ALANN ENGINEERING GROUP
CONSULTING ENGINEERS SINCE 1989

Stormwater Calculations

FLAGLER LANDING

FLAGLER COUNTY, FL

PREPARED FOR:
SEMINOLE WOODS INVESTMENTS, LLC
7331 OFFICE PARK PLACE
SUITE 200
VIERA, FL 32940

JUNE 16, 2023

REVISED FEBRUARY 28, 2024

Cole T. Buck, State of Florida, Professional Engineer, License No. 88690

2024.02.28 16:30:51-05'00'

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FLAGLER LANDING - STORMWATER SUMMARY

PROJECT DESCRIPTION

The referenced project is the construction of the frontage on state road 100, that consists of 11 commercial outparcels measuring to approximately 14.87 ac. of developed area. The site is located to the northeast of the Flagler County Airport.

The site is currently undeveloped, densely wooded, with thick brush and wetlands. A little over 50% of the developed area will be within wetlands and those impacts amount to 9.31 acres. The site consists mainly of A/D soils as shown on the attached NRCS soil survey map. With the proximity of the water table to the surface, the soils will be modeled as D soils on this site.

Pre-Development

CN Number:
- Area in "D" Soils is 14.34 acres.
- CN = 77 (see attached TR55 Calculations)

Time of Concentration
- Predevelopment Basin 1 – 0.841 Hours, 50.46 minutes (see attached TR55 Calculations)

Post Development

CN Number
- Pervious Area = 6.502 acres
- Impervious Area = 10.158
- CN = 91 (see attached TR55 calculations)

Time of Concentration
- Postdevelopment Basin 1 – 0.167 Hours (see attached TR55 Calculations)

The stormwater treatment for Post Basin 1 is provided in a wet detention pond. The site discharges to the adjacent wetland and is not OFW or impaired. Therefore, the treatment volume required is 1.87 ac-ft.

The treatment volume is provided from elevation 25.94 to 26.92 which is the invert elevation of the 2.5' wide weir. The normal water elevation is set at the seasonal high water table elevation of 25.94 and is maintained with an orifice pipe.

Pre/Post Discharge Comparison

Storm Event	Pre Discharge (cfs)	Post Discharge (cfs)
Mean Annual	11.82	5.90
25yr24hr	28.31	24.15
100yr24hr	36.82	34.46

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WET DETENTION CALCULATIONS

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BASIN # 1

TOTAL AREA: 14.34
IMPERVIOUS AREA: 8.96
PERVIOUS AREA: 5.38
PERCENT IMPERVIOUS: 62%

RUNOFF COEFFICIENT: 0.64

NWL 25.94

STAGE/STORAGE:

	STAGE (FT)	AREA (AC)	STORAGE (AC-FT)	CUMULATIVE STOARGE (AC-FT)	CUMULATIVE STORAGE ABOVE ORIFICE
	16.00	1.06	0.00	0.00	
	23.94	1.50	10.16	10.16	
NWL	25.94	1.73	3.23	13.39	0.00
	27.00	1.85	1.90	15.29	1.90
	28.00	1.98	1.92	17.21	3.81
	29.00	2.10	2.04	19.25	5.85
	29.50	2.30	1.10	20.35	6.95

REQ'D TREATMENT VOL.: Area x 1 inch of runoff OR 2.5" x impervious area, whichever is greater
(add 50% to above number for OFW water quality standards)

1.20 OR 1.87
VOLUME REQ'D.= 1.87
1.87 Site is not OFW or impaired

SET CONTROL ELEV.

ORIFICE INVERT: 25.94
WEIR ELEV: 26.92
TREATMENT VOL. DEPTH= 0.98

PERM. POOL VOLUME:

RUNOFF COEFF.= 0.64
2 WEEK RES. TIME: 21 days/153 days

MIN. PERM POOL VOL. = Area x runoff coefficient x wet season rainfall of 30" x 3 week res. Time divided by 12"/'

MIN. PERM POOL VOL = 3.14 AC-FT.

POND VOLUME BELOW
ORIFICE INVERT = 13.39 AC-FT.

SIZE CONTROL STRUCTURE:
Note: volume to draw down is 2.72 ac-ft
DETERMINE ORIFICE SIZE TO DRAWDOWN VOLUME IN 24 - 30 HOURS

A = Q / C(2gh) to 1/2 power

h = (h1 + h2)/2

h1 =	0.98		
h2 =	0.49		
C =	0.60		
g =	32.20		
Q =	treatment volume x 43560 sf/ac x 1/2 x 1/24 hrs x 1hr/3600 sec =		0.47
h =	0.74		
A =	0.11	SQ. FT.	
DIA. OF ORIFICE =	SQ. RT. OF (4A/3.1416) =	0.38	FT.
	OR	4.57	INCHES

MEAN DEPTH OF POND: volume of pond at orifice inv. Divided by area of pond at orifice invert

VOLUME OF POND =	13.39
AREA OF POND =	1.73
MEAN DEPTH OF POND =	7.74

LITTORAL ZONE ALTERNATE:

IN LIEU OF LITTORAL ZONE PLANTINGS ADD 50% PERM. POOL VOLUME:

NORMAL PERM POOL VOL:	3.14
REQ'D VOLUME:	4.70
VOLUME PROVIDED:	13.39

PRE-DEVELOPMENT

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PRE-DEVELOPMENT BASIN MAP

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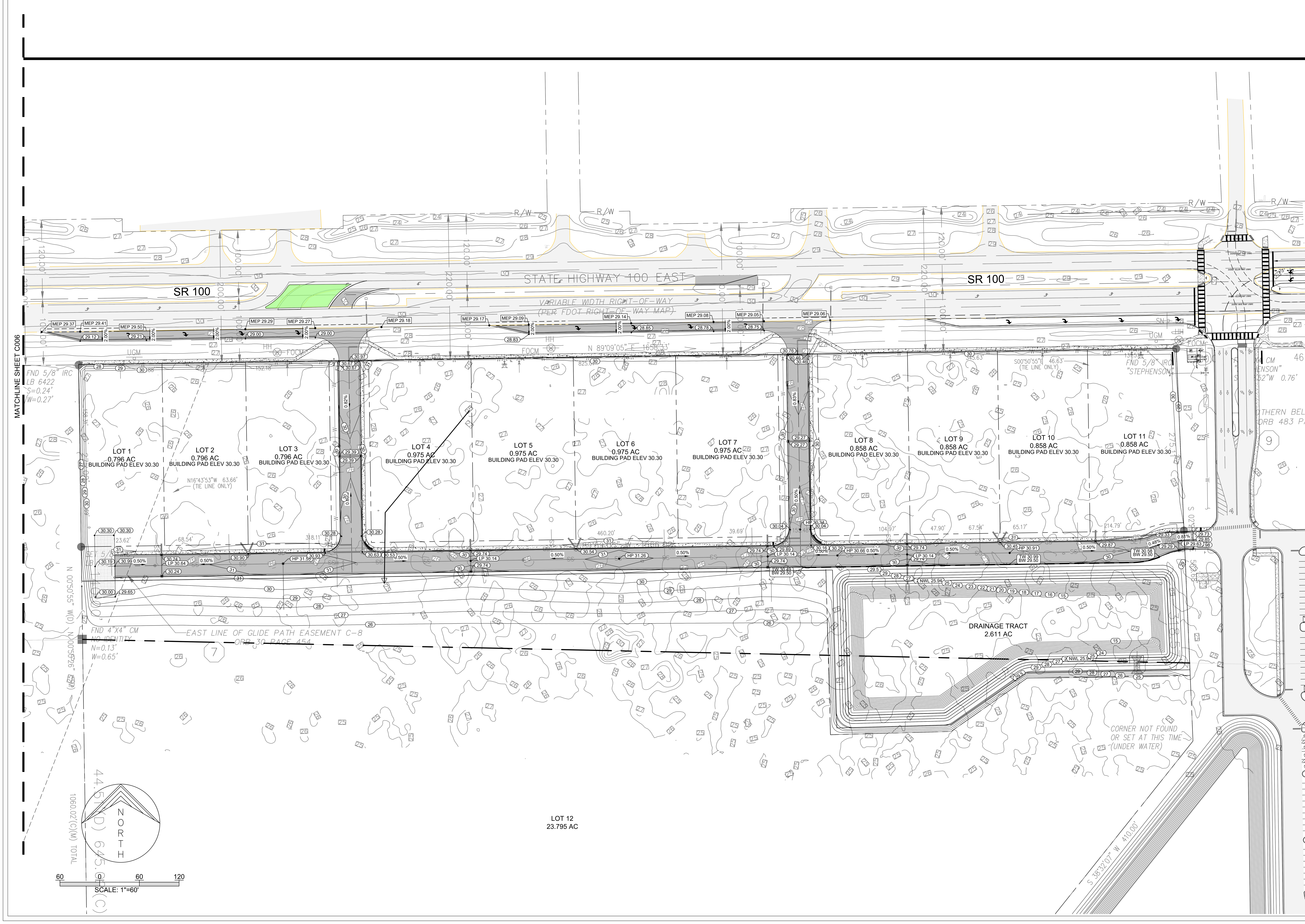

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FLAGLER LANDING
FLAGLER COUNTY
PRE-DEVELOPMENT MAP

NO.	DATE	REVISION	BY
3	2/4/24	SITE PLAN REVISION	JKB
2	10/25/23	ENTRANCE REVISION	JKB
1	9/11/23	POND REVISIONS	JKB

DESIGNER	FILE	DATE
KAB	2213-1	1/19/23
DRAWN BY	PROJECT	SCALE
JKB	2213-1	AS NOTED

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TR-55 CALCULATIONS

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WinTR-55 Current Data Description

--- Identification Data ---

User: Kim Buck
Project: FLAGLER LANDING
SubTitle: PRE-DEVELOPMENT
State: Florida
County: FLAGLER EAST MSE5
Filename: P:\2213-1 Tidelands SR-100\Calcs\tr55\newfile pre unknown.w55

Date: 1/8/2024
Units: English
Areal Units: Acres

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
SITE			14.87	77	.841

Total area: 14.87 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

1-Yr (in)	2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)
2.81	3.42	4.44	5.33	6.68	7.87	9.2

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type II
Dimensionless Unit Hydrograph: <standard>

FLAGLER LANDING
PRE-DEVELOPMENT
FLAGLER EAST MSE5 County, Florida

Storm Data

Rainfall Depth by Rainfall Return Period

1-Yr (in)	2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)
2.81	3.42	4.44	5.33	6.68	7.87	9.2

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type II
Dimensionless Unit Hydrograph: <standard>

Kim Buck

FLAGLER LANDING
PRE-DEVELOPMENT
FLAGLER EAST MSE5 County, Florida

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
SITE	14.87	0.841	77		

Total Area: 14.87 (ac)

FLAGLER LANDING
PRE-DEVELOPMENT
FLAGLER EAST MSE5 County, Florida

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
SITE							
SHEET	100	0.0097	0.800				0.805
SHALLOW	208	0.0097	0.050				0.036
						Time of Concentration	.841

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PRE-DEVELOPMENT
FLAGLER EAST MSE5 County, Florida

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
SITE	Woods (good)	D	14.87	77
	Total Area / Weighted Curve Number		14.87	77

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==========
==== Basins ====
==========

Name: site Node: site Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 50.46
Area(ac): 14.870 Time Shift(hrs): 0.00
Curve Number: 77.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

==========
==== Nodes ====
==========

Name: Base Flow(cfs): 0.000 Init Stage(ft): 0.000
Group: BASE Warn Stage(ft): 0.000
Type: Stage/Area

Stage(ft)	Area(ac)

==========
==== Hydrology Simulations ====
==========

Name: 100yr24hr
Filename: P:\2213-1 Tidelands SR-100\Calcs\icpr\100yr24hr.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Flmod
Rainfall Amount(in): 11.00

Time(hrs)	Print Inc(min)
30.000	5.00

Name: 25yr24hr
Filename: P:\2213-1 Tidelands SR-100\Calcs\icpr\25yr24hr.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Flmod
Rainfall Amount(in): 9.00

Time(hrs)	Print Inc(min)
30.000	5.00

Name: meanannual
Filename: P:\2213-1 Tidelands SR-100\Calcs\icpr\meanannual.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Flmod
Rainfall Amount(in): 5.00

Time(hrs)	Print Inc(min)
30.000	5.00

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```
            Basin Name: site
            Group Name: BASE
            Simulation: 100yr24hr
             Node Name: site
            Basin Type: SCS Unit Hydrograph

        Unit Hydrograph: Uh256
          Peaking Fator: 256.0
    Spec Time Inc (min): 6.73
    Comp Time Inc (min): 5.00
         Rainfall File: Flmod
   Rainfall Amount (in): 11.000
   Storm Duration (hrs): 24.00
                 Status: Onsite
     Time of Conc (min): 50.46
       Time Shift (hrs): 0.00
              Area (ac): 14.870
   Vol of Unit Hyd (in): 1.000
          Curve Number: 77.000
              DCIA (%): 0.000

        Time Max (hrs): 12.50
        Flow Max (cfs): 36.82
     Runoff Volume (in): 8.072
    Runoff Volume (ft3): 435730


--------------------------------------------------------------------------------

            Basin Name: site
            Group Name: BASE
            Simulation: 25yr24hr
             Node Name: site
            Basin Type: SCS Unit Hydrograph

        Unit Hydrograph: Uh256
          Peaking Fator: 256.0
    Spec Time Inc (min): 6.73
    Comp Time Inc (min): 5.00
         Rainfall File: Flmod
   Rainfall Amount (in): 9.000
   Storm Duration (hrs): 24.00
                 Status: Onsite
     Time of Conc (min): 50.46
       Time Shift (hrs): 0.00
              Area (ac): 14.870
   Vol of Unit Hyd (in): 1.000
          Curve Number: 77.000
              DCIA (%): 0.000

        Time Max (hrs): 12.50
        Flow Max (cfs): 28.31
     Runoff Volume (in): 6.192
    Runoff Volume (ft3): 334210


--------------------------------------------------------------------------------

            Basin Name: site
            Group Name: BASE
            Simulation: meanannual
             Node Name: site
            Basin Type: SCS Unit Hydrograph

        Unit Hydrograph: Uh256
          Peaking Fator: 256.0
    Spec Time Inc (min): 6.73
    Comp Time Inc (min): 5.00
         Rainfall File: Flmod
   Rainfall Amount (in): 5.000
   Storm Duration (hrs): 24.00
                 Status: Onsite
     Time of Conc (min): 50.46
       Time Shift (hrs): 0.00
              Area (ac): 14.870
   Vol of Unit Hyd (in): 1.000
          Curve Number: 77.000
              DCIA (%): 0.000

        Time Max (hrs): 12.58
        Flow Max (cfs): 11.82
     Runoff Volume (in): 2.620
    Runoff Volume (ft3): 141416
```

POST-DEVELOPMENT

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POST-DEVELOPMENT BASIN MAP

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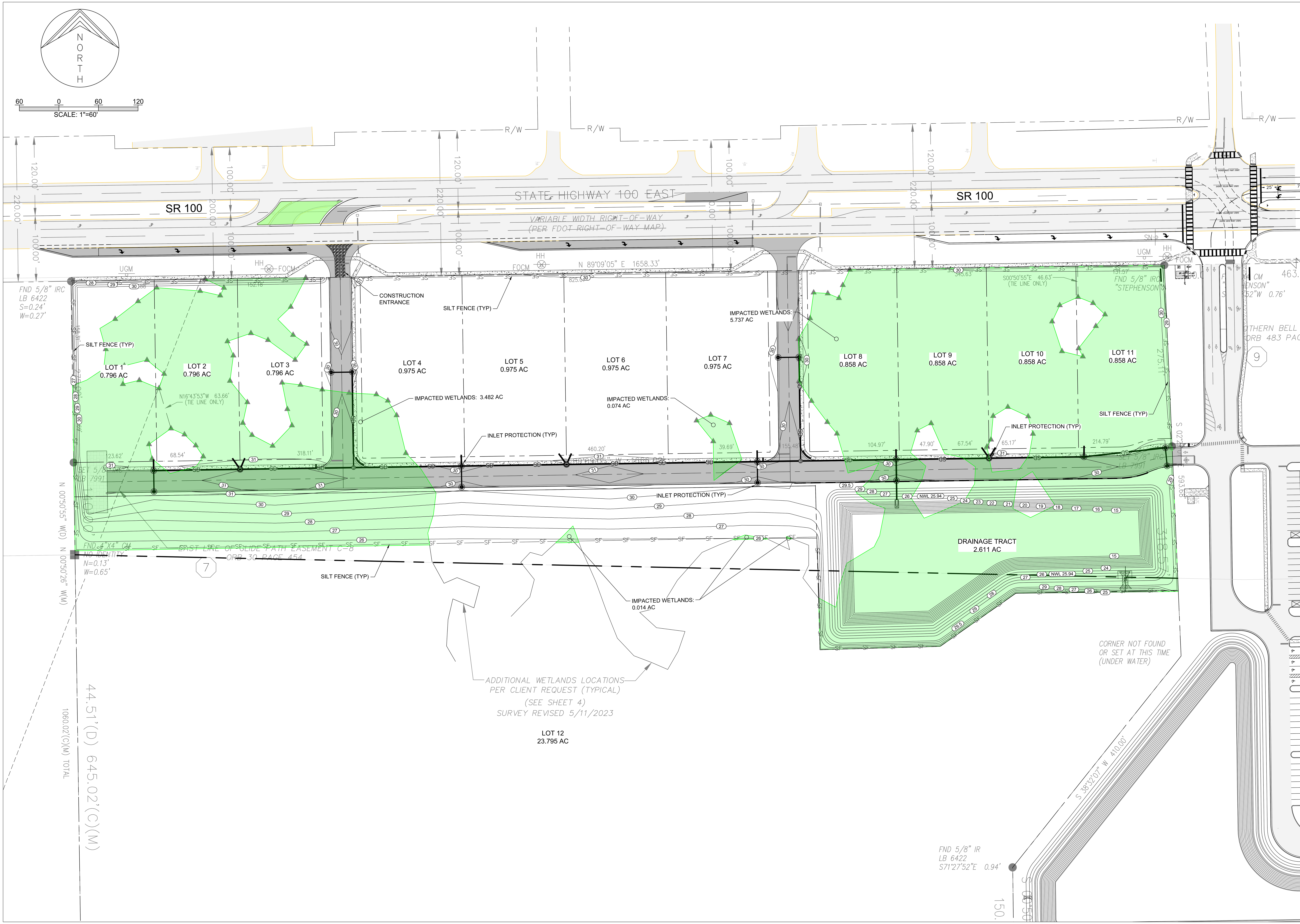

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FLAGLER LANDING
FLAGLER COUNTY
EROSION CONTROL PLAN

NO.	DATE	REVISION	BY
3	2/4/24	SITE PLAN REVISION	JKB
2	10/25/23	ENTRANCE REVISION	JKB
1	9/11/23	POND REVISIONS	JKB

DESIGNER	FILE	DATE
KAB	2213-1	1/19/23
DRAWN BY	**PROJECT**	**SCALE**
JKB	2213-1	AS NOTED

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TR55 CALCULATIONS

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WinTR-55 Current Data Description

--- Identification Data ---

User: BUCK
Project: Flagler Airport 100
SubTitle: Post-Development
State: Florida
County: FLAGLER WEST MSE5
Filename: P:\2213-1 Tidelands SR-100\Calcs\tr55\post_commercial.w55

Date: 9/11/2023
Units: English
Areal Units: Acres

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
Site			14.87	92	0.670

Total area: 14.87 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

-Yr (in)	-Yr (in)	-Yr (in)	-Yr (in)	-Yr (in)	-Yr (in)	-Yr (in)
.0	.0	.0	.0	.0	.0	.0

Storm Data Source: Flagler County, FL (NRCS)
Rainfall Distribution Type:
Dimensionless Unit Hydrograph: <standard>

Flagler Airport 100
Post-Development
FLAGLER WEST MSE5 County, Florida

Storm Data

Rainfall Depth by Rainfall Return Period

-Yr (in)	-Yr (in)	-Yr (in)	-Yr (in)	-Yr (in)	-Yr (in)	-Yr (in)
.0	.0	.0	.0	.0	.0	.0

Storm Data Source: Flagler County, FL (NRCS)
Rainfall Distribution Type:
Dimensionless Unit Hydrograph: <standard>

Flagler Airport 100
Post-Development
FLAGLER WEST MSE5 County, Florida

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
Site	14.87	0.670	92		

Total Area: 14.87 (ac)

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Post-Development
FLAGLER WEST MSE5 County, Florida

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Site							
User-provided							0.670
						Time of Concentration	0.670

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Post-Development
FLAGLER WEST MSE5 County, Florida

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Site	Open space; grass cover > 75% (good)	D	5.12	80
	Paved parking lots, roofs, driveways	D	9.75	98
	Total Area / Weighted Curve Number		14.87	92

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==========
==== Basins ====
==========

Name: site | Node: site | Status: Onsite
Group: BASE | Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh323 | Peaking Factor: 323.0
Rainfall File: | Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 | Time of Conc(min): 10.00
Area(ac): 14.870 | Time Shift(hrs): 0.00
Curve Number: 92.00 | Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

==========
==== Nodes ====
==========

Name: 99 | Base Flow(cfs): 0.000 | Init Stage(ft): 25.940
Group: BASE | Warn Stage(ft): 25.940
Type: Time/Stage

Time(hrs)	Stage(ft)
0.00	25.940
24.00	25.940

Name: site | Base Flow(cfs): 0.000 | Init Stage(ft): 25.940
Group: BASE | Warn Stage(ft): 29.500
Type: Stage/Area

Stage(ft)	Area(ac)
25.940	1.7300
27.000	1.8500
28.000	1.9800
29.000	2.1000
29.500	2.3000

==========
==== Pipes ====
==========

Name: orifice | From Node: site | Length(ft): 30.00
Group: BASE | To Node: 99 | Count: 1
Friction Equation: Automatic

	UPSTREAM	DOWNSTREAM
Geometry:	Circular	Circular
Span(in):	4.57	4.57
Rise(in):	4.57	4.57
Invert(ft):	25.940	25.940
Manning's N:	0.010000	0.010000
Top Clip(in):	0.000	0.000
Bot Clip(in):	0.000	0.000

Solution Algorithm: Most Restrictive
Flow: Both
Entrance Loss Coef: 0.00
Exit Loss Coef: 1.00
Bend Loss Coef: 0.00
Outlet Ctrl Spec: Use dc or tw
Inlet Ctrl Spec: Use dc
Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

==========
==== Weirs ====
==========

Name: weir | From Node: site
Group: BASE | To Node: 99
Flow: Both | Count: 1
Type: Vertical: Fread | Geometry: Trapezoidal

Bottom Width(ft): 2.50
Left Side Slope(h/v): 0.25
Right Side Slope(h/v): 0.25

```
                Invert(ft): 26.920
      Control Elevation(ft): 26.920
     Struct Opening Dim(ft): 9999.00
                                        TABLE
           Bottom Clip(ft): 0.000
              Top Clip(ft): 0.000
        Weir Discharge Coef: 3.200
     Orifice Discharge Coef: 0.600



================================================================================
==== Hydrology Simulations =====================================================
================================================================================

         Name: 100yr24hr
     Filename: P:\2213-1 Tidelands SR-100\Calcs\icpr\100yr24hr.R32

      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: Flmod
    Rainfall Amount(in): 11.00

Time(hrs)       Print Inc(min)
--------------- ---------------
30.000          5.00

--------------------------------------------------------------------------------------------------------
         Name: 25yr24hr
     Filename: P:\2213-1 Tidelands SR-100\Calcs\icpr\25yr24hr.R32

      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: Flmod
    Rainfall Amount(in): 9.00

Time(hrs)       Print Inc(min)
--------------- ---------------
30.000          5.00

--------------------------------------------------------------------------------------------------------
         Name: meanannual
     Filename: P:\2213-1 Tidelands SR-100\Calcs\icpr\meanannual.R32

      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: Flmod
    Rainfall Amount(in): 5.00

Time(hrs)       Print Inc(min)
--------------- ---------------
30.000          5.00

================================================================================
==== Routing Simulations =======================================================
================================================================================

         Name: 100yr24hr           Hydrology Sim: 100yr24hr
     Filename: P:\2213-1 Tidelands SR-100\Calcs\icpr\100yr24hr.I32

      Execute: Yes         Restart: No           Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                    Delta Z Factor: 0.10000
    Time Step Optimizer: 0.000
        Start Time(hrs): 0.000                    End Time(hrs): 24.00
     Min Calc Time(sec): 5.0000              Max Calc Time(sec): 150.0000
        Boundary Stages:                         Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
30.000          5.000

Group           Run
--------------- -----
BASE            Yes


--------------------------------------------------------------------------------------------------------
         Name: 25yr24hr            Hydrology Sim: 25yr24hr
     Filename: P:\2213-1 Tidelands SR-100\Calcs\icpr\25yr24hr.I32

      Execute: Yes         Restart: No           Patch: No
```

Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.10000
Time Step Optimizer: 0.000
Start Time(hrs): 0.000 End Time(hrs): 24.00
Min Calc Time(sec): 5.0000 Max Calc Time(sec): 150.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
30.000	5.000

Group	Run
BASE	Yes

Name: meanannual Hydrology Sim: meanannual
Filename: P:\2213-1 Tidelands SR-100\Calcs\icpr\meanannual.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.10000
Time Step Optimizer: 0.000
Start Time(hrs): 0.000 End Time(hrs): 24.00
Min Calc Time(sec): 5.0000 Max Calc Time(sec): 150.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
30.000	5.000

Group	Run
BASE	Yes

HYDROLOGY

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```
            Basin Name: site
            Group Name: BASE
            Simulation: 100yr24hr
             Node Name: site
            Basin Type: SCS Unit Hydrograph

        Unit Hydrograph: Uh323
          Peaking Fator: 323.0
    Spec Time Inc (min): 1.33
    Comp Time Inc (min): 1.33
         Rainfall File: Flmod
   Rainfall Amount (in): 11.000
   Storm Duration (hrs): 24.00
                 Status: Onsite
     Time of Conc (min): 10.00
       Time Shift (hrs): 0.00
              Area (ac): 14.870
   Vol of Unit Hyd (in): 1.001
          Curve Number: 92.000
              DCIA (%): 0.000

        Time Max (hrs): 12.02
        Flow Max (cfs): 105.16
     Runoff Volume (in): 10.025
    Runoff Volume (ft3): 541154


--------------------------------------------------------------------------------

            Basin Name: site
            Group Name: BASE
            Simulation: 25yr24hr
             Node Name: site
            Basin Type: SCS Unit Hydrograph

        Unit Hydrograph: Uh323
          Peaking Fator: 323.0
    Spec Time Inc (min): 1.33
    Comp Time Inc (min): 1.33
         Rainfall File: Flmod
   Rainfall Amount (in): 9.000
   Storm Duration (hrs): 24.00
                 Status: Onsite
     Time of Conc (min): 10.00
       Time Shift (hrs): 0.00
              Area (ac): 14.870
   Vol of Unit Hyd (in): 1.001
          Curve Number: 92.000
              DCIA (%): 0.000

        Time Max (hrs): 12.02
        Flow Max (cfs): 85.27
     Runoff Volume (in): 8.038
    Runoff Volume (ft3): 433872


--------------------------------------------------------------------------------

            Basin Name: site
            Group Name: BASE
            Simulation: meanannual
             Node Name: site
            Basin Type: SCS Unit Hydrograph

        Unit Hydrograph: Uh323
          Peaking Fator: 323.0
    Spec Time Inc (min): 1.33
    Comp Time Inc (min): 1.33
         Rainfall File: Flmod
   Rainfall Amount (in): 5.000
   Storm Duration (hrs): 24.00
                 Status: Onsite
     Time of Conc (min): 10.00
       Time Shift (hrs): 0.00
              Area (ac): 14.870
   Vol of Unit Hyd (in): 1.001
          Curve Number: 92.000
              DCIA (%): 0.000

        Time Max (hrs): 12.02
        Flow Max (cfs): 45.03
     Runoff Volume (in): 4.091
    Runoff Volume (ft3): 220825
```

OUTPUT

880 Airport Rd. Suite 113
Ormond Beach, FL 32174
CA5479

T. 386-673-7640
www.ae-group.com

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
99	BASE	100yr24hr	0.00	25.94	25.94	0.0000	0	12.49	34.46	0.00	0.00
site	BASE	100yr24hr	12.49	29.24	29.50	0.0942	95717	12.01	103.00	12.49	34.46
99	BASE	25yr24hr	0.00	25.94	25.94	0.0000	0	12.57	24.15	0.00	0.00
site	BASE	25yr24hr	12.57	28.78	29.50	0.0972	90333	12.01	83.33	12.57	24.15
99	BASE	meanannual	0.00	25.94	25.94	0.0000	0	12.94	5.90	0.00	0.00
site	BASE	meanannual	12.94	27.65	29.50	0.0799	84270	12.03	43.65	12.94	5.90

Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
orifice	BASE	100yr24hr	12.49	0.91	0.020	12.49	29.24	12.33	26.32
weir	BASE	100yr24hr	12.49	33.55	1.663	12.49	29.24	0.00	25.94
orifice	BASE	25yr24hr	12.57	0.84	0.023	12.57	28.78	12.36	26.32
weir	BASE	25yr24hr	12.57	23.31	1.272	12.57	28.78	0.00	25.94
orifice	BASE	meanannual	12.94	0.62	0.029	12.94	27.65	12.82	26.31
weir	BASE	meanannual	12.94	5.28	0.457	12.94	27.65	0.00	25.94

SOILS REPORT

880 Airport Rd. Suite 113
Ormond Beach, FL 32174
CA5479

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L E G A C Y
ENGINEERING, INC
Geotechnical & Materials Engineering and Testing

DRAFT REPORT OF GEOTECHNICAL EXPLORATION
PALM COAST VILLAGE
PALM COAST, FLORIDA
LEGACY PROJECT NO. 22-1041.1

Prepared for:

Mr. Ken Atlee
Atlee Development Group
7645 Gate Parkway Suite 202
Jacksonville, Florida 32256

Prepared by:

Legacy Engineering, Inc.
6415 Greenland Road
Jacksonville, Florida 32258
Phone: 904.721.1100
www.legacyengineeringinc.com

April 8, 2022

L E G A C Y
ENGINEERING, INC
Geotechnical & Materials Engineering and Testing

April 8, 2022

Mr. Ken Atlee
Atlee Development Group
7645 Gate Parkway Suite 202
Jacksonville, Florida 32256

Draft Report of Geotechnical Exploration and Engineering Services
Palm Coast Village
Palm Coast, Florida
Legacy Project No. 22-1041.1

Dear Mr. Atlee:

As requested, Legacy Engineering, Inc. has completed a portion of geotechnical exploration for the subject project. The exploration was performed to evaluate the general subsurface conditions within the proposed construction areas, and to provide guidelines to facilitate foundation support, earthwork preparation, and paving design.

Due to site access conditions (soft surficial soils and standing water from recent rainfall), portions of the site were not accessible to our ATV-Skidder type drill rig. We will complete the remaining work with our tracked Marooka drill rig once schedule permits. We have prepared this draft report to present the results of the currently completed work and our preliminary recommendations.

We appreciate this opportunity to be of service as your geotechnical consultant on this phase of the project. If you have any questions, or if we may be of any further service, please contact us.

Sincerely:
Legacy Engineering, Inc.

Isabella Trejo
Geotechnical Specialist

Jared Pitts, P.E.
Licensed, Florida 92090

Table of Contents

1.0 PROJECT INFORMATION

1.1 Site Location and Description

The site for the subject project is located on East Moody Boulevard, approximately 0.4 miles west of Seminole Woods Boulevard, in Palm Coast, Florida. The subject site is densely wooded with pine and oak trees, palmettos, and dense underbrush. Adjacent areas to the east, west, and south are occupied by commercial structures. Wetland areas are scattered throughout the site. At the time of our site visit, portions of the wetland areas were inundated with standing water from previous rainfall.

1.2 Project Description

Project information has been provided to us in discussions with you. We were provided with the following documents that show the layout of the proposed construction, property boundary limits, wetland areas, and topographic information:

- Preliminary Site Plan prepared by Baker Design Build
- Site Plan prepared by Sleiman Enterprises
- Wetland Delineation Map dated May 10, 2016, prepared by Carter Environmental Services, Inc.

Based on the information provided to us, we understand the proposed project will consist of constructing a commercial development at the subject site. The construction will consist of commercial structures, parking and drive areas, and a stormwater pond. We have assumed that the construction will include concrete-masonry-units (CMU), timber framing, or pre-engineered steel framing with exterior steel panels. We have not been provided with detailed foundation loading information; therefore, we have assumed the compressive wall, column, and floor loading will not exceed 4.0 klf, 75.0 kips, and 100 psf, respectively.

Proposed parking and drive areas will likely consist of flexible asphaltic pavement underlain by base course and stabilized subgrade soils. The proposed stormwater pond will be constructed within the southeast portion of the site. We have assumed fill heights for site development will generally not exceed 5 feet above existing grade.

2.0 FIELD EXPLORATION

In order to explore the subsurface conditions within the area of the proposed building areas, 11 Standard Penetration Test (SPT) borings (B1 through B4, B8, B9, B11, and B14 through B17) were performed to a depth of 25 feet each. Within the proposed pavement areas, four auger borings (A3, A4, A5, and A10) were conducted to depths of 3 to 3.5 feet below existing grade. The auger borings were terminated before the scheduled 6-foot exploration depths due to wet subsurface conditions causing the borehole to collapse. The borings were located using a handheld Global Positioning System (GPS) unit, and should be considered accurate to the degree implied by the method utilized. The SPT and auger borings were

conducted in accordance with ASTM D 1586 and ASTM D 1452, respectively. The subsurface conditions encountered at each boring location, and the recorded groundwater levels, are presented on the Generalized Soil Profiles and Test Boring Records in Appendix A.

3.0 LABORATORY TESTING

Soil samples recovered during the field exploration were visually classified in accordance with ASTM D 2488. Additional testing consisting of moisture content and organic content tests were performed to better define the classification of soils encountered and to provide engineering characteristics of the soils. The results of the testing are presented on the Test Boring Records and the Generalized Soil Profiles in Appendix A.

4.0 GENERAL SUBSURFACE CONDITIONS

4.1 General Soil Profile

The boring locations and general subsurface conditions that were encountered are graphically illustrated on the Field Exploration Plan and Generalized Soil Profiles. A relatively detailed description of the encountered subsurface conditions is presented on the Test Boring Records. When reviewing these records, it should be understood the soil conditions may change significantly between the boring locations. The following discussion summarizes the soil conditions encountered.

In general, the borings performed within the area of the proposed structures (B1 through B4, B8, B9, B11, and B14 through B17) encountered very loose to very firm fine sand (SP), fine sand with silt (SP-SM), and fine sand with clay (SP-SC) throughout the 25-foot exploration depths. As an exception, Boring B15 encountered a layer of silty fine sand with many organic materials within the upper 2 feet. Additionally, Borings B2, B9, B16, and B17 encountered layers of silty to very silty fine sand (SM) varying between the depths of 11 and 18.5 feet below existing grade. Topsoil was encountered within the upper 4 to 7 inches.

The auger borings performed within the proposed parking and drive areas (A3, A4, A5, and A10) encountered fine sand (SP) and fine sand with silt (SP-SM) extending to the boring termination depths of 3 to 3.5 feet.

4.2 Groundwater Level

The groundwater level was measured at the boring locations, subsequent to boring completion, at depths varying between the ground surface and 1 foot below existing grade. Based on the results of the soil borings, and review of available published literature, we estimate the seasonal high groundwater level at the groundwater levels measured during this exploration.

5.0 BUILDING AREA RECOMMENDATIONS

5.1 General

The following recommendations are made based upon a review of the attached soil test data, our understanding of the proposed construction, and experience with similar projects and subsurface conditions. If the structural loads, construction locations, or grading information change from those discussed previously, we request the opportunity to review and possibly amend our recommendations with respect to those changes.

Please report to us any conditions encountered during construction that were not observed during the performance of the borings. We will review, and provide additional evaluation as required.

A layer of silty fine sand with many organic materials was encountered at the locations of Boring B15 within the upper 2 feet. A significant portion of this soil type is composed of organic materials which will consolidate under loading information and will therefore result in excessive settlement to the overlying structure. This material should be over-excavated in its entirety from within the building limits.

5.2 Building Foundations

Based on the results of the subsurface exploration, we consider the subsurface conditions at the site favorable for support of the proposed car wash building and pay station when constructed on properly designed shallow foundation systems. Provided the soils are prepared in accordance with the Site Preparation Section of this report, the following parameters may be used for foundation design.

5.2.1 Bearing Pressure

The maximum allowable net soil bearing pressure for shallow foundations should not exceed 3,000 pounds per square foot (psf). Net bearing pressure is defined as the soil bearing pressure at the base of the foundation in excess of the natural overburden pressure. The foundations should be designed based upon the maximum load that could be imposed by all loading conditions.

5.2.2 Foundation Size

The minimum widths recommended for any isolated column footing and continuous wall footings are 24 inches and 18 inches, respectively. Even though the maximum allowable soil bearing pressure may not be achieved, these width recommendations should control the size of the foundations.

5.2.3 Bearing Depth

The exterior foundations should bear at a depth of at least 18 inches below the exterior final grades and the interior footings should bear at a depth of at least 18 inches below the finish

floor elevation to provide confinement to the bearing level soils. We recommend stormwater and surface water be diverted away from the building exteriors, both during and after construction, to reduce the possibility of erosion adjacent to the exterior footings.

5.2.4 Bearing Material

The foundations may bear on either the compacted suitable in-place natural soils or compacted structural fill. The bearing level soils, after compaction, should exhibit densities of at least 95 percent of the maximum dry density as determined by ASTM D 1557 (Modified Proctor), to the depth described subsequently in the Site Preparation section of the report. In addition to compaction, the bearing soils must exhibit stability and be free of "pumping" conditions.

5.2.5 Settlement Estimates

Post-construction settlement of the structure will be influenced by several interrelated factors, such as (1) subsurface stratification and strength/compressibility characteristics of the bearing soils; (2) footing size, bearing level, applied loads, and resulting bearing pressures beneath the foundations; (3) site preparation and earthwork construction techniques used by the contractor, and (4) external factors, including but not limited to vibration from offsite sources and groundwater fluctuations beyond those normally anticipated for the naturally-occurring site and soil conditions which are present.

Our settlement estimates for the structure are based upon the use of successful adherence to the site preparation recommendations presented later in this report. Any deviation from these recommendations could result in an increase in the estimated post-construction settlement of the structure.

Due to the sandy nature of the surficial soils, following the compaction operations, we expect a significant portion of settlement to be elastic in nature. This settlement is expected to occur relatively quickly, upon application of the loads, during and immediately following construction. Using the recommended maximum bearing pressure, the maximum structural loads presented in this report, and the field and laboratory test data which we have correlated to the strength and compressibility characteristics of the subsurface soils, we estimate the total settlements of the structure to be approximately one inch or less.

Differential settlement results from differences in applied bearing pressures and the variations in the compressibility characteristics of the subsurface soils. Based on the subsurface conditions as determined by the borings, it is anticipated that differential settlements will be within tolerable limits.

5.3 Site Preparation for Shallow Foundations

We recommend the following site preparation guidelines for the building areas:

1. Implement temporary groundwater control measures, as required. The groundwater should be maintained at least two feet below the depth of excavation required and two feet below compacted surfaces. Temporary groundwater control measures should be the responsibility of the contractor.

2. Strip the proposed construction limits of all grass, roots, topsoil and other deleterious materials from within, and extending at least 5 feet beyond, the proposed building limits. Expect initial clearing and grubbing to depths of approximately 6 inches.

   Over-excavate soil containing significant amounts of organic materials in its entirety, as encountered at the locations of Boring B15. Unsuitable soils should be over-excavated from within, and extending a horizontal distance of at least 5 feet beyond, the proposed building limits.

3. Proof-roll the building areas. The proof-rolling should be conducted with a fully-loaded tandem-axle dump truck. The truck should be driven back and forth over the subject area, with each wheel path overlapping the previous in order to provide full site coverage. This will help identify any areas where pumping/yielding soils are present. Any areas that exhibit pumping soils should be addressed by the geotechnical engineer to determine the most effective remedy. Methods typically used to remediate pumping soils are undercutting and replacement, moisture conditioning, etc.

4. Compact the exposed surface using a vibratory drum roller having a minimum static, at-drum weight of 7 tons and a drum diameter of at least 5 feet. It is recommended that repeated passes of the roller be made in one direction, followed by repeated passes of the roller in a direction perpendicular to the initial passes. The upper two feet of soils below the exposed surface (after stripping and grubbing) within the building areas should be improved to achieve a minimum compaction requirement of 95% of the Modified Proctor Test (ASTM D 1557). We recommend the soils, at the time of compaction, exhibit moisture contents within 2 percent of the optimum moisture content as determined by the Modified Proctor Test (ASTM D 1557).

   The use of the vibratory mechanism on the roller should be used with caution when compacting the exposed surface and the initial lifts of fill in order to avoid drawing the groundwater to the surface and causing soil instability (pumping) conditions. If vibration is drawing water to the exposed surface, the vibratory mechanism should be turned off and the roller should be operated in static mode.

Should the soils experience pumping and soil strength loss during the compaction operations, compaction work should be immediately terminated and (1) the disturbed soils removed and backfilled with dry structural fill soils which are then compacted, or (2) the excess moisture content within the disturbed soils allowed to dissipate before recompacting.

5. Test the compacted surface for density at a minimum of one test per 5,000 square feet of building area.

6. Place structural fill in loose lifts not exceeding a thickness of 12 inches and compact until finished subgrade is achieved. Structural fill and backfill is typically defined as non-plastic, inorganic, granular soil having less than 10 percent material passing the No. 200 mesh sieve and containing less than 4 percent organic material. Typically, the material should exhibit moisture contents within 2 percent of the Modified Proctor optimum moisture content (ASTM D 1557) during the compaction operations. Compaction should continue until densities of at least 95 percent of the Modified Proctor maximum dry density (ASTM D 1557) have been achieved within each foot of the compacted structural fill.

7. Perform density tests within each lift of fill at a minimum of one test per 5,000 square feet of building area.

8. Excavate, compact and test footing excavations for density to a depth of one foot below bearing level. We recommend that you test one out of every four column footings and perform one test per every 100 linear feet of wall footing. Compaction operations in confined areas, such as footing excavations, can best be performed with a lightweight vibratory sled or other hand-held compaction equipment.

6.0 PAVEMENT RECOMMENDATIONS

6.1 General

We have assumed the subject project will utilize flexible asphaltic pavement underlain by base course and stabilized subgrade soils. In the following sections, we have presented our recommendations to guide pavement design and site preparation.

6.2 Pavement Section Recommendations

Our recommendations for pavement sections are presented below. Detailed traffic loading conditions were not available; therefore, we have provided pavement sections which can accommodate loading conditions typical of the subject construction over a design life of 20 years. The light duty pavement section is based on 500,000 Equivalent Single Axle Loads (ESALs) of 18 kips. The heavy duty pavement section is based on 1,500,000 ESALs. Frequent use of heavy trucks may warrant a stronger pavement section. Legacy

Engineering can provide a detailed pavement design if provided with the anticipated traffic loading.

Pavement Section	Asphalt(1) Thickness (in)	Base Course(2) Thickness (in)	Stabilized(3) Subgrade (in)
Light Duty Asphalt	1.5	6.0	12
Heavy Duty Asphalt	2.0	8.0	12

1) Flexible pavement should consist of SP 9.5 or SP 12.5.
2) Base course should consist of limerock exhibiting an LBR of at least 100, or crushed concrete exhibiting an LBR of at least 130. Limerock and crushed concrete base course materials and gradations should conform to FDOT Standard Specifications for Road and Bridge Construction Sections 911 and 204, respectively.
3) Subgrade should exhibit an LBR of at least 40.

6.3 Site Preparation for Pavements

We recommend the following site preparation guidelines for pavement construction:

1. Implement temporary groundwater control measures, as required. The groundwater should be maintained at least two feet below the depth of excavation required and two feet below compacted surfaces. Temporary groundwater control measures should be the responsibility of the contractor.

2. Strip the proposed construction limits of all grass, roots, topsoil and other deleterious materials from within, and extending at least 3 feet beyond, the proposed pavement limits. Expect initial clearing and grubbing to average depths of approximately 6 inches

3. Compact the exposed surface with a vibratory drum roller until densities of at least 95 percent of the modified Proctor maximum dry density (ASTM D 1557) are achieved within the upper one foot below the exposed surface with the exception that densities of at least 98 percent should be obtained in the upper 12 inches below base course. We recommend the compacted soils exhibit moisture contents within 2 percent of the optimum moisture content as determined by the Modified Proctor Test (ASTM D 1557).

   Should the soils experience pumping and soil strength loss during the compaction operations, compaction work should be immediately terminated and (1) the disturbed soils removed and backfilled with dry structural fill soils which are then compacted, or (2) the excess moisture content within the disturbed soils allowed to dissipate before recompacting.

   Care should be exercised to avoid damaging any nearby structures while the compaction operation is underway. Prior to commencing compaction, occupants of adjacent structures should be notified and the existing conditions of the structures be documented with photographs and survey (if deemed necessary). Compaction should cease if deemed

detrimental to adjacent structures and Legacy Engineering, Inc. should be contacted immediately. It is recommended the vibratory roller remain a minimum of 75 feet from existing structures. Within this zone, use of a vibratory roller operating in the static mode is recommended.

4. Test the compacted surface for density at a frequency of not less than one test per 10,000 square feet of pavement area (minimum three locations).

5. Place structural fill in loose lifts not exceeding 12 inches and compact until finished subgrade is achieved. Structural fill and backfill is typically defined as non-plastic, inorganic, granular soil having less than 10 percent material passing the No. 200 mesh sieve and containing less than 4 percent organic material. Typically, the material should exhibit moisture contents within 2 percent of the Modified Proctor optimum moisture content (ASTM D 1557) during the compaction operations. Compaction should continue until densities of at least 95 percent of the Modified Proctor maximum dry density (ASTM D 1557) have been achieved within each foot of the compacted structural fill, with the exception that densities of at least 98 percent should be obtained in the upper 12 inches below base course.

6. Perform density tests within each lift of fill at a frequency of not less than one test per 10,000 square feet of pavement area (minimum of three locations).

7. Place and compact base course until densities of at least 100 percent of the modified Proctor maximum dry density are achieved. Compaction operations should be conducted with the drum roller noted above.

8. Perform density tests within the base course at a frequency of not less than one test per 10,000 square feet of pavement area (minimum of three locations).

6.4 Additional Pavement Considerations

6.4.1 Asphaltic Concrete Pavement

Asphaltic concrete mixes should be a current FDOT approved design of the materials actually used. Samples of the materials delivered to the project should be tested to verify that the aggregate gradation and asphalt content satisfies the mix design requirements.

After placement and field compaction, core the wearing surface to evaluate material thickness and to perform laboratory densities. Obtain cores at frequencies of at least one core per 3,000 square feet of placed pavement, or a minimum of two cores per day of production.

6.4.2 Groundwater Separation

Groundwater, if not maintained below the base course an adequate distance, can result in weakened subgrade and base course soils, and therefore a greatly reduced pavement life. It is recommended the seasonal high groundwater level be maintained at least 18 inches below limerock base courses and at least 12 inches below crushed concrete base courses. If the recommended vertical separation cannot be achieved with the proposed finished grades, underdrains can be considered to maintain the groundwater level at the recommended depths.

7.0 BORROW SUITABILITY

Although the borings in the pond area have not yet been performed, it could be anticipated that some suitable fill soils will be present due to the conditions at the remainder of the site.

The fine sand (SP), fine sand with silt (SP-SM), and fine sand with clay (SP-SC), as encountered at the borings, are suitable for use as structural fill and backfill material. The fine sand typically exhibits higher permeability than the fine sand with silt and fine sand with clay, and therefore, is more desirable for use in areas requiring substantial drainage potential. Because the fine sand with silt and fine sand with clay soils inherently retain moisture, strict moisture control will be required to avoid soil instability (pumping) during placement and compaction operations.

Density requirements typical of structural soils are very difficult to achieve with silty and clayey fine sand (SM and SC) due to their extreme nature to retain moisture. Therefore, we do not recommend clayey fine sand (SC) and silty fine sand (SM) for use as structural fill materials.

The soils in the proposed pond area that are below the groundwater level will have moisture contents in excess of the Modified Proctor optimum moisture content and will require stockpiling or spreading to bring the moisture content to within 2 percent of the optimum moisture content corresponding to the required degree of compaction.

8.0 LIMITATIONS

We have conducted the geotechnical engineering in accordance with principles and practices normally accepted in the geotechnical engineering profession. Our analysis and recommendations are dependent on the information provided to us. Legacy Engineering, Inc. is not responsible for independent conclusions or interpretations based on the information presented in this report.

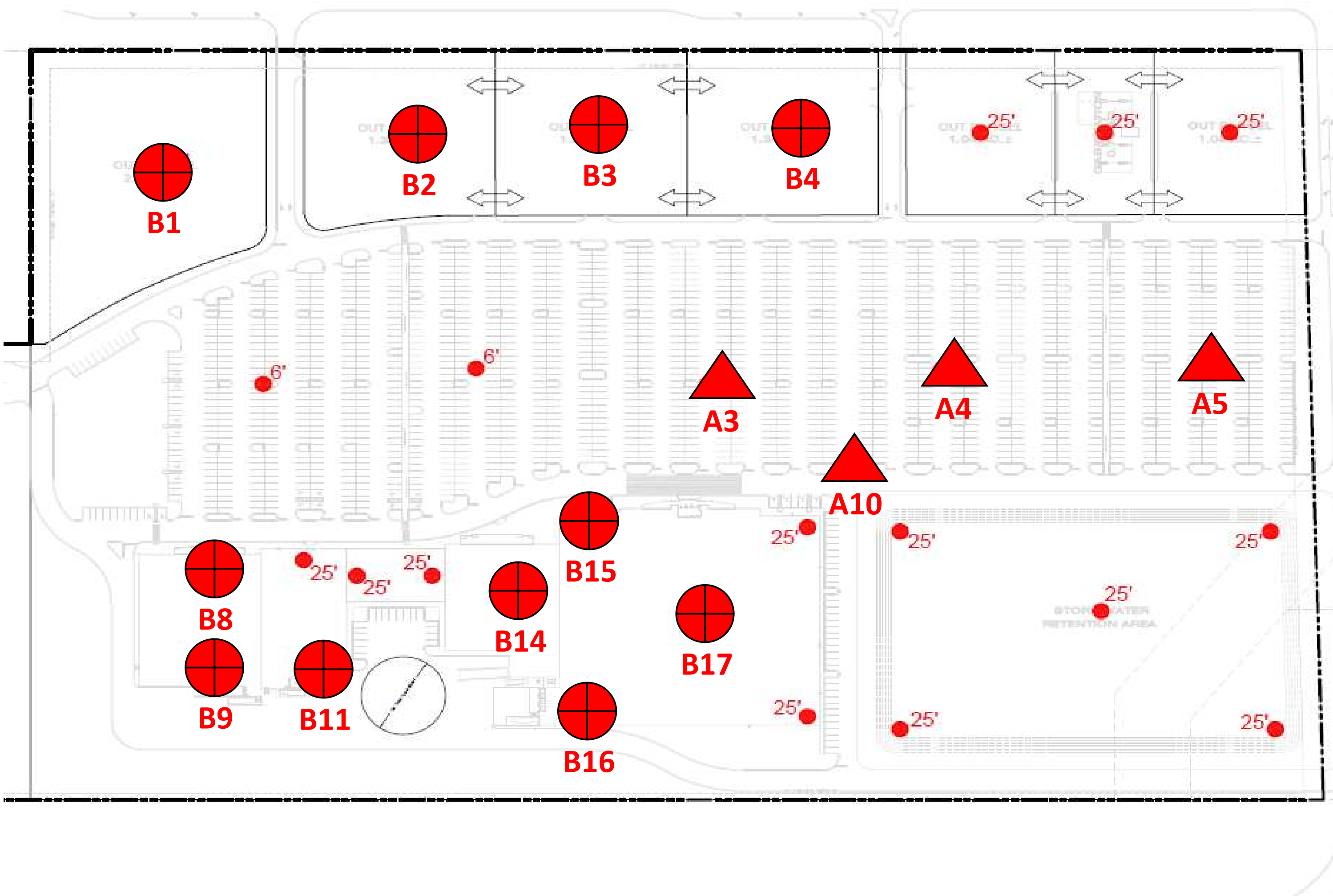
APPENDIX A

FIELD EXPLORATION PLAN

GENERALIZED SOIL PROFILES

TEST BORING RECORDS

SUMMARY OF LABORATORY INDEX TEST DATA



FIELD EXPLORATION PLAN

Approximate Boring Locations

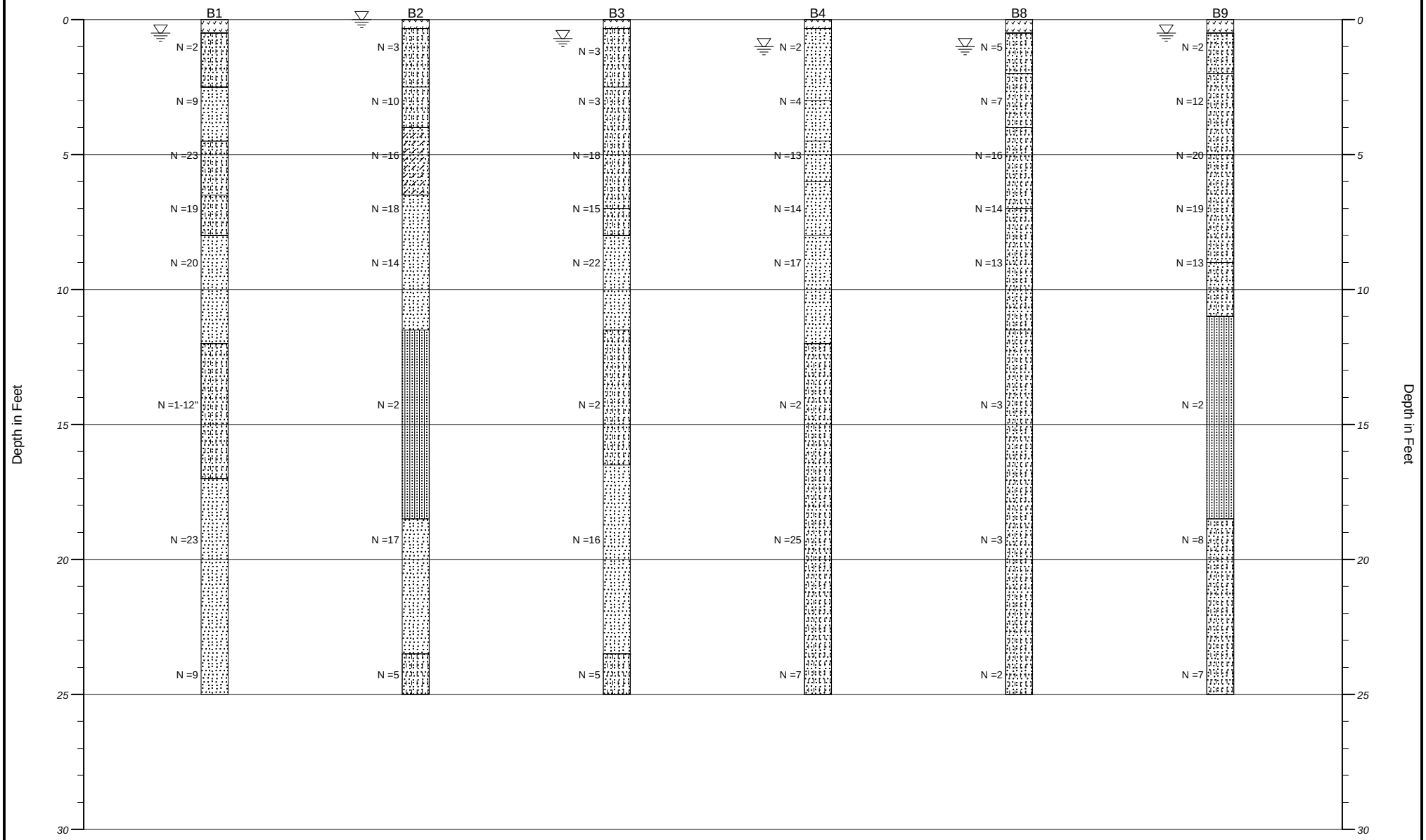
Approximate Auger Locations

Reference

Plan Created Using Provided Plan

Field Exploration Plan **Palm Coast Village** Palm Coast, Florida
L E G A C Y **Engineering, Inc.** *Geotechnical & Materials Engineering & Testing*

Date: 03/31/2022	Proj. No.: 22-1041	Figure 1



Strata symbols

- Topsoil
- Fine SAND with Silt (SP-SM)
- Fine SAND (SP)
- Fine SAND with Clay (SP-SC)
- Silty to Very Silty Fine SAND (SM)

Ground Water Depth

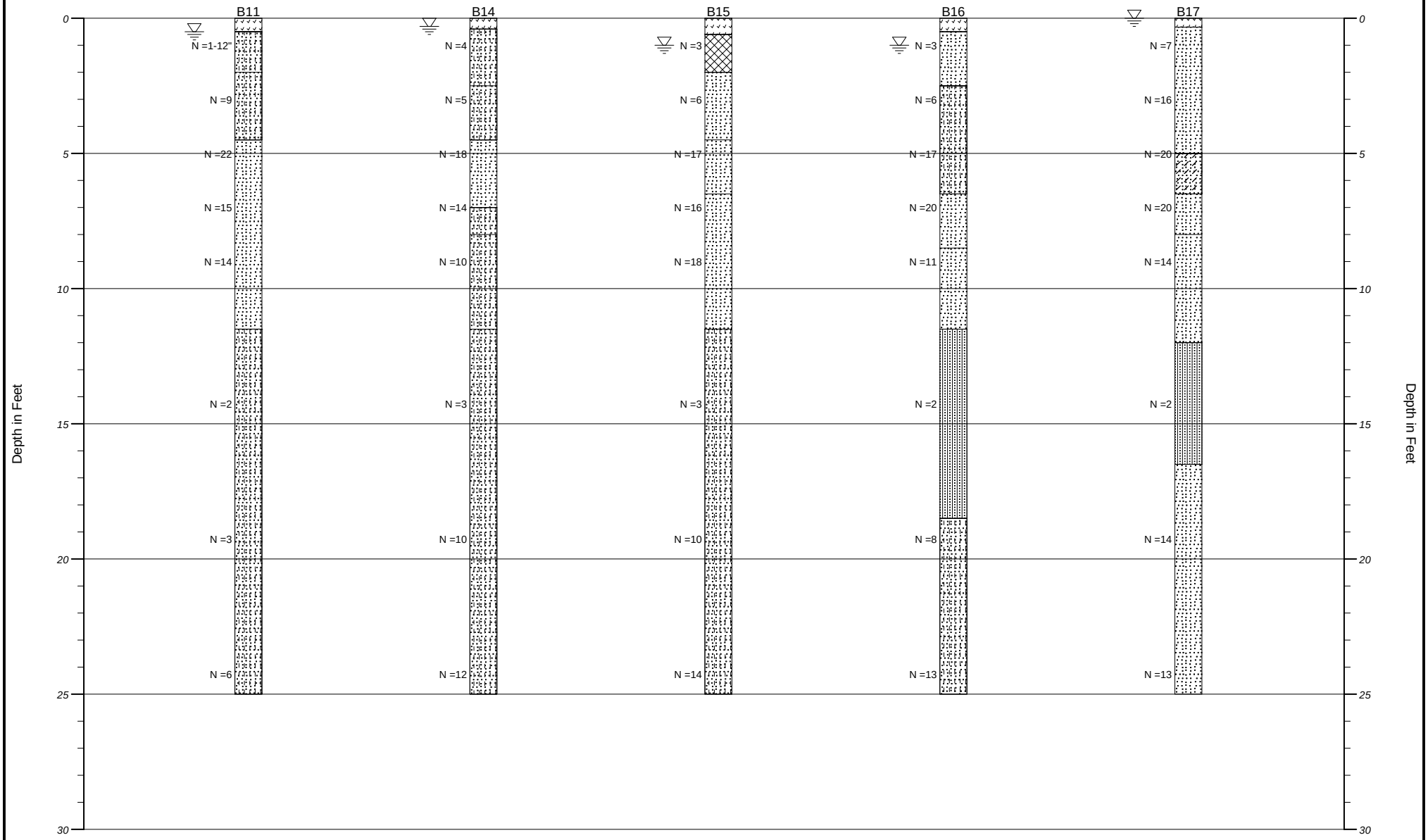
Legacy Engineering, Inc.

GENERALIZED SOIL PROFILE

HORIZONTAL SCALE:	DRAWN BY/APPROVED BY	DATE DRAWN
VERTICAL SCALE: 1"=5'	JEEII/JEEII	4/8/2022

Palm Coast Village
Palm Coast, Florida

PROJECT NO. 22-1041 | FIGURE NUMBER 2



Strata symbols

- Topsoil
- Fine SAND with Silt (SP-SM)
- Fine SAND (SP)
- Fine SAND with Clay (SP-SC)
- Silty to Very Silty Fine SAND (SM)
- Silty Fine SAND with Many Organic Materials (PT)

Ground Water Depth

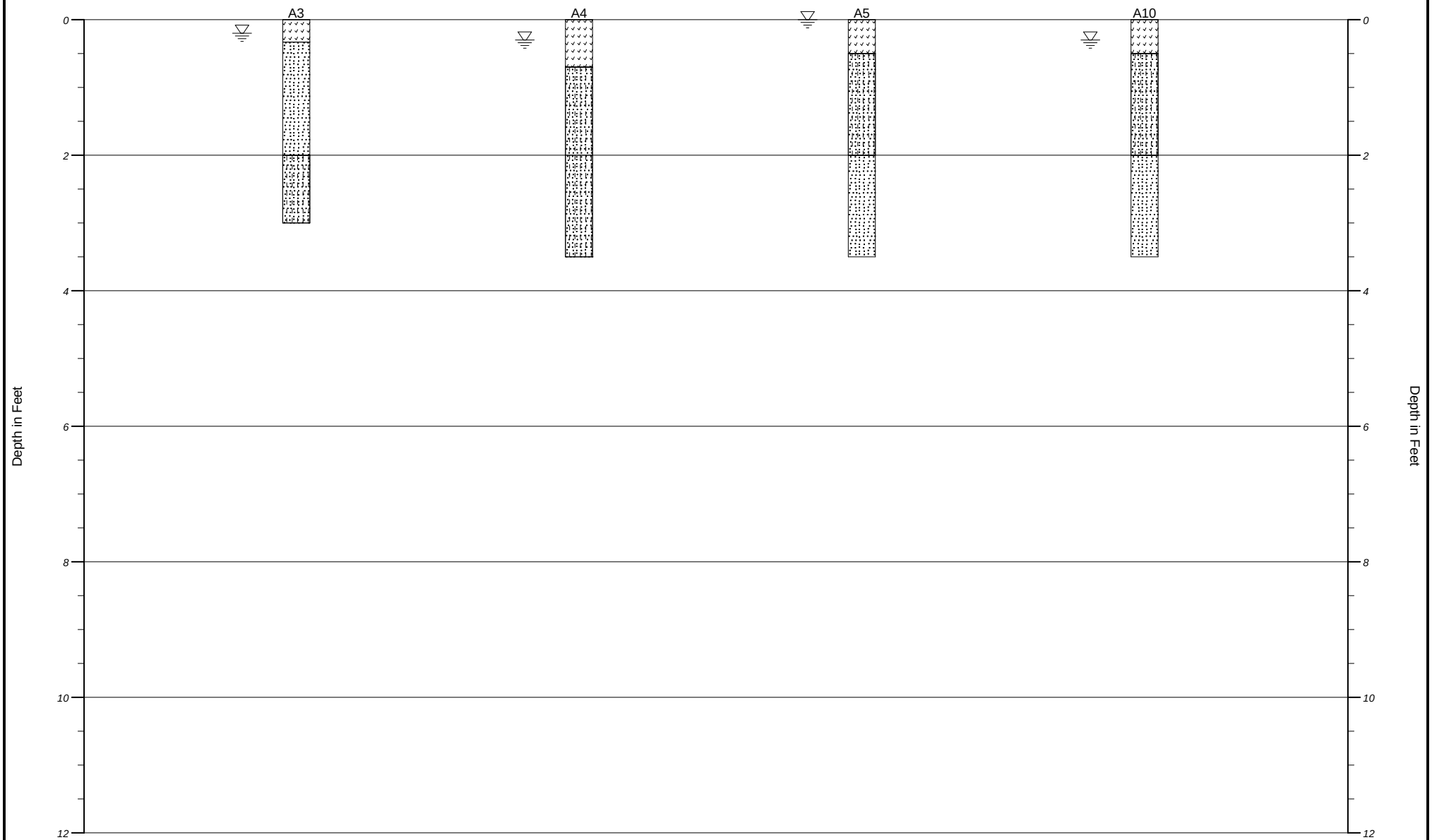
Legacy Engineering, Inc.

GENERALIZED SOIL PROFILE

HORIZONTAL SCALE:	DRAWN BY/APPROVED BY	DATE DRAWN
VERTICAL SCALE: 1"=5'	JEEII/JEEII	4/8/2022

Palm Coast Village
Palm Coast, Florida

PROJECT NO. 22-1041 | FIGURE NUMBER 3



Strata symbols

- Topsoil
- Fine SAND (SP)
- Fine SAND with Silt (SP-SM)

Ground Water Depth

Legacy Engineering, Inc.

GENERALIZED SOIL PROFILE

HORIZONTAL SCALE:	DRAWN BY/APPROVED BY	DATE DRAWN
VERTICAL SCALE: 1"=2'	JEEII/JEEII	4/8/2022

Palm Coast Village
Palm Coast, Florida

PROJECT NO. 22-1041 | FIGURE NUMBER 4

LEGACY
ENGINEERING, INC.
Geotechnical & Materials Engineering and Testing

TEST BORING RECORD

JOB NO. 22-1041
BORING NO. B1
Sheet 1 **of** 2

Project Palm Coast Village
Boring Location See Field Exploration Plan
Ground Elevation N/A **Datum** N/A **Groundwater Depth** 0.5 feet
Length of Casing Set 5 feet **Casing Size** 4 inches

Boring Begun 03/22/2022
Boring Completed 03/22/2022
Driller DK
Engineer Jared Pitts

ELEV. (FT)	DEPTH (FT)	MATERIAL DESCRIPTION	SOIL SYMBOL	SAMPLE NO.	STANDARD PENETRATION TEST: BLOWS / 6-INCH	STANDARD PENETRATION TEST: BLOW COUNT
	0	Topsoil (6 inches)			1	
	1	Very Loose to Loose Brown and Light Brown Mottled Fine SAND with Silt and Trace Roots (SP-SM)		1	1 1 1	2
	2				1 3	
	3	Loose to Very Firm Light Brown Fine SAND (SP)		2	3 6	9
	4				5 4	
	5	Very Firm to Firm Brown Fine SAND with Silt (SP-SM)		3	11 12	23
	6				12 3	
	7	Firm Gray Fine SAND with Silt (SP-SM)		4	8 11	19
	8				12 10	
	9	Firm Gray Brown Fine SAND (SP)		5	9 11	20
	10					
	11					
	12	Very Loose Gray Fine SAND with Silt and Trace Shell Fragments (SP-SM)				
	13					
	14			6	1 1-12"	1-12"
	15					

REMARKS:

BORING & SAMPLING: ASTM D1586/CORE DRILLING: ASTM D2113

Ground Water Table

BLOW COUNT IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

LEGACY
ENGINEERING, INC.
Geotechnical & Materials Engineering and Testing

TEST BORING RECORD

JOB NO. 22-1041

BORING NO. B1

Project Palm Coast Village

Sheet 2 **of** 2

ELEV. (FT)	DEPTH (FT)	MATERIAL DESCRIPTION	SOIL SYMBOL	SAMPLE NO.	STANDARD PENETRATION TEST	
					BLOWS / 6-INCH	BLOW COUNT
	16	Very Loose Gray Fine SAND with Silt and Trace Shell Fragments (SP-SM), Continued				
	17	Very Firm to Loose Gray Fine SAND (SP)				
	18					
	19			7	7 12 11	23
	20					
	21					
	22					
	23					
	24			8	4 5 4	9
	25	Boring Terminated at 25 Feet				
	26					
	27					
	28					
	29					
	30					
	31					

LEGACY
ENGINEERING, INC.

Geotechnical & Materials Engineering and Testing

TEST BORING RECORD

JOB NO. 22-1041

BORING NO. B2

Sheet 1 **of** 2

Project Palm Coast Village

Boring Begun 03/22/2022

Boring Location See Field Exploration Plan

Boring Completed 03/22/2022

Ground Elevation N/A **Datum** N/A **Groundwater Depth** 0 feet (Ground Surface)

Driller DK

Length of Casing Set 5 feet **Casing Size** 4 inches

Engineer Jared Pitts

ELEV. (FT)	DEPTH (FT)	MATERIAL DESCRIPTION	SOIL SYMBOL	SAMPLE NO.	STANDARD PENETRATION TEST: BLOWS / 6-INCH	STANDARD PENETRATION TEST: BLOW COUNT
	0	Topsoil (4 inches)			1	
		Very Loose to Loose Brown Fine SAND with Silt and Trace Roots (SP-SM)		1	1	3
	1				2	
	2				3	
		Loose Brown Fine SAND with Silt (SP-SM)		2	3	10
	3				5	
					5	
	4	Firm Gray Brown Fine SAND with Clay (SP-SC)			4	
					5	
	5			3	7	16
					9	
	6				9	
		Firm Light Gray Brown Fine SAND (SP)			7	
	7			4	9	18
					9	
	8				9	
					7	
	9			5	7	14
					7	
	10					
	11					
		Very Loose Gray Silty Fine SAND with Few Shell Fragments (SM)				
	12					
	13					
	14			6	1	2
					1	
	15				1	

REMARKS:

BORING & SAMPLING: ASTM D1586/CORE DRILLING: ASTM D2113

Ground Water Table

BLOW COUNT IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

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TEST BORING RECORD

JOB NO. 22-1041

BORING NO. B2

Project Palm Coast Village

Sheet 2 **of** 2

ELEV. (FT)	DEPTH (FT)	MATERIAL DESCRIPTION	SOIL SYMBOL	SAMPLE NO.	STANDARD PENETRATION TEST	
					BLOWS / 6-INCH	BLOW COUNT
	16	Very Loose Gray Silty Fine SAND with Few Shell Fragments (SM), Continued				
	17					
	18					
	19	Firm Gray Fine SAND (SP)		7	5 8 9	17
	20					
	21					
	22					
	23					
	24	Loose Gray Fine SAND with Silt (SP-SM)		8	2 3 2	5
	25	Boring Terminated at 25 Feet				
	26					
	27					
	28					
	29					
	30					
	31					

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TEST BORING RECORD

JOB NO. 22-1041
BORING NO. B3
Sheet 1 **of** 2

Project Palm Coast Village
Boring Location See Field Exploration Plan
Ground Elevation N/A **Datum** N/A **Groundwater Depth** 0.7 feet
Length of Casing Set 5 feet **Casing Size** 4 inches

Boring Begun 03/22/2022
Boring Completed 03/22/2022
Driller DK
Engineer Jared Pitts

ELEV. (FT)	DEPTH (FT)	MATERIAL DESCRIPTION	SOIL SYMBOL	SAMPLE NO.	STANDARD PENETRATION TEST BLOWS / 6-INCH	STANDARD PENETRATION TEST BLOW COUNT
	0	Topsoil (4 inches)				
	1	Very Loose Brown Fine SAND with Silt and Trace Roots (SP-SM)		1	1 2 1 1 2	3
	2				2 2 1	
	3	Very Loose to Firm Gray Brown Fine SAND with Silt (SP-SM)		2	2 4 5	3
	4				8 10 10	
	5			3	5 7 8	18
	6				8 6 9	
	7	Firm to Very Firm Gray Fine SAND with Silt (SP-SM)		4	13	15
	8	Very Firm Light Gray Brown Fine SAND (SP)				
	9			5		22
	10					
	11					
	12	Very Loose Gray Fine SAND with Silt (SP-SM)				
	13					
	14			6	1 1 1	2
	15					

REMARKS:

BORING & SAMPLING: ASTM D1586/CORE DRILLING: ASTM D2113

Ground Water Table

BLOW COUNT IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

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Geotechnical & Materials Engineering and Testing

TEST BORING RECORD

JOB NO. 22-1041

BORING NO. B3

Project Palm Coast Village

Sheet 2 **of** 2

ELEV. (FT)	DEPTH (FT)	MATERIAL DESCRIPTION	SOIL SYMBOL	SAMPLE NO.	STANDARD PENETRATION TEST	
					BLOWS / 6-INCH	BLOW COUNT
	16	Very Loose Gray Fine SAND with Silt (SP-SM), Continued				
	17	Firm Gray Fine SAND (SP)				
	18					
	19			7	6 7 9	16
	20					
	21					
	22					
	23					
	24	Loose Gray Fine SAND with Silt (SP-SM)		8	2 2 3	5
	25	Boring Terminated at 25 Feet				
	26					
	27					
	28					
	29					
	30					
	31					

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TEST BORING RECORD

JOB NO. 22-1041
BORING NO. B4
Sheet 1 **of** 2

Project Palm Coast Village
Boring Location See Field Exploration Plan
Ground Elevation N/A **Datum** N/A **Groundwater Depth** 1.0 feet
Length of Casing Set 5 feet **Casing Size** 4 inches

Boring Begun 03/22/2022
Boring Completed 03/22/2022
Driller DK
Engineer Jared Pitts

ELEV. (FT)	DEPTH (FT)	MATERIAL DESCRIPTION	SOIL SYMBOL	SAMPLE NO.	STANDARD PENETRATION TEST: BLOWS / 6-INCH	STANDARD PENETRATION TEST: BLOW COUNT
	0	Topsoil (4 inches)			1	
		Very Loose Light Brown Fine SAND (SP)			1	
	1			1	1	2
					2	
	2				1	
					2	
	3	Very Loose to Firm Gray Brown Fine SAND (SP)		2	2	4
					2	
	4				2	
		Firm Light Gray Brown Fine SAND (SP)			4	
	5			3	9	13
					13	
	6	Firm Light Brown Fine SAND (SP)			8	
					7	
	7			4	7	14
					9	
	8	Firm Light Gray Brown Fine SAND (SP)			6	
					8	
	9			5	9	17
	10					
	11					
	12	Very Loose to Very Firm Gray Fine SAND with Silt (SP-SM)				
	13					
	14				1	
				6	1	2
	15				1	

REMARKS:

BORING & SAMPLING: ASTM D1586/CORE DRILLING: ASTM D2113

Ground Water Table

BLOW COUNT IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

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TEST BORING RECORD

JOB NO. 22-1041

BORING NO. B4

Project Palm Coast Village

Sheet 2 **of** 2

ELEV. (FT)	DEPTH (FT)	MATERIAL DESCRIPTION	SOIL SYMBOL	SAMPLE NO.	STANDARD PENETRATION TEST	
					BLOWS / 6-INCH	BLOW COUNT
	16	Very Loose to Very Firm Gray Fine SAND with Silt (SP-SM), Continued				
	17					
	18					
	19			7	8 12 13	25
	20					
	21					
	22					
	23					
	24			8	2 4 3	7
	25	Boring Terminated at 25 Feet				
	26					
	27					
	28					
	29					
	30					
	31					

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TEST BORING RECORD

JOB NO. 22-1041
BORING NO. B8
Sheet 1 **of** 2

Project Palm Coast Village
Boring Location See Field Exploration Plan
Ground Elevation N/A **Datum** N/A **Groundwater Depth** 1 foot (Estimated)
Length of Casing Set 5 feet **Casing Size** 4 inches

Boring Begun 03/23/2022
Boring Completed 03/23/2022
Driller DK
Engineer Jared Pitts

ELEV. (FT)	DEPTH (FT)	MATERIAL DESCRIPTION	SOIL SYMBOL	SAMPLE NO.	STANDARD PENETRATION TEST: BLOWS / 6-INCH	STANDARD PENETRATION TEST: BLOW COUNT
	0	Topsoil (6 inches)			1	
	1	Loose Light Brown Fine SAND with Silt (SP-SM)		1	2 3 5	5
	2	Loose Light Brown and Dark Gray Brown Mottled Fine SAND with Silt (SP-SM)		2	6 4 3 6	7
	4	Firm Gray Fine SAND with Silt (SP-SM)		3	8 8 8 9	16
	6				6	
	7	Firm Gray Brown Fine SAND with Silt (SP-SM)		4	7 7 5	14
	8				6	
	9			5	6 7	13
	10					
	11					
	12	Very Loose Gray Fine SAND with Silt (SP-SM)				
	13					
	14			6	1 1 2	3
	15					

REMARKS:

BORING & SAMPLING: ASTM D1586/CORE DRILLING: ASTM D2113

Ground Water Table

BLOW COUNT IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

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BORING NO. B8

Project Palm Coast Village

Sheet 2 **of** 2

ELEV. (FT)	DEPTH (FT)	MATERIAL DESCRIPTION	SOIL SYMBOL	SAMPLE NO.	STANDARD PENETRATION TEST	
					BLOWS / 6-INCH	BLOW COUNT
	16	Very Loose Gray Fine SAND with Silt (SP-SM), Continued				
	17					
	18					
	19			7	3 2 1	3
	20					
	21					
	22					
	23					
	24			8	2 1 1	2
	25	Boring Terminated at 25 Feet				
	26					
	27					
	28					
	29					
	30					
	31					

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TEST BORING RECORD

JOB NO. 22-1041

BORING NO. B9

Sheet 1 **of** 2

Project Palm Coast Village

Boring Begun 03/23/2022

Boring Location See Field Exploration Plan

Boring Completed 03/23/2022

Ground Elevation N/A **Datum** N/A **Groundwater Depth** 0.5 feet

Driller DK

Length of Casing Set 5 feet **Casing Size** 4 inches

Engineer Jared Pitts

ELEV. (FT)	DEPTH (FT)	MATERIAL DESCRIPTION	SOIL SYMBOL	SAMPLE NO.	STANDARD PENETRATION TEST: BLOWS / 6-INCH	STANDARD PENETRATION TEST: BLOW COUNT
	0	Topsoil (6 inches)			1	
	1	Very Loose Dark Brown Fine SAND with Silt and Trace Organic Materials (SP-SM)		1	1 1 1	2
	2	Firm Light Brown Fine SAND with Silt (SP-SM)		2	3 5 7	12
	4				8 7 8	
	5	Firm Gray Fine SAND with Silt (SP-SM)		3	12 10	20
	6				6 9	
	7			4	10 7	19
	8				7 7	
	9	Firm Gray Brown Fine SAND with Silt (SP-SM)		5	6	13
	10					
	11	Very Loose Dark Gray Very Silty Fine SAND (SM)				
	12					
	13					
	14			6	2 1 1	2
	15					

REMARKS:

BORING & SAMPLING: ASTM D1586/CORE DRILLING: ASTM D2113

Ground Water Table

BLOW COUNT IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

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TEST BORING RECORD

JOB NO. 22-1041

BORING NO. B9

Project Palm Coast Village

Sheet 2 **of** 2

ELEV. (FT)	DEPTH (FT)	MATERIAL DESCRIPTION	SOIL SYMBOL	SAMPLE NO.	STANDARD PENETRATION TEST	
					BLOWS / 6-INCH	BLOW COUNT
	16	Very Loose Dark Gray Very Silty Fine SAND (SM), Continued				
	17					
	18					
	19	Loose Gray Fine SAND with Silt (SP-SM)		7	4 4 4	8
	20					
	21					
	22					
	23					
	24			8	3 4 3	7
	25	Boring Terminated at 25 Feet				
	26					
	27					
	28					
	29					
	30					
	31					

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TEST BORING RECORD

JOB NO. 22-1041
BORING NO. B11
Sheet 1 **of** 2

Project Palm Coast Village
Boring Location See Field Exploration Plan
Ground Elevation N/A **Datum** N/A **Groundwater Depth** 0.5 feet
Length of Casing Set 5 feet **Casing Size** 4 inches

Boring Begun 03/23/2022
Boring Completed 03/23/2022
Driller DK
Engineer Jared Pitts

ELEV. (FT)	DEPTH (FT)	MATERIAL DESCRIPTION	SOIL SYMBOL	SAMPLE NO.	STANDARD PENETRATION TEST BLOWS / 6-INCH	STANDARD PENETRATION TEST BLOW COUNT
	0	Topsoil (6 inches)			1-12"	
	1	Very Loose Light Brown Fine SAND with Silt and Trace Roots (SP-SM)		1	1 2	1-12"
	2	Loose to Very Firm Light Brown Fine SAND with Silt and Trace Shell Fragments (SP-SM)		2	4 4 5 7	9
	4				4	
	5	Very Firm to Firm Light Gray Fine SAND (SP)		3	10 12 13	22
	6				6	
	7			4	7 8	15
	8				6 8	
	9			5	8 6	14
	10					
	11					
	12	Very Loose to Loose Gray Fine SAND with Silt (SP-SM)				
	13					
	14			6	1 1	2
	15				1	

REMARKS:

BORING & SAMPLING: ASTM D1586/CORE DRILLING: ASTM D2113

Ground Water Table

BLOW COUNT IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

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Geotechnical & Materials Engineering and Testing

TEST BORING RECORD

JOB NO. 22-1041

BORING NO. B11

Project Palm Coast Village

Sheet 2 **of** 2

ELEV. (FT)	DEPTH (FT)	MATERIAL DESCRIPTION	SOIL SYMBOL	SAMPLE NO.	STANDARD PENETRATION TEST	
					BLOWS / 6-INCH	BLOW COUNT
	16	Very Loose to Loose Gray Fine SAND with Silt (SP-SM), Continued				
	17					
	18					
	19			7	3 2 1	3
	20					
	21					
	22					
	23					
	24			8	4 3 3	6
	25	Boring Terminated at 25 Feet				
	26					
	27					
	28					
	29					
	30					
	31					

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Geotechnical & Materials Engineering and Testing

TEST BORING RECORD

JOB NO. 22-1041
BORING NO. B14
Sheet 1 **of** 2

Project Palm Coast Village
Boring Location See Field Exploration Plan
Ground Elevation N/A **Datum** N/A **Groundwater Depth** 0.3 feet
Length of Casing Set 5 feet **Casing Size** 4 inches

Boring Begun 03/23/2022
Boring Completed 03/23/2022
Driller DK
Engineer Jared Pitts

ELEV. (FT)	DEPTH (FT)	MATERIAL DESCRIPTION	SOIL SYMBOL	SAMPLE NO.	STANDARD PENETRATION TEST BLOWS / 6-INCH	STANDARD PENETRATION TEST BLOW COUNT
	0	Topsoil (5 inches)			2	
	1	Very Loose to Loose Gray and Dark Brown Silty Fine SAND with Some Organic Materials and Trace Roots		1	1 3	4
	2	Moisture Content = 40.1% Organic Content = 4.7%			2 2	
	3	Loose to Firm Gray Brown Fine SAND with Silt and Trace Roots (SP-SM)		2	2 3	5
	4				3 5	
	5	Firm Light Gray Brown Fine SAND (SP)		3	8 10	18
	6				11 7	
	7	Firm Gray Fine SAND with Silt (SP-SM)		4	7 7	14
	8	Loose Gray Brown Fine SAND with Silt (SP-SM)			5 5	
	9			5	5 5	10
	10					
	11					
	12	Very Loose to Firm Gray Fine SAND with Silt (SP-SM)				
	13					
	14			6	2 2	3
	15				1	

REMARKS:

BORING & SAMPLING: ASTM D1586/CORE DRILLING: ASTM D2113

Ground Water Table

BLOW COUNT IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

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BORING NO. B14

Project Palm Coast Village

Sheet 2 **of** 2

ELEV. (FT)	DEPTH (FT)	MATERIAL DESCRIPTION	SOIL SYMBOL	SAMPLE NO.	STANDARD PENETRATION TEST	
					BLOWS / 6-INCH	BLOW COUNT
	16	Very Loose to Firm Gray Fine SAND with Silt (SP-SM), Continued				
	17					
	18					
	19			7	4 5 5	10
	20					
	21					
	22					
	23					
	24			8	6 6 6	12
	25	Boring Terminated at 25 Feet				
	26					
	27					
	28					
	29					
	30					
	31					

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TEST BORING RECORD

JOB NO. 22-1041

BORING NO. B15

Sheet 1 **of** 2

Project Palm Coast Village

Boring Begun 03/23/2022

Boring Location See Field Exploration Plan

Boring Completed 03/23/2022

Ground Elevation N/A **Datum** N/A **Groundwater Depth** 1.0 feet

Driller DK

Length of Casing Set 5 feet **Casing Size** 4 inches

Engineer Jared Pitts

ELEV. (FT)	DEPTH (FT)	MATERIAL DESCRIPTION	SOIL SYMBOL	SAMPLE NO.	STANDARD PENETRATION TEST: BLOWS / 6-INCH	STANDARD PENETRATION TEST: BLOW COUNT
	0	Topsoil (7 inches)			1	
	1	Very Loose Dark Brown Silty Fine SAND with Many Organic Materials and Trace Roots ▼		1	1 2	3
	2	Moisture Content = 40.9% Organic Content = 9.0%			2	
	3	Loose to Firm Light Brown Fine SAND (SP)		2	2 3 3	6
	4				3 2	
	5	Firm Gray Brown Fine SAND (SP)		3	5 12	17
	6				14 9	
	7	Firm Light Gray Brown Fine SAND (SP)		4	9 7	16
	8				7 7	
	9			5	9 9	18
	10					
	11					
	12	Very Loose to Firm Gray Fine SAND with Silt (SP-SM)				
	13					
	14			6	1 2	3
	15				1	

REMARKS:

BORING & SAMPLING: ASTM D1586/CORE DRILLING: ASTM D2113

▼ **Ground Water Table**

BLOW COUNT IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

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BORING NO. B15

Project Palm Coast Village

Sheet 2 **of** 2

ELEV. (FT)	DEPTH (FT)	MATERIAL DESCRIPTION	SOIL SYMBOL	SAMPLE NO.	STANDARD PENETRATION TEST	
					BLOWS / 6-INCH	BLOW COUNT
	16	Very Loose to Firm Gray Fine SAND with Silt (SP-SM), Continued				
	17					
	18					
	19			7	3 4 6	10
	20					
	21					
	22					
	23					
	24			8	6 6 8	14
	25	Boring Terminated at 25 Feet				
	26					
	27					
	28					
	29					
	30					
	31					

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TEST BORING RECORD

JOB NO. 22-1041

BORING NO. B16

Sheet 1 **of** 2

Project Palm Coast Village

Boring Begun 03/23/2022

Boring Location See Field Exploration Plan

Boring Completed 03/23/2022

Ground Elevation N/A **Datum** N/A **Groundwater Depth** 1.0 feet

Driller DK

Length of Casing Set 5 feet **Casing Size** 4 inches

Engineer Jared Pitts

ELEV. (FT)	DEPTH (FT)	MATERIAL DESCRIPTION	SOIL SYMBOL	SAMPLE NO.	STANDARD PENETRATION TEST BLOWS / 6-INCH	STANDARD PENETRATION TEST BLOW COUNT
	0	Topsoil (6 inches)			1	
		Very Loose to Loose Gray Fine SAND (SP)			2	
	1			1	1	3
					2	
	2				2	
		Loose to Firm Brown Fine SAND with Silt (SP-SM)			2	
	3			2	4	6
					4	
	4				5	
					8	
	5	Firm Light Brown Fine SAND with Silt and Trace Clay (SP-SM)		3	9	17
					13	
	6				10	
		Firm Light Brown and Brown Mottled Fine SAND (SP)			10	
	7			4	10	20
					9	
	8				6	
		Firm Light Gray Brown Fine SAND (SP)			5	
	9			5	6	11
	10					
	11					
		Very Loose Gray Silty Fine SAND (SM)				
	12					
	13					
					2	
	14			6	1	2
					1	
	15					

REMARKS:

BORING & SAMPLING: ASTM D1586/CORE DRILLING: ASTM D2113

Ground Water Table

BLOW COUNT IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

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Geotechnical & Materials Engineering and Testing

TEST BORING RECORD

JOB NO. 22-1041

BORING NO. B16

Project Palm Coast Village

Sheet 2 **of** 2

ELEV. (FT)	DEPTH (FT)	MATERIAL DESCRIPTION	SOIL SYMBOL	SAMPLE NO.	STANDARD PENETRATION TEST BLOWS / 6-INCH	STANDARD PENETRATION TEST BLOW COUNT
	16	Very Loose Gray Silty Fine SAND (SM), Continued				
	17					
	18					
	19	Loose to Firm Gray Fine SAND with Silt (SP-SM)		7	1 3 5	8
	20					
	21					
	22					
	23					
	24			8	7 6 7	13
	25	Boring Terminated at 25 Feet				
	26					
	27					
	28					
	29					
	30					
	31					

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TEST BORING RECORD

JOB NO. 22-1041

BORING NO. B17

Sheet 1 **of** 2

Project Palm Coast Village

Boring Begun 03/23/2022

Boring Location See Field Exploration Plan

Boring Completed 03/23/2022

Ground Elevation N/A **Datum** N/A **Groundwater Depth** 0 feet (Ground Surface)

Driller DK

Length of Casing Set 5 feet **Casing Size** 4 inches

Engineer Jared Pitts

ELEV. (FT)	DEPTH (FT)	MATERIAL DESCRIPTION	SOIL SYMBOL	SAMPLE NO.	STANDARD PENETRATION TEST BLOWS / 6-INCH	STANDARD PENETRATION TEST BLOW COUNT
	0	Topsoil (4 inches)				
	1	Loose to Firm Gray Brown Fine SAND (SP)		1	1 2 5	7
	2				5 5	
	3			2	7 9	16
	4				12 7	
	5	Firm Gray Fine SAND with Clay (SP-SC)		3	9 11	20
	6				10 8	
	7	Firm Gray Brown Fine SAND (SP)		4	9 11	20
	8				10 5	
	9	Firm Light Gray Brown Fine SAND (SP)		5	8 6	14
	10					
	11					
	12	Very Loose Dark Gray and Brown Silty Fine SAND with Some Organic Materials (SM) Moisture Content = 47.3% Organic Content = 7.6%				
	13					
	14			6	1 1	2
	15				1	

REMARKS:

BORING & SAMPLING: ASTM D1586/CORE DRILLING: ASTM D2113

Ground Water Table

BLOW COUNT IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

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TEST BORING RECORD

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BORING NO. B17

Project Palm Coast Village

Sheet 2 **of** 2

ELEV. (FT)	DEPTH (FT)	MATERIAL DESCRIPTION	SOIL SYMBOL	SAMPLE NO.	STANDARD PENETRATION TEST	
					BLOWS / 6-INCH	BLOW COUNT
	16	Very Loose Dark Gray and Brown Silty Fine SAND with Few Organic Materials (SM), Continued				
	17	Firm Gray Fine SAND (SP)				
	18					
	19			7	5 8 6	14
	20					
	21					
	22					
	23					
	24			8	5 6 7	13
	25	Boring Terminated at 25 Feet				
	26					
	27					
	28					
	29					
	30					
	31					

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Geotechnical & Materials Engineering and Testing

TEST BORING RECORD

JOB NO. 22-1041

BORING NO. A3

Sheet 1 **of** 1

Project Palm Coast Village

Boring Begun 02/14/2022

Boring Location See Field Exploration Plan

Boring Completed 02/14/2022

Ground Elevation N/A **Datum** N/A **Groundwater Depth** 0.2 feet

Driller DK

Length of Casing Set N/A **Casing Size** N/A

Engineer Jared Pitts

ELEV. (FT)	DEPTH (FT)	MATERIAL DESCRIPTION	SOIL SYMBOL	SAMPLE NO.	STANDARD PENETRATION TEST: BLOWS / 6-INCH	STANDARD PENETRATION TEST: BLOW COUNT
	0	Topsoil (4 inches)				
	1	Light Brown Fine SAND (SP)		1		
	2	Gray Brown Fine SAND with Silt (SP-SM)		2		
	3	Boring Terminated at 3 Feet Due to Borehole Collapse				
	4					
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					
	13					
	14					
	15					

REMARKS:

BORING & SAMPLING: ASTM D1586/CORE DRILLING: ASTM D2113

Ground Water Table

BLOW COUNT IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

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TEST BORING RECORD

JOB NO. 22-1041

BORING NO. A4

Sheet 1 **of** 1

Project Palm Coast Village

Boring Begun 02/14/2022

Boring Location See Field Exploration Plan

Boring Completed 02/14/2022

Ground Elevation N/A **Datum** N/A **Groundwater Depth** 0.3 feet

Driller DK

Length of Casing Set N/A **Casing Size** N/A

Engineer Jared Pitts

ELEV. (FT)	DEPTH (FT)	MATERIAL DESCRIPTION	SOIL SYMBOL	SAMPLE NO.	STANDARD PENETRATION TEST: BLOWS / 6-INCH	STANDARD PENETRATION TEST: BLOW COUNT
	0	Topsoil (8 inches)				
	1	Light Brown Fine SAND with Silt and Trace Roots (SP-SM)		1		
	2	Light Brown Fine SAND with Silt (SP-SM)				
	3			2		
	4	Boring Terminated at 3.5 Feet Due to Borehole Collapse				
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					
	13					
	14					
	15					

REMARKS:

BORING & SAMPLING: ASTM D1586/CORE DRILLING: ASTM D2113

Ground Water Table

BLOW COUNT IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

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TEST BORING RECORD

JOB NO. 22-1041

BORING NO. A5

Sheet 1 **of** 1

Project Palm Coast Village

Boring Begun 02/14/2022

Boring Location See Field Exploration Plan

Boring Completed 02/14/2022

Ground Elevation N/A **Datum** N/A **Groundwater Depth** 0 feet (Ground Surface)

Driller DK

Length of Casing Set N/A **Casing Size** N/A

Engineer Jared Pitts

ELEV. (FT)	DEPTH (FT)	MATERIAL DESCRIPTION	SOIL SYMBOL	SAMPLE NO.	STANDARD PENETRATION TEST: BLOWS / 6-INCH	STANDARD PENETRATION TEST: BLOW COUNT
	0	Topsoil (6 inches)				
	1	Gray Brown Fine SAND with Silt (SP-SM)		1		
	2	Light Gray Brown Fine SAND (SP)		2		
	3					
	4	Boring Terminated at 3.5 Feet Due to Borehole Collapse				
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					
	13					
	14					
	15					

REMARKS:

BORING & SAMPLING: ASTM D1586/CORE DRILLING: ASTM D2113

Ground Water Table

BLOW COUNT IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

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TEST BORING RECORD

JOB NO. 22-1041

BORING NO. A10

Sheet 1 **of** 1

Project Palm Coast Village

Boring Location See Field Exploration Plan

Ground Elevation N/A **Datum** N/A **Groundwater Depth** 0.3 feet

Length of Casing Set N/A **Casing Size** N/A

Boring Begun 02/14/2022

Boring Completed 02/14/2022

Driller DK

Engineer Jared Pitts

ELEV. (FT)	DEPTH (FT)	MATERIAL DESCRIPTION	SOIL SYMBOL	SAMPLE NO.	STANDARD PENETRATION TEST: BLOWS / 6-INCH	STANDARD PENETRATION TEST: BLOW COUNT
	0	Topsoil (6 inches)				
	1	Dark Gray Brown Fine SAND with Silt (SP-SM)		1		
	2	Light Brown Fine SAND (SP)		2		
	3					
	4	Boring Terminated at 3.5 Feet Due to Borehole Collapse				
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					
	13					
	14					
	15					

REMARKS:

BORING & SAMPLING: ASTM D1586/CORE DRILLING: ASTM D2113

Ground Water Table

BLOW COUNT IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

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JACKSONVILLE, FL 32258

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SUMMARY OF LABORATORY INDEX TEST RESULTS

Palm Coast Village
Palm Coast, Florida
Legacy Engineering Project No. 22-1041.1

Boring No.	Sample No.	Depth Range, Feet		Percent Passing U.S. Standard Sieve[1]							Liquid Limit[2]	Plastic Limit[2]	Plasticity Index	Moisture Content[3]	Organic Content[4]	Unified Soil Classification
		From	To	#4	#10	#20	#40	#60	#100	#200						
B14	1	0.4	2											40.1%	4.7%	SP-SM
B15	1	0.6	2											40.9%	9.0%	-
B17	6	13.5	15											47.3%	7.6%	SM

Notes: 1. Grain size distribution testing performed in accordance with ASTM D422. Fines content testing performed in accordance with ASTM D1140
2. Performed in accordance with ASTM D4318
3. Performed in accordance with ASTM D2216
4. Performed in accordance with ASTM D2974

APPENDIX B

KEY TO SOIL CLASSIFICATION

FIELD AND LABORATORY TEST PROCEDURES

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KEY TO SOIL CLASSIFICATION

CORRELATION OF PENETRATION WITH RELATIVE DENSITY & CONSISTENCY

SANDS AND GRAVEL	
BLOW COUNT	RELATIVE DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-20	FIRM
21-30	VERY FIRM
31-50	DENSE
OVER 50	VERY DENSE

SILTS AND CLAYS	
BLOW COUNT	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	FIRM
9-15	STIFF
16-30	VERY STIFF
31-50	HARD
OVER 50	VERY HARD

PARTICLE SIZE IDENTIFICATION (UNIFIED CLASSIFICATION SYSTEM)

CATEGORY	*DIMENSIONS*
Boulders	Diameter exceeds 12 inches
Cobbles	3 to 12 inches
Gravel	Coarse – 0.75 to 3 inches in diameter Fine – 4.76 mm to 0.75 inch diameter
Sand	Coarse – 2.0 mm to 4.76 mm diameter Medium – 0.42 mm to 2.0 mm diameter Fine – 0.074 mm to 0.42 mm diameter
Silt and Clay	Less than 0.074 mm (invisible to the naked eye)

MODIFIERS

These modifiers provide our estimate of the amount of minor constituent (sand, silt, or clay size particles) in the soil sample

PERCENTAGE OF MINOR CONSTITUENT	*MODIFIERS*
0% to 5%	No Modifier
5 % to 12 %	With Silt, With Clay
12% to 30%	Silty, Clayey, Sandy
30% to 50%	Very Silty, Very Clayey, Very Sandy

APPROXIMATE CONTENT OF OTHER COMPONENTS (SHELL, GRAVEL, ETC.)	*MODIFIERS*	*APPROXIMATE CONTENT OF ORGANIC COMPONENTS*
0% to 5%	TRACE	1 to 2%
5% to 12%	FEW	2% to 4%
12% to 30%	SOME	4% to 8%
30% to 50%	MANY	>8%

FIELD AND LABORATORY TEST PROCEDURES

Penetration Borings

The penetration borings were made in general accordance with ASTM D 1586-67, "Penetration Test and Split-Barrel Sampling of Soils". Each boring was advanced to the water table by augering and, after encountering the groundwater table, further advanced with a rotary drilling technique that uses a circulating bentonite fluid for borehole flushing and stability. At two-foot intervals within the upper 10 feet and at five-foot intervals thereafter, the drilling tools were removed from the borehole and a split-barrel sampler inserted to the borehole bottom. The sampler was then driven 18 inches into the material using a 140-pound SPT hammer falling, on the average, 30 inches per hammer blow. The number of hammer blows for the final 12 inches of penetration is termed the "penetration resistance, blow count, or N-value". This value is an index to several in-place geotechnical properties of the material tested, such as relative density and Young's Modulus.

After driving the sampler 18 inches (or less, if in hard rock or rock-like material) at each test interval, the sampler was retrieved from the borehole and a representative sample of the material within the split-barrel was placed in a watertight container and sealed. After completing the drilling operations, the samples for each boring were transported to our laboratory where our Geotechnical Engineer examined them in order to verify the driller's field classifications. The samples will be kept in our laboratory for a period of two months after submittal of formal written report, unless otherwise directed by the Client.

Auger Borings

The auger borings were performed using a continuous flight auger attached to a rotary drill rig or manually using a post-hole auger; and thus in general accordance with ASTM D 1452-80, "Soil Investigation and Sampling by Auger Borings". Representative samples of the soils brought to the ground surface by the augering process were placed in watertight containers and sealed. After completing the drilling operations, the samples for each boring were transported to the laboratory where the Geotechnical Engineer examined them in order to verify the driller's field classifications. The samples will be kept in our laboratory for a period of two months after submittal of formal written report, unless otherwise directed by the Client.

Soil Classification

Soil samples obtained from the performance of the borings were transported to our laboratory for observation and review. An engineer, registered in the State of Florida and familiar with local geological conditions, conducted the review and classified the soils in accordance with ASTM 2488. The results of the soil classification are presented on the boring records.

Moisture Content

The moisture content of the sample tested was determined in general accordance with ASTM D 2216. The moisture content is the actual moisture content of the sample as sampled in the field during the performance of the soil boring.

Organics Content

The organics content of the sample tested was determined in general accordance with ASTM D 2974. The organics content is the percent of loss of material of an oven-dried sample of material after the sample has been heated in a muffle furnace to 440 ºC.