July 26, 2019

Highlands County
Board of County Commissioners
Engineering Department
505South Commerce Avenue
Sebring, FL 33870

Attn: Mr. Stanley W. Merantus
Email: smerantus@hcbcc.org

Re: Geotechnical Engineering Services – Pavement Evaluation Report
Stryker Road Resurfacing from North Olivia Drive to US-27
Highlands County, Florida
Highlands County Project No.: 18008
TSF File No. 7111-19-206

Dear Stanley:

Tierra South Florida, Inc. (TSF) has completed a pavement evaluation for the above referenced project. The project involves obtained pavement cores to evaluate the existing asphalt. The evaluated section is approximately 1.99 miles long.

This report contains the data collected during our initial site reconnaissance, presents pavement information from the asphalt cores and provides recommendation regarding reconstruction for the road at the referenced site. Our findings and laboratory results are attached to this report.

EVALUATION OF EXISTING PAVEMENT

In general, the pavement was considered to be in poor to bad condition. The following types of failures, varying on their degree of severity, were observed during this investigation.

1. **Alligator Cracks**: Interconnected cracks forming series of small blocks. Encountered in most areas of the existing pavement surface. These are fatigue type cracks. The failure can be due to weakness in the surface, base or sub grade; a surface or base that is too thin; poor drainage or the combination of all three. It often starts in the wheel path as longitudinal cracking and ends up as alligator cracking after severe distress.

2. **Potholes:** Potholes are bowl-shaped holes resulting from localized disintegration. It is common to have a pothole extend through or into the aggregate base.

3. **Block Cracks:** Interconnected cracks forming rectangular shape blocks. Encountered in few areas along the pavement surface. Typically, representative of old and dried-out mix.

4. **Edge Cracking:** Edge cracks were observed along the roadway. Edge cracks are longitudinal cracks, 1-foot or so from the edge of the pavement. Usually, edge cracks are due to lack of lateral support. The may also be caused by settlement or yielding of the material underlying the cracked area.

5. **Flexible Depression:** A depression is a deviation of the pavement from design grade.

6. **Patching:** Pavement failures were present through the entire project related to asphalt patching.

Asphalt Cores

A total of eleven (11) asphalt cores were obtained from the existing road. Core information is shown in the Appendix. (Pavement Evaluation Coring and Condition Data Sheet)

RECOMMENDATIONS

Analysis of the pavement coring data revealed the existing asphalt pavement is in bad condition. The base course is classified as Shell Rock with varying thickness between 7 and 10 inches, about 8.1 inches average thickness. The subgrade consists more than 12 inches of sand throughout the road. The pavement cores thickness varies between 1.0 and 7.5 inches, with an average thickness of 2.4 inches. The pavement cores crack depth varies between 1.0 to 3.2 inches, with most of the pavement cores having a complete crack depth. Once traffic loading information is final, the existing recommendation could be further evaluated, however, based on data collected, roadway inspection and analysis, our recommendation will be as follow:

We recommend reconstruction of the existing road section. The asphalt surface needs to be removed, the base course materials in the pavements should consist of limerock or shell rock, having a minimum Limerock Bearing Ratio (LBR) of 100. The subgrade should have a minimum LBR of 40. Actual reconstruction limits, and final pavement thickness should be determined by the civil engineer of record following his review and final traffic loading information.

The pavement should be reconstructed per Highlands County Roadway standards.

REPORT LIMITATIONS

The geotechnical engineer warrants that the findings, recommendations, specifications, or professional advice contained herein have been made in accordance with generally accepted professional geotechnical engineering practices in the local area. No other warranties are implied or expressed.

This geotechnical report has been prepared for the exclusive use of Highlands County. for the specific application to the Stryker Road Resurfacing in Highlands County Florida.

Very truly yours,

TIERRA SOILS FLORIDA, INC.

MAXIMO PERALTA ALVAREZ LICENSE No. 84213 STATE OF FLORIDA PROFESSIONAL ENGINEER

7/26/19

Maximo Peralta Alvarez, P.E.
Geotechnical Engineer
FL Registration No. 84213

7/26/19

Ramakumar Vedula, P.E.
Principal Engineer
FL Registration No. 54873

APPENDIX

Pavement Core Location Plan
Pavement Evaluation Coring and Condition Data Sheet
Pavement Cores Pictures

PAVEMENT CORE LOCATION PLAN

◉ **Approximate Location of Pavement Cores**

DRAWN BY: NG CHECKED BY: JO	APPROVED BY: RK DATE: 06-28-2019	ENGINEER OF RECORD: RAJ KRISHNASAMY, P.E. FLORIDA LICENSE NO.: 53567	RAJ KRISHNASAMY, P.E. P.E. LICENSE NUMBER 53567 TIERRA SOUTH FLORIDA, INC. 2765 VISTA PARKWAY, S-10 WEST PALM BEACH, FL 33411 CERTIFICATE OF AUTHORIZATION 28073	SCALE: NTS	PROJECT NUMBER: 7111-19-206	PAVEMENT CORE LOCATION PLAN STRYKER ROAD RESURFACING HIGHLANDS COUNTY, FLORIDA	Sheet: 1

jolva 6/28/2019 11:41:24 AM J:\Tierra Documents\Projects\TSF 2019\7111-19-206_Stryker Road Resurfacing (Highlands County)\7111-19-206_Splan_Sprofiles.DGN

Stryker Road Resurfacing
Highlands County, FL
Tierra South Florida Project 7111-19-206
Pavement Evaluation Coring and Condition Data Sheet

Core ID	Core Date	Pavement Layers (inches)						Total Core Length (inches)	Base Material		Crack Depth (inches)	Pavement Condition	Rut Depth (inches)	Cross Slope (%)	Notes
		Layer 1	Layer 2	Layer 3	Layer 4	Layer 5	Layer 6		Type Stratum	Thickness (inches)					
1	6/25/2019		1.2					1.2	SHELL	8.0	1.2	P	-	0.60 O	
2	6/25/2019		1.2					1.2	SHELL	7.0	1.2	P	0.1	2.2 O	
3	6/25/2019		1.4					1.4	SHELL	10.0	1.4	P	0.1	1.6 O	
4	6/25/2019		0.8	1.2	1.2			3.2	SHELL	7.0	3.2	P	0.1	1.0 O	
5	6/25/2019		1.8	1.5				3.3	SHELL	9.0	-	P	-	1.8 O	
6	6/25/2019		1.0					1.0	SHELL	8.0	1.0	P	0.1	1.5 O	
7	6/25/2019		2.6	1.4				4.0	SHELL	8.0	-	P	-	2.5 O	
8	6/25/2019		1.3					1.3	SHELL	7.0	1.3	P	0.1	1.8 O	
9	6/25/2019		1.2					1.2	SHELL	9.0	1.2	P	0.1	1.2 O	
10	6/25/2019		1.5					1.5	SHELL	7.0	1.5	P	0.1	1.4 O	
11	6/25/2019	FC 1.1	2.4	4.0				7.5	SHELL	9.0	-	F	-	1.3 O	

Remarks: LR= Limerock
SHELL= Shell Rock
O = Outside
Pavement conditions based on visual observations only

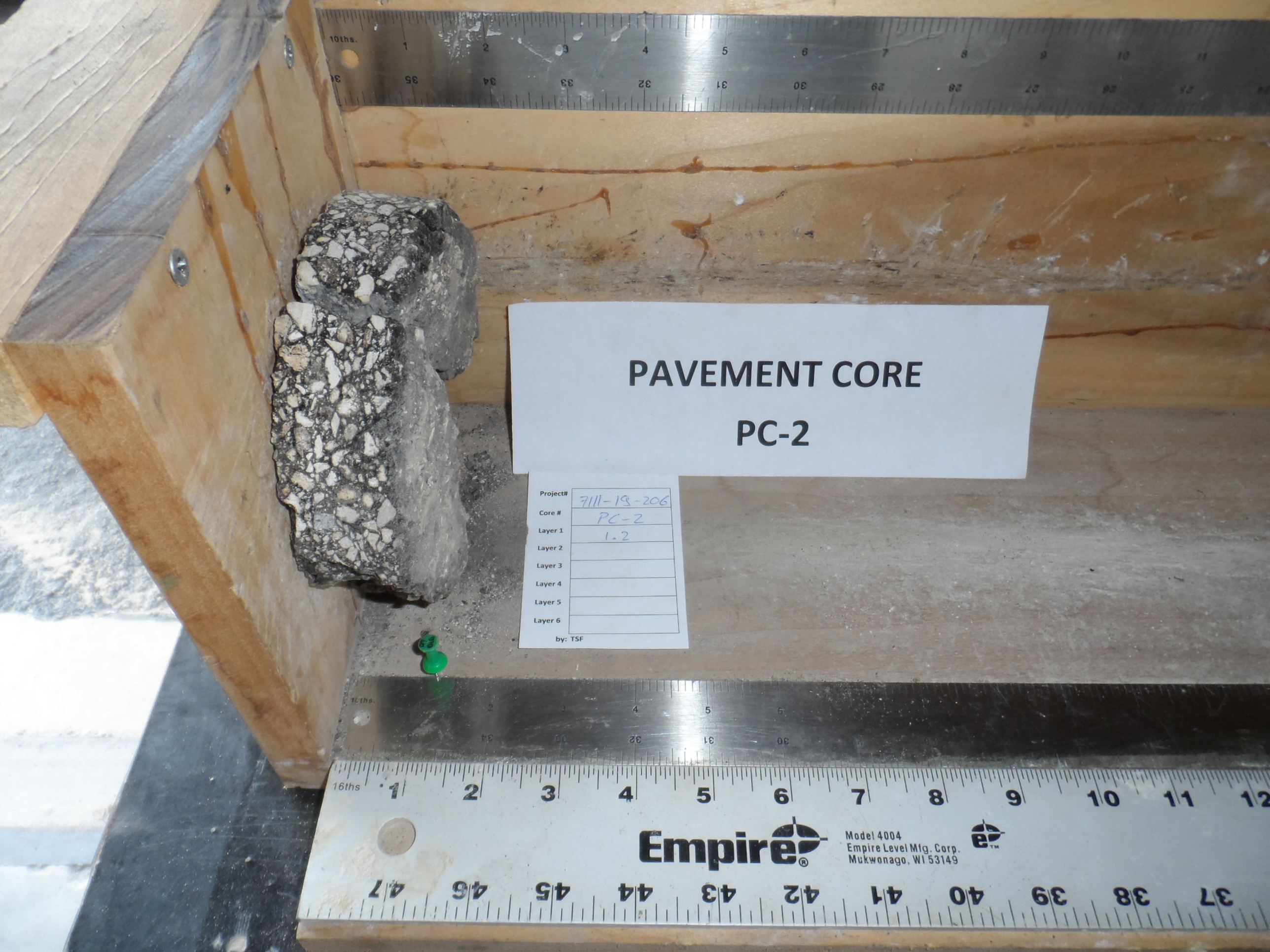
Pavement Conditions: G = Good
F = Fair
P = Poor
B = Bad

PAVEMENT CORE

PC-1

Project#	7111-19-206
Core #	PC-1
Layer 1	1.2
Layer 2	
Layer 3	
Layer 4	
Layer 5	
Layer 6	

by: TSF


PAVEMENT CORE
PC-2
Project# 7111-19-206
Core # PC-2
Layer 1 1.2
Layer 2
Layer 3
Layer 4
Layer 5
Layer 6
by: TSF
Empire
Model 4004
Empire Level Mfg. Corp.
Mukwonago, WI 53149

PAVEMENT CORE

PC-3

Project#	7111-19-206
Core #	PC-3
Layer 1	1.4
Layer 2	
Layer 3	
Layer 4	
Layer 5	
Layer 6	

by: TSF

Empire

Model 4004
Empire Level Mfg. Corp.
Mukwonago, WI 53149

PAVEMENT CORE

PC-4

Project#	7111-19-206
Core #	PC-4
Layer 1	0.8
Layer 2	1.2
Layer 3	1.2
Layer 4	
Layer 5	
Layer 6	

by: TSF

Empire
Model 4004
Empire Level Mfg. Corp.
Mukwonago, WI 53149

PAVEMENT CORE

PC-5

Project#	7111-19-206
Core #	PC-5
Layer 1	1.8
Layer 2	1.5
Layer 3	
Layer 4	
Layer 5	
Layer 6	

by: TSF

Empire® Model 4004 Empire Level Mfg. Corp. Mukwonago, WI 53149

PAVEMENT CORE

PC-6

Project#	7111-19-206
Core #	PC-6
Layer 1	1.0
Layer 2	
Layer 3	
Layer 4	
Layer 5	
Layer 6	

by: TSF

Empire®
Model 4004
Empire Level Mfg. Corp.
Mukwonago, WI 53149


PAVEMENT CORE
PC-7
Project# 7111-19-206
Core # PC-7
Layer 1 2.6
Layer 2 1.4
Layer 3
Layer 4
Layer 5
Layer 6
by: TSF
Empire
Model 4004
Empire Level Mfg. Corp.
Mukwonago, WI 53149


PAVEMENT CORE
PC-8
Project# 7111-19-206
Core # PC-8
Layer 1 1.3
Layer 2
Layer 3
Layer 4
Layer 5
Layer 6
by: TSF
Empire
Model 4004
Empire Level Mfg. Corp.
Mukwonago, WI 53149


PAVEMENT CORE
PC-9
Project# 7111-19-206
Core # PC-9
Layer 1 1.2
Layer 2
Layer 3
Layer 4
Layer 5
Layer 6
by: TSF
Empire
Model 4004
Empire Level Mfg. Corp.
Mukwonago, WI 53149

PAVEMENT CORE

PC-10

Project#	7111-19-206
Core #	PC-10
Layer 1	1.5
Layer 2	
Layer 3	
Layer 4	
Layer 5	
Layer 6	

by: TSF

Empire® Model 4004 Empire Level Mfg. Corp. Mukwonago, WI 53149

PAVEMENT CORE

PC-11

Project#	7111-13-206
Core #	PC-11
Layer 1	F.C 1.1
Layer 2	2.4
Layer 3	4.0
Layer 4	
Layer 5	
Layer 6	

by: TSF

Empire
Model 4004
Empire Level Mfg. Corp.
Mukwonago, WI 53149