MAGNUM ENGINEERING INC
GEOTECHNICAL ENGINEERING CONSULTANTS

GEOTECHNICAL ENGINEERING REPORT

L & W SUPPLY
PE PROJECT NO: 167001
PANAMA CITY, FLORIDA

PREPARED FOR:

PANHANDLE ENGINEERING, INC.
600 OHIO AVENUE
LYNN HAVEN, FLORIDA 32444

429 FLORIDA AVENUE
LYNN HAVEN, FLORIDA 32444
TELEPHONE (850) 258.0994

MAGNUM ENGINEERING INC
GEOTECHNICAL ENGINEERING CONSULTANTS

November 18, 2021

Mr. Doug Crook, P.E.
Panhandle Engineering, Inc.
600 Ohio Avenue
Lynn Haven, FL 32444

SUBJECT: L & W Supply - Geotechnical Services
PE Job No: 167001
Panama City, Florida
MEI Project No. M121-107-278

Dear Mr. Crook:

This letter forwards the results of the auger borings performed at the subject site in Panama City, Florida. A total of Seven (7) 5-feet deep auger borings and One (1) Double Ring Infiltrometer Test (DRI) were performed in the proposed pavement and stormwater management areas. Upon completion of our field testing, the samples were brought back to the office for visual inspection, classification and analysis by our engineering staff.

Project Information

The subject site is located south of East 34th Street at the existing IC Contractors shop in Panama City, Florida. At the time of our exploration, the site was developed with a pre-engineered metal building and office trailer present. The remainder of the site was clear and covered with surficial grasses. Based on visual inspection, the site appears to be relatively level with less than 3 feet of grade change.

If any of the above information is incorrect, please inform Magnum Engineering, Inc. so that we can review and update our recommendations, as needed.

Subsurface Conditions

Figure #1 show the Boring Location Plan and Figure #2 shows the Logs of Borings for the Hand Auger borings HA-1 through HA-7. The test locations were established in the field using the provided site plan, a 100-foot tape and estimating right angles with reference to existing landmarks, thus, the test location should be considered approximate.

The borings (HA-1through HA-7) generally encountered clean fine sands and slightly silty fine sands from the ground surface to the boring termination depth of 5 feet below existing grade.

The above subsurface descriptions are of a generalized nature, provided to highlight the major soil strata encountered. The Logs of Boring should be reviewed for specific subsurface conditions at each boring location. The stratifications shown on the Logs of Boring represent the subsurface conditions at the actual boring locations only, and variations in the subsurface conditions can and may occur between boring locations and should therefore be expected. The stratifications represent the approximate boundary between subsurface materials, and the transitions between strata may be gradual.

Please refer to the attached Logs of Borings presented as Figure #2 for a more detailed description of the soils encountered.

Groundwater Conditions

Groundwater was encountered from approximately 3.0 feet to 4.5 feet below existing grade at the time of drilling (November 9, 2021), which was during a period of slightly above normal seasonal rainfall. By definition, the normal seasonal high groundwater table elevation is the highest level of the saturated zone in the soil during a year with normal rainfall. The procedure used in estimating the seasonal high groundwater table is based on adjusting the existing groundwater table encountered upward or downward, taking into consideration factors such as antecedent rainfall, redoximorphic features (identifying soil mottling) and vegetative indicators. Based on the resources and methodology provided, **we estimate the seasonal high groundwater levels at each boring location as shown in the following Table #1.**

TABLE #1

LOCATION	DEPTH TO EXISTING GROUNDWATER TABLE (ft)	DEPTH TO ESTIMATED SEASONAL HIGH GROUNDWATER TABLE (ft)
HA-1	4.0 feet	4.0 feet
HA-2	3.0 feet	3.0 feet
HA-3	3.5 feet	3.5 feet
HA-4	3.3 feet	3.3 feet
HA-5	4.0 feet	4.0 feet
HA-6	3.8 feet	3.8 feet
HA-7	4.5 feet	4.5 feet

Groundwater levels will fluctuate with rainfall and could vary several feet during typical seasonal fluctuations. Larger fluctuations are possible under severe weather conditions. We recommend that the Contractor verify the actual groundwater levels at the time of construction to determine potential impacts groundwater will have on construction procedures.

Pavements

Initially, the pavement areas should be cleared, grubbed, and stripped of topsoil and other deleterious material (i.e. stumps, roots, etc.).

Prior to placing fill soils, where applicable, the top of the ground surface should be compacted to a minimum soil density of 95% of the Modified Proctor Test (ASTM D1557). Structural fill soils should be placed in maximum 12-inch lifts and compacted to a minimum soil density of 95% of the Modified Proctor Test (ASTM D1557). The top 12 inches of subgrade should be compacted to a minimum soil density of 98% of the Modified Proctor Test (ASTM D1557). The top 12 inches of subgrade should have a minimum LBR value of 40. We recommend that structural fill soils, where planned, have a minimum LBR of 40.

Based on the subsurface conditions encountered in the test borings, we recommend using a graded aggregate base (i.e. limerock or crushed concrete). The base course should be compacted to a minimum soil density of 98% of the Modified Proctor Test (ASTM D1557). The base course should have a minimum LBR value of 100.

Without benefit of traffic loads, volumes, and serviceability parameters, a pavement section cannot be designed. However, typical residential subdivisions in the local area generally consist of a minimum of 1½ inches of FDOT Superpave Mix SP-12.5 asphaltic concrete and a minimum of 6 inches of base. Moderate duty traffic areas (e.g. main entrance areas) typically have a minimum pavement section consisting of 2 inches of FDOT Superpave Mix SP-12.5 asphaltic concrete and 8 inches of base. The above sections represent minimum thicknesses representative of typical, local construction practices, and as such periodic maintenance should be anticipated. All pavement materials and construction procedures should conform to FDOT and/or appropriate city or county requirements

While specific traffic loads and volumes for the project have not been provided, we are providing recommended light-duty and medium-duty pavement sections, which have been successfully utilized for this type of commercial development in the Northwest Florida area.

Light Duty (Automobile Parking)

- 1 ½ inches Asphalt Concrete (FDOT SP-12.5 or SP-9.5)
- 6 inches Crushed Limerock or Graded Aggregate Base (minimum LBR 100)
- 12 inches stabilized subgrade (minimum LBR 40)

Medium Duty (Entrance Lanes)

- 2 inches Asphaltic Concrete (FDOT SP-12.5)
- 8 inches Crushed Limerock or Graded Aggregate Base (minimum LBR 100)
- 12 inches Stabilized Subgrade (minimum LBR 40)

The above recommended pavement sections represent minimum design thicknesses and, as such, periodic maintenance should be anticipated. Also, these recommended pavement sections should be confirmed or modified by your Civil Engineer, based on actual traffic and the owner's requirements. The pavement section materials and construction should comply with the Florida DOT and local municipality requirements

Double Ring Infiltrometer Test

One (1) Double Ring Infiltrometer test was performed in the field in general accordance with the procedures outlined in ASTM D-3385, ``Infiltration Rate of Soils in Field using Double Ring Infiltrometers". Testing consisted of initially clearing all surface vegetation and topsoil from within the test area. The Infiltration test was performed approximately 1 ½ feet below existing grade at location DRI-1. The outer ring, which is approximately 24 inches in diameter, was then driven to a depth of 6 inches below the exposed ground surface. The inner ring, approximately 12 inches in diameter, was then centrally located within the outer ring and driven to a depth of 2 inches. The two rings were then simultaneously filled with water to a height of 4 inches above the exposed ground surface test soils. The water level was maintained at this height throughout the test period, with the required amount of water added to maintain this level in both rings recorded at time intervals of 5 minutes.

The infiltration rate for the inner ring and the annular space between the rings is determined by dividing (a) the water volume used (within each specific area) during the stabilized flow period of the test, by (b) the specific area and (c) the time interval. Infiltration rates are generally converted to units of inches per hour. The infiltration rate for the inner ring, if different than the infiltration rate of the annular area between the rings, according to ASTM, should be used as the infiltration rate for the soils.

INFILTRATION DATA

LOCATION	ORIENTATION	TEST DEPTH (feet)	SUSTAINED INFILTRATION RATE (in/hr)
DRI-1	$K_{V\ (unsaturated)}$	1.5	2.9* in/hr

***Note: The above infiltration rate has not been factored and is up to the designer to apply an appropriate factor of safety.**

ENVIRONMENTAL RESOURCE PERMITTING (ERP) DESIGN PARAMETERS

DESCRIPTION	LOCATION	DESIGN PARAMTER
SUSTAINED INFILTRATION RATE (K_{VU})	DRI-1	2.9 IN/HR*
TEST DEPTH	DRI-1	1.5 FT
FILLABLE POROSITY	DRI-1	30%
DEPTH TO EXISTING GROUNDWATER TABLE	DRI-1	4.5 FT BELOW EXISTING GRADE
DEPTH TO ESTIMATED SEASONAL HIGH GROUNDWATER TABLE	DRI-1	4.5 FT BELOW EXISTING GRADE
DEPTH TO CONFINING LAYER	DRI-1	>15 FEET**

We recommend using a transformation ratio of 1 horizontal to 1 vertical (i.e. the estimated ratio of horizontal to vertical permeability).

***** The above infiltration rate has not been factored and it is up to the designer to apply an appropriate factor of safety.

**Based on our experience with soils in the general area.

Warranty and Limitations of Study

Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. This warranty is in lieu of all other warranties, either expressed or implied. Magnum Engineering, Inc. is not responsible for the independent conclusions, opinions or recommendations made by others based on the field exploration and laboratory test data presented in this report.

We wish to point out that a geotechnical study is inherently limited in that the engineering recommendations are developed from information obtained from test borings that only depict subsurface conditions at the specific locations, times and depth shown on the logs. Soil conditions at other locations may differ from those encountered in the test borings, and the passage of time may cause the soils conditions to change from those described in this report.

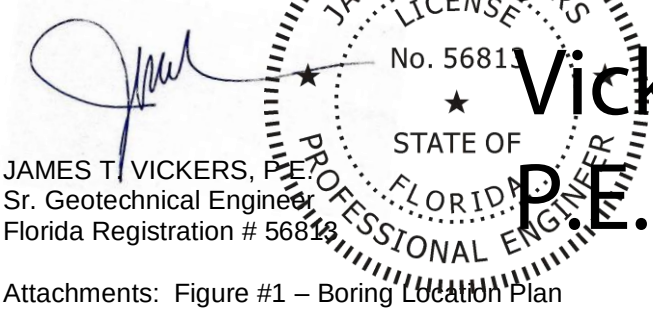
This report is intended for use by the designers of this project. While we have no objections to it being provided for review by parties to this project, it is not a specification document and is not to be used as a part of the specifications. If desired, we can assist in the development of specifications for this project based upon our exploration.

The nature and extent of variation and change in the subsurface conditions at the site may not become evident until the course of construction. Construction monitoring by the geotechnical engineer or his representative is therefore considered necessary to verify the subsurface conditions. If significant variations or changes are in evidence, it may be necessary to reevaluate the recommendations in this report.

Furthermore, if the project characteristics are altered significantly from those discussed in this report, if the project information contained in this report is incorrect or if additional information becomes available, a review must be made by this office to determine if any modifications in the recommendations will be necessary.

We hope this letter provides sufficient information for the present. If you have any questions or comments, please feel free to call.

Sincerely,
MAGNUM ENGINEERING, INC.



James T. Vickers, P.E.
Digitally signed by James T. Vickers, P.E.
Date: 2021.11.18 06:51:57 -06'00'

JAMES T. VICKERS, P.E.
Sr. Geotechnical Engineer
Florida Registration # 56813

Attachments: Figure #1 – Boring Location Plan
Figure #2 – Logs of Borings
Figure #3 – Double Ring Infiltrometer Test Results

This item has been electronically signed and sealed by James T. Vickers, 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

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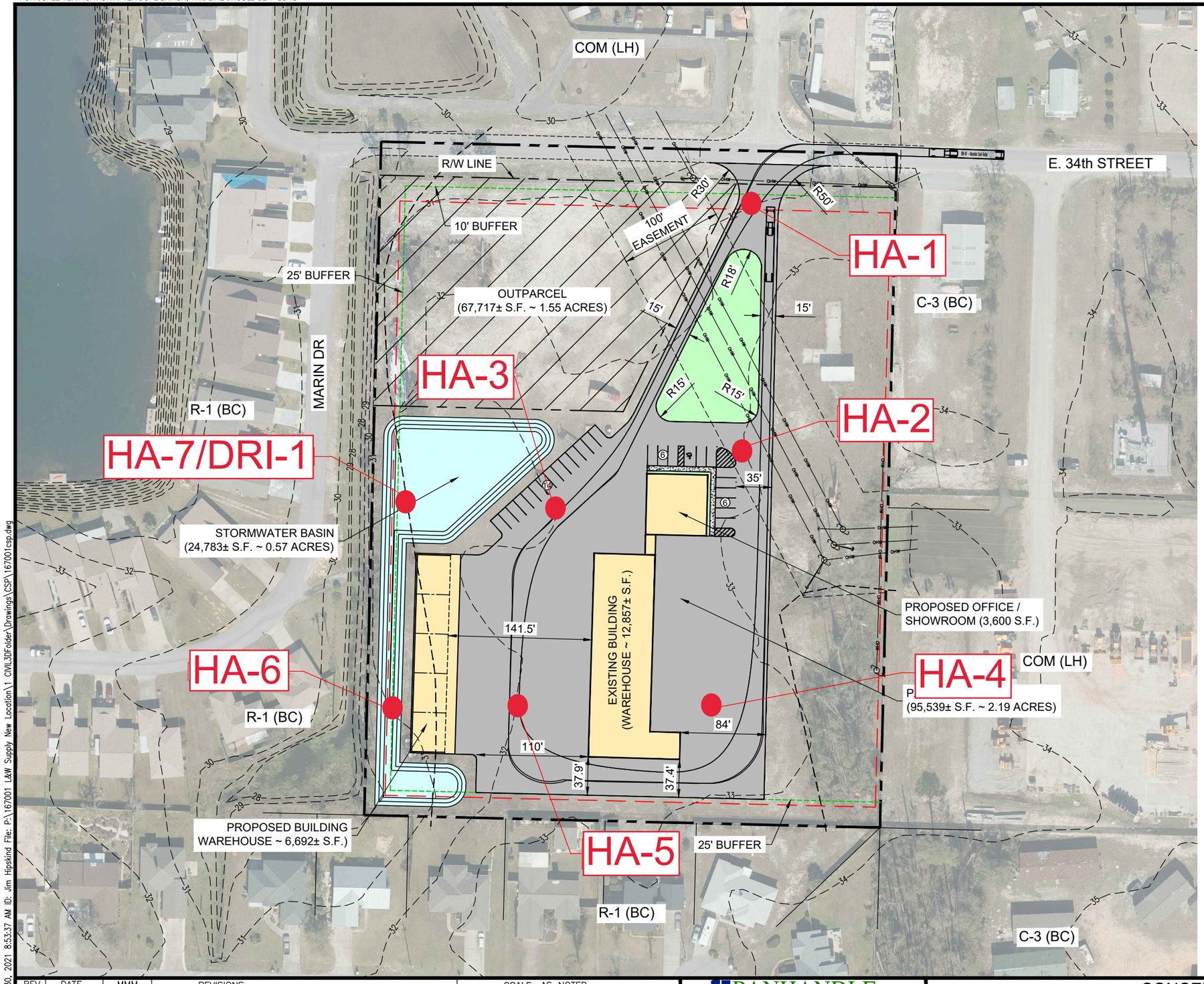
GEOTECHNICAL ENGINEERING CONSULTANTS

BORING LOCATION PLAN

FIGURE # 1

FOR SCALE VERIFICATION AFTER DUPLICATION, THIS LINE SHOULD BE 1" LONG



CONCEPTUAL SITE DATA

DEVELOPMENT AREA		337,242± SF 7.7± AC
BUILDING AREA		16,550± SF
PARKING REQUIREMENTS	REQUIRED	18 PARKS
	PROVIDED	26 PARKS

PREPARED WITHOUT BENEFIT OF TOPO SURVEY AND SOIL PERCOLATION TEST, THEREFORE SITE LAYOUT & STORMWATER BASIN SIZING IS PRELIMINARY.

ZONED:
C-3 (BAY COUNTY)

BUFFER:
ZONE R-1: BUFFER D = 25'
10 FT. BUFFER ALONG STREETS & HIGHWAYS

BUILDING SETBACKS:
FRONT: 25'
SIDE: 5'
SIDE WHEN ADJACENT TO "R" ZONES: 20'
REAR: 20'

FLOOR AREA RATIO:
200%

IMPERVIOUS SURFACE RATIO:
75%

MAX. BUILDING HEIGHT:
230'

PARKING STALL REQUIREMENT:
STANDARD STALL 9'min.X20'min.
HC STALL 12'min.X20'min. W/5' ISLE
HC VAN STALL 12'minX20'min. W/8' ISLE
(90° PARKS)

PARKING REQUIREMENTS:

1.	COMMERCIAL, MANUFACTURING AND INDUSTRIAL ESTABLISHMENTS NOT CATERING TO RETAIL TRADE	2 SPACES PER 1,000 SQ. FT. OF GROSS FLOOR AREA FOR EACH SQ. FT. UP TO 100,000 SQ. FT. PLUS 1 SPACE PER 1,000 SQ. FT. OVER 100,000 SQ. FT. OF GROSS FLOOR AREA
2.	WHOLESALE, MANUFACTURE, PROCESSING OR ASSEMBLY	2 SPACES PER 1,000 SQ. FT. OF GROSS FLOOR AREA FOR EACH SQ. FT. UP TO 150,000 SQ. FT. PLUS 1 SPACE PER 1,000 SQ. FT. OVER 150,000 SQ. FT. OF GROSS FLOOR AREA
3.	WAREHOUSING NO ASSOCIATED WITH ANY OTHER INDUSTRIAL OR WHOLESALE USE	1/2 SPACE PER 1,000 SQ. FT. OF GROSS FLOOR AREA

0' 50' 100' 200'
SCALE: 1" = 100'

SCALE 1"=100'

REV	DATE	MMM	REVISIONS

NOT RELEASED FOR CONSTRUCTION BY: DATE:

SCALE: AS NOTED
DESIGNED BY: JDC
DRAWN BY: JAH
REVIEWED BY: JDC
ISSUE DATE: JULY 2021
ACAD FILE NAME: 167001csp.dwg

PANHANDLE ENGINEERING, INC.
ENVIRONMENTAL ENGINEERS ● CIVIL ENGINEERS ● LAND PLANNERS
600 Ohio Avenue Lynn Haven, Florida 32444
(850)763-5200 www.panhandleengineering.com

CONCEPTUAL SITE PLAN
L & W SUPPLY
NEW LOCATION
PANAMA CITY, FLORIDA

DPR CERTIFICATION No: EB-7806
SHEET NO: 1
PROJECT NUMBER: 167001

Date: Friday, July 30, 2021 8:53:37 AM ID: Jim Hipskind File: P:\167001 L&W Supply New Location\1 CIVIL3DFolder\Drawings\CSP\167001csp.dwg

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LOGS OF BORINGS

FIGURE # 2

Magnum Engineering, Inc.
1026 Pierson Drive
Lynn Haven, Florida 32444
Telephone: 850-265-8332

BORING NUMBER HA-1

CLIENT Panhandle Engineering, INC
PROJECT NAME L & W Supply
PROJECT NUMBER M121-107-278
PROJECT LOCATION Panama City, FL
DATE STARTED 11/9/21 **COMPLETED** 11/9/21
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR GeoDrill Tech, LLC
GROUND WATER LEVELS:
DRILLING METHOD Hand Auger Boring
▽ **DEPTH TO GROUNDWATER AT TIME OF DRILLING** 4.0 ft
LOGGED BY J. Governale **CHECKED BY** J. Vickers
ESTIMATED SEASONAL HIGH GWT ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		Tan Slightly Silty Fine SAND (SP-SM)	AU									
2.5		Light Tan Slightly Silty Fine SAND (SP-SM) ▽										
		Gray Slightly Silty Fine SAND (SP-SM)										
5.0		Boring Termination Depth at 5.0 feet.										

Magnum Engineering, Inc.
1026 Pierson Drive
Lynn Haven, Florida 32444
Telephone: 850-265-8332

BORING NUMBER HA-2

CLIENT Panhandle Engineering, INC
PROJECT NAME L & W Supply
PROJECT NUMBER M121-107-278
PROJECT LOCATION Panama City, FL
DATE STARTED 11/9/21 **COMPLETED** 11/9/21
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR GeoDrill Tech, LLC
GROUND WATER LEVELS:
DRILLING METHOD Hand Auger Boring
▽ **DEPTH TO GROUNDWATER AT TIME OF DRILLING** 3.0 ft
LOGGED BY J. Governale **CHECKED BY** J. Vickers
ESTIMATED SEASONAL HIGH GWT ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		Gray/Brown Slightly Silty Fine SAND (SP-SM)	AU									
2.5		Brown Slightly Silty Fine SAND (SP-SM) ▽										
		Gray/Brown Slightly Silty Fine SAND (SP-SM)										
5.0		Boring Termination Depth at 5.0 feet.										

Magnum Engineering, Inc.
1026 Pierson Drive
Lynn Haven, Florida 32444
Telephone: 850-265-8332

BORING NUMBER HA-3

CLIENT Panhandle Engineering, INC
PROJECT NAME L & W Supply
PROJECT NUMBER M121-107-278
PROJECT LOCATION Panama City, FL
DATE STARTED 11/9/21 **COMPLETED** 11/9/21
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR GeoDrill Tech, LLC
GROUND WATER LEVELS:
DRILLING METHOD Hand Auger Boring
▽ **DEPTH TO GROUNDWATER AT TIME OF DRILLING** 3.5 ft
LOGGED BY J. Governale **CHECKED BY** J. Vickers
ESTIMATED SEASONAL HIGH GWT ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		Gray Slightly Silty Fine SAND (SP-SM)	AU									
2.5		Gray/Brown Slightly Silty Fine SAND (SP-SM)										
		Brown Slightly Silty Fine SAND (SP-SM) ▽										
5.0		Boring Termination Depth at 5.0 feet.										

Magnum Engineering, Inc.
1026 Pierson Drive
Lynn Haven, Florida 32444
Telephone: 850-265-8332

BORING NUMBER HA-4

CLIENT Panhandle Engineering, INC
PROJECT NAME L & W Supply
PROJECT NUMBER M121-107-278
PROJECT LOCATION Panama City, FL
DATE STARTED 11/9/21 **COMPLETED** 11/9/21
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR GeoDrill Tech, LLC
GROUND WATER LEVELS:
DRILLING METHOD Hand Auger Boring
▽ **DEPTH TO GROUNDWATER AT TIME OF DRILLING** 3.3 ft
LOGGED BY J. Governale **CHECKED BY** J. Vickers
ESTIMATED SEASONAL HIGH GWT ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		Brown Slightly Silty Fine SAND (SP-SM)	AU									
2.5		Tan Slightly Silty Fine SAND (SP-SM) ▽										
5.0		Gray Slightly Silty Fine SAND (SP-SM)										
		Boring Termination Depth at 5.0 feet.										

Magnum Engineering, Inc.
1026 Pierson Drive
Lynn Haven, Florida 32444
Telephone: 850-265-8332

BORING NUMBER HA-5

CLIENT Panhandle Engineering, INC
PROJECT NAME L & W Supply
PROJECT NUMBER M121-107-278
PROJECT LOCATION Panama City, FL
DATE STARTED 11/9/21 **COMPLETED** 11/9/21
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR GeoDrill Tech, LLC
GROUND WATER LEVELS:
DRILLING METHOD Hand Auger Boring
▽ **DEPTH TO GROUNDWATER AT TIME OF DRILLING** 4.0 ft
LOGGED BY J. Governale **CHECKED BY** J. Vickers
ESTIMATED SEASONAL HIGH GWT ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		Brown Slightly Silty Fine SAND (SP-SM)										
		Tan Slightly Silty Fine SAND (SP-SM)										
		Dark Gray/Gray Slightly Silty Fine SAND (SP-SM)										
		Gray Slighty Silty Fine SAND (SP-SM)	AU									
2.5		▽										
5.0		Boring Termination Depth at 5.0 feet.										

Magnum Engineering, Inc.
1026 Pierson Drive
Lynn Haven, Florida 32444
Telephone: 850-265-8332

BORING NUMBER HA-6

CLIENT Panhandle Engineering, INC
PROJECT NAME L & W Supply
PROJECT NUMBER M121-107-278
PROJECT LOCATION Panama City, FL
DATE STARTED 11/9/21 **COMPLETED** 11/9/21
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR GeoDrill Tech, LLC
GROUND WATER LEVELS:
DRILLING METHOD Hand Auger Boring
▽ **DEPTH TO GROUNDWATER AT TIME OF DRILLING** 3.8 ft
LOGGED BY J. Governale **CHECKED BY** J. Vickers
ESTIMATED SEASONAL HIGH GWT ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		Gray Slightly Silty Fine SAND (SP-SM)										
		Dark Gray/Brown Slightly Silty Fine SAND (SP-SM)										
		Gray/Brown Slightly Silty Fine SAND (SP-SM)	AU									
2.5		▽										
5.0		Boring Termination Depth at 5.0 feet.										

Magnum Engineering, Inc.
1026 Pierson Drive
Lynn Haven, Florida 32444
Telephone: 850-265-8332

BORING NUMBER HA-7

CLIENT Panhandle Engineering, INC
PROJECT NAME L & W Supply
PROJECT NUMBER M121-107-278
PROJECT LOCATION Panama City, FL
DATE STARTED 11/9/21 **COMPLETED** 11/9/21
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR GeoDrill Tech, LLC
GROUND WATER LEVELS:
DRILLING METHOD Hand Auger Boring
▽ **DEPTH TO GROUNDWATER AT TIME OF DRILLING** 4.5 ft
LOGGED BY J. Governale **CHECKED BY** J. Vickers
ESTIMATED SEASONAL HIGH GWT ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		Gray Slightly Silty Fine SAND with Trace of LIMEROCK (SP-SM)										
		Gray Slightly Silty Fine SAND (SP-SM)										
		Tan Slightly Silty Fine SAND (SP-SM)	AU									
2.5		▽										
5.0		Boring Termination Depth at 5.0 feet.										

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DOUBLE RING INFILTROMETER TEST RESULTS

FIGURE # 3

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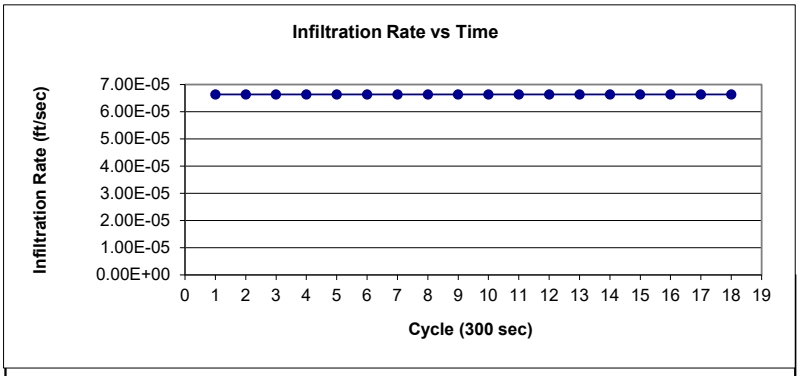
Double-Ring Field Infiltration Test

Test Location:	DRI-1			
Project Name:	L&W Supply			
Project Location:	Panama City, Florida			
Test Depth:	1.5	ft		
Depth to GWT:	4.5	ft		
Inner Ring Diameter:	12	in	0.3048	m
Outer Ring Diameter:	24	in	0.6096	m
Pre-Saturation	30	min		
Area Outer Ring:	3.1416	ft^2	0.00202683	m^2
Area Inner Ring:	0.7854	ft^2	0.00050671	m^2
Net Outer Ring Area:	2.3562	ft^2	0.00152013	m^2

	Inner Ring		
Cycle	ElapTime (sec)	Vol Used (in^3)	Infiltration Rate (ft/sec)
1	300	27	6.63E-05
2	300	27	6.63E-05
3	300	27	6.63E-05
4	300	27	6.63E-05
5	300	27	6.63E-05
6	300	27	6.63E-05
7	300	27	6.63E-05
8	300	27	6.63E-05
9	300	27	6.63E-05
10	300	27	6.63E-05
11	300	27	6.63E-05
12	300	27	6.63E-05
13	300	27	6.63E-05
14	300	27	6.63E-05
15	300	27	6.63E-05
16	300	27	6.63E-05
17	300	27	6.63E-05
18	300	27	6.63E-05
Results	Sustained Rate	27	6.63E-05



Infiltration Rate: **2.02E-03 cm/sec** **2.9 in/hr**