# ENGINEER'S REPORT

FOR
## REALIGN AND EXTEND TAXIWAY F

AT THE
## AVON PARK EXECUTIVE AIRPORT

**FAA AIP No. 3-12-0004-019-2019**
**FDOT FM No. NA**
**CITY OF AVON PARK BID No. TBD**

**MAY 2019**

AMHERST CONSULTING

## A. INTRODUCTION

**Project Name:** Realign and Extend Taxiway F
**Airport:** Avon Park Executive Airport
**Location:** Avon Park, Florida
**FAA AIP No.:** 3-12-0004-019-2019
**FDOT FM No.:** NA
**City of Avon Park Bid No.:** TBD
**Date of Report:** May 2019

## B. SITE INFORMATION

Avon Park Executive Airport (AVO) is a publicly owned, public-use airport located on the west side of Avon Park, which is in the northwest corner of Highlands County in south central Florida. The airport is located on State Road 64, one mile west of U.S. Highway 27. Avon Park is located on U.S. Highway 27 approximately 25 miles south of Lake Wales and State Road 60.

Two asphalt runways serve Avon Park Executive Airport. These runways are Runway 05/23 which is 5,374 feet long and 100 feet wide and in good condition, and Runway 10/28 which is 3,844 feet long and 75 feet wide and in good condition. Runway 05/23 is served by a full parallel taxiway that is 35 feet wide. Runway 10/28 is served by a partial taxiway that is 30 feet wide. Runway 05/23 has both PAPIs and REILs. Runway 10/28 has PAPIs. The airport has a 5,000 square foot general aviation terminal building to serve pilots and passengers. There are 18 on-airport auto parking spaces to serve the terminal. There are 11 tie-down spaces and 58 T-hangars. The airport also has two corporate hangars and one building suitable for a maintenance operation.

The airport has identified several initiatives as necessary to serve general aviation demand in the near term. A complete Master Plan rewrite was initiated in 2015. The airport's current Airport Reference Code (ARC) is B-II, per the Airport Layout Plan (ALP) approved in January, 2017.

## C. PROJECT DESCRIPTION

**Objective:**

This project includes realignment of Taxiway F from the Terminal Apron to the Runway 23 threshold, and construction of Taxiway G from the Runway 23 threshold to the Runway 28 threshold. This project will also include Demolition of Taxiway B, eliminating direct access (Hot Spots) from the apron areas to the runways. The project includes new required Taxiway F edge lighting and signage (taxiway and mandatory runway). Access from runways to the terminal apron and fuel farm will be maintained throughout construction.

**Benefits Anticipated:**

This project will enhance safety by eliminating direct access from the Terminal Apron to Runway 5-23 and Runway 10-28 and direct access from the southeast quadrant to Runway 5-23 and Runway 10-28, consistent with Approved Master Plan Update. The new section of Taxiway F

between Runway 28 and Runway 10 will provide a compensating taxi route after removal of the direct access taxiways.

***Note: All work is consistent with the adopted Master Plan and FAA Advisory Circulars.***

The proposed pavements were designed based on existing geotechnical conditions and the projected aircraft fleet mix (see associated appendices of this report).

**Bid Schedule A:** Realign and Extend Taxiway F (AIP Eligible)

It is in the best interest of the City of Avon Park to award one or more contracts for the work in the Bid Advertisement.

The award shall be made to the qualified bidder(s) submitting the lowest and most responsive bid in accordance with the unit prices quoted for one, or any combination as detailed in the bid sheet and bid schedule, whichever is in the best interest of the City of Avon Park.

## D. PROJECT SCHEDULE AND COORDINATION

The proposed project schedule anticipates beginning construction in the August/September 2019 timeframe and completing all work items including project closeout in the FAA's 3rd Quarter, 2020.

The specified contract times for the project are identified in Special Provision No. 5, excerpted below:

1. Excluding any procurement period, the total Contract Times for work under the Contract is 112 Calendar Days as defined by the Phasing Plans, which depict specific performance criteria.

   (a) In addition to what is stipulated in the Phasing Plans, Dates NOT considered eligible days for work:

   (i) Labor Day (September 2, 2019)
   (ii) Thanksgiving (November 28 through November 29, 2019)
   (iii) Christmas (December 24 through December 26, 2019)
   (iv) New Year's (December 31, 2019 through January 1, 2020)
   (v) Government holidays (Contractor's option with prior approval from the Owner)
   (vi) Unanticipated events – to be discussed with Owner

2. There will be no specific materials procurement period included as part of the Contract Times.

3. Specific attention is directed toward the Scheduling Notes.

4. The Contractor's Project Closeout must be complete to the Engineer's and Owner's satisfaction within 45 calendar days of the contract Construction Completion Date as identified in the Notice to Proceed (NTP) issued after award and prior to commencement of work.

A calendar day contract time format is suggested to simplify time accounting in the event that the Contractor chooses or needs to work 6 or 7 days per week. The project is scheduled to be advertised for construction bids on May 20, 2019 with Construction Documents available to Contractors on May 22, 2019 at the Amherst offices in Maitland. A Pre-Bid meeting has been scheduled for 10:30 a.m. June 6, 2019 but is not mandatory for prospective bidders. The Bid Opening is scheduled for 2:00 p.m. on June 19, 2019. All matters related to the project scope and schedule have been/will be presented, coordinated and reviewed by the City of Avon Park, the FDOT and the FAA. The Project schedule is attached in **Appendix "A"**.

## E. SUBSURFACE CONDITIONS

Geotechnical subsurface explorations were performed by Madrid Engineering Group, Inc. A Report of Geotechnical Exploration is attached in **Appendix "B"**.

## F. GEOMETRIC DESIGN

The geometric design is in conformance with the FAA standards presented in Advisory Circular 150/5300-13A, Airport design (latest edition at the time of this report) for an ARC of B-II.

## G. VERTICAL ALIGNMENT AND TRANSVERSE GRADES

Taxiway F was designed to include one grade break at a .06% grade change. Taxiway G will not include any grade breaks or vertical curves. Transverse grades are set at 1.0% for both taxiways.

## H. AIRFIELD PAVEMENT DESIGN

Pavement thickness designs have been developed using the FAA pavement design software FAARFIELD, Version 1.42. FAARFIELD implements both layered elastic based and three-dimensional finite element-based design procedures developed by the Federal Aviation Administration (FAA) for new and overlay design of flexible and rigid pavements. FAARFIELD is directly associated with FAA Advisory Circular 150/5320-6F, Airfield Pavement Design and Evaluation.

### Pavement Design Input Data

The pavement designs developed for the taxiways associated with this project used two primary sources of information, projected fleet mix characteristics (obtained from the Avon Park Master Plan Update, dated January 2016) and existing soil characteristics (see Report of Geotechnical Exploration by Madrid Engineering Group, Inc. in Appendix "B").

#### *Fleet Mix*

The fleet mix forecast is based on Table 3-16 and other information from the above mentioned forecast. Standard FAARFIELD aircraft were assigned, as well as each aircrafts maximum takeoff weight (MTOW). The resulting data is consolidated in **Table 3** below.

**Table 3 Fleet Mix used for Pavement Design**

| Vehicle Name | FAARFIELD Type | FAARFIELD Name | MTOW | Projected Annual Departures |
|---|---|---|---|---|
| Cessna Skylane | General Aviation | Skylane-1-82 | 3,110 | 3,664 |
| Cessna Skyhawk | General Aviation | Skyhawk-172 | 2,558 | 3,664 |
| Piper Cherokee | General Aviation | Chk. Arrow-PA-28-200 | 2,500 | 3,664 |
| Beech Bonanza V35B | General Aviation | Bonanza-F-33A | 3,412 | 3,664 |
| Beech 55 Baron | General Aviation | Baron-E-55 | 5,424 | 3,664 |
| Fuel Truck | Ground Vehicle | Truck Axle Tandem | 37,480 | 50 |
| Fire Truck | Ground Vehicle | ARFF Vehicle - 3000 gal | 83,000 | 1 |

*Geotechnical Information*

Soil boring samples were taken in six locations along the proposed Taxiway F and Taxiway G alignments (See Report of Geotechnical Exploration). Asphalt cores were also taken, with core thickness results shown below in **Table 4**.

**Table 4 Existing Asphalt and Base Thickness Results**

| Core ID | Asphalt Thickness | Base Thickness |
|---|---|---|
| C1 | 1.7" | 2.5" |
| C2 | 2.2" | 7" |
| C3 | 2.2" | 5" |
| C4 | 2.5" | 5.5" |
| C5 | 1.8" | 6" |
| BC1 | 1.9" | 5.5" |

In addition, three samples were taken for Limestone Bearing Ratio (LBR) tests. LBR results are shown in **Table 5**.

**Table 5 Limestone Bearing Ratio (LBR) Test Results**

| Sample ID | LBR Value | Calculated CBR Value* |
|---|---|---|
| LBR1 | 18 | 14 |
| LBR2 | 19 | 15 |
| LBR3 | 16 | 13 |

* Calculated CBR value = 0.8 x LBR per AC 150/5320-6 (Latest Edition)

In order to account for the variability in materials, moisture contents and field versus laboratory conditions, one standard deviation below the mean was used to determine the design CBR. Based on the soil types, plus working knowledge of soil types throughout the airport, the Engineer has concluded that the calculated CBRs are reasonable for this location. Calculating one standard deviation below the mean results in a design CBR of 12.9.

*Conclusions*
The final design pavement section is 4" of P-401 surface course over 6" LBR 100 P-211, the minimum allowable layer thickness for flexible pavement structures in AC 150-5320-6F. Printouts of the results for the pavement thickness design using the FAA pavement design software FAARFIELD are shown in **Appendix "C"**.

## I. ROADWAY DESIGN

There are no roadways associated with this project.

## J. SITE PREPARATION

Refer to the contract documents for special site preparation measures. Generally stated, all disturbed areas will conform to the requirements of FAA AC 150/5300-13A.

## K. DRAINAGE

The realignment of Taxiway F and new construction of Taxiway G will require the relocation of a dry pond as well as relocation of culverts and swales. The relocated dry pond will have approximately the same storage volume as the existing dry pond. The pond outfall elevation and size have also been kept constant. The drainage ditches are designed to convey runoff parallel to the taxiway, eventually making way Northeast to an FDOT culvert under State Road 64. The drainage design will provide a functional system that effectively conveys runoff from Taxiways F and G while maintaining FAA grade and slope requirements along the unpaved areas. New drainage pipe material and strength were selected based on project conditions and FAA AC 5320-5D.

## L. AIRFIELD LIGHTING, SIGNAGE AND LANDING AIDS

New LED taxiway edge lighting and signage will be provided to each taxiway. The lighting and signage will be consistent with FAA Advisory Circulars 150/5340-30J and 150/5340-18G, respectively.

## M. MARKING

All airfield pavement markings will be accomplished in accordance with FAA Advisory Circular 150/5340-1M, Standards for Airport Markings. All markings shall be performed in accordance with the contract documents and the FAA specification for Item P-620. Markings will include all required taxiway items, including any runway markings possibly damaged during construction.

## N. TURFING

Turfing is not necessary for this project. All work will occur on existing pavements, including haul routes. The staging area is located on top of old pavement, and will not require turfing.

## O. SAFETY AND SECURITY PROVISIONS

Utmost importance will be given to safety and security during construction. The "Contractor's Safety and Security Requirements" notes are placed on the construction plans for the Contractor's attention. Additional information is included in the Contract Documents and has more specific details taken directly from Advisory Circulars 150-5370-2G (Operational Safety on Airports During Construction) and 150 /5200-18C (Airport Safety Self-Inspection).

## P. DEVIATION / MODIFICATION TO FAA STANDARDS

There are no deviations to FAA standards.

The Project Manual will include the standard FAA 150/5370-10H, Standards for Specifying Construction of Airports. Changes and additions to the standard construction specifications shall be noted by ***bold italic*** text. Deletions shall be noted by the ~~strikeout~~ method.

## Q. CONSTRUCTION PHASING

The project includes (2) two distinct phases, each phase includes (2) two subphases to minimize disruptions to airport operations along Runway 5-23, Runway 10-28, T-Hangars and other areas serving airfield tenant facilities. This phasing design will maintain airfield access for all airport tenants during construction. The first phase will construct a "new" section of Taxiway F (300 LF) to provide access into the terminal apron for the duration of the project. Each subphase (1A/1B) allows demolition and reconstruction of Taxiway F (610 LF) to minimize Runway 05/23 closure time during runway safety area (RSA) work activity. The second phase includes the construction of Taxiway G from the Runway 23 threshold to the Runway 28 threshold (450 LF). Each subphase (2A/2B) allows for demolition of Taxiway B and removal of Runway 05/23 pavement markings. Each phase will occur sequentially, not concurrently.

## R. AVAILABILITY OF MATERIALS

All materials necessary for construction of this project are generally in ready supply. The continuing volatility in the cost of fuel may also increase costs of items that involve trucking and use of heavy motorized equipment.

## S. AVAILABILITY OF CONTRACTORS

Review of past projects in the area indicates local construction firms are normally low bidders. Recent projects bid in the project area have had an adequate number of local bidders. The local plans rooms will be furnished a set of Contract Documents to encourage participation.

## T. NON-AIP ITEMS

There are no non-AIP items associated with this project.

## U. ENVIRONMENTAL CONSIDERATIONS

There are no potential Wetlands Impact associated with this project.

## V. CONTRACT TIME AND LIQUIDATED DAMAGES

The Construction time and Liquidated Damages are specified and listed in the Project Contract. They are summarized below:

| WORK PHASE/OTHER | MAXIMUM CALENDAR DAYS TO COMPLETE WORK | LIQUIDATED DAMAGES PER CALENDAR DAY BEYOND REQUIREMENTS |
|---|---|---|
| *PHASE 2A* | AS SHOWN IN THE PHASING PLANS | $5,000.00 |
| *ALL OTHER PHASES* | | $2,000.00 |
| **CONTRACTOR'S PROJECT CLOSEOUT** | **45 from the Date of Substantial Completion (No field work at this time)** | **$1,500.00** |

The amounts of liquidated damages can be determined in a general amount based on the following items in which the sponsor may lose revenue or absorb extra costs for every day that construction is incomplete and the runway pavement or adjacent runway or runway pavements are not available for use:

1. The inconvenience of the runway being closed and the loss of revenue from its associated use.

2. Extra construction engineering, inspection, legal and administrative cost.

3. Extra safety hazard contingent with construction.

The basic unit of contract time has been modified to "calendar day" from the FAA standard "working day". This gives the Contractor the option to work on weekends or holidays (as applicable) and eliminates any confusion about if a day is a "working" day or not. Special Provision No. 5 further defines this.

## W. WORK BY OTHERS

The Owner's staff and Amherst Consulting Company, LLC's program/construction management staff will be integral in communicating with the local FAA personnel during this project.

At the time of this writing, there are no work elements to be performed by entities other than the Prime Contractor and its subcontractors.

## X. ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COSTS

See **Appendix "D"** for the Engineer's Opinion of Probable Construction costs.

## Y. ENGINEER'S CERTIFICATION

See **Appendix "E"** for the Engineer's Certification.

# APPENDIX A

# AIP SCHEDULE

## AIP CONSTRUCTION PROJECT SCHEDULE

**Project:** Realign and Extend Taxiway F
**AIP No.:** 3-12-0004-019-2019
**FDOT FM No.:** NA
**Location:** Avon Park Executive Airport
**Date:** May 2019

| **Proposed Project Schedule:** | **Dates:** |
|---|---|
| Selection of Consultant | 2/2019 |
| Pre-Application Submittal to FAA | 11/16/2018 |
| Pre-design Conference | 3/2019 |
| CSPP and Airspace Coordination in OE/AAA | 5/2019 |
| Completion of Plans, Project Manual, and Engineer's Report | 5/2019 |
| Submit Plans and Specs to FAA | 5/2019 |
| Advertisement of Project for Bids | 5/2019 |
| Bid Opening | 6/2019 |
| Bid Tabulation Submittal and Recommendation of Award | 6/2019 |
| Application Submittal to FAA | 6/28/2019 |
| Grant Offer | TBD |
| Execution of FAA Grant | TBD |
| Pre-construction Conference | TBD |
| Notice to Proceed to Contractor | TBD |
| Substantial Completion of Construction | TBD |
| Final Inspection | TBD |
| Project Close-Out | TBD |

# APPENDIX B

# GEOTECHNICAL REPORT

**MADRID ENGINEERING GROUP, INC.**
2030 State Road 60 E
Bartow FL 33830-4268
Ph: (863) 533-9007
Fax: (863) 533-8997

March 7, 2019

Amherst Consulting Company, LLC
2300 Maitland Center Parkway, Suite 106
Maitland, FL 32751
Attn: Daniel Doyle

**RE: Avon Park Executive Airport Taxiway F**
**Geotechnical Report**
**Avon Park, Florida**
**Madrid Project No. 13952**

Mr. Doyle:

This letter report (data report) from Madrid Engineering Group, Inc. (Madrid) summarizes the results from our limited subsurface soil exploration, pavement coring program and laboratory testing for the proposed Taxiway F improvements at the Avon Park Executive Airport in Avon Park, Florida. The purpose of our exploration was to gather data for the design team and provide a discussion regarding any deleterious soil conditions at the site and site suitability for construction. Our evaluation is based upon the results of our field exploration and laboratory testing programs.

**Introduction**

The subject site is located directly southwest of the intersection of State Road 64 and North Oleander Drive within the Avon Park Executive Airport in Avon Park, Florida. The site is relatively flat and level. Madrid did not complete elevation surveys during this investigation. The proposed site plan is shown as **Figure 1** (provided by the Client).

**Soil Survey Map Review**

The Natural Resources Conservation Services (NRCS) Soil Survey reports provide a general description of the typical shallow soil strata (about 6 feet) encountered within each particular soil mapping unit and reports typical depth to seasonal high water levels. The NRCS defines seasonal high water as "a zone of saturation at the highest average depth during the wettest season that is at least six inches thick, persists for more than a few weeks, and is within six feet of the soil surface." The Soil Survey for Highlands County indicates shallow soils at the area of interest are comprised of **Pomello sand, 0 to 5 percent slopes** (map unit 36) in most of the site with **Basinger fine sand, 0 to 2 percent slopes** (map unit 12) along the northern and eastern portions of the site (north of the existing northernmost taxiway and in the northern portion of the proposed taxiway connecting runways 23 and 28. The borders between soil map units are approximate.

According to the NRCS, this **Pomello** sand is *nearly level to gently sloping, moderately well drained soil on slightly elevated ridges and knolls in the flatwoods part of the county and is also, to a small extent, in the ridge part of the county. Typically, the surface layer is dark gray sand about 4 inches thick. The subsurface layer, to a depth*

*of 56 inches is white sand. The upper part of the subsoil, to a depth of 62 inches, is mixed dark reddish brown and dark brown sand. The lower part, to a depth of 80 inches or more, grades to brown sand. The available water capacity of this Pomello soil is very low. The permeability is moderately rapid. The water table is at a depth of 24 to 40 inches for 2 to 5 months. It is generally higher during the summer rainy season but may recede to a depth of more than 60 inches during the dry winter and other extended dry periods.*

According to the NRCS, this **Basinger** soil is *on the low flatwoods and in sloughs and poorly defined drainageways. Typically, the surface layer is dark gray fine sand about 6 inches thick. The subsurface layer, to a depth of about 21 inches, is light gray and light brownish gray fine sand. The subsoil, to a depth of 52 inches, is brown fine sand. The upper part of the substratum, to a depth of 62 inches, is light brownish gray fine sand. The lower part to a depth of 80 inches is grayish brown loamy fine sand. The available water capacity is low. The permeability is rapid. The water table is within 12 inches of the surface for 2 to 5 months during the summer rainy season.*

**Field Exploration**

Madrid conducted limited subsurface exploration at the site on February 28, 2019. Madrid performed six (6) pavement cores to investigate the asphaltic concrete pavement and base layer thicknesses. These cores were designated C1 through C5 (in yellow) and BC1 (in green) as shown on **Figure 1** (figure provided by the Client). The pavement cores were returned to our laboratory for review and documentation. It should be noted that core BC1 also included a Standard Penetration Test (SPT) boring (ASTM D1586) to a depth of 10 feet below ground surface (bgs). Seven (7) additional SPT borings (for a total of 8 SPT borings completed at this site) without cores, B1 through B7 (in red) on **Figure 1**, were completed to a depth of 10 feet bgs in areas where there was no existing pavement. Bulk samples were collected from the surficial 1 to 2 feet of soil for Limerock Bearing Ratio (LBR) testing in our laboratory. These sample locations were designated LBR1 through LBR3 (in blue) on **Figure 1**.

The core, boring and bulk sample locations were selected by the Client and were located in the field with a hand-held gps unit (typical accuracy of +/- 10 feet).

**Pavement Core Results**

In general, the asphaltic concrete (AC) pavement course ranged from 1.7 to 2.5 inches thick. The base course varied in type and thickness. Cores C1 and C5 found large pieces of recycled concrete (up to 4" diameter) that ranged from about 2.5 to 6 inches thick. Cores C2 and C3 found what appeared to be a fine asphalt mix (visible on attached **Core Photo Log**) and ranged in thickness from about 5 to 7 inches. For cores C4 and BC1, the base material was crushed limerock and was 5.5 inches thick at both locations. A **Core Photo Log** is attached to this letter report. The following is a summary of the pavement core results:

**Table 1 Summary of Pavement Cores**

| Core Number | Latitude (°N) | Longitude (°W) | Asphaltic Concrete Thickness (in) | Base | |
|---|---|---|---|---|---|
| | | | | Thickness (in) | Type |
| C1 | 27.59449 | 81.52533 | 1.7 | 2.5 | Recycled Concrete |
| C2 | 27.59488 | 81.52497 | 2.2 | 7 | Asphalt Mix |
| C3 | 27.59488 | 81.52407 | 2.2 | 5 | Asphalt Mix |
| C4 | 27.59402 | 81.52514 | 2.5 | 5.5 | Limerock |
| C5 | 27.59293 | 81.5246 | 1.8 | 6 | Recycled Concrete |
| BC1 | 27.59420 | 81.52579 | 1.9 | 5.5 | Limerock |

**Subsurface Soil Conditions**

In general, the SPT borings encountered very sand soil conditions that were mostly loose to occasionally very loose or medium dense fine sands (SP) or slightly silty sands (SP-SM). Mostly, the slightly silty sands were at or near the surface. There were no anomalous soil conditions and very little organic material was detected in the samples. The organics encountered were mostly topsoil and do not appear to be problematic. The **SPT Boring Logs** are included with this report.

**Groundwater Conditions and Seasonal High Ground Water**

The water table was encountered between about 5.3 and 8 feet bgs across the site. The borings were completed during the "dry season". The Soil Survey describes the Seasonal High Water Table (SHWT) for these map units to be either within 12 inches of the surface or between 24 to 40 inches below the surface; however, we found some mixed soil colors in at least one of the samples from 2 to 4 feet bgs that suggests fill has been added to the site which may make the reported SHWT depth inaccurate based on current development. Our scope for this project did not include an on-site evaluation of SHWT depth, but the SHWT is likely in the vicinity of about 3 to 4 feet bgs at this site.

**Laboratory Testing**

Laboratory tests for natural water content (ASTM D2216), percent passing the No. 200 sieve (ASTM D1140), organic content (ASTM D2974) and Limerock Bearing Ratio (LBR) (FM 5-515) were performed on selected samples from the SPT borings and bulk samples collected to verify the visual and tactile soil classifications. Laboratory test reports are included with this letter report.

- The laboratory tests indicate variable fines content in the SPT borings. Percent passing the No. 200 sieve for the samples tested ranges from 1.4 to 8.9 percent.
- Moisture testing for samples from the SPT borings revealed in-situ natural moisture contents ranging from about 3 to 20 percent.
- Organic Content for the trace organic samples (topsoil) from the SPT borings revealed organic contents ranging from 1.2 to 1.3 percent.

- Testing for the bulk samples revealed a LBR values ranging from 16 to 19 (typical for clean sands) and maximum dry density ranges between 107.2 to 110.1pcf (also typical for clean sands).

**Evaluation of Findings**

The soils encountered during the field activities were mostly loose to occasionally very loose or medium dense. Soil conditions at all of the boring locations were suitable for construction. The soil is very sandy throughout the site, but the soil was generally loose and soil compaction will be an important activity for long-term pavement performance. If yielding or very loose soils are encountered at the base of excavations, over-excavation and re-compaction may be necessary. Clean sandy soil (SP and SP-SM) should be suitable for re-use as structural fill provided the topsoil is removed. No deleterious soils (very clayey or highly organic) were found at the boring locations. Dewatering should not be necessary unless used for utility installations. As shown in **Table 1**, pavement type and thicknesses vary and this data should be used by the pavement designer to determine if some of the existing pavement can be reused.

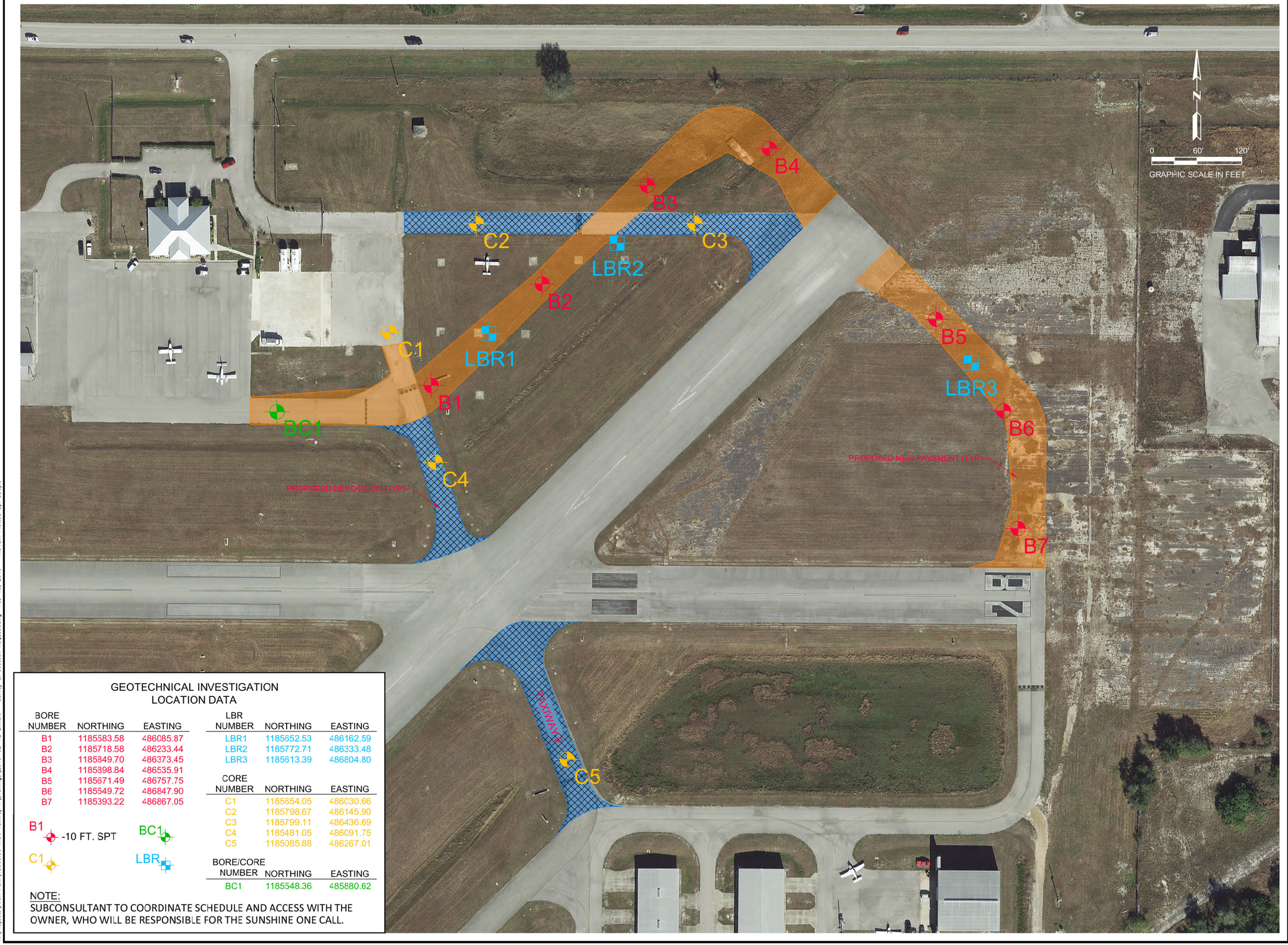
**Limitations**

This report has been prepared for Amherst Consulting Company, LLC for the proposed Taxiway F project at the Avon Park Executive Airport. The data and conclusions presented herein are based on Madrid's interpretation and understanding of site conditions. This report is intended for use by the designers of this project; it is not a specification document and is not intended for use as a part of the specifications. Varying degrees of non-uniformity of the horizontal and vertical soil conditions are likely to exist at the project site. The study reported herein has been conducted in accordance with the generally accepted standards, principles and practices in the geotechnical engineering profession. No other warranty, expressed or implied, is made. Madrid is not responsible for the independent conclusions, opinions, and/or recommendations made by others based on the field investigation data presented in this report.

Sincerely,
***Madrid Engineering Group, Inc. (EB 6509)***

Kevin M. Hill, P.E.
Project Manager
Florida P.E. No. 72949

**Attachments:** Figure 1 Site Plan showing boring/core/test locations (Provided by Client)
Core Photo Log
SPT Boring Logs
Laboratory Test Results




## GEOTECHNICAL INVESTIGATION LOCATION DATA

| BORE NUMBER | NORTHING | EASTING |
|---|---|---|
| B1 | 1185583.58 | 486085.87 |
| B2 | 1185718.58 | 486233.44 |
| B3 | 1185849.70 | 486373.45 |
| B4 | 1185898.84 | 486535.91 |
| B5 | 1185671.49 | 486757.75 |
| B6 | 1185549.72 | 486847.90 |
| B7 | 1185393.22 | 486867.05 |

B1 -10 FT. SPT

BC1

C1

LBR

| LBR NUMBER | NORTHING | EASTING |
|---|---|---|
| LBR1 | 1185552.53 | 486162.59 |
| LBR2 | 1185772.71 | 486333.48 |
| LBR3 | 1185613.39 | 486804.80 |

| CORE NUMBER | NORTHING | EASTING |
|---|---|---|
| C1 | 1185654.05 | 486030.66 |
| C2 | 1185798.67 | 486145.90 |
| C3 | 1185799.11 | 486436.69 |
| C4 | 1185481.05 | 486091.75 |
| C5 | 1185085.88 | 486267.01 |

| BORE/CORE NUMBER | NORTHING | EASTING |
|---|---|---|
| BC1 | 1185548.36 | 485880.62 |

NOTE:
SUBCONSULTANT TO COORDINATE SCHEDULE AND ACCESS WITH THE OWNER, WHO WILL BE RESPONSIBLE FOR THE SUNSHINE ONE CALL.


AVON PARK EXECUTIVE AIRPORT
1545 STATE ROAD 64
AVON PARK, FLORIDA 33825

AMHERST CONSULTING
2300 MAITLAND CENTER PKWY.
SUITE 106 MAITLAND, FLORIDA 32751
CERTIFICATE OF AUTHORIZATION #29728


KEY MAP

| NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|

PROJECT NAME:
REALIGN AND EXTEND TAXIWAY F

SHEET TITLE:
BORING/CORING LOCATION MAP

ENGINEER OF RECORD:

JOB NO.: 18060.06 DRAWN: DD
DATE: FEB 2019 DESIGN: TZ
SHEET NO. CHECKED: AHC

**Figure 1**

**Pavement Core Photo Log**


**Photo 1:** Core C1


**Photo 2:** Core C2

**Pavement Core Photo Log**

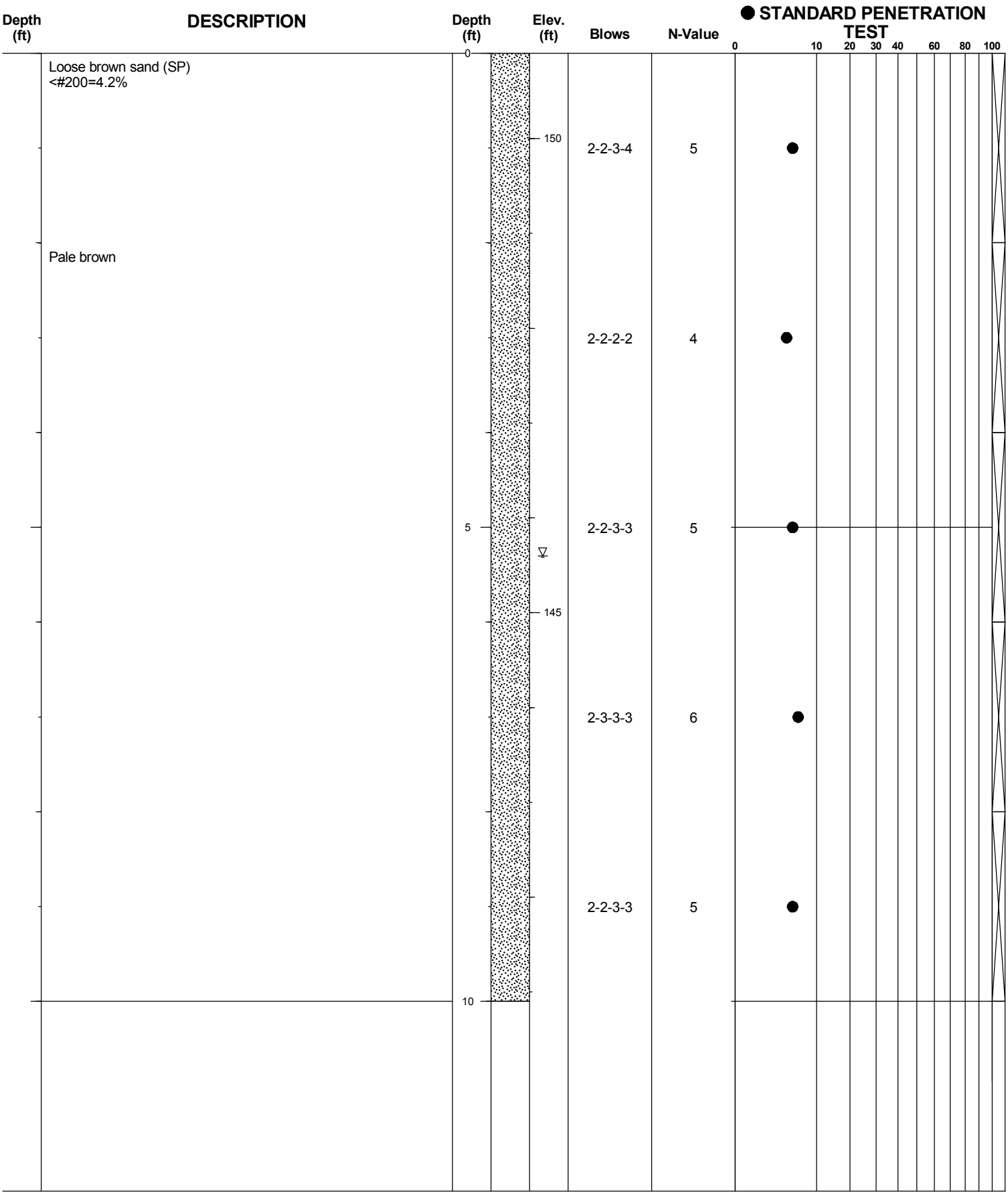

**Photo 3:** Core C3


**Photo 4:** Core C4

**Pavement Core Photo Log**


**Photo 5:** Core C5


**Photo 6:** Core BC1



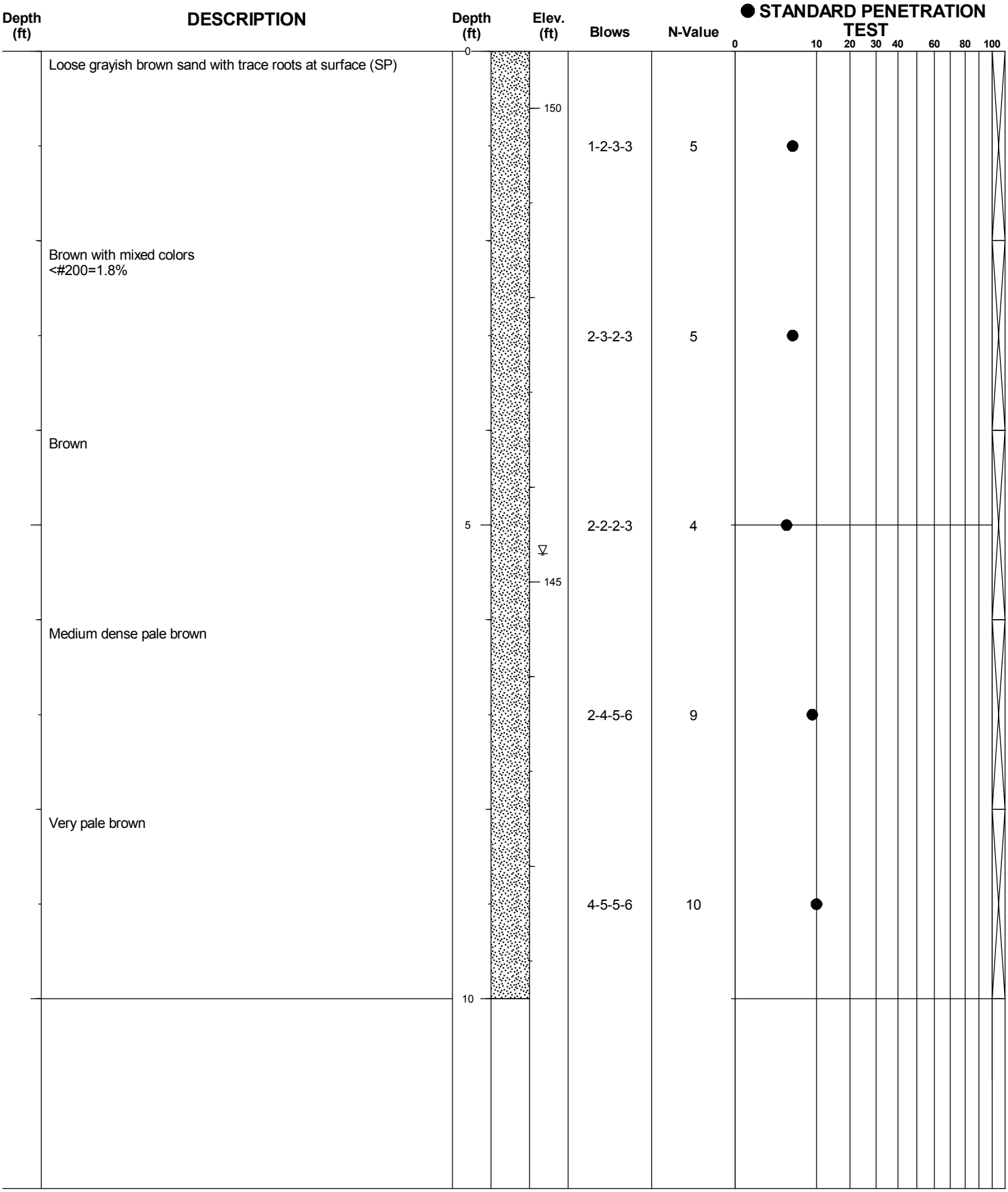

**BORING LOCATION:** 27.594295037°N, 81.525155633°W

| | |
|---|---|
| **BORING NUMBER** | B-01 |
| **DATE DRILLED** | 2/28/2019 |
| **PROJECT NUMBER** | 13952 |
| **PROJECT** | Taxiway F |
| **PAGE 1 OF 1** | |

# TEST BORING RECORD
**Madrid Engineering Group, Inc.**

**REMARKS:** Water table encountered at 5.3 feet bgs. Auto hammer used.

MEG WITH BLOW COUNTS 13952 GINT.GPJ SAMPLE.GDT 3/7/19



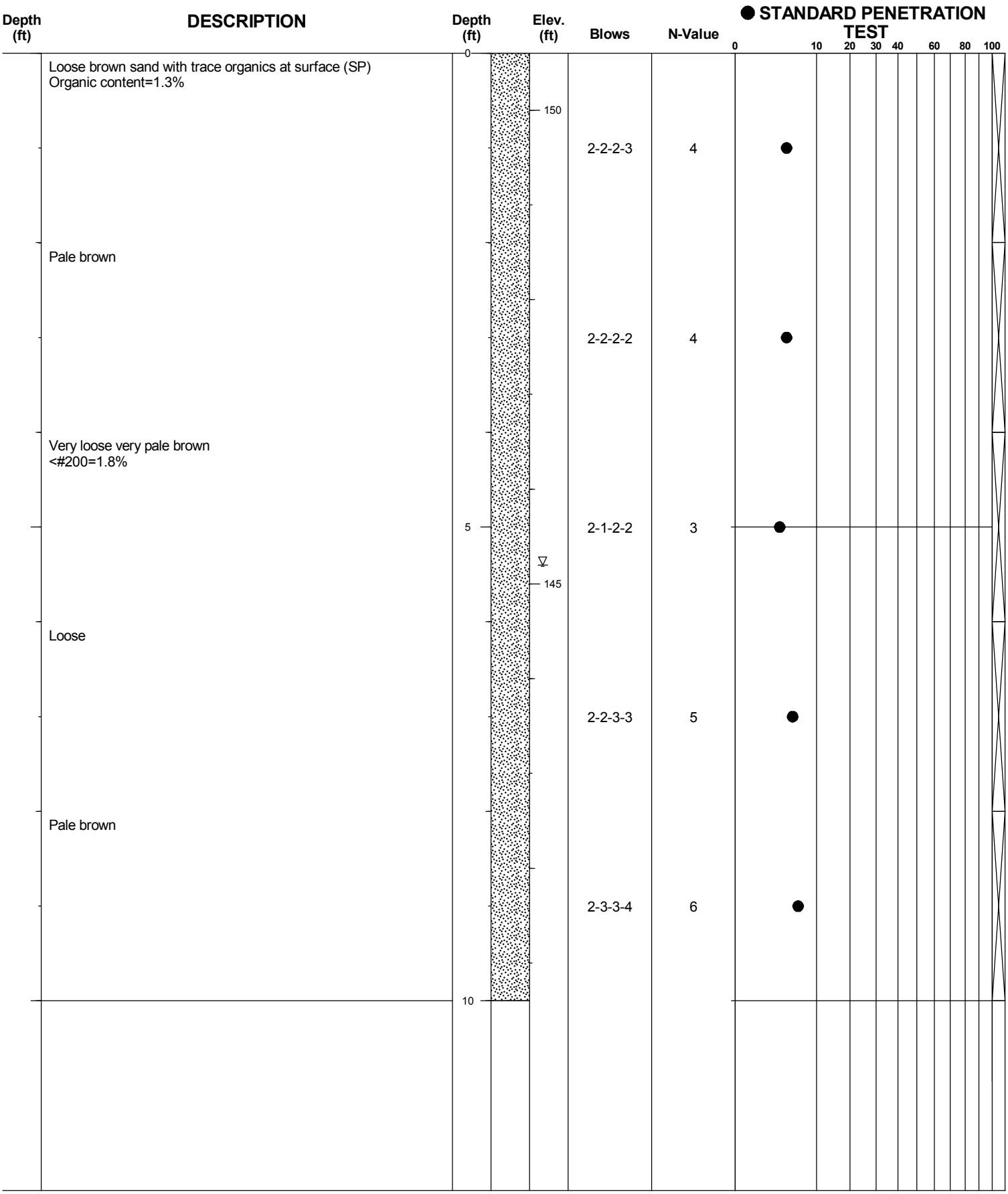

**BORING LOCATION:** 27.594661272°N, 81.52470166°W

| | |
|---|---|
| **BORING NUMBER** | B-02 |
| **DATE DRILLED** | 2/28/2019 |
| **PROJECT NUMBER** | 13952 |
| **PROJECT** | Taxiway F |
| **PAGE 1 OF 1** | |

# TEST BORING RECORD
**Madrid Engineering Group, Inc.**

**REMARKS:** Water table encountered at 5.3 feet bgs. Auto hammer used.

MEG WITH BLOW COUNTS 13952 GINT.GPJ SAMPLE.GDT 3/7/19




MEG WITH BLOW COUNTS 13952 GINT.GPJ SAMPLE.GDT 3/7/19

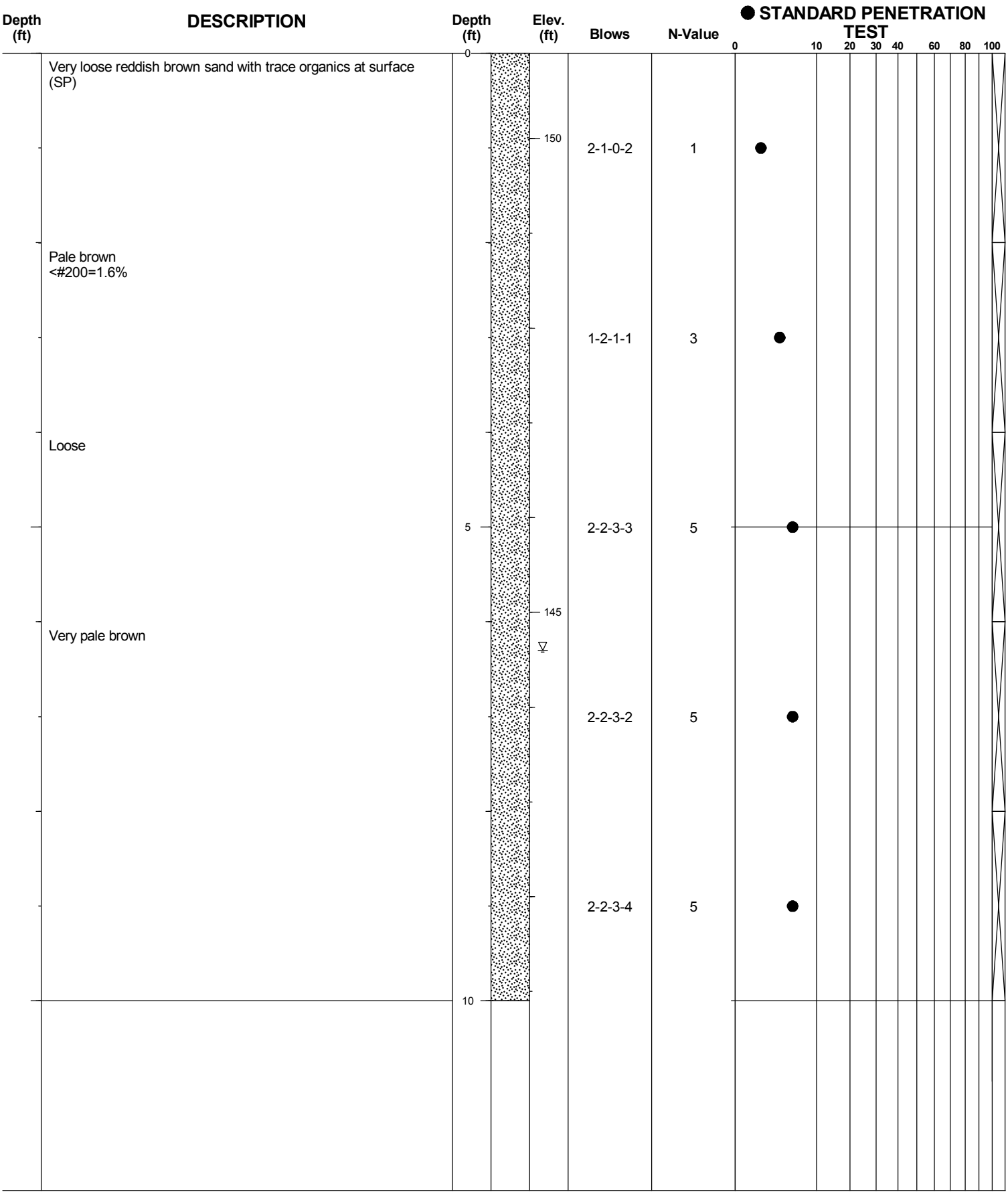
**BORING LOCATION:** 27.595024921°N, 81.524267845°W

| | |
|---|---|
| **BORING NUMBER** | B-03 |
| **DATE DRILLED** | 2/28/2019 |
| **PROJECT NUMBER** | 13952 |
| **PROJECT** | Taxiway F |
| **PAGE 1 OF 1** | |

# TEST BORING RECORD

**Madrid Engineering Group, Inc.**

**REMARKS:** Water table encountered at 5.4 feet bgs. Auto hammer used.



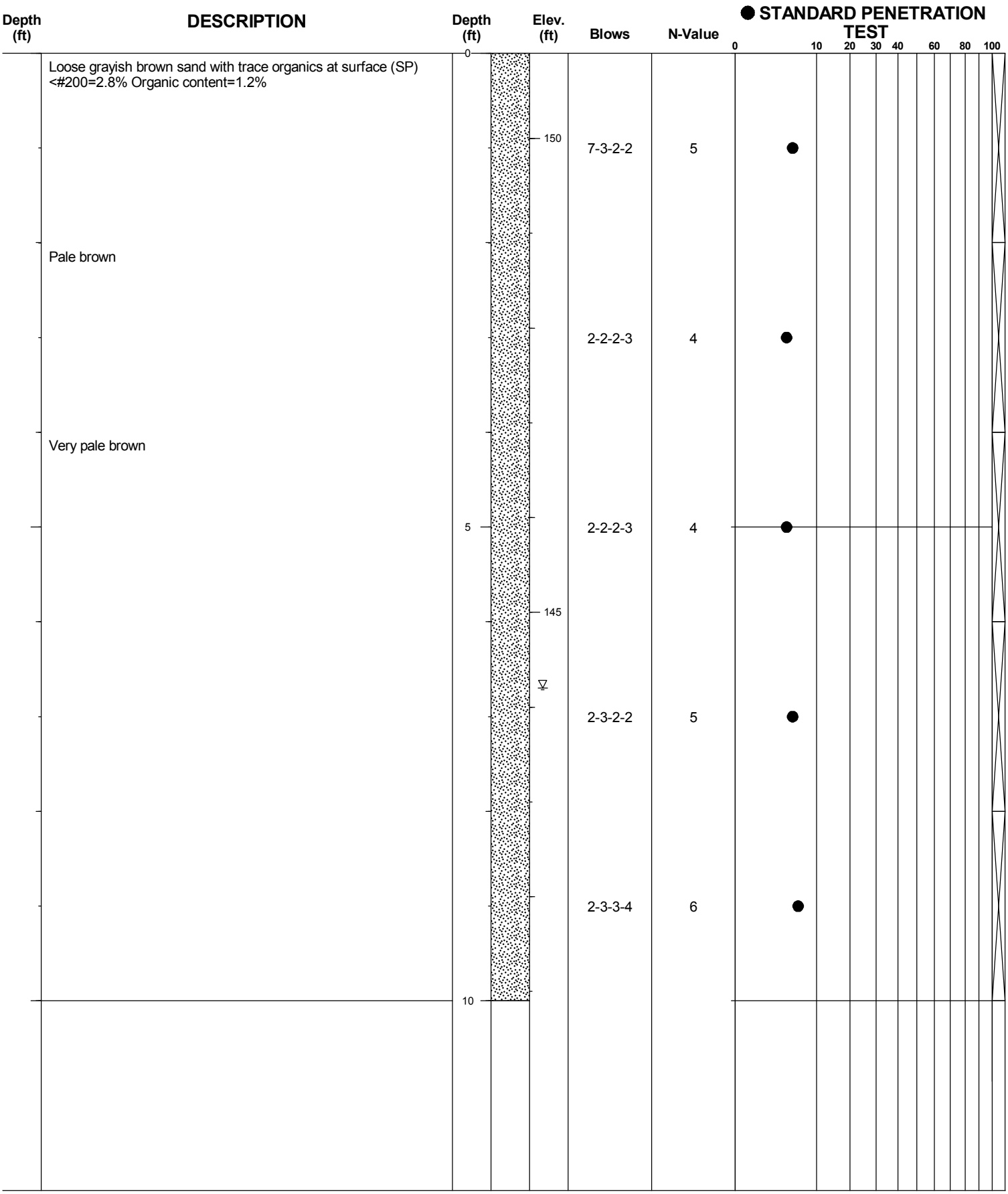

MEG WITH BLOW COUNTS 13952 GINT.GPJ SAMPLE.GDT 3/7/19

**BORING LOCATION:** 27.595158632°N, 81.523760517°W

| | |
|---|---|
| **BORING NUMBER** | B-04 |
| **DATE DRILLED** | 2/28/2019 |
| **PROJECT NUMBER** | 13952 |
| **PROJECT** | Taxiway F |
| **PAGE 1 OF 1** | |

## TEST BORING RECORD
**Madrid Engineering Group, Inc.**

**REMARKS:** Water table encountered at 6.3 feet bgs. Auto hammer used.



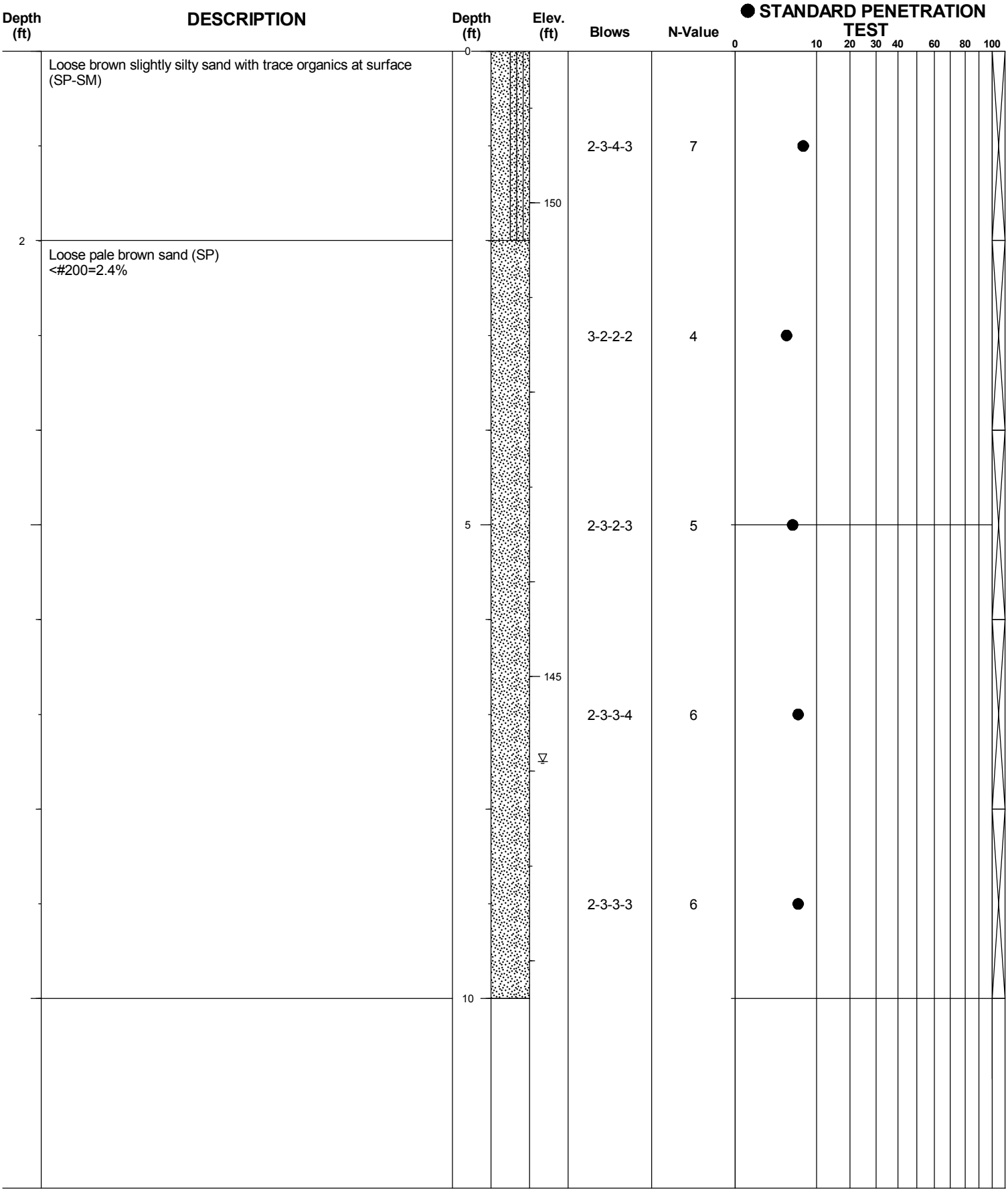

**BORING LOCATION:** 27.594535242°N, 81.523073841°W

| | |
|---|---|
| **BORING NUMBER** | B-05 |
| **DATE DRILLED** | 2/28/2019 |
| **PROJECT NUMBER** | 13952 |
| **PROJECT** | Taxiway F |
| **PAGE 1 OF 1** | |

# TEST BORING RECORD
**Madrid Engineering Group, Inc.**

**REMARKS:** Water table encountered at 6.7 feet bgs. Auto hammer used.

MEG WITH BLOW COUNTS 13952 GINT.GPJ SAMPLE.GDT 3/7/19




MEG WITH BLOW COUNTS 13952 GINT.GPJ SAMPLE.GDT 3/7/19

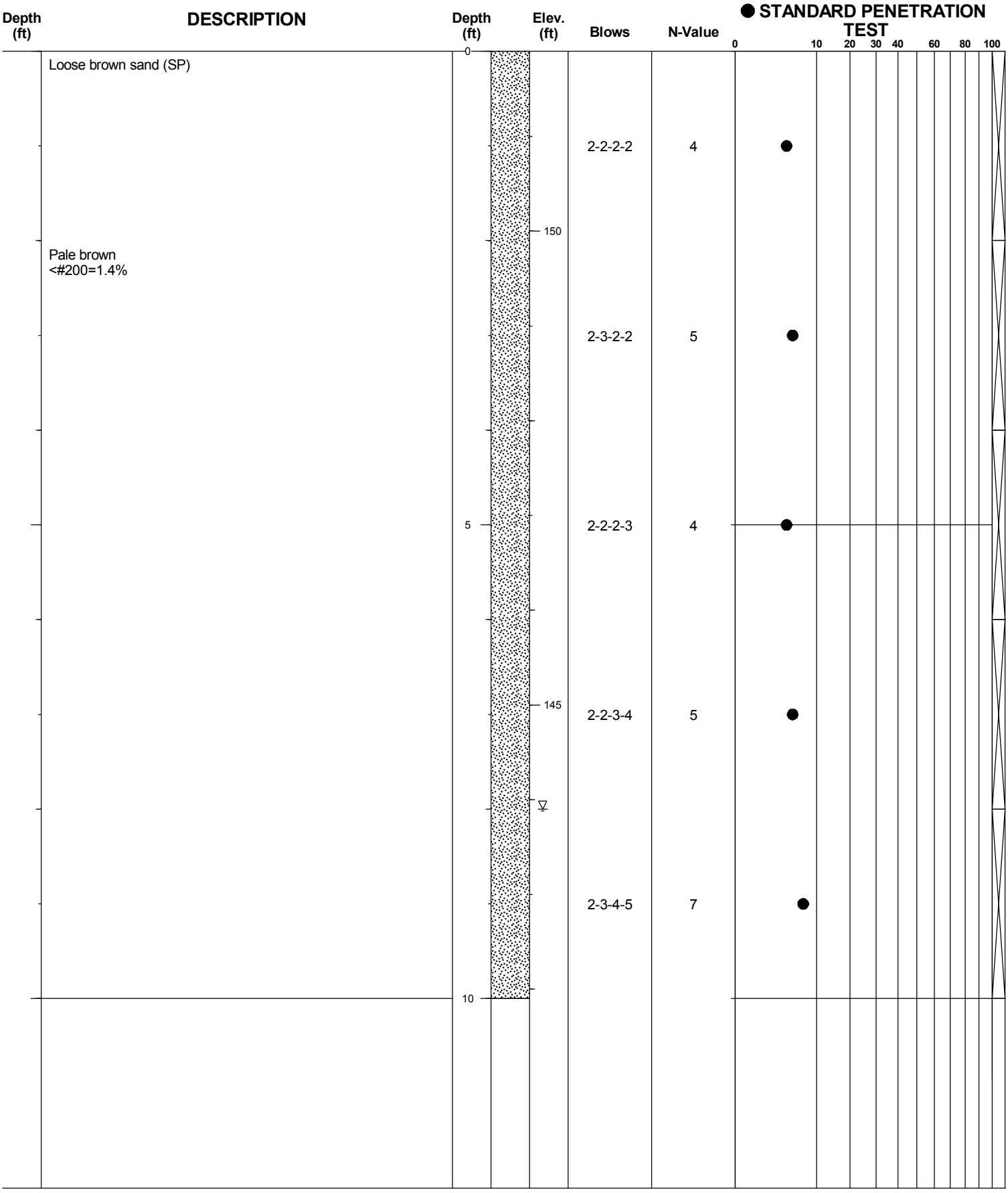
**BORING LOCATION:** 27.59420284°N, 81.522794066°W

| | |
|---|---|
| **BORING NUMBER** | B-06 |
| **DATE DRILLED** | 2/28/2019 |
| **PROJECT NUMBER** | 13952 |
| **PROJECT** | Taxiway F |
| **PAGE 1 OF 1** | |

# TEST BORING RECORD

**Madrid Engineering Group, Inc.**

**REMARKS:** Water table encountered at 7.5 feet bgs. Auto hammer used.



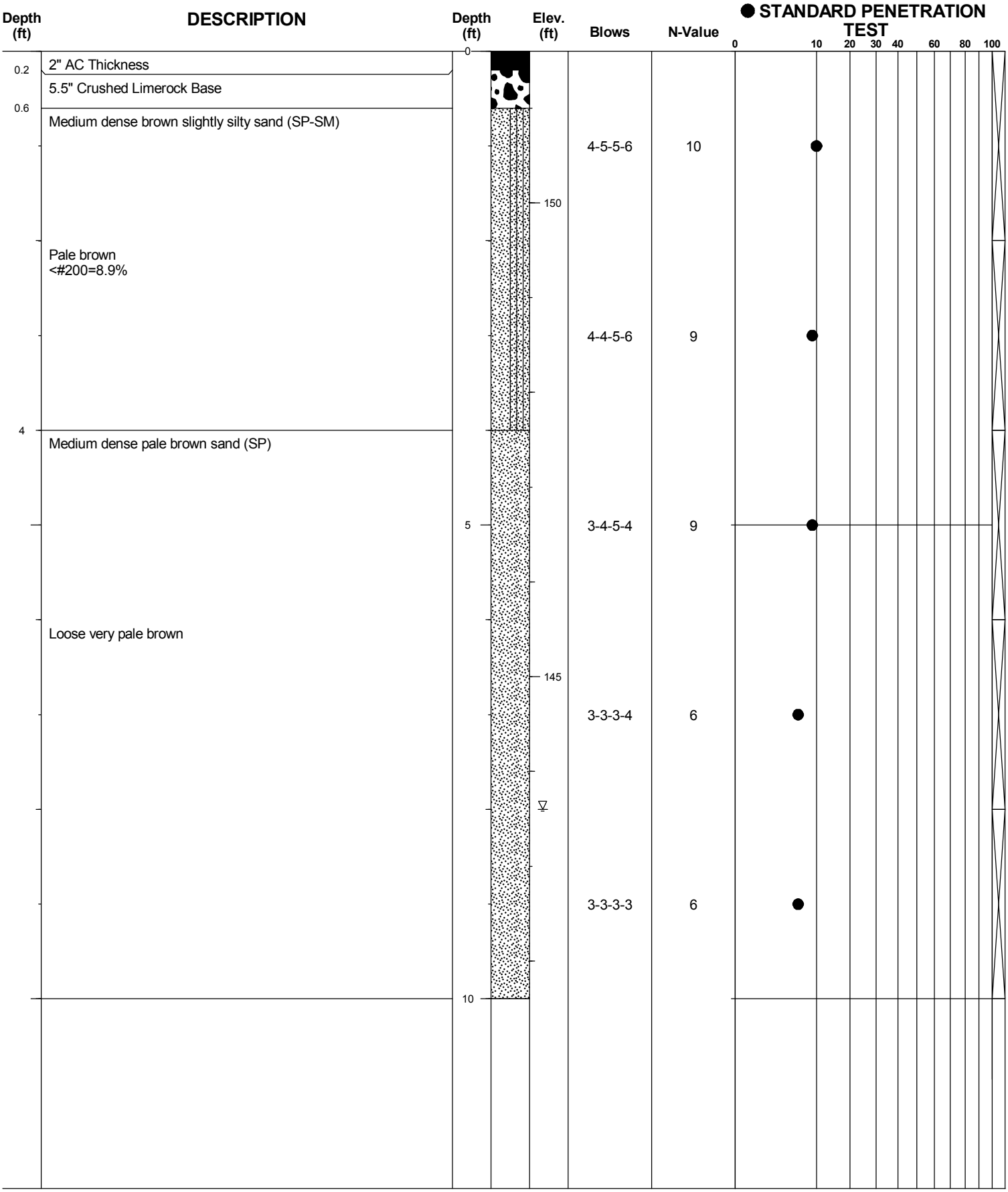

**BORING LOCATION:** 27.593773096°N, 81.522735861°W

| | |
|---|---|
| **BORING NUMBER** | B-07 |
| **DATE DRILLED** | 2/28/2019 |
| **PROJECT NUMBER** | 13952 |
| **PROJECT** | Taxiway F |
| **PAGE 1 OF 1** | |

# TEST BORING RECORD
**Madrid Engineering Group, Inc.**

**REMARKS:** Water table encountered at about 8 feet bgs. Auto hammer used.

MEG WITH BLOW COUNTS 13952 GINT.GPJ SAMPLE.GDT 3/7/19




MEG WITH BLOW COUNTS 13952 GINT.GPJ SAMPLE.GDT 3/7/19

**BORING LOCATION:** 27.59419965°N, 81.525793349°W

| | |
|---|---|
| **BORING NUMBER** | BC-01 |
| **DATE DRILLED** | 2/28/2019 |
| **PROJECT NUMBER** | 13952 |
| **PROJECT** | Taxiway F |
| **PAGE 1 OF 1** | |

# TEST BORING RECORD

**Madrid Engineering Group, Inc.**

**REMARKS:** Water table encountered at about 8 feet bgs. Auto hammer used.

**MADRID ENGINEERING GROUP, INC.**
2030 State Road 60 East
Bartow, Florida 33830
(863)533-9007 FAX: (863)533-8997

# ASTM C117-13 MOISTURE / PERCENT < No. 200 SIEVE

**Project Number:** 13952 **Date Tested:** 3/5/2019
**Project Name:** Taxiway F **Tested By:** TW
**Project Location:** Avon Park
**Client:** Amherst Consulting



| Sample | Cont. Name | $W_C+S_W$ (g) | $W_C+S_D$ (g) | $W_C$ (g) | Solids Content (%) | Moisture Content (%) | $W_C+S_R$ (g) | <#200 (%) |
|---|---|---|---|---|---|---|---|---|
| B-1 0-2' | 20 | 196.91 | 185.85 | 8.29 | 94.1% | 6.2% | 178.32 | 4.2% |
| B-2 2-4' | 9 | 115.91 | 111.32 | 8.50 | 95.7% | 4.5% | 109.50 | 1.8% |
| B-3 4-6' | 6 | 138.67 | 116.96 | 8.50 | 83.3% | 20.0% | 115.02 | 1.8% |
| B-4 2-4' | 21 | 107.82 | 103.88 | 8.39 | 96.0% | 4.1% | 102.39 | 1.6% |
| B-5 0-2' | 24 | 126.99 | 121.72 | 8.29 | 95.6% | 4.6% | 118.56 | 2.8% |
| B-6 6-8' | 63 | 165.69 | 159.76 | 8.32 | 96.2% | 3.9% | 156.15 | 2.4% |
| B-7 2-4' | 2 | 176.01 | 170.74 | 8.32 | 96.9% | 3.2% | 168.40 | 1.4% |
| BC-1 2-4' | 35 | 213.84 | 191.22 | 8.45 | 89.0% | 12.4% | 175.00 | 8.9% |
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$W_C$ = Weight of Container
$S_W$ = Weight of Wet Sample
$S_D$ = Weight of Dry Sample
$S_R$ = Weight of Sample Retained

$$\text{Solids Content } (\%) = \frac{S_D}{S_W} * 100$$

$$\text{Moisture Content } (\%) = \frac{W_{H_2O}}{S_D} * 100$$

$$< \#200 \text{ Sieve } (\%) = \frac{(S_D - S_R)}{S_D} * 100$$

**MADRID ENGINEERING GROUP, INC.**
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# AASHTO T267 ORGANIC CONTENT

**Project Number:** 13952
**Project Name:** Taxiway F
**Project Location:** Avon Park
**Client:** Amherst Consulting
**Date Tested:** 3/5/2019
**Technician:** TW

| Sample | Container Name | $W_C+S_W$ (g) | $W_C+S_D$ (g) | $W_C$ (g) | Solids Content (%) | Moist-ure Content (%) | Furnace Container Name | $W_{fC}+S_D$ (g) | $W_{fC}+S_{FD}$ (g) | $W_{fC}$ (g) | Organic Content (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B-3 0-0.5' | 41 | 138.25 | 131.00 | 8.68 | 94.4% | 5.9% | 12 | 180.02 | 178.48 | 57.60 | 1.3% |
| B-5 0-2' | 43 | 120.42 | 115.11 | 8.54 | 95.3% | 5.0% | 2 | 161.68 | 160.35 | 55.12 | 1.2% |
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Average Organic Content (%): 1.3%

$W_C$ = Weight of Container
$S_W$ = Weight of Wet Sample
$S_D$ = Weight of Dry Sample
$W_{fC}$ = Weight of Furnace Container
$S_{FD}$ = Weight of Furnace Dried Sample

$$\text{Solids Content (\%)} = \frac{S_D}{S_W} * 100$$

$$\text{Moisture Content (\%)} = \frac{(S_W - S_D)}{S_D} * 100$$

$$\text{Organic Content (\%)} = \frac{(S_D - S_{FD})}{S_D} * 100$$

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# LIMEROCK BEARING RATIO FM 5-515

**Project Number:** 13952
**Project Name:** Avon Park TWY F
**Project Location:** Highlands County, FL
**Client:** Amherst Consulting

**MEG Report Number:** 13952 LBR-1
**Date Sampled:** 3/1/2019
**Date Finished:** 3/5/2019
**Technician:** M. Sanchez

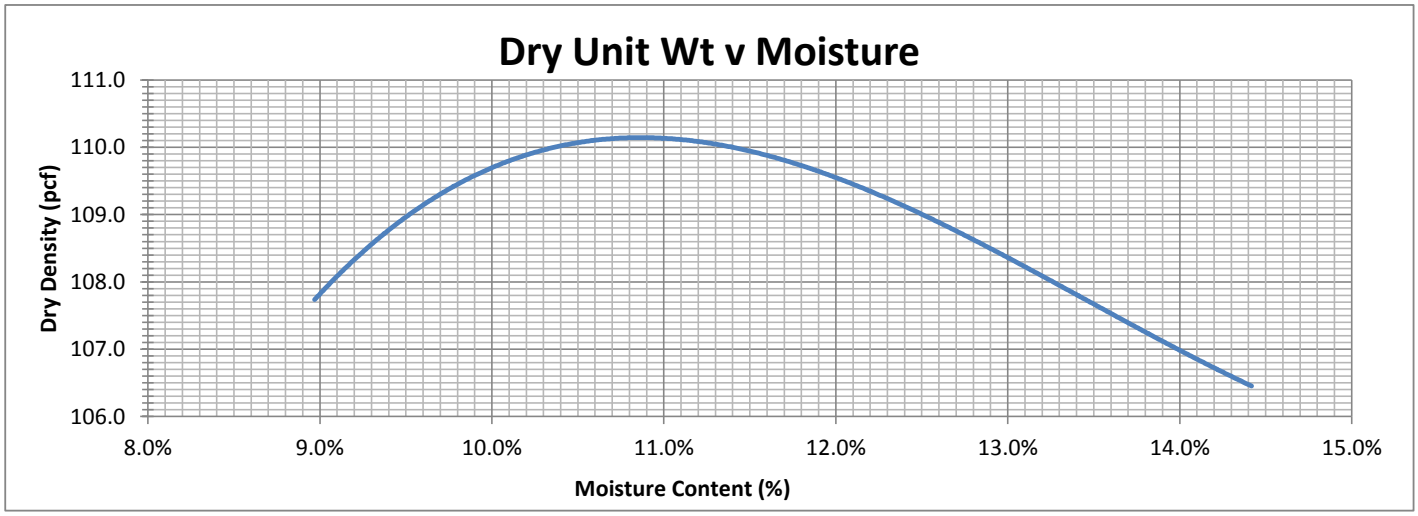
**Sample Number:** LBR-1
**Soil Description:** Light brown sand
**Proctor Type:** Modified

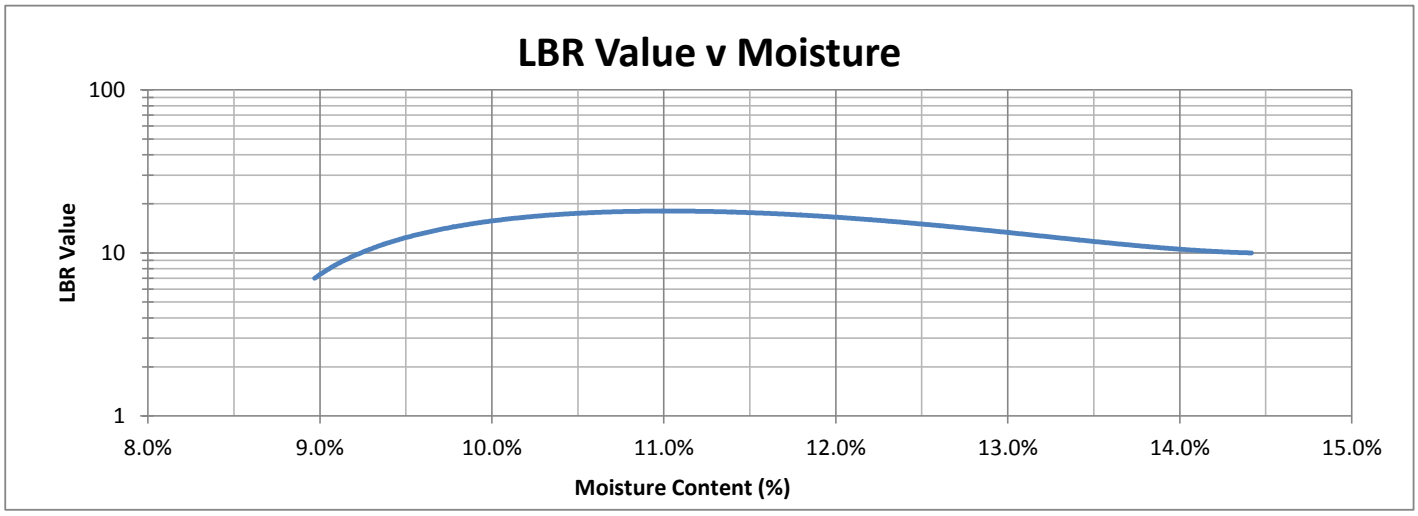
**Sample Location:** 27° 35' 40.13" N, 81° 31' 29.70" W

**Soil Classification:** N/A
**Mold Diameter:** 6.0 inch

**Moisture/Density Relationship**

| | |
|---|---|
| Optimum Moisture: | 10.9% |
| Max Dry Density: | 110.1 pcf |
| LBR: | 18 |



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Bartow, Florida 33830
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# LIMEROCK BEARING RATIO FM 5-515

**Project Number:** 13952
**Project Name:** Avon Park TWY F
**Project Location:** Highlands County, FL
**Client:** Amherst Consulting

**MEG Report Number:** 13952 LBR-2
**Date Sampled:** 3/1/2019
**Date Finished:** 3/5/2019
**Technician:** M. Sanchez

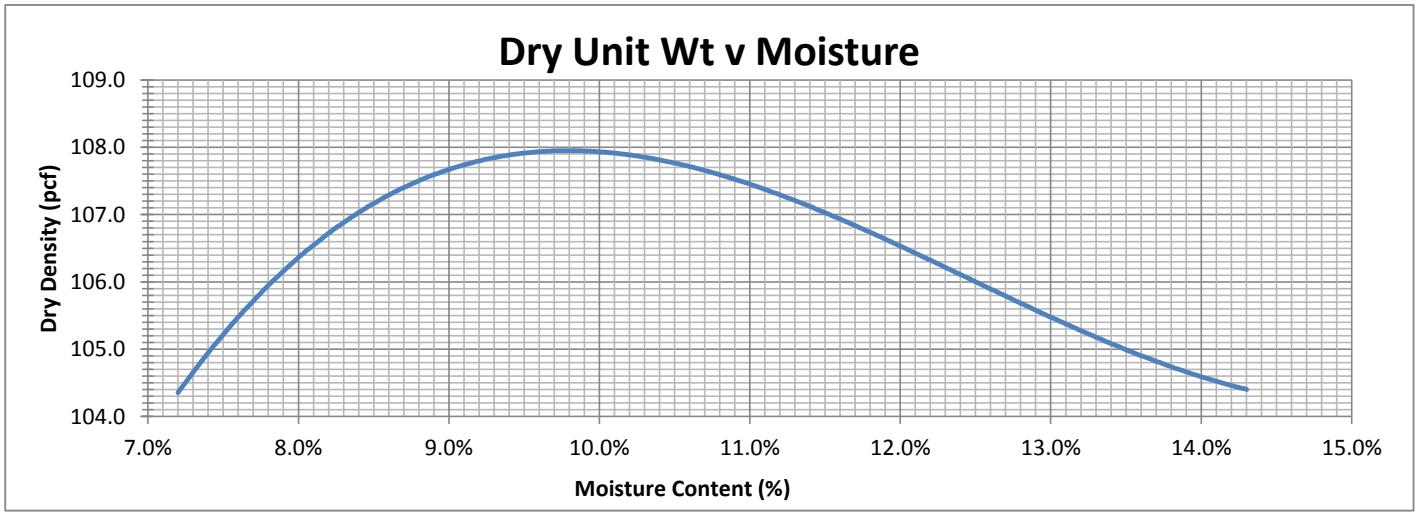
**Sample Number:** LBR-2
**Soil Description:** Brown sand
**Proctor Type:** Modified

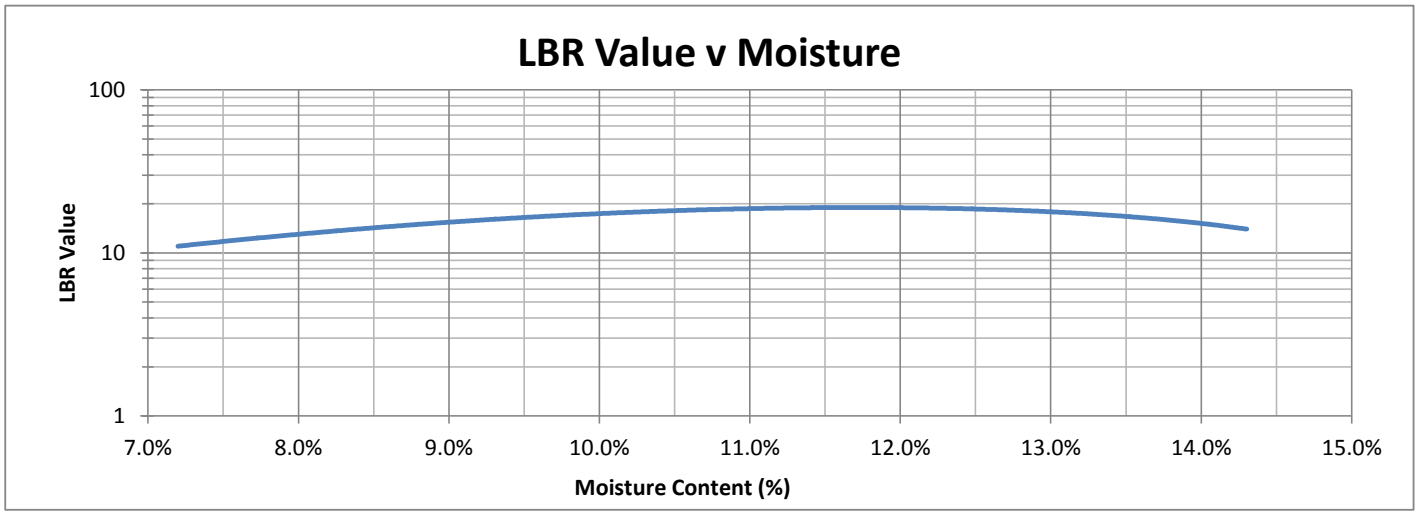
**Sample Location:** 27° 35' 41.32" N, 81° 31' 27.80" W

**Soil Classification:** N/A
**Mold Diameter:** 6.0 inch

**Moisture/Density Relationship**

| | |
|---|---|
| Optimum Moisture: | 9.8% |
| Max Dry Density: | 108.0 pcf |
| LBR: | 19 |



***MADRID ENGINEERING GROUP, INC.***
2030 SR 60 East
Bartow, Florida 33830
(863) 533-9007  FAX: (863) 533-8997

## LIMEROCK BEARING RATIO FM 5-515

**Project Number:** 13952
**Project Name:** Avon Park TWY F
**Project Location:** Highlands County, FL
**Client:** Amherst Consulting

**MEG Report Number:** 13952 LBR-3
**Date Sampled:** 3/1/2019
**Date Finished:** 3/5/2019
**Technician:** M. Sanchez

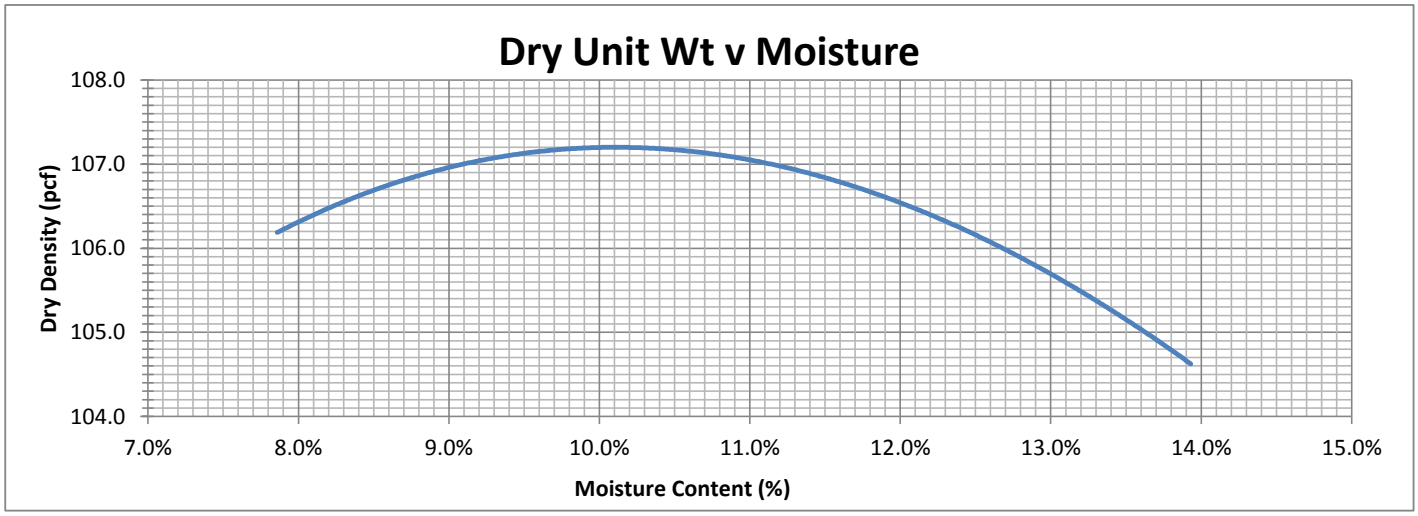
**Sample Number:** LBR-3
**Soil Description:** Brown sand
**Proctor Type:** Modified

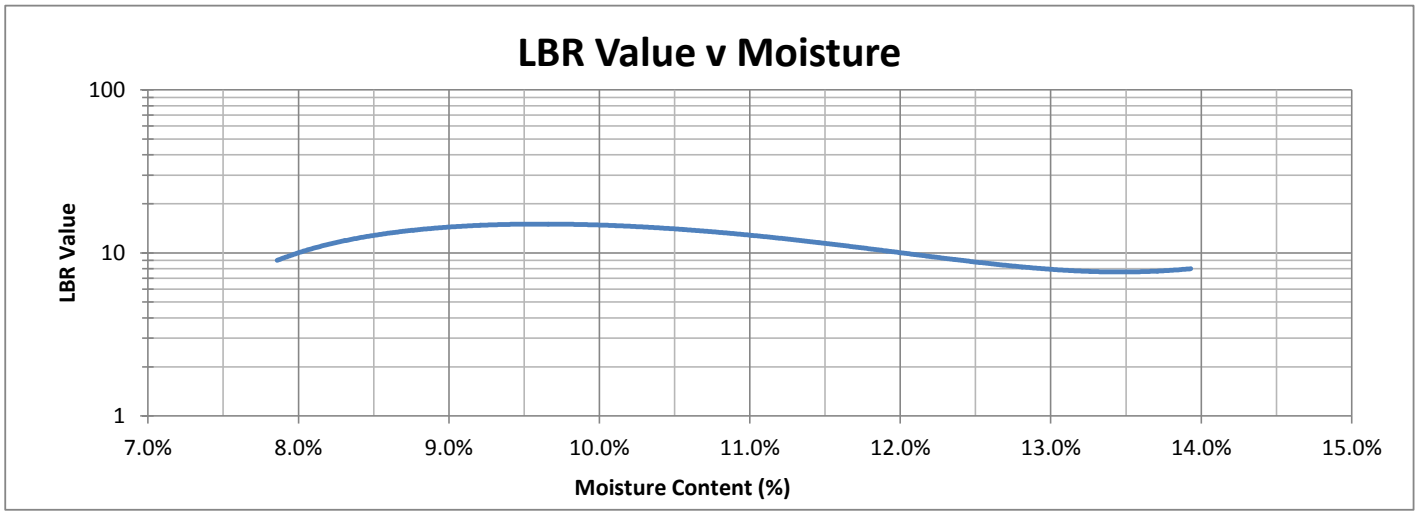
**Sample Location:** 27° 35' 39.75" N, 81° 31' 22.54" W

**Soil Classification:** N/A
**Mold Diameter:** 6.0 inch

**Moisture/Density Relationship**

| | |
|---|---|
| Optimum Moisture: | 10.1% |
| Max Dry Density: | 107.2 pcf |
| LBR: | 16 |



# APPENDIX C

# FAARFIELD PAVEMENT DESIGN

# FAARFIELD

**FAARFIELD v 1.42 - Airport Pavement Design**

Section TWY_F_G in Job TWY_F.

Working directory is H:\Projects\Avon Park\18060.06 TA06 Taxiway F\Engineer's Report\FAARFIELD\

The structure is New Flexible. Asphalt CDF was not computed.

Design Life = 20 years.

A design for this section was completed on 05/29/19 at 16:15:35.

Minimum layer thicknesses were reached.

**Pavement Structure Information by Layer, Top First**

| No. | Type | Thickness in | Modulus psi | Poisson's Ratio | Strength R,psi |
|---|---|---|---|---|---|
| 1 | P-401/ P-403 HMA Surface | 4.00 | 200,000 | 0.35 | 0 |
| 2 | P-209 Cr Ag | 3.00 | 37,322 | 0.35 | 0 |
| 3 | Subgrade | 0.00 | 19,350 | 0.35 | 0 |

**Total thickness to the top of the subgrade = 7.00 in**

**Airplane Information**

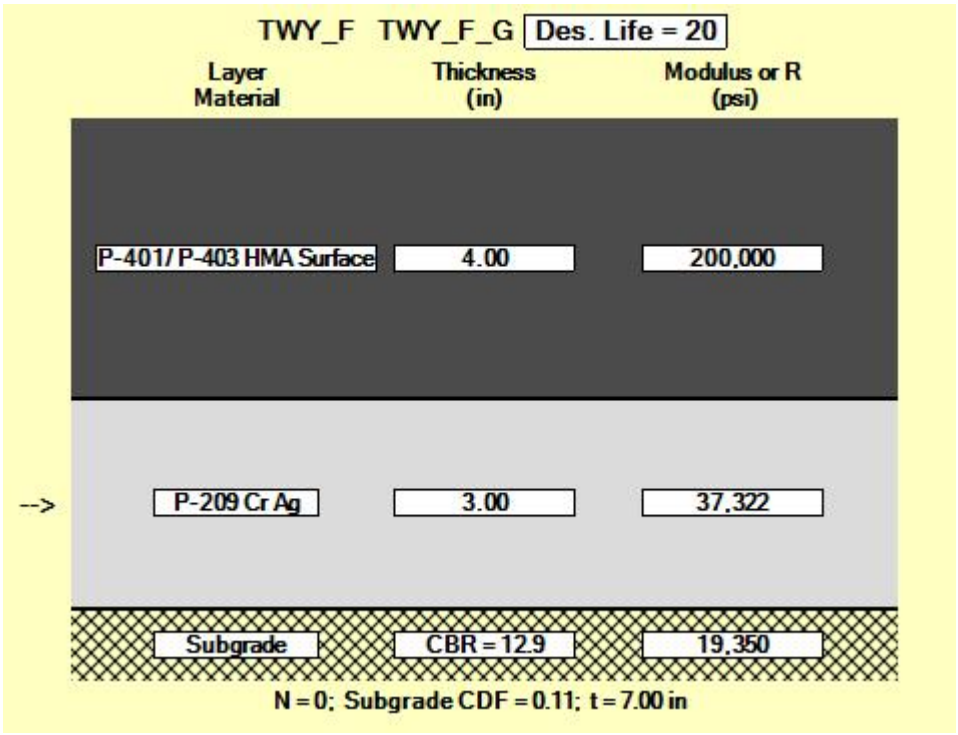
| No. | Name | Gross Wt. lbs | Annual Departures | % Annual Growth |
|---|---|---|---|---|
| 1 | Skylane-1-82 | 3,110 | 3,664 | 0.00 |
| 2 | Skyhawk-172 | 2,558 | 3,664 | 0.00 |
| 3 | Chk.Arrow-PA-28-200 | 2,500 | 3,664 | 0.00 |
| 4 | Bonanza-F-33A | 3,412 | 3,664 | 0.00 |
| 5 | Baron-E-55 | 5,424 | 3,664 | 0.00 |
| 6 | Truck Axle Dual | 37,480 | 50 | 0.00 |
| 7 | ARFF Vehicle - 3000 gal | 83,000 | 1 | 0.00 |

**Additional Airplane Information**

Subgrade CDF

| No. | Name | CDF Contribution | CDF Max for Airplane | P/C Ratio |
|---|---|---|---|---|
| 1 | Skylane-1-82 | 0.00 | 0.00 | 6.45 |
| 2 | Skyhawk-172 | 0.00 | 0.00 | 6.60 |
| 3 | Chk.Arrow-PA-28-200 | 0.00 | 0.00 | 6.79 |
| 4 | Bonanza-F-33A | 0.00 | 0.00 | 6.08 |
| 5 | Baron-E-55 | 0.00 | 0.00 | 5.87 |
| 6 | Truck Axle Dual | 0.10 | 0.10 | 2.48 |
| 7 | ARFF Vehicle - 3000 gal | 0.01 | 0.02 | 4.07 |

## User is responsible for checking frost protection requirements.


TWY_F TWY_F_G Des. Life = 20
Layer Material
Thickness (in)
Modulus or R (psi)
P-401/P-403 HMA Surface
4.00
200,000
-->
P-209 Cr Ag
3.00
37,322
Subgrade
CBR = 12.9
19,350
N = 0; Subgrade CDF = 0.11; t = 7.00 in

# APPENDIX D

# ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COSTS

| BID SCHEDULE A | | | | | | |
|---|---|---|---|---|---|---|
| Item | Spec. No. | Description | Unit | Est. Qty | Unit Price | Extension |
| 1 | GP-105-1 | MOBILIZATION | LS | 1 | $ 113,377.50 | $ 113,377.50 |
| 2 | SP-14-1 | RESIDENT PROJECT REPRESENTATIVE OFFICE | DAY | 112 | $ 100.00 | $ 11,200.00 |
| 3 | P-102-5.1 | TRAFFIC CONTROL | LS | 1 | $ 15,000.00 | $ 15,000.00 |
| 4 | P-103-5.1 | ASPHALTIC PAVEMENT REMOVAL (SURFACE AND BASE) | SY | 4400 | $ 3.00 | $ 13,200.00 |
| 5 | P-103-5.2 | CONCRETE PAVEMENT REMOVAL | SY | 225 | $ 20.00 | $ 4,500.00 |
| 6 | P-103-5.5 | MISCELLANEOUS/INCIDENTAL DEMOLITION | LS | 1 | $ 15,000.00 | $ 15,000.00 |
| 7 | P-152-4.1 | UNCLASSIFIED EXCAVATION | CY | 6000 | $ 12.00 | $ 72,000.00 |
| 8 | P-152-4.2 | BORROW EXCAVATION (RELATED TO UNSUITABLE) | CY | 500 | $ 18.00 | $ 9,000.00 |
| 9 | P-152-4.3 | UNSUITABLE EXCAVATION | CY | 500 | $ 12.00 | $ 6,000.00 |
| 10 | P-156-5.1 | TEMPORARY ENVIRONMENTAL CONTROLS | LS | 1 | $ 5,000.00 | $ 5,000.00 |
| 11 | P-211-5.1 | LIMEROCK BASE COURSE (6" THICK) LBR=100 | SY | 8150 | $ 13.50 | $ 110,025.00 |
| 12 | P-401-8.1 | BITUMINOUS SURFACE COURSE | TON | 1850 | $ 160.00 | $ 296,000.00 |
| 13 | P-602-5.1 | BITUMINOUS PRIME COAT | GAL | 2500 | $ 6.00 | $ 15,000.00 |
| 14 | P-603-5.1 | BITUMINOUS TACK COAT | GAL | 825 | $ 5.50 | $ 4,537.50 |
| 15 | P-620-5.2 | RUNWAY AND TAXIWAY PAINTING, YELLOW REFLECTIVE | SF | 1600 | $ 4.00 | $ 6,400.00 |
| 16 | P-620-5.3 | RUNWAY AND TAXIWAY PAINTING, BLACK NON-REFLECTIVE | SF | 3200 | $ 2.50 | $ 8,000.00 |
| 17 | T-904-5.1 | SODDING (ARGENTINE BAHIA) | SY | 22450 | $ 3.25 | $ 72,962.50 |
| 18 | 430-175-124 | PIPE CULVERT, CONCRETE, CLASS IV, ELLIPTICAL, 12"x18" | LF | 454 | $ 125.00 | $ 56,750.00 |
| 19 | 430-982-133 | MITERED END SECTION, CONCRETE, ELLIPTICAL, 12"x18" CD | EA | 8 | $ 2,000.00 | $ 16,000.00 |
| 20 | PLANS | CONCRETE SPILLWAY | LS | 1 | $ 10,000.00 | $ 10,000.00 |
| 21 | PLANS | CONCRETE SWALE - 160 LF | LF | 160 | $ 50.00 | $ 8,000.00 |
| 22 | L-108-5.1 | L-824, 1/C, NO. 8, TYPE "C", STRANDED COPPER, 5 KV, CABLE INCLUDING L-823 CONNECTORS INSTALLED IN DUCT OR CONDUIT | LF | 10750 | $ 2.00 | $ 21,500.00 |
| 23 | L-108-5.2 | #6 BARE COPPER COUNTERPOISE WIRE INSTALLED IN TRENCH OR DUCT INCLUDING GROUND RODS AND GROUND CONNECTORS, INCL. TRENCH | LF | 4200 | $ 2.75 | $ 11,550.00 |
| 24 | L-108-5.3 | EXISTING RUNWAY 5-23 AND 10-28 CIRCUIT MODIFICATION (INCLUDING SIGN CONNECTION, AND SPLICING CONDUCTORS) | EA | 6 | $ 100.00 | $ 600.00 |
| 25 | L-108-5.4 | ELECTRICAL DEMOLITION | LS | 1 | $ 5,000.00 | $ 5,000.00 |
| 26 | L-110-5.1 | 2-WAY 4" CONCRETE ENCASED DUCTBANK | LF | 350 | $ 40.00 | $ 14,000.00 |
| 27 | L-110-5.2 | 1-WAY 2" PVC SCHEDULE 40 CONDUIT, INCL. TRENCH | LF | 5500 | $ 10.00 | $ 55,000.00 |
| 28 | L-125-5.1 | INSTALL NEW INCANDESCENT ELEVATED MEDIUM INTENSITY L-8671 RUNWAY EDGE LIGHT ON L-867 CONCRETE BASE CAN, BI-DIRECTIONAL, YELLOW AND WHITE LENS, INCLUDING CONNECTION TO EXISTING CIRCUIT | EA | 2 | $ 3,000.00 | $ 6,000.00 |
| 29 | L-125-5.2 | L-861T LED TAXIWAY EDGE LIGHT (BLUE UV RESISTANT LENS, OMNIDIRECTIONAL), MOUNT NEW LED FIXTURE INCLUDING ALL PARTS NECESSARY USING FRANGIBLE COUPLING AND NEW L-867B BASE | EA | 55 | $ 2,500.00 | $ 137,500.00 |
| 30 | L-125-5.3 | L-867E JUNCTION CAN IN TURF INCLUDING ALL DUCT CONNECTIONS | EA | 12 | $ 2,500.00 | $ 30,000.00 |
| 31 | L-125-5.4 | SPARE PARTS (MUST EQUAL 10% OF THE VALUE OF THE SUM TOTAL OF LIGHT AND SIGN AND REGULATOR PAY ITEMS) | LS | 1 | $ 14,350.00 | $ 14,350.00 |
| 32 | L-126-9.1 | L-858 Y/R/L SINGLE OR DOUBLE FACE (1 MODULE) LED SIGN, POWER CORDSET THROUGH SIDE OF SIGN, MOUNTED ON EXISTING CONCRETE BASE W/ NEW LEGEND PANELS | EA | 3 | $ 2,400.00 | $ 7,200.00 |
| 33 | L-126-9.2 | L-858 Y/R/L SINGLE OR DOUBLE FACE (2 MODULE) LED SIGN, POWER CORDSET THROUGH SIDE OF SIGN, MOUNTED ON EXISTING CONCRETE BASE W/ NEW LEGEND PANELS, COMPLETE | EA | 3 | $ 3,200.00 | $ 9,600.00 |
| 34 | L-126-9.3 | L-858 Y/R/L SINGLE OR DOUBLE FACE (3 MODULE) LED SIGN, POWER CORDSET THROUGH SIDE OF SIGN, MOUNTED ON EXISTING | EA | 1 | $ 3,900.00 | $ 3,900.00 |
| 35 | L-109-5.1 | MODIFY EXISTING AIRFIELD ELECTRICAL VAULT AND ELECTRICAL DISTRIBUTION SYSTEM, COMPLETE | LS | 1 | $ 45,000.00 | $ 45,000.00 |
| 36 | L-109-5.2 | NEW 4.0KW FERRORESONANT, AIR COOLED, CONSTANT CURRENT REGULATOR, INSTALLED COMPLETE | EA | 2 | $ 9,000.00 | $ 18,000.00 |
| | | | | TOTAL COST - BID SCHEDULE A | | $1,247,153 |

# APPENDIX E

# ENGINEER'S CERTIFICATION

# ENGINEER CERTIFICATION OF COMPLIANCE WITH DESIGN DEVELOPMENT CRITERIA FOR FDOT AVIATION / INTERMODAL GRANT PROJECTS AND FAA GRANT PROJECTS

**AIRPORT:** AVON PARK EXECUTIVE AIRPORT

**PROJECT DESCRIPTION:** REALIGN AND EXTEND TAXIWAY F

**FAA AIP NO.:** 3-12-0004-019-2019

**FDOT FM NO.:** NA

**AVON PARK BID NO.:** TBD

**AGENCY/SPONSOR:** CITY OF AVON PARK

**ENGINEERING FIRM:** AMHERST CONSULTING COMPANY, LLC

I hereby certify that the plans, specifications, and contract documents produced by the Engineer for the above referenced project have been developed in compliance with the "DESIGN DEVELOPMENT CRITERIA" described in the FDOT Joint Participation Agreement, in accordance with FAA DESIGN CRITERIA and in accordance with sound engineering practices.

This Certification by Amherst Consulting Company, LLC and its subconsultants is limited to the services performed under contract for this assignment.

Todd N. Zimmerman, State of Florida, Professional Engineer, License N. 46037

Digitally signed by Todd N. Zimmerman, State of Florida, Professional Engineer, License N. 46037
Date: 2019.06.12 07:52:26 -04'00'

06/12/19

**TODD N. ZIMMERMAN, P.E.**
**FL P.E. NO. 46037**

**DATE**