

January 26, 2024

Greenville-Spartanburg Airport District 2000 GSP Drive, Suite 1 Greer, South Carolina 29651

c/o LCK 55 East Camperdown Way, Suite 200 Greenville, South Carolina 29601

Attention: Mr. Scott Rush

Reference: Limited Engineering Evaluation Report GSP Airport – Tradeport Connector GSP International Airport Greer, Spartanburg County, South Carolina S&ME Project No. 23600898

Dear Mr. Rush:

S&ME, Inc. (S&ME) is pleased to submit this Limited Engineering Evaluation Report for the referenced project. Our services were performed in general accordance with the scope of work described in our Proposal No. 23600898, dated December 15, 2023, and authorized by GSP Airport District (GSP) on January 4, 2024 through Work Authorization #24. This limited report presents a brief confirmation of our understanding of the project, our field services, and our observations and recommendations regarding the planned temporary road.

PROJECT INFORMATION

The civil plans by WK Dickson (dated September 27, 2023) were provided to Mr. Kyle Anderson with S&ME by Mr. Rush by e-mail on December 6, 2023. Based on the information provided, we understand a new temporary roadway is planned to extend Tradeport Drive to the south, connecting to the General Aviation Hangar facility. We understand the temporary roadway will have a planned section of 2 inches of asphalt intermediate course – type C underlaid by 8 inches of SCDOT graded aggregate base. The roadway extension will be roughly 18 feet wide and 928 feet long. A graded road swale is planned at Station 15+04.25. Minor cuts and fills on the order of 1 to 2 feet are planned. Deeper cuts will likely be required for utilities.

FIELD SERVICES

On January 23, 2024, Mr. Kyle Anderson, P.E. with S&ME arrived on-site, as requested by Mr. Scott Rush with LCK. Our representative performed six (6) hand auger borings (supplemented with Dynamic Cone Penetrometer testing at 1-ft depth intervals) to hand auger refusal, spaced roughly between 130 to 180 feet apart, to characterize and evaluate the underlying soil conditions in the planned roadway area. Please refer to Figure 1: Hand Auger Boring Locations for more detailed location information.



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Our representative observed rock outcrops throughout the surface of the planned roadway. The surface material ranged between exposed soil (bare) to light grass. Topsoil was encountered in hand auger borings HA-3 and HA-4 and was measured at roughly 4 and 8 inches thick, respectively. Fill soils were encountered at the surface in hand auger borings HA-2 and HA-5. The fill consisted of silty sands (SM) and sandy silts (ML). We observed some topsoil, organic odor, roots, with some rock fragments in the fill encountered at HA-5. The blows per increment (bpi) ranged between 4 to 25+ in the fill sections. Based on the field testing, the fill appeared to be loosely to moderately well compacted. Hand auger boring HA-5 was terminated in the fill at a depth of 4 feet below the ground surface due to encountering hand auger refusal.

Residual soils ("residuum") were encountered at the ground surface in hand auger borings HA-1 and HA-6, beneath the fill in HA-2, and beneath the topsoil in HA-3 and HA-4. The residual soils primarily consisted of silty sands (SM) with some rock fragments. The bpi ranged between 16 to 25+ in the residual soils, indicating a generally medium dense consistency. Hand auger refusal was encountered at depths ranging between 0.3 to 3 feet below the existing ground surface in residual soils.

CONCLUSIONS AND RECOMMENDATIONS

Based on the hand auger boring data and our understanding of the project information, the site is considered generally adaptable for the proposed construction. Some limited undercutting of the existing fill could be required, especially near hand auger boring HA-5. The contractor should have a plan for difficult excavation conditions, especially for the utility line excavations. The following presents our geotechnical recommendations regarding site preparation of the proposed roadway. As the project progresses or requirements change, we would be happy to expand or provide additional recommendations as needed.

Site Preparation & Existing Utility Lines

Site preparation and fill placement recommendations are for the new pavement area only. These recommendations should extend at least 5 feet outside new pavement areas, where practical.

Site preparation should begin with the removal of the topsoil. Our experience indicates that the backfill soils for existing utility lines could be poorly compacted. If any utility lines remain below the proposed pavements, we suggest that the trench backfill material be carefully evaluated by proofrolling to assess whether it is satisfactorily stable to support the pavement.

After removal of the topsoil, site preparation measures should continue with the removal of all unsuitable surface materials, including any roots, surface vegetation, organic-laden topsoil, and any unstable near-surface soils in the planned construction area.

Existing Fill Soils

Fill soils were encountered in hand auger borings HA-2 and HA-5. Additional existing fill could be encountered in unexplored areas of the site between/beyond the borings, especially near and above existing underground utilities.



Existing fill soils should be carefully evaluated by a Geotechnical Professional to assess whether they are satisfactory to support the proposed pavement areas. This evaluation would consist of the proofrolling procedures discussed below. These fill soils could potentially remain in-place below pavement areas, pending thorough evaluation. Some undercutting should be anticipated and planned in the area around hand auger HA-5. If fill soils remain, the surface should be recompacted as discussed below in *Structural Fill Placement and Compaction*.

Proofrolling

At multiple stages during grading (following site preparation, excavation to the design subgrade levels, and after any necessary undercutting of unsuitable soils), the exposed subgrade should be thoroughly proofrolled with a heavily loaded, tandem-axle dump truck or similar rubber-tired equipment under the observation of the Geotechnical Engineer or their representative. The proofrolling will help reveal the stability of the existing fill and the presence of unstable or otherwise unsuitable surface materials. Areas that are unstable should be undercut as recommended by the Geotechnical Engineer and backfilled as discussed in *Structural Fill Placement and Compaction*. Options of backfilling undercut volumes can be provided in the field after proofrolling.

Excavation

Based on the boring data, excavation for the project is anticipated to extend through residual soils with some rock fragments. Based on experience, there could be shallow boulders or rock lenses located within the proposed roadway area, and within planned utility trench excavations, such as the 30-inch deep conduit trench. Relatively shallow excavations can typically be performed by routine earthmoving equipment such as a bulldozer, moderately heavy front-end loader, or bulldozer-pushed scraper. Local excavation for shallow utility trenches can possibly be accomplished by trencher, but if rocks are encountered a heavy tracked excavator with rock teeth may be needed. Additionally, please keep in mind that rock in a weathered, boulder, and mass form varies erratically in depth and location in this geologic region. Accordingly, such materials could be encountered at shallow depths between or near the borings, and blasting or use of pneumatic tools could be required to remove the rock.

All excavations should be sloped or shored in accordance with local, state, and federal regulations, including OSHA (29 CFR Part 1926) excavation trench safety standards. The contractor is solely responsible for site safety. This information is provided only as a service and under no circumstances should S&ME be assumed to be responsible for construction site safety.

Structural Fill Placement and Compaction

Areas requiring fill placement should be raised to their design subgrade elevation with soil free of deleterious materials. Any rock fragments within the new fill should be less than 4 inches in diameter. The fill should be uniformly spread in 6- to 8-inch-thick loose lifts and be compacted to at least 95 percent of the soil's maximum dry density, as determined by a laboratory standard Proctor compaction test (ASTM D698). The moisture content should be controlled at plus to minus 3 percent of optimum; however, a slight increase in optimum moisture could be allowable if the minimum compacted density is achieved and subgrade is stable.



Fill placement should be monitored by a qualified Materials Technician working under the direction of the Geotechnical Engineer. In addition to this visual evaluation, the Technician should perform enough in-place field density tests to confirm that the required degree of compaction is being attained.

Use of Excavated Soils as Fill

The sampled fill and residual soils appear generally adaptable for use as well-compacted structural fill with proper moisture adjustment, except the fill at hand auger boring HA-5. The exploration indicates the in-situ moisture content of site soils were generally below to near optimum for compaction at the time the exploration was performed. However, the moisture content of these soils will fluctuate with prevailing weather conditions prior to and during site grading, and with depth. Accordingly, moisture adjustment (wetting or drying) at the time of construction could be required to achieve the recommended degree of compaction. If the soils are stockpiled, they should be protected from precipitation. If unsuitable soils are encountered, they should be placed outside the construction area.

Use of Off-Site Borrow Materials as Fill

If required, imported fill used for site grading should consist of a clean material (free of organics and debris), have a maximum particle size no greater than 4 inches, be of low to moderately low plasticity soil (Liquid Limit less than 30, Plasticity Index less than 20), with a standard Proctor maximum dry density of at least 100 pounds per cubic foot (pcf). The borrow material should be evaluated by a Geotechnical Engineer prior to use.

General Pavement Recommendations

Flexible (asphalt) pavement is planned for the proposed roadway. The pavement areas should be constructed in general accordance with the South Carolina Department (SCDOT) Standard Specifications for Highway Construction, 2007 edition.

Limitations of Report

This report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. The conclusions and recommendations contained in this report are based upon applicable standards of our practice in this geographic area at the time this report was prepared. No other representation or warranty, either express or implied, is made.

We relied on conceptual project information given to us to develop our conclusions and recommendations. If project information described in this report is not accurate, or if it changes during project development, we should be notified of the changes so that we can modify our recommendations based on this additional information if necessary.

Our conclusions and recommendations are based on limited data from a field exploration program. Subsurface conditions can vary between or near explored areas. Some variations may not become evident until construction. If conditions are encountered which appear different than those described in our report, we should be notified. This report should not be construed to represent subsurface conditions for the entire site.



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Unless specifically noted otherwise, our field exploration program did not include an assessment of regulatory compliance, environmental conditions or pollutants, or presence of any biological materials (mold, fungi, bacteria). If there is a concern about these items, other studies should be performed. S&ME can provide a proposal and perform these services if requested.

CLOSING

If you have any questions relative to the services we have outlined above and our recommendations, please do not hesitate to contact us at (864) 297-9944.

Sincerely,

S&ME, Inc. 0

Kyle Anderson, P.E. Project Manager



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Gant M. Taylor, P.E. Principal Engineer



Attachments: Figure 1: Hand Auger Boring Location Plan Hand Auger Boring Records Photograph Log



HAND AUGER BORING RECORD

GSP Airport - Tradeport Connector 2000 GSP Drive / Greer, Spartanburg County, South Carolina 29651 S&ME Project No. 23600898

Date Performed: January 23, 2024 Personnel: Kyle D. Anderson, P.E.

| HAND AUGER | DEPTH (ft) | | | DCP RESULTS | |
|------------|---|-----|--|-------------|-------------|
| NO. | FROM | TO | SUL DESCRIPTION | DEPTH (ft) | BLOW COUNTS |
| HA-1 | 0 | 1.5 | Residuum: Brown Silty Sand (SM) Fine to Medium with Some Rock Fragments | -1 | 20-25+ |
| | Hand auger refusal at 1.5 feet below ground surface | | | | |
| | | | | | |
| HA-2 | 0 | 1 | Fill: Dark Brown Silty Sandy (SM) Fine to Medium | | |
| | 1 | 2 | Fill: Brown Red Silty Sand (SM) Fine to Medium, Moist | -1 | 5-4-4 |
| | 2 | 3 | Residuum: Red Light Brown Silty Sand (SM) Fine to Medium with Some Rock Fragments | -2 | 6-13-25+ |
| | | | | -3 | 25+ |
| | Hand auger refusal at 3 feet below ground surface | | | | |
| | | | | | |
| HA-3 | 0 | 0.3 | Topsoil (4 inches) | | |
| | 0.3 | 2.5 | Residuum: Brown Yellow to Red Yellow Silty Sand (SM) Fine to Medium with Some Rock | -1 | 12-15-21 |
| | | | Fragments | -2 | 25+ |
| | Hand auger refusal at 2.5 feet below ground surface | | | | |
| | | | | | 1 |
| HA-4 | 0 | 0.7 | Topsoil (8 inches) | | _ |
| | 0.7 | 1 | Residuum: Red Brown Silty Sand (SM) Fine to Medium with Some Rock Fragments | -1 | 25+ |
| | Hand auger refusal at 1 foot below ground surface | | | | |
| | | | IF'IL Design O'lle Ossel (ON) First to Madi una ville Osses Tassas'l | | |
| HA-5 | 0 | 1 | Fill: Brown Silty Sand (SM) Fine to Medium with Some Topsoli | | |
| | 1 | 2 | Fill: Gray Brown Sandy Silt (ML) Fine to Medium with Some Organic Odor and Roots | -1 | 5-5-9 |
| | | | | -2 | 19-25+ |
| | 2 | 4 | Fill: Red Silty Sand (SM) Fine to Medium with Some Rock Fragments | -3 | 15-23-16 |
| | | | | -4 | 25+ |
| | Hand auger refusal at 4 feet below ground surface | | | | |
| | | | | <u>^</u> | 05 |
| HA-6 | 0 | 0.3 | Residuum: Yellow Red Silty Sand (SM) Fine to Medium with Some Rock Fragments | 0 | 25+ |
| | Hand auger refusal at 0.3 feet below ground surface (also attempted 3 offset borings with similar refusal conditions) | | | | |

Notes:

- 1. Depths are measured from the top of existing ground surface
- 2. Rock outcrops observed at surface throughout planned roadway
- 3. The surface of planned roadway appeared to firm under the weight of pickup truck, except near HA-2 (ponded water from recent rain event)















