Subsurface Exploration and
Geotechnical Engineering Evaluation
SLPS Green Zone K-8
1201 Mississippi Avenue
Fort Pierce, Florida

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St. Lucie Public Schools
9461 Brandywine Lane
Port St. Lucie, FL 34986

Attention: Mr. Tony Rake

Subject: Proposal for Subsurface Exploration and Geotechnical Engineering Evaluation
SLPS Green Zone K-8
1201 Mississippi Avenue
Fort Pierce, Florida

As requested and authorized, we have completed a shallow subsurface exploration for the subject project. The purposes of performing this exploration were to evaluate the general subsurface conditions within the building, parking/drive and retention pond areas, and to provide recommendations for site preparation, foundation support, and pavement design. This report documents our findings and presents our engineering recommendations.

We note that this report has been revised to include the results of additional subsurface soil exploration relative to the location of unsuitable organic soils encountered during the original subsurface soil exploration for the subject site.

The analyses and recommendations submitted herein are based on the data obtained from the attached soil boring logs and the client provided loading conditions. This report does not reflect any variations which may occur adjacent to or between the borings. The nature and extent of the variations between the borings may not become evident until during construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations presented in this report after performing on-site observations during the construction period and noting the characteristics of the variations.

In the event any changes occur in the design, nature, or location of the proposed facility, we should review the applicability of the conclusions and recommendations in this report. We recommend a general review of final design and specifications by our office to verify that earthwork and foundation recommendations are properly interpreted and implemented in the design specifications. Ardaman & Associates should attend the pre-bid and preconstruction meetings to verify that the bidders/contractors understand the recommendations contained in this report.

Because of Ardaman & Associates' familiarity with this site and the proposed development gained through performing the subsurface soil exploration and geotechnical engineering evaluation as presented in this report, Ardaman & Associates is best suited to provide monitoring and testing

services during earthwork and to provide continued evaluation and guidance during construction should variations in the soil conditions be encountered.

This study is based on a relatively shallow exploration and is not intended to evaluate sinkhole potential. This study does not include an evaluation of the environmental (ecological or hazardous/toxic material related) condition of the site and subsurface.

This report has been prepared for the exclusive use of St. Lucie Public Schools in accordance with generally accepted geotechnical engineering practices. No other warranty, expressed or implied, is made.

We are pleased to be of assistance to you on this phase of the project. Please contact us if we may be of further service to you or if you have any questions.

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Attachments

- Figure 1: Site Location Map
- Figures 2 & 3: Boring Location Plan
- Figure 4: Muck Delineation Plan
- Soil Boring Logs
- Subsurface Exploration Information and Procedures

1.0 INTRODUCTION

1.1 Site Location and Site Description

The site for the proposed school is located at 1201 Mississippi Ave in Fort Pierce, Florida (Section 16, Township 35 South, Range 40 East). The general site location is shown in the attached Figure 1.

The site is currently developed with the existing Dan McCarty School. The portion of the site for the proposed school is south of the existing school and consists of gently sloping, grassy areas, a retention pond on the order of approximately 4 to 5 feet deep and athletic tracks/courts.

1.2 Proposed Construction and Grading

It is our understanding that the proposed development includes below structures along with the retention pond.

- Building 1 – Partially One and Partially Two-story Administration Building
- Building 2 – Two-story Classroom Building
- Building 3 – One-story Auditorium Building
- Building 4 – One-story Gym Building
- Building 5 – Two-story Classroom Building

The preliminary loads provided by the client are listed below:

Description	Column Load (kips)	Wall Load (kips/ft.)
Building 1	175	6.2
Buildings 2 and 5	200	10
Building 3	100	6.5
Building 4	110	6.5

Floor loads are assumed to be less than 100 pounds per square foot.

Grading plans are not complete at this time; therefore, we have assumed that 0 to 5 feet of cut or fill is required to bring the existing site grade to final design elevations. If actual building loads or cut/fill height exceed as listed above, then the recommendations in this report may not be valid.

1.3 Review of Soil Survey Maps

Based on information obtained online from the Web Soil Survey as operated by the U.S. Department of Agriculture Natural Resources Conservation Services, the site is located in an area mapped as the "Waveland and Immokalee fine sands", "Urban land, 0 to 2 percent slopes", and "Winder sand, shell substratum" soil series.

Waveland and Immokalee fine sands:

"Waveland and Immokalee fine sands" is a nearly level, poorly drained soil found on flatwoods on marine terraces. A representative profile consists of sand to 47 inches, underlain by loamy fine sand to 77 inches, and fine sand to 99 inches. The water table is at a depth of about 6 to 18 inches.

Urban land, 0 to 2 percent slopes:

"Urban land, 0 to 2 percent slopes" is found on flatwoods, rises, knolls, ridges and hills on marine terraces. Urban land consists of areas that are more than 70 percent covered by airports, shopping centers, parking lots, large buildings, streets, and sidewalks. Other areas, for example, lawns, parks, vacant lots, and playgrounds are made up mostly of Ankona, Lawnwood, Nettles, Pendarvis, Pepper, Tantile, St. Lucie, Paola, and Waveland soils. The surface of these soils, to a depth of about 12 inches, has been covered with fill material consisting of sandy and loamy materials which contain limestone and shell fragments in places. These areas of soils are too small to be mapped separately.

Winder sand, shell substratum:

"Winder sand, shell substratum" is a nearly level, poorly drained soil found on flats on marine terraces. A representative profile consists of sand to 9 inches, underlain by sandy clay loam to 27 inches, by gravelly sandy loam to 32 inches, and by sandy loam to 80 inches. The water table is at a depth of 12 to 18 inches.

Please refer to the attached USDA Soil Survey Map for the mapped locations of individual soil units.

2.0 FIELD EXPLORATION PROGRAM

2.1 SPT and Auger Borings

The field exploration program included performing 24 Standard Penetration Test (SPT) borings and 29 auger borings. The SPT borings were advanced to depths of 30 and 50 feet below the existing ground surface in general accordance with the methodology outlined in ASTM D-1586.

The auger borings were advanced to depths ranging from 3 and 10 feet below the existing ground surface in general accordance with the methodology outlined in ASTM D-1452. The attached Subsurface Exploration Information includes a summary of this field procedure.

Soil samples recovered during the performance of the borings were visually classified in the field, and representative portions of the samples were transported to our laboratory in sealed sample jars.

An attempt was made to measure the groundwater level at each of the boring locations during drilling. The borings were backfilled with soil cuttings upon completion.

2.2 Double-Ring Infiltrometer Tests

Double-ring infiltrometer (DRI) tests were performed at locations DRI-1 through DRI-4. The DRI tests were conducted in general accordance with the ASTM D-3385 procedure, “Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer”.

Prior to running the test, an excavation was made to a depth of 6 to 8 inches below the ground surface at the test location. The DRI test consisted of driving two open-ended cylinders, one inside the other, into the ground at the test locations. The inner and outer rings were seated approximately 6 inches, respectively, below the bottom of the excavation. Water was added to the rings to achieve a constant water level. A measurement of time versus water volumes added to the inner ring to maintain a constant water level was then recorded while the water level in the outer ring was maintained at a constant level during the duration of the test.

The results of the Double-Ring Infiltrometer (DRI) tests are presented in the Retention Pond section of this report. Please refer to Attachments for detailed test measurements.

2.3 Test Locations

The approximate locations of the field explorations are schematically illustrated in the attached Figures 2 through 4. The test locations were laid out in the field in reference to recognized property boundaries and other distinguishable features. Boring locations should be considered accurate only to the degree implied by the method of locating used.

3.0 LABORATORY PROGRAM

Representative soil samples obtained during our field sampling operation were packaged and transferred to our laboratory for further visual examination and classification. The soil samples were classified using visual-manual procedures in general accordance with the Unified Soil Classification System (ASTM D-2488). The resulting soil descriptions are shown on the attached soil boring logs.

In addition, we conducted natural moisture content tests (ASTM D-2216), percent fines analyses (ASTM D-1140), and organic content tests (ASTM D-2974-87) on selected soil samples obtained from the borings. The results of these tests are presented adjacent to the sample depth on the soil boring logs.

4.0 GENERAL SUBSURFACE CONDITIONS

4.1 General Soil Profile

The field exploration and laboratory program results are summarized in the attached boring logs. The stratification of the boring profiles represents our interpretation of the field boring logs and the results of laboratory examinations of the recovered samples. The stratification lines represent the approximate boundary between soil types. The actual transitions may be more gradual than implied.

The results of the borings indicate the following general soil profile:

Depth Below Ground Surface (feet)		Description
From	To	
0	2	Fine sand (SP)
2	6	Very loose to medium dense fine sand (SP), fine sand with silt (SP-SM), very soft muck (OL/OH) some hardpan-type soil
6	33 to 38	Loose to very dense fine sand (SP) and fine sand with silt (SP-SM)
33 to 38	50	Very dense fine sand (SP)

The above soil profile is outlined in general terms only. Please refer to the soil boring logs for more details.

4.2 Groundwater Level

An attempt was made to measure the groundwater level was measured in the boreholes during drilling. As shown on the attached soil boring logs, groundwater was encountered at depths that ranged from 3.5 to 9 feet below the existing ground surface on the dates indicated. The difference in groundwater table is due to the difference in elevation of the existing ground surface. Fluctuation in groundwater levels should be anticipated throughout the year due to various factors, including recharge from rainfall, tidal fluctuations, established drainage patterns, and other factors that may vary from when the borings were conducted.

For borings referenced “GNE” as shown on the boring profiles, groundwater was not encountered within the vertical reach of the soil boring on the date drilled. However, this does not necessarily mean that groundwater would not be encountered within the vertical reach of the borings at some other time.

5.0 NORMAL SEASONAL HIGH GROUNDWATER LEVEL

The groundwater level is affected by several factors. The amount of rainfall and the drainage characteristics of the soils, the land surface elevation, relief points such as drainage ditches, lakes, rivers, swamp areas, etc., and distance to relief points are some of the more critical factors influencing the groundwater level.

Each year, the normal seasonal high groundwater level is the level in the August-September period at the end of the rainy season during a year of normal (average) rainfall. The water table elevations associated with a higher than average rainfall and, in the extreme case, flood, would be higher to much higher than the average seasonal high groundwater level and could occur at times outside of the August-September period. The normal high water levels would approximate the normal seasonal high groundwater levels.

Based on our interpretation of the site conditions using our boring logs, we estimate the normal seasonal high groundwater level at the boring locations to be approximately 3 to 3.5 feet above the groundwater levels measured at the time of our field exploration.

6.0 ENGINEERING EVALUATION AND RECOMMENDATIONS

6.1 General

The results of our exploration indicate that sandy organic muck is present on the northern portion of the site, as encountered in Borings B-5, B-6, B-7, B-10, B-12, B-14, AB-3, HAB-1 through HAB-3, HAB-6 through HAB-10, HAB-12 through HAB-18 at depths ranging from 2 to 5.5 feet below the existing ground surface. Sandy organic muck is not suitable to serve as foundation soils and would need to be removed (i.e.; demucked) in structure, roadway, hardscape, utility areas, and any other areas that cannot tolerate greater than typical settlement. For preliminary estimating purposes, we have included an approximate muck delineation line superimposed on the proposed development plan presented as Figure 4. Sandy organic muck may be present to greater thicknesses and depths at unexplored locations.

Based on the findings of our field explorations and our evaluation of the encountered subsurface conditions, we conclude that the soils encountered at the locations explored, with the exception of the sandy organic muck, are suitable for supporting the proposed buildings and pavement. Spread footings should provide an adequate support system for the structures.

The following are our recommendations for overall site preparation, foundation support, and pavement construction for the proposed facility based on the existing soil conditions encountered during the exploration. In addition, these recommendations consider that deleterious organic muck as encountered in the borings are removed from the structure and parking/drive areas in accordance with the recommendations in the following report sections. The recommendations are made as a guide for the design engineer and/or architect, parts of which should be incorporated into the project's specifications.

6.2 Stripping and Grubbing/Root-Raking

The "footprints" of the proposed construction, the parking/drive areas, and other hardscape areas, plus a minimum margin of five feet, should be stripped of all surface vegetation, stumps, debris, organic topsoil, or other deleterious materials, as encountered.

After stripping, the site should be grubbed/root-raked such that roots with a diameter greater than ½ inch, stumps, or small roots in a dense state are entirely removed. The actual stripping and grubbing/root-raking depths must be determined by visual observation and judgment during the earthwork operation. Grubbing/root-raking should continue until determined to be adequate by Ardaman's representative, who is monitoring the root-raking.

All existing foundations, slabs, asphalt, and any other underground structures (if any) should be removed from the proposed construction area. If pipes or collapsible or leak-prone utilities are not removed or filled with grout or concrete, they might serve as conduits for subsurface erosion, resulting in excessive settlements. Over-excavated areas resulting from the removal of underground structures and unsuitable materials should be backfilled in accordance with the fill soils section of this report. This excavation must not undermine the existing building foundations. Provide shoring, bracing, and/or underpinning of existing footings as necessary to protect from failure.

It has been our experience that soils surrounding existing buildings sometimes contain pockets of construction debris or other deleterious materials requiring removal and replacement with compacted, clean, fine sands. Therefore, we recommend Ardaman & Associates, Inc. inspect the stripped surface.

6.3 Demucking

We note that the recommendation to excavate the organic soils is made knowing that excavating below the groundwater table will be necessary. The logistics and permitting requirements for dewatering should be carefully considered as part of the evaluation for this approach. Careful coordination of the excavation activities and backfilling operations is necessary for the successful ground improvement program. If the contractor is unable to quickly replace the excavated organic soil with clean, compacted fill before groundwater is allowed to enter the excavation, dewatering

in advance of excavation may be necessary. We strongly recommend that the excavation of the organic soil operation be continuously monitored by a representative of Ardaman & Associates.

The sandy soils above the organic soils (overburden) should be excavated and stockpiled for reuse as backfill material. The organic soil can then be excavated from beneath the proposed structural and pavement areas (and any other areas that cannot tolerate greater than typical settlement), to its entire vertical limits and to a minimum horizontal margin equivalent to the depth of organic muck/silt outside the development area. A minimum horizontal margin of 5 feet should be used if the depth to the bottom of the organic muck is less than 5 feet. Once the organic soil has been removed, the bottom of the excavation should then be compacted to produce dry densities not less than 98 percent of the modified Proctor (ASTM D-1557) maximum dry density of the compacted material to a depth of 1 foot below the bottom of the excavation. The overburden soils containing no more than 12 percent passing the U.S. No. 200 standard sieve may be returned to the excavation once the bottom of the excavation is inspected and approved. The backfill can be placed in lifts not to exceed 12 inches in thickness (6 inches if hand-held compaction equipment is used), and compacted to produce dry densities not less than 95 percent of the modified Proctor (ASTM D-1557) maximum dry density of the compacted material. Care must be exercised to avoid mixing the overburden soils with any unsuitable soils (i.e., organic silty fine sand, muck, soil containing debris, etc.).

In general, it is desired to complete the excavation and backfilling operations in as short a time as possible. If deemed necessary, consideration should be given to proceeding with the excavating/backfilling operation in stages so that no deep excavations remain open overnight. Such a staged approach may also reduce slope bracing needs.

If the excavation reaches areas near the property lines or any existing structure or pavement area, the slope of the excavation may have to be protected with a bracing system. The contractor is to be responsible for the integrity of existing structures and adjacent property, and for implementing all necessary safety measures. At a minimum, safe excavation slopes in accordance with appropriate regulatory authorities such as OSHA, should be used. Additionally, some form of dewatering may be necessary to control groundwater entering the excavation, and subsequently hindering visual observations and backfill compaction activities. Means and methods of dewatering should be the responsibility of the contractor.As encountered in the muck probes, the deleterious organic muck/peat shown on the attached soil borings logs should be removed (demucked) to its entire vertical limits and a minimum horizontal margin equivalent to the depth of muck outside the development area. A minimum horizontal margin of 5 feet should be used if the depth to the bottom of the muck is less than 5 feet.

6.4 Proof-rolling

We recommend proof-rolling the cleared surface to locate any unforeseen soft areas or unsuitable surface or near-surface soils, to increase the density of the upper soils, and to prepare the existing surface for adding the fill soils (as required). Proof-rolling of the building areas should consist of at least 10 passes of a compactor capable of achieving the density requirements described in the next paragraph. Each pass should overlap the preceding pass by 30 percent to achieve complete coverage. If deemed necessary, remove all deleterious material in areas that continue to "yield" and replace it with a clean, compacted sand backfill. The proof-rolling should occur after cutting and before filling. Passes can be reduced to 3 within the proposed parking/drive areas. Proofrolling should be monitored in the field by an Ardaman representative.

A density equivalent to or greater than 98 percent of the modified Proctor (ASTM D-1557) maximum dry density value for a depth of 2 feet in the building areas and 1 foot in the parking/drive areas must be achieved beneath the stripped and grubbed ground surface. Additional passes and/or over-excavation and compaction may be required if these minimum density requirements are not achieved. The soil moisture should be adjusted as necessary during compaction.

Care should be exercised to avoid damaging any neighboring or existing structures while the compaction operation is underway. Prior to commencing compaction, occupants of adjacent structures should be notified, and the existing condition (i.e., cracks) of the structures should be documented with photographs and surveys. If deemed necessary, the site preparation contractor should closely monitor the ground vibrations produced by the operation of the compaction equipment to minimize the risk of structural damage to any adjacent structures and avoid creating excessive nuisance. A seismograph with a suitable indicator range should be arranged along the edge of the nearest structure to ensure that ground vibrations do not reach objectionable levels. We can assist you in planning and implementing a suitable vibration monitoring program if deemed necessary. Compaction should cease if deemed detrimental to adjacent structures, and Ardaman & Associates should be notified immediately. Heavy vibratory compaction should not be used within 200 feet of existing structures.

6.5 Suitable Fill Material and Compaction of Fill Soils

All fill materials should be free of organic materials, such as roots and vegetation. We recommend using fill with less than 8 percent by dry weight of material passing the U.S. Standard No. 200 sieve size. The fill should be uniform across the area of the proposed construction and should not contain particles larger than 3 inches in diameter.

The organic silt/peat (“muck”) encountered Borings B-5, B-6, B-7, B-10, B-12, B-14, AB-3, HAB-1 through HAB-3, HAB-6 through HAB-10, HAB-12 through HAB-18 is not suitable for use as structural fill material and should be disposed of offsite as directed by the owner. Careful attention

should be made by the contractor not to mix the unsuitable soils with otherwise suitable soils while excavating these organic soils.

We note that the partially cemented hardpan-type soils can be problematic for several reasons. Hardpan can be difficult to excavate, often requiring special equipment; especially in confined excavations such as utility trenches, footings, etc. Excavated hardpan-type soils are often boulder-size chunks of cemented soils which are not easily broken down for re-use as structural fill. In addition, when pulverized into fragments that can be compacted to an adequately dense matrix, the in-place soil often fails the relative compaction test because the laboratory test continues to pulverize the soil into smaller particles resulting in a denser laboratory matrix than that which occurs in the field. Alternative acceptance criteria may need to be used for hardpan-type soils used as fill. This criteria would need to be developed by Ardaman & Associates on a site specific basis after observing the contractor's earthwork methodology and the nature and condition of the compacted hardpan-type soils.

All structural fill should be placed in level lifts not to exceed 12 inches in uncompacted thickness. Each lift should be compacted to at least 98 percent of the modified Proctor (ASTM D-1557) maximum dry density value. The filling and compaction operations should continue in lifts until the desired elevation(s) is achieved. If hand-held compaction equipment is used, the lift thickness should be reduced to no more than 6 inches.

The use of soils with relatively high fines content (i.e., silty and clayey soils) as fill should be avoided near the ground surface in green-space areas since these relatively low permeability soils promote ponding of water during and following rainfall. Also, in high groundwater areas, silty and clayey soils may cause a rise in the water table elevation due to capillary action. These relatively low permeability soils should not be used directly beneath any pavement section as they may trap water within the pavement section, leading to premature pavement failure.

Our fill soil recommendations do not apply to the stormwater pond vicinity as the pond designer should recommend types of fill, if any, in the stormwater pond vicinity to be compatible with the pond design.

6.6 **Foundation Support by Spread Footings**

Foundations should be excavated to the proposed bottom of footing elevations, and the in-place compaction for a depth of 2 feet below the footing bottoms should be verified. If necessary, compact the soils at the bottom of the excavations to at least 98 percent of the modified Proctor maximum dry density (ASTM D-1557) for a depth 2 feet below the footing bottoms. Based on the existing soil conditions and, assuming the above-outlined proof-rolling and compaction criteria are implemented, an allowable soil bearing pressure of 2,500 pounds per square foot (psf) may be used in the foundation design. This bearing pressure should result in foundation settlement within

tolerable limits (i.e., 1 inch or less). For design purposes, we recommend using a subgrade reaction modulus of 120 pounds per cubic inch (pci) for all well-compacted shallow sands.

Bearing foundations should be a minimum of 24 inches wide. A minimum soil cover of 18 inches should be maintained from the bottom of the foundations to the adjacent finished grades.

A preliminary settlement analysis was undertaken for the buildings using a foundation bearing pressure of 2,500 psf, the computer program SETTLE 3D, and the results of the SPT borings. The SETTLE 3D program calculates stresses and settlements under uniformly loaded rectangular areas. Analyses were performed assuming the loading conditions as provided by the client. A depth to the bottom of the foundations of 2 feet below the ground surface was used in our analyses. For the sandy soils encountered, published correlations relying on SPT N-values were used to estimate the elastic moduli. The Westergard stress distribution method was used for calculating the stress changes caused by the estimated weight of the proposed structure in the underlying foundation soils. This analysis also assumed that the subgrade soils below the existing foundations are compacted to at least 98 percent of the modified Proctor maximum dry density value. Settlement may be greater at locations where stresses overlap due to relatively close foundation spacing. Therefore, the results of the settlement analyses should be considered preliminary until complete foundation loading conditions and a foundation arrangement plan are provided and additional analyses performed.

The results of the preliminary settlement calculations indicated maximum total settlement on the order of 1-inch or less beneath a single column foundation and/or wall foundation.

6.7 Floor Slab Moisture Reducer and Slab Compaction Requirements

Prior to concrete placement, soil compaction beneath floor slabs should be verified for a depth of 12 inches and meet the 98 percent criteria (modified Proctor, ASTM D-1557).

Precautions should be taken during the slab construction to reduce moisture entry from the underlying subgrade soils. Moisture entry can be reduced by installing a membrane between the subgrade soils and the floor slab. Care should be exercised when placing the reinforcing steel (or mesh) and slab concrete such that the membrane is not punctured. We note that the membrane alone does not prevent moisture from occurring beneath or on top of the slab.

If interior columns are isolated from the floor slab, an expansion joint should be provided around the columns and sealed with a waterproof sealant.

6.8 Dewatering

Based on the groundwater conditions encountered, the control of the groundwater may be required to achieve the necessary stripping and subsequent construction, backfilling, and

compaction requirements presented in the preceding sections. The groundwater control requirement should be particularly anticipated for footing and utility excavations.

The contractor should determine the actual method(s) of dewatering. However, regardless of the method(s) used, we suggest drawing down the water table a minimum of 2 feet, below the bottom of any excavation or compaction surface to preclude "pumping" and/or compaction-related problems with the foundation soils. The dewatering should be performed before any excavation to minimize soil disturbance caused by water seeping into the excavation. Dewatering measures should be controlled so that the groundwater is not lowered below existing/adjacent structures.

The contractor should be aware that cuts may expose confined aquifers where relatively permeable sandy soils underlie less permeable zones of clayey soils. These relatively permeable zones may require dewatering efforts to include relatively deep full aquifer penetrating wells, airlift of water from wells, trench drains, seepage barriers, etc.

6.9 Utility Installation

The hardpan layers may hinder backfilling and compacting activities related to utility installations (both for piping and structures) or other excavations. The hardpan soils are often boulder-size chunks of cemented soils which are not easily broken down for re-use, making such earthwork operations difficult. The importing of clean, free draining fine sand for excavation backfill is often conducted on projects of this nature to facilitate construction. The contractor should be made aware of the hardpan-type soils at the site.

6.10 Typical Asphaltic Concrete Surface Pavement Section

6.10.1 Site Preparation

Areas to be paved should be prepared as previously outlined. Prior to installation of the first course of the pavement section, the foundation soil compaction should be verified for a depth of 12 inches (i.e., compacted to at least 98 percent of the modified Proctor (ASTM D-1557, AASHTO T-180) maximum dry density value).

6.10.2 Limerock Base

A limerock base course 6 inches thick overlying an 8-inch thick stabilized subgrade may be used, provided that grading and drainage plans preclude periodic saturation of the base material. The periodic saturation of a limerock base material could lead to premature pavement distress. A minimum clearance of 18 inches must be maintained between the bottom of the limerock base and the seasonal high groundwater table. For truck parking and drive areas, the base thickness should be a minimum of 8 inches.

The limerock should have a minimum Limerock Bearing Ratio (LBR) value of 100 and should be compacted to at least 98 percent of the modified Proctor (ASTM D-1557, AASHTO T-180) maximum density value.

An 8-inch thick subgrade having a minimum Limerock Bearing Ratio (LBR) value of 40 should be achieved beneath the limerock base. The natural soils may have to be stabilized with suitable clayey soil or other materials in order to achieve the required LBR value. The stabilized subgrade should be compacted to at least 98 percent of the modified Proctor maximum dry density (ASTM D-1557, AASHTO T-180).

6.10.3 Recycled Concrete Aggregate Base (Optional)

Recycled concrete aggregate base supported by a free-draining subgrade may be used. Six inches of recycled concrete aggregate base should be used in parking areas, and 8 inches of recycled concrete aggregate base should be used in truck parking and drive areas. A minimum clearance of 12 inches should be maintained between the bottom of the recycled concrete aggregate base and the seasonal high groundwater table.

The recycled concrete aggregate base should have a minimum Limerock Bearing Ratio (LBR) value of 150 and should be compacted to at least 98 percent of the modified Proctor maximum dry density (ASTM D-1557, AASHTO T-180). The recycled concrete aggregate should meet the material requirements outlined in Section 911 of the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest Edition. The subgrade beneath the recycled concrete aggregate base should consist of free-draining sand compacted to at least 98 percent of the modified Proctor maximum dry density (ASTM D-1557, AASHTO T-180).

We note that if the contractor's means and methods include stabilizing soils beneath the recycled concrete aggregate base, then the stabilizing material should be coarse material (e.g., gravel). Low permeability soils (e.g., silt and/or clay) should not be used as stabilizing material beneath recycled concrete aggregate base.

6.10.4 Wearing Surface

A minimum 1½ inch layer of Type SP-9.5 or SP-12.5 asphaltic concrete should be used for a wearing surface in automobile parking areas. For truck parking and drive areas, 2 inches of Type SP-9.5 or SP-12.5 asphaltic concrete should be used.

The Type SP asphalt should include Asphalt Binder Grade PG 67-22 (or a higher temperature range binder) and contain no more than 15 percent Recycled Asphalt Pavement (RAP) aggregate. Other requirements for the Type SP asphaltic concrete wearing surface are outlined in Section 334 in the Florida Department of Transportation, Standard Specifications for Road and Bridge Construction, latest Edition.

Florida Department of Transportation's latest specifications should govern the base placement and asphaltic concrete wearing surface. The above minimum requirements will satisfactorily support pavements subject to personal vehicle and occasional truck traffic. The design section should be increased accordingly if a heavier traffic pattern is anticipated.

The typical pavement sections presented in this report could be damaged by heavier traffic patterns and loads that may be associated with construction vehicles and operations. As such, we recommend that the pavement section(s) be protected during construction unless designed to accommodate the construction loads.

6.11 **Heavy-Duty Asphaltic Concrete Surface Pavement Section**

The base course may be either crushed limerock or crushed concrete with an LBR value in excess of 100 and conforming to the gradation and other criteria specified in the FDOT Standard Specification for Road and Bridge Construction. It should have a minimum thickness of 12 inches, and should be placed in two lifts, individually compacted to a minimum dry density of 98 percent of its Modified Proctor maximum dry density value.

We recommend a minimum 2-inch thick FDOT Type SP-9.5 or SP-12.5 asphaltic wearing surface. Care must be exercised to place the asphalt over dry, well-primed base material.

6.12 **Typical Concrete Pavement Section**

This typical pavement section is provided if a rigid, Portland cement concrete pavement is desired for the proposed parking/drive areas. A concrete pavement design includes selecting dimensions and other details to provide a section that will adequately carry the anticipated traffic, provide the correct types of joints in the proper locations, and promote positive drainage. The pavement thickness recommendations are based on the “Guide for Design and Construction of Concrete Parking Lots” published by the American Concrete Institute (ACI 330R-08).

All areas to be paved should be prepared as previously outlined, with the additional requirement that the subgrade within 12 inches of the bottom of the pavement consist of well-drained soils (Unified Classification SP) compacted to achieve a density equivalent to 98 percent of the modified Proctor (ASTM D-1557, AASHTO T-180) maximum dry density value for a depth of 12 inches. A minimum clearance of 2 feet must be maintained between the bottom of the concrete pavement and the seasonal high water table.
Assuming the pavement will be subjected to Traffic Category C (ADTT=100) levels as described in Table 3.3 of ACI 330R-08, and the subgrade is prepared as outlined above, the concrete pavement should be a minimum of 6.5 inches in thickness and have a minimum compressive strength of 4,000 pounds per square inch.

The above minimum design recommendations can be used for unreinforced, fiber-reinforced, or steel-reinforced pavements. Steel reinforcement and joint design should be in accordance with the recommendations presented in ACI 330R-08.

6.13 Landscape Drainage

It is the landscape designer's responsibility to specify the soil types required in greenspace areas. Low permeability soils should typically be removed from greenspace areas because low permeability soils inhibit internal drainage and promote standing water and/or saturated ground conditions. These water conditions can harm plant survival and cause deterioration of adjacent pavements and water intrusion into adjacent buildings.

Seepage from landscaped areas, under and over curbs, can result in aesthetic problems, pedestrian safety issues, and, in extreme cases, premature pavement failures. Such seepage can be reduced by the use of relatively free-draining sands in berms, reducing the height of berms, controlling the frequency and amount of irrigation, the use of full-depth curbs, and/or the use of edge/strip drains or underdrains behind curbs. An often successfully used method of enhancing landscape drainage is to slope the greenspace areas downward, away from curbs, buildings, etc., and incorporate catch basins with positive outflow to prevent excess water buildup in the greenspace areas.

6.14 Retention Pond and Other Green Areas

We understand that a dry-bottom retention pond is planned. For this study, soil conditions were explored in the proposed pond areas with one SPT boring (B-24) to a depth of 30 feet below the existing ground surface.

6.14.1 Soil Permeability

The fine sand and fine sand with silt are generally considered to be relatively permeable. The underlying hardpan-type soils are likely less permeable than the fine sand and fine sand with silt, and should be considered to be aquitards for retention pond drawdown evaluation. Typically, for pond drawdown calculation purposes, the surface of the aquitard that underlies and is closest to the pond bottom is considered to be the "base of the aquifer." However, despite its low soil permeability, an aquitard does allow some transmission of water. The permeability of an aquitard(s) could be included in pond recovery calculations. However, the calculation typically requires more complex groundwater flow modeling.

The results of the DRI tests for the pond and other requested green areas are presented in the following table:

Test Location	Test Depth (feet)	Measured Permeability (feet/day)
DRI-1	0.5	>40
DRI-2	0.5	32
DRI-3	0.5	>40
DRI-4	0.5	1.8

It is noted that a suitable safety factor should be used with these values. In addition, for the type of soils tested, a transformation ratio of 1 horizontal to 1 vertical is appropriate (i.e., the estimated ratio of horizontal to vertical permeability).

We recommend using a soil porosity of 30 percent for pond recovery calculations.

6.14.2 Other Retention Pond Considerations

For dry bottom retention ponds, pond performance will be significantly influenced by the soil permeability and the vertical separation between the pond bottom and the seasonal high groundwater level. Because of the high groundwater level and poorly draining soil conditions at this site, underdrains may be necessary to prevent the growth of aquatic vegetation and for pond volume recovery. An outfall (i.e., stormwater drain, ditch, canal, natural low areas, etc.) will be necessary to utilize underdrains.

Ardaman & Associates, Inc. would be pleased to assist in evaluating the design exfiltration rates, underdrains, and/or groundwater baseflow as pond geometry and stormwater volume requirements become available.

7.0 QUALITY ASSURANCE

We recommend establishing a comprehensive quality assurance program to verify that all site preparation and foundation and pavement construction are conducted in accordance with the appropriate plans and specifications. Materials testing and inspection services should be provided by Ardaman & Associates.

At a minimum, an on-site engineering technician should monitor all test pits, demucking, stripping and grubbing to verify that deleterious materials have been removed and observe the proof-rolling operation to verify that the appropriate number of passes are applied to the subgrade. In-situ

density tests should be conducted during earthwork activities and below all structural areas, including footings, floor slabs, pavement, and other hardscape areas, to verify that the required densities have been achieved. In-situ density values should be compared to laboratory Proctor moisture-density results for each of the different natural and fill soils encountered.

Additionally, for the pavements, Limerock Bearing Ratio tests should be performed. The base course(s) should be tested for density and thickness. We recommend that Ardaman & Associates be retained to review the asphalt pavement mix design proposed for the project prior to pavement placement. During asphalt pavement construction, samples of the asphaltic concrete should be obtained and tested in the laboratory to verify compliance with the mix design. We also recommend full-time monitoring/testing during pavement placement in the batch plant and on the site. The asphaltic concrete thickness should be verified in the field.

Finally, we recommend inspecting and testing the construction materials for the foundations and other structural components.

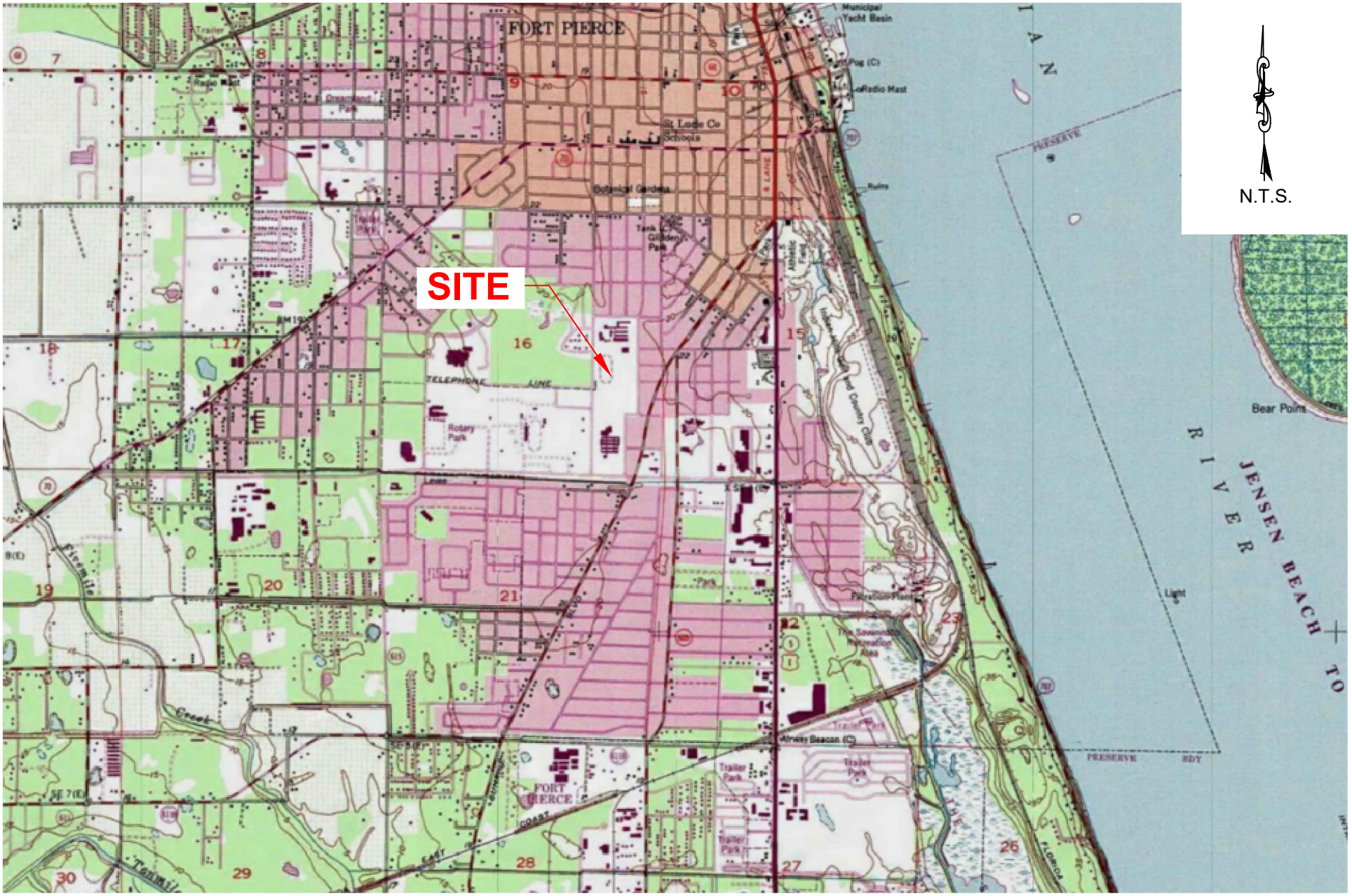
8.0 IN-PLACE DENSITY TESTING FREQUENCY

In Southeast Florida, earthwork testing is typically performed on an on-call basis when the contractor has completed a portion of the work. The test result from a specific location only represents a larger area if the contractor has used consistent means and methods and the soils are practically uniform throughout. The testing frequency can be increased, and full-time construction inspection can be provided to account for variations. We recommend that the following minimum testing frequencies be utilized.

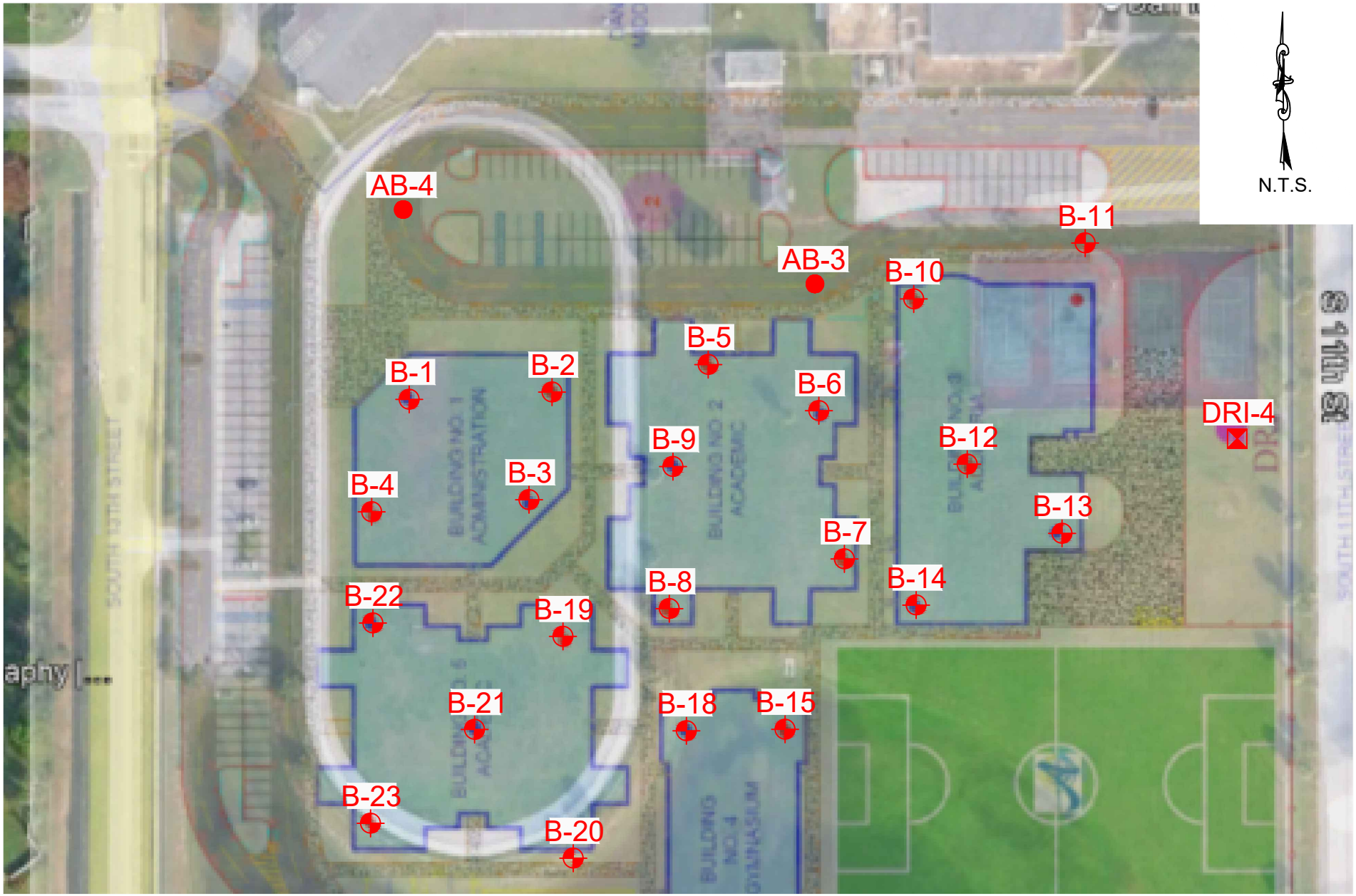
A minimum frequency of one in-place density test for each 2,500 square feet of area should be used in proposed building areas. In-place density testing should be performed at this minimum frequency for a depth of 2 feet below natural ground and for every 1-foot lift of fill placed in the structural area. In addition, density tests should be performed in each column footing for a depth of 2 feet below the bearing surface. For continuous or wall footings, density tests should be performed at a minimum frequency of one test for every 50 linear feet of footing and for a depth 2 feet below the bearing surface.

A minimum frequency of one in-place density test for each 5,000 square feet of area should be used in proposed pavement and other hardscape areas. The existing, natural ground should be tested to a depth of 12 inches at the prescribed frequency. Each 12-inch lift of fill, as well as the stabilized subgrade (where applicable) and base, should be tested at this frequency. Utility backfill should be tested at a minimum frequency of one in-place density test for each 12-inch lift for each 200 linear feet of pipe. Additional tests should be performed in backfill for manholes, inlets, etc.

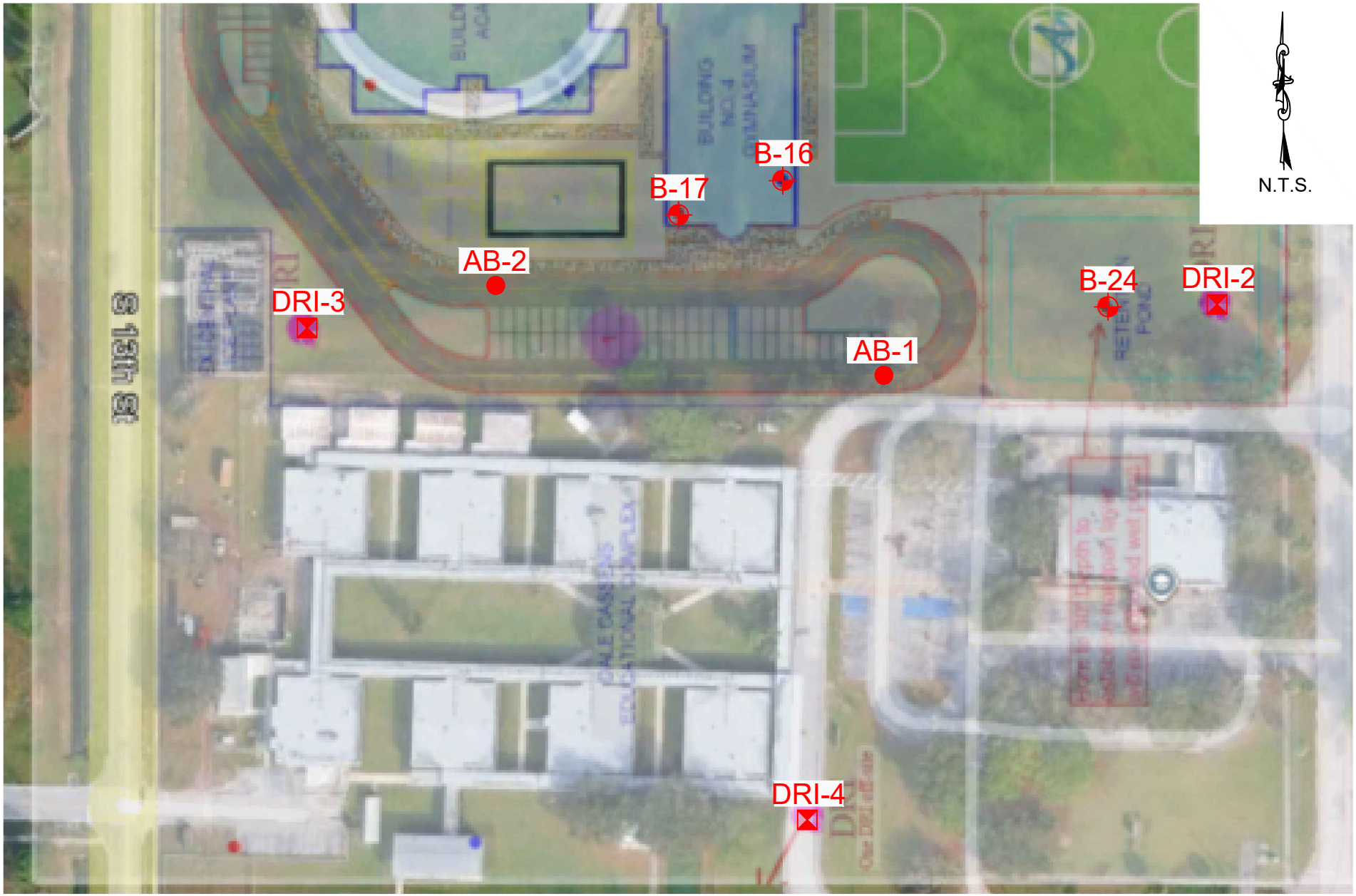
Representative samples of the various natural ground and fill soils, stabilized subgrade (where applicable), and base materials should be obtained and transported to our laboratory for Proctor compaction tests. These tests will determine the maximum dry density and optimum moisture content for the materials tested. They will be used in conjunction with the results of the in-place density tests to determine the degree of compaction achieved.



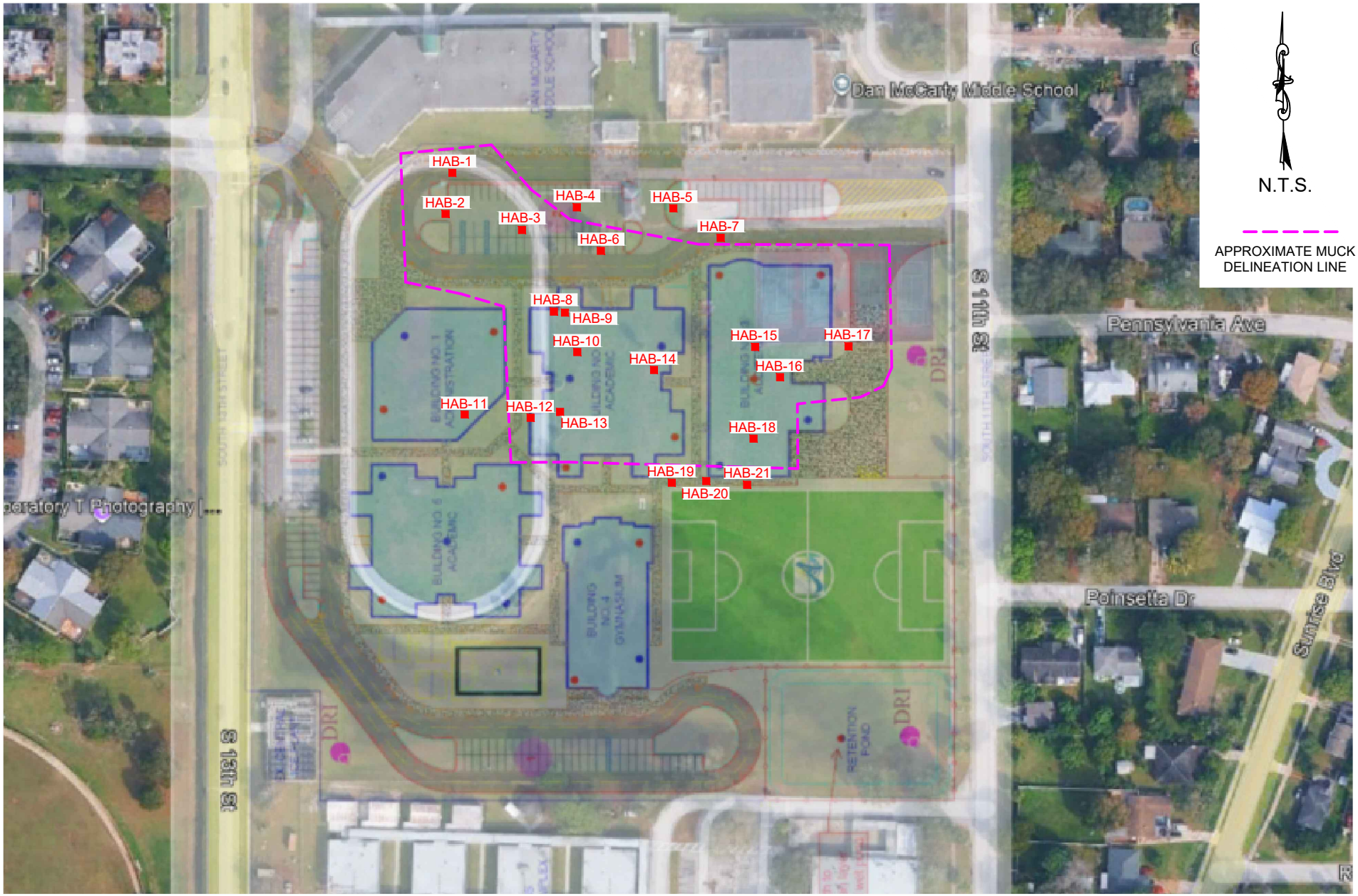
Ardaman & Associates, Inc. Geotechnical, Environmental & Materials Consultants 2190 Reserve Park Trace, Suite 9 Port St. Lucie, FL 34986 Phone: (772) 878 0072	SUBSURFACE EXPLORATION SLPS GREEN ZONE K-8 1201 MISSISSIPPI AVE, FORT PIERCE, FLORIDA	SITE VICINITY MAP Figure No. 1	File No.: 25-5405 Prepared By: SP Date: 3/29/2026



Ardaman & Associates, Inc. Geotechnical, Environmental & Materials Consultants 2190 Reserve Park Trace, Suite 9 Port St. Lucie, FL 34986 Phone: (772) 878 0072	SUBSURFACE EXPLORATION SLPS GREEN ZONE K-8 1201 MISSISSIPPI AVE, FORT PIERCE, FLORIDA	BORING LOCATION PLAN Figure No. 2	File No.: 25-5405 Prepared By: SP Date: 3/29/2026



Ardaman & Associates, Inc. Geotechnical, Environmental & Materials Consultants 2190 Reserve Park Trace, Suite 9 Port St. Lucie, FL 34986 Phone: (772) 878 0072	SUBSURFACE EXPLORATION SLPS GREEN ZONE K-8 1201 MISSISSIPPI AVE, FORT PIERCE, FLORIDA	BORING LOCATION PLAN Figure No. 3	File No.: 25-5405 Prepared By: SP Date: 3/29/2026



Ardaman & Associates, Inc. Geotechnical, Environmental & Materials Consultants 2190 Reserve Park Trace, Suite 9 Port St. Lucie, FL 34986 Phone: (772) 878 0072	SUBSURFACE EXPLORATION SLPS GREEN ZONE K-8 1201 MISSISSIPPI AVE, FORT PIERCE, FLORIDA	MUCK DELINEATION PLAN Figure No. 4	File No.: 25-5405 Prepared By: SP Date: 6/10/2026

Ardaman & Associates, Inc.

STANDARD PENETRATION TEST BORING LOG

BORING B-1

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

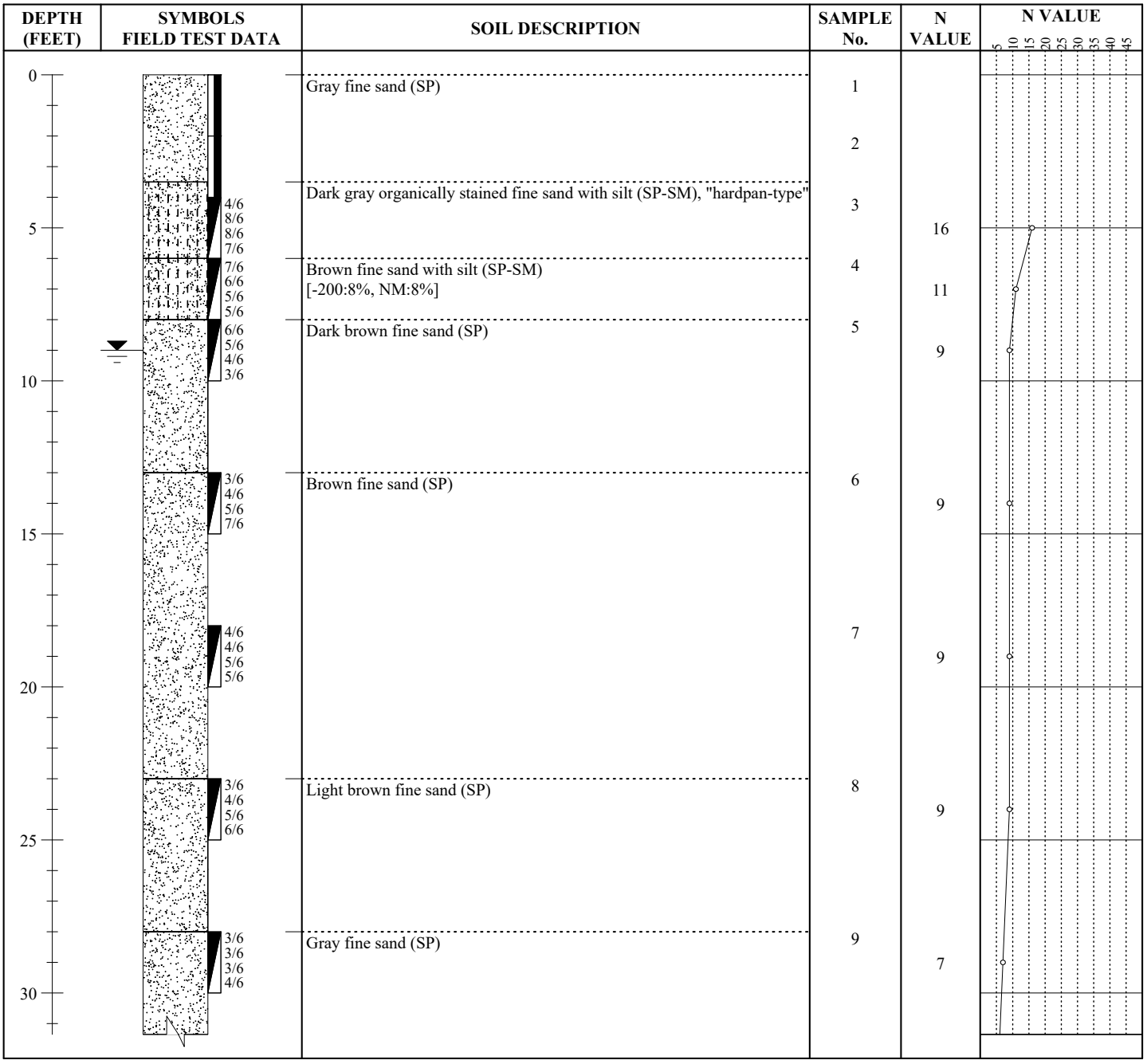
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 9 feet

DATE DRILLED: 2/14/2026



NOTES:

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: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

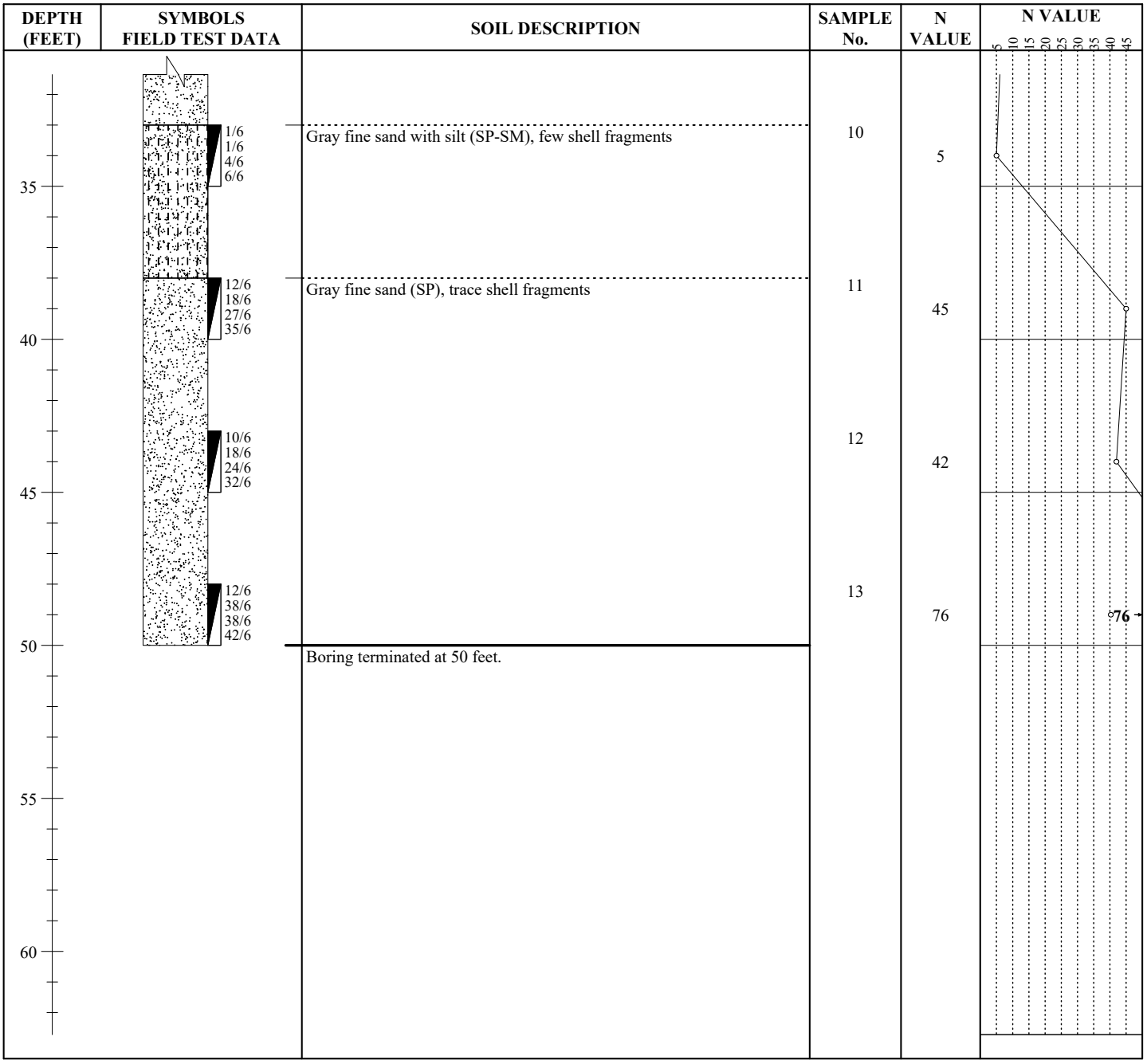
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 9 feet

DATE DRILLED: 2/14/2026



NOTES:

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: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

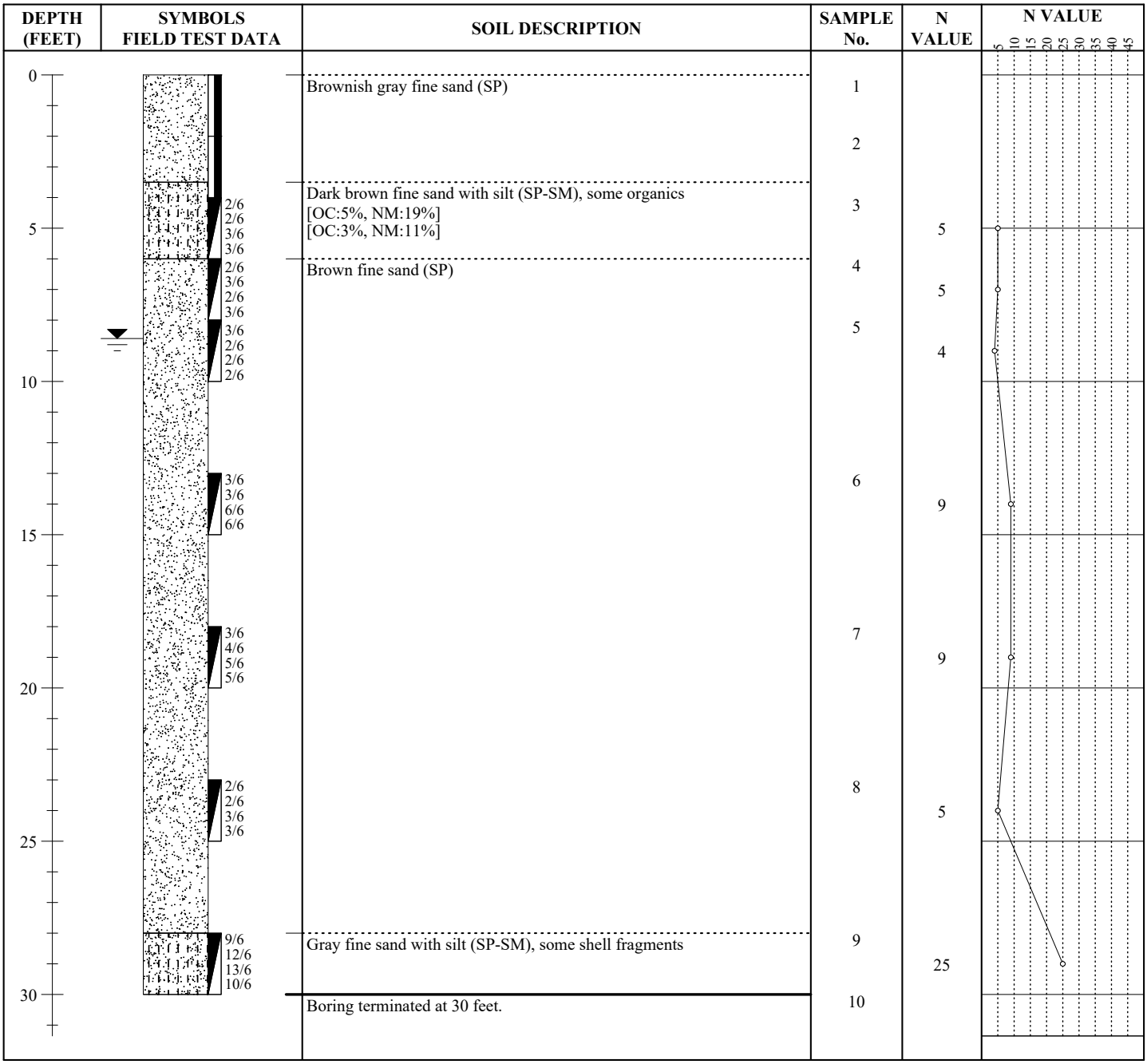
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 8.6 feet

DATE DRILLED: 2/14/2026



NOTES:

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: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

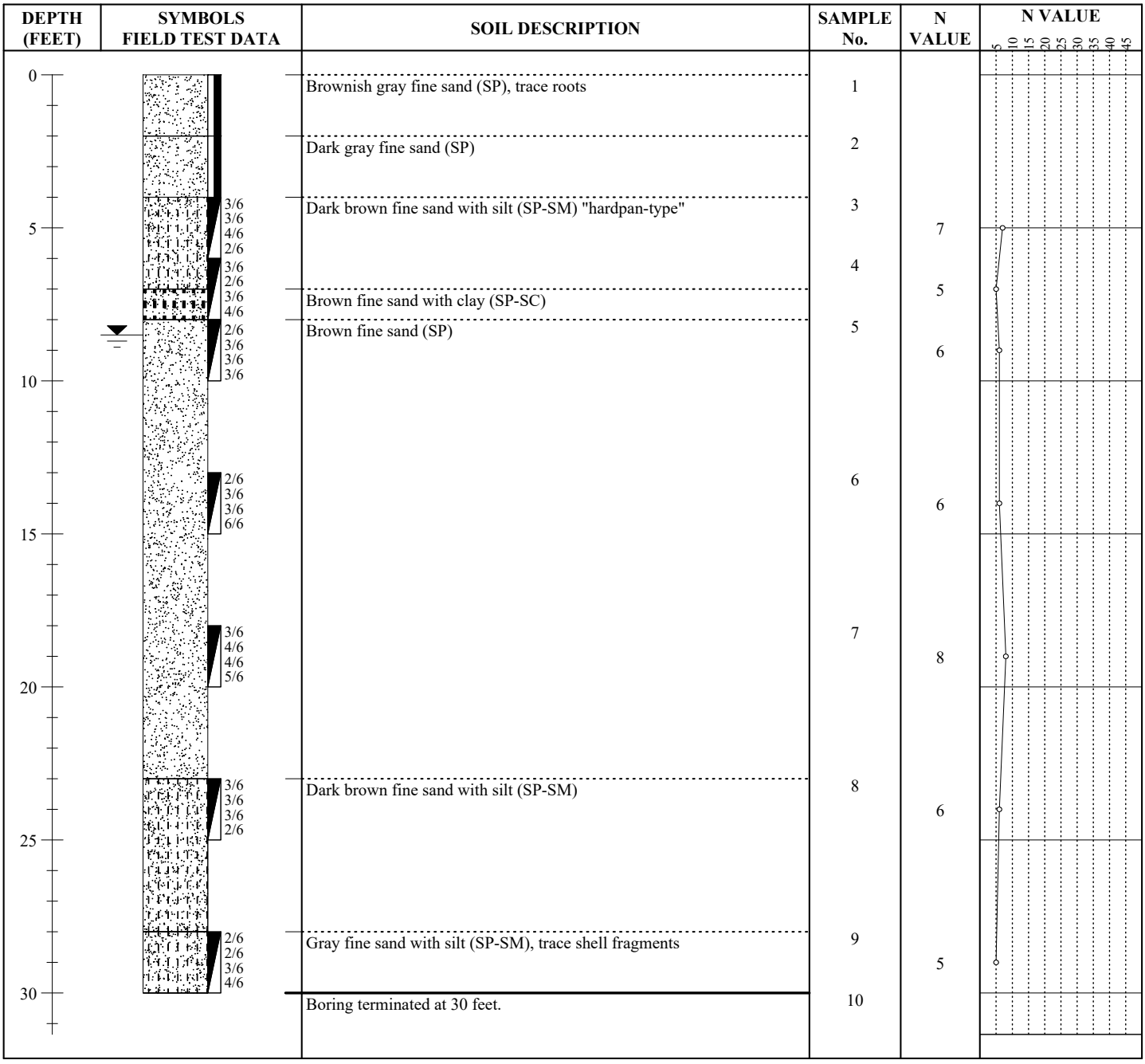
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 8.5 feet

DATE DRILLED: 2/14/2026



NOTES:

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: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

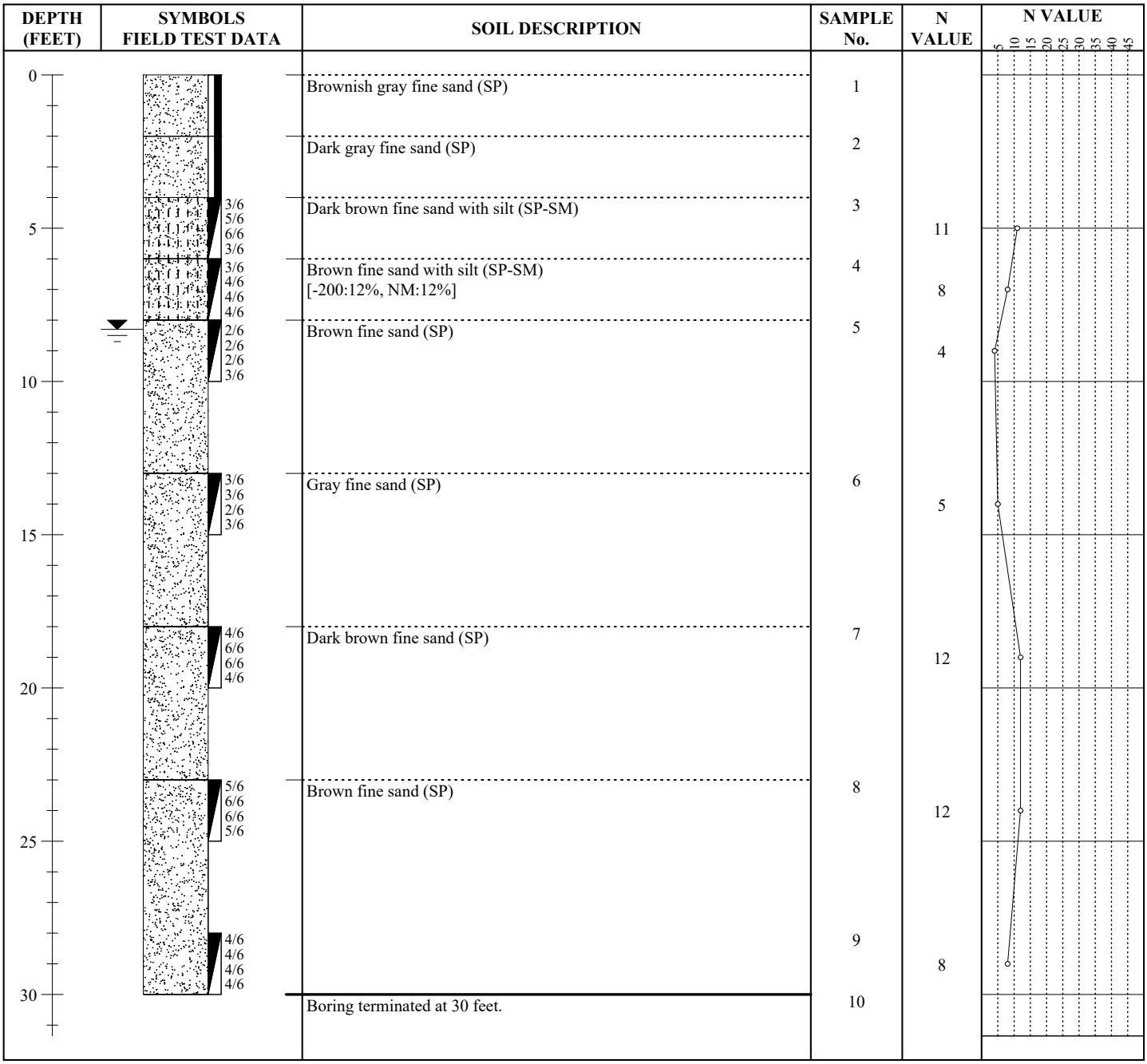
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 8.3 feet

DATE DRILLED: 2/14/2026



NOTES:

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: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

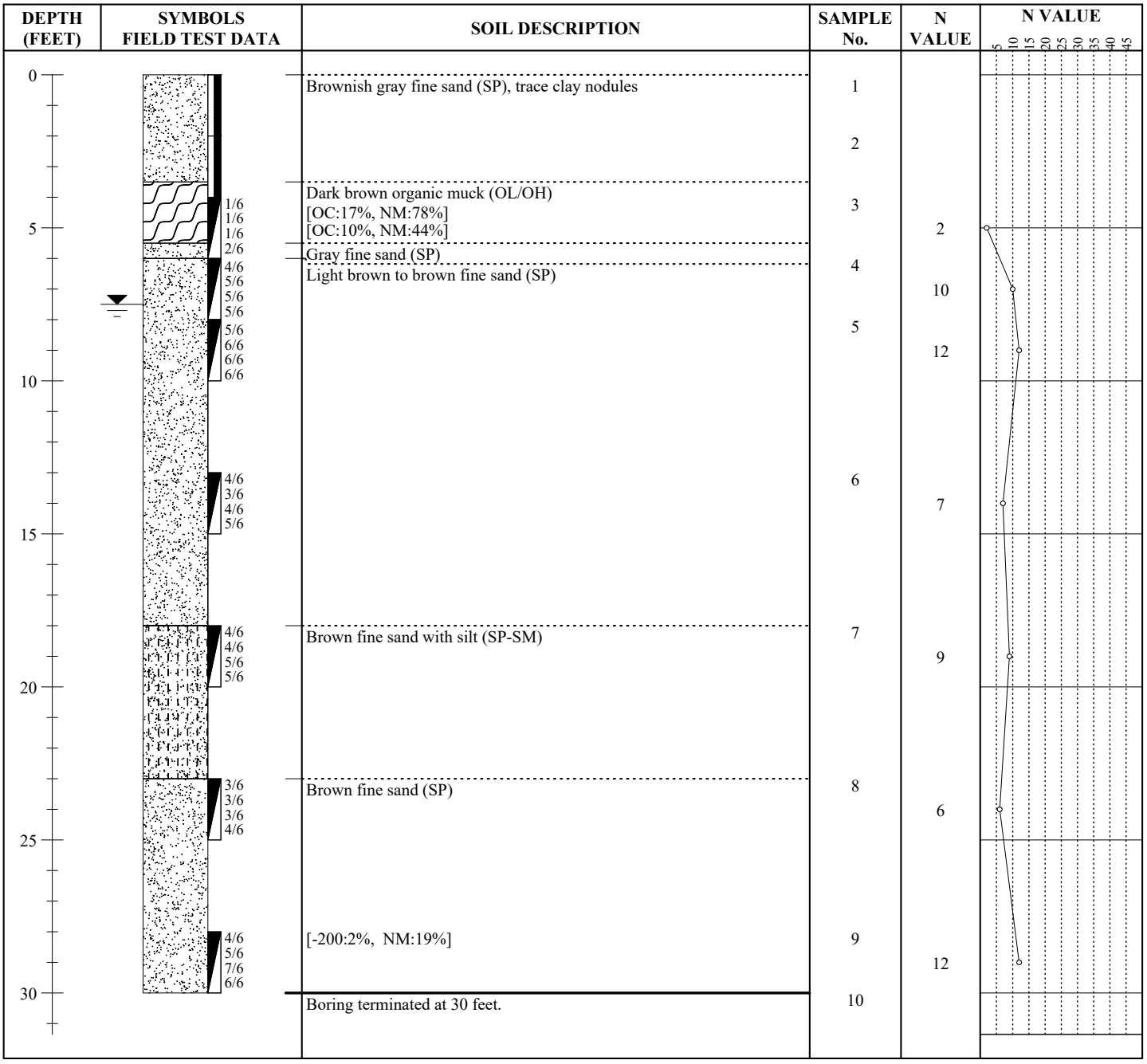
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 7.5 feet

DATE DRILLED: 2/14/2026



NOTES:

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-6

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

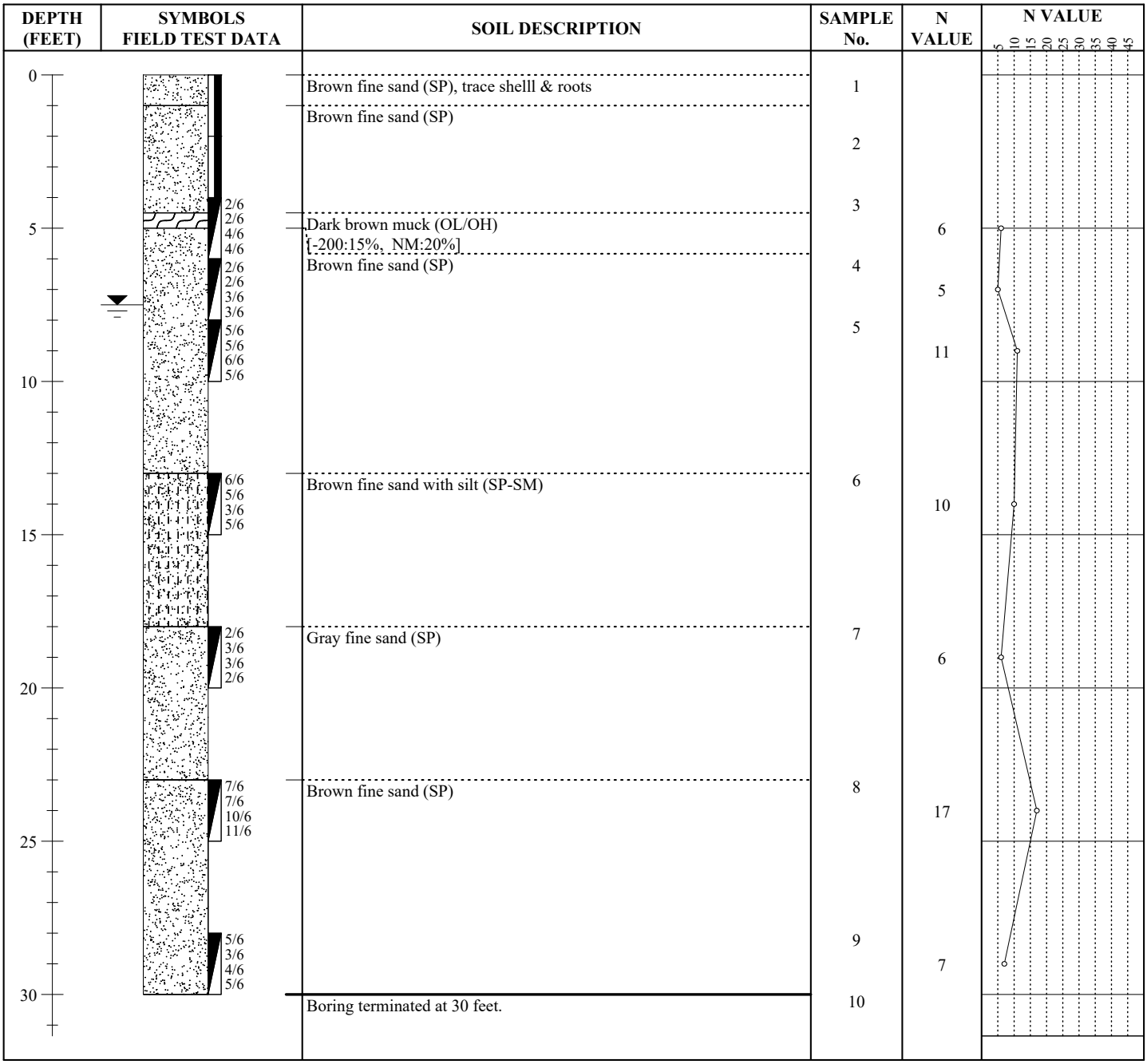
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 7.5 feet

DATE DRILLED: 2/14/2026



NOTES:

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-7

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

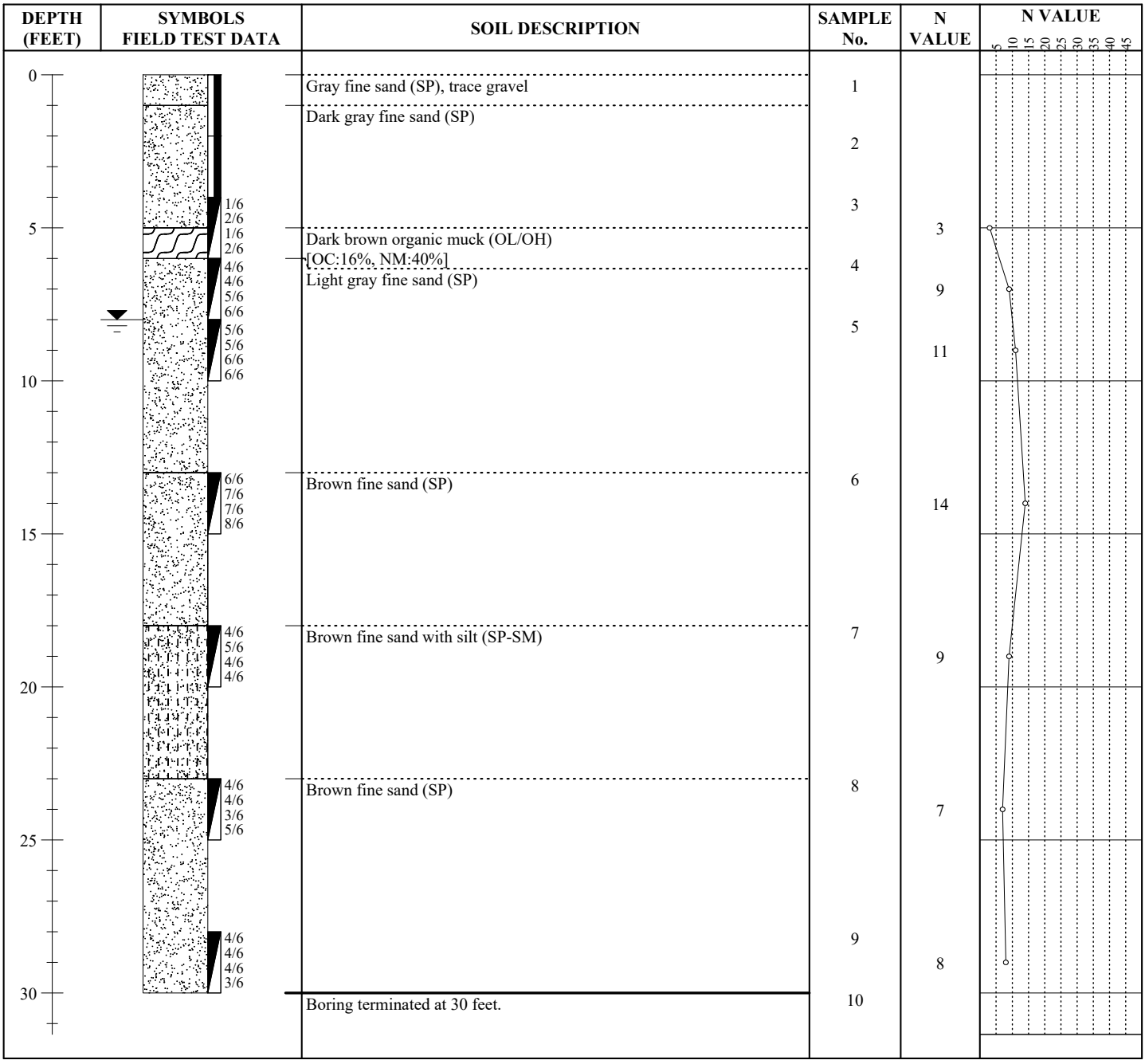
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 8 feet

DATE DRILLED: 2/14/2026



NOTES:

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-8

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

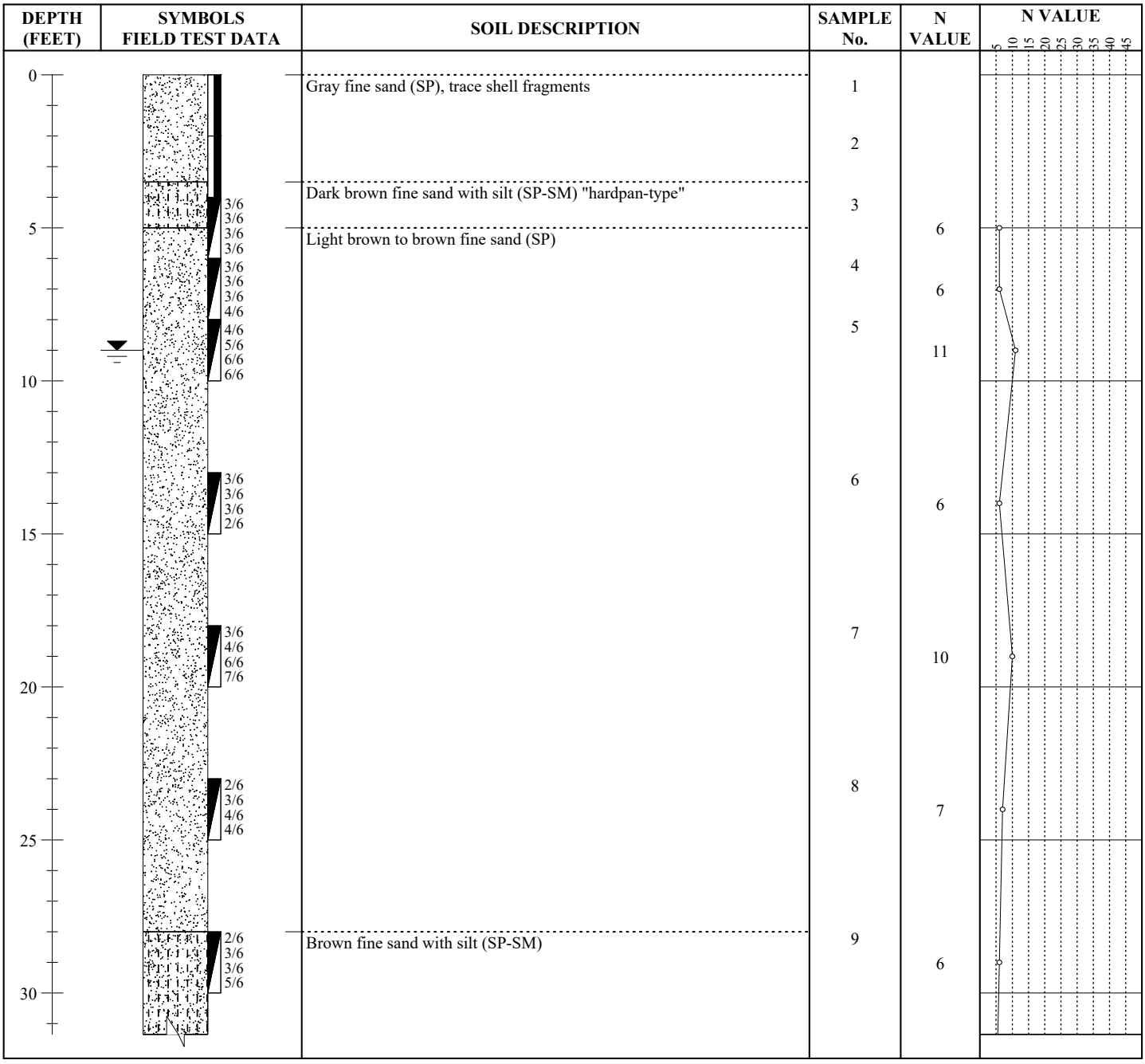
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 9 feet

DATE DRILLED: 2/14/2026



NOTES:

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-8

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 9 feet

DATE DRILLED: 2/14/2026

DEPTH (FEET)	SYMBOLS FIELD TEST DATA	SOIL DESCRIPTION	SAMPLE No.	N VALUE
35	1/6 2/6 3/6 5/6	Gray fine sand (SP)	10	5
40	12/6 20/6 28/6 36/6	Light gray fine sand (SP), some shell fragments	11	48
45	14/6 23/6 30/6 34/6	Gray fine sand with silt (SP-SM), some shell fragments	12	53
50	18/6 24/6 30/6 36/6	Gray fine sand (SP), trace shell fragments	13	54
55		Boring terminated at 50 feet.		
60				

N VALUE
5 10 15 20 25 30 35 40 45

53

54

NOTES:

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-9

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

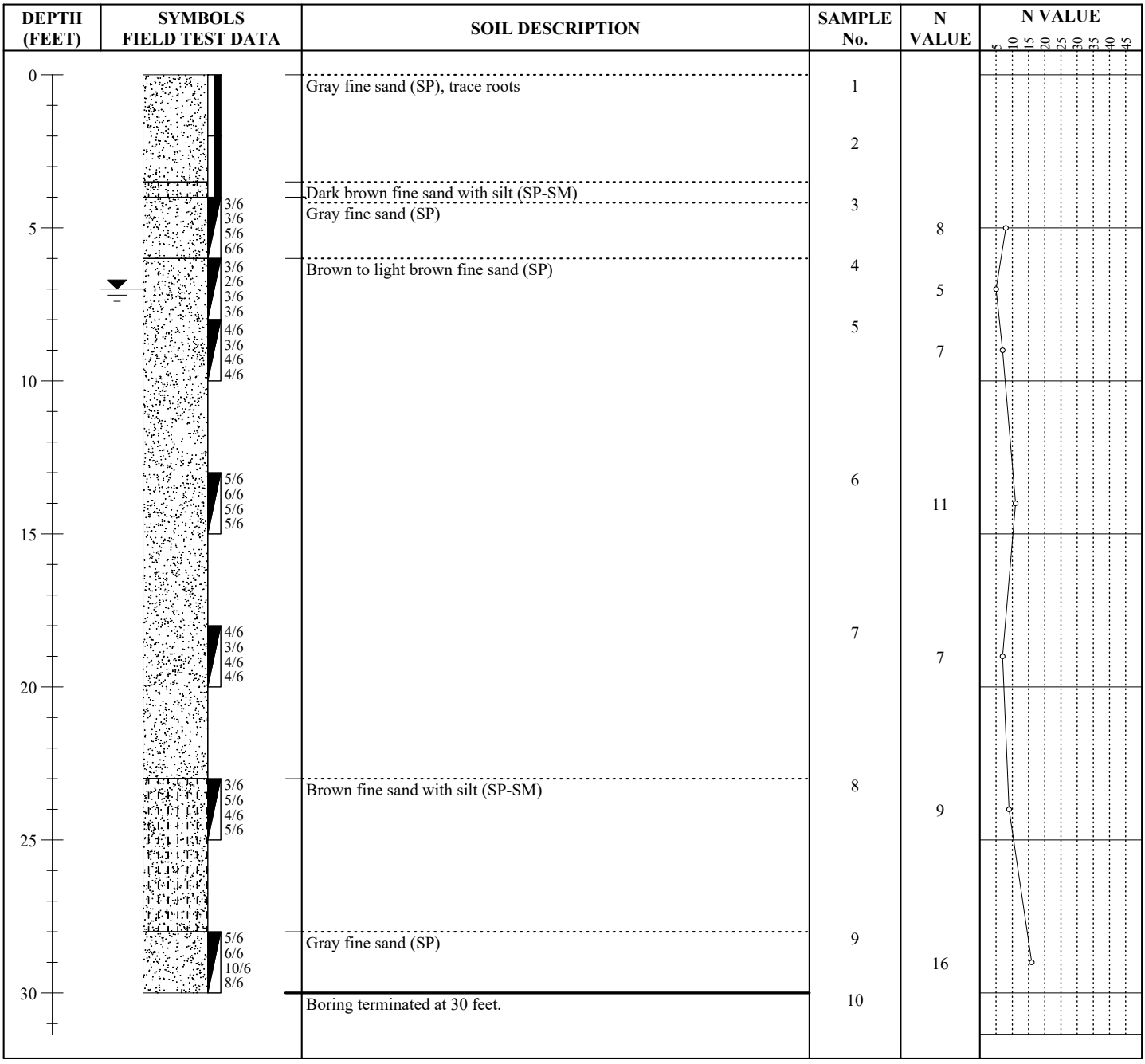
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 7 feet

DATE DRILLED: 2/14/2026



NOTES:

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-10

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

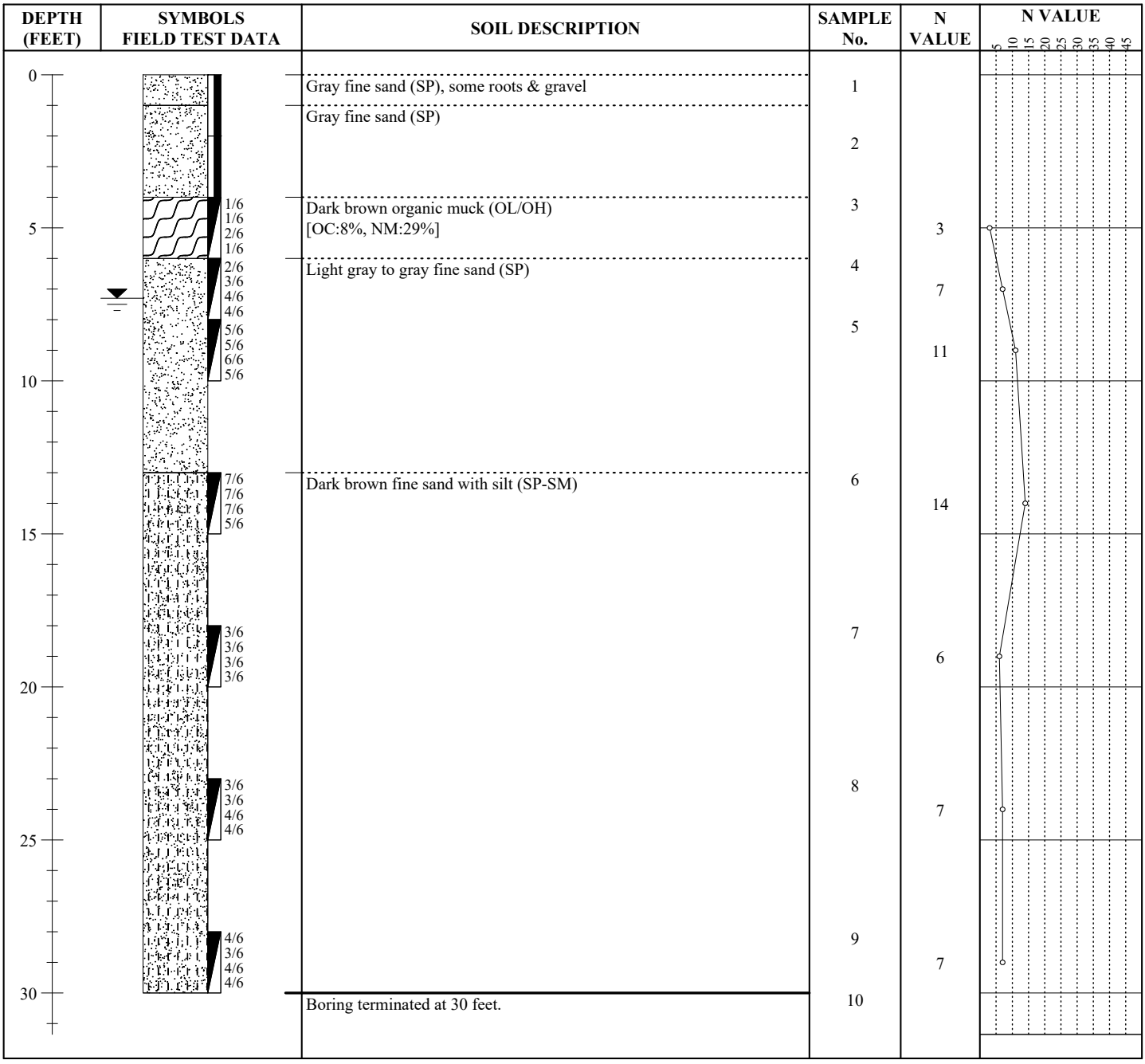
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 7.3 feet

DATE DRILLED: 2/14/2026



NOTES:

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-11

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

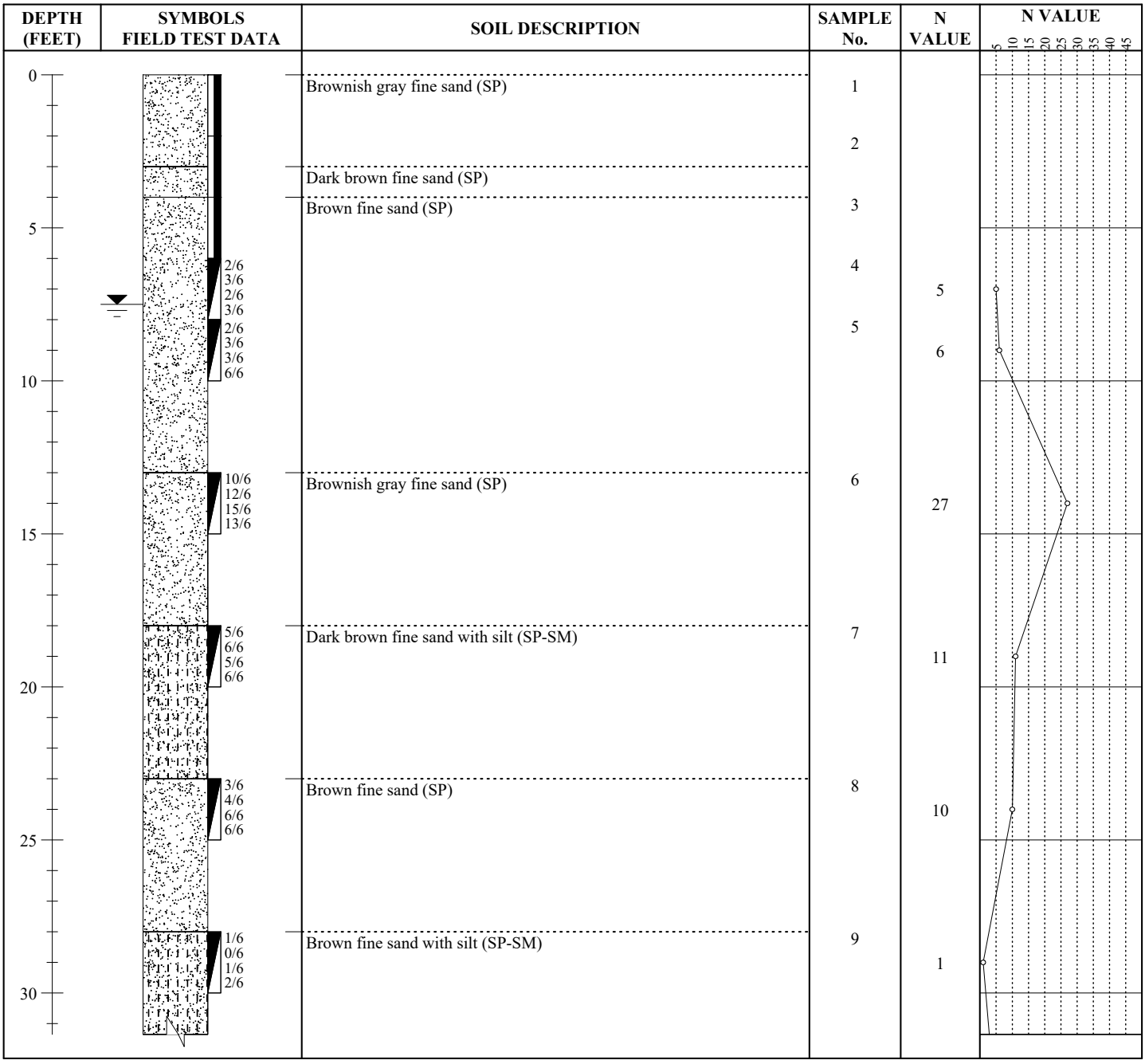
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 7.5 feet

DATE DRILLED: 2/14/2026



NOTES:

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-11

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

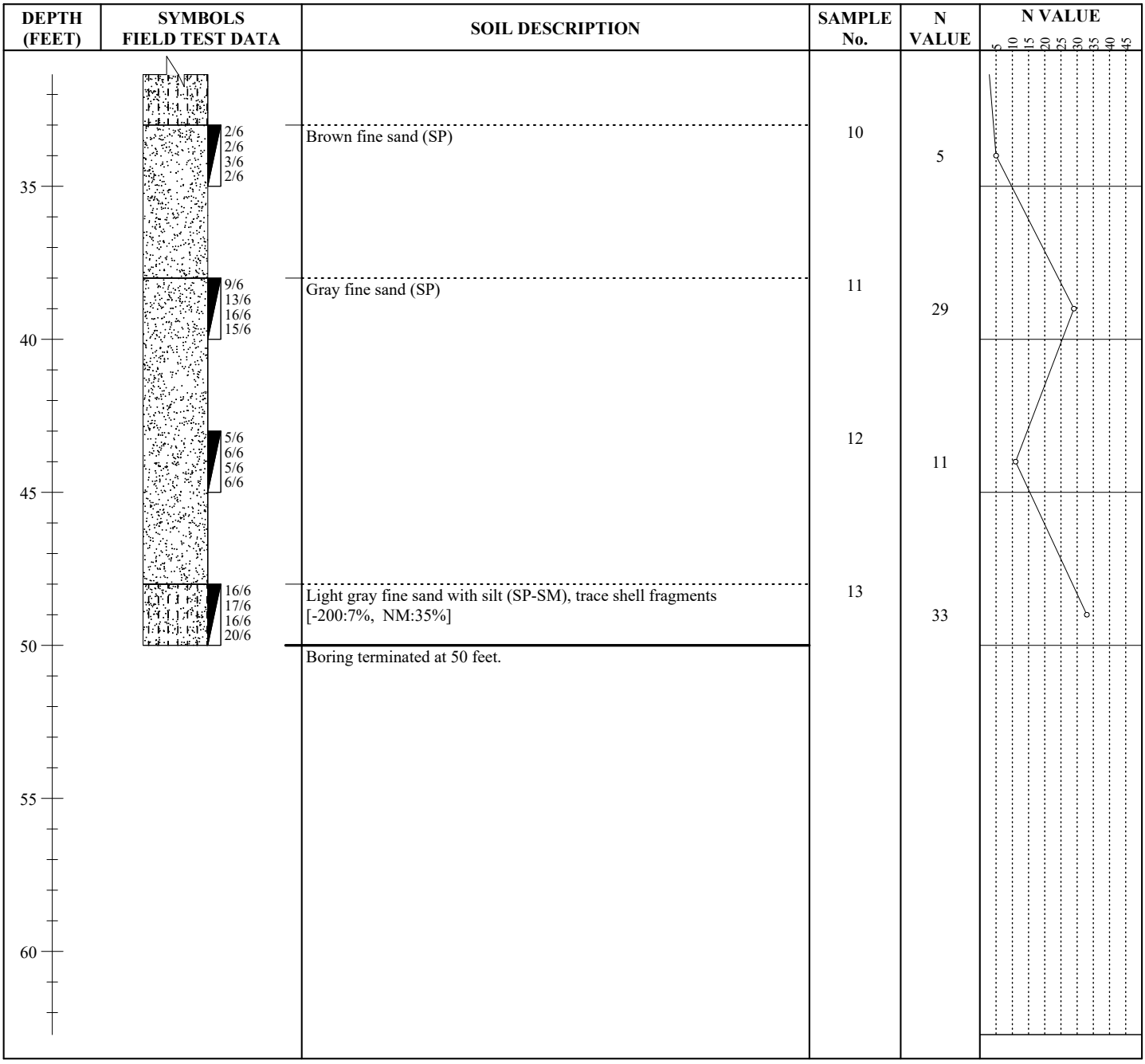
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 7.5 feet

DATE DRILLED: 2/14/2026



NOTES:

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-12

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

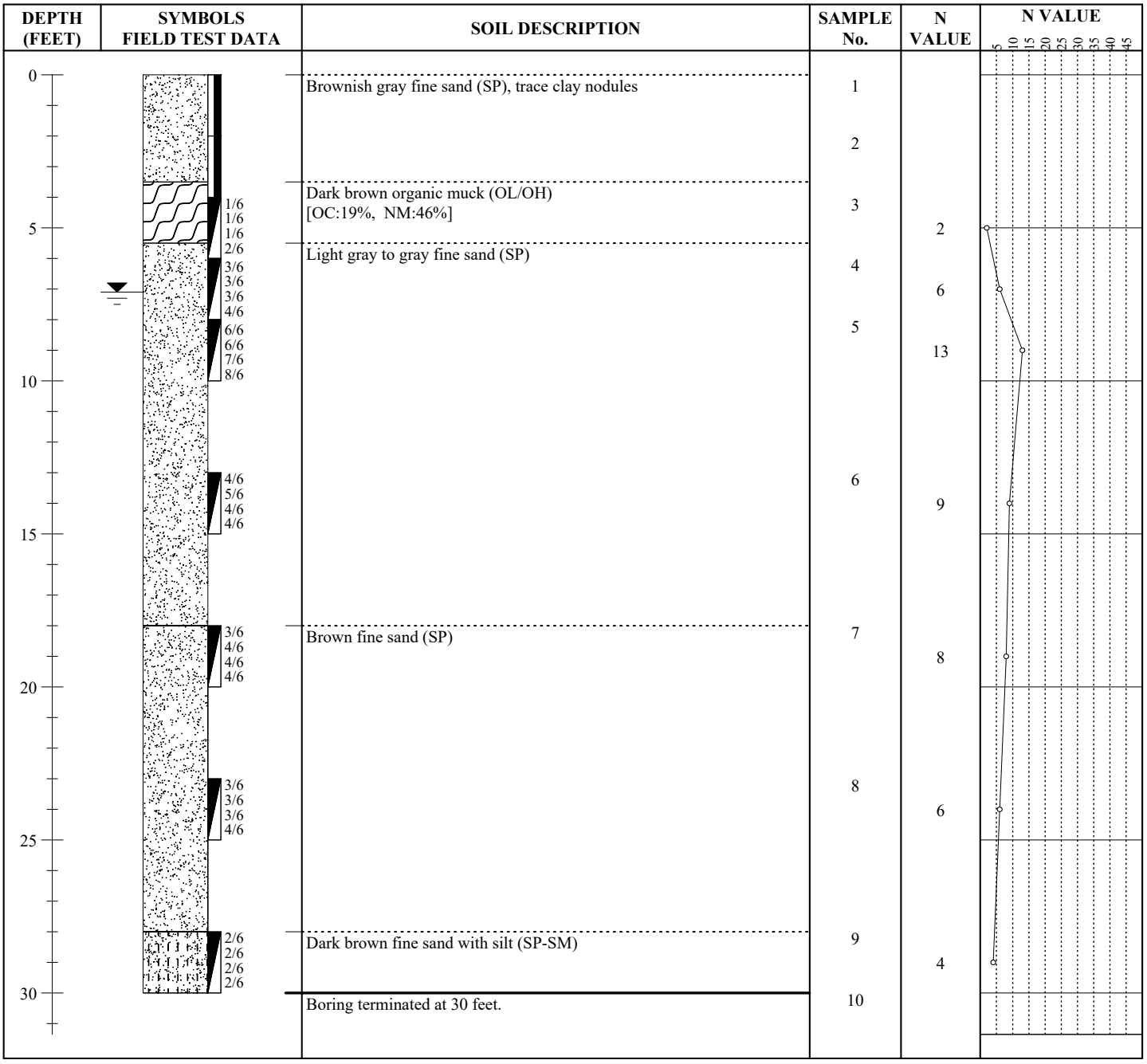
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 7.1 feet

DATE DRILLED: 2/14/2026



NOTES:

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-13

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

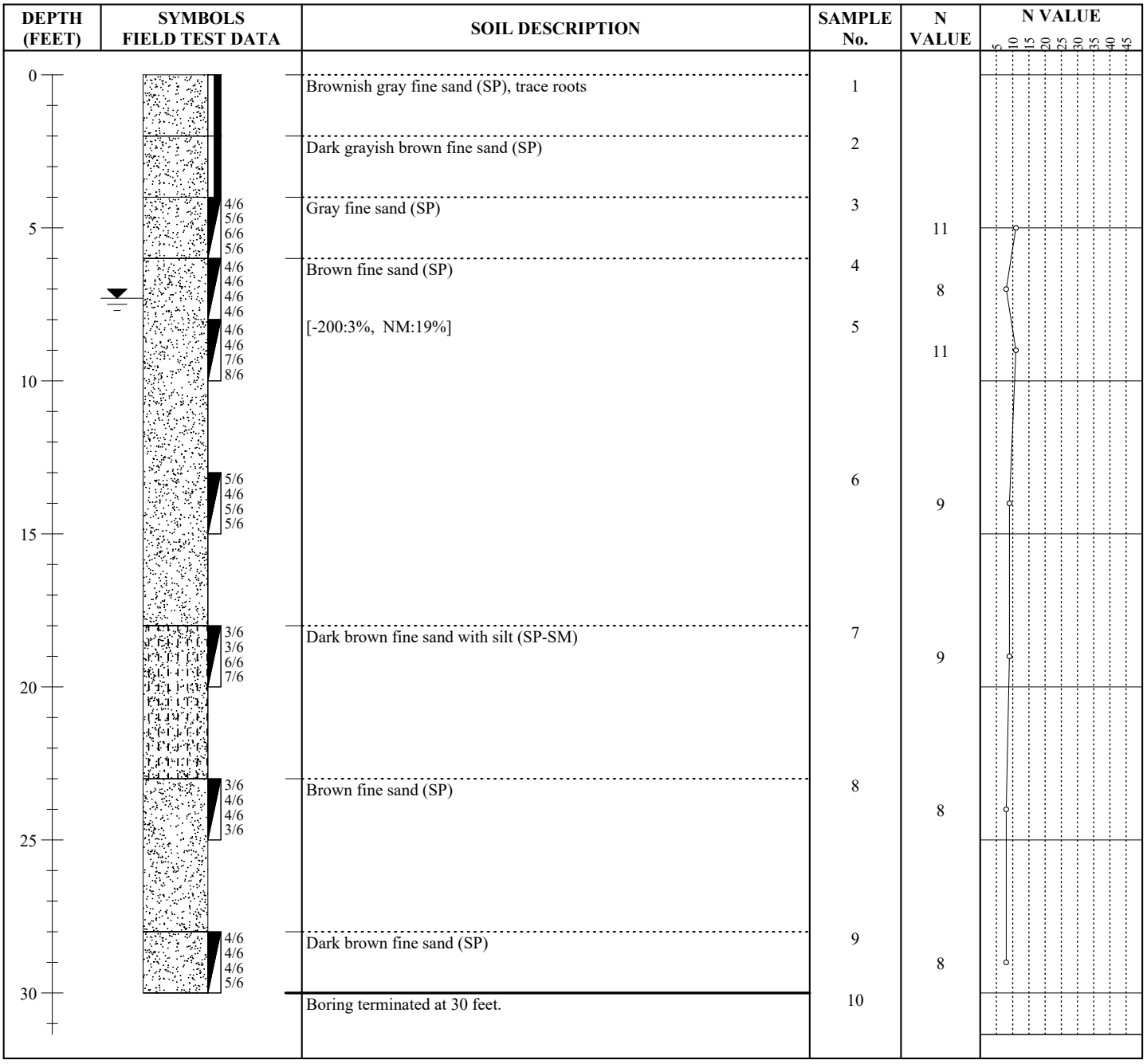
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 7.3 feet

DATE DRILLED: 2/14/2026



NOTES:

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-14

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

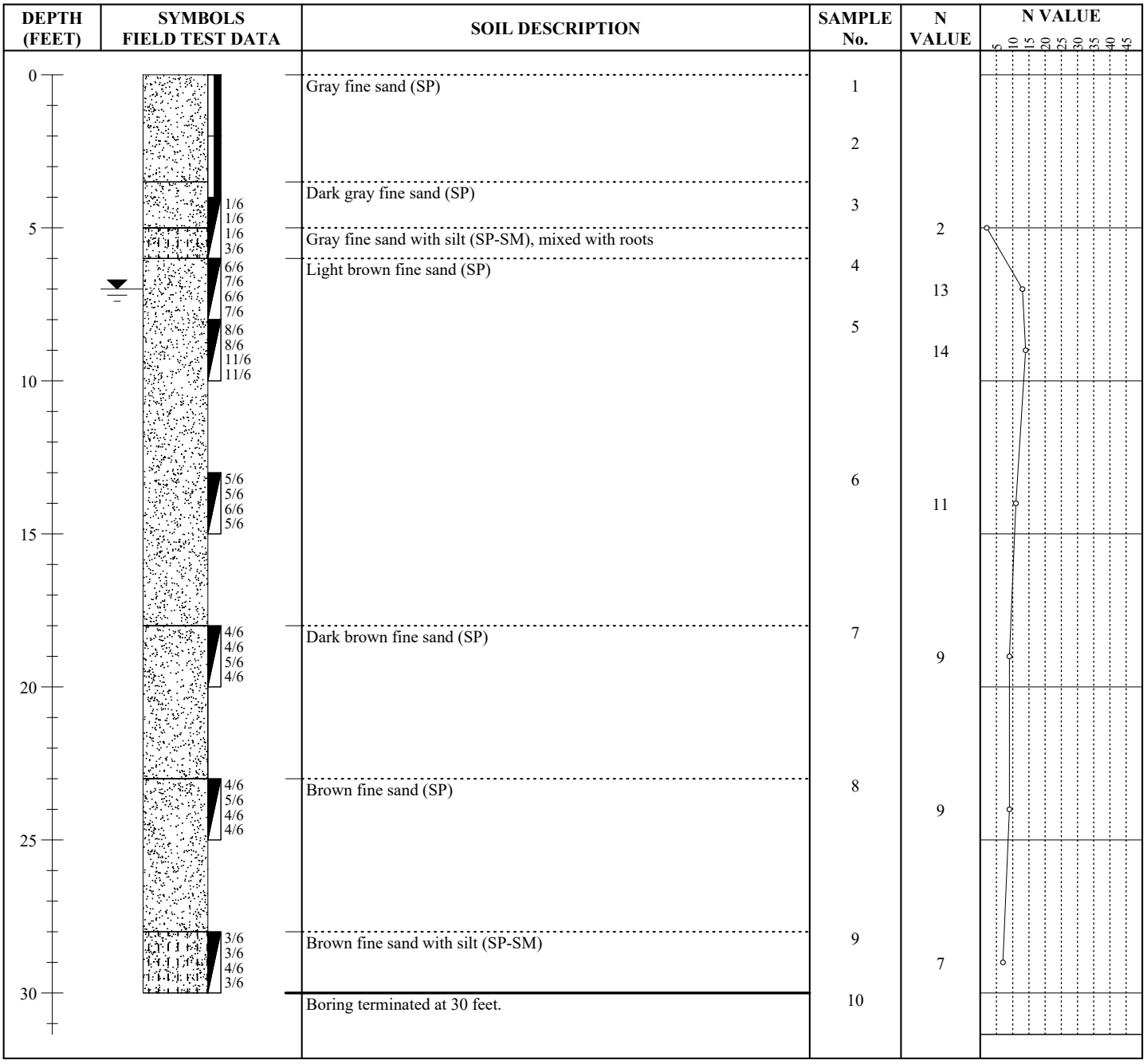
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 7 feet

DATE DRILLED: 2/14/2026



NOTES:

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-15

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

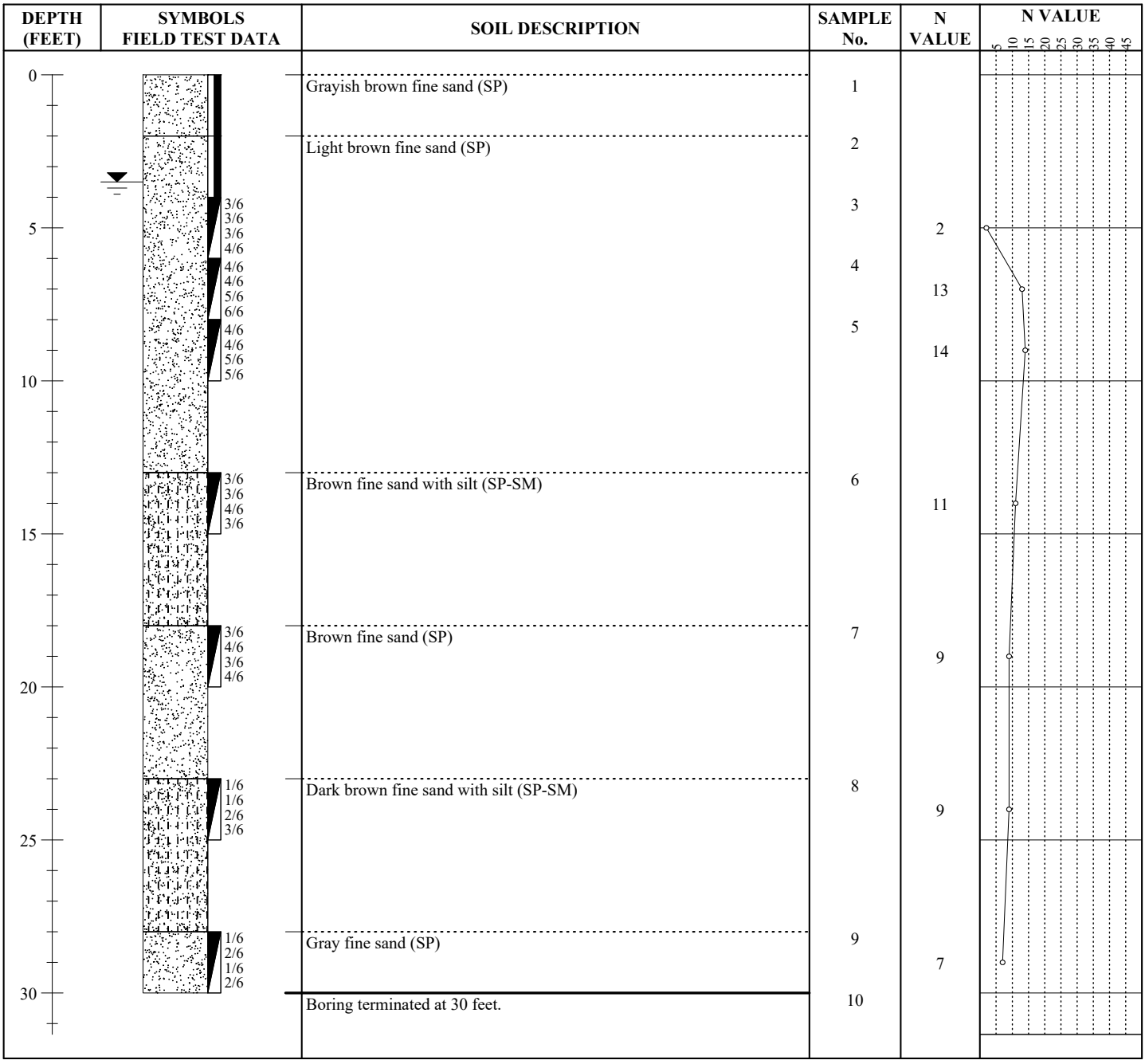
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 3.5 feet

DATE DRILLED: 2/14/2026



NOTES:

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-16

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

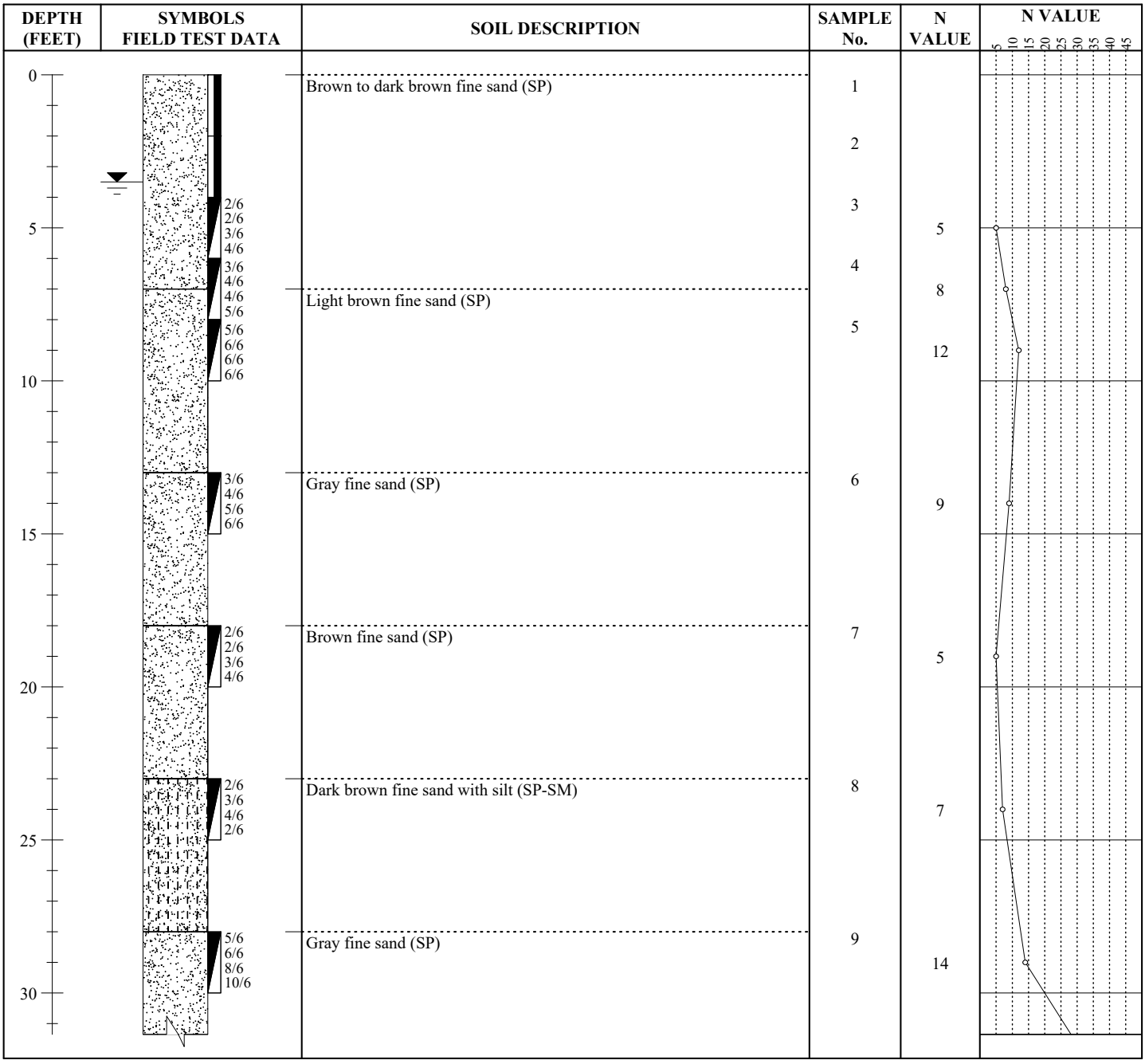
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 3.5 feet

DATE DRILLED: 2/14/2026



NOTES:

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-16

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

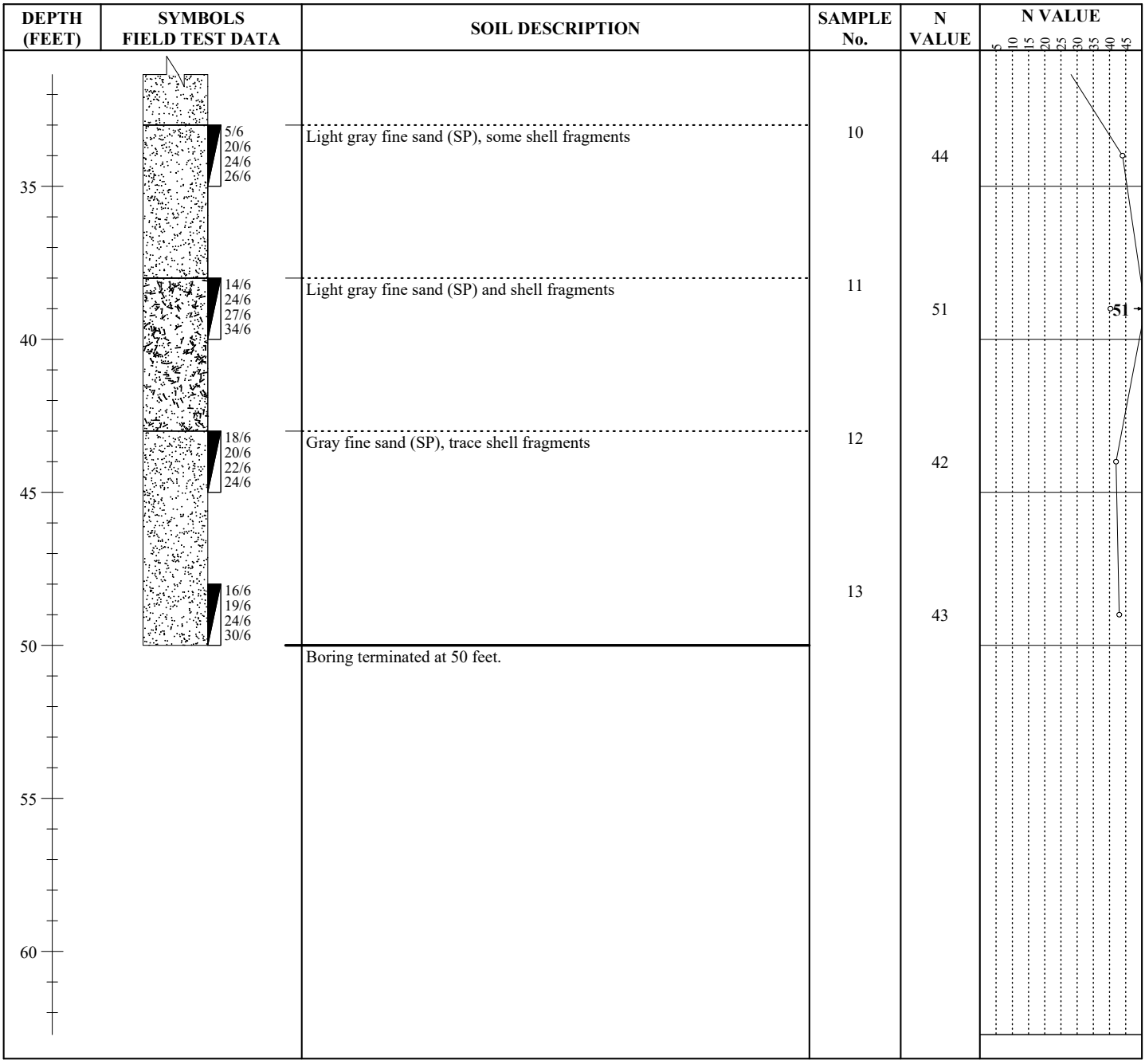
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 3.5 feet

DATE DRILLED: 2/14/2026



NOTES:

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-17

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

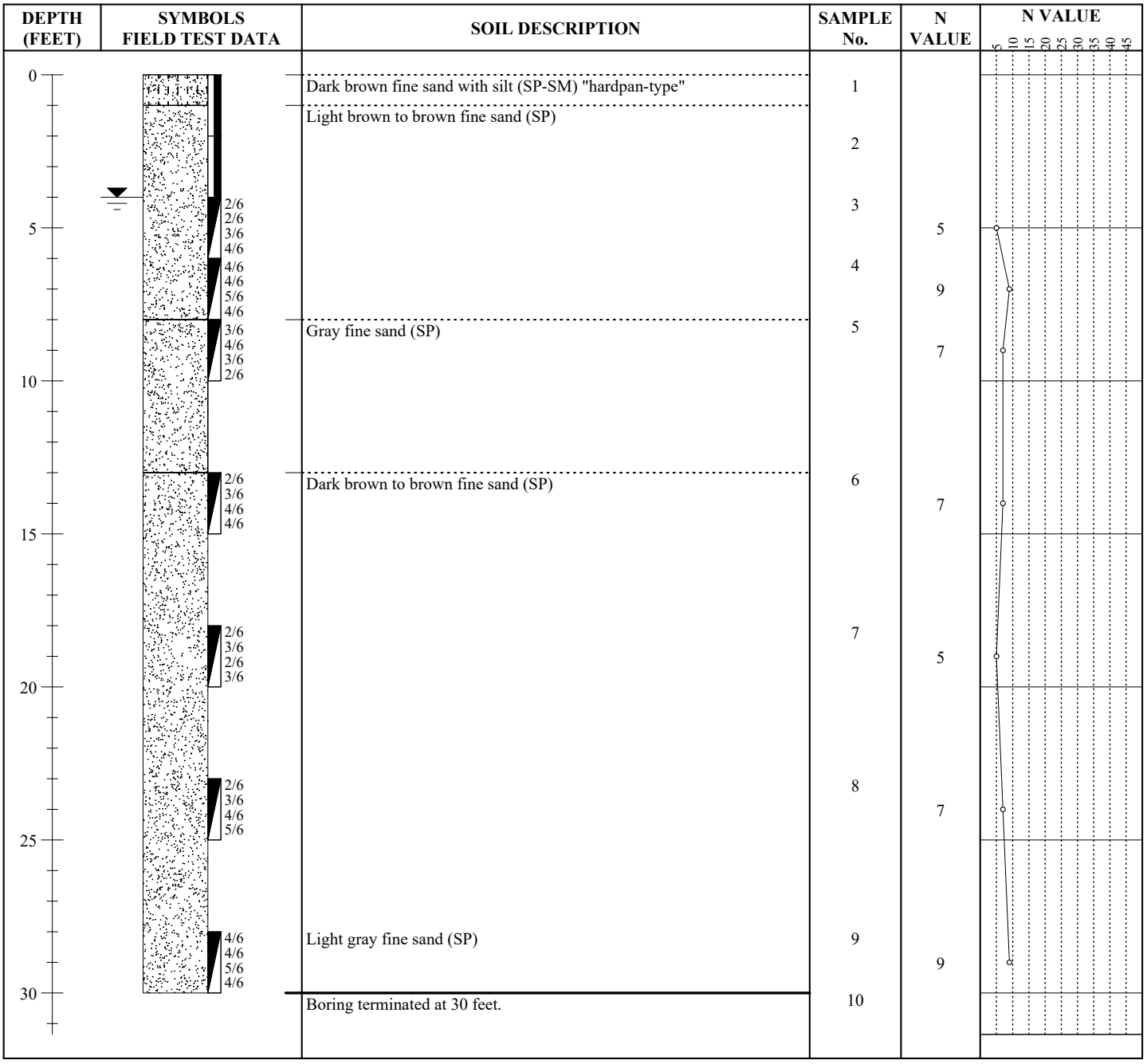
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 4 feet

DATE DRILLED: 2/14/2026



NOTES:

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-18

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

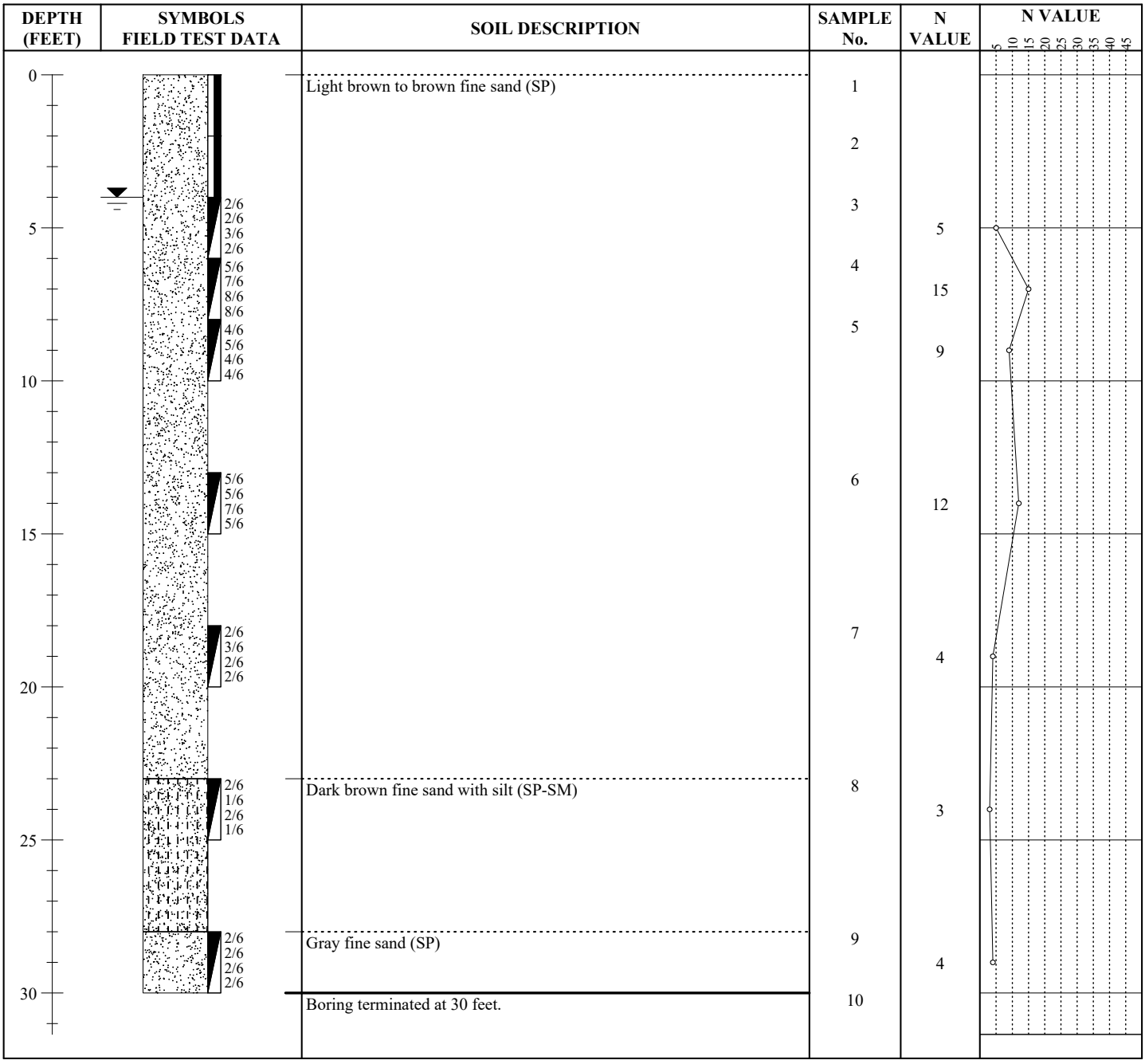
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 4 feet

DATE DRILLED: 2/14/2026



NOTES:

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-19

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

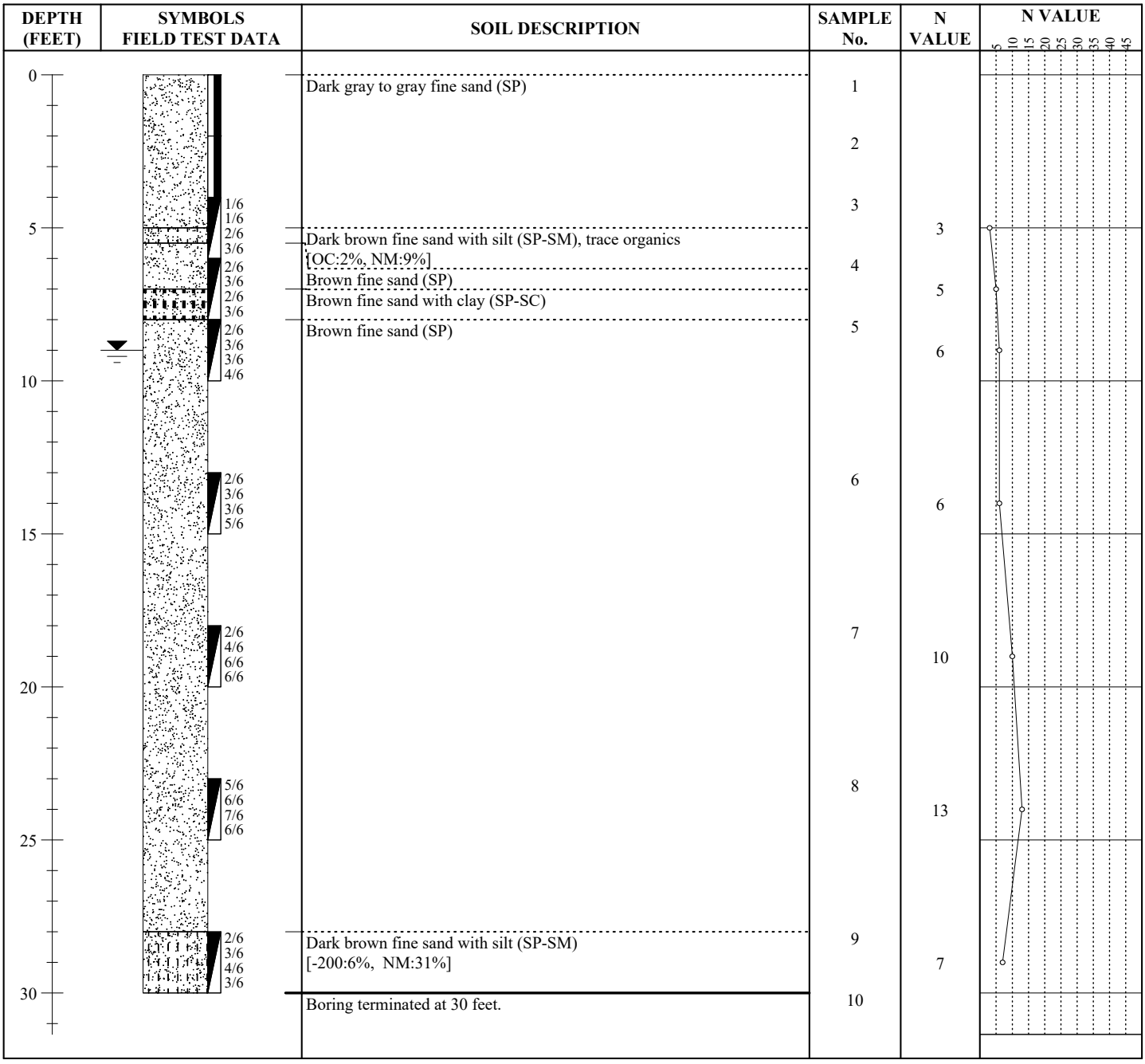
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 9 feet

DATE DRILLED: 2/14/2026



NOTES:

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-20

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

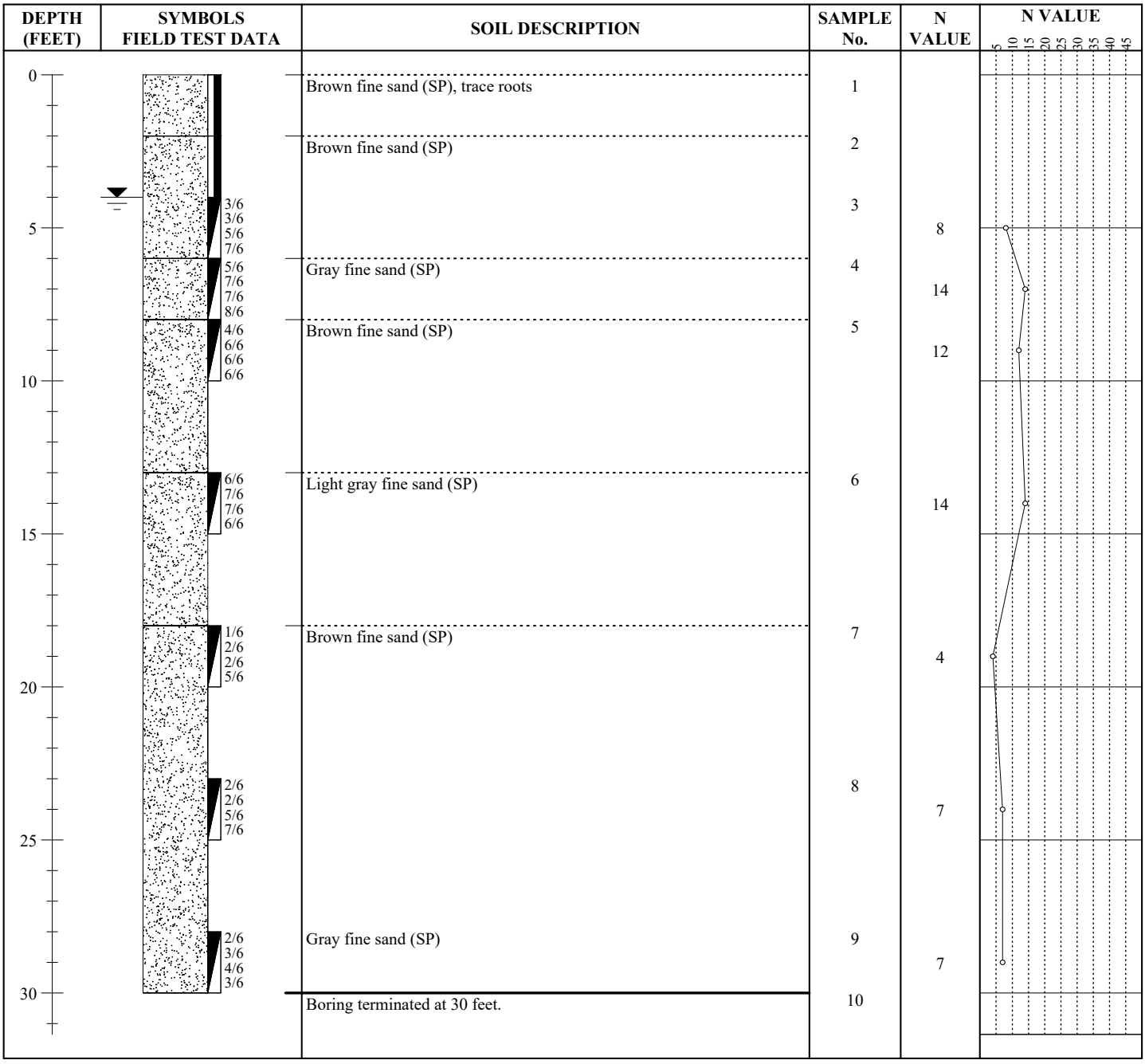
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 4 feet

DATE DRILLED: 2/14/2026



NOTES:

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-21

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

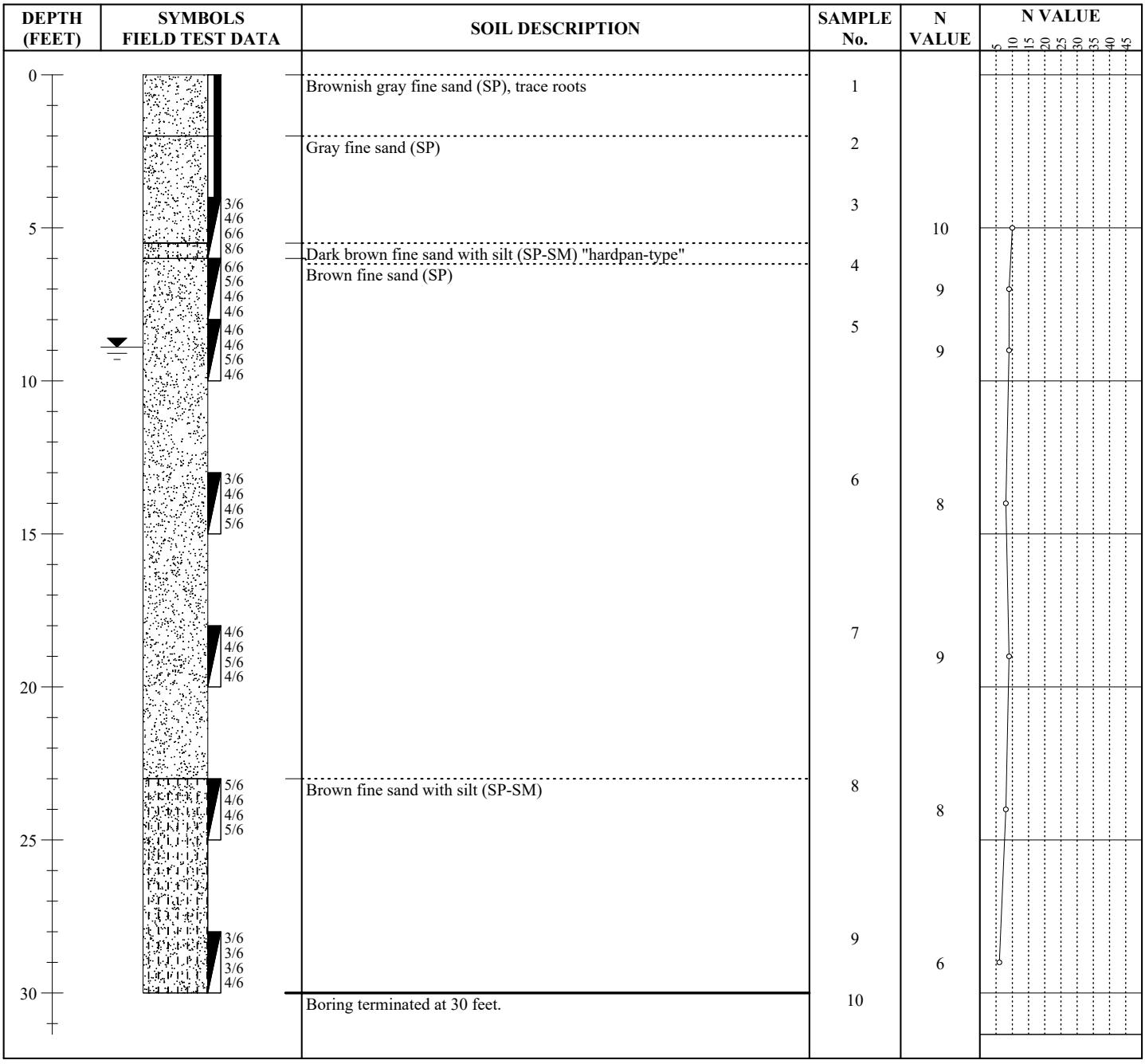
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 8.9 feet

DATE DRILLED: 2/14/2026



NOTES:

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-22

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

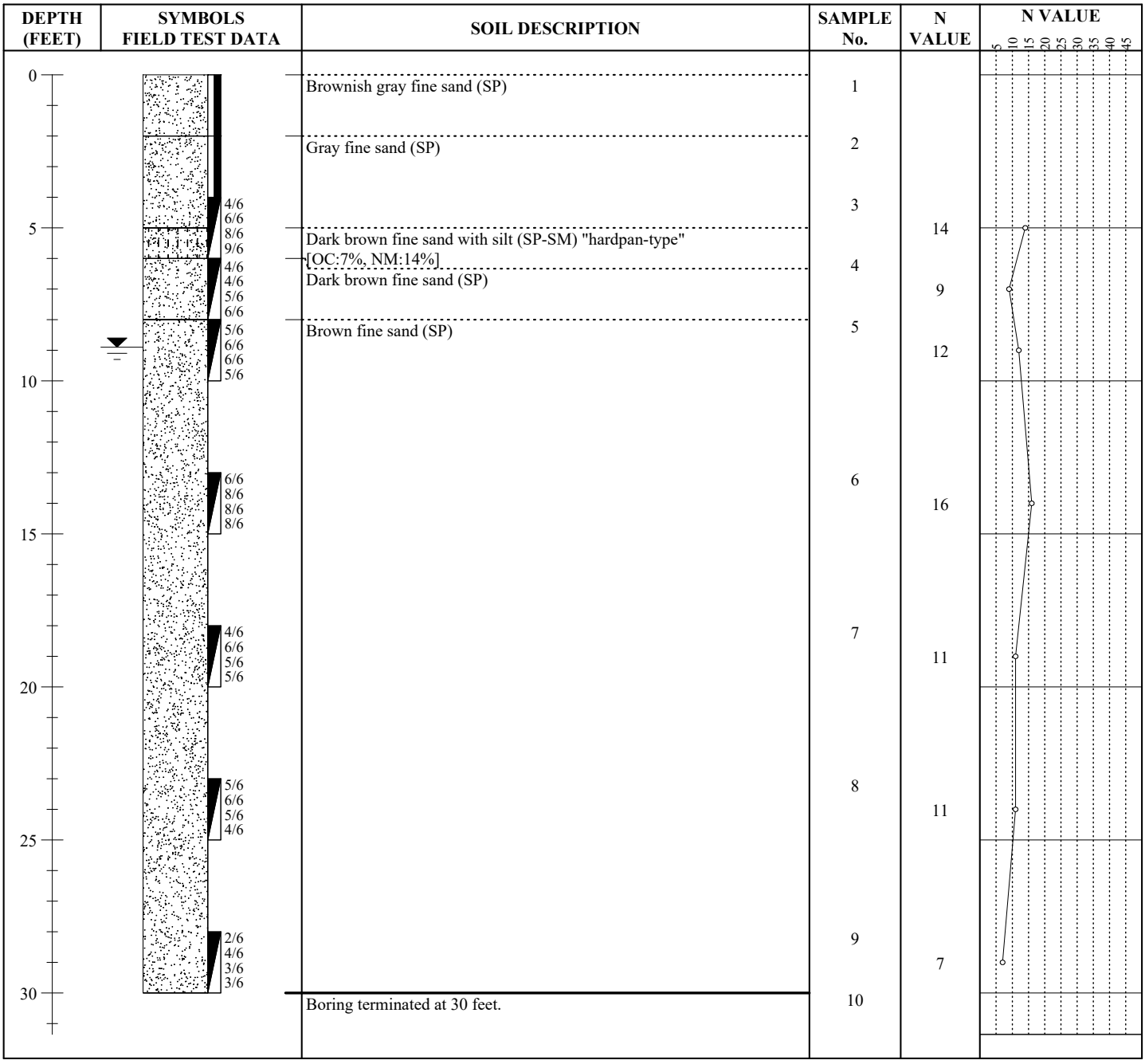
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 8.9 feet

DATE DRILLED: 2/14/2026



NOTES:

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-23

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

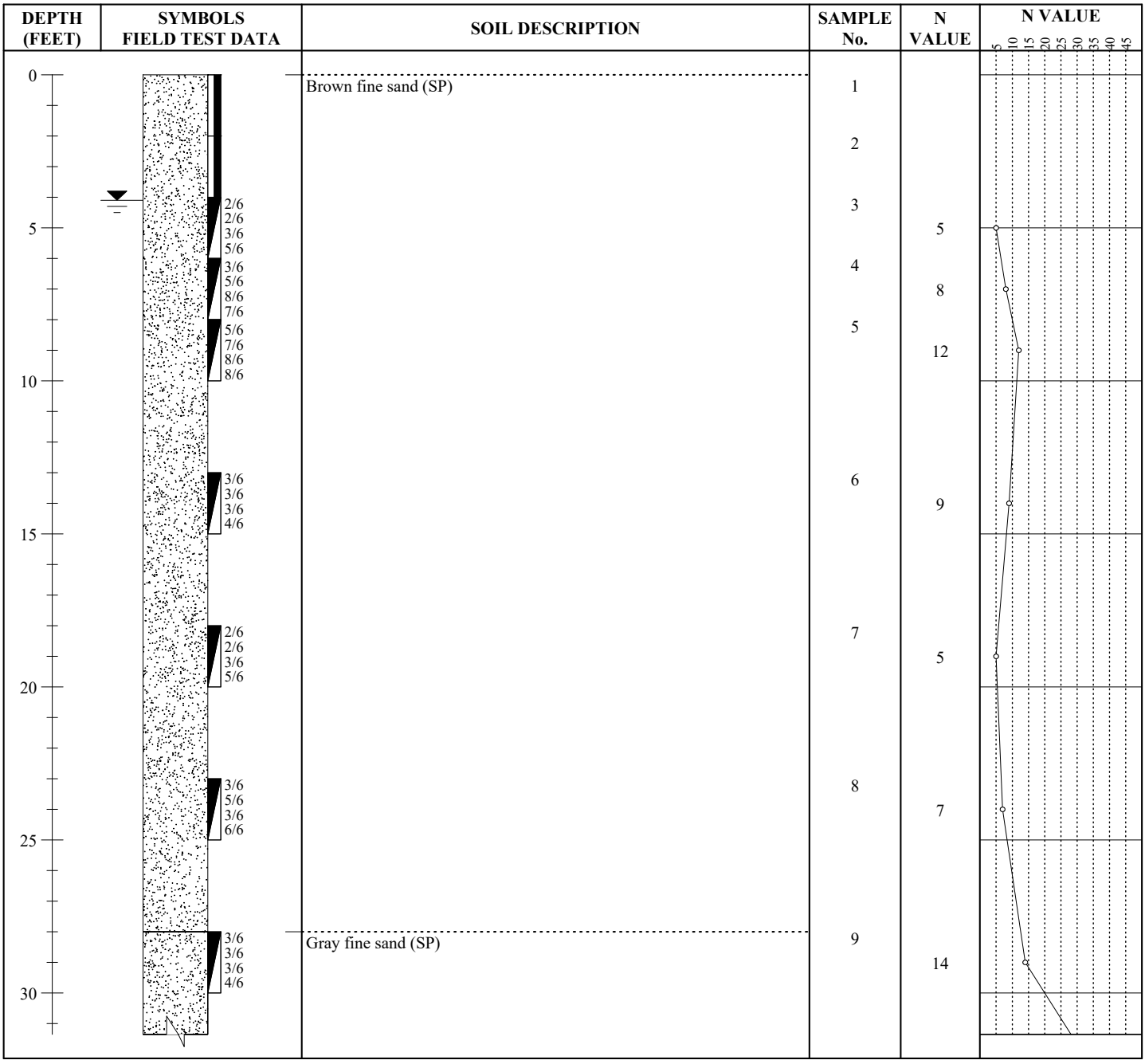
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 4.1 feet

DATE DRILLED: 2/14/2026



NOTES:

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-23

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

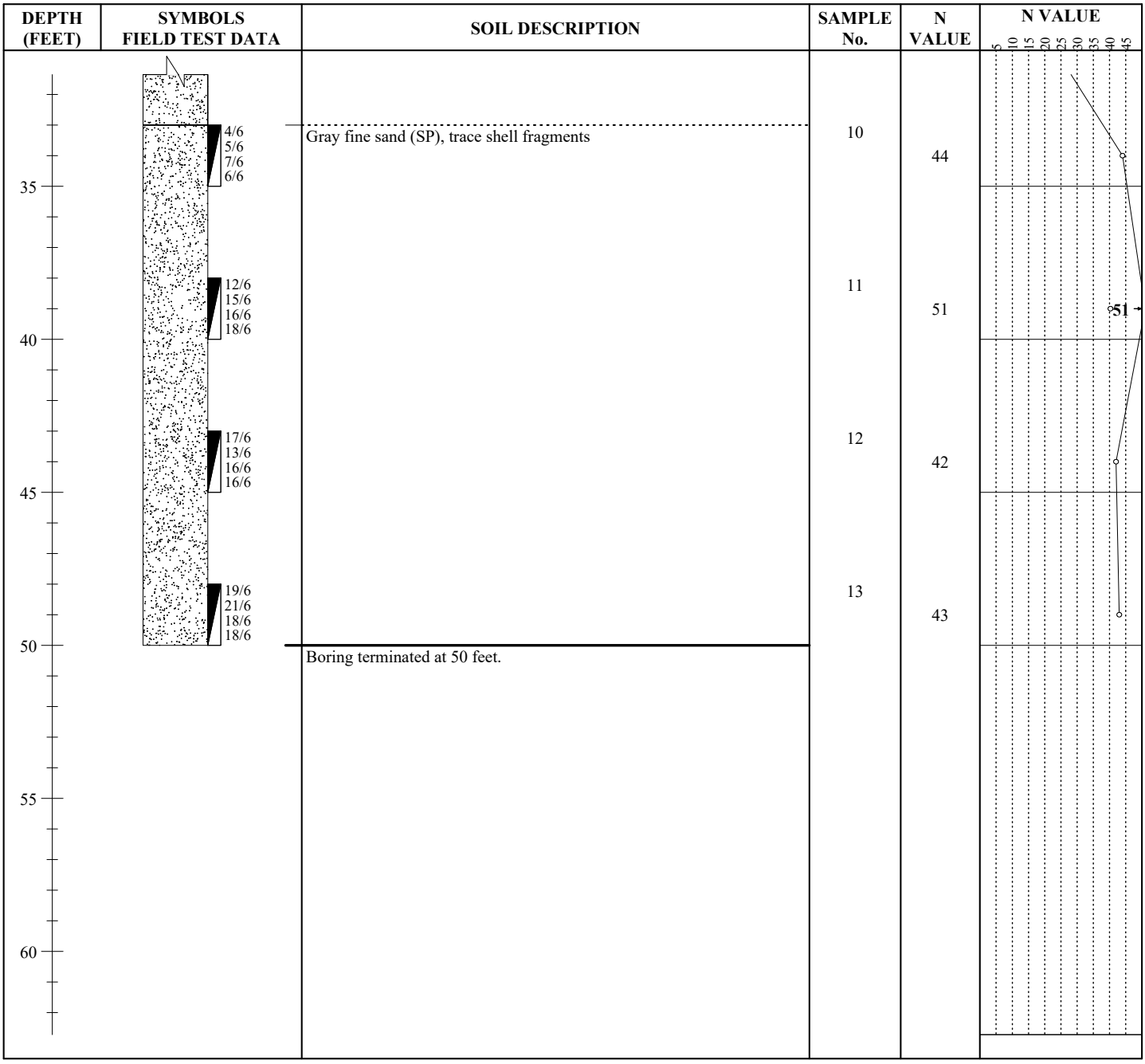
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 4.1 feet

DATE DRILLED: 2/14/2026



NOTES:

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-24

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

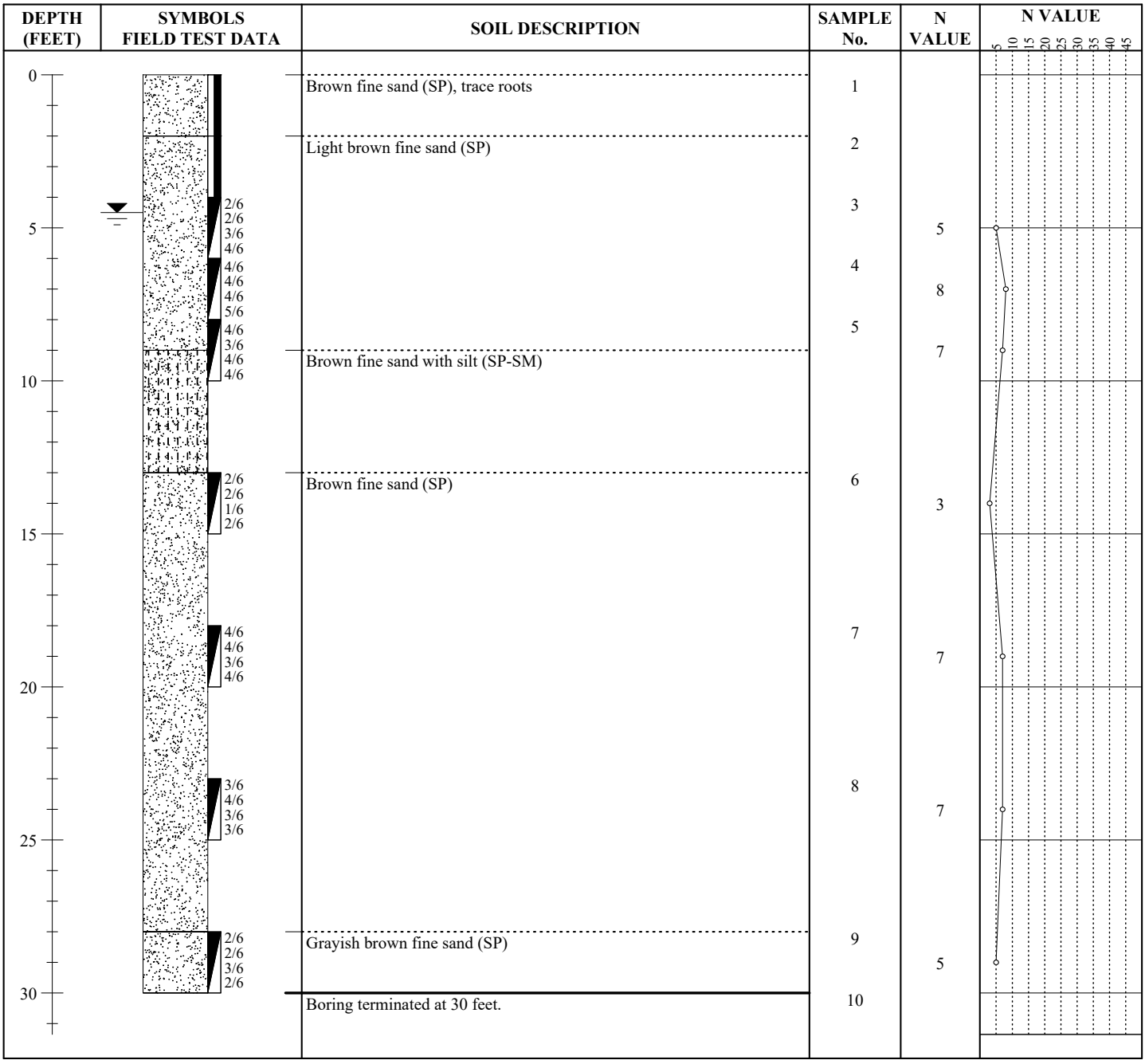
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 4.5 feet

DATE DRILLED: 2/14/2026



NOTES:

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

Ardaman & Associates, Inc.

AUGER BORING LOG

BORING AB-1

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

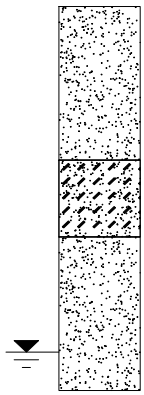
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 4.5 feet

DATE DRILLED: 2/14/2026

DEPTH	SYMBOLS	SOIL DESCRIPTION	SAMPLE No.
0		Brown fine sand (SP)	1
		Light brown clayey fine sand (SC)	2
		Light gray fine sand (SP)	3
5		Boring terminated at 5 feet.	
10			
15			

NOTES:

Ardaman & Associates, Inc.

AUGER BORING LOG

BORING AB-2

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

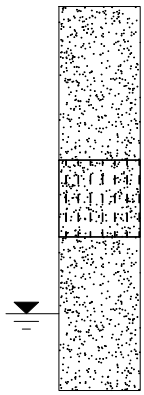
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 4 feet

DATE DRILLED: 2/14/2026

DEPTH	SYMBOLS	SOIL DESCRIPTION	SAMPLE No.
0		Dark gray fine sand (SP), trace roots	1
		Dark gray organically stained fine sand with silt (SP-SM), "hardpan-type"	2
		Orangish brown gray fine sand (SP)	3
5		Boring terminated at 5 feet.	
10			
15			

NOTES:

Ardaman & Associates, Inc.

AUGER BORING LOG

BORING AB-3

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

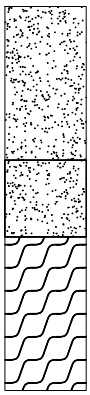
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH GNE

DATE DRILLED: 2/14/2026

DEPTH	SYMBOLS	SOIL DESCRIPTION	SAMPLE No.
0		Dark brown fine sand (SP), trace shell & roots	1
		Dark gray fine sand (SP)	2
		Dark brown organic muck (OL/OH) [OC:18%, NM:42%]	3
5		Boring terminated at 5 feet.	
10			
15			

NOTES:

Ardaman & Associates, Inc.

AUGER BORING LOG

BORING AB-4

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

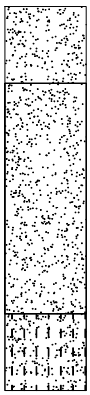
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH GNE

DATE DRILLED: 2/14/2026

DEPTH	SYMBOLS	SOIL DESCRIPTION	SAMPLE No.
0		Gray fine sand (SP), trace roots	1
		Light gray fine sand (SP)	2
		Dark brown fine sand with silt (SP-SM), trace organics	3
5		Boring terminated at 5 feet.	
10			
15			

NOTES:

Ardaman & Associates, Inc.

AUGER BORING LOG

BORING DRI-1

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

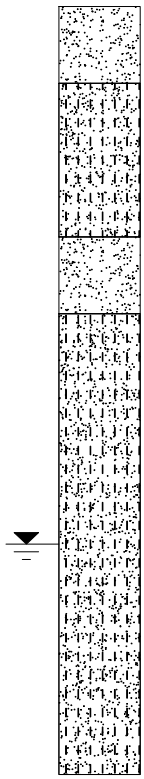
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 7 feet

DATE DRILLED: 2/14/2026

DEPTH	SYMBOLS	SOIL DESCRIPTION	SAMPLE No.
0		Gray fine sand (SP), trace roots	1
		Dark gray organically stained fine sand with silt (SP-SM), "hardpan-type"	2
		Dark brown fine sand (SP)	3
		Dark brown fine sand with silt (SP-SM)	4
5			
10		Boring terminated at 10 feet.	
15			

NOTES:

Ardaman & Associates, Inc.

AUGER BORING LOG

BORING DRI-2

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

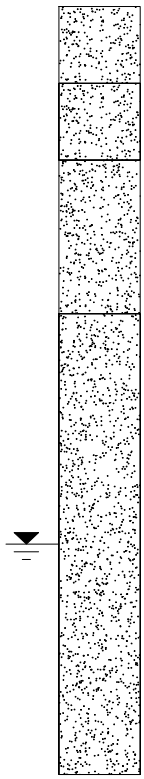
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 7 feet

DATE DRILLED: 2/14/2026

DEPTH	SYMBOLS	SOIL DESCRIPTION	SAMPLE No.
0		Gray fine sand (SP), trace roots & gravel	1
		Gray fine sand (SP)	2
		Dark gray fine sand (SP)	3
		Light brown fine sand (SP)	4
5			
10		Boring terminated at 10 feet.	
15			

NOTES:

Ardaman & Associates, Inc.

AUGER BORING LOG

BORING DRI-3

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

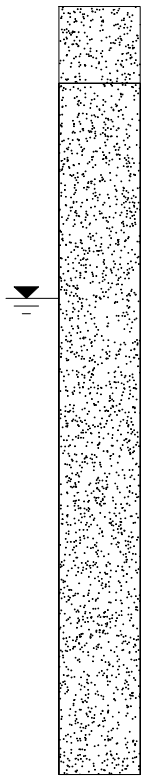
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 3.8 feet

DATE DRILLED: 2/14/2026

DEPTH	SYMBOLS	SOIL DESCRIPTION	SAMPLE No.
0		Gray fine sand (SP), trace roots	1
		Brown fine sand (SP)	2
10		Boring terminated at 10 feet.	
15			

NOTES:

Ardaman & Associates, Inc.

AUGER BORING LOG

BORING DRI-4

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

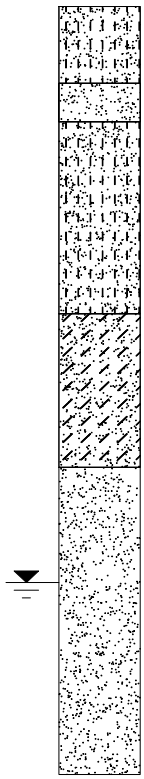
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Plan

DRILL CREW: DTH

WATER OBSERVED AT DEPTH 7.5 feet

DATE DRILLED: 2/14/2026

DEPTH	SYMBOLS	SOIL DESCRIPTION	SAMPLE No.
0		Brown fine sand with silt (SP-SM), trace shell, mixed with base & clay nodules	1
		Gray fine sand (SP), trace shell	2
		Dark gray organically stained fine sand with silt (SP-SM), "hardpan-type"	3
5		Brown fine sand with clay (SP-SC)	4
		Brown fine sand (SP)	5
10		Boring terminated at 10 feet.	
15			

NOTES:

Ardaman & Associates, Inc.

HAND AUGER BORING LOG

BORING HAB-1

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

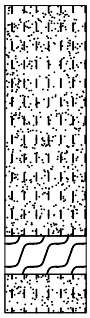
FILE No.: 26-66-5405

BORING LOCATION: As per Muck Delineation Plan

DRILL CREW: ML/AB

WATER OBSERVED AT DEPTH Groundwater not encountered on the date drilled.

DATE DRILLED: 4/22/2026

DEPTH	SYMBOL	SOIL DESCRIPTION	SAMPLE No.
0		Brown fine sand (SP)	
		Dark brown sandy organic muck (OL/OH)	1
		Brown fine sand with silt (SP-SM)	
		Boring terminated at 4 feet.	
5			
10			
15			

NOTES:

Ardaman & Associates, Inc.

HAND AUGER BORING LOG

BORING HAB-2

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

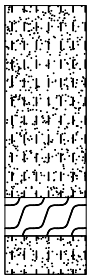
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Map

DRILL CREW: ML/AB

WATER OBSERVED AT DEPTH Groundwater not encountered on the date drilled.

DATE DRILLED: 4/22/2026

DEPTH	SYMBOL	SOIL DESCRIPTION	SAMPLE No.
0		Brown fine sand (SP)	
		Dark gray organically stained fine sand with silt (SP-SM), trace organics & some roots, mixed with "hardpan-type"	1
		Dark brown fine sand with silt (SP-SM)	
		Boring terminated at 3.5 feet.	
5			
10			
15			

NOTES:

Ardaman & Associates, Inc.

HAND AUGER BORING LOG

BORING HAB-3

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

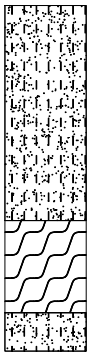
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Map

DRILL CREW: ML/AB

WATER OBSERVED AT DEPTH Groundwater not encountered on the date drilled.

DATE DRILLED: 4/22/2026

DEPTH	SYMBOL	SOIL DESCRIPTION	SAMPLE No.
0		Brown fine sand (SP) to fine sand with silt (SP-SM)	
		Dark brown sandy organic muck (OL/OH) [OC:23%,NM:82%]	1
		Brown fine sand with silt (SP-SM)	
5		Boring terminated at 4.5 feet.	
10			
15			

NOTES:

Ardaman & Associates, Inc.

HAND AUGER BORING LOG

BORING HAB-4

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

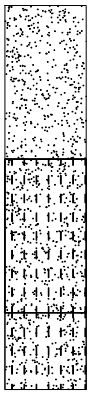
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Map

DRILL CREW: ML/AB

WATER OBSERVED AT DEPTH Groundwater not encountered on the date drilled.

DATE DRILLED: 4/22/2026

DEPTH	SYMBOL	SOIL DESCRIPTION	SAMPLE No.
0		Brown fine sand (SP)	
		Dark brown fine sand with silt (SP-SM)	
		Brown fine sand with silt (SP-SM)	
5		Boring terminated at 5 feet.	
10			
15			

NOTES:

Ardaman & Associates, Inc.

HAND AUGER BORING LOG

BORING HAB-5

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

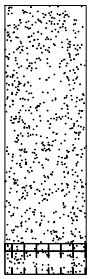
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Map

DRILL CREW: ML/AB

WATER OBSERVED AT DEPTH Groundwater not encountered on the date drilled.

DATE DRILLED: 4/22/2026

DEPTH	SYMBOL	SOIL DESCRIPTION	SAMPLE No.
0		Brown fine sand (SP)	
		Dark brown fine sand with silt (SP-SM)	1
		[OC:6%,NM:30%]	
		Brown fine sand with silt (SP-SM)	
		Boring terminated at 3.5 feet.	
5			
10			
15			

NOTES:

Ardaman & Associates, Inc.

HAND AUGER BORING LOG

BORING HAB-6

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

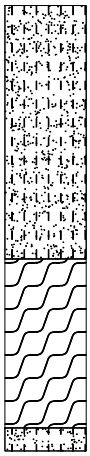
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Map

DRILL CREW: ML/AB

WATER OBSERVED AT DEPTH Groundwater not encountered on the date drilled.

DATE DRILLED: 4/22/2026

DEPTH	SYMBOL	SOIL DESCRIPTION	SAMPLE No.
0		Brown fine sand (SP) to fine sand with silt (SP-SM)	
		Dark brown sandy organic muck (OL/OH) [OC:12%, NM:45%]	1
5		Brown fine sand with silt (SP-SM) Boring terminated at 5.8 feet.	
10			
15			

NOTES:

Ardaman & Associates, Inc.

HAND AUGER BORING LOG

BORING HAB-7

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

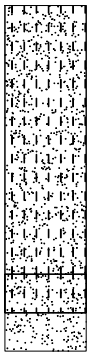
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Map

DRILL CREW: ML/AB

WATER OBSERVED AT DEPTH Groundwater not encountered on the date drilled.

DATE DRILLED: 4/22/2026

DEPTH	SYMBOL	SOIL DESCRIPTION	SAMPLE No.
0		Brown fine sand (SP) to fine sand with silt (SP-SM)	
		Dark brown fine sand with silt, some organics (SP-SM)	1
		[OC:2%, NM:19%]	
		Gray fine sand (SP)	
5		Boring terminated at 4.5 feet.	
10			
15			

NOTES:

Ardaman & Associates, Inc.

HAND AUGER BORING LOG

BORING HAB-8

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

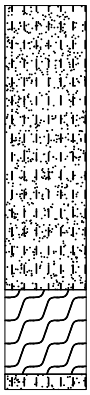
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Map

DRILL CREW: ML/AB

WATER OBSERVED AT DEPTH Groundwater not encountered on the date drilled.

DATE DRILLED: 4/22/2026

DEPTH	SYMBOL	SOIL DESCRIPTION	SAMPLE No.
0		Brown fine sand with silt (SP-SM)	
		Dark brown sandy organic muck (OL/OH) [OC:8%, NM:62%]	1
5		Gray fine sand with silt (SP-SM) Boring terminated at 5 feet.	
10			
15			

NOTES:

Ardaman & Associates, Inc.

HAND AUGER BORING LOG

BORING HAB-9

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Map

DRILL CREW: ML/AB

WATER OBSERVED AT DEPTH Groundwater not encountered on the date drilled.

DATE DRILLED: 4/22/2026

DEPTH	SYMBOL	SOIL DESCRIPTION	SAMPLE No.
0		Brown fine sand (SP) to fine sand with silt (SP-SM)	
		Dark brown sandy organic muck (OL/OH) [OC:16%, NM:114%]	1
5		Brown fine sand with silt (SP-SM) Boring terminated at 5 feet.	
10			
15			

NOTES:

Ardaman & Associates, Inc.

HAND AUGER BORING LOG

BORING HAB-10

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

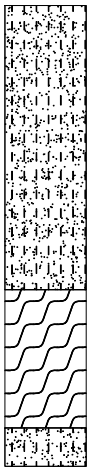
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Map

DRILL CREW: ML/AB

WATER OBSERVED AT DEPTH Groundwater not encountered on the date drilled.

DATE DRILLED: 4/22/2026

DEPTH	SYMBOL	SOIL DESCRIPTION	SAMPLE No.
0		Brown fine sand with silt (SP-SM)	
		Dark brown sandy organic muck (OL/OH) [OC:14%, NM:71%]	1
5		Gray fine sand with silt (SP-SM)	
		Boring terminated at 6 feet.	
10			
15			

NOTES:

Ardaman & Associates, Inc.

HAND AUGER BORING LOG

BORING HAB-11

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

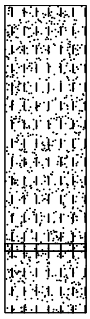
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Map

DRILL CREW: ML/AB

WATER OBSERVED AT DEPTH Groundwater not encountered on the date drilled.

DATE DRILLED: 4/22/2026

DEPTH	SYMBOL	SOIL DESCRIPTION	SAMPLE No.
0		Brown fine sand (SP) to fine sand with silt (SP-SM)	
		Dark brown fine sand with silt, some organics "hardpan-type"(SP-SM) [OC:6%, NM:30%]	1
		Brown fine sand with silt (SP-SM)	
		Boring terminated at 4 feet.	
5			
10			
15			

NOTES:

Ardaman & Associates, Inc.

HAND AUGER BORING LOG

BORING HAB-12

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Map

DRILL CREW: ML/AB

WATER OBSERVED AT DEPTH Groundwater not encountered on the date drilled.

DATE DRILLED: 4/22/2026

DEPTH	SYMBOL	SOIL DESCRIPTION	SAMPLE No.
0		Brown fine sand (SP) to fine sand with silt (SP-SM)	
		Dark brown sandy organic muck (OL/OH) [OC:21%,NM:67%]	1
		Gray fine sand (SP)	
		Boring terminated at 4 feet.	
5			
10			
15			

NOTES:

Ardaman & Associates, Inc.

HAND AUGER BORING LOG

BORING HAB-13

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Map

DRILL CREW: ML/AB

WATER OBSERVED AT DEPTH Groundwater not encountered on the date drilled.

DATE DRILLED: 4/22/2026

DEPTH	SYMBOL	SOIL DESCRIPTION	SAMPLE No.
0		Brown fine sand (SP) to fine sand with silt (SP-SM)	
		Dark brown sandy organic muck (OL/OH) [OC:8%,NM:55%]	1
		Gray fine sand (SP)	
5		Boring terminated at 5 feet.	
10			
15			

NOTES:

Ardaman & Associates, Inc.

HAND AUGER BORING LOG

BORING HAB-14

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

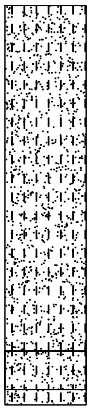
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Map

DRILL CREW: ML/AB

WATER OBSERVED AT DEPTH Groundwater not encountered on the date drilled.

DATE DRILLED: 4/22/2026

DEPTH	SYMBOL	SOIL DESCRIPTION	SAMPLE No.
0		Gray fine sand (SP) to fine sand with silt (SP-SM)	
5		Dark brown fine sand with silt, trace organics [OC:4%, NM:48%]	1
		Dark brown fine sand with silt (SP-SM)	
		Boring terminated at 5.2 feet.	
10			
15			

NOTES:

Ardaman & Associates, Inc.

HAND AUGER BORING LOG

BORING HAB-15

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Map

DRILL CREW: ML/AB

WATER OBSERVED AT DEPTH Groundwater not encountered on the date drilled.

DATE DRILLED: 4/22/2026

DEPTH	SYMBOL	SOIL DESCRIPTION	SAMPLE No.
0		Brownish gray fine sand (SP) to fine sand with silt (SP-SM)	
		Dark brown sandy organic muck (OL/OH) [OC:11%, NM:44%]	1
		Gray fine sand with silt (SP-SM)	
5		Boring terminated at 5 feet.	
10			
15			

NOTES:

Ardaman & Associates, Inc.

HAND AUGER BORING LOG

BORING HAB-16

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

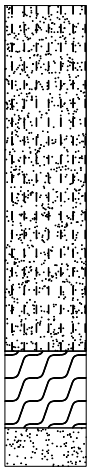
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Map

DRILL CREW: ML/AB

WATER OBSERVED AT DEPTH Groundwater not encountered on the date drilled.

DATE DRILLED: 4/22/2026

DEPTH	SYMBOL	SOIL DESCRIPTION	SAMPLE No.
0		Brown fine sand (SP) to fine sand with silt (SP-SM)	
5		Dark brown sandy organic muck (OL/OH) [OC:7%, NM:37%]	1
		Gray fine sand (SP)	
		Boring terminated at 6 feet.	
10			
15			

NOTES:

Ardaman & Associates, Inc.

HAND AUGER BORING LOG

BORING HAB-17

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Map

DRILL CREW: ML/AB

WATER OBSERVED AT DEPTH Groundwater not encountered on the date drilled.

DATE DRILLED: 4/22/2026

DEPTH	SYMBOL	SOIL DESCRIPTION	SAMPLE No.
0		Brownish gray fine sand (SP) to fine sand with silt (SP-SM)	
		Dark brown sandy organic muck (OL/OH)	1
		[OC:12%,NM:38%]	
		Brown fine sand with silt (SP-SM)	
		Boring terminated at 3 feet.	
5			
10			
15			

NOTES:

Ardaman & Associates, Inc.

HAND AUGER BORING LOG

BORING HAB-18

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

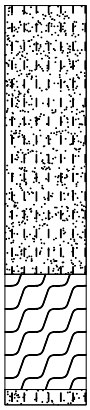
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Map

DRILL CREW: ML/AB

WATER OBSERVED AT DEPTH Groundwater not encountered on the date drilled.

DATE DRILLED: 4/22/2026

DEPTH	SYMBOL	SOIL DESCRIPTION	SAMPLE No.
0		Gray fine sand (SP) to fine sand with silt (SP-SM)	
		Dark brown sandy organic muck (OL/OH) [OC:12%, NM:56%]	1
5		Brown fine sand with silt (SP-SM) Boring terminated at 5.2 feet.	
10			
15			

NOTES:

Ardaman & Associates, Inc.

HAND AUGER BORING LOG

BORING HAB-19

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

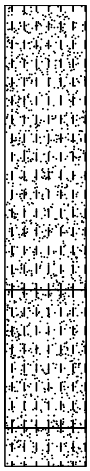
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Map

DRILL CREW: ML/AB

WATER OBSERVED AT DEPTH Groundwater not encountered on the date drilled.

DATE DRILLED: 4/22/2026

DEPTH	SYMBOL	SOIL DESCRIPTION	SAMPLE No.
0		Brown fine sand (SP) to fine sand with silt (SP-SM)	
		Dark brown organically stained fine sand with silt (SP-SM), trace organics [OC:4%, NM:20%]	1
5		Brown fine sand with silt (SP-SM)	
		Boring terminated at 6 feet.	
10			
15			

NOTES:

Ardaman & Associates, Inc.

HAND AUGER BORING LOG

BORING HAB-20

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Map

DRILL CREW: ML/AB

WATER OBSERVED AT DEPTH Groundwater not encountered on the date drilled.

DATE DRILLED: 4/22/2026

DEPTH	SYMBOL	SOIL DESCRIPTION	SAMPLE No.
0		Gray fine sand (SP)	
5		Dark brown organically stained fine sand with silt (SP-SM), trace organics [OC:4%, NM:21%]	1
		Dark brown fine sand with silt (SP-SM)	
		Boring terminated at 6.2 feet.	
10			
15			

NOTES:

Ardaman & Associates, Inc.

HAND AUGER BORING LOG

BORING HAB-21

PROJECT: Dan McCarty Middle School
1201 Mississippi Ave, Fort Pierce

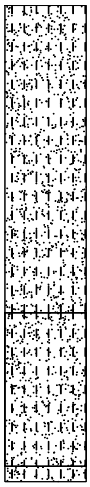
FILE No.: 26-66-5405

BORING LOCATION: As per Boring Location Map

DRILL CREW: ML/AB

WATER OBSERVED AT DEPTH Groundwater not encountered on the date drilled.

DATE DRILLED: 4/22/2026

DEPTH	SYMBOL	SOIL DESCRIPTION	SAMPLE No.
0		Brown fine sand (SP) to fine sand with silt (SP-SM)	
		Dark brown fine sand with silt, trace organics [OC:4%, NM:26%]	1
5		Gray fine sand with silt (SP-SM)	
		Boring terminated at 6.2 feet.	
10			
15			

NOTES:

Subsurface Exploration Information

Ardaman & Associates, Inc.

Our borings describe subsurface conditions only at the locations drilled and at the time drilled. They provide no information about subsurface conditions below the bottom of the boreholes. At locations not explored, surface conditions that differ from those observed in the borings may exist and should be anticipated.

The information reported on our boring logs is based on our drillers' logs and on visual examination in our laboratory of disturbed soil samples recovered from the borings. The distinction shown on the logs between soil types is approximate only. The actual transition from one soil to another may be gradual and indistinct.

The groundwater depth shown on our boring logs is the water level the driller observed in the borehole when it was drilled. These water levels may have been influenced by the drilling procedures, especially in borings made by rotary drilling with bentonitic drilling mud. An accurate determination of groundwater level requires long-term observation of suitable monitoring wells. Fluctuations in groundwater levels throughout the year should be anticipated.

The absence of a groundwater level on certain logs indicates that no groundwater data is available. It does not mean that no groundwater will be encountered at that boring location.

STANDARD PENETRATION TEST BORINGS

The Standard Penetration Test is a widely accepted method of testing foundation soils in place. The N-Value obtained from the test has been correlated empirically with various soil properties. These empirical correlations allow satisfactory estimates to be made of how the soil is likely to behave when subjected to foundation loads. Tests are usually performed in the boreholes at intervals of five feet. In addition, our Firm performs tests continuously in the interval directly below the expected foundation bearing grade where the soil will be most highly stressed.

Boreholes where Standard Penetration Tests will be performed are drilled with a truck-mounted CME 45 drill rig or a CME 55 drill rig. The boreholes are advanced by rotary drilling with a winged bit that makes a hole about three inches in diameter. A bentonitic drilling mud is recirculated in order to remove the cuttings and support the walls of the borehole. The drag bit is specially modified to direct the mud upward and reduce disturbance of the soil ahead of the bit. If access is not available for our truck-mounted drilling equipment, portable tripod drilling equipment can be used instead.

Occasionally, running or squeezing ground is encountered that cannot be stabilized by the drilling mud alone. In addition, drilling mud may be lost into the soil or rock strata that are unusually pervious. In such cases, flush-coupled steel casing with an outside diameter of about 3.5 inches is driven as a liner for the borehole.

After the borehole has been advanced to the depth where a Standard Penetration Test will be performed, the soil sampler used to run the test is attached to the end of the drill rods and lowered to the bottom of the borehole. The testing procedure used conforms closely to the methods recommended in ASTM D-1586. The sampler used has a split-barrel 24 inches long and an outside diameter of 2.0 inches. It is driven into the ground below the bottom of the borehole using a hammer that weighs 140 pounds and falls 30 inches. The driller records the number of hammer blows needed to advance the sampler in successive increments of six inches. The total number of blows required to advance the sampler the second and third six-inch increments constitutes the test result; that is, the N-value at the depth. The test is completed after the sampler has been driven not more than 24 inches or when refusal is encountered, whichever occurs first. Refusal occurs when 50 hammer blows advance the sampler six inches or less. After the test is completed, the sampler is removed from the borehole and opened.

The driller examines and classifies the soil recovered by the sampler. He places representative soil specimens from each test in closed glass jars or plastic bags and takes them to our laboratory. In the laboratory, additional evaluations and tests are performed, if needed. The driller's classifications may be adjusted, if necessary, to conform more closely with the Unified Soil Classification System (USCS). Jar samples are retained in our laboratory for thirty days, then discarded unless our clients request otherwise.

After completion of a test boring, the water level in the borehole is recorded.

SOLID-STEM AUGER BORINGS

Solid-stem auger borings are used when a relatively large, continuous sampling of soil strata close to the ground surface is desired. The testing procedure used conforms closely to the methods recommended in ASTM D-1452. A 4-inch diameter continuous flight, helical auger with a cutting head at its end is screwed into the ground in 5 foot sections. It is powered by the rotary drill rig. The samples are recovered by withdrawing the auger out of the ground without rotating it. The soil samples so obtained, are described and representative samples put in jars or bags and returned to the laboratory for further classification and testing, if necessary.

HAND AUGER BORINGS

Hand auger borings are used, if soil conditions are favorable, when the soil strata are to be determined within a shallow (approximately 5 foot) depth, or when access is not available for our truck-mounted drilling equipment. A 3-inch diameter hand bucket auger with a cutting head is simultaneously turned and pressed into the ground. The bucket auger is retrieved at approximately 6-inch increments and its content emptied for inspection. Sometimes post-hole diggers are used, especially in the upper 3 feet or so. The soil samples obtained are described and representative samples put in jars or bags and transported to the laboratory for further classification and testing, if necessary.

ENGINEERING CLASSIFICATION OF SOILS

The following tables relate N-values to a qualitative description of the relative soil density.

	Description	N
Cohesionless Soils	Very loose	0-4
	Loose	5-9
	Medium dense	10-29
	Dense	30-49
	Very dense	50+

	Description	N
Cohesive Soils	Very soft	0-2
	Soft	3-4
	Medium stiff	5-8
	Stiff	9-15
	Very stiff	16-30
	Hard	31+