Report of Pavement Coring and Subgrade Exploration Taxiway Pavement Rehabilitation GSP International Airport Greer, South Carolina S&ME Project No. 1569-20-052

PREPARED FOR:

Greenville-Spartanburg Airport District
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July 31, 2020

July 31, 2020

Greenville-Spartanburg Airport District
2000 GSP Drive, Suite 1
Greer, South Carolina 29651-9202

Attention: Mr. Joe Capriola

Reference: **Report of Pavement Coring and Subgrade Exploration**
Taxiway Pavement Rehabilitation
GSP International Airport
Greer, Spartanburg County, South Carolina
S&ME Project No. 1569-20-052

Dear Mr. Capriola:

S&ME is pleased to submit this Report of Pavement Coring and Subgrade Exploration for the Taxiway Pavement Rehabilitation project at GSP International Airport. Our services were performed in general accordance with the scope of work described in our Proposal No. 15-2000153, dated May 5, 2020, and authorized by GSP Airport District (GSP) on June 25, 2020 through Work Authorization #6. The exploration was performed to evaluate the existing pavement section thickness and shallow subsurface conditions at the site, to assist Kimley-Horn (the project Civil Engineer) with their pavement rehabilitation design. This report presents a brief confirmation of our understanding of the project, the findings of the exploration, and our conclusions and recommendations regarding the above considerations.

We appreciate the opportunity to work with the GSP Airport District by providing our services for this project. Should you have any questions concerning the contents of this report, or if we may be of further assistance, please do not hesitate to contact us.

Sincerely,

S&ME, Inc.

Gant M. Taylor, P.E.
Senior Engineer
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APPENDICES

1.0 PROJECT INFORMATION

Our understanding of the project is based on the following information:

- Email and telephone correspondence between Mr. Joe Capriola of GSP and Mr. Gant Taylor of S&ME during the period of April 23 through April 29, 2020;
- Review of two documents prepared by Kimley-Horn, and attached to the April 23rd email: the aerial photograph figure titled "*GSP AIP Survey & Geotech Locations_DRAFT.pdf*" showing 26 requested locations for pavement coring (including 2 soil borings); and "*GSP Taxiway Improvements-Survey Geotech Scope.pdf*" which outlines the requested scope of exploration;
- Review of the existing pavement data and soil test boring data presented in our previous *Geotechnical Exploration Report* (#1426-14-190, dated November 21, 2014) for a portion of Taxiway G; and
- Review of historical aerial photographs available from Google Earth™.

From our correspondence and review of the referenced documents, we understand Kimley-Horn will be providing civil design services for the upcoming Taxiway Pavement Rehabilitation project for GSP. To help support Kimley-Horn's evaluation and design process, S&ME was requested to assess the pavement conditions (section thickness and subgrade support) at 26 locations indicated on the provided figure.

The GSP airfield taxiway layout consists of the primary Taxiway Lima (labeled "TW-L" on the figure), which is approximately 2.1 miles long and parallels Runway 4-22, and nine connecting Taxiways. There are three perpendicular taxiways at the southwest end of the runway (labeled "TW-A", "TW-B" and "TW-C"), and two perpendicular taxiways at the northeast end of the runway (labeled "TW-J" and "TW-K"), each approximately 500 feet in length. There are also four skewed high-speed taxiways near the middle portion of the runway (labeled "TW-D", "TW-E", "TW-F" and "TW-G"), each approximately 1000 feet in length. Kimley-Horn also requested pavement coring on four link taxiways (labeled "L4", "L5", "L6" and "L9") which connect TW-L to adjacent aprons.

Fourteen of the requested test locations are along the sideline *shoulder* pavements, and twelve locations (four on TW-L, five total on TW-D through TW-G, and three total on L4 through L6) are within the delineated taxiway *travel lanes*. Regardless of lane (shoulder or travel), half of the borings are along/near TW-L, and the other half are spread across the other TWs. We understand GSP and Kimley-Horn will evaluate options for pavement rehabilitation, likely consisting of milling some depth of existing pavement and replacement with lifts of new Hot Mix Asphalt (HMA) pavement.

2.0 EXPLORATION & SUBSURFACE CONDITIONS

During four days over the period of June 29 through July 8, 2020, representatives of S&ME's professional staff visually observed the general pavement conditions, and cored the taxiway pavements at the following locations:

- Six (6) cores on Taxiway TW-L *shoulder* pavements, labeled C-4, C-8, C-10, C-14, C-18, and C-22;
- Eight (8) cores on *shoulder* pavements of Taxiways TW-A through TW-K, and TW-L9, labeled C-1, C-2, C-3, C-5, C-23, C-24, C-25, and C-26;
- Four (4) cores on Taxiway TW-L *travel lane* pavements, labeled C-6, C-9, C-15, and C-21;
- Five (5) cores on *travel lane* pavements of Taxiways TW-D through TW-G, labeled C-7, C-11, C-13, C-16, and C-17; and

- Three (3) cores on *travel lane* pavements of Link Taxiways TW-L4 through TW-L6, labeled C-12, C-19, and C-20.

We established the core locations at the requested locations shown of the provided figure from Kimley-Horn, using GPS coordinates and estimating distances from existing site features. One exception was C-22, where the core location was shifted from the outer shoulder to the inner shoulder (due to the shoulder reconstruction associated with the recent Cargo Ramp project). The approximate core locations are shown on the Test Location Plan (Figure 1) contained in Appendix I.

2.1 Pavement Coring

At each location, we cored the asphaltic pavement utilizing portable rotary coring machine equipped with a diamond-tipped circular core barrel. The core diameters varied from 4 to 6 inches, as we used smaller diameter barrels to extract the deeper/thicker pavement sections. The cores were performed to determine the thickness of the asphalt pavement sections (and observe the condition and thicknesses of individual pavement layers), and to expose the underlying stone base and/or soil subgrade. Where present, we removed the stone base and measured the thickness of the layer. At select locations, we performed the core on top of an existing crack in the pavement to assess the depth of crack penetration through the asphalt.

We transported the extracted asphalt core specimens to our laboratory to measure, photograph, and visually assess the pavement layer conditions. The measured pavement section thicknesses are summarized on the Pavement Coring Summary Table in Appendix I. Our observations of the individual pavement layers of twelve cores (from travel lanes) are presented on the Pavement Core Details (Figures 2A and 2B) in Appendix I, along with photographs of all twenty-six cores. On these detail figures, we denoted numerous locations where the pavement sections had nonbonded ("cold") joints between asphalt layers at various depths. At three locations (C-9, C-12 and C-16), deeper portions of the pavement cores became lodged inside the core barrel. These core sections required extraction in our laboratory, which resulted in breaking up of softer and apparently lower-quality pavement layers (as shown in the photographs and detail figures).

In brief summary, the total asphalt thickness for ten of the twelve *travel lane* cores ranged from approximately 10½ to 18¾ inches, with no underlying stone base, indicating a "full-depth" pavement section. The two exceptions were at C-12 (TW-L4), where 12 inches of asphalt pavement was underlain by a 3-inch thick layer of a low-grade asphalt/stone/soil mixture; and at C-20 (TW-L6), where 4¾inches of asphalt pavement was underlain by a 7¼-inch thick layer of stone base.

The total pavement section of the taxiway *shoulder* cores exhibited greater variability, ranging from approximately 9¾ to 17 inches. Most of the asphalt pavement thicknesses ranged from approximately 2½ to 6½ inches, underlain by a layer of stone base with thicknesses ranging from 4¾ to 12¾ inches. One exception was at C-14 (TW-L shoulder), which had a 9¾-inch full depth asphalt pavement section with no stone base.

2.2 Subgrade Exploration

After removing the asphalt pavement core and stone base (where present), we performed Kessler Dynamic Cone Penetrometer (DCP) testing to evaluate the soil subgrade stability. Kessler DCP is a device used to help evaluate the consistency of the subgrade soils and provide a correlation for subgrade reaction modulus and/or California

Bearing Ratio (CBR) for use in pavement design. DCP testing extended to depths of 1.3 to 3.8 feet below pavement (the shallower test depths were due to encountering practical refusal conditions at three locations: C-20, C-23, and C-25). Based on correlations, the estimated CBR values mostly ranged between approximately 3.6 to 100+ percent. The lowest CBR value was encountered at C-18 (TW-L shoulder) where soft silty soils were encountered below the stone base layer. The remaining CBR values (greater than 7% percent) were generally consistent with what is typically observed in stable Piedmont natural soils and fill subgrade soils. The attached Kessler DCP Spreadsheets detail the test location, asphalt and stone base thicknesses, raw blow count with corresponding cumulative penetration, along with estimated values for in-situ CBR, Subgrade Modulus "k", and Subgrade Elastic Modulus "E_{SG}" (based on correlations with published sources).

Our representatives then performed shallow hand auger borings at multiple locations to obtain representative samples of the subgrade soils. The samples were manually and visually classified by our Project Engineer. The soil classification was estimated in accordance with the Unified Soil Classification System (USCS). Soils of similar classification were placed in buckets, to create blended "composite" bulk samples of the prevalent subgrade soil conditions. In general, the majority of the subgrade soils were assessed to be sandy materials with a smaller proportion of silt/clay fines (both native Piedmont soil, and what appeared to be a defined soil "sub-base" layer in several borings). At some locations, the subgrade soils were assessed to be primarily cohesive silty/clayey materials with a smaller proportion of sand (also native Piedmont soil).

At two requested core locations, C-19 (TW-L5) and C-20 (TW-L6), we performed hand auger borings to explore the deeper soil profile conditions. At C-19, the hand auger boring extended to a depth of 10 feet, and encountered fill and Piedmont residual soils consisting of silty sand (USCS Classification "SM") and sandy silt (ML). Sowers DCP testing (different from the previously described Kessler DCP) indicated loose/firm to stiff/medium dense consistency. At C-20, we attempted two hand auger borings, but both encountered auger refusal at depths of approximately 1.3 and 2.7 feet below the pavement surface. Below an upper layer of residual clay soil (CL), these hand auger borings encountered material classified as partially weathered rock (PWR). This shallow refusal condition is consistent with available soil test boring data from the nearby General Aviation expansion areas to the east.

Following completion of the field testing at each location, the core hole was backfilled with soil and crushed stone, and then patched using cold-patch asphalt (each component layer corresponded to the existing condition). The asphalt cores and soil samples were transported to our laboratory for testing and further evaluation.

Subsurface information in this report is based upon the Engineer's classification of the obtained soil samples, our measurement of extracted core specimens, and interpretation of the laboratory test results. Depths or thicknesses of soils should be considered approximate. Subsurface conditions can change significantly over relatively short horizontal distances. Variations in soil conditions should be expected intermediate and beyond the coring locations. Similarly, although we measured pavement thicknesses at the core locations, the thicknesses will vary in other areas of the site, particularly where the pavements have been previously overlaid or otherwise rehabilitated. The preceding description of subsurface conditions is relatively brief and general. For more detailed information, please refer to the referenced figures and data tables in Appendix I.

3.0 LABORATORY TESTING

The soil samples collected in the field were blended (based on similar soil classification) to prepare three composite bulk soil samples to represent the prevalent subgrade soil conditions. In order of predominant occurrence across the site, the samples were labeled "SM" (USCS Classification "SC-SM", clayey silty sand, most prevalent), "Sub-base" (also classified as "SC-SM", clayey silty sand), and "CL/ML" (USCS Classification "CL", sandy lean clay with silt, least prevalent).

Each composite sample was subjected to index tests (gradation and Atterberg limits), Modified Proctor compaction testing, and California Bearing Ratio testing for pavement section thickness design (by others). The CBR specimens were remolded to 95 percent (for SC-SM) to 90 percent (for CL) of the soil's maximum dry density, based on the modified Proctor (ASTM D 1557). These levels of compaction were based on the typical consistency of the soils based on the measured Kessler DCP values, and general guideline specifications of the FAA Advisory Circular for Section "P-152". Briefly, the laboratory CBR test values ranged from 6.3 and 8.5 percent for the Clayey/Silty Sand (SC-SM) to 13.3 percent for the Sandy Lean Clay (CL). The laboratory test results are contained in Appendix II, including a Summary Table and individual test reports.

4.0 OBSERVATIONS AND RECOMMENDATIONS

4.1 Pavements

At Most of the asphalt pavements at GSP International Airport range in age from relatively recent (20 to 25 years) for the runway/taxiway extensions in the mid- to late-1990s to over 50 years for the some of the oldest pavements of the 1962 original airport construction. We anticipate that most of the travel lane pavements have undergone rehabilitation of various degrees over the operational life of the airport. As typical with aging pavements, especially with older pavements that are subject to heavier aircraft than originally expected/designed decades ago, some pavement distress can be common (including fatigue cracking in longitudinal/transverse/random directions). However, the type and severity of some observed pavement distress suggests deficiencies in the pavement structure. These indications of distress include significant "shoving" and spread cracking on high-speed taxiways (at C-7/TW-D, C-13/TW-F, and C-16/TW-G), and heaving on link taxiway TW-L4 (at C-12), for example.

The pavement cores at multiple locations indicated evidence of previous milling/overlay, but many of the travel lane pavement cores exhibited signs of poorly bonded or nonbonded/smooth joints ("cold joints") between successive layers. Furthermore, several cores revealed a layer of low-grade asphaltic material below the surface course or upper intermediate course, below depths of 2 to 5 inches below the pavement surface. This material was observed to be similar to asphalt "build-up" or "leveling" course, with generally low strength/rigidity and low proportion of coarser aggregate.

Coincidentally, some of the more significant pavement distress was observed at locations with shallow cold joints and/or this intermediate low-strength layer. It has been our experience that lack of proper tack/bonding between pavement layers (especially those near the wearing surface) can cause slippage/shoving of the upper layers, leading to tension cracking and progressive failure over time. This is exacerbated by braking and turning wheels of heavier aircraft. The presence of a soft/weak pavement layer in the shallow pavement profile becomes the

"weak link" in the pavement section, often resulting in rutting, heaving, and longitudinal cracking along the wheel gear paths.

Because milling and replacement is being evaluated for the new rehabilitated pavement section, it is important to consider the problematic conditions created by the non-bonded/cold joints at various depths, as well as the presence of the weaker pavement layer that could be exposed at the proposed milling depth. Both of these conditions could be detrimental to the goal of creating a stronger, more durable pavement section. Although more costly in the short-term, consideration of a deeper milling depth could provide a greater long-term value for the rehabilitation.

4.2 CBR / Subgrade Modulus

As indicated by the laboratory CBR test results and field Kessler DCP test results, the soil subgrade modulus (k) values generally vary for the different soil types at pavement subgrade. While a very conservative approach would be to use the *lowest* measured value (k of 78 pci, correlated from a Kessler DCP-to-CBR value of 3.6 percent at C-18/TW-L shoulder), this value appears to be the low-end outlier. Alternatively, for a slightly less conservative approach, the subgrade modulus used for design could be selected to represent the majority of soils near final subgrade elevation. Thus, we recommend using a slightly higher value, such as a subgrade modulus "k" of 140 pci (correlated from a CBR of 7.8 percent) For overall consistency, this value aligns with the lower laboratory CBR values of 6.3 and 8.5 percent (which average to 7.4 percent), and represents the majority of the subgrade soils.

By selecting a subgrade modulus k value that is greater than the observed low-point threshold, it is important to recognize the risk (although manageable) associated with this design methodology. Some areas of pavement subgrade, including areas not explored by the widely spaced corings/borings of this investigation, could exhibit pavement support characteristics below the k value used in design.

5.0 Limitations of Report

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

The opinions and recommendations submitted herein are based, in part, upon the data obtained from the described evaluation. The nature and extent of variations between or near the test locations will not become evident until pavement rehabilitation commences. If variations appear evident, then we will re-evaluate the recommendations of this report. In the event that any changes in the nature or design of the taxiway pavement rehabilitation occurs, the conclusions and recommendations contained in this report will not be considered valid unless the changes are reviewed and conclusions modified or verified in writing.

APPENDICES

Appendix I – Field Data

Test Location Plan – Figure 1
Pavement Coring Summary Table
Pavement Core Details (2 pages)
Photographs of Pavement Cores (10 pages)
Kessler DCP Field Data Reports (25)
Hand Auger Boring Logs (2)

Appendix II – Laboratory Testing

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APPENDIX I

FIELD DATA

Test Location Plan – Figure 1

Pavement Coring Summary Table

Pavement Core Details (2 pages)

Photographs of Pavement Cores (10 pages)

Kessler DCP Field Data Reports (25)

Hand Auger Boring Logs (2)

LEGEND

- Approximate Coring Location
- Approximate Coring/Boring Location

SOURCES

GSP AIP Survey Geotech Locations_DRAFT provided by Kimley Horn (dated April 23, 2020)

Aerial Basemap obtained from Google Earth™ (Imagery dated June 3, 2018)

TEST LOCATION PLAN

TAXIWAY PAVEMENT REHABILITATION
GSP INTERNATIONAL AIRPORT
GREER, SPARTANBURG COUNTY, SOUTH CAROLINA

SCALE:	AS SHOWN
DATE:	JULY 2020
PROJECT NUMBER	1569-20-052
FIGURE NO.	1

Drawing path: T:\Projects\2020\GEO\1569-20-052 GSP Airport Taxiway Pavement Rehabilitation\Graphics\1569-20-052 GSP Taxiway TIP.dwg

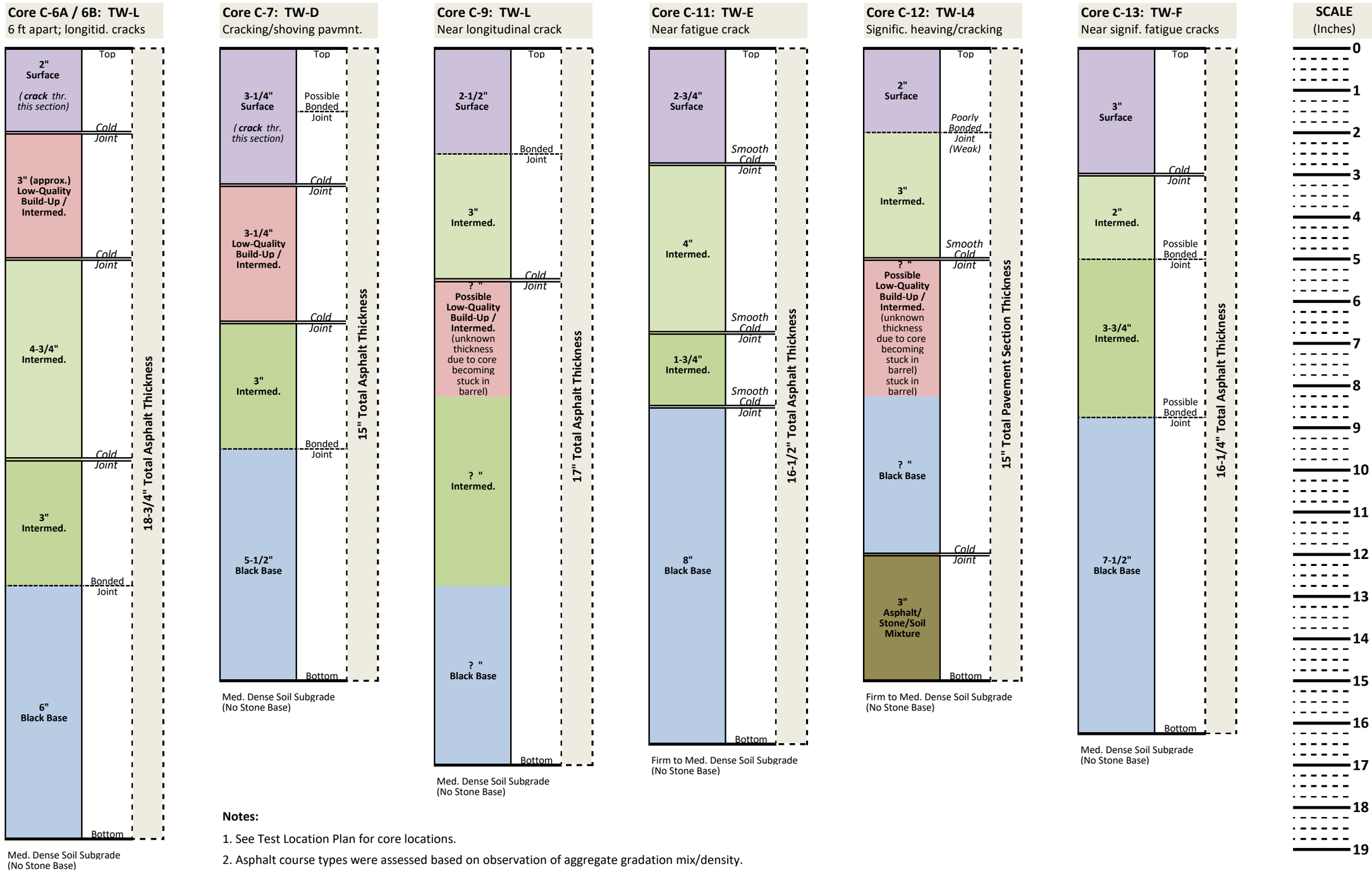
Pavement Coring Summary Table
GSP Airport - Taxiway Pavement Rehabilitation
Greer, Spartanburg County, South Carolina
S&ME Project No. 1569-20-052

Label / ID	Core / Test Location	Asphalt Pavement Thickness (in)	Stone Base Thickness (in)	Pavement Section Thickness, Total (in)	Notes (*See also Pavement Core Detail Figures)
C-1	Taxiway A, outer shoulder	3-1/4	12-3/4	16	No apparent cracks; 2 layers: 1.5" upper, 1.75" bottom
C-2	TW-A / TW-B, inner shoulder	3	11-1/2	14-1/2	No apparent surface cracking; 2 layers @ 1.5"
C-3	Taxiway B, shoulder	3-1/2	11-1/2	15	No apparent cracks; 2 layers: 2" upper, 1.5" bottom
C-4	Taxiway L, outer shoulder	3	12	15	Cracks (w/ sealant); transverse cracks; 2 layers @ 1.5"
C-5	TW-C / TW-L, inner shoulder	3	11	14	Crack through core; appears to be 1 layer of coarse mix
C-6	Taxiway L, travel lane	18-3/4	0	18-3/4	*Crack through upper 2" layer; low-quality layer below
C-7	Taxiway D, travel lane	15	0	15	*Many cracks; low-quality middle lift btw. -3.2" & -6.5"
C-8	Taxiway L, inner shoulder	6-1/4	10-3/4	17	2 layers: 2.5" upper (marg.), 3.7" bottom; 5" deep crack
C-9	Taxiway L, travel lane	17	0	17	*Nonbonded joint at -5.5"; low-quality layer below
C-10	Taxiway L, outer shoulder	6	5-3/4	11-3/4	2 bonded layers: 2.75" upper, and 3.25" bottom
C-11	Taxiway E, travel lane	16-1/2	0	16-1/2	*Nonbonded/smooth joints at -2.75", -6.75", and -8.5"
C-12	Taxiway L4, travel lane	12	3 (*mixture)	15	*Significant heaving and random cracking
C-13	Taxiway F, travel lane	16-1/4	0	16-1/4	*Nonbonded joint at -3"
C-14	Taxiway L, inner shoulder	9-3/4	0	9-3/4	3 bonded layers: 2" upper, 4.75" middle, and 3" bottom
C-15	Taxiway L, travel lane	16-1/2	0	16-1/2	*Nonbonded joint at -4"
C-16	TW-G (runway side of stop bar)	14-1/2	0	14-1/2	*Nonbonded joint at -4"
C-17	TW-G (taxiway side of stop bar)	15-1/2	0	15-1/2	*Nonbonded joint at -7.25"
C-18	Taxiway L, outer shoulder	6-1/2	4-3/4	11-1/4	3 bonded layers: 1.7" upper, 2.1" mid., and 2.7" bot.
C-19	Taxiway L5, travel lane	10-1/2	0	10-1/2	*Nonbonded joint at -1.75"; low-quality layer below
C-20	Taxiway L6, travel lane	4-3/4	7-1/4	12	*Vertical crack from -2.5" to bottom; shallow refusal
C-21	Taxiway L, travel lane	16	0	16	*Nonbonded/smooth joint at -12.5"
C-22	Taxiway L, inner shoulder	2-3/4	8-3/4	11-1/2	Core had a coarse, uneven bottom; single layer (?)
C-23	TW-J / TW-L, inner shoulder	2-1/2	9	11-1/2	Single layer of asphalt (?)
C-24	TW-J / TW-K, inner shoulder	3-1/2	8-1/4	11-3/4	Single layer of asphalt (?)
C-25	Taxiway L9, shoulder	3-3/4	11-1/4	15	2 bonded layers: 1.25" upper, and 2.5" bottom
C-26	TW-L9 / FedEx Apron shoulder	3-1/4	10-1/2	13-3/4	Single layer of asphalt (?)

Figure 2A: Pavement Core Details (Page 1 of 2)

GSP International Airport - Taxiway Pavement Rehabilitation

S&ME Project No. 1569-20-052



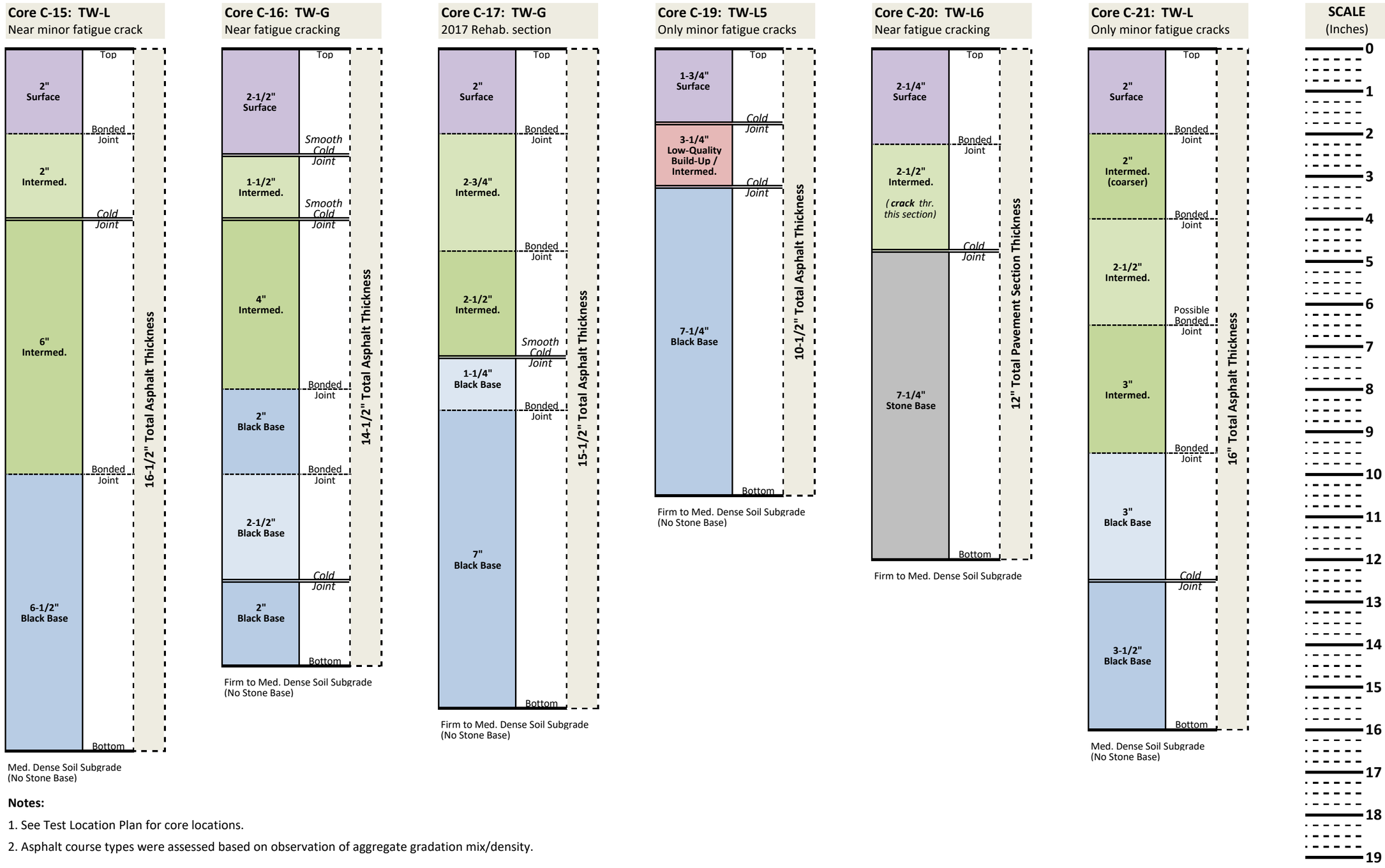
Notes:

1. See Test Location Plan for core locations.
2. Asphalt course types were assessed based on observation of aggregate gradation mix/density.

Figure 2B: Pavement Core Details (Page 2 of 2)

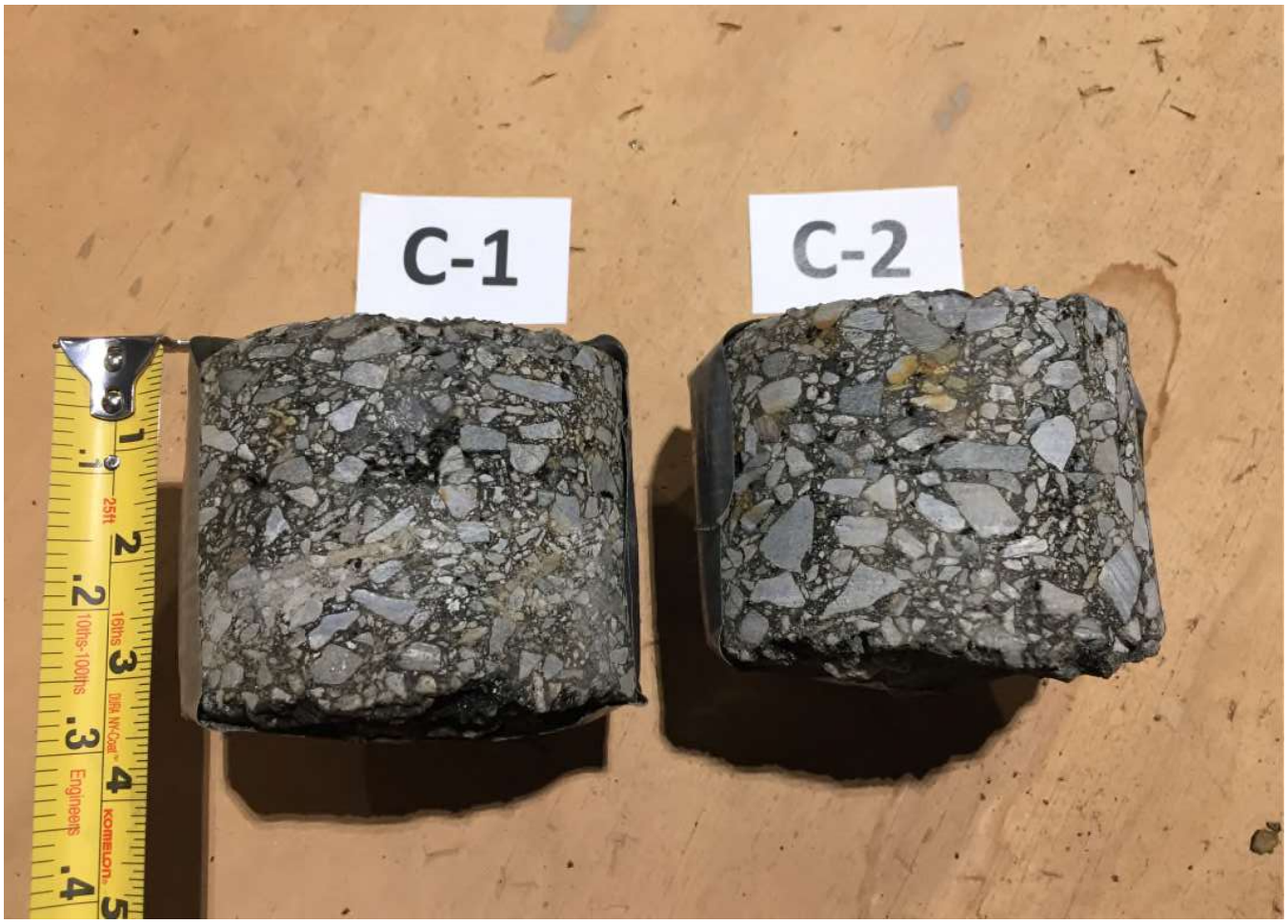
GSP International Airport - Taxiway Pavement Rehabilitation

S&ME Project No. 1569-20-052



Notes:

1. See Test Location Plan for core locations.
2. Asphalt course types were assessed based on observation of aggregate gradation mix/density.


C-1
C-2


C-3
C-4


C-5
C-8


C-6A
C-6B


C-7
C-7
middle
3¼ - 6½"


C-9


C-10
C-14


C-11

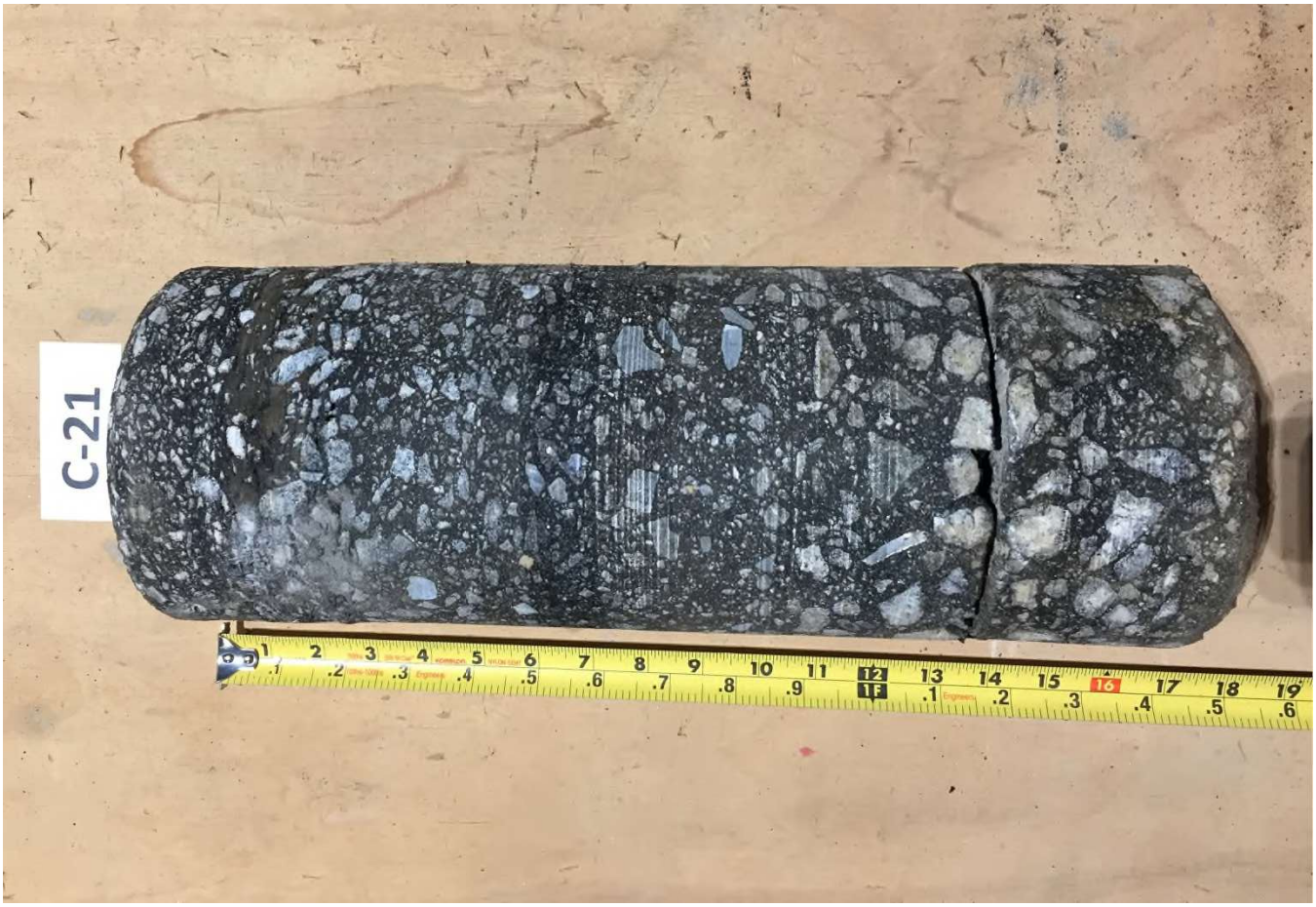

C-12


C-17


C-13


C-15

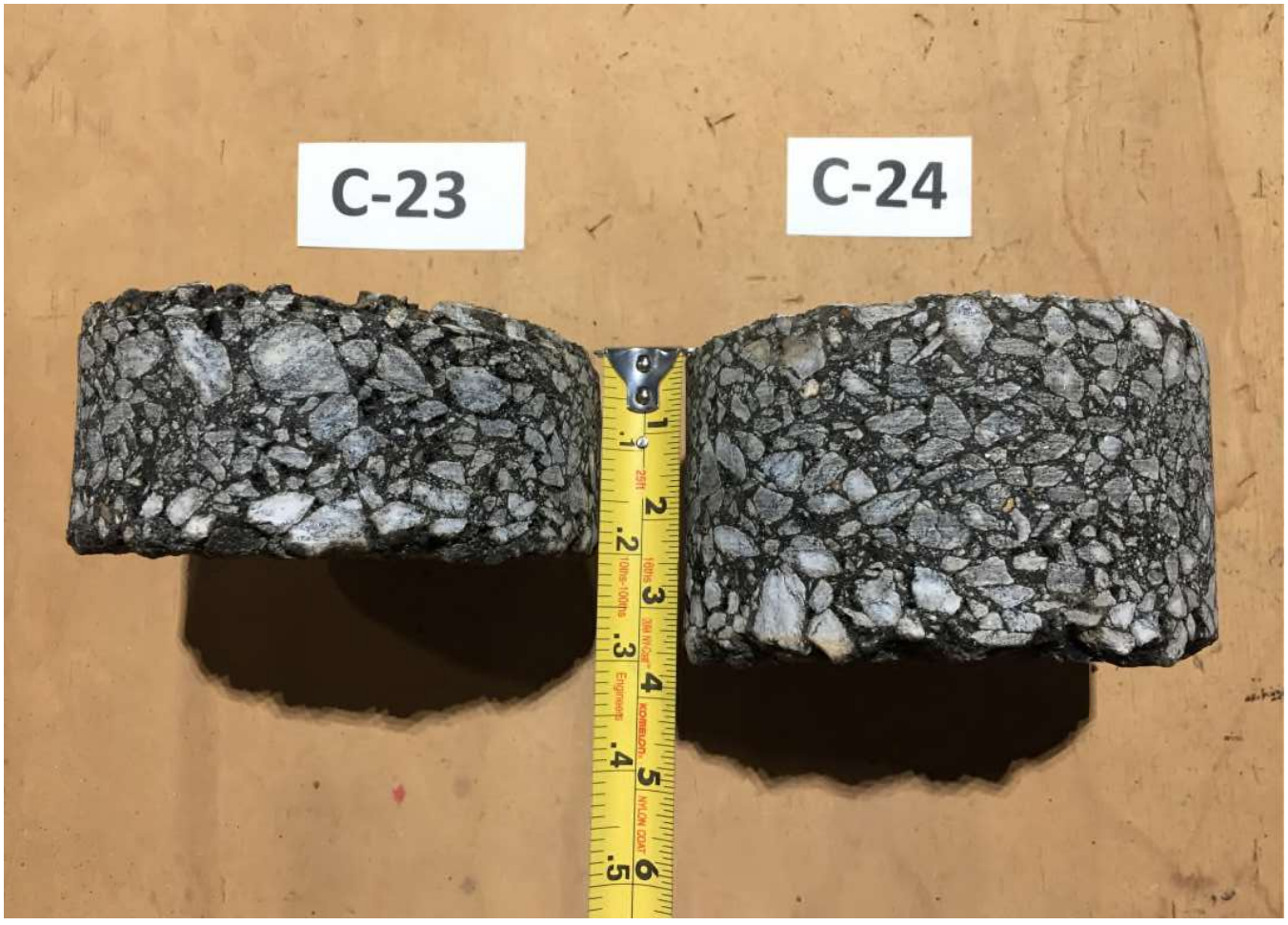

C-16


C-21


C-18
C-22


C-19


C-20A
C-20B


C-23
C-24


C-25
C-26

Kessler DCP Field Data Table

Project Name:	GSP Taxiway Pavement Rehabilitation
Project No.:	1569-20-052
Test Date:	6/29/2020
Test ID:	**C-1**
Asphalt Thickness (in.):	3-1/4
Stone Base Thickness (in.):	12-3/4
Total Pavement Thickness (in):	16

Depth[1] (in)	Number of Blows	Cumulative Penetration (mm)	Penetration Rate (mm/blow)	Hammer Blow Factor	DCP Index (mm/blow)	CBR[2] (%)	Subgrade Modulus, k [3] (pci)	Subgrade Elastic Modulus, E_{SG} [4] (psi)
16.0	-	406	-	-	-	-	-	-
18.0	3	457	16.9	1.0	16.9	12.3	202	18417
20.0	4	508	12.7	1.0	12.7	16.9	260	25419
22.0	3	559	16.9	1.0	16.9	12.3	202	18417
24.0	3	610	16.9	1.0	16.9	12.3	202	18417
26.0	2	660	25.4	1.0	25.4	7.8	142	11695
28.0	2	711	25.4	1.0	25.4	7.8	142	11695
30.0	3	762	16.9	1.0	16.9	12.3	202	18417
32.0	4	813	12.7	1.0	12.7	16.9	260	25419
34.0	5	864	10.2	1.0	10.2	21.8	316	32635
36.0	4	914	12.7	1.0	12.7	16.9	260	25419
38.0	3	965	16.9	1.0	16.9	12.3	202	18417
40.0	3	1016	16.9	1.0	16.9	12.3	202	18417
					Average	**13.5**	**216**	**20232**

Notes

1. Depth is referenced from top of existing pavement surface.
2. DCP-to-CBR correlations from Section 5-A and Table 1 of Kessler DCP User's Manual (dated Aug. 2014); function of DCP index and soil type.
3. CBR-to-Subgrade Modulus correlation based on Section 3.14.4.1 of FAA Advisory Circular 150/5320-6F (11/10/16): $k = 28.6926 \times CBR^{0.7788}$
4. Subgrade Modulus-to-Elastic Modulus correlation based on Section 3.14.4.1 of FAA Circular 150/5320-6F (11/10/16): $E_{SG} = 20.15 \times k^{1.284}$

Kessler DCP Field Data Table

Project Name:	GSP Taxiway Pavement Rehabilitation
Project No.:	1569-20-052
Test Date:	6/29/2020
Test ID:	**C-2**
Asphalt Thickness (in.):	3
Stone Base Thickness (in.):	11-1/2
Total Pavement Thickness (in):	14-1/2

Depth[(1)] (in)	Number of Blows	Cumulative Penetration (mm)	Penetration Rate (mm/blow)	Hammer Blow Factor	DCP Index (mm/blow)	CBR[(2)] (%)	Subgrade Modulus, k [(3)] (pci)	Subgrade Elastic Modulus, E_{SG} [(4)] (psi)
14.5	-	368	-	-	-	-	-	-
16.5	2	419	25.4	1.0	25.4	7.8	142	11695
18.5	4	470	12.7	1.0	12.7	16.9	260	25419
20.5	2	521	25.4	1.0	25.4	7.8	142	11695
22.5	2	572	25.4	1.0	25.4	7.8	142	11695
24.5	2	622	25.4	1.0	25.4	7.8	142	11695
26.5	4	673	12.7	1.0	12.7	16.9	260	25419
28.5	4	724	12.7	1.0	12.7	16.9	260	25419
30.5	4	775	12.7	1.0	12.7	16.9	260	25419
32.5	5	826	10.2	1.0	10.2	21.8	316	32635
34.5	4	876	12.7	1.0	12.7	16.9	260	25419
36.5	5	927	10.2	1.0	10.2	21.8	316	32635
38.5	6	978	8.5	1.0	8.5	26.7	370	40028
					Average	**15.5**	**239**	**23264**

Notes

1. Depth is referenced from top of existing pavement surface.
2. DCP-to-CBR correlations from Section 5-A and Table 1 of Kessler DCP User's Manual (dated Aug. 2014); function of DCP index and soil type.
3. CBR-to-Subgrade Modulus correlation based on Section 3.14.4.1 of FAA Advisory Circular 150/5320-6F (11/10/16): $k = 28.6926 \times CBR^{0.7788}$
4. Subgrade Modulus-to-Elastic Modulus correlation based on Section 3.14.4.1 of FAA Circular 150/5320-6F (11/10/16): $E_{SG} = 20.15 \times k^{1.284}$

Kessler DCP Field Data Table

Project Name: GSP Taxiway Pavement Rehabilitation
Project No.: 1569-20-052
Test Date: 6/29/2020
Test ID: **C-3**
Asphalt Thickness (in.): 3-1/2
Stone Base Thickness (in.): 11-1/2
Total Pavement Thickness (in): 15

Depth[1] (in)	Number of Blows	Cumulative Penetration (mm)	Penetration Rate (mm/blow)	Hammer Blow Factor	DCP Index (mm/blow)	CBR[2] (%)	Subgrade Modulus, k [3] (pci)	Subgrade Elastic Modulus, E_{SG} [4] (psi)
15.0	-	381	-	-	-	-	-	-
17.0	3	432	16.9	1.0	16.9	12.3	202	18417
19.0	2	483	25.4	1.0	25.4	7.8	142	11695
21.0	2	533	25.4	1.0	25.4	7.8	142	11695
23.0	2	584	25.4	1.0	25.4	7.8	142	11695
25.0	2	635	25.4	1.0	25.4	7.8	142	11695
27.0	2	686	25.4	1.0	25.4	7.8	142	11695
29.0	3	737	16.9	1.0	16.9	12.3	202	18417
31.0	3	787	16.9	1.0	16.9	12.3	202	18417
33.0	3	838	16.9	1.0	16.9	12.3	202	18417
35.0	4	889	12.7	1.0	12.7	16.9	260	25419
37.0	4	940	12.7	1.0	12.7	16.9	260	25419
39.0	2	991	25.4	1.0	25.4	7.8	142	11695
41.0	3	1041	16.9	1.0	16.9	12.3	202	18417
43.0	3	1092	16.9	1.0	16.9	12.3	202	18417
45.0	3	1143	16.9	1.0	16.9	12.3	202	18417
					Average	**11.1**	**186**	**16662**

Notes

1. Depth is referenced from top of existing pavement surface.
2. DCP-to-CBR correlations from Section 5-A and Table 1 of Kessler DCP User's Manual (dated Aug. 2014); function of DCP index and soil type.
3. CBR-to-Subgrade Modulus correlation based on Section 3.14.4.1 of FAA Advisory Circular 150/5320-6F (11/10/16): $k = 28.6926 \times CBR^{0.7788}$
4. Subgrade Modulus-to-Elastic Modulus correlation based on Section 3.14.4.1 of FAA Circular 150/5320-6F (11/10/16): $E_{SG} = 20.15 \times k^{1.284}$

Kessler DCP Field Data Table

Project Name:	GSP Taxiway Pavement Rehabilitation
Project No.:	1569-20-052
Test Date:	6/29/2020
Test ID:	**C-4**
Asphalt Thickness (in.):	3
Stone Base Thickness (in.):	12
Total Pavement Thickness (in):	15

Depth[(1)] (in)	Number of Blows	Cumulative Penetration (mm)	Penetration Rate (mm/blow)	Hammer Blow Factor	DCP Index (mm/blow)	CBR[(2)] (%)	Subgrade Modulus, k [(3)] (pci)	Subgrade Elastic Modulus, E_{SG} [(4)] (psi)
15.0	-	381	-	-	-	-	-	-
17.0	5	432	10.2	1.0	10.2	21.8	316	32635
19.0	3	483	16.9	1.0	16.9	12.3	202	18417
21.0	2	533	25.4	1.0	25.4	7.8	142	11695
23.0	2	584	25.4	1.0	25.4	7.8	142	11695
25.0	2	635	25.4	1.0	25.4	7.8	142	11695
27.0	2	686	25.4	1.0	25.4	7.8	142	11695
29.0	2	737	25.4	1.0	25.4	7.8	142	11695
31.0	4	787	12.7	1.0	12.7	16.9	260	25419
33.0	5	838	10.2	1.0	10.2	21.8	316	32635
35.0	6	889	8.5	1.0	8.5	26.7	370	40028
37.0	6	940	8.5	1.0	8.5	26.7	370	40028
39.0	5	991	10.2	1.0	10.2	21.8	316	32635
					Average	**15.6**	**238**	**23356**

Notes

1. Depth is referenced from top of existing pavement surface.
2. DCP-to-CBR correlations from Section 5-A and Table 1 of Kessler DCP User's Manual (dated Aug. 2014); function of DCP index and soil type.
3. CBR-to-Subgrade Modulus correlation based on Section 3.14.4.1 of FAA Advisory Circular 150/5320-6F (11/10/16): $k = 28.6926 \times CBR^{0.7788}$
4. Subgrade Modulus-to-Elastic Modulus correlation based on Section 3.14.4.1 of FAA Circular 150/5320-6F (11/10/16): $E_{SG} = 20.15 \times k^{1.284}$

Kessler DCP Field Data Table

Project Name:	GSP Taxiway Pavement Rehabilitation
Project No.:	1569-20-052
Test Date:	6/29/2020
Test ID:	**C-5**
Asphalt Thickness (in.):	3
Stone Base Thickness (in.):	11
Total Pavement Thickness (in):	14

Depth[1] (in)	Number of Blows	Cumulative Penetration (mm)	Penetration Rate (mm/blow)	Hammer Blow Factor	DCP Index (mm/blow)	CBR[2] (%)	Subgrade Modulus, k [3] (pci)	Subgrade Elastic Modulus, E_{SG} [4] (psi)
14.0	-	356	-	-	-	-	-	-
16.0	4	406	12.7	1.0	12.7	16.9	260	25419
18.0	3	457	16.9	1.0	16.9	12.3	202	18417
20.0	2	508	25.4	1.0	25.4	7.8	142	11695
22.0	2	559	25.4	1.0	25.4	7.8	142	11695
24.0	2	610	25.4	1.0	25.4	7.8	142	11695
26.0	2	660	25.4	1.0	25.4	7.8	142	11695
28.0	2	711	25.4	1.0	25.4	7.8	142	11695
30.0	3	762	16.9	1.0	16.9	12.3	202	18417
32.0	2	813	25.4	1.0	25.4	7.8	142	11695
34.0	3	864	16.9	1.0	16.9	12.3	202	18417
36.0	3	914	16.9	1.0	16.9	12.3	202	18417
38.0	3	965	16.9	1.0	16.9	12.3	202	18417
					Average	**10.4**	**177**	**15640**

Notes

1. Depth is referenced from top of existing pavement surface.
2. DCP-to-CBR correlations from Section 5-A and Table 1 of Kessler DCP User's Manual (dated Aug. 2014); function of DCP index and soil type.
3. CBR-to-Subgrade Modulus correlation based on Section 3.14.4.1 of FAA Advisory Circular 150/5320-6F (11/10/16): $k = 28.6926 \times CBR^{0.7788}$
4. Subgrade Modulus-to-Elastic Modulus correlation based on Section 3.14.4.1 of FAA Circular 150/5320-6F (11/10/16): $E_{SG} = 20.15 \times k^{1.284}$

Kessler DCP Field Data Table

Project Name:	GSP Taxiway Pavement Rehabilitation
Project No.:	1569-20-052
Test Date:	6/29/2020
Test ID:	**C-6**
Asphalt Thickness (in.):	18-3/4
Stone Base Thickness (in.):	0
Total Pavement Thickness (in):	18-3/4

Depth[1] (in)	Number of Blows	Cumulative Penetration (mm)	Penetration Rate (mm/blow)	Hammer Blow Factor	DCP Index (mm/blow)	CBR[2] (%)	Subgrade Modulus, k [3] (pci)	Subgrade Elastic Modulus, E_{SG} [4] (psi)
18.8	-	476	-	-	-	-	-	-
20.8	4	527	12.7	1.0	12.7	16.9	260	25419
22.8	11	578	4.6	1.0	4.6	52.6	628	78921
24.8	17	629	3.0	1.0	3.0	85.7	919	128508
26.8	28	679	1.8	1.0	1.8	149.8	1420	224719
28.8	26	730	2.0	1.0	2.0	137.9	1331	206821
30.8	11	781	4.6	1.0	4.6	52.6	628	78921
32.8	13	832	3.9	1.0	3.9	63.5	727	95159
34.8	20	883	2.5	1.0	2.5	102.8	1059	154163
36.8	16	933	3.2	1.0	3.2	80.1	871	120072
					Average	**82.4**	**871**	**123634**

Notes

1. Depth is referenced from top of existing pavement surface.
2. DCP-to-CBR correlations from Section 5-A and Table 1 of Kessler DCP User's Manual (dated Aug. 2014); function of DCP index and soil type.
3. CBR-to-Subgrade Modulus correlation based on Section 3.14.4.1 of FAA Advisory Circular 150/5320-6F (11/10/16): $k = 28.6926 \times CBR^{0.7788}$
4. Subgrade Modulus-to-Elastic Modulus correlation based on Section 3.14.4.1 of FAA Circular 150/5320-6F (11/10/16): $E_{SG} = 20.15 \times k^{1.284}$

Kessler DCP Field Data Table

Project Name:	GSP Taxiway Pavement Rehabilitation
Project No.:	1569-20-052
Test Date:	7/2/2020
Test ID:	**C-7**
Asphalt Thickness (in.):	15
Stone Base Thickness (in.):	0
Total Pavement Thickness (in):	15

Depth[(1)] (in)	Number of Blows	Cumulative Penetration (mm)	Penetration Rate (mm/blow)	Hammer Blow Factor	DCP Index (mm/blow)	CBR[(2)] (%)	Subgrade Modulus, k [(3)] (pci)	Subgrade Elastic Modulus, E_{SG} [(4)] (psi)
15.0	-	381	-	-	-	-	-	-
17.0	7	432	7.3	1.0	7.3	31.7	424	47572
19.0	7	483	7.3	1.0	7.3	31.7	424	47572
21.0	13	533	3.9	1.0	3.9	63.5	727	95159
23.0	13	584	3.9	1.0	3.9	63.5	727	95159
25.0	9	635	5.6	1.0	5.6	42.0	527	63036
27.0	9	686	5.6	1.0	5.6	42.0	527	63036
29.0	11	737	4.6	1.0	4.6	52.6	628	78921
31.0	5	787	10.2	1.0	10.2	21.8	316	32635
33.0	6	838	8.5	1.0	8.5	26.7	370	40028
35.0	5	889	10.2	1.0	10.2	21.8	316	32635
37.0	4	940	12.7	1.0	12.7	16.9	260	25419
39.0	5	991	10.2	1.0	10.2	21.8	316	32635
					Average	**36.3**	**464**	**54484**

Notes

1. Depth is referenced from top of existing pavement surface.
2. DCP-to-CBR correlations from Section 5-A and Table 1 of Kessler DCP User's Manual (dated Aug. 2014); function of DCP index and soil type.
3. CBR-to-Subgrade Modulus correlation based on Section 3.14.4.1 of FAA Advisory Circular 150/5320-6F (11/10/16): $k = 28.6926 \times CBR^{0.7788}$
4. Subgrade Modulus-to-Elastic Modulus correlation based on Section 3.14.4.1 of FAA Circular 150/5320-6F (11/10/16): $E_{SG} = 20.15 \times k^{1.284}$

Kessler DCP Field Data Table

Project Name:	GSP Taxiway Pavement Rehabilitation
Project No.:	1569-20-052
Test Date:	7/2/2020
Test ID:	**C-8**
Asphalt Thickness (in.):	6-1/4
Stone Base Thickness (in.):	10-3/4
Total Pavement Thickness (in):	17

Depth[(1)] (in)	Number of Blows	Cumulative Penetration (mm)	Penetration Rate (mm/blow)	Hammer Blow Factor	DCP Index (mm/blow)	CBR[(2)] (%)	Subgrade Modulus, k [(3)] (pci)	Subgrade Elastic Modulus, E_{SG} [(4)] (psi)
17.0	-	432	-	-	-	-	-	-
19.0	7	483	7.3	1.0	7.3	31.7	424	47572
21.0	15	533	3.4	1.0	3.4	74.5	824	111700
23.0	13	584	3.9	1.0	3.9	63.5	727	95159
25.0	17	635	3.0	1.0	3.0	85.7	919	128508
27.0	8	686	6.3	1.0	6.3	36.8	476	55245
29.0	3	737	16.9	1.0	16.9	12.3	202	18417
31.0	2	787	25.4	1.0	25.4	7.8	142	11695
33.0	2	838	25.4	1.0	25.4	7.8	142	11695
35.0	3	889	16.9	1.0	16.9	12.3	202	18417
37.0	3	940	16.9	1.0	16.9	12.3	202	18417
39.0	3	991	16.9	1.0	16.9	12.3	202	18417
41.0	3	1041	16.9	1.0	16.9	12.3	202	18417
					Average	**30.8**	**389**	**46138**

Notes

1. Depth is referenced from top of existing pavement surface.
2. DCP-to-CBR correlations from Section 5-A and Table 1 of Kessler DCP User's Manual (dated Aug. 2014); function of DCP index and soil type.
3. CBR-to-Subgrade Modulus correlation based on Section 3.14.4.1 of FAA Advisory Circular 150/5320-6F (11/10/16): $k = 28.6926 \times CBR^{0.7788}$
4. Subgrade Modulus-to-Elastic Modulus correlation based on Section 3.14.4.1 of FAA Circular 150/5320-6F (11/10/16): $E_{SG} = 20.15 \times k^{1.284}$

Kessler DCP Field Data Table

Project Name:	GSP Taxiway Pavement Rehabilitation
Project No.:	1569-20-052
Test Date:	7/2/2020
Test ID:	**C-9**
Asphalt Thickness (in.):	17
Stone Base Thickness (in.):	0
Total Pavement Thickness (in):	17

Depth[1] (in)	Number of Blows	Cumulative Penetration (mm)	Penetration Rate (mm/blow)	Hammer Blow Factor	DCP Index (mm/blow)	CBR[2] (%)	Subgrade Modulus, k [3] (pci)	Subgrade Elastic Modulus, E_{SG} [4] (psi)
17.0	-	432	-	-	-	-	-	-
19.0	6	483	8.5	1.0	8.5	26.7	370	40028
21.0	15	533	3.4	1.0	3.4	74.5	824	111700
23.0	20	584	2.5	1.0	2.5	102.8	1059	154163
25.0	23	635	2.2	1.0	2.2	120.2	1196	180285
27.0	18	686	2.8	1.0	2.8	91.4	966	137004
29.0	13	737	3.9	1.0	3.9	63.5	727	95159
31.0	18	787	2.8	1.0	2.8	91.4	966	137004
33.0	11	838	4.6	1.0	4.6	52.6	628	78921
35.0	6	889	8.5	1.0	8.5	26.7	370	40028
37.0	3	940	16.9	1.0	16.9	12.3	202	18417
39.0	4	991	12.7	1.0	12.7	16.9	260	25419
41.0	5	1041	10.2	1.0	10.2	21.8	316	32635
					Average	**58.4**	**657**	**87564**

Notes

1. Depth is referenced from top of existing pavement surface.
2. DCP-to-CBR correlations from Section 5-A and Table 1 of Kessler DCP User's Manual (dated Aug. 2014); function of DCP index and soil type.
3. CBR-to-Subgrade Modulus correlation based on Section 3.14.4.1 of FAA Advisory Circular 150/5320-6F (11/10/16): $k = 28.6926 \times CBR^{0.7788}$
4. Subgrade Modulus-to-Elastic Modulus correlation based on Section 3.14.4.1 of FAA Circular 150/5320-6F (11/10/16): $E_{SG} = 20.15 \times k^{1.284}$

Kessler DCP Field Data Table

Project Name:	GSP Taxiway Pavement Rehabilitation
Project No.:	1569-20-052
Test Date:	7/2/2020
Test ID:	**C-10**
Asphalt Thickness (in.):	6
Stone Base Thickness (in.):	5-3/4
Total Pavement Thickness (in):	11-3/4

Depth[(1)] (in)	Number of Blows	Cumulative Penetration (mm)	Penetration Rate (mm/blow)	Hammer Blow Factor	DCP Index (mm/blow)	CBR[(2)] (%)	Subgrade Modulus, k [(3)] (pci)	Subgrade Elastic Modulus, E_{SG} [(4)] (psi)
11.8	-	298	-	-	-	-	-	-
13.8	2	349	25.4	1.0	25.4	7.8	142	11695
15.8	2	400	25.4	1.0	25.4	7.8	142	11695
17.8	2	451	25.4	1.0	25.4	7.8	142	11695
19.8	3	502	16.9	1.0	16.9	12.3	202	18417
21.8	3	552	16.9	1.0	16.9	12.3	202	18417
23.8	3	603	16.9	1.0	16.9	12.3	202	18417
25.8	2	654	25.4	1.0	25.4	7.8	142	11695
27.8	3	705	16.9	1.0	16.9	12.3	202	18417
29.8	2	756	25.4	1.0	25.4	7.8	142	11695
31.8	2	806	25.4	1.0	25.4	7.8	142	11695
33.8	2	857	25.4	1.0	25.4	7.8	142	11695
35.8	2	908	25.4	1.0	25.4	7.8	142	11695
					Average	**9.3**	**162**	**13936**

Notes

1. Depth is referenced from top of existing pavement surface.
2. DCP-to-CBR correlations from Section 5-A and Table 1 of Kessler DCP User's Manual (dated Aug. 2014); function of DCP index and soil type.
3. CBR-to-Subgrade Modulus correlation based on Section 3.14.4.1 of FAA Advisory Circular 150/5320-6F (11/10/16): $k = 28.6926 \times CBR^{0.7788}$
4. Subgrade Modulus-to-Elastic Modulus correlation based on Section 3.14.4.1 of FAA Circular 150/5320-6F (11/10/16): $E_{SG} = 20.15 \times k^{1.284}$

Kessler DCP Field Data Table

Project Name:	GSP Taxiway Pavement Rehabilitation
Project No.:	1569-20-052
Test Date:	7/2/2020
Test ID:	**C-11**
Asphalt Thickness (in.):	16-1/2
Stone Base Thickness (in.):	0
Total Pavement Thickness (in):	16-1/2

Depth[(1)] (in)	Number of Blows	Cumulative Penetration (mm)	Penetration Rate (mm/blow)	Hammer Blow Factor	DCP Index (mm/blow)	CBR[(2)] (%)	Subgrade Modulus, k [(3)] (pci)	Subgrade Elastic Modulus, E_{SG} [(4)] (psi)
16.5	-	419	-	-	-	-	-	-
18.5	4	470	12.7	1.0	12.7	16.9	260	25419
20.5	6	521	8.5	1.0	8.5	26.7	370	40028
22.5	12	572	4.2	1.0	4.2	58.0	678	86999
24.5	13	622	3.9	1.0	3.9	63.5	727	95159
26.5	13	673	3.9	1.0	3.9	63.5	727	95159
28.5	11	724	4.6	1.0	4.6	52.6	628	78921
30.5	8	775	6.3	1.0	6.3	36.8	476	55245
32.5	15	826	3.4	1.0	3.4	74.5	824	111700
34.5	14	876	3.6	1.0	3.6	68.9	775	103394
36.5	6	927	8.5	1.0	8.5	26.7	370	40028
38.5	4	978	12.7	1.0	12.7	16.9	260	25419
40.5	4	1029	12.7	1.0	12.7	16.9	260	25419
					Average	**43.5**	**530**	**65241**

Notes

1. Depth is referenced from top of existing pavement surface.
2. DCP-to-CBR correlations from Section 5-A and Table 1 of Kessler DCP User's Manual (dated Aug. 2014); function of DCP index and soil type.
3. CBR-to-Subgrade Modulus correlation based on Section 3.14.4.1 of FAA Advisory Circular 150/5320-6F (11/10/16): $k = 28.6926 \times CBR^{0.7788}$
4. Subgrade Modulus-to-Elastic Modulus correlation based on Section 3.14.4.1 of FAA Circular 150/5320-6F (11/10/16): $E_{SG} = 20.15 \times k^{1.284}$

Kessler DCP Field Data Table

Project Name:	GSP Taxiway Pavement Rehabilitation
Project No.:	1569-20-052
Test Date:	7/2/2020
Test ID:	**C-12**
Asphalt Thickness (in.):	15
Stone Base Thickness (in.):	0
Total Pavement Thickness (in):	15

Depth[(1)] (in)	Number of Blows	Cumulative Penetration (mm)	Penetration Rate (mm/blow)	Hammer Blow Factor	DCP Index (mm/blow)	CBR[(2)] (%)	Subgrade Modulus, k [(3)] (pci)	Subgrade Elastic Modulus, E_{SG} [(4)] (psi)
15.0	-	381	-	-	-	-	-	-
17.0	4	432	12.7	1.0	12.7	16.9	260	25419
19.0	5	483	10.2	1.0	10.2	21.8	316	32635
21.0	6	533	8.5	1.0	8.5	26.7	370	40028
23.0	8	584	6.3	1.0	6.3	36.8	476	55245
25.0	6	635	8.5	1.0	8.5	26.7	370	40028
27.0	6	686	8.5	1.0	8.5	26.7	370	40028
29.0	12	737	4.2	1.0	4.2	58.0	678	86999
31.0	8	787	6.4	1.0	6.4	36.8	476	55245
33.0	5	838	10.2	1.0	10.2	21.8	316	32635
35.0	2	889	25.4	1.0	25.4	7.8	142	11695
37.0	2	940	25.4	1.0	25.4	7.8	142	11695
39.0	3	991	16.9	1.0	16.9	12.3	202	18417
					Average	**25.0**	**343**	**37506**

Notes

1. Depth is referenced from top of existing pavement surface.
2. DCP-to-CBR correlations from Section 5-A and Table 1 of Kessler DCP User's Manual (dated Aug. 2014); function of DCP index and soil type.
3. CBR-to-Subgrade Modulus correlation based on Section 3.14.4.1 of FAA Advisory Circular 150/5320-6F (11/10/16): $k = 28.6926 \times CBR^{0.7788}$
4. Subgrade Modulus-to-Elastic Modulus correlation based on Section 3.14.4.1 of FAA Circular 150/5320-6F (11/10/16): $E_{SG} = 20.15 \times k^{1.284}$

Kessler DCP Field Data Table

Project Name:	GSP Taxiway Pavement Rehabilitation
Project No.:	1569-20-052
Test Date:	7/6/2020
Test ID:	**C-13**
Asphalt Thickness (in.):	16-1/4
Stone Base Thickness (in.):	0
Total Pavement Thickness (in):	16-1/4

Depth[(1)] (in)	Number of Blows	Cumulative Penetration (mm)	Penetration Rate (mm/blow)	Hammer Blow Factor	DCP Index (mm/blow)	CBR[(2)] (%)	Subgrade Modulus, k [(3)] (pci)	Subgrade Elastic Modulus, E_{SG} [(4)] (psi)
16.3	-	413	-	-	-	-	-	-
18.3	8	464	6.3	1.0	6.3	36.8	476	55245
20.3	13	514	3.9	1.0	3.9	63.5	727	95159
22.3	15	565	3.4	1.0	3.4	74.5	824	111700
24.3	17	616	3.0	1.0	3.0	85.7	919	128508
26.3	11	667	4.6	1.0	4.6	52.6	628	78921
28.3	8	718	6.3	1.0	6.3	36.8	476	55245
30.3	8	768	6.3	1.0	6.3	36.8	476	55245
32.3	14	819	3.6	1.0	3.6	68.9	775	103394
34.3	9	870	5.6	1.0	5.6	42.0	527	63036
36.3	6	921	8.5	1.0	8.5	26.7	370	40028
38.3	5	972	10.2	1.0	10.2	21.8	316	32635
40.3	4	1022	12.7	1.0	12.7	16.9	260	25419
					Average	**46.9**	**565**	**70378**

Notes

1. Depth is referenced from top of existing pavement surface.
2. DCP-to-CBR correlations from Section 5-A and Table 1 of Kessler DCP User's Manual (dated Aug. 2014); function of DCP index and soil type.
3. CBR-to-Subgrade Modulus correlation based on Section 3.14.4.1 of FAA Advisory Circular 150/5320-6F (11/10/16): $k = 28.6926 \times CBR^{0.7788}$
4. Subgrade Modulus-to-Elastic Modulus correlation based on Section 3.14.4.1 of FAA Circular 150/5320-6F (11/10/16): $E_{SG} = 20.15 \times k^{1.284}$

Kessler DCP Field Data Table

Project Name:	GSP Taxiway Pavement Rehabilitation
Project No.:	1569-20-052
Test Date:	7/2/2020
Test ID:	**C-14**
Asphalt Thickness (in.):	9-3/4
Stone Base Thickness (in.):	0
Total Pavement Thickness (in):	9-3/4

Depth[(1)] (in)	Number of Blows	Cumulative Penetration (mm)	Penetration Rate (mm/blow)	Hammer Blow Factor	DCP Index (mm/blow)	CBR[(2)] (%)	Subgrade Modulus, k [(3)] (pci)	Subgrade Elastic Modulus, E_{SG} [(4)] (psi)
9.8	-	248	-	-	-	-	-	-
11.8	4	298	12.7	1.0	12.7	16.9	260	25419
13.8	3	349	16.9	1.0	16.9	12.3	202	18417
15.8	4	400	12.7	1.0	12.7	16.9	260	25419
17.8	5	451	10.2	1.0	10.2	21.8	316	32635
19.8	6	502	8.5	1.0	8.5	26.7	370	40028
21.8	5	552	10.2	1.0	10.2	21.8	316	32635
23.8	5	603	10.2	1.0	10.2	21.8	316	32635
25.8	5	654	10.2	1.0	10.2	21.8	316	32635
27.8	4	705	12.7	1.0	12.7	16.9	260	25419
29.8	4	756	12.7	1.0	12.7	16.9	260	25419
31.8	3	806	16.9	1.0	16.9	12.3	202	18417
33.8	4	857	12.7	1.0	12.7	16.9	260	25419
					Average	**18.6**	**278**	**27875**

Notes

1. Depth is referenced from top of existing pavement surface.
2. DCP-to-CBR correlations from Section 5-A and Table 1 of Kessler DCP User's Manual (dated Aug. 2014); function of DCP index and soil type.
3. CBR-to-Subgrade Modulus correlation based on Section 3.14.4.1 of FAA Advisory Circular 150/5320-6F (11/10/16): $k = 28.6926 \times CBR^{0.7788}$
4. Subgrade Modulus-to-Elastic Modulus correlation based on Section 3.14.4.1 of FAA Circular 150/5320-6F (11/10/16): $E_{SG} = 20.15 \times k^{1.284}$

Kessler DCP Field Data Table

Project Name:	GSP Taxiway Pavement Rehabilitation
Project No.:	1569-20-052
Test Date:	7/6/2020
Test ID:	**C-15**
Asphalt Thickness (in.):	16-1/2
Stone Base Thickness (in.):	0
Total Pavement Thickness (in):	16-1/2

Depth[(1)] (in)	Number of Blows	Cumulative Penetration (mm)	Penetration Rate (mm/blow)	Hammer Blow Factor	DCP Index (mm/blow)	CBR[(2)] (%)	Subgrade Modulus, k [(3)] (pci)	Subgrade Elastic Modulus, E_{SG} [(4)] (psi)
16.5	-	419	-	-	-	-	-	-
18.5	7	470	7.3	1.0	7.3	31.7	424	47572
20.5	11	521	4.6	1.0	4.6	52.6	628	78921
22.5	11	572	4.6	1.0	4.6	52.6	628	78921
24.5	10	622	5.1	1.0	5.1	47.3	578	70931
26.5	9	673	5.6	1.0	5.6	42.0	527	63036
28.5	12	724	4.2	1.0	4.2	58.0	678	86999
30.5	22	775	2.3	1.0	2.3	114.4	1150	171530
32.5	24	826	2.1	1.0	2.1	126.1	1241	189087
34.5	15	876	3.4	1.0	3.4	74.5	824	111700
36.5	5	927	10.2	1.0	10.2	21.8	316	32635
38.5	5	978	10.2	1.0	10.2	21.8	316	32635
40.5	4	1029	12.7	1.0	12.7	16.9	260	25419
					Average	**55.0**	**631**	**82449**

Notes

1. Depth is referenced from top of existing pavement surface.
2. DCP-to-CBR correlations from Section 5-A and Table 1 of Kessler DCP User's Manual (dated Aug. 2014); function of DCP index and soil type.
3. CBR-to-Subgrade Modulus correlation based on Section 3.14.4.1 of FAA Advisory Circular 150/5320-6F (11/10/16): $k = 28.6926 \times CBR^{0.7788}$
4. Subgrade Modulus-to-Elastic Modulus correlation based on Section 3.14.4.1 of FAA Circular 150/5320-6F (11/10/16): $E_{SG} = 20.15 \times k^{1.284}$

Kessler DCP Field Data Table

Project Name: GSP Taxiway Pavement Rehabilitation
Project No.: 1569-20-052
Test Date: 7/6/2020
Test ID: **C-16**
Asphalt Thickness (in.): 14-1/2
Stone Base Thickness (in.): 0
Total Pavement Thickness (in): 14-1/2

Depth[1] (in)	Number of Blows	Cumulative Penetration (mm)	Penetration Rate (mm/blow)	Hammer Blow Factor	DCP Index (mm/blow)	CBR[2] (%)	Subgrade Modulus, k [3] (pci)	Subgrade Elastic Modulus, E_{SG} [4] (psi)
14.5	-	368	-	-	-	-	-	-
16.5	5	419	10.2	1.0	10.2	21.8	316	32635
18.5	7	470	7.3	1.0	7.3	31.7	424	47572
20.5	6	521	8.5	1.0	8.5	26.7	370	40028
22.5	4	572	12.7	1.0	12.7	16.9	260	25419
24.5	7	622	7.3	1.0	7.3	31.7	424	47572
26.5	9	673	5.6	1.0	5.6	42.0	527	63036
28.5	8	724	6.4	1.0	6.4	36.8	476	55245
30.5	5	775	10.2	1.0	10.2	21.8	316	32635
32.5	4	826	12.7	1.0	12.7	16.9	260	25419
34.5	4	876	12.7	1.0	12.7	16.9	260	25419
36.5	5	927	10.2	1.0	10.2	21.8	316	32635
38.5	6	978	8.5	1.0	8.5	26.7	370	40028
					Average	**26.0**	**360**	**38970**

Notes

1. Depth is referenced from top of existing pavement surface.
2. DCP-to-CBR correlations from Section 5-A and Table 1 of Kessler DCP User's Manual (dated Aug. 2014); function of DCP index and soil type.
3. CBR-to-Subgrade Modulus correlation based on Section 3.14.4.1 of FAA Advisory Circular 150/5320-6F (11/10/16): $k = 28.6926 \times CBR^{0.7788}$
4. Subgrade Modulus-to-Elastic Modulus correlation based on Section 3.14.4.1 of FAA Circular 150/5320-6F (11/10/16): $E_{SG} = 20.15 \times k^{1.284}$

Kessler DCP Field Data Table

Project Name:	GSP Taxiway Pavement Rehabilitation
Project No.:	1569-20-052
Test Date:	7/6/2020
Test ID:	**C-17**
Asphalt Thickness (in.):	15-1/2
Stone Base Thickness (in.):	0
Total Pavement Thickness (in):	15-1/2

Depth[(1)] (in)	Number of Blows	Cumulative Penetration (mm)	Penetration Rate (mm/blow)	Hammer Blow Factor	DCP Index (mm/blow)	CBR[(2)] (%)	Subgrade Modulus, k [(3)] (pci)	Subgrade Elastic Modulus, E_{SG} [(4)] (psi)
15.5	-	394	-	-	-	-	-	-
17.5	5	445	10.2	1.0	10.2	21.8	316	32635
19.5	10	495	5.1	1.0	5.1	47.3	578	70931
21.5	9	546	5.6	1.0	5.6	42.0	527	63036
23.5	10	597	5.1	1.0	5.1	47.3	578	70931
25.5	13	648	3.9	1.0	3.9	63.5	727	95159
27.5	11	699	4.6	1.0	4.6	52.6	628	78921
29.5	10	749	5.1	1.0	5.1	47.3	578	70931
31.5	12	800	4.2	1.0	4.2	58.0	678	86999
33.5	8	851	6.4	1.0	6.4	36.8	476	55245
35.5	5	902	10.2	1.0	10.2	21.8	316	32635
37.5	10	953	5.1	1.0	5.1	47.3	578	70931
39.5	14	1003	3.6	1.0	3.6	68.9	775	103394
					Average	**46.2**	**563**	**69312**

Notes

1. Depth is referenced from top of existing pavement surface.
2. DCP-to-CBR correlations from Section 5-A and Table 1 of Kessler DCP User's Manual (dated Aug. 2014); function of DCP index and soil type.
3. CBR-to-Subgrade Modulus correlation based on Section 3.14.4.1 of FAA Advisory Circular 150/5320-6F (11/10/16): $k = 28.6926 \times CBR^{0.7788}$
4. Subgrade Modulus-to-Elastic Modulus correlation based on Section 3.14.4.1 of FAA Circular 150/5320-6F (11/10/16): $E_{SG} = 20.15 \times k^{1.284}$

Kessler DCP Field Data Table

Project Name:	GSP Taxiway Pavement Rehabilitation
Project No.:	1569-20-052
Test Date:	7/6/2020
Test ID:	**C-18**
Asphalt Thickness (in.):	6-1/2
Stone Base Thickness (in.):	4-3/4
Total Pavement Thickness (in):	11-1/4

Depth[(1)] (in)	Number of Blows	Cumulative Penetration (mm)	Penetration Rate (mm/blow)	Hammer Blow Factor	DCP Index (mm/blow)	CBR[(2)] (%)	Subgrade Modulus, k [(3)] (pci)	Subgrade Elastic Modulus, E_{SG} [(4)] (psi)
11.3	-	286	-	-	-	-	-	-
13.3	1	337	50.8	1.0	50.8	3.6	78	5381
15.3	1	387	50.8	1.0	50.8	3.6	78	5381
17.3	2	438	25.4	1.0	25.4	7.8	142	11695
19.3	3	489	16.9	1.0	16.9	12.3	202	18417
21.3	2	540	25.4	1.0	25.4	7.8	142	11695
23.3	2	591	25.4	1.0	25.4	7.8	142	11695
25.3	2	641	25.4	1.0	25.4	7.8	142	11695
27.3	3	692	16.9	1.0	16.9	12.3	202	18417
29.3	3	743	16.9	1.0	16.9	12.3	202	18417
31.3	3	794	16.9	1.0	16.9	12.3	202	18417
33.3	4	845	12.7	1.0	12.7	16.9	260	25419
35.3	4	895	12.7	1.0	12.7	16.9	260	25419
					Average	**10.1**	**171**	**15171**

Notes

1. Depth is referenced from top of existing pavement surface.
2. DCP-to-CBR correlations from Section 5-A and Table 1 of Kessler DCP User's Manual (dated Aug. 2014); function of DCP index and soil type.
3. CBR-to-Subgrade Modulus correlation based on Section 3.14.4.1 of FAA Advisory Circular 150/5320-6F (11/10/16): $k = 28.6926 \times CBR^{0.7788}$
4. Subgrade Modulus-to-Elastic Modulus correlation based on Section 3.14.4.1 of FAA Circular 150/5320-6F (11/10/16): $E_{SG} = 20.15 \times k^{1.284}$

Kessler DCP Field Data Table

Project Name:	GSP Taxiway Pavement Rehabilitation
Project No.:	1569-20-052
Test Date:	7/8/2020
Test ID:	**C-20B**
Asphalt Thickness (in.):	4-3/4
Stone Base Thickness (in.):	7-1/4
Total Pavement Thickness (in):	12

Depth[1] (in)	Number of Blows	Cumulative Penetration (mm)	Penetration Rate (mm/blow)	Hammer Blow Factor	DCP Index (mm/blow)	CBR[2] (%)	Subgrade Modulus, k [3] (pci)	Subgrade Elastic Modulus, E_{SG} [4] (psi)
12.0	-	305	-	-	-	-	-	-
14.0	4	356	12.7	1.0	12.7	16.9	260	25419
16.0	3	406	16.9	1.0	16.9	12.3	202	18417
18.0	4	457	12.7	1.0	12.7	16.9	260	25419
20.0	5	508	10.2	1.0	10.2	21.8	316	32635
22.0	4	559	12.7	1.0	12.7	16.9	260	25419
24.0	4	610	12.7	1.0	12.7	16.9	260	25419
26.0	3	660	16.9	1.0	16.9	12.3	202	18417
28.0	4	711	12.7	1.0	12.7	16.9	260	25419
30.0	4	762	12.7	1.0	12.7	16.9	260	25419
32.0	25	813	2.0	1.0	2.0	132.0	1286	197933
Kessler DCP refusal at 32 inches deep; Refusal in initial hole (C-20A) occurred at 15.5 inches deep.								
					Average	**28.0**	**357**	**41991**

Notes

1. Depth is referenced from top of existing pavement surface.
2. DCP-to-CBR correlations from Section 5-A and Table 1 of Kessler DCP User's Manual (dated Aug. 2014); function of DCP index and soil type.
3. CBR-to-Subgrade Modulus correlation based on Section 3.14.4.1 of FAA Advisory Circular 150/5320-6F (11/10/16): $k = 28.6926 \times CBR^{0.7788}$
4. Subgrade Modulus-to-Elastic Modulus correlation based on Section 3.14.4.1 of FAA Circular 150/5320-6F (11/10/16): $E_{SG} = 20.15 \times k^{1.284}$

Kessler DCP Field Data Table

Project Name:	GSP Taxiway Pavement Rehabilitation
Project No.:	1569-20-052
Test Date:	7/8/2020
Test ID:	**C-21**
Asphalt Thickness (in.):	16
Stone Base Thickness (in.):	0
Total Pavement Thickness (in):	16

Depth[(1)] (in)	Number of Blows	Cumulative Penetration (mm)	Penetration Rate (mm/blow)	Hammer Blow Factor	DCP Index (mm/blow)	CBR[(2)] (%)	Subgrade Modulus, k [(3)] (pci)	Subgrade Elastic Modulus, E_{SG} [(4)] (psi)
16.0	-	406	-	-	-	-	-	-
18.0	5	457	10.2	1.0	10.2	21.8	316	32635
20.0	4	508	12.7	1.0	12.7	16.9	260	25419
22.0	12	559	4.2	1.0	4.2	58.0	678	86999
24.0	31	610	1.6	1.0	1.6	167.9	1551	251853
26.0	20	660	2.5	1.0	2.5	102.8	1059	154163
28.0	11	711	4.6	1.0	4.6	52.6	628	78921
30.0	8	762	6.4	1.0	6.4	36.8	476	55245
32.0	9	813	5.6	1.0	5.6	42.0	527	63036
34.0	6	864	8.5	1.0	8.5	26.7	370	40028
36.0	5	914	10.2	1.0	10.2	21.8	316	32635
38.0	5	965	10.2	1.0	10.2	21.8	316	32635
40.0	5	1016	10.2	1.0	10.2	21.8	316	32635
					Average	**49.2**	**568**	**73850**

Notes

1. Depth is referenced from top of existing pavement surface.
2. DCP-to-CBR correlations from Section 5-A and Table 1 of Kessler DCP User's Manual (dated Aug. 2014); function of DCP index and soil type.
3. CBR-to-Subgrade Modulus correlation based on Section 3.14.4.1 of FAA Advisory Circular 150/5320-6F (11/10/16): $k = 28.6926 \times CBR^{0.7788}$
4. Subgrade Modulus-to-Elastic Modulus correlation based on Section 3.14.4.1 of FAA Circular 150/5320-6F (11/10/16): $E_{SG} = 20.15 \times k^{1.284}$

Kessler DCP Field Data Table

Project Name:	GSP Taxiway Pavement Rehabilitation
Project No.:	1569-20-052
Test Date:	7/8/2020
Test ID:	**C-22**
Asphalt Thickness (in.):	2-3/4
Stone Base Thickness (in.):	8-3/4
Total Pavement Thickness (in):	11-1/2

Depth[(1)] (in)	Number of Blows	Cumulative Penetration (mm)	Penetration Rate (mm/blow)	Hammer Blow Factor	DCP Index (mm/blow)	CBR[(2)] (%)	Subgrade Modulus, k [(3)] (pci)	Subgrade Elastic Modulus, E_{SG} [(4)] (psi)
11.5	-	292	-	-	-	-	-	-
13.5	3	343	16.9	1.0	16.9	12.3	202	18417
15.5	3	394	16.9	1.0	16.9	12.3	202	18417
17.5	5	445	10.2	1.0	10.2	21.8	316	32635
19.5	4	495	12.7	1.0	12.7	16.9	260	25419
21.5	4	546	12.7	1.0	12.7	16.9	260	25419
23.5	7	597	7.3	1.0	7.3	31.7	424	47572
25.5	7	648	7.3	1.0	7.3	31.7	424	47572
27.5	9	699	5.6	1.0	5.6	42.0	527	63036
29.5	10	749	5.1	1.0	5.1	47.3	578	70931
31.5	6	800	8.5	1.0	8.5	26.7	370	40028
33.5	6	851	8.5	1.0	8.5	26.7	370	40028
35.5	6	902	8.5	1.0	8.5	26.7	370	40028
					Average	**26.1**	**359**	**39125**

Notes

1. Depth is referenced from top of existing pavement surface.
2. DCP-to-CBR correlations from Section 5-A and Table 1 of Kessler DCP User's Manual (dated Aug. 2014); function of DCP index and soil type.
3. CBR-to-Subgrade Modulus correlation based on Section 3.14.4.1 of FAA Advisory Circular 150/5320-6F (11/10/16): $k = 28.6926 \times CBR^{0.7788}$
4. Subgrade Modulus-to-Elastic Modulus correlation based on Section 3.14.4.1 of FAA Circular 150/5320-6F (11/10/16): $E_{SG} = 20.15 \times k^{1.284}$

Kessler DCP Field Data Table

Project Name:	GSP Taxiway Pavement Rehabilitation
Project No.:	1569-20-052
Test Date:	7/8/2020
Test ID:	**C-23**
Asphalt Thickness (in.):	2-1/2
Stone Base Thickness (in.):	9
Total Pavement Thickness (in):	11-1/2

Depth[1] (in)	Number of Blows	Cumulative Penetration (mm)	Penetration Rate (mm/blow)	Hammer Blow Factor	DCP Index (mm/blow)	CBR[2] (%)	Subgrade Modulus, k [3] (pci)	Subgrade Elastic Modulus, E_{SG} [4] (psi)
11.5	-	292	-	-	-	-	-	-
13.5	4	343	12.7	1.0	12.7	16.9	260	25419
15.5	9	394	5.6	1.0	5.6	42.0	527	63036
17.5	24	445	2.1	1.0	2.1	126.1	1241	189087
19.5	25	495	2.0	1.0	2.0	132.0	1286	197933
21.5	21	546	2.4	1.0	2.4	108.6	1105	162822
23.5	24	597	2.1	1.0	2.1	126.1	1241	189087
25.5	37	648	1.4	1.0	1.4	204.7	1810	307048
Kessler DCP refusal at 25.5 inches deep.								
					Average	**108.1**	**1067**	**162061**

Notes

1. Depth is referenced from top of existing pavement surface.
2. DCP-to-CBR correlations from Section 5-A and Table 1 of Kessler DCP User's Manual (dated Aug. 2014); function of DCP index and soil type.
3. CBR-to-Subgrade Modulus correlation based on Section 3.14.4.1 of FAA Advisory Circular 150/5320-6F (11/10/16): $k = 28.6926 \times CBR^{0.7788}$
4. Subgrade Modulus-to-Elastic Modulus correlation based on Section 3.14.4.1 of FAA Circular 150/5320-6F (11/10/16): $E_{SG} = 20.15 \times k^{1.284}$

Kessler DCP Field Data Table

Project Name:	GSP Taxiway Pavement Rehabilitation
Project No.:	1569-20-052
Test Date:	7/8/2020
Test ID:	**C-24**
Asphalt Thickness (in.):	3-1/2
Stone Base Thickness (in.):	8-1/4
Total Pavement Thickness (in):	11-3/4

Depth[(1)] (in)	Number of Blows	Cumulative Penetration (mm)	Penetration Rate (mm/blow)	Hammer Blow Factor	DCP Index (mm/blow)	CBR[(2)] (%)	Subgrade Modulus, k [(3)] (pci)	Subgrade Elastic Modulus, E_{SG} [(4)] (psi)
11.8	-	298	-	-	-	-	-	-
13.8	7	349	7.3	1.0	7.3	31.7	424	47572
15.8	7	400	7.3	1.0	7.3	31.7	424	47572
17.8	6	451	8.5	1.0	8.5	26.7	370	40028
19.8	12	502	4.2	1.0	4.2	58.0	678	86999
21.8	7	552	7.3	1.0	7.3	31.7	424	47572
23.8	4	603	12.7	1.0	12.7	16.9	260	25419
25.8	3	654	16.9	1.0	16.9	12.3	202	18417
27.8	3	705	16.9	1.0	16.9	12.3	202	18417
29.8	5	756	10.2	1.0	10.2	21.8	316	32635
31.8	4	806	12.7	1.0	12.7	16.9	260	25419
33.8	4	857	12.7	1.0	12.7	16.9	260	25419
35.8	3	908	16.9	1.0	16.9	12.3	202	18417
					Average	**24.1**	**335**	**36157**

Notes

1. Depth is referenced from top of existing pavement surface.
2. DCP-to-CBR correlations from Section 5-A and Table 1 of Kessler DCP User's Manual (dated Aug. 2014); function of DCP index and soil type.
3. CBR-to-Subgrade Modulus correlation based on Section 3.14.4.1 of FAA Advisory Circular 150/5320-6F (11/10/16): $k = 28.6926 \times CBR^{0.7788}$
4. Subgrade Modulus-to-Elastic Modulus correlation based on Section 3.14.4.1 of FAA Circular 150/5320-6F (11/10/16): $E_{SG} = 20.15 \times k^{1.284}$

Kessler DCP Field Data Table

Project Name:	GSP Taxiway Pavement Rehabilitation
Project No.:	1569-20-052
Test Date:	7/8/2020
Test ID:	**C-25**
Asphalt Thickness (in.):	3-3/4
Stone Base Thickness (in.):	11-1/4
Total Pavement Thickness (in):	15

Depth[1] (in)	Number of Blows	Cumulative Penetration (mm)	Penetration Rate (mm/blow)	Hammer Blow Factor	DCP Index (mm/blow)	CBR[2] (%)	Subgrade Modulus, k [3] (pci)	Subgrade Elastic Modulus, E_{SG} [4] (psi)
15.0	-	381	-	-	-	-	-	-
15.5	25	394	0.5	1.0	0.5	623.5	4309	934998
Kessler DCP refusal at 15.5 inches deep.								
					Average	**623.5**	**4309**	**934998**

Notes

1. Depth is referenced from top of existing pavement surface.
2. DCP-to-CBR correlations from Section 5-A and Table 1 of Kessler DCP User's Manual (dated Aug. 2014); function of DCP index and soil type.
3. CBR-to-Subgrade Modulus correlation based on Section 3.14.4.1 of FAA Advisory Circular 150/5320-6F (11/10/16): $k = 28.6926 \times CBR^{0.7788}$
4. Subgrade Modulus-to-Elastic Modulus correlation based on Section 3.14.4.1 of FAA Circular 150/5320-6F (11/10/16): $E_{SG} = 20.15 \times k^{1.284}$

Kessler DCP Field Data Table

Project Name:	GSP Taxiway Pavement Rehabilitation
Project No.:	1569-20-052
Test Date:	7/8/2020
Test ID:	**C-26**
Asphalt Thickness (in.):	3-1/4
Stone Base Thickness (in.):	10-1/2
Total Pavement Thickness (in):	13-3/4

Depth[(1)] (in)	Number of Blows	Cumulative Penetration (mm)	Penetration Rate (mm/blow)	Hammer Blow Factor	DCP Index (mm/blow)	CBR[(2)] (%)	Subgrade Modulus, k [(3)] (pci)	Subgrade Elastic Modulus, E_{SG} [(4)] (psi)
13.8	-	349	-	-	-	-	-	-
15.8	5	400	10.2	1.0	10.2	21.8	316	32635
17.8	4	451	12.7	1.0	12.7	16.9	260	25419
19.8	4	502	12.7	1.0	12.7	16.9	260	25419
21.8	3	552	16.9	1.0	16.9	12.3	202	18417
23.8	2	603	25.4	1.0	25.4	7.8	142	11695
25.8	3	654	16.9	1.0	16.9	12.3	202	18417
27.8	4	705	12.7	1.0	12.7	16.9	260	25419
29.8	4	756	12.7	1.0	12.7	16.9	260	25419
31.8	5	806	10.2	1.0	10.2	21.8	316	32635
33.8	12	857	4.2	1.0	4.2	58.0	678	86999
35.8	7	908	7.3	1.0	7.3	31.7	424	47572
37.8	6	959	8.5	1.0	8.5	26.7	370	40028
39.8	7	1010	7.3	1.0	7.3	31.7	424	47572
41.8	8	1060	6.4	1.0	6.4	36.8	476	55245
					Average	**23.5**	**328**	**35206**

Notes

1. Depth is referenced from top of existing pavement surface.
2. DCP-to-CBR correlations from Section 5-A and Table 1 of Kessler DCP User's Manual (dated Aug. 2014); function of DCP index and soil type.
3. CBR-to-Subgrade Modulus correlation based on Section 3.14.4.1 of FAA Advisory Circular 150/5320-6F (11/10/16): $k = 28.6926 \times CBR^{0.7788}$
4. Subgrade Modulus-to-Elastic Modulus correlation based on Section 3.14.4.1 of FAA Circular 150/5320-6F (11/10/16): $E_{SG} = 20.15 \times k^{1.284}$

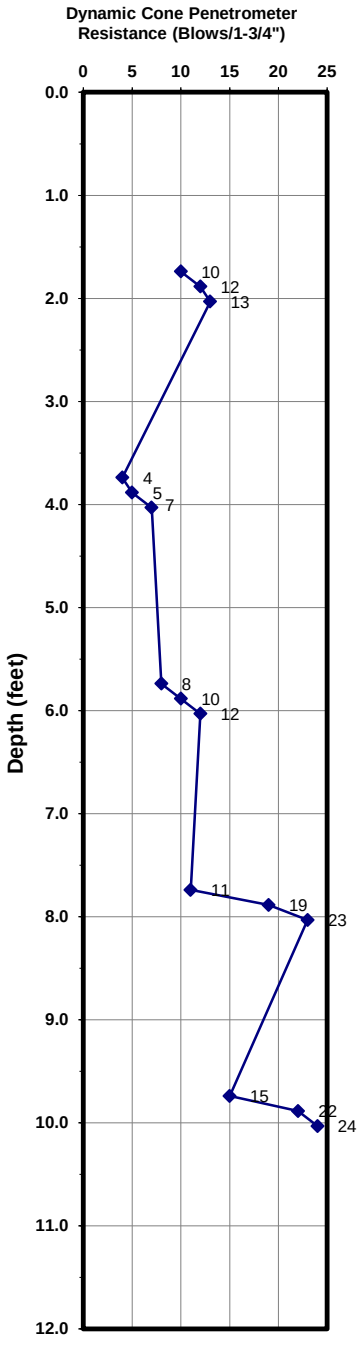
PROJECT:	**GSP Airport - Taxiway Pavement Rehabilitation** **Greer, Spartanburg County, South Carolina** **S&ME Project No. 1569-20-052**	**BORING LOG:**	**C-19**

DATE PERFORMED: **7/6/2020** PERFORMED BY: **J. Gathro** LATITUDE: **N 34.899217°** LONGITUDE: **W-82.213165°**	ELEVATION: **951 feet** BORING DEPTH: **10 feet** WATER LEVEL: **Not Encountered at TOB**	NOTES: **Ground surface elevation and Lat./Long. coordinates estimated from Google Earth (and should be considered approximate). Dynamic Cone Penetrometer Testing performed in general accordance with ASTM STP-399.**

HAND AUGER / DYNAMIC CONE PENETROMETER SOUNDING RECORD

DEPTH (FEET)	DESCRIPTION
0 - 10.5"	**Asphalt Pavement** - 10.5 inches (see Pavement Core Details for additional information)
10.5" - 2.5 ft	**FILL:** Silty Sand (SM) - medium dense, brown and red, medium to fine
2.5 ft - 3.0 ft	**FILL:** Sandy Silt (ML) - stiff, brown and red, medium to fine
3.0 ft - 4.5 ft	**FILL:** Silty Sand (SM) - loose, brown and red, medium to fine
4.5 ft - 6.5 ft	**FILL:** Sandy Silt (ML) - firm to stiff, brown and red, medium to fine
6.5 ft - 10 ft	**RESIDUUM**: Clayey Sand (SC) - loose to medium dense, red and yellowish brown, medium to fine, slightly moist

Hand auger terminated at a depth of 10.0 feet



48 Brookfield Oaks Drive, Suite F
Greenville, South Carolina 29607
Phone: (864) 297-9944

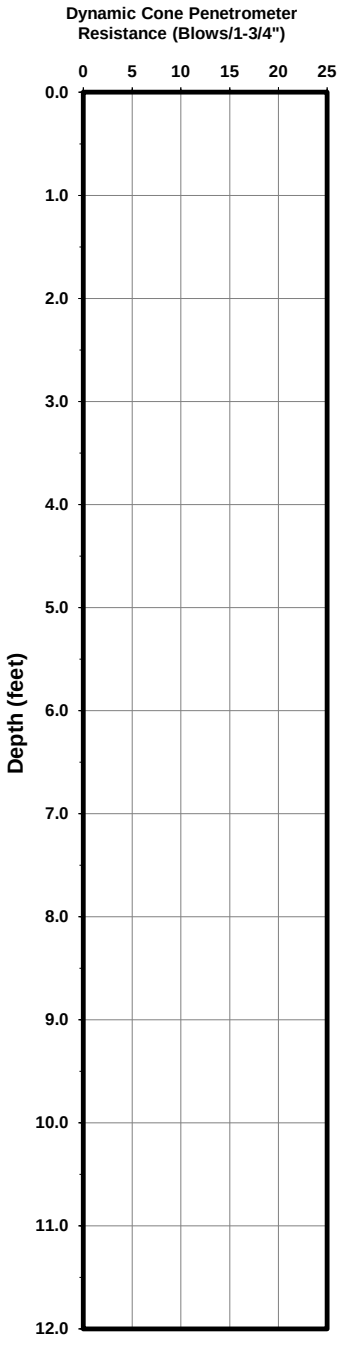
PROJECT:	**GSP Airport - Taxiway Pavement Rehabilitation** **Greer, Spartanburg County, South Carolina** **S&ME Project No. 1569-20-052**	**BORING LOG:**	**C-20**

DATE PERFORMED: **7/8/2020**	ELEVATION: **958 feet**	NOTES: **Ground surface elevation and Lat./Long. coordinates estimated from Google Earth (and should be considered approximate). Kessler DCP performed instead of Dynamic Cone Penetrometer Testing.**
PERFORMED BY: **J. Gathro**	BORING DEPTH: **10 feet**	
LATITUDE: **N 34.901505°**	WATER LEVEL: **Not Encountered at TOB**	
LONGITUDE: **W-82.211362°**		

HAND AUGER / DYNAMIC CONE PENETROMETER SOUNDING RECORD

DEPTH (FEET)	DESCRIPTION
0 - 12"	**Pavement Section** - 4.75 inches Asphalt, 7.25 inches Stone Base (see Pavement Core Details for additional information)
12" - 2.5 ft	**RESIDUUM:** Clay (CL) - firm, red brown (see Kessler DCP Data Report)
2.5 ft - 2.7 ft	**PWR:** Silty Sand (SM) - very dense, brown, fine to coarse

Hand auger terminated upon refusal at a depth of 2.7 ft;
Offset 10 ft and attempted another boring, but it also refused at 1.3 ft



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Greenville, South Carolina 29607
Phone: (864) 297-9944

APPENDIX II

LABORATORY TESTING

Summary of Laboratory Test Data

Laboratory Test Reports (12)

S&ME, Inc.
48 Brookfield Oaks Drive, Suite F
Greenville, SC 29607
864.297.9944

SUMMARY OF LABORATORY TEST DATA

GSP Airport - Taxiway Pavement Rehabilitation
Greer, Spartanburg County, South Carolina
S&ME Project No. 1569-20-052

Label	Sample ID	Sample Depth (feet)	Percent Finer #200 Sieve (%)	Atterberg Limits			Modified Proctor		CBR (%)	USCS Symbol	Soil Description
				LL (%)	PL (%)	PI (%)	MDD (pcf)	OMC (%)			
"SM"	Bulk #1	0 -2	40	27	21	6	124.4	11.0	8.5	SC-SM	Silty Clayey SAND [Residuum / Fill]
"Sub-base"	Bulk #2	0-1	30	16	12	4	133.0	6.8	6.3	SC-SM	Silty Clayey SAND [Fill]
"CL/ML"	Bulk #3	0 - 2	56	34	20	14	117.4	13.0	13.3	CL	Sandy Lean CLAY [Residuum / Fill]
TOTAL QUANTITIES:			3	3			3		3		

Notes:

LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index

MDD = Maximum Dry Density
OMC = Optimum Moisture Content
pcf = pounds per cubic foot

USCS = Unified Soil Classification System
CBR = California Bearing Ratio
Note: CBR tests remolded to approx. 95% (SC-SM) to 90% (CL) of *Modified* Proctor maximum dry density, at +2% above OMC, and soaked for 96 hours prior to testing. *% Swell* of the CBR specimens (after soaking) was 0.4% or less.

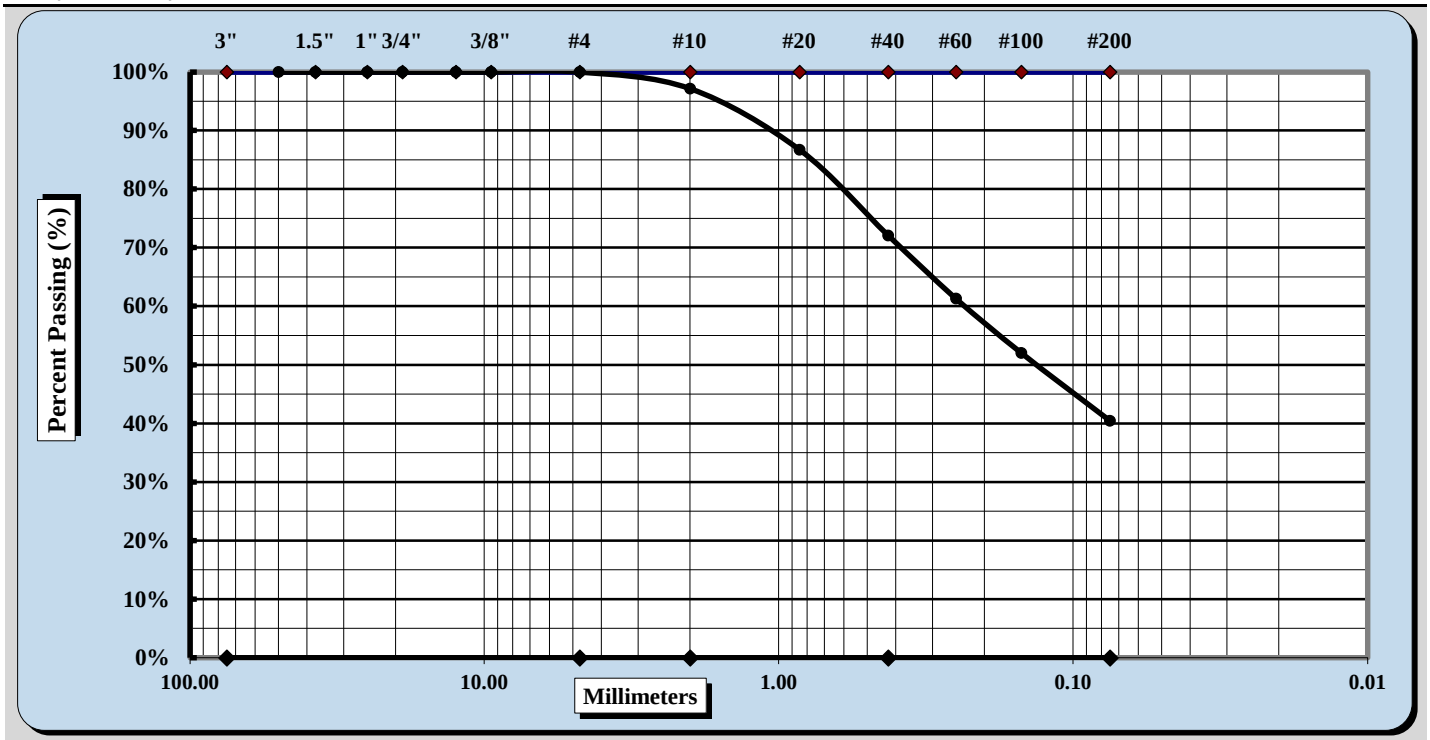
Form No: TR-D422-WH-1Ga
Revision No. 1
Revision Date: 8/10/17

SIEVE ANALYSIS OF SOILS

ASTM D 422

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1569-20-052	Report Date:	7/22/20
Project Name:	GSP Airport - Taxiway Pavement Coring	Test Date(s):	7/18 - 7/22/20
Client Name:	GSP Airport District		
Client Address:	2000 GSP Drive, Suite 1 Greer, SC 29651		
Boring #:	Multiple	Log #: 79g	Sample Date: 6/29 - 7/08/20
Location:	"SM"	Type: Bulk	Depth: 0 - 2'
Sample Description:	SILTY CLAYEY SAND (SC-SM) - brown red, medium to fine, micaceous		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	4.75 mm	Coarse Sand	2.9%	Fine Sand	31.7%
Gravel	0.0%	Medium Sand	25.0%	Silt & Clay	40.4%
Liquid Limit	27	Plastic Limit	21	Plastic Index	6
Specific Gravity	2.600			Moisture Content	N/A
Coarse Sand	2.9%	Medium Sand	25.0%	Fine Sand	31.7%

Description of Sand & Gravel Particles: Rounded ☐ Angular ☒
Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Notes / Deviations / References:

Brian Vaughan, P.E. — *Technical Responsibility*
Brian Vaughan — *Signature*
Group Leader — *Position*
7/22/20 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

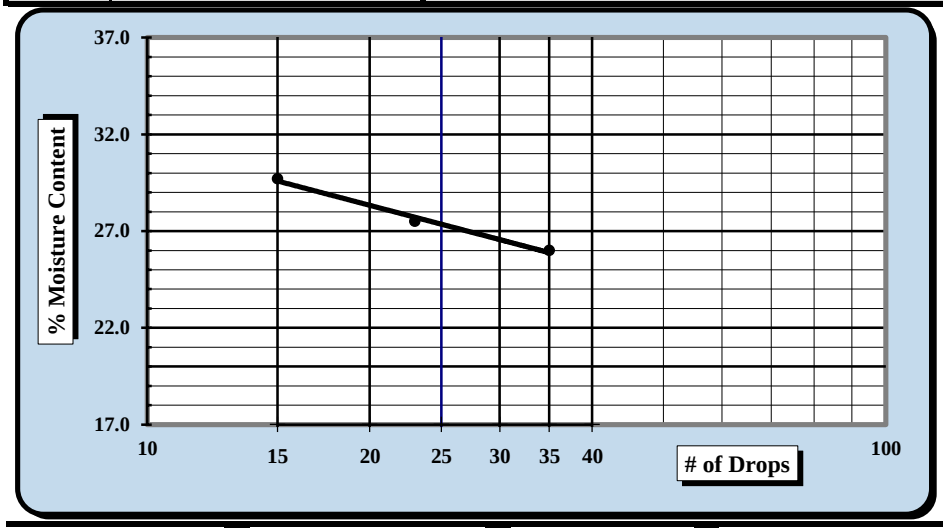
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1569-10-052	Report Date:	7/22/20
Project Name:	GSP Airport - Taxiway Pavement Coring	Test Date:	7/21/20
Client Name:	GSP Airport District		
Client Address:	2000 GSP Drive, Suite 1 Greer, SC 29651		

Boring #:	Multiple	Log #:	79g	Sample Date:	6/29 - 7/08/20
Location:	"SM"	Type:	Bulk	Depth:	0 - 2'
Sample Description:	SILTY CLAYEY SAND (SC-SM) - brown red, medium to fine, micaceous				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	9/10/2019	Grooving tool	23119	10/15/2019
LL Apparatus	23158	2/1/2020			
Oven	13978	10/7/2019			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3				4	5	
A	Tare Weight	26.70	26.48	26.32				25.92	26.97	
B	Wet Soil Weight + A	46.00	47.45	47.26				33.63	33.85	
C	Dry Soil Weight + A	42.02	42.93	42.46				32.28	32.64	
D	Water Weight (B-C)	3.98	4.52	4.80				1.35	1.21	
E	Dry Soil Weight (C-A)	15.32	16.45	16.14				6.36	5.67	
F	% Moisture (D/E)*100	26.0%	27.5%	29.7%				21.2%	21.3%	
N	# OF DROPS	35	23	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**21.3%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐
Liquid Limit **27**
Plastic Limit **21**
Plastic Index **6**
Group Symbol **SC-SM**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 40.4%

Notes / Deviations / References:

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	7/22/20	Brian Vaughan	7/22/20
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

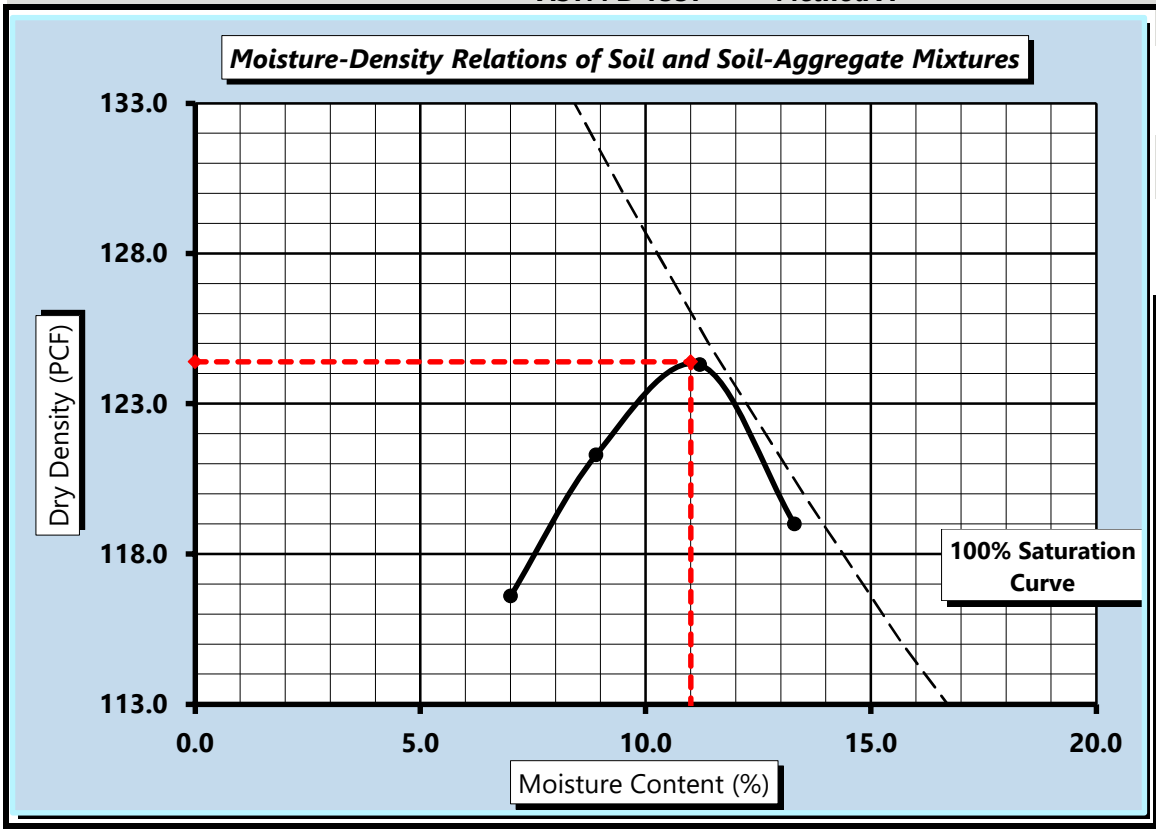
S&ME Project #:	1569-20-052	Report Date:	7/22/20
Project Name:	GSP Airport - Taxiway Pavement Coring	Test Date(s):	7/16/20
Client Name:	GSP Airport District		
Client Address:	2000 GSP Drive, Suite 1 Greer, SC 29651		

Boring #:	Multiple	Log #:	79g	Sample Date:	6/29 - 7/08/20
Location:	"SM"	Type:	Bulk	Depth:	0 - 2'

Sample Description: SILTY CLAYEY SAND (SC-SM) - brown red, medium to fine, micaceous

Maximum Dry Density **124.4** PCF. Optimum Moisture Content **11.0%**

ASTM D 1557 - - Method A



Soil Properties

Natural Moisture Content	N/A
Specific Gravity of Soil	2.600
Liquid Limit	27
Plastic Limit	21
Plastic Index	6

% Passing	
3/4"	100.0%
3/8"	100.0%
#4	100.0%
#10	97.1%
#40	72.1%
#60	61.3%
#100	52.0%
#200	40.4%

Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☒ 3/8 inch Sieve ☐ 3/4 inch Sieve ☐

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 1557: Laboratory Compaction Characteristics of Soil Using Modified Effort

Brian Vaughan, P.E.		Group Leader	7/22/20
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1569-20-052	Report Date:	7/22/20
Project Name:	GSP Airport - Taxiway Pavement Coring	Test Date(s)	7/17 - 7/21/20
Client Name:	GSP Airport District		
Client Address:	2000 GSP Drive, Suite 1 Greer, SC 29651		

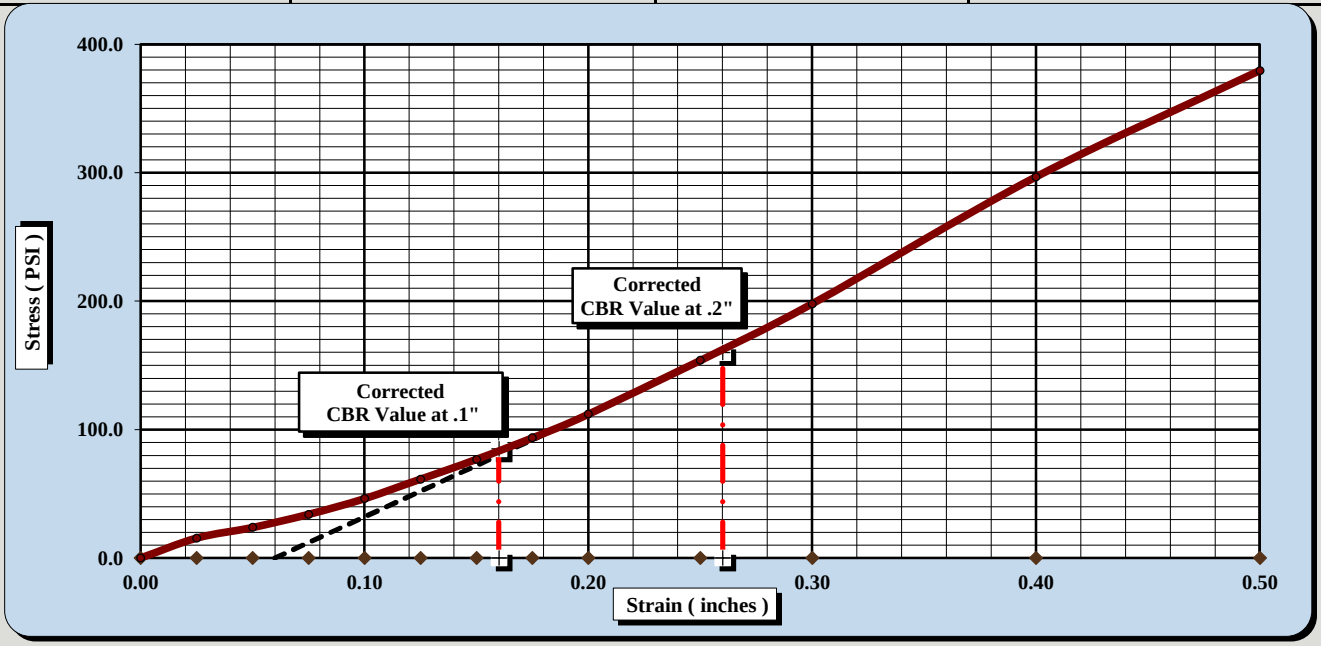
Boring #:	Multiple	Log #:	79g	Sample Date:	6/29 - 7/08/20
Location:	"SM"	Type:	Bulk	Depth:	0 - 2'

Sample Description: SILTY CLAYEY SAND (SC-SM) - brown red, medium to fine, micaceous

ASTM D1557 *Method A* Maximum Dry Density: 124.4 PCF Optimum Moisture Content: 11.0%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values				Corrected CBR Values			
CBR at 0.1 in.	4.6	CBR at 0.2 in.	7.5	CBR at 0.1 in.	**8.5**	CBR at 0.2 in.	**10.7**



CBR Sample Preparation:

The entire gradation was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	25		
Initial Dry Density (PCF)	118.2	Final Dry Density (PCF)	117.7
Moisture Content of the Compacted Specimen	13.5%	Moisture Content (top 1" after soaking)	15.4%
Percent Compaction	95.0%	Percent Swell	0.4%

Soak Time:	96 hrs.	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	27	Plastic Index	6	Apparent Relative Density	2.600

Notes/Deviations/References: Liquid Limit: ASTM D 4318, Specific Gravity: ASTM D 854, Classification: ASTM D 2487

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	7/22/20
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No: TR-D422-WH-1Ga
Revision No. 1
Revision Date: 8/10/17

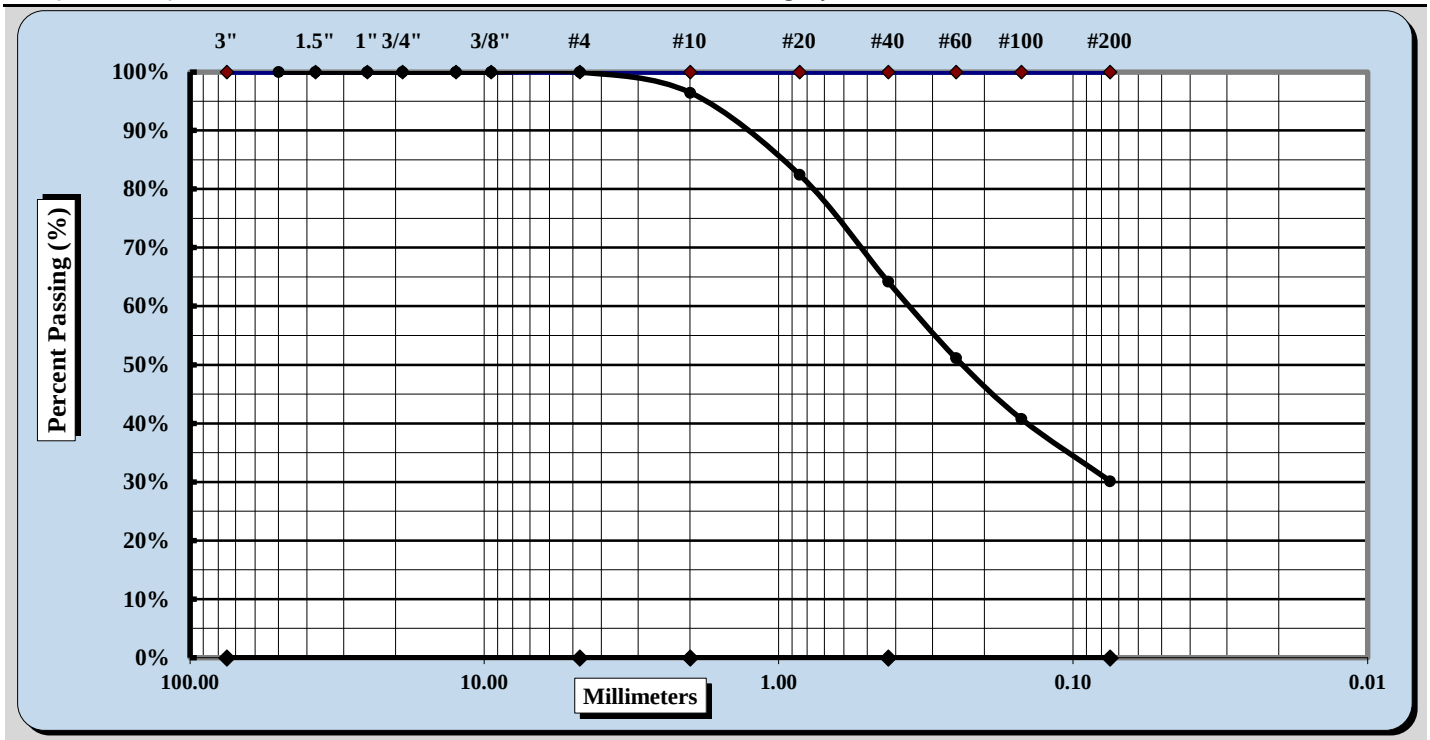
SIEVE ANALYSIS OF SOILS

ASTM D 422

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1569-20-052	Report Date:	7/22/20
Project Name:	GSP Airport - Taxiway Pavement Coring	Test Date(s):	7/18 - 7/22/20
Client Name:	GSP Airport District		
Client Address:	2000 GSP Drive, Suite 1 Greer, SC 29651		
Boring #:	Multiple	Log #: 79g	Sample Date: 6/29 - 7/08/20
Location:	"Sub-base"	Type: Bulk	Depth: 0 - 1'

Sample Description: SILTY CLAYEY SAND (SC-SM) - brown gray, medium to fine



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	4.75 mm	Coarse Sand	3.5%	Fine Sand	34.0%
Gravel	0.0%	Medium Sand	32.2%	Silt & Clay	30.2%
Liquid Limit	16	Plastic Limit	12	Plastic Index	4
Specific Gravity	2.600			Moisture Content	N/A
Coarse Sand	3.5%	Medium Sand	32.2%	Fine Sand	34.0%

Description of Sand & Gravel Particles: Rounded ☐ Angular ☒
Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Notes / Deviations / References:

Brian Vaughan, P.E. — *Technical Responsibility*
Brian Vaughan — *Signature*
Group Leader — *Position*
7/22/20 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

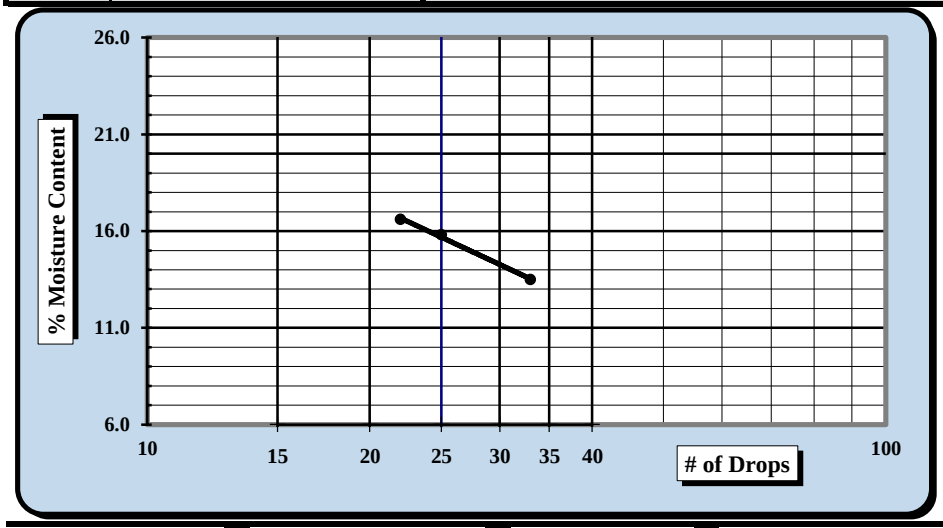
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1569-10-052	Report Date:	7/22/20
Project Name:	GSP Airport - Taxiway Pavement Coring	Test Date:	7/21/20
Client Name:	GSP Airport District		
Client Address:	2000 GSP Drive, Suite 1 Greer, SC 29651		

Boring #:	Multiple	Log #:	79g	Sample Date:	6/29 - 7/08/20
Location:	"Sub-base"	Type:	Bulk	Depth:	0 - 1'
Sample Description:	SILTY CLAYEY SAND (SC-SM) - brown gray, medium to fine				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	9/10/2019	Grooving tool	23119	10/15/2019
LL Apparatus	23158	2/1/2020			
Oven	13978	10/7/2019			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	11	12	13				14	15	
A	Tare Weight	26.70	26.68	26.77				26.65	27.60	
B	Wet Soil Weight + A	50.29	47.91	46.23				34.82	34.10	
C	Dry Soil Weight + A	47.48	45.02	43.46				33.92	33.38	
D	Water Weight (B-C)	2.81	2.89	2.77				0.90	0.72	
E	Dry Soil Weight (C-A)	20.78	18.34	16.69				7.27	5.78	
F	% Moisture (D/E)*100	13.5%	15.8%	16.6%				12.4%	12.5%	
N	# OF DROPS	33	25	22				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**12.5%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐
Liquid Limit **16**
Plastic Limit **12**
Plastic Index **4**
Group Symbol **SC-SM**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 30.2%

Notes / Deviations / References:

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski — *Technician Name*
7/22/20 — *Date*
Brian Vaughan — *Technical Responsibility*
7/22/20 — *Date*

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

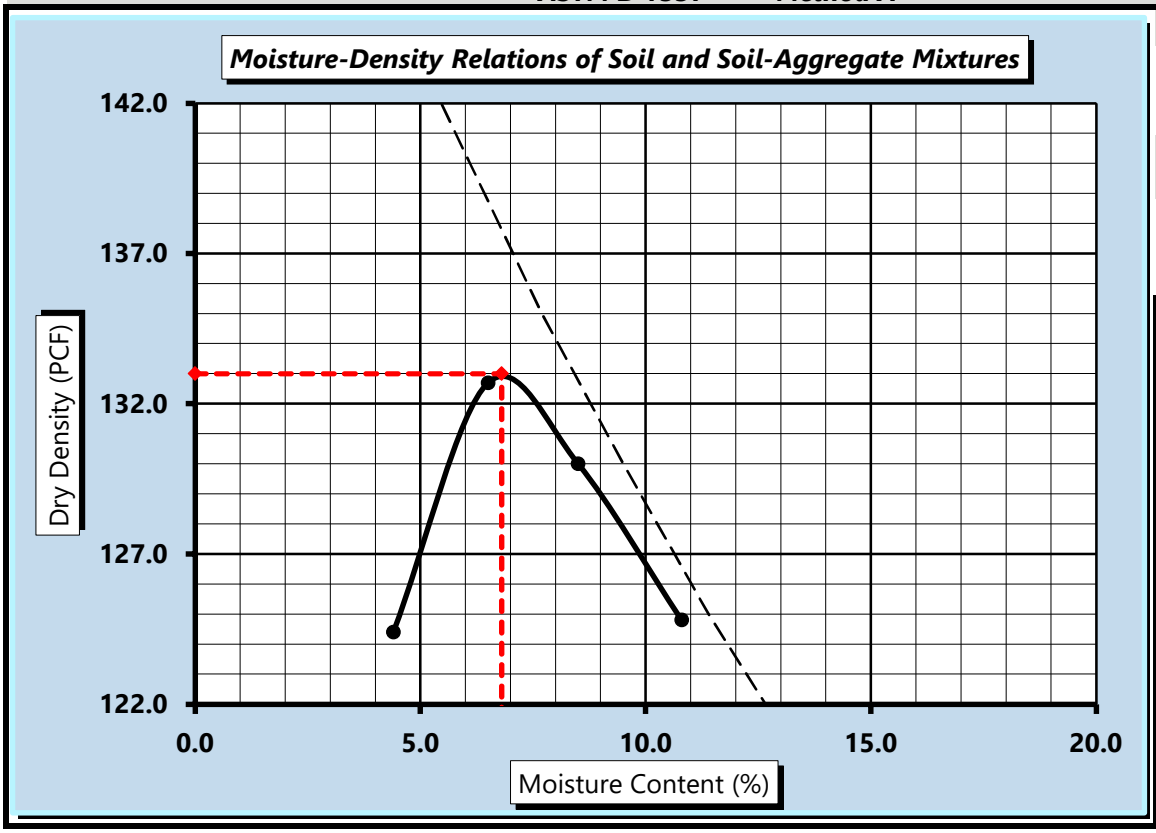
S&ME Project #:	1569-20-052	Report Date:	7/22/20
Project Name:	GSP Airport - Taxiway Pavement Coring	Test Date(s):	7/15/20
Client Name:	GSP Airport District		
Client Address:	2000 GSP Drive, Suite 1 Greer, SC 29651		

Boring #:	Multiple	Log #:	79g	Sample Date:	6/29 - 7/08/20
Location:	"Sub-base"	Type:	Bulk	Depth:	0 - 1'

Sample Description: SILTY CLAYEY SAND (SC-SM) - brown gray, medium to fine

Maximum Dry Density **133.0** PCF. Optimum Moisture Content **6.8%**

ASTM D 1557 - - Method A



Soil Properties	
Natural Moisture Content	N/A
Specific Gravity of Soil	2.600
Liquid Limit	16
Plastic Limit	12
Plastic Index	4

% Passing	
3/4"	100.0%
3/8"	100.0%
#4	100.0%
#10	96.5%
#40	64.2%
#60	51.2%
#100	40.8%
#200	30.2%

Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☒ 3/8 inch Sieve ☐ 3/4 inch Sieve ☐

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 1557: Laboratory Compaction Characteristics of Soil Using Modified Effort

Brian Vaughan, P.E.		Group Leader	7/22/20
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1569-20-052	Report Date:	7/21/20
Project Name:	GSP Airport - Taxiway Pavement Coring	Test Date(s)	7/17 - 7/21/20
Client Name:	GSP Airport District		
Client Address:	2000 GSP Drive, Suite 1 Greer, SC 29651		

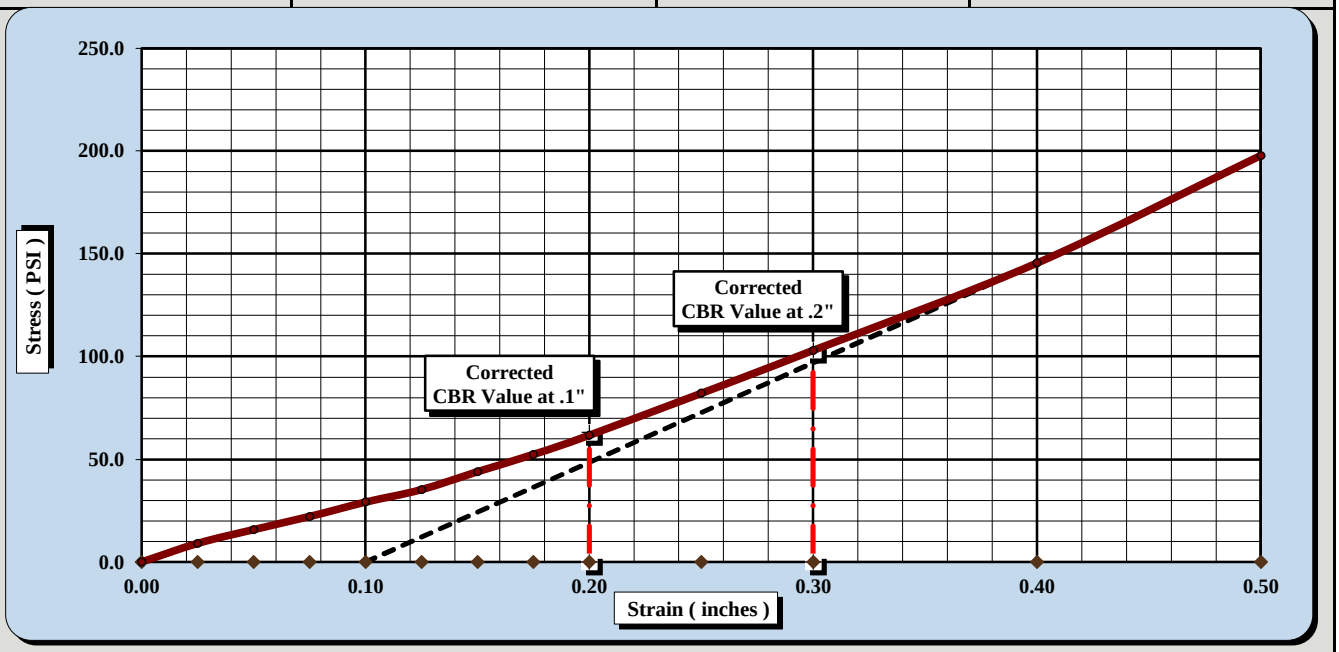
Boring #:	Multiple	Log #:	79g	Sample Date:	6/29 - 7/08/20
Location:	"Sub-base"	Type:	Bulk	Depth:	0 - 1'

Sample Description: SILTY CLAYEY SAND (SC-SM) - brown gray, medium to fine

ASTM D1557 *Method A* Maximum Dry Density: 133.0 PCF Optimum Moisture Content: 6.8%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values				Corrected CBR Values			
CBR at 0.1 in.	2.9	CBR at 0.2 in.	4.1	CBR at 0.1 in.	**6.3**	CBR at 0.2 in.	**6.9**



CBR Sample Preparation:

The entire gradation was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	15		
Initial Dry Density (PCF)	126.3	Final Dry Density (PCF)	126.6
Moisture Content of the Compacted Specimen	9.8%	Moisture Content (top 1" after soaking)	10.4%
Percent Compaction	95.0%	Percent Swell	-0.2%

Soak Time:	96 hrs.	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	16	Plastic Index	4	Apparent Relative Density	2.600

Notes/Deviations/References: Liquid Limit: ASTM D 4318, Specific Gravity: ASTM D 854, Classification: ASTM D 2487

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	7/21/20
Technical Responsibility	*Signature*	*Position*	*Date*

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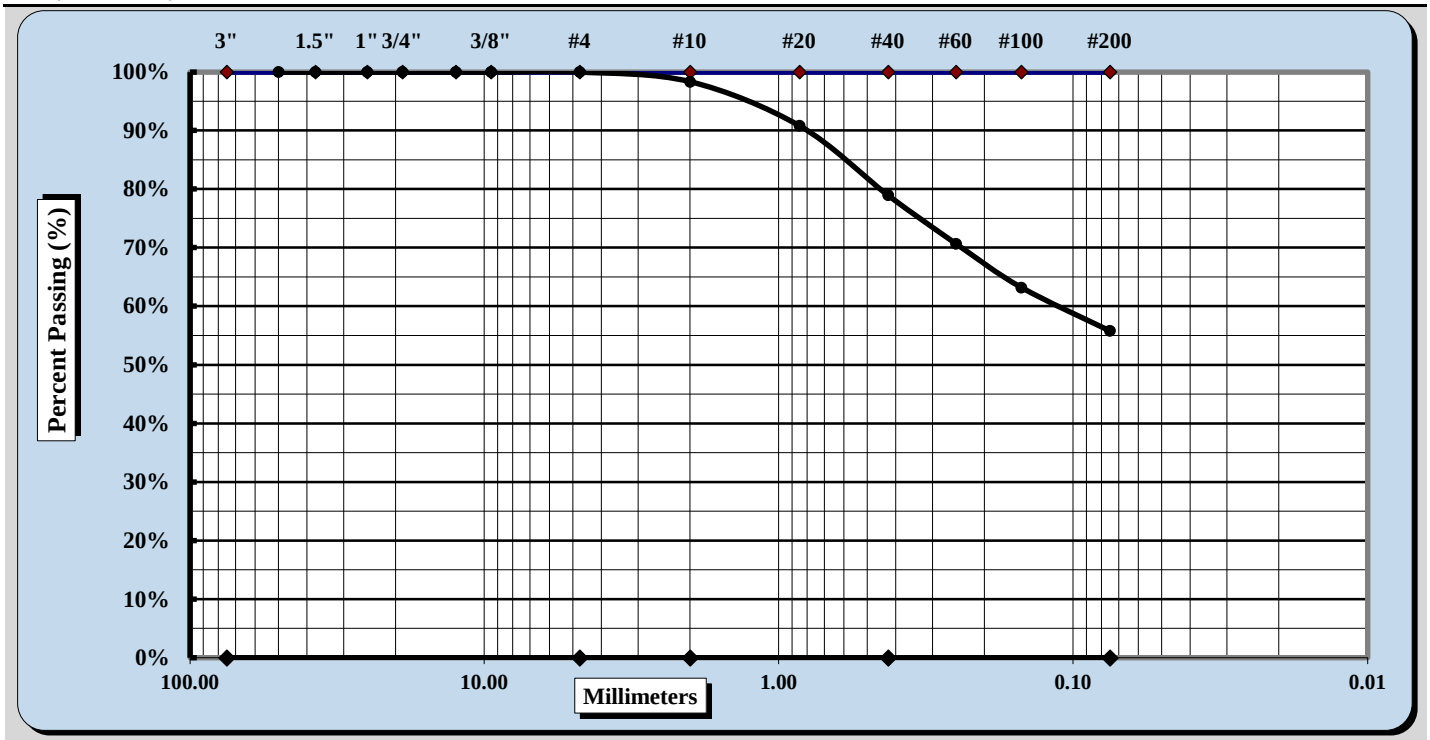
SIEVE ANALYSIS OF SOILS

ASTM D 422

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1569-20-052	Report Date:	7/22/20
Project Name:	GSP Airport - Taxiway Pavement Coring	Test Date(s):	7/18 - 7/22/20
Client Name:	GSP Airport District		
Client Address:	2000 GSP Drive, Suite 1 Greer, SC 29651		
Boring #:	Multiple	Log #: 79g	Sample Date: 6/29 - 7/08/20
Location:	"CL/ML"	Type: Bulk	Depth: 0 - 2'

Sample Description: SANDY LEAN CLAY (CL) - brown red, medium to fine, micaceous



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	4.75 mm	Coarse Sand	1.7%	Fine Sand	23.2%
Gravel	0.0%	Medium Sand	19.4%	Silt & Clay	55.8%
Liquid Limit	34	Plastic Limit	20	Plastic Index	14
Specific Gravity	2.600			Moisture Content	N/A
Coarse Sand	1.7%	Medium Sand	19.4%	Fine Sand	23.2%

Description of Sand & Gravel Particles: Rounded ☐ Angular ☒
Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Notes / Deviations / References:

Brian Vaughan, P.E.		Group Leader	7/22/20
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

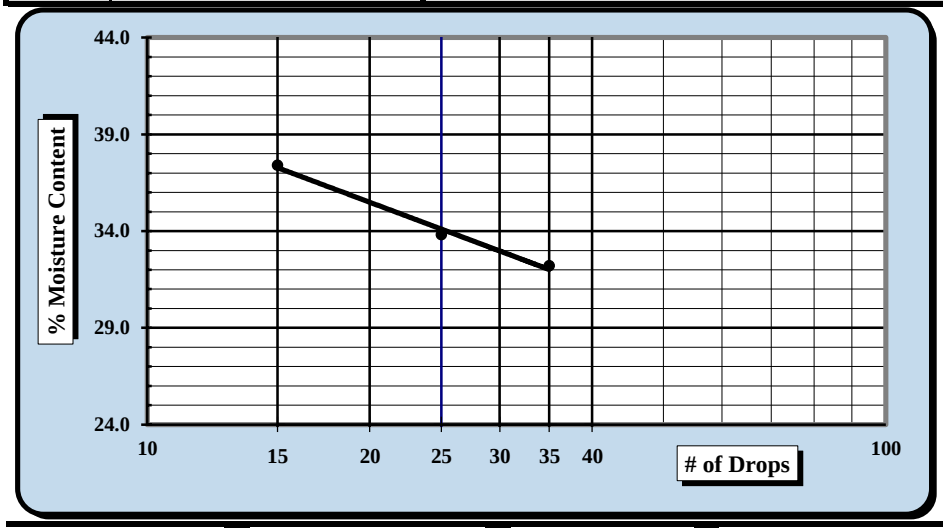
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1569-10-052	Report Date:	7/22/20
Project Name:	GSP Airport - Taxiway Pavement Coring	Test Date:	7/21/20
Client Name:	GSP Airport District		
Client Address:	2000 GSP Drive, Suite 1 Greer, SC 29651		

Boring #:	Multiple	Log #:	79g	Sample Date:	6/29 - 7/08/20
Location:	"CL/ML"	Type:	Bulk	Depth:	0 - 2'
Sample Description:	SANDY LEAN CLAY (CL) - brown red, medium to fine, micaceous				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	9/10/2019	Grooving tool	23119	10/15/2019
LL Apparatus	23158	2/1/2020			
Oven	13978	10/7/2019			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	6	7	8				9	10	
A	Tare Weight	27.78	26.28	27.32				26.82	26.74	
B	Wet Soil Weight + A	44.97	42.94	44.85				33.88	33.25	
C	Dry Soil Weight + A	40.78	38.73	40.08				32.72	32.17	
D	Water Weight (B-C)	4.19	4.21	4.77				1.16	1.08	
E	Dry Soil Weight (C-A)	13.00	12.45	12.76				5.90	5.43	
F	% Moisture (D/E)*100	32.2%	33.8%	37.4%				19.7%	19.9%	
N	# OF DROPS	35	25	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**19.8%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**34**
Plastic Limit	**20**
Plastic Index	**14**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 55.8%

Notes / Deviations / References:

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski — *Technician Name*
7/22/20 — *Date*
Brian Vaughan — *Technical Responsibility*
7/22/20 — *Date*

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

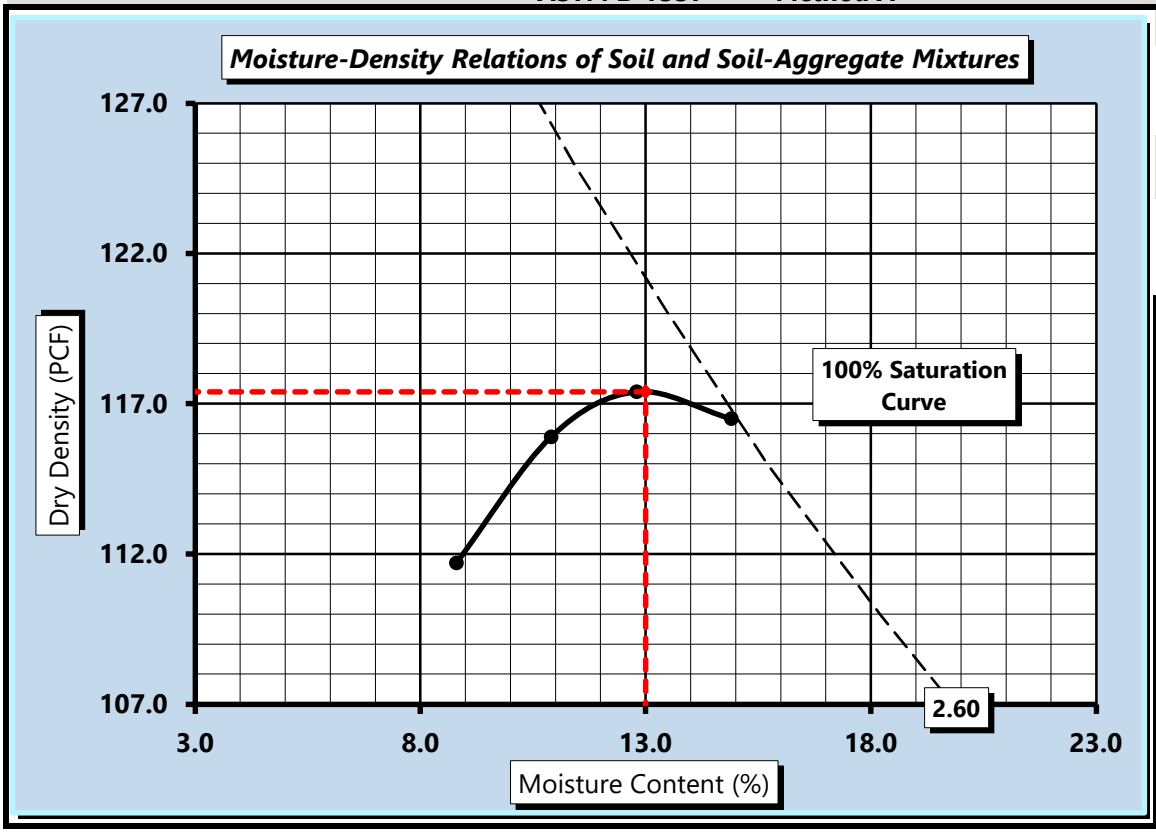
S&ME Project #:	1569-20-052	Report Date:	7/22/20
Project Name:	GSP Airport - Taxiway Pavement Coring	Test Date(s):	7/15/20
Client Name:	GSP Airport District		
Client Address:	2000 GSP Drive, Suite 1 Greer, SC 29651		

Boring #:	Multiple	Log #:	79g	Sample Date:	6/29 - 7/08/20
Location:	"CL/ML"	Type:	Bulk	Depth:	0 - 2'

Sample Description: SANDY LEAN CLAY (CL) - brown red, medium to fine, micaceous

Maximum Dry Density **117.4** PCF. Optimum Moisture Content **13.0%**

ASTM D 1557 - - Method A



Soil Properties	
Natural Moisture Content	N/A
Specific Gravity of Soil	2.600
Liquid Limit	34
Plastic Limit	20
Plastic Index	14

% Passing	
3/4"	100.0%
3/8"	100.0%
#4	100.0%
#10	98.3%
#40	79.0%
#60	70.7%
#100	63.2%
#200	55.8%

Oversize Fraction
Bulk Gravity
% Moisture
% Oversize
MDD
Opt. MC

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☒ 3/8 inch Sieve ☐ 3/4 inch Sieve ☐

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 1557: Laboratory Compaction Characteristics of Soil Using Modified Effort

Brian Vaughan, P.E.		Group Leader	7/22/20
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1569-20-052	Report Date:	7/21/20
Project Name:	GSP Airport - Taxiway Pavement Coring	Test Date(s)	7/17 - 7/21/20
Client Name:	GSP Airport District		
Client Address:	2000 GSP Drive, Suite 1 Greer, SC 29651		

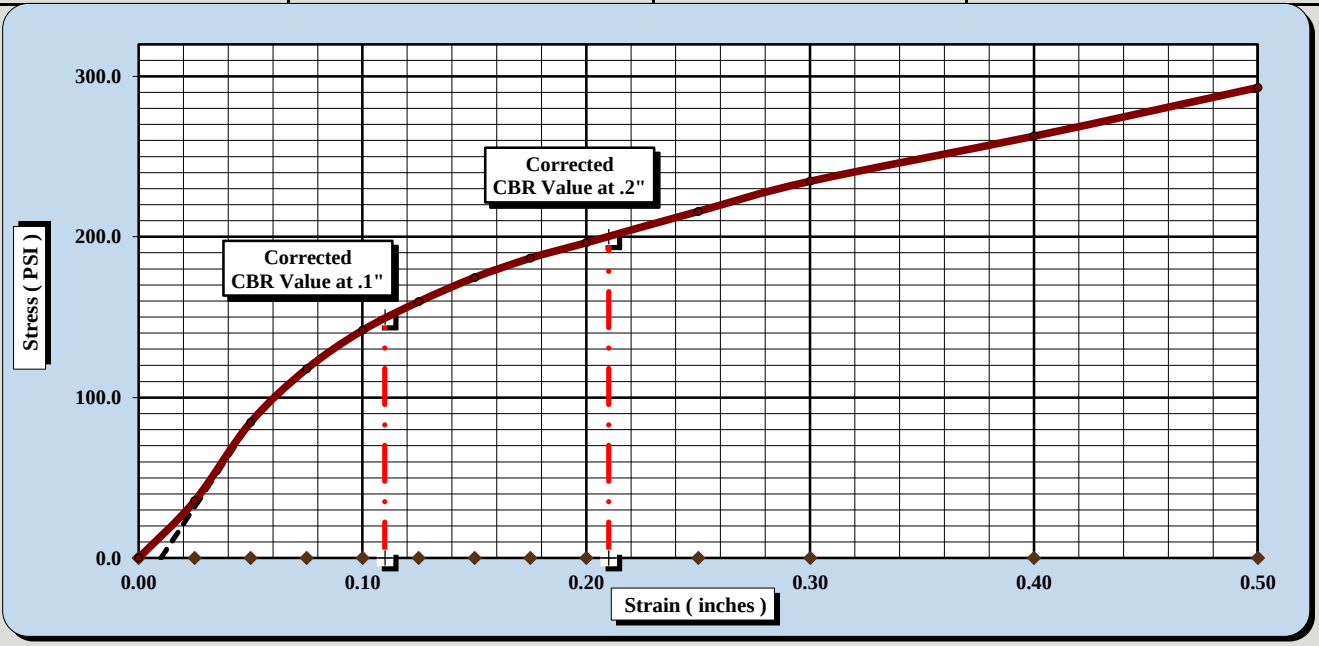
Boring #:	Multiple	Log #:	79g	Sample Date:	6/29 - 7/08/20
Location:	"CL/ML"	Type:	Bulk	Depth:	0 - 2'

Sample Description: SANDY LEAN CLAY (CL) - brown red, medium to fine, micaceous

ASTM D1557 *Method A* Maximum Dry Density: 117.4 PCF Optimum Moisture Content: 13.0%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values				Corrected CBR Values			
CBR at 0.1 in.	14.2	CBR at 0.2 in.	13.1	CBR at 0.1 in.	**15.0**	CBR at 0.2 in.	**13.3**



CBR Sample Preparation:

The entire gradation was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	10		
Initial Dry Density (PCF)	105.7	Final Dry Density (PCF)	105.5
Moisture Content of the Compacted Specimen	15.0%	Moisture Content (top 1" after soaking)	18.1%
Percent Compaction	90.0%	Percent Swell	0.2%

Soak Time:	96 hrs.	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	51.0
Liquid Limit	34	Plastic Index	14	Apparent Relative Density	2.600

Notes/Deviations/References: Liquid Limit: ASTM D 4318, Specific Gravity: ASTM D 854, Classification: ASTM D 2487

Brian Vaughan, P.E.		Group Leader	7/21/20
Technical Responsibility	*Signature*	*Position*	*Date*

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