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June 23, 2021

Mr. Brian Wood, P.E.  
Baldwin County  
1601 North Columbia Street  
Milledgeville, GA 31061

RE: Shallow Subsurface Investigation  
Full Depth Pavement Reclamation Recommendations  
Daisy Trail  
Baldwin County, GA  
PGC #2021023

Dear Brian:

Preston Geotechnical Consultants, LLC (PGC) is pleased to submit the following shallow subsurface investigation report. We completed the field portion of this shallow subsurface investigation on June 7, 2021. The following is a report of our findings.

**1. PURPOSE OF SUBSURFACE INVESTIGATION:**

The County intends to contract for Full Depth Pavement Reclamation of the 0.25 mile Daisy Trail in Baldwin County, Georgia. In an effort to aid in the bid process and provide

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contractors with information on existing subgrade materials and potential cement/spread rates, the County contracted with PGC to perform this investigation.

## **2. METHOD OF BORING AND SAMPLING:**

A truck mounted drill, mechanically turning a 5 5/8 -inch, hollow stem auger was used to advance four shallow bore holes at locations as shown on the enclosed bore hole location sketch. In addition to the location sketches, a boring log of each hole is attached.

Borings B-1 through B-4 were sampled in substantial accordance with "Penetration Test and Split Barrel Sampling of Soils", ASTM D 1586, current edition. The penetration recorded indicates the number of blows required to effect a 12-inch penetration into the undisturbed soil stratum, using a pin guided, 140 pound drive hammer falling 30 inches per blow, driving a split barrel sampler having a 2-inch outside diameter. The depth to the beginning of the test is shown on the boring log. Each penetration test extends 18 inches below the indicated beginning depth. The final 12-inch penetration is reported as the blows per foot or the standard penetration.

The use of the standard penetration test (SPT) along with laboratory tests of the soil removed from the sampler enables us to make an assessment of the ability of the soil to support foundations.

The borings were backfilled immediately after completion of drilling of each borehole after a final check for the presence and depth of subsurface water was made.

Soil samples obtained from the project site are the property of the client. Unless other arrangements are agreed upon in writing, Preston Geotechnical Consultants, LLC will hold such samples for no more than 180 calendar days from the date Preston Geotechnical Consultants, LLC issued the first document that includes the data obtained from these samples. After that date, Preston will dispose of samples that are not contaminated by hazardous substances.

### **3. GENERAL FINDINGS:**

The site is located in the Washington Slope District of the Piedmont Province in Baldwin County, Georgia. More specifically, Daisy Trail is a  $\frac{1}{4}$  mile rural road on the north end of Baldwin County near Lake Sinclair. Daisy Trail extends westward from Forte Drive NW to a dead end. The existing rural road is bordered on both sides by a combination of woods and residential areas.

Borings were located at scattered locations throughout the length of roadway to be improved. These borings revealed a surface layer of asphalt varying from  $\frac{1}{2}$  to  $2\frac{1}{2}$  inches. The asphalt was underlain by red, red/brown to red/tan loose to medium density silty sands and stiff sandy micaceous silts extending through the 5 feet depth of the borings. At boring

B-3, we found the top 2 ½ feet to be silty sandy fills of similar density. No subsurface water was encountered at the time of our investigation.

The following table communicates the thickness of asphalt encountered at each of the borings.

<b>Boring Number</b>	<b>Thickness of Asphalt (inches)</b>
B-1	2 ¼
B-2	½
B-3	1
B-4	2 ½

Boring logs showing the soil profile at each bore hole are attached. The logs show changes in soil strata. The depths to changes should be considered to be approximate depths of changes based on the best estimate of the driller.

The methods used indicate subsurface conditions only at the specific locations where samples were obtained, only at the time they were obtained, and only to the depths penetrated. Samples cannot be expressly relied on to accurately represent the strata variations that usually exist between sampling locations.

With the exception of having obtained utility clearances for drilling operations (call before you dig), Preston Geotechnical Consultants, LLC has obtained no detailed knowledge of the on-site utilities or any other structures beneath the surface of the site.

#### 4. LAB TESTS:

We secured bulk soil samples of the subgrade soils just beneath the asphalt in borings B-1 and B-4. These samples were transported back to the laboratory for analysis. Each sample was laboratory tested for the following:

- ❖ Maximum Dry Density ASTM D 698
- ❖ Material Finer Than No. 200 Sieve ASTM D 1140

Following is a summary of the soil parameters obtained through this battery of laboratory tests (full results are attached).

Sample ID	ASTM D 698 Maximum Dry Density (pcf)	Optimum Moisture (%)	ASTM D 1140 % Finer Than No. 200 Sieve	Subgrade Soil Type Encountered
B-1	102.5	15.5	48.1	SM (silty sand)
B-4	102.0	15.5	53.4	ML (sandy silt)

We also performed laboratory cookouts (ASTM D 2216) on the upper level subgrade soils secured from test borings B-1 and B-4. These tests are helpful for the contractor in that they provide an indication of insitu moisture at the time of our investigation and a means of comparing that insitu moisture to the optimum moisture level of the existing subgrade soils. The following is a summary of our findings.

Boring Number	Insitu Moisture Percent	+/- Percent of Optimum Moisture
B-1	18.2	+3
B-4	19.2	+4

**5. RECOMMENDATIONS:**

The following table was compiled to communicate the recommended cement requirements based upon the subgrade soils in the two samples collected (from B-1 and B-4). The cement requirements were obtained utilizing short cut test procedures recognized by the Portland Cement Association.

Sample ID	Cement Content by Weight (%)	Cement Content by Volume (%)	Cement Spread Rate (lbs/square yard /6-inch depth)	Cement Spread Rate (lbs/square yard /8-inch depth)
B-1	12.5	12	51	68
B-4	13.0	12.5	53	70

The soils were quite similar (silty sands and sandy silts), and we therefore **anticipate, based upon the base thickness desired, a range of between approximately 50 and 55 pounds per square yard spread rate (for the 6-inch depth) and ±70 pounds per square yard spread rate (for the 8-inch depth).**

Specific application rates based on the soils encountered will require field judgment during construction. Contractors experienced in Full Depth Reclamation and Soil Cement Base Construction are typically able to field judge changes in color and texture of soils encountered.


We suggest Section 301 Soil Cement Construction from the Georgia Department of Transportation Standard Specifications (Specifically, subsections 301.3.03 Preparation and 301.3.05 Construction) be considered as a general guide to contractors in construction of the cement stabilized and reclaimed base course.

Should paving of the road not follow within 24 hours of the construction of the base or should traffic be allowed on the base course, we suggest that the base receive a prime coat to protect the surface from rain and light traffic. Furthermore, if traffic is allowed before paving, the road should be sanded following placement of prime coat.

We hope this information is helpful. Please call if you have any questions or if we may be of further service.

Very truly yours,

PRESTON GEOTECHNICAL CONSULTANTS, LLC



Robin C. Webb, P.E.





**BORE HOLE LOCATION SKETCH  
PGC# 2021023**

**Legend**  
● Daisy Trail NW





**PRESTON GEOTECHNICAL CONSULTANTS, LLC**

**PGC No. 2021023**

<b>CLIENT:</b> BALDWIN COUNTY		<b>BORING NO.:</b> B-1	
<b>PROJECT NAME:</b> DAISY TRAIL, FULL DEPTH RECLAMATION RECOMMENDATIONS, BALDWIN COUNTY, GA			
<b>BORING LOCATION:</b> SEE BORE HOLE LOCATION SKETCH			
<b>DATUM:</b> EXISTING GRADE	<b>HAMMER WT.:</b> 140 lbs	<b>HAMMER DROP:</b> 30 inches	<b>HOLE DIA.:</b> 6 inches
<b>SUBSURFACE WATER DEPTH:</b> NONE OBSERVED @ TIME OF BORING; BACKFILLED @ TIME OF BORING			
<b>SURFACE ELEV.:</b> N/A	<b>DATE STARTED:</b> 06-07-21	<b>COMPLETED:</b> 06-07-21	<b>BORING METHOD:</b> ASTM D 1586

SAMPLES		BLOWS PER FOOT	DEPT H (FEET)	BORING LOG					
STANDARD	PENETRATION			DESCRIPTION					
BLOWS PER FOOT									
0	10	20	40	60	80	100			
	10						9	0.19	2 1/4" ASPHALT
1								1	RED, MICACEOUS SILTY FINE TO MEDIUM SAND (SM)
2							12	2.5	
3								3	
4								4	BORING TERMINATED
5							11	5	
6								6	
7								7	
8								8	
9								9	
10								10	
11								11	
12								12	
13								13	
14								14	
15								15	
16								16	
17								17	
18								18	
19								19	
20								20	



**PRESTON GEOTECHNICAL CONSULTANTS, LLC**

**PGC No. 2021023**

**CLIENT:** BALDWIN COUNTY **BORING NO.** B-2

**PROJECT NAME:** DAISY TRAIL, FULL DEPTH RECLAMATION RECOMMENDATIONS, BALDWIN COUNTY, GA

**BORING LOCATION:** SEE BORE HOLE LOCATION SKETCH

**DATUM:** EXISTING GRADE **HAMMER WT.** 140 lbs **HAMMER DROP:** 30 inches **HOLE DIA:** 6 inches

**SUBSURFACE WATER DEPTH:** NONE OBSERVED @ TIME OF BORING; BACKFILLED @ TIME OF BORING

**SURFACE ELEV.:** N/A **DATE STARTED:** 06-07-21 **COMPLETED:** 06-07-21 **BORING METHOD:** ASTM D 1586

SAMPLES		BLOWS PER FOOT	DEPT H (FEET)	BORING LOG
STANDARD PENETRATION BLOWS PER FOOT	DESCRIPTION			
0	10			
	20			
	40			
	60			
	80			
	100			
		12	0.04	0.5" ASPHALT
1			1	RED-TAN, FINE TO MEDIUM SANDY MICACEOUS SILT (ML)
2			2	
3		22	2.5	
4			3	TAN, MICACEOUS SILTY FINE TO MEDIUM SAND (SM)
5			4	
6		16	5	BORING TERMINATED
7			6	
8			7	
9			8	
10			9	
11			10	
12			11	
13			12	
14			13	
15			14	
16			15	
17			16	
18			17	
19			18	
20			19	
			20	



**PRESTON GEOTECHNICAL CONSULTANTS, LLC**

**PGC No. 2021023**

**CLIENT:** BALDWIN COUNTY

**BORING NO.** B-3

**PROJECT NAME:** DAISY TRAIL, FULL DEPTH RECLAMATION RECOMMENDATIONS, BALDWIN COUNTY, GA

**BORING LOCATION:** SEE BORE HOLE LOCATION SKETCH

**DATUM:** EXISTING GRADE

**HAMMER WT.** 140 lbs

**HAMMER DROP:** 30 inches

**HOLE DIA:** 6 inches

**SUBSURFACE WATER DEPTH:** NONE OBSERVED @ TIME OF BORING; BACKFILLED @ TIME OF BORING

**SURFACE ELEV.:** N/A

**DATE STARTED:** 06-07-21

**COMPLETED:** 06-07-21

**BORING METHOD:** ASTM D 1586

SAMPLES		BLOWS PER FOOT	DEPT H (FEET)	BORING LOG
STANDARD PENETRATION BLOWS PER FOOT	DESCRIPTION			
0	10			
1		10	0.08	1" ASPHALT
2		12	2.5	RED-BROWN, SILTY FINE TO MEDIUM SAND (SM) (FILL)
3		13	5	RED, FINE SANDY MICACEOUS SILT (ML) (ORIGINAL)
4				BORING TERMINATED
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				



**PRESTON GEOTECHNICAL CONSULTANTS, LLC**

**PGC No. 2021023**

**CLIENT:** BALDWIN COUNTY **BORING NO.** B-4

**PROJECT NAME:** DAISY TRAIL, FULL DEPTH RECLAMATION RECOMMENDATIONS, BALDWIN COUNTY, GA

**BORING LOCATION:** SEE BORE HOLE LOCATION SKETCH

**DATUM:** EXISTING GRADE **HAMMER WT.** 140 lbs **HAMMER DROP:** 30 inches **HOLE DIA:** 6 inches

**SUBSURFACE WATER DEPTH:** NONE OBSERVED @ TIME OF BORING; BACKFILLED @ TIME OF BORING

**SURFACE ELEV.:** N/A **DATE STARTED:** 06-07-21 **COMPLETED:** 06-07-21 **BORING METHOD:** ASTM D 1586

SAMPLES		BLOWS PER FOOT	DEPT H (FEET)	BORING LOG					
STANDARD PENETRATION BLOWS PER FOOT	DESCRIPTION								
0	10	20	40	60	80	100			
				14	0.21				2 1/2" ASPHALT
1					1				RED, FINE TO MEDIUM SANDY MICACEOUS SILT (ML)
2				14	2			2.5	
3					3				
4					4				RED-TAN, MICACEOUS SILTY FINE TO MEDIUM SAND (SM)
5				15	5				BORING TERMINATED
6					6				
7					7				
8					8				
9					9				
10					10				
11					11				
12					12				
13					13				
14					14				
15					15				
16					16				
17					17				
18					18				
19					19				
20					20				



**FAMILY OF CURVES METHOD FOR DETERMINING  
MAXIMUM DENSITY OF SOILS  
ASTM D 698**

CLIENT: Baldwin County

DATE: June 22, 2021

PROJECT: Daisy Trail  
FDR Recommendations  
Baldwin County, GA

PGC NO.: 2021023

SAMPLE DESCRIPTION: Red, fine to medium sandy micaceous silt

MAXIMUM DRY DENSITY FROM FAMILY OF CURVES: 102.0 pcf

OPTIMUM MOISTURE CONTENT FROM FAMILY OF CURVES: 15.5 %

DATE SAMPLED: June 7, 2021

SAMPLED FROM: Boring B-4 @ 0 to 1.0'

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**ONE POINT PROCTOR RESULTS**

WET DENSITY: 116.6 pcf

MOISTURE CONTENT: 14.9 %

FAMILY OF CURVES USED: B

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## SOIL CLASSIFICATION

**Client:** Baldwin County

**Date:** June 22, 2021

**Project:** Daisy Trail  
FDR Recommendations  
Baldwin County, GA

**PGC No.:** 2021023

**Date Sampled:** June 7, 2021

**Sampled From:** B-4 @ 0 to 1.0'

<b>(ASTM D 4318)</b>		
<b>Liquid Limit</b> 47	<b>Plastic Limit</b> 29	<b>Plastic Index</b> 18
<b>ASTM D 1140</b>		
<b>Percent Finer Than No. 200 Sieve</b> 53.4		
<b>ASTM D 2487</b>		
<b>Soil Classification Group Symbol</b> ML	<b>Soil Description</b> Sandy Silt	

Remarks:

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**FAMILY OF CURVES METHOD FOR DETERMINING  
MAXIMUM DENSITY OF SOILS  
ASTM D 698**

CLIENT: Baldwin County

DATE: June 22, 2021

PROJECT: Daisy Trail  
FDR Recommendations  
Baldwin County, GA

PGC NO.: 2021023

SAMPLE DESCRIPTION: Red, micaceous silty fine to medium sand

MAXIMUM DRY DENSITY FROM FAMILY OF CURVES: 102.5 pcf

OPTIMUM MOISTURE CONTENT FROM FAMILY OF CURVES: 15.5 %

DATE SAMPLED: June 7, 2021

SAMPLED FROM: Boring B-1 from 0 to 1.0'

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**ONE POINT PROCTOR RESULTS**

WET DENSITY: 117.5 pcf

MOISTURE CONTENT: 14.9 %

FAMILY OF CURVES USED: B

***"Woman Owned Small Business"***  
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## SOIL CLASSIFICATION

**Client:** Baldwin County

**Date:** June 22, 2021

**Project:** Daisy Trail  
FDR Recommendations  
Baldwin County, GA

**PGC No.:** 2021023

**Date Sampled:** June 7, 2021

**Sampled From:** B-1 @ 0 to 1.0'

<b>(ASTM D 4318)</b>		
<b>Liquid Limit</b> 44	<b>Plastic Limit</b> 28	<b>Plastic Index</b> 16
<b>ASTM D 1140</b>		
<b>Percent Finer Than No. 200 Sieve</b> 48.1		
<b>ASTM D 2487</b>		
<b>Soil Classification Group Symbol</b> SM	<b>Soil Description</b> Silty Sand	

Remarks:

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## DEFINITION OF TERMS

SPT - Standard Penetration Test (ASTM D 1586, Split Spoon)  
L.L. - Liquid Limit (ASTM D 4318)  
P.L. - Plastic Limit (ASTM D 4318)  
P.I. - Plasticity Index (ASTM D 4318)  
ATOB - At Time of Boring

## CLAYS AND SILTS

<u>Consistency</u>	<u>SPT (Blows per foot)</u>
Very soft	Less than 2
Soft (L.L.)	2 - 4
Medium	4 - 8
Stiff	8 - 15
Very Stiff (P.L.)	15 - 30
Hard	Over

## SANDS

<u>Relative density</u>	<u>SPT (Blows per foot)</u>
Very loose	0 - 4
Loose	4 - 10
Medium or firm	10 - 30
Dense	30 - 50
Very dense	Over 50

## SOIL FRACTIONS

<u>Term</u>	<u>Size Range</u>
Cobbles	Above 3"
Gravel	Coarse 3" to 3/4"
Fine	3/4" to No. 4 Sieve
Sand Coarse	No. 4 to No. 10
Medium	No. 10 to No. 40
Fine	No. 40 to No. 200
Fines Clay-Silt	Below No. 200 sieve
Gravel - Naturally occurring aggregates	
Crushed Stone - Man-made aggregates such as crushed granite	