ADDENDUM

ADDENDUM NO: 1
IMPROVEMENTS to PAVILION LAKE PIERS, DOCKS and GANGWAYS
DATE: 3/26/2020

BID NO: 01-2020
BID OPENING DATE: April 6th, 2020 @ 4:00PM.

NUMBER OF PAGES: 24

This Addendum to the drawings, specifications and contract documents is issued to provide additional information and clarification to the original bid specifications and bid form and is hereby declared a part of the original drawings, specifications and contract documents. In case of conflict, this Addendum shall govern.

Bidders shall acknowledge receipt of this Addendum by inserting this Addendum in the attachment section of the Bid Form.

Description: RFI Questions and Answers

1. Will the COVID-19 outbreak effect the bidding process at all?

No. The process remains the same. Review and approval may be extended.

2. Would Manta Ray MR-SR Earth Anchors be allowed as alternate to helical anchors?

Alternate soil anchors are acceptable but must be designed by a specialty engineer and have a minimum working / service load capacity of 24 tons. Signed and sealed design calculations and anchor specifications must be submitted to our office for review.

3. In our experience in working with Truline seawall, the project time of 150 days is very very short to complete this scope professionally. MCG would request a time to complete extension.

The City agrees to add an additional thirty (30) calendar days to the project. Substantial completion shall be one hundred fifty (150) calendar days, Final completion shall be one hundred eighty (180) calendar days.

4. What is the Engineer's estimate for this project?

See #5 below.

5. What is the Owner's budget for this project?

There is no separate budget for this project. The City will use grant funds and draw the balance from the Capitol Projects fund.

6. What is the anticipated start date of construction?

The City anticipates a May start date. However, this can change due to COVID-19 consequences.

7. Special Conditions – Part 1 – Permits: Please confirm Contractor is required obtain and pay all fees associated with City Building Permit.

The Contractor is required to obtain City permits, however, the permit fees will be waived.

8. What assumptions should be made by the Bidder as it relates to the existing asphalt drives occupied by Recreational vehicles (RV's)? it appears that currently most all spaces are occupied and rear ends of some RV's are within a few feet of the construction limits. This will prohibit the use of heavy land equipment to construct the work in a continuous and efficient manner.

Work areas will be vacated for construction.

9. Does the City have any agreements or arrangements to work with Torry Island Campground to vacate or relocate RV's so Contractor can continuously access the work from land or is it the City's intent to require work to be performed from barges and with small equipment intermittently around RV's?

The contractor can assume the area will be vacant. The city will move all campers away from the area. Means and methods are the contractor's choice.

10. Plans Page C-08, Seawall Detail calls for a 12" tall cap but beam schedule on Plans Page S-1.00 calls for a 14" tall cap. Please clarify.

MUE Response: the cap must be minimum 14" deep as indicated on S-1.00.

11. Plans Page S-1.00, SWP-1 Details calls for 4 each #5 rebars per sheet wall unit but Plans Page S-2.00 call for 4 each #8 rebars per sheet wall unit. Please clarify.

MUE Response: 4#5 is a typo. 4#8 are required.

12. Specification Section 03300, Part 3.02 states that concrete cannot be placed underwater. The typical installation for concrete filled Truline sheet piles is via wet tremie method. Please confirm this method will be acceptable.

MUE Response: That is acceptable

13. Is there a plan view map showing locations of borings?

Post geotechnical report online? Answer: The geotechnical report has been posted online. The requested map appears on, or about page 7. A copy will be attached to this Addendum 1.

14. Please provide the full Geotechnical Report No. 19-1624 by Ardaman & Associates, Inc. if available.

Post geotechnical report online? Answer: The geotechnical report has been posted online.

15. What is the anticipated procedure if sheet pilings refuse in limestone layer when installed via conventional vibratory methods?

MUE Response: Installation of pin piles inside the Truline sheet pile section is recommended as per Truline's installation recommendations for this condition (see below)

16. Boring #3 indicates limestone with blow counts of 50/6 will be encountered some 8 to 10 feet above sheet pile tips, as does Boring #2 with blows of 24/6 some 3 to 4 feet above tip. The Truline 800 series is a very light and thin vinyl section that will not penetrate these layers without continuously pre-drilling the setting line. Is it the Engineers intent to allow refused sheet cut-off or should Contractor plan to pre-drill setting line? Please understand there is a significant cost difference between these methods.

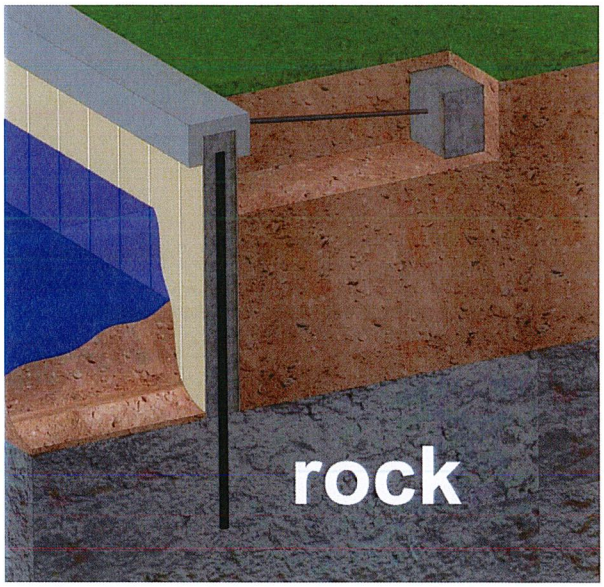
MUE Response: Installation of a pin pile inside the truline sheet pile section as per truline's installation recommendations indicated below.

https://truline.us/installation/installation-options/

Pin Pile Installation

When conditions PREVENT the sheet to be installed to the required depth for a stable wall.

- Truline is first driven to refusal.
- A pin pile is then driven into the rock, extending below the toe of the sheet and up into the hollow of the Truline form.



Pin Pile Installation

17. After overlaying the existing wall plan on the proposed wall plan, it appears that the new wall will be installed rough 6 to 7 feet waterward of the existing wall except for around proposed STA 6+00 to 7+00 where it becomes further offset. Please confirm our understanding is correct.

Yes, your understanding is correct.

18. Please confirm Contractor will not have to compact backfill below water level.

Correct, Contractor will not have to compact backfill below the water level.

19. Detail section 1 on sheet S-2.00 specifies 1-1/2" diam thread bar. That big of bar is not available for typical tiebacks because there is no thread bar adapter available to accommodate thread bar that big. We would normally use 1" diam Dywidag thread bar (Grade 150) which is rated for 100+ kips ultimate. Can we just use 1" high-strength thread bars since adapters for 1.5" bar are simply not available.

MUE Response: Yes, the use of a 1" dia. grade 150 dywidag bar is acceptable.

20. Please clarify what format for these references. Will a listing of similar projects with contact info suffice? Or are we to solicit written references from the owners?

A listing of similar projects with contact information will satisfy the requirement.

21. Plans Page S-0.00, Helical Pile Notes call for 30-ton capacity piles and Plans Page S-2.00 call for 24-ton capacity piles. Please specify the ultimate capacity and tension needed for anchors and what safety factor that value includes.

    Various drawings refer to a req'd anchor capacity of 24 tons tension. Is that a **factored** capacity or is it just an the un-factored (i.e. service) load?

    Helical Pile Note #4 on sheet S-0.00 refers to 30 ton max working capacity. Which is correct, 24 ton or 30 ton? Seems like there's a direct discrepancy here.

    MUE Response: The soil anchors must have a minimum service / working load capacity of 24 tons and an ultimate minimum capacity of 48 tons.

22. Is it the Bidder's responsibility to determine the length and depth of penetration for helical anchors, or will this information be provided by Engineer in an addendum?

MUE Response: Yes, the helical soil anchors must be designed by the contractor's specialty engineer. Signed and sealed design calculations must be provided for review and approval.

23. Referencing Plans Page S-0.00, Helical Pile Note No. 3 – Helical anchor suppliers are stating that a 3-1/2" square shaft does not existing and want to confirm this note is intended to be 1-1/2" square shaft, which is standard and has 32 tons ultimate capacity and tension?

    Helical Pile Note #3 on sheet S-0.00 refers to 3.5" square steel shaft. We have never seen square shaft that big. Perhaps that is referring to pipe shaft which is available that big. However – **PIPE** shaft piles should not be used for all tension anchors. Only solid **SQUARE** shaft should be used for all tension applications. Is it safe to assume we can use the appropriate size solid square shaft anchors for this which would likely be 1.75" square shaft? These are mechanically rated for 100+ kips ultimate.

    MUE Response: The shaft should be 3-1/2" diameter (not square) but ultimately the shaft design is part of the helical pile design which is a specialty engineered item delegated to the contractor's specialty engineer.

24. Referencing Plans Page S-0.00, Helical Pile Note No. 3 – Can Contractor use 2.875" Schedule 40 round pipe which has 24.5 tons ult. capacity and tension, or 2.875" Schedule 80 round pipe which has 30 ult. capacity and tension, for helical shafts?
    MUE Response: No, the minimum soil anchor ultimate tension capacity must not be less than 48 tons. The minimum shaft diameter should be not less than 3-1/2" diameter.

25. Considering the scope of this project I would like to ask if an alternate pile spec would be considered for the floating docks. The 14'' pile as designed and spec'd will be over 14,000 lbs requiring very large equipment on an even larger barge.
    No, the piles supporting the floating docks must be at a minimum 14" square precast concrete piles.

CITY OF BELLE GLADE

NEIL APPEL, C.P.M.
PURCHASING MANAGER

BIDDER

_____
Signature

_____
Printed, Title

_____
COMPANY

Ardaman & Associates, Inc.
Geotechnical, Environmental and Materials Consultants

AAI File No. 19-1624
May 8, 2019

Craig A. Smith & Associates
21045 Commercial Trail
Boca Raton, Florida 33486

Attention: Mr. James R. Orth, P.E.

SUBSURFACE EXPLORATION AND GEOTECHNICAL ENGINEERING EVALUATION WALL/BOARDWALK & FLOATING DOCK PROJECT TORRY ISLAND, BELLE GLADE, FLORIDA

1.0 INTRODUCTION

In accordance with your request and authorization, Ardaman & Associates, Inc. has completed a subsurface exploration and geotechnical engineering evaluation for the above referenced project. We explored the general subsurface conditions in order to provide geotechnical recommendations for the geotechnical aspects of the project. Our work included Standard Penetration Test (SPT) borings and engineering analyses. This report describes our explorations and summarizes our conclusions and recommendations based on our findings.

2.0 PROJECT LOCATION

The site is located on Torry Island (Section 6, Township 44 South, Range 37 East) in Belle Glade, Palm Beach County, Florida. The site is currently operating as a campground facility for recreational vehicles. A Site Vicinity Map is presented as our Figure 1.

3.0 PROJECT DESCRIPTION

It is our understanding that the project involves replacing an existing lakefront wall/boardwalk with a new wall/boardwalk and will include a future floating dock that will extend out to the west in the adjacent lake. It was reported that the deepest part of the existing lake was approximately 28 feet below the grade where our borings were performed. We expect finish (land-side) grades to be at or near the existing grades at the time of exploration.

If any of this information is incorrect or anticipated to change, please notify our office so that we can review the changes and make corrections to this report as needed.

4.0 FIELD EXPLORATION

To explore the subsurface conditions in the area of proposed wall/boardwalk, five (5) Standard Penetration Test (SPT) borings were performed in the approximate locations shown on our attached Figure 2: Boring Location Plan. The borings were performed using a conventional truck-mounted drilling rig in general accordance with the procedures outlined in ASTM D-1586. The borings were advanced to depths of 30 to 60 feet. The boring logs and a description of our drilling and testing procedures are attached.

Our field exploration was conducted from April 30 to May 2, 2019. The boring locations were laid out in the field in reference to existing site features and distinguishable landmarks. We estimate that the actual boring locations are within approximately 15 feet of the locations shown on Figure 2.

5.0 LABORATORY TESTING

Our field crew examined the soils recovered from the SPT sampler, placed the recovered soil samples in moisture proof containers, and maintained a log for each boring. The field soil boring logs and recovered soil samples were transported to our West Palm Beach soils laboratory from the project site. Each soil sample was then examined by a Geotechnical Engineer and visually classified using nomenclature consistent with the Unified Soil Classification System (USCS). The soil classifications and other pertinent data obtained from our explorations are reported on the attached boring logs. The soil samples recovered from our explorations will be kept in our laboratory for 60 days, then discarded unless you request otherwise.

6.0 GENERAL SUBSURFACE CONDITIONS

The attached boring logs present a detailed description of the soils encountered at the locations and the depths explored. The soil stratification shown on the boring logs is based on examination of recovered soil samples and interpretation of the driller's field logs. It indicates only the approximate boundaries between soil types. The actual transitions between adjacent soil strata may be gradual and indistinct.

The borings were performed from the existing grades (located immediately east from the top of the existing lakeside retaining wall/boardwalk). The soils in the explored locations consisted generally of organic topsoil with occasional limerock fragments to an approximate depth of 1 foot underlain by sandy to silty limerock fill to depths of about 5 to 8 feet, followed by soft silty organics with fibrous peat lenses ("muck") to depths of 13.5 to 15.5 feet. These soils were followed by slightly clayey to silty fine sands with varying amounts of shell and limestone fragments ("marl") interbedded with pockets and thin layers of hard limestone to the termination depth of our deepest boring at 60 feet. A relatively consistent hard layer of limestone was typically found in the borings between about 47 and 50 feet. Please refer to the individual boring logs for additional details.

7.0 GROUNDWATER CONDITIONS

Groundwater was greater than 10 feet below the existing grades in our borings at the time of exploration (our crew estimated groundwater was approximately 10 to 13 feet below existing grade). A viscous drilling fluid was introduced at depths of about 10 feet to advance the SPT boreholes to the next sample interval (which precluded us from accurately measuring the groundwater depth). Fluctuations in groundwater level on this site should be anticipated throughout the year due to a variety of factors, the most important of which is recharge from rainfall and control elevations in adjacent water bodies. Groundwater levels slightly above the present levels should be expected after major storm events and periods of heavy or prolonged rainfall.

8.0 DISCUSSIONS AND RECOMMENDATIONS

8.1 General Considerations and Soil Properties

Based on our understanding of the proposed construction, we anticipate that a combination of different construction methods will be used. The new wall/boardwalk will likely consist of a preformed vinyl channel/form that is driven to a design depth and then filled with reinforced bars and concrete. It will likely be necessary to predrill past the random pockets and thin layers of limestone encountered in our borings to prevent damage to the wall segments. Additionally, the existing concrete debris and other riprap material used around the existing wall may need to be removed to help with construction of the new wall and prevent damage. Based on the observed conditions, the grading and drainage for the new wall will need to be considered carefully in the designs. Below we have listed our conservative estimate of pertinent engineering properties for the different soil strata underlying the site for others to use in the design of the proposed wall.

Table 1: Engineering Properties of the Encountered Subsurface Soils

Soil Type	Depth (ft)**	Unit Weight (pcf) *		Internal Friction Angle [degrees]	Cohesion [psf]	Lateral Soil Modulus K_H [pci]
		Moist	Saturated			
Organic fine sands with occasional limerock fragments (loose to medium dense)	0 to 1	110	115	28	0	5
Sandy to silty limerock fill (loose to medium dense)	1 to 5	115	120	35	0	45
Silty organics with random fibrous peat lenses (very soft to soft)	5 to 15.5	85	105	0	0	0
Slightly clayey to silty fine sands with varying amounts of shell and limestone INTERBEDDED WITH Slightly sandy to slightly silty limestone (moderately hard to very hard)	15.5 to 60	--	120	32	0	35
		--	130	37	250	250

* The effective unit weight can be obtained using the following equations:
Above groundwater level: $\gamma_{EFFECTIVE} = \gamma_{MOIST}$
Below groundwater level: $\gamma_{EFFECTIVE} = \gamma_{SATURATED} - \gamma_{WATER}$

** Below the ground surface

Backfill behind the wall should consist of clean sand (or perhaps gravel or #57 stone), particularly pervious, with less than 5 percent by dry weight passing the No. 200 sieve. The backfill should be free from organics and other deleterious materials with no particles greater than 3 inches in diameter. A geotextile may be incorporated behind any joints in the wall to prevent the migration of soil through joints/connections. The backfill sand should be placed in lifts six inches or less in loose thickness, individually compacted with a vibratory plate compactor to a minimum dry density of 95 percent of the Modified Proctor (ASTM D-1557) maximum dry density value of the backfill.

Care must be exercised to ensure the wall is not damaged or adversely affected by the compaction and backfilling operations. For design purposes, we recommend using a unit weight of 120 pounds per cubic foot (pcf), an internal friction angle of 30 degrees and no cohesion for the sand backfill. The installation of weep holes should be considered to allow the rapid reduction of hydrostatic pressures against the wall after heavy rains and other periods of groundwater fluctuation; alternately a layer of gravel can be placed behind the wall (or the use a geotextile sheet drain) to facilitate proper drainage. The wall should be designed to resist all hydrostatic forces, boardwalks and other associated loading conditions including any surcharge/traffic loads. The routing and proximity of irrigation systems and other utility lines (if any) should be discussed carefully before finalizing any new wall designs.

8.2 Driven Piles

Design details for the floating docks and other structures had not been finalized at the time this report was prepared. However, based on other structures in the general vicinity, we expect 14-inch square, precast, prestressed concrete piles (PPCP) to be used for this project. Other pile sizes and foundation types can be considered upon request. The computer software FB Deep Version 2.04 was used to evaluate the estimated Davisson pile capacities for the proposed PPCP. The input soil parameters were obtained from the soil conditions encountered in our borings performed for this project. It should be noted that that the actual capacities should be expected to vary somewhat at each location

depending on the underlying soil conditions. The lateral load on the piles will depend on the height and magnitude of the applied load(s), the size and design of the pile and the surrounding soil conditions and depth of embedment. Assuming the pile is 28 feet above the lake bottom and embedded at least 20 feet into the underlying medium dense slightly clayey to silty fine sands (the "marl" encountered in our borings), the 14-inch piles should tolerate at least 0.5 tons of lateral load with less than ½ inch deflection at the embedment level. Other embedment depths, loads and pile sizes can be considered upon request.

Random pockets and layers of hard limestone may need to be predrilled in order to limit the potential for damage to the piles during installation (and achieve the necessary depth for the design lateral capacity). The depth and diameter of all predrilled piles should be considered carefully. Deeper layers of hard limestone should be expected to cause refusal conditions when of suitable thickness to resist the dynamic force of the pile driving operations. Piles that punch through the limestone will need to be driven to much greater depths to achieve capacity. Our estimates of expected pile capacity versus pile tip elevation (allowable capacity curves) for a single pile are presented in the Appendices of this report. The loads do not account for reduced efficiency related to closely spaced piles or pile groups.

The estimated capacities presented in this report need to be adjusted to reflect the actual lake depths and any anticipated scour. A minimum center to center spacing of at least three pile diameters is recommended. The piles should develop uplift capacities of at least 50 percent of their axial compression capacities. Lateral capacities will depend on the pile cap design and connection details in conjunction with the elevation of any applied loads. Additionally, while only limited amounts of fill were considered, it must be noted that additional fill added to these sites could cause a potentially damaging "negative friction" effect to occur in the piles due to the compression of soft underlying organic soils encountered in all of our boring locations.

The actual pile installation depths should be determined in the field on an individual pile basis. We recommend a WEAP analyses be performed and that a test pile program using a Pile Driving Analyzer (PDA) be implemented on this project. The selection and sequencing of equipment (predrilling, pile hammer type, etc.) will help ensure the success of the pile driving operations and determine if the deeper layers of hard limestone are hard enough and thick enough to cause refusal during driving.

9.0 CLOSURE

This report has been prepared specifically for the subject project. It is intended for the exclusive use of Craig A. Smith & Associates and their representatives. Our work has used methods and procedures consistent with local foundation engineering practices. No other warranty, expressed or implied, is made. We do not guarantee project performance in any respect, only that our work meets normal standards of professional care. Environmental concerns, including (but not limited to) the possibility that hazardous materials or petroleum-contaminated soils or groundwater may be present on the subject site, were not included in the scope of work. The recommendations submitted in this report are based on the data obtained from our exploration program and our understanding of the proposed construction and loading conditions as described herein. This report may not account for any variations that may exist between conditions observed in the borings and conditions at locations that were not explored. The nature and extent of any such variations may not become evident until construction is underway. If variations are then observed, we should be requested to review the conclusions and recommendations in this report.

In the event any changes occur in the design, nature or location of any project facilities, we should be requested to review the conclusions and recommendations in this report. We also recommend that we be requested to review the final foundation drawings and earthwork specifications so that our recommendations may be properly interpreted and implemented in the contract documents.

It has been a pleasure to assist you on this phase of your project. Please contact us whenever we may be of service to you, and please call if you have any questions concerning this report.

ARDAMAN & ASSOCIATES, INC.
FL. Certificate of Authorization No. 5950

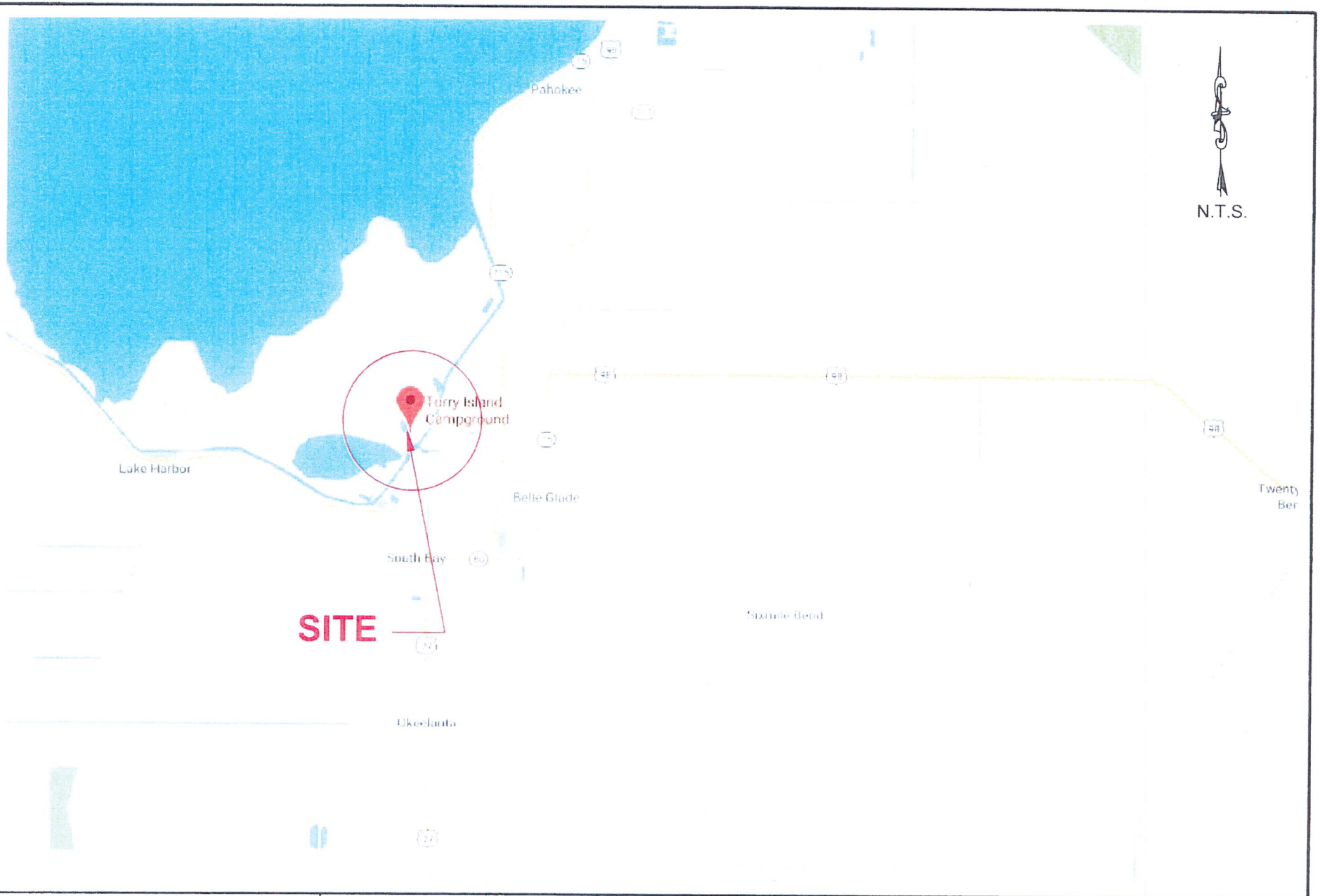
5-21-19

Kevin Ferguson, P.E.
Geotechnical Engineer
Fla. Reg. No. 60712

5/21/19

Dan Zrallack, P.E.
Branch Manager
FL Reg. No. 63911

Attachments: Site Vicinity Map - Figure 1
Boring Location Plan - Figure 2
Subsurface Exploration Information
SPT Boring Logs (5)
FB Deep Estimated Davisson Pile Capacity Curves



Ardaman & Associates, Inc. Geotechnical, Environmental & Materials Consultants 2200 N. Florida Mango Road, Suite 101 West Palm Beach, Florida 33409 Phone: (561) 687 8200 / Fax: (561) 640 7375	SUBSURFACE EXPLORATION LAKESIDE WALL/BOARDWALK & DOCK TORRY ISLAND, FLORIDA	SITE VICINITY MAP Figure No. 1	File No.: 19-1624 Prepared By: KF Date: 5/08/19

Ardaman & Associates, Inc. Geotechnical, Environmental & Materials Consultants 2200 N. Florida Mango Road, Suite 101 West Palm Beach, Florida 33409 Phone: (561) 687 8200 / Fax: (561) 640 7375	SUBSURFACE EXPLORATION LAKESIDE WALL?BOARDWALK & DOCK TORRY ISLAND, FLORIDA	BORING LOCATION PLAN Figure No. 2	File No.: 19-1624 Prepared By: KF Date: 5/08/19

Ardaman & Associates, Inc.

STANDARD PENETRATION TEST BORING LOG

BORING B-1

PROJECT: Torry Island Lakeside Wall & Boardwalk
Belle Glade, Florida

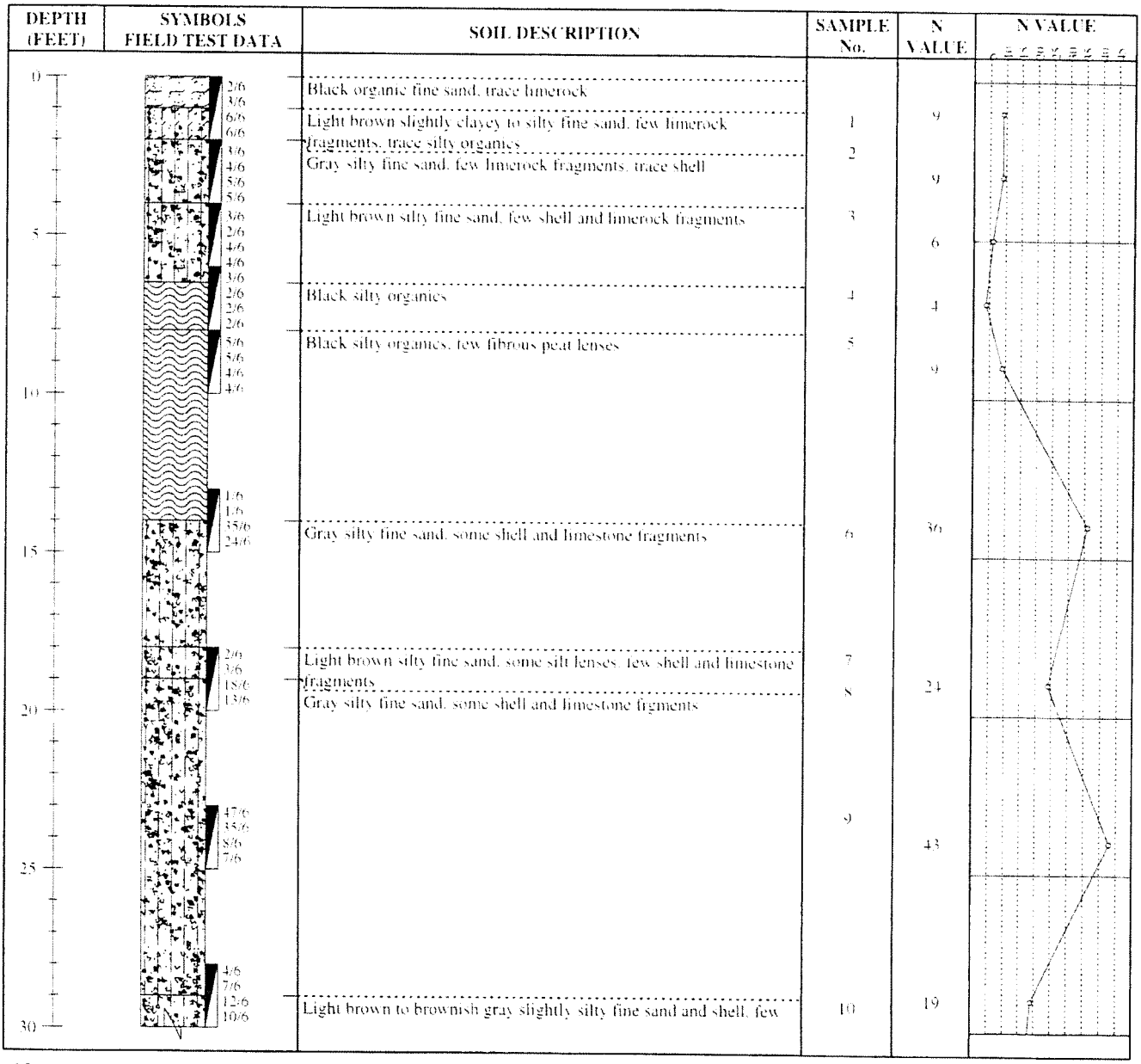
FILE No.: 19-1624

BORING LOCATION: As per plan

DRILL CREW: DG/MC

WATER OBSERVED AT DEPTH Greater than 10 feet (est. at 10-13' below grade)

DATE DRILLED: 5/02/19



NOTES: Boring testing terminated at 60 feet.

FIELD TEST DATA ARE "BLOWS"/"INCHES DRIVEN" 140-LB HAMMER, 30-INCH FALL. (ASTM D-1586)

Ardaman & Associates, Inc.

STANDARD PENETRATION TEST BORING LOG

BORING B-1

PROJECT: Torry Island Lakeside Wall & Boardwalk
Belle Glade, Florida

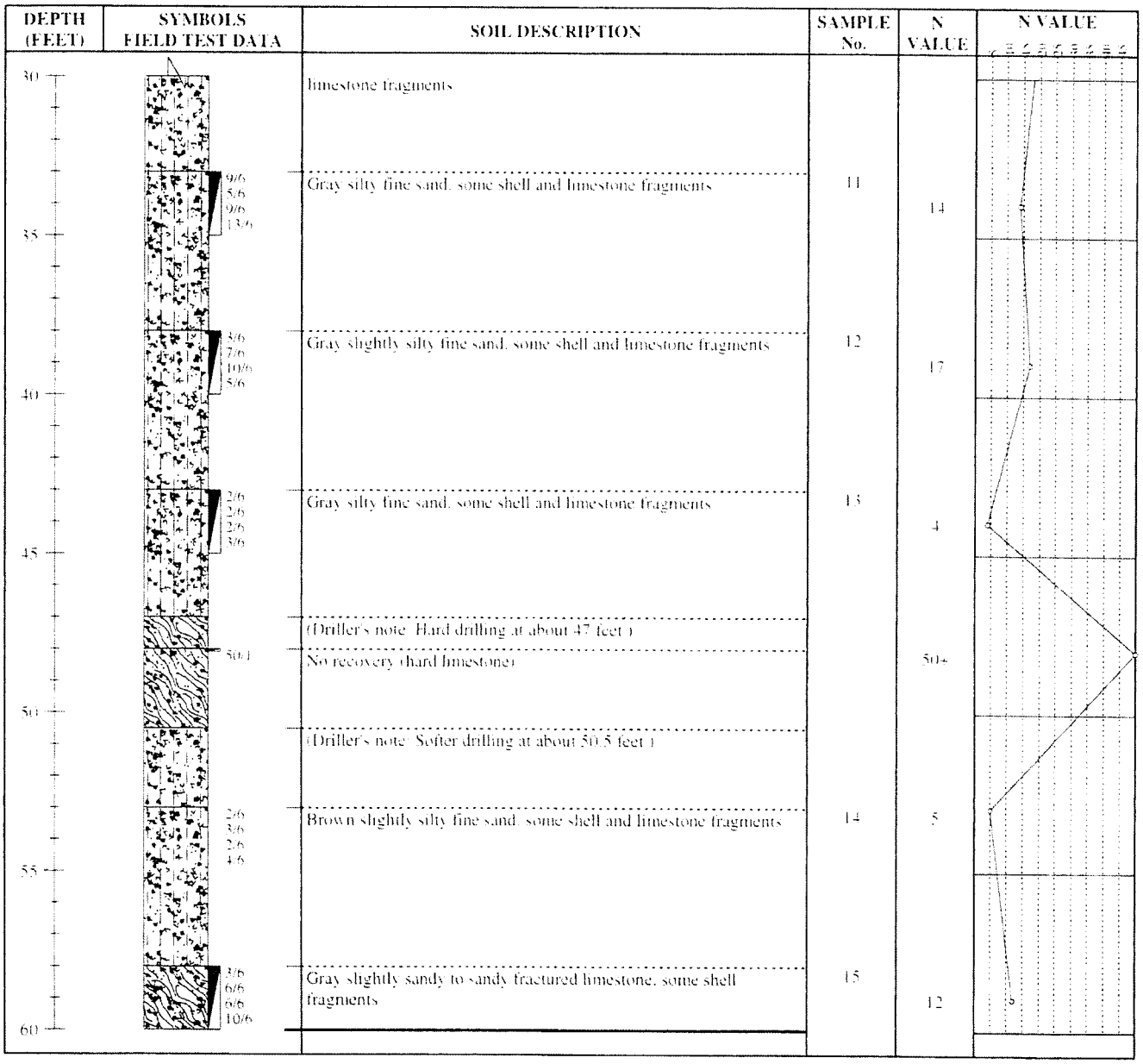
FILE No.: 19-1624

BORING LOCATION: As per plan

DRILL CREW: DG/MC

WATER OBSERVED AT DEPTH Greater than 10 feet (est. at 10-13' below grade)

DATE DRILLED: 5/02/19



NOTES: Boring testing terminated at 60 feet.

FIELD TEST DATA ARE "BLOWS"/"INCHES DRIVEN" 140-LB HAMMER, 30-INCH FALL. (ASTM D-1586)

Ardaman & Associates, Inc.

STANDARD PENETRATION TEST BORING LOG

BORING B-1

PROJECT: Torry Island Lakeside Wall & Boardwalk
Belle Glade, Florida

FILE No.: 19-1624

BORING LOCATION: As per plan

DRILL CREW: DG/MC

WATER OBSERVED AT DEPTH Greater than 10 feet (est. at 10-13' below grade)

DATE DRILLED: 5/02/19

DEPTH (FEET)	SYMBOLS FIELD TEST DATA	SOIL DESCRIPTION	SAMPLE No.	N VALUE	N VALUE
		Boring testing terminated at 60 feet			
65					
70					
75					
80					
85					
90					

NOTES: Boring testing terminated at 60 feet.

FIELD TEST DATA ARE "BLOWS"/"INCHES DRIVEN" 140-LB HAMMER, 30-INCH FALL. (ASTM D-1586)

Ardaman & Associates, Inc.

STANDARD PENETRATION TEST BORING LOG

BORING B-2

PROJECT: Torry Island Lakeside Wall & Boardwalk
Belle Glade, Florida

FILE No.: 19-1624

BORING LOCATION: As per plan

DRILL CREW: DG/MC

WATER OBSERVED AT DEPTH Greater than 10 feet (est. at 10-13' below grade)

DATE DRILLED: 4/30/19

DEPTH (FEET)	SYMBOLS FIELD TEST DATA	SOIL DESCRIPTION	SAMPLE No.	N VALUE	N VALUE
0	2/6, 3/6, 4/6, 5/6	Black to very dark brown organic fine sand, some limerock fragments	1	7	
	5/6, 5/6, 6/6, 5/6	Gray silty fine sand, some limerock	2	11	
5	4/6, 4/6, 4/6, 4/6, 8/6, 5/6, 4/6		3	8	
	4/6, 4/6, 4/6, 5/6, 5/6, 4/6	Very dark brown silty organics, few peat lenses ("muck")	4	9	
10	1/6, 1/6, 1/6, 2/6	No recovery	5	10	
15		(Driller's note: Harder drilling encountereed at about 15.5 feet.)		2	
	1/6, 2/6, 1/6, 24/6	Light brown silty fine sand, some limestone fragments	6	3	
20		Gray silty to sandy fractured limestone	7		
		(Driller's note: Softer drilling at about 21 feet.)			
	6/6, 6/6, 6/6, 43/6	Gray slightly clayey to silty fine sand, some shell and limestone fragments	8	12	
25		Brown fractured limestone	9		
	1/6, 2/6, 2/6, 10/6	Brownish gray silty fine sand, some limestone fragments	10	4	
30			11		

NOTES: Boring terminated at 30 feet.

FIELD TEST DATA ARE "BLOWS"/"INCHES DRIVEN" 140-LB HAMMER, 30-INCH FALL. (ASTM D-1586)

Ardaman & Associates, Inc.

STANDARD PENETRATION TEST BORING LOG

BORING B-2

PROJECT: Torry Island Lakeside Wall & Boardwalk
Belle Glade, Florida

FILE No.: 19-1624

BORING LOCATION: As per plan

DRILL CREW: DG/MC

WATER OBSERVED AT DEPTH Greater than 10 feet (est. at 10-13' below grade)

DATE DRILLED: 4/30/19

DEPTH (FEET)	SYMBOLS FIELD TEST DATA	SOIL DESCRIPTION	SAMPLE No.	N VALUE	N VALUE
30		Brownish gray to tan slightly clayey to silty fine sand, some shell fragments			
		Boring terminated at 30 feet			
35					
40					
45					
50					
55					
60					

NOTES: Boring terminated at 30 feet.

FIELD TEST DATA ARE "BLOWS"/"INCHES DRIVEN" 140-LB HAMMER, 30-INCH FALL. (ASTM D-1586)

Ardaman & Associates, Inc.

STANDARD PENETRATION TEST BORING LOG

BORING B-3

PROJECT: Torry Island Lakeside Wall & Boardwalk
Belle Glade, Florida

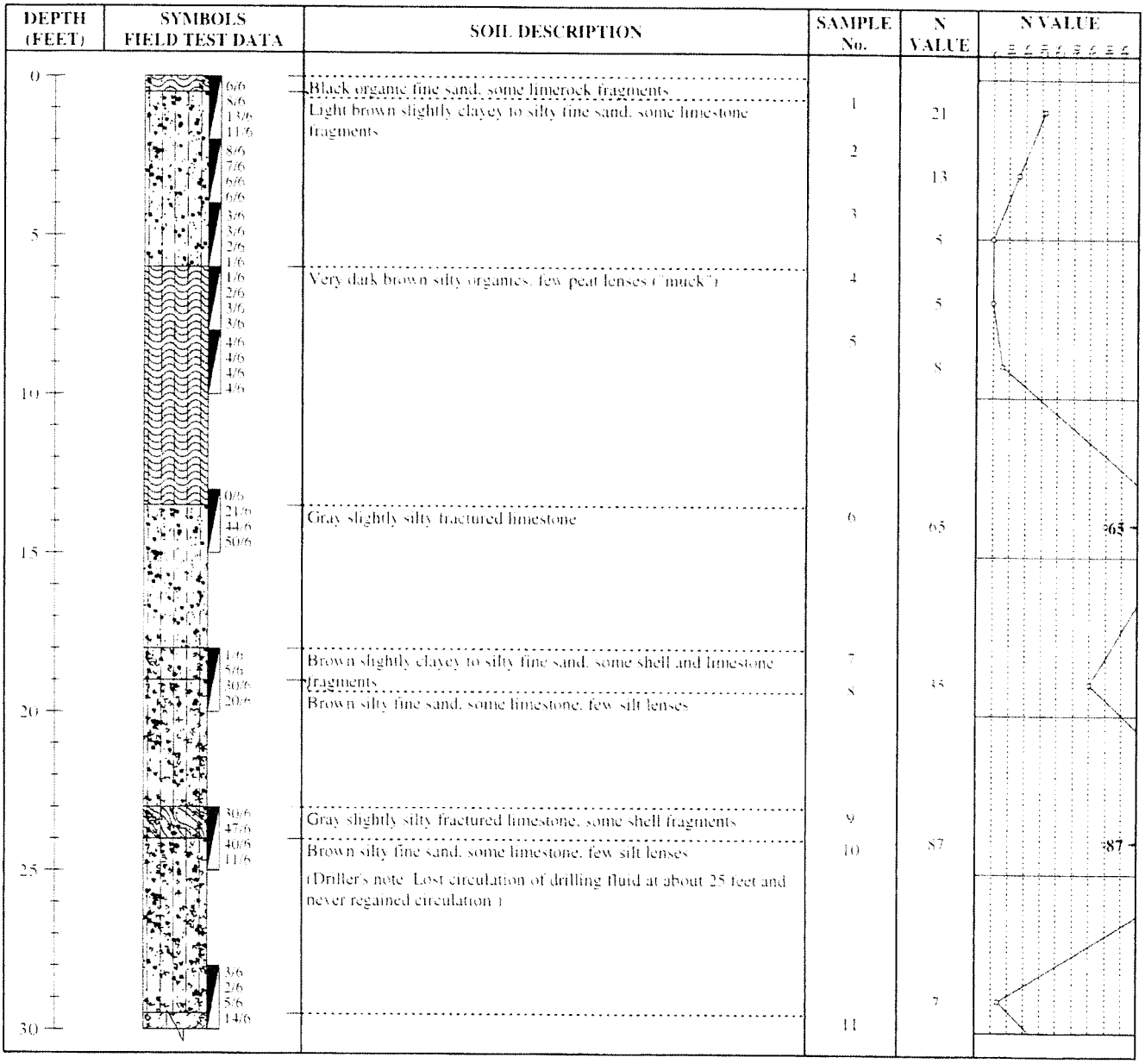
FILE No.: 19-1624

BORING LOCATION: As per plan

DRILL CREW: DG/MC

WATER OBSERVED AT DEPTH Greater than 10 feet (est. at 10-13' below grade)

DATE DRILLED: 4/30/19



NOTES: Boring terminated at 50 feet.

FIELD TEST DATA ARE "BLOWS"/"INCHES DRIVEN" 140-LB HAMMER, 30-INCH FALL. (ASTM D-1586)

Ardaman & Associates, Inc.

STANDARD PENETRATION TEST BORING LOG

BORING B-3

PROJECT: Torry Island Lakeside Wall & Boardwalk
Belle Glade, Florida

FILE No.: 19-1624

BORING LOCATION: As per plan

DRILL CREW: DG/MC

WATER OBSERVED AT DEPTH Greater than 10 feet (est. at 10-13' below grade)

DATE DRILLED: 4/30/19

DEPTH (FEET)	SYMBOLS FIELD TEST DATA	SOIL DESCRIPTION	SAMPLE No.	N VALUE	N VALUE
30		Gray fine sand to slightly clayey fine sand, some shell			
	5/6 45/6 11/6 10/6	Gray slightly silty to silty fine sand, some shell and limestone	12	56	56
35					
	4/6 4/6 5/6 6/6	Gray slightly silty fine sand, some shell, trace limestone	13	9	
40					
	4/6 3/6 2/6 2/6	Gray silty fine sand, some shell, few limestone fragments, few silt lenses	14	5	
45		(Driller's note: Hard drilling noted at about 46.0 feet.)			
	50/2	No recovery (hard limestone)		50+	
50		Boring terminated at 50 feet			
55					
60					

NOTES: Boring terminated at 50 feet

FIELD TEST DATA ARE "BLOWS"/"INCHES DRIVEN" 140-LB HAMMER, 30-INCH FALL. (ASTM D-1586)

Ardaman & Associates, Inc.

STANDARD PENETRATION TEST BORING LOG

BORING B-4

PROJECT: Torry Island Lakeside Wall & Boardwalk
Belle Glade, Florida

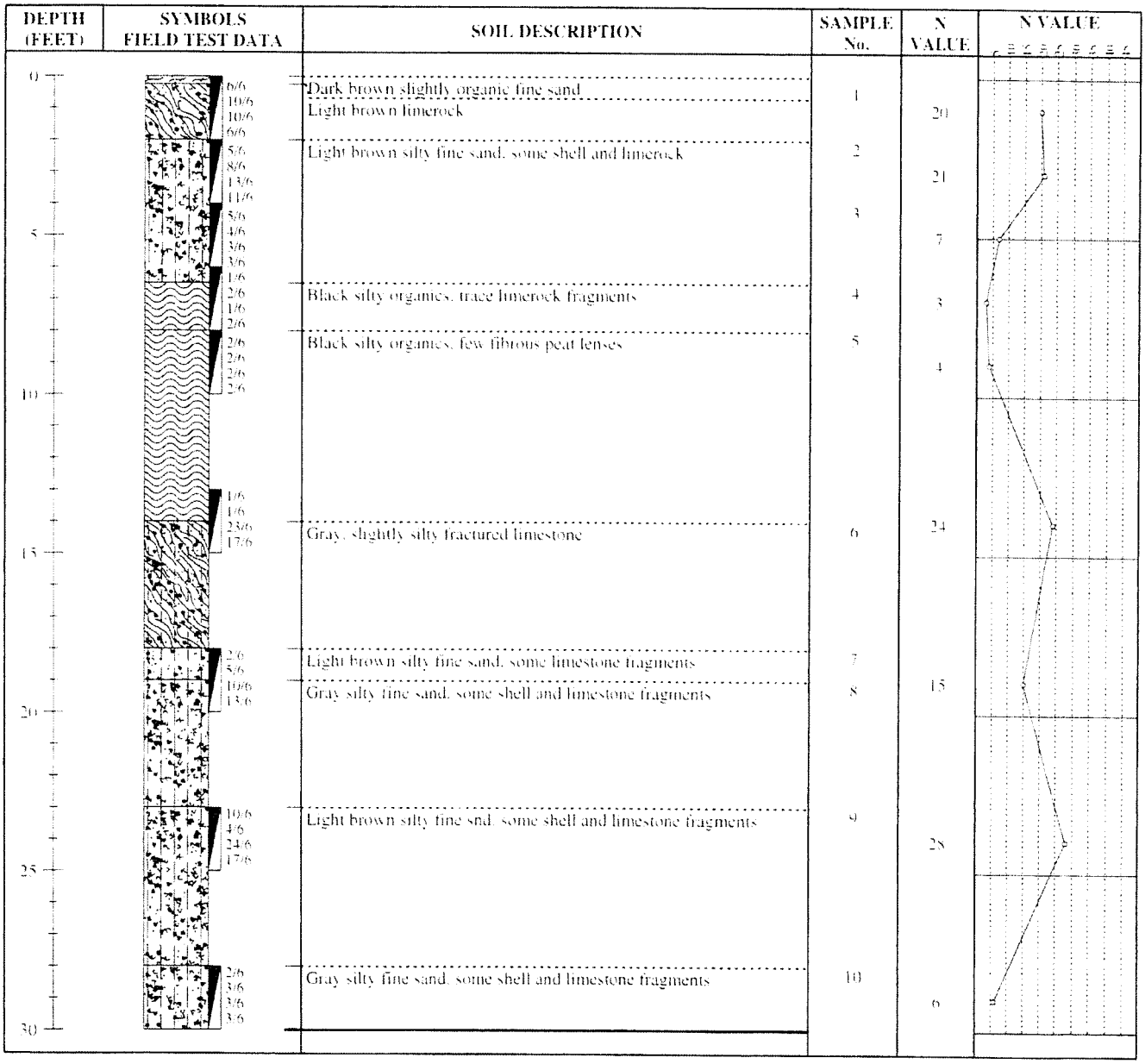
FILE No.: 19-1624

BORING LOCATION: As per plan

DRILL CREW: DG/MC

WATER OBSERVED AT DEPTH Greater than 10 feet.

DATE DRILLED: 4/30/19



NOTES: Boring terminated at 30 feet.

FIELD TEST DATA ARE "BLOWS"/"INCHES DRIVEN" 140-LB HAMMER, 30-INCH FALL. (ASTM D-1586)

Ardaman & Associates, Inc.

STANDARD PENETRATION TEST BORING LOG

BORING B-4

PROJECT: Torry Island Lakeside Wall & Boardwalk
Belle Glade, Florida

FILE No.: 19-1624

BORING LOCATION: As per plan

DRILL CREW: DG/MC

WATER OBSERVED AT DEPTH Greater than 10 feet.

DATE DRILLED: 4/30/19

DEPTH (FEET)	SYMBOLS FIELD TEST DATA	SOIL DESCRIPTION	SAMPLE No.	N VALUE	N VALUE
30		Boring terminated at 30 feet			
35					
40					
45					
50					
55					
60					

NOTES: Boring terminated at 30 feet.

FIELD TEST DATA ARE "BLOWS"/"INCHES DRIVEN" 140-LB HAMMER, 30-INCH FALL. (ASTM D-1586)

Ardaman & Associates, Inc.

STANDARD PENETRATION TEST BORING LOG

BORING B-5

PROJECT: Torry Island Lakeside Wall & Boardwalk
Belle Glade, Florida

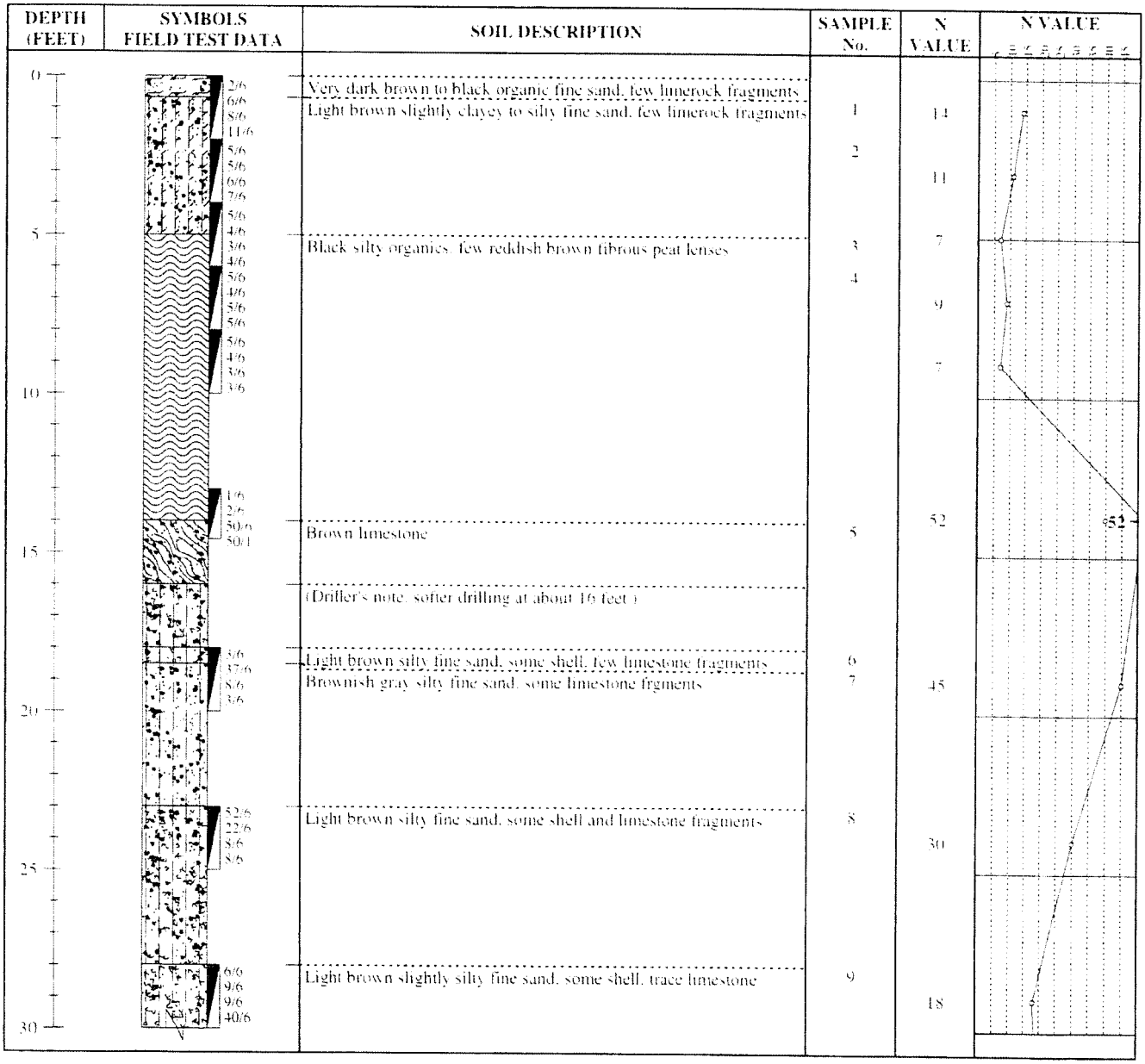
FILE No.: 19-1624

BORING LOCATION: As per plan

DRILL CREW: DG/MC

WATER OBSERVED AT DEPTH Greater than 10 feet (est. at 10-13' below grade)

DATE DRILLED: 5/01/19



NOTES: Boring terminated at 60 feet.

FIELD TEST DATA ARE "BLOWS"/"INCHES DRIVEN" 140-LB HAMMER, 30-INCH FALL. (ASTM D-1586)

Ardaman & Associates, Inc.

STANDARD PENETRATION TEST BORING LOG

BORING B-5

PROJECT: Torry Island Lakeside Wall & Boardwalk
Belle Glade, Florida

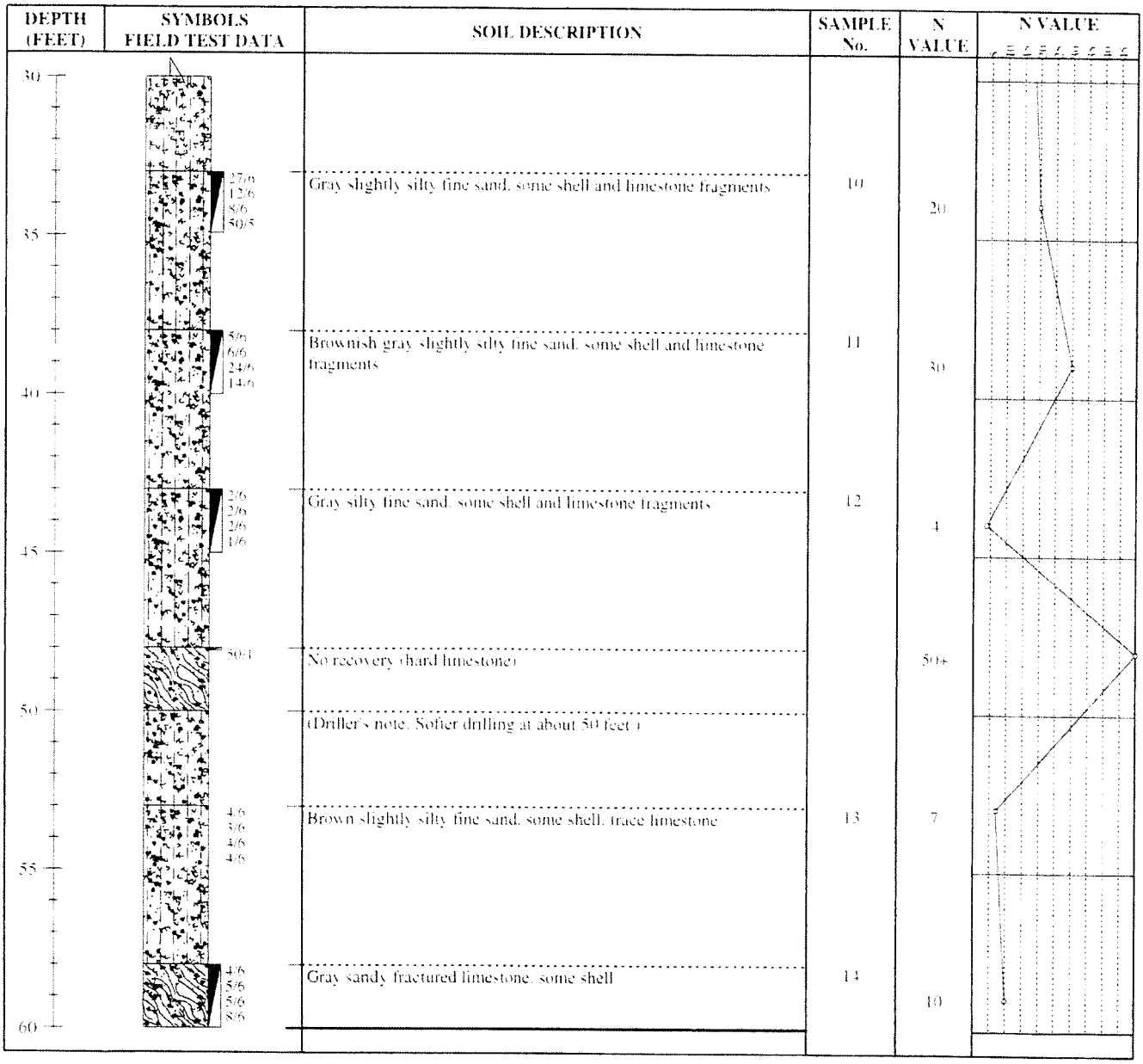
FILE No.: 19-1624

BORING LOCATION: As per plan

DRILL CREW: DG/MC

WATER OBSERVED AT DEPTH Greater than 10 feet (est. at 10-13' below grade)

DATE DRILLED: 5/01/19



NOTES: Boring terminated at 60 feet.

FIELD TEST DATA ARE "BLOWS"/"INCHES DRIVEN" 140-LB HAMMER, 30-INCH FALL. (ASTM D-1586)

Ardaman & Associates, Inc.

STANDARD PENETRATION TEST BORING LOG

BORING B-5

PROJECT: Torry Island Lakeside Wall & Boardwalk
Belle Glade, Florida

FILE No.: 19-1624

BORING LOCATION: As per plan

DRILL CREW: DG/MC

WATER OBSERVED AT DEPTH Greater than 10 feet (est. at 10-13' below grade)

DATE DRILLED: 5/01/19

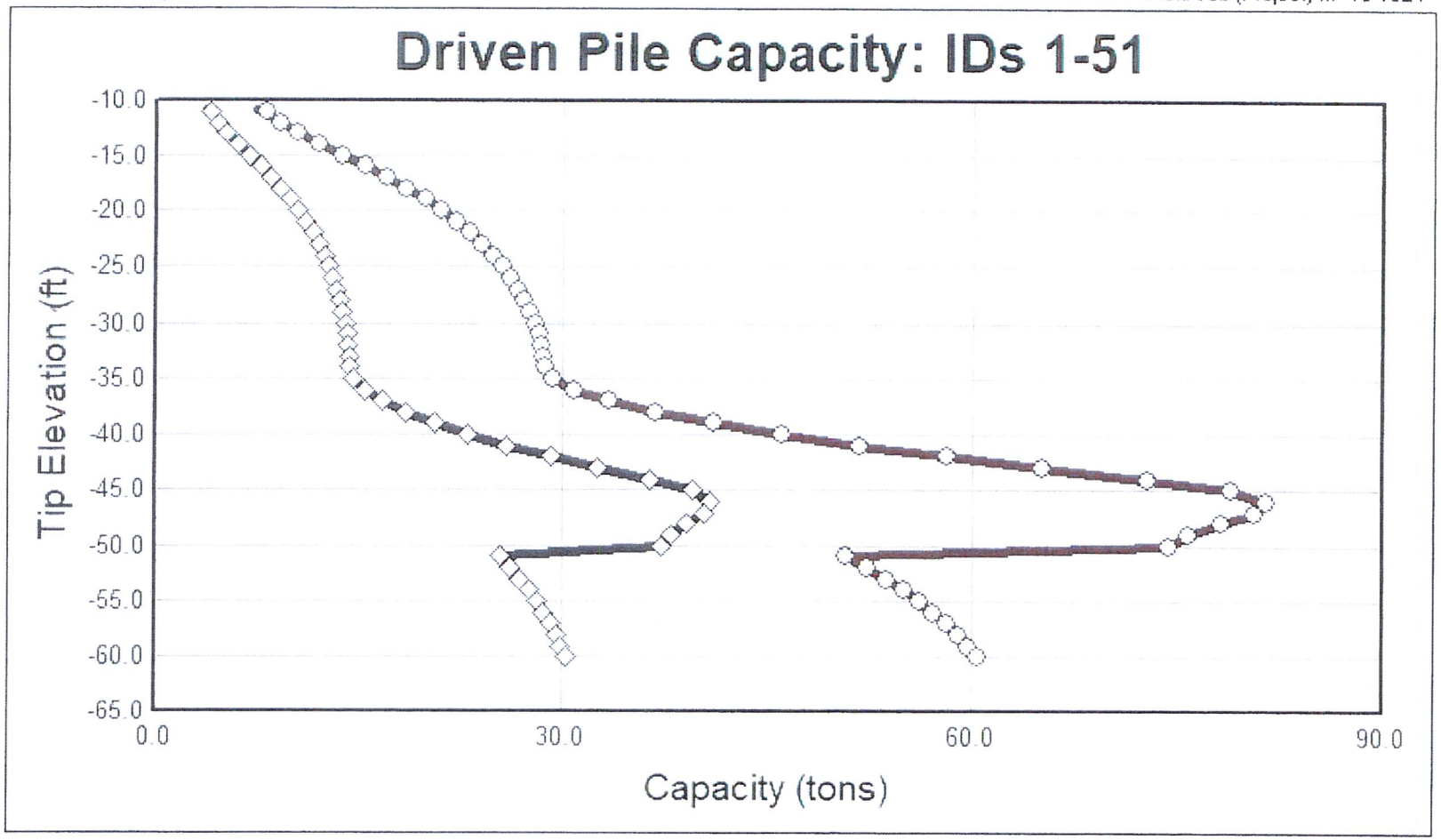
DEPTH (FEET)	SYMBOLS FIELD TEST DATA	SOIL DESCRIPTION	SAMPLE No.	N VALUE	N VALUE
65		Boring terminated at 60 feet			
70					
75					
80					
85					
90					

NOTES: Boring terminated at 60 feet.

FIELD TEST DATA ARE "BLOWS"/"INCHES DRIVEN" 140-LB HAMMER, 30-INCH FALL. (ASTM D-1586)

Job Name: Torry Island

State Job (Project) #: 19-1624



Curves

- ☐ Ultimate Side Friction
- ☐ Mobilized End Bearing
- ☐ Ultimate Pile Capacity
- ☑ Estimated Davisson Capacity
- ☑ Allowable Pile Capacity

*The 'Save to File' button saves the currently selected Curves to a text file.

Driven Pile Data

Boring Number:		
Ground Surface Elevation	0.00	(ft)
Section:	Square	
Width	14.00	(in)

Project Data

File:	*********
Date:	May 08, 2019
Engineer:	KF

Analysis Data

Analysis Type:	SPT