TIERRA

April 8, 2015

AmHerst Consulting Company, LLC
1000 Legion Place, Suite 1285
Orlando, FL 32801

Attn: Mr. Wes Teel

RE: Results of Geotechnical and Testing Services
Avon Park Executive Airport Fuel Farm
1545 State Road 64
Avon Park, Highlands County, Florida
AHC Subcontract #: 14060.02
Tierra Project No.: 5511-15-011

Mr. Teel:

Tierra, Inc. (Tierra) was contracted to perform geotechnical and testing services for the above referenced project in accordance with a Subcontract Agreement between Tierra and AmHerst Consulting Company, LLC ("AmHerst"), dated March 3, 2015. All testing by Tierra was performed at locations designated by Amherst.

1.0 Purpose and Scope of Services

The proposed project consists of converting the existing facilities at the Avon Park Executive Airport into an expanded fueling station. Tierra provided the following services:

1. Reviewed published soil information obtained from the "Soil Survey of Highlands County, Florida" published by the United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS). Reviewed topographic and potentiometric information obtained from the "Avon Park, Florida" Quadrangle Map and Potentiometric Surface Map published by the United States Geological Survey (USGS).
2. Performed a single SPT boring to a depth of 10 feet below existing ground surface to determine the subgrade soil reaction of the soil for it to support a shallow spread foundation measuring 32'x32'. The thickness of the slab will vary from 14 inches in the area of the slab that will support the fuel tank footings and 6 inches elsewhere.
3. Collected one (1) bulk sample and performed laboratory testing including Limerock Bearing Ratio (LBR) and full gradation sieve analysis. The LBR value was converted to a California Bearing Ratio (CBR).
4. Performed two (2) concrete cores in the airport metal hangar building slab to determine the thickness of the concrete foundation.
5. Performed one (1) core in the flexible pavement section located west of the airport hangar to determine the asphalt thickness, base thickness and base material type.

2.0 Review of Published Data

2.1 USDA Soil Survey

Based on a review of the "Soil Survey of Highlands County, Florida" published by the USDA, it appears that there are two (2) primary soil-mapping unit noted along the project alignment. The general soil description of each soil type is presented below.

Basinger Fine Sand, 0 to 2 percent slopes (Map Unit 12)

The Basinger component makes up 82 percent of the map unit. Slopes are 0 to 2 percent. This component is on drainageways on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during June, July, August, September, and October.

Pomello Sand, 0 to 5 percent slopes (Map Unit 36)

The Pomello component makes up 87 percent of the map unit. Slopes are 0 to 5 percent. This component is on ridges on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 33 inches during June, July, August, September, October, and November.

2.2 USGS Quadrangle Map

Based on a review of the "Avon Park, Florida" USGS Quadrangle Map, it appears that the natural ground surface elevations along the project alignment range from approximately +150 to +155 feet, National Geodetic Vertical Datum of 1929 (NGVD29).

2.3 Potentiometric Surface Elevation

Based on a review of the "Potentiometric Surface of the Upper Floridan Aquifer, West-Central Florida" map, published by the USGS, the potentiometric surface elevation of the upper Floridan Aquifer at the site is approximately +70 to +80 feet, NGVD 29. Artesian flow conditions were not encountered during the field exploration.

3.0 Findings and Results

On March 26, 2015, our representatives arrived at the Avon Park Executive Airport and conducted the field services.

3.1 Subsurface Exploration

The SPT boring was performed with the use of a track-mounted drill rig using Bentonite Mud drilling

procedures. The soil sampling was performed in general accordance with ASTM D-1586, "Penetration Test and Split-Barrel Sampling of Soils". Soils were visually classified by a Geotechnical Engineer and stratified in general accordance with the Unified Soil Classification System (USCS). Soil stratification was determined based on a review of recovered samples, laboratory test results, and interpretation of field boring logs.

The SPT boring was performed north of the hangar building in which the fuel tanks were located. The boring generally encountered loose, brown to dark brown sand to sand with silts [SP-SM] and was terminated at a depth of 10 feet below the ground surface. The groundwater table was encountered at 4 feet below the surface at the time the boring was performed.

While not part of the scope, Seasonal High Groundwater Table (SHGWT) levels were estimated at depths ranging from 0 to 3.5 feet below the existing ground surface. The SHGWT estimates made by Tierra are estimated historic levels based off of USDA soil survey data. Man-made influences, such as existing water management ditches, swales, and drainage ponds, will affect groundwater levels but are not considered when determining the historical SHGWT.

3.2 California Bearing Ratio (CBR)

A bulk sample of soil was collected approximately 2 feet west and 50 feet north from the southwest corner of the hangar building to a depth of 2 feet for CBR testing. Originally, we analyzed the bulk soil sample as an LBR test in accordance to ASTM FM 5-515, and the resulting LBR value was then converted to a CBR value by multiplying the LBR value with a coefficient of 0.8. Based on our analysis, a design CBR value of 21 is recommended (LBR value: 26). The full grain sieve analysis results indicate the soil sample is classified as an A-3 soil in accordance with the American Association of State Highway and Transportation Officials (AASHTO) classification standards. Results of the laboratory testing can be found in the **Appendix.**

3.3 Asphalt and Concrete Cores

A total of three (3) core cuts were performed in the asphalt pavement and inside the hangar building to determine the thickness of each material. The following table summarizes the results of our testing.

Core Number	Approximate Location*	Material Type	Average Measured Core Thickness (inch)
C1	40' North and 20' West from the exterior SW corner	Asphalt/Limerock Base	1.9/4.3
C2	35' North and 35' West from the interior SE corner	Concrete	3.7
C3	20' South and 30' West from the interior NE corner	Concrete	4.2
*Location measurements were taken from the hangar building.			

4.0 Evaluation and Recommendations

Based only on the results of our SPT boring, and the anticipated size of the shallow foundation measuring approximately 32' x 32' feet, we anticipate the subgrade modulus to be approximately 20 ksf. The foundation and floor slab should bear on properly placed and compacted cohesionless (sand) structural fill or properly compacted sandy soils encountered at the site. The existing near surface sandy soils should be improved by compaction after clearing operations to improve foundation support and reduce total and differential settlement.

4.1 Subgrade Preparation

After general site clearing/stripping operations, the exposed subgrade should be proof rolled. Proof-rolling should consist of compaction with a medium size, drum roller operated in the static mode. Proof-rolling should consist of a minimum of ten overlapping coverages of the roller in a criss-cross pattern at walking pace. The subgrade should be thoroughly compacted to achieve a minimum density of 95 percent of the soils' modified Proctor to a depth of 12 inches.

New hardscape areas should be similarly proof-rolled to provide a stable/unyielding subgrade prior to placing new fill (if any). Fill soils can then be placed and compacted to a minimum of 95 percent of their modified Proctor maximum dry density (ASTM D-1557). A representative of Tierra, Inc. should be retained to provide on-site observations and testing of the compaction and filling operations so that proper documentation of the required minimum compaction and compliance with the recommendations herein can be provided.

4.2 Engineered Fill

Any off site fill imported for the project should consist of clean fine sand with less than 12 percent by dry weight passing the U.S. Standard No. 200 sieve and be free of rubble, organics, clay, debris and other deleterious material. Fill should be tested and approved prior to import and placement. Each lift should have a loose thickness not exceeding 12 inches. Density tests should be performed to confirm the required compaction is being achieved prior to placing the next lift.

Prior to beginning compaction, soil moisture conditioning may be required. Soil moisture contents should be controlled in order to facilitate proper compaction. A moisture content within two percentage points of the material's optimum indicated by the modified Proctor test (ASTM D-1557) is recommended prior to compaction of the natural ground and fill. All engineered fill should be compacted to at least 95 percent of the material's modified Proctor (ASTM D-1557) maximum dry density.

5.0 Pavement Considerations

Highlands County Aviation Authority and/or FDOT guidelines for separation between the bottom of the base and SHGWT should be adhered to for the roadway/pavement section. Correspondingly, the base should remain equally above sustained water treatment levels in roadside ditches, making positive drainage of the ditches important. The choice of base material would depend upon the relationship of final roadway/pavement improvement grades and the bottom of the base to the estimated seasonal high groundwater table levels or sustained water treatment levels in adjacent roadway ditches. The design of the pavement section should be in accordance with project specifications.

6.0 Report Limitations

The analyses, conclusions and recommendations contained in this report are professional opinions based on the site conditions and project layout described herein and further assume that the conditions observed in the exploratory borings are representative of the subsurface conditions throughout the site, i.e., the subsurface conditions elsewhere on the site are the same as those disclosed by the borings. If, during construction, subsurface conditions different from those encountered in the exploratory borings are observed or appear to be present beneath excavations, we should be advised at once so that we can review these conditions and reconsider our recommendations where necessary.

This report was prepared for the exclusive use of Tierra, Inc. for evaluating the design of the project as it relates to the geotechnical aspects discussed herein. It should be made available to prospective contractors for information on factual data only and not as a warranty of subsurface conditions included in this report. Unanticipated soil conditions may require that additional expense be made to attain a properly constructed project. Therefore, some contingency fund is recommended to accommodate such potential extra costs.

Tierra appreciates the opportunity to be of service to you on this project. If you have any questions or comments regarding this report, please contact Tierra at your earliest convenience at (407) 877-1354.

Respectfully Submitted,

TIERRA, INC.

Anthony Oliver, E.I.
Geotechnical Engineer Intern

Mustapha Abboud, P.E.
Senior Geotechnical Engineer
Florida License No. 56112

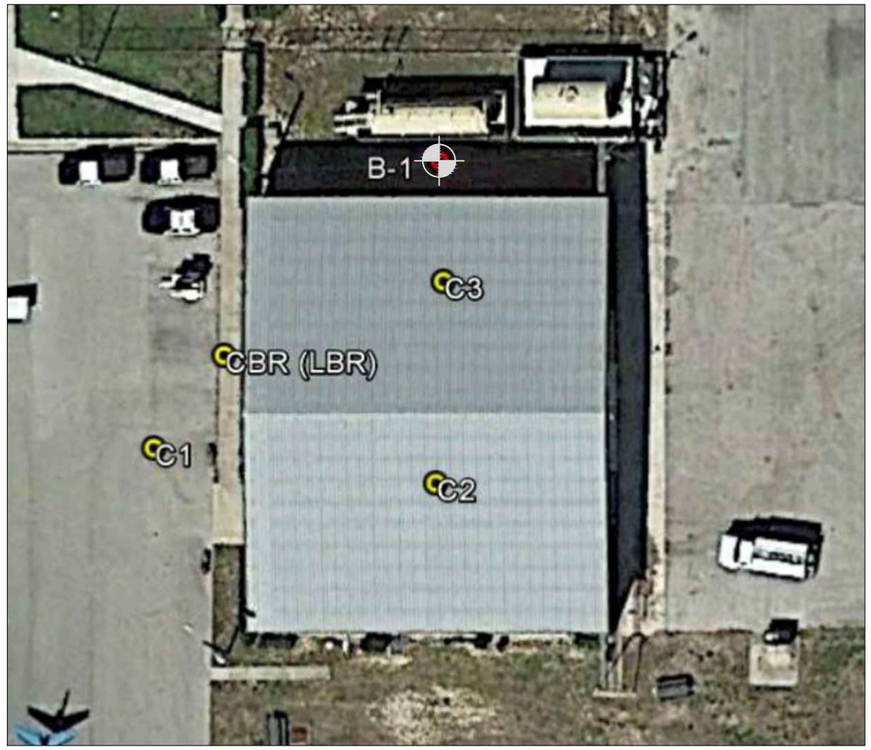
Attachment:

- Appendix
  - Boring Location Plan and Soil Profile Sheet
  - Results of Laboratory Testing Presented as an LBR Test

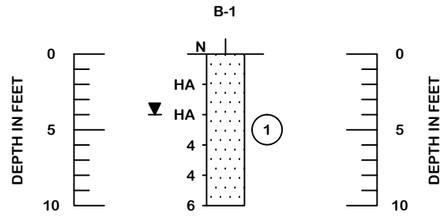
APPENDIX

Boring Location Plan and Soil Profile Sheet
Results of Laboratory Testing Presented as an LBR Test

BORING LOCATION PLAN



SOIL PROFILES



LEGEND

1	BROWN TO DARK BROWN SAND TO SAND WITH SILT (SP/SP-SM)
▼	GROUNDWATER LEVEL ENCOUNTERED DURING INVESTIGATION
N	SPT N-VALUE IN BLOWS/FOOT FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED)
SP	UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D 2488) GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW.
HA	HAND AUGERED TO VERIFY UTILITY CLEARANCES
⊕	APPROXIMATE LOCATION OF SPT BORING
◉	APPROXIMATE LOCATION OF ASPHALT / CONCRETE CORES

GRANULAR MATERIALS-RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 3
LOOSE	3 TO 8
MEDIUM	8 TO 24
DENSE	24 TO 40
VERY DENSE	GREATER THAN 40

SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 1
SOFT	1 TO 3
FIRM	3 TO 6
STIFF	6 TO 12
VERY STIFF	12 TO 24
HARD	GREATER THAN 24

DRAWN BY: MAF
CHECKED BY: AJO
APPROVED BY: MA
DATE: APRIL 2015
ENGINEER OF RECORD: MUSTAPHA ABBOUD, P.E.
FLORIDA LICENSE NO.: 56112

TIERRA
1133 Crown Park Circle
Winter Garden, Florida 34787
Phone: 407-877-1354 Fax: 407-654-7347
FL Cert. No.: 6486

SCALE: NOTED
PROJECT NUMBER: 5511-15-011

GEOTECHNICAL ENGINEERING SERVICES
AVON PARK EXECUTIVE AIRPORT
HIGHLANDS COUNTY, FLORIDA

SHEET 1

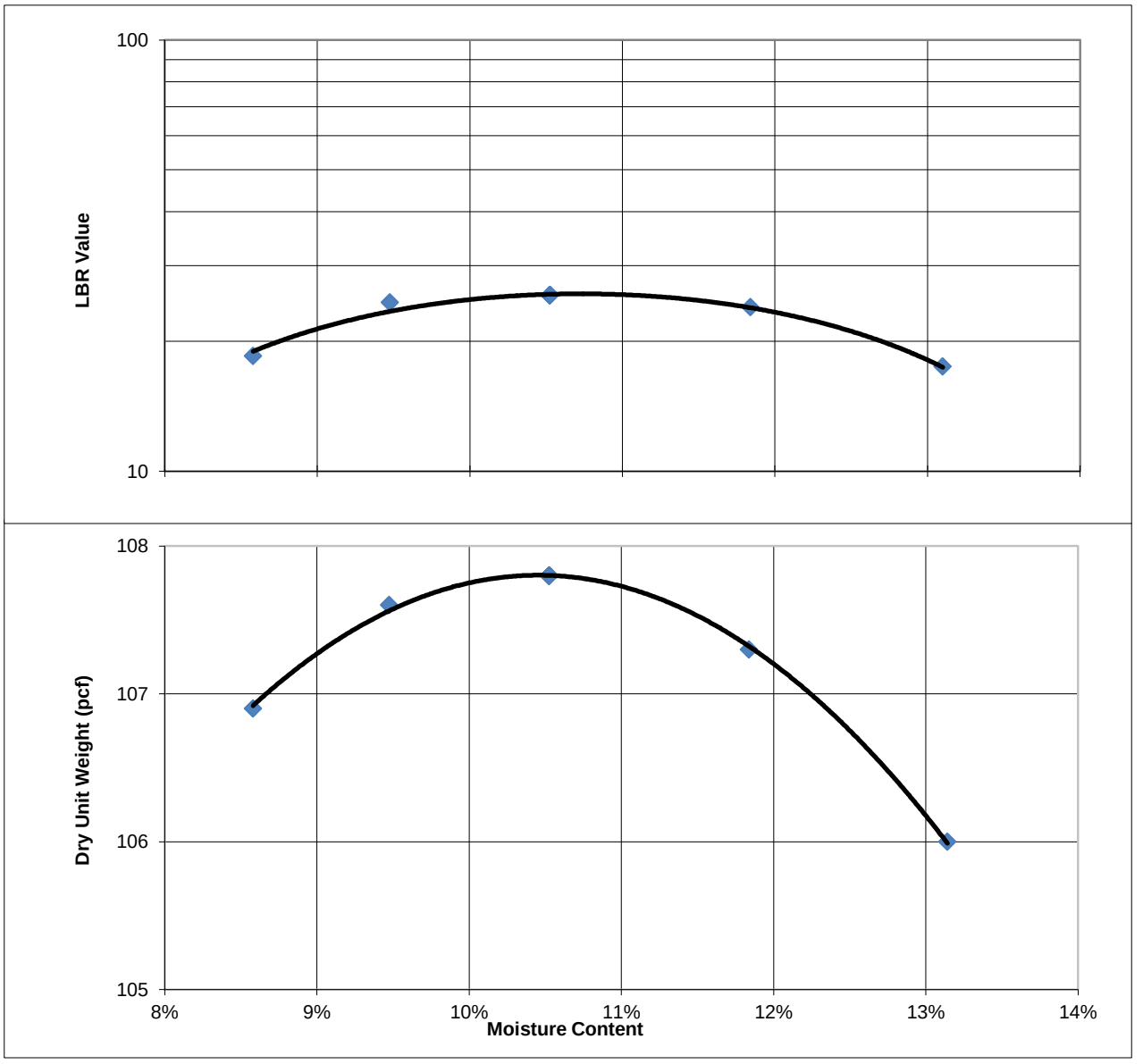
TIERRA

1133 Crown Park Circle ● Winter Garden, Florida 34787
Phone: (407) 877-1354 ● Fax: (407) 654-7347
Florida Certification No. 6486

RESULTS OF LABORATORY TESTING

Tested For:	AmHerst Consulting Company, LLC. Wes Teel 1000 Legion Place, Suite 1285 Orlando, FL 32801	Project:	Avon Park Executive Airport Fuel Park
		Material Use:	Stabilized Subgrade
		Project No:	5511-15-011
Report Date:	3/30/2015	Sample No:	1

LBR & MOISTURE-DENSITY RELATIONSHIP



LBR Value	26	
Maximum Density	108	pcf
Optimum Moisture	11	%
Test Method:	**ASTM FM 5-515**	
(%)Passing #4 Sieve	100.0%	
Sampled By:	GM	
Tested By:	KS	
Soil Classification (AASHTO):	**A-3**	
Liquid Limit:	Non-Plastic	
Plastic Limit:	Non-Plastic	
Plasticity Index:	Non-Plastic	
Average Organic Content:	**1.0**	

Description: Brown Fine Sand With Roots

Sample Location: 2' of West Side, 50' from Building Corner

Grain Size Distribution (Percent Passing)

3/8"	#4	#10	#40	#60	#100	#200
100	100	100	78.9	25.4	6.9	3.8

Sampled in accordance with AASHTO T-2

Copies:

Respectfully Submitted,
TIERRA INC.