

# REVIEW COPY

REPORT OF FINDINGS  
SINKHOLE INVESTIGATION  
**HARBINWOOD ESTATES SWMF SINKHOLE**  
LONGVIEW DRIVE  
LEON COUNTY, FLORIDA

*Prepared For:*

**LEON COUNTY PUBLIC WORKS**  
ENGINEERING SERVICES DIVISION  
2280 MICCOSUKEE ROAD  
TALLAHASSEE, FLORIDA 32308

*Prepared By:*

**ENVIRONMENTAL AND GEOTECHNICAL SPECIALISTS, INC.**  
104 NORTH MAGNOLIA DRIVE  
TALLAHASSEE, FLORIDA 32301  
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*June 2019*  
*03-47-18-04*

## ENVIRONMENTAL AND GEOTECHNICAL SPECIALISTS, INC.

June 14, 2019

EGS File Number: 03-47-18

Leon County Public Works  
2280 Miccosukee Road  
Tallahassee, Florida 32308

**ATTN:** Theresa Heiker, PE  
Stormwater Management Coordinator

**SUBJECT:** **Review Copy** - Report of Findings of the Sinkhole Investigation  
and Remedial Recommendations  
Harbinwood Estates Stormwater Management Facility Sinkhole  
Longview Drive  
Leon County, Florida

Theresa:

Environmental and Geotechnical Specialists (**EGS**) has completed the subsurface investigation as authorized for the sinkhole that formed in the Harbinwood Stormwater Management Facility (**SWMF**). The intent of this investigation was to evaluate the safety of Longview Road, identify the horizontal and vertical extent of the karst feature, develop recommendations to stabilize the karst feature while maintaining the operation of the **SWMF**, and provide an engineering cost estimate for the remediation.

### SCOPE OF SERVICES

The Scope of Services approved for this investigation included the following:

- Conducting a Geophysical Survey using Electrical Resistivity Imaging (**ERI**) to evaluate the location, horizontal, and vertical extent of the karst feature;
- Installation of 22 soil borings to depths varying from 18 to 70 feet to calibrate the Geophysical data and provide physical measurements of the subsurface conditions;
- Identify the approximate horizontal and vertical extent of the karst feature, develop a remedial Option, and prepare Preliminary Construction Plans to implement the Remedial Option; and,
- Preparation of this Report.

## SITE CONDITIONS

The existing site is a **SWMF** that was constructed to improve the drainage issues within the Harbinwood Estates Subdivision. The **SWMF** was constructed around 2007 and consisted of constructing an infiltration/surge pond, collection piping, and an overflow structure. A Site Location Map has been included as **Figure 1**.

Although the **SWMF** is not within an area mapped by Leon County as being a potential karst feature, it is close to Lake Jackson, which has several known active karst features around the perimeter. Since the construction of this **SWMF**, there has been no reported karst activity either within the **SWMF** or adjacent to it. A copy of the Leon County GIS Potential Karst Features Map is provided in **Figure 2**.

Also shown in **Figure 2** are the United States Geological Survey (**USGS**) Topographic Contours. As can be seen in **Figure 2**, the flow of surface water and the likely flow of groundwater is to the north toward Lake Jackson. *Since a karst feature is normally the result of erosion of the underlying soil and limestone caused by the migration of groundwater, it is likely that the sinkhole will continue to grow toward the south and southwest with time.*

**EGS** personnel traveled to the site in May 2019 and observed the sinkhole. It appears that the limits of soil erosion in the vicinity of the sinkhole has increased in size since the last site visit, indicating that the sinkhole is continuing to grow. Photographs of the existing soil erosion at the time of the visit has been provided in **Figures 3A** and **3B**. In addition to the growing sinkhole, **EGS observed** several depressions have formed around the perimeter of the sinkhole, which will likely continue to grow and eventually connect with the main sinkhole area. Pictures of some of the depressions have been provided in **Figures 3C** and **3D**.

## GEOPHYSICAL SURVEY

A Geophysical Survey of the sinkhole area was started by **EGS** on January 7, 2019 and continued through April 4, 2019 using Electrical Resistivity Imaging (**ERI**). The **ERI** survey consisted of installing 13 Transect Lines, labeled **HW-1** through **HW-13**. The **ERI** testing along Transect Lines **HW-1** through **HW-3**, **HW-7**, **HW-12**, and **HW-13** were conducted using traditional ground cables, while **ERI** testing along Transect Lines **HW-4** through **HW-6** and **HW-8** through **HW-11** were conducted using special water resistant marine cables. **ERI** Transect Lines **HW-7**, **HW-12**, and **HW-13** were conducted on the North side of Longview Road. The locations of the 13 Transect Lines are shown in the Field Test Location Map provided as **Figure 4** with detailed location data provided in **TABLE 1**. Copies of the Subsurface Profiles developed from the **ERI** test results are provided in **Figures 5A** through **5G**.

The following can be seen in **Figures 5A** through **5G**:

- **Transect HW-7 (Figure 5A)** - This Transect Line is located immediately north of Longview Drive. There is a zone of very loose highly weathered limestone that extends from a depth of about 30 feet to 60 feet between Soil Borings **VB-4** and **VB-7**. At the western end of this Transect Line is a visible dip in the limestone to a depth of greater than 70 feet. Although the limestone dips in this area it does not appear to be a zone where significant vertical erosion is occurring. It appears that subsurface erosion is south in the direction of Transect Line **HW-1**.
- **Transect HW-1 (Figure 5A)** – This Transect Line is immediately south of Longview Drive. There is a zone of very loose subsoils, between Soil Borings **VB-1** and **VB-3**, which extends from a depth of about 5 feet to a depth of greater than 60 feet. Since there is no significant confining layer in this zone, there is likely a downward migration of subsoil in this zone. This zone likely connects with the zone of very loose soil shown in Transect Line **HW-2** causing the soil to move downward and to the south.
- **Transect HW-2 (Figure 5B)** – This Transect Line is approximately 25 feet south of Transect Line **HW-1** and intersects the edge of the existing surface depression. There is a zone of very loose subsoils near Soil Boring **VB-2** that extends from a depth of about 40 feet to a depth of greater than 70 feet. It appears there is a downward migration of soil to the southwest from Soil Boring **VB-5** toward Soil Boring **VB-2**. This area appears to be the likely “chimney” of the karst feature. It is likely this deep erosion zone is continuous with that identified in Transect Line **HW-1**.
- **Transect HW-3 (Figure 5B)** – This Transect Line is approximately 25 feet south of Transect Line **HW-2** and is between a smaller surface depression and the large sinkhole. There appears to be rock below the sinkhole in this area; however, there is a small vertical zone of eroded rock near Soil Boring **VB-8** that extends from a depth of 18 feet to a depth of greater than 70 feet. This erosion area is likely a “chimney” of active vertical erosion. **EGS believes** that with continued vertical erosion of subsoils, this area will become a sinkhole in the future. This future sinkhole has been identified as **AREA 2** in this Report.
- **Transect Line HW-4 (Figure 5C)** – This Transect Line is approximately 25 feet south of Transect Line **HW-3** and intersects the edge of the large existing sinkhole. There is a zone of very loose subsoils and weathered rock near Soil Boring **VB-20** that extends from a depth of about 35 feet to a depth of greater than 70 feet immediately east of the existing sinkhole. The erosion in this area appears to be downward, creating what is likely a path helping to form the large sinkhole at the surface. It is likely this deep erosion zone is continuous with that identified in Transect Lines **HW-2** and **HW-3**.

The vertical channel visible in this **Figure** corresponds approximately to the location where a small water vortex is visible in the bottom of the large sinkhole. This location has been identified as **AREA 1** in this Report.

- **Transect Line HW-5 (Figure 5C)** – This Transect Line is approximately 40 feet south of Transect Line **HW-4** and intersects the southern edge of the large existing sinkhole. There does not appear to be a significant vertical zone of very loose subsoils. In this area most of the erosion is horizontal and is likely moving to the north toward Transect Line **HW-4**. Based on the results of Soil Boring **VB-17**, installed about 4 months after ERI scan **HW-5** was performed, very loose subsoils were encountered from a depth of about 30 feet to 60 feet which supports the belief that horizontal erosion is occurring.
- **Transect Line HW-6 (Figure 5D)** – This Transect Line is approximately 50 feet south of Transect Line **HW-5** and is south of the large existing sinkhole. Although there are large holes in the rock at depths of 60 feet or more, there does not appear to be any significant vertical zone of the loose subsoils, as evidenced by Soil Boring **VB-14**.
- **Transect Lines HW-8 through HW-11 (Figures 5E and 5F)** – These Transect Lines were performed to confirm the subsurface conditions identified in the other Transect Lines and estimate the horizontal dimension of the active zones of vertical erosion (“chimneys”).
- **Transect Lines HW-12 and HW-13 (Figure 5G)** – These Transect Lines were conducted on the North side of Longview Drive to identify if the karst conditions extended north of the roadway. As can be seen in **Figure 5G**, the karst conditions are deep seated, below about 30 feet, with no clear vertical channel of soil erosion. The karst conditions that caused the large sinkhole in the **SWMF** are not significantly affecting the area to the north of Longview Drive.

*Based on the Geophysical Investigation conducted for this Study, there appears to be 2 primary areas where vertical subsoil erosion is occurring. **AREA 1** is immediately to the east of the existing sinkhole and is likely the location where the “chimney” of the large sinkhole exists. **AREA 2** appears to be an active “chimney” forming approximately 60 feet west of the existing sinkhole.*

## SOIL BORINGS

**EGS** installed 22 soil borings for this investigation, labeled **VB-1** through **VB-22**. The locations of the Soil Borings are shown in the Field Test Location Map provided as **Figure 4** with detailed location data provided in **TABLE 2**. A summary of the field and laboratory testing has been included on the *Report of Soil Borings* provided in **APPENDIX A**. Detailed *Soil Boring Logs* and *Soil Classification Data* sheets have been provided in **APPENDICES B** and **C**, respectively. In addition, the Soil Boring Logs are shown on the Subsurface Profiles in **Figures 5A** through **5G**.

As can be seen in **Figures 5A** through **5G**, the Soil Borings and the Geophysical Survey are in good agreement and confirm the locations of the subsurface karst features.

## DEPTH TO A CONFINING LAYER

The depths to a definitive confining layer is shown in **Figure 6**. As can be seen in **Figure 6**, there are some deep holes in the underlying rock surface that are the direct cause of the existing sinkhole. Although there are a number of holes in the rock, it appears the largest and deepest holes are to the south of Longview Drive. Because sinkholes are normally caused by the vertical erosion of soil downward into the underlying limestone, the presence of these vertical holes in the limestone are a good indicator of the locations of current and future sinkholes. Visual observations indicate the direction of growth in the sinkhole is fairly rapid to the south.

## HORIZONTAL EXTENT OF LARGE SINKHOLE

As can be seen in **Figure 5G**, the horizontal extent of the large sinkhole that formed in **SWMF** is mostly to the south. To verify the Geophysical Survey conducted on the North side of Longview Drive, **EGS installed** Soil Boring **VB-10** on the North side of Longview Drive at the right-of-way line. As can be seen in the *Report of Soil Borings* provided in **APPENDIX A**, the subsoils on the North side of Longview Drive are fairly dense, with a layer of Plastic Sandy Clay (**CH**) near the surface. *This layer of clay is likely causing stormwater to “perch” near the ground surface after periods of heavy or prolonged rainfall. In addition, the clay layer is moderately expansive and will exhibit shrinkage and swelling with changes in moisture content.*

## CONCLUSION

Based on the subsurface investigation conducted to date for this Study, the following can be concluded:

- The sinkhole within the stormwater pond is a result of the erosion of subsoils into a vertical “chimney” in the rock located immediately east of the depression;
- There is a vertical “chimney” located immediately west of the existing sinkhole, which is allowing soil to migrate downward into the underlying rock formation and will likely result in the formation of another sinkhole in the near future; and,
- There does not appear to be any significant impact to the subsoils on the Northside of Longview Drive as a result of the sinkhole that formed in the **SWMF**.

## REMEDIAL RECOMMENDATIONS

### AREA 1 – SEAL LARGE SINKHOLE “CHIMNEY” CLOSED

Because of the large size of the sinkhole and difficulty in getting equipment close to the sinkhole, **EGS recommends** sealing the “chimney” of the sinkhole using a “high slump” self-consolidating non-excavatable flowable fill cap. The general construction sequence will consist of the following:

- Prepare the staging/work areas at the locations shown in **Figure 7**;
- Construct a temporary diversion dike from the stormwater inlet location to the overflow grate as shown in **APPENDIX A** - the side slope of the dike facing the water should be covered with an impermeable liner (*Visqueen or equivalent*) to reduce the chance for a piping failure of the dike;
- Construct a temporary sump pit in the bottom of the **SWMF** at the general location shown in **APPENDIX A** to pump stormwater into the overflow structure - to protect the work area from flooding;
- Stage a “long reach” excavator next to the sinkhole within the staging/working area shown and remove all the loose sediment within the general limits of **AREA 1** shown in **APPENDIX A**;
- Excavate **AREA 1** to a depth of 10 feet below the existing **SWMF** (approximately EL 87);
- Clean **AREA 1** of all loose soil and debris;
- Pump 2 feet of Non-Excavatable Flowable Fill (FDOT Specification 121-3) into the excavation made at **AREA 1**;
- Allowable the flowable fill to cure for 3 days prior to placing any fill on top of flowable fill;
- After 3 days, place 12-inches of Clayey Sand (**A-2-6/A-6**) on top of the flowable fill and compact using the excavator bucket to create a semi-rigid compacted mass; and,
- On top of the semi-compacted mass, place Clayey Sand (**A-2-6/A-6**) to the bottom of the **SWMF** (EL 97 feet) in lifts not to exceed 9-inches of loose soil, compacting to full using a small smooth non-vibratory roller (static weight of 5 tons or less) making at least 5 passes.

An engineering estimate of the cost seal the sinkhole throat at **AREA 1** is provided in **TABLE 3**.

### AREA 2 – SEAL SMALL “CHIMNEY” CLOSED

**EGS recommends** the “very loose” subsoils and void surrounding the active smaller “chimney” at **AREA 2** be stabilized by means of a targeted cement grout injection program to densify the subsoils and fill any subsurface voids.

**EGS** has prepared a figure depicting the recommended staging and work areas for the Contractor, provided in **Figure 7**. The “targeted” grouting program should would generally consist of the following:

- Installation of 9 grout injection pipes (points) around the perimeter of the known “chimney” at the locations shown in **APPENDIX A**;
- Inject cement grout under pressure on 2 foot intervals through the grout pipes to compact the in situ soils and fill any voids; and,
- Check the effectiveness of the grouting injection program by installing 2 verification soil borings within the grouted area to ensure the soils have been densified and the area adequately remediated.

An engineering estimate of the cost seal the grout the throat of the karst feature at **AREA 2** is provided in **TABLE 4**. The *Cement Grout Plan* is provided in **APPENDIX A** with a copy of the Technical Special Provision (**TSP**) for the grouting operation provided in **APPENDIX D**.

### **CLAY LINER IN BOTTOM OF SWMF**

Once the chimney has been sealed and the sinkhole has been filled in, **EGS recommends** lining the bottom of the **SWMF** to retard the infiltration of stormwater and thus reduce future movement of subsoil into the underlying limestone. The general construction sequence will consist of the following:

- Remove all existing vegetation from the bottom of the **SWMF** and side slopes to top of over flow grate;
- Place 2 lifts of clayey sand (**A-2-6/A-6**) over the bottom of the **SWMF** and up the side slopes to the top of the overflow grate;
- Each lift should not exceed 9-inches of loose soil and each lift should be compacted using the small smooth roller described above; and,
- Cover the compacted fill in the bottom of the **SWMF** 6-inches of uncompacted Sand (**A-3/A-2-4**) having a maximum fines content of 25%.

An engineering estimate of the cost cover the SWMF with a clay liner is provided in **TABLE 5**.



*Report of Findings of Sinkhole Investigation  
Harbinwood Estates SWMF Sinkhole  
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## **CLOSURE**

The data and results presented in this Geotechnical Investigation are intended for the use of Leon County Public Works for the remediation of the Harbinwood Estates Stormwater Management Facility Sinkhole, described herein. This Report is not intended for any other use and will likely not be applicable. The data may not be used without the expressed written consent of Leon County Public Works. This Report shall not be reproduced, except in full, without the written approval of Environmental and Geotechnical Specialists, Inc. The data and results presented in this Report are based on the tests performed at the specific locations and depths noted. Subsurface conditions at other locations may vary significantly from those presented herein. Should data become available which is different from the data presented herein, Environmental and Geotechnical Specialists, Inc. requests the opportunity to review the data and make any modifications to the design recommendations which may be appropriate.

## **SIGNATURE**

Environmental and Geotechnical Specialists, Inc. appreciates the opportunity to be of service on this project. If you have any questions concerning the information contained in this Report or **EGS** can be of further service please call Katie Ball at (904) 580-8533 or me at (850) 536-8350.

Sincerely,

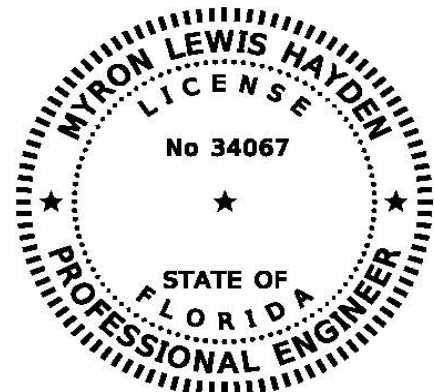
**Environmental and Geotechnical Specialists, Inc.**  
*Florida Certificate of Engineering Authorization 6222*

*Myron L. Hayden*

Myron L. Hayden, Ph.D., P.E.  
Chief Geotechnical Engineer  
FL P.E. No. 34067

This Report has been digitally signed and sealed by Myron Hayden on the date adjacent to the seal.

Printed copies of this document are not considered signed and sealed and the signature must be verified on all electronic copies.



# *TABLES*

**TABLE 1**  
**ERI TEST LOCATION DATA**  
**HARBINWOOD ESTATES SWMF SINKHOLE**  
**LONGVIEW DRIVE**  
**LEON COUNTY, FLORIDA**

| ERI TRANSECT<br>LINE LOCATION <sup>1</sup> |       | STATE PLANE<br>COORDINATES |                   | GEOGRAPHIC POSITIONING SATELLITE<br>COORDINATES SYSTEM (GPS) <sup>2</sup> |         |           |         |
|--|-------|----------------------------|-------------------|---|---------|-----------|---------|
|  |       | NORTHING<br>(FEET)         | EASTING<br>(FEET) | LATITUDE  |         | LONGITUDE |         |
|  |       |                            |                   | DEG (°)   | MIN (') | DEG (°)   | MIN (') |
| HW-1                                       | BEGIN | 551172                     | 2021101           | 30  | 30.927  | 84        | 19.978  |
|  | END   | 551314                     | 2021334           | 30  | 30.950  | 84        | 19.934  |
| HW-2                                       | BEGIN | 551150                     | 2021114           | 30  | 30.923  | 84        | 19.976  |
|  | END   | 551293                     | 2021347           | 30  | 30.947  | 84        | 19.931  |
| HW-3                                       | BEGIN | 551132                     | 2021124           | 30  | 30.920  | 84        | 19.974  |
|  | END   | 551274                     | 2021353           | 30  | 30.944  | 84        | 19.930  |
| HW-4                                       | BEGIN | 551096                     | 2021147           | 30  | 30.914  | 84        | 19.970  |
|  | END   | 551252                     | 2021355           | 30  | 30.940  | 84        | 19.930  |
| HW-5                                       | BEGIN | 551060                     | 2021159           | 30  | 30.908  | 84        | 19.967  |
|  | END   | 551216                     | 2021380           | 30  | 30.934  | 84        | 19.925  |
| HW-6                                       | BEGIN | 551022                     | 2021177           | 30  | 30.902  | 84        | 19.964  |
|  | END   | 551172                     | 2021412           | 30  | 30.927  | 84        | 19.919  |
| HW-7                                       | BEGIN | 551215                     | 2021081           | 30  | 30.934  | 84        | 19.982  |
|  | END   | 551359                     | 2021316           | 30  | 30.958  | 84        | 19.937  |
| HW-8                                       | BEGIN | 551215                     | 2021136           | 30  | 30.934  | 84        | 19.972  |
|  | END   | 550985                     | 2021277           | 30  | 30.896  | 84        | 19.945  |
| HW-9                                       | BEGIN | 551236                     | 2021170           | 30  | 30.937  | 84        | 19.965  |
|  | END   | 551006                     | 2021311           | 30  | 30.899  | 84        | 19.938  |
| HW-10                                      | BEGIN | 551280                     | 2021240           | 30  | 30.945  | 84        | 19.952  |
|  | END   | 551050                     | 2021381           | 30  | 30.907  | 84        | 19.925  |
| HW-11                                      | BEGIN | 551293                     | 2021262           | 30  | 30.947  | 84        | 19.948  |
|  | END   | 551062                     | 2021403           | 30  | 30.909  | 84        | 19.921  |
| HW-12                                      | BEGIN | 551242                     | 2021068           | 30  | 30.938  | 84        | 19.985  |
|  | END   | 551386                     | 2021302           | 30  | 30.962  | 84        | 19.940  |
| HW-13                                      | BEGIN | 551229                     | 2021075           | 30  | 30.936  | 84        | 19.983  |
|  | END   | 551373                     | 2021310           | 30  | 30.960  | 84        | 19.938  |

**NOTES:**

1. ERI MEANS ELECTRICAL RESISTIVITY IMAGING.
2. COORDINATES RECORDED USING A TRIMBLE GEO7X HANDHELD UNIT.

**TABLE 2**  
**SOIL BORING LOCATION AND GROUNDWATER DATA**  
**HARBINWOOD ESTATES SWMF SINKHOLE**  
**LONGVIEW DRIVE**  
**LEON COUNTY, FLORIDA**

| BORING LABEL | BORING DEPTH <sup>1</sup><br><br>(FEET) | DATE INSTALLED | APPROXIMATE GROUND SURFACE ELEVATION <sup>2</sup><br><br>(FEET) | STATE PLANE COORDINATES <sup>3</sup> |                       | GEOGRAPHIC POSITIONING COORDINATES SYSTEM (GPS) |         |           |         | MEASURED GROUNDWATER |                         |
|--------------|---|----------------|---|--------------------------------------|-----------------------|---|---------|-----------|---------|----------------------|-------------------------|
|              |   |                |   | NORTHING<br><br>(FEET)               | EASTING<br><br>(FEET) | LATITUDE  |         | LONGITUDE |         | DEPTH<br><br>(FEET)  | ELEVATION<br><br>(FEET) |
|              |   |                |   |                                      |                       | DEG (°)   | MIN (') | DEG (°)   | MIN (') |                      |                         |
| VB-1         | 50.0                                    | 1/7/19         | 112   | 551239                               | 2021221               | 30  | 30.938  | 84        | 19.955  | > 6.0                | < 106.0                 |
| VB-2         | 50.0                                    | 1/9/19         | 112   | 551252                               | 2021257               | 30  | 30.940  | 84        | 19.948  | 10.0                 | 102.0                   |
| VB-3         | 50.0                                    | 1/11/19        | 112   | 551250                               | 2021240               | 30  | 30.940  | 84        | 19.952  | > 7.5                | < 104.5                 |
| VB-4         | 61.2                                    | 1/10/19        | 111   | 551261                               | 2021210               | 30  | 30.942  | 84        | 19.957  | 4.7                  | 106.3                   |
| VB-5         | 50.0                                    | 1/21/19        | 112   | 551275                               | 2021317               | 30  | 30.944  | 84        | 19.937  | 13.0                 | 99.0                    |
| VB-6         | 70.0                                    | 2/11/19        | 112   | 551238                               | 2021169               | 30  | 30.938  | 84        | 19.965  | 5.0                  | 107.0                   |
| VB-7         | 58.2                                    | 2/12/19        | 110   | 551281                               | 2021240               | 30  | 30.945  | 84        | 19.952  | 5.0                  | 105.0                   |
| VB-8         | 68.6                                    | 2/15/19        | 107   | 551181                               | 2021204               | 30  | 30.928  | 84        | 19.959  | > 3.0                | < 104.0                 |
| VB-9         | 55.1                                    | 2/20/19        | 112   | 551192                               | 2021162               | 30  | 30.930  | 84        | 19.967  | > 6.5                | < 105.5                 |
| VB-10        | 51.5                                    | 4/4/19         | 110   | 551293                               | 2021207               | 30  | 30.947  | 84        | 19.958  | > 6.5                | < 103.5                 |
| VB-11        | 38.0                                    | 5/15/19        | 104   | 551171                               | 2021230               | 30  | 30.927  | 84        | 19.953  | > 3.0                | < 101.0                 |
| VB-12        | 38.4                                    | 5/14/19        | 104   | 551146                               | 2021235               | 30  | 30.923  | 84        | 19.952  | > 3.0                | < 101.0                 |
| VB-13        | 40.0                                    | 5/14/19        | 104   | 551120                               | 2021256               | 30  | 30.918  | 84        | 19.948  | 2.5                  | 101.50                  |
| VB-14        | 24.0                                    | 5/16/19        | 104   | 551106                               | 2021300               | 30  | 30.916  | 84        | 19.939  | > 3.0                | < 101.0                 |
| VB-15        | 17.9                                    | 5/13/19        | 104   | 551062                               | 2021202               | 30  | 30.909  | 84        | 19.958  | 0.5                  | 103.50                  |
| VB-16        | 40.0                                    | 5/22/19        | 104   | 551107                               | 2021338               | 30  | 30.916  | 84        | 19.932  | > 3.0                | < 101.0                 |
| VB-17        | 60.1                                    | 5/16/19        | 104   | 551146                               | 2021312               | 30  | 30.923  | 84        | 19.937  | > 3.0                | < 101.0                 |
| VB-18        | 33.1                                    | 5/21/19        | 104   | 551167                               | 2021325               | 30  | 30.926  | 84        | 19.935  | > 3.0                | < 101.0                 |
| VB-19        | 26.5                                    | 5/17/19        | 104   | 551185                               | 2021300               | 30  | 30.929  | 84        | 19.940  | > 3.0                | < 101.0                 |
| VB-20        | 49.0                                    | 5/20/19        | 104   | 551199                               | 2021292               | 30  | 30.931  | 84        | 19.941  | > 3.0                | < 101.0                 |
| VB-21        | 40.0                                    | 5/20/19        | 104   | 551196                               | 2021316               | 30  | 30.931  | 84        | 19.936  | > 3.0                | < 101.0                 |
| VB-22        | 41.5                                    | 5/23/19        | 104   | 551102                               | 2021228               | 30  | 30.916  | 84        | 19.953  | > 3.0                | < 101.0                 |

**NOTES:** 1. DEPTHS MEASURED BELOW EXISTING GROUND SURFACE.  
2. APPROXIMATE EXISTING GROUND SURFACE DETERMINED FROM USGS TOPOGRAPHIC CONTOURS.  
3. APPROXIMATE LOCATIONS BASED ON COORDINATES RECORDED USING A TRIMBLE GEO7X HANDHELD UNIT.

**TABLE 3  
ENGINEERING COST ESTIMATE  
SEALING SINKHOLE "CHIMNEY" IN AREA 1  
HARBINWOOD ESTATES SWMF  
LONGVIEW DRIVE  
LEON COUNTY, FLORIDA**

| <b>PAY ITEM DESCRIPTION</b>                      | <b>UNITS</b>    | <b>NUMBER OF UNITS</b> | <b>COST PER UNIT (\$)</b> | <b>ESTIMATED COST (\$)</b> |
|--|-----------------|------------------------|---------------------------|----------------------------|
| <b>MOBILIZATION / DEMOBILIZATION</b>             | LS              | 1                      | \$25,000                  | <b>\$25,000</b>            |
| <b>TEMPORARY DIKE CONSTRUCTION</b>               | CY              | 90                     | \$10                      | <b>\$900</b>               |
| <b>SOIL TRACKING PREVENTION AREA</b>             | LS              | 1                      | \$2,500                   | <b>\$2,500</b>             |
| <b>NON-EXCAVATABLE FLOWABLE FILL<sup>1</sup></b> | YD <sup>3</sup> | 100                    | \$200                     | <b>\$20,000</b>            |
| <b>CLAYEY FINE SAND BACKFILL<sup>2</sup></b>     | CY              | 3,600                  | \$25                      | <b>\$90,000</b>            |
| <b>CONSTRUCTION MONITORING</b>                   | LS              | 1                      | \$20,000                  | <b>\$20,000</b>            |
| SUBTOTAL   |                 |                        |                           | \$158,400                  |
| CONTINGENCY (20%)                                |                 |                        |                           | \$31,680                   |
| <b>CONSTRUCTION ESTIMATE</b>                     |                 |                        |                           | <b>\$190,080</b>           |

**NOTES:** 1. BASED ON FILLING "CHIMNEY" WITH FLOWABLE FILL.

2. BASED ON A FILLING SINKHOLE AND DEPRESSIONS WITH CLAYEY FINE SAND EMBANKMENT FILL.

**TABLE 4**  
**ENGINEERING COST ESTIMATE**  
**GROUT CHIMNEY CLOSED IN AREA 2**  
**HARBINWOOD ESTATES SWMF SINKHOLE**  
**LONGVIEW DRIVE**  
**LEON COUNTY, FLORIDA**

| <b>PAY ITEM DESCRIPTION</b>                     | <b>UNITS</b>    | <b>NUMBER OF UNITS</b> | <b>COST PER UNIT (\$)</b> | <b>ESTIMATED COST (\$)</b> |
|---|-----------------|------------------------|---------------------------|----------------------------|
| <b>MOBILIZATION / DEMOBILIZATION</b>            | LS              | 1                      | \$10,000                  | <b>\$10,000</b>            |
| <b>NUMBER OF GROUT POINTS</b>                   |                 | 9                      |                           |                            |
| <b>INSTALLATION OF GROUT POINTS<sup>1</sup></b> | FT              | 540                    | \$20                      | <b>\$10,800</b>            |
| <b>CEMENT GROUT INJECTION<sup>2,3</sup></b>     | YD <sup>3</sup> | 95                     | \$200                     | <b>\$19,000</b>            |
| <b>PER DIEM</b>                                 | DAYS            | 3                      | \$250                     | <b>\$750</b>               |
| <b>CONSTRUCTION MONITORING</b>                  | LS              | 1                      | \$5,000                   | <b>\$5,000</b>             |
| <b>SUBTOTAL</b>                                 |                 |                        |                           | <b>\$45,550</b>            |
| <b>CONTINGENCY (20%)</b>                        |                 |                        |                           | <b>\$9,110</b>             |
| <b>TOTAL CONSTRUCTION ESTIMATE</b>              |                 |                        |                           | <b>\$54,660</b>            |

**NOTES:** 1. BASED ON A 5-FEET SPACING OF GROUT POINTS.  
2. BASED ON INJECTIING GROUT FROM A DEPTH OF 4 TO 60 FEET.  
3. BASED ON SOIL COMPACTION OF 20%.

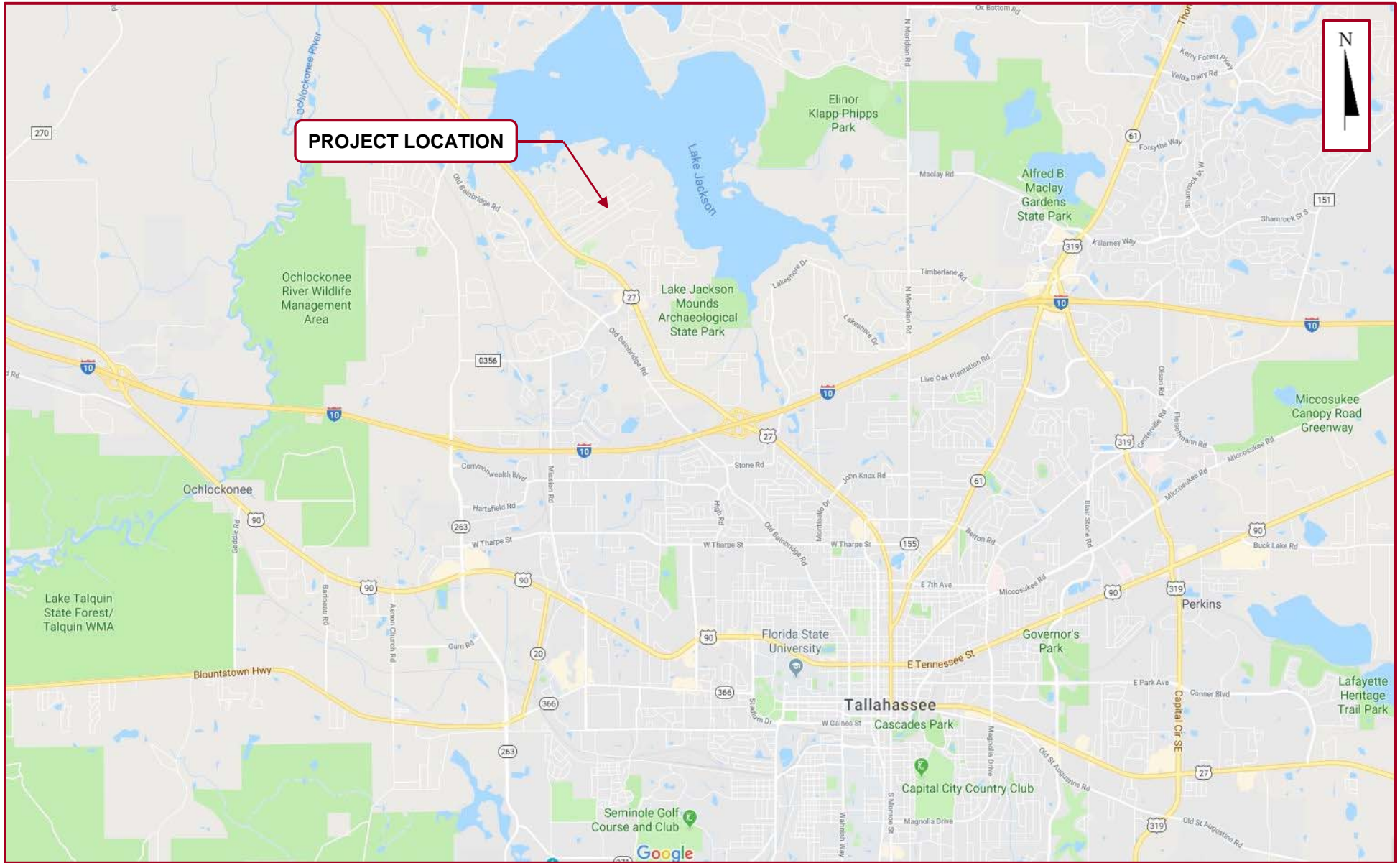
**TABLE 5  
ENGINEERING COST ESTIMATE  
ADDING A CLAY LINER  
HARBINWOOD ESTATES SWMF  
LONGVIEW DRIVE  
LEON COUNTY, FLORIDA**

| <b>PAY ITEM DESCRIPTION</b>        | <b>UNITS</b> | <b>NUMBER OF UNITS</b> | <b>COST PER UNIT (\$)</b> | <b>ESTIMATED COST (\$)</b> |
|------------------------------------|--------------|------------------------|---------------------------|----------------------------|
| <b>CLAY LINER<sup>3</sup></b>      | CY           | 3,590                  | \$25                      | <b>\$89,750</b>            |
| <b>SAND COVER<sup>3</sup></b>      | CY           | 1,795                  | \$20                      | <b>\$35,900</b>            |
| <b>REPAIR LANDSCAPING</b>          | LS           | 1                      | \$15,000                  | <b>\$15,000</b>            |
| <b>CONSTRUCTION MONITORING</b>     | LS           | 1                      | \$15,000                  | <b>\$15,000</b>            |
| SUBTOTAL                           |              |                        |                           | \$155,650                  |
| CONTINGENCY (20%)                  |              |                        |                           | \$31,130                   |
| <b>TOTAL CONSTRUCTION ESTIMATE</b> |              |                        |                           | <b>\$186,780</b>           |

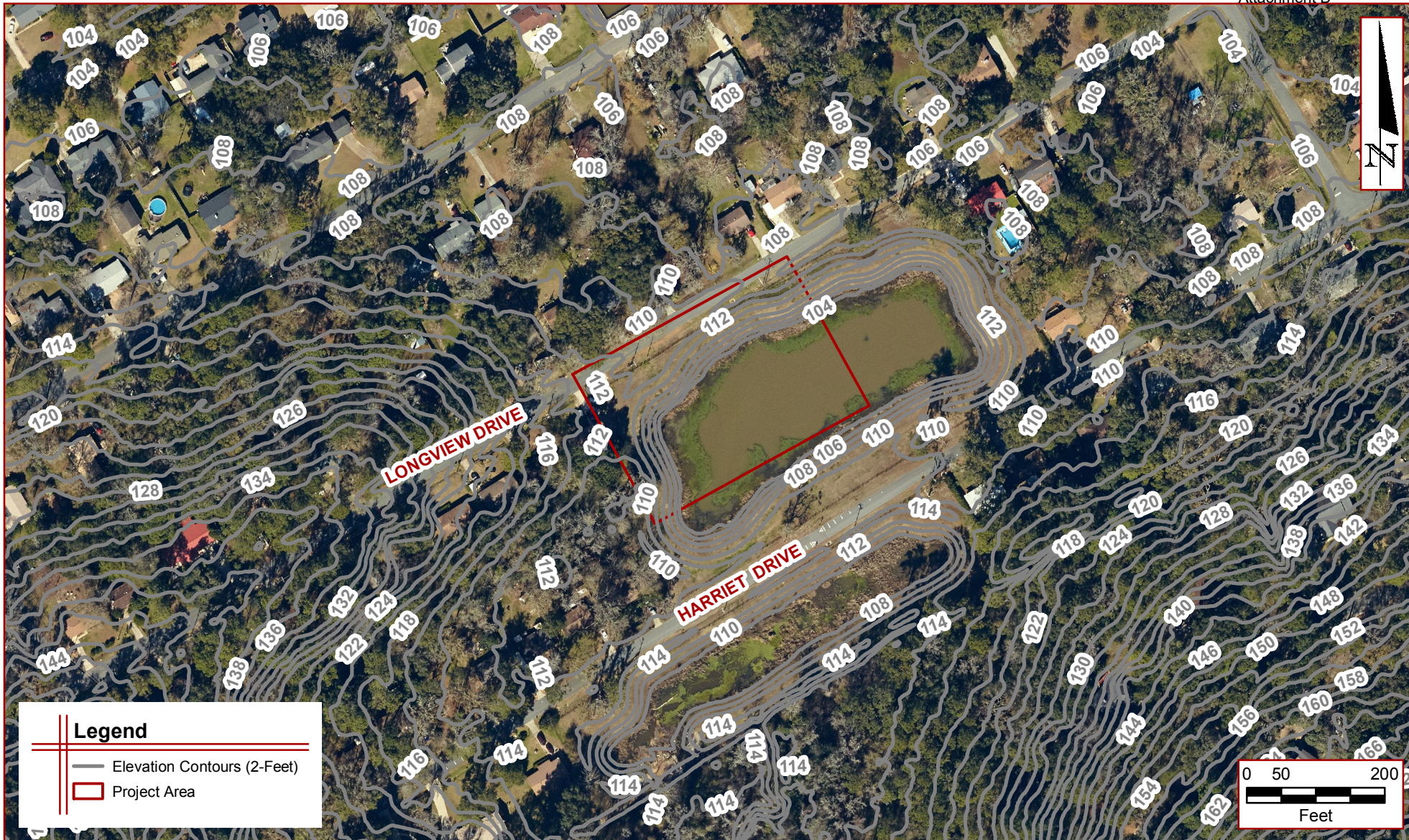
**NOTE:** 1. BASED ON COVERING BOTTOM OF SWMF WITH CLAYEY SAND AND SAND

# FIGURES





|  |                                  |   |  |                         |
|--|----------------------------------|---|--|-------------------------|
| DRAWN:<br><b>I. CAPORINI</b>               | CHECKED:<br><b>K. BALL, E.I.</b> | <b>ENVIRONMENTAL AND GEOTECHNICAL<br/>SPECIALISTS, INC.</b><br><br>104 NORTH MAGNOLIA DRIVE<br>TALLAHASSEE, FLORIDA 32301<br>OFFICE: (850) 386-1253 | TITLE:<br><b>PROJECT LOCATION MAP<br/>HARBINWOOD ESTATES SWMF SINKHOLE<br/>LONGVIEW DRIVE<br/>LEON COUNTY, FLORIDA</b> |                         |
| ENGINEER:<br><b>M. HAYDEN, P.E.</b>        |                                  |   | DATE:<br><b>JUNE 2019</b>  | FIGURE NO.:<br><b>1</b> |
| CLIENT:<br><b>LEON COUNTY PUBLIC WORKS</b> |                                  |   |  |                         |
| PROJ. NO.:<br><b>03-47-18-04</b>           | SCALE:                           |   |  |                         |



|                                     |                           |  |  |                  |
|-------------------------------------|---------------------------|--|--|------------------|
| DRAWN:<br>I. CAPORINI               | CHECKED:<br>K. BALL, E.I. | ENVIRONMENTAL AND GEOTECHNICAL<br>SPECIALISTIS, INC.<br><br>104 NORTH MAGNOLIA DRIVE<br>TALLAHASSEE, FLORIDA 32301<br>OFFICE: (850) 386-1253 | TITLE:<br><br>USGS TOPOGRAPHIC MAP<br>HARBINWOOD ESTATES SWMF SINKHOLE<br>LONGVIEW DRIVE<br>LEON COUNTY, FLORIDA |                  |
| ENGINEER:<br>M. HAYDEN, P.E.        |                           |  | DATE:<br>JUNE 2019   | FIGURE NO.:<br>2 |
| CLIENT:<br>LEON COUNTY PUBLIC WORKS |                           |  |  |                  |
| PROJ. NO.:<br>03-47-18-04           | SCALE:                    |  |  |                  |



**FIGURE 3A:** PHOTOGRAPH OF EXISTING SITE CONDITIONS NEAR SOIL BORING VB-14 (FACING NORTH)



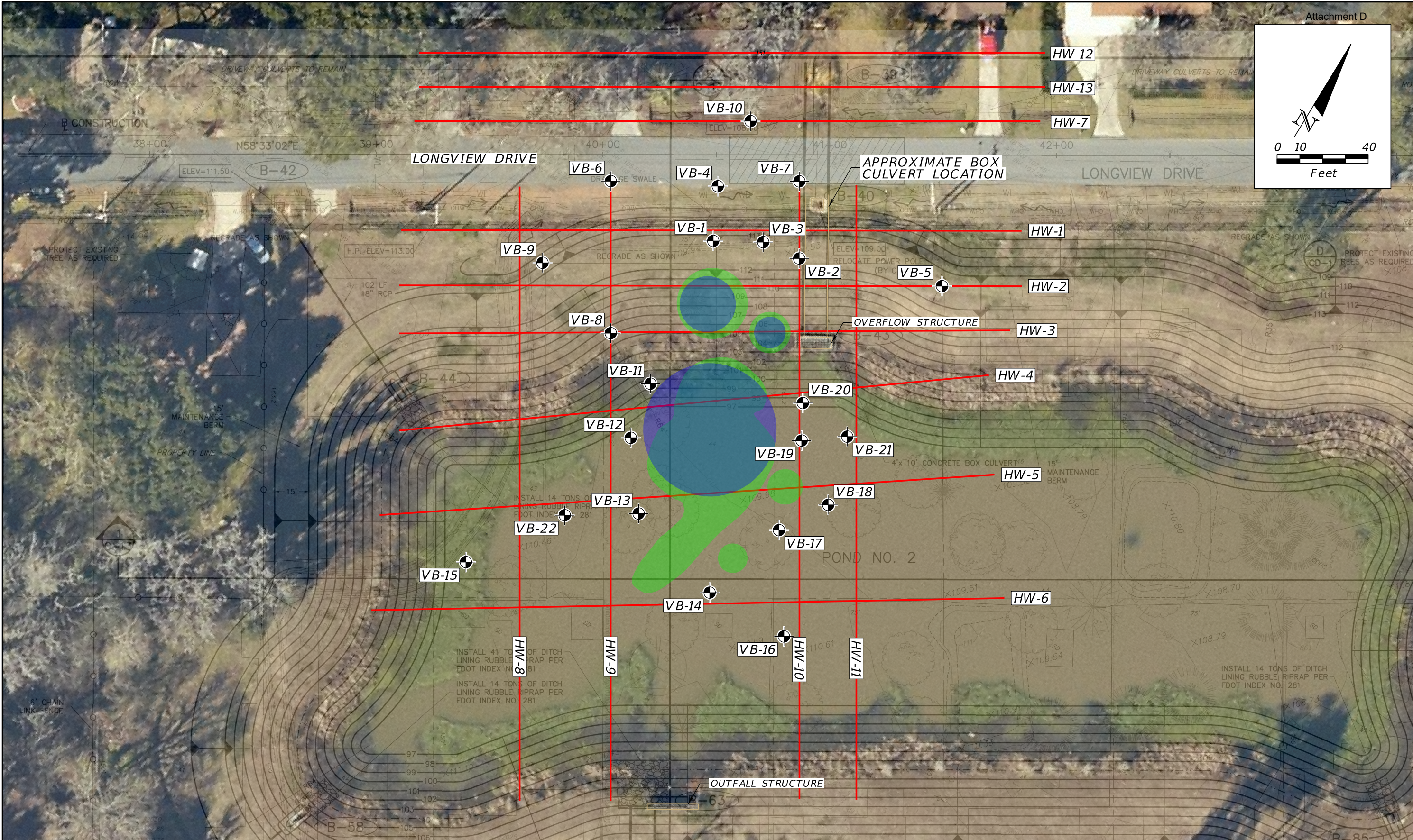
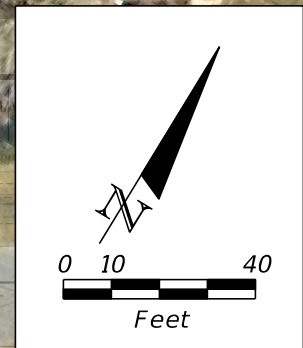
**FIGURE 3B:** PHOTOGRAPH OF EXISTING SITE CONDITIONS NEAR SOIL BORING VB-11 (FACING EAST)



**FIGURE 3C: PHOTOGRAPH OF EXISTING SITE CONDITIONS NEAR SOIL BORING VB-1 (FACING EAST)**



**FIGURE 3D: PHOTOGRAPH OF EXISTING SITE CONDITIONS NEAR SOIL BORING VB-17 (FACING WEST)**



**LEGEND**

-  SOIL BORING LOCATION
-  ERI TRANSECT LINE LOCATION
-  APPROXIMATE ORIGINAL SINKHOLE LOCATION
-  APPROXIMATE LIMITS OF SOIL EROSION

PREPARED: K. BALL, E.I.  
 CHECKED: D. DEMEZA, E.I.  
 REVISED: K. BALL, E.I.  
 ENGINEER: M. HAYDEN, P.E.

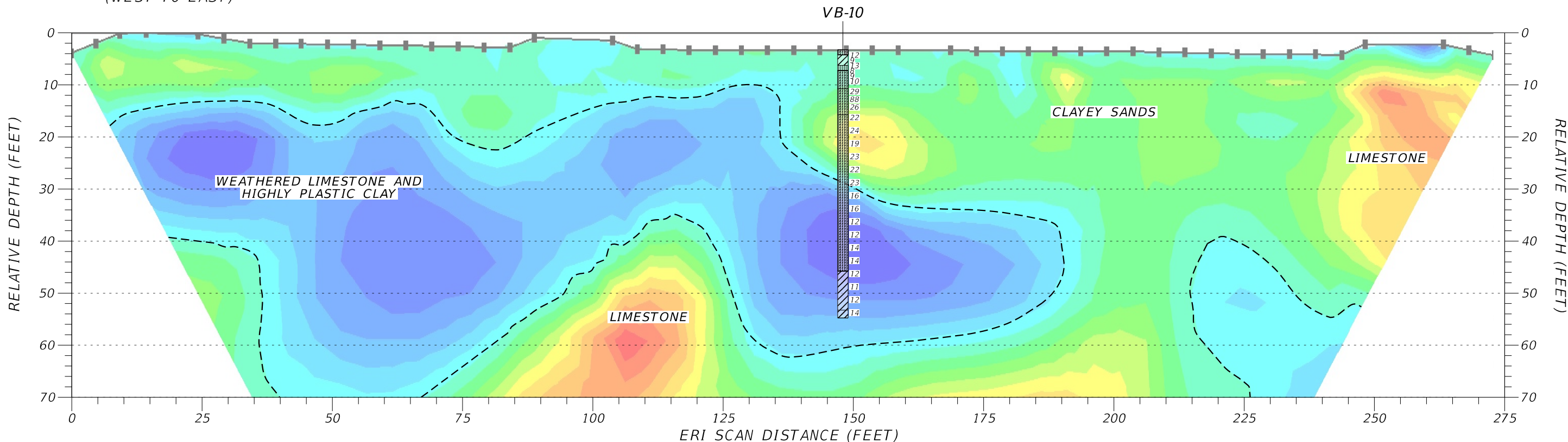
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 SPECIALISTS, INC.  
 104 NORTH MAGNOLIA DRIVE  
 TALLAHASSEE, FLORIDA 32301  
 OFFICE: (850) 386-1253

**FIELD TEST LOCATION MAP**  
 HARBINWOOD ESTATES SWMF SINKHOLE  
 LONGVIEW DRIVE  
 LEON COUNTY, FLORIDA

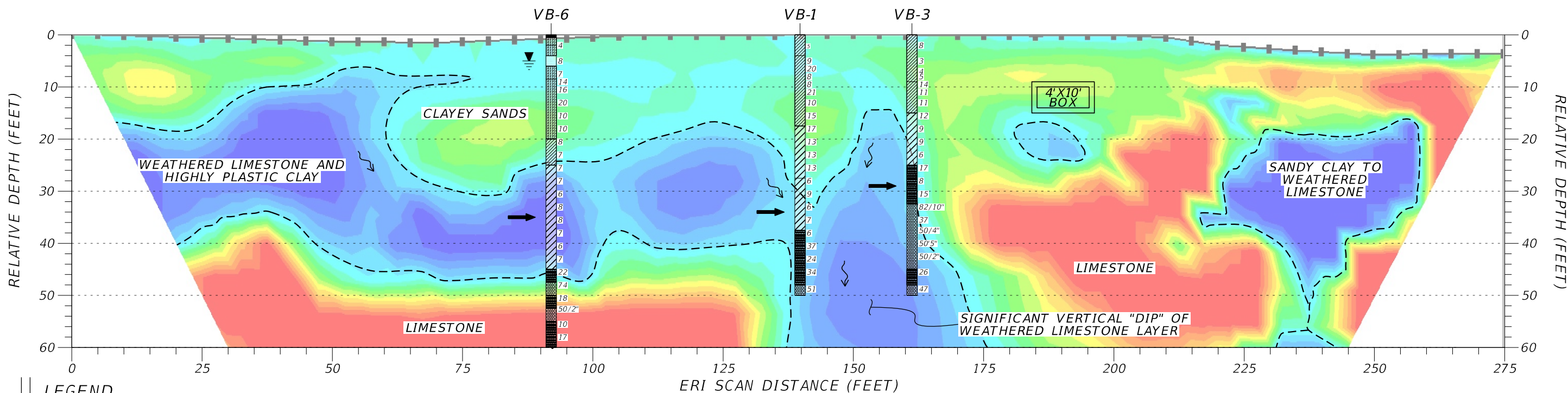
|                        |                 |
|------------------------|-----------------|
| SCALE: AS SHOWN        | DATE: JUNE 2019 |
| PROJ. NO.: 03-47-18-04 | FIGURE NO.: 4   |

DIRECTION OF SCANS  
(WEST TO EAST)

**SUBSURFACE PROFILE  
TRANSECT LINE HW-7**



**SUBSURFACE PROFILE  
TRANSECT LINE HW-1**



**LEGEND**

- LIKELY DIRECTION OF SOIL MIGRATION
  - MEASURED GROUNDWATER LEVEL
  - FLUID LOSS
  - SOIL BORING TRUNCATED. SEE APPENDIX C FOR DETAILED SOIL PROPERTIES
- 7.2    24.4    83    285    971  
 RESISTIVITY (Ohm-m)

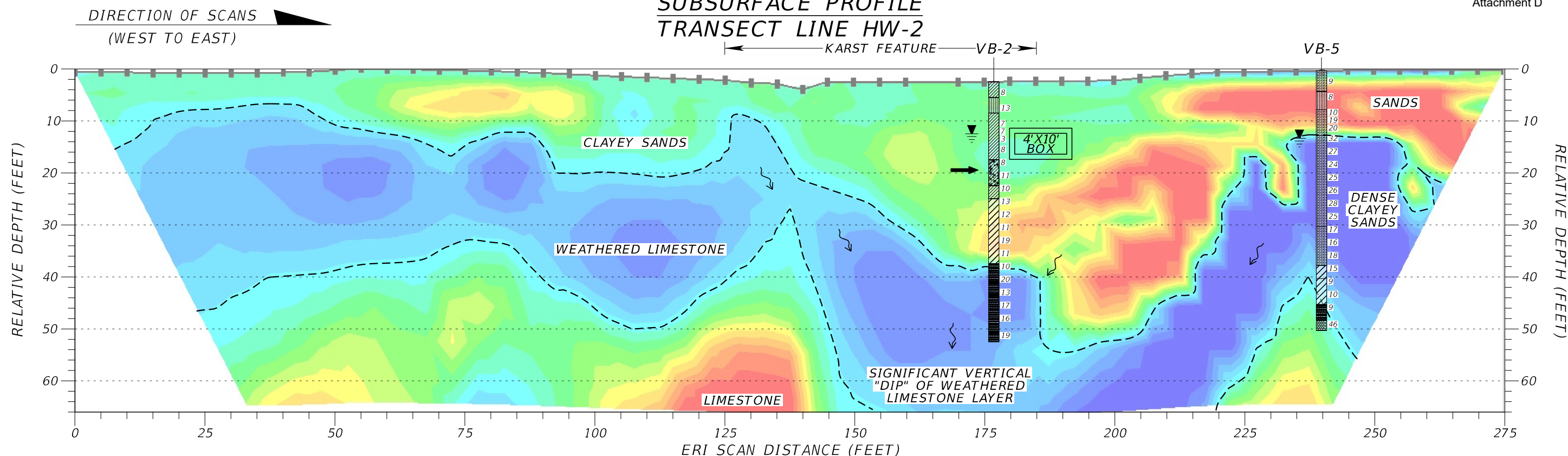
PREPARED: K. BALL, E.I.  
 CHECKED: M. HAYDEN, P.E.  
 REVISED: K. BALL, E.I.  
 ENGINEER: M. HAYDEN, P.E.

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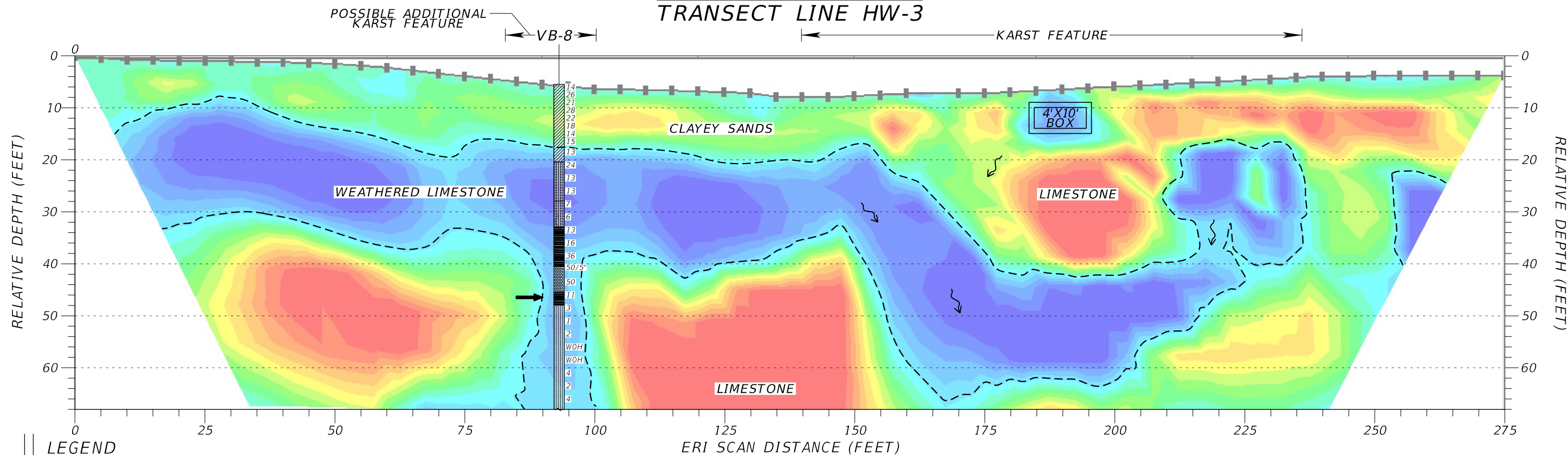
SUBSURFACE PROFILE  
 HARBINWOOD ESTATES SWMF SINKHOLE  
 LONGVIEW DRIVE  
 LEON COUNTY, FLORIDA

SCALE: AS SHOWN    DATE: JUNE 2019  
 PROJ. NO.: 03-47-18-04    FIGURE NO.: 5A

### SUBSURFACE PROFILE TRANSECT LINE HW-2



### SUBSURFACE PROFILE TRANSECT LINE HW-3



**LEGEND**

- LIKELY DIRECTION OF SOIL MIGRATION
  - MEASURED GROUNDWATER LEVEL
  - FLUID LOSS
  - SOIL BORING TRUNCATED. SEE APPENDIX C FOR DETAILED SOIL PROPERTIES
- 7.2    24.4    83    285    971
   
 RESISTIVITY (Ohm-m)

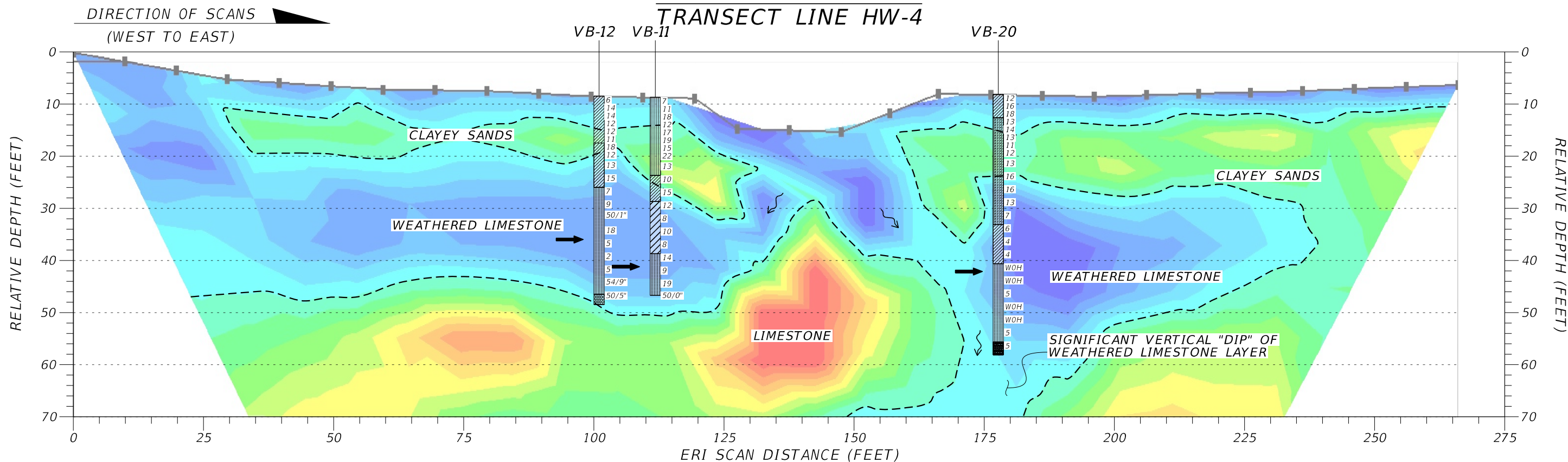
PREPARED: K. BALL, E.I.  
 CHECKED: M. HAYDEN, P.E.  
 REVISED: K. BALL, E.I.  
 ENGINEER: M. HAYDEN, P.E.

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 TALLAHASSEE, FLORIDA 32301  
 OFFICE: (850) 386-1253

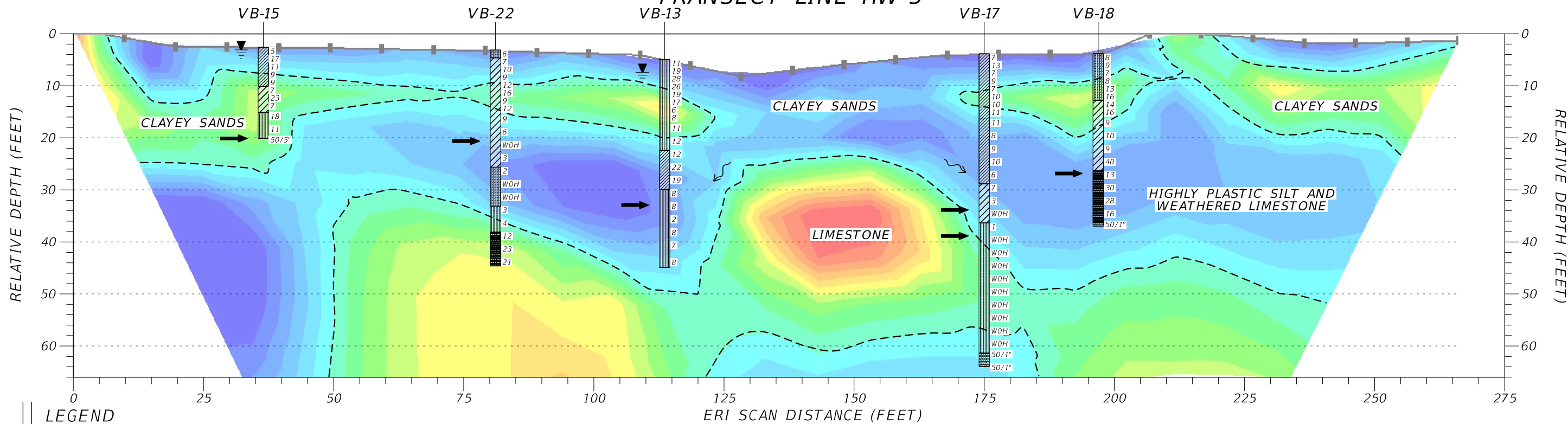
SUBSURFACE PROFILE  
 HARBINWOOD ESTATES SWMF SINKHOLE  
 LONGVIEW DRIVE  
 LEON COUNTY, FLORIDA

SCALE: AS SHOWN    DATE: JUNE 2019  
 PROJ. NO.: 03-47-18-04    FIGURE NO.: 5B

### SUBSURFACE PROFILE TRANSECT LINE HW-4



### SUBSURFACE PROFILE TRANSECT LINE HW-5



LEGEND

- LIKELY DIRECTION OF SOIL MIGRATION
- MEASURED GROUNDWATER LEVEL
- FLUID LOSS
- SOIL BORING TRUNCATED. SEE APPENDIX C FOR DETAILED SOIL PROPERTIES

PREPARED: K. BALL, E.I.  
 CHECKED: M. HAYDEN, P.E.  
 REVISED: K. BALL, E.I.  
 ENGINEER: M. HAYDEN, P.E.

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 SPECIALISTS, INC.  
 104 NORTH MAGNOLIA DRIVE  
 TALLAHASSEE, FLORIDA 32301  
 OFFICE: (850) 386-1253

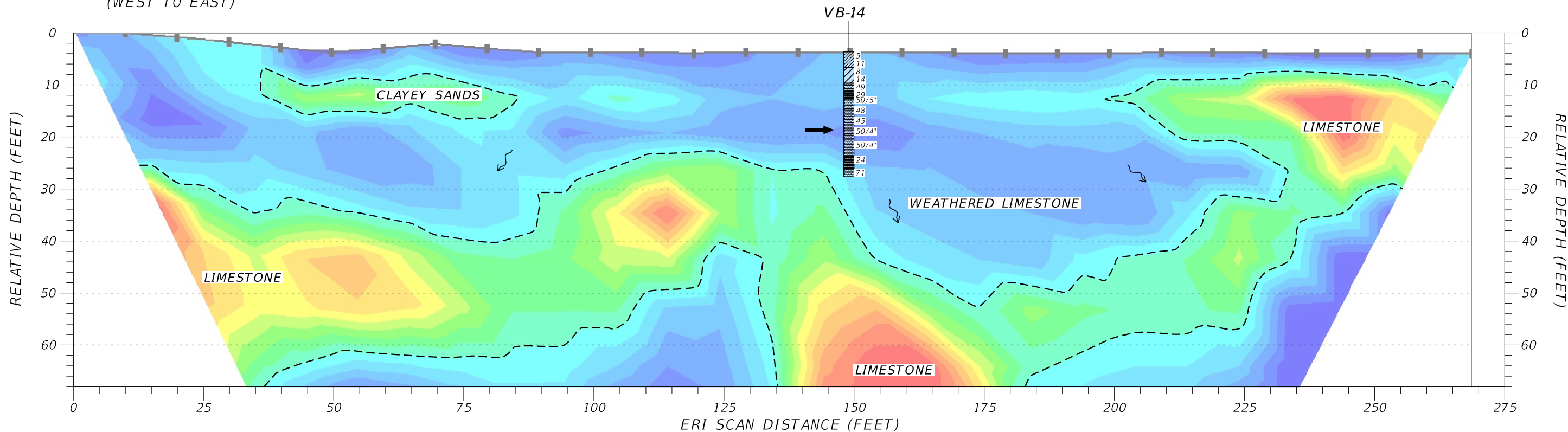
SUBSURFACE PROFILE  
 HARBINWOOD ESTATES SWMF SINKHOLE  
 LONGVIEW DRIVE  
 LEON COUNTY, FLORIDA

SCALE: AS SHOWN DATE: JUNE 2019  
 PROJ. NO.: 03-47-18-04 FIGURE NO.: 5C



# SUBSURFACE PROFILE TRANSECT LINE HW-6

DIRECTION OF SCANS  
(WEST TO EAST)



## LEGEND

- LIKELY DIRECTION OF SOIL MIGRATION
  - MEASURED GROUNDWATER LEVEL
  - FLUID LOSS
  - SOIL BORING TRUNCATED. SEE APPENDIX C FOR DETAILED SOIL PROPERTIES
- 7.2    24.4    83    285    971  
 RESISTIVITY (Ohm-m)

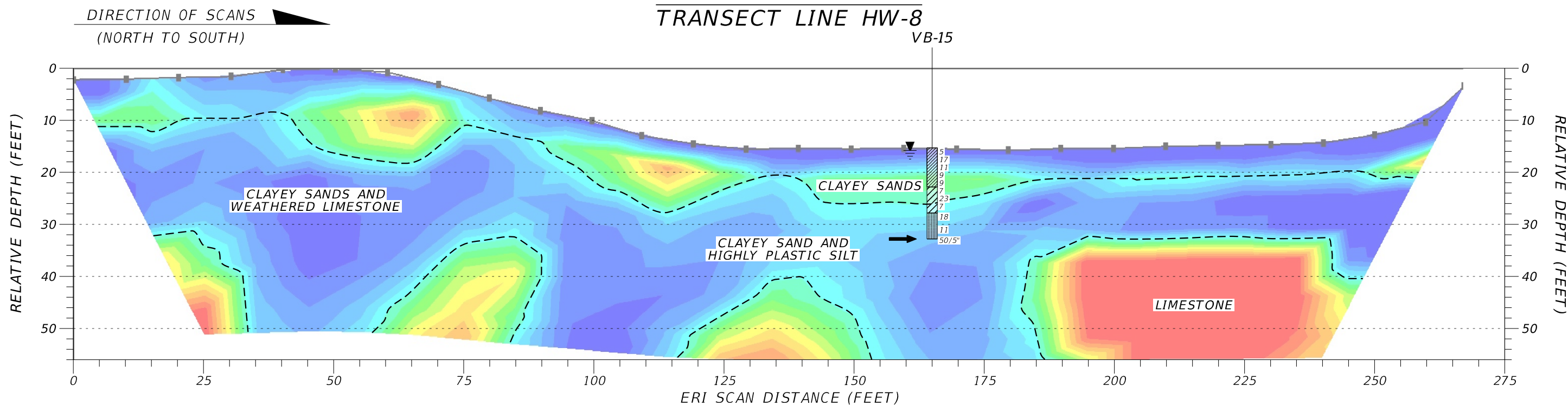
PREPARED: K. BALL, E.I.  
 CHECKED: M. HAYDEN, P.E.  
 REVISED: K. BALL, E.I.  
 ENGINEER: M. HAYDEN, P.E.

ENVIRONMENTAL AND GEOTECHNICAL  
 SPECIALISTS, INC.  
 104 NORTH MAGNOLIA DRIVE  
 TALLAHASSEE, FLORIDA 32301  
 OFFICE: (850) 386-1253

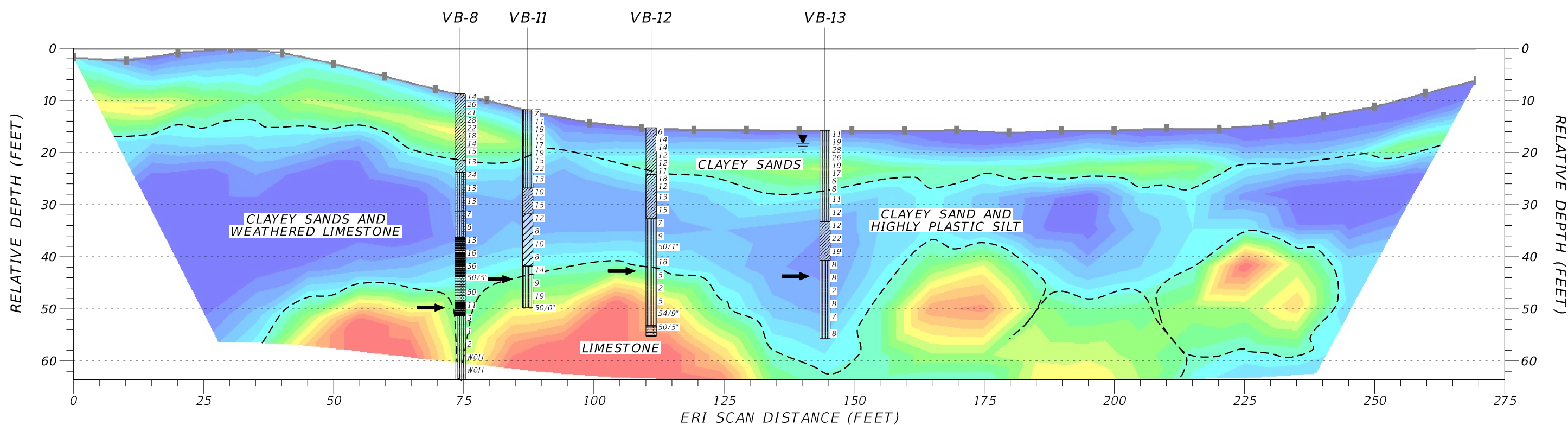
SUBSURFACE PROFILE  
 HARBINWOOD ESTATES SWMF SINKHOLE  
 LONGVIEW DRIVE  
 LEON COUNTY, FLORIDA

SCALE: AS SHOWN    DATE: JUNE 2019  
 PROJ. NO.: 03-47-18-04    FIGURE NO.: 5D

### SUBSURFACE PROFILE TRANSECT LINE HW-8



### SUBSURFACE PROFILE TRANSECT LINE HW-9



**LEGEND**

- LIKELY DIRECTION OF SOIL MIGRATION
  - MEASURED GROUNDWATER LEVEL
  - FLUID LOSS
  - SOIL BORING TRUNCATED. SEE APPENDIX C FOR DETAILED SOIL PROPERTIES
- RESISTIVITY (Ohm-m) color scale: 7.2, 24.4, 83, 285, 971

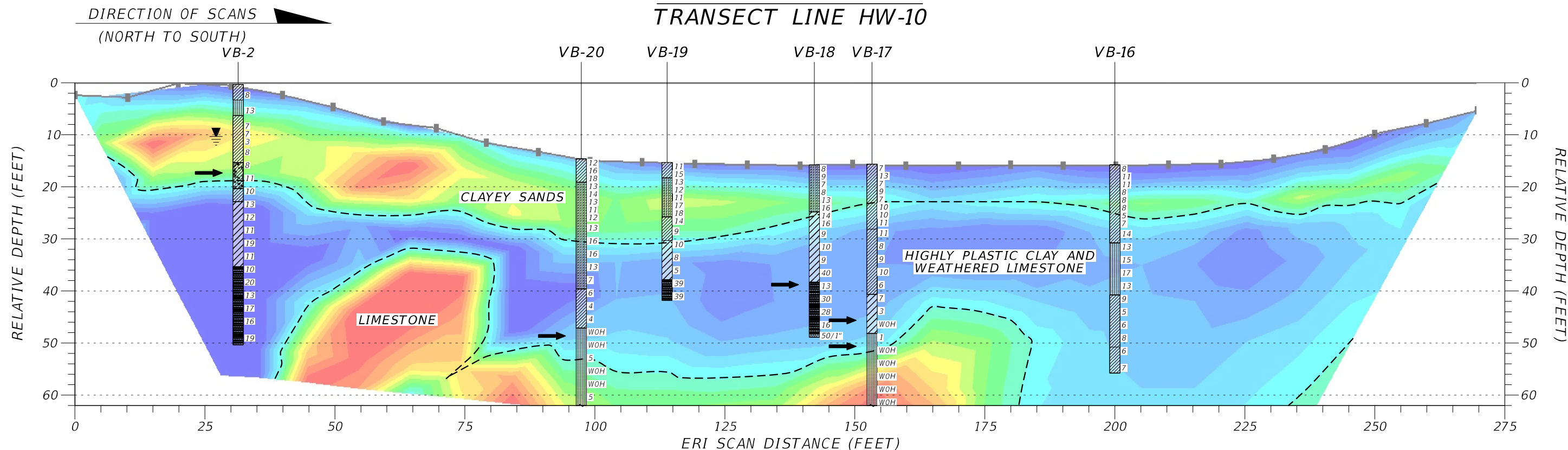
PREPARED: K. BALL, E.I.  
 CHECKED: M. HAYDEN, P.E.  
 REVISED: K. BALL, E.I.  
 ENGINEER: M. HAYDEN, P.E.

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 SPECIALISTS, INC.  
 104 NORTH MAGNOLIA DRIVE  
 TALLAHASSEE, FLORIDA 32301  
 OFFICE: (850) 386-1253

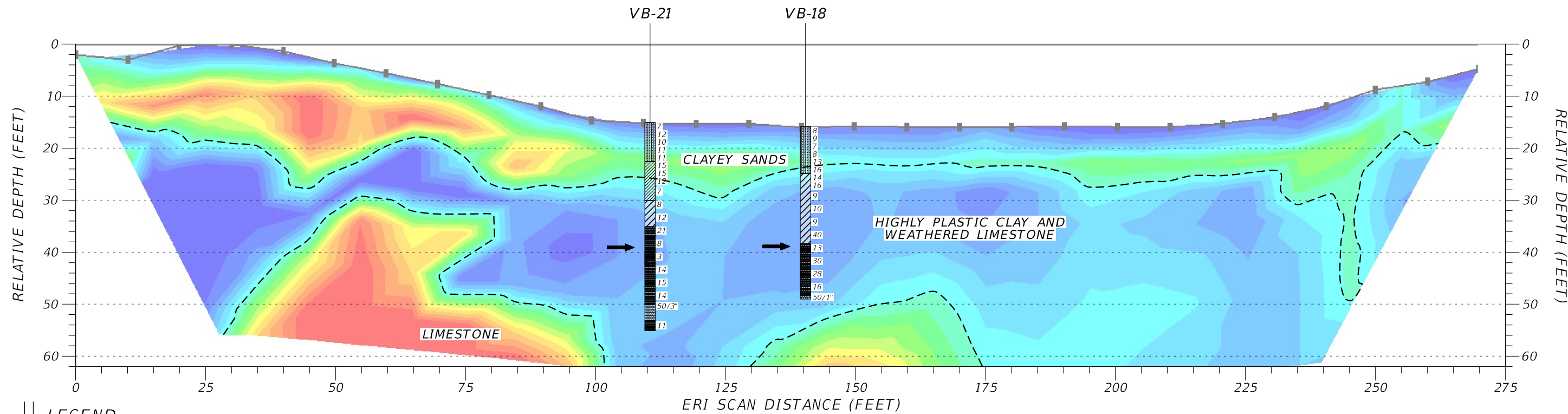
SUBSURFACE PROFILE  
 HARBINWOOD ESTATES SWMF SINKHOLE  
 LONGVIEW DRIVE  
 LEON COUNTY, FLORIDA

SCALE: AS SHOWN      DATE: JUNE 2019  
 PROJ. NO.: 03-47-18-04      FIGURE NO.: 5E

### SUBSURFACE PROFILE TRANSECT LINE HW-10



### SUBSURFACE PROFILE TRANSECT LINE HW-11



**LEGEND**

- LIKELY DIRECTION OF SOIL MIGRATION
  - MEASURED GROUNDWATER LEVEL
  - FLUID LOSS
  - SOIL BORING TRUNCATED. SEE APPENDIX C FOR DETAILED SOIL PROPERTIES
- 7.2    24.4    83    285    971  
 RESISTIVITY (Ohm-m)

PREPARED: K. BALL, E.I.  
 CHECKED: M. HAYDEN, P.E.  
 REVISED: K. BALL, E.I.  
 ENGINEER: M. HAYDEN, P.E.

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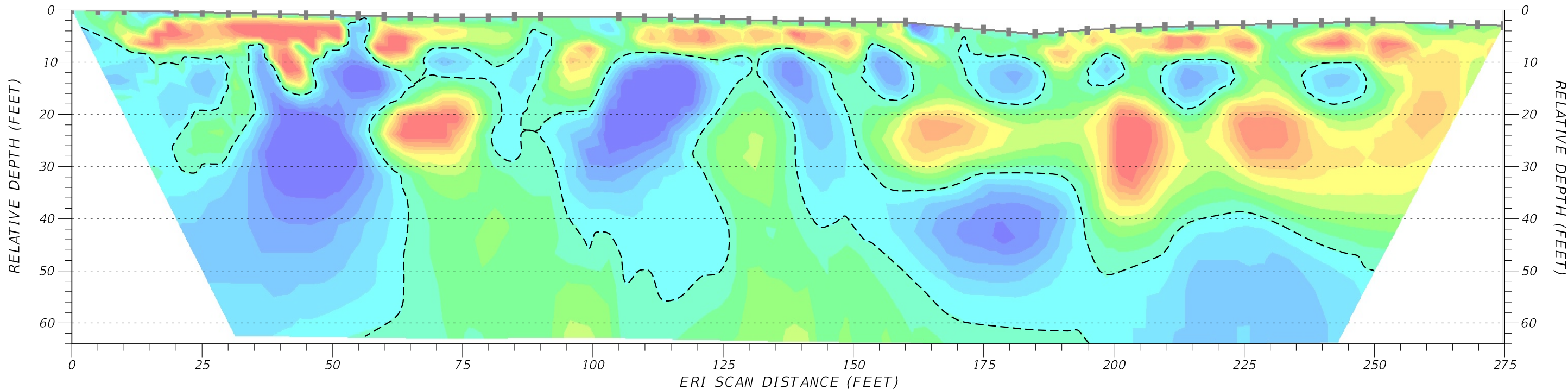
SUBSURFACE PROFILE  
 HARBINWOOD ESTATES SWMF SINKHOLE  
 LONGVIEW DRIVE  
 LEON COUNTY, FLORIDA

SCALE: AS SHOWN    DATE: JUNE 2019  
 PROJ. NO.: 03-47-18-04    FIGURE NO.: 5F

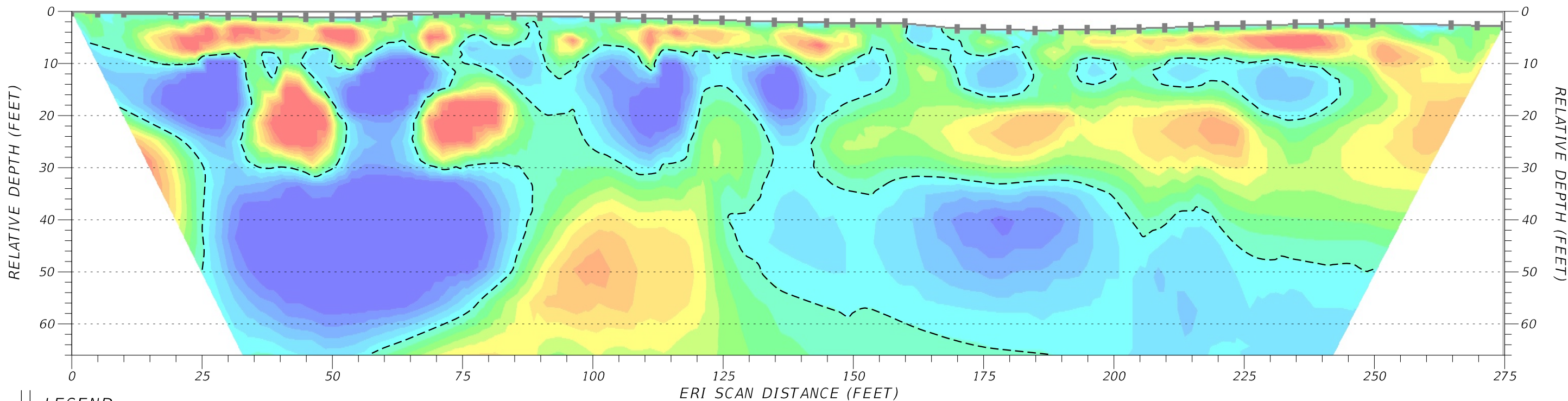
DIRECTION OF SCANS  
(WEST TO EAST)



**SUBSURFACE PROFILE  
TRANSECT LINE HW-12**



**SUBSURFACE PROFILE  
TRANSECT LINE HW-13**



**LEGEND**

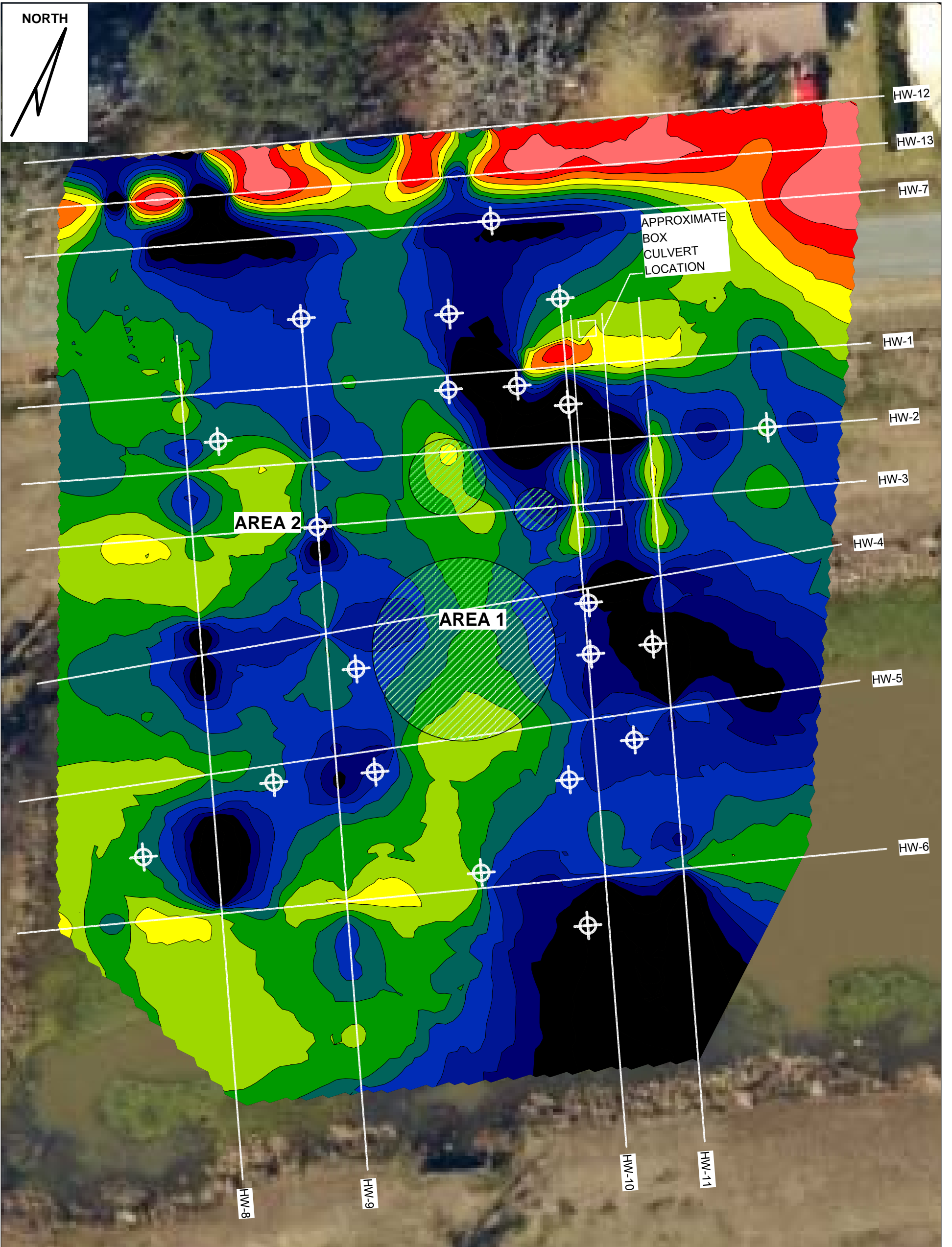
-  LIKELY DIRECTION OF SOIL MIGRATION
  -  MEASURED GROUNDWATER LEVEL
  -  FLUID LOSS
  -  SOIL BORING TRUNCATED. SEE APPENDIX C FOR DETAILED SOIL PROPERTIES
- 

PREPARED: K. BALL, E.I.  
 CHECKED: M. HAYDEN, P.E.  
 REVISED: K. BALL, E.I.  
 ENGINEER: M. HAYDEN, P.E.

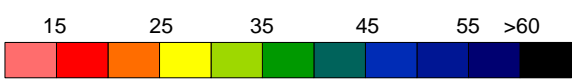
ENVIRONMENTAL AND GEOTECHNICAL  
 SPECIALISTS, INC.  
 104 NORTH MAGNOLIA DRIVE  
 TALLAHASSEE, FLORIDA 32301  
 OFFICE: (850) 386-1253

SUBSURFACE PROFILE  
 HARBINWOOD ESTATES SWMF SINKHOLE  
 LONGVIEW DRIVE  
 LEON COUNTY, FLORIDA

|                        |                 |
|------------------------|-----------------|
| SCALE: AS SHOWN        | DATE: JUNE 2019 |
| PROJ. NO.: 03-47-18-04 | FIGURE NO.: 5G  |



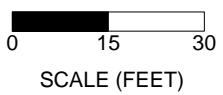
**COLOR SCALE**



RELATIVE DEPTH TO CONFINING LAYER (FEET)

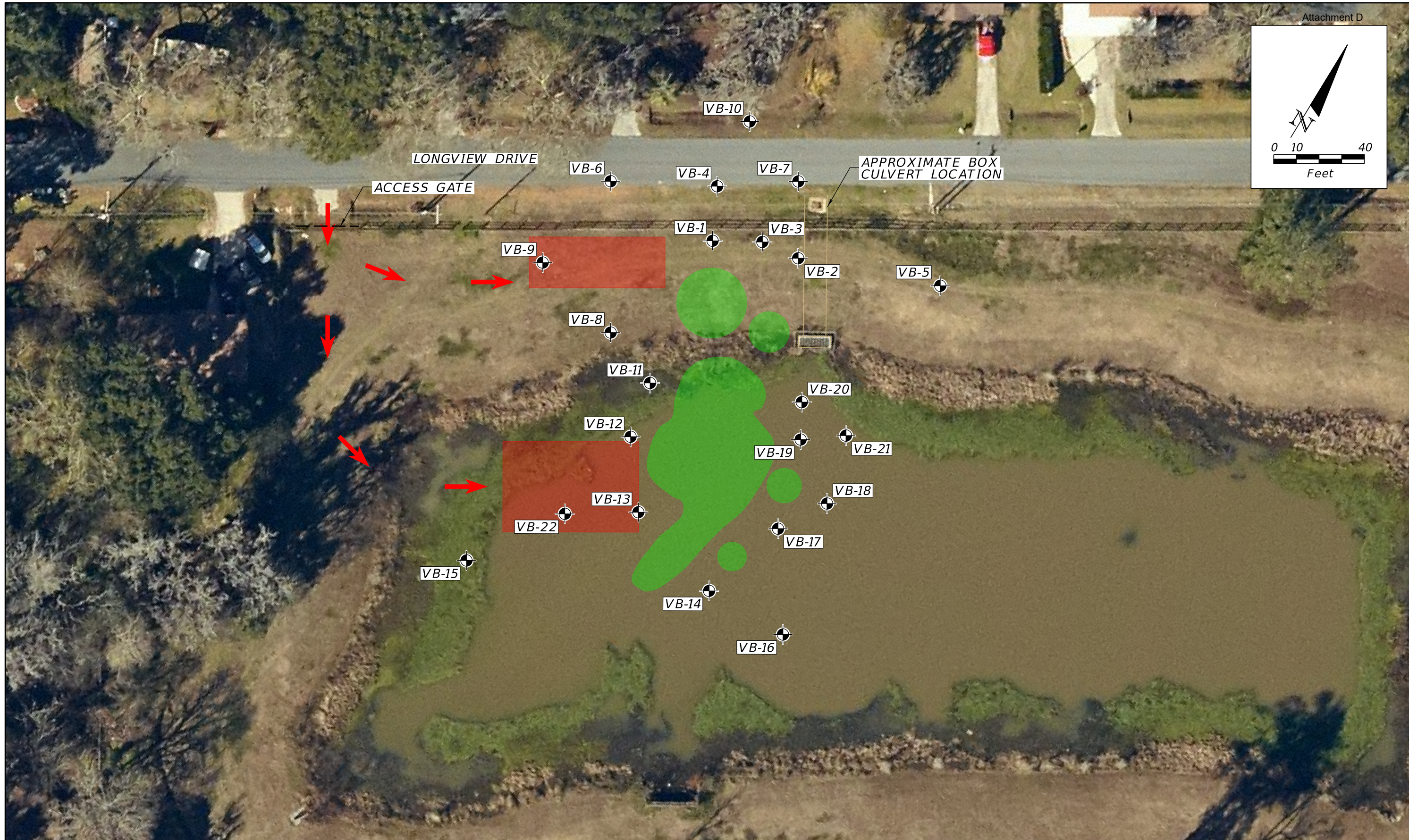
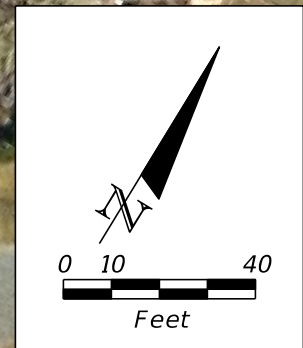
**LEGEND**

APPROXIMATE ORIGINAL SINKHOLE LOCATION



SCALE (FEET)

|                                     |                             |  |  |                  |
|-------------------------------------|-----------------------------|--|--|------------------|
| DRAWN:<br>K. BALL, E.I.             | CHECKED:<br>D. DEMEZA, E.I. | Environmental and Geotechnical Specialists, Inc.<br><br>104 North Magnolia Drive<br>Tallahassee, Florida 32301<br>Office: (850) 386-1253 | TITLE:<br>APPROXIMATED CONTOUR MAP<br>OF CONFINING SURFACE<br>HABINWOOD ESTATES SWMF SINKHOLE<br>LONVIEW DRIVE<br>LEON COUNTY, FLORIDA |                  |
| ENGINEER:<br>M. HAYDEN, P.E.        |                             |  | DATE:<br>JUNE 2019   | FIGURE NO.:<br>6 |
| CLIENT:<br>LEON COUNTY PUBLIC WORKS | PROJECT NO.:<br>03-47-18-04 |  |  |                  |



**LEGEND**

SOIL BORING LOCATION

CONTRACTOR STAGING/WORK AREA

SITE ACCESS ROUTE

APPROXIMATE LIMITS OF SOIL EROSION

PREPARED: K. BALL, E.I.

CHECKED: D. DEMEZA, E.I.

REVISED: K. BALL, E.I.

ENGINEER: M. HAYDEN, P.E.

ENVIRONMENTAL AND GEOTECHNICAL  
SPECIALISTS, INC.

104 NORTH MAGNOLIA DRIVE  
TALLAHASSEE, FLORIDA 32301  
OFFICE: (850) 386-1253

STAGING/WORK AREA AND ACCESS  
HARBINWOOD ESTATES SWMF SINKHOLE  
LONGVIEW DRIVE  
LEON COUNTY, FLORIDA

SCALE: AS SHOWN

DATE: JUNE 2019

PROJ. NO.: 03-47-18-04

FIGURE NO.: 7

*APPENDIX A*  
***GEOTECHNICAL PLAN SHEETS***

NOTES

1. NUMBERS LEFT OF BORING INDICATE STANDARD PENETRATION TEST (SPT) N-VALUES FOR 12 INCH PENETRATION, OR EQUIVALENT.
2. WATER ELEVATIONS SHOWN ARE THE WATER ELEVATIONS ENCOUNTERED, FLUCTUATIONS IN THE ELEVATIONS OF WATER SHOULD BE EXPECTED.
3. SOIL DESCRIPTIONS, TEST DATA, AND STANDARD PENETRATION VALUES SHOWN ARE FOR THE SOIL BORING ONLY AND MAY NOT APPLY TO ANY OTHER LOCATIONS EXCEPT AT THE LOCATION OF THE SOIL BORING. EXTRAPOLATION OF THE SOIL BORING DATA TO OTHER LOCATIONS IS THE SOLE RESPONSIBILITY OF THE PERSON PERFORMING THE EXTRAPOLATION.
4. ASTERISK (\*) INDICATES EQUIVALENT SPT N-VALUES CONVERTED FROM CONE PENETROMETER INDEX (CPI) VALUES.

| SAFETY HAMMER                       |                    |                             |                    |
|-------------------------------------|--------------------|-----------------------------|--------------------|
| GRANULAR MATERIALS RELATIVE DENSITY | SPT (BLOWS/12 IN.) | SILTS AND CLAYS CONSISTENCY | SPT (BLOWS/12 IN.) |
| VERY LOOSE                          | LESS THAN 4        | VERY SOFT                   | LESS THAN 2        |
| LOOSE                               | 4 - 10             | SOFT                        | 2 - 4              |
| MEDIUM DENSE                        | 10 - 30            | FIRM                        | 4 - 8              |
| DENSE                               | 30 - 50            | STIFF                       | 8 - 15             |
| VERY DENSE                          | GREATER THAN 50    | VERY STIFF                  | 15 - 30            |
|                                     |                    | HARD                        | GREATER THAN 30    |

| AUTOMATIC HAMMER                    |                    |                             |                    |
|-------------------------------------|--------------------|-----------------------------|--------------------|
| GRANULAR MATERIALS RELATIVE DENSITY | SPT (BLOWS/12 IN.) | SILTS AND CLAYS CONSISTENCY | SPT (BLOWS/12 IN.) |
| VERY LOOSE                          | LESS THAN 3        | VERY SOFT                   | LESS THAN 1        |
| LOOSE                               | 3 - 8              | SOFT                        | 1 - 3              |
| MEDIUM DENSE                        | 8 - 24             | FIRM                        | 3 - 6              |
| DENSE                               | 24 - 40            | STIFF                       | 6 - 12             |
| VERY DENSE                          | GREATER THAN 40    | VERY STIFF                  | 12 - 24            |
|                                     |                    | HARD                        | GREATER THAN 24    |

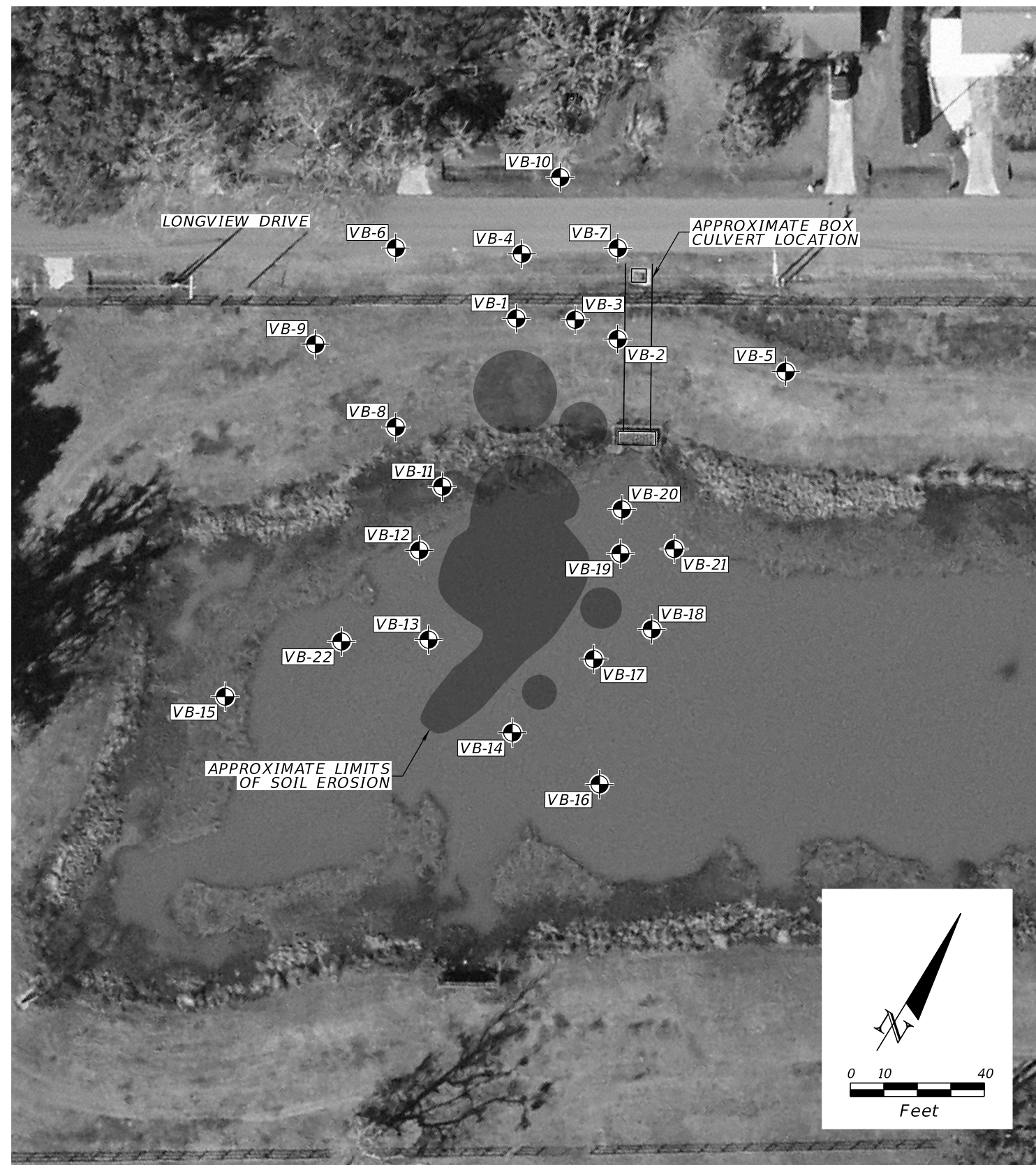
  

SPLIT-SPOON: INSIDE DIAMETER: 1.375 IN  
 OUTSIDE DIAMETER: 2.0 IN  
 AVG. HAMMER DROP: 30.0 IN  
 HAMMER WEIGHT: 140 LBS

LEGEND

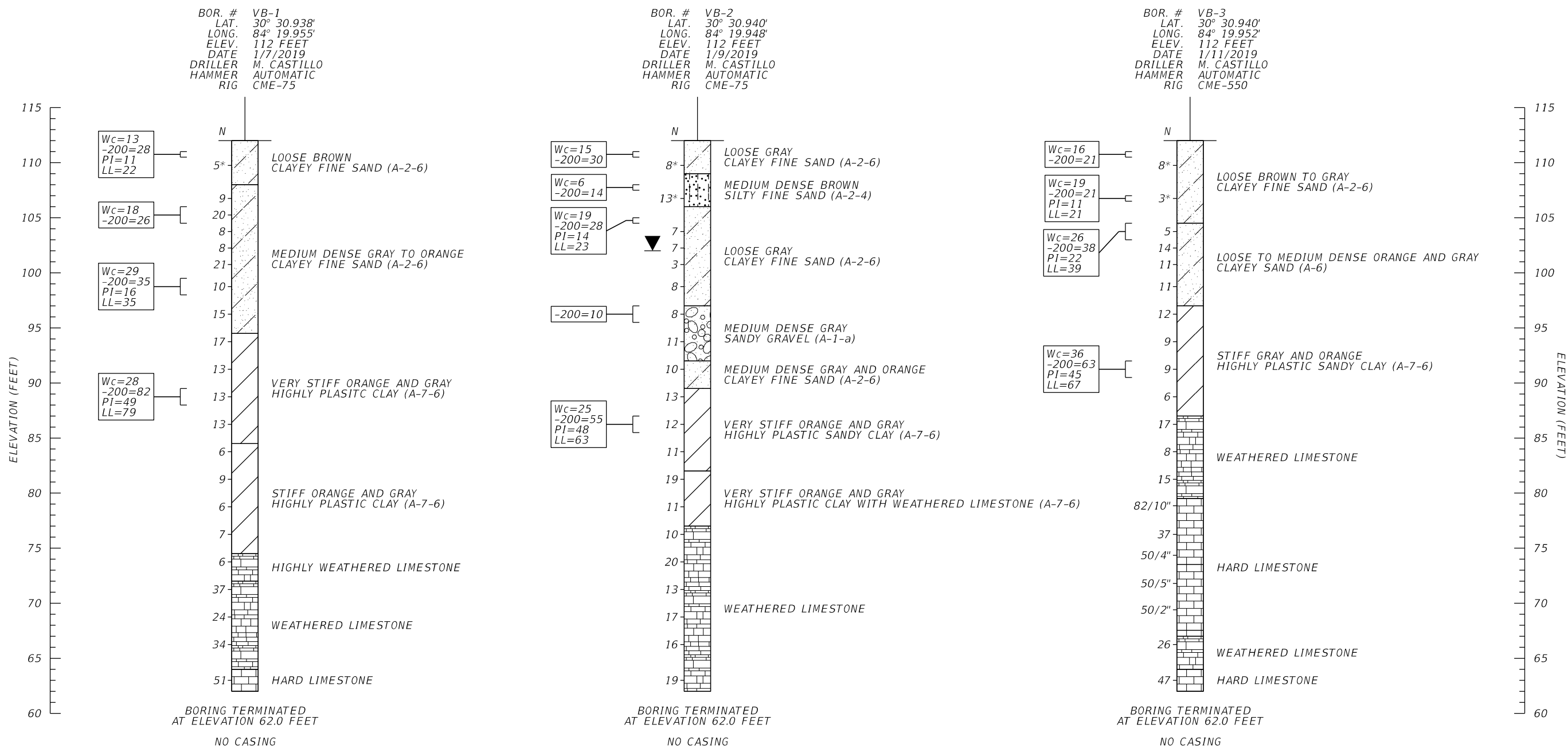
|                             |       |   |  |
|-----------------------------|-------|---|--|
| SPT SOIL BORING LOCATION    |       | ASPHALT   |  |
| MEASURED WATER LEVEL        |       | SANDY GRAVEL (A-1-a)  |  |
| LABORATORY TESTING RESULTS  |       | FINE SAND (A-3)   |  |
| CASING                      |       | SILTY FINE SAND (A-2-4)   |  |
| WATER CONTENT               | Wc=   | CLAYEY FINE SAND TO HIGHLY PLASTIC CLAYEY SAND (A-2-6 TO A-7-6) |  |
| -200 SIEVE                  | -200= | PLASTIC CLAY TO HIGHLY PLASTIC CLAY (A-7-6)                     |  |
| PLASTICITY INDEX            | PI=   | HIGHLY PLASTIC SILT (A-7-5)                                     |  |
| LIQUID LIMIT                | LL=   | HIGHLY WEATHERED LIMESTONE, WEATHERED LIMESTONE                 |  |
| WEIGHT OF HAMMER            | WOH   | HARD LIMESTONE  |  |
| GROUNDWATER NOT ENCOUNTERED | GNE   |   |  |

(A-3) AASHTO GROUP CLASSIFICATION SYMBOL

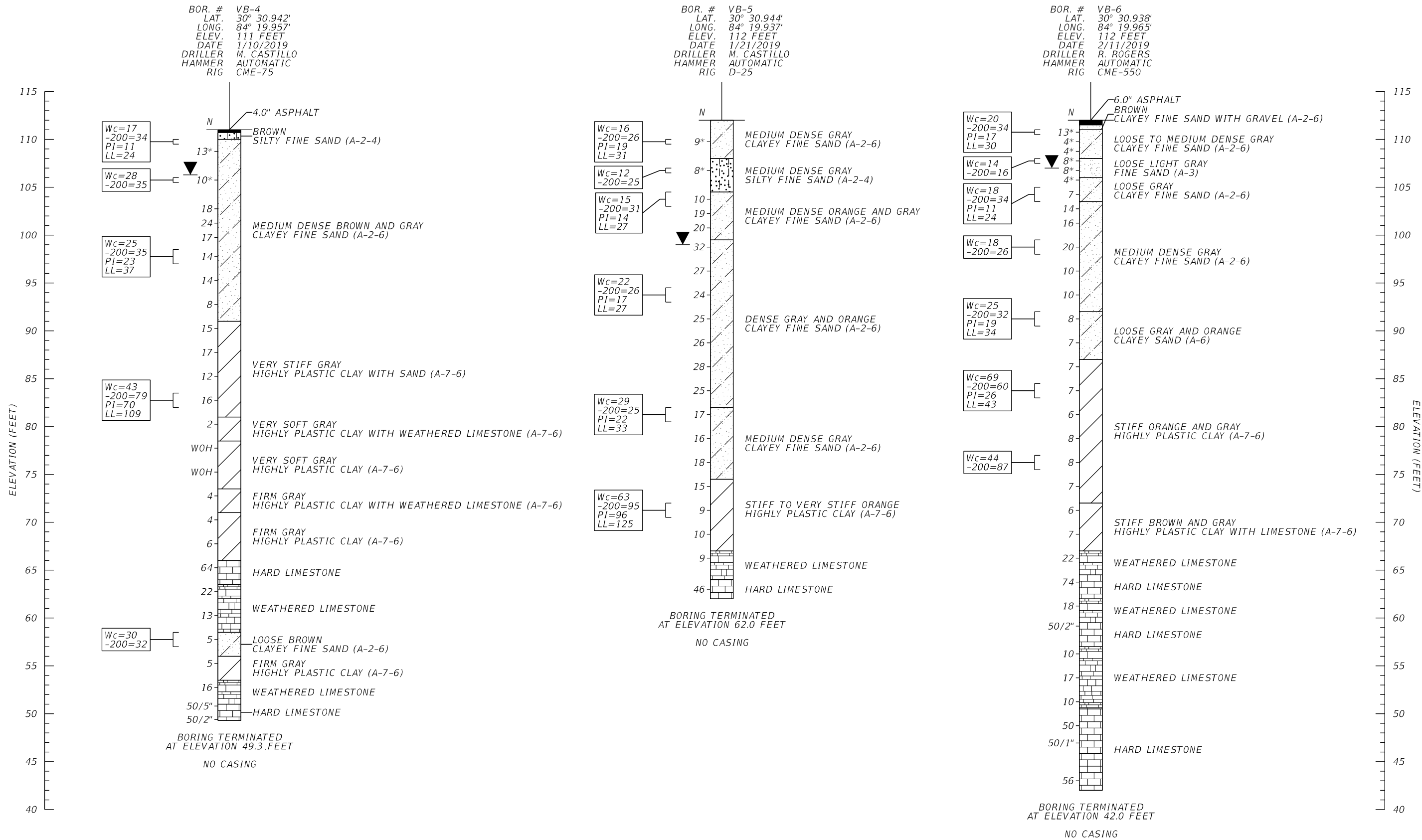


| REVISIONS |    |             |      |    |             | SEAL:           | <b>Environmental &amp; Geotechnical Specialists, Inc.</b><br><b>EGS</b> 104 NORTH MAGNOLIA DRIVE<br>TALLAHASSEE, FLORIDA 32301<br>OFFICE: (850) 386-1253<br>Cert. of Auth.: 6222 | LEON COUNTY PUBLIC WORKS<br>PROJECT TITLE<br>HARBINWOOD ESTATES SWMF SINKHOLE | REPORT OF SOIL BORINGS<br>(1 OF 8) | SHEET NO. |
|-----------|----|-------------|------|----|-------------|-----------------|--|---|------------------------------------|-----------|
| DATE      | BY | DESCRIPTION | DATE | BY | DESCRIPTION |                 |  |   |                                    |           |
|           |    |             |      |    |             | MYRON L. HAYDEN |  |   |                                    |           |
|           |    |             |      |    |             | P.E. NO.: 34067 |  |   |                                    |           |

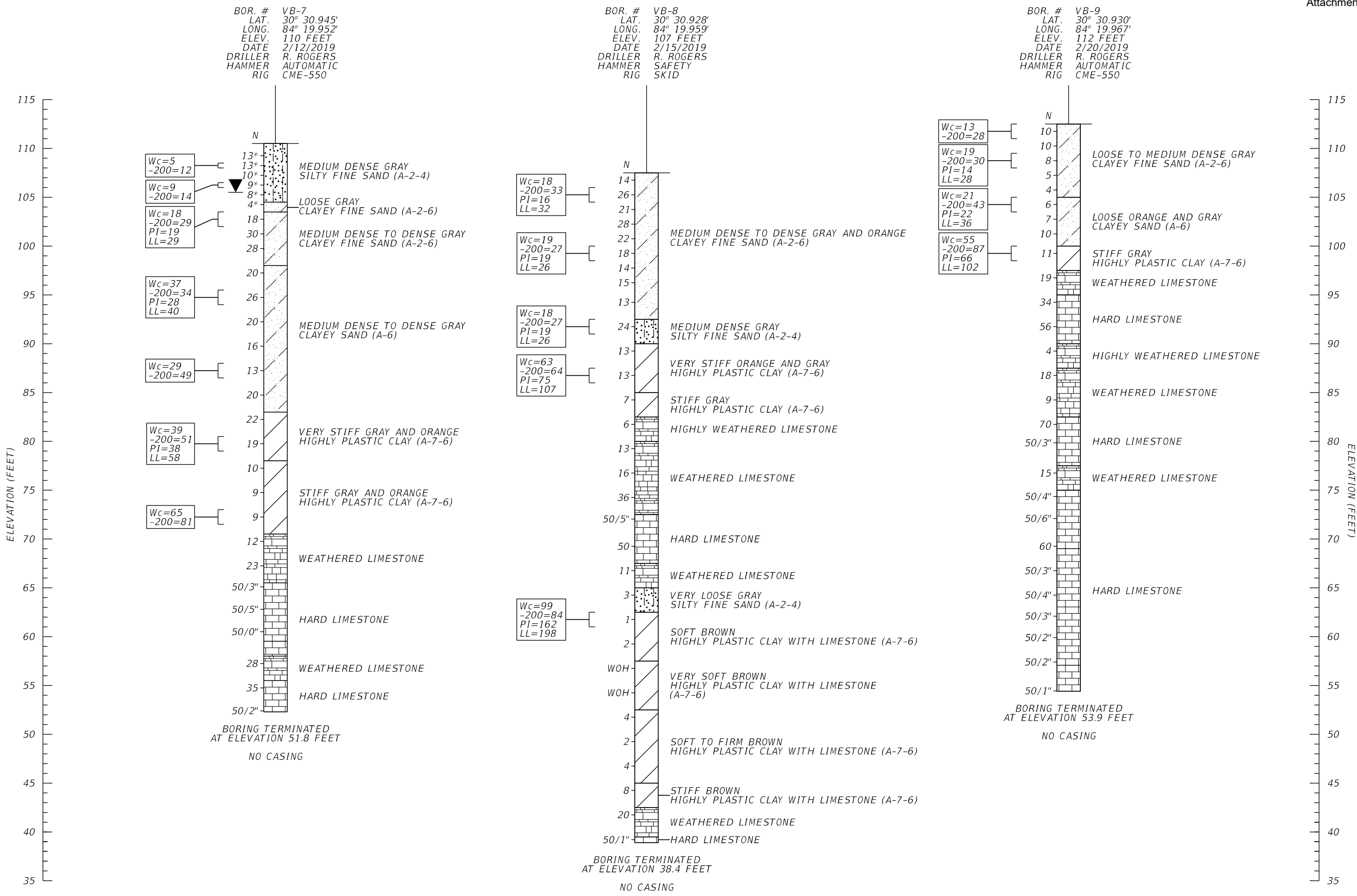




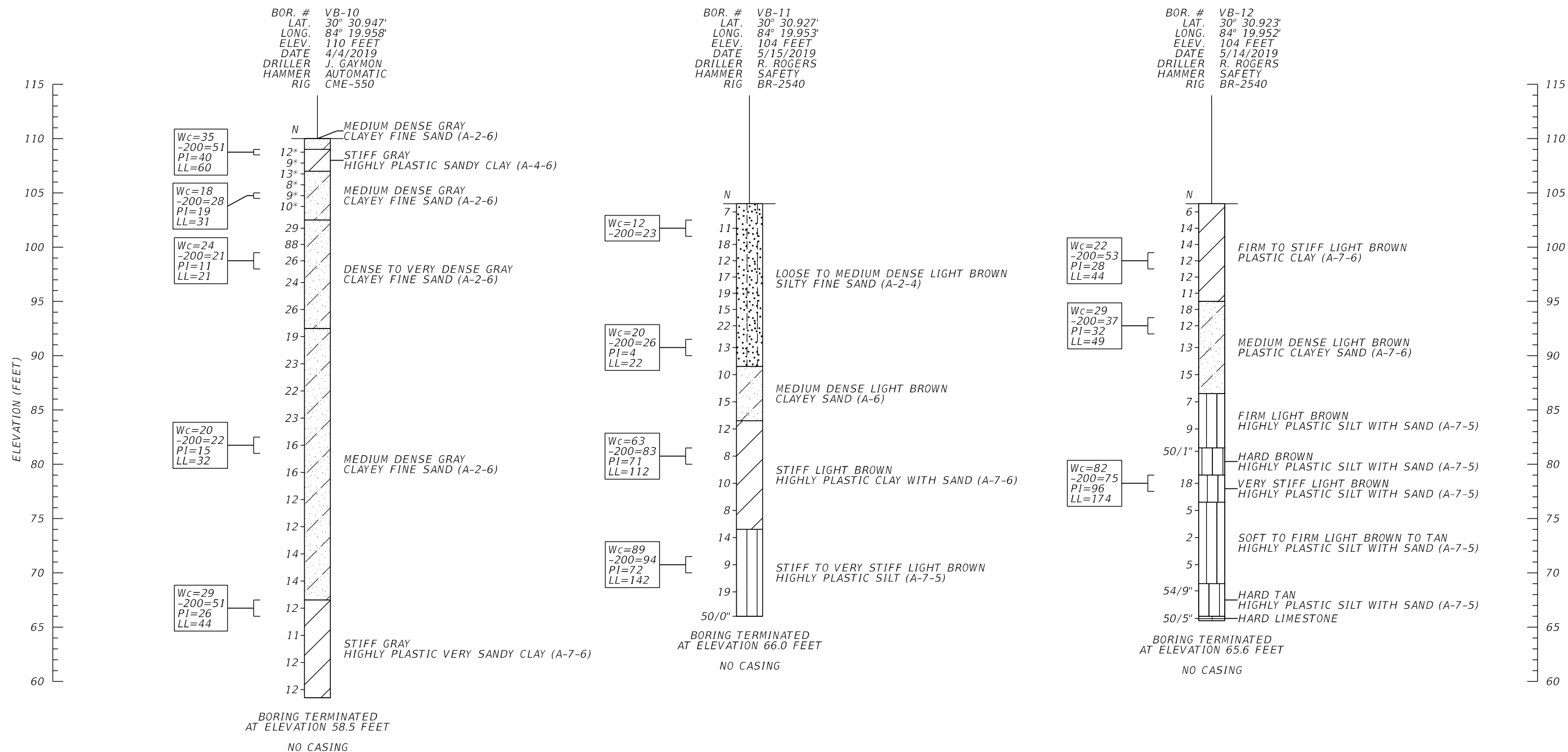
| REVISIONS |    |             |      |    |             | SEAL:           | <b>Environmental &amp; Geotechnical Specialists, Inc.</b><br><b>EGS</b> 104 NORTH MAGNOLIA DRIVE<br>TALLAHASSEE, FLORIDA 32301<br>OFFICE: (850) 386-1253<br>Cert. of Auth.: 6222 | LEON COUNTY PUBLIC WORKS<br>PROJECT TITLE<br>HARBINWOOD ESTATES SWMF SINKHOLE | <b>REPORT OF SOIL BORINGS</b><br>(2 OF 8) | SHEET NO. |
|-----------|----|-------------|------|----|-------------|-----------------|--|---|---|-----------|
| DATE      | BY | DESCRIPTION | DATE | BY | DESCRIPTION |                 |  |   |   |           |
|           |    |             |      |    |             | MYRON L. HAYDEN |  |   |   |           |
|           |    |             |      |    |             | P.E. NO.: 34067 |  |   |   |           |



| REVISIONS |    |             |      |    |             | SEAL:           | <b>Environmental &amp; Geotechnical Specialists, Inc.</b><br><b>EGS</b> 104 NORTH MAGNOLIA DRIVE<br>TALLAHASSEE, FLORIDA 32301<br>OFFICE: (850) 386-1253<br>Cert. of Auth.: 6222 | LEON COUNTY PUBLIC WORKS<br>PROJECT TITLE<br>HARBINWOOD ESTATES SWMF SINKHOLE | <b>REPORT OF SOIL BORINGS</b><br>(3 OF 8) | SHEET NO. |
|-----------|----|-------------|------|----|-------------|-----------------|--|---|---|-----------|
| DATE      | BY | DESCRIPTION | DATE | BY | DESCRIPTION |                 |  |   |   |           |
|           |    |             |      |    |             | MYRON L. HAYDEN |  |   |   |           |
|           |    |             |      |    |             | P.E. NO.: 34067 |  |   |   |           |



| REVISIONS |    |             |      |    |             | SEAL:           | <b>Environmental &amp; Geotechnical Specialists, Inc.</b><br><b>EGS</b> 104 NORTH MAGNOLIA DRIVE<br>TALLAHASSEE, FLORIDA 32301<br>OFFICE: (850) 386-1253<br>Cert. of Auth.: 6222 | LEON COUNTY PUBLIC WORKS<br>PROJECT TITLE<br>HARBINWOOD ESTATES SWMF SINKHOLE | <b>REPORT OF SOIL BORINGS</b><br>(4 OF 8) | SHEET NO. |
|-----------|----|-------------|------|----|-------------|-----------------|--|---|---|-----------|
| DATE      | BY | DESCRIPTION | DATE | BY | DESCRIPTION |                 |  |   |   |           |
|           |    |             |      |    |             | MYRON L. HAYDEN |  |   |   |           |
|           |    |             |      |    |             | P.E. NO.: 34067 |  |   |   |           |

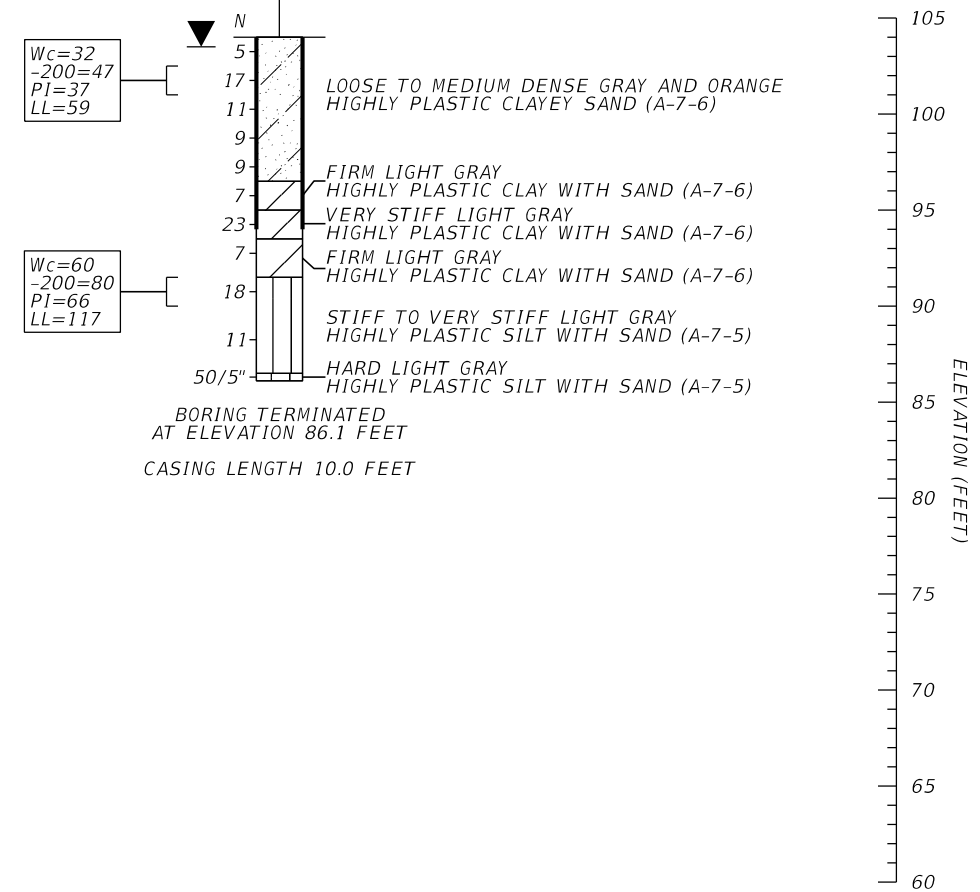
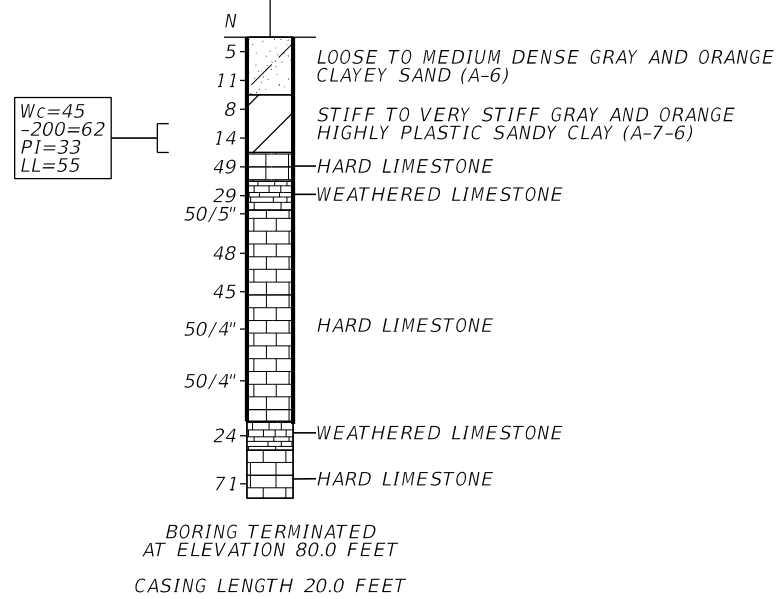
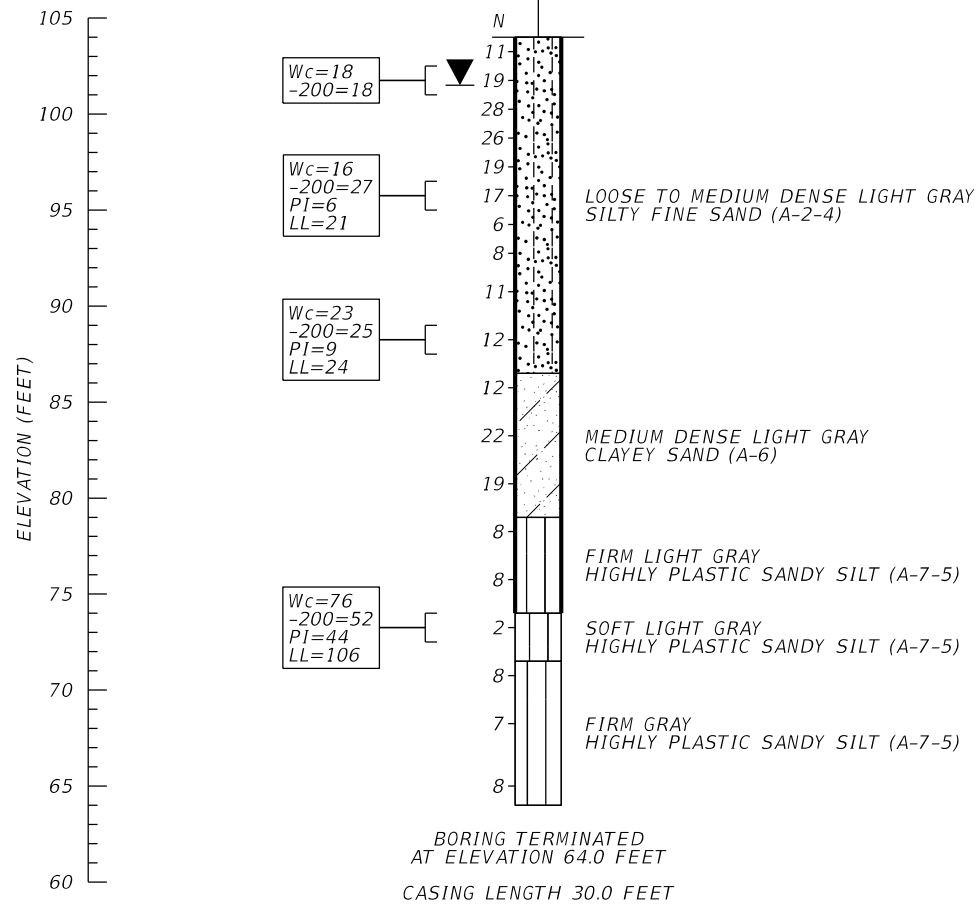


| REVISIONS |    |             |      |    |             | SEAL:                              | <b>Environmental &amp; Geotechnical Specialists, Inc.</b><br><b>EGS</b> 104 NORTH MAGNOLIA DRIVE<br>TALLAHASSEE, FLORIDA 32301<br>OFFICE: (850) 386-1253<br>Cert. of Auth.: 6222 | LEON COUNTY PUBLIC WORKS<br>PROJECT TITLE<br>HARBINWOOD ESTATES SWMF SINKHOLE | <b>REPORT OF SOIL BORINGS</b><br>(5 OF 8) | SHEET NO. |
|-----------|----|-------------|------|----|-------------|------------------------------------|--|---|---|-----------|
| DATE      | BY | DESCRIPTION | DATE | BY | DESCRIPTION |                                    |  |   |   |           |
|           |    |             |      |    |             | MYRON L. HAYDEN<br>P.E. NO.: 34067 |  |   |   |           |

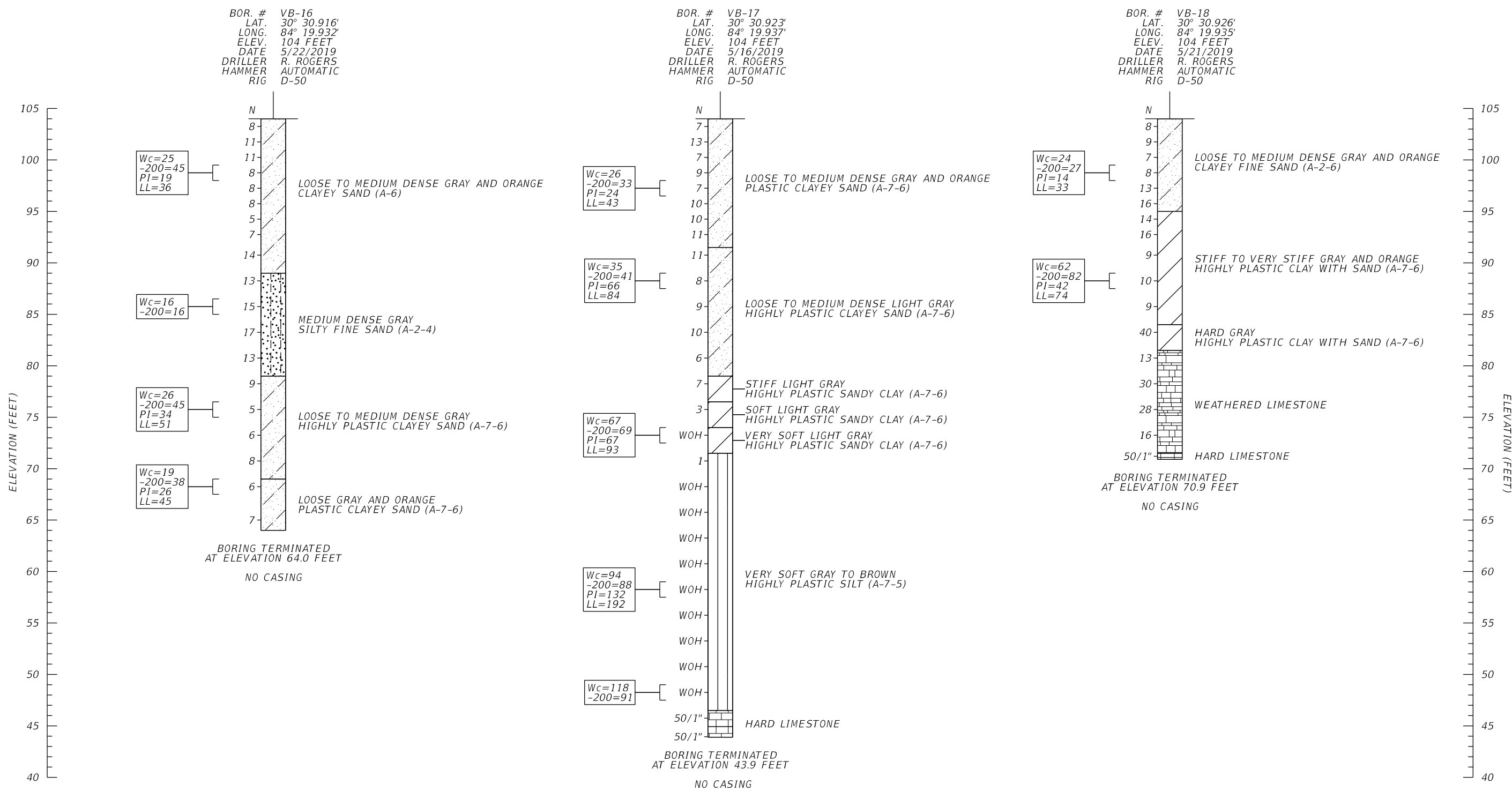
BOR. # VB-13  
 LAT. 30° 30.918'  
 LONG. 84° 19.948'  
 ELEV. 104 FEET  
 DATE 5/14/2019  
 DRILLER R. ROGERS  
 HAMMER SAFETY  
 RIG BR-2540

BOR. # VB-14  
 LAT. 30° 30.916'  
 LONG. 84° 19.939'  
 ELEV. 104 FEET  
 DATE 5/16/2019  
 DRILLER R. ROGERS  
 HAMMER AUTOMATIC  
 RIG D-50

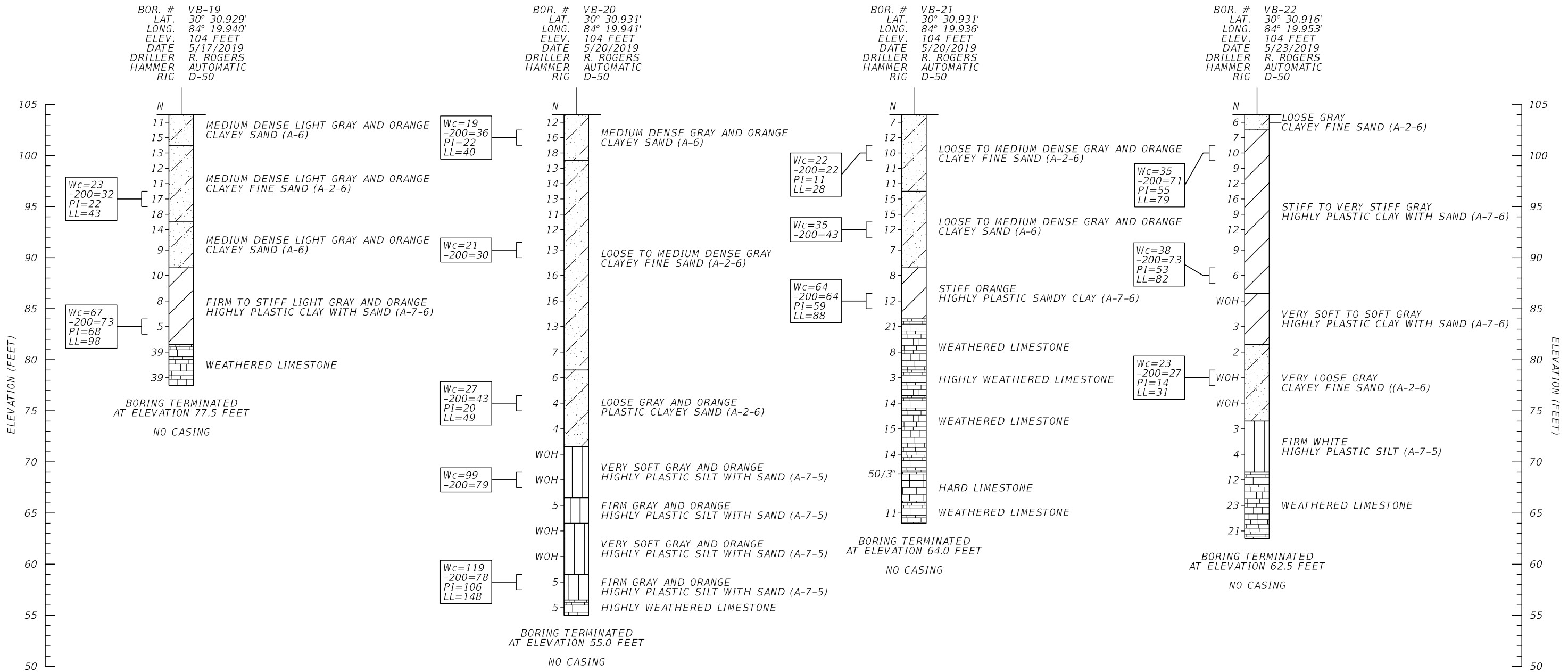
BOR. # VB-15  
 LAT. 30° 30.909'  
 LONG. 84° 19.958'  
 ELEV. 104 FEET  
 DATE 5/13/2019  
 DRILLER R. ROGERS  
 HAMMER SAFETY  
 RIG BR-2540



| REVISIONS |    |             |      |    |             | SEAL:           | <b>Environmental &amp; Geotechnical Specialists, Inc.</b><br><b>EGS</b> 104 NORTH MAGNOLIA DRIVE<br>TALLAHASSEE, FLORIDA 32301<br>OFFICE: (850) 386-1253<br>Cert. of Auth.: 6222 | LEON COUNTY PUBLIC WORKS<br>PROJECT TITLE<br>HARBINWOOD ESTATES SWMF SINKHOLE | <b>REPORT OF SOIL BORINGS</b><br>(6 OF 8) | SHEET NO. |
|-----------|----|-------------|------|----|-------------|-----------------|--|---|---|-----------|
| DATE      | BY | DESCRIPTION | DATE | BY | DESCRIPTION |                 |  |   |   |           |
|           |    |             |      |    |             | MYRON L. HAYDEN |  |   |   |           |
|           |    |             |      |    |             | P.E. NO.: 34067 |  |   |   |           |



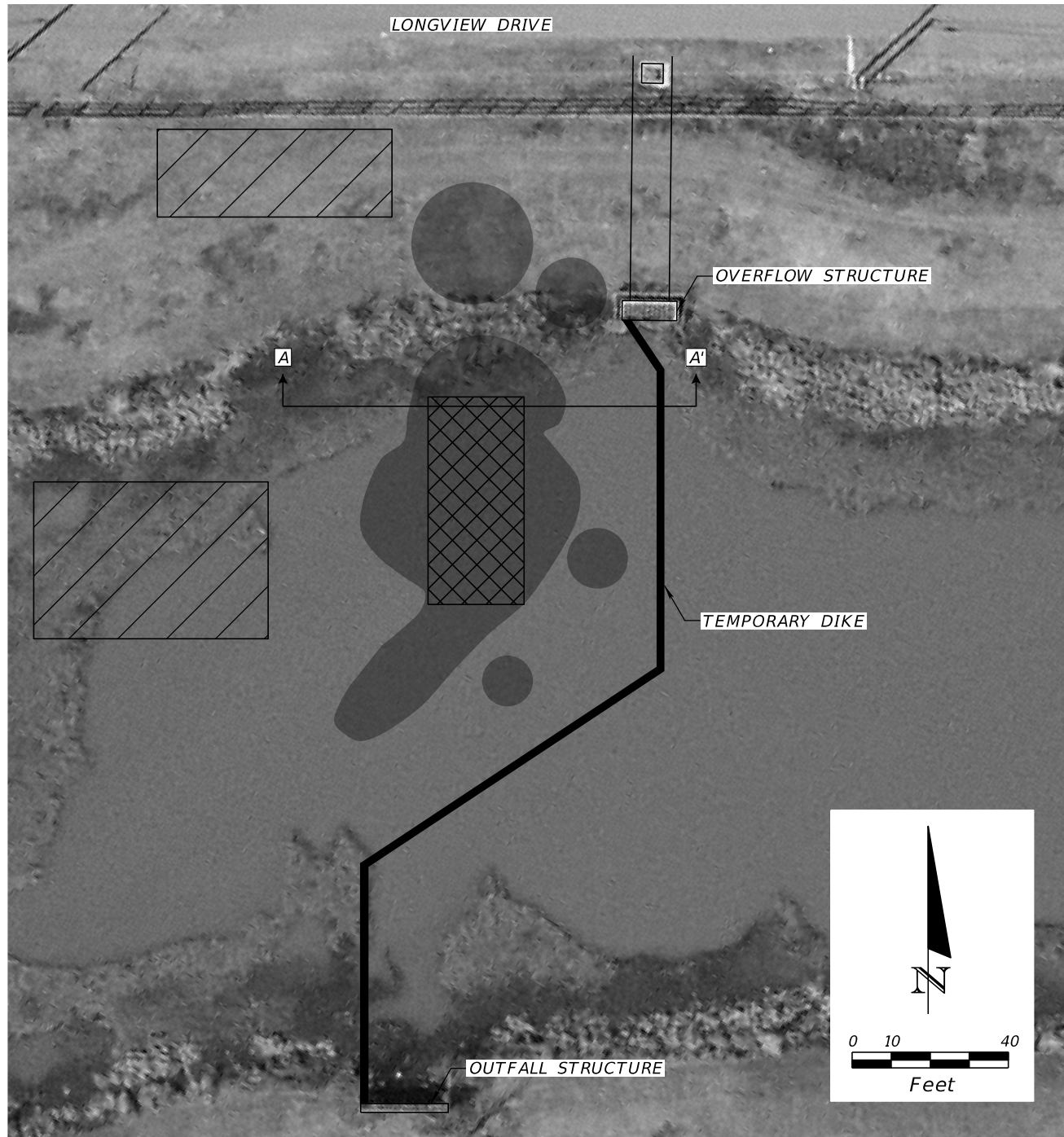
| REVISIONS |    |             |      |    |             | SEAL:           | <b>Environmental &amp; Geotechnical Specialists, Inc.</b><br><b>EGS</b> 104 NORTH MAGNOLIA DRIVE<br>TALLAHASSEE, FLORIDA 32301<br>OFFICE: (850) 386-1253<br>Cert. of Auth.: 6222 | LEON COUNTY PUBLIC WORKS<br>PROJECT TITLE<br>HARBINWOOD ESTATES SWMF SINKHOLE | <b>REPORT OF SOIL BORINGS</b><br>(7 OF 8) | SHEET NO. |
|-----------|----|-------------|------|----|-------------|-----------------|--|---|---|-----------|
| DATE      | BY | DESCRIPTION | DATE | BY | DESCRIPTION |                 |  |   |   |           |
|           |    |             |      |    |             | MYRON L. HAYDEN |  |   |   |           |
|           |    |             |      |    |             | P.E. NO.: 34067 |  |   |   |           |



| REVISIONS |    |             |      |    |             | SEAL:           | <b>Environmental &amp; Geotechnical Specialists, Inc.</b><br><b>EGS</b> 104 NORTH MAGNOLIA DRIVE<br>TALLAHASSEE, FLORIDA 32301<br>OFFICE: (850) 386-1253<br>Cert. of Auth.: 6222 | LEON COUNTY PUBLIC WORKS<br>PROJECT TITLE<br>HARBINWOOD ESTATES SWMF SINKHOLE | <b>REPORT OF SOIL BORINGS</b><br>(8 OF 8) | SHEET NO. |
|-----------|----|-------------|------|----|-------------|-----------------|--|---|---|-----------|
| DATE      | BY | DESCRIPTION | DATE | BY | DESCRIPTION |                 |  |   |   |           |
|           |    |             |      |    |             | MYRON L. HAYDEN |  |   |   |           |
|           |    |             |      |    |             | P.E. NO.: 34067 |  |   |   |           |

# SINKHOLE REMEDIATION PLAN

## AREA 1

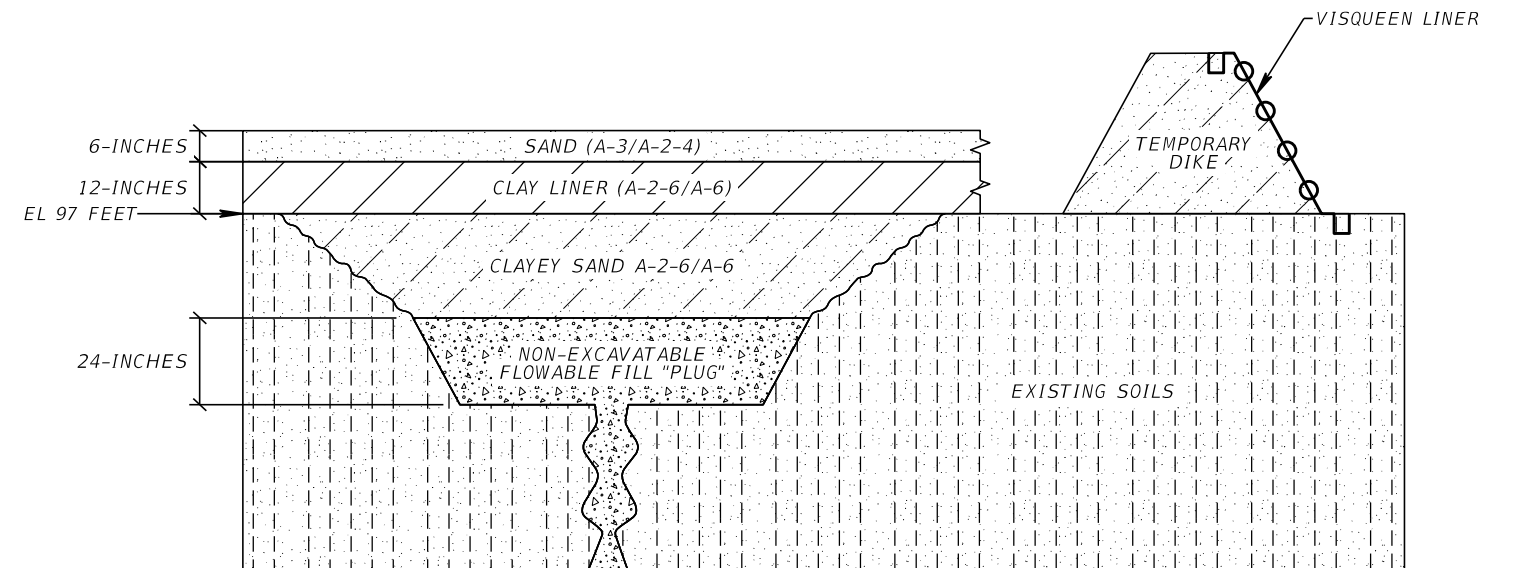


### NOTES

1. A TEMPORARY DIKE SHOULD BE ANTICIPATED TO DIVERT WATER AWAY FROM THE WORK ZONE DURING CONSTRUCTION.
2. EXISTING SOILS ARE SUITABLE FOR USE IN THE TEMPORARY DIKE.
3. NON-EXCAVATABLE FLOWABLE FILL SHALL BE IN ACCORDANCE WITH FDOT STANDARD SPECIFICATIONS, SECTION 121.
4. COMPACTION SHOULD BE ACHIEVED USING A 5-TON ROLLER IN STATIC MODE ONLY.
5. REFER TO THE TYPICAL SECTION FOR NON-EXCAVATABLE FLOWABLE FILL PLUG THICKNESS, LAYER PLACEMENT, AND TEMPORARY DIKE WITH VISQUEEN LINER.

### LEGEND

- LIMITS OF PROPOSED SINKHOLE THROAT PLUG (AREA A)
- CONTRACTOR STAGING/WORK AREA
- APPROXIMATE LIMITS OF SOIL EROSION (5/23/2019)



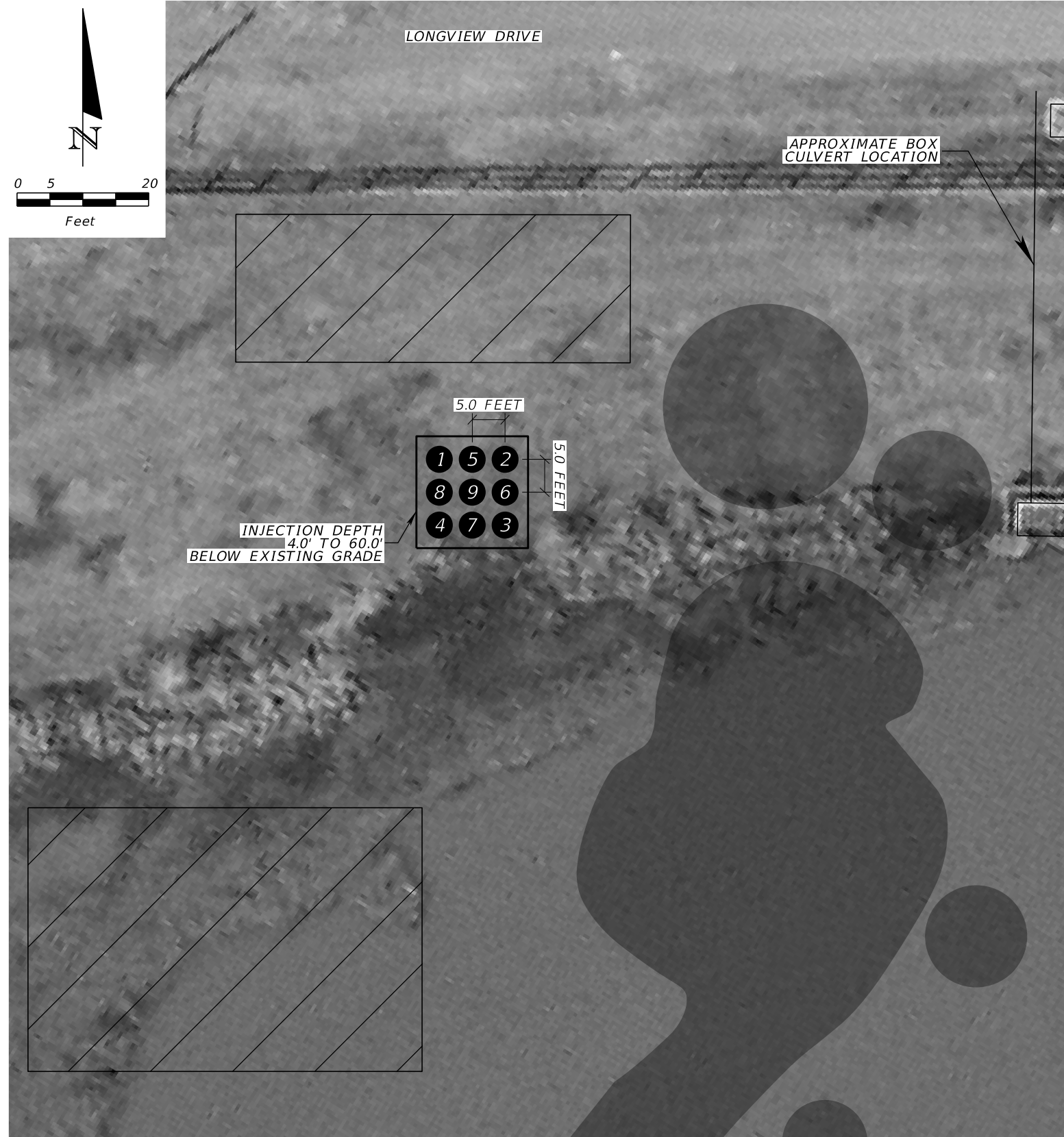
**SINKHOLE REMEDIATION DETAIL**  
SECTION A-A' - NOT TO SCALE

| REVISIONS |    |             |      |    |             | SEAL:           | <b>Environmental &amp; Geotechnical Specialists, Inc.</b><br><b>EGS</b> 104 NORTH MAGNOLIA DRIVE<br>TALLAHASSEE, FLORIDA 32301<br>OFFICE: (850) 386-1253<br>Cert. of Auth.: 6222 | LEON COUNTY PUBLIC WORKS<br>PROJECT TITLE<br>HARBINWOOD ESTATES SWMF SINKHOLE | <b>CLAY LINER AND DIKE<br/>DETAIL</b> | SHEET NO. |
|-----------|----|-------------|------|----|-------------|-----------------|--|---|---------------------------------------|-----------|
| DATE      | BY | DESCRIPTION | DATE | BY | DESCRIPTION |                 |  |   |                                       |           |
|           |    |             |      |    |             | MYRON L. HAYDEN |  |   |                                       |           |
|           |    |             |      |    |             | P.E. NO.: 34067 |  |   |                                       |           |



# GROUT INJECTION PLAN




## AREA 2



### NOTES

1. REFER TO TECHNICAL SPECIAL PROVISION FOR SUBSURFACE PRESSURE GROUTING AND GROUT PIPE INSTALLATION PROCEDURES.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING LOCATIONS OF EXISTING UTILITIES PRIOR TO CONSTRUCTION.
3. LOCATIONS OF GROUT POINTS ARE APPROXIMATE. DETAILED SURVEY INFORMATION NOT AVAILABLE AT TIME OF THIS INVESTIGATION.
4. NOTIFY THE ENGINEER A MINIMUM OF 48 HOURS IN ADVANCE OF INITIATING ANY GROUT INJECTION.
5. NUMBERS IN THE CENTER OF INJECTION POINTS INDICATE THE SEQUENCE ORDER. SEE DETAILS FOR INJECTION DEPTH OF GROUT COLUMNS AND INJECTION SEQUENCE.
6. GROUT POINTS MAY BE RELOCATED  $\pm$  6-INCHES IN ANY DIRECTION TO AVOID ANY INTERFERENCE.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO THE UTILITIES IN THE AREA FROM CEMENT INJECTION, CASING INSTALLATION, OR ANY OTHER GROUTING OPERATION.
8. POST PRODUCTION SPT SHALL BE INSTALLED CENTRALLY LOCATED IN THE GROUT REMEDIATION AREA TO CONFIRM THE ZONE OF "VERY LOOSE" SUBSURFACE SOILS HAVE BEEN ADEQUATELY DENSIFIED (SPT "N" > 8).

### LEGEND

-  CEMENT GROUT INJECTION POINT LOCATION/NUMBER
-  APPROXIMATE LIMITS OF SOIL EROSION (5/23/2019)
-  CONTRACTOR STAGING/WORK AREA

| REVISIONS |    |             |      |    |             | SEAL:                              | <b>Environmental &amp; Geotechnical Specialists, Inc.</b><br><b>EGS</b> 104 NORTH MAGNOLIA DRIVE<br>TALLAHASSEE, FLORIDA 32301<br>OFFICE: (850) 386-1253<br>Cert. of Auth.: 6222 | LEON COUNTY PUBLIC WORKS<br>PROJECT TITLE<br>HARBINWOOD ESTATES SWMF SINKHOLE | CEMENT GROUT PLAN | SHEET NO. |
|-----------|----|-------------|------|----|-------------|------------------------------------|--|---|-------------------|-----------|
| DATE      | BY | DESCRIPTION | DATE | BY | DESCRIPTION |                                    |  |   |                   |           |
|           |    |             |      |    |             | MYRON L. HAYDEN<br>P.E. NO.: 34067 |  |   |                   |           |

*APPENDIX B*  
***SOIL BORING LOGS***

**ENVIRONMENTAL & GEOTECHNICAL  
SPECIALISTS, INC.**

104 North Magnolia Drive  
Tallahassee, Florida 32301  
Office #: (850) 386-1253  
Fax #: (850) 385-8050

**PROJECT:** HARBINWOOD ESTATES SWMF SINKHOLE

**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-1

**DRILLER:** M. CASTILLO

**DEPTH TO WATER: INITIAL:** ∅ > 6.0'

**HAMMER TYPE:** AUTOMATIC

**ELEVATION (FEET):** 112

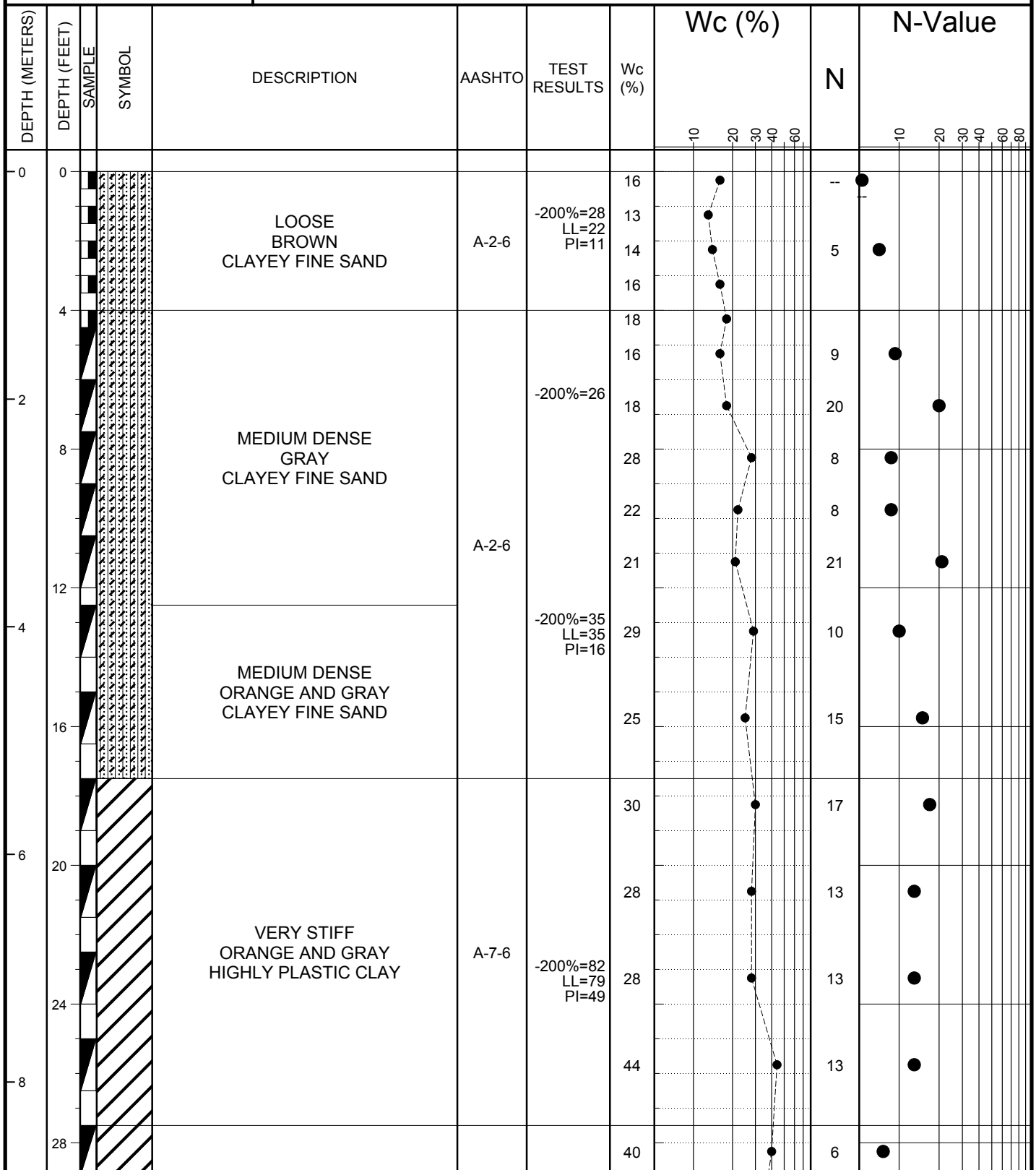
**DATE:** 1/7/19

**FLUID LOSS:** 100% @ 34'

**CAVING:** ∅ NONE

**24 HR:** ∅ N/M

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



**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

**ENVIRONMENTAL & GEOTECHNICAL  
SPECIALISTS, INC.**

104 North Magnolia Drive  
Tallahassee, Florida 32301  
Office #: (850) 386-1253  
Fax #: (850) 385-8050

**PROJECT:** HARBINWOOD ESTATES SWMF SINKHOLE

**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-1

**DRILLER:** M. CASTILLO

**DEPTH TO WATER: INITIAL:** ≅ > 6.0'

**HAMMER TYPE:** AUTOMATIC

**ELEVATION (FEET):** 112

**DATE:** 1/7/19

**FLUID LOSS:** 100% @ 34'

**CAVING:** C NONE

**24 HR:** ≅ N/M

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

| DEPTH (METERS) | DEPTH (FEET) | SAMPLE | SYMBOL | DESCRIPTION                                     | AASHTO | TEST RESULTS | Wc (%) | Wc (%) |    | N  | N-Value |    |    |
|----------------|--------------|--------|--------|---|--------|--------------|--------|--------|----|----|---------|----|----|
|                |              |        |        |   |        |              |        | 10     | 20 |    | 30      | 40 | 60 |
|                | 32           |        |        | STIFF<br>ORANGE AND GRAY<br>HIGHLY PLASTIC CLAY | A-7-6  |              | 32     |        |    | 9  |         |    |    |
| 10             |              |        |        |   |        |              |        | 35     |    |    | 6       |    |    |
|                | 36           |        |        |   |        |              |        | 36     |    |    | 7       |    |    |
|                | 40           |        |        | HIGHLY WEATHERED LIMESTONE                      | --     |              |        |        |    | 6  |         |    |    |
| 12             |              |        |        | WEATHERED LIMESTONE                             | --     |              |        |        |    | 37 |         |    |    |
|                | 44           |        |        |   |        |              |        |        |    |    | 24      |    |    |
| 14             |              |        |        |   |        |              |        |        |    |    | 34      |    |    |
|                | 48           |        |        | HARD LIMESTONE                                  | --     |              |        |        |    | 51 |         |    |    |
| 16             | 52           |        |        |   |        |              |        |        |    |    |         |    |    |
|                | 56           |        |        |   |        |              |        |        |    |    |         |    |    |

**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

**ENVIRONMENTAL & GEOTECHNICAL  
SPECIALISTS, INC.**

104 North Magnolia Drive  
Tallahassee, Florida 32301  
Office #: (850) 386-1253  
Fax #: (850) 385-8050

**PROJECT:** HARBINWOOD ESTATES SWMF SINKHOLE

**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-2

**DRILLER:** M. CASTILLO

**DEPTH TO WATER: INITIAL:** 10.0'

**HAMMER TYPE:** AUTOMATIC

**ELEVATION (FEET):** 112

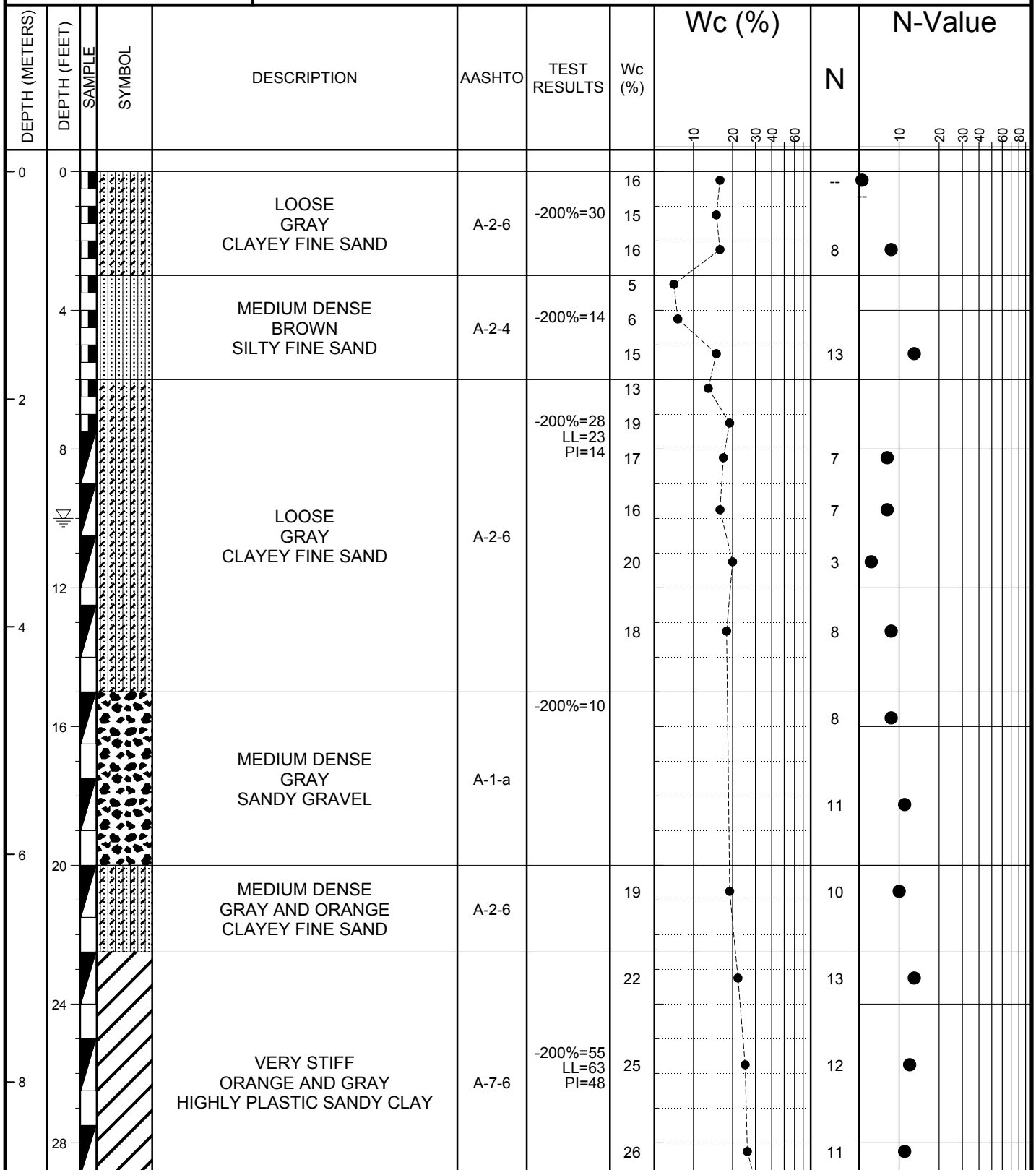
**DATE:** 1/9/19

**FLUID LOSS:** 100% @ 17'

**CAVING:** C NONE

**24 HR:** N/M

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



**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

**ENVIRONMENTAL & GEOTECHNICAL  
SPECIALISTS, INC.**

104 North Magnolia Drive  
Tallahassee, Florida 32301  
Office #: (850) 386-1253  
Fax #: (850) 385-8050

**PROJECT:** HARBINWOOD ESTATES SWMF SINKHOLE

**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-2

**DRILLER:** M. CASTILLO

**DEPTH TO WATER: INITIAL:** 10.0'

**HAMMER TYPE:** AUTOMATIC

**ELEVATION (FEET):** 112

**DATE:** 1/9/19

**FLUID LOSS:** 100% @ 17'

**CAVING:** C NONE

**24 HR:** N/M

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

| DEPTH (METERS) | DEPTH (FEET) | SAMPLE | SYMBOL | DESCRIPTION  | AASHTO | TEST RESULTS | Wc (%) | Wc (%) |    | N  | N-Value |    |    |
|----------------|--------------|--------|--------|--|--------|--------------|--------|--------|----|----|---------|----|----|
|                |              |        |        |  |        |              |        | 10     | 20 |    | 30      | 40 | 60 |
|                |              |        |        |  |        |              |        |        |    |    |         |    |    |
|                | 32           |        |        | VERY STIFF<br>ORANGE AND GRAY<br>HIGHLY PLASTIC CLAY<br>WITH WEATHERED LIMESTONE | A-7-6  |              | 39     |        |    | 19 |         |    |    |
| 10             |              |        |        |  |        |              |        | 34     |    |    | 11      |    |    |
|                | 36           |        |        | WEATHERED LIMESTONE  | --     |              |        |        |    | 10 |         |    |    |
|                | 40           |        |        |  |        |              |        |        |    |    | 20      |    |    |
| 12             |              |        |        |  |        |              |        |        |    |    | 13      |    |    |
|                | 44           |        |        |  |        |              |        |        |    |    | 17      |    |    |
| 14             |              |        |        |  |        |              |        |        |    |    | 16      |    |    |
|                | 48           |        |        |  |        |              |        |        |    | 19 |         |    |    |
|                | 52           |        |        |  |        |              |        |        |    |    |         |    |    |
| 16             |              |        |        |  |        |              |        |        |    |    |         |    |    |
|                | 56           |        |        |  |        |              |        |        |    |    |         |    |    |

**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

**ENVIRONMENTAL & GEOTECHNICAL  
SPECIALISTS, INC.**

104 North Magnolia Drive  
Tallahassee, Florida 32301  
Office #: (850) 386-1253  
Fax #: (850) 385-8050

**PROJECT:** HARBINWOOD ESTATES SWMF SINKHOLE

**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-3

**DRILLER:** M. CASTILLO

**DEPTH TO WATER: INITIAL:**  $\nabla$  > 7.5'

**HAMMER TYPE:** AUTOMATIC

**ELEVATION (FEET):** 112

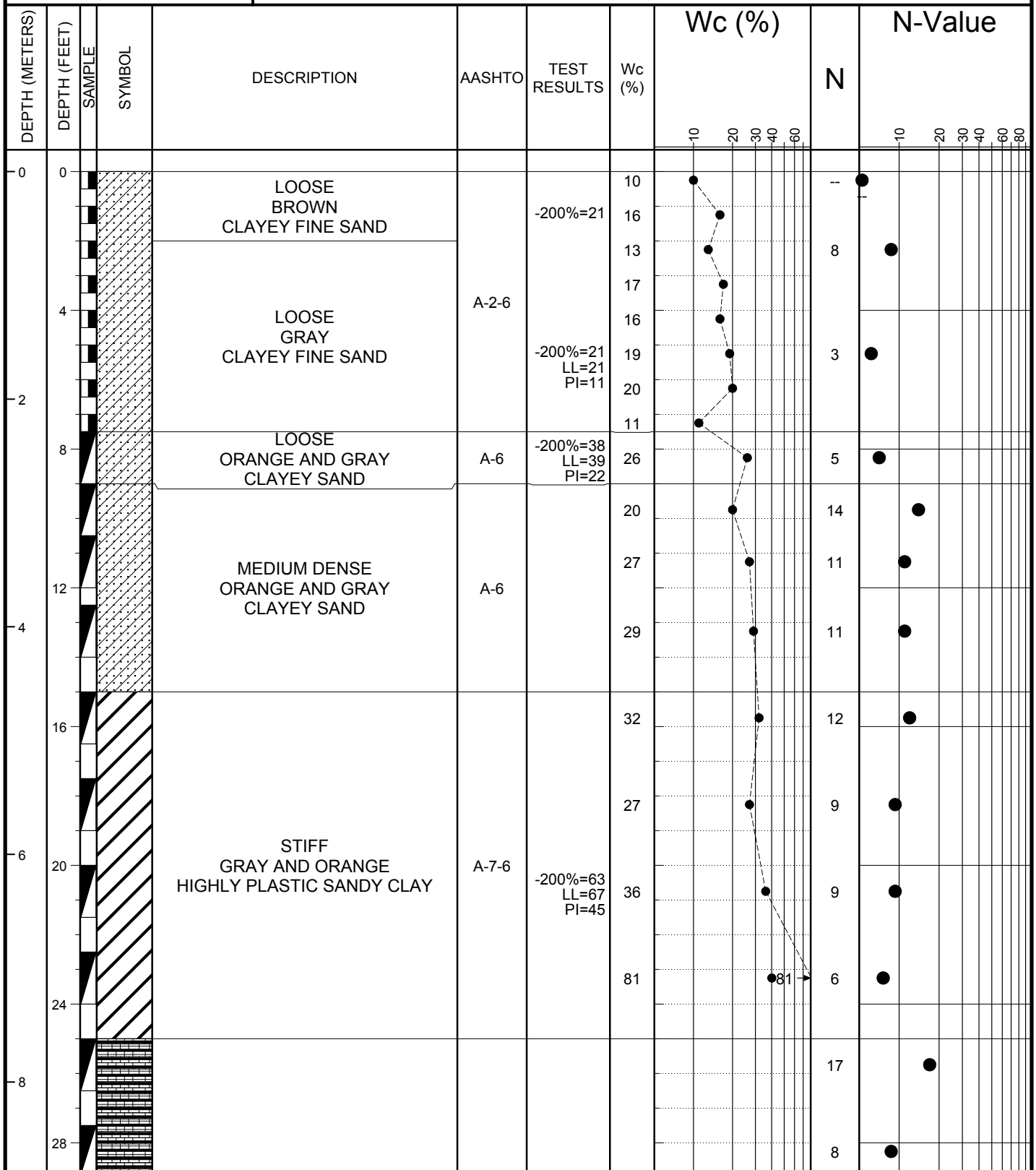
**DATE:** 1/11/19

**FLUID LOSS:** 100% @ 29'

**CAVING:**  NONE

**24 HR:**  $\nabla$  N/M

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



**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

|  |  |                               |
|--|--|-------------------------------|
| <b>ENVIRONMENTAL &amp; GEOTECHNICAL SPECIALISTS, INC.</b><br>104 North Magnolia Drive<br>Tallahassee, Florida 32301<br>Office #: (850) 386-1253<br>Fax #: (850) 385-8050 | PROJECT: <u>HARBINWOOD ESTATES SWMF SINKHOLE</u> | HAMMER TYPE: <u>AUTOMATIC</u> |
|  | CLIENT: <u>LEON COUNTY PUBLIC WORKS</u>          | ELEVATION (FEET): <u>112</u>  |
|  | PROJECT NO.: <u>03-47-18-04</u>                  | DATE: <u>1/11/19</u>          |
|  | PROJECT LOCATION: <u>LEON COUNTY, FLORIDA</u>    | FLUID LOSS: <u>100% @ 29'</u> |
|  | BORING NO.: <u>VB-3</u>                          | CAVING: <u>☐</u> NONE         |
|  | DRILLER: <u>M. CASTILLO</u>                      | 24 HR: <u>☑</u> N/M           |
| DEPTH TO WATER: INITIAL: <u>☒</u> > 7.5'   |  |                               |

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

| DEPTH (METERS) | DEPTH (FEET) | SAMPLE | SYMBOL | DESCRIPTION         | AASHTO | TEST RESULTS | Wc (%) | Wc (%) |    |    |    |    | N      | N-Value |    |    |    |        |
|----------------|--------------|--------|--------|---------------------|--------|--------------|--------|--------|----|----|----|----|--------|---------|----|----|----|--------|
|                |              |        |        |                     |        |              |        | 10     | 20 | 30 | 40 | 60 |        | 10      | 20 | 30 | 40 | 60     |
|                |              |        |        | WEATHERED LIMESTONE | -      |              |        |        |    |    |    |    | 15     |         |    |    |    |        |
|                | 10           |        |        | HARD LIMESTONE      | -      |              |        |        |    |    |    |    | 82/10" |         |    |    |    | 82/10" |
|                | 36           |        |        | HARD LIMESTONE      | -      |              |        |        |    |    |    |    | 37     |         |    |    |    |        |
|                | 12           |        |        | HARD LIMESTONE      | -      |              |        |        |    |    |    |    | 50/4"  |         |    |    |    |        |
|                | 40           |        |        | HARD LIMESTONE      | -      |              |        |        |    |    |    |    | 50/5"  |         |    |    |    |        |
|                | 44           |        |        | HARD LIMESTONE      | -      |              |        |        |    |    |    |    | 50/2"  |         |    |    |    |        |
|                | 14           |        |        | WEATHERED LIMESTONE | --     |              |        |        |    |    |    |    | 26     |         |    |    |    |        |
|                | 48           |        |        | HARD LIMESTONE      | --     |              |        |        |    |    |    |    | 47     |         |    |    |    |        |
|                | 52           |        |        |                     |        |              |        |        |    |    |    |    |        |         |    |    |    |        |
|                | 16           |        |        |                     |        |              |        |        |    |    |    |    |        |         |    |    |    |        |
|                | 56           |        |        |                     |        |              |        |        |    |    |    |    |        |         |    |    |    |        |

NOTES: N/M MEANS NOT MEASURED  
 N/A MEANS NOT AVAILABLE



**ENVIRONMENTAL & GEOTECHNICAL  
SPECIALISTS, INC.**

104 North Magnolia Drive  
Tallahassee, Florida 32301  
Office #: (850) 386-1253  
Fax #: (850) 385-8050

**PROJECT:** HARBINWOOD ESTATES SWMF SINKHOLE

**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-4

**DRILLER:** M. CASTILLO

**DEPTH TO WATER: INITIAL:**  $\nabla$  4.7'

**HAMMER TYPE:** AUTOMATIC

**ELEVATION (FEET):** 111

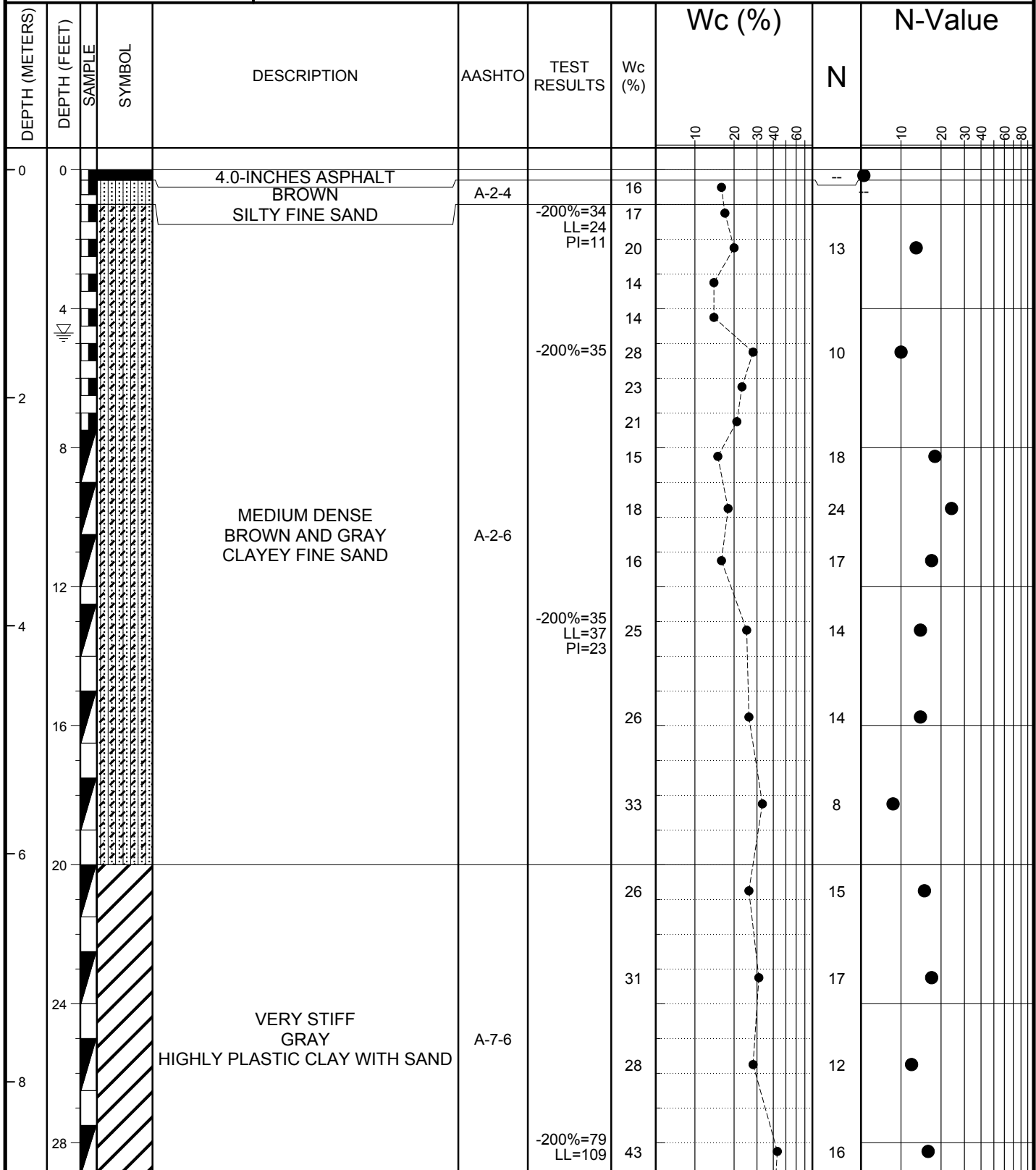
**DATE:** 1/10/19

**FLUID LOSS:** 100% @ 30'

**CAVING:**  $\underline{C}$  NONE

**24 HR:**  $\nabla$  N/M

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



**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

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**PROJECT:** HARBINWOOD ESTATES SWMF SINKHOLE

**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-4

**DRILLER:** M. CASTILLO

**DEPTH TO WATER: INITIAL:** 4.7'

**HAMMER TYPE:** AUTOMATIC

**ELEVATION (FEET):** 111

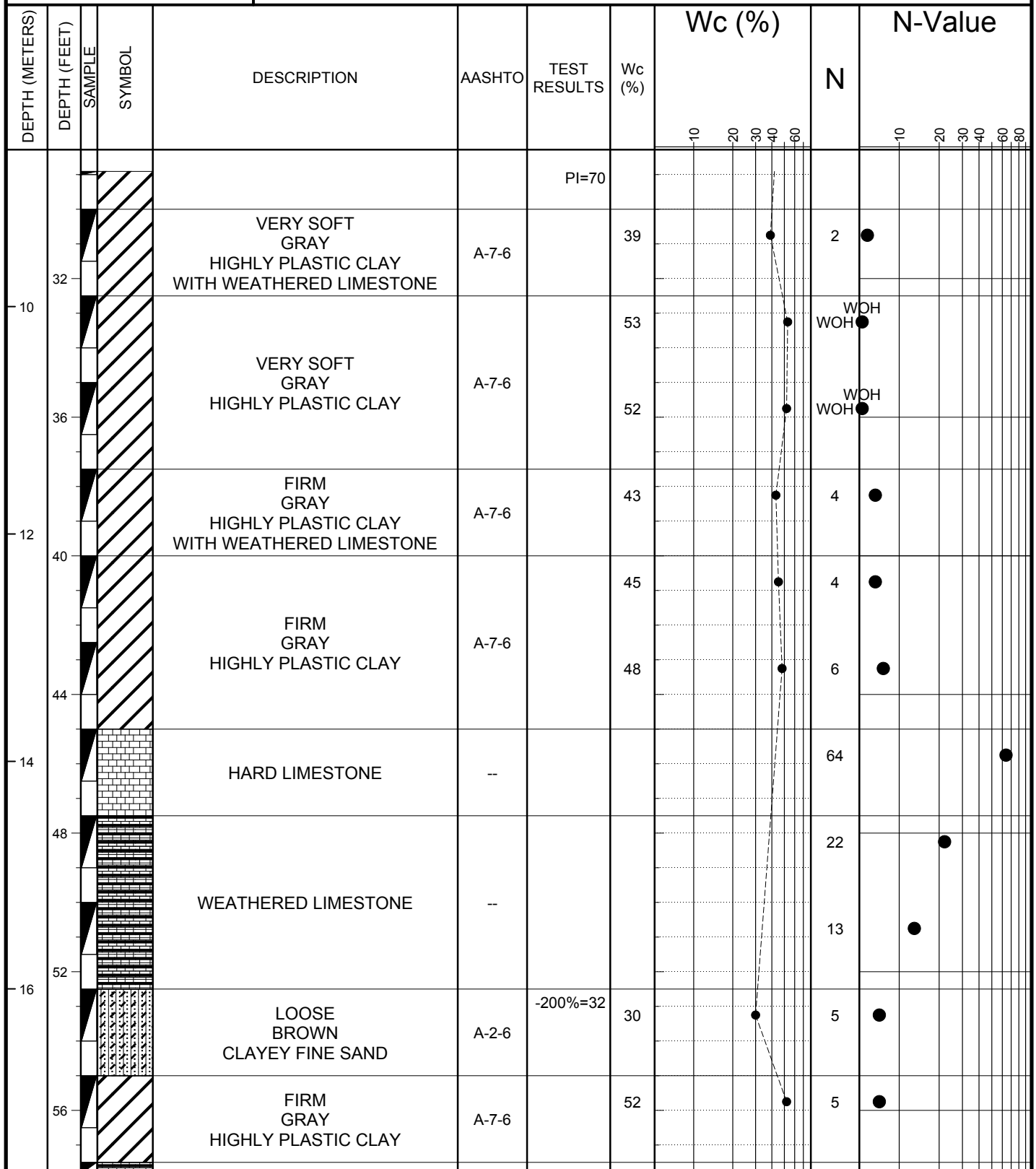
**DATE:** 1/10/19

**FLUID LOSS:** 100% @ 30'

**CAVING:** C NONE

**24 HR:** N/M

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



**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

|  |   |                                      |
|--|---|--------------------------------------|
| <b>ENVIRONMENTAL &amp; GEOTECHNICAL<br/>SPECIALISTS, INC.</b><br><br>104 North Magnolia Drive<br>Tallahassee, Florida 32301<br>Office #: (850) 386-1253<br>Fax #: (850) 385-8050 | <b>PROJECT:</b> <u>HARBINWOOD ESTATES SWMF SINKHOLE</u> | <b>HAMMER TYPE:</b> <u>AUTOMATIC</u> |
|  | <b>CLIENT:</b> <u>LEON COUNTY PUBLIC WORKS</u>          | <b>ELEVATION (FEET):</b> <u>111</u>  |
|  | <b>PROJECT NO.:</b> <u>03-47-18-04</u>                  | <b>DATE:</b> <u>1/10/19</u>          |
|  | <b>PROJECT LOCATION:</b> <u>LEON COUNTY, FLORIDA</u>    | <b>FLUID LOSS:</b> <u>100% @ 30'</u> |
|  | <b>BORING NO.:</b> <u>VB-4</u>                          | <b>CAVING:</b> <u>C NONE</u>         |
| <b>DRILLER:</b> <u>M. CASTILLO</u>   | <b>DEPTH TO WATER: INITIAL:</b> $\nabla$ <u>4.7'</u>    | <b>24 HR:</b> $\nabla$ <u>N/M</u>    |

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

| DEPTH (METERS) | DEPTH (FEET) | SAMPLE | SYMBOL | DESCRIPTION         | AASHTO | TEST RESULTS | Wc (%) | Wc (%) |    |    |    |       | N | N-Value |    |    |    |    |    |  |  |  |  |  |  |
|----------------|--------------|--------|--------|---------------------|--------|--------------|--------|--------|----|----|----|-------|---|---------|----|----|----|----|----|--|--|--|--|--|--|
|                |              |        |        |                     |        |              |        | 10     | 20 | 30 | 40 | 60    |   | 10      | 20 | 30 | 40 | 60 | 80 |  |  |  |  |  |  |
|                | 18           |        |        | WEATHERED LIMESTONE | --     |              |        |        |    |    |    | 16    |   |         |    |    |    |    |    |  |  |  |  |  |  |
|                | 60           |        |        | HARD LIMESTONE      | --     |              |        |        |    |    |    | 50/5" |   |         |    |    |    |    |    |  |  |  |  |  |  |
|                | 50/2"        |        |        |                     |        |              |        |        |    |    |    | 50/2" |   |         |    |    |    |    |    |  |  |  |  |  |  |
|                | 64           |        |        |                     |        |              |        |        |    |    |    |       |   |         |    |    |    |    |    |  |  |  |  |  |  |
|                | 20           |        |        |                     |        |              |        |        |    |    |    |       |   |         |    |    |    |    |    |  |  |  |  |  |  |
|                | 68           |        |        |                     |        |              |        |        |    |    |    |       |   |         |    |    |    |    |    |  |  |  |  |  |  |
|                | 22           |        |        |                     |        |              |        |        |    |    |    |       |   |         |    |    |    |    |    |  |  |  |  |  |  |
|                | 72           |        |        |                     |        |              |        |        |    |    |    |       |   |         |    |    |    |    |    |  |  |  |  |  |  |
|                | 76           |        |        |                     |        |              |        |        |    |    |    |       |   |         |    |    |    |    |    |  |  |  |  |  |  |
|                | 24           |        |        |                     |        |              |        |        |    |    |    |       |   |         |    |    |    |    |    |  |  |  |  |  |  |
|                | 80           |        |        |                     |        |              |        |        |    |    |    |       |   |         |    |    |    |    |    |  |  |  |  |  |  |
|                | 84           |        |        |                     |        |              |        |        |    |    |    |       |   |         |    |    |    |    |    |  |  |  |  |  |  |
|                | 26           |        |        |                     |        |              |        |        |    |    |    |       |   |         |    |    |    |    |    |  |  |  |  |  |  |

**NOTES: N/M MEANS NOT MEASURED**  
**N/A MEANS NOT AVAILABLE**

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Office #: (850) 386-1253  
Fax #: (850) 385-8050

**PROJECT:** HARBINWOOD ESTATES SWMF SINKHOLE

**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-5

**DRILLER:** M. CASTILLO

**DEPTH TO WATER: INITIAL:**  $\nabla$  13.0'

**HAMMER TYPE:** AUTOMATIC

**ELEVATION (FEET):** 112

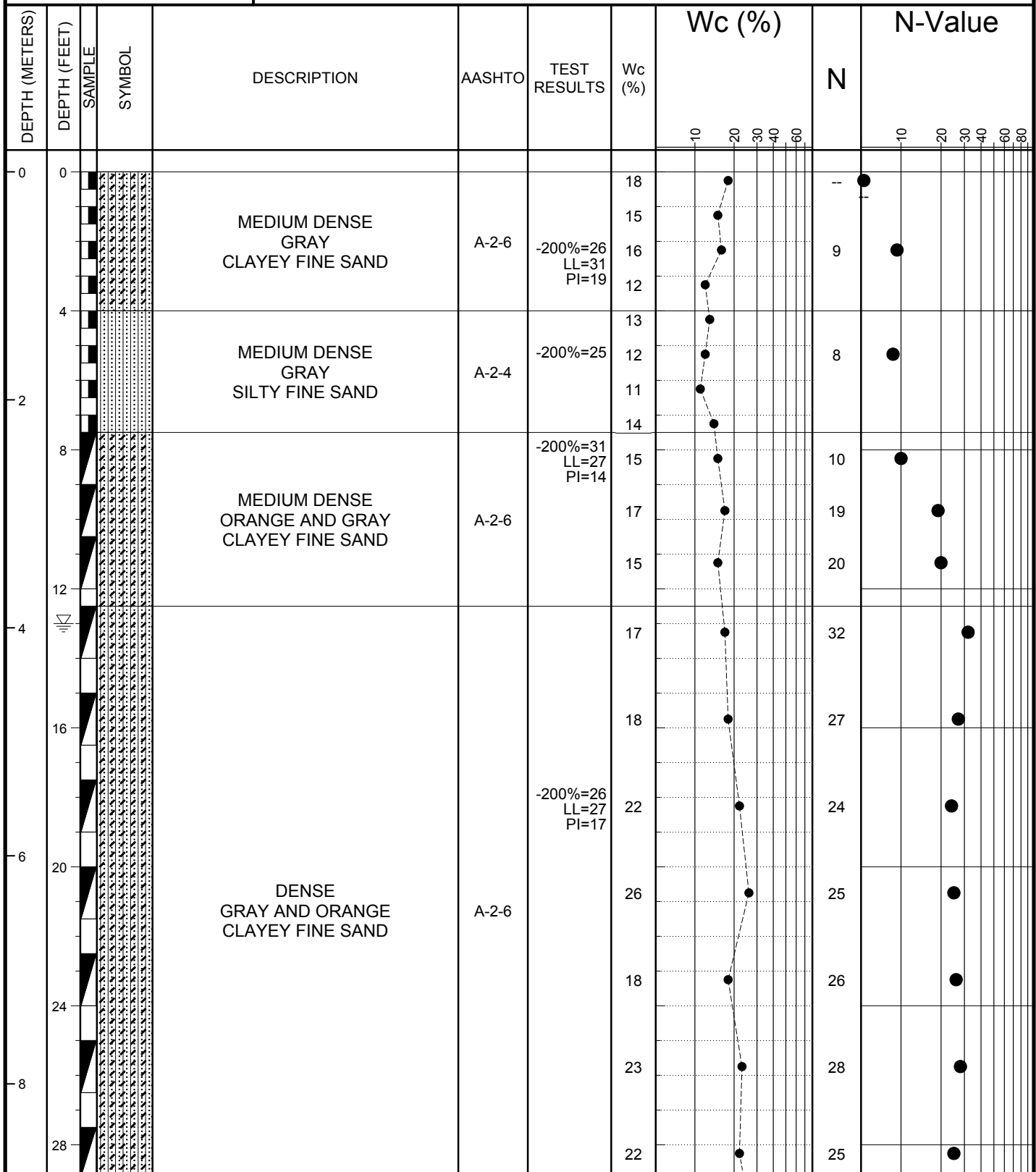
**DATE:** 1/21/19

**FLUID LOSS:** NONE

**CAVING:**  $\underline{C}$  NONE

**24 HR:**  $\nabla$  N/M

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**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

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**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-5

**DRILLER:** M. CASTILLO

**DEPTH TO WATER: INITIAL:** 13.0'

**HAMMER TYPE:** AUTOMATIC

**ELEVATION (FEET):** 112

**DATE:** 1/21/19

**FLUID LOSS:** NONE

**CAVING:** C NONE

**24 HR:** N/M

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

| DEPTH (METERS) | DEPTH (FEET) | SAMPLE | SYMBOL | DESCRIPTION                                 | AASHTO | TEST RESULTS                | Wc (%) | Wc (%) |    | N  | N-Value |    |
|----------------|--------------|--------|--------|---|--------|-----------------------------|--------|--------|----|----|---------|----|
|                |              |        |        |   |        |                             |        | 10     | 20 |    | 30      | 40 |
|                | 32           |        |        | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND    | A-2-6  | -200%=25<br>LL=33<br>PI=22  | 29     |        |    | 17 |         |    |
|                | 36           |        |        |   |        |                             | 30     |        |    | 16 |         |    |
|                | 40           |        |        | VERY STIFF<br>ORANGE<br>HIGHLY PLASTIC CLAY | A-7-6  |                             | 51     |        |    | 15 |         |    |
|                | 44           |        |        | STIFF<br>ORANGE<br>HIGHLY PLASTIC CLAY      | A-7-6  | -200%=95<br>LL=125<br>PI=96 | 63     |        |    | 9  |         |    |
|                | 48           |        |        | WEATHERED LIMESTONE                         | --     |                             | 58     |        |    | 10 |         |    |
|                | 52           |        |        | HARD LIMESTONE                              | --     |                             |        |        |    | 9  |         |    |
|                | 56           |        |        |   |        |                             |        |        |    | 46 |         |    |

**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

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**PROJECT:** HARBINWOOD ESTATES SWMF SINKHOLE

**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-6

**DRILLER:** R. ROGERS

**DEPTH TO WATER: INITIAL:** 5.0'

**HAMMER TYPE:** AUTOMATIC

**ELEVATION (FEET):** 112

**DATE:** 2/11/19

**FLUID LOSS:** 100% @ 35.0'

**CAVING:** C NONE

**24 HR:** N/M

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

| DEPTH (METERS) | DEPTH (FEET) | SAMPLE | SYMBOL | DESCRIPTION                        | AASHTO | TEST RESULTS               | Wc (%) | Wc (%) |    | N  | N-Value |    |
|----------------|--------------|--------|--------|------------------------------------|--------|----------------------------|--------|--------|----|----|---------|----|
|                |              |        |        |                                    |        |                            |        | 10     | 20 |    | 30      | 40 |
| 0              | 0            |        |        | 6.0-INCHES ASPHALT                 | --     |                            |        |        |    | -- |         |    |
|                |              |        |        | BROWN CLAYEY FINE SAND WITH GRAVEL | A-2-6  | -200%=34<br>LL=30<br>PI=17 | 15     |        |    | 13 |         |    |
|                |              |        |        | MEDIUM DENSE GRAY CLAYEY FINE SAND | A-2-6  |                            | 20     |        |    | 4  |         |    |
|                |              |        |        | LOOSE GRAY CLAYEY FINE SAND        | A-2-6  |                            | 23     |        |    | 4  |         |    |
|                | 4            |        |        | LOOSE GRAY CLAYEY FINE SAND        | A-3    | -200%=16                   | 17     |        |    | 4  |         |    |
|                |              |        |        | LOOSE LIGHT GRAY FINE SAND         | A-3    |                            | 14     |        |    | 8  |         |    |
|                |              |        |        | LOOSE GRAY CLAYEY FINE SAND        | A-2-6  | -200%=34<br>LL=24<br>PI=11 | 16     |        |    | 8  |         |    |
|                | 2            |        |        | LOOSE GRAY CLAYEY FINE SAND        | A-2-6  |                            | 22     |        |    | 4  |         |    |
|                |              |        |        | LOOSE GRAY CLAYEY FINE SAND        | A-2-6  |                            | 18     |        |    | 7  |         |    |
|                | 8            |        |        |                                    |        |                            | 17     |        |    | 14 |         |    |
|                |              |        |        |                                    |        |                            | 18     |        |    | 16 |         |    |
|                | 4            |        |        | MEDIUM DENSE GRAY CLAYEY FINE SAND | A-2-6  | -200%=26                   | 18     |        |    | 20 |         |    |
|                |              |        |        |                                    |        |                            | 22     |        |    | 10 |         |    |
|                | 6            |        |        |                                    |        |                            | 26     |        |    | 10 |         |    |
|                |              |        |        |                                    |        |                            | 25     |        |    | 8  |         |    |
|                | 20           |        |        | LOOSE GRAY AND ORANGE CLAYEY SAND  | A-6    | -200%=32<br>LL=34<br>PI=19 | 27     |        |    | 7  |         |    |
|                |              |        |        |                                    |        |                            | 44     |        |    | 7  |         |    |
|                | 24           |        |        |                                    |        |                            | 69     |        |    | 7  |         |    |
|                | 8            |        |        |                                    |        |                            |        |        |    |    |         |    |
|                | 28           |        |        |                                    |        |                            |        |        |    |    |         |    |

**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

**ENVIRONMENTAL & GEOTECHNICAL  
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104 North Magnolia Drive  
Tallahassee, Florida 32301  
Office #: (850) 386-1253  
Fax #: (850) 385-8050

**PROJECT:** HARBINWOOD ESTATES SWMF SINKHOLE

**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-6

**DRILLER:** R. ROGERS

**DEPTH TO WATER: INITIAL:** 5.0'

**HAMMER TYPE:** AUTOMATIC

**ELEVATION (FEET):** 112

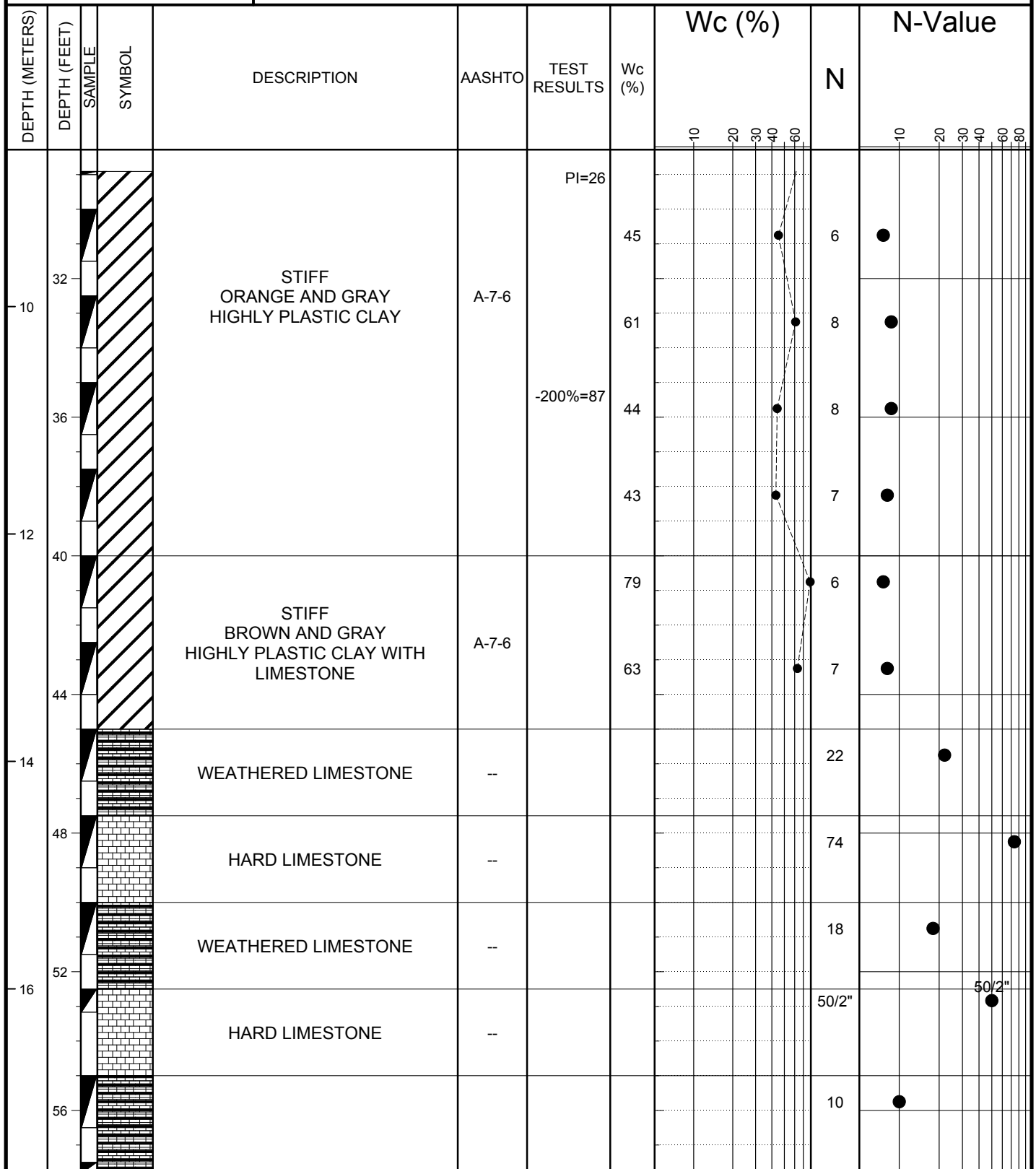
**DATE:** 2/11/19

**FLUID LOSS:** 100% @ 35.0'

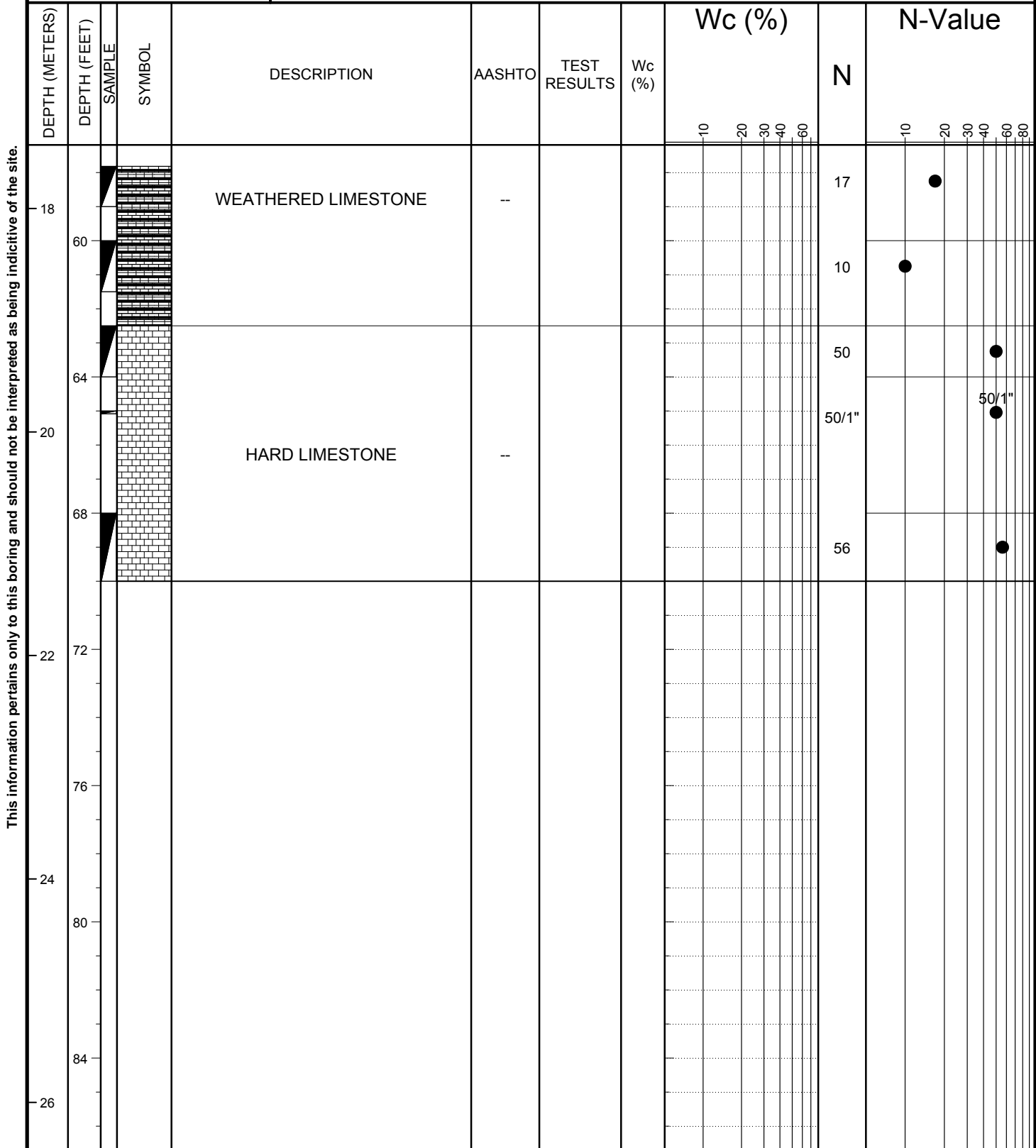
**CAVING:** C NONE

**24 HR:** N/M

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



**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

**ENVIRONMENTAL & GEOTECHNICAL  
SPECIALISTS, INC.**104 North Magnolia Drive  
Tallahassee, Florida 32301  
Office #: (850) 386-1253  
Fax #: (850) 385-8050PROJECT: HARBINWOOD ESTATES SWMF SINKHOLECLIENT: LEON COUNTY PUBLIC WORKSPROJECT NO.: 03-47-18-04PROJECT LOCATION: LEON COUNTY, FLORIDABORING NO.: VB-6DRILLER: R. ROGERSDEPTH TO WATER: INITIAL:  $\nabla$  5.0'HAMMER TYPE: AUTOMATICELEVATION (FEET): 112DATE: 2/11/19FLUID LOSS: 100% @ 35.0'CAVING:  $\underline{\underline{c}}$  NONE24 HR:  $\nabla$  N/MNOTES: N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE



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**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-7

**DRILLER:** R. ROGERS

**DEPTH TO WATER: INITIAL:** 5.0'

**HAMMER TYPE:** AUTOMATIC

**ELEVATION (FEET):** 110

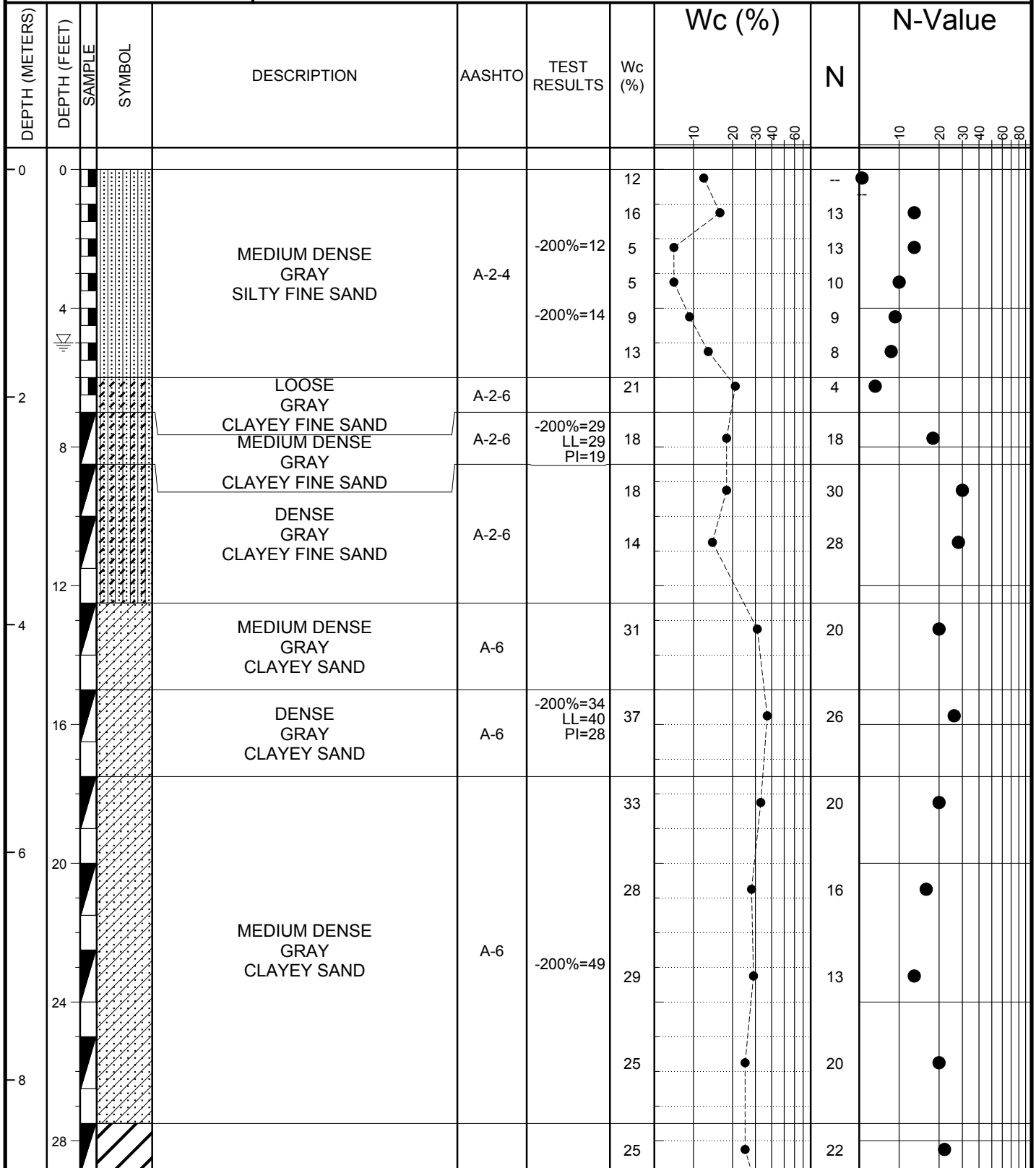
**DATE:** 2/12/19

**FLUID LOSS:** 25% @ 52.0'

**CAVING:** C NONE

**24 HR:** N/M

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**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

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**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-7

**DRILLER:** R. ROGERS

**DEPTH TO WATER: INITIAL:** 5.0'

**HAMMER TYPE:** AUTOMATIC

**ELEVATION (FEET):** 110

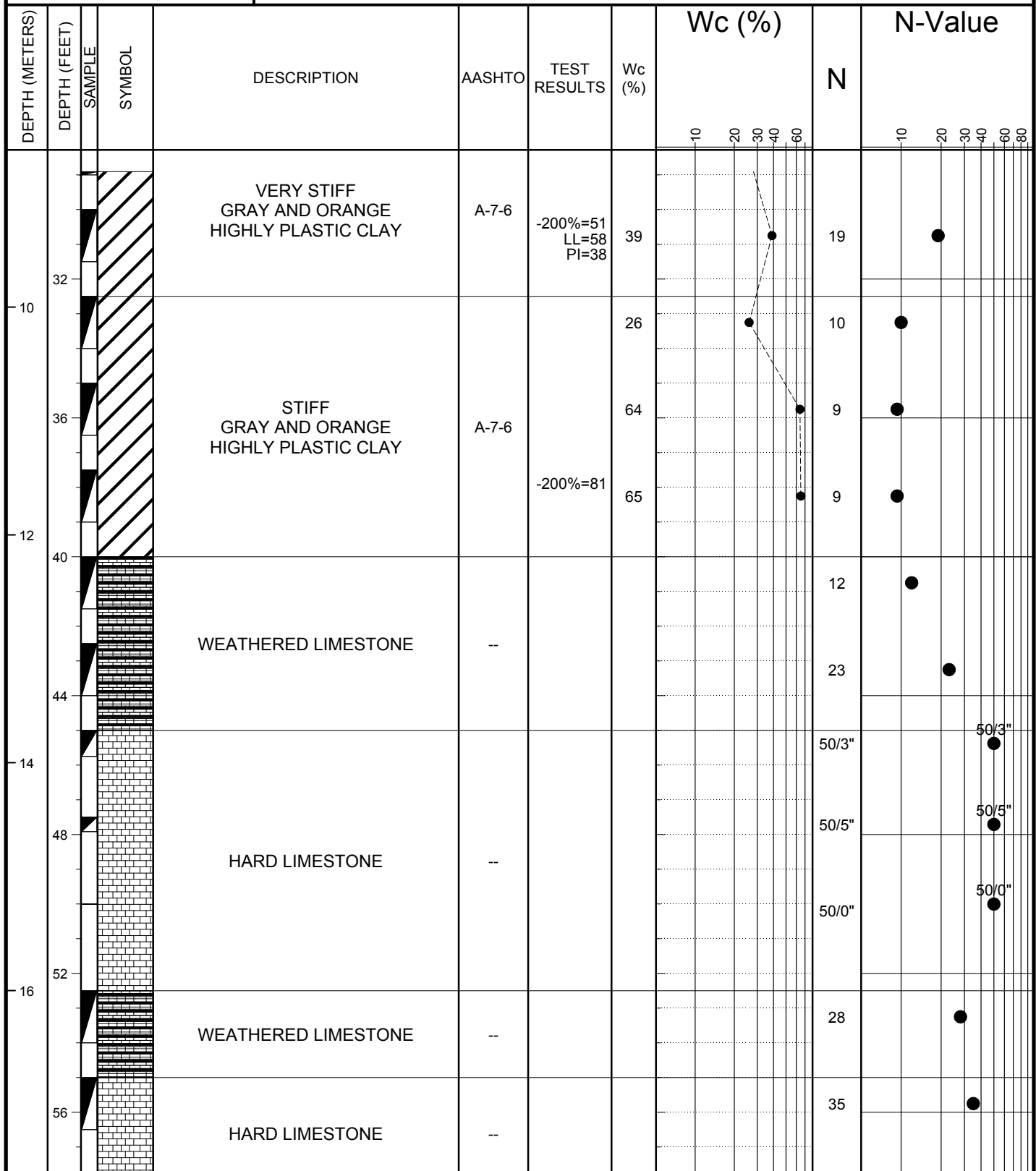
**DATE:** 2/12/19

**FLUID LOSS:** 25% @ 52.0'

**CAVING:** C NONE

**24 HR:** N/M

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



**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

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PROJECT: HARBINWOOD ESTATES SWMF SINKHOLE

CLIENT: LEON COUNTY PUBLIC WORKS

PROJECT NO.: 03-47-18-04

PROJECT LOCATION: LEON COUNTY, FLORIDA

BORING NO.: VB-7

DRILLER: R. ROGERS

DEPTH TO WATER: INITIAL:  $\sphericalangle$  5.0'

HAMMER TYPE: AUTOMATIC

ELEVATION (FEET): 110

DATE: 2/12/19

FLUID LOSS: 25% @ 52.0'

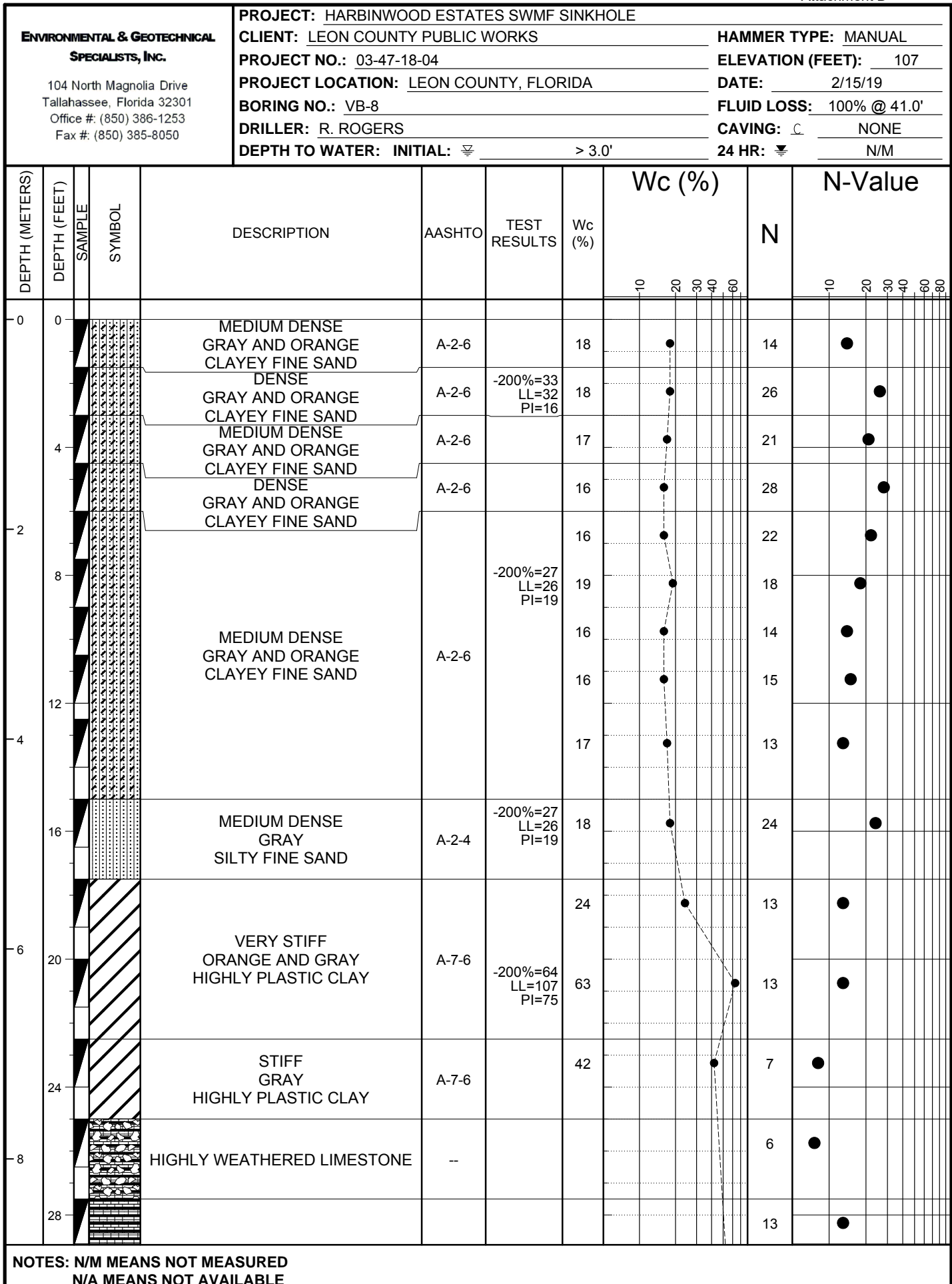
CAVING: C NONE

24 HR:  $\sphericalangle$  N/M

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

| DEPTH (METERS) | DEPTH (FEET) | SAMPLE | SYMBOL | DESCRIPTION | AASHTO | TEST RESULTS | Wc (%) | Wc (%) |    |    |    |       | N | N-Value |    |    |    |    |    |  |       |  |
|----------------|--------------|--------|--------|-------------|--------|--------------|--------|--------|----|----|----|-------|---|---------|----|----|----|----|----|--|-------|--|
|                |              |        |        |             |        |              |        | 10     | 20 | 30 | 40 | 60    |   | 10      | 20 | 30 | 40 | 60 | 80 |  |       |  |
| 18             | 60           |        |        |             |        |              |        |        |    |    |    | 50/2" |   |         |    |    |    |    |    |  | 50/2" |  |
| 20             | 64           |        |        |             |        |              |        |        |    |    |    |       |   |         |    |    |    |    |    |  |       |  |
| 22             | 72           |        |        |             |        |              |        |        |    |    |    |       |   |         |    |    |    |    |    |  |       |  |
| 24             | 76           |        |        |             |        |              |        |        |    |    |    |       |   |         |    |    |    |    |    |  |       |  |
| 26             | 80           |        |        |             |        |              |        |        |    |    |    |       |   |         |    |    |    |    |    |  |       |  |
|                | 84           |        |        |             |        |              |        |        |    |    |    |       |   |         |    |    |    |    |    |  |       |  |

NOTES: N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE



NOTES: N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

**ENVIRONMENTAL & GEOTECHNICAL SPECIALISTS, INC.**

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Office #: (850) 386-1253  
Fax #: (850) 385-8050

**PROJECT:** HARBINWOOD ESTATES SWMF SINKHOLE

**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-8

**DRILLER:** R. ROGERS

**DEPTH TO WATER: INITIAL:**  $\sphericalangle$  > 3.0'

**HAMMER TYPE:** MANUAL

**ELEVATION (FEET):** 107

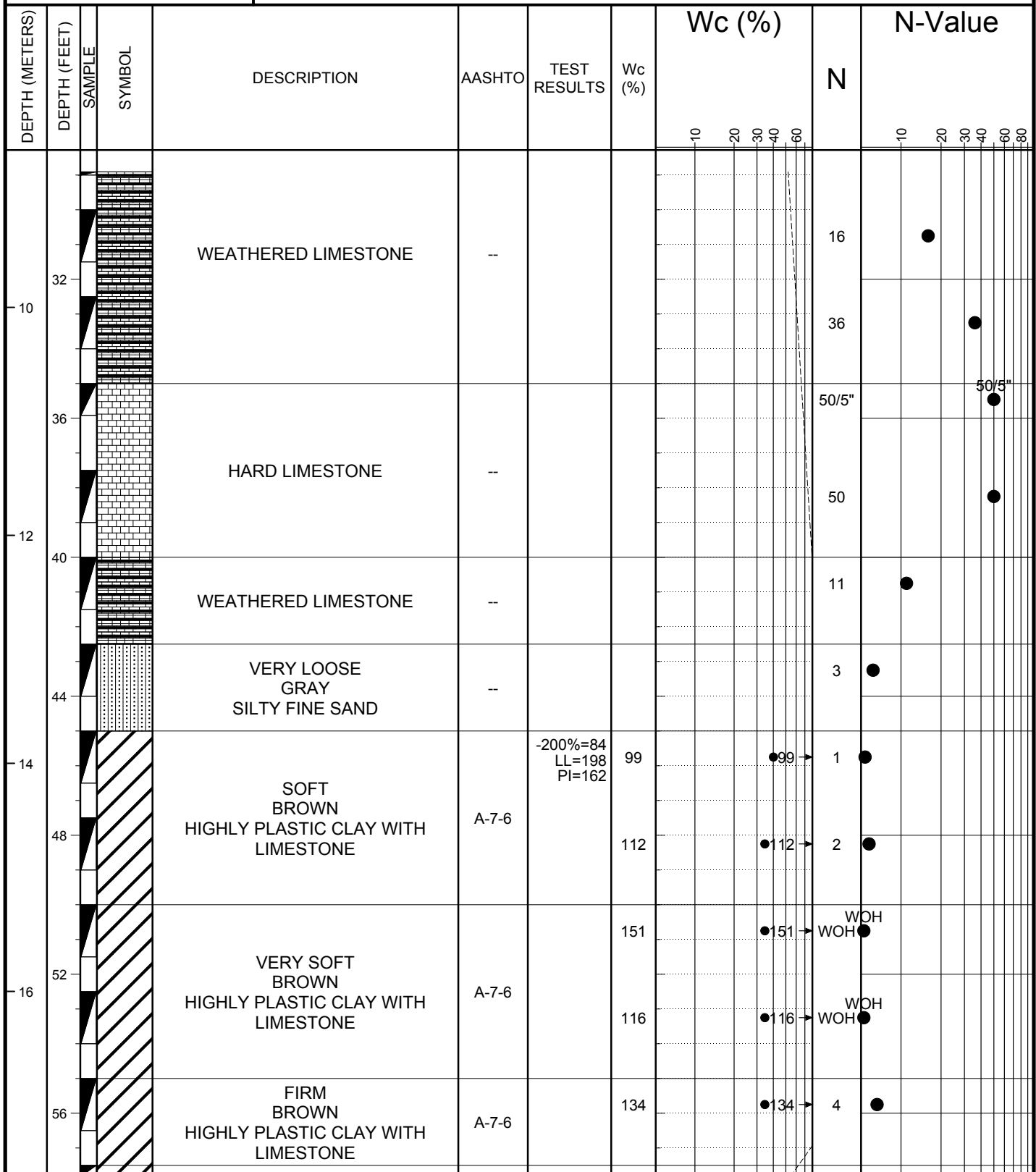
**DATE:** 2/15/19

**FLUID LOSS:** 100% @ 41.0'

**CAVING:** C NONE

**24 HR:**  $\sphericalangle$  N/M

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



**NOTES: N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE**

**ENVIRONMENTAL & GEOTECHNICAL  
SPECIALISTS, INC.**

104 North Magnolia Drive  
Tallahassee, Florida 32301  
Office #: (850) 386-1253  
Fax #: (850) 385-8050

**PROJECT:** HARBINWOOD ESTATES SWMF SINKHOLE

**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-8

**DRILLER:** R. ROGERS

**DEPTH TO WATER: INITIAL:**  $\nabla$  > 3.0'

**HAMMER TYPE:** MANUAL

**ELEVATION (FEET):** 107

**DATE:** 2/15/19

**FLUID LOSS:** 100% @ 41.0'

**CAVING:** C NONE

**24 HR:**  $\nabla$  N/M

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

| DEPTH (METERS) | DEPTH (FEET) | SAMPLE | SYMBOL | DESCRIPTION                                    | AASHTO | TEST RESULTS | Wc (%) | Wc (%) |    | N     | N-Value |       |
|----------------|--------------|--------|--------|--|--------|--------------|--------|--------|----|-------|---------|-------|
|                |              |        |        |  |        |              |        | 10     | 20 |       | 30      | 40    |
| 18             | 60           |        |        | SOFT BROWN HIGHLY PLASTIC CLAY WITH LIMESTONE  | A-7-6  |              | 45     |        |    | 2     |         |       |
|                |              |        |        | FIRM BROWN HIGHLY PLASTIC CLAY WITH LIMESTONE  | A-7-6  |              | 99     |        |    | 4     |         |       |
|                |              |        |        | STIFF BROWN HIGHLY PLASTIC CLAY WITH LIMESTONE | A-7-6  |              | 148    |        |    | 8     |         |       |
| 20             |              |        |        | WEATHERED LIMESTONE                            | --     |              |        |        |    | 20    |         |       |
|                |              |        |        | HARD LIMESTONE                                 | --     |              |        |        |    | 50/1" |         | 50/1" |
| 22             | 72           |        |        |  |        |              |        |        |    |       |         |       |
|                |              |        |        |  |        |              |        |        |    |       |         |       |
|                |              |        |        |  |        |              |        |        |    |       |         |       |
|                |              |        |        |  |        |              |        |        |    |       |         |       |
| 24             | 80           |        |        |  |        |              |        |        |    |       |         |       |
|                |              |        |        |  |        |              |        |        |    |       |         |       |
|                |              |        |        |  |        |              |        |        |    |       |         |       |
|                |              |        |        |  |        |              |        |        |    |       |         |       |
| 26             | 84           |        |        |  |        |              |        |        |    |       |         |       |

**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

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SPECIALISTS, INC.**

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Office #: (850) 386-1253  
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**PROJECT:** HARBINWOOD ESTATES SWMF SINKHOLE

**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-9

**DRILLER:** R. ROGERS

**DEPTH TO WATER: INITIAL:** ∅ 6.5'

**HAMMER TYPE:** AUTOMATIC

**ELEVATION (FEET):** 112

**DATE:** 2/20/19

**FLUID LOSS:** 100% @ 24.0'

**CAVING:** ∅ NONE

**24 HR:** ∅ N/M

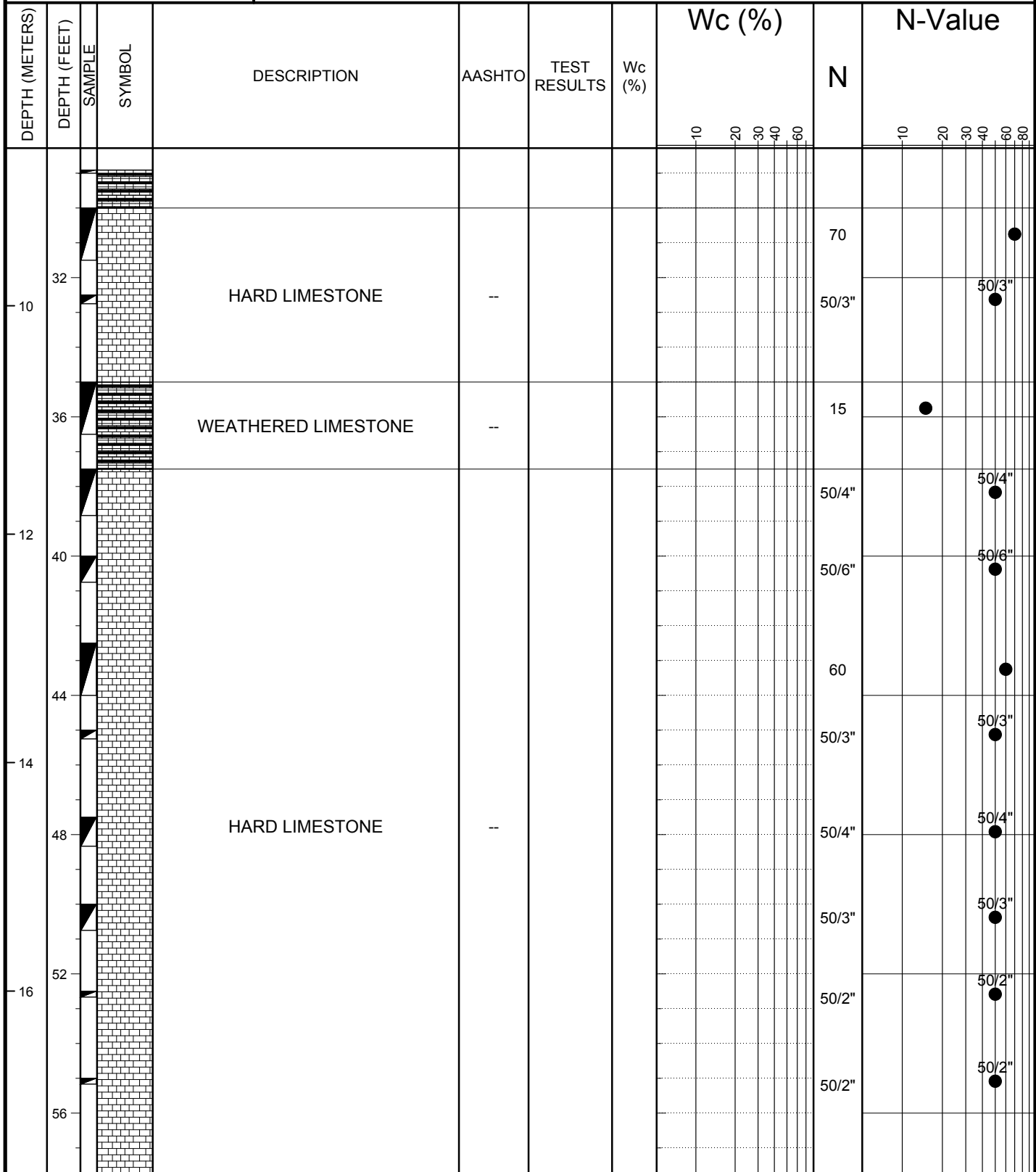
This information pertains only to this boring and should not be interpreted as being indicative of the site.

| DEPTH (METERS) | DEPTH (FEET) | SAMPLE | SYMBOL | DESCRIPTION                              | AASHTO | TEST RESULTS                | Wc (%) | Wc (%) |    | N  | N-Value |    |    |    |  |  |
|----------------|--------------|--------|--------|--|--------|-----------------------------|--------|--------|----|----|---------|----|----|----|--|--|
|                |              |        |        |  |        |                             |        | 10     | 20 |    | 30      | 40 | 60 | 80 |  |  |
| 0              | 0            |        |        | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND | A-2-6  | -200%=28                    | 13     | 10     | 10 | 10 | 10      |    |    |    |  |  |
|                | 4            |        |        | LOOSE<br>GRAY<br>CLAYEY FINE SAND        | A-2-6  | -200%=30<br>LL=28<br>PI=14  | 19     | 20     | 22 | 8  | 5       | 4  |    |    |  |  |
|                | 8            |        |        | LOOSE<br>ORANGE AND GRAY<br>CLAYEY SAND  | A-6    | -200%=43<br>LL=36<br>PI=22  | 21     | 21     | 22 | 6  | 7       | 10 |    |    |  |  |
|                | 12           |        |        | STIFF<br>GRAY<br>HIGHLY PLASTIC CLAY     | A-7-6  | -200%=87<br>LL=102<br>PI=66 | 55     | 55     |    | 11 |         |    |    |    |  |  |
|                | 16           |        |        | WEATHERED LIMESTONE                      | --     |                             |        |        |    | 19 |         |    |    |    |  |  |
|                | 20           |        |        | HARD LIMESTONE                           | --     |                             |        |        |    | 34 |         |    |    |    |  |  |
|                | 24           |        |        | HIGHLY WEATHERED LIMESTONE               | --     |                             |        |        |    | 4  |         |    |    |    |  |  |
|                | 28           |        |        | WEATHERED LIMESTONE                      | --     |                             |        |        |    | 18 |         |    |    |    |  |  |
|                |              |        |        |  |        |                             |        |        |    | 9  |         |    |    |    |  |  |

**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

|  |  |  |
|--|--|--|
| <b>ENVIRONMENTAL &amp; GEOTECHNICAL<br/>SPECIALISTS, INC.</b><br><br>104 North Magnolia Drive<br>Tallahassee, Florida 32301<br>Office #: (850) 386-1253<br>Fax #: (850) 385-8050 | <b>PROJECT:</b> <u>HARBINWOOD ESTATES SWMF SINKHOLE</u><br><b>CLIENT:</b> <u>LEON COUNTY PUBLIC WORKS</u><br><b>PROJECT NO.:</b> <u>03-47-18-04</u><br><b>PROJECT LOCATION:</b> <u>LEON COUNTY, FLORIDA</u><br><b>BORING NO.:</b> <u>VB-9</u><br><b>DRILLER:</b> <u>R. ROGERS</u><br><b>DEPTH TO WATER: INITIAL:</b> <u>∅ 6.5'</u> | <b>HAMMER TYPE:</b> <u>AUTOMATIC</u><br><b>ELEVATION (FEET):</b> <u>112</u><br><b>DATE:</b> <u>2/20/19</u><br><b>FLUID LOSS:</b> <u>100% @ 24.0'</u><br><b>CAVING:</b> <u>C NONE</u><br><b>24 HR:</b> <u>∅ N/M</u> |
|--|--|--|

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NOTES: N/M MEANS NOT MEASURED  
 N/A MEANS NOT AVAILABLE



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**PROJECT:** HARBINWOOD ESTATES SWMF SINKHOLE

**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-9

**DRILLER:** R. ROGERS

**DEPTH TO WATER: INITIAL:**  $\sphericalangle$  6.5'

**HAMMER TYPE:** AUTOMATIC

**ELEVATION (FEET):** 112

**DATE:** 2/20/19

**FLUID LOSS:** 100% @ 24.0'

**CAVING:**  NONE

**24 HR:**  $\sphericalangle$  N/M

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

| DEPTH (METERS) | DEPTH (FEET) | SAMPLE | SYMBOL | DESCRIPTION | AASHTO | TEST RESULTS | Wc (%) | Wc (%) |    |    |    |       | N | N-Value |    |    |    |    |    |  |  |  |  |  |       |  |
|----------------|--------------|--------|--------|-------------|--------|--------------|--------|--------|----|----|----|-------|---|---------|----|----|----|----|----|--|--|--|--|--|-------|--|
|                |              |        |        |             |        |              |        | 10     | 20 | 30 | 40 | 60    |   | 10      | 20 | 30 | 40 | 60 | 80 |  |  |  |  |  |       |  |
| 18             | 60           |        |        |             |        |              |        |        |    |    |    | 50/1" |   |         |    |    |    |    |    |  |  |  |  |  | 50/1" |  |
| 20             | 64           |        |        |             |        |              |        |        |    |    |    |       |   |         |    |    |    |    |    |  |  |  |  |  |       |  |
| 22             | 72           |        |        |             |        |              |        |        |    |    |    |       |   |         |    |    |    |    |    |  |  |  |  |  |       |  |
| 24             | 80           |        |        |             |        |              |        |        |    |    |    |       |   |         |    |    |    |    |    |  |  |  |  |  |       |  |
| 26             | 84           |        |        |             |        |              |        |        |    |    |    |       |   |         |    |    |    |    |    |  |  |  |  |  |       |  |

**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

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**PROJECT:** HARBINWOOD ESTATES SWMF SINKHOLE

**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-10

**DRILLER:** J.GAYMON

**DEPTH TO WATER: INITIAL:**  $\nabla$  > 6.5'

**HAMMER TYPE:** AUTOMATIC

**ELEVATION (FEET):** 110

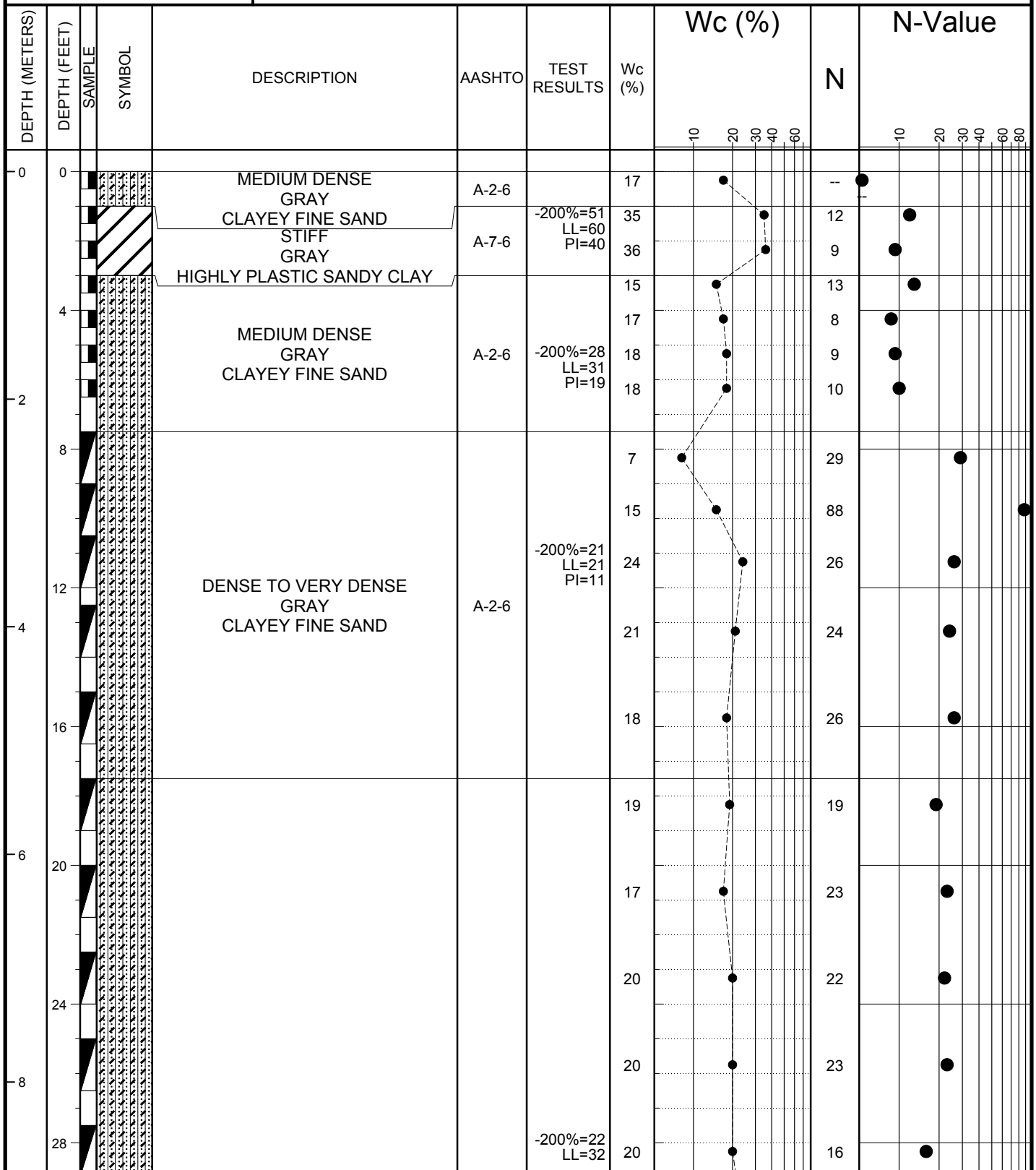
**DATE:** 4/4/2019

**FLUID LOSS:** NONE

**CAVING:**  $\underline{C}$  NONE

**24 HR:**  $\nabla$  N/M

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**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

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**PROJECT:** HARBINWOOD ESTATES SWMF SINKHOLE

**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-10

**DRILLER:** J.GAYMON

**DEPTH TO WATER: INITIAL:** ∅ > 6.5'

**HAMMER TYPE:** AUTOMATIC

**ELEVATION (FEET):** 110

**DATE:** 4/4/2019

**FLUID LOSS:** NONE

**CAVING:** C NONE

**24 HR:** ∅ N/M

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

| DEPTH (METERS) | DEPTH (FEET) | SAMPLE | SYMBOL | DESCRIPTION  | AASHTO | TEST RESULTS               | Wc (%) | Wc (%) |    | N  | N-Value |    |    |
|----------------|--------------|--------|--------|--|--------|----------------------------|--------|--------|----|----|---------|----|----|
|                |              |        |        |  |        |                            |        | 10     | 20 |    | 30      | 40 | 60 |
|                |              |        |        | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND           | A-2-6  | PI=15                      |        |        |    |    |         |    |    |
|                | 32           |        |        |  |        |                            | 25     |        |    | 16 |         |    |    |
| 10             |              |        |        |  |        |                            | 20     |        |    | 12 |         |    |    |
|                | 36           |        |        |  |        |                            | 22     |        |    | 12 |         |    |    |
|                | 40           |        |        |  |        |                            | 23     |        |    | 14 |         |    |    |
| 12             |              |        |        |  |        |                            | 28     |        |    | 14 |         |    |    |
|                | 44           |        |        |  |        | -200%=51<br>LL=44<br>PI=26 | 29     |        |    | 12 |         |    |    |
| 14             |              |        |        | STIFF<br>GRAY<br>HIGHLY PLASTIC VERY SANDY<br>CLAY | A-7-6  |                            | 36     |        |    | 11 |         |    |    |
|                | 48           |        |        |  |        |                            | 35     |        |    | 12 |         |    |    |
|                | 52           |        |        |  |        |                            | 37     |        |    | 12 |         |    |    |
| 16             |              |        |        |  |        |                            |        |        |    |    |         |    |    |
|                | 56           |        |        |  |        |                            |        |        |    |    |         |    |    |

**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

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PROJECT: HARBINWOOD ESTATES SWMF SINKHOLE

CLIENT: LEON COUNTY PUBLIC WORKS

PROJECT NO.: 03-47-18-04

PROJECT LOCATION: LEON COUNTY, FLORIDA

BORING NO.: VB-11

DRILLER: R. ROGERS

DEPTH TO WATER: INITIAL:  $\nabla$  > 3.0'

HAMMER TYPE: MANUAL

ELEVATION (FEET): 104

DATE: 5/15/2019

FLUID LOSS: 100% 32.5'

CAVING: C NONE

24 HR:  $\nabla$  N/M

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

| DEPTH (METERS) | DEPTH (FEET) | SAMPLE | SYMBOL | DESCRIPTION   | AASHTO | TEST RESULTS                | Wc (%) | Wc (%) |    | N  | N-Value |    |
|----------------|--------------|--------|--------|---|--------|-----------------------------|--------|--------|----|----|---------|----|
|                |              |        |        |   |        |                             |        | 10     | 20 |    | 30      | 40 |
| 0              | 0            |        |        | LOOSE<br>LIGHT BROWN<br>SILTY FINE SAND               | A-2-4  |                             | 11     | 10     | 20 | 7  | 10      |    |
|                | 4            |        |        | MEDIUM DENSE<br>LIGHT BROWN<br>SILTY FINE SAND        | A-2-4  | -200%=23                    | 12     | 10     | 20 | 11 | 10      |    |
|                | 8            |        |        |   |        | 14                          | 18     | 18     | 20 |    |         |    |
|                | 12           |        |        |   |        | 16                          | 12     | 17     | 20 |    |         |    |
|                | 16           |        |        |   |        | 15                          | 17     | 19     | 20 |    |         |    |
|                | 20           |        |        |   |        | 18                          | 19     | 15     | 20 |    |         |    |
|                | 24           |        |        | MEDIUM DENSE<br>LIGHT BROWN<br>CLAYEY SAND            | A-6    | -200%=26<br>LL=22<br>PI=4   | 19     | 10     | 20 | 13 | 10      |    |
|                | 28           |        |        |   |        | 20                          | 13     | 15     | 20 |    |         |    |
|                | 32           |        |        | STIFF<br>LIGHT BROWN<br>HIGHLY PLASTIC CLAY WITH SAND | A-7-6  | -200%=83<br>LL=112<br>PI=71 | 27     | 10     | 20 | 10 | 10      |    |
|                | 36           |        |        |   |        | 28                          | 15     | 8      | 20 |    |         |    |
|                | 40           |        |        |   |        | 64                          | 12     | 10     | 20 |    |         |    |
|                | 44           |        |        |   |        |                             | 63     | 8      | 20 | 8  |         |    |
|                | 48           |        |        |   |        |                             | 59     | 10     | 20 | 10 |         |    |
|                | 52           |        |        |   |        |                             | 62     | 8      | 20 | 8  |         |    |

NOTES: N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

|  |   |                          |                                      |
|--|---|--------------------------|--------------------------------------|
| <b>ENVIRONMENTAL &amp; GEOTECHNICAL SPECIALISTS, INC.</b><br><br>104 North Magnolia Drive<br>Tallahassee, Florida 32301<br>Office #: (850) 386-1253<br>Fax #: (850) 385-8050 | <b>PROJECT:</b> <u>HARBINWOOD ESTATES SWMF SINKHOLE</u> |                          | <b>HAMMER TYPE:</b> <u>MANUAL</u>    |
|  | <b>CLIENT:</b> <u>LEON COUNTY PUBLIC WORKS</u>          |                          | <b>ELEVATION (FEET):</b> <u>104</u>  |
|  | <b>PROJECT NO.:</b> <u>03-47-18-04</u>                  |                          | <b>DATE:</b> <u>5/15/2019</u>        |
|  | <b>PROJECT LOCATION:</b> <u>LEON COUNTY, FLORIDA</u>    |                          | <b>FLUID LOSS:</b> <u>100% 32.5'</u> |
|  | <b>BORING NO.:</b> <u>VB-11</u>                         |                          | <b>CAVING:</b> <u>C NONE</u>         |
| <b>DRILLER:</b> <u>R. ROGERS</u>   |   | <b>24 HR:</b> <u>N/M</u> |                                      |
| <b>DEPTH TO WATER: INITIAL:</b> $\nabla$ <u>&gt; 3.0'</u>  |   |                          |                                      |

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

| DEPTH (METERS) | DEPTH (FEET) | SAMPLE | SYMBOL | DESCRIPTION                                      | AASHTO | TEST RESULTS                | Wc (%) | Wc (%) |    | N     | N-Value |       |
|----------------|--------------|--------|--------|--|--------|-----------------------------|--------|--------|----|-------|---------|-------|
|                |              |        |        |  |        |                             |        | 10     | 20 |       | 30      | 40    |
|                |              |        |        |  |        |                             |        |        |    |       |         |       |
|                | 32           |        |        | STIFF<br>LIGHT BROWN<br>HIGHLY PLASTIC SILT      | A-7-5  | -200%=94<br>LL=142<br>PI=72 | 92     |        |    | 14    |         |       |
| 10             |              |        |        |  |        |                             | 89     |        |    | 9     |         |       |
|                | 36           |        |        | VERY STIFF<br>LIGHT BROWN<br>HIGHLY PLASTIC SILT | A-7-5  |                             | 82     |        |    | 19    |         |       |
|                |              |        |        | REFUSAL  | --     |                             | --     |        |    | 50/0" |         | 50/C" |
| 12             | 40           |        |        |  |        |                             |        |        |    |       |         |       |
|                | 44           |        |        |  |        |                             |        |        |    |       |         |       |
| 14             | 48           |        |        |  |        |                             |        |        |    |       |         |       |
|                | 52           |        |        |  |        |                             |        |        |    |       |         |       |
| 16             | 56           |        |        |  |        |                             |        |        |    |       |         |       |

**NOTES:** N/M MEANS NOT MEASURED  
 N/A MEANS NOT AVAILABLE

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**PROJECT:** HARBINWOOD ESTATES SWMF SINKHOLE

**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-12

**DRILLER:** R. ROGERS

**DEPTH TO WATER: INITIAL:**  $\nabla$  > 3.0'

**HAMMER TYPE:** MANUAL

**ELEVATION (FEET):** 104

**DATE:** 5/14/2019

**FLUID LOSS:** 100% AT 27.5'

**CAVING:**  $\surd$  NONE

**24 HR:**  $\nabla$  N/M

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

| DEPTH (METERS) | DEPTH (FEET) | SAMPLE | SYMBOL | DESCRIPTION  | AASHTO | TEST RESULTS                | Wc (%) | Wc (%) |    | N     | N-Value |    |
|----------------|--------------|--------|--------|--|--------|-----------------------------|--------|--------|----|-------|---------|----|
|                |              |        |        |  |        |                             |        | 10     | 20 |       | 30      | 40 |
| 0              | 0            |        |        | FIRM<br>LIGHT BROWN<br>PLASTIC CLAY                        | A-7-6  |                             | 20     |        |    | 6     |         |    |
|                | 4            |        |        | STIFF<br>LIGHT BROWN<br>PLASTIC CLAY                       | A-7-6  | -200%=53<br>LL=44<br>PI=28  | 21     |        |    | 14    |         |    |
|                | 8            |        |        |  |        |                             | 21     |        |    | 14    |         |    |
|                | 12           |        |        |  |        |                             | 22     |        |    | 12    |         |    |
|                | 16           |        |        |  |        |                             | 22     |        |    | 12    |         |    |
|                | 20           |        |        |  |        |                             | 24     |        |    | 11    |         |    |
|                | 24           |        |        | MEDIUM DENSE<br>LIGHT BROWN<br>PLASTIC CLAYEY SAND         | A-7-6  | -200%=37<br>LL=49<br>PI=32  | 24     |        |    | 18    |         |    |
|                | 28           |        |        |  |        |                             | 29     |        |    | 12    |         |    |
|                | 32           |        |        |  |        |                             | 32     |        |    | 13    |         |    |
|                | 36           |        |        |  |        |                             | 40     |        |    | 15    |         |    |
|                | 40           |        |        | FIRM<br>LIGHT BROWN<br>HIGHLY PLASTIC SILT WITH SAND       | A-7-5  |                             | 73     |        |    | 7     |         |    |
|                | 44           |        |        |  |        |                             | 56     |        |    | 9     |         |    |
|                | 48           |        |        | HARD<br>BROWN<br>HIGHLY PLASTIC SILT WITH SAND             | A-7-5  |                             | 82     |        |    | 50/1" |         |    |
|                | 52           |        |        |  |        |                             | 82     |        |    | 50/1" |         |    |
|                | 56           |        |        | VERY STIFF<br>LIGHT BROWN<br>HIGHLY PLASTIC SILT WITH SAND | A-7-5  | -200%=75<br>LL=174<br>PI=96 | 82     |        |    | 18    |         |    |
|                | 60           |        |        | FIRM   |        |                             | 109    |        |    | 5     |         |    |

**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

|  |   |                          |   |
|--|---|--------------------------|---|
| <b>ENVIRONMENTAL &amp; GEOTECHNICAL SPECIALISTS, INC.</b><br><br>104 North Magnolia Drive<br>Tallahassee, Florida 32301<br>Office #: (850) 386-1253<br>Fax #: (850) 385-8050 | <b>PROJECT:</b> <u>HARBINWOOD ESTATES SWMF SINKHOLE</u> |                          | <b>HAMMER TYPE:</b> <u>MANUAL</u>       |
|  | <b>CLIENT:</b> <u>LEON COUNTY PUBLIC WORKS</u>          |                          | <b>ELEVATION (FEET):</b> <u>104</u>     |
|  | <b>PROJECT NO.:</b> <u>03-47-18-04</u>                  |                          | <b>DATE:</b> <u>5/14/2019</u>           |
|  | <b>PROJECT LOCATION:</b> <u>LEON COUNTY, FLORIDA</u>    |                          | <b>FLUID LOSS:</b> <u>100% AT 27.5'</u> |
|  | <b>BORING NO.:</b> <u>VB-12</u>                         |                          | <b>CAVING:</b> <u>C</u> <u>NONE</u>     |
| <b>DRILLER:</b> <u>R. ROGERS</u>   |   | <b>24 HR:</b> <u>N/M</u> |   |
| <b>DEPTH TO WATER: INITIAL:</b> $\nabla$ <u>&gt; 3.0'</u>  |   |                          |   |

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

| DEPTH (METERS) | DEPTH (FEET) | SAMPLE | SYMBOL | DESCRIPTION  | AASHTO | TEST RESULTS | Wc (%) | Wc (%) |    |    |    |    | N     | N-Value |    |    |    |       |
|----------------|--------------|--------|--------|--|--------|--------------|--------|--------|----|----|----|----|-------|---------|----|----|----|-------|
|                |              |        |        |  |        |              |        | 10     | 20 | 30 | 40 | 60 |       | 10      | 20 | 30 | 40 | 60    |
|                |              |        |        | LIGHT BROWN<br>HIGHLY PLASTIC SILT WITH SAND         | A-7-5  |              |        |        |    |    |    |    |       |         |    |    |    |       |
|                | 32           |        |        | SOFT<br>LIGHT BROWN<br>HIGHLY PLASTIC SILT WITH SAND | A-7-5  |              | 132    |        |    |    |    |    | 2     |         |    |    |    |       |
| 10             |              |        |        | FIRM<br>TAN<br>HIGHLY PLASTIC SILT WITH SAND         | A-7-5  |              | 127    |        |    |    |    |    | 5     |         |    |    |    |       |
|                | 36           |        |        | HARD<br>TAN<br>HIGHLY PLASTIC SILT WITH SAND         | A-7-5  |              | 81     |        |    |    |    |    | 54/9" |         |    |    |    | 54/9" |
|                |              |        |        | HARD LIMESTONE                                       | --     |              | --     |        |    |    |    |    | 50/5" |         |    |    |    | 50/5" |
| 12             |              |        |        |  |        |              |        |        |    |    |    |    |       |         |    |    |    |       |
|                | 40           |        |        |  |        |              |        |        |    |    |    |    |       |         |    |    |    |       |
|                | 44           |        |        |  |        |              |        |        |    |    |    |    |       |         |    |    |    |       |
| 14             |              |        |        |  |        |              |        |        |    |    |    |    |       |         |    |    |    |       |
|                | 48           |        |        |  |        |              |        |        |    |    |    |    |       |         |    |    |    |       |
|                | 52           |        |        |  |        |              |        |        |    |    |    |    |       |         |    |    |    |       |
| 16             |              |        |        |  |        |              |        |        |    |    |    |    |       |         |    |    |    |       |
|                | 56           |        |        |  |        |              |        |        |    |    |    |    |       |         |    |    |    |       |

**NOTES: N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE**

**ENVIRONMENTAL & GEOTECHNICAL  
SPECIALISTS, INC.**

104 North Magnolia Drive  
Tallahassee, Florida 32301  
Office #: (850) 386-1253  
Fax #: (850) 385-8050

**PROJECT:** HARBINWOOD ESTATES SWMF SINKHOLE

**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-13

**DRILLER:** R. ROGERS

**DEPTH TO WATER: INITIAL:** 2.5'

**HAMMER TYPE:** MANUAL

**ELEVATION (FEET):** 104

**DATE:** 5/14/2019

**FLUID LOSS:** 100% AT 28.0'

**CAVING:** C NONE

**24 HR:** N/M

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

| DEPTH (METERS) | DEPTH (FEET) | SAMPLE | SYMBOL | DESCRIPTION                                     | AASHTO | TEST RESULTS              | Wc (%) | Wc (%) |    | N  | N-Value |    |
|----------------|--------------|--------|--------|---|--------|---------------------------|--------|--------|----|----|---------|----|
|                |              |        |        |   |        |                           |        | 10     | 20 |    | 30      | 40 |
| 0              | 0            |        |        |   |        |                           | 21     |        |    | 11 |         |    |
|                |              |        |        |   |        | -200%=18                  | 18     |        |    | 19 |         |    |
|                | 4            |        |        | MEDIUM DENSE<br>LIGHT GRAY<br>SILTY FINE SAND   | A-2-4  |                           | 20     |        |    | 28 |         |    |
|                |              |        |        |   |        |                           | 16     |        |    | 26 |         |    |
|                | 8            |        |        |   |        | -200%=27<br>LL=21<br>PI=6 | 18     |        |    | 19 |         |    |
|                |              |        |        |   |        |                           | 16     |        |    | 17 |         |    |
|                | 12           |        |        | LOOSE<br>LIGHT GRAY<br>SILTY FINE SAND          | A-2-4  |                           | 24     |        |    | 6  |         |    |
|                |              |        |        |   |        |                           | 24     |        |    | 8  |         |    |
|                | 16           |        |        | MEDIUM DENSE<br>LIGHT GRAY<br>SILTY FINE SAND   | A-2-4  |                           | 25     |        |    | 11 |         |    |
|                |              |        |        |   |        | -200%=25<br>LL=24<br>PI=9 | 23     |        |    | 12 |         |    |
|                | 20           |        |        | MEDIUM DENSE<br>LIGHT GRAY<br>CLAYEY SAND       | A-6    |                           | 36     |        |    | 12 |         |    |
|                |              |        |        |   |        |                           | 21     |        |    | 22 |         |    |
|                | 24           |        |        |   |        |                           | 20     |        |    | 19 |         |    |
|                | 28           |        |        | FIRM<br>LIGHT GRAY<br>HIGHLY PLASTIC SANDY SILT | A-7-5  |                           | 77     |        |    | 8  |         |    |
|                |              |        |        |   |        |                           | 79     |        |    | 8  |         |    |

**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE



|  |  |                                     |
|--|--|-------------------------------------|
| <b>ENVIRONMENTAL &amp; GEOTECHNICAL SPECIALISTS, INC.</b><br><br>104 North Magnolia Drive<br>Tallahassee, Florida 32301<br>Office #: (850) 386-1253<br>Fax #: (850) 385-8050 | <b>PROJECT:</b> HARBINWOOD ESTATES SWMF SINKHOLE       | <b>HAMMER TYPE:</b> MANUAL          |
|  | <b>CLIENT:</b> LEON COUNTY PUBLIC WORKS                | <b>ELEVATION (FEET):</b> 104        |
|  | <b>PROJECT NO.:</b> 03-47-18-04                        | <b>DATE:</b> 5/14/2019              |
|  | <b>PROJECT LOCATION:</b> LEON COUNTY, FLORIDA          | <b>FLUID LOSS:</b> 100% AT 28.0'    |
|  | <b>BORING NO.:</b> VB-13                               | <b>CAVING:</b> NONE                 |
| <b>DRILLER:</b> R. ROGERS  | <b>DEPTH TO WATER:</b> INITIAL: $\sphericalangle$ 2.5' | <b>24 HR:</b> $\sphericalangle$ N/M |

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

| DEPTH (METERS) | DEPTH (FEET) | SAMPLE | SYMBOL | DESCRIPTION                                     | AASHTO | TEST RESULTS                | Wc (%) | Wc (%) |    | N | N-Value |    |    |    |    |
|----------------|--------------|--------|--------|---|--------|-----------------------------|--------|--------|----|---|---------|----|----|----|----|
|                |              |        |        |   |        |                             |        | 10     | 20 |   | 30      | 40 | 60 | 10 | 20 |
|                | 32           |        |        | SOFT<br>LIGHT GRAY<br>HIGHLY PLASTIC SANDY SILT | A-7-5  | -200%=52<br>LL=106<br>PI=44 | 76     |        |    | 2 |         |    |    |    |    |
| 10             |              |        |        | FIRM<br>GRAY<br>HIGHLY PLASTIC SANDY SILT       | A-7-5  |                             | 97     | 97     | 8  |   |         |    |    |    |    |
| 36             |              |        |        |   |        |                             | 58     | 7      |    |   |         |    |    |    |    |
| 12             | 40           |        |        |   |        |                             | 64     |        | 8  |   |         |    |    |    |    |
| 44             |              |        |        |   |        |                             |        |        |    |   |         |    |    |    |    |
| 14             | 48           |        |        |   |        |                             |        |        |    |   |         |    |    |    |    |
| 16             | 52           |        |        |   |        |                             |        |        |    |   |         |    |    |    |    |
|                | 56           |        |        |   |        |                             |        |        |    |   |         |    |    |    |    |

**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

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**PROJECT:** HARBINWOOD ESTATES SWMF SINKHOLE

**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-14

**DRILLER:** R. ROGERS

**DEPTH TO WATER: INITIAL:** ∅ > 3.0'

**HAMMER TYPE:** AUTOMATIC

**ELEVATION (FEET):** 104

**DATE:** 5/16/2019

**FLUID LOSS:** 100% AT 15.0'

**CAVING:** ∅ NONE

**24 HR:** ∅ N/M

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

| DEPTH (METERS) | DEPTH (FEET) | SAMPLE | SYMBOL | DESCRIPTION  | AASHTO | TEST RESULTS               | Wc (%) | Wc (%) |    | N     | N-Value |    |
|----------------|--------------|--------|--------|--|--------|----------------------------|--------|--------|----|-------|---------|----|
|                |              |        |        |  |        |                            |        | 10     | 20 |       | 30      | 40 |
| 0              | 0            |        |        | LOOSE<br>GRAY AND ORANGE<br>CLAYEY SAND                    | A-6    |                            | 21     |        |    | 5     |         |    |
|                |              |        |        | MEDIUM DENSE<br>GRAY AND ORANGE<br>CLAYEY SAND             | A-6    |                            | 21     |        |    | 11    |         |    |
|                | 4            |        |        | STIFF<br>GRAY AND ORANGE<br>HIGHLY PLASTIC SANDY CLAY      | A-7-6  |                            | 60     |        |    | 8     |         |    |
|                |              |        |        | VERY STIFF<br>GRAY AND ORANGE<br>HIGHLY PLASTIC SANDY CLAY | A-7-6  | -200%=62<br>LL=55<br>PI=33 | 45     |        |    | 14    |         |    |
|                | 2            |        |        | HARD LIMESTONE   | --     |                            |        |        |    | 49    |         |    |
|                | 8            |        |        | WEATHERED LIMESTONE  | --     |                            |        |        |    | 29    |         |    |
|                |              |        |        | HARD LIMESTONE   | --     |                            |        |        |    | 50/5" |         |    |
|                | 12           |        |        |  |        |                            |        |        |    | 48    |         |    |
|                | 4            |        |        |  |        |                            |        |        |    | 45    |         |    |
|                |              |        |        |  |        |                            |        |        |    | 50/4" |         |    |
|                | 16           |        |        |  |        |                            |        |        |    | 50/4" |         |    |
|                | 6            |        |        |  |        |                            |        |        |    | 50/4" |         |    |
|                | 20           |        |        | WEATHERED LIMESTONE  | --     |                            |        |        |    | 24    |         |    |
|                | 24           |        |        | HARD LIMESTONE   | --     |                            |        |        |    | 71    |         |    |
|                | 8            |        |        |  |        |                            |        |        |    |       |         |    |
|                | 28           |        |        |  |        |                            |        |        |    |       |         |    |

**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

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Office #: (850) 386-1253  
Fax #: (850) 385-8050

**PROJECT:** HARBINWOOD ESTATES SWMF SINKHOLE

**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-15

**DRILLER:** R. ROGERS

**DEPTH TO WATER: INITIAL:** ∅ 0.5'

**HAMMER TYPE:** MANUAL

**ELEVATION (FEET):** 104

**DATE:** 5/13/2019

**FLUID LOSS:** 100% AT 17.5'

**CAVING:** ∅ NONE

**24 HR:** ∅ GNE

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

| DEPTH (METERS) | DEPTH (FEET) | SAMPLE | SYMBOL | DESCRIPTION   | AASHTO | TEST RESULTS                | Wc (%) | Wc (%) |    | N     | N-Value |       |
|----------------|--------------|--------|--------|---|--------|-----------------------------|--------|--------|----|-------|---------|-------|
|                |              |        |        |   |        |                             |        | 10     | 20 |       | 30      | 40    |
| 0              | 0            |        |        | LOOSE<br>GRAY AND ORANGE<br>HIGHLY PLASTIC CLAYEY SAND        | A-7-6  |                             | 26     |        |    | 5     |         |       |
|                |              |        |        | MEDIUM DENSE<br>GRAY AND ORANGE<br>HIGHLY PLASTIC CLAYEY SAND | A-7-6  | -200%=47<br>LL=59<br>PI=37  | 32     |        |    | 17    |         |       |
| 4              | 4            |        |        | LOOSE<br>LIGHT GRAY<br>HIGHLY PLASTIC CLAYEY SAND             | A-7-6  |                             | 31     |        |    | 11    |         |       |
|                |              |        |        | LOOSE<br>LIGHT GRAY<br>HIGHLY PLASTIC CLAYEY SAND             | A-7-6  |                             | 30     |        |    | 9     |         |       |
| 2              | 2            |        |        | FIRM<br>LIGHT GRAY<br>HIGHLY PLASTIC CLAY WITH SAND           | A-7-6  |                             | 30     |        |    | 9     |         |       |
|                |              |        |        | VERY STIFF<br>LIGHT GRAY<br>HIGHLY PLASTIC CLAY WITH SAND     | A-7-6  |                             | 69     |        |    | 23    |         |       |
| 8              | 8            |        |        | FIRM<br>LIGHT GRAY<br>HIGHLY PLASTIC CLAY WITH SAND           | A-7-6  |                             | 66     |        |    | 7     |         |       |
|                |              |        |        | VERY STIFF<br>GRAY<br>HIGHLY PLASTIC SILT WITH SAND           | A-7-5  | -200%=80<br>LL=117<br>PI=66 | 60     |        |    | 18    |         |       |
| 4              | 4            |        |        | STIFF<br>LIGHT GRAY<br>HIGHLY PLASTIC SILT WITH SAND          | A-7-5  |                             | 57     |        |    | 11    |         |       |
| 16             | 16           |        |        | HARD<br>LIGHT GRAY<br>HIGHLY PLASTIC SILT WITH SAND           | A-7-5  |                             | 56     |        |    | 50/5" |         | 50/5" |
| 6              | 6            |        |        |   |        |                             |        |        |    |       |         |       |
| 20             | 20           |        |        |   |        |                             |        |        |    |       |         |       |
| 24             | 24           |        |        |   |        |                             |        |        |    |       |         |       |
| 8              | 8            |        |        |   |        |                             |        |        |    |       |         |       |
| 28             | 28           |        |        |   |        |                             |        |        |    |       |         |       |

**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

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**PROJECT:** HARBINWOOD ESTATES SWMF SINKHOLE

**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-16

**DRILLER:** R. ROGERS

**DEPTH TO WATER: INITIAL:**  $\nabla$  > 3.0'

**HAMMER TYPE:** AUTOMATIC

**ELEVATION (FEET):** 104

**DATE:** 5/22/2019

**FLUID LOSS:** NONE

**CAVING:**  $\checkmark$  NONE

**24 HR:**  $\nabla$  N/M

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

| DEPTH (METERS) | DEPTH (FEET) | SAMPLE | SYMBOL | DESCRIPTION                                  | AASHTO | TEST RESULTS               | Wc (%) | Wc (%) |    | N  | N-Value |    |
|----------------|--------------|--------|--------|--|--------|----------------------------|--------|--------|----|----|---------|----|
|                |              |        |        |  |        |                            |        | 10     | 20 |    | 30      | 40 |
| 0              | 0            |        |        | LOOSE GRAY CLAYEY SAND                       | A-6    |                            | 12     |        |    | 8  |         |    |
|                |              |        |        | MEDIUM DENSE GRAY CLAYEY SAND                | A-6    |                            | 22     |        |    | 11 |         |    |
|                | 4            |        |        |  |        |                            | 30     |        |    | 11 |         |    |
|                |              |        |        |  |        | -200%=45<br>LL=36<br>PI=19 | 25     |        |    | 8  |         |    |
|                | 2            |        |        |  |        |                            | 19     |        |    | 8  |         |    |
|                | 8            |        |        | LOOSE GRAY AND ORANGE CLAYEY SAND            | A-6    |                            | 25     |        |    | 8  |         |    |
|                |              |        |        |  |        |                            | 20     |        |    | 5  |         |    |
|                | 12           |        |        |  |        |                            | 17     |        |    | 7  |         |    |
|                | 4            |        |        | MEDIUM DENSE GRAY AND ORANGE CLAYEY SAND     | A-6    |                            | 17     |        |    | 14 |         |    |
|                | 16           |        |        |  |        |                            | 15     |        |    | 13 |         |    |
|                |              |        |        |  |        | -200%=16                   | 16     |        |    | 15 |         |    |
|                | 6            |        |        | MEDIUM DENSE GRAY SILTY FINE SAND            | A-2-4  |                            | 15     |        |    | 17 |         |    |
|                | 20           |        |        |  |        |                            | 19     |        |    | 13 |         |    |
|                | 24           |        |        |  |        |                            | 24     |        |    | 9  |         |    |
|                | 8            |        |        | MEDIUM DENSE GRAY HIGHLY PLASTIC CLAYEY SAND | A-7-6  |                            | 24     |        |    | 9  |         |    |
|                | 28           |        |        |  |        | -200%=45<br>LL=51          | 26     |        |    | 5  |         |    |

**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

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Office #: (850) 386-1253  
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**PROJECT:** HARBINWOOD ESTATES SWMF SINKHOLE

**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-16

**DRILLER:** R. ROGERS

**DEPTH TO WATER: INITIAL:** ≅ > 3.0'

**HAMMER TYPE:** AUTOMATIC

**ELEVATION (FEET):** 104

**DATE:** 5/22/2019

**FLUID LOSS:** NONE

**CAVING:** ☐ NONE

**24 HR:** ≅ N/M

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

| DEPTH (METERS) | DEPTH (FEET) | SAMPLE | SYMBOL | DESCRIPTION                                     | AASHTO | TEST RESULTS               | Wc (%) | Wc (%) |    | N | N-Value |    |
|----------------|--------------|--------|--------|---|--------|----------------------------|--------|--------|----|---|---------|----|
|                |              |        |        |   |        |                            |        | 10     | 20 |   | 30      | 40 |
|                | 32           |        |        | LOOSE<br>GRAY<br>HIGHLY PLASTIC CLAYEY SAND     | A-7-6  | PI=34                      | 23     |        |    | 6 |         |    |
| 10             |              |        |        |   |        |                            | 25     |        |    | 8 |         |    |
|                | 36           |        |        | LOOSE<br>GRAY AND ORANGE<br>PLASTIC CLAYEY SAND | A-7-6  | -200%=38<br>LL=45<br>PI=26 | 19     |        |    | 6 |         |    |
| 12             | 40           |        |        |   |        |                            | 22     |        |    | 7 |         |    |
|                | 44           |        |        |   |        |                            |        |        |    |   |         |    |
| 14             |              |        |        |   |        |                            |        |        |    |   |         |    |
|                | 48           |        |        |   |        |                            |        |        |    |   |         |    |
| 16             | 52           |        |        |   |        |                            |        |        |    |   |         |    |
|                | 56           |        |        |   |        |                            |        |        |    |   |         |    |

**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

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**PROJECT:** HARBINWOOD ESTATES SWMF SINKHOLE

**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-17

**DRILLER:** R. ROGERS

**DEPTH TO WATER: INITIAL:**  $\nabla$  > 3.0'

**HAMMER TYPE:** AUTOMATIC

**ELEVATION (FEET):** 104

**DATE:** 5/16/2019

**FLUID LOSS:** 100% AT 35.0'

**CAVING:**  $\sphericalangle$  NONE

**24 HR:**  $\nabla$  N/M

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

| DEPTH (METERS) | DEPTH (FEET) | SAMPLE | SYMBOL | DESCRIPTION  | AASHTO | TEST RESULTS               | Wc (%) | Wc (%) |    | N  | N-Value |    |
|----------------|--------------|--------|--------|--|--------|----------------------------|--------|--------|----|----|---------|----|
|                |              |        |        |  |        |                            |        | 10     | 20 |    | 30      | 40 |
| 0              | 0            |        |        | LOOSE<br>GRAY AND ORANGE<br>PLASTIC CLAYEY SAND          | A-7-6  |                            | 19     |        |    | 7  |         |    |
|                |              |        |        | MEDIUM DENSE<br>GRAY AND ORANGE<br>PLASTIC CLAYEY SAND   | A-7-6  |                            | 20     |        |    | 13 |         |    |
|                | 4            |        |        | LOOSE<br>GRAY AND ORANGE<br>PLASTIC CLAYEY SAND          | A-7-6  |                            | 22     |        |    | 7  |         |    |
|                |              |        |        | MEDIUM DENSE<br>GRAY AND ORANGE<br>PLASTIC CLAYEY SAND   | A-7-6  |                            | 31     |        |    | 9  |         |    |
|                | 2            |        |        | LOOSE<br>GRAY AND ORANGE<br>PLASTIC CLAYEY SAND          | A-7-6  | -200%=33<br>LL=43<br>PI=24 | 26     |        |    | 7  |         |    |
|                | 8            |        |        | GRAY AND ORANGE<br>PLASTIC CLAYEY SAND                   |        |                            | 24     |        |    | 10 |         |    |
|                |              |        |        | MEDIUM DENSE<br>GRAY AND ORANGE<br>PLASTIC CLAYEY SAND   | A-7-6  |                            | 23     |        |    | 10 |         |    |
|                | 12           |        |        |  |        |                            | 24     |        |    | 11 |         |    |
|                | 4            |        |        |  |        |                            | 32     |        |    | 11 |         |    |
|                | 16           |        |        | MEDIUM DENSE<br>LIGHT GRAY<br>HIGHLY PLASTIC CLAYEY SAND | A-7-6  | -200%=41<br>LL=84<br>PI=66 | 35     |        |    | 8  |         |    |
|                | 20           |        |        |  |        |                            | 39     |        |    | 9  |         |    |
|                | 6            |        |        |  |        |                            | 35     |        |    | 10 |         |    |
|                | 24           |        |        | LOOSE<br>LIGHT GRAY<br>HIGHLY PLASTIC CLAYEY SAND        | A-7-6  |                            | 38     |        |    | 6  |         |    |
|                | 8            |        |        | STIFF<br>LIGHT GRAY<br>HIGHLY PLASTIC SANDY CLAY         | A-7-6  |                            | 61     |        |    | 7  |         |    |
|                | 28           |        |        | SOFT   |        |                            | 65     |        |    | 3  |         |    |

**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

**ENVIRONMENTAL & GEOTECHNICAL  
SPECIALISTS, INC.**

104 North Magnolia Drive  
Tallahassee, Florida 32301  
Office #: (850) 386-1253  
Fax #: (850) 385-8050

**PROJECT:** HARBINWOOD ESTATES SWMF SINKHOLE

**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-17

**DRILLER:** R. ROGERS

**DEPTH TO WATER: INITIAL:** ∅ > 3.0'

**HAMMER TYPE:** AUTOMATIC

**ELEVATION (FEET):** 104

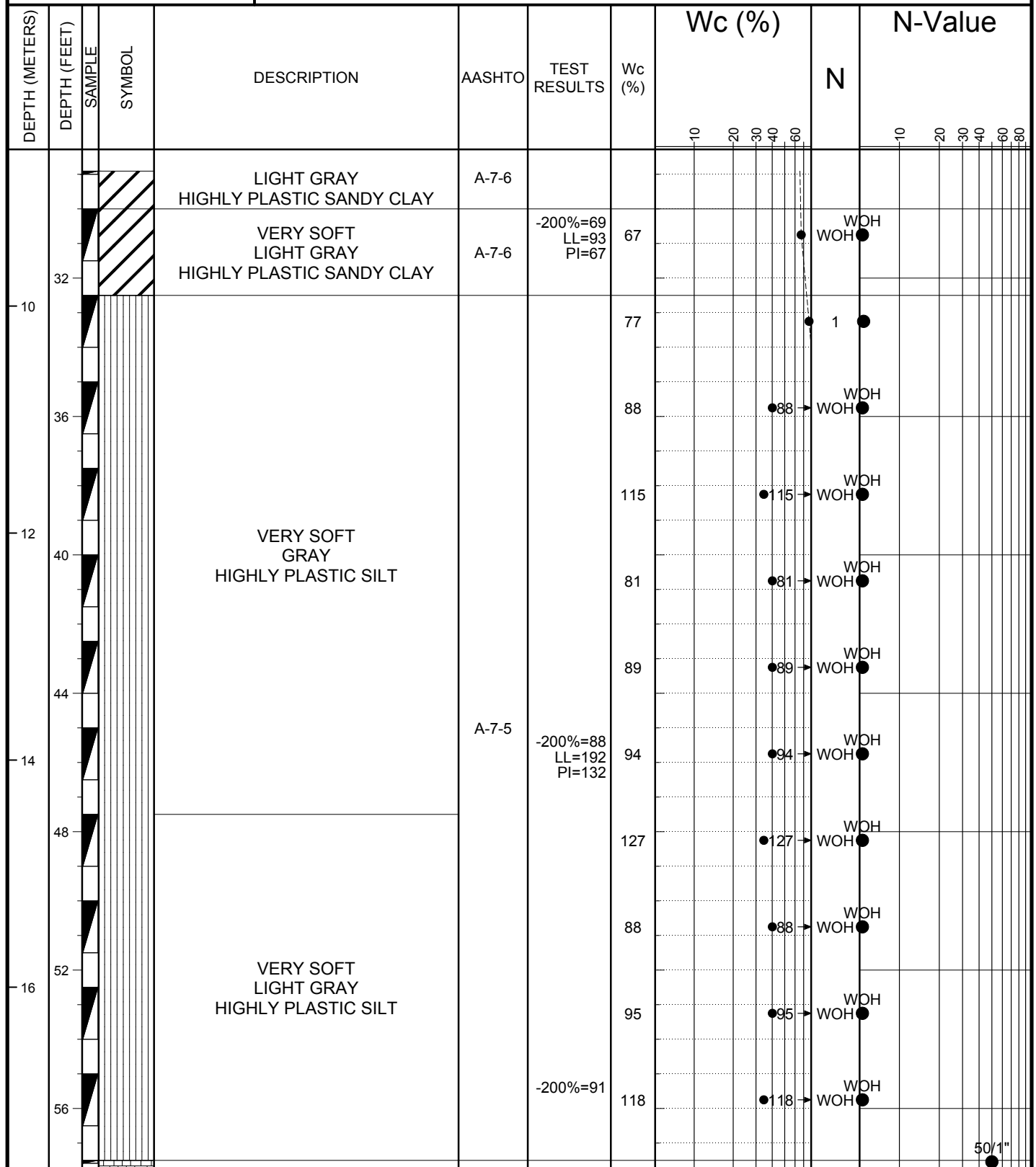
**DATE:** 5/16/2019

**FLUID LOSS:** 100% AT 35.0'

**CAVING:** ∅ NONE

**24 HR:** ∅ N/M

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



**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

50/1"

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PROJECT: HARBINWOOD ESTATES SWMF SINKHOLE

CLIENT: LEON COUNTY PUBLIC WORKS

PROJECT NO.: 03-47-18-04

PROJECT LOCATION: LEON COUNTY, FLORIDA

BORING NO.: VB-17

DRILLER: R. ROGERS

DEPTH TO WATER: INITIAL: ∅ > 3.0'

HAMMER TYPE: AUTOMATIC

ELEVATION (FEET): 104

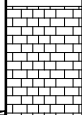
DATE: 5/16/2019

FLUID LOSS: 100% AT 35.0'

CAVING: C NONE

24 HR: ∅ N/M

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

| DEPTH (METERS) | DEPTH (FEET) | SAMPLE | SYMBOL  | DESCRIPTION    | AASHTO | TEST RESULTS | Wc (%) | Wc (%) |    |    |    |    | N     | N-Value |    |    |    |    |    |  |  |  |  |  |       |  |
|----------------|--------------|--------|---|----------------|--------|--------------|--------|--------|----|----|----|----|-------|---------|----|----|----|----|----|--|--|--|--|--|-------|--|
|                |              |        |   |                |        |              |        | 10     | 20 | 30 | 40 | 60 |       | 10      | 20 | 30 | 40 | 60 | 80 |  |  |  |  |  |       |  |
| 18             | 60           |        |  | HARD LIMESTONE | --     |              |        |        |    |    |    |    | 50/1" |         |    |    |    |    |    |  |  |  |  |  | 50/1" |  |
| 22             | 72           |        |   |                |        |              |        |        |    |    |    |    |       | 50/1"   |    |    |    |    |    |  |  |  |  |  |       |  |
| 24             | 80           |        |   |                |        |              |        |        |    |    |    |    |       |         |    |    |    |    |    |  |  |  |  |  |       |  |
| 26             | 84           |        |   |                |        |              |        |        |    |    |    |    |       |         |    |    |    |    |    |  |  |  |  |  |       |  |

**NOTES: N/M MEANS NOT MEASURED**  
**N/A MEANS NOT AVAILABLE**



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**PROJECT:** HARBINWOOD ESTATES SWMF SINKHOLE

**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-18

**DRILLER:** R. ROGERS

**DEPTH TO WATER: INITIAL:**  $\nabla$  > 3.0'

**HAMMER TYPE:** AUTOMATIC

**ELEVATION (FEET):** 104

**DATE:** 5/21/2019

**FLUID LOSS:** 100% AT 23.0'

**CAVING:**  $\square$  NONE

**24 HR:**  $\nabla$  N/M

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

| DEPTH (METERS) | DEPTH (FEET) | SAMPLE | SYMBOL | DESCRIPTION  | AASHTO | TEST RESULTS               | Wc (%) | Wc (%) |    | N  | N-Value |    |
|----------------|--------------|--------|--------|--|--------|----------------------------|--------|--------|----|----|---------|----|
|                |              |        |        |  |        |                            |        | 10     | 20 |    | 30      | 40 |
| 0              | 0            |        |        | MEDIUM DENSE<br>GRAY AND ORANGE<br>CLAYEY FINE SAND            | A-2-6  |                            | 16     |        |    | 8  |         |    |
|                |              |        |        |  |        |                            | 23     |        |    | 9  |         |    |
|                | 4            |        |        | LOOSE<br>GRAY<br>CLAYEY FINE SAND                              | A-2-6  |                            | 20     |        |    | 7  |         |    |
|                |              |        |        |  |        | -200%=27<br>LL=33<br>PI=14 | 24     |        |    | 8  |         |    |
|                | 2            |        |        | MEDIUM DENSE<br>GRAY AND ORANGE<br>CLAYEY FINE SAND            | A-2-6  |                            | 24     |        |    | 13 |         |    |
|                | 8            |        |        |  |        |                            | 25     |        |    | 16 |         |    |
|                |              |        |        | VERY STIFF<br>GRAY AND ORANGE<br>HIGHLY PLASTIC CLAY WITH SAND | A-7-6  |                            | 32     |        |    | 14 |         |    |
|                | 12           |        |        |  |        |                            | 33     |        |    | 16 |         |    |
|                | 4            |        |        | STIFF<br>GRAY AND ORANGE<br>HIGHLY PLASTIC CLAY WITH SAND      | A-7-6  |                            | 44     |        |    | 9  |         |    |
|                | 16           |        |        |  |        | -200%=82<br>LL=74<br>PI=42 | 62     |        |    | 10 |         |    |
|                | 6            |        |        | HARD<br>GRAY<br>HIGHLY PLASTIC CLAY WITH SAND                  | A-7-6  |                            | 48     |        |    | 9  |         |    |
|                | 20           |        |        |  |        |                            | 49     |        |    | 40 |         |    |
|                | 24           |        |        |  |        |                            |        |        |    | 13 |         |    |
|                | 8            |        |        | WEATHERED LIMESTONE  | --     |                            |        |        |    | 30 |         |    |
|                | 28           |        |        |  |        |                            |        |        |    | 28 |         |    |

**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

|  |   |   |
|--|---|---|
| <b>ENVIRONMENTAL &amp; GEOTECHNICAL SPECIALISTS, INC.</b><br><br>104 North Magnolia Drive<br>Tallahassee, Florida 32301<br>Office #: (850) 386-1253<br>Fax #: (850) 385-8050 | <b>PROJECT:</b> <u>HARBINWOOD ESTATES SWMF SINKHOLE</u> | <b>HAMMER TYPE:</b> <u>AUTOMATIC</u>    |
|  | <b>CLIENT:</b> <u>LEON COUNTY PUBLIC WORKS</u>          | <b>ELEVATION (FEET):</b> <u>104</u>     |
|  | <b>PROJECT NO.:</b> <u>03-47-18-04</u>                  | <b>DATE:</b> <u>5/21/2019</u>           |
|  | <b>PROJECT LOCATION:</b> <u>LEON COUNTY, FLORIDA</u>    | <b>FLUID LOSS:</b> <u>100% AT 23.0'</u> |
|  | <b>BORING NO.:</b> <u>VB-18</u>                         | <b>CAVING:</b> <u>C NONE</u>            |
|  | <b>DRILLER:</b> <u>R. ROGERS</u>                        | <b>24 HR:</b> <u>N/M</u>                |
| <b>DEPTH TO WATER: INITIAL:</b> <u>∅ &gt; 3.0'</u>   |   |   |

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

| DEPTH (METERS) | DEPTH (FEET) | SAMPLE | SYMBOL | DESCRIPTION    | AASHTO | TEST RESULTS | Wc (%) | Wc (%) |    |    |    |       | N | N-Value |    |    |    |    |    |
|----------------|--------------|--------|--------|----------------|--------|--------------|--------|--------|----|----|----|-------|---|---------|----|----|----|----|----|
|                |              |        |        |                |        |              |        | 10     | 20 | 30 | 40 | 60    |   | 10      | 20 | 30 | 40 | 60 | 80 |
|                |              |        |        |                |        |              |        |        |    |    |    | 16    |   |         |    |    |    |    |    |
|                | 10           |        |        | HARD LIMESTONE | --     |              |        |        |    |    |    | 50/1" |   |         |    |    |    |    |    |
|                | 32           |        |        |                |        |              |        |        |    |    |    |       |   |         |    |    |    |    |    |
|                | 36           |        |        |                |        |              |        |        |    |    |    |       |   |         |    |    |    |    |    |
|                | 40           |        |        |                |        |              |        |        |    |    |    |       |   |         |    |    |    |    |    |
|                | 44           |        |        |                |        |              |        |        |    |    |    |       |   |         |    |    |    |    |    |
|                | 48           |        |        |                |        |              |        |        |    |    |    |       |   |         |    |    |    |    |    |
|                | 52           |        |        |                |        |              |        |        |    |    |    |       |   |         |    |    |    |    |    |
|                | 56           |        |        |                |        |              |        |        |    |    |    |       |   |         |    |    |    |    |    |

**NOTES:** N/M MEANS NOT MEASURED  
 N/A MEANS NOT AVAILABLE

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**PROJECT:** HARBINWOOD ESTATES SWMF SINKHOLE

**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-19

**DRILLER:** R. ROGERS

**DEPTH TO WATER: INITIAL:** ∅ > 3.0'

**HAMMER TYPE:** AUTOMATIC

**ELEVATION (FEET):** 104

**DATE:** 5/17/2019

**FLUID LOSS:** NONE

**CAVING:** C NONE

**24 HR:** ∅ N/M

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

| DEPTH (METERS) | DEPTH (FEET) | SAMPLE | SYMBOL | DESCRIPTION   | AASHTO | TEST RESULTS               | Wc (%) | Wc (%) |    | N  | N-Value |    |
|----------------|--------------|--------|--------|---|--------|----------------------------|--------|--------|----|----|---------|----|
|                |              |        |        |   |        |                            |        | 10     | 20 |    | 30      | 40 |
| 0              | 0            |        |        | MEDIUM DENSE<br>LIGHT GRAY AND ORANGE<br>CLAYEY SAND            | A-6    |                            | 21     |        |    | 11 |         |    |
|                |              |        |        |   |        |                            | 21     |        |    | 15 |         |    |
| 4              | 4            |        |        | MEDIUM DENSE<br>LIGHT GRAY AND ORANGE<br>CLAYEY FINE SAND       | A-2-6  |                            | 24     |        |    | 13 |         |    |
|                |              |        |        |   |        |                            | 24     |        |    | 12 |         |    |
| 2              | 2            |        |        |   |        |                            | 25     |        |    | 11 |         |    |
|                |              |        |        |   |        | -200%=32<br>LL=43<br>PI=22 | 23     |        |    | 17 |         |    |
| 8              | 8            |        |        |   |        |                            | 23     |        |    | 18 |         |    |
|                |              |        |        | MEDIUM DENSE<br>LIGHT GRAY AND ORANGE<br>CLAYEY SAND            | A-6    |                            | 33     |        |    | 14 |         |    |
| 4              | 4            |        |        |   |        |                            | 26     |        |    | 9  |         |    |
| 12             | 12           |        |        |   |        |                            | 55     |        |    | 10 |         |    |
| 16             | 16           |        |        | STIFF<br>LIGHT GRAY AND ORANGE<br>HIGHLY PLASTIC CLAY WITH SAND | A-7-6  |                            | 60     |        |    | 8  |         |    |
| 6              | 6            |        |        |   |        |                            | 67     |        |    | 5  |         |    |
| 20             | 20           |        |        | FIRM<br>GRAY AND BROWN<br>HIGHLY PLASTIC CLAY WITH SAND         | A-7-6  | -200%=73<br>LL=98<br>PI=68 |        |        |    |    |         |    |
| 24             | 24           |        |        | WEATHERED LIMESTONE   | --     |                            |        |        |    | 39 |         |    |
| 8              | 8            |        |        |   |        |                            |        |        |    | 39 |         |    |
| 28             | 28           |        |        |   |        |                            |        |        |    |    |         |    |

**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

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PROJECT: HARBINWOOD ESTATES SWMF SINKHOLE

CLIENT: LEON COUNTY PUBLIC WORKS

PROJECT NO.: 03-47-18-04

PROJECT LOCATION: LEON COUNTY, FLORIDA

BORING NO.: VB-20

DRILLER: R. ROGERS

DEPTH TO WATER: INITIAL:  $\nabla$  > 3.0'

HAMMER TYPE: AUTOMATIC

ELEVATION (FEET): 104

DATE: 5/20/2019

FLUID LOSS: 100% AT 34.0'

CAVING: C NONE

24 HR:  $\nabla$  N/M

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

| DEPTH (METERS) | DEPTH (FEET) | SAMPLE | SYMBOL | DESCRIPTION                                    | AASHTO | TEST RESULTS               | Wc (%) | Wc (%) |    | N  | N-Value |    |
|----------------|--------------|--------|--------|--|--------|----------------------------|--------|--------|----|----|---------|----|
|                |              |        |        |  |        |                            |        | 10     | 20 |    | 10      | 20 |
| 0              | 0            |        |        | MEDIUM DENSE<br>GRAY AND ORANGE<br>CLAYEY SAND | A-6    | -200%=36<br>LL=40<br>PI=22 | 20     | 20     | 12 | 10 | 20      |    |
|                | 4            |        |        |  |        |                            | 19     | 19     | 16 | 20 |         |    |
|                | 4            |        |        |  |        |                            | 17     | 17     | 18 | 20 |         |    |
|                | 2            |        |        | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND       | A-2-6  | -200%=30                   | 19     | 19     | 13 | 10 | 20      |    |
|                | 8            |        |        |  |        |                            | 18     | 18     | 14 | 20 |         |    |
|                | 8            |        |        |  |        |                            | 22     | 22     | 13 | 20 |         |    |
|                | 12           |        |        |  |        |                            | 21     | 21     | 11 | 20 |         |    |
|                | 12           |        |        |  |        |                            | 19     | 19     | 12 | 20 |         |    |
|                | 4            |        |        |  |        |                            | 21     | 21     | 13 | 20 |         |    |
|                | 16           |        |        |  |        |                            | 22     | 22     | 16 | 20 |         |    |
|                | 6            |        |        | 21   | 21     | 16                         | 20     |        |    |    |         |    |
|                | 20           |        |        | 21   | 21     | 13                         | 20     |        |    |    |         |    |
|                | 24           |        |        | LOOSE<br>GRAY<br>CLAYEY FINE SAND              | A-2-6  |                            | 21     | 21     | 7  | 10 | 20      |    |
|                | 8            |        |        | LOOSE  |        | -200%=43<br>LL=49          | 43     | 43     | 6  | 10 | 20      |    |
|                | 28           |        |        |  |        |                            | 27     | 27     | 4  | 10 | 20      |    |

NOTES: N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

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**PROJECT:** HARBINWOOD ESTATES SWMF SINKHOLE

**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-20

**DRILLER:** R. ROGERS

**DEPTH TO WATER: INITIAL:** ∅ > 3.0'

**HAMMER TYPE:** AUTOMATIC

**ELEVATION (FEET):** 104

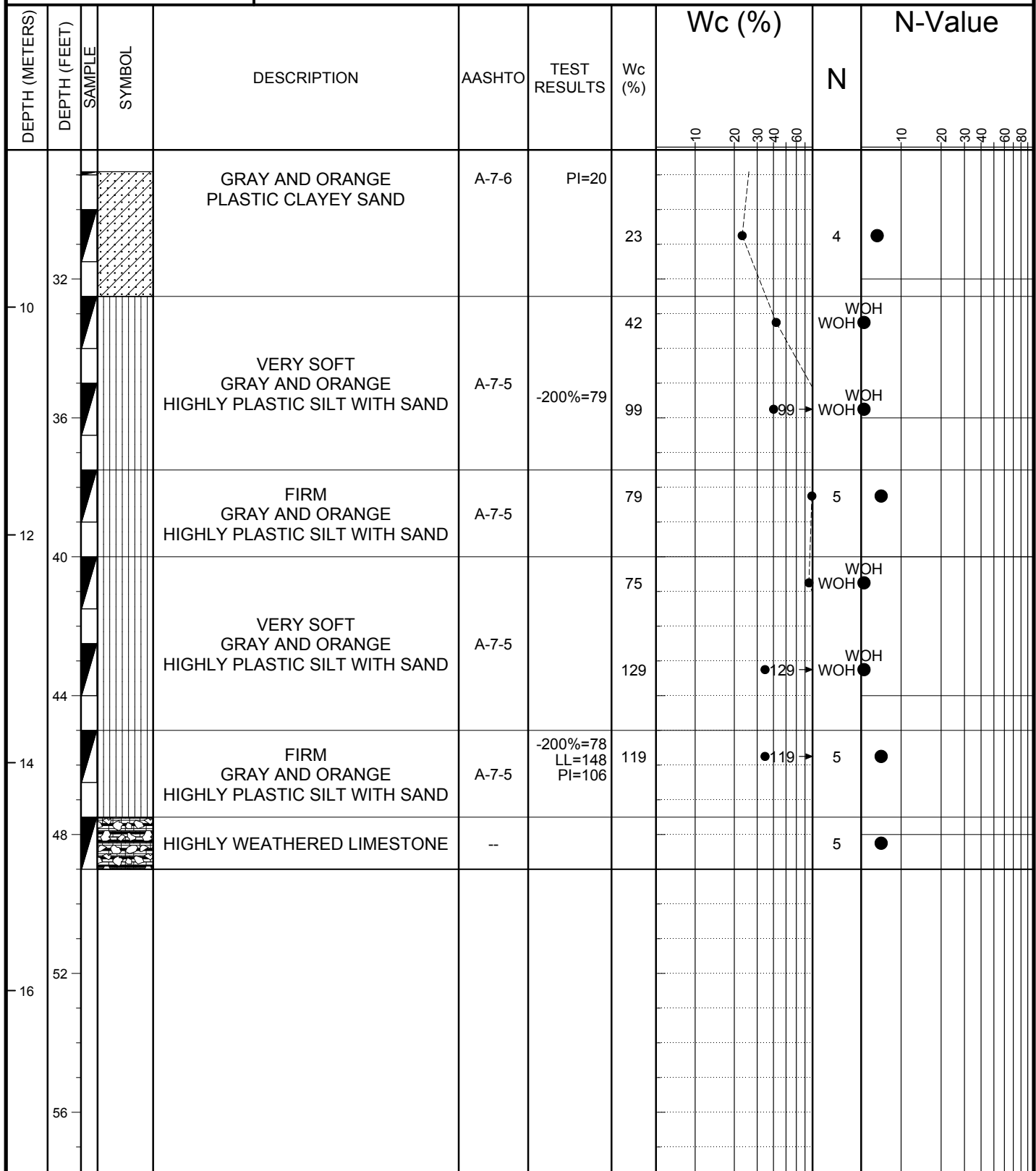
**DATE:** 5/20/2019

**FLUID LOSS:** 100% AT 34.0'

**CAVING:** C NONE

**24 HR:** ∅ N/M

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



**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

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**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-21

**DRILLER:** R. ROGERS

**DEPTH TO WATER: INITIAL:** ≅ >3.0'

**HAMMER TYPE:** AUTOMATIC

**ELEVATION (FEET):** 104

**DATE:** 5/20/2019

**FLUID LOSS:** 90% AT 24.0'

**CAVING:** ☐ NONE

**24 HR:** ≅ N/M

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

| DEPTH (METERS) | DEPTH (FEET) | SAMPLE | SYMBOL | DESCRIPTION   | AASHTO | TEST RESULTS               | Wc (%) | Wc (%) |    | N  | N-Value |    |
|----------------|--------------|--------|--------|---|--------|----------------------------|--------|--------|----|----|---------|----|
|                |              |        |        |   |        |                            |        | 10     | 20 |    | 30      | 40 |
| 0              | 0            |        |        | LOOSE<br>GRAY<br>CLAYEY FINE SAND                   | A-2-6  |                            | 26     |        |    | 7  |         |    |
|                | 4            |        |        | MEDIUM DENSE<br>GRAY AND ORANGE<br>CLAYEY FINE SAND | A-2-6  | -200%=22<br>LL=28<br>PI=11 | 20     |        |    | 12 |         |    |
|                |              |        |        |   |        |                            | 22     |        |    | 10 |         |    |
|                |              |        |        |   |        |                            | 23     |        |    | 11 |         |    |
|                |              |        |        |   |        |                            | 24     |        |    | 11 |         |    |
|                | 8            |        |        | MEDIUM DENSE<br>GRAY AND ORANGE<br>CLAYEY SAND      | A-6    |                            | 27     |        |    | 15 |         |    |
|                |              |        |        |   |        |                            | 31     |        |    | 15 |         |    |
|                |              |        |        |   |        |                            | 35     |        |    | 12 |         |    |
|                | 12           |        |        |   |        |                            |        |        |    |    |         |    |
|                |              |        |        | LOOSE<br>GRAY AND ORANGE<br>CLAYEY SAND             | A-6    |                            | 35     |        |    | 7  |         |    |
|                | 16           |        |        | STIFF<br>ORANGE<br>HIGHLY PLASTIC SANDY CLAY        | A-7-6  | -200%=64<br>LL=88<br>PI=59 | 60     |        |    | 8  |         |    |
|                |              |        |        |   |        |                            | 64     |        |    | 12 |         |    |
|                | 20           |        |        | WEATHERED LIMESTONE                                 | --     |                            |        |        |    | 21 |         |    |
|                |              |        |        |   |        |                            |        |        |    | 8  |         |    |
|                | 24           |        |        | HIGHLY WEATHERED LIMESTONE                          | --     |                            |        |        |    | 3  |         |    |
|                |              |        |        |   |        |                            |        |        |    |    |         |    |
|                | 28           |        |        |   |        |                            |        |        |    | 14 |         |    |

**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

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**PROJECT:** HARBINWOOD ESTATES SWMF SINKHOLE

**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-21

**DRILLER:** R. ROGERS

**DEPTH TO WATER:** INITIAL:  $\nabla$  >3.0'

**HAMMER TYPE:** AUTOMATIC

**ELEVATION (FEET):** 104

**DATE:** 5/20/2019

**FLUID LOSS:** 90% AT 24.0'

**CAVING:**  $\underline{C}$  NONE

**24 HR:**  $\nabla$  N/M

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

| DEPTH (METERS) | DEPTH (FEET) | SAMPLE | SYMBOL | DESCRIPTION         | AASHTO | TEST RESULTS | Wc (%) | Wc (%) |    |    |    |       | N | N-Value |    |    |    |    |    |  |
|----------------|--------------|--------|--------|---------------------|--------|--------------|--------|--------|----|----|----|-------|---|---------|----|----|----|----|----|--|
|                |              |        |        |                     |        |              |        | 10     | 20 | 30 | 40 | 60    |   | 10      | 20 | 30 | 40 | 60 | 80 |  |
|                | 32           |        |        | WEATHERED LIMESTONE | --     |              |        |        |    |    |    | 15    |   |         |    |    |    |    |    |  |
| 10             |              |        |        |                     |        |              |        |        |    |    |    | 14    |   |         |    |    |    |    |    |  |
|                | 36           |        |        | HARD LIMESTONE      | --     |              |        |        |    |    |    | 50/3" |   |         |    |    |    |    |    |  |
| 12             | 40           |        |        | WEATHERED LIMESTONE | --     |              |        |        |    |    |    | 11    |   |         |    |    |    |    |    |  |
|                | 44           |        |        |                     |        |              |        |        |    |    |    |       |   |         |    |    |    |    |    |  |
| 14             | 48           |        |        |                     |        |              |        |        |    |    |    |       |   |         |    |    |    |    |    |  |
|                | 52           |        |        |                     |        |              |        |        |    |    |    |       |   |         |    |    |    |    |    |  |
| 16             | 56           |        |        |                     |        |              |        |        |    |    |    |       |   |         |    |    |    |    |    |  |

**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

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**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-22

**DRILLER:** R. ROGERS

**DEPTH TO WATER: INITIAL:**  $\nabla$  > 3.0'

**HAMMER TYPE:** AUTOMATIC

**ELEVATION (FEET):** 104

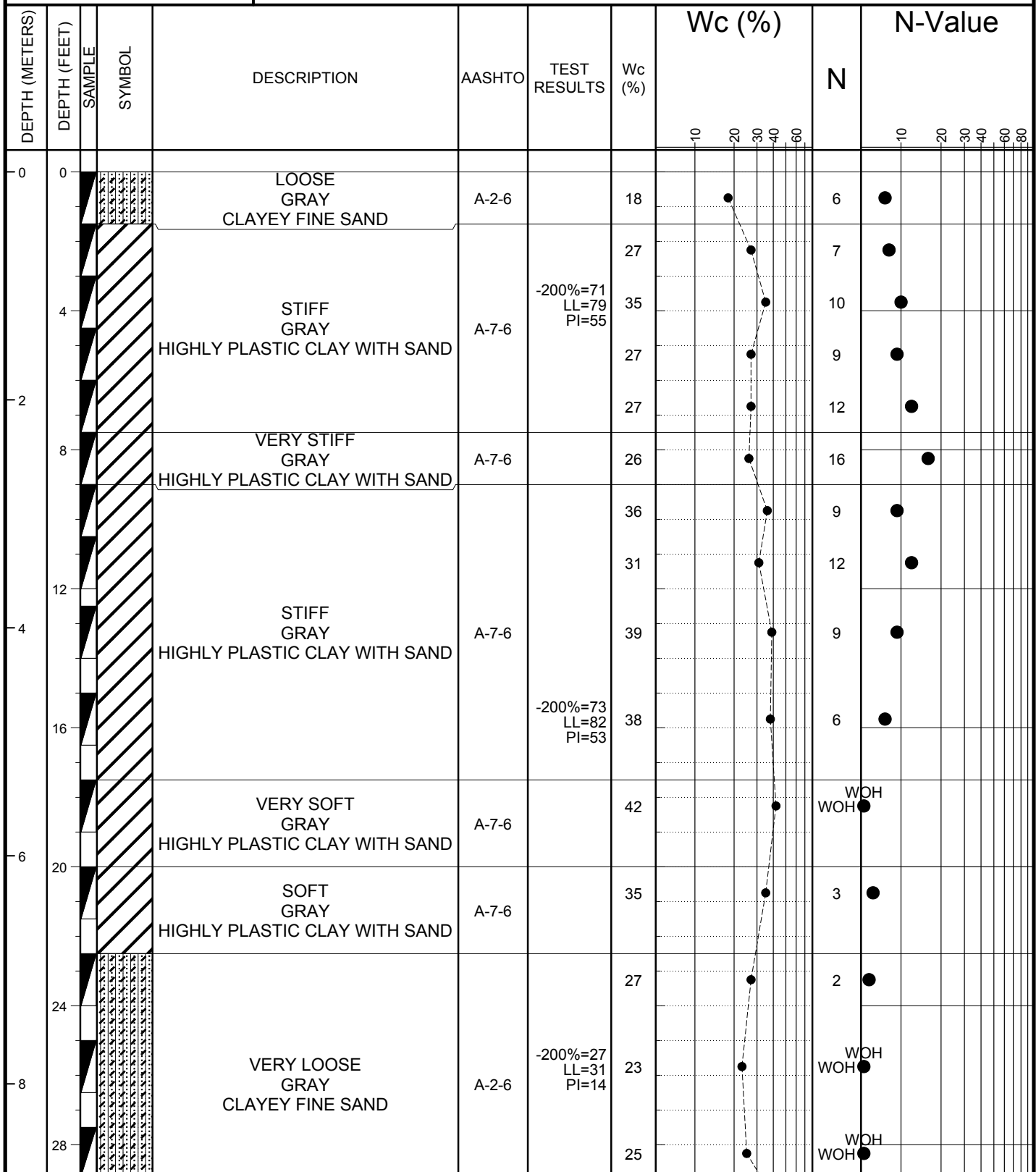
**DATE:** 5/23/2019

**FLUID LOSS:** 100% AT 17.5'

**CAVING:**  $\surd$  NONE

**24 HR:**  $\nabla$  N/M

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



**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE



**ENVIRONMENTAL & GEOTECHNICAL  
SPECIALISTS, INC.**

104 North Magnolia Drive  
Tallahassee, Florida 32301  
Office #: (850) 386-1253  
Fax #: (850) 385-8050

**PROJECT:** HARBINWOOD ESTATES SWMF SINKHOLE

**CLIENT:** LEON COUNTY PUBLIC WORKS

**PROJECT NO.:** 03-47-18-04

**PROJECT LOCATION:** LEON COUNTY, FLORIDA

**BORING NO.:** VB-22

**DRILLER:** R. ROGERS

**DEPTH TO WATER: INITIAL:** ∅ > 3.0'

**HAMMER TYPE:** AUTOMATIC

**ELEVATION (FEET):** 104

**DATE:** 5/23/2019

**FLUID LOSS:** 100% AT 17.5'

**CAVING:** ∅ NONE

**24 HR:** ∅ N/M

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

| DEPTH (METERS) | DEPTH (FEET) | SAMPLE | SYMBOL | DESCRIPTION                       | AASHTO | TEST RESULTS | Wc (%) | Wc (%) |    | N  | N-Value |    |
|----------------|--------------|--------|--------|-----------------------------------|--------|--------------|--------|--------|----|----|---------|----|
|                |              |        |        |                                   |        |              |        | 10     | 20 |    | 30      | 40 |
|                |              |        |        |                                   |        |              |        |        |    |    |         |    |
|                | 32           |        |        | FIRM WHITE<br>HIGHLY PLASTIC SILT | A-7-5  |              | 64     |        |    | 3  |         |    |
| 10             |              |        |        |                                   |        |              | 68     |        |    | 4  |         |    |
|                | 36           |        |        | WEATHERED LIMESTONE               | --     |              |        |        |    | 12 |         |    |
| 12             |              |        |        |                                   |        |              |        |        |    | 23 |         |    |
|                | 40           |        |        |                                   |        |              |        |        |    | 21 |         |    |
|                | 44           |        |        |                                   |        |              |        |        |    |    |         |    |
| 14             |              |        |        |                                   |        |              |        |        |    |    |         |    |
|                | 48           |        |        |                                   |        |              |        |        |    |    |         |    |
|                | 52           |        |        |                                   |        |              |        |        |    |    |         |    |
| 16             |              |        |        |                                   |        |              |        |        |    |    |         |    |
|                | 56           |        |        |                                   |        |              |        |        |    |    |         |    |

**NOTES:** N/M MEANS NOT MEASURED  
N/A MEANS NOT AVAILABLE

*APPENDIX C*  
***SOIL CLASSIFICATION DATA***

## SOIL CLASSIFICATION DATA

Project: HARBINWOOD ESTATES SWMF SINKHOLE

Client: LEON COUNTY PUBLIC WORKS

Project No.: 03-47-18-04

Boring: VB-1

Location: LEON COUNTY, FLORIDA

| DEPTH<br>(FEET) | Wc<br>(%) | -4<br>(%) | -10<br>(%) | -20<br>(%) | -40<br>(%) | -60<br>(%) | -100<br>(%) | -200<br>(%) | LL | PI | Org.<br>(%) | N<br>Value | AASHTO | Description   |
|-----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|----|----|-------------|------------|--------|---|
| 0.0-0.5         | 16        |           |            |            |            |            |             |             |    |    |             | --         | A-2-6  | LOOSE<br>BROWN<br>CLAYEY FINE SAND                  |
| 1.0-1.5         | 13        | 100       | 100        | 100        | 94         | 80         | 52          | 28          | 22 | 11 |             |            | A-2-6  | LOOSE<br>BROWN<br>CLAYEY FINE SAND                  |
| 2.0-2.5         | 14        |           |            |            |            |            |             |             |    |    |             | 5          | A-2-6  | LOOSE<br>BROWN<br>CLAYEY FINE SAND                  |
| 3.0-3.5         | 16        |           |            |            |            |            |             |             |    |    |             |            | A-2-6  | LOOSE<br>BROWN<br>CLAYEY FINE SAND                  |
| 4.0-4.5         | 18        |           |            |            |            |            |             |             |    |    |             |            | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND            |
| 4.5-6.0         | 16        |           |            |            |            |            |             |             |    |    |             | 9          | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND            |
| 6.0-7.5         | 18        | 100       | 100        | 99         | 92         | 75         | 42          | 26          |    |    |             | 20         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND            |
| 7.5-9.0         | 28        |           |            |            |            |            |             |             |    |    |             | 8          | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND            |
| 9.0-10.5        | 22        |           |            |            |            |            |             |             |    |    |             | 8          | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND            |
| 10.5-12.0       | 21        |           |            |            |            |            |             |             |    |    |             | 21         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND            |
| 12.5-14.0       | 29        | 100       | 100        | 100        | 99         | 98         | 94          | 35          | 35 | 16 |             | 10         | A-2-6  | MEDIUM DENSE<br>ORANGE AND GRAY<br>CLAYEY FINE SAND |
| 15.0-16.5       | 25        |           |            |            |            |            |             |             |    |    |             | 15         | A-2-6  | MEDIUM DENSE<br>ORANGE AND GRAY<br>CLAYEY FINE SAND |
| 17.5-19.0       | 30        |           |            |            |            |            |             |             |    |    |             | 17         | A-7-6  | VERY STIFF<br>ORANGE AND GRAY                       |

SOIL CLASSIFICATION DATA

Project: HARBINWOOD ESTATES SWMF SINKHOLE

Client: LEON COUNTY PUBLIC WORKS

Project No.: 03-47-18-04

Boring: VB-1

Location: LEON COUNTY, FLORIDA

| DEPTH<br>(FEET) | Wc<br>(%) | -4<br>(%) | -10<br>(%) | -20<br>(%) | -40<br>(%) | -60<br>(%) | -100<br>(%) | -200<br>(%) | LL | PI | Org.<br>(%) | N<br>Value | AASHTO | Description  |
|-----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|----|----|-------------|------------|--------|--|
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        | HIGHLY PLASTIC CLAY                                  |
| 20.0-21.5       | 28        |           |            |            |            |            |             |             |    |    |             | 13         | A-7-6  | VERY STIFF<br>ORANGE AND GRAY<br>HIGHLY PLASTIC CLAY |
| 22.5-24.0       | 28        | 100       | 100        | 100        | 99         | 98         | 96          | 82          | 79 | 49 |             | 13         | A-7-6  | VERY STIFF<br>ORANGE AND GRAY<br>HIGHLY PLASTIC CLAY |
| 25.0-26.5       | 44        |           |            |            |            |            |             |             |    |    |             | 13         | A-7-6  | VERY STIFF<br>ORANGE AND GRAY<br>HIGHLY PLASTIC CLAY |
| 27.5-29.0       | 40        |           |            |            |            |            |             |             |    |    |             | 6          | A-7-6  | STIFF<br>ORANGE AND GRAY<br>HIGHLY PLASTIC CLAY      |
| 30.0-31.5       | 32        |           |            |            |            |            |             |             |    |    |             | 9          | A-7-6  | STIFF<br>ORANGE AND GRAY<br>HIGHLY PLASTIC CLAY      |
| 32.5-34.0       | 35        |           |            |            |            |            |             |             |    |    |             | 6          | A-7-6  | STIFF<br>ORANGE AND GRAY<br>HIGHLY PLASTIC CLAY      |
| 35.0-36.5       | 36        |           |            |            |            |            |             |             |    |    |             | 7          | A-7-6  | STIFF<br>ORANGE AND GRAY<br>HIGHLY PLASTIC CLAY      |
| 37.5-39.0       |           |           |            |            |            |            |             |             |    |    |             | 6          | --     | HIGHLY WEATHERED LIMESTONE                           |
| 40.0-41.5       |           |           |            |            |            |            |             |             |    |    |             | 37         | --     | WEATHERED LIMESTONE                                  |
| 42.5-44.0       |           |           |            |            |            |            |             |             |    |    |             | 24         | --     | WEATHERED LIMESTONE                                  |
| 45.0-46.5       |           |           |            |            |            |            |             |             |    |    |             | 34         | --     | WEATHERED LIMESTONE                                  |
| 48.0-50.0       |           |           |            |            |            |            |             |             |    |    |             | 51         | --     | HARD LIMESTONE                                       |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |

## SOIL CLASSIFICATION DATA

Project: HARBINWOOD ESTATES SWMF SINKHOLE

Client: LEON COUNTY PUBLIC WORKS

Project No.: 03-47-18-04

Boring: VB-2

Location: LEON COUNTY, FLORIDA

| DEPTH<br>(FEET) | Wc<br>(%) | -4<br>(%) | -10<br>(%) | -20<br>(%) | -40<br>(%) | -60<br>(%) | -100<br>(%) | -200<br>(%) | LL | PI | Org.<br>(%) | N<br>Value | AASHTO | Description                              |
|-----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|----|----|-------------|------------|--------|--|
| 0.0-0.5         | 16        |           |            |            |            |            |             |             |    |    |             | --         | A-2-6  | LOOSE<br>GRAY<br>CLAYEY FINE SAND        |
| 1.0-1.5         | 15        | 100       | 99         | 99         | 93         | 77         | 47          | 30          |    |    |             |            | A-2-6  | LOOSE<br>GRAY<br>CLAYEY FINE SAND        |
| 2.0-2.5         | 16        |           |            |            |            |            |             |             |    |    |             | 8          | A-2-6  | LOOSE<br>GRAY<br>CLAYEY FINE SAND        |
| 3.0-3.5         | 5         |           |            |            |            |            |             |             |    |    |             |            | A-2-4  | MEDIUM DENSE<br>BROWN<br>SILTY FINE SAND |
| 4.0-4.5         | 6         | 100       | 100        | 96         | 80         | 52         | 29          | 14          |    |    |             |            | A-2-4  | MEDIUM DENSE<br>BROWN<br>SILTY FINE SAND |
| 5.0-5.5         | 15        |           |            |            |            |            |             |             |    |    |             | 13         | A-2-4  | MEDIUM DENSE<br>BROWN<br>SILTY FINE SAND |
| 6.0-6.5         | 13        |           |            |            |            |            |             |             |    |    |             |            | A-2-6  | LOOSE<br>GRAY<br>CLAYEY FINE SAND        |
| 7.0-7.5         | 19        | 100       | 99         | 99         | 93         | 73         | 46          | 28          | 23 | 14 |             |            | A-2-6  | LOOSE<br>GRAY<br>CLAYEY FINE SAND        |
| 7.5-9.0         | 17        |           |            |            |            |            |             |             |    |    |             | 7          | A-2-6  | LOOSE<br>GRAY<br>CLAYEY FINE SAND        |
| 9.0-10.5        | 16        |           |            |            |            |            |             |             |    |    |             | 7          | A-2-6  | LOOSE<br>GRAY<br>CLAYEY FINE SAND        |
| 10.5-12.0       | 20        |           |            |            |            |            |             |             |    |    |             | 3          | A-2-6  | LOOSE<br>GRAY<br>CLAYEY FINE SAND        |
| 12.5-14.0       | 18        |           |            |            |            |            |             |             |    |    |             | 8          | A-2-6  | LOOSE<br>GRAY<br>CLAYEY FINE SAND        |
| 15.0-16.5       |           | 60        | 47         | 39         | 30         | 23         | 15          | 10          |    |    |             | 8          | A-1-a  | MEDIUM DENSE<br>GRAY                     |

## SOIL CLASSIFICATION DATA

Project: HARBINWOOD ESTATES SWMF SINKHOLE

Client: LEON COUNTY PUBLIC WORKS

Project No.: 03-47-18-04

Boring: VB-2

Location: LEON COUNTY, FLORIDA

| DEPTH<br>(FEET) | Wc<br>(%) | -4<br>(%) | -10<br>(%) | -20<br>(%) | -40<br>(%) | -60<br>(%) | -100<br>(%) | -200<br>(%) | LL | PI | Org.<br>(%) | N<br>Value | AASHTO | Description  |
|-----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|----|----|-------------|------------|--------|--|
| 17.5-19.0       |           |           |            |            |            |            |             |             |    |    |             | 11         | A-1-a  | SANDY GRAVEL<br>MEDIUM DENSE<br>GRAY   |
| 20.0-21.5       | 19        |           |            |            |            |            |             |             |    |    |             | 10         | A-2-6  | SANDY GRAVEL<br>MEDIUM DENSE<br>GRAY AND ORANGE<br>CLAYEY FINE SAND              |
| 22.5-24.0       | 22        |           |            |            |            |            |             |             |    |    |             | 13         | A-7-6  | VERY STIFF<br>ORANGE AND GRAY<br>HIGHLY PLASTIC SANDY CLAY                       |
| 25.0-26.5       | 25        | 100       | 100        | 100        | 96         | 81         | 68          | 55          | 63 | 48 |             | 12         | A-7-6  | VERY STIFF<br>ORANGE AND GRAY<br>HIGHLY PLASTIC SANDY CLAY                       |
| 27.5-29.0       | 26        |           |            |            |            |            |             |             |    |    |             | 11         | A-7-6  | VERY STIFF<br>ORANGE AND GRAY<br>HIGHLY PLASTIC SANDY CLAY                       |
| 30.0-31.5       | 39        |           |            |            |            |            |             |             |    |    |             | 19         | A-7-6  | VERY STIFF<br>ORANGE AND GRAY<br>HIGHLY PLASTIC CLAY<br>WITH WEATHERED LIMESTONE |
| 32.5-34.0       | 34        |           |            |            |            |            |             |             |    |    |             | 11         | A-7-6  | VERY STIFF<br>ORANGE AND GRAY<br>HIGHLY PLASTIC CLAY<br>WITH WEATHERED LIMESTONE |
| 35.0-36.5       |           |           |            |            |            |            |             |             |    |    |             | 10         | --     | WEATHERED LIMESTONE  |
| 37.5-39.0       |           |           |            |            |            |            |             |             |    |    |             | 20         | --     | WEATHERED LIMESTONE  |
| 40.0-41.5       |           |           |            |            |            |            |             |             |    |    |             | 13         | --     | WEATHERED LIMESTONE  |
| 42.5-44.0       |           |           |            |            |            |            |             |             |    |    |             | 17         | --     | WEATHERED LIMESTONE  |
| 45.0-46.5       |           |           |            |            |            |            |             |             |    |    |             | 16         | --     | WEATHERED LIMESTONE  |
| 48.0-50.0       |           |           |            |            |            |            |             |             |    |    |             | 19         | --     | WEATHERED LIMESTONE  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |

## SOIL CLASSIFICATION DATA

Project: HARBINWOOD ESTATES SWMF SINKHOLE

Client: LEON COUNTY PUBLIC WORKS

Project No.: 03-47-18-04

Boring: VB-3

Location: LEON COUNTY, FLORIDA

| DEPTH<br>(FEET) | Wc<br>(%) | -4<br>(%) | -10<br>(%) | -20<br>(%) | -40<br>(%) | -60<br>(%) | -100<br>(%) | -200<br>(%) | LL | PI | Org.<br>(%) | N<br>Value | AASHTO | Description                                    |
|-----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|----|----|-------------|------------|--------|--|
| 0.0-0.5         | 10        |           |            |            |            |            |             |             |    |    |             | --         | A-2-6  | LOOSE<br>BROWN<br>CLAYEY FINE SAND             |
| 1.0-1.5         | 16        | 100       | 99         | 98         | 91         | 76         | 41          | 21          |    |    |             |            | A-2-6  | LOOSE<br>BROWN<br>CLAYEY FINE SAND             |
| 2.0-2.5         | 13        |           |            |            |            |            |             |             |    |    |             | 8          | A-2-6  | LOOSE<br>GRAY<br>CLAYEY FINE SAND              |
| 3.0-3.5         | 17        |           |            |            |            |            |             |             |    |    |             |            | A-2-6  | LOOSE<br>GRAY<br>CLAYEY FINE SAND              |
| 4.0-4.5         | 16        |           |            |            |            |            |             |             |    |    |             |            | A-2-6  | LOOSE<br>GRAY<br>CLAYEY FINE SAND              |
| 5.0-5.5         | 19        | 100       | 99         | 99         | 92         | 76         | 41          | 21          | 21 | 11 |             | 3          | A-2-6  | LOOSE<br>GRAY<br>CLAYEY FINE SAND              |
| 6.0-6.5         | 20        |           |            |            |            |            |             |             |    |    |             |            | A-2-6  | LOOSE<br>GRAY<br>CLAYEY FINE SAND              |
| 7.0-7.5         | 11        |           |            |            |            |            |             |             |    |    |             |            | A-2-6  | LOOSE<br>GRAY<br>CLAYEY FINE SAND              |
| 7.5-9.0         | 26        | 100       | 100        | 99         | 95         | 81         | 51          | 38          | 39 | 22 |             | 5          | A-6    | LOOSE<br>ORANGE AND GRAY<br>CLAYEY SAND        |
| 9.0-10.5        | 20        |           |            |            |            |            |             |             |    |    |             | 14         | A-6    | MEDIUM DENSE<br>ORANGE AND GRAY<br>CLAYEY SAND |
| 10.5-12.0       | 27        |           |            |            |            |            |             |             |    |    |             | 11         | A-6    | MEDIUM DENSE<br>ORANGE AND GRAY<br>CLAYEY SAND |
| 12.5-14.0       | 29        |           |            |            |            |            |             |             |    |    |             | 11         | A-6    | MEDIUM DENSE<br>ORANGE AND GRAY<br>CLAYEY SAND |
| 15.0-16.5       | 32        |           |            |            |            |            |             |             |    |    |             | 12         | A-7-6  | STIFF<br>GRAY AND ORANGE                       |

**SOIL CLASSIFICATION DATA**

**Project: HARBINWOOD ESTATES SWMF SINKHOLE**

**Client: LEON COUNTY PUBLIC WORKS**

**Project No.: 03-47-18-04**

**Boring: VB-3**

**Location: LEON COUNTY, FLORIDA**

| DEPTH<br>(FEET) | Wc<br>(%) | -4<br>(%) | -10<br>(%) | -20<br>(%) | -40<br>(%) | -60<br>(%) | -100<br>(%) | -200<br>(%) | LL | PI | Org.<br>(%) | N<br>Value | AASHTO | Description   |
|-----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|----|----|-------------|------------|--------|---|
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        | HIGHLY PLASTIC SANDY CLAY                             |
| 17.5-19.0       | 27        |           |            |            |            |            |             |             |    |    |             | 9          | A-7-6  | STIFF<br>GRAY AND ORANGE<br>HIGHLY PLASTIC SANDY CLAY |
| 20.0-21.5       | 36        | 100       | 100        | 99         | 98         | 96         | 95          | 63          | 67 | 45 |             | 9          | A-7-6  | STIFF<br>GRAY AND ORANGE<br>HIGHLY PLASTIC SANDY CLAY |
| 22.5-24.0       | 81        |           |            |            |            |            |             |             |    |    |             | 6          | A-7-6  | STIFF<br>GRAY AND ORANGE<br>HIGHLY PLASTIC SANDY CLAY |
| 25.0-26.5       |           |           |            |            |            |            |             |             |    |    |             | 17         | --     | WEATHERED LIMESTONE                                   |
| 27.5-29.0       |           |           |            |            |            |            |             |             |    |    |             | 8          | --     | WEATHERED LIMESTONE                                   |
| 30.0-31.5       |           |           |            |            |            |            |             |             |    |    |             | 15         | --     | WEATHERED LIMESTONE                                   |
| 32.5-33.8       |           |           |            |            |            |            |             |             |    |    |             | 82/10"     | --     | HARD LIMESTONE  |
| 35.0-36.5       |           |           |            |            |            |            |             |             |    |    |             | 37         | --     | HARD LIMESTONE  |
| 37.5-37.8       |           |           |            |            |            |            |             |             |    |    |             | 50/4"      | --     | HARD LIMESTONE  |
| 40.0-40.4       |           |           |            |            |            |            |             |             |    |    |             | 50/5"      | --     | HARD LIMESTONE  |
| 42.5-42.7       |           |           |            |            |            |            |             |             |    |    |             | 50/2"      | --     | HARD LIMESTONE  |
| 45.0-46.5       |           |           |            |            |            |            |             |             |    |    |             | 26         | --     | WEATHERED LIMESTONE                                   |
| 48.0-50.0       |           |           |            |            |            |            |             |             |    |    |             | 47         | --     | HARD LIMESTONE  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |   |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |   |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |   |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |   |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |   |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |   |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |   |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |   |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |   |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |   |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |   |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |   |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |   |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |   |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |   |



## SOIL CLASSIFICATION DATA

Project: HARBINWOOD ESTATES SWMF SINKHOLE

Client: LEON COUNTY PUBLIC WORKS

Project No.: 03-47-18-04

Boring: VB-4

Location: LEON COUNTY, FLORIDA

| DEPTH<br>(FEET) | Wc<br>(%) | -4<br>(%) | -10<br>(%) | -20<br>(%) | -40<br>(%) | -60<br>(%) | -100<br>(%) | -200<br>(%) | LL | PI | Org.<br>(%) | N<br>Value | AASHTO | Description  |
|-----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|----|----|-------------|------------|--------|--|
| 0.0-0.3         |           |           |            |            |            |            |             |             |    |    |             | --         |        | 4.0-INCHES ASPHALT                                 |
| 0.3-0.8         | 16        |           |            |            |            |            |             |             |    |    |             |            | A-2-4  | BROWN<br>SILTY FINE SAND                           |
| 1.0-1.5         | 17        | 100       | 99         | 98         | 94         | 82         | 54          | 34          | 24 | 11 |             |            | A-2-6  | MEDIUM DENSE<br>BROWN AND GRAY<br>CLAYEY FINE SAND |
| 2.0-2.5         | 20        |           |            |            |            |            |             |             |    |    |             | 13         | A-2-9  | MEDIUM DENSE<br>BROWN AND GRAY<br>CLAYEY FINE SAND |
| 3.0-3.5         | 14        |           |            |            |            |            |             |             |    |    |             |            | A-2-6  | MEDIUM DENSE<br>BROWN AND GRAY<br>CLAYEY FINE SAND |
| 4.0-4.5         | 14        |           |            |            |            |            |             |             |    |    |             |            | A-2-6  | MEDIUM DENSE<br>BROWN AND GRAY<br>CLAYEY FINE SAND |
| 5.0-5.5         | 28        | 100       | 100        | 99         | 94         | 80         | 51          | 35          |    |    |             | 10         | A-2-6  | MEDIUM DENSE<br>BROWN AND GRAY<br>CLAYEY FINE SAND |
| 6.0-6.5         | 23        |           |            |            |            |            |             |             |    |    |             |            | A-2-6  | MEDIUM DENSE<br>BROWN AND GRAY<br>CLAYEY FINE SAND |
| 7.0-7.5         | 21        |           |            |            |            |            |             |             |    |    |             |            | A-2-6  | MEDIUM DENSE<br>BROWN AND GRAY<br>CLAYEY FINE SAND |
| 7.5-9.0         | 15        |           |            |            |            |            |             |             |    |    |             | 18         | A-2-6  | MEDIUM DENSE<br>BROWN AND GRAY<br>CLAYEY FINE SAND |
| 9.0-10.5        | 18        |           |            |            |            |            |             |             |    |    |             | 24         | A-2-6  | MEDIUM DENSE<br>BROWN AND GRAY<br>CLAYEY FINE SAND |
| 10.5-12.0       | 16        |           |            |            |            |            |             |             |    |    |             | 17         | A-2-6  | MEDIUM DENSE<br>BROWN AND GRAY<br>CLAYEY FINE SAND |
| 12.5-14.0       | 25        | 100       | 100        | 99         | 98         | 96         | 55          | 35          | 37 | 23 |             | 14         | A-2-6  | MEDIUM DENSE<br>BROWN AND GRAY<br>CLAYEY FINE SAND |
| 15.0-16.5       | 26        |           |            |            |            |            |             |             |    |    |             | 14         | A-2-6  | MEDIUM DENSE<br>BROWN AND GRAY                     |

## SOIL CLASSIFICATION DATA

Project: HARBINWOOD ESTATES SWMF SINKHOLE

Client: LEON COUNTY PUBLIC WORKS

Project No.: 03-47-18-04

Boring: VB-4

Location: LEON COUNTY, FLORIDA

| DEPTH<br>(FEET) | Wc<br>(%) | -4<br>(%) | -10<br>(%) | -20<br>(%) | -40<br>(%) | -60<br>(%) | -100<br>(%) | -200<br>(%) | LL  | PI | Org.<br>(%) | N<br>Value | AASHTO | Description  |
|-----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|-----|----|-------------|------------|--------|--|
|                 |           |           |            |            |            |            |             |             |     |    |             |            |        | CLAYEY FINE SAND   |
| 17.5-19.0       | 33        |           |            |            |            |            |             |             |     |    |             | 8          | A-2-6  | MEDIUM DENSE<br>BROWN AND GRAY<br>CLAYEY FINE SAND                   |
| 20.0-21.5       | 26        |           |            |            |            |            |             |             |     |    |             | 15         | A-7-6  | VERY STIFF<br>GRAY<br>HIGHLY PLASTIC CLAY WITH SAND                  |
| 22.5-24.0       | 31        |           |            |            |            |            |             |             |     |    |             | 17         | A-7-6  | VERY STIFF<br>GRAY<br>HIGHLY PLASTIC CLAY WITH SAND                  |
| 25.0-26.5       | 28        |           |            |            |            |            |             |             |     |    |             | 12         | A-7-6  | VERY STIFF<br>GRAY<br>HIGHLY PLASTIC CLAY WITH SAND                  |
| 27.5-29.0       | 43        | 100       | 100        | 100        | 99         | 98         | 94          | 79          | 109 | 70 |             | 16         | A-7-6  | VERY STIFF<br>GRAY<br>HIGHLY PLASTIC CLAY WITH SAND                  |
| 30.0-31.5       | 39        |           |            |            |            |            |             |             |     |    |             | 2          | A-7-6  | VERY SOFT<br>GRAY<br>HIGHLY PLASTIC CLAY<br>WITH WEATHERED LIMESTONE |
| 32.5-34.0       | 53        |           |            |            |            |            |             |             |     |    |             | WOH        | A-7-6  | VERY SOFT<br>GRAY<br>HIGHLY PLASTIC CLAY                             |
| 35.0-36.5       | 52        |           |            |            |            |            |             |             |     |    |             | WOH        | A-7-6  | VERY SOFT<br>GRAY<br>HIGHLY PLASTIC CLAY                             |
| 37.5-39.0       | 43        |           |            |            |            |            |             |             |     |    |             | 4          | A-7-6  | FIRM<br>GRAY<br>HIGHLY PLASTIC CLAY<br>WITH WEATHERED LIMESTONE      |
| 40.0-41.5       | 45        |           |            |            |            |            |             |             |     |    |             | 4          | A-7-6  | FIRM<br>GRAY<br>HIGHLY PLASTIC CLAY                                  |
| 42.5-44.0       | 48        |           |            |            |            |            |             |             |     |    |             | 6          | A-7-6  | FIRM<br>GRAY<br>HIGHLY PLASTIC CLAY                                  |
| 45.0-46.5       |           |           |            |            |            |            |             |             |     |    |             | 64         | --     | HARD LIMESTONE   |
| 47.5-49.0       |           |           |            |            |            |            |             |             |     |    |             | 22         | --     | WEATHERED LIMESTONE  |

## SOIL CLASSIFICATION DATA

Project: HARBINWOOD ESTATES SWMF SINKHOLE

Client: LEON COUNTY PUBLIC WORKS

Project No.: 03-47-18-04

Boring: VB-4

Location: LEON COUNTY, FLORIDA

| DEPTH<br>(FEET) | Wc<br>(%) | -4<br>(%) | -10<br>(%) | -20<br>(%) | -40<br>(%) | -60<br>(%) | -100<br>(%) | -200<br>(%) | LL | PI | Org.<br>(%) | N<br>Value | AASHTO | Description                         |
|-----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|----|----|-------------|------------|--------|-------------------------------------|
| 50.0-51.5       |           |           |            |            |            |            |             |             |    |    |             | 13         | --     | WEATHERED LIMESTONE                 |
| 52.5-54.0       | 30        | 100       | 99         | 98         | 92         | 72         | 52          | 32          |    |    |             | 5          | A-2-6  | LOOSE<br>BROWN<br>CLAYEY FINE SAND  |
| 55.0-56.5       | 52        |           |            |            |            |            |             |             |    |    |             | 5          | A-7-6  | FIRM<br>GRAY<br>HIGHLY PLASTIC CLAY |
| 57.5-59.0       |           |           |            |            |            |            |             |             |    |    |             | 16         | --     | WEATHERED LIMESTONE                 |
| 60.0-60.4       |           |           |            |            |            |            |             |             |    |    |             | 50/5"      | --     | HARD LIMESTONE                      |
| 61.5-61.7       |           |           |            |            |            |            |             |             |    |    |             | 50/2"      | --     | HARD LIMESTONE                      |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |                                     |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |                                     |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |                                     |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |                                     |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |                                     |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |                                     |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |                                     |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |                                     |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |                                     |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |                                     |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |                                     |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |                                     |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |                                     |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |                                     |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |                                     |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |                                     |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |                                     |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |                                     |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |                                     |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |                                     |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |                                     |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |                                     |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |                                     |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |                                     |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |                                     |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |                                     |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |                                     |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |                                     |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |                                     |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |                                     |

## SOIL CLASSIFICATION DATA

Project: HARBINWOOD ESTATES SWMF SINKHOLE

Client: LEON COUNTY PUBLIC WORKS

Project No.: 03-47-18-04

Boring: VB-5

Location: LEON COUNTY, FLORIDA

| DEPTH<br>(FEET) | Wc<br>(%) | -4<br>(%) | -10<br>(%) | -20<br>(%) | -40<br>(%) | -60<br>(%) | -100<br>(%) | -200<br>(%) | LL | PI | Org.<br>(%) | N<br>Value | AASHTO | Description   |
|-----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|----|----|-------------|------------|--------|---|
| 0.0-0.5         | 18        |           |            |            |            |            |             |             |    |    |             | --         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND            |
| 1.0-1.5         | 15        |           |            |            |            |            |             |             |    |    |             |            | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND            |
| 2.0-2.5         | 16        | 100       | 100        | 99         | 89         | 69         | 37          | 26          | 31 | 19 |             | 9          | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND            |
| 3.0-3.5         | 12        |           |            |            |            |            |             |             |    |    |             |            | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND            |
| 4.0-4.5         | 13        |           |            |            |            |            |             |             |    |    |             |            | A-2-4  | MEDIUM DENSE<br>GRAY<br>SILTY FINE SAND             |
| 5.0-5.5         | 12        | 100       | 100        | 99         | 94         | 77         | 47          | 25          |    |    |             | 8          | A-2-4  | MEDIUM DENSE<br>GRAY<br>SILTY FINE SAND             |
| 6.0-6.5         | 11        |           |            |            |            |            |             |             |    |    |             |            | A-2-4  | MEDIUM DENSE<br>GRAY<br>SILTY FINE SAND             |
| 7.0-7.5         | 14        |           |            |            |            |            |             |             |    |    |             |            | A-2-4  | MEDIUM DENSE<br>GRAY<br>SILTY FINE SAND             |
| 7.5-9.0         | 15        | 100       | 100        | 100        | 96         | 82         | 51          | 31          | 27 | 14 |             | 10         | A-2-6  | MEDIUM DENSE<br>ORANGE AND GRAY<br>CLAYEY FINE SAND |
| 9.0-10.5        | 17        |           |            |            |            |            |             |             |    |    |             | 19         | A-2-6  | MEDIUM DENSE<br>ORANGE AND GRAY<br>CLAYEY FINE SAND |
| 10.5-12.0       | 15        |           |            |            |            |            |             |             |    |    |             | 20         | A-2-6  | MEDIUM DENSE<br>ORANGE AND GRAY<br>CLAYEY FINE SAND |
| 12.5-14.0       | 17        |           |            |            |            |            |             |             |    |    |             | 32         | A-2-6  | DENSE<br>GRAY AND ORANGE<br>CLAYEY FINE SAND        |
| 15.0-16.5       | 18        |           |            |            |            |            |             |             |    |    |             | 27         | A-2-6  | DENSE<br>GRAY AND ORANGE                            |

## SOIL CLASSIFICATION DATA

Project: HARBINWOOD ESTATES SWMF SINKHOLE

Client: LEON COUNTY PUBLIC WORKS

Project No.: 03-47-18-04

Boring: VB-5

Location: LEON COUNTY, FLORIDA

| DEPTH<br>(FEET) | Wc<br>(%) | -4<br>(%) | -10<br>(%) | -20<br>(%) | -40<br>(%) | -60<br>(%) | -100<br>(%) | -200<br>(%) | LL  | PI | Org.<br>(%) | N<br>Value | AASHTO | Description                                  |
|-----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|-----|----|-------------|------------|--------|--|
|                 |           |           |            |            |            |            |             |             |     |    |             |            |        | CLAYEY FINE SAND                             |
| 17.5-19.0       | 22        | 100       | 100        | 99         | 93         | 76         | 44          | 26          | 27  | 17 |             | 24         | A-2-6  | DENSE<br>GRAY AND ORANGE<br>CLAYEY FINE SAND |
| 20.0-21.5       | 26        |           |            |            |            |            |             |             |     |    |             | 25         | A-2-6  | DENSE<br>GRAY AND ORANGE<br>CLAYEY FINE SAND |
| 22.5-24.0       | 18        |           |            |            |            |            |             |             |     |    |             | 26         | A-2-6  | DENSE<br>GRAY AND ORANGE<br>CLAYEY FINE SAND |
| 25.0-26.5       | 23        |           |            |            |            |            |             |             |     |    |             | 28         | A-2-6  | DENSE<br>GRAY AND ORANGE<br>CLAYEY FINE SAND |
| 27.5-29.0       | 22        |           |            |            |            |            |             |             |     |    |             | 25         | A-2-6  | DENSE<br>GRAY AND ORANGE<br>CLAYEY FINE SAND |
| 30.0-31.5       | 29        | 100       | 100        | 100        | 99         | 98         | 81          | 25          | 33  | 22 |             | 17         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND     |
| 32.5-34.0       | 30        |           |            |            |            |            |             |             |     |    |             | 16         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND     |
| 35.0-36.5       | 33        |           |            |            |            |            |             |             |     |    |             | 18         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND     |
| 37.5-39.0       | 51        |           |            |            |            |            |             |             |     |    |             | 15         | A-7-6  | VERY STIFF<br>ORANGE<br>HIGHLY PLASTIC CLAY  |
| 40.0-41.5       | 63        | 100       | 100        | 100        | 100        | 100        | 98          | 95          | 125 | 96 |             | 9          | A-7-6  | STIFF<br>ORANGE<br>HIGHLY PLASTIC CLAY       |
| 42.5-44.0       | 58        |           |            |            |            |            |             |             |     |    |             | 10         | A-7-6  | STIFF<br>ORANGE<br>HIGHLY PLASTIC CLAY       |
| 45.0-46.5       |           |           |            |            |            |            |             |             |     |    |             | 9          | --     | WEATHERED LIMESTONE                          |
| 48.0-50.0       |           |           |            |            |            |            |             |             |     |    |             | 46         | --     | HARD LIMESTONE                               |
|                 |           |           |            |            |            |            |             |             |     |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |     |    |             |            |        |  |

## SOIL CLASSIFICATION DATA

Project: HARBINWOOD ESTATES SWMF SINKHOLE

Client: LEON COUNTY PUBLIC WORKS

Project No.: 03-47-18-04

Boring: VB-6

Location: LEON COUNTY, FLORIDA

| DEPTH<br>(FEET) | Wc<br>(%) | -4<br>(%) | -10<br>(%) | -20<br>(%) | -40<br>(%) | -60<br>(%) | -100<br>(%) | -200<br>(%) | LL | PI | Org.<br>(%) | N<br>Value | AASHTO | Description                              |
|-----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|----|----|-------------|------------|--------|--|
| 0.0-0.5         |           |           |            |            |            |            |             |             |    |    |             | --         | --     | 6.0-INCHES ASPHALT                       |
| 0.5-1.0         | 15        |           |            |            |            |            |             |             |    |    |             |            | A-2-6  | BROWN<br>CLAYEY FINE SAND WITH GRAVEL    |
| 1.0-1.5         | 20        | 99        | 99         | 98         | 94         | 80         | 51          | 34          | 30 | 17 |             | 13         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND |
| 2.0-2.5         | 23        |           |            |            |            |            |             |             |    |    |             | 4          | A-2-6  | LOOSE<br>GRAY<br>CLAYEY FINE SAND        |
| 3.0-3.5         | 17        |           |            |            |            |            |             |             |    |    |             | 4          | A-2-6  | LOOSE<br>GRAY<br>CLAYEY FINE SAND        |
| 4.0-4.5         | 14        | 100       | 100        | 99         | 93         | 74         | 35          | 16          |    |    |             | 8          | A-3    | LOOSE<br>LIGHT GRAY<br>FINE SAND         |
| 5.0-5.5         | 16        |           |            |            |            |            |             |             |    |    |             | 8          | A-3    | LOOSE<br>LIGHT GRAY<br>FINE SAND         |
| 6.0-6.5         | 22        |           |            |            |            |            |             |             |    |    |             | 4          | A-2-6  | LOOSE<br>GRAY<br>CLAYEY FINE SAND        |
| 7.0-8.5         | 18        | 100       | 100        | 99         | 95         | 83         | 52          | 34          | 24 | 11 |             | 7          | A-2-6  | LOOSE<br>GRAY<br>CLAYEY FINE SAND        |
| 8.5-10.0        | 17        |           |            |            |            |            |             |             |    |    |             | 14         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND |
| 10.0-11.5       | 18        |           |            |            |            |            |             |             |    |    |             | 16         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND |
| 12.5-14.0       | 18        | 100       | 100        | 100        | 94         | 75         | 46          | 26          |    |    |             | 20         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND |
| 15.0-16.5       | 22        |           |            |            |            |            |             |             |    |    |             | 10         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND |
| 17.5-19.0       | 26        |           |            |            |            |            |             |             |    |    |             | 10         | A-2-6  | MEDIUM DENSE<br>GRAY                     |

## SOIL CLASSIFICATION DATA

Project: HARBINWOOD ESTATES SWMF SINKHOLE

Client: LEON COUNTY PUBLIC WORKS

Project No.: 03-47-18-04

Boring: VB-6

Location: LEON COUNTY, FLORIDA

| DEPTH<br>(FEET) | Wc<br>(%) | -4<br>(%) | -10<br>(%) | -20<br>(%) | -40<br>(%) | -60<br>(%) | -100<br>(%) | -200<br>(%) | LL | PI | Org.<br>(%) | N<br>Value | AASHTO | Description   |
|-----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|----|----|-------------|------------|--------|---|
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        | CLAYEY FINE SAND  |
| 20.0-21.5       | 25        | 100       | 100        | 100        | 100        | 99         | 92          | 32          | 34 | 19 |             | 8          | A-6    | LOOSE<br>GRAY AND ORANGE<br>CLAYEY SAND                       |
| 22.5-24.0       | 27        |           |            |            |            |            |             |             |    |    |             | 7          | A-6    | LOOSE<br>GRAY AND ORANGE<br>CLAYEY SAND                       |
| 25.0-26.5       | 44        |           |            |            |            |            |             |             |    |    |             | 7          | A-7-6  | STIFF<br>ORANGE AND GRAY<br>HIGHLY PLASTIC CLAY               |
| 27.5-29.0       | 69        | 100       | 100        | 100        | 99         | 97         | 84          | 60          | 43 | 26 |             | 7          | A-7-6  | STIFF<br>ORANGE AND GRAY<br>HIGHLY PLASTIC CLAY               |
| 30.0-31.5       | 45        |           |            |            |            |            |             |             |    |    |             | 6          | A-7-6  | STIFF<br>ORANGE AND GRAY<br>HIGHLY PLASTIC CLAY               |
| 32.5-34.0       | 61        |           |            |            |            |            |             |             |    |    |             | 8          | A-7-6  | STIFF<br>ORANGE AND GRAY<br>HIGHLY PLASTIC CLAY               |
| 35.0-36.5       | 44        | 100       | 100        | 100        | 99         | 98         | 95          | 87          |    |    |             | 8          | A-7-6  | STIFF<br>ORANGE AND GRAY<br>HIGHLY PLASTIC CLAY               |
| 37.5-39.0       | 43        |           |            |            |            |            |             |             |    |    |             | 7          | A-7-6  | STIFF<br>ORANGE AND GRAY<br>HIGHLY PLASTIC CLAY               |
| 40.0-41.5       | 79        |           |            |            |            |            |             |             |    |    |             | 6          | A-7-6  | STIFF<br>BROWN AND GRAY<br>HIGHLY PLASTIC CLAY WITH LIMESTONE |
| 42.5-44.0       | 63        |           |            |            |            |            |             |             |    |    |             | 7          | A-7-6  | STIFF<br>BROWN AND GRAY<br>HIGHLY PLASTIC CLAY WITH LIMESTONE |
| 45.0-46.5       |           |           |            |            |            |            |             |             |    |    |             | 22         | --     | WEATHERED LIMESTONE   |
| 47.5-49.0       |           |           |            |            |            |            |             |             |    |    |             | 74         | --     | HARD LIMESTONE  |
| 50.0-51.5       |           |           |            |            |            |            |             |             |    |    |             | 18         | --     | WEATHERED LIMESTONE   |
| 52.5-53.2       |           |           |            |            |            |            |             |             |    |    |             | 50/2"      | --     | HARD LIMESTONE  |
| 55.0-56.5       |           |           |            |            |            |            |             |             |    |    |             | 10         | --     | WEATHERED LIMESTONE   |
| 57.5-59.0       |           |           |            |            |            |            |             |             |    |    |             | 17         | --     | WEATHERED LIMESTONE   |
| 60.0-61.5       |           |           |            |            |            |            |             |             |    |    |             | 10         | --     | WEATHERED LIMESTONE   |

SOIL CLASSIFICATION DATA

Project: HARBINWOOD ESTATES SWMF SINKHOLE

Client: LEON COUNTY PUBLIC WORKS

Project No.: 03-47-18-04

Boring: VB-6

Location: LEON COUNTY, FLORIDA

| DEPTH (FEET) | Wc (%) | -4 (%) | -10 (%) | -20 (%) | -40 (%) | -60 (%) | -100 (%) | -200 (%) | LL | PI | Org. (%) | N Value | AASHTO | Description    |
|--------------|--------|--------|---------|---------|---------|---------|----------|----------|----|----|----------|---------|--------|----------------|
| 62.5-64.0    |        |        |         |         |         |         |          |          |    |    |          | 50      | --     | HARD LIMESTONE |
| 65.0-65.1    |        |        |         |         |         |         |          |          |    |    |          | 50/1"   | --     | HARD LIMESTONE |
| 68.0-70.0    |        |        |         |         |         |         |          |          |    |    |          | 56      | --     | HARD LIMESTONE |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |                |



## SOIL CLASSIFICATION DATA

Project: HARBINWOOD ESTATES SWMF SINKHOLE

Client: LEON COUNTY PUBLIC WORKS

Project No.: 03-47-18-04

Boring: VB-7

Location: LEON COUNTY, FLORIDA

| DEPTH<br>(FEET) | Wc<br>(%) | -4<br>(%) | -10<br>(%) | -20<br>(%) | -40<br>(%) | -60<br>(%) | -100<br>(%) | -200<br>(%) | LL | PI | Org.<br>(%) | N<br>Value | AASHTO | Description                              |
|-----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|----|----|-------------|------------|--------|--|
| 0.0-0.5         | 12        |           |            |            |            |            |             |             |    |    |             | --         | A-2-4  | MEDIUM DENSE<br>GRAY<br>SILTY FINE SAND  |
| 1.0-1.5         | 16        |           |            |            |            |            |             |             |    |    |             | 13         | A-2-4  | MEDIUM DENSE<br>GRAY<br>SILTY FINE SAND  |
| 2.0-2.5         | 5         | 99        | 98         | 94         | 76         | 47         | 22          | 12          |    |    |             | 13         | A-2-4  | MEDIUM DENSE<br>GRAY<br>SILTY FINE SAND  |
| 3.0-3.5         | 5         |           |            |            |            |            |             |             |    |    |             | 10         | A-2-4  | MEDIUM DENSE<br>GRAY<br>SILTY FINE SAND  |
| 4.0-4.5         | 9         | 100       | 99         | 95         | 73         | 45         | 23          | 14          |    |    |             | 9          | A-2-4  | MEDIUM DENSE<br>GRAY<br>SILTY FINE SAND  |
| 5.0-5.5         | 13        |           |            |            |            |            |             |             |    |    |             | 8          | A-2-4  | MEDIUM DENSE<br>GRAY<br>SILTY FINE SAND  |
| 6.0-6.5         | 21        |           |            |            |            |            |             |             |    |    |             | 4          | A-2-6  | LOOSE<br>GRAY<br>CLAYEY FINE SAND        |
| 7.0-8.5         | 18        | 100       | 100        | 100        | 92         | 75         | 44          | 29          | 29 | 19 |             | 18         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND |
| 8.5-10.0        | 18        |           |            |            |            |            |             |             |    |    |             | 30         | A-2-6  | DENSE<br>GRAY<br>CLAYEY FINE SAND        |
| 10.0-11.5       | 14        |           |            |            |            |            |             |             |    |    |             | 28         | A-2-6  | DENSE<br>GRAY<br>CLAYEY FINE SAND        |
| 12.5-14.0       | 31        |           |            |            |            |            |             |             |    |    |             | 20         | A-6    | MEDIUM DENSE<br>GRAY<br>CLAYEY SAND      |
| 15.0-16.5       | 37        | 100       | 100        | 100        | 99         | 96         | 44          | 34          | 40 | 28 |             | 26         | A-6    | DENSE<br>GRAY<br>CLAYEY SAND             |
| 17.5-19.0       | 33        |           |            |            |            |            |             |             |    |    |             | 20         | A-6    | MEDIUM DENSE<br>GRAY                     |

**SOIL CLASSIFICATION DATA**

**Project: HARBINWOOD ESTATES SWMF SINKHOLE**

**Client: LEON COUNTY PUBLIC WORKS**

**Project No.: 03-47-18-04**

**Boring: VB-7**

**Location: LEON COUNTY, FLORIDA**

| DEPTH (FEET) | Wc (%) | -4 (%) | -10 (%) | -20 (%) | -40 (%) | -60 (%) | -100 (%) | -200 (%) | LL | PI | Org. (%) | N Value | AASHTO | Description                                    |
|--------------|--------|--------|---------|---------|---------|---------|----------|----------|----|----|----------|---------|--------|--|
|              |        |        |         |         |         |         |          |          |    |    |          |         |        | CLAYEY SAND                                    |
| 20.0-21.5    | 28     |        |         |         |         |         |          |          |    |    |          | 16      | A-6    | MEDIUM DENSE GRAY CLAYEY SAND                  |
| 22.5-24.0    | 29     | 100    | 100     | 100     | 100     | 98      | 80       | 49       |    |    |          | 13      | A-6    | MEDIUM DENSE GRAY CLAYEY SAND                  |
| 25.0-26.5    | 25     |        |         |         |         |         |          |          |    |    |          | 20      | A-6    | MEDIUM DENSE GRAY CLAYEY SAND                  |
| 27.5-29.0    | 25     |        |         |         |         |         |          |          |    |    |          | 22      | A-7-6  | VERY STIFF GRAY AND ORANGE HIGHLY PLASTIC CLAY |
| 30.0-31.5    | 39     | 100    | 99      | 98      | 98      | 94      | 87       | 51       | 58 | 38 |          | 19      | A-7-6  | VERY STIFF GRAY AND ORANGE HIGHLY PLASTIC CLAY |
| 32.5-34.0    | 26     |        |         |         |         |         |          |          |    |    |          | 10      | A-7-6  | STIFF GRAY AND ORANGE HIGHLY PLASTIC CLAY      |
| 35.0-36.5    | 64     |        |         |         |         |         |          |          |    |    |          | 9       | A-7-6  | STIFF GRAY AND ORANGE HIGHLY PLASTIC CLAY      |
| 37.5-39.0    | 65     | 100    | 100     | 100     | 99      | 98      | 93       | 81       |    |    |          | 9       | A-7-6  | STIFF GRAY AND ORANGE HIGHLY PLASTIC CLAY      |
| 40.0-41.5    |        |        |         |         |         |         |          |          |    |    |          | 12      | --     | WEATHERED LIMESTONE                            |
| 42.5-44.0    |        |        |         |         |         |         |          |          |    |    |          | 23      | --     | WEATHERED LIMESTONE                            |
| 45.0-45.8    |        |        |         |         |         |         |          |          |    |    |          | 50/3"   | --     | HARD LIMESTONE                                 |
| 47.5-47.9    |        |        |         |         |         |         |          |          |    |    |          | 50/5"   | --     | HARD LIMESTONE                                 |
| 50.0         |        |        |         |         |         |         |          |          |    |    |          | 50/0"   | --     | HARD LIMESTONE                                 |
| 52.5-54.0    |        |        |         |         |         |         |          |          |    |    |          | 28      | --     | WEATHERED LIMESTONE                            |
| 55.0-56.5    |        |        |         |         |         |         |          |          |    |    |          | 35      | --     | HARD LIMESTONE                                 |
| 58.0-58.2    |        |        |         |         |         |         |          |          |    |    |          | 50/2"   | --     | HARD LIMESTONE                                 |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |  |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |  |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |  |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |  |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |  |
|              |        |        |         |         |         |         |          |          |    |    |          |         |        |  |

## SOIL CLASSIFICATION DATA

Project: HARBINWOOD ESTATES SWMF SINKHOLE

Client: LEON COUNTY PUBLIC WORKS

Project No.: 03-47-18-04

Boring: VB-8

Location: LEON COUNTY, FLORIDA

| DEPTH<br>(FEET) | Wc<br>(%) | -4<br>(%) | -10<br>(%) | -20<br>(%) | -40<br>(%) | -60<br>(%) | -100<br>(%) | -200<br>(%) | LL  | PI | Org.<br>(%) | N<br>Value | AASHTO | Description  |
|-----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|-----|----|-------------|------------|--------|--|
| 0.0-1.5         | 18        |           |            |            |            |            |             |             |     |    |             | 14         | A-2-6  | MEDIUM DENSE<br>GRAY AND ORANGE<br>CLAYEY FINE SAND  |
| 1.5-3.0         | 18        | 100       | 100        | 100        | 96         | 86         | 54          | 33          | 32  | 16 |             | 26         | A-2-6  | DENSE<br>GRAY AND ORANGE<br>CLAYEY FINE SAND         |
| 3.0-4.5         | 17        |           |            |            |            |            |             |             |     |    |             | 21         | A-2-6  | MEDIUM DENSE<br>GRAY AND ORANGE<br>CLAYEY FINE SAND  |
| 4.5-6.0         | 16        |           |            |            |            |            |             |             |     |    |             | 28         | A-2-6  | DENSE<br>GRAY AND ORANGE<br>CLAYEY FINE SAND         |
| 6.0-7.5         | 16        |           |            |            |            |            |             |             |     |    |             | 22         | A-2-6  | MEDIUM DENSE<br>GRAY AND ORANGE<br>CLAYEY FINE SAND  |
| 7.5-9.0         | 19        | 100       | 100        | 98         | 88         | 66         | 40          | 27          | 26  | 19 |             | 18         | A-2-6  | MEDIUM DENSE<br>GRAY AND ORANGE<br>CLAYEY FINE SAND  |
| 9.0-10.5        | 16        |           |            |            |            |            |             |             |     |    |             | 14         | A-2-6  | MEDIUM DENSE<br>GRAY AND ORANGE<br>CLAYEY FINE SAND  |
| 10.5-12.0       | 16        |           |            |            |            |            |             |             |     |    |             | 15         | A-2-6  | MEDIUM DENSE<br>GRAY AND ORANGE<br>CLAYEY FINE SAND  |
| 12.5-14.0       | 17        |           |            |            |            |            |             |             |     |    |             | 13         | A-2-6  | MEDIUM DENSE<br>GRAY AND ORANGE<br>CLAYEY FINE SAND  |
| 15.0-16.5       | 18        | 100       | 100        | 99         | 88         | 66         | 40          | 27          | 26  | 19 |             | 24         | A-2-4  | MEDIUM DENSE<br>GRAY<br>SILTY FINE SAND              |
| 17.5-19.0       | 24        |           |            |            |            |            |             |             |     |    |             | 13         | A-7-6  | VERY STIFF<br>ORANGE AND GRAY<br>HIGHLY PLASTIC CLAY |
| 20.0-21.5       | 63        | 100       | 100        | 100        | 99         | 97         | 93          | 64          | 107 | 75 |             | 13         | A-7-6  | VERY STIFF<br>ORANGE AND GRAY<br>HIGHLY PLASTIC CLAY |
| 22.5-24.0       | 42        |           |            |            |            |            |             |             |     |    |             | 7          | A-7-6  | STIFF<br>GRAY  |

## SOIL CLASSIFICATION DATA

Project: HARBINWOOD ESTATES SWMF SINKHOLE

Client: LEON COUNTY PUBLIC WORKS

Project No.: 03-47-18-04

Boring: VB-8

Location: LEON COUNTY, FLORIDA

| DEPTH<br>(FEET) | Wc<br>(%) | -4<br>(%) | -10<br>(%) | -20<br>(%) | -40<br>(%) | -60<br>(%) | -100<br>(%) | -200<br>(%) | LL  | PI  | Org.<br>(%) | N<br>Value | AASHTO | Description  |
|-----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|-----|-----|-------------|------------|--------|--|
|                 |           |           |            |            |            |            |             |             |     |     |             |            |        | HIGHLY PLASTIC CLAY                                      |
| 25.0-26.5       |           |           |            |            |            |            |             |             |     |     |             | 6          | --     | HIGHLY WEATHERED LIMESTONE                               |
| 27.5-29.0       |           |           |            |            |            |            |             |             |     |     |             | 13         | --     | WEATHERED LIMESTONE                                      |
| 30.0-31.5       |           |           |            |            |            |            |             |             |     |     |             | 16         | --     | WEATHERED LIMESTONE                                      |
| 32.5-34.0       |           |           |            |            |            |            |             |             |     |     |             | 36         | --     | WEATHERED LIMESTONE                                      |
| 35.0-35.9       |           |           |            |            |            |            |             |             |     |     |             | 50/5"      | --     | HARD LIMESTONE   |
| 37.5-39.0       |           |           |            |            |            |            |             |             |     |     |             | 50         | --     | HARD LIMESTONE   |
| 40.0-41.5       |           |           |            |            |            |            |             |             |     |     |             | 11         | --     | WEATHERED LIMESTONE                                      |
| 42.5-44.0       |           |           |            |            |            |            |             |             |     |     |             | 3          | --     | VERY LOOSE<br>GRAY<br>SILTY FINE SAND                    |
| 45.0-46.5       | 99        | 100       | 99         | 97         | 96         | 95         | 92          | 84          | 198 | 162 |             | 1          | A-7-6  | SOFT<br>BROWN<br>HIGHLY PLASTIC CLAY WITH LIMESTONE      |
| 47.5-49.0       | 112       |           |            |            |            |            |             |             |     |     |             | 2          | A-7-6  | SOFT<br>BROWN<br>HIGHLY PLASTIC CLAY WITH LIMESTONE      |
| 50.0-51.5       | 151       |           |            |            |            |            |             |             |     |     |             | WOH        | A-7-6  | VERY SOFT<br>BROWN<br>HIGHLY PLASTIC CLAY WITH LIMESTONE |
| 52.5-54.0       | 116       |           |            |            |            |            |             |             |     |     |             | WOH        | A-7-6  | VERY SOFT<br>BROWN<br>HIGHLY PLASTIC CLAY WITH LIMESTONE |
| 55.0-56.5       | 134       |           |            |            |            |            |             |             |     |     |             | 4          | A-7-6  | FIRM<br>BROWN<br>HIGHLY PLASTIC CLAY WITH LIMESTONE      |
| 57.5-59.0       | 45        |           |            |            |            |            |             |             |     |     |             | 2          | A-7-6  | SOFT<br>BROWN<br>HIGHLY PLASTIC CLAY WITH LIMESTONE      |
| 60.0-61.5       | 99        |           |            |            |            |            |             |             |     |     |             | 4          | A-7-6  | FIRM<br>BROWN<br>HIGHLY PLASTIC CLAY WITH LIMESTONE      |
| 62.5-64.0       | 148       |           |            |            |            |            |             |             |     |     |             | 8          | A-7-6  | STIFF<br>BROWN<br>HIGHLY PLASTIC CLAY WITH LIMESTONE     |
| 65.0-66.5       |           |           |            |            |            |            |             |             |     |     |             | 20         | --     | WEATHERED LIMESTONE                                      |
| 68.0-68.6       |           |           |            |            |            |            |             |             |     |     |             | 50/1"      | --     | HARD LIMESTONE   |

## SOIL CLASSIFICATION DATA

Project: HARBINWOOD ESTATES SWMF SINKHOLE

Client: LEON COUNTY PUBLIC WORKS

Project No.: 03-47-18-04

Boring: VB-9

Location: LEON COUNTY, FLORIDA

| DEPTH<br>(FEET) | Wc<br>(%) | -4<br>(%) | -10<br>(%) | -20<br>(%) | -40<br>(%) | -60<br>(%) | -100<br>(%) | -200<br>(%) | LL  | PI | Org.<br>(%) | N<br>Value | AASHTO | Description                              |
|-----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|-----|----|-------------|------------|--------|--|
| 0.0-1.5         | 13        | 100       | 100        | 99         | 94         | 77         | 52          | 28          |     |    |             | 10         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND |
| 1.5-3.0         | 13        |           |            |            |            |            |             |             |     |    |             | 10         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND |
| 3.0-4.5         | 19        | 100       | 100        | 100        | 95         | 82         | 50          | 30          | 28  | 14 |             | 8          | A-2-6  | LOOSE<br>GRAY<br>CLAYEY FINE SAND        |
| 4.5-6.0         | 22        |           |            |            |            |            |             |             |     |    |             | 5          | A-2-6  | LOOSE<br>GRAY<br>CLAYEY FINE SAND        |
| 6.0-7.5         | 20        |           |            |            |            |            |             |             |     |    |             | 4          | A-2-6  | LOOSE<br>GRAY<br>CLAYEY FINE SAND        |
| 7.5-9.0         | 21        | 100       | 100        | 100        | 99         | 96         | 75          | 43          | 36  | 22 |             | 6          | A-6    | LOOSE<br>ORANGE AND GRAY<br>CLAYEY SAND  |
| 9.0-10.5        | 21        |           |            |            |            |            |             |             |     |    |             | 7          | A-6    | LOOSE<br>ORANGE AND GRAY<br>CLAYEY SAND  |
| 10.5-12.0       | 22        |           |            |            |            |            |             |             |     |    |             | 10         | A-6    | LOOSE<br>ORANGE AND GRAY<br>CLAYEY SAND  |
| 12.5-14.0       | 55        | 100       | 100        | 100        | 100        | 99         | 98          | 87          | 102 | 66 |             | 11         | A-7-6  | STIFF<br>GRAY<br>HIGHLY PLASTIC CLAY     |
| 15.0-16.5       |           |           |            |            |            |            |             |             |     |    |             | 19         | --     | WEATHERED LIMESTONE                      |
| 17.5-19.0       |           |           |            |            |            |            |             |             |     |    |             | 34         | --     | HARD LIMESTONE                           |
| 20.0-21.5       |           |           |            |            |            |            |             |             |     |    |             | 56         | --     | HARD LIMESTONE                           |
| 22.5-24.0       |           |           |            |            |            |            |             |             |     |    |             | 4          | --     | HIGHLY WEATHERED LIMESTONE               |
| 25.0-26.5       |           |           |            |            |            |            |             |             |     |    |             | 18         | --     | WEATHERED LIMESTONE                      |
| 27.5-29.0       |           |           |            |            |            |            |             |             |     |    |             | 9          | --     | WEATHERED LIMESTONE                      |
| 30.0-31.5       |           |           |            |            |            |            |             |             |     |    |             | 70         | --     | HARD LIMESTONE                           |
| 32.5-32.8       |           |           |            |            |            |            |             |             |     |    |             | 50/3"      | --     | HARD LIMESTONE                           |
| 35.0-36.5       |           |           |            |            |            |            |             |             |     |    |             | 15         | --     | WEATHERED LIMESTONE                      |
| 37.5-38.8       |           |           |            |            |            |            |             |             |     |    |             | 50/4"      | --     | HARD LIMESTONE                           |
| 40.0-40.8       |           |           |            |            |            |            |             |             |     |    |             | 50/6"      | --     | HARD LIMESTONE                           |

### SOIL CLASSIFICATION DATA

**Project: HARBINWOOD ESTATES SWMF SINKHOLE**

**Client: LEON COUNTY PUBLIC WORKS**

**Project No.: 03-47-18-04**

**Boring: VB-9**

**Location: LEON COUNTY, FLORIDA**

| <b>DEPTH<br/>(FEET)</b> | <b>Wc<br/>(%)</b> | <b>-4<br/>(%)</b> | <b>-10<br/>(%)</b> | <b>-20<br/>(%)</b> | <b>-40<br/>(%)</b> | <b>-60<br/>(%)</b> | <b>-100<br/>(%)</b> | <b>-200<br/>(%)</b> | <b>LL</b> | <b>PI</b> | <b>Org.<br/>(%)</b> | <b>N<br/>Value</b> | <b>AASHTO</b> | <b>Description</b> |
|-------------------------|-------------------|-------------------|--------------------|--------------------|--------------------|--------------------|---------------------|---------------------|-----------|-----------|---------------------|--------------------|---------------|--------------------|
| 42.5-44.0               |                   |                   |                    |                    |                    |                    |                     |                     |           |           |                     | 60                 | --            | HARD LIMESTONE     |
| 45.0-45.3               |                   |                   |                    |                    |                    |                    |                     |                     |           |           |                     | 50/3"              | --            | HARD LIMESTONE     |
| 47.5-48.3               |                   |                   |                    |                    |                    |                    |                     |                     |           |           |                     | 50/4"              | --            | HARD LIMESTONE     |
| 50.0-50.8               |                   |                   |                    |                    |                    |                    |                     |                     |           |           |                     | 50/3"              | --            | HARD LIMESTONE     |
| 52.5-52.7               |                   |                   |                    |                    |                    |                    |                     |                     |           |           |                     | 50/2"              | --            | HARD LIMESTONE     |
| 55.0-55.2               |                   |                   |                    |                    |                    |                    |                     |                     |           |           |                     | 50/2"              | --            | HARD LIMESTONE     |
| 58.0-58.1               |                   |                   |                    |                    |                    |                    |                     |                     |           |           |                     | 50/1"              | --            | HARD LIMESTONE     |
|                         |                   |                   |                    |                    |                    |                    |                     |                     |           |           |                     |                    |               |                    |
|                         |                   |                   |                    |                    |                    |                    |                     |                     |           |           |                     |                    |               |                    |
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|                         |                   |                   |                    |                    |                    |                    |                     |                     |           |           |                     |                    |               |                    |

## SOIL CLASSIFICATION DATA

Project: HARBINWOOD ESTATES SWMF SINKHOLE

Client: LEON COUNTY PUBLIC WORKS

Project No.: 03-47-18-04

Boring: VB-10

Location: LEON COUNTY, FLORIDA

| DEPTH<br>(FEET) | Wc<br>(%) | -4<br>(%) | -10<br>(%) | -20<br>(%) | -40<br>(%) | -60<br>(%) | -100<br>(%) | -200<br>(%) | LL | PI | Org.<br>(%) | N<br>Value | AASHTO | Description                                     |
|-----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|----|----|-------------|------------|--------|---|
| 0.0-0.5         | 17        |           |            |            |            |            |             |             |    |    |             | --         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND        |
| 1.0-1.5         | 35        | 100       | 99         | 99         | 96         | 82         | 71          | 51          | 60 | 40 |             | 12         | A-7-6  | STIFF<br>GRAY<br>HIGHLY PLASTIC SANDY CLAY      |
| 2.0-2.5         | 36        |           |            |            |            |            |             |             |    |    |             | 9          | A-7-6  | STIFF<br>GRAY<br>HIGHLY PLASTIC SANDY CLAY      |
| 3.0-3.5         | 15        |           |            |            |            |            |             |             |    |    |             | 13         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND        |
| 4.0-4.5         | 17        |           |            |            |            |            |             |             |    |    |             | 8          | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND        |
| 5.0-5.5         | 18        | 100       | 100        | 99         | 92         | 72         | 51          | 28          | 31 | 19 |             | 9          | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND        |
| 6.0-6.5         | 18        |           |            |            |            |            |             |             |    |    |             | 10         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND        |
| 7.5-9.0         | 7         |           |            |            |            |            |             |             |    |    |             | 29         | A-2-6  | DENSE TO VERY DENSE<br>GRAY<br>CLAYEY FINE SAND |
| 9.0-10.5        | 15        |           |            |            |            |            |             |             |    |    |             | 88         | A-2-6  | DENSE TO VERY DENSE<br>GRAY<br>CLAYEY FINE SAND |
| 10.5-12.0       | 24        | 100       | 100        | 99         | 95         | 76         | 40          | 21          | 21 | 11 |             | 26         | A-2-6  | DENSE TO VERY DENSE<br>GRAY<br>CLAYEY FINE SAND |
| 12.5-14.0       | 21        |           |            |            |            |            |             |             |    |    |             | 24         | A-2-6  | DENSE TO VERY DENSE<br>GRAY<br>CLAYEY FINE SAND |
| 15.0-16.5       | 18        |           |            |            |            |            |             |             |    |    |             | 26         | A-2-6  | DENSE TO VERY DENSE<br>GRAY<br>CLAYEY FINE SAND |
| 17.5-19.0       | 19        |           |            |            |            |            |             |             |    |    |             | 19         | A-2-6  | MEDIUM DENSE<br>GRAY                            |

## SOIL CLASSIFICATION DATA

Project: HARBINWOOD ESTATES SWMF SINKHOLE

Client: LEON COUNTY PUBLIC WORKS

Project No.: 03-47-18-04

Boring: VB-10

Location: LEON COUNTY, FLORIDA

| DEPTH<br>(FEET) | Wc<br>(%) | -4<br>(%) | -10<br>(%) | -20<br>(%) | -40<br>(%) | -60<br>(%) | -100<br>(%) | -200<br>(%) | LL | PI | Org.<br>(%) | N<br>Value | AASHTO | Description                                     |
|-----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|----|----|-------------|------------|--------|---|
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        | CLAYEY FINE SAND                                |
| 20.0-21.5       | 17        |           |            |            |            |            |             |             |    |    |             | 23         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND        |
| 22.5-24.0       | 20        |           |            |            |            |            |             |             |    |    |             | 22         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND        |
| 25.0-26.5       | 20        |           |            |            |            |            |             |             |    |    |             | 23         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND        |
| 27.5-29.0       | 20        | 100       | 100        | 99         | 94         | 72         | 39          | 22          | 32 | 15 |             | 16         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND        |
| 30.0-31.5       | 25        |           |            |            |            |            |             |             |    |    |             | 16         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND        |
| 32.5-34.0       | 20        |           |            |            |            |            |             |             |    |    |             | 12         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND        |
| 35.0-36.5       | 22        |           |            |            |            |            |             |             |    |    |             | 12         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND        |
| 37.5-39.0       | 23        |           |            |            |            |            |             |             |    |    |             | 14         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND        |
| 40.0-41.5       | 28        |           |            |            |            |            |             |             |    |    |             | 14         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND        |
| 42.5-44.0       | 29        | 100       | 100        | 98         | 99         | 90         | 79          | 51          | 44 | 26 |             | 12         | A-7-6  | STIFF<br>GRAY<br>HIGHLY PLASTIC VERY SANDY CLAY |
| 45.0-46.5       | 36        |           |            |            |            |            |             |             |    |    |             | 11         | A-7-6  | STIFF<br>GRAY<br>HIGHLY PLASTIC VERY SANDY CLAY |
| 47.5-49.0       | 35        |           |            |            |            |            |             |             |    |    |             | 12         | A-7-6  | STIFF<br>GRAY<br>HIGHLY PLASTIC VERY SANDY CLAY |
| 50.0-51.5       | 37        |           |            |            |            |            |             |             |    |    |             | 12         | A-7-6  | STIFF   |



**SOIL CLASSIFICATION DATA**

**Project: HARBINWOOD ESTATES SWMF SINKHOLE**

**Client: LEON COUNTY PUBLIC WORKS**

**Project No.: 03-47-18-04**

**Boring: VB-10**

**Location: LEON COUNTY, FLORIDA**

| DEPTH<br>(FEET) | Wc<br>(%) | -4<br>(%) | -10<br>(%) | -20<br>(%) | -40<br>(%) | -60<br>(%) | -100<br>(%) | -200<br>(%) | LL | PI | Org.<br>(%) | N<br>Value | AASHTO | Description                            |
|-----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|----|----|-------------|------------|--------|--|
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        | GRAY<br>HIGHLY PLASTIC VERY SANDY CLAY |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
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|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
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## SOIL CLASSIFICATION DATA

Project: HARBINWOOD ESTATES SWMF SINKHOLE

Client: LEON COUNTY PUBLIC WORKS

Project No.: 03-47-18-04

Boring: VB-11

Location: LEON COUNTY, FLORIDA

| DEPTH<br>(FEET) | Wc<br>(%) | -4<br>(%) | -10<br>(%) | -20<br>(%) | -40<br>(%) | -60<br>(%) | -100<br>(%) | -200<br>(%) | LL  | PI | Org.<br>(%) | N<br>Value | AASHTO | Description   |
|-----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|-----|----|-------------|------------|--------|---|
| 0.0-1.5         | 11        |           |            |            |            |            |             |             |     |    |             | 7          | A-2-4  | LOOSE<br>LIGHT BROWN<br>SILTY FINE SAND               |
| 1.5-3.0         | 12        | 100       | 100        | 100        | 95         | 79         | 48          | 23          |     |    |             | 11         | A-2-4  | MEDIUM DENSE<br>LIGHT BROWN<br>SILTY FINE SAND        |
| 3.0-4.5         | 14        |           |            |            |            |            |             |             |     |    |             | 18         | A-2-4  | MEDIUM DENSE<br>LIGHT BROWN<br>SILTY FINE SAND        |
| 4.5-6.0         | 16        |           |            |            |            |            |             |             |     |    |             | 12         | A-2-4  | MEDIUM DENSE<br>LIGHT BROWN<br>SILTY FINE SAND        |
| 6.0-7.5         | 15        |           |            |            |            |            |             |             |     |    |             | 17         | A-2-4  | MEDIUM DENSE<br>LIGHT BROWN<br>SILTY FINE SAND        |
| 7.5-9.0         | 18        |           |            |            |            |            |             |             |     |    |             | 19         | A-2-4  | MEDIUM DENSE<br>LIGHT BROWN<br>SILTY FINE SAND        |
| 9.0-10.5        | 19        |           |            |            |            |            |             |             |     |    |             | 15         | A-2-4  | MEDIUM DENSE<br>LIGHT BROWN<br>SILTY FINE SAND        |
| 10.5-12.0       | 20        |           |            |            |            |            |             |             |     |    |             | 22         | A-2-4  | MEDIUM DENSE<br>LIGHT BROWN<br>SILTY FINE SAND        |
| 12.5-14.0       | 20        | 100       | 100        | 99         | 92         | 74         | 34          | 26          | 22  | 4  |             | 13         | A-2-4  | MEDIUM DENSE<br>LIGHT BROWN<br>SILTY FINE SAND        |
| 15.0-16.5       | 27        |           |            |            |            |            |             |             |     |    |             | 10         | A-6    | MEDIUM DENSE<br>LIGHT BROWN<br>CLAYEY SAND            |
| 17.5-19.0       | 28        |           |            |            |            |            |             |             |     |    |             | 15         | A-6    | MEDIUM DENSE<br>LIGHT BROWN<br>CLAYEY SAND            |
| 20.0-21.5       | 64        |           |            |            |            |            |             |             |     |    |             | 12         | A-7-6  | STIFF<br>LIGHT BROWN<br>HIGHLY PLASTIC CLAY WITH SAND |
| 22.5-24.0       | 63        | 100       | 100        | 100        | 99         | 97         | 94          | 83          | 112 | 71 |             | 8          | A-7-6  | STIFF<br>LIGHT BROWN                                  |



## SOIL CLASSIFICATION DATA

Project: HARBINWOOD ESTATES SWMF SINKHOLE

Client: LEON COUNTY PUBLIC WORKS

Project No.: 03-47-18-04

Boring: VB-12

Location: LEON COUNTY, FLORIDA

| DEPTH<br>(FEET) | Wc<br>(%) | -4<br>(%) | -10<br>(%) | -20<br>(%) | -40<br>(%) | -60<br>(%) | -100<br>(%) | -200<br>(%) | LL | PI | Org.<br>(%) | N<br>Value | AASHTO | Description  |
|-----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|----|----|-------------|------------|--------|--|
| 0.0-1.5         | 20        |           |            |            |            |            |             |             |    |    |             | 6          | A-7-6  | FIRM<br>LIGHT BROWN<br>PLASTIC CLAY                  |
| 1.5-3.0         | 21        |           |            |            |            |            |             |             |    |    |             | 14         | A-7-6  | STIFF<br>LIGHT BROWN<br>PLASTIC CLAY                 |
| 3.0-4.5         | 21        |           |            |            |            |            |             |             |    |    |             | 14         | A-7-6  | STIFF<br>LIGHT BROWN<br>PLASTIC CLAY                 |
| 4.5-6.0         | 22        | 100       | 100        | 100        | 99         | 93         | 67          | 53          | 44 | 28 |             | 12         | A-7-6  | STIFF<br>LIGHT BROWN<br>PLASTIC CLAY                 |
| 6.0-7.5         | 22        |           |            |            |            |            |             |             |    |    |             | 12         | A-7-6  | STIFF<br>LIGHT BROWN<br>PLASTIC CLAY                 |
| 7.5-9.0         | 24        |           |            |            |            |            |             |             |    |    |             | 11         | A-7-6  | STIFF<br>LIGHT BROWN<br>PLASTIC CLAY                 |
| 9.0-10.5        | 24        |           |            |            |            |            |             |             |    |    |             | 18         | A-7-6  | MEDIUM DENSE<br>LIGHT BROWN<br>PLASTIC CLAYEY SAND   |
| 10.5-12.0       | 29        | 99        | 99         | 99         | 97         | 91         | 74          | 37          | 49 | 32 |             | 12         | A-7-6  | MEDIUM DENSE<br>LIGHT BROWN<br>PLASTIC CLAYEY SAND   |
| 12.5-14.0       | 32        |           |            |            |            |            |             |             |    |    |             | 13         | A-7-6  | MEDIUM DENSE<br>LIGHT BROWN<br>PLASTIC CLAYEY SAND   |
| 15.0-16.5       | 40        |           |            |            |            |            |             |             |    |    |             | 15         | A-7-6  | MEDIUM DENSE<br>LIGHT BROWN<br>PLASTIC CLAYEY SAND   |
| 17.5-19.0       | 73        |           |            |            |            |            |             |             |    |    |             | 7          | A-7-5  | FIRM<br>LIGHT BROWN<br>HIGHLY PLASTIC SILT WITH SAND |
| 20.0-21.5       | 56        |           |            |            |            |            |             |             |    |    |             | 9          | A-7-5  | FIRM<br>LIGHT BROWN<br>HIGHLY PLASTIC SILT WITH SAND |
| 22.5-23.1       | 82        |           |            |            |            |            |             |             |    |    |             | 50/1"      | A-7-5  | HARD<br>BROWN  |



## SOIL CLASSIFICATION DATA

Project: HARBINWOOD ESTATES SWMF SINKHOLE

Client: LEON COUNTY PUBLIC WORKS

Project No.: 03-47-18-04

Boring: VB-13

Location: LEON COUNTY, FLORIDA

| DEPTH<br>(FEET) | Wc<br>(%) | -4<br>(%) | -10<br>(%) | -20<br>(%) | -40<br>(%) | -60<br>(%) | -100<br>(%) | -200<br>(%) | LL | PI | Org.<br>(%) | N<br>Value | AASHTO | Description                                   |
|-----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|----|----|-------------|------------|--------|---|
| 0.0-1.5         | 21        |           |            |            |            |            |             |             |    |    |             | 11         | A-2-4  | MEDIUM DENSE<br>LIGHT GRAY<br>SILTY FINE SAND |
| 1.5-3.0         | 18        | 100       | 100        | 100        | 91         | 57         | 28          | 18          |    |    |             | 19         | A-2-4  | MEDIUM DENSE<br>LIGHT GRAY<br>SILTY FINE SAND |
| 3.0-4.5         | 20        |           |            |            |            |            |             |             |    |    |             | 28         | A-2-4  | MEDIUM DENSE<br>LIGHT GRAY<br>SILTY FINE SAND |
| 4.5-6.0         | 16        |           |            |            |            |            |             |             |    |    |             | 26         | A-2-4  | MEDIUM DENSE<br>LIGHT GRAY<br>SILTY FINE SAND |
| 6.0-7.5         | 18        |           |            |            |            |            |             |             |    |    |             | 19         | A-2-4  | MEDIUM DENSE<br>LIGHT GRAY<br>SILTY FINE SAND |
| 7.5-9.0         | 16        | 100       | 100        | 99         | 91         | 64         | 39          | 27          | 21 | 6  |             | 17         | A-2-4  | MEDIUM DENSE<br>LIGHT GRAY<br>SILTY FINE SAND |
| 9.0-10.5        | 24        |           |            |            |            |            |             |             |    |    |             | 6          | A-2-4  | LOOSE<br>LIGHT GRAY<br>SILTY FINE SAND        |
| 10.5-12.0       | 24        |           |            |            |            |            |             |             |    |    |             | 8          | A-2-4  | LOOSE<br>LIGHT GRAY<br>SILTY FINE SAND        |
| 12.5-14.0       | 25        |           |            |            |            |            |             |             |    |    |             | 11         | A-2-4  | MEDIUM DENSE<br>LIGHT GRAY<br>SILTY FINE SAND |
| 15.0-16.5       | 23        | 100       | 100        | 100        | 94         | 64         | 38          | 25          | 24 | 9  |             | 12         | A-2-4  | MEDIUM DENSE<br>LIGHT GRAY<br>SILTY FINE SAND |
| 17.5-19.0       | 36        |           |            |            |            |            |             |             |    |    |             | 12         | A-6    | MEDIUM DENSE<br>LIGHT GRAY<br>CLAYEY SAND     |
| 20.0-21.5       | 21        |           |            |            |            |            |             |             |    |    |             | 22         | A-6    | MEDIUM DENSE<br>LIGHT GRAY<br>CLAYEY SAND     |
| 22.5-24.0       | 20        |           |            |            |            |            |             |             |    |    |             | 19         | A-6    | MEDIUM DENSE<br>LIGHT GRAY                    |



## SOIL CLASSIFICATION DATA

Project: HARBINWOOD ESTATES SWMF SINKHOLE

Client: LEON COUNTY PUBLIC WORKS

Project No.: 03-47-18-04

Boring: VB-14

Location: LEON COUNTY, FLORIDA

| DEPTH<br>(FEET) | Wc<br>(%) | -4<br>(%) | -10<br>(%) | -20<br>(%) | -40<br>(%) | -60<br>(%) | -100<br>(%) | -200<br>(%) | LL | PI | Org.<br>(%) | N<br>Value | AASHTO | Description  |
|-----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|----|----|-------------|------------|--------|--|
| 0.0-1.5         | 21        |           |            |            |            |            |             |             |    |    |             | 5          | A-6    | LOOSE<br>GRAY AND ORANGE<br>CLAYEY SAND                    |
| 1.5-3.0         | 21        |           |            |            |            |            |             |             |    |    |             | 11         | A-6    | MEDIUM DENSE<br>GRAY AND ORANGE<br>CLAYEY SAND             |
| 3.0-4.5         | 60        |           |            |            |            |            |             |             |    |    |             | 8          | A-7-6  | STIFF<br>GRAY AND ORANGE<br>HIGHLY PLASTIC SANDY CLAY      |
| 4.5-6.0         | 45        | 100       | 100        | 100        | 99         | 95         | 84          | 62          | 55 | 33 |             | 14         | A-7-6  | VERY STIFF<br>GRAY AND ORANGE<br>HIGHLY PLASTIC SANDY CLAY |
| 6.0-7.5         |           |           |            |            |            |            |             |             |    |    |             | 49         | --     | HARD LIMESTONE   |
| 7.5-9.0         |           |           |            |            |            |            |             |             |    |    |             | 29         | --     | WEATHERED LIMESTONE  |
| 9.0-9.4         |           |           |            |            |            |            |             |             |    |    |             | 50/5"      | --     | HARD LIMESTONE   |
| 10.5-12.0       |           |           |            |            |            |            |             |             |    |    |             | 48         | --     | HARD LIMESTONE   |
| 12.5-14.0       |           |           |            |            |            |            |             |             |    |    |             | 45         | --     | HARD LIMESTONE   |
| 15.0-15.3       |           |           |            |            |            |            |             |             |    |    |             | 50/4"      | --     | HARD LIMESTONE   |
| 17.5-18.3       |           |           |            |            |            |            |             |             |    |    |             | 50/4"      | --     | HARD LIMESTONE   |
| 20.0-21.5       |           |           |            |            |            |            |             |             |    |    |             | 24         | --     | WEATHERED LIMESTONE  |
| 22.5-24.0       |           |           |            |            |            |            |             |             |    |    |             | 71         | --     | HARD LIMESTONE   |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |
|                 |           |           |            |            |            |            |             |             |    |    |             |            |        |  |



## SOIL CLASSIFICATION DATA

Project: HARBINWOOD ESTATES SWMF SINKHOLE

Client: LEON COUNTY PUBLIC WORKS

Project No.: 03-47-18-04

Boring: VB-15

Location: LEON COUNTY, FLORIDA

| DEPTH<br>(FEET) | Wc<br>(%) | -4<br>(%) | -10<br>(%) | -20<br>(%) | -40<br>(%) | -60<br>(%) | -100<br>(%) | -200<br>(%) | LL  | PI | Org.<br>(%) | N<br>Value | AASHTO | Description   |
|-----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|-----|----|-------------|------------|--------|---|
| 0.0-1.5         | 26        |           |            |            |            |            |             |             |     |    |             | 5          | A-7-6  | LOOSE<br>GRAY AND ORANGE<br>HIGHLY PLASTIC CLAYEY SAND        |
| 1.5-3.0         | 32        | 100       | 100        | 100        | 98         | 95         | 73          | 47          | 59  | 37 |             | 17         | A-7-6  | MEDIUM DENSE<br>GRAY AND ORANGE<br>HIGHLY PLASTIC CLAYEY SAND |
| 3.0-4.5         | 31        |           |            |            |            |            |             |             |     |    |             | 11         | A-7-6  | MEDIUM DENSE<br>GRAY AND ORANGE<br>HIGHLY PLASTIC CLAYEY SAND |
| 4.5-6.0         | 30        |           |            |            |            |            |             |             |     |    |             | 9          | A-7-6  | LOOSE<br>LIGHT GRAY<br>HIGHLY PLASTIC CLAYEY SAND             |
| 6.0-7.5         | 30        |           |            |            |            |            |             |             |     |    |             | 9          | A-7-6  | LOOSE<br>LIGHT GRAY<br>HIGHLY PLASTIC CLAYEY SAND             |
| 7.5-9.0         | 55        |           |            |            |            |            |             |             |     |    |             | 7          | A-7-6  | FIRM<br>LIGHT GRAY<br>HIGHLY PLASTIC CLAY WITH SAND           |
| 9.0-10.5        | 69        |           |            |            |            |            |             |             |     |    |             | 23         | A-7-6  | VERY STIFF<br>LIGHT GRAY<br>HIGHLY PLASTIC CLAY WITH SAND     |
| 10.5-12.0       | 66        |           |            |            |            |            |             |             |     |    |             | 7          | A-7-6  | FIRM<br>LIGHT GRAY<br>HIGHLY PLASTIC CLAY WITH SAND           |
| 12.5-14.0       | 60        | 100       | 100        | 100        | 99         | 99         | 97          | 80          | 117 | 66 |             | 18         | A-7-5  | VERY STIFF<br>GRAY<br>HIGHLY PLASTIC SILT WITH SAND           |
| 15.0-16.5       | 57        |           |            |            |            |            |             |             |     |    |             | 11         | A-7-5  | STIFF<br>LIGHT GRAY<br>HIGHLY PLASTIC SILT WITH SAND          |
| 17.5-17.9       | 56        |           |            |            |            |            |             |             |     |    |             | 50/5"      | A-7-5  | HARD<br>LIGHT GRAY<br>HIGHLY PLASTIC SILT WITH SAND           |
|                 |           |           |            |            |            |            |             |             |     |    |             |            |        |   |
|                 |           |           |            |            |            |            |             |             |     |    |             |            |        |   |

## SOIL CLASSIFICATION DATA

Project: HARBINWOOD ESTATES SWMF SINKHOLE

Client: LEON COUNTY PUBLIC WORKS

Project No.: 03-47-18-04

Boring: VB-16

Location: LEON COUNTY, FLORIDA

| DEPTH<br>(FEET) | Wc<br>(%) | -4<br>(%) | -10<br>(%) | -20<br>(%) | -40<br>(%) | -60<br>(%) | -100<br>(%) | -200<br>(%) | LL | PI | Org.<br>(%) | N<br>Value | AASHTO | Description                                    |
|-----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|----|----|-------------|------------|--------|--|
| 0.0-1.5         | 12        |           |            |            |            |            |             |             |    |    |             | 8          | A-6    | LOOSE<br>GRAY<br>CLAYEY SAND                   |
| 1.5-3.0         | 22        |           |            |            |            |            |             |             |    |    |             | 11         | A-6    | MEDIUM DENSE<br>GRAY<br>CLAYEY SAND            |
| 3.0-4.5         | 30        |           |            |            |            |            |             |             |    |    |             | 11         | A-6    | MEDIUM DENSE<br>GRAY<br>CLAYEY SAND            |
| 4.5-6.0         | 25        | 100       | 100        | 100        | 99         | 87         | 52          | 45          | 36 | 19 |             | 8          | A-6    | LOOSE<br>GRAY AND ORANGE<br>CLAYEY SAND        |
| 6.0-7.5         | 19        |           |            |            |            |            |             |             |    |    |             | 8          | A-6    | LOOSE<br>GRAY AND ORANGE<br>CLAYEY SAND        |
| 7.5-9.0         | 25        |           |            |            |            |            |             |             |    |    |             | 8          | A-6    | LOOSE<br>GRAY AND ORANGE<br>CLAYEY SAND        |
| 9.0-10.5        | 20        |           |            |            |            |            |             |             |    |    |             | 5          | A-6    | LOOSE<br>GRAY AND ORANGE<br>CLAYEY SAND        |
| 10.5-12.0       | 17        |           |            |            |            |            |             |             |    |    |             | 7          | A-6    | LOOSE<br>GRAY AND ORANGE<br>CLAYEY SAND        |
| 12.5-14.0       | 17        |           |            |            |            |            |             |             |    |    |             | 14         | A-6    | MEDIUM DENSE<br>GRAY AND ORANGE<br>CLAYEY SAND |
| 15.0-16.5       | 15        |           |            |            |            |            |             |             |    |    |             | 13         | A-2-4  | MEDIUM DENSE<br>GRAY<br>SILTY FINE SAND        |
| 17.5-19.0       | 16        | 100       | 100        | 100        | 100        | 98         | 45          | 16          |    |    |             | 15         | A-2-4  | MEDIUM DENSE<br>GRAY<br>SILTY FINE SAND        |
| 20.0-21.5       | 15        |           |            |            |            |            |             |             |    |    |             | 17         | A-2-4  | MEDIUM DENSE<br>GRAY<br>SILTY FINE SAND        |
| 22.5-24.0       | 19        |           |            |            |            |            |             |             |    |    |             | 13         | A-2-4  | MEDIUM DENSE<br>GRAY                           |



## SOIL CLASSIFICATION DATA

Project: HARBINWOOD ESTATES SWMF SINKHOLE

Client: LEON COUNTY PUBLIC WORKS

Project No.: 03-47-18-04

Boring: VB-17

Location: LEON COUNTY, FLORIDA

| DEPTH<br>(FEET) | Wc<br>(%) | -4<br>(%) | -10<br>(%) | -20<br>(%) | -40<br>(%) | -60<br>(%) | -100<br>(%) | -200<br>(%) | LL | PI | Org.<br>(%) | N<br>Value | AASHTO | Description  |
|-----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|----|----|-------------|------------|--------|--|
| 0.0-1.5         | 19        |           |            |            |            |            |             |             |    |    |             | 7          | A-7-6  | LOOSE<br>GRAY AND ORANGE<br>PLASTIC CLAYEY SAND          |
| 1.5-3.0         | 20        |           |            |            |            |            |             |             |    |    |             | 13         | A-7-6  | MEDIUM DENSE<br>GRAY AND ORANGE<br>PLASTIC CLAYEY SAND   |
| 3.0-4.5         | 22        |           |            |            |            |            |             |             |    |    |             | 7          | A-7-6  | LOOSE<br>GRAY AND ORANGE<br>PLASTIC CLAYEY SAND          |
| 4.5-6.0         | 31        |           |            |            |            |            |             |             |    |    |             | 9          | A-7-6  | MEDIUM DENSE<br>GRAY AND ORANGE<br>PLASTIC CLAYEY SAND   |
| 6.0-7.5         | 26        | 100       | 100        | 100        | 100        | 98         | 59          | 33          | 43 | 24 |             | 7          | A-7-6  | LOOSE<br>GRAY AND ORANGE<br>PLASTIC CLAYEY SAND          |
| 7.5-9.0         | 24        |           |            |            |            |            |             |             |    |    |             | 10         | A-7-6  | MEDIUM DENSE<br>GRAY AND ORANGE<br>PLASTIC CLAYEY SAND   |
| 9.0-10.5        | 23        |           |            |            |            |            |             |             |    |    |             | 10         | A-7-6  | MEDIUM DENSE<br>GRAY AND ORANGE<br>PLASTIC CLAYEY SAND   |
| 10.5-12.0       | 24        |           |            |            |            |            |             |             |    |    |             | 11         | A-7-6  | MEDIUM DENSE<br>GRAY AND ORANGE<br>PLASTIC CLAYEY SAND   |
| 12.5-14.0       | 32        |           |            |            |            |            |             |             |    |    |             | 11         | A-7-6  | MEDIUM DENSE<br>LIGHT GRAY<br>HIGHLY PLASTIC CLAYEY SAND |
| 15.0-16.5       | 35        | 100       | 100        | 100        | 100        | 98         | 79          | 41          | 84 | 66 |             | 8          | A-7-6  | MEDIUM DENSE<br>LIGHT GRAY<br>HIGHLY PLASTIC CLAYEY SAND |
| 17.5-19.0       | 39        |           |            |            |            |            |             |             |    |    |             | 9          | A-7-6  | MEDIUM DENSE<br>LIGHT GRAY<br>HIGHLY PLASTIC CLAYEY SAND |
| 20.0-21.5       | 35        |           |            |            |            |            |             |             |    |    |             | 10         | A-7-6  | MEDIUM DENSE<br>LIGHT GRAY<br>HIGHLY PLASTIC CLAYEY SAND |
| 22.5-24.0       | 38        |           |            |            |            |            |             |             |    |    |             | 6          | A-7-6  | LOOSE<br>LIGHT GRAY                                      |

## SOIL CLASSIFICATION DATA

Project: HARBINWOOD ESTATES SWMF SINKHOLE

Client: LEON COUNTY PUBLIC WORKS

Project No.: 03-47-18-04

Boring: VB-17

Location: LEON COUNTY, FLORIDA

| DEPTH<br>(FEET) | Wc<br>(%) | -4<br>(%) | -10<br>(%) | -20<br>(%) | -40<br>(%) | -60<br>(%) | -100<br>(%) | -200<br>(%) | LL  | PI  | Org.<br>(%) | N<br>Value | AASHTO | Description  |
|-----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|-----|-----|-------------|------------|--------|--|
|                 |           |           |            |            |            |            |             |             |     |     |             |            |        | HIGHLY PLASTIC CLAYEY SAND                           |
| 25.0-26.5       | 61        |           |            |            |            |            |             |             |     |     |             | 7          | A-7-6  | STIFF<br>LIGHT GRAY<br>HIGHLY PLASTIC SANDY CLAY     |
| 27.5-29.0       | 65        |           |            |            |            |            |             |             |     |     |             | 3          | A-7-6  | SOFT<br>LIGHT GRAY<br>HIGHLY PLASTIC SANDY CLAY      |
| 30.0-31.5       | 67        | 100       | 100        | 100        | 99         | 98         | 87          | 69          | 93  | 67  |             | WOH        | A-7-6  | VERY SOFT<br>LIGHT GRAY<br>HIGHLY PLASTIC SANDY CLAY |
| 32.5-34.0       | 77        |           |            |            |            |            |             |             |     |     |             | 1          | A-7-5  | VERY SOFT<br>GRAY<br>HIGHLY PLASTIC SILT             |
| 35.0-36.5       | 88        |           |            |            |            |            |             |             |     |     |             | WOH        | A-7-5  | VERY SOFT<br>GRAY<br>HIGHLY PLASTIC SILT             |
| 37.5-39.0       | 115       |           |            |            |            |            |             |             |     |     |             | WOH        | A-7-5  | VERY SOFT<br>GRAY<br>HIGHLY PLASTIC SILT             |
| 40.0-41.5       | 81        |           |            |            |            |            |             |             |     |     |             | WOH        | A-7-5  | VERY SOFT<br>GRAY<br>HIGHLY PLASTIC SILT             |
| 42.5-44.0       | 89        |           |            |            |            |            |             |             |     |     |             | WOH        | A-7-5  | VERY SOFT<br>GRAY<br>HIGHLY PLASTIC SILT             |
| 45.0-46.5       | 94        | 100       | 100        | 100        | 99         | 98         | 95          | 88          | 192 | 132 |             | WOH        | A-7-5  | VERY SOFT<br>GRAY<br>HIGHLY PLASTIC SILT             |
| 47.5-49.0       | 127       |           |            |            |            |            |             |             |     |     |             | WOH        | A-7-5  | VERY SOFT<br>LIGHT GRAY<br>HIGHLY PLASTIC SILT       |
| 50.0-51.5       | 88        |           |            |            |            |            |             |             |     |     |             | WOH        | A-7-5  | VERY SOFT<br>LIGHT GRAY<br>HIGHLY PLASTIC SILT       |
| 52.5-54.0       | 95        |           |            |            |            |            |             |             |     |     |             | WOH        | A-7-5  | VERY SOFT<br>LIGHT GRAY<br>HIGHLY PLASTIC SILT       |
| 55.0-56.5       | 118       | 100       | 100        | 100        | 100        | 100        | 100         | 91          |     |     |             | WOH        | A-7-5  | VERY SOFT  |



## SOIL CLASSIFICATION DATA

Project: HARBINWOOD ESTATES SWMF SINKHOLE

Client: LEON COUNTY PUBLIC WORKS

Project No.: 03-47-18-04

Boring: VB-18

Location: LEON COUNTY, FLORIDA

| DEPTH<br>(FEET) | Wc<br>(%) | -4<br>(%) | -10<br>(%) | -20<br>(%) | -40<br>(%) | -60<br>(%) | -100<br>(%) | -200<br>(%) | LL | PI | Org.<br>(%) | N<br>Value | AASHTO | Description  |
|-----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|----|----|-------------|------------|--------|--|
| 0.0-1.5         | 16        |           |            |            |            |            |             |             |    |    |             | 8          | A-2-6  | MEDIUM DENSE<br>GRAY AND ORANGE<br>CLAYEY FINE SAND            |
| 1.5-3.0         | 23        |           |            |            |            |            |             |             |    |    |             | 9          | A-2-6  | MEDIUM DENSE<br>GRAY AND ORANGE<br>CLAYEY FINE SAND            |
| 3.0-4.5         | 20        |           |            |            |            |            |             |             |    |    |             | 7          | A-2-6  | LOOSE<br>GRAY<br>CLAYEY FINE SAND                              |
| 4.5-6.0         | 24        | 100       | 100        | 100        | 100        | 99         | 79          | 27          | 33 | 14 |             | 8          | A-2-6  | MEDIUM DENSE<br>GRAY AND ORANGE<br>CLAYEY FINE SAND            |
| 6.0-7.5         | 24        |           |            |            |            |            |             |             |    |    |             | 13         | A-2-6  | MEDIUM DENSE<br>GRAY AND ORANGE<br>CLAYEY FINE SAND            |
| 7.5-9.0         | 25        |           |            |            |            |            |             |             |    |    |             | 16         | A-2-6  | MEDIUM DENSE<br>GRAY AND ORANGE<br>CLAYEY FINE SAND            |
| 9.0-10.5        | 32        |           |            |            |            |            |             |             |    |    |             | 14         | A-7-6  | VERY STIFF<br>GRAY AND ORANGE<br>HIGHLY PLASTIC CLAY WITH SAND |
| 10.5-12.0       | 33        |           |            |            |            |            |             |             |    |    |             | 16         | A-7-6  | VERY STIFF<br>GRAY AND ORANGE<br>HIGHLY PLASTIC CLAY WITH SAND |
| 12.5-14.0       | 44        |           |            |            |            |            |             |             |    |    |             | 9          | A-7-6  | STIFF<br>GRAY AND ORANGE<br>HIGHLY PLASTIC CLAY WITH SAND      |
| 15.0-16.5       | 62        | 100       | 100        | 100        | 99         | 98         | 95          | 82          | 74 | 42 |             | 10         | A-7-6  | STIFF<br>GRAY AND ORANGE<br>HIGHLY PLASTIC CLAY WITH SAND      |
| 17.5-19.0       | 48        |           |            |            |            |            |             |             |    |    |             | 9          | A-7-6  | STIFF<br>GRAY AND ORANGE<br>HIGHLY PLASTIC CLAY WITH SAND      |
| 20.0-21.5       | 49        |           |            |            |            |            |             |             |    |    |             | 40         | A-7-6  | HARD<br>GRAY<br>HIGHLY PLASTIC CLAY WITH SAND                  |
| 22.5-24.0       |           |           |            |            |            |            |             |             |    |    |             | 13         | --     | WEATHERED LIMESTONE  |
| 25.0-26.5       |           |           |            |            |            |            |             |             |    |    |             | 30         | --     | WEATHERED LIMESTONE  |





## SOIL CLASSIFICATION DATA

Project: HARBINWOOD ESTATES SWMF SINKHOLE

Client: LEON COUNTY PUBLIC WORKS

Project No.: 03-47-18-04

Boring: VB-19

Location: LEON COUNTY, FLORIDA

| DEPTH<br>(FEET) | Wc<br>(%) | -4<br>(%) | -10<br>(%) | -20<br>(%) | -40<br>(%) | -60<br>(%) | -100<br>(%) | -200<br>(%) | LL | PI | Org.<br>(%) | N<br>Value | AASHTO | Description   |
|-----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|----|----|-------------|------------|--------|---|
| 0.0-1.5         | 21        |           |            |            |            |            |             |             |    |    |             | 11         | A-6    | MEDIUM DENSE<br>LIGHT GRAY AND ORANGE<br>CLAYEY SAND            |
| 1.5-3.0         | 21        |           |            |            |            |            |             |             |    |    |             | 15         | A-6    | MEDIUM DENSE<br>LIGHT GRAY AND ORANGE<br>CLAYEY SAND            |
| 3.0-4.5         | 24        |           |            |            |            |            |             |             |    |    |             | 13         | A-2-6  | MEDIUM DENSE<br>LIGHT GRAY AND ORANGE<br>CLAYEY FINE SAND       |
| 4.5-6.0         | 24        |           |            |            |            |            |             |             |    |    |             | 12         | A-2-6  | MEDIUM DENSE<br>LIGHT GRAY AND ORANGE<br>CLAYEY FINE SAND       |
| 6.0-7.5         | 25        |           |            |            |            |            |             |             |    |    |             | 11         | A-2-6  | MEDIUM DENSE<br>LIGHT GRAY AND ORANGE<br>CLAYEY FINE SAND       |
| 7.5-9.0         | 23        | 100       | 100        | 100        | 98         | 93         | 78          | 32          | 43 | 22 |             | 17         | A-2-6  | MEDIUM DENSE<br>LIGHT GRAY AND ORANGE<br>CLAYEY FINE SAND       |
| 9.0-10.5        | 23        |           |            |            |            |            |             |             |    |    |             | 18         | A-2-6  | MEDIUM DENSE<br>LIGHT GRAY AND ORANGE<br>CLAYEY FINE SAND       |
| 10.5-12.0       | 33        |           |            |            |            |            |             |             |    |    |             | 14         | A-6    | MEDIUM DENSE<br>LIGHT GRAY AND ORANGE<br>CLAYEY SAND            |
| 12.5-14.0       | 26        |           |            |            |            |            |             |             |    |    |             | 9          | A-6    | MEDIUM DENSE<br>LIGHT GRAY AND ORANGE<br>CLAYEY SAND            |
| 15.0-16.5       | 55        |           |            |            |            |            |             |             |    |    |             | 10         | A-7-6  | STIFF<br>LIGHT GRAY AND ORANGE<br>HIGHLY PLASTIC CLAY WITH SAND |
| 17.5-19.0       | 60        |           |            |            |            |            |             |             |    |    |             | 8          | A-7-6  | STIFF<br>LIGHT GRAY AND ORANGE<br>HIGHLY PLASTIC CLAY WITH SAND |
| 20.0-21.5       | 67        | 99        | 97         | 96         | 95         | 94         | 88          | 73          | 98 | 68 |             | 5          | A-7-6  | FIRM<br>GRAY AND BROWN<br>HIGHLY PLASTIC CLAY WITH SAND         |
| 22.5-24.0       |           |           |            |            |            |            |             |             |    |    |             | 39         | --     | WEATHERED LIMESTONE   |
| 25.0-26.5       |           |           |            |            |            |            |             |             |    |    |             | 39         | --     | WEATHERED LIMESTONE   |

## SOIL CLASSIFICATION DATA

Project: HARBINWOOD ESTATES SWMF SINKHOLE

Client: LEON COUNTY PUBLIC WORKS

Project No.: 03-47-18-04

Boring: VB-20

Location: LEON COUNTY, FLORIDA

| DEPTH<br>(FEET) | Wc<br>(%) | -4<br>(%) | -10<br>(%) | -20<br>(%) | -40<br>(%) | -60<br>(%) | -100<br>(%) | -200<br>(%) | LL | PI | Org.<br>(%) | N<br>Value | AASHTO | Description                                    |
|-----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|----|----|-------------|------------|--------|--|
| 0.0-1.5         | 20        |           |            |            |            |            |             |             |    |    |             | 12         | A-6    | MEDIUM DENSE<br>GRAY AND ORANGE<br>CLAYEY SAND |
| 1.5-3.0         | 19        | 100       | 100        | 100        | 99         | 90         | 42          | 36          | 40 | 22 |             | 16         | A-6    | MEDIUM DENSE<br>GRAY AND ORANGE<br>CLAYEY SAND |
| 3.0-4.5         | 17        |           |            |            |            |            |             |             |    |    |             | 18         | A-6    | MEDIUM DENSE<br>GRAY AND ORANGE<br>CLAYEY SAND |
| 4.5-6.0         | 19        |           |            |            |            |            |             |             |    |    |             | 13         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND       |
| 6.0-7.5         | 18        |           |            |            |            |            |             |             |    |    |             | 14         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND       |
| 7.5-9.0         | 22        |           |            |            |            |            |             |             |    |    |             | 13         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND       |
| 9.0-10.5        | 21        |           |            |            |            |            |             |             |    |    |             | 11         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND       |
| 10.5-12.0       | 19        |           |            |            |            |            |             |             |    |    |             | 12         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND       |
| 12.5-14.0       | 21        | 100       | 100        | 100        | 99         | 96         | 79          | 30          |    |    |             | 13         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND       |
| 15.0-16.5       | 22        |           |            |            |            |            |             |             |    |    |             | 16         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND       |
| 17.5-19.0       | 21        |           |            |            |            |            |             |             |    |    |             | 16         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND       |
| 20.0-21.5       | 21        |           |            |            |            |            |             |             |    |    |             | 13         | A-2-6  | MEDIUM DENSE<br>GRAY<br>CLAYEY FINE SAND       |
| 22.5-24.0       | 21        |           |            |            |            |            |             |             |    |    |             | 7          | A-2-6  | LOOSE<br>GRAY                                  |

**SOIL CLASSIFICATION DATA**

**Project: HARBINWOOD ESTATES SWMF SINKHOLE**

**Client: LEON COUNTY PUBLIC WORKS**

**Project No.: 03-47-18-04**

**Boring: VB-20**

**Location: LEON COUNTY, FLORIDA**

| DEPTH (FEET) | Wc (%) | -4 (%) | -10 (%) | -20 (%) | -40 (%) | -60 (%) | -100 (%) | -200 (%) | LL  | PI  | Org. (%) | N Value | AASHTO | Description   |
|--------------|--------|--------|---------|---------|---------|---------|----------|----------|-----|-----|----------|---------|--------|---|
|              |        |        |         |         |         |         |          |          |     |     |          |         |        | CLAYEY FINE SAND  |
| 25.0-26.5    | 43     |        |         |         |         |         |          |          |     |     |          | 6       | A-7-6  | LOOSE<br>GRAY AND ORANGE<br>PLASTIC CLAYEY SAND               |
| 27.5-29.0    | 27     | 100    | 100     | 100     | 99      | 97      | 84       | 43       | 49  | 20  |          | 4       | A-7-6  | LOOSE<br>GRAY AND ORANGE<br>PLASTIC CLAYEY SAND               |
| 30.0-31.5    | 23     |        |         |         |         |         |          |          |     |     |          | 4       | A-7-6  | LOOSE<br>GRAY AND ORANGE<br>PLASTIC CLAYEY SAND               |
| 32.5-34.0    | 42     |        |         |         |         |         |          |          |     |     |          | WOH     | A-7-5  | VERY SOFT<br>GRAY AND ORANGE<br>HIGHLY PLASTIC SILT WITH SAND |
| 35.0-36.5    | 99     | 100    | 100     | 100     | 99      | 99      | 96       | 79       |     |     |          | WOH     | A-7-5  | VERY SOFT<br>GRAY AND ORANGE<br>HIGHLY PLASTIC SILT WITH SAND |
| 37.5-39.0    | 79     |        |         |         |         |         |          |          |     |     |          | 5       | A-7-5  | FIRM<br>GRAY AND ORANGE<br>HIGHLY PLASTIC SILT WITH SAND      |
| 40.0-41.5    | 75     |        |         |         |         |         |          |          |     |     |          | WOH     | A-7-5  | VERY SOFT<br>GRAY AND ORANGE<br>HIGHLY PLASTIC SILT WITH SAND |
| 42.5-44.0    | 129    |        |         |         |         |         |          |          |     |     |          | WOH     | A-7-5  | VERY SOFT<br>GRAY AND ORANGE<br>HIGHLY PLASTIC SILT WITH SAND |
| 45.0-46.5    | 119    | 100    | 100     | 100     | 99      | 98      | 93       | 78       | 148 | 106 |          | 5       | A-7-5  | FIRM<br>GRAY AND ORANGE<br>HIGHLY PLASTIC SILT WITH SAND      |
| 47.5-49.0    |        |        |         |         |         |         |          |          |     |     |          | 5       | --     | HIGHLY WEATHERED LIMESTONE                                    |
|              |        |        |         |         |         |         |          |          |     |     |          |         |        |   |
|              |        |        |         |         |         |         |          |          |     |     |          |         |        |   |
|              |        |        |         |         |         |         |          |          |     |     |          |         |        |   |
|              |        |        |         |         |         |         |          |          |     |     |          |         |        |   |
|              |        |        |         |         |         |         |          |          |     |     |          |         |        |   |
|              |        |        |         |         |         |         |          |          |     |     |          |         |        |   |
|              |        |        |         |         |         |         |          |          |     |     |          |         |        |   |
|              |        |        |         |         |         |         |          |          |     |     |          |         |        |   |
|              |        |        |         |         |         |         |          |          |     |     |          |         |        |   |
|              |        |        |         |         |         |         |          |          |     |     |          |         |        |   |
|              |        |        |         |         |         |         |          |          |     |     |          |         |        |   |
|              |        |        |         |         |         |         |          |          |     |     |          |         |        |   |
|              |        |        |         |         |         |         |          |          |     |     |          |         |        |   |

## SOIL CLASSIFICATION DATA

Project: HARBINWOOD ESTATES SWMF SINKHOLE

Client: LEON COUNTY PUBLIC WORKS

Project No.: 03-47-18-04

Boring: VB-21

Location: LEON COUNTY, FLORIDA

| DEPTH<br>(FEET) | Wc<br>(%) | -4<br>(%) | -10<br>(%) | -20<br>(%) | -40<br>(%) | -60<br>(%) | -100<br>(%) | -200<br>(%) | LL | PI | Org.<br>(%) | N<br>Value | AASHTO | Description   |
|-----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|----|----|-------------|------------|--------|---|
| 0.0-1.5         | 26        |           |            |            |            |            |             |             |    |    |             | 7          | A-2-6  | LOOSE<br>GRAY<br>CLAYEY FINE SAND                   |
| 1.5-3.0         | 20        |           |            |            |            |            |             |             |    |    |             | 12         | A-2-6  | MEDIUM DENSE<br>GRAY AND ORANGE<br>CLAYEY FINE SAND |
| 3.0-4.5         | 22        | 100       | 100        | 100        | 99         | 98         | 53          | 22          | 28 | 11 |             | 10         | A-2-6  | MEDIUM DENSE<br>GRAY AND ORANGE<br>CLAYEY FINE SAND |
| 4.5-6.0         | 23        |           |            |            |            |            |             |             |    |    |             | 11         | A-2-6  | MEDIUM DENSE<br>GRAY AND ORANGE<br>CLAYEY FINE SAND |
| 6.0-7.5         | 24        |           |            |            |            |            |             |             |    |    |             | 11         | A-2-6  | MEDIUM DENSE<br>GRAY AND ORANGE<br>CLAYEY FINE SAND |
| 7.5-9.0         | 27        |           |            |            |            |            |             |             |    |    |             | 15         | A-6    | MEDIUM DENSE<br>GRAY AND ORANGE<br>CLAYEY SAND      |
| 9.0-10.5        | 31        |           |            |            |            |            |             |             |    |    |             | 15         | A-6    | MEDIUM DENSE<br>GRAY AND ORANGE<br>CLAYEY SAND      |
| 10.5-12.0       | 35        | 100       | 100        | 100        | 99         | 93         | 81          | 43          |    |    |             | 12         | A-6    | MEDIUM DENSE<br>GRAY AND ORANGE<br>CLAYEY SAND      |
| 12.5-14.0       | 35        |           |            |            |            |            |             |             |    |    |             | 7          | A-6    | LOOSE<br>GRAY AND ORANGE<br>CLAYEY SAND             |
| 15.0-16.5       | 60        |           |            |            |            |            |             |             |    |    |             | 8          | A-7-6  | STIFF<br>ORANGE<br>HIGHLY PLASTIC SANDY CLAY        |
| 17.5-19.0       | 64        | 100       | 98         | 96         | 92         | 89         | 78          | 64          | 88 | 59 |             | 12         | A-7-6  | STIFF<br>ORANGE<br>HIGHLY PLASTIC SANDY CLAY        |
| 20.0-21.5       |           |           |            |            |            |            |             |             |    |    |             | 21         | --     | WEATHERED LIMESTONE                                 |
| 22.5-24.0       |           |           |            |            |            |            |             |             |    |    |             | 8          | --     | WEATHERED LIMESTONE                                 |
| 25.0-26.5       |           |           |            |            |            |            |             |             |    |    |             | 3          | --     | HIGHLY WEATHERED LIMESTONE                          |
| 27.5-29.0       |           |           |            |            |            |            |             |             |    |    |             | 14         | --     | WEATHERED LIMESTONE                                 |
| 30.0-31.5       |           |           |            |            |            |            |             |             |    |    |             | 15         | --     | WEATHERED LIMESTONE                                 |



## SOIL CLASSIFICATION DATA

Project: HARBINWOOD ESTATES SWMF SINKHOLE

Client: LEON COUNTY PUBLIC WORKS

Project No.: 03-47-18-04

Boring: VB-22

Location: LEON COUNTY, FLORIDA

| DEPTH<br>(FEET) | Wc<br>(%) | -4<br>(%) | -10<br>(%) | -20<br>(%) | -40<br>(%) | -60<br>(%) | -100<br>(%) | -200<br>(%) | LL | PI | Org.<br>(%) | N<br>Value | AASHTO | Description   |
|-----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|----|----|-------------|------------|--------|---|
| 0.0-1.5         | 18        |           |            |            |            |            |             |             |    |    |             | 6          | A-2-6  | LOOSE<br>GRAY<br>CLAYEY FINE SAND                   |
| 1.5-3.0         | 27        |           |            |            |            |            |             |             |    |    |             | 7          | A-7-6  | STIFF<br>GRAY<br>HIGHLY PLASTIC CLAY WITH SAND      |
| 3.0-4.5         | 35        | 100       | 100        | 100        | 100        | 99         | 90          | 71          | 79 | 55 |             | 10         | A-7-6  | STIFF<br>GRAY<br>HIGHLY PLASTIC CLAY WITH SAND      |
| 4.5-6.0         | 27        |           |            |            |            |            |             |             |    |    |             | 9          | A-7-6  | STIFF<br>GRAY<br>HIGHLY PLASTIC CLAY WITH SAND      |
| 6.0-7.5         | 27        |           |            |            |            |            |             |             |    |    |             | 12         | A-7-6  | STIFF<br>GRAY<br>HIGHLY PLASTIC CLAY WITH SAND      |
| 7.5-9.0         | 26        |           |            |            |            |            |             |             |    |    |             | 16         | A-7-6  | VERY STIFF<br>GRAY<br>HIGHLY PLASTIC CLAY WITH SAND |
| 9.0-10.5        | 36        |           |            |            |            |            |             |             |    |    |             | 9          | A-7-6  | STIFF<br>GRAY<br>HIGHLY PLASTIC CLAY WITH SAND      |
| 10.5-12.0       | 31        |           |            |            |            |            |             |             |    |    |             | 12         | A-7-6  | STIFF<br>GRAY<br>HIGHLY PLASTIC CLAY WITH SAND      |
| 12.5-14.0       | 39        |           |            |            |            |            |             |             |    |    |             | 9          | A-7-6  | STIFF<br>GRAY<br>HIGHLY PLASTIC CLAY WITH SAND      |
| 15.0-16.5       | 38        | 100       | 100        | 100        | 100        | 100        | 93          | 73          | 82 | 53 |             | 6          | A-7-6  | STIFF<br>GRAY<br>HIGHLY PLASTIC CLAY WITH SAND      |
| 17.5-19.0       | 42        |           |            |            |            |            |             |             |    |    |             | WOH        | A-7-6  | VERY SOFT<br>GRAY<br>HIGHLY PLASTIC CLAY WITH SAND  |
| 20.0-21.5       | 35        |           |            |            |            |            |             |             |    |    |             | 3          | A-7-6  | SOFT<br>GRAY<br>HIGHLY PLASTIC CLAY WITH SAND       |
| 22.5-24.0       | 27        |           |            |            |            |            |             |             |    |    |             | 2          | A-2-6  | VERY LOOSE<br>GRAY                                  |



*APPENDIX D*  
***TECHNICAL SPECIAL PROVISION***



TECHNICAL SPECIAL PROVISION  
FOR  
SUBSURFACE PRESSURE GROUTING

*This item has been digitally signed and sealed by Myron L. Hayden, P.E, on the date adjacent to the seal. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.*

Professional Engineer: Myron L. Hayden, P.E.  
Date: June 13, 2019  
Fla. License No.: 34067  
Firm Name: Environmental & Geotechnical  
Specialists, Inc.  
Firm Address: 104 North Magnolia Drive  
City, State, Zip Code: Tallahassee, FL 32301  
Certificate of Authorization: 6222  
Pages: 1 - 5

## **SECTION T173 SUBSURFACE PRESSURE GROUTING**

### **T173-1 Description**

The work specified in this Technical Special Provision consists of subsurface pressure grouting and grout pipe installation as shown in the plans. The purpose of the grouting program is to improve the subsurface conditions by injecting cement grout to fill voids and to densify the soils to minimize the potential for future ground subsidence. Grout pipe installation consists of drilling or driving pipes to convey grout through the underlying soils. Cement grout injection shall be at the depths indicated on the Cement Grout Plan or as directed by the Engineer. The Contractor shall submit with bid the reference documentation of at least five years experience in subsurface pressure grouting of projects with similar size and scope.

### **T173-2 Contractor Submittals**

1. Grout pipe installation procedures.
2. Grout mix design.
3. Heave monitoring instrumentation and procedures.
4. Contractor's Project Management contact information.
5. Calibration procedures for pump equipment.
6. List of pumping equipment to be used in the preparation or handling of grout.
7. Qualifications of Grouting Supervisor.
  - a. A minimum of 5 years experience in subsurface pressure grouting.
  - b. Experience record of at least 3 project in the last 5 years of a similar size and scope of this project.
  - c. Experience shall be provided as outlined in FDOT Standard Specification 105-8.

The Contractor shall not begin work until these documents are submitted and accepted in writing, as sufficient, by the Engineer.

### **T173-3 Materials**

1. Portland Cement shall meet requirements of FDOT Standard Specification 921.
2. Fine Aggregate shall meet requirements of FDOT Standard Specification 902.
3. Water shall meet requirements of FDOT Standard Specification 923.
4. Fly Ash shall meet the requirements of FDOT Standard Specification 929-2.
5. Admixtures shall meet the requirements of FDOT Standard Specification 924.
6. Grout mix shall be delivered from an FDOT approved plant, and shall be a sand-cement mixture with appropriate additive and minimum 2-day compressive strength of 150 pounds per square inch (psi). Design mix shall be submitted to Engineer for approval.

### **T173-4 Mix Proportions**

The grout mix shall include a minimum Portland cement content of 12 percent of the dry weight of sand. Addition of water on site to ensure pumpability shall not be allowed without authorization of Engineer. Evaluate and adjust source and characteristics of sand, and adjust mix proportions including sand, fly ash, and other mix components. The grout mix proportions shall be adjusted

for each point of injection, and from batch to batch during injection, if necessary, to obtain optimum grout pumpability consistent with requirements of this Technical Special Provision.

### **T173-5 Equipment**

Equipment shall be capable to sufficiently advance the grout casing through the existing subsoil to the depth required to meet the grouting program objectives. All oil or rust inhibitors shall be removed from all portions of the equipment in contact with the grout prior to use. Pressure grout pumps shall have a variable range of rate of delivery between 1 cubic foot per minute and 10 cubic feet per minute and shall be equipped with on-line pressure gauges with range of 50-500 psi and remote controls capable of reaching all the grout injection points. Pressure grout pumps shall be calibrated to measure the grout volume and rate of delivery for the intended grout mix design in units of cubic feet and cubic feet per minute, respectively. Provide vertical survey control in the vicinity of each injection point to determine if surface heave has occurred.

### **T173-6 Construction Methods**

Prior to the start of any grout injection operations, the Contractor and Engineer shall jointly inspect the site to observe and document the pre-construction condition of the site and any existing structures or facilities. Measure and record the elevation of the ground surface at representative locations in the grout injection area. Document the results of the site inspection in a written report and provide a copy of this report to the Engineer prior to the start of the grouting operations. Calibration of grout pumps shall be required as directed by the Engineer. Ready mix tickets shall be submitted to the Engineer. The cement grout injection program shall be performed to fill voids and densify any loose soil underlying the roadway at the specified locations shown on the Cement Grout Plans or as directed by the Engineer. The placement of cement grout within the soil shall act to densify the surrounding soil. A slump ranging from 6 to 9 inches shall be used or as directed by the Engineer. Grouting shall start with a 7-inch slump. Depending upon the intake, the slump may be increased or decreased at the direction of the Engineer.

#### **T173-6.1 Injection Point Spacing and Placement**

Primary grout injection pipes shall be driven or installed in a predrilled pilot hole, not jetted, to the specified depths as noted in the Cement Grout Plan. Any variation from the depths listed in the Cement Grout Plan shall be approved by the Engineer. If the grout injection pipes are installed in predrilled pilot holes, the pilot hole shall have a diameter at least  $\frac{3}{4}$  inch smaller than the grout injection pipe. The injection pipes shall be installed at the injection point locations and in the sequence shown on the Cement Grout Plan unless otherwise directed by the Engineer. Dependent upon the grout take and grout injection pipe depths, the grouting sequence shown on the Cement Grout Plan may be modified by the Engineer. All changes in injection pipe spacing, grout delivery pressure, and allowable quantities of grout at a given depth and location shall be approved by the Engineer. The use of rotary wash drilling techniques or vibratory hammers for installation of grout injection pipes is not permitted. The diameter of injection pipes shall be adequate to permit injection of cement grout. The injection pipes should have a minimum of 2  $\frac{1}{2}$  inches inside diameter. "Nippled" casing shall not be allowed. Hard caps able to withstand the driving forces shall be used at the pipe bottom to prevent soil plugging the casing during grout pipe installation. The use of augers in lieu of injection pipes is not acceptable. Keep accurate installation records for all injection points, including location and depth of injection points, method of installation, and other pertinent data such as difficulties encountered during drilling or pipe driving.

**T173-6.2 Grout Injection Procedures**

The grouting sequence shall proceed as indicated on the Cement Grout Plan. The injection of grout shall begin at the bottom depth of the injection pipe and proceed upward in 2-foot intervals to a depth of approximately 4 feet below the existing grade or as directed by the Engineer. No grout other than that required to fill the hole shall be injected above the 4-foot depth. The grouting program shall commence with a test program for evaluation of equipment performance, selection of grout pressure criteria and refusal criteria. In general, injection at each interval shall continue until one of the following occurs:

1. Maximum grout pressure of 200 psi increase over the pressure required to initiate grout take.
2. Maximum grout pressures at the ground surface of 400 psi is achieved unless otherwise directed by the Engineer.
3. Maximum grout "take" quantity of 5 cubic yards within a 2-foot interval occurs.
4. Maximum 20 cubic yards of grout has been pumped at any one injection point.
5. Maximum surface heave of ¼ inch occurs at any location within the injection area. If there is a dip in the existing ground profile that needs correction, this limit may be increased by the Engineer.

The above criteria may be modified by the Engineer during grouting depending upon field conditions. Grouting procedure shall continue with the grout pipe withdrawn in a controlled manner and with sufficient pressure on the grout to assure that the drilled hole is filled with grout to prevent a breaching of any clayey layer present.

**T173-7 Contractor's Supervision and Quality Control**

Keep accurate records for grout mix proportions, quantities of grout taken at each 2 feet interval, and respective injection pressures. The actual sequence of grouting operations, proportions of grout mixes, etc., shall be as provided herein, except that the provisions may be modified by the Engineer as required by field conditions. All daily drilling, grouting, and testing reports shall be submitted to the Engineer within 48 hours. Grout Point Installation Reports shall be required and shall contain at least the following information: Name of driller, type of drill, method being used, date started, dated completed, location of hole, type and depth of materials encountered. Grouting Reports shall be required and shall contain at least the following information: Name of grout technician, constituents and proportions of grout, measured grout slump, log of quantity injected per linear foot of hole, date, rate of pumping, and pressure at the hole.

**T173-8 Testing and Quality**

Perform slump test in the field on each truck or as directed by the Engineer. One sample shall be collected on the first truck for compressive strength testing and one sample shall be collected and tested for compressive strength every 100 cubic yards of grout pumped or as directed by the Engineer. A laser level control system shall be installed and operated by the Contractor for use during grouting. The monitoring shall be carried out to detect any movement within 25 feet of the grouting operations whenever grouting is occurring.

Payment will not be authorized for grouting resulting in surface heave above the maximum allowed. Contractor shall be responsible for any damage to the roadway, embankment and nearby structures resulting from pressure grouting operation.

Calibration for volume production, pressure loss, and slump loss shall be performed to the satisfaction and at the frequency directed by the Engineer. Contractor shall perform Standard Penetration Test borings in improved areas to evaluate the success of the grouting operation when requested by the Engineer. Borings may be required to be performed during the grouting operations and again at the the completion of grouting.

The contractor will have full responsibility for all testing and quality control necessary to ensure that the work is in compliance with the contract and applicable specifications. Any testing or on-site observations performed by the Engineer are for verification only and do not absolve contractor from sole responsibility of full compliance and performance of the work.

**T173-9 Method of Measurement**

The project is lump sum and shall include Maintenance of Traffic, Injection point piping, Grout, and Mobilization.

**T173-10 Basis of Payment**

The work under this section shall be paid for at the contract unit price as listed in the proposal. Such prices and payments shall be full compensation for all work specified under this Section and all other work, materials, tests, equipment, labor, repairs and incidentals to complete the work.

Payment shall be made under:

Pay Item No. (E999 10 41) Lump Sum Contract