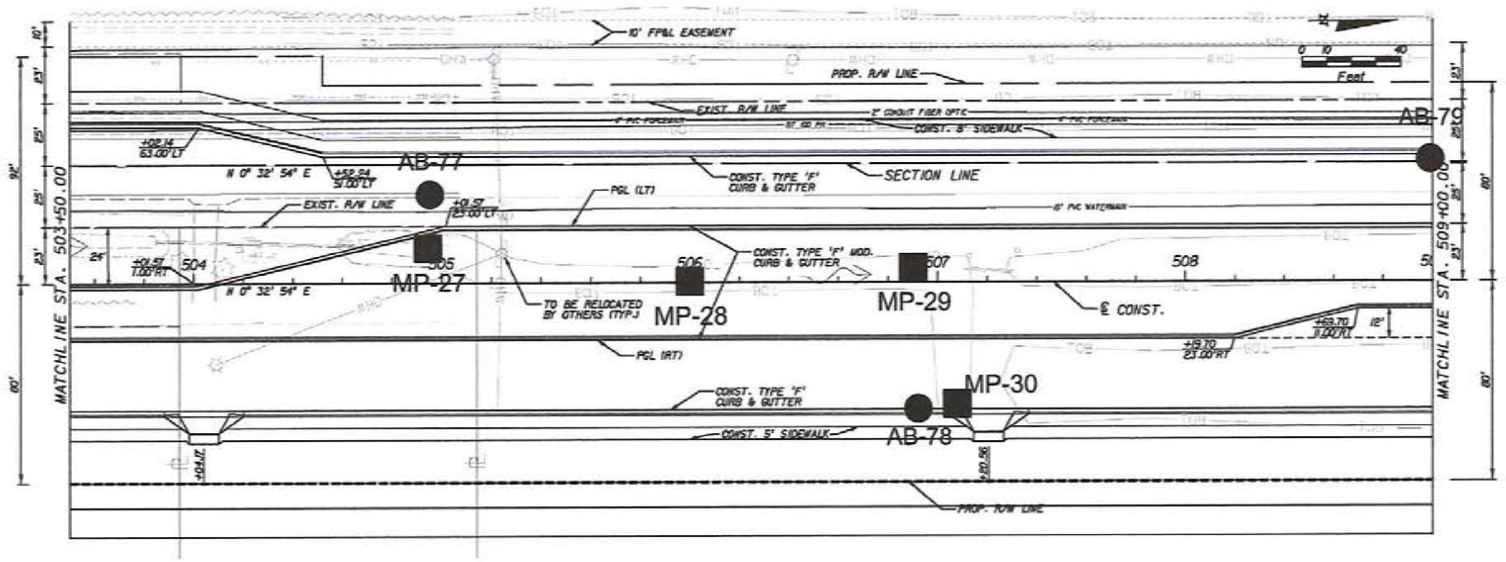
DATE	PROJ. NO.	SHEET
11-27-06	06-11-2352	2-28



0' 25' 50' 100'

Scale: 1" = 50'

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

LEGEND

AB-77 - AUGER BORING LOCATION AND NUMBER

MP-31 - MUCK PROBE LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

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DATE	PROJ. NO.	SHEET
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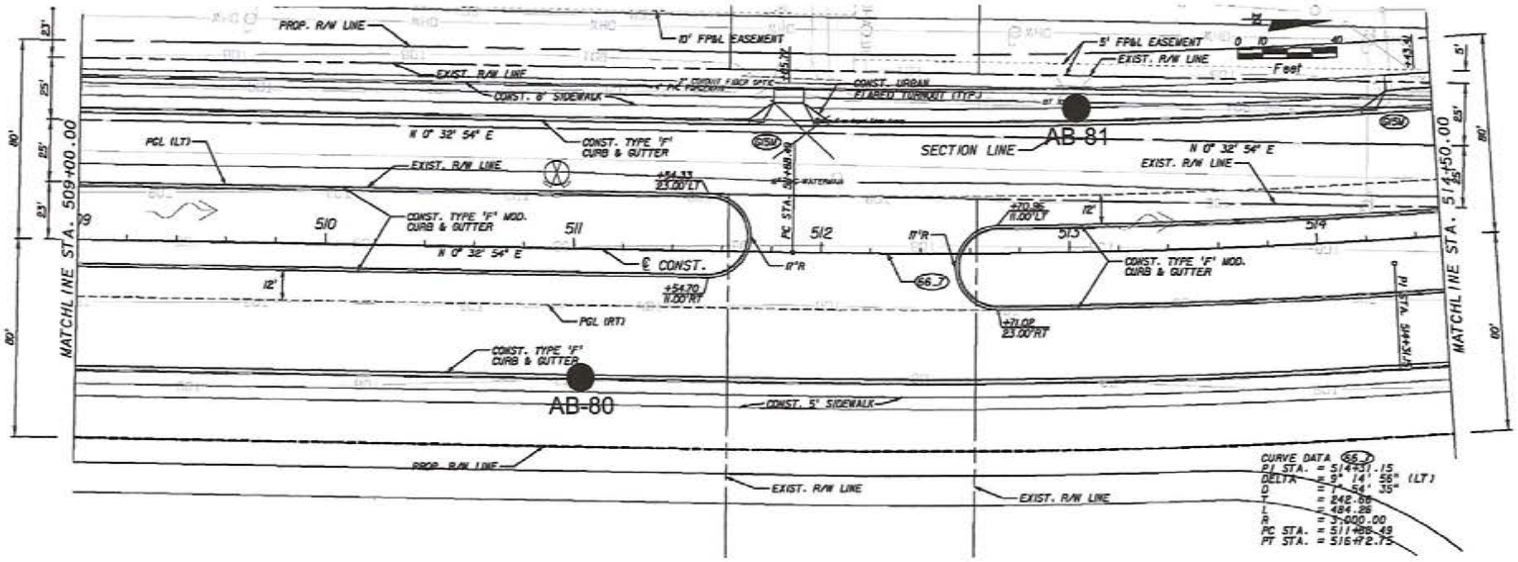

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

0' 25' 50' 100'

Scale: 1" = 50'

LEGEND

AB-80 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

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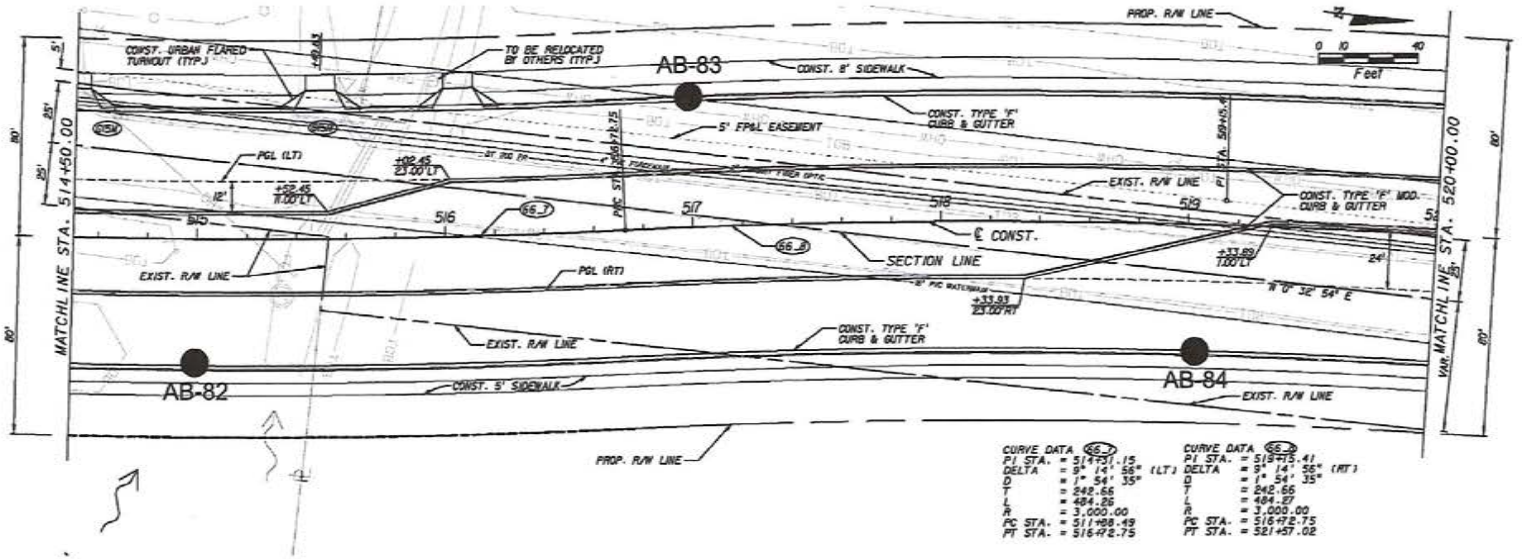
DATE	PROJ. NO.	SHEET
11-27-06	06-11-2352	2-30



0' 25' 50' 100'

Scale: 1" = 50'

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

LEGEND

AB-82 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

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DATE	PROJ. NO.	SHEET
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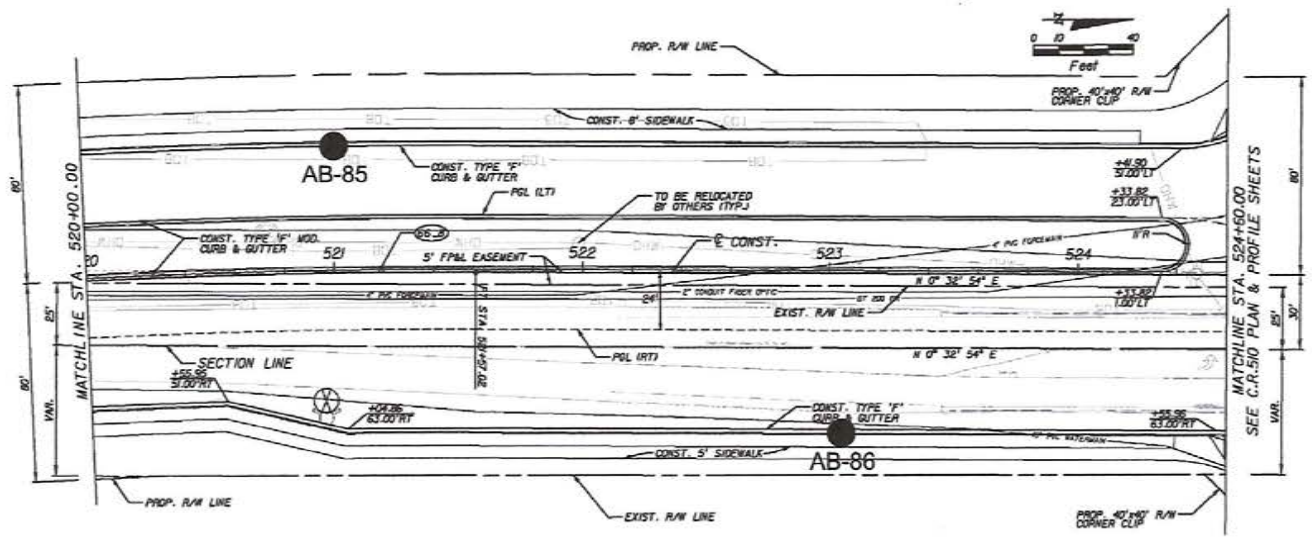

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

0' 25' 50' 100'

Scale: 1" = 50'

LEGEND

AB-85 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

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DATE	PROJ. NO.	SHEET
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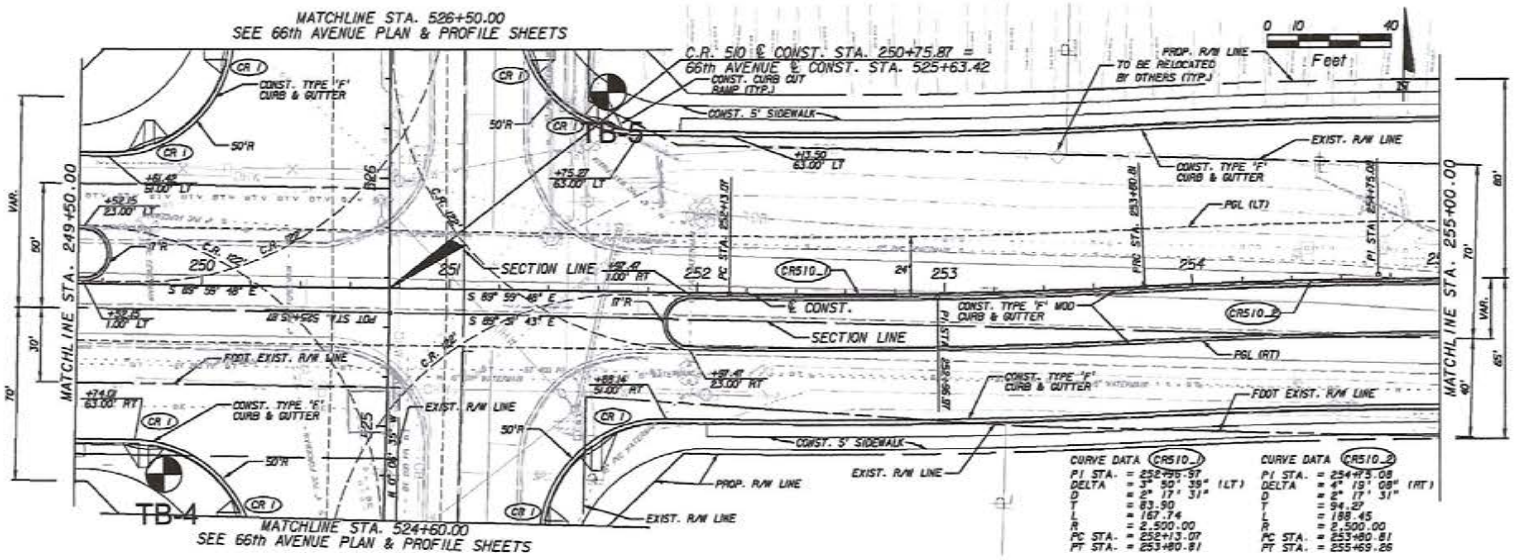

LEGEND

TB-4 - STANDARD PENETRATION TEST (SPT) BORING LOCATION AND NUMBER

0' 25' 50' 100'

Scale: 1" = 50'

Locations are approximate

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

DRAWN	GD
CHECKED	MB
APPROVED	CED
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

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DATE	PROJ. NO.	SHEET
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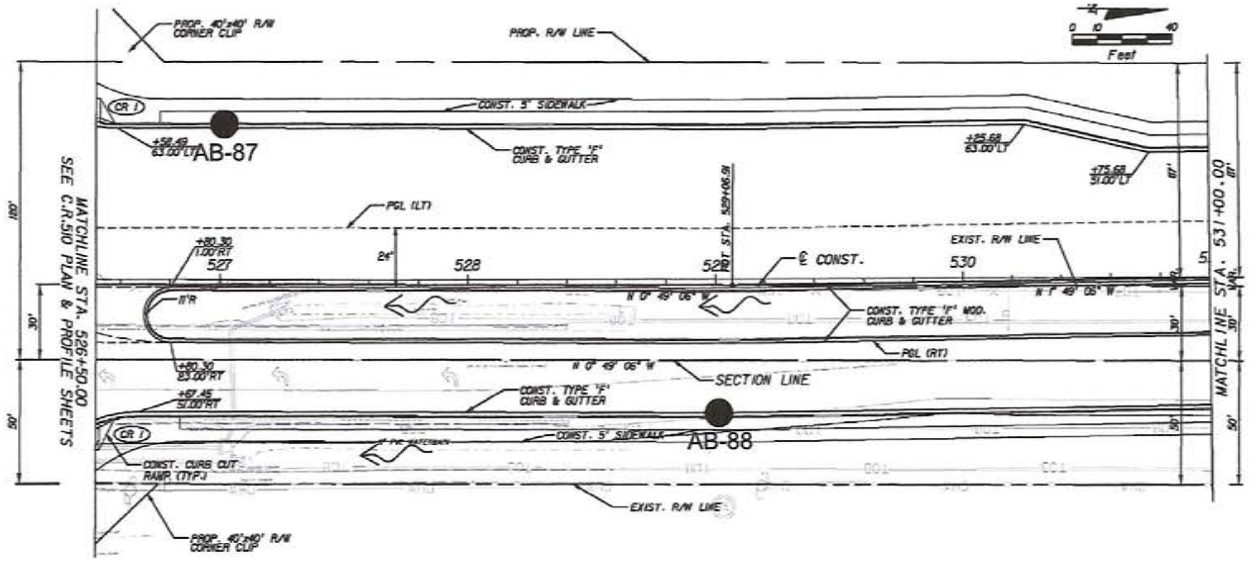

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

0' 25' 50' 100'

Scale: 1" = 50'

LEGEND

AB-87 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

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DATE	PROJ. NO.	SHEET
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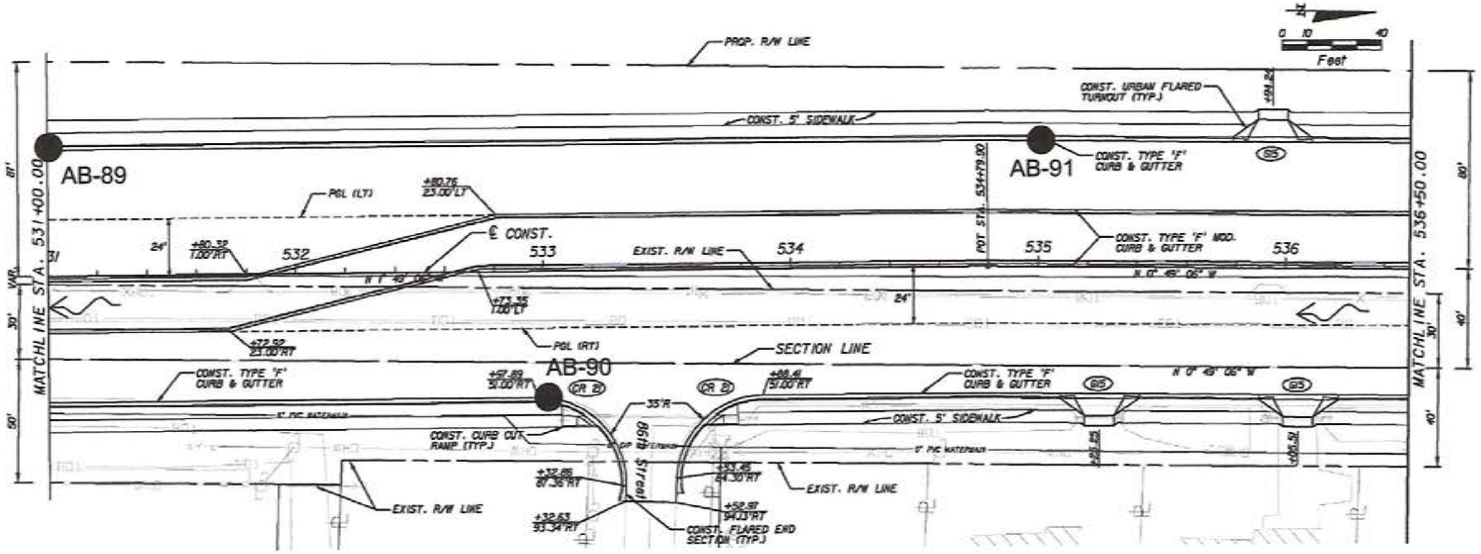

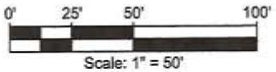

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

LEGEND

AB-89 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

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DATE	PROJ. NO.	SHEET
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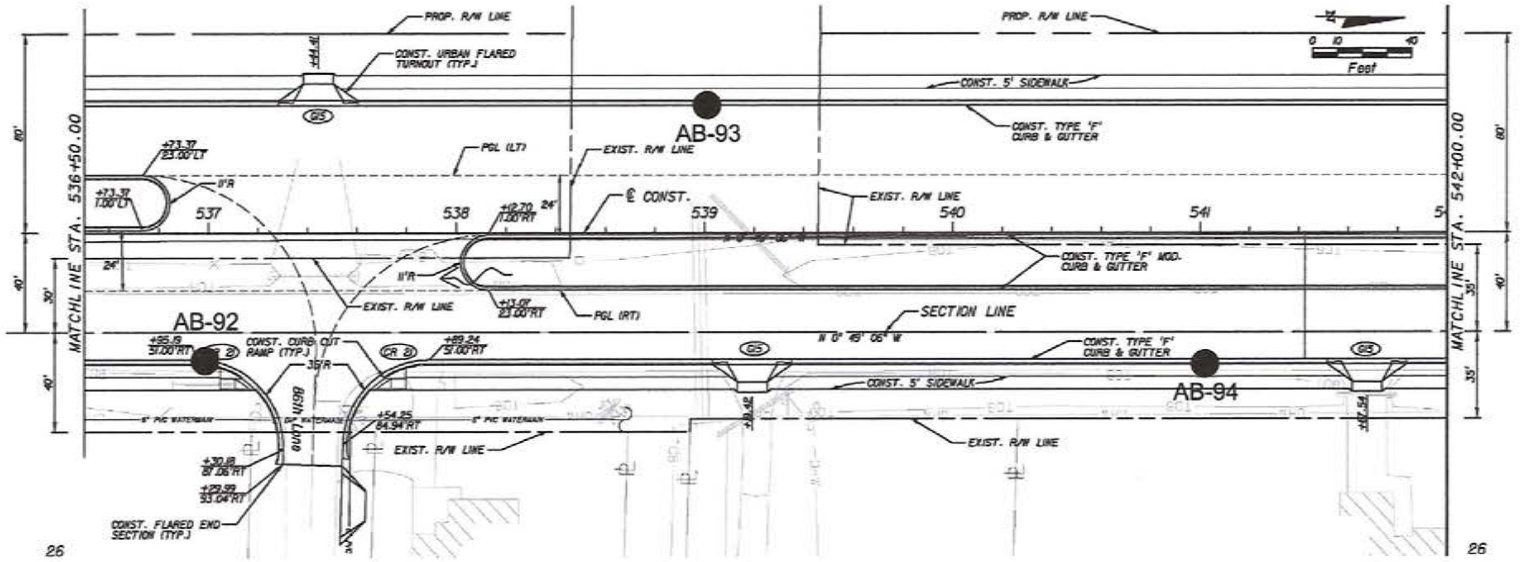

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

LEGEND

AB-92 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.

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DATE	PROJ. NO.	SHEET
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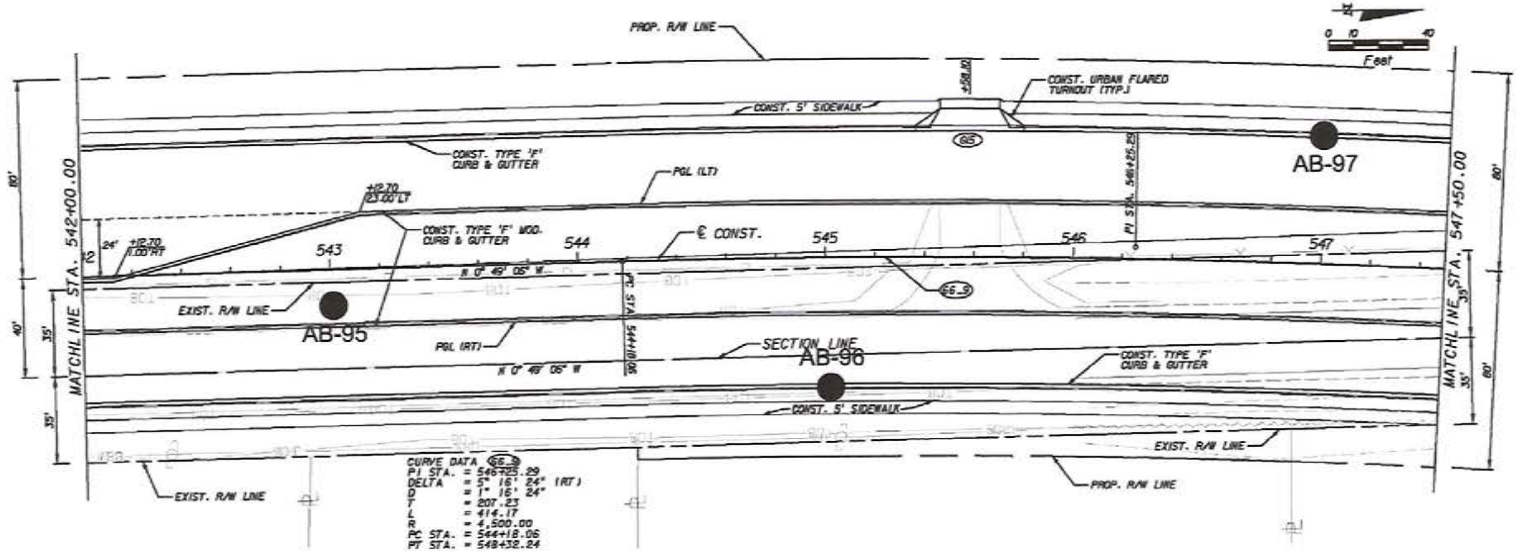

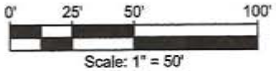

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

LEGEND

AB-95 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

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Geotechnical • Materials Testing/Inspection • Environmental

DATE	PROJ. NO.	SHEET
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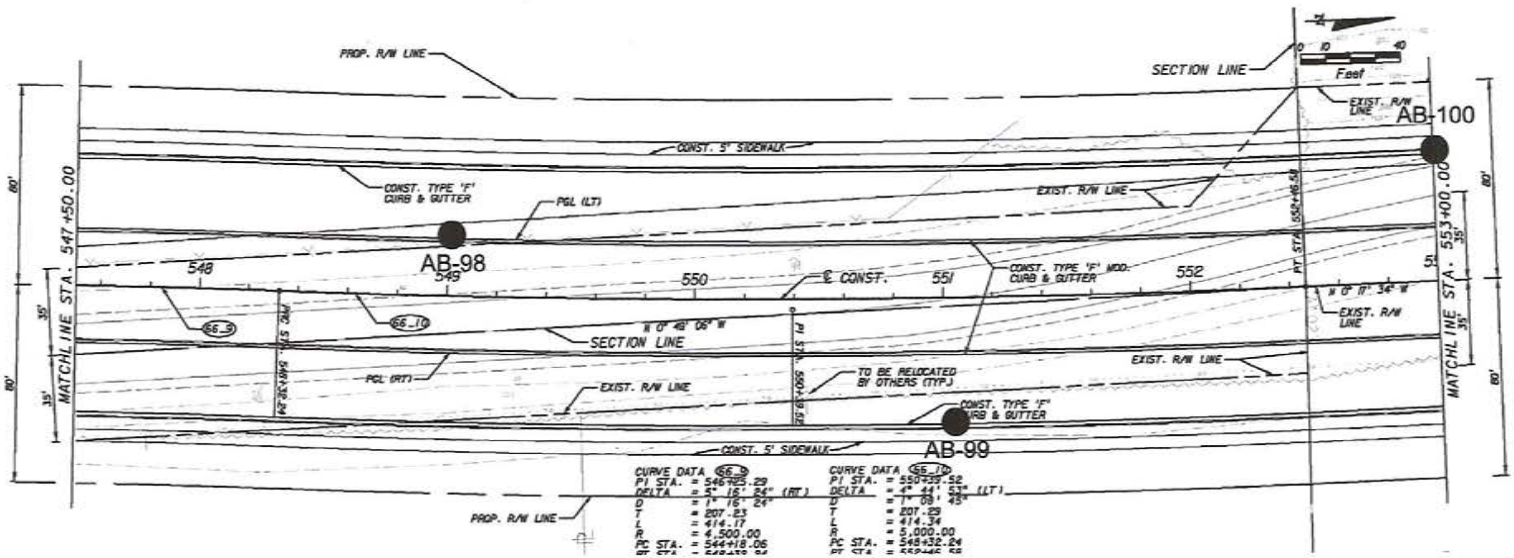

0' 25' 50' 100'

Scale: 1" = 50'

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

LEGEND

AB-98 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

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DATE	PROJ. NO.	SHEET
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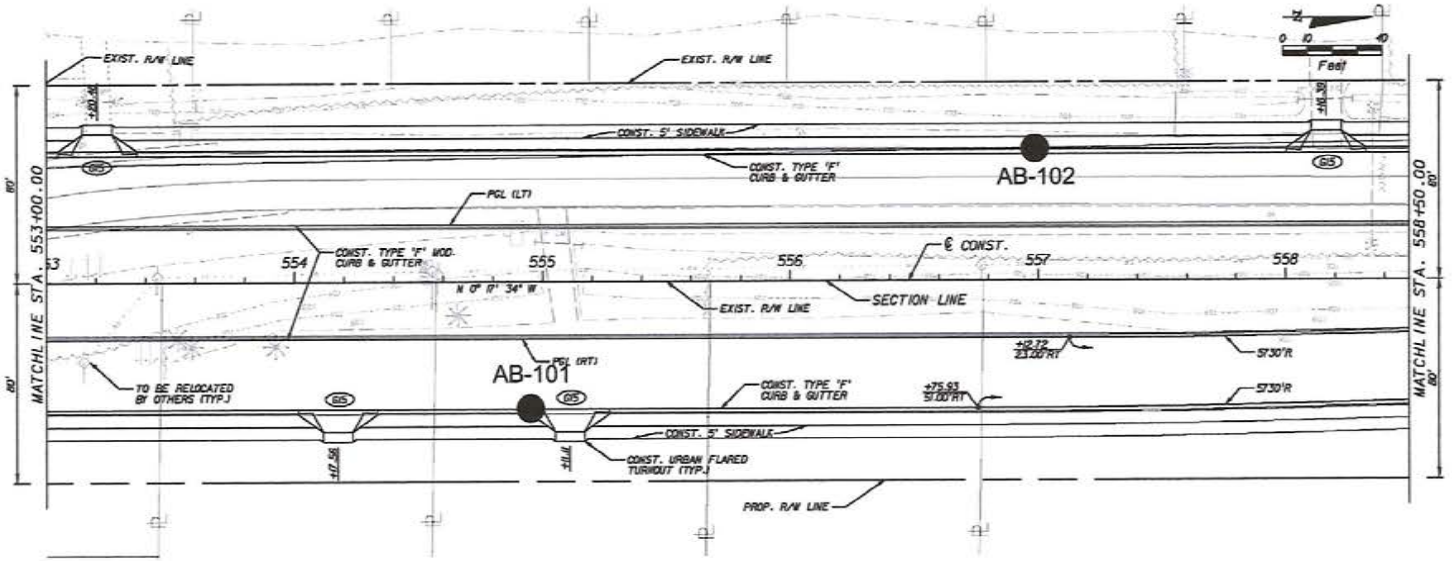

0' 25' 50' 100'

Scale: 1" = 50'

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

LEGEND

AB-101 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

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DATE	PROJ. NO.	SHEET
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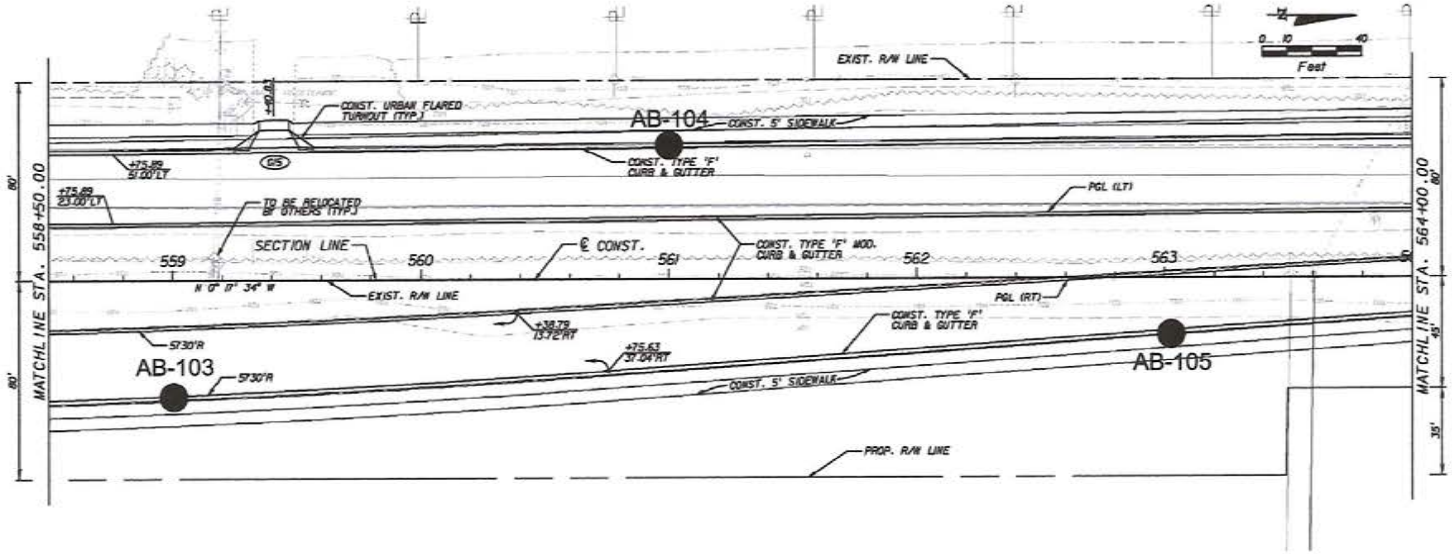

0' 25' 50' 100'

Scale: 1" = 50'

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

LEGEND

AB-103 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

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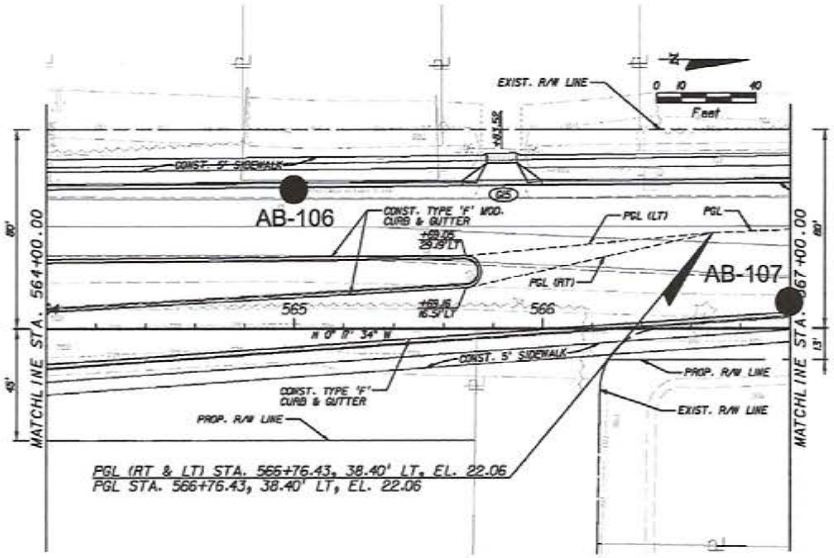

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

0' 25' 50' 100'

Scale: 1" = 50'

LEGEND

AB-106 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

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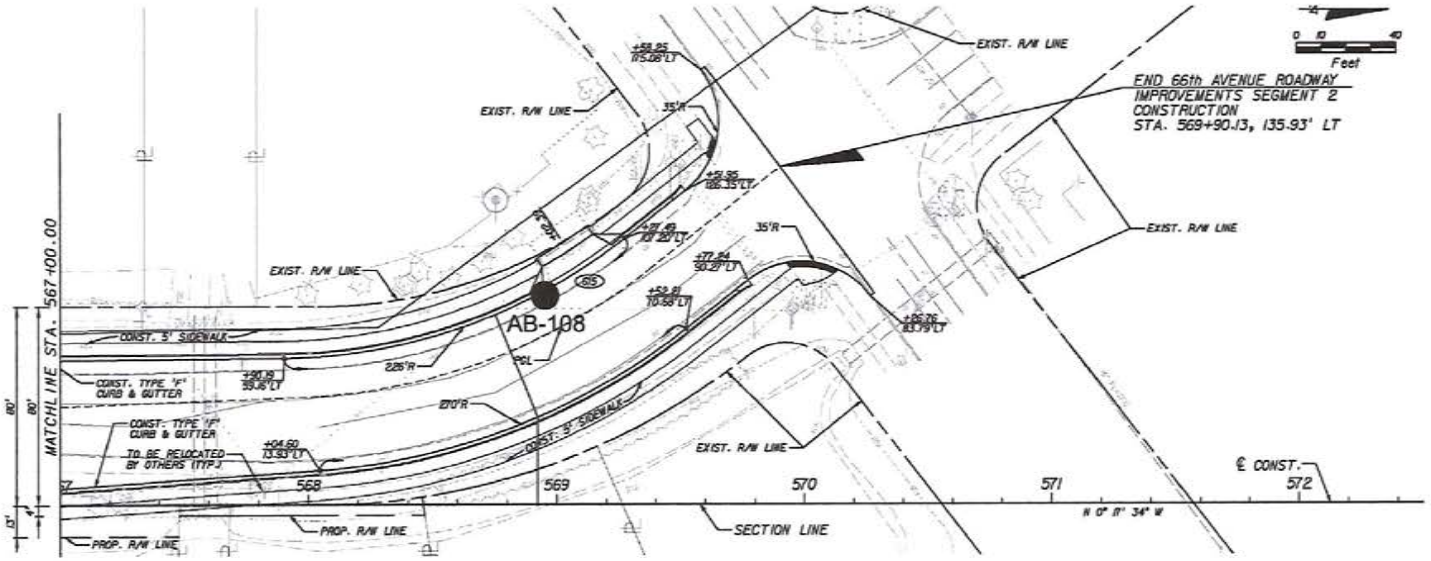

0' 25' 50' 100'

Scale: 1" = 50'

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

LEGEND

AB-108 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

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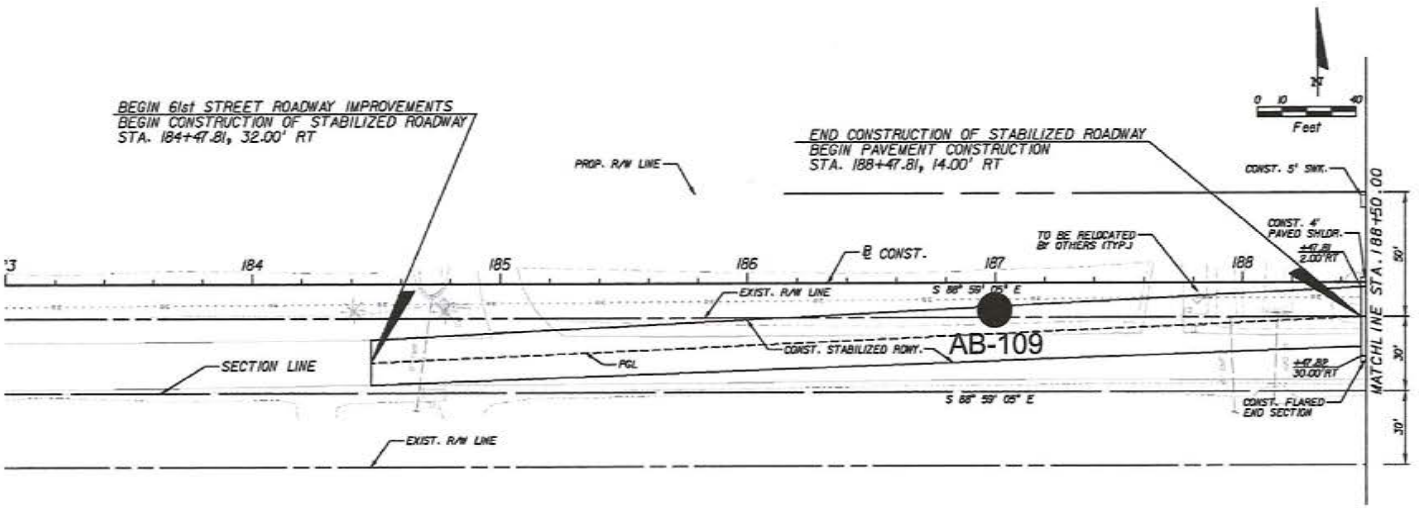

0' 25' 50' 100'

Scale: 1" = 50'

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

LEGEND

AB-109 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN
61ST STREET
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DATE	PROJ. NO.	SHEET
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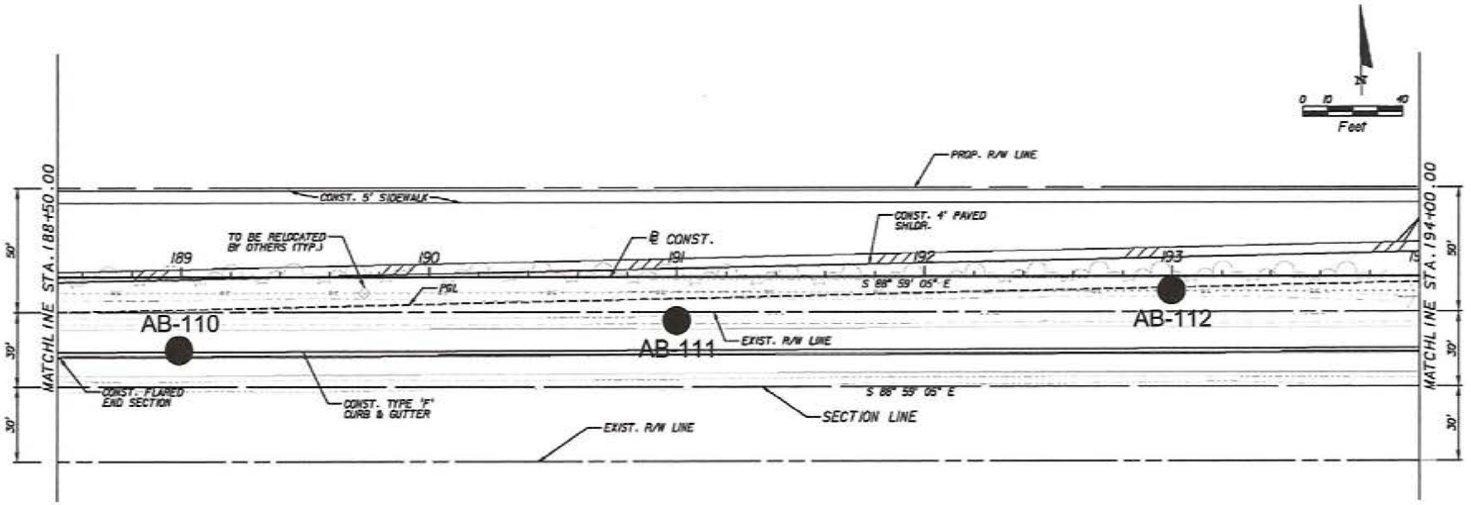

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

0' 25' 50' 100'

Scale: 1" = 50'

LEGEND

AB-110 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN
61ST STREET
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DATE	PROJ. NO.	SHEET
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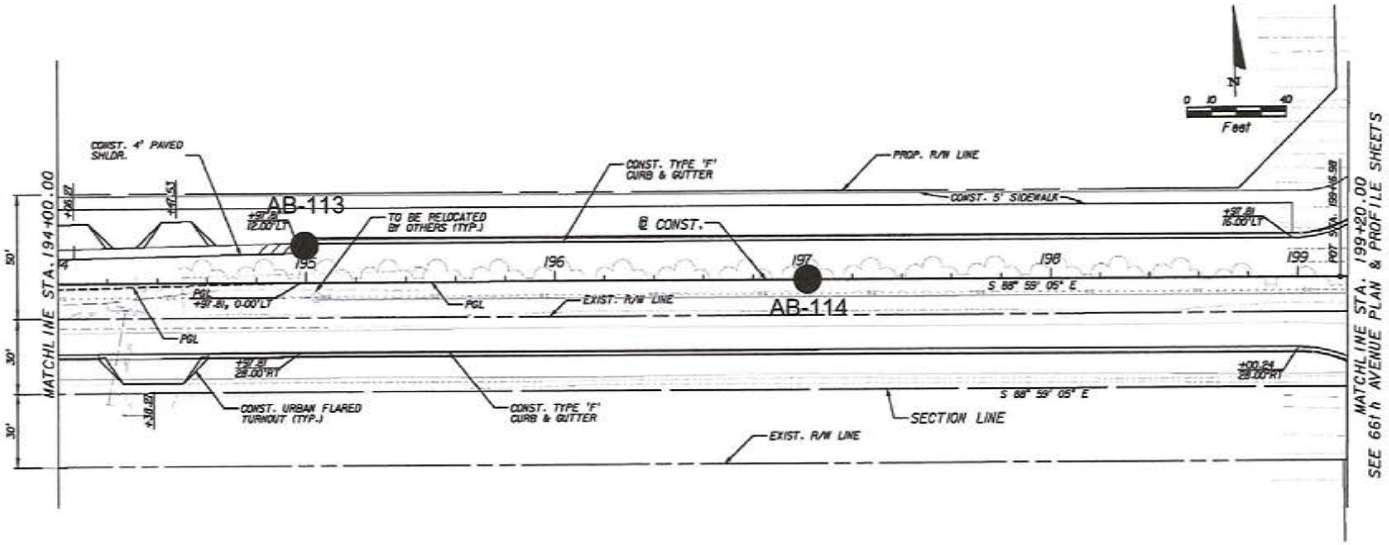

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

0' 25' 50' 100'

Scale: 1" = 50'

LEGEND

AB-113 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN
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DATE	PROJ. NO.	SHEET
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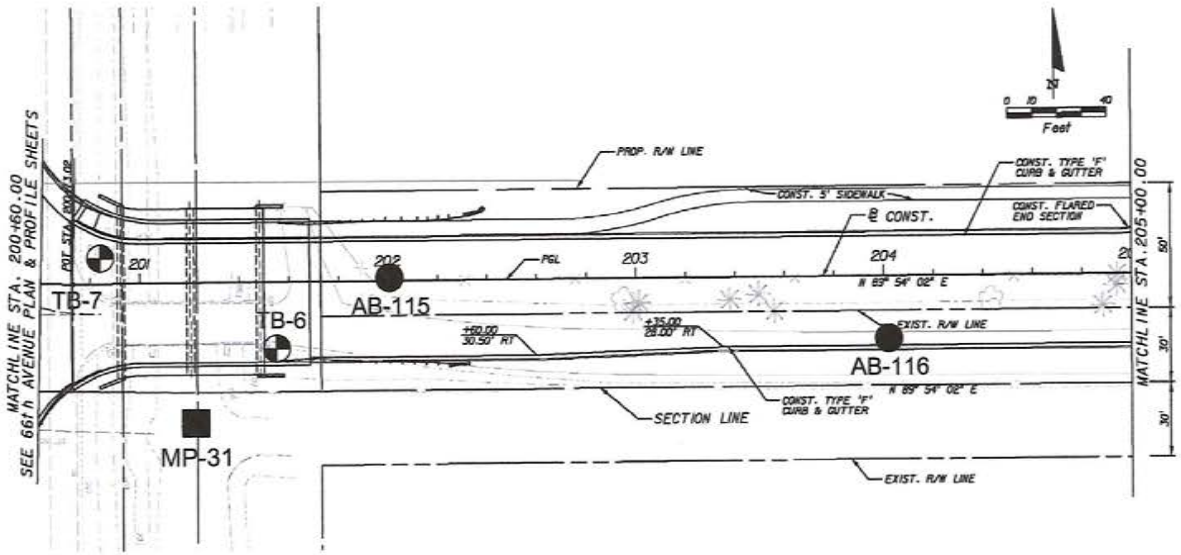

LEGEND

TB-6 - STANDARD PENETRATION TEST (SPT) BORING LOCATION AND NUMBER

AB-115 - AUGER BORING LOCATION AND NUMBER

MP-35 - MUCK PROBE LOCATION AND NUMBER

Locations are approximate

0' 25' 50' 100'

Scale: 1" = 50'

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN
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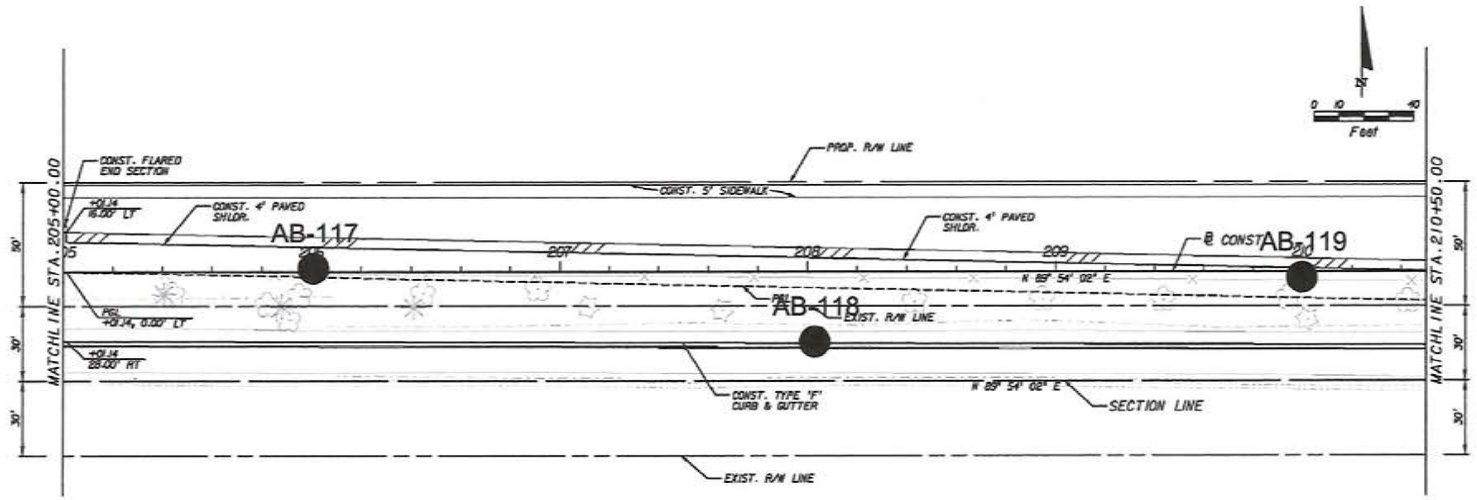

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

0' 25' 50' 100'

Scale: 1" = 50'

LEGEND

AB-117 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN
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DATE	PROJ. NO.	SHEET
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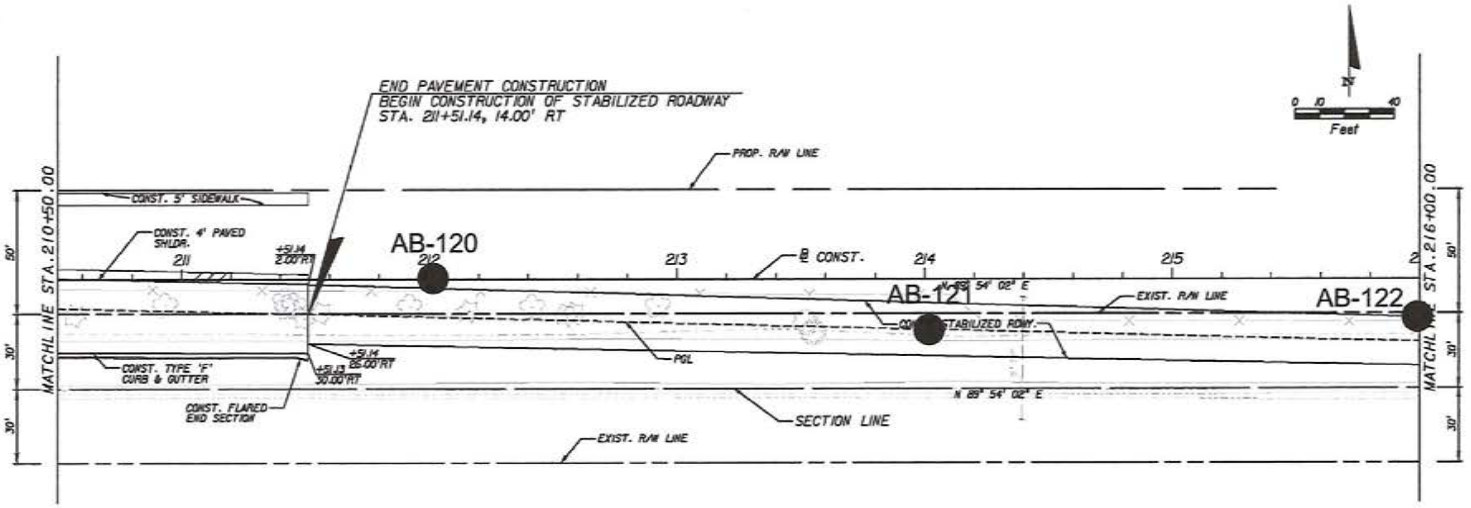

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

0' 25' 50' 100'

Scale: 1" = 50'

LEGEND

AB-120 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN
61ST STREET
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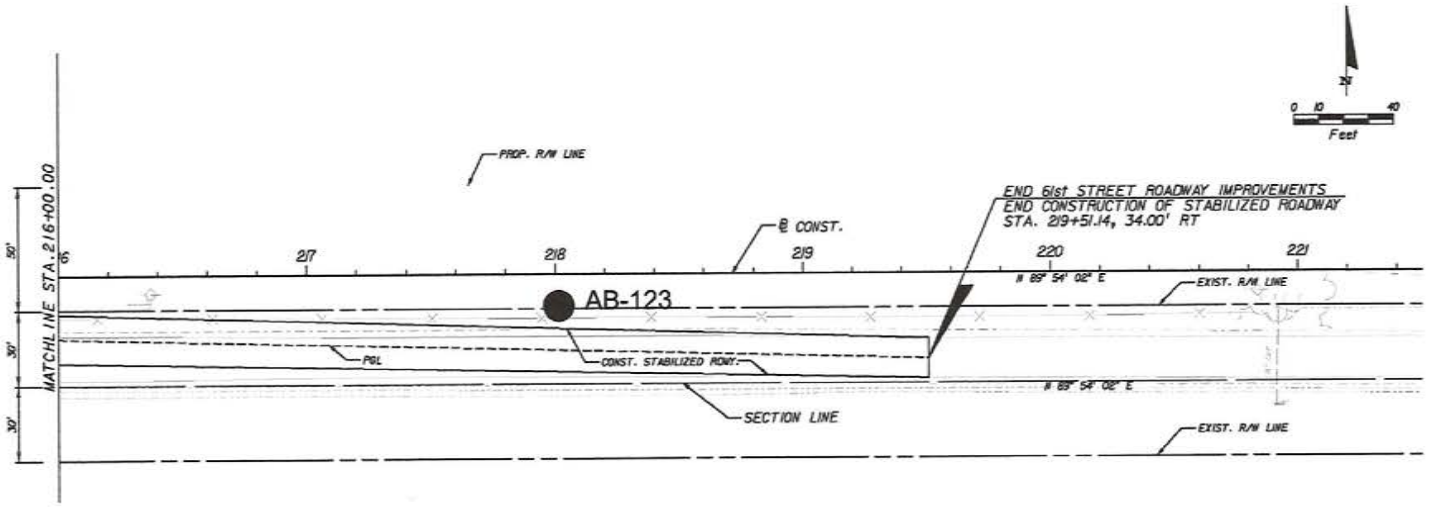

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

0' 25' 50' 100'

Scale: 1" = 50'

LEGEND

AB-123 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN
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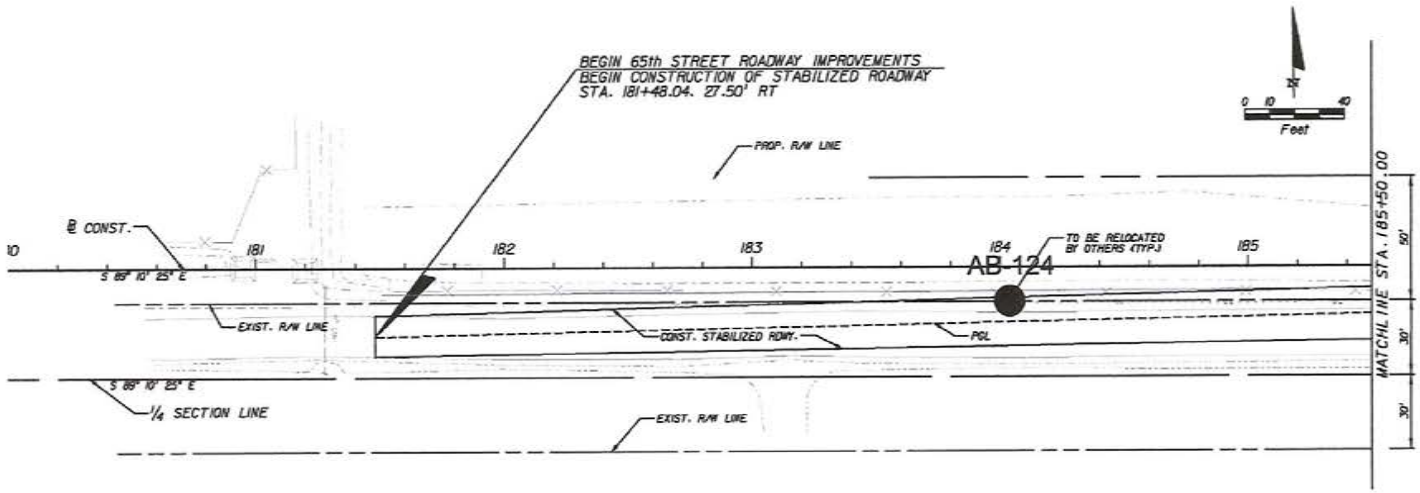


0' 25' 50' 100'

Scale: 1" = 50'

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

LEGEND

AB-124 - AUGER BORING LOCATION AND NUMBER

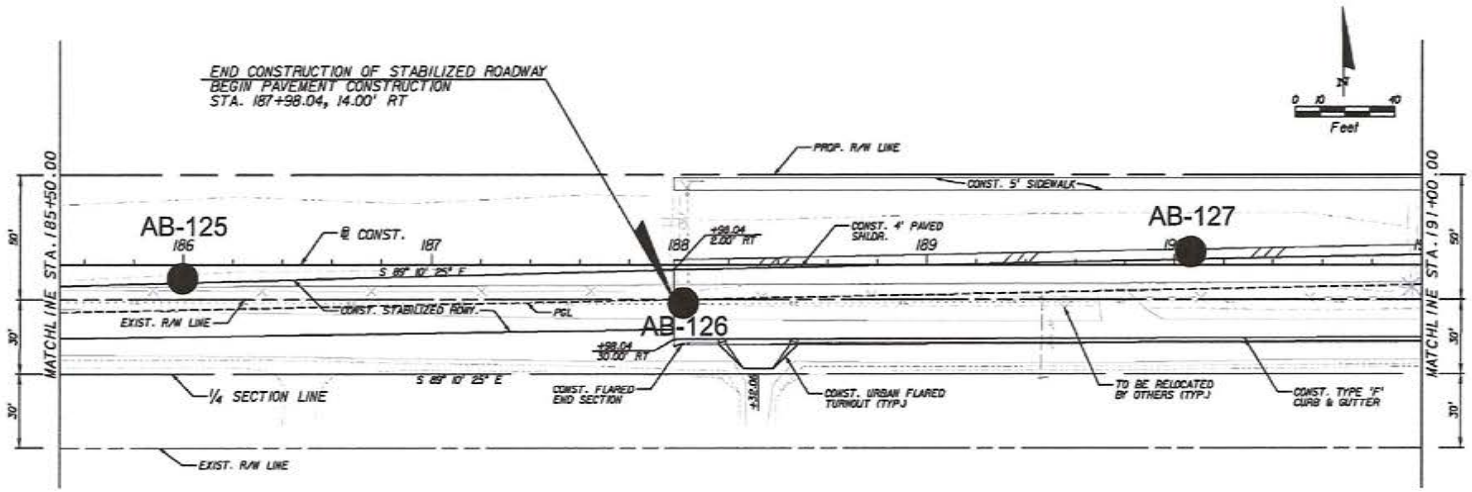
Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN
65TH STREET
66TH AVENUE ROADWAY WIDENING
INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.
Geotechnical • Materials Testing/Inspection • Environmental

DATE	PROJ. NO.	SHEET
11-27-06	06-11-2352	2-50



SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

0' 25' 50' 100'

Scale: 1" = 50'

LEGEND

AB-125 - AUGER BORING LOCATION AND NUMBER

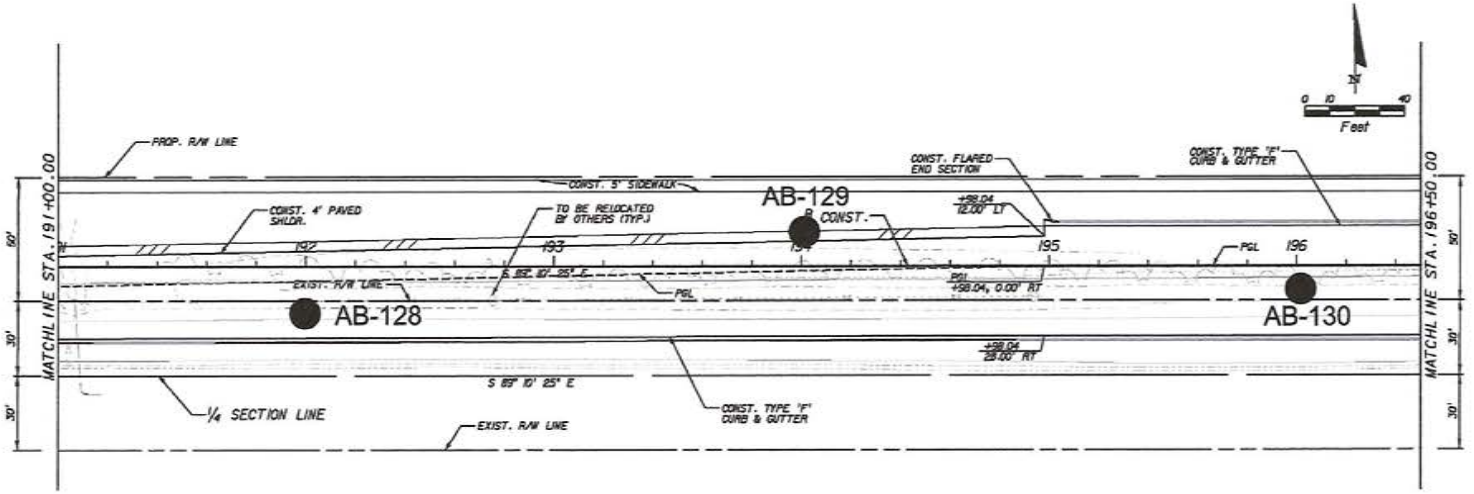
Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN
65TH STREET
66TH AVENUE ROADWAY WIDENING
INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.
Geotechnical • Materials Testing/Inspection • Environmental

DATE	PROJ. NO.	SHEET
11-27-06	06-11-2352	2-51



SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

0' 25' 50' 100'

Scale: 1" = 50'

LEGEND

AB-128 - AUGER BORING LOCATION AND NUMBER

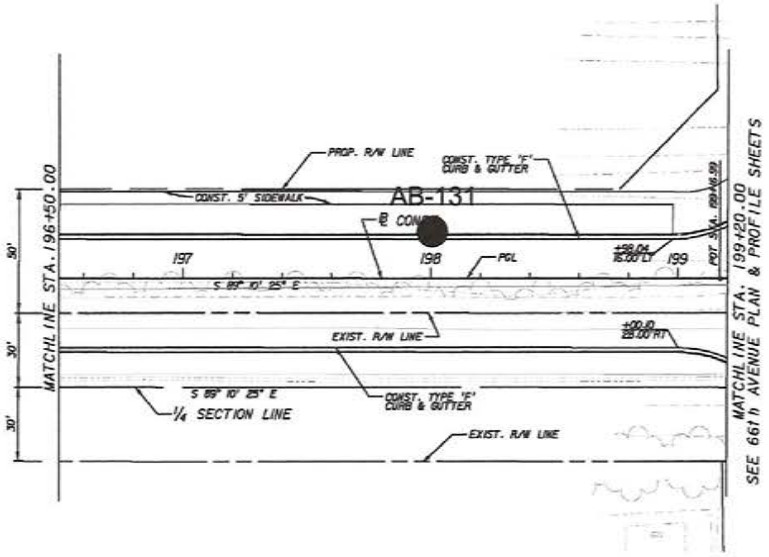
Locations are approximate

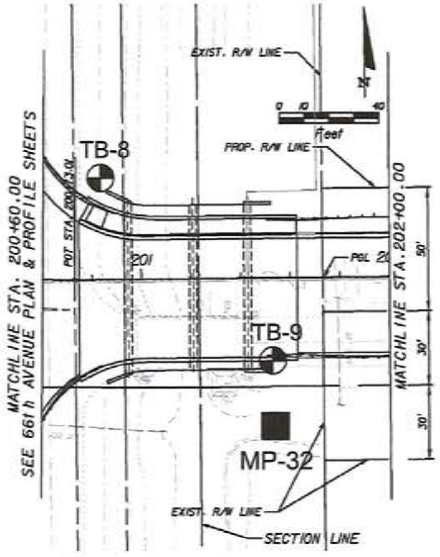
DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN
65TH STREET
66TH AVENUE ROADWAY WIDENING
INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.
Geotechnical • Materials Testing/Inspection • Environmental

DATE	PROJ. NO.	SHEET
11-27-06	06-11-2352	2-52





0' 25' 50' 100'

Scale: 1" = 50'

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

LEGEND

TB-8 - STANDARD PENETRATION TEST (SPT) BORING LOCATION AND NUMBER

AB-131 - AUGER BORING LOCATION AND NUMBER

MP-32 - MUCK PROBE LOCATION AND NUMBER

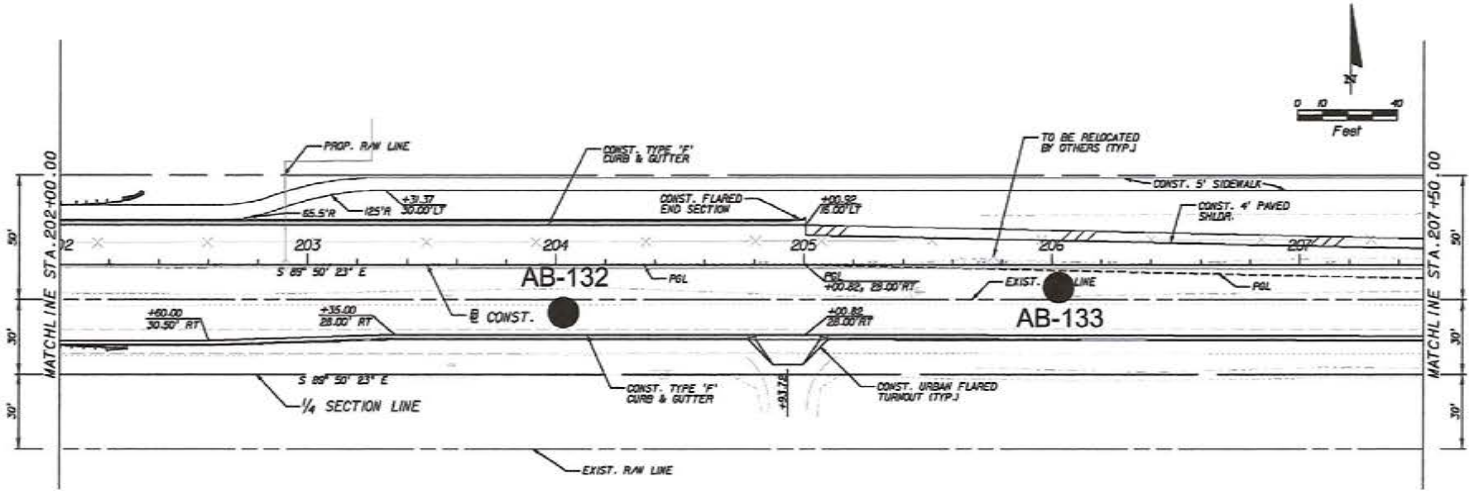
Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN
65TH STREET
66TH AVENUE ROADWAY WIDENING
INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.
Geotechnical • Materials Testing/Inspection • Environmental

DATE	PROJ. NO.	SHEET
11-27-06	06-11-2352	2-53



LEGEND

AB-132 - AUGER BORING LOCATION AND NUMBER

Locations are approximate

0' 25' 50' 100'

Scale: 1" = 50'

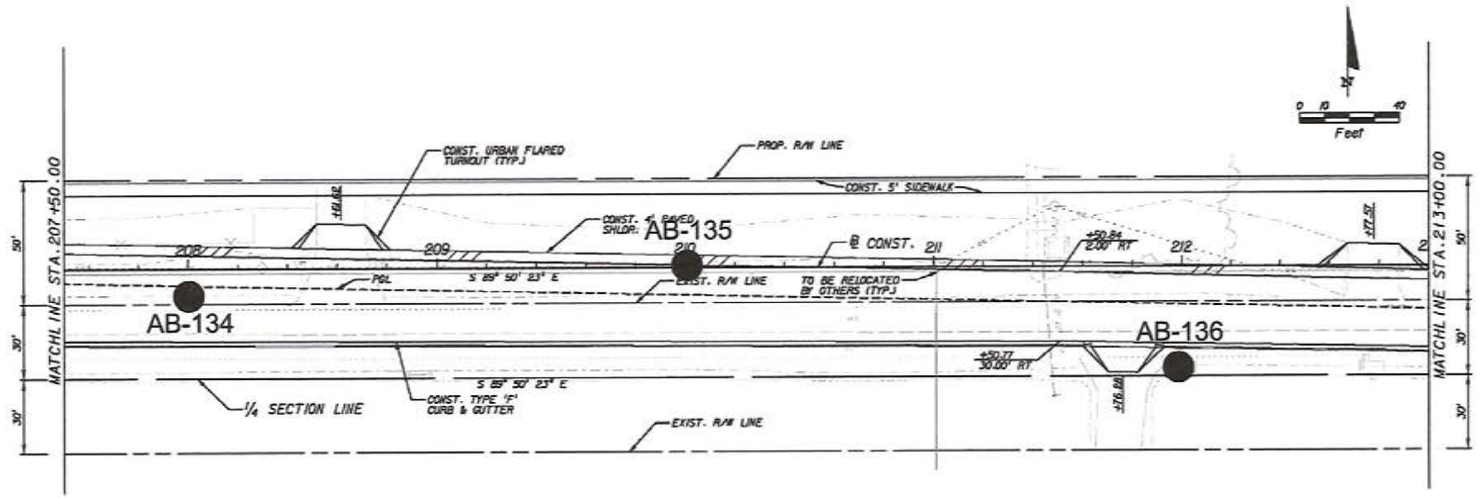
SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN
65TH STREET
66TH AVENUE ROADWAY WIDENING
INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.
Geotechnical • Materials Testing/Inspection • Environmental

DATE	PROJ. NO.	SHEET
11-27-06	06-11-2352	2-54



0' 25' 50' 100'

Scale: 1" = 50'

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

LEGEND

AB-134 - AUGER BORING LOCATION AND NUMBER

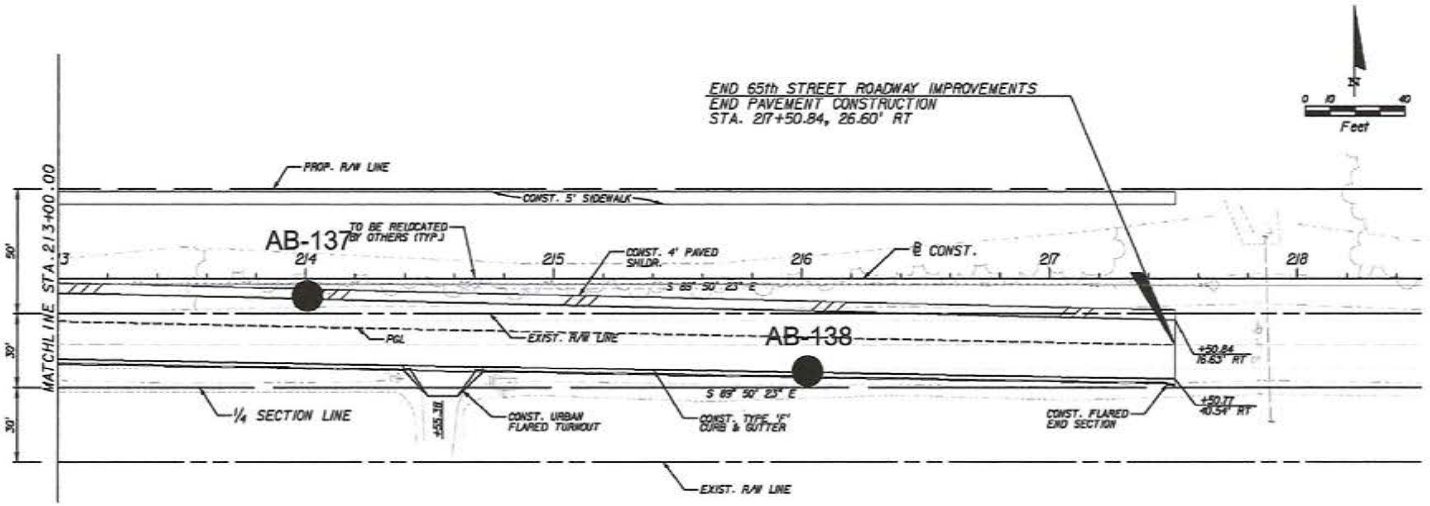
Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN
65TH STREET
66TH AVENUE ROADWAY WIDENING
INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.
Geotechnical • Materials Testing/Inspection • Environmental

DATE	PROJ. NO.	SHEET
11-27-06	06-11-2352	2-55



SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

0' 25' 50' 100'

Scale: 1" = 50'

LEGEND

AB-137 - AUGER BORING LOCATION AND NUMBER

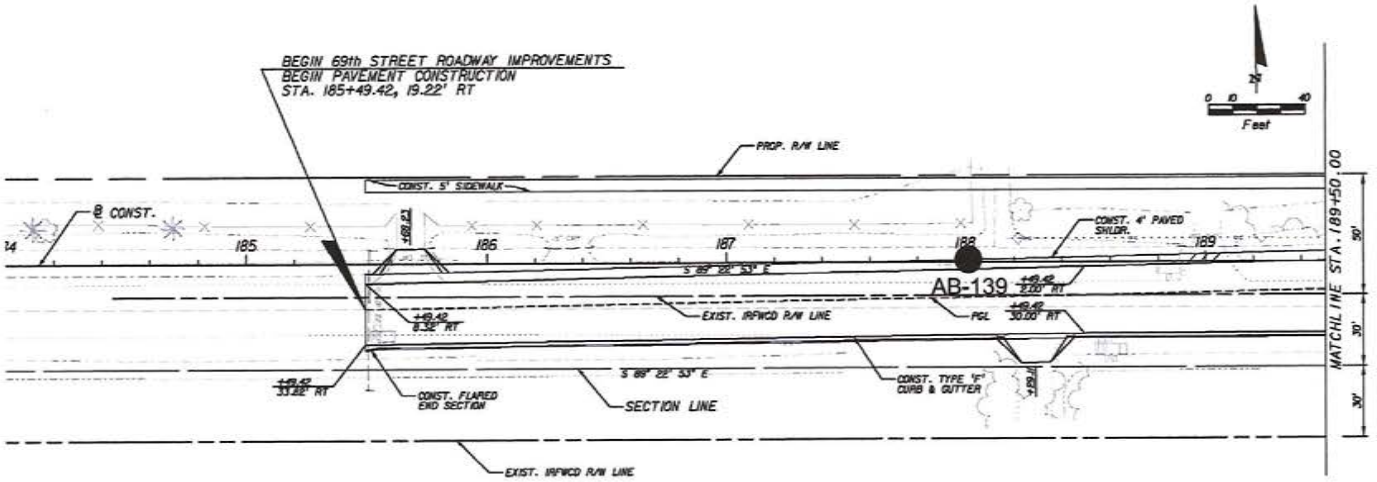
Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN
65TH STREET
66TH AVENUE ROADWAY WIDENING
INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.
Geotechnical • Materials Testing/Inspection • Environmental

DATE	PROJ. NO.	SHEET
11-27-06	06-11-2352	2-56



0' 25' 50' 100'

Scale: 1" = 50'

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

LEGEND

AB-139 - AUGER BORING LOCATION AND NUMBER

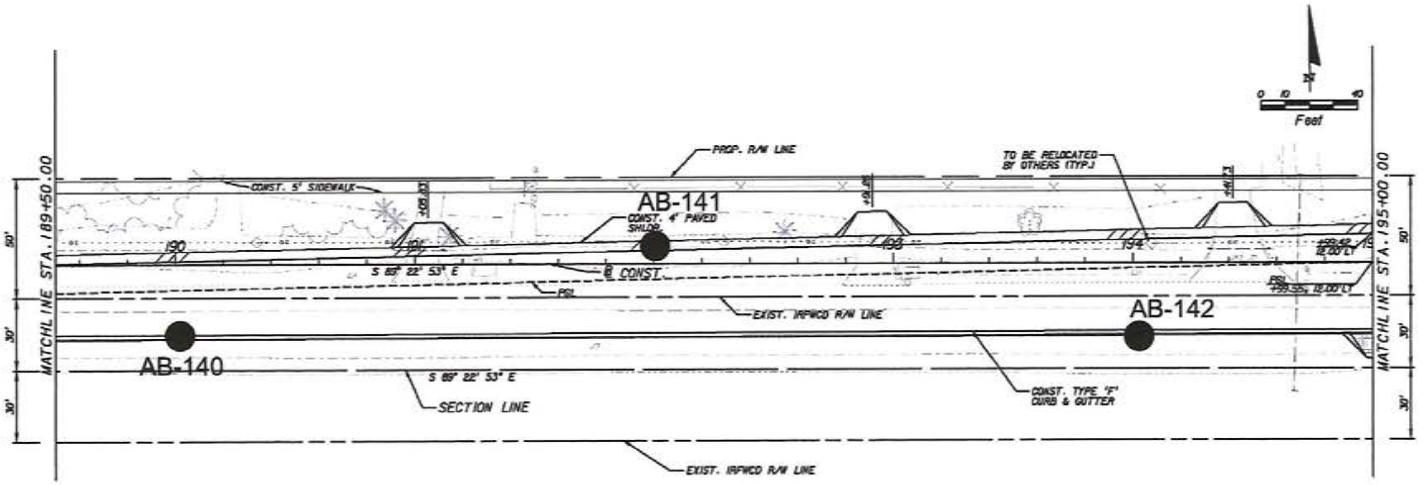
Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN
69TH STREET
66TH AVENUE ROADWAY WIDENING
INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.
Geotechnical • Materials Testing/Inspection • Environmental

DATE	PROJ. NO.	SHEET
11-27-06	06-11-2352	2-57



0' 25' 50' 100'

Scale: 1" = 50'

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

LEGEND

AB-140 - AUGER BORING LOCATION AND NUMBER

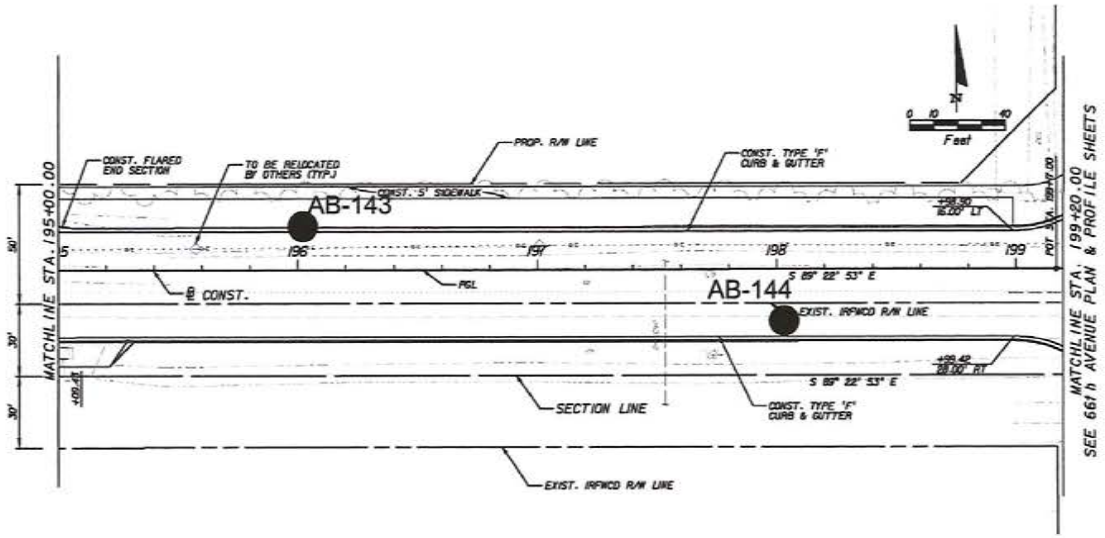
Locations are approximate

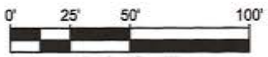
DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN
69TH STREET
66TH AVENUE ROADWAY WIDENING
INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.
Geotechnical - Materials Testing/Inspection - Environmental

DATE	PROJ. NO.	SHEET
11-27-06	06-11-2352	2-58





SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

LEGEND

AB-143 - AUGER BORING LOCATION AND NUMBER

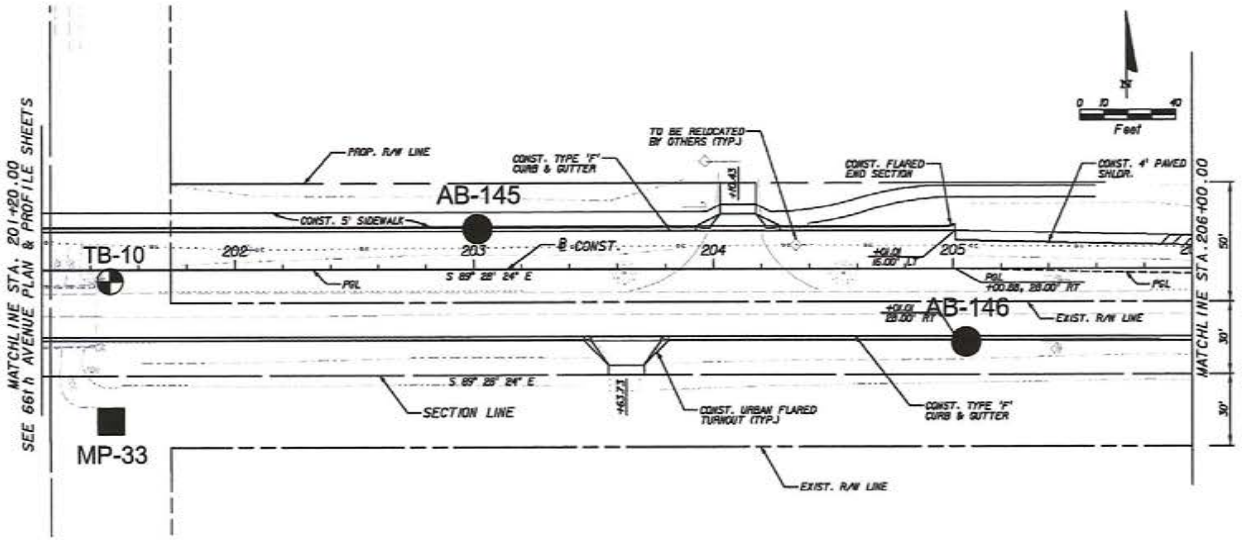
Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN
69TH STREET
66TH AVENUE ROAWAY WIDENING
INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.
Geotechnical • Materials Testing/Inspection • Environmental

DATE	PROJ. NO.	SHEET
11-27-06	06-11-2352	2-59



LEGEND

TB-10 - STANDARD PENETRATION TEST (SPT) BORING LOCATION AND NUMBER

AB-145 - AUGER BORING LOCATION AND NUMBER

MP-33 - MUCK PROBE LOCATION AND NUMBER

Locations are approximate

0' 25' 50' 100'

Scale: 1" = 50'

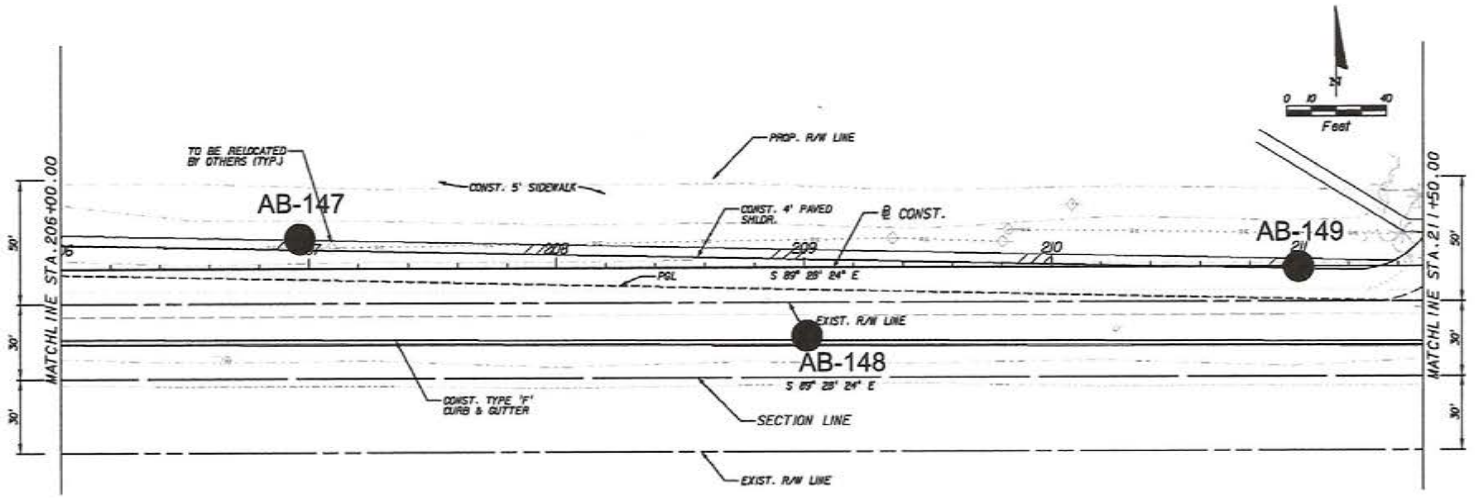
SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

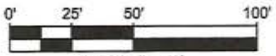
DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN
69TH STREET
66TH AVENUE ROADWAY WIDENING
INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.
Geotechnical • Materials Testing/Inspection • Environmental

DATE	PROJ. NO.	SHEET
11-27-06	06-11-2352	2-60





Scale: 1" = 50'

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

LEGEND

AB-147 - AUGER BORING LOCATION AND NUMBER

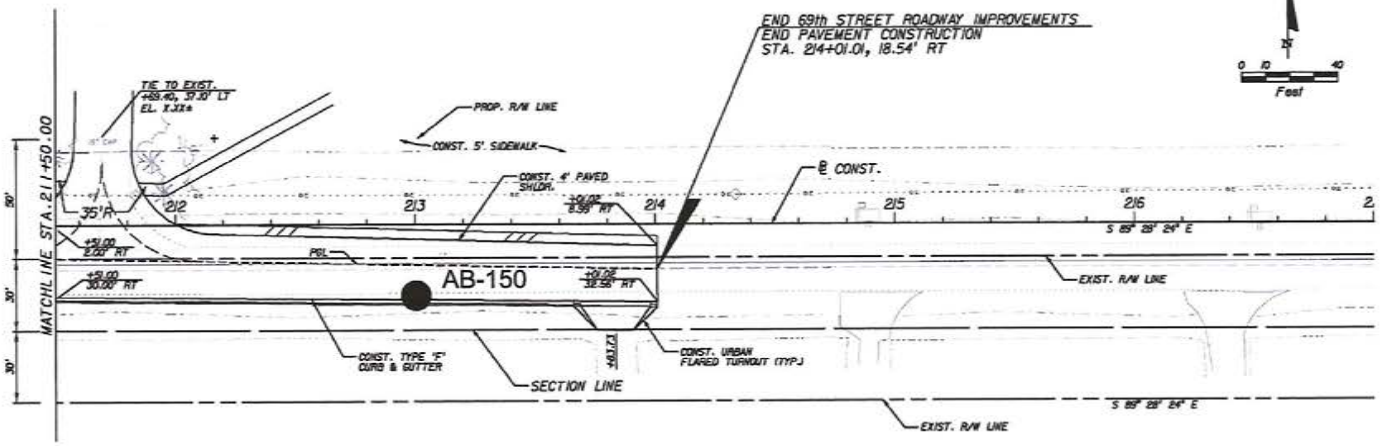
Locations are approximate

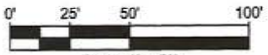
DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN
69TH STREET
66TH AVENUE ROADWAY WIDENING
INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.
Geotechnical • Materials Testing/Inspection • Environmental

DATE	PROJ. NO.	SHEET
11-27-06	06-11-2352	2-61





SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

LEGEND

AB-150 - AUGER BORING LOCATION AND NUMBER

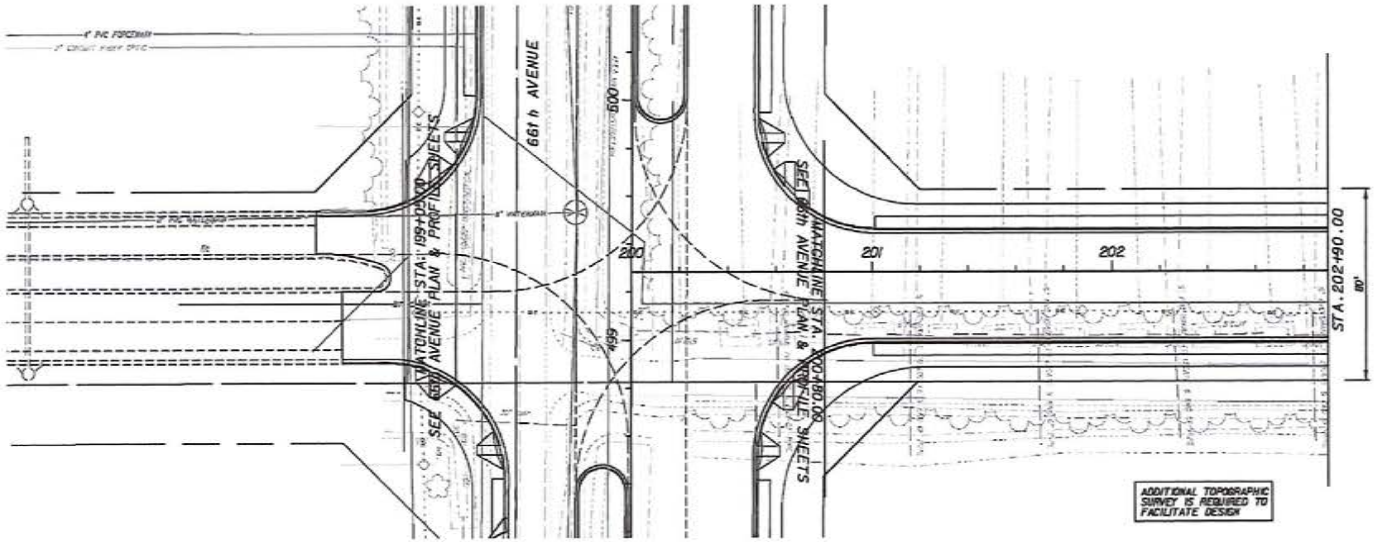
Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN
69TH STREET
66TH AVENUE ROADWAY WIDENING
INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.
Geotechnical • Materials Testing/Inspection • Environmental

DATE	PROJ. NO.	SHEET
11-27-06	06-11-2352	2-62



0' 25' 50' 100'

Scale: 1" = 50'

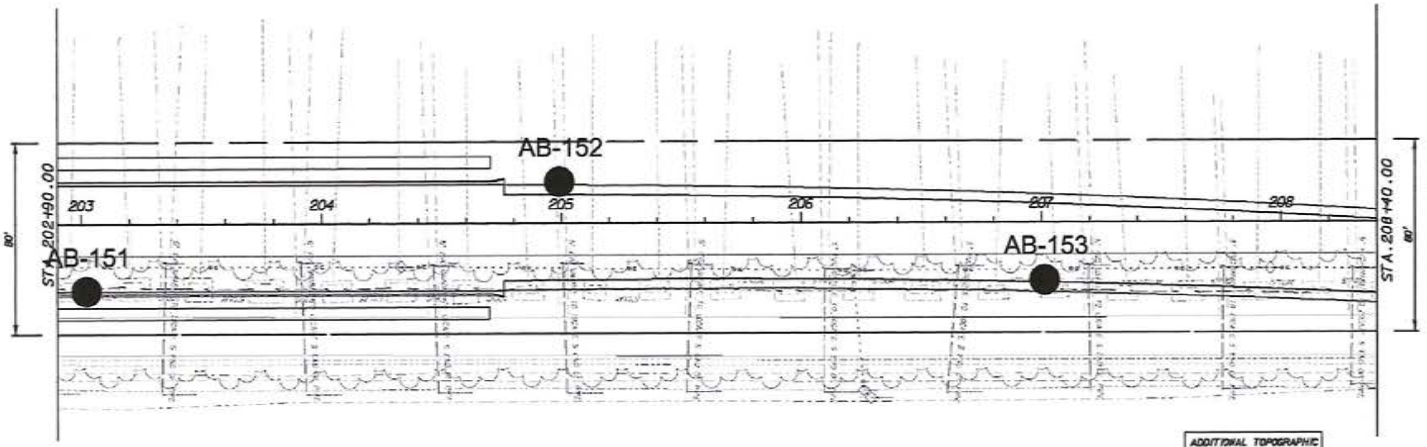
SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN
81ST STREET
66TH AVENUE ROADWAY WIDENING
INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.
Geotechnical • Materials Testing/Inspection • Environmental

DATE	PROJ. NO.	SHEET
11-27-06	06-11-2352	2-63



SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

0' 25' 50' 100'

Scale: 1" = 50'

LEGEND

AB-151 - AUGER BORING LOCATION AND NUMBER

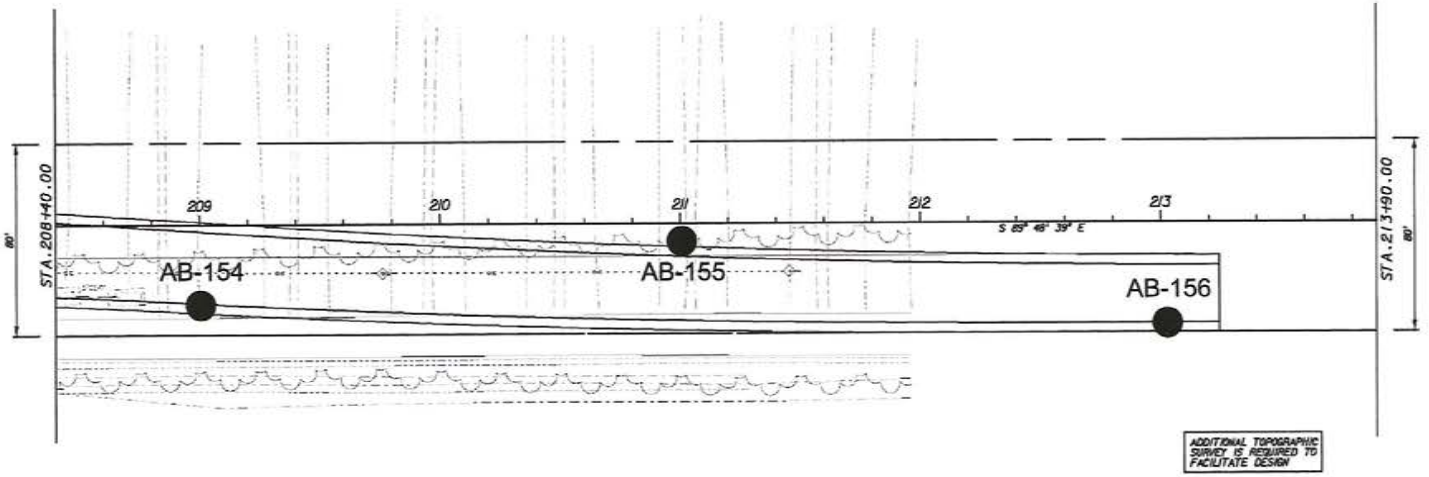
Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN
81ST STREET
66TH AVENUE ROADWAY WIDENING
INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.
Geotechnical • Materials Testing/Inspection • Environmental

DATE	PROJ. NO.	SHEET
11-27-06	06-11-2352	2-64



0' 25' 50' 100'

Scale: 1" = 50'

SOURCE: KIMLEY HORN AND ASSOCIATES, INC.

LEGEND

AB-154 - AUGER BORING LOCATION AND NUMBER

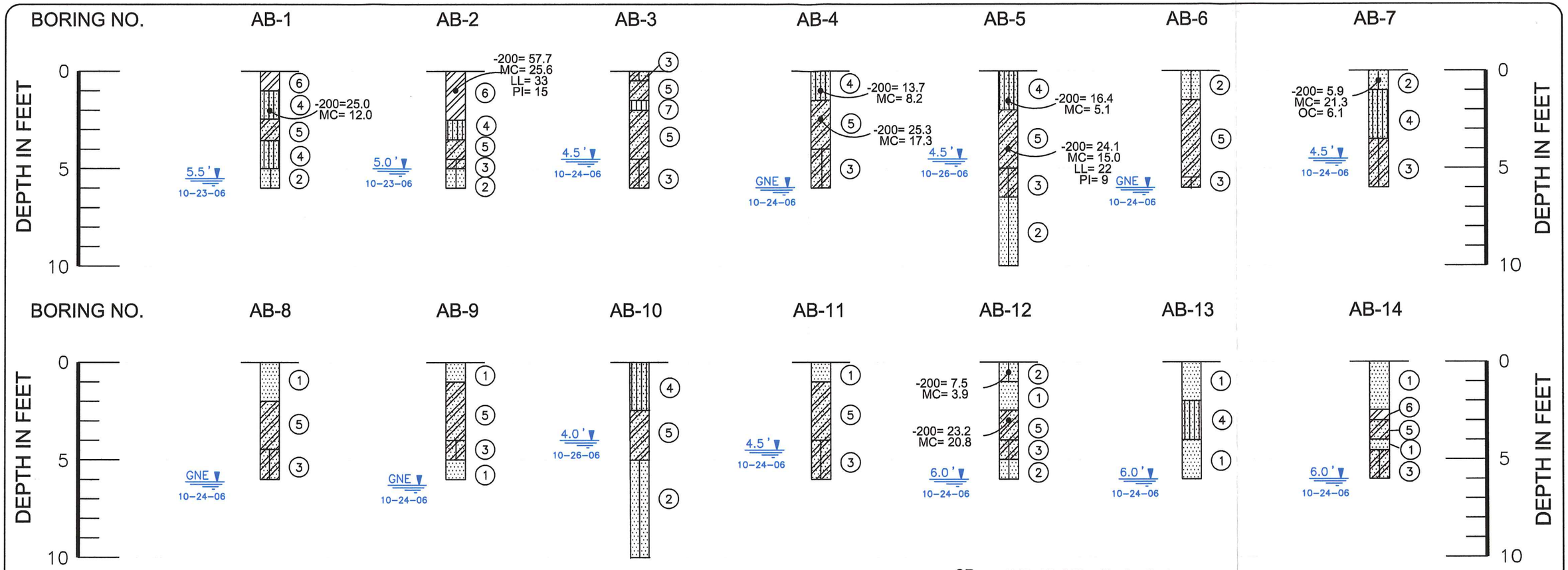
Locations are approximate

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1"= 50'
REVISED	

BORING LOCATION PLAN
81ST STREET
66TH AVENUE ROADWAY WIDENING
INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.
Geotechnical • Materials Testing/Inspection • Environmental

DATE	PROJ. NO.	SHEET
11-27-06	06-11-2352	2-65



LEGEND

1. Gray, black, orange, white and brown SAND (A-3) In general, surficial soils contained some roots and deeper soils contained varying amounts of shell fragments. Surficial soils contained some subrounded fine gravel at some locations. Surficial soils in borings AB-22, AB-23 and AB-52 contained some hard cemented nodules. Roots were present in this unit in borings AB-99, AB-101 and AB-103 down to 3 to 4 feet below surface.
2. Gray, brown and black SAND with silt (A-3). In general, surficial soils contained some roots and deeper soils contained varying amounts of shell fragments. This unit in boring AB-22 contained some fine subrounded gravel. This surficial unit in borings AB-30, AB-35 and AB-40 contained some cemented nodules.
3. Gray and brown SAND with clay (A-3), In general, surficial soils contained some roots and deeper soils contained varying amounts shell fragments. A large piece of tree root was found in this unit in boring AB-47.
4. Gray and brown slightly silty to silty SAND (A-2-4). Near surface soils contained some roots. Surficial soils contained some shell fragments at some locations. This unit contained some fine subrounded gravel at some locations. This unit contained some shell fragments in AB-13.
5. Gray, orange and brown clayey SAND (A-2-4). This unit in boring AB-9 contained coarse llimestone fragments.
6. Gray and brown sandy CLAY(A-6). Near surface soils contained some roots. Tree root pieces were found in boring AB-56 in this unit.
7. Gray sandy SILT (A-4)
8. Black and brown SAND with silt or silty SAND with some organics (A-3/A-2-4)(HARDPAN)

SP – Unified Soil Classification System Group Symbol (ASTM D 2487)

AB-1 – Auger boring and number

OC – Organic Content (%)

-200 – Amount passing U.S. Standard No. 200 Sieve (%)

MC – Moisture Content (%)

LL – Liquid Limit (%)

PL – Plastic Limit (%)

5.5 ' 10-23-06 – Depth of groundwater (feet) & date measured

GNE 10-24-06 – Groundwater level not encountered on date drilled

NOTES

(1) Borings were drilled on October 23, 24 and 26, 2006 using hand-turned augering equipment and truck mounted Mobile (B-47) drill rig.

(2) Strata boundaries are approximate and represent soil strata at each test hole location only. Soil transitions may be more gradual than implied.

(3) Groundwater depths shown on the subsurface profiles represent groundwater surfaces on the dates shown. Groundwater level fluctuations should be anticipated throughout the year.

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1" = 5'
REVISED	

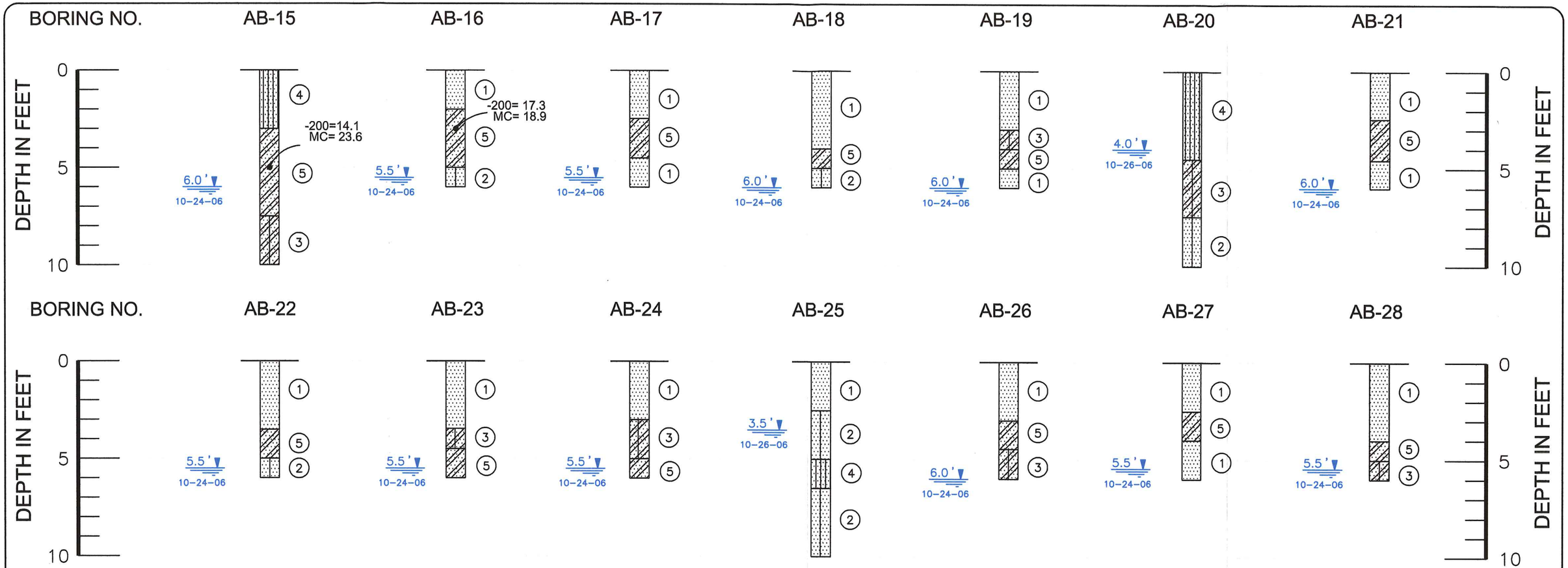
SUBSURFACE PROFILES

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.
Geotechnical Materials Testing/Inspection Environmental

DATE	PROJ. NO.	SHEET
12-11-06	06-11-2352	3A



LEGEND

① Gray, black, orange, white and brown SAND (A-3) In general, surficial soils contained some roots and deeper soils contained varying amounts of shell fragments. Surficial soils contained some subrounded fine gravel at some locations. Surficial soils in borings AB-22, AB-23 and AB-52 contained some hard cemented nodules. Roots were present in this unit in borings AB-99, AB-101 and AB-103 down to 3 to 4 feet below surface.

② Gray, brown and black SAND with silt (A-3). In general, surficial soils contained some roots and deeper soils contained varying amounts of shell fragments. This unit in boring AB-22 contained some fine subrounded gravel. This surficial unit in borings AB-30, AB-35 and AB-40 contained some cemented nodules.

③ Gray and brown SAND with clay (A-3), In general, surficial soils contained some roots and deeper soils contained varying amounts shell fragments. A large piece of tree root was found in this unit in boring AB-47.

④ Gray and brown slightly silty to silty SAND (A-2-4). Near surface soils contained some roots. Surficial soils contained some shell fragments at some locations. This unit contained some fine subrounded gravel at some locations. This unit contained some shell fragments in AB-13.

⑤ Gray, orange and brown clayey SAND (A-2-4). This unit in boring AB-9 contained coarse llimestone fragments.

⑥ Gray and brown sandy CLAY(A-6). Near surface soils contained some roots. Tree root pieces were found in boring AB-56 in this unit.

⑦ Gray sandy SILT (A-4)

⑧ Black and brown SAND with silt or silty SAND with some organics (A-3/A-2-4)(HARDPAN)

-200 – Amount passing U.S. Standard No. 200 Sieve (%)

MC – Moisture Content (%)

LL – Liquid Limit (%)

PL – Plastic Limit (%)

SP – Unified Soil Classification System Group Symbol (ASTM D 2487)

AB-15 – Auger boring and number

6.0 ' 10-24-06 – Depth of groundwater (feet) & date measured

NOTES

(1) Borings were drilled on October 24 and 26, 2006 using hand-turned augering equipment and truck mounted Mobile (B-47) drill rig.

(2) Strata boundaries are approximate and represent soil strata at each test hole location only. Soil transitions may be more gradual than implied.

(3) Groundwater depths shown on the subsurface profiles represent groundwater surfaces on the dates shown. Groundwater level fluctuations should be anticipated throughout the year.

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1" = 5'
REVISED	

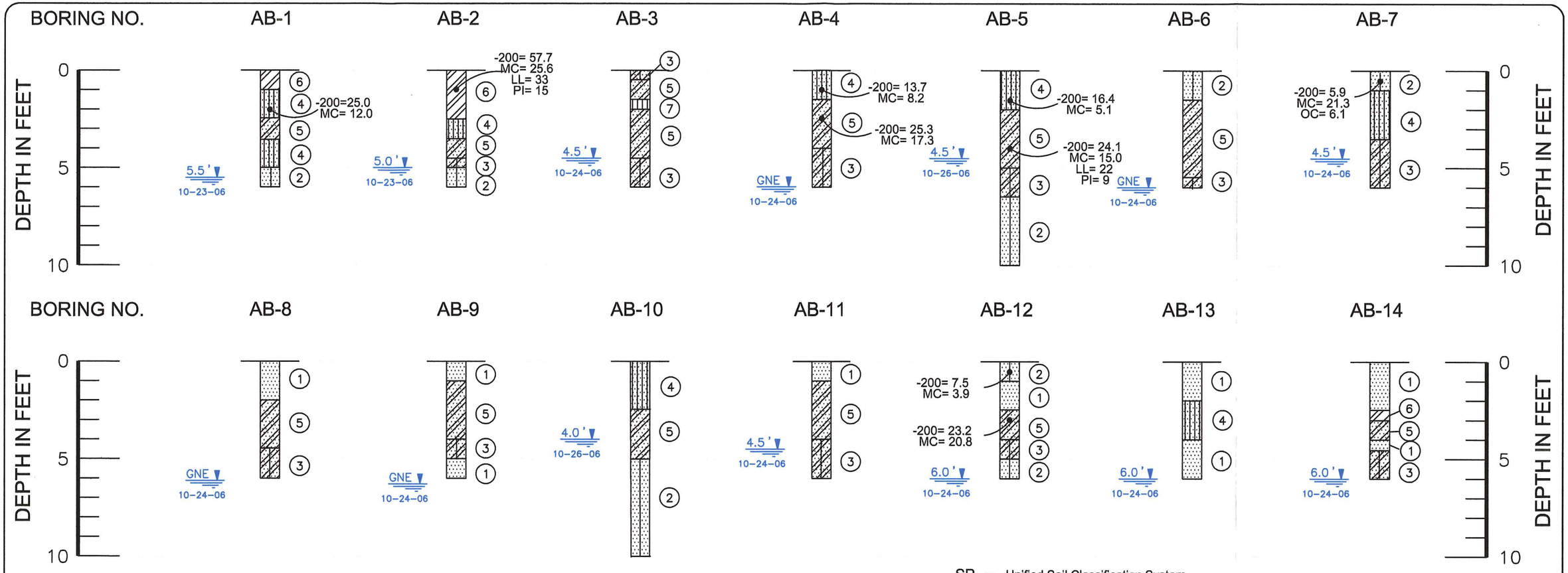
SUBSURFACE PROFILES

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.
Geotechnical Materials Testing/Inspection Environmental

DATE	PROJ. NO.	SHEET
12-11-06	06-11-2352	3B



LEGEND

(1) Gray, black, orange, white and brown SAND (A-3) In general, surficial soils contained some roots and deeper soils contained varying amounts of shell fragments. Surficial soils contained some subrounded fine gravel at some locations. Surficial soils in borings AB-22, AB-23 and AB-52 contained some hard cemented nodules. Roots were present in this unit in borings AB-99, AB-101 and AB-103 down to 3 to 4 feet below surface.

(2) Gray, brown and black SAND with silt (A-3). In general, surficial soils contained some roots and deeper soils contained varying amounts of shell fragments. This unit in boring AB-22 contained some fine subrounded gravel. This surficial unit in borings AB-30, AB-35 and AB-40 contained some cemented nodules.

(3) Gray and brown SAND with clay (A-3), In general, surficial soils contained some roots and deeper soils contained varying amounts shell fragments. A large piece of tree root was found in this unit in boring AB-47.

(4) Gray and brown slightly silty to silty SAND (A-2-4). Near surface soils contained some roots. Surficial soils contained some shell fragments at some locations. This unit contained some fine subrounded gravel at some locations. This unit contained some shell fragments in AB-13.

(5) Gray, orange and brown clayey SAND (A-2-4). This unit in boring AB-9 contained coarse limestone fragments.

(6) Gray and brown sandy CLAY(A-6). Near surface soils contained some roots. Tree root pieces were found in boring AB-56 in this unit.

(7) Gray sandy SILT (A-4)

(8) Black and brown SAND with silt or silty SAND with some organics (A-3/A-2-4)(HARDPAN)

SP – Unified Soil Classification System Group Symbol (ASTM D 2487)

AB-1 – Auger boring and number

OC – Organic Content (%)

-200 – Amount passing U.S. Standard No. 200 Sieve (%)

MC – Moisture Content (%)

LL – Liquid Limit (%)

PL – Plastic Limit (%)

5.5 ' 10-23-06 – Depth of groundwater (feet) & date measured

GNE 10-24-06 – Groundwater level not encountered on date drilled

NOTES

(1) Borings were drilled on October 23, 24 and 26, 2006 using hand-turned augering equipment and truck mounted Mobile (B-47) drill rig.

(2) Strata boundaries are approximate and represent soil strata at each test hole location only. Soil transitions may be more gradual than implied.

(3) Groundwater depths shown on the subsurface profiles represent groundwater surfaces on the dates shown. Groundwater level fluctuations should be anticipated throughout the year.

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1" = 5'
REVISED	

SUBSURFACE PROFILES

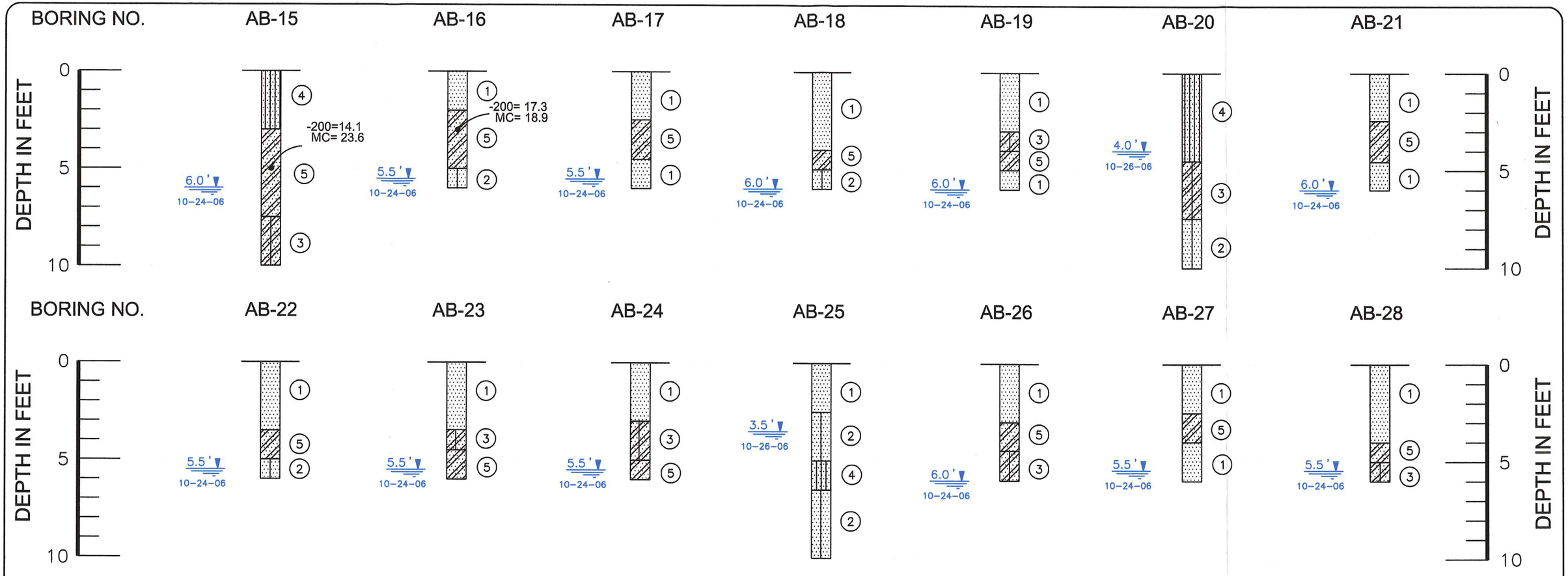
66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.

Geotechnical Materials Testing/Inspection Environmental

DATE	PROJ. NO.	SHEET
12-11-06	06-11-2352	3A



LEGEND

(1) Gray, black, orange, white and brown SAND (A-3) In general, surficial soils contained some roots and deeper soils contained varying amounts of shell fragments. Surficial soils contained some subrounded fine gravel at some locations. Surficial soils in borings AB-22, AB-23 and AB-52 contained some hard cemented nodules. Roots were present in this unit in borings AB-99, AB-101 and AB-103 down to 3 to 4 feet below surface.

(2) Gray, brown and black SAND with silt (A-3). In general, surficial soils contained some roots and deeper soils contained varying amounts of shell fragments. This unit in boring AB-22 contained some fine subrounded gravel. This surficial unit in borings AB-30, AB-35 and AB-40 contained some cemented nodules.

(3) Gray and brown SAND with clay (A-3), In general, surficial soils contained some roots and deeper soils contained varying amounts shell fragments. A large piece of tree root was found in this unit in boring AB-47.

(4) Gray and brown slightly silty to silty SAND (A-2-4). Near surface soils contained some roots. Surficial soils contained some shell fragments at some locations. This unit contained some fine subrounded gravel at some locations. This unit contained some shell fragments in AB-13.

(5) Gray, orange and brown clayey SAND (A-2-4). This unit in boring AB-9 contained coarse llimestone fragments.

(6) Gray and brown sandy CLAY(A-6). Near surface soils contained some roots. Tree root pieces were found in boring AB-56 in this unit.

(7) Gray sandy SILT (A-4)

(8) Black and brown SAND with silt or silty SAND with some organics (A-3/A-2-4)(HARDPAN)

-200 – Amount passing U.S. Standard No. 200 Sieve (%)

MC – Moisture Content (%)

LL – Liquid Limit (%)

PL – Plastic Limit (%)

SP – Unified Soil Classification System Group Symbol (ASTM D 2487)

AB-15 – Auger boring and number

6.0 ' / 10-24-06 – Depth of groundwater (feet) & date measured

NOTES

(1) Borings were drilled on October 24 and 26, 2006 using hand-turned augering equipment and truck mounted Mobile (B-47) drill rig.

(2) Strata boundaries are approximate and represent soil strata at each test hole location only. Soil transitions may be more gradual than implied.

(3) Groundwater depths shown on the subsurface profiles represent groundwater surfaces on the dates shown. Groundwater level fluctuations should be anticipated throughout the year.

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1" = 5'
REVISED	

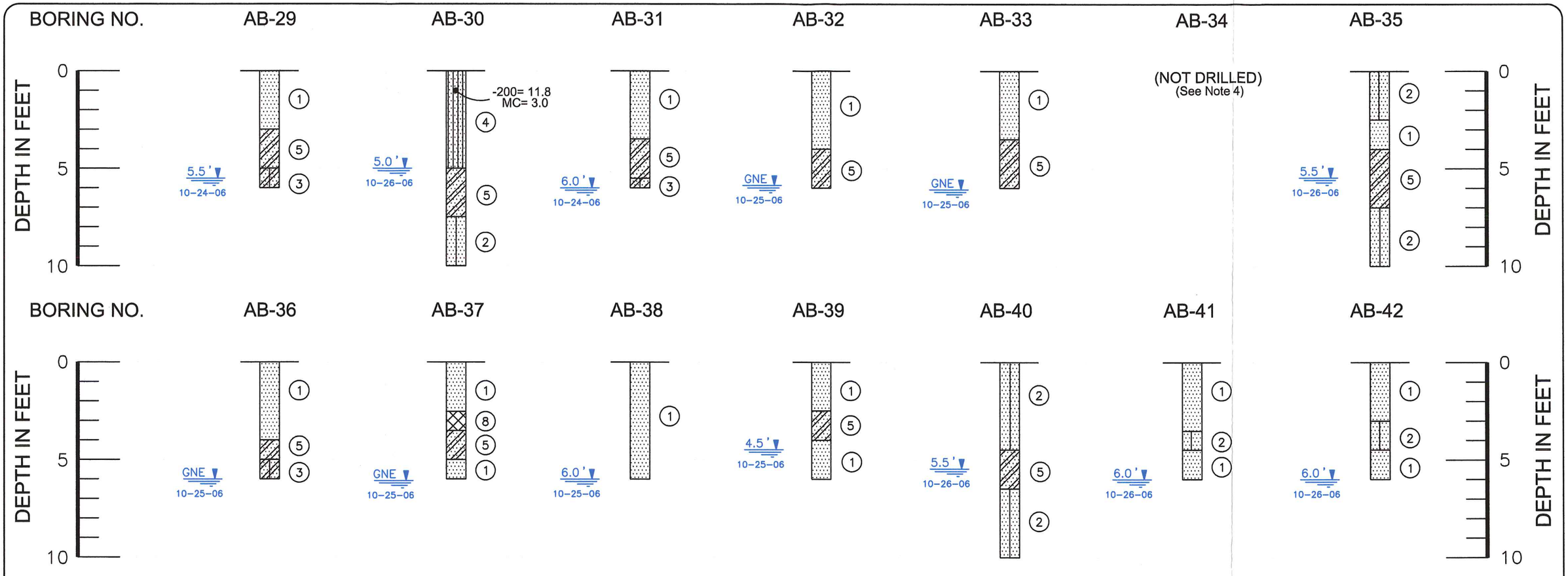
SUBSURFACE PROFILES

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.
Geotechnical Materials Testing/Inspection Environmental

DATE	PROJ. NO.	SHEET
12-11-06	06-11-2352	3B



LEGEND

(1) Gray, black, orange, white and brown SAND (A-3) In general, surficial soils contained some roots and deeper soils contained varying amounts of shell fragments. Surficial soils contained some subrounded fine gravel at some locations. Surficial soils in borings AB-22, AB-23 and AB-52 contained some hard cemented nodules. Roots were present in this unit in borings AB-99, AB-101 and AB-103 down to 3 to 4 feet below surface.

(2) Gray, brown and black SAND with silt (A-3). In general, surficial soils contained some roots and deeper soils contained varying amounts of shell fragments. This unit in boring AB-22 contained some fine subrounded gravel. This surficial unit in borings AB-30, AB-35 and AB-40 contained some cemented nodules.

(3) Gray and brown SAND with clay (A-3), In general, surficial soils contained some roots and deeper soils contained varying amounts shell fragments. A large piece of tree root was found in this unit in boring AB-47.

(4) Gray and brown slightly silty to silty SAND (A-2-4). Near surface soils contained some roots. Surficial soils contained some shell fragments at some locations. This unit contained some fine subrounded gravel at some locations. This unit contained some shell fragments in AB-13.

(5) Gray, orange and brown clayey SAND (A-2-4). This unit in boring AB-9 contained coarse llimestone fragments.

(6) Gray and brown sandy CLAY(A-6). Near surface soils contained some roots. Tree root pieces were found in boring AB-56 in this unit.

(7) Gray sandy SILT (A-4)

(8) Black and brown SAND with silt or silty SAND with some organics (A-3/A-2-4)(HARDPAN)

-200 – Amount passing U.S. Standard No. 200 Sieve (%)

MC – Moisture Content (%)

SP – Unified Soil Classification System Group Symbol (ASTM D 2487)

AB-29 – Auger boring and number

5.5 ' 10-24-06 – Depth of groundwater (feet) & date measured

GNE 10-25-06 – Groundwater level not encountered on date drilled

NOTES

(1) Borings were drilled on October 24, 25 and 26, using hand-turned augering equipment and truck mounted Mobile (B-47) drill rig.

(2) Strata boundaries are approximate and represent soil strata at each test hole location only. Soil transitions may be more gradual than implied.

(3) Groundwater depths shown on the subsurface profiles represent groundwater surfaces on the dates shown. Groundwater level fluctuations should be anticipated throughout the year.

(4) Boring AB-34 was not drilled due to the close proximity to mast arm boring TB-3.

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1" = 5'
REVISED	

SUBSURFACE PROFILES

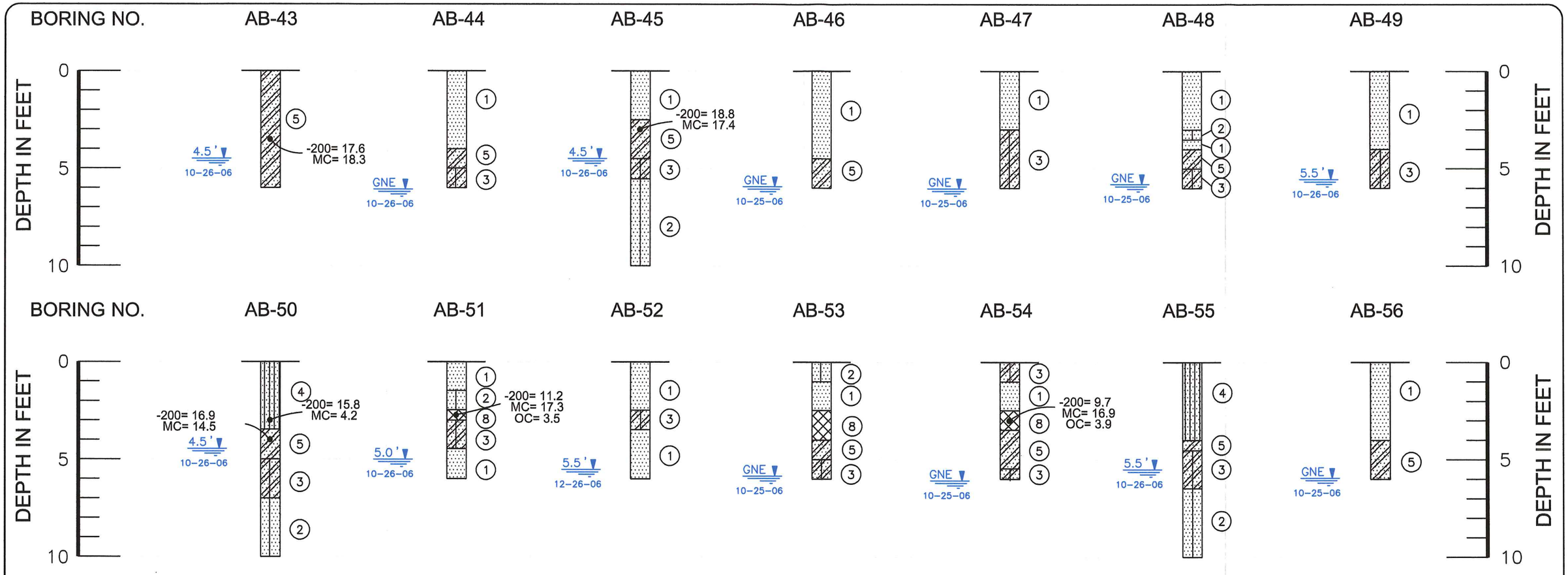
66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.

Geotechnical Materials Testing/Inspection Environmental

DATE	PROJ. NO.	SHEET
12-11-06	06-11-2352	3C



LEGEND

① Gray, black, orange, white and brown SAND (A-3) In general, surficial soils contained some roots and deeper soils contained varying amounts of shell fragments. Surficial soils contained some subrounded fine gravel at some locations. Surficial soils in borings AB-22, AB-23 and AB-52 contained some hard cemented nodules. Roots were present in this unit in borings AB-99, AB-101 and AB-103 down to 3 to 4 feet below surface.

② Gray, brown and black SAND with silt (A-3). In general, surficial soils contained some roots and deeper soils contained varying amounts of shell fragments. This unit in boring AB-22 contained some fine subrounded gravel. This surficial unit in borings AB-30, AB-35 and AB-40 contained some cemented nodules.

③ Gray and brown SAND with clay (A-3), In general, surficial soils contained some roots and deeper soils contained varying amounts shell fragments. A large piece of tree root was found in this unit in boring AB-47.

④ Gray and brown slightly silty to silty SAND (A-2-4). Near surface soils contained some roots. Surficial soils contained some shell fragments at some locations. This unit contained some fine subrounded gravel at some locations. This unit contained some shell fragments in AB-13.

⑤ Gray, orange and brown clayey SAND (A-2-4). This unit in boring AB-9 contained coarse llimestone fragments.

⑥ Gray and brown sandy CLAY(A-6). Near surface soils contained some roots. Tree root pieces were found in boring AB-56 in this unit.

⑦ Gray sandy SILT (A-4)

⑧ Black and brown SAND with silt or silty SAND with some organics (A-3/A-2-4)(HARDPAN)

-200 – Amount passing U.S. Standard No. 200 Sieve (%)

MC – Moisture Content (%)

OC – Organic Content (%)

SP – Unified Soil Classification System Group Symbol (ASTM D 2487)

AB-43 – Auger boring and number

4.5 ' 10-26-06 – Depth of groundwater (feet) & date measured

GNE 10-26-06 – Groundwater level not encountered on date drilled

NOTES

(1) Borings were drilled on October 25 and 26, 2006 using hand-turned augering equipment and truck mounted Mobile (B-47) drill rig.

(2) Strata boundaries are approximate and represent soil strata at each test hole location only. Soil transitions may be more gradual than implied.

(3) Groundwater depths shown on the subsurface profiles represent groundwater surfaces on the dates shown. Groundwater level fluctuations should be anticipated throughout the year.

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1" = 5'
REVISED	

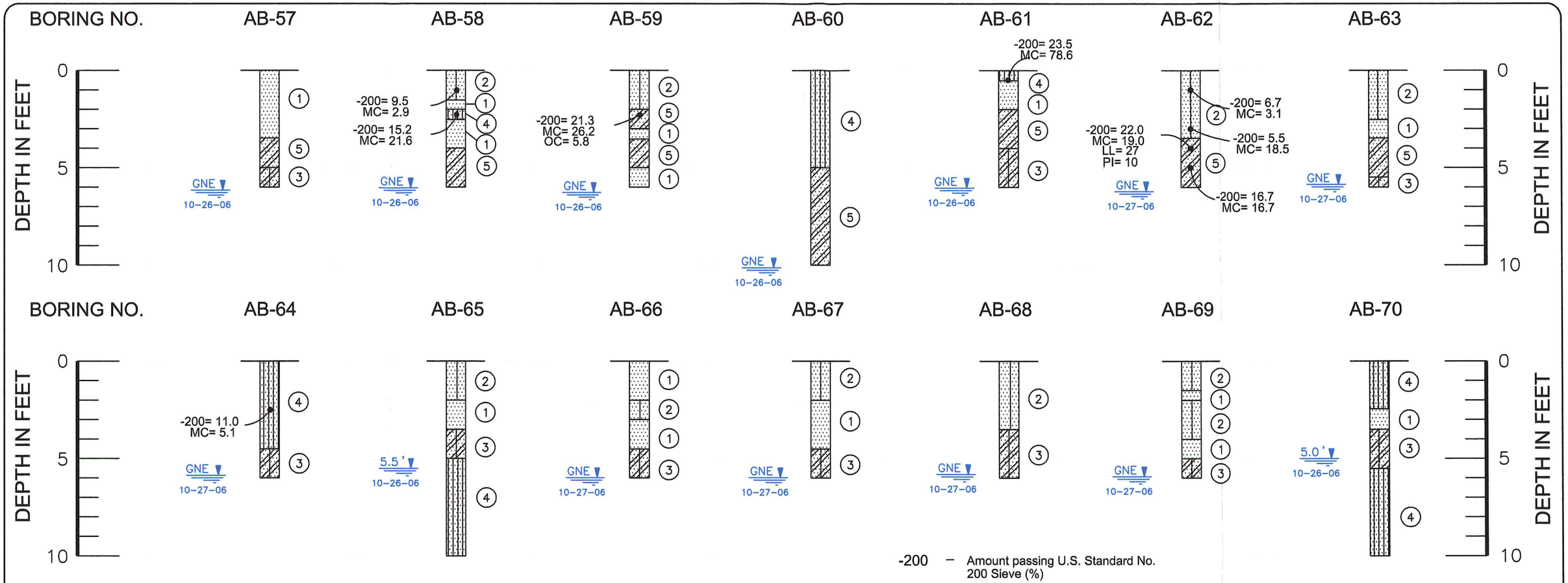
SUBSURFACE PROFILES

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.
Geotechnical Materials Testing/Inspection Environmental

DATE	PROJ. NO.	SHEET
12-11-06	06-11-2352	3D



LEGEND

1. Gray, black, orange, white and brown SAND (A-3) In general, surficial soils contained some roots and deeper soils contained varying amounts of shell fragments. Surficial soils contained some subrounded fine gravel at some locations. Surficial soils in borings AB-22, AB-23 and AB-52 contained some hard cemented nodules. Roots were present in this unit in borings AB-99, AB-101 and AB-103 down to 3 to 4 feet below surface.
2. Gray, brown and black SAND with silt (A-3). In general, surficial soils contained some roots and deeper soils contained varying amounts of shell fragments. This unit in boring AB-22 contained some fine subrounded gravel. This surficial unit in borings AB-30, AB-35 and AB-40 contained some cemented nodules.
3. Gray and brown SAND with clay (A-3), In general, surficial soils contained some roots and deeper soils contained varying amounts shell fragments. A large piece of tree root was found in this unit in boring AB-47.
4. Gray and brown slightly silty to silty SAND (A-2-4). Near surface soils contained some roots. Surficial soils contained some shell fragments at some locations. This unit contained some fine subrounded gravel at some locations. This unit contained some shell fragments in AB-13.
5. Gray, orange and brown clayey SAND (A-2-4). This unit in boring AB-9 contained coarse llimestone fragments.
6. Gray and brown sandy CLAY(A-6). Near surface soils contained some roots. Tree root pieces were found in boring AB-56 in this unit.
7. Gray sandy SILT (A-4)
8. Black and brown SAND with silt or silty SAND with some organics (A-3/A-2-4)(HARDPAN)

-200	Amount passing U.S. Standard No. 200 Sieve (%)
MC	Moisture Content (%)
OC	Organic Content (%)
LL	Liquid Limit (%)
PL	Plastic Limit (%)
SP	Unified Soil Classification System Group Symbol (ASTM D 2487)
AB-57	Auger boring and number
5.5' 10-26-06	Depth of groundwater (feet) & date measured
GNE 10-26-06	Groundwater level not encountered on date drilled

NOTES

(1) Borings were drilled on October 26, and 27, 2006 using hand-turned augering equipment and truck mounted Mobile (B-47) drill rig.

(2) Strata boundaries are approximate and represent soil strata at each test hole location only. Soil transitions may be more gradual than implied.

(3) Groundwater depths shown on the subsurface profiles represent groundwater surfaces on the dates shown. Groundwater level fluctuations should be anticipated throughout the year.

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1" = 5'
REVISED	

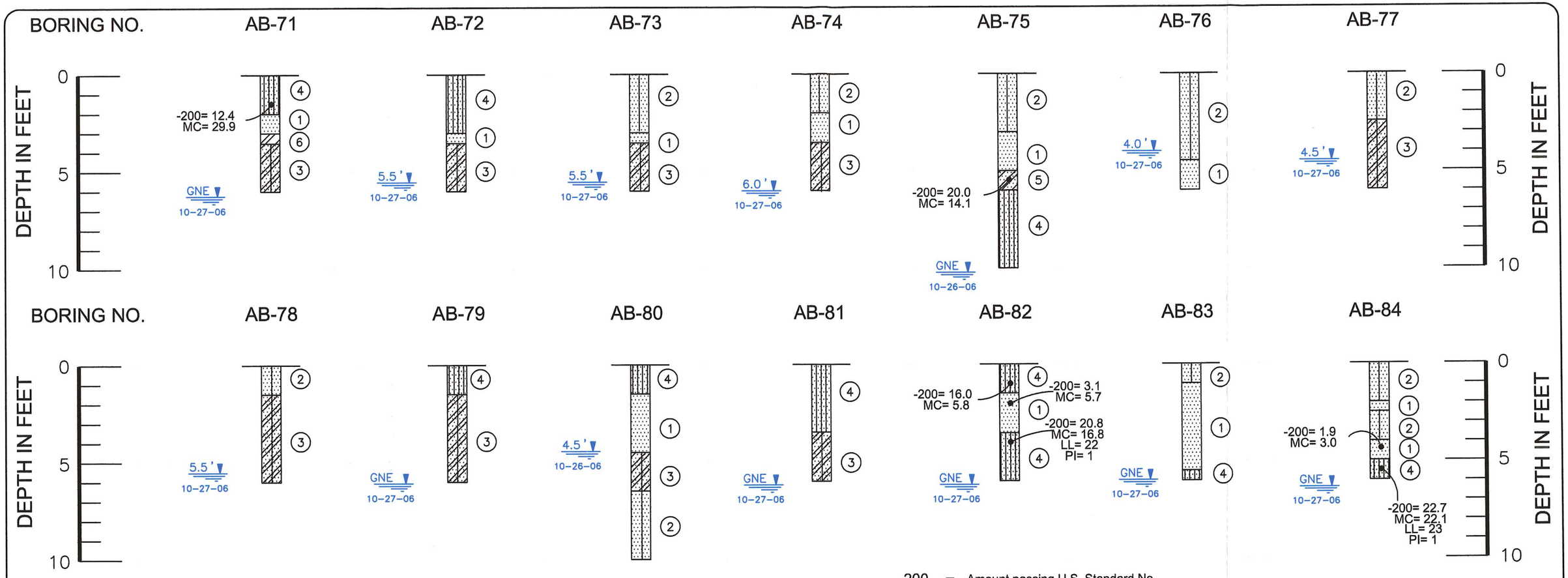
SUBSURFACE PROFILES

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.
Geotechnical Materials Testing/Inspection Environmental

DATE	PROJ. NO.	SHEET
12-11-06	06-11-2352	3E



LEGEND

① Gray, black, orange, white and brown SAND (A-3) In general, surficial soils contained some roots and deeper soils contained varying amounts of shell fragments. Surficial soils contained some subrounded fine gravel at some locations. Surficial soils in borings AB-22, AB-23 and AB-52 contained some hard cemented nodules. Roots were present in this unit in borings AB-99, AB-101 and AB-103 down to 3 to 4 feet below surface.

② Gray, brown and black SAND with silt (A-3). In general, surficial soils contained some roots and deeper soils contained varying amounts of shell fragments. This unit in boring AB-22 contained some fine subrounded gravel. This surficial unit in borings AB-30, AB-35 and AB-40 contained some cemented nodules.

③ Gray and brown SAND with clay (A-3), In general, surficial soils contained some roots and deeper soils contained varying amounts shell fragments. A large piece of tree root was found in this unit in boring AB-47.

④ Gray and brown slightly silty to silty SAND (A-2-4). Near surface soils contained some roots. Surficial soils contained some shell fragments at some locations. This unit contained some fine subrounded gravel at some locations. This unit contained some shell fragments in AB-13.

⑤ Gray, orange and brown clayey SAND (A-2-4). This unit in boring AB-9 contained coarse llimestone fragments.

⑥ Gray and brown sandy CLAY(A-6). Near surface soils contained some roots. Tree root pieces were found in boring AB-56 in this unit.

⑦ Gray sandy SILT (A-4)

⑧ Black and brown SAND with silt or silty SAND with some organics (A-3/A-2-4)(HARDPAN)

-200 – Amount passing U.S. Standard No. 200 Sieve (%)

MC – Moisture Content (%)

LL – Liquid Limit (%)

PL – Plastic Limit (%)

SP – Unified Soil Classification System Group Symbol (ASTM D 2487)

AB-71 – Auger boring and number

5.5' 10-27-06 – Depth of groundwater (feet) & date measured

GNE 10-27-06 – Groundwater level not encountered on date drilled

NOTES

(1) Borings were drilled on October 26 and 27, 2006 using hand-turned augering equipment and truck mounted Mobile (B-47) drill rig.

(2) Strata boundaries are approximate and represent soil strata at each test hole location only. Soil transitions may be more gradual than implied.

(3) Groundwater depths shown on the subsurface profiles represent groundwater surfaces on the dates shown. Groundwater level fluctuations should be anticipated throughout the year.

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1" = 5'
REVISED	

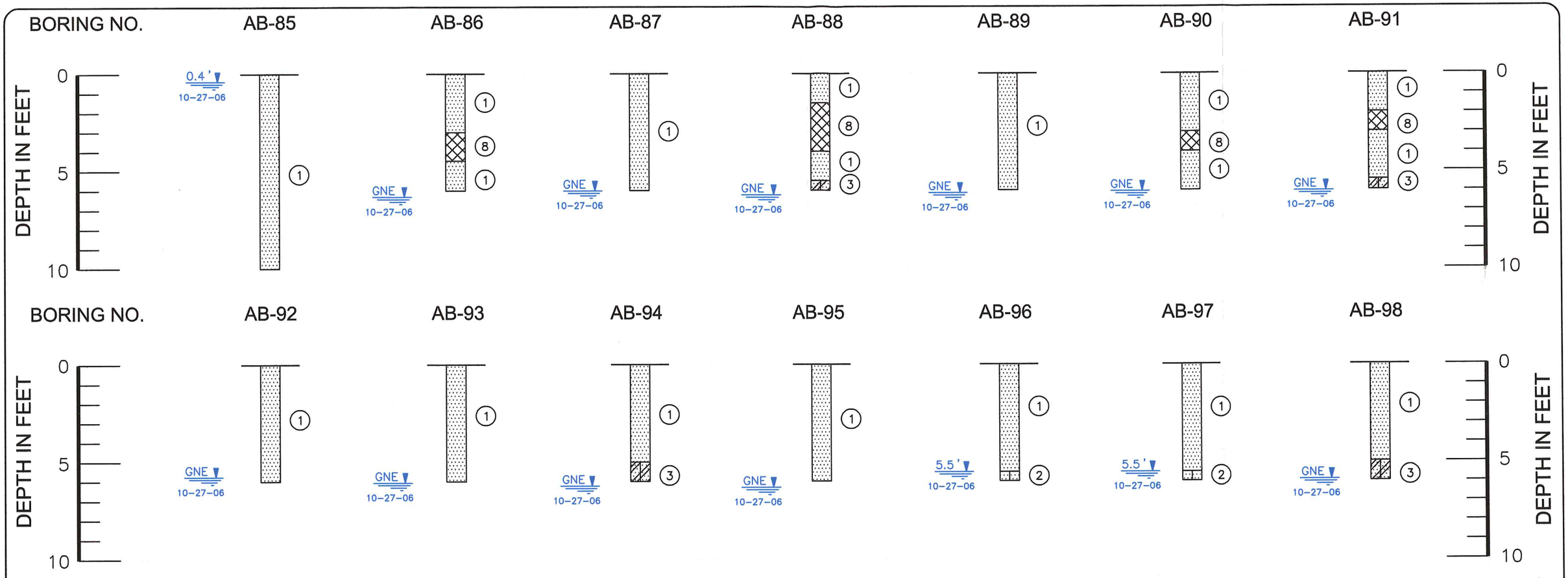
SUBSURFACE PROFILES

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.
Geotechnical Materials Testing/Inspection Environmental

DATE	PROJ. NO.	SHEET
12-11-06	06-11-2352	3F



LEGEND

1. Gray, black, orange, white and brown SAND (A-3) In general, surficial soils contained some roots and deeper soils contained varying amounts of shell fragments. Surficial soils contained some subrounded fine gravel at some locations. Surficial soils in borings AB-22, AB-23 and AB-52 contained some hard cemented nodules. Roots were present in this unit in borings AB-99, AB-101 and AB-103 down to 3 to 4 feet below surface.
2. Gray, brown and black SAND with silt (A-3). In general, surficial soils contained some roots and deeper soils contained varying amounts of shell fragments. This unit in boring AB-22 contained some fine subrounded gravel. This surficial unit in borings AB-30, AB-35 and AB-40 contained some cemented nodules.
3. Gray and brown SAND with clay (A-3), In general, surficial soils contained some roots and deeper soils contained varying amounts shell fragments. A large piece of tree root was found in this unit in boring AB-47.
4. Gray and brown slightly silty to silty SAND (A-2-4). Near surface soils contained some roots. Surficial soils contained some shell fragments at some locations. This unit contained some fine subrounded gravel at some locations. This unit contained some shell fragments in AB-13.
5. Gray, orange and brown clayey SAND (A-2-4). This unit in boring AB-9 contained coarse llimestone fragments.
6. Gray and brown sandy CLAY(A-6). Near surface soils contained some roots. Tree root pieces were found in boring AB-56 in this unit.
7. Gray sandy SILT (A-4)
8. Black and brown SAND with silt or silty SAND with some organics (A-3/A-2-4)(HARDPAN)

SP – Unified Soil Classification System Group Symbol (ASTM D 2487)

AB-85 – Auger boring and number

0.4 ' 10-27-06 – Depth of groundwater (feet) & date measured

GNE 10-27-06 – Groundwater level not encountered on date drilled

NOTES

(1) Borings were drilled on October 27, 2006 using hand-turned augering equipment and truck mounted Mobile (B-47) drill rig.

(2) Strata boundaries are approximate and represent soil strata at each test hole location only. Soil transitions may be more gradual than implied.

(3) Groundwater depths shown on the subsurface profiles represent groundwater surfaces on the dates shown. Groundwater level fluctuations should be anticipated throughout the year.

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1" = 5'
REVISED	

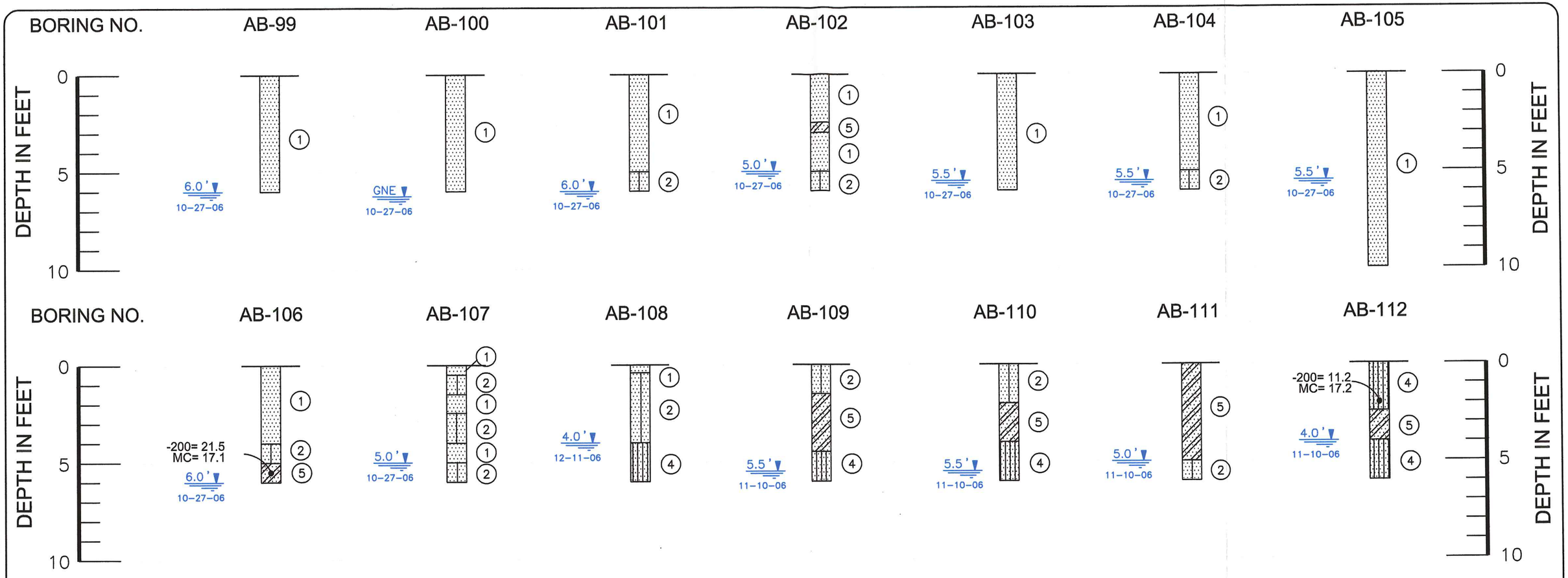
SUBSURFACE PROFILES

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.
Geotechnical Materials Testing/Inspection Environmental

DATE	PROJ. NO.	SHEET
12-11-06	06-11-2352	3G



LEGEND

(1) Gray, black, orange, white and brown SAND (A-3) In general, surficial soils contained some roots and deeper soils contained varying amounts of shell fragments. Surficial soils contained some subrounded fine gravel at some locations. Surficial soils in borings AB-22, AB-23 and AB-52 contained some hard cemented nodules. Roots were present in this unit in borings AB-99, AB-101 and AB-103 down to 3 to 4 feet below surface.

(2) Gray, brown and black SAND with silt (A-3). In general, surficial soils contained some roots and deeper soils contained varying amounts of shell fragments. This unit in boring AB-22 contained some fine subrounded gravel. This surficial unit in borings AB-30, AB-35 and AB-40 contained some cemented nodules.

(3) Gray and brown SAND with clay (A-3), In general, surficial soils contained some roots and deeper soils contained varying amounts shell fragments. A large piece of tree root was found in this unit in boring AB-47.

(4) Gray and brown slightly silty to silty SAND (A-2-4). Near surface soils contained some roots. Surficial soils contained some shell fragments at some locations. This unit contained some fine subrounded gravel at some locations. This unit contained some shell fragments in AB-13.

(5) Gray, orange and brown clayey SAND (A-2-4). This unit in boring AB-9 contained coarse llimestone fragments.

(6) Gray and brown sandy CLAY(A-6). Near surface soils contained some roots. Tree root pieces were found in boring AB-56 in this unit.

(7) Gray sandy SILT (A-4)

(8) Black and brown SAND with silt or silty SAND with some organics (A-3/A-2-4)(HARDPAN)

-200 – Amount passing U.S. Standard No. 200 Sieve (%)

MC – Moisture Content (%)

SP – Unified Soil Classification System Group Symbol (ASTM D 2487)

AB-99 – Auger boring and number

6.0 ' / 10-27-06 – Depth of groundwater (feet) & date measured

GNE / 10-27-06 – Groundwater level not encountered on date drilled

NOTES

(1) Borings were drilled on October 27, November 10 and 11, 2006 using hand-turned augering eqipment and truck mounted Mobile (B-47) drill rig.

(2) Strata boundaries are approximate and represent soil strata at each test hole location only. Soil transitions may be more gradual than implied.

(3) Groundwater depths shown on the subsurface profiles represent groundwater surfaces on the dates shown. Groundwater level fluctuations should be anticipated throughout the year.

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1" = 5'
REVISED	

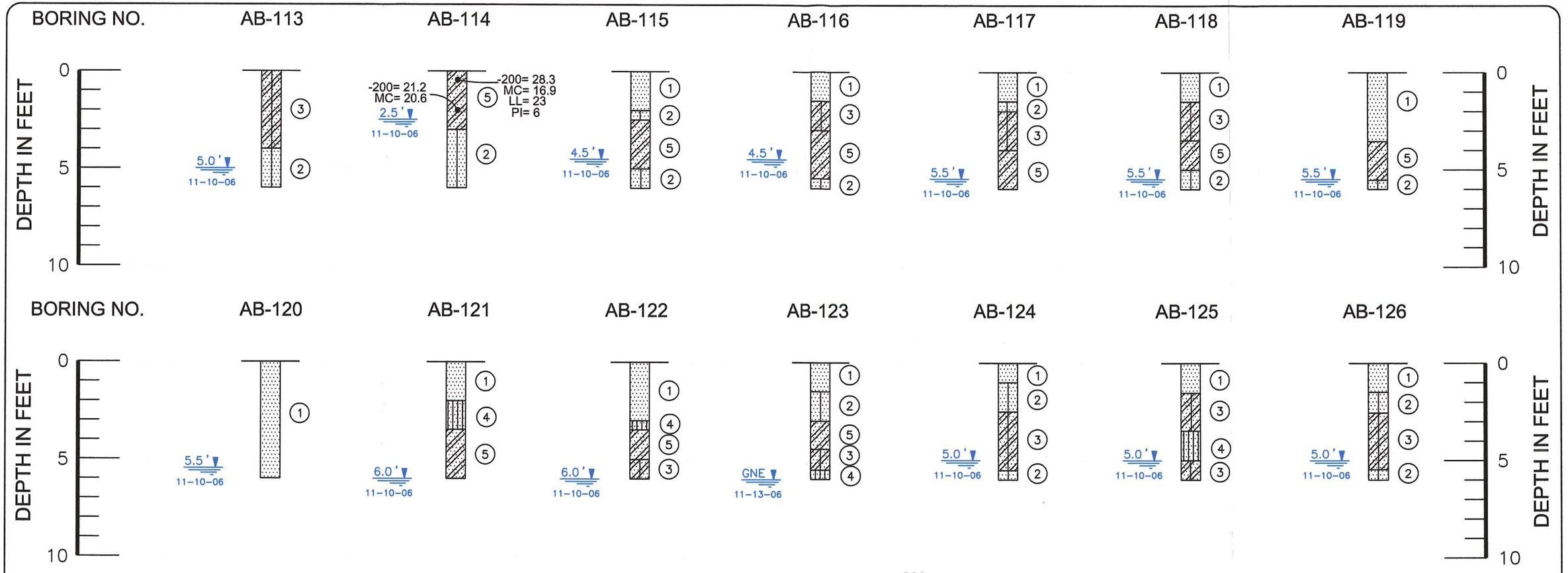
SUBSURFACE PROFILES

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.
Geotechnical Materials Testing/Inspection Environmental

DATE	PROJ. NO.	SHEET
12-11-06	06-11-2352	3H



LEGEND

(1) Gray, black, orange, white and brown SAND (A-3) In general, surficial soils contained some roots and deeper soils contained varying amounts of shell fragments. Surficial soils contained some subrounded fine gravel at some locations. Surficial soils in borings AB-22, AB-23 and AB-52 contained some hard cemented nodules. Roots were present in this unit in borings AB-99, AB-101 and AB-103 down to 3 to 4 feet below surface.

(2) Gray, brown and black SAND with silt (A-3). In general, surficial soils contained some roots and deeper soils contained varying amounts of shell fragments. This unit in boring AB-22 contained some fine subrounded gravel. This surficial unit in borings AB-30, AB-35 and AB-40 contained some cemented nodules.

(3) Gray and brown SAND with clay (A-3), In general, surficial soils contained some roots and deeper soils contained varying amounts shell fragments. A large piece of tree root was found in this unit in boring AB-47.

(4) Gray and brown slightly silty to silty SAND (A-2-4). Near surface soils contained some roots. Surficial soils contained some shell fragments at some locations. This unit contained some fine subrounded gravel at some locations. This unit contained some shell fragments in AB-13.

(5) Gray, orange and brown clayey SAND (A-2-4). This unit in boring AB-9 contained coarse llimestone fragments.

(6) Gray and brown sandy CLAY(A-6). Near surface soils contained some roots. Tree root pieces were found in boring AB-56 in this unit.

(7) Gray sandy SILT (A-4)

(8) Black and brown SAND with silt or silty SAND with some organics (A-3/A-2-4)(HARDPAN)

-200 – Amount passing U.S. Standard No. 200 Sieve (%)

MC – Moisture Content (%)

LL – Liquid Limit (%)

PL – Plastic Limit (%)

SP – Unified Soil Classification System Group Symbol (ASTM D 2487)

AB-113 – Auger boring and number

5.0 ' 11-10-06 – Depth of groundwater (feet) & date measured

GNE 11-13-06 – Groundwater level not encountered on date drilled

NOTES

(1) Borings were drilled on November 10 and 13, 2006 using hand-turned augering equipment.

(2) Strata boundaries are approximate and represent soil strata at each test hole location only. Soil transitions may be more gradual than implied.

(3) Groundwater depths shown on the subsurface profiles represent groundwater surfaces on the dates shown. Groundwater level fluctuations should be anticipated throughout the year.

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1" = 5'
REVISED	

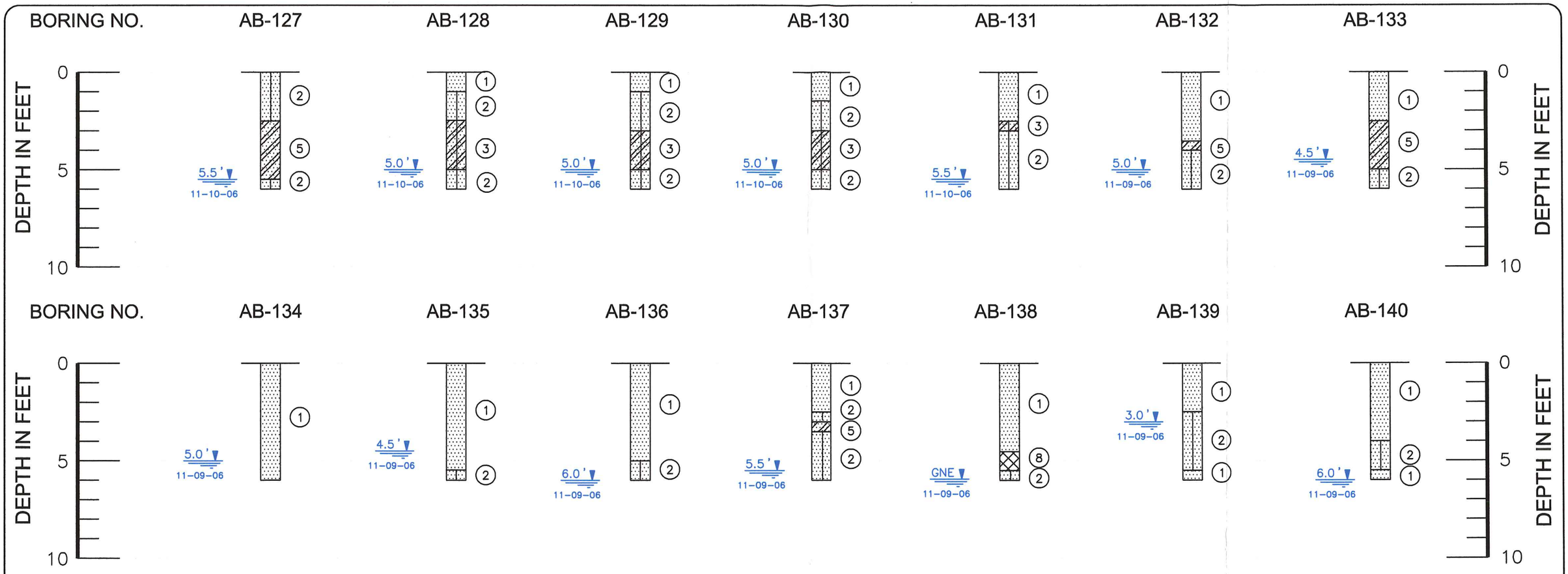
SUBSURFACE PROFILES

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.
Geotechnical Materials Testing/Inspection Environmental

DATE	PROJ. NO.	SHEET
12-11-06	06-11-2352	31



LEGEND

(1) Gray, black, orange, white and brown SAND (A-3) In general, surficial soils contained some roots and deeper soils contained varying amounts of shell fragments. Surficial soils contained some subrounded fine gravel at some locations. Surficial soils in borings AB-22, AB-23 and AB-52 contained some hard cemented nodules. Roots were present in this unit in borings AB-99, AB-101 and AB-103 down to 3 to 4 feet below surface.

(2) Gray, brown and black SAND with silt (A-3). In general, surficial soils contained some roots and deeper soils contained varying amounts of shell fragments. This unit in boring AB-22 contained some fine subrounded gravel. This surficial unit in borings AB-30, AB-35 and AB-40 contained some cemented nodules.

(3) Gray and brown SAND with clay (A-3), In general, surficial soils contained some roots and deeper soils contained varying amounts shell fragments. A large piece of tree root was found in this unit in boring AB-47.

(4) Gray and brown slightly silty to silty SAND (A-2-4). Near surface soils contained some roots. Surficial soils contained some shell fragments at some locations. This unit contained some fine subrounded gravel at some locations. This unit contained some shell fragments in AB-13.

(5) Gray, orange and brown clayey SAND (A-2-4). This unit in boring AB-9 contained coarse llimestone fragments.

(6) Gray and brown sandy CLAY(A-6). Near surface soils contained some roots. Tree root pieces were found in boring AB-56 in this unit.

(7) Gray sandy SILT (A-4)

(8) Black and brown SAND with silt or silty SAND with some organics (A-3/A-2-4)(HARDPAN)

SP – Unified Soil Classification System Group Symbol (ASTM D 2487)

AB-127 – Auger boring and number

5.5 ' / 11-10-06 – Depth of groundwater (feet) & date measured

GNE / 11-09-06 – Groundwater level not encountered on date drilled

NOTES

(1) Borings were drilled on November 9 and 10, 2006 using hand-turned augering equipment.

(2) Strata boundaries are approximate and represent soil strata at each test hole location only. Soil transitions may be more gradual than implied.

(3) Groundwater depths shown on the subsurface profiles represent groundwater surfaces on the dates shown. Groundwater level fluctuations should be anticipated throughout the year.

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1" = 5'
REVISED	

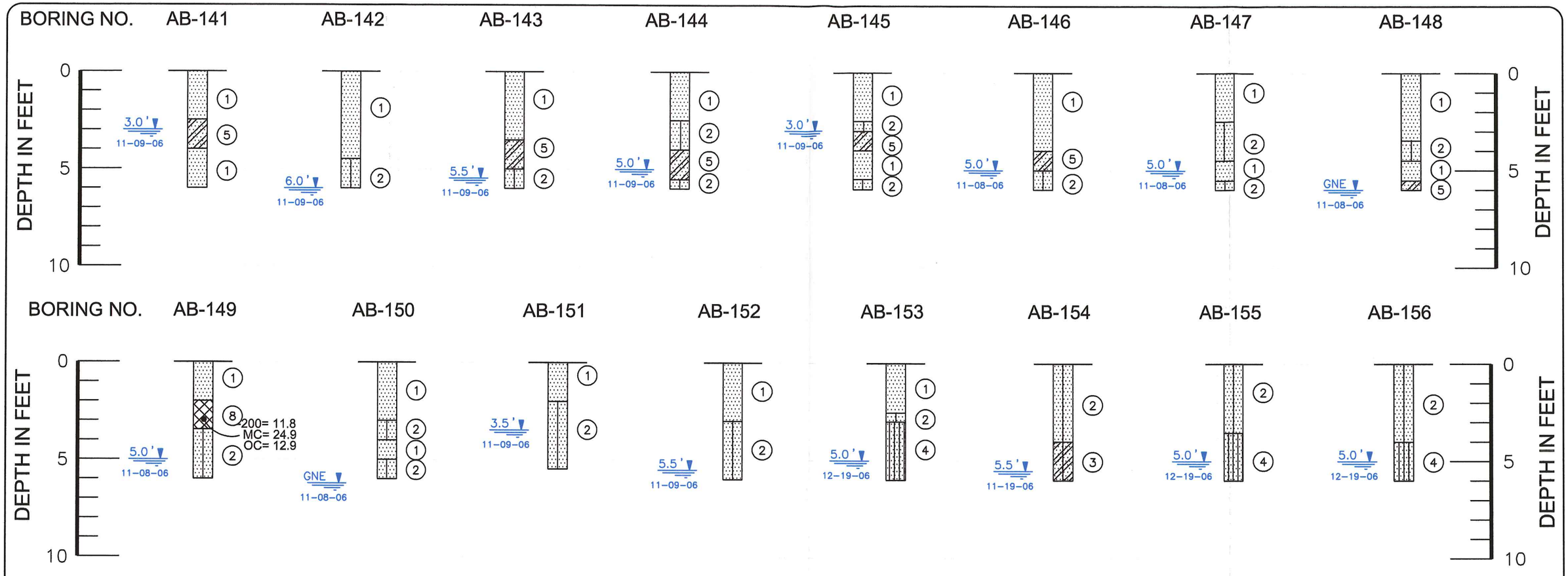
SUBSURFACE PROFILES

66TH AVENUE WIDENING

INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.
Geotechnical Materials Testing/Inspection Environmental

DATE	PROJ. NO.	SHEET
12-11-06	06-11-2352	3J



LEGEND

1. Gray, black, orange, white and brown SAND (A-3) In general, surficial soils contained some roots and deeper soils contained varying amounts of shell fragments. Surficial soils contained some subrounded fine gravel at some locations. Surficial soils in borings AB-22, AB-23 and AB-52 contained some hard cemented nodules. Roots were present in this unit in borings AB-99, AB-101 and AB-103 down to 3 to 4 feet below surface.

2. Gray, brown and black SAND with silt (A-3). In general, surficial soils contained some roots and deeper soils contained varying amounts of shell fragments. This unit in boring AB-22 contained some fine subrounded gravel. This surficial unit in borings AB-30, AB-35 and AB-40 contained some cemented nodules.

3. Gray and brown SAND with clay (A-3), In general, surficial soils contained some roots and deeper soils contained varying amounts shell fragments. A large piece of tree root was found in this unit in boring AB-47.

4. Gray and brown slightly silty to silty SAND (A-2-4). Near surface soils contained some roots. Surficial soils contained some shell fragments at some locations. This unit contained some fine subrounded gravel at some locations. This unit contained some shell fragments in AB-13.

5. Gray, orange and brown clayey SAND (A-2-4). This unit in boring AB-9 contained coarse llimestone fragments.

6. Gray and brown sandy CLAY(A-6). Near surface soils contained some roots. Tree root pieces were found in boring AB-56 in this unit.

7. Gray sandy SILT (A-4)

8. Black and brown SAND with silt or silty SAND with some organics (A-3/A-2-4)(HARDPAN)

-200 – Amount passing U.S. Standard No. 200 Sieve (%)

MC – Moisture Content (%)

OC – Organic Content (%)

SP – Unified Soil Classification System Group Symbol (ASTM D 2487)

AB-141 – Auger boring and number

3.0' 11-09-06 – Depth of groundwater (feet) & date measured

GNE 11-08-06 – Groundwater level not encountered on date drilled

NOTES

(1) Borings were drilled on November 8, 9 and December 19, 2006 using hand-turned augering equipment.

(2) Strata boundaries are approximate and represent soil strata at each test hole location only. Soil transitions may be more gradual than implied.

(3) Groundwater depths shown on the subsurface profiles represent groundwater surfaces on the dates shown. Groundwater level fluctuations should be anticipated throughout the year.

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1" = 5'
REVISED	

SUBSURFACE PROFILES

66TH AVENUE ROADWAY WIDENING

INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.
Geotechnical Materials Testing/Inspection Environmental

DATE	PROJ. NO.	SHEET
12-21-06	06-11-2352	3K

LEGEND

(1) Gray, black, orange, white and brown SAND (SP)(A-3) In general, surficial soils contained some roots and deeper soils contained varying amounts of shell fragments.

(2) Gray, brown and black SAND with silt (SP-SM)(A-3). In general, surficial soils contained some roots and deeper soils contained varying amounts of shell fragments.

(3) Gray and brown SAND with clay (SP-SC)(A-3). In general, deeper soils contained varying amounts shell fragments.

(4) Gray and brown slightly silty to silty SAND (SM)(A-2-4).

(5) Gray, orange and brown clayey SAND (SC)(A-2-4).

(6) Gray and brown sandy CLAY (CL)(A-6).

(7) Gray sandy SILT (ML)(A-4)

(8) Black and brown SAND with silt or silty SAND with some organics (SP-SM/SM)(A-3/A-2-4)(HARDPAN)

N – Indicates the number of blows of a 140 pound hammer, freely falling a distance of 30 inches, required to drive a 2-inch diameter sampler 12 inches (ASTM D 1586)

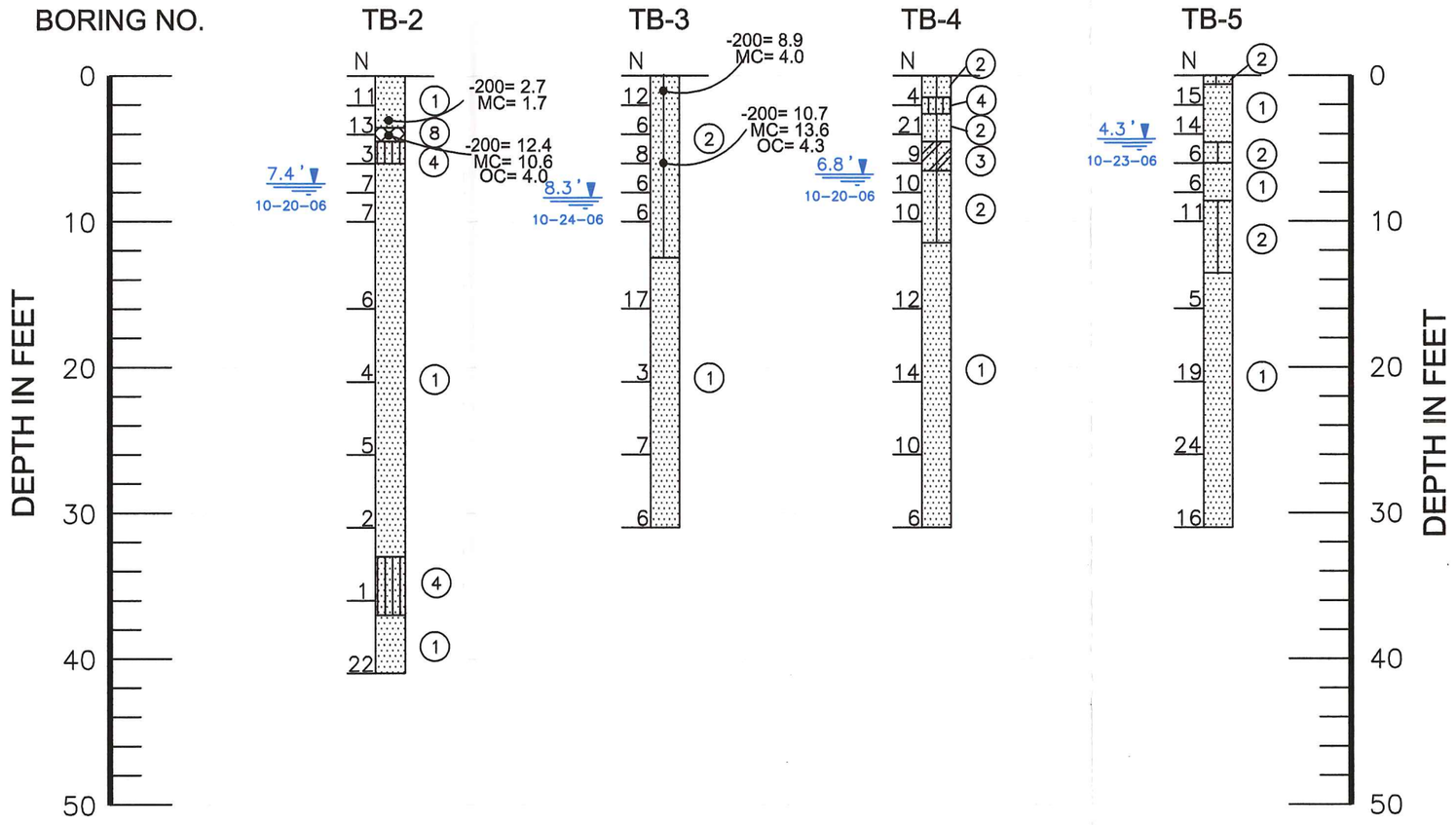
-200 – Amount passing U.S. Standard No. 200 Sieve (%)

MC – Moisture Content (%)

SP – Unified Soil Classification System Group Symbol (ASTM D 2487)

TB-1 – Standard Penetration Test (SPT) boring and number

7.4 ' 10–23–06 – Depth of groundwater (feet) & date measured



NOTES

(1) Borings were drilled on October 20, 23 and 24, 2006 using a Mobile (B-47) drill rig.

(2) Strata boundaries are approximate and represent soil strata at each test hole location only. Soil transitions may be more gradual than implied.

(3) Groundwater depths shown on the subsurface profiles represent groundwater surfaces on the dates shown. Groundwater level fluctuations should be anticipated throughout the year.

DRAWN	GD
CHECKED	MB
APPROVED	CLM
SCALE	1" = 10'
REVISED	

SUBSURFACE PROFILES
66TH AVENUE ROADWAY WIDENING
MASTARM LOCATIONS
INDIAN RIVER COUNTY, FLORIDA

DUNKELBERGER ENGINEERING & TESTING, INC.
Geotechnical Materials Testing/Inspection Environmental

DATE	PROJ. NO.	SHEET
12-11-06	06-11-2352	3L

MUCK PROBE RESULTS

MUCK PROBE NUMBER	MUCK THICKNESS (INCHES)	
	AT EDGES	AT MIDDLE
MP-1	6	12
MP-2	6	12
MP-3	-	12
MP-4	-	12
MP-5	6	12 - 18
MP-6	6	12 - 18
MP-7	12	24 - 30
MP-8	6 - 12	18 - 24
MP-9	6 - 12	24 - 30
MP-10	6 - 12	12 - 24
MP-11	< 6	12
MP-12	6 - 12	12 - 24
MP-13	6 - 12	24 - 30
MP-14	6	24 - 30
MP-15	3 - 6	12 - 24
MP-16	3 - 6	12 - 24
MP-17	6	18 - 24
MP-18	6	18 - 24
MP-19	6 - 12	24
MP-20	6 - 12	24
MP-21	12 - 24	24 - 36
MP22	12 - 24	24 - 36
MP-23	-	0*
MP-24	-	6 - 12
MP-25	-	6 - 12
MP-26	-	6 - 12
MP-27	-	6 - 12
MP-28	-	6 - 12
MP-29	-	6 - 12
MP-30	-	6 - 12
MP-31	12	12 - 24
MP-32	6	6 - 12
MP-33	6 - 18	18 - 24

* Cleaned out during our site visit. Organic stained sand.was present at the bottom of the canal.

PROJECT No.	SHEET No.
06-11-2352	5

DATE OF SURVEY: DECEMBER 2006
SURVEY MADE BY: M. BAHIRADHAN
SUBMITTED BY: M. BAHIRADHAN
PROJECT No. 06-11-2352

ROAD NAME.: 66TH AVENUE ROADWAY WIDENING
CITY: VERO BEACH
COUNTY: INDIAN RIVER

CROSS SECTION SOIL SURVEY
66TH AVENUE ROADWAY WIDENING

	ORGANIC CONTENT			SIEVE ANALYSIS						ATTERBERG LIMITS (%)			SOIL TYPE	
STRATUM NO.	NO. OF TESTS	% ORGANIC	% MOISTURE	NO. OF TESTS	% PASSING 10 MESH	% PASSING 40 MESH	% PASSING 60 MESH	% PASSING 100 MESH	% PASSING 200 MESH	NO. OF TESTS	LIQUID LIMIT	PLASTICITY INDEX	AASHTO GROUP	MATERIAL DESCRIPTION
1	3	–	1.7–5.7	3	–	–	–	–	1.9–3.1	–	–	–	A–3	Gray, black, orange, brown and white SAND (SP)
2	1	6.1	21.3	6	–	–	–	–	5.5–9.5	–	–	–	A–3	Gray, brown and black SAND with silt (SP–SM)
3	–	–	–	–	–	–	–	–	–	–	–	–	A–3	Gray and brown SAND with clay (SP–SC)
4	1	4.3	13.6	14	–	–	–	–	10.7–25.0	2	22–23	1	A–2–4	Gray and brown slightly silty to silty SAND (SP–SM/SM)
5	1	5.8	26.2	15	–	–	–	–	14.1–28.3	3	22–27	6–10	A–2–4	Gray, orange and brown clayey SAND (SC)
6	1	–	25.6	1	–	–	–	–	57.7	1	33	15	A–6	Gray and brown sandy CLAY (CL)
7**	–	–	–	–	–	–	–	–	–	–	–	–	A–4	Gray sandy SILT (ML)
8	4	3.5–12.9	10.6–24.9	4	–	–	–	–	9.7–12.4	–	–	–	A–2–4	Black slightly silty to silty SAND with organics (SP–SM/SM)

**– Stratum 7 soils were only encountered in bridge borings TB–6 and TB–7 below the depth of 37 feet,

GENERAL LEGEND

AASHTO – AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS SOIL CLASSIFICATION SYSTEM (ASTM D 3282)

NOTES

(1) Embankment construction shall be in accordance with FDOT Standard Index No. 505.

(2) The materials from Strata Nos 1, 2, 3 , 4 and 8 are considered "select" soils per Index No. 505.

(3) The material from Strata No. 5, 6 and 7 are considered "plastic" per Index No. 505 and should be removed in accordance with Index 500, where the minimum separation between the bottom of the baserock and the top of the Strata 5, 6 and 7 clayey/silty soils is less than 24 inches.

(4) Strata 5, 6 and 7 soils may be placed uniformly in the lower portion of the embankment (see Index No. 505) for some distances along the project rather than full depth for short distances.

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

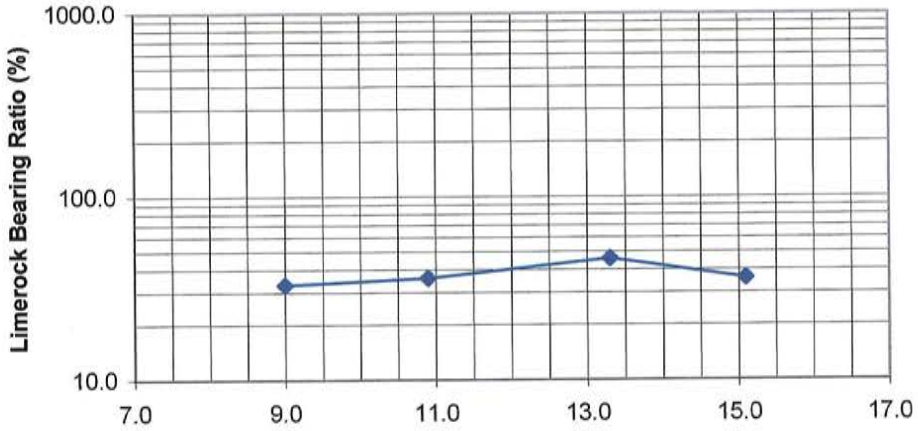
DUNKELBERGER ENGINEERING & TESTING, INC.
Geotechnical • Materials Testing/Inspection • Environmental

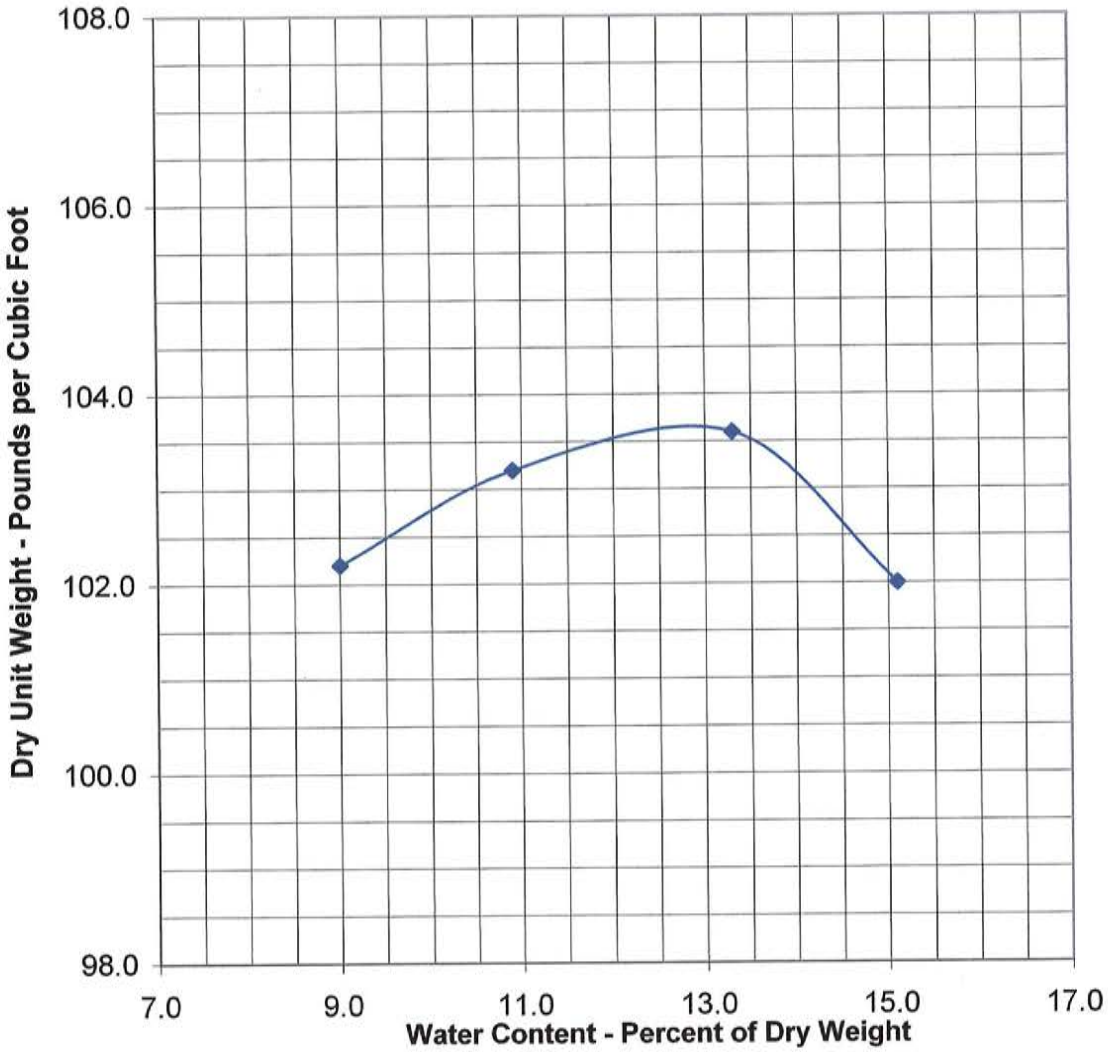
APPROVED BY :
Chris L. Mings, P.E.
FL REG. No. 61556
DATE :04-10-07

ROADWAY SOIL SURVEY
66TH AVENUE ROADWAY WIDENING
INDIAN RIVER COUNTY, FL

APPENDIX A

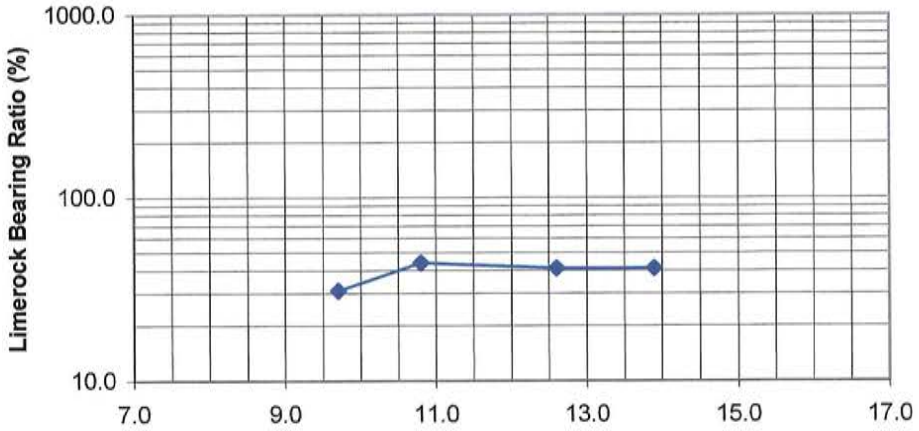
LBR TEST RESULTS

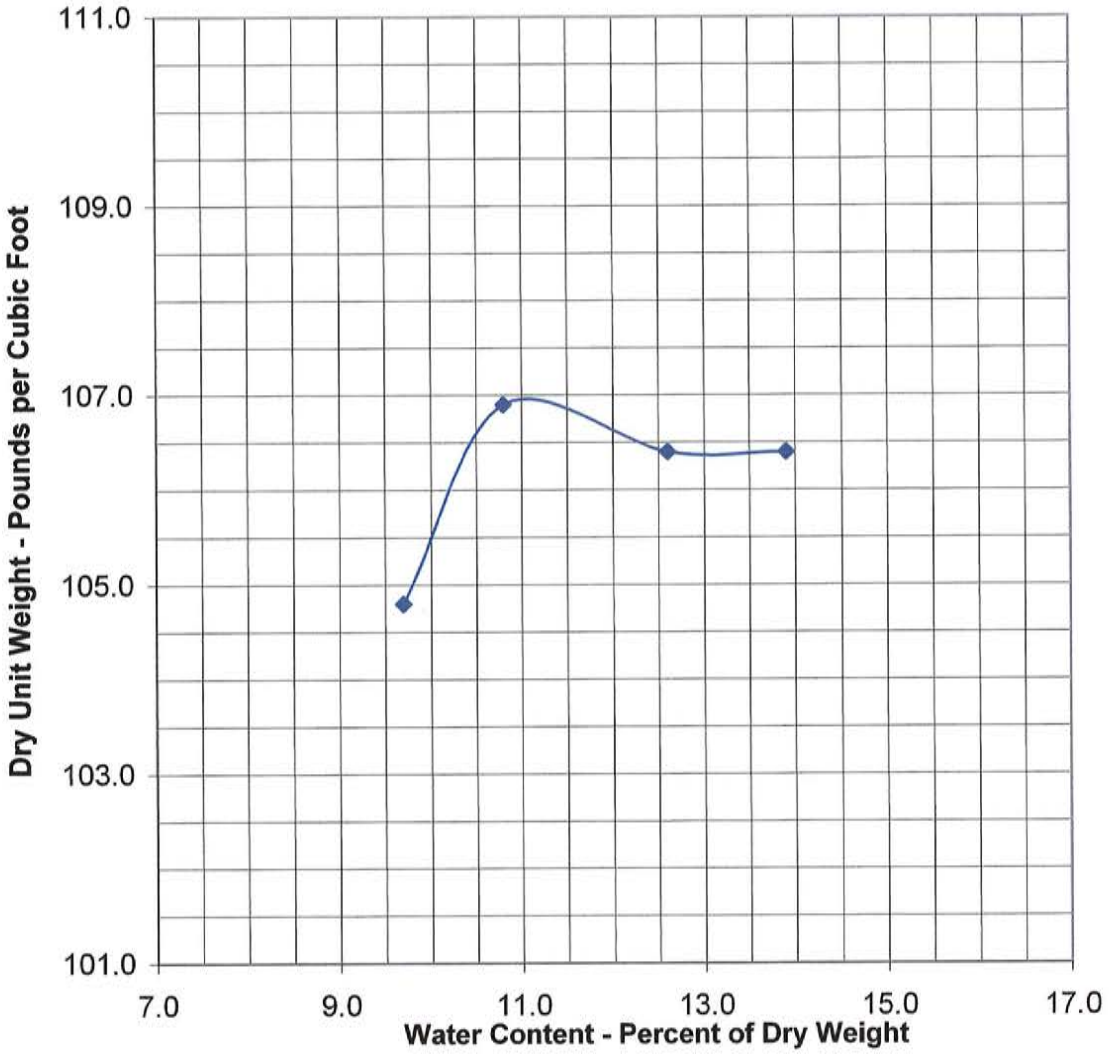




SUMMARY OF TEST RESULTS		LIMEROCK BEARING RATIO		
MAXIMUM LBR VALUE (%):	46	66th Avenue Widening Indian River County, Florida		
MAXIMUM DRY DENSITY (pcf):	104			
OPTIMUM WATER CONTENT (%):	13	DE&T	DUNKELBERGER ENGINEERING & TESTING, INC. GEOTECHNICAL-MATERIALS TESTING-INSPECTION-ENVIRONMENTAL	
SAMPLE NO:	8002	Tested By: AG	Test Date: 11-28-06	Project No.: 06-11-2352
LOCATION:	Structure AB-50, on site subgrade	Checked By: TP	Report Date: 12-19-06	Sheet No.: 1 of 1
MATERIAL:	Gray fine to medium SAND (-200: 4.0%)	cc: Client...(2)		
PROJECT REQUIREMENTS: 40 SOIL CLASS: A-3		FM 5-515 Limerock Bearing Ratio Manual of Florida Sampling and Testing Methods		2352LBR1, 8002

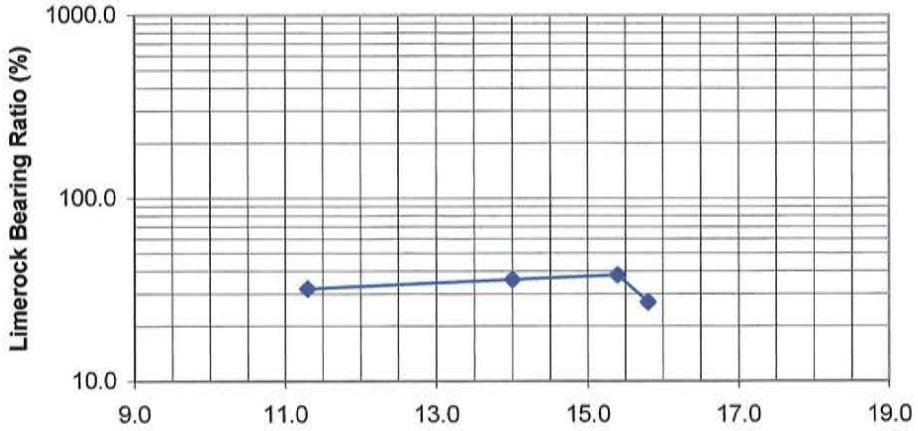
Craig E. Dunkelberger, P.E.
FL Registration No. 49932

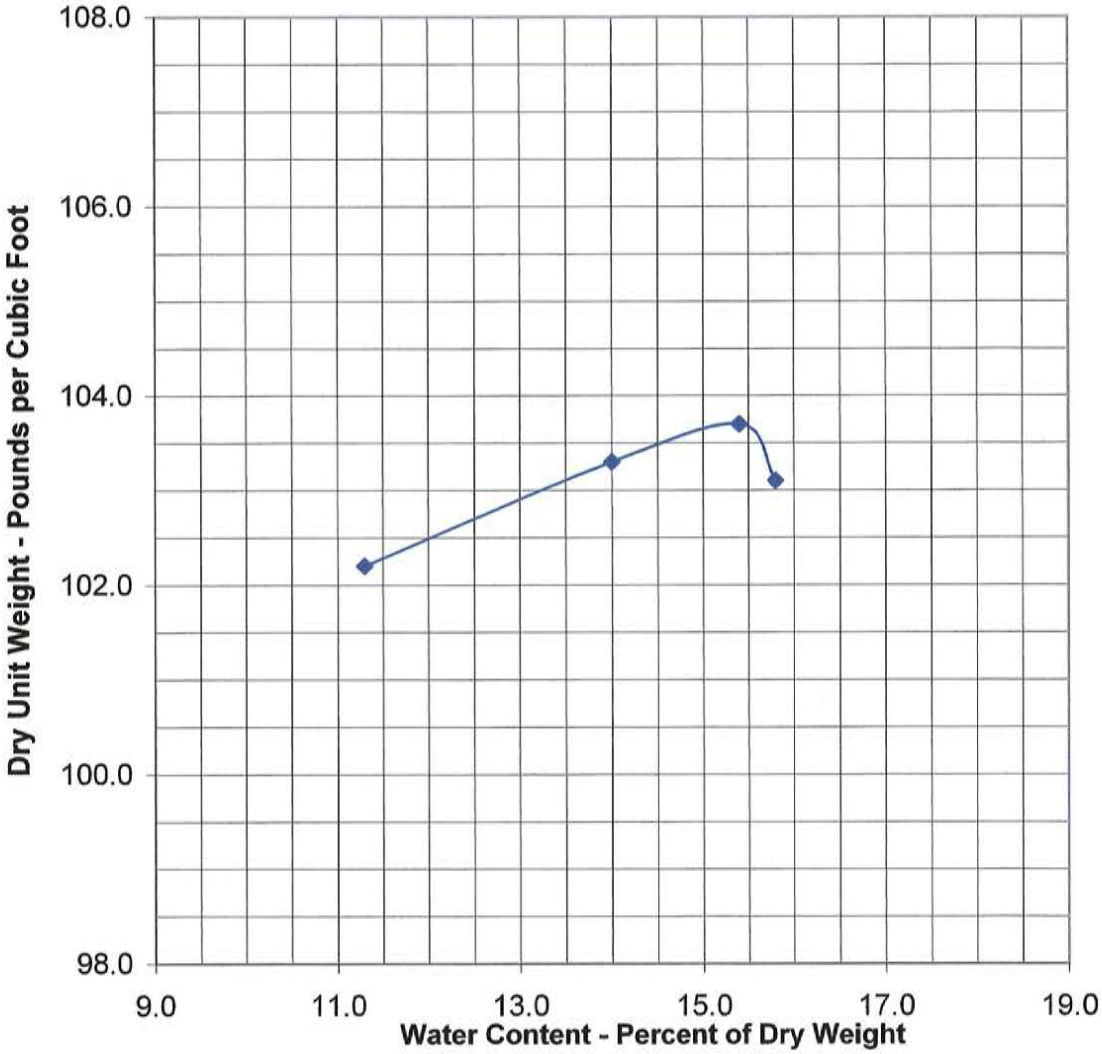




SUMMARY OF TEST RESULTS		LIMEROCK BEARING RATIO		
MAXIMUM LBR VALUE (%):	44	66th Avenue Widening Indian River County, Florida		
MAXIMUM DRY DENSITY (pcf):	107			
OPTIMUM WATER CONTENT (%):	11	DE&T	DUNKELBERGER ENGINEERING & TESTING, INC. GEOTECHNICAL-MATERIALS TESTING-INSPECTION-ENVIRONMENTAL	
SAMPLE NO:	8003	Tested By: AG	Test Date: 12-11-06	Project No.: 06-11-2352
LOCATION:	Structure AB-60, on site subgrade	Checked By: TP	Report Date: 12-19-06	Sheet No.: 1 of 1
MATERIAL:	Brown-tan medium to fine SAND (-200: 3.0%)	cc: Client...(2)		
PROJECT REQUIREMENTS: 40 SOIL CLASS: A-3		FM 5-515 Limerock Bearing Ratio Manual of Florida Sampling and Testing Methods		2352LBR2, 8003

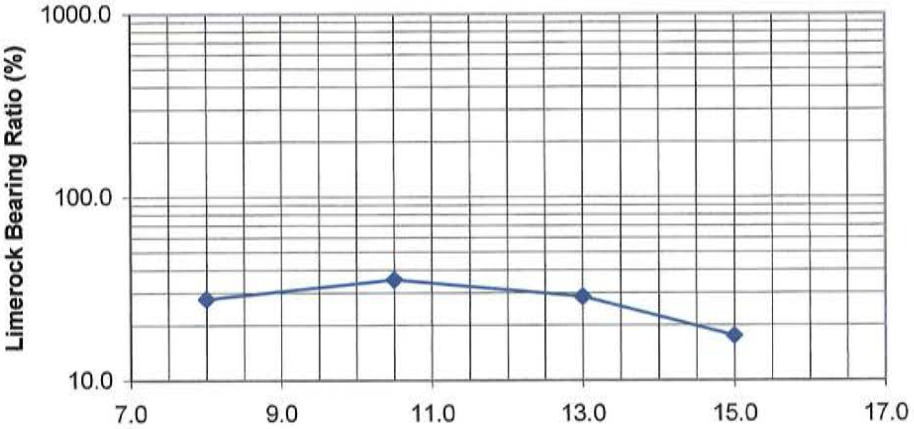
Craig E. Dunkelberger, P.E.
FL Registration No. 49932

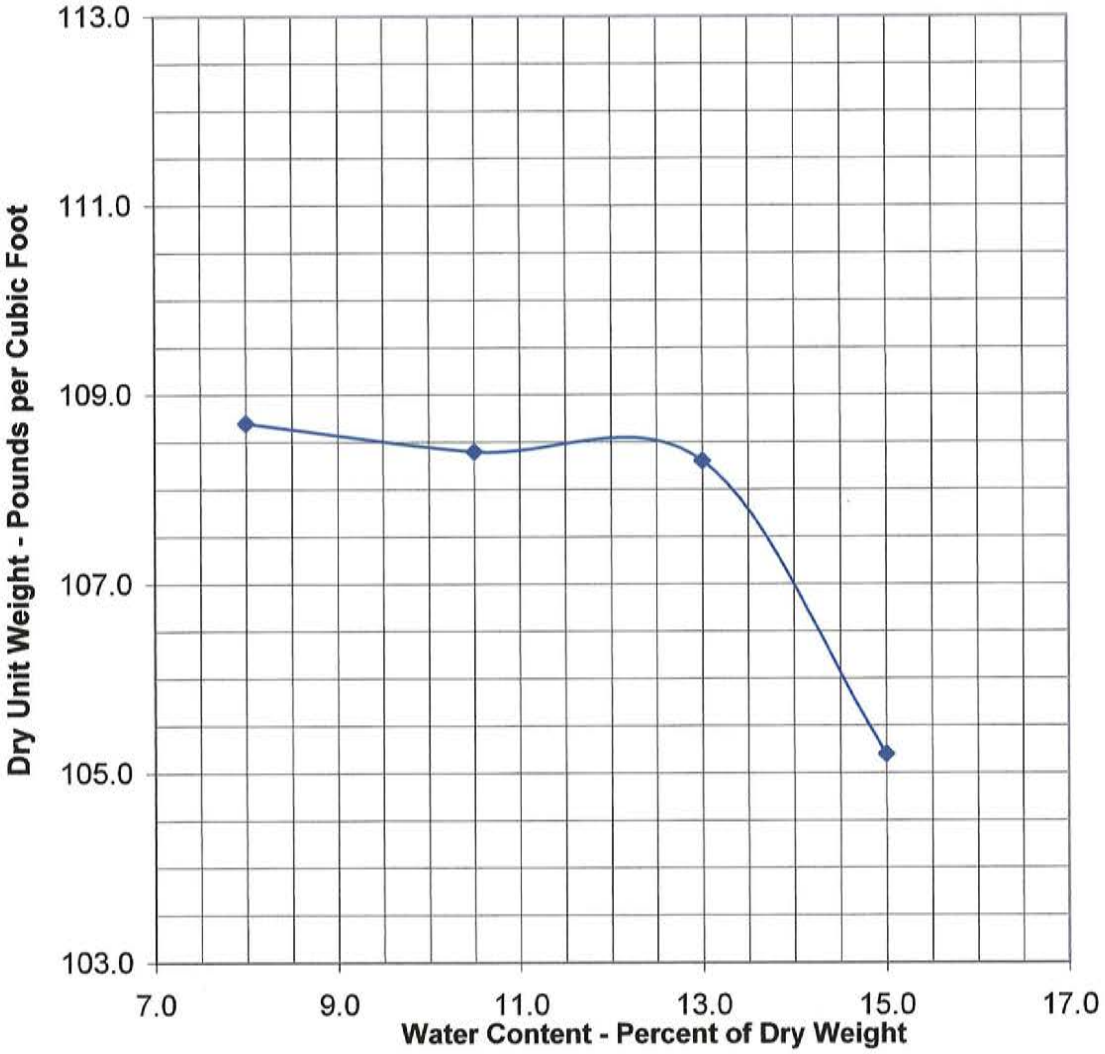




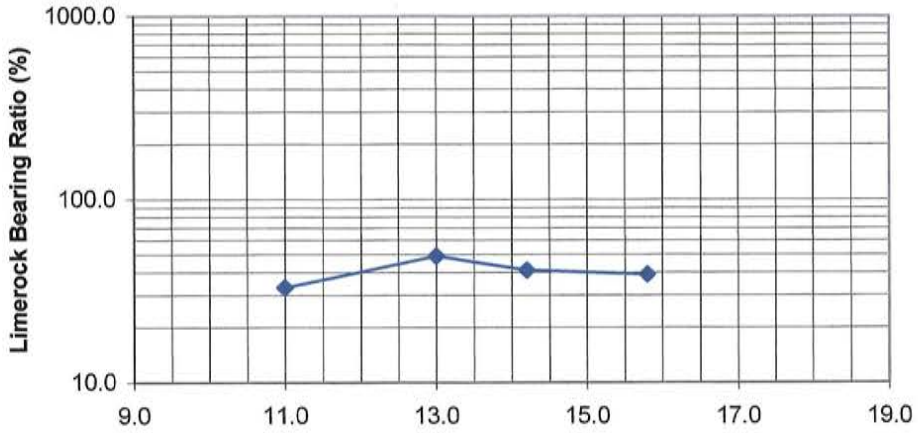
SUMMARY OF TEST RESULTS		LIMEROCK BEARING RATIO		
MAXIMUM LBR VALUE (%):	38	66th Avenue Widening		
MAXIMUM DRY DENSITY (pcf):	104	Indian River County, Florida		
OPTIMUM WATER CONTENT (%):	15	DE&T	DUNKELBERGER ENGINEERING & TESTING, INC. GEOTECHNICAL-MATERIALS TESTING-INSPECTION-ENVIRONMENTAL	
SAMPLE NO:	8004	Tested By: AG	Test Date: 11-28-06	Project No.: 06-11-2352
LOCATION:	Structure AB-87, on site subgrade	Checked By: TP	Report Date: 01-16-07	Sheet No.: 1 of 1
MATERIAL:	Black-tan medium to fine SAND (-200: 5.0%)	cc: Client...(2)		
PROJECT REQUIREMENTS: 40 SOIL CLASS: A-3		FM 5-515 Limerock Bearing Ratio Manual of Florida Sampling and Testing Methods		2352LBR3, 8004

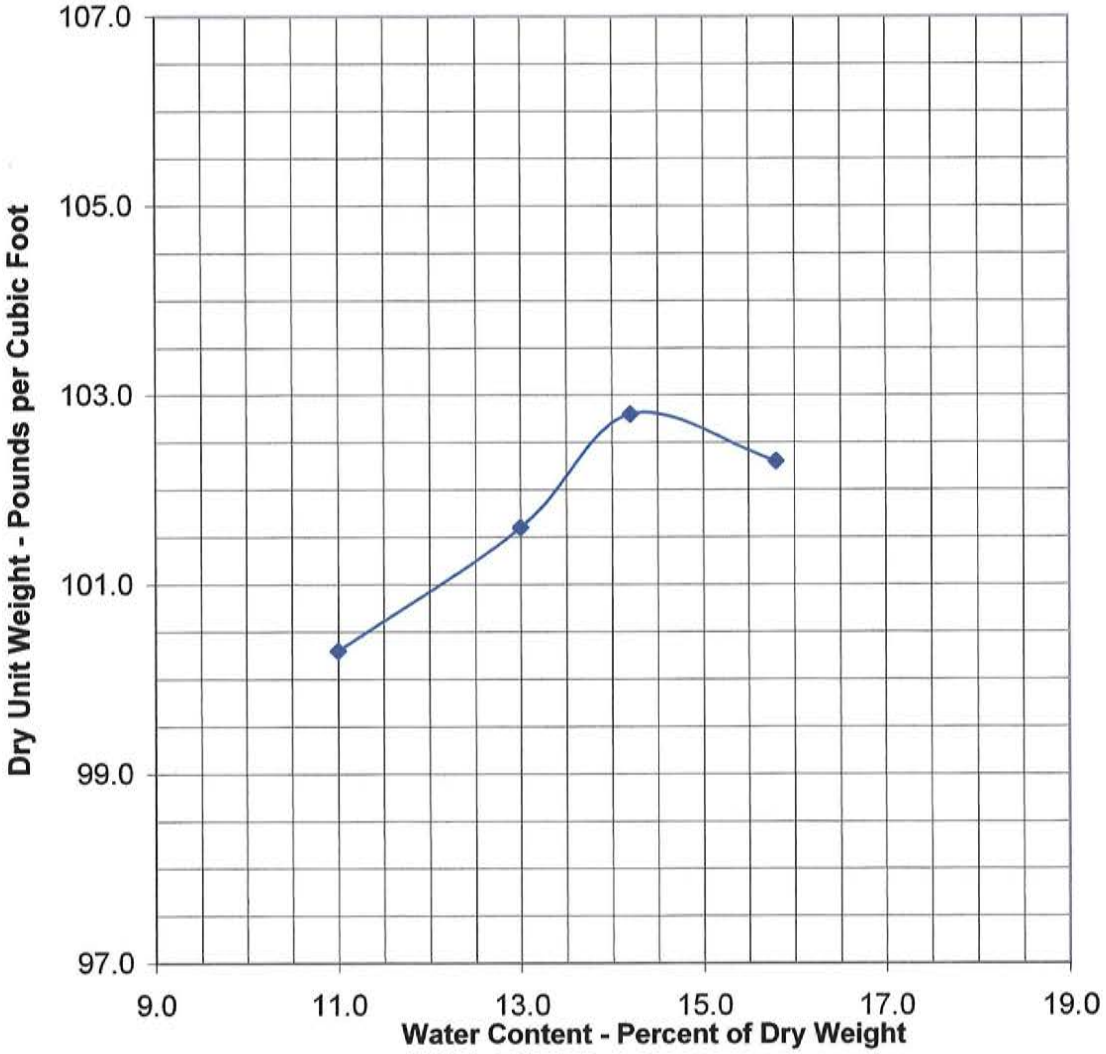
Craig E. Dunkelberger, P.E.
FL Registration No. 49932





SUMMARY OF TEST RESULTS		LIMEROCK BEARING RATIO		
MAXIMUM LBR VALUE (%):	28	66th Avenue Widening		
MAXIMUM DRY DENSITY (pcf):	109	Indian River County, Florida		
OPTIMUM WATER CONTENT (%):	8	DE&T	DUNKELBERGER ENGINEERING & TESTING, INC. GEOTECHNICAL-MATERIALS TESTING-INSPECTION-ENVIRONMENTAL	
SAMPLE NO:	8005	Tested By: AG	Test Date: 12-19-06	Project No.: 06-11-2352
LOCATION:	Structure AB-94, on site subgrade	Checked By: TP	Report Date: 01-16-07	Sheet No.: 1 of 1
MATERIAL:	Brown fine to medium SAND (-200: 5.0%)	cc: Client...(2)		
			Craig E. Dunkelberger, P.E. FL Registration No. 49932	
PROJECT REQUIREMENTS: 40 SOIL CLASS: A-3		FM 5-515 Limerock Bearing Ratio Manual of Florida Sampling and Testing Methods		2352LBR4, 8005





SUMMARY OF TEST RESULTS		LIMEROCK BEARING RATIO		
MAXIMUM LBR VALUE (%):	41	66th Avenue Widening		
MAXIMUM DRY DENSITY (pcf):	103	Indian River County, Florida		
OPTIMUM WATER CONTENT (%):	14	DE&T	DUNKELBERGER ENGINEERING & TESTING, INC. GEOTECHNICAL-MATERIALS TESTING-INSPECTION-ENVIRONMENTAL	
SAMPLE NO:	8006	Tested By: AG	Test Date: 12-18-06	Project No.: 06-11-2352
LOCATION:	Structure AB-105, on site subgrade	Checked By: TP	Report Date: 01-16-07	Sheet No.: 1 of 1
MATERIAL:	Gray medium to fine SAND (-200: 2.0%)	cc: Client...(2)		
PROJECT REQUIREMENTS: 40 SOIL CLASS: A-3		FM 5-515 Limerock Bearing Ratio Manual of Florida Sampling and Testing Methods		2352LBR5, 8006

Craig E. Dunkelberger, P.E.
FL Registration No. 49932

APPENDIX B

CORROSION SERIES TEST RESULTS

Jupiter Environmental Laboratories, Inc.
150 S. Old Dixie Highway
Jupiter, FL 33458
Phone: (561)575-0030
Fax: (561)575-4118

SAMPLE ANALYTE COUNT

LOG# 617365
Project ID: 06-11-2363 66th ave widening

Lab ID	Sample ID	Method	Analytes Reported
617365001	SAMPLE #1	EPA 120.1	1
		EPA 9045	1
		SW-846 9056	2
617365002	SAMPLE #2	EPA 120.1	1
		EPA 9045	1
		SW-846 9056	2
617365003	SAMPLE #3	EPA 120.1	1
		EPA 9045	1
		SW-846 9056	2
617365004	SAMPLE #4	EPA 120.1	1
		EPA 9045	1
		SW-846 9056	2
617365005	SAMPLE #5	EPA 120.1	1
		EPA 9045	1
		SW-846 9056	2

Jupiter Environmental Laboratories, Inc.
150 S. Old Dixie Highway
Jupiter, FL 33458
Phone: (561)575-0030
Fax: (561)575-4118

SAMPLE SUMMARY

LOG# 617365
Project ID: 06-11-2363 66th ave widening

Lab ID	Sample ID	Matrix	Date Collected	Date Received
617365001	SAMPLE #1	Soil/Solid/Sediment	11/15/2006 00:00	11/20/2006 08:44
617365002	SAMPLE #2	Soil/Solid/Sediment	11/15/2006 00:00	11/20/2006 08:44
617365003	SAMPLE #3	Soil/Solid/Sediment	11/15/2006 00:00	11/20/2006 08:44
617365004	SAMPLE #4	Soil/Solid/Sediment	11/15/2006 00:00	11/20/2006 08:44
617365005	SAMPLE #5	Soil/Solid/Sediment	11/15/2006 00:00	11/20/2006 08:44

Jupiter Environmental Laboratories, Inc.
150 S. Old Dixie Highway
Jupiter, FL 33458
Phone: (561)575-0030
Fax: (561)575-4118

ANALYTICAL RESULTS

LOG# 617365
Project ID: 06-11-2363 66th ave widening

Lab ID: **617365001** Date Received: 11/20/2006 Matrix: Soil/Solid/Sediment
Sample ID: **SAMPLE #1** Date Collected: 11/15/2006

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	By	Analyzed	By	Qual	CAS
Analysis Desc: Resistivity by EPA 120.1 (W) [REF] (W)			Analytical Method: EPA 120.1								
Resistivity	170	ohm-cm			1			11/20/06	SS		
Analysis Desc: Sulfate by SW-846 9056 [REF] (S)			Analytical Method: SW-846 9056								
Sulfate	U	mg/Kg	50		1			11/28/06	ESC	J	14808-79-8
Chloride	10	mg/Kg	10		1			11/28/06	ESC		16887-00-6
Analysis Desc: Corrosivity (pH) by EPA 9045			Analytical Method: EPA 9045								
Corrosivity (pH)	8.50	-log[H+]			1			11/20/06	SS		

FDOH# E86546

CERTIFICATE OF ANALYSIS

Jupiter Environmental Laboratories, Inc.
150 S. Old Dixie Highway
Jupiter, FL 33458
Phone: (561)575-0030
Fax: (561)575-4118

ANALYTICAL RESULTS

LOG# 617365
Project ID: 06-11-2363 66th ave widening

Lab ID: **617365002** Date Received: 11/20/2006 Matrix: Soil/Solid/Sediment
Sample ID: **SAMPLE #2** Date Collected: 11/15/2006

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	By	Analyzed	By	Qual	CAS
Analysis Desc: Resistivity by EPA 120.1 (W) [REF] (W)		Analytical Method: EPA 120.1									
Resistivity	150	ohm-cm			1			11/20/06	SS		
Analysis Desc: Sulfate by SW-846 9056 [REF] (S)		Analytical Method: SW-846 9056									
Sulfate	U	mg/Kg	50		1			11/28/06	ESC	J	14808-79-8
Chloride	U	mg/Kg	10		1			11/28/06	ESC	J	16887-00-6
Analysis Desc: Corrosivity (pH) by EPA 9045		Analytical Method: EPA 9045									
Corrosivity (pH)	8.05	-log[H+]			1			11/20/06	SS		

FDOH# E86546

CERTIFICATE OF ANALYSIS

Jupiter
Environmental Laboratories, Inc.

Jupiter Environmental Laboratories, Inc.
150 S. Old Dixie Highway
Jupiter, FL 33458
Phone: (561)575-0030
Fax: (561)575-4118

ANALYTICAL RESULTS

LOG# 617365
Project ID: 06-11-2363 66th ave widening

Lab ID: **617365003** Date Received: 11/20/2006 Matrix: Soil/Solid/Sediment
Sample ID: **SAMPLE #3** Date Collected: 11/15/2006

Parameters	Results	Units	Report Limit	MDL	DF	Prepared By	Analyzed	By	Qual	CAS
Analysis Desc: Resistivity by EPA 120.1 (W) [REF] (W)		Analytical Method: EPA 120.1								
Resistivity	42	ohm-cm			1		11/20/06	SS		
Analysis Desc: Sulfate by SW-846 9056 [REF] (S)		Analytical Method: SW-846 9056								
Sulfate	U	mg/Kg	50		1		11/28/06	ESC	J	14808-79-8
Chloride	U	mg/Kg	10		1		11/28/06	ESC	J	16887-00-6
Analysis Desc: Corrosivity (pH) by EPA 9045		Analytical Method: EPA 9045								
Corrosivity (pH)	7.55	-log[H+]			1		11/20/06	SS		

FDOH# E86546

CERTIFICATE OF ANALYSIS

nelac

Jupiter Environmental Laboratories, Inc.
150 S. Old Dixie Highway
Jupiter, FL 33458
Phone: (561)575-0030
Fax: (561)575-4118

ANALYTICAL RESULTS QUALIFIERS

LOG# 617365
Project ID: 06-11-2363 66th ave widening

PARAMETER QUALIFIERS

J	Estimated value.
[]	

SUBCONTRACTOR NELAC CERTIFICATION

617365	ESC = E87487

FDOH# E86546

CERTIFICATE OF ANALYSIS