GEOTECHNICAL INVESTIGATION
Rehabilitation of Taxiways RA, RB, SA and SB
George Bush Intercontinental Airport
Houston, Texas

SUBMITTED TO

Garver

12141 Wickchester Lane, Suite 640

Houston, Texas 77079

BY

HVJ ASSOCIATES, INC.

HOUSTON, TEXAS

APRIL 10, 2023

REPORT NO. HG1810124

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April 10, 2023

Mr. Jason Frank, P.E.
Senior Project Manager – Aviation Team Leader
Garver
12141 Wickchester Lane, Suite 640
Houston, Texas 77079

Re: Geotechnical Investigation – Rehabilitation of Taxiways RA, RB, SA and SB
George Bush Intercontinental Airport
Houston, Texas
Owner: Houston Airport Systems (HAS)
HVJ Report No.: HG1810124

Dear Mr. Frank:

Submitted herein is the final report of our geotechnical investigation for the above referenced project. The study was performed in accordance with HVJ Proposal Number HG1810124 dated December 19, 2018 and subject to the limitations presented in this report.

It has been a pleasure to work with you on this project and we appreciate the opportunity to be of service. Please notify us if there are questions or if we may be of further assistance.

Sincerely,

HVJ ASSOCIATES, INC.
Texas Firm Registration No. F-000646

Sharmi Vedantam, P.E.
Houston Branch Manager

4/10/2023

Prakash Dahal, E.I.T.
Project Engineer

The seal appearing on this document was authorized by Sharmi P. Vedantam, PE 100218 on April 10, 2023. Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

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1 EXECUTIVE SUMMARY

HVJ Associates, Inc. (HVJ) was retained by Garver to perform a geotechnical investigation for the rehabilitation of taxiways RA, RB, SA and SB at George Bush International Airport in Houston, Texas. The proposed rehabilitation includes the following:

- Reconstruction of approximately 4,000 linear feet of Portland Cement Concrete (PCC) pavement on Taxiway RA (from Taxiway SF to JFK Bridge)
- Rehabilitation of identified distressed PCC pavement on Taxiway RB (from Taxiway SF to JFK Bridge)
- Complete Reconstruction of Taxiway SA, approximately 1,000 linear feet from asphalt surface to PCC
- Resurfacing of Taxiway SB, approximately 10,000 linear feet of asphalt surface pavement

HVJ was requested to perform soil borings and pavement cores, obtain the subsurface soils and pavement core, and groundwater level information, and provide laboratory test data. The subsurface stratigraphy at the project site was determined by drilling and sampling ten (10) borings on RA, RB taxiways and twenty-nine (29) borings on SA, SB taxiways to 10-foot depth below the existing grade. We also cored at sixteen (16) and at twenty-eight (28) locations below the existing pavement on RA, RB and SA, SB taxiways, respectively. Pavement coring and boring locations were determined by the Garver project team based on Non-Destructive Testing (NDT) testing performed by others. Laboratory tests were performed to provide soils information for the pavement design to be performed by others.

A draft report for Taxiways RA/RB was submitted on June 25, 2020 (HVJ Report No.: HG1810124). The draft report previously submitted is now updated with Taxiways SA/SB information after performing the remaining borings and pavement cores from 2020. A brief summary of the findings of this investigation is presented below:

1. A generalized summary of the subsurface conditions in the borings is shown in the table below. Substantial deviations from the summarized conditions should be accounted for in design and construction. Details of the subsurface stratigraphy encountered in the borings are shown on the boring logs presented in Appendix A.

Table 1-1 – Generalized Soil Profile (Taxiway RA/RB Borings B-1 to B-10)

Borings	Depth (below grade), Feet		Material
	From	To	
B-1, B-3, B-7* & B-9	Below Pavement	10	*Cohesive soils:* Firm to Very Stiff Sandy Lean Clay (CL)
B-2, B-4, B-5, B-6, B-8 & B-10	Below Pavement	10	*Cohesionless Soils*: Silty Sand (SM), Clayey Sand (SC); Silty, Clayey Sand (SC-SM)

Note: *- Silty Clayey Sand (SC-SM) layer was observed in boring B-7 at a depth between 4 feet and 6 feet.

Table 1-2 – Generalized Soil Profile (Taxiway SA/SB Borings B-1 through B-29)

Borings	Depth (below grade), Feet		Material
	From	To	
B-1, B-2*, B-3*, B-4*, B-5, B-6*, B-7, B-8, B-9, B-10, B-11*, B-12, B-13*, B-14, B-15*, B-16*, B-17, B-18*, B-21*, B-24*, B-25, B-26, B-27, B-28 & B-29	Below Pavement	10	*Cohesive soils:* Soft to hard Lean Clay (CL) & Silty Clay (CL-ML)
B-19, B-20, B-22 & B-23	Below Pavement	10	*Cohesionless Soils*: Silty Sand (SM), Clayey Sand (SC); Silty, Clayey Sand (SC-SM)

Note: *- Cohesionless Soils (SC, SM and SC-SM) were observed in borings B-2, B-3, B-4, B-6, B-11, B-13, B-15, B-16, B-18, B-21 & B-24 at different depths.

2. Existing pavement thicknesses at the boring and pavement coring locations are presented in Section 5.5 of the report. Existing pavement in the taxiways for (RA/RB) generally consisted of concrete approximately 16 to 38 inches thick underlain by asphalt, approximately 1 to 5 inches thick and/or variable thicknesses of cement-treated base, cement stabilized sand, or lime stabilized base. Several pavement core locations in the taxiway shoulder shown 2.5 to 4 inches of asphalt underlain by the aforementioned stabilized bases. Thickness of base materials was quite variable ranging from 5 inches at C-3 to 88 inches at B-2 location.

   The existing pavement in the taxiways for (SA/SB) generally consisted of asphalt approximately 1 to 11.5 inches thick underlain by concrete approximately 11.5 to 15 inches thick and/or variable thicknesses of cement-treated base, cement stabilized sand, or lime stabilized base. Several core locations in the taxiway shoulder encountered 3 to 10 inches asphalt underlain by the aforementioned stabilized bases. Thickness of base materials was quite variable ranging from 14 inches at B-22 shoulder to 6.5 inches at B-27 location.

3. At RA/RB taxiway location, groundwater was encountered in borings B-7 and B-9 at a depth of 2.6 feet below the existing pavement during the drilling operations. Similarly, at SA/SB taxiway location, groundwater was observed in borings B-11, B-17, B-19, B-21, B-22, B-26 and B-27 at a depth between 2.9 feet and 4.5 feet below the existing pavement during drilling operations.

4. A literature review of surface faults near the project area was made from published reports. The primary objective of this review was to evaluate available information from published and open file reports. Based on HVJ's review, the project site is situated about one mile north of the Lee Fault, about 3 miles east of the Hardy Fault, and about 3 miles southwest of the Humble Salt Dome system. Faulting is not anticipated to impact the project site. A detailed fault study is beyond the scope of this study.

5. Laboratory (CBR) and field (DCP) test results are presented in Sections 3.2 and 4.6, respectively for the subgrade soils observed below existing pavements for Taxiway RA/RB and SA/SB, which consisted of variable thicknesses of stabilized base materials underlain by clayey sand soils and some areas of sandy lean clay. As discussed in Section 4.1 and Section 6 of the report,

subgrade stabilization may not be needed for the generally sandy soils. However, lime percentage and lime/fly-ash recommendations are presented in Section 4.1.

Please note that this executive summary does not fully relate HVJ's findings and opinions. These findings and opinions are only presented through the full report.

2 INTRODUCTION

2.1 General

HVJ Associates, Inc. (HVJ) was retained by Garver to perform a geotechnical investigation for the rehabilitation of taxiways RA, RB, SA and SB at George Bush International Airport in Houston, Texas. The proposed rehabilitation includes the following:

- Reconstruction of approximately 4,000 linear feet of Portland Cement Concrete (PCC) pavement on Taxiway RA (from Taxiway SF to JFK Bridge)
- Rehabilitation of identified distressed PCC pavement on Taxiway RB (from Taxiway SF to JFK Bridge)
- Complete Reconstruction of Taxiway SA, approximately 1,000 linear feet from asphalt surface to PCC.
- Resurfacing of Taxiway SB, approximately 10,000 linear feet of asphalt surface pavement.

Pavement coring and boring locations were determined by Garver's project team based on Non-Destructive Testing (NDT) testing performed by others. The proposed fieldwork could not be completed in 2020 since the SA/SB taxiways were blocked with parked aero planes. Later in May 2022, the fieldwork was resumed and completed in June, 2022.

2.2 Scope of Work

The primary objectives of this study were to investigate subsurface conditions at the site and to facilitate the pavement design performed by others on the Garver team. The objectives were accomplished by:

- Drilling and sampling ten (10) borings on RA, RB taxiways and twenty-nine (29) borings on SA, SB taxiways to 10-foot depth below the existing grade to investigate soil stratigraphy and to obtain samples for laboratory testing.
- Performing laboratory tests to determine physical characteristics of the soils.
- Providing subgrade preparation recommendations for the proposed pavement.

Subsequent sections of this report contain descriptions of the field exploration, laboratory testing program, general subsurface conditions, and pavement design.

3 FIELD INVESTIGATION

3.1 General

The field exploration program for Taxiways RA/RB and SA/SB was performed between April 20, 2020 and June 3, 2022. The proposed fieldwork could not be completed in 2020 since the SA/SB taxiways were blocked with parked aero planes. Later in May 2022, the fieldwork was resumed and completed in June 2022. Subsurface conditions at the site were investigated by drilling and sampling 39 borings to a depth of 10 feet below the existing grade to investigate soil stratigraphy and to obtain samples for laboratory testing. The soil borings were drilled using truck mounted drilling equipment using dry auger and wet rotary techniques during night-time. Pavement was cored at the boring locations as well as 44 additional locations in Taxiways RA/RB and SA/SB. All the borings were backfilled with cement-bentonite grout, and pavement were plugged with high strength non-shrink grout. The approximate boring and pavement coring locations are presented on the plan of borings, Plate 2.

3.2 Survey Data

Survey data for the boring and coring locations was provided by Garver as shown in the table below.

Table 3-1 – Borehole and Pavement Core Survey Data for Taxiway RA/RB

Boring	Northing (feet)	Easting (feet)	Elevation (feet)
B-1 (RA-RB)	13,924,356.88	3,126,903.21	92.59
B-2 (RA-RB)	13,924,213.48	3,127,844.68	92.12
B-3 (RA-RB)	13,924,198.77	3,19,072.48	91.33
B-4 (RA-RB)	13,924,230.39	3,129,573.56	92.30
B-5 (RA-RB)	13,924,247.07	3,129,912.05	92.23
B-6 (RA-RB)	13,924,157.32	3,126,926.83	93.06
B-7 (RA-RB)	13,923,971.55	3,127,263.27	92.16
B-8 (RA-RB)	13,924,058.54	3,128,288.72	91.27
B-9 (RA-RB)	13,924,065.06	3,129,137.69	90.78
B-10 (RA-RB)	13,923,827.09	3,130,363.21	91.15
C-1 (RA-RB)	13,924,365.90	3,127,049.18	91.97
C-2 (RA-RB)	13,924,233.95	3,127,262.08	91.28
C-3 (RA-RB)	13,924,233.95	3,128,314.48	91.77
C-4 (RA-RB)	13,924,171.95	3,128,749.69	92.17
C-5 (RA-RB)	13,924,198.38	3,129,549.92	92.08
C-6 (RA-RB)	13,924,209.15	3,129,845.72	92.20
C-7 (RA-RB)	13,924,210.74	3,129,972.23	91.82
C-8 (RA-RB)	13,924,230.94	3,130,308.57	91.06
C-9 (RA-RB)	13,923,947.61	3,127,489.18	92.09
C-10 (RA-RB)	13,923,957.61	3,127,863.41	91.69
C-11(RA-RB)	13,923,942.00	3,128,064.47	91.43
C-12 (RA-RB)	13,923,904.32	3,128,546.95	91.62
C-13 (RA-RB)	13,923,916.32	3,129,070.38	91.18
C-14 (RA-RB)	13,923,797.89	3,129,184.50	91.66
C-15 (RA-RB)	13,923,932.95	3,129,532.54	91.21
C-16 (RA-RB)	13,923,948.73	3,130,041.48	90.88

Table 3-2 – Borehole and Pavement Core Survey Data for Taxiway SA/SB

Boring	Northing (feet)	Easting (feet)	Elevation (feet)
B-1 (SA-SB)	13,923,028.08	3,129,630.75	89.87
B-2 (SA-SB)	13,923,065.68	3,130,762.87	89.31
B-3 (SA-SB)	13,923,088.50	3,131,682.05	88.38
B-4 (SA-SB)	13,923,127.10	3,132,874.88	87.66
B-5 (SA-SB)	13,923,174.42	3,134,264.06	86.89
B-6 (SA-SB)	13,923,239.98	3,136,209.86	85.74
B-7 (SA-SB)	13,923,252.16	3,137,555.41	84.65

Boring	Northing (feet)	Easting (feet)	Elevation (feet)
B-8 (SA-SB)	13,923,320.73	3,138,854.25	84.31
B-9 (SA-SB)	13,922,714.09	3,130,998.24	88.85
B-10 (SA-SB)	13,922,745.81	3,132,090.43	87.94
B-11 (SA-SB)	13,922,715.74	3,132,538.37	86.95
B-12 (SA-SB)	13,922,811.59	3,133,982.41	86.9
B-13 (SA-SB)	13,922,867.18	3,135,749.79	85.68
B-14 (SA-SB)	13,922,888.74	3,137,555.73	83.89
B-15 (SA-SB)	13,923,143.11	3,137,896.94	83.04
B-16 (SA-SB)	13,923,101.11	3,139,103.57	83.81
B-17 (SA-SB)	13,923,948.73	3,130,041.48	90.43
B-18 (SA-SB)	13,922,870.34	3,129,188.10	91.16
B-19 (SA-SB)	13,923,307.25	3,130,356.14	88.08
B-20 (SA-SB)	13,922,419.65	3,130,915.71	88.6
B-21 (SA-SB)	13,922,650.36	3,137,368.80	84.16
B-22 (SA-SB)	13,923,128.42	3,130,560.90	88.64
B-23 (SA-SB)	13,923,121.70	3,131,758.55	88.2
B-24 (SA-SB)	13,923,237.51	3,135,257.73	85.89
B-25 (SA-SB)	13,923,315.72	3,138,059.63	84.77
B-26 (SA-SB)	13,922,714.02	3,129,878.47	88.95
B-27 (SA-SB)	13,922,802.14	3,132,818.69	87.35
B-28 (SA-SB)	13,922,943.28	3,137,028.68	84.71
B-29 (SA-SB)	13,922,972.73	3,138,628.73	84.11
C-1 (SA-SB)	13,923,014.62	3,129,937.08	89.42
C-2 (SA-SB)	13,923,076.18	3,131,170.62	88.94
C-3 (SA-SB)	13,923,121.07	3,132,684.19	87.78
C-4 (SA-SB)	13,923,146.98	3,133,362.88	87.47
C-5 (SA-SB)	13,923,168.62	3,133,971.80	87.14
C-6 (SA-SB)	13,923,183.19	3,135,021.68	85.99
C-7 (SA-SB)	13,923,253.39	3,136,576.12	85.57
C-8 (SA-SB)	13,923,302.75	3,138,075.12	84.82
C-9 (SA-SB)	13,922,726.42	3,131,405.32	88.5
C-10 (SA-SB)	13,922,784.68	3,133,247.63	87.38
C-11 (SA-SB)	13,922,805.11	3,134,951.69	85.41
C-12 (SA-SB)	13,922,811.59	3,133,982.41	86.9
C-13 (SA-SB)	13,922,913.42	3,138,322.64	83.66
C-14 (SA-SB)	13,922,863.03	3,136,753.85	84.53
C-15 (SA-SB)	13,923,092.74	3,135,921.10	84.2
C-16 (SA-SB)	13,922,856.62	3,130,393.57	87.69
C-17 (SA-SB)	13,922,483.44	3,129,185.16	88.68

Boring	Northing (feet)	Easting (feet)	Elevation (feet)
C-18 (SA-SB)	13,922,667.80	3,129,536.53	89.48
C-19 (SA-SB)	13,922,662.58	3,130,366.38	88.6
C-20 (SA-SB)	13,922,574.13	3,132,833.34	86.36
C-21 (SA-SB)	13,922,651.56	3,135,436.04	84.49
C-22 (SA-SB)	13,922,704.80	3,139,102.49	83.16
C-23 (SA-SB)	13,923,948.73	3,129,490.54	89.5
C-24 (SA-SB)	13,923,154.69	3,133,057.68	87.65
C-25 (SA-SB)	13,923,092.74	3,135,921.10	84.2
C-26 (SA-SB)	13,923,293.75	3,137,050.22	85.2
C-27 (SA-SB)	13,922,894.82	3,135,423.75	85.32
C-28 (SA-SB)	13,922,933.23	3,136,201.13	84.77

3.3 Sampling Method

Soil samples were obtained continuously to the termination depth of the borings. Cohesive soil samples were obtained with a three-inch thin-walled (Shelby) tube sampler in general accordance with ASTM D 1587 standard. Each sample was removed from the sampler in the field, carefully examined, and then classified. The shear strength of the cohesive soils was estimated by a hand penetrometer in the field. Cohesionless soils were sampled with the split spoon sampler in accordance with ASTM D 1586 standard. Suitable portions of each sample were sealed and packaged for transportation to HVJ's laboratory.

Detailed descriptions of the soils encountered in the borings are given in the boring logs presented in Appendix A, along with a key to the terms and symbols used for soil classification on the boring logs.

3.4 Water Level Measurements

Groundwater level observations were made in the open boreholes during drilling operations. Details of the groundwater levels are presented on the boring logs in Appendix A and in Section 4.4 of the report.

4 LABORATORY TESTING

Selected soil samples were tested in the laboratory to determine applicable physical and engineering properties. The field and laboratory program included moisture content, Atterberg Limits, hand penetrometer, percent passing No. 200 Sieve, and unconfined compressive strength (UC) and unit weight tests. The Atterberg Limits, moisture content and percent passing No. 200 Sieve were used to verify field classification by the Unified Soils Classification System, while the compression tests were performed to obtain the undrained shear strength of the soil. Additional testing included Standard Proctor and CBR, and pH Lime Series to estimate subgrade strength and soil stabilization. The type and number of tests performed for this investigation are summarized below:

Table 4-1 – Laboratory Test Summary for Taxiways (RA/RB) and SA/SB

Type of Test	Number of Tests
Moisture Content (ASTM D2216)	106
Atterberg Limits (ASTM D4318)	52
Percent Passing No. 200 Sieve (ASTM D1140)	56
Hand Penetrometer	101
Unit Dry Weight (ASTM D 2166/2850)	33
Unconfined Compressive (UC) Strength (ASTM D2166)	33
pH Lime Series (ASTM D6276)	9
Standard Proctor (ASTM D698)	2
Laboratory California Bearing Ratio (ASTM D1883)	2

The laboratory test results are shown on the boring logs in Appendix A. The conversion between pocket penetrometer readings obtained in the field to the shear strength parameters presented in the borings logs were obtained using a conversion factor of 1/3. A summary of the laboratory test results is presented in Appendix B.

4.1 pH Lime Series

Lime series tests were conducted on sandy lean clay, clayey sand and lean clay with sand samples from 3 of the 10 borings for RA/RB and from 6 of the 19 borings for SA/SB locations. Based on the lime series test results, 6% to 8% lime per unit dry weight appears to be an adequate estimate for stabilization of the onsite lean clays/clayey sands to perform satisfactorily as pavement subgrade. The lime series test results are presented in Appendix C of the report. Cohesionless clayey sand was also encountered in the borings. At locations where sandy soils are encountered during construction, the subgrade soils may be stabilized with lime and flyash (2% lime and 8% flyash).

4.2 California Bearing Ratio (CBR)

The California Bearing Ratio test was performed on the composite material from the Taxiway RA/RB (B-1 (RA-RB) thru B-10 (RA-RB)) and SA/SB (S-1 (SA-SB) thru S-29 (SA-SB)) borings in accordance with ASTM D1883, which is classified as silty clayey sand and clayey sand. The method of compaction was in accordance with ASTM D698. According to the City of Houston compaction requirements, 95% of Maximum Dry Density (MDD) is specified and this is considered for CBR testing. The MDD for the composite sample were 111.8 and 109.4 pcf and the CBR values corresponding to 95% of MDD were 10.2 and 8.2 for RA/RB and SA/SB, respectively.

5 SITE AND SUBSURFACE CONDITIONS

5.1 General Geology

There are two major surface geological formations that exist in the Houston area: the Beaumont formation and the Lissie formation. The Beaumont formation is a relatively younger formation generally found to the southeast of the Lissie formation. The Beaumont formation dips southeastward and extends beneath beach sand and waters of the Gulf of Mexico as far as the continental shelf. The project site is located in an area where the Lissie formation is typically encountered.

The upper Lissie formation is sometimes denoted as the Montgomery formation. The upper Lissie formation is heterogeneous, containing interbedded layers of clay, sand and silt. It was deposited in mid-Pleistocene times in shallow coastal river channels and flood plains. The clay present in the

formation has been preconsolidated by a process of desiccation. Numerous wetting and drying cycles have produced a network of randomly oriented and closely spaced joints, which are sometimes slickensided, that is, have a shiny appearance when exposed. The joint pattern strongly influences the engineering behavior of the soil.

The sand layers vary in compactness from loose to very dense, and in thickness from a fraction of an inch to many feet due to an irregular depositional environment. Sands are generally subrounded to subangular and vary from coarse to very fine, are poorly graded, and often contain significant amounts of silt-sized particles in the sand matrix.

5.2 Geologic Faulting

The tectonic history of the Texas Gulf Coast includes a relatively stable depositional cycle since the Cretaceous Period (about 65 million years). During this period the area has been subjected to deposition of clays, silts, and sands resulting in over 30 thousand feet of sedimentary rocks. Underlying this clastic sequence are salt formations, which have migrated upwards to produce the typical salt dome features associated with the Texas Gulf Coast. In conjunction with salt movement, dewatering and compaction of some of the deeper sediments in the basin have resulted in the development of growth faults.

A literature review of surface faults near the project area was made from published reports. The primary objective of this review was to evaluate available information from published and open file reports. Based on HVJ's review, the project site is situated about one mile north of the Lee Fault, about 3 miles east of the Hardy Fault, and about 3 miles southwest of the Humble Salt Dome system. Faulting is not anticipated to impact the project site. A detailed fault study is beyond the scope of this study.

5.3 Soil Stratigraphy

HVJ's interpretation of soil and water conditions at the project site is based on information obtained at the boring locations only. This information has been used as the basis for the conclusions and recommendations. Significant variations at areas not explored by the project borings may require reevaluation of HVJ's findings and conclusions.

A generalized summary of the subsurface conditions in the borings is shown in the table below. The generalized profile is intended to provide a conceptual framework for considering the site and is not intended as a basis of any particular analysis. Details of the subsurface stratigraphy encountered in the borings are shown on the boring logs presented in Appendix A.

Table 5-1 – Generalized Soil Profile (Taxiway RA/RB - Borings B-1 to B-10)

Borings	Depth (below grade), Feet		Material
	From	To	
B-1, B-3, B-7* & B-9	Below Pavement	10	*Cohesive soils:* Firm to Very Stiff Sandy Lean Clay (CL)
B-2, B-4, B-5, B-6, B-8 & B-10	Below Pavement	10	*Cohesionless Soils*: Silty Sand (SM), Clayey Sand (SC); Silty, Clayey Sand (SC-SM)

Note: *- Silty Clayey Sand (SC-SM) layer was observed in boring B-7 at a depth between 4 & 6 feet.

Table 5-2 – Generalized Soil Profile (Taxiway SA/SB Borings - B-1 through B-29)

Borings	Depth (below grade), Feet		Material
	From	To	
B-1, B-2*, B-3*, B-4*, B-5, B-6*, B-7, B-8, B-9, B-10, B-11*, B-12, B-13*, B-14, B-15*, B-16*, B-17, B-18*, B-21*, B-24*, B-25, B-26, B-27, B-28 & B-29	Below Pavement	10	*Cohesive soils:* Soft to hard Lean Clay (CL) & Silty Clay (CL-ML)
B-19, B-20, B-22 & B-23	Below Pavement	10	*Cohesionless Soils*: Silty Sand (SM), Clayey Sand (SC); Silty, Clayey Sand (SC-SM)

Note: *- Cohesionless Soils (SC, SM and SC-SM) were observed in borings B-2, B-3, B-4, B-6, B-11, B-13, B-15, B-16, B-18, B-21 & B-24 at different depths.

Specific types and depths of subsurface strata encountered at the site are shown on the boring logs presented in Appendix A.

5.4 Groundwater

At RA/RB taxiway location, groundwater was encountered in borings B-7 and B-9 at a depth of 2.6 feet below the existing pavement during drilling operations. Similarly, at SA/SB taxiway location, groundwater was observed in borings B-11, B-17, B-19, B-21, B-22, B-26 and B-27 at a depth between 2.9 and 4.5 feet below the existing pavement during drilling operations.

It should be noted that water levels determined during drilling may not accurately reflect the true groundwater conditions, and therefore should only be considered as approximate. Other factors that might impact groundwater levels include leakage from existing sewers and/or sanitary sewers. Piezometers were not installed in this portion of the project.

5.5 Existing Pavement Thickness

Existing pavement was cored at the boring and coring locations requested by the Garver project team. The pavement thicknesses at Taxiways RA/RB and SA/SB are shown in the following tables.

Table 5-3 – Existing Pavement Thickness – Taxiways RA/RB

Boring/Coring Location	Thickness (Inches)		
	Concrete, inches	Asphalt, inches	Base
B-1 (RA/RB)	16.75	1.75	53" Lime Stabilized Base
B-2 (RA/RB)	19.5	2.75 (Asphalt at surface)	7" Cement Treated Base, 2" Lime Stabilized Base, 7" Cement Treated Base 72" Lime Stabilized Base
B-3 (RA/RB)	35.5	--	24" Lime Stabilized Base
B-4 (RA/RB)	35	--	24" Lime Stabilized Base
B-5 (RA/RB)	35	--	24" Lime Stabilized Base
B-6 (RA/RB)	38	--	10" Lime Stabilized Base

Boring/Coring Location	Thickness (Inches)		
	Concrete, inches	**Asphalt, inches**	**Base**
B-7 (RA/RB)	16 & 14 (Groundwater Below Concrete)	1 (between Concrete layers)	17" Lime Stabilized Base
B-8 (RA/RB)	17.75 & 15	0.75 (between Concrete layers)	33.5" Lime Stabilized Base
B-9 (RA/RB)	31 (Groundwater Below Concrete)	--	41" Lime Stabilized Base
B-10 (RA/RB)	18	3.5	26.5" Lime Stabilized Base
C-1 (RA/RB)*	19	5	--
C-2 (RA/RB)*	18	3	11" Lime Stabilized Base (Groundwater at 32" Depth)
C-3 (RA/RB)	27	--	5" Cement Treated Base (Groundwater at 32" Depth)
C-4 (RA/RB)	19.5	3.5 (Asphalt at surface)	9" Cement Treated Base (Groundwater at 34" Depth)
C-5 (RA/RB)*	--	3.5	37" Cement Treated Base (Groundwater at 40.5" Depth)
C-6 (RA/RB)	--	3.25	28.5" Cement Treated Base 4.5" Lime Stabilized Base (Groundwater at 35" Depth)
C-7 (RA/RB)	--	3.5	28" Cement Treated Base 10" Lime Stabilized Base (Groundwater at 41.5" Depth)
C-8 (RA/RB)	21	5	9.5" Lime Stabilized Base
C-9 (RA/RB)*	17 & 15	1 (between Concrete layers)	30" Lime Stabilized Base
C-10 (RA/RB)	15.5	1	15.5" Cement Treated Base 10.5" Lime Stabilized Base
C-11 (RA/RB)*	--	2.5	20" Cement Treated Base 8" Cement Stabilized Sand 30.5" Lime Stabilized Base
C-12 (RA/RB)	--	3 & 3.5	15" Cement Stabilized Sand (between Asphalt layers) 8.5" Lime Stabilized Base
C-13 (RA/RB)*	21.5	--	11.5" Cement Stabilized Sand 13" Lime Stabilized Base 4" Sandy Clay 18.5" Lime Stabilized Base
C-14 (RA/RB)	19.5	3.5	13.5" Cement Stabilized Sand
C-15 (RA/RB)*	--	4	5.5" Cement Stabilized Sand 15.5" Lime Stabilized Base 5.5" Cement Stabilized Sand 29" Lime Stabilized Base
C-16 (RA/RB)	--	3.5	61" Lime Stabilized Base

Table 5-4 – Existing Pavement Thickness – Taxiways SA/SB

Coring	Thickness (Inches)		
	Asphalt, inches	Concrete, inches	Base
B-1 (SA/SB)	4.5	--	28" Cement Stabilized Sand 15.5" Lime Stabilized Base
B-2 (SA/SB)	7.25	--	28.25" Cement Treated Base
B-3 (SA/SB)	6.5	--	28" Cement Stabilized Sand 13.5" Lime Stabilized Base
B-4 (SA/SB)	6.5	--	27.5" Cement Treated Base
B-5 (SA/SB)	6.5	--	29" Cement Treated Base
B-6 (SA/SB)	6.5	--	29" Cement Treated Base
B-7 (SA/SB)	7.5	--	27.5" Cement Treated Base
B-8 (SA/SB)	8	--	30" Cement Treated Base
B-9 (SA/SB)	8	--	28" Cement Stabilized Sand 26" Lime Stabilized Base
B-10 (SA/SB)	7	--	29.5" Cement Stabilized Sand 11.5" Lime Stabilized Base
B-11 (SA/SB)	7.5	--	27" Cement Stabilized Sand 13.5" Lime Stabilized Base (Groundwater at 35" Depth)
B-12 (SA/SB)	7.5	--	28" Cement Stabilized Sand 36.5" Lime Stabilized Base
B-13 (SA/SB)	7.5	--	29" Cement Stabilized Sand 11.5" Lime Stabilized Base
B-14 (SA/SB)	4.5	--	8" Cement Treated Base 22" Cement Stabilized Sand 13.5" Lime Stabilized Base
B-15 (SA/SB)	10	--	28.5" Cement Treated Base
B-16 (SA/SB)	5.5	--	29.5" Cement Treated Base
B-17 (SA/SB)	2.5	14	18.5" Cement Stabilized Sand 13" Lime Stabilized Base (Groundwater at 37" Depth)
B-18 (SA/SB)	5.5	15	27" Cement Stabilized Sand 12.5" Lime Stabilized Base
B-19 (SA/SB)	2	11.5	23" Cement Stabilized Sand 11.5" Lime Stabilized Base (Groundwater at 36.5" Depth)
B-20 (SA/SB)	11	14	26" Cement Stabilized Sand 9" Lime Stabilized Base
B-21 (SA/SB)	2	15	26" Cement Stabilized Sand 5" Lime Stabilized Base (Groundwater at 45" Depth)
B-22 (SA/SB)	1.5	12.5	20.5" Cement Stabilized Sand 12" Cement Treated Base 25.5" Lime Stabilized Base (Groundwater at 54.5" Depth)
B-22 (SA/SB) Shoulder	4	--	12" Cement Treated Base 2" Lime Stabilized Base
B-23 (SA/SB)	7	--	28" Cement Stabilized Sand 13" Lime Stabilized Base

Coring	Thickness (Inches)		
	Asphalt, inches	**Concrete, inches**	**Base**
B-23 (SA/SB) Shoulder	3	--	11" Cement Treated Base 20" Cement Stabilized Sand 8.5" Lime Stabilized Base
B-26 (SA/SB)	1	15	23" Cement Stabilized Sand 9" Lime Stabilized Base (Groundwater at 39" Depth)
B-24 (SA/SB	6.75	--	28.25" Cement Treated Base
B-25 (SA/SB	6.5	--	29" Cement Treated Base
B-26 (SA/SB) Shoulder	4	--	10" Cement Treated Base 13.5" Cement Stabilized Sand 7" Lime Stabilized Base
B-27 (SA/SB)	6.5	--	29" Cement Stabilized Sand 36.5" Lime Stabilized Base (Groundwater at 33" Depth)
B-27 (SA/SB) Shoulder	2.5	--	11.5" Cement Treated Base 11.5" Lime Stabilized Base 7.5" Cement Stabilized Sand
B-28 (SA/SB)	7	--	28.5" Cement Stabilized Sand 12.5" Lime Stabilized Base
B-28 (SA/SB) Shoulder	3	--	10" Cement Treated Base 21" Cement Stabilized Sand 1" Lime Stabilized Base
B-29 (SA/SB)	7.5	--	28.5" Cement Stabilized Sand 36" Lime Stabilized Base
B-29 (SA/SB) Shoulder	4	--	9" Cement Treated Base 23" Cement Stabilized Sand 1.5" Lime Stabilized Base
C-1 (SA/SB)*	6	--	30" Cement Treated Base
C-2 (SA/SB)	6.5	--	29.5" Cement Treated Base
C-3 (SA/SB)	6.5	--	27.5" Cement Treated Base
C-4 (SA/SB)*	6.5	--	28.5" Cement Treated Base
C-5 (SA/SB)	6.75	--	29.25" Cement Treated Base
C-6 (SA/SB)*	7.25	--	28.25" Cement Treated Base
C-7 (SA/SB)	7.25	--	28" Cement Treated Base
C-8 (SA/SB)*	6.75	--	27.25" Cement Treated Base
C-9 (SA/SB)	7.5	--	28" Cement Stabilized Sand 7" Lime Stabilized Base (Groundwater at 42.5" Depth)
C-10 (SA/SB)*	7.25	--	29" Cement Stabilized Sand 32" Lime Stabilized Base
C-11 (SA/SB)	3.5	--	5.5" Cement Treated Base 23.5" Cement Stabilized Sand 7" Lime Stabilized Base (Slight Groundwater Seepage at 39.5" Depth)

Coring	Thickness (Inches)		
	Asphalt, inches	Concrete, inches	Base
C-12 (SA/SB)	3	--	8.5" Cement Treated Base 24" Cement Stabilized Sand 26" Lime Stabilized Base
C-13 (SA/SB)	3.75	--	8.75" Cement Treated Base 21.5" Cement Stabilized Sand 3" Lime Stabilized Base
C-14 (SA/SB)	7.5	--	28" Cement Stabilized Sand 5.5" Lime Stabilized Base (Groundwater at 41" Depth)
C-15 (SA/SB)	8.5	--	29" Cement Treated Base
C-16 (SA/SB)*	1	11.5	23.5" Cement Treated Base
C-17 (SA/SB)	2	14.5	20.5" Cement Stabilized Sand 43" Lime Stabilized Base
C-18 (SA/SB)*	2.75	14.25	14" Cement Stabilized Sand 34" Lime Stabilized Base
C-19 (SA/SB)	2	14.5	19.5" Cement Stabilized Sand 36" Lime Stabilized Base (Groundwater at 35" Depth)
C-20 (SA/SB)	2.5	14	21.5" Cement Stabilized Sand 35" Lime Stabilized Base
C-21 (SA/SB)	2.5	14	15.5" Cement Stabilized Sand 20" Lime Stabilized Base
C-22 (SA/SB)	11.5	14.75	16" Cement Stabilized Sand 29" Lime Stabilized Base
C-23 (SA/SB)*	9	--	30" Cement Treated Base
C-24 (SA/SB)	6.75	--	28.25" Cement Treated Base
C-25 (SA/SB)*	7	--	28" Cement Treated Base
C-26 (SA/SB)*	3	--	9.5" Cement Treated Base 21" Cement Stabilized Sand 34.5" Lime Stabilized Base
C-27 (SA/SB)	3.75	--	8.25" Cement Treated Base 22" Cement Stabilized Sand 4.5" Lime Stabilized Base (Groundwater at 38.5" Depth)
C-28 (SA/SB)*	3.5	--	16" Cement Treated Base 4.5" Lime Stabilized Base

*DCP tests were conducted at 18 coring locations as discussed in Section 5.6 below.

5.6 DCP Test Results

Eighteen (18) Dynamic Cone Penetrometer (DCP) tests were performed in accordance with ASTM D6951 at pavement coring locations selected by the Garver project team. DCP test results are presented in Appendix E. Seven (7) DCP tests were performed for RA/RB taxiway segment whereas eleven (11) were performed for SA/SB taxiway segment.

DCP tests were performed after coring through the pavement and stabilized base materials until natural soils were encountered. The depths cored below which DCP tests were conducted varied from 24 to 68 inches, as shown in the Remarks on the DCP test records. In the DCP tests, the penetration rate was fairly consistent except at cores C-1 and C-15 for RA/RB and cores C-4, C-6

and C-25 for SA/SB where relatively hard 6-inch intervals were encountered. These harder subgrade layers may be additional unobserved stabilized layers since the stabilized soil depth across the Taxiway RA/RB site was variable. It also should be noted, the DCP test at cores C-2 at RA/RB and C-1 at SA/SB encountered a very hard layer and the test was terminated so the DCP test is invalid.

6 SUBGRADE STABILIZATION RECOMMENDATIONS

6.1 Subgrade Stabilization

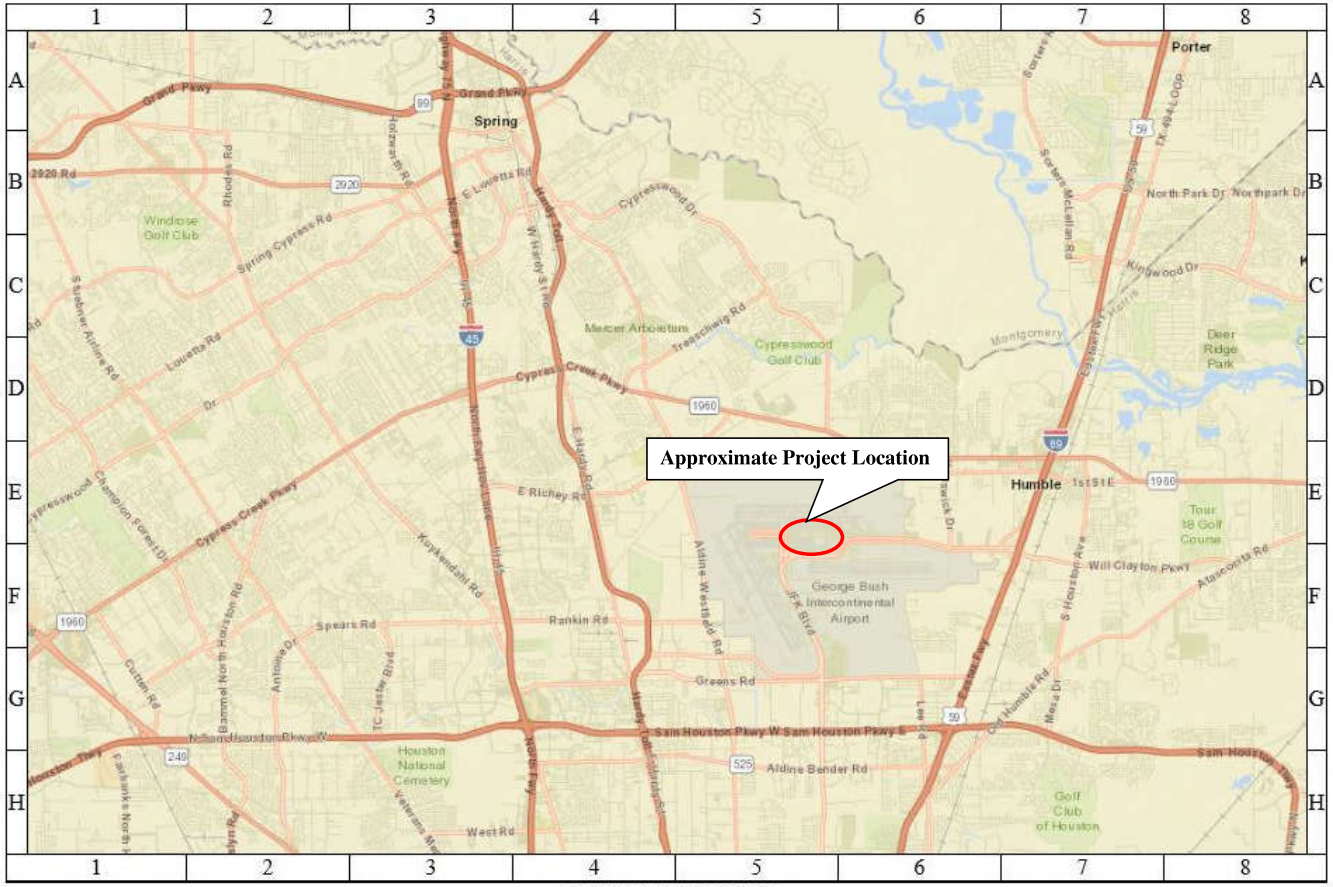
Based on a review of laboratory geotechnical data, the subsurface stratigraphy generally consists of sandy lean clay and various types of sand. The California Bearing Ratio (CBR) test, performed on the composite material obtained from the 10 borings for (RA/RB) taxiway and for (SA/SB) from the 19 borings as discussed in Section 4.2, resulted in a CBR value of 10.2 and 8.2, respectively. which represents classification of clayey sand for both (Plasticity Index = 7) and (Plasticity Index = 8).

Based on the lime series test results, 6% to 8% lime per unit dry weight appears to be an adequate estimate for stabilization of the onsite lean clays/clayey sands to perform satisfactorily as pavement subgrade. Cohesionless clayey sand was also encountered in the borings. At locations where sandy soils are encountered during construction, the subgrade soils may be stabilized with lime and fly-ash (2% lime and 8% fly-ash).

7 LIMITATIONS

This investigation was performed for the exclusive use of Garver for the proposed rehabilitation of taxiways RA, RB, SA and SB at George Bush International Airport in Houston, Texas. HVJ has endeavored to comply with generally accepted geotechnical engineering practice common in the local area. HVJ makes no warranty, express or implied. The analyses and recommendations contained in this report are based on data obtained from subsurface exploration, laboratory testing, the project information provided to HVJ and HVJ's experience with similar soils and site condition. The methods used indicate subsurface conditions only at the specific locations where samples were obtained, only at the time they were obtained, and only to the depths penetrated. Samples cannot be relied on to accurately reflect the strata variations that usually exist between sampling locations. Should any subsurface conditions other than those described in the boring logs be encountered, HVJ should be immediately notified so that further investigation and supplemental geotechnical information can be provided.

PLATES



1 2 3 4 5 6 7 8

A B C D E F G H

CITY OF HOUSTON
Department of Public Works and Engineering
Geographic Information & Management System (GIMS)

DISCLAIMER: THIS MAP REPRESENTS THE BEST INFORMATION AVAILABLE TO THE CITY.
THE CITY DOES NOT WARRANT ITS ACCURACY OR COMPLETENESS.
FIELD VERIFICATIONS SHOULD BE DONE AS NECESSARY.

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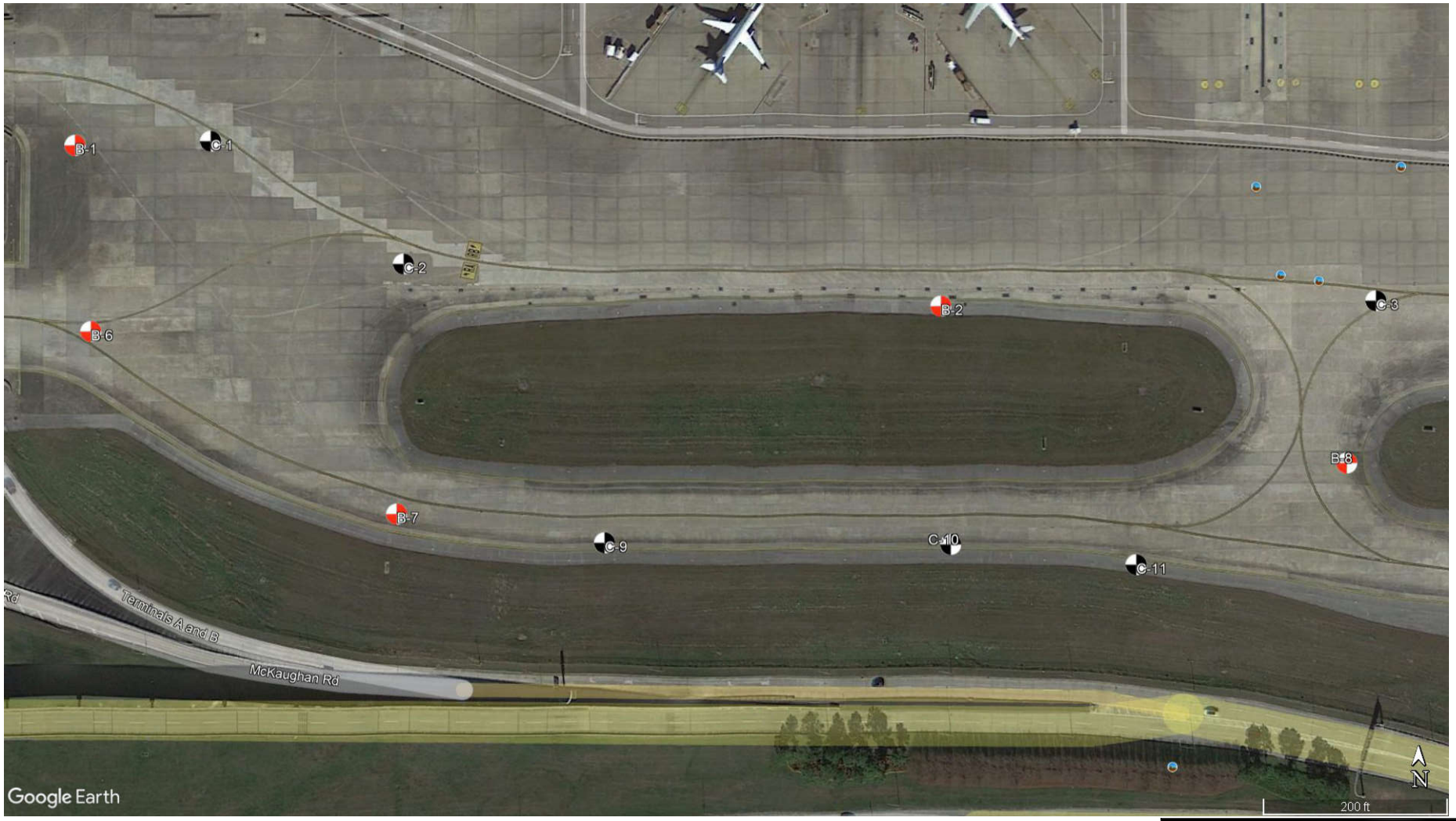
DATE: 06/15/2022	APPROVED BY: SV	PREPARED BY: PD

SITE VICINITY MAP
REHABILITATION OF TAXIWAY RA, RB, SA AND SB AT GEORGE BUSH INTERCONTINENTAL AIRPORT (IAH)

PROJECT NO.:	DRAWING NO.:
HG1810124	PLATE 1



LEGEND:

APPROXIMATE BORING LOCATIONS (RA, RB)

APPROXIMATE CORING LOCATIONS (RA, RB)

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PLAN OF BORINGS
REHABILITATION OF TAXIWAY RA, RB, SA AND SB AT
GEORGE BUSH INTERCONTINENTAL AIRPORT (IAH)

PROJECT NO.: HG1810124	DRAWING NO.: PLATE 2A

LEGEND:

APPROXIMATE BORING LOCATIONS (RA, RB)

APPROXIMATE CORING LOCATIONS (RA, RB)

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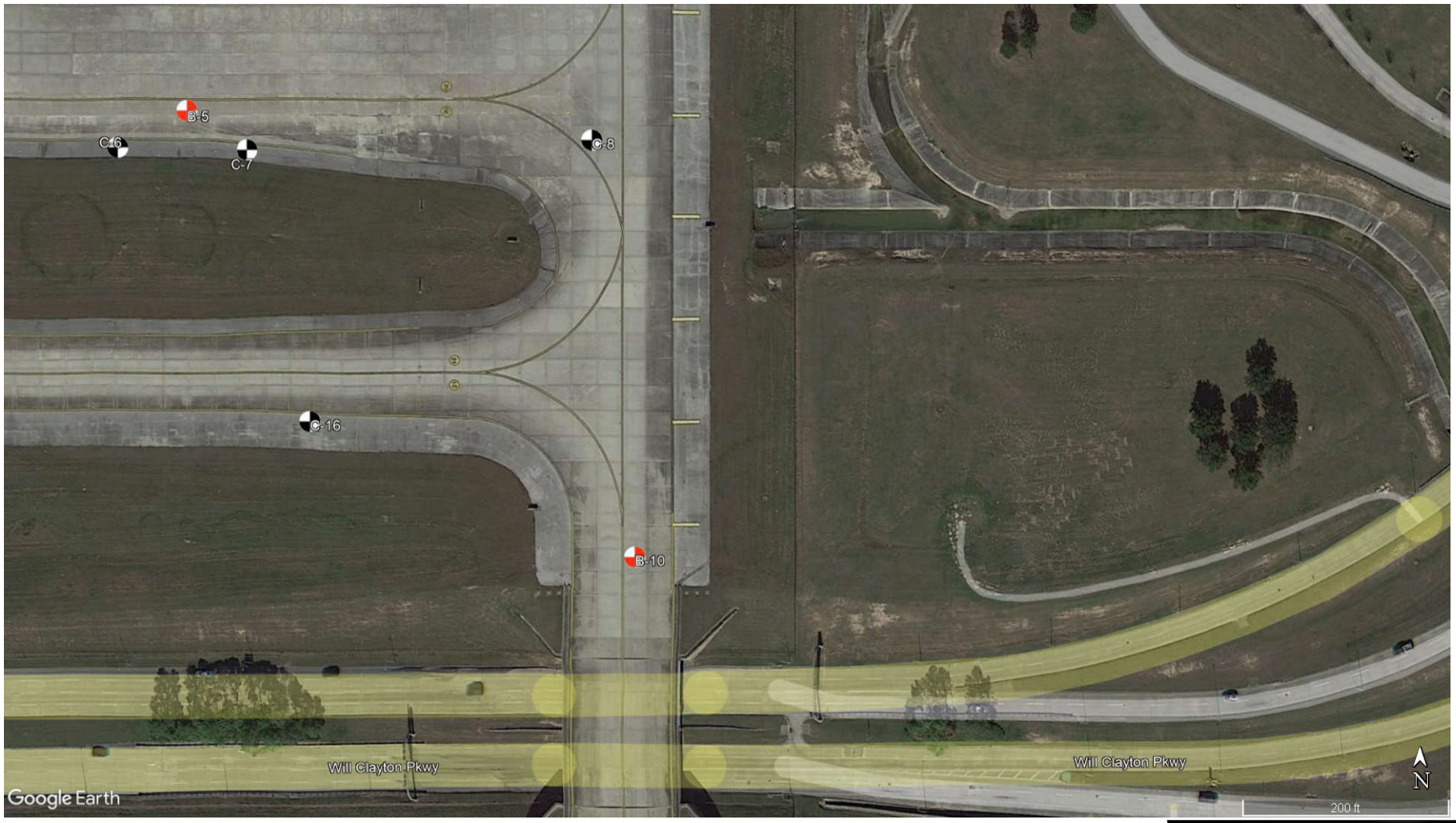
PLAN OF BORINGS
REHABILITATION OF TAXIWAY RA, RB, SA AND SB AT
GEORGE BUSH INTERCONTINENTAL AIRPORT (IAH)

PROJECT NO.: HG1810124	DRAWING NO.: PLATE 2B



LEGEND:

APPROXIMATE BORING LOCATIONS (RA, RB)

APPROXIMATE CORING LOCATIONS (RA, RB)

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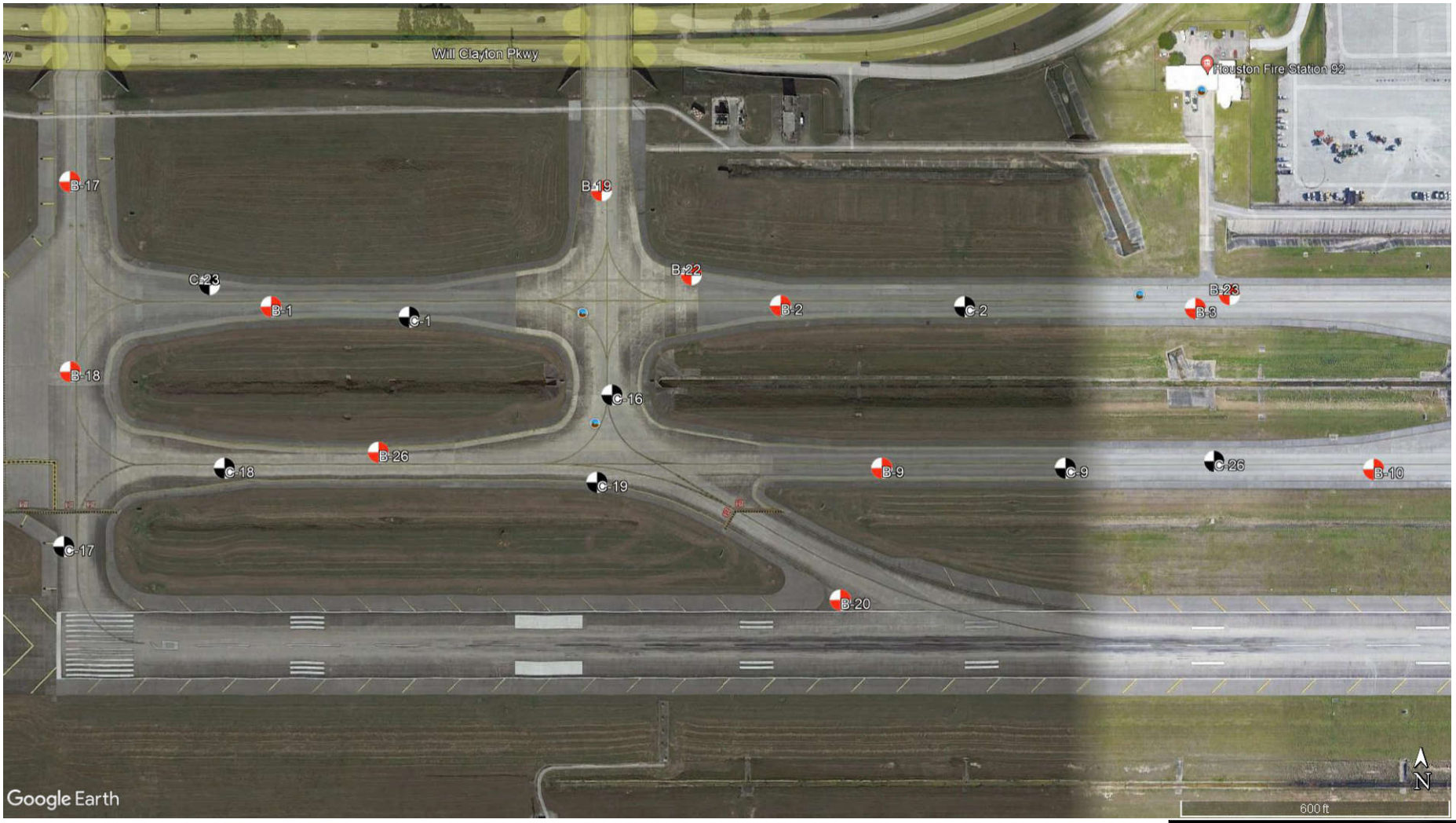
PLAN OF BORINGS
REHABILITATION OF TAXIWAY RA, RB, SA AND SB AT GEORGE BUSH INTERCONTINENTAL AIRPORT (IAH)

PROJECT NO.: HG1810124	DRAWING NO.: PLATE 2C



LEGEND:

APPROXIMATE BORING LOCATIONS (SA, SB)

APPROXIMATE CORING LOCATIONS (SA, SB)

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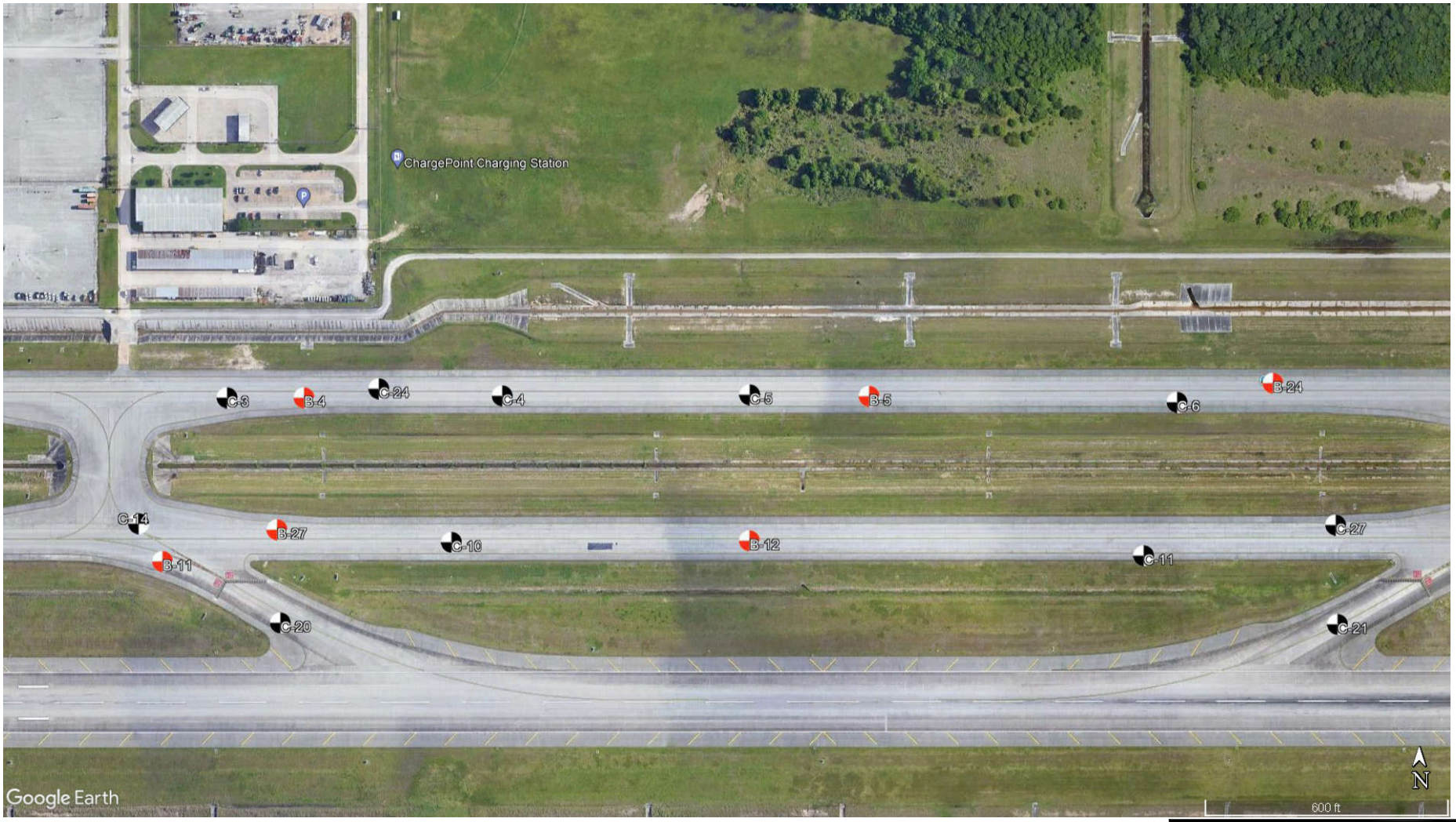
PLAN OF BORINGS
REHABILITATION OF TAXIWAY RA, RB, SA AND SB AT GEORGE BUSH INTERCONTINENTAL AIRPORT (IAH)

PROJECT NO.: HG1810124	DRAWING NO.: PLATE 2D



LEGEND:

APPROXIMATE BORING LOCATIONS (SA, SB)

APPROXIMATE CORING LOCATIONS (SA, SB)

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PLAN OF BORINGS
REHABILITATION OF TAXIWAY RA, RB, SA AND SB AT GEORGE BUSH INTERCONTINENTAL AIRPORT (IAH)

PROJECT NO.: HG1810124	DRAWING NO.: PLATE 2E

LEGEND:

APPROXIMATE BORING LOCATIONS (SA, SB)

APPROXIMATE CORING LOCATIONS (SA, SB)

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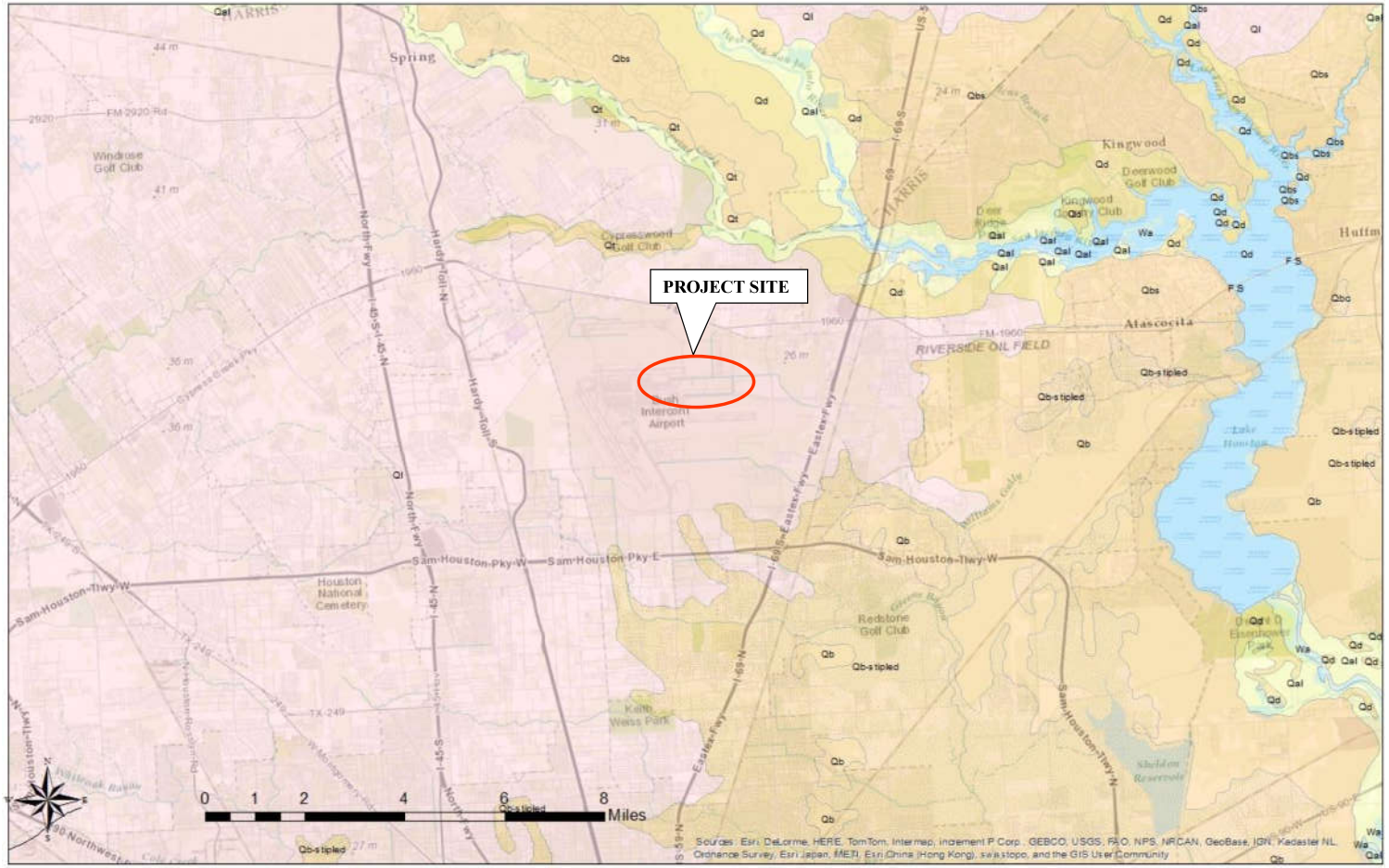
PLAN OF BORINGS
REHABILITATION OF TAXIWAY RA, RB, SA AND SB AT GEORGE BUSH INTERCONTINENTAL AIRPORT (IAH)

PROJECT NO.: HG1810124	DRAWING NO.: PLATE 2F



Ql

Qb-stipled

Lissie Formation -- Upper part, clay, silt, sand, and very minor siliceous gravel of granule and small pebble size gravel more abundant northwestward, locally calcareous, concretions of calcium carbonate, iron oxide, and iron-manganese oxides common in zone of weathering; fluviatile; surface fairly flat and featureless except for numerous rounded shallow depressions and pimple mounds, bower part, clay, silt, sand, and minor amount of gravel; gravel slightly coarser than in upper part, noncalcareous, iron oxide concretions mare

Beaumont Formation -- Dominantly clay and mud of low permeability, high water-holding capacity, high compressibility, high to very high shrink-swell potential, poor drainage, level to depressed relief, low shear strength, and high plasticity; geologic units include interdistributary muds, abandoned channel-fill muds, and overbank fluvial muds

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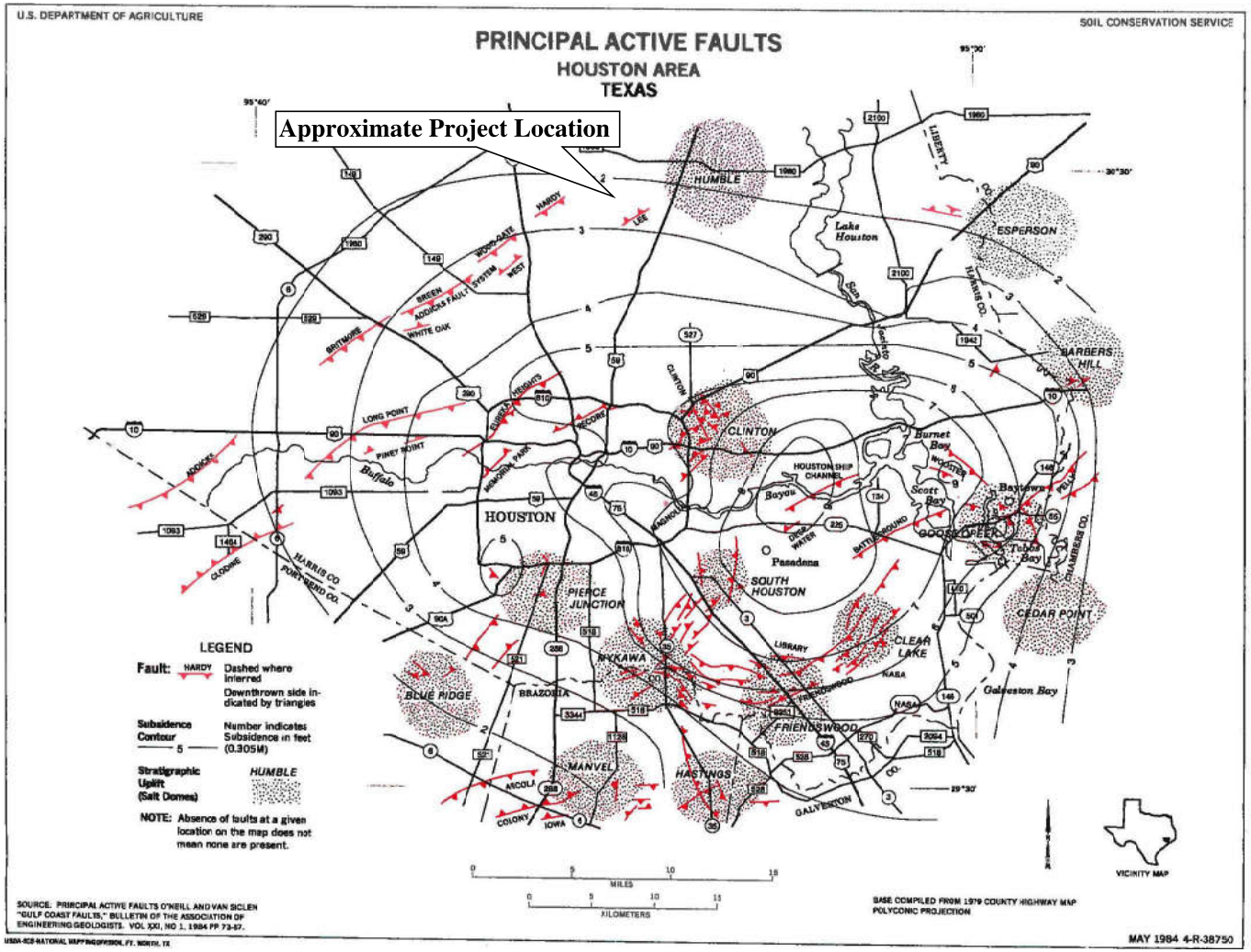
GEOLOGIC MAP
REHABILITATION OF TAXIWAY RA, RB, SA AND SB AT
GEORGE BUSH INTERCONTINENTAL AIRPORT (IAH)

PROJECT NO.:	DRAWING NO.:
HG1810124	PLATE 3



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FAULT MAP
REHABILITATION OF TAXIWAY RA, RB, SA AND SB AT GEORGE BUSH INTERCONTINENTAL AIRPORT (IAH)

PROJECT NO.: HG1810124	DRAWING NO.: PLATE 4

APPENDIX A

BORING LOGS AND KEY TO TERMS & SYMBOLS

LOG OF BORING B-1 (RA-RB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13924356.88; E: 3126903.21
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 92.59 FT

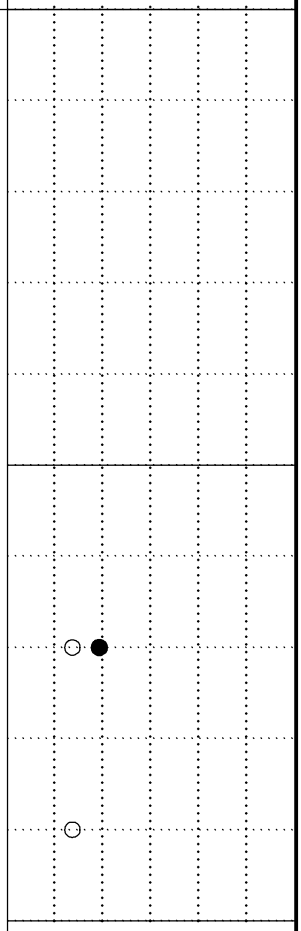
PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 4/20/2020

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Pavement: 16.75" Concrete, 1.75" Asphaltic Concrete, 53" Lime Stabilized Base							
90									
	5					18			
		Stiff, gray and brown, SANDY LEAN CLAY (CL)			112	13			
85		-w/ roots at 8'-10'		56.1		20	21	13	8
	10								

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5



COH HG1810124.GPJ 6/22/20

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: —
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: MP

HVJ Asssociates, Inc.

PLATE A-1

LOG OF BORING B-2 (RA-RB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13924213.48; E: 3127844.68
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 92.12 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 4/20/2020

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0			Pavement: 2.75" Asphaltic Concrete, 19.5" Concrete, 7" Cement Treated Base, 2" Lime Stabilized Base, 7" Cement Treated Base, 72" Lime Stabilized Base							
90											
	5			Medium dense, Silty Sand (SM) - lime stabilized hard layer	31	22.1		14			
85					34						
	10										

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: —
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: MP

HVJ Asssociates, Inc.

PLATE A-2

COH HG1810124.GPJ 6/22/20

LOG OF BORING B-3 (RA-RB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13924198.77; E: 3129072.48
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 91.33 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 4/22/2020

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Pavement: 35.5" Concrete, 24" Lime Stabilized Base							
90									
	5	Firm to very stiff, gray and reddish brown, SANDY LEAN CLAY (CL) -w/ ferrous stains at 5'-10'		57.8		16	26	17	9
85					117	17			
		-w/ calcareous nodules at 8'-10'		51.3		12	36	16	20
	10								

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: —
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: MP

HVJ Asssociates, Inc.

PLATE A-3

COH HG1810124.GPJ 6/22/20

LOG OF BORING B-4 (RA-RB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13924230.39; E: 3129573.56
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 92.3 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 4/22/2020

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Pavement: 35" Concrete, 24" Lime Stabilized Base							
90	5	Gray, reddish brown and tan, CLAYEY SAND (SC) -w/ gravel at 5'-6' -w/ ferrous stains and calcareous nodules at 5'-10'		45.8	123	20 15 15	30	16	14
85	10								

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: —
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: MP

HVJ Asssociates, Inc.

PLATE A-4

COH HG1810124.GPJ 6/22/20

LOG OF BORING B-5 (RA-RB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13924247.07; E: 3129912.05
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 92.23 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 4/22/2020

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Pavement: 35" Concrete, 24" Lime Stabilized Base							
90	5	Gray, tan and reddish brown, SILTY SAND (SM)		39.3		13			
		-w/ ferrous stains at 6'-10			113	16			
85	10					15			

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: —
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: MP

HVJ Asssociates, Inc.

PLATE A-5

COH HG1810124.GPJ 6/22/20

LOG OF BORING B-6 (RA-RB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13924157.32; E: 3126926.83
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 93.06 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 4/21/2020

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0			Pavement: 38" Concrete, 10" Lime Stabilized Base							
90											
	5			Gray, CLAYEY SAND (SC)		41.6		14	26	16	10
				-w/ roots at 6'-8'							
85				-w/ woods at 8'-10'		50.0	115	12	26	17	9
	10										

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: —
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: MP

HVJ Asssociates, Inc.

PLATE A-6

COH HG1810124.GPJ 6/22/20

LOG OF BORING B-7 (RA-RB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13923971.55; E: 3127263.27
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 92.16 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 4/22/2020

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 3 FT
WET ROTARY: 3 TO 10 FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Pavement: 16" Concrete, 1" Asphaltic concrete, 14" Concrete, 17" Lime Stabilized Base							
90 ▽									
	5	Gray, SILTY CLAYEY SAND (SC-SM)		48.4		11	22	17	5
85		Stiff to very stiff, gray and brown, SANDY LEAN CLAY (CL) -w/ ferrous stains at 6'-10'			109	13			
	10			51.4		13	26	18	8

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 2.6 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: MP

HVJ Asssociates, Inc.

PLATE A-7

COH HG1810124.GPJ 6/22/20

LOG OF BORING B-8 (RA-RB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13924058.54; E: 3128288.72
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 91.27 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 4/21/2020

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0										
90				Pavement: 17.75" Concrete, 0.75" Asphaltic concrete, 15" Concrete, 33.5" Lime Stabilized Base							
	5										
85				Gray and tan, CLAYEY SAND (SC)		46.9	111	14 17	22	13	9
	10										

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: —
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: MP

HVJ Asssociates, Inc.

PLATE A-8

COH HG1810124.GPJ 6/22/20

LOG OF BORING B-9 (RA-RB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13924065.06; E: 3129137.69
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 90.78 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 4/23/2020

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 3 FT
WET ROTARY: 3 TO 10 FT

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
90	0	Pavement: 31" Concrete, 41" Lime Stabilized Base							
	5								
85	10	Very stiff, gray, tan and reddish brown, SANDY LEAN CLAY (CL) -w/ ferrous stains at 6'-10'		69.6		14	37	17	20
						14			

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 2.6 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: MP

HVJ Asssociates, Inc.

PLATE A-9

COH HG1810124.GPJ 6/22/20

LOG OF BORING B-10 (RA-RB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13923827.09; E: 3130363.21
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 91.15 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 4/23/2020

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Pavement: 18" Concrete, 3.5" Asphaltic Concrete, 26.5" Lime Stabilized Base							
90									
	5	Gray and tan, CLAYEY SAND (SC) -w/ calcareous nodules and ferrous stains at 4'-10'		37.2		16	35	20	15
85		-w/ woods at 6'-8'			116	17			
	10					13			

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: —
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: MP

HVJ Asssociates, Inc.

PLATE A-10

COH HG1810124.GPJ 6/22/20

LOG OF BORING B-1 (SA-SB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13923028.08; E: 3129630.75
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 89.87 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 5/1/2020

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Pavement: 4.5" Asphaltic Concrete, 28" Stabilized Sand, 15.5" Lime Stabilized Base							
85	5	Stiff to very stiff, gray, SANDY LEAN CLAY (CL) -w/ ferrous stains at 4'-10' -w/ calcareous nodules at 4'-6'			110	17			
				68.6		15	36	11	25
		-w/ calcareous nodules at 8'-10'				12			
80	10								

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: —
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: MP

HVJ Asssociates, Inc.

PLATE A-11

COH HG1810124 - SA-SB.GPJ 6/17/22

LOG OF BORING B-2 (SA-SB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13923065.68; E: 3130762.87
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 89.31 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 5/19/2022

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Pavement: 7.25" Asphalt, 28.25" Cement Treated Base							
		Gray and brown, SILTY CLAYEY SAND (SC-SM)				22			
85	5			42.2		22	29	22	7
		Stiff to very stiff, brown and gray, SANDY LEAN CLAY (CL) -w/ ferrous stains at 6'-10'			118	15			
80	10			60.5		18	32	13	19

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: —
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: JE

HVJ Asssociates, Inc.

PLATE A-12

COH HG1810124 - SA-SB.GPJ 6/17/22

LOG OF BORING B-3 (SA-SB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13923088.5; E: 3131682.05
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 88.38 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 5/1/2020

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Pavement: 6.5" Asphaltic Concrete, 28" Stabilized Sand, 13.5" Lime Stabilized Base							
85									
	5	Gray, CLAYEY SAND (SC)		33.5		25	28	18	10
		Stiff to very stiff, gray, SANDY LEAN CLAY (CL)				16			
80		-w/ ferrous stains at 8'-10'		56.4	110	19	39	22	17
	10								

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: —
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: MP

HVJ Asssociates, Inc.

PLATE A-13

COH HG1810124 - SA-SB.GPJ 6/17/22

LOG OF BORING B-4 (SA-SB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13923127.1; E: 3132874.88
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 87.66 FT

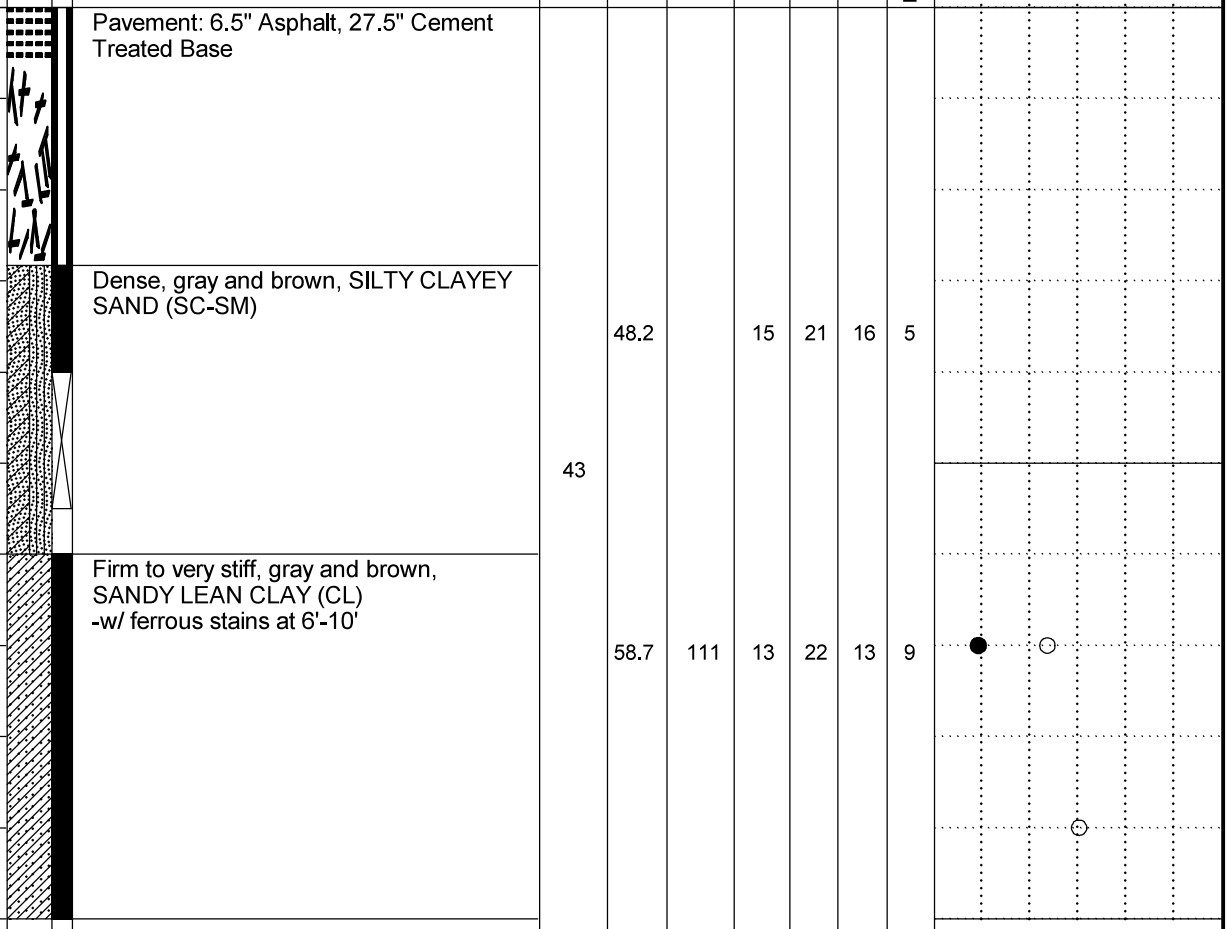
PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 5/19/2022

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Pavement: 6.5" Asphalt, 27.5" Cement Treated Base							
85		Dense, gray and brown, SILTY CLAYEY SAND (SC-SM)		48.2		15	21	16	5
	5		43						
		Firm to very stiff, gray and brown, SANDY LEAN CLAY (CL) -w/ ferrous stains at 6'-10'		58.7	111	13	22	13	9
80	10								

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5



DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: —
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: JE

HVJ Asssociates, Inc.

PLATE A-14

COH HG1810124 - SA-SB.GPJ 6/17/22

LOG OF BORING B-5 (SA-SB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13923174.42; E: 3134264.06
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 86.89 FT

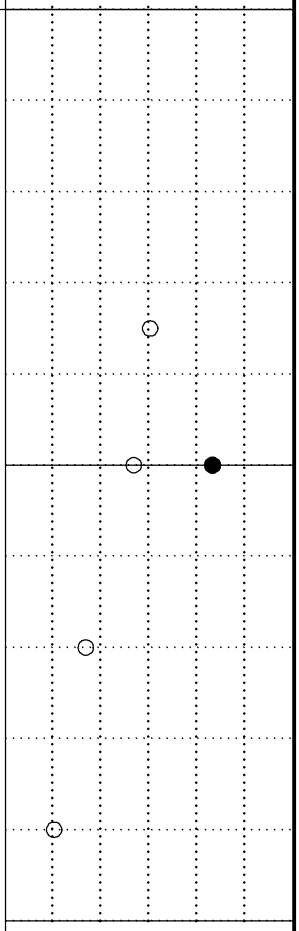
PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 5/19/2022

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Pavement: 6.5" Asphalt, 29" Cement Treated Base							
85		Stiff to hard, gray and brown, SANDY LEAN CLAY (CL)		58.5		14	26	16	10
	5	-w/ calcareous nodules and ferrous stains at 4'-10'			116	15			
80									
	10			67.2		16	31	15	16

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5



DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: —
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: JE

HVJ Asssociates, Inc.

PLATE A-15

COH HG1810124 - SA-SB.GPJ 6/17/22

LOG OF BORING B-6 (SA-SB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13923239.98; E: 3136209.86
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 85.74 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 5/19/2022

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
85	0	Pavement: 6.5" Asphalt, 29" Cement Treated Base							
		Gray and brown, CLAYEY SAND (SC)		46.6		21	31	22	9
	5	Stiff to very stiff, brown and gray, SANDY LEAN CLAY (CL)							
80		-w/ ferrous stains at 6'-10'		74.1	112	16	38	14	24
	10					16			

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: —
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: JE

HVJ Asssociates, Inc.

PLATE A-16

COH HG1810124 - SA-SB.GPJ 6/17/22

LOG OF BORING B-7 (SA-SB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13923252.16; E: 3137555.41
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 84.65 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 5/20/2022

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Pavement: 7.5" Asphalt, 27.5" Cement Treated Base							
		Stiff to very stiff, gray and brown, SANDY LEAN CLAY (CL)				23			
		-w/ calcareous nodules at 4'-5'							
80	5			51.4		31	33	23	10
					113	17			
		-w/ calcareous nodules at 8'-10'							
				68.3		13	34	16	18
75	10								

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: —
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: JE

HVJ Asssociates, Inc.

PLATE A-17

COH HG1810124 - SA-SB.GPJ 6/17/22

LOG OF BORING B-8 (SA-SB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13923320.73; E: 3138854.25
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 84.31 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 5/20/2022

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Pavement: 8" Asphalt, 30" Cement Treated Base							
80	5	Very stiff, gray and brown, SANDY LEAN CLAY (CL) -w/ calcareous nodules at 4'-6'		57.5		14 13	32	14	18
75	10	-w/ calcareous nodules at 8'-10'				20			

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: —
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: JE

HVJ Asssociates, Inc.

PLATE A-18

COH HG1810124 - SA-SB.GPJ 6/17/22

LOG OF BORING B-9 (SA-SB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13922714.09; E: 3130998.24
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 88.85 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 5/1/2020

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0			Pavement: 8" Asphalt, 28" Lime Stabiliized Sand, 24" Lime Stabilized Base							
85	5			Soft to very stiff, gray and light brown, SANDY LEAN CLAY (CL)				19			
						61.7		15	30	14	16
				-w/ ferrous stains at 8'-10'							
80	10						123	14			

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: —
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: MP

HVJ Asssociates, Inc.

PLATE A-19

COH HG1810124 - SA-SB.GPJ 6/17/22

LOG OF BORING B-10 (SA-SB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13922745.81; E: 3132090.43
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 87.94 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 5/2/2020

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Pavement: 7" Asphalt, 29.5" Stabilized Sand, 11.5" Lime Stabilized Base							
85									
	5	Gray, SANDY SILTY CLAY (CL-ML) -w/ calcareous at 4'-8' -w/ ferrous stains at 4'-10'				17			
				54.6		11	20	13	7
80					120	12			
	10								

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: —
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: MP

HVJ Asssociates, Inc.

PLATE A-20

COH HG1810124 - SA-SB.GPJ 6/17/22

LOG OF BORING B-11 (SA-SB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13922715.74; E: 3132538.37
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 86.95 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 4/30/2020

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Pavement: 7.5" Asphaltic Concrete, 27" Cement Stabilized Sand, 13.5" Lime Stabilized Base							
85									
	5	Gray and brown, SILTY SAND (SM) -w/ clay seams at 4'-8' -w/ gravel at 4'-6'		21.7		23			
		-w/ ferrous stains at 6'-8'			99	24			
80									
	10	Very stiff, gray and reddish brown, SANDY LEAN CLAY (CL) -w/ ferrous stains at 8'-10'		54.4		17	35	17	18

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 2.9 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: MP

HVJ Asssociates, Inc.

PLATE A-21

COH HG1810124 - SA-SB.GPJ 6/17/22

LOG OF BORING B-12 (SA-SB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13922811.59; E: 3133982.41
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 86.9 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 5/2/2020

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Pavement: 7.5" Asphalltic, 28" Cement Stabilized Sand, 36.5" Lime Stabilized Base							
85	5								
80	10	Stiff to very stiff, gray, SANDY LEAN CLAY (CL) -w/ ferrous stains at 6'-10'		65.4	119	14 16	29	15	14

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: —
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: MP

HVJ Asssociates, Inc.

PLATE A-22

COH HG1810124 - SA-SB.GPJ 6/17/22

LOG OF BORING B-13 (SA-SB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13922867.18; E: 3135749.79
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 85.68 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 4/30/2020

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Pavement: 7.5" Asphaltic Concrete, 29" Cement Stabilized Sand, 11.5" Lime Stabilized Base							
85									
	5	Dark gray, SILTY SAND (SM) -w/ ferrous stains at 4'-6'		27.9		17	25	22	3
80		Very stiff, gray, SANDY LEAN CLAY (CL) -w/ ferrous stains at 6'-10' -w/ calcareous nodules at 8'-10'		59.0	124	13	26	17	9
	10								

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: —
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: MP

HVJ Asssociates, Inc.

PLATE A-23

COH HG1810124 - SA-SB.GPJ 6/17/22

LOG OF BORING B-14 (SA-SB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13922888.74; E: 3137555.73
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 83.89 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 4/30/2020

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Pavement: 4.5" Asphaltic Concrete, 8" Cement Treated Base, 22" Cement Stabilized Sand, 13.5" Lime Stabilized Base							
80	5	Stiff, gray, LEAN CLAY WITH SAND (CL) -w/ ferrous stains at 4'-6'		74.9		15	31	17	14
		Stiff, gray and brown, SANDY LEAN CLAY (CL) -w/ calcareous nodules and ferrous stains at 6'-10' -w/ gravel at 6'-8'		63.7		16	37	16	21
75	10				115	16			

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: —
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: MP

HVJ Asssociates, Inc.

PLATE A-24

COH HG1810124 - SA-SB.GPJ 6/17/22

LOG OF BORING B-15 (SA-SB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13923143.11; E: 3137896.94
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 83.04 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 5/17/2022

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Pavement: 10" Asphalt, 28.5" Cement Treated Base							
80		Medium dense, gray and brown, CLAYEY SAND (SC)		41.8		20	38	27	11
	5		18						
		Very stiff, gray and brown, SANDY LEAN CLAY (CL)	23	63.7		18	36	19	17
75		-w/ calcareous nodules at 8'-10'			115	15			
	10								

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: —
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: JE

HVJ Asssociates, Inc.

PLATE A-25

COH HG1810124 - SA-SB.GPJ 6/17/22

LOG OF BORING B-16 (SA-SB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13923101.11; E: 3139103.57
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 83.81 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 5/17/2022

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Pavement: 5.5" Asphalt, 29.5" Cement Treated Base							
80	5	Medium dense, gray and brown, SILTY CLAYEY SAND (SC-SM)	19	13.7		24	22	16	6
75	10	Stiff to very stiff, brown and gray, SANDY LEAN CLAY (CL) -w/ calcareous nodules at 6'-10'		67.0	112	13 14	34	19	15

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: —
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: JE

HVJ Asssociates, Inc.

PLATE A-26

COH HG1810124 - SA-SB.GPJ 6/17/22

LOG OF BORING B-17 (SA-SB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13923948.73; E: 3130041.48
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 90.43 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT
DATE: 4/30/2020

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
90	0	Pavement: 14" Concret, 2.5' Asphalltic,18.5" Cement Stabilized Sand, 13" Lime Stabilized Base							
	5	Firm to stiff, gray, reddish brown and light brown, SANDY LEAN CLAY (CL) -w/ lime stabilized sand at 4'-6'				21			
85		-w/ calclcareous at 6'-8' -w/ ferrous stains at 6'-10'		60.5	122	16 15	36	17	19
	10								

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 3.1 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: MP

HVJ Asssociates, Inc.

PLATE A-27

COH HG1810124 - SA-SB.GPJ 6/17/22

LOG OF BORING B-18 (SA-SB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13922870.34; E: 3129188.1
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 91.16 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 4/30/2020

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Pavement: 15" Concrete, 5.5' Asphalltic, 27" Cement Stabilized Sand, 12.5" Lime Stabilized Base							
90									
	5	Gray, CLAYEY SAND (SC)		44.1		17	36	24	12
85		-w/ ferrous stains at 6'-8'				14			
	10	Firm to very stiff, gray, SANDY LEAN CLAY -w/ ferrous stains at 8'-10'		57.2		12	26	17	9

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: —
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: MP

HVJ Asssociates, Inc.

PLATE A-28

COH HG1810124 - SA-SB.GPJ 6/17/22

LOG OF BORING B-19 (SA-SB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13923307.25; E: 3130356.14
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 88.08 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 5/1/2020

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Pavement: 11.5" Concret, 2" Asphalt, 23" Cement Stabilized Sand, 11.5" Lime Stabilized Base							
85	5	Gray and light brown, CLAYEY SAND (SC) -w/ ferrous stains at 4'-10'			122	13			
				48.3		13	28	14	14
80	10					15			

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 3.0 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: MP

HVJ Asssociates, Inc.

PLATE A-29

COH HG1810124 - SA-SB.GPJ 6/17/22

LOG OF BORING B-20 (SA-SB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13922419.65; E: 3130915.71
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 88.6 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 4/29/2020

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Pavement: 14" Concrete, 11" Asphalt, 26" Cement Stabilized Sand, 9" Lime Stabilized Base							
85	5	Gray and dark gray, SILTY CLAYEY SAND (SC-SM) -w/ calcareous nodules and wood at 5'-6' -w/ ferrous stains at 5'-10'		22.9		19	29	22	7
						18			
80	10				118	14			

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: —
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: MP

HVJ Asssociates, Inc.

PLATE A-30

COH HG1810124 - SA-SB.GPJ 6/17/22

LOG OF BORING B-21 (SA-SB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13922650.36; E: 3137368.8
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 84.16 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 4/29/2020

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Pavement: 15" Concrete, 2" Asphaltic Concrete, 26" Cement Stabilized Sand, 5" Lime Stabilized Base							
80	5	Gray and reddish brown, CLAYEY SAND (SC) -w/ calcareous nodules at 6'-8'		33.5		25	42	28	14
75	10	Stiff, gray, SANDY LEAN CLAY (CL) -w/ ferrous stains at 8'-10'		65.8	118	15	33	17	16

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 3.8 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: MP

HVJ Asssociates, Inc.

PLATE A-31

COH HG1810124 - SA-SB.GPJ 6/17/22

LOG OF BORING B-22 (SA-SB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13923128.42; E: 3130560.9
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 88.64 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 5/1/2020

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL
85	0	Pavement: 12.5" Concrete, 1.5" Asphalt, 20.5" Cement Stabilized Sand, 12" Cement Treated Base, 25.5" Lime Stabilized Base
	5	
80	10	Gray and reddish brown, SILTY SAND (SM) -w/ ferrous stains at 6-10'

▽ 5

MOISTURE CONTENT, %
17

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

COH HG1810124 - SA-SB.GPJ 6/17/22

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 4.5 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: MP

HVJ Asssociates, Inc.

PLATE A-32

LOG OF BORING B-23 (SA-SB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13923121.7; E: 3131758.55
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 88.2 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 5/1/2020

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0			Pavement: 7" Asphaltic Concrete, 28" Cement Stabilized Sand, 13" Lime Stabilized Base							
85											
	5			Gray and light brown, SILTY SAND (SM) -w/ ferrous stains at 4'-10'		13.4		21			
							111	19			
80								18			
	10										

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: —
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: MP

HVJ Asssociates, Inc.

PLATE A-33

COH HG1810124 - SA-SB.GPJ 6/17/22

LOG OF BORING B-24 (SA-SB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13923237.51; E: 3135257.73
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 85.89 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 5/19/2022

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Pavement: 6.75" Asphalt, 28.25" Cement Treated Base							
85									
	5	Brown and gray, SILTY CLAYEY SAND (SC-SM) -w/ calcareous nodules at 4'-6'		12.6		18	23	17	6
80		Very stiff, brown and gray, LEAN CLAY WITH SAND (CL) -w/ calcareous nodules at 6'-8' -w/ ferrous stains at 8'-10'		76.9	124	15 16	46	23	23
	10								

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: —
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: JE

HVJ Asssociates, Inc.

PLATE A-34

COH HG1810124 - SA-SB.GPJ 6/17/22

LOG OF BORING B-25 (SA-SB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13923315.72; E: 3138059.63
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 84.77 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 5/20/2022

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Pavement: 6.5" Asphalt, 29" Cement Treated Base							
		Stiff to very stiff, gray and brown, SANDY LEAN CLAY (CL)		68.4		18	32	16	16
80	5	-w/ calcareous nodules at 4'-10'			107	19			
		-w/ ferrous stains at 6'-10'		71.0		19	35	17	18
75	10								

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: —
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: JE

HVJ Asssociates, Inc.

PLATE A-35

COH HG1810124 - SA-SB.GPJ 6/17/22

LOG OF BORING B-26 (SA-SB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13922714.02; E: 3129878.47
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 88.95 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 4/30/2020

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Pavement: 15" Concrete, 1" Asphaltic Concrete, 23" Cement Stabilized Sand, 9" Lime Stabilized Base							
85	5	Firm to stiff, gray and reddish brown, SANDY LEAN CLAY (CL) -w/ ferrous stains at 4-10'		56.0		12	25	16	9
						16			
80	10				122	16			

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 3.3 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: MP

HVJ Asssociates, Inc.

PLATE A-36

COH HG1810124 - SA-SB.GPJ 6/17/22

LOG OF BORING B-27 (SA-SB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13922802.14; E: 3132818.69
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 87.35 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 5/1/2020

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Pavement: 6.5" Asphalt, 29" Cement Stabilized Sand, 36.5" Lime Stabilized Base							
85 ▽	5	Firm to very stiff, gray and light brown, SANDY LEAN CLAY (CL)							
80	10	-w/ roots at 6'-8' -w/ ferrous stains at 6'-10'		55.1	96	13 46	25	15	10

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 2.8 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: MP

HVJ Asssociates, Inc.

PLATE A-37

COH HG1810124 - SA-SB.GPJ 6/17/22

LOG OF BORING B-28 (SA-SB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13922943.28; E: 3137028.68
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 84.71 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 5/2/2020

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Pavement: 7" Asphalt, 28.5" Cement Stabilized Sand, 12.5" Lime Stabilized Base							
80	5	Firm, gray, LEAN CLAY WITH SAND (CL)		72.4		19	30	16	14
		-w/ ferrous stains at 4'-10'			90	32			
						21			
75	10								

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: —
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: MP

HVJ Asssociates, Inc.

PLATE A-38

COH HG1810124 - SA-SB.GPJ 6/17/22

LOG OF BORING B-29 (SA-SB)

PROJECT: Rehabilitation of Taxiways RA, RB, SA and SB
LOCATION: N: 13922972.73; E: 3138628.73
STATION: N/A
OFFSET: N/A
SURFACE ELEVATION: 84.11 FT

PROJECT NO.: HG1810124
WBS NO.: NA
COMPLETION DEPTH: 10 FT

DATE: 5/2/2020

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 10 FT
WET ROTARY: NA TO NA FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Pavement: 7.5" Asphalt, 28.5" Cement Stabilized Sand, 36" Lime Stabilized Base							
80	5								
		Firm to stiff, gray, SANDY LEAN CLAY (CL) -w/ ferrous stains at 6'-10'		69.0		16	33	17	16
75	10								

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.5 1.0 1.5 2.0 2.5

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: —
▼ WATER DEPTH 24 HOURS AFTER DRILLING: —

Drilled By: Soltek Logged By: MP

HVJ Asssociates, Inc.

PLATE A-39

COH HG1810124 - SA-SB.GPJ 6/17/22

SOIL SYMBOLS

Soil Types


Clay


Silt


Sand


Gravel

Modifiers


Clayey


Silty


Sandy


Cemented

Construction Materials


Asphaltic Concrete


Stabilized Base


Fill or Debris


Portland Cement Concrete

SAMPLER TYPES

Thin Walled Shelby Tube


No Recovery


Auger


Split Barrel


Core


Liner Tube


Jar Sample

WATER LEVEL SYMBOLS

Groundwater level after drilling in open borehole or piezometer


Groundwater level determined during drilling operations

SOIL GRAIN SIZE

Classification	Particle Size	Particle Size or Sieve No. (U.S. Standard)
Clay	< 0.002 mm	< 0.002 mm
Silt	0.002 - 0.075 mm	0.002 mm - #200 sieve
Sand	0.075 - 4.75 mm	#200 sieve - #4 sieve
Gravel	4.75 - 75 mm	#4 sieve - 3 in.
Cobble	75 - 200 mm	3 in. - 8 in.
Boulder	> 200 mm	> 8 in.

DENSITY OF COHESIONLESS SOILS

Descriptive Term	Penetration Resistance "N" * Blows/Foot
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	> 50

CONSISTENCY OF COHESIVE SOILS

Consistency	Undrained Shear Strength (tsf)	Penetration Resistance "N" * Blows/Foot
Very Soft	0 - 0.125	0 - 2
Soft	0.125 - 0.25	2 - 4
Firm	0.25 - 0.5	4 - 8
Stiff	0.5 - 1.0	8 - 16
Very Stiff	1.0 - 2.0	16 - 32
Hard	> 2.0	> 32

PENETRATION RESISTANCE

3/6	Blows required to penetrate each of three consecutive 6-inch increments per ASTM D-1586 *
50/4"	If more than 50 blows are required, driving is discontinued and penetration at 50 blows is noted
0/18"	Sampler penetrated full depth under weight of drill rods and hammer

* The N value is taken as the blows required to penetrate the final 12 inches

TERMS DESCRIBING SOIL STRUCTURE

Slickensided	Fracture planes appear polished or glossy, sometimes striated
Fissured	Breaks along definite planes of fracture with little resistance to fracturing
Inclusion	Small pockets of different soils, such as small lenses of sand scattered through a mass of clay
Parting	Inclusion less than 1/4 inch thick extending through the sample
Seam	Inclusion 1/4 inch to 3 inches thick extending through the sample
Layer	Inclusion greater than 3 inches thick extending through the sample
Laminated	Soil sample composed of alternating partings of different soil type
Stratified	Soil sample composed of alternating seams or layers of different soil type
Intermixed	Soil sample composed of pockets of different soil type and laminated or stratified structure is not evident
Calcareous	Having appreciable quantities of calcium carbonate
Ferrous	Having appreciable quantities of iron
Nodule	A small mass of irregular shape

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KEY TO TERMS AND SYMBOLS USED ON BORING LOGS

PROJECT NO.: HG1810124

DRAWING NO.: PLATE A-40

APPENDIX B

SUMMARY OF LABORATORY TEST RESULTS

Project Name: Rehabilitation of Taxiway RA, RB, SA & SB at IAH
Project Location: Houston, Texas
Project Number: HG1810124

Borehole	Depth (ft)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	% Pass #200 Sieve	Moisture Content (%)	Total Unit Weight (pcf)	Shear Strength (UC) (tsf)	Shear Strength (Pocket Pen) (tsf)
B-1 (RA-RB)	5					18			
B-1 (RA-RB)	7					13	127	0.96	0.67
B-1 (RA-RB)	9	21	13	8	56.1	20			0.67
B-2 (RA-RB)	7				22.1	14			
B-3 (RA-RB)	5.5	26	17	9	57.8	16			0.33
B-3 (RA-RB)	7					17	137	0.75	0.58
B-3 (RA-RB)	9	36	16	20	51.3	12			1.17
B-4 (RA-RB)	5.5					20			1.33
B-4 (RA-RB)	7	30	16	14	45.8	15			0.33
B-4 (RA-RB)	9					15	141	1.01	0.92
B-5 (RA-RB)	5.5				39.3	13			0.83
B-5 (RA-RB)	7					16	131	0.81	0.50
B-5 (RA-RB)	9					15			1.17
B-6 (RA-RB)	5	26	16	10	41.6	14			1.50
B-6 (RA-RB)	7								0.75
B-6 (RA-RB)	9	26	17	9	50.0	12	129	0.70	1.17
B-7 (RA-RB)	5	22	17	5	48.4	11			0.92
B-7 (RA-RB)	7					13	123	0.76	0.75
B-7 (RA-RB)	9	26	18	8	51.4	13			1.08
B-8 (RA-RB)	7	22	13	9	46.9	14			0.58
B-8 (RA-RB)	9					17	130	0.35	0.33
B-9 (RA-RB)	7	37	17	20	69.6	14			1.50
B-9 (RA-RB)	9					14			1.50
B-10 (RA-RB)	5	35	20	15	37.2	16			1.50
B-10 (RA-RB)	7					17	136	0.69	1.00
B-10 (RA-RB)	9					13			1.50
B-1 (SA-SB)	5					17	129	0.80	0.80
B-1 (SA-SB)	7	36	11	25	68.6	15			1.50
B-1 (SA-SB)	9					12			1.50
B-2 (SA-SB)	3.5					22			
B-2 (SA-SB)	5	29	22	7	42.2	22			
B-2 (SA-SB)	7					15	21	1.50	0.83
B-2 (SA-SB)	9	32	13	9	60.5	18			1.17
B-3 (SA-SB)	4.5	28	18	10	33.5	25			0.20
B-3 (SA-SB)	5.5								0.20
B-3 (SA-SB)	7					16			1.50
B-3 (SA-SB)	9	39	22	17	56.4	19	131	0.40	1.20
B-4 (SA-SB)	3.5	21	16	5	48.2	15			
B-4 (SA-SB)	7	22	13	9	58.7	13	127	0.46	1.17

Project Name: Rehabilitation of Taxiway RA, RB, SA & SB at IAH
Project Location: Houston, Texas
Project Number: HG1810124

Borehole	Depth (ft)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	% Pass #200 Sieve	Moisture Content (%)	Total Unit Weight (pcf)	Shear Strength (UC) (tsf)	Shear Strength (Pocket Pen) (tsf)
B-4 (SA-SB)	9								1.50
B-5 (SA-SB)	3.5	26	16	10	58.5	14			1.50
B-5 (SA-SB)	5					15	133	2.16	1.33
B-5 (SA-SB)	7								0.83
B-5 (SA-SB)	9	31	15	16	67.2	16			0.50
B-6 (SA-SB)	3.5	31	22	9	46.6	21			1.17
B-6 (SA-SB)	5								0.67
B-6 (SA-SB)	7	38	14	24	74.1	16			0.67
B-6 (SA-SB)	9					16	130	1.13	0.92
B-7 (SA-SB)	3.5					23			
B-7 (SA-SB)	5	33	23	10	51.4	31			
B-7 (SA-SB)	7					17	132	1.12	0.58
B-7 (SA-SB)	9	34	16	18	68.3	13			1.17
B-8 (SA-SB)	3.5					14			
B-8 (SA-SB)	7	32	14	18	57.5	13			
B-8 (SA-SB)	9					20			1.50
B-9 (SA-SB)	5.5					19			0.20
B-9 (SA-SB)	7	30	14	16	61.7	15			1.50
B-9 (SA-SB)	9					14	140	1.00	1.50
B-10 (SA-SB)	5					17			0.30
B-10 (SA-SB)	7	20	13	7	54.6	11			1.50
B-10 (SA-SB)	9					12	134	0.80	1.20
B-11 (SA-SB)	5				21.7	23			0.60
B-11 (SA-SB)	7					24	123	0.90	0.40
B-11 (SA-SB)	9	35	17	18	54.4	17			1.50
B-12 (SA-SB)	5.5					23			
B-12 (SA-SB)	7	29	15	14	65.4	14			1.30
B-12 (SA-SB)	9					16	138	1.10	0.70
B-13 (SA-SB)	5	25	22	3	27.9	17			0.40
B-13 (SA-SB)	7								1.50
B-13 (SA-SB)	9	26	17	9	59.0	13	140	1.50	1.50
B-14 (SA-SB)	5	31	17	14	74.9	15			0.70
B-14 (SA-SB)	7	37	16	21	63.7	16			0.80
B-14 (SA-SB)	9					16	133	0.90	0.90
B-15 (SA-SB)	3.5	38	28	10	41.8	20			1.50
B-15 (SA-SB)	7	36	19	17	63.7	18			
B-15 (SA-SB)	9					15	132	1.62	1.50
B-16 (SA-SB)	3.5	22	16	6	13.7	24			1.17
B-16 (SA-SB)	7					13	127	1.34	1.33

Project Name: Rehabilitation of Taxiway RA, RB, SA & SB at IAH
Project Location: Houston, Texas
Project Number: HG1810124

Borehole	Depth (ft)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	% Pass #200 Sieve	Moisture Content (%)	Total Unit Weight (pcf)	Shear Strength (UC) (tsf)	Shear Strength (Pocket Pen) (tsf)
B-16 (SA-SB)	9	34	19	15	67.0	14			0.92
B-17 (SA-SB)	5					21			0.30
B-17 (SA-SB)	7	36	17	19	60.5	16			0.50
B-17 (SA-SB)	9					15	140	0.90	1.00
B-18 (SA-SB)	5.5	36	24	12	44.1	17			0.20
B-18 (SA-SB)	7					14			1.50
B-18 (SA-SB)	9	26	17	9	57.2	12			0.50
B-19 (SA-SB)	5					13	138	1.60	0.80
B-19 (SA-SB)	7	28	14	14	48.3	13			1.50
B-19 (SA-SB)	9					15			1.50
B-20 (SA-SB)	5.5	29	22	7	22.9	19			0.30
B-20 (SA-SB)	7					18			0.30
B-20 (SA-SB)	9					14	135	1.30	1.50
B-21 (SA-SB)	7	42	28	16	33.5	25			1.50
B-21 (SA-SB)	9	33	17	16	65.8	15	136	0.90	1.00
B-22 (SA-SB)	9					17			1.50
B-23 (SA-SB)	5				13.4	21			1.50
B-23 (SA-SB)	7					19	132	1.80	1.20
B-23 (SA-SB)	9					18			0.50
B-24 (SA-SB)	5	23	17	6	12.6	18			
B-24 (SA-SB)	7					15	143	1.70	1.00
B-24 (SA-SB)	9	46	23	23	76.9	16			1.00
B-25 (SA-SB)	3.5	32	16	16	68.4	18			
B-25 (SA-SB)	5					18	126	0.67	1.17
B-25 (SA-SB)	7	35	17	18	71.0	19			0.83
B-25 (SA-SB)	9								1.17
B-26 (SA-SB)	5	25	16	9	56.0	12			0.30
B-26 (SA-SB)	7					16			0.50
B-26 (SA-SB)	9					16	142	1.30	0.70
B-27 (SA-SB)	7	25	15	10	55.1	13			1.50
B-27 (SA-SB)	9					46	140	1.20	0.50
B-28 (SA-SB)	5	30	16	14	72.4	19			0.50
B-28 (SA-SB)	7					32	119	0.40	0.30
B-28 (SA-SB)	9					21			0.30
B-29 (SA-SB)	7	33	17	16	69.0	16			0.30
B-29 (SA-SB)	9								0.70
Total		**52**	**52**	**52**	**56**	**106**	**33**	**33**	**101**

APPENDIX C

PH LIME SERIES TEST RESULTS

HVJ ASSOCIATES

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Estimate of Soil-Lime Proportion using pH ASTM D-6276

PROJECT: Rehabilitation of Taxiway RA, RB, SA & SB at George Bush Intercontinental Airport (IAH)

REPORT DATE : 6/9/2020

PROJECT NO: HG1810124

REPORT NO. :

LOCATION: Boring B-3 at 5'-6' (RA/RB)

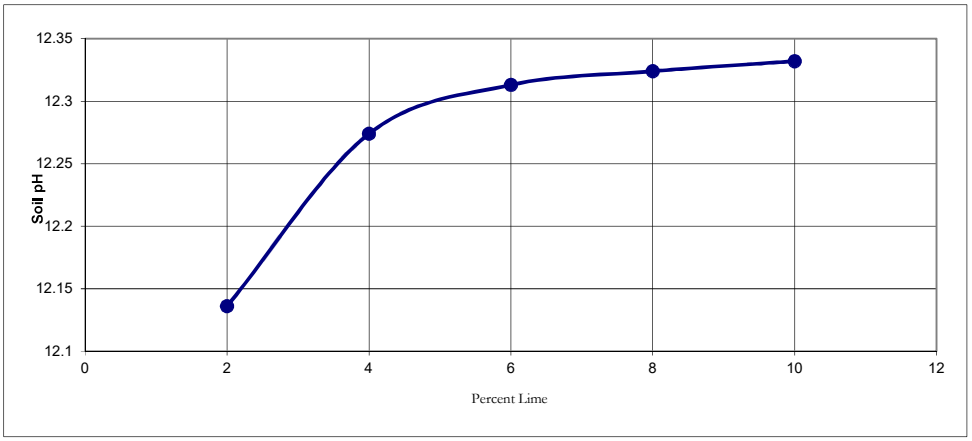
SAMPLE NO. : S-3

TYPE OF MATERIAL: Gray and Reddish Brown, Sandy Lean Clay

SAMPLED BY : Geo staff

LIME CURVE
ASTM D-6276
(Soil pH vs Percent of Lime)

Percent of Lime	2	4	6	8	10
Soil pH	12.14	12.27	12.31	12.32	12.33



SAMPLE DESCRIPTION: GRAY AND REDDISH BROWN SANDY LEAN CLAY

MIN. % LIME ESTIMATED: 6%

HVJ ASSOCIATES

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Estimate of Soil-Lime Proportion using pH ASTM D-6276

PROJECT: Rehabilitation of RA, RB, SA & SB at George Bush Intercontinental Airport (IAH)

REPORT DATE : 6/9/2020

PROJECT NO: HG1810124

REPORT NO. :

LOCATION: Boring B-6 at 4'-6' (RA/RB)

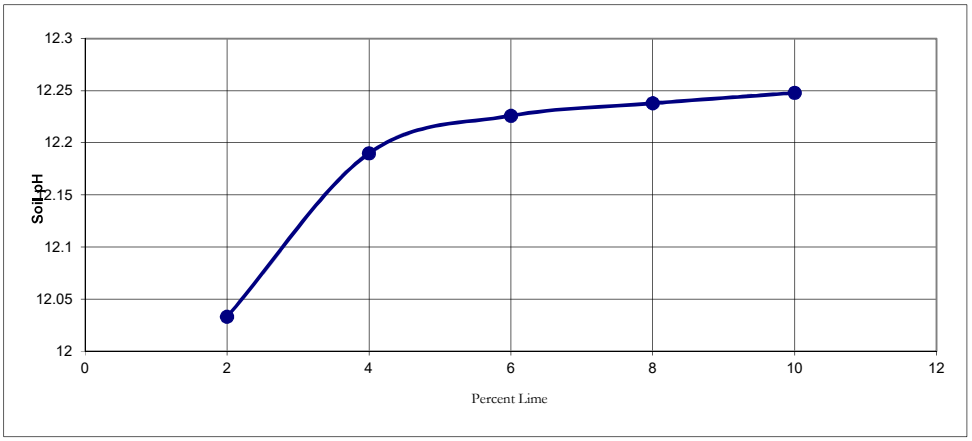
SAMPLE NO. : S-4

TYPE OF MATERIAL: Gray Clayey Sand

SAMPLED BY : Geo staff

LIME CURVE
ASTM D-6276
(Soil pH vs Percent of Lime)

Percent of Lime	2	4	6	8	10
Soil pH	12.03	12.19	12.22	12.24	12.25



SAMPLE DESCRIPTION: GRAY CLAYEY SAND

MIN. % LIME ESTIMATED: 8%

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Estimate of Soil-Lime Proportion using pH ASTM D-6276

PROJECT: Rehabilitation of RA, RB, SA & SB at George Bush Intercontinental Airport (IAH)

REPORT DATE : 6/9/2020

PROJECT NO: HG1810124

REPORT NO. :

LOCATION: Boring B-10 at 4'-6' (RA/RB)

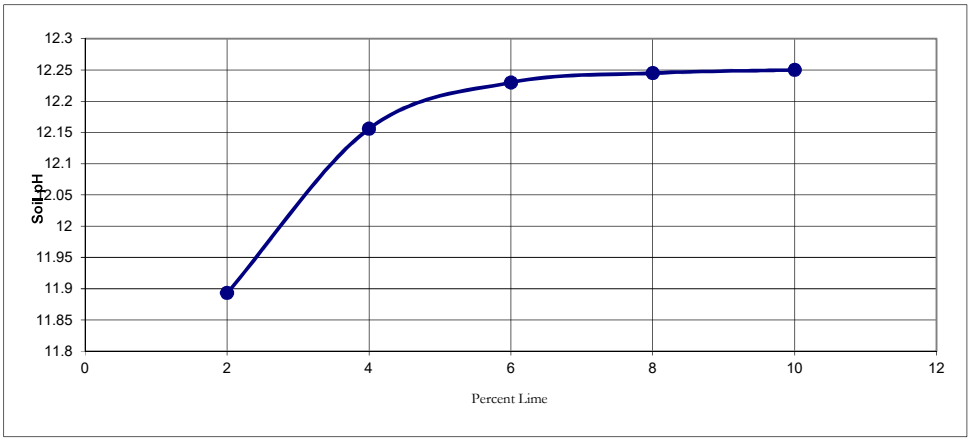
SAMPLE NO. : S-4

TYPE OF MATERIAL: Gray and Tan, Clayey Sand

SAMPLED BY : Geo staff

LIME CURVE
ASTM D-6276
(Soil pH vs Percent of Lime)

Percent of Lime	2	4	6	8	10
Soil pH	11.89	12.16	12.23	12.25	12.25



SAMPLE DESCRIPTION: GRAY AND TAN CLAYEY SAND

MIN. % LIME ESTIMATED: 8%

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Estimate of Soil-Lime Proportion using pH ASTM D-6276

PROJECT: Rehabilitation of RA, RB, SA & SB at George Bush Intercontinental Airport (IAH)

REPORT DATE : 6/9/2020

PROJECT NO: HG1810124

REPORT NO. :

LOCATION: Boring B-11 at 8'-10' (SA/SB)

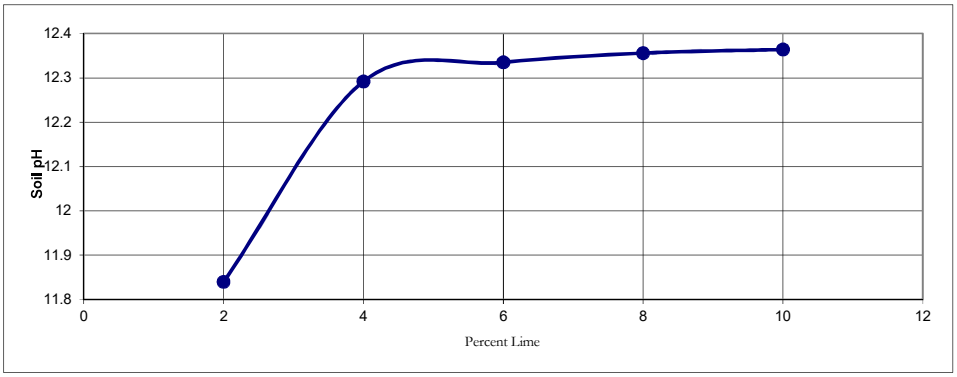
SAMPLE NO. : S-5

TYPE OF MATERIAL: Gray and Reddish Brown, Sandy Lean Clay

SAMPLED BY : KC

LIME CURVE
ASTM D-6276
(Soil pH vs Percent of Lime)

Percent of Lime	2	4	6	8	10
Soil pH	11.84	12.29	12.34	12.36	12.36



SAMPLE DESCRIPTION: GRAY AND REDDISH BROWN SANDY LEAN CLAY

MIN. % LIME ESTIMATED: 8%

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Estimate of Soil-Lime Proportion using pH ASTM D-6276

PROJECT: Rehabilitation of RA, RB, SA & SB at George Bush Intercontinental Airport (IAH)

REPORT DATE : 6/9/2020

PROJECT NO: HG1810124

REPORT NO. :

LOCATION: Boring B-14 at 4'-6' (SA/SB)

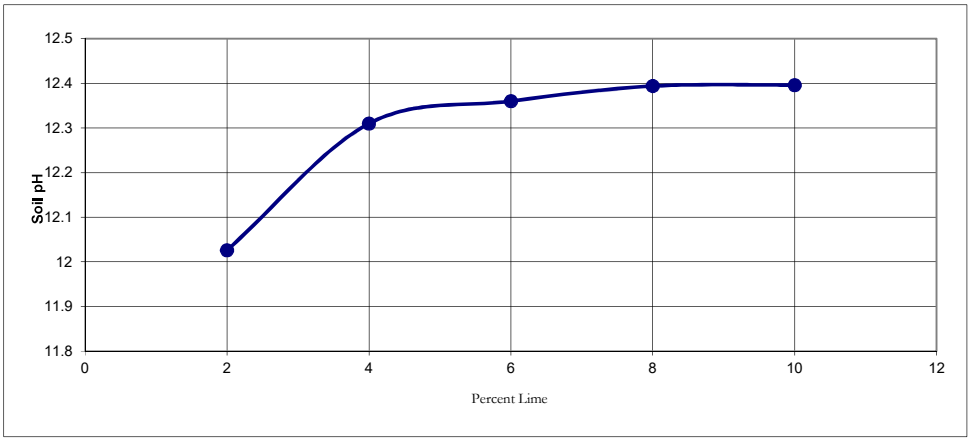
SAMPLE NO. : S-4

TYPE OF MATERIAL: Gray Lean Clay w/ Sand

SAMPLED BY : KC

LIME CURVE
ASTM D-6276
(Soil pH vs Percent of Lime)

Percent of Lime	2	4	6	8	10
Soil pH	12.03	12.31	12.36	12.39	12.40



SAMPLE DESCRIPTION: GRAY LEAN CLAY WITH SAND

MIN. % LIME ESTIMATED: 6%

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Estimate of Soil-Lime Proportion using pH ASTM D-6276

PROJECT: Rehabilitation of RA, RB, SA & SB at George Bush Intercontinental Airport (IAH)

REPORT DATE : 1/6/2020

PROJECT NO: HG1810124

REPORT NO. :

LOCATION: Boring B-17 at 6'-8' (SA/SB)

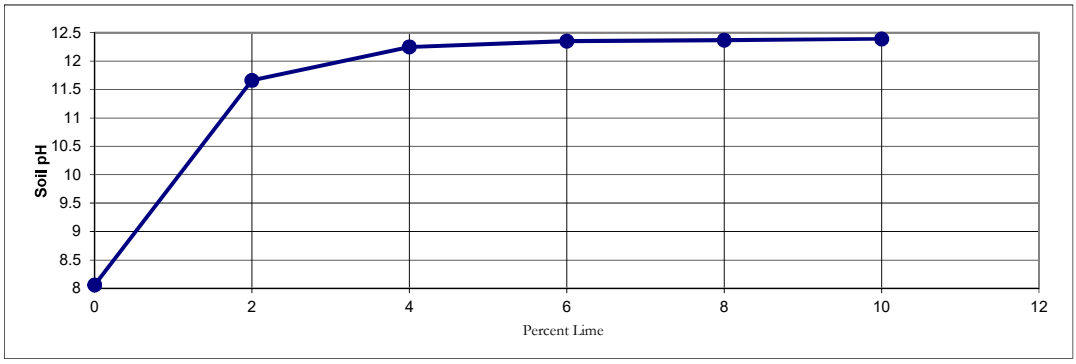
SAMPLE NO. : S-4

TYPE OF MATERIAL: Reddishbrown & Light Gray, Sandy Lean Clay

SAMPLED BY : KC

LIME CURVE
ASTM D-6276
(Soil pH vs Percent of Lime)

Percent of Lime	0	2	4	6	8	10
Soil pH	8.06	11.66	12.25	12.35	12.37	12.39



SAMPLE DESCRIPTION:REDDISH BROWN AND GRAY SANDY LEAN CLAY

MIN. % LIME ESTIMATED: 6%

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Estimate of Soil-Lime Proportion using pH ASTM D-6276

PROJECT: Rehabilitation of RA, RB, SA & SB at George Bush Intercontinental Airport (IAH)

REPORT DATE : 12/20/2020

PROJECT NO: HG1810124

REPORT NO. :

LOCATION: Boring B-19 at 4'-6' (SA/SB)

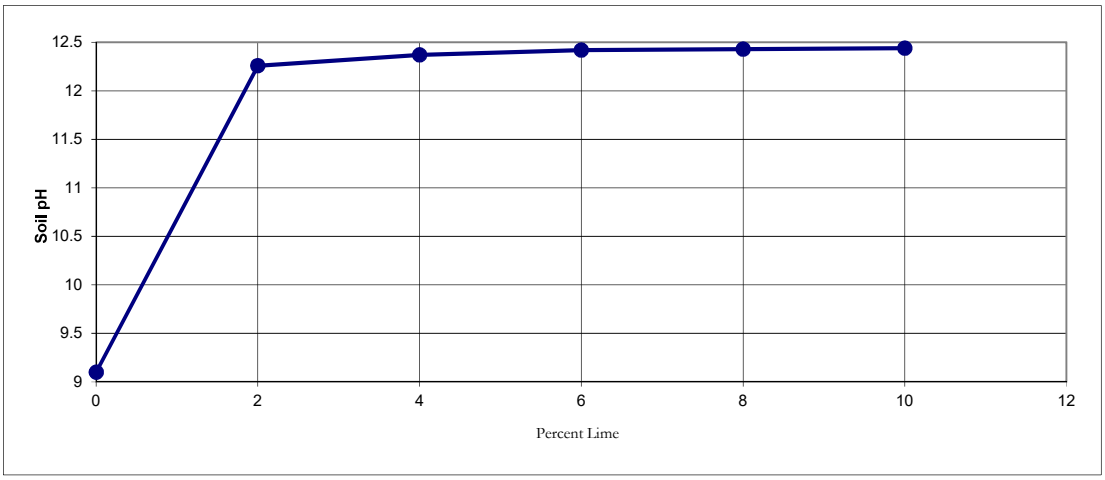
SAMPLE NO. : S-3

TYPE OF MATERIAL: Gray & Light Brown, Clayey Sand

SAMPLED BY : KC

LIME CURVE
ASTM D-6276
(Soil pH vs Percent of Lime)

Percent of Lime	0	2	4	6	8	10
Soil pH	9.01	12.26	12.37	12.42	12.43	12.44



SAMPLE DESCRIPTION: GRAY & LIGHT BROWN CLAYEY SAND

MIN. % LIME ESTIMATED: 6%

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Estimate of Soil-Lime Proportion using pH ASTM D-6276

PROJECT: Rehabilitation of RA, RB, SA & SB at George Bush Intercontinental Airport (IAH)

REPORT DATE : 6/9/2020

PROJECT NO: HG1810124

REPORT NO. :

LOCATION: Boring B-21 at 8'-10' (SA/SB)

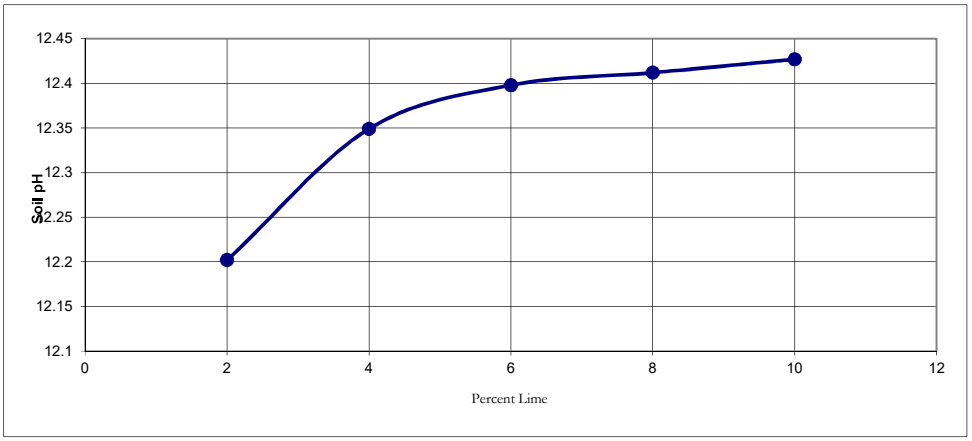
SAMPLE NO. : S-5

TYPE OF MATERIAL: Gray, Sandy Lean Clay

SAMPLED BY : KC

LIME CURVE
ASTM D-6276
(Soil pH vs Percent of Lime)

Percent of Lime	2	4	6	8	10
Soil pH	12.20	12.35	12.39	12.41	12.43



SAMPLE DESCRIPTION: GRAY SANDY LEAN CLAY

MIN. % LIME ESTIMATED: 6%

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Estimate of Soil-Lime Proportion using pH ASTM D-6276

PROJECT: Rehabilitation of RA, RB, SA & SB at George Bush Intercontinental Airport (IAH)

REPORT DATE : 9/25/2020

PROJECT NO: HG1810124

REPORT NO. :

LOCATION: Boring B-28 at 4'-6' (SA/SB)

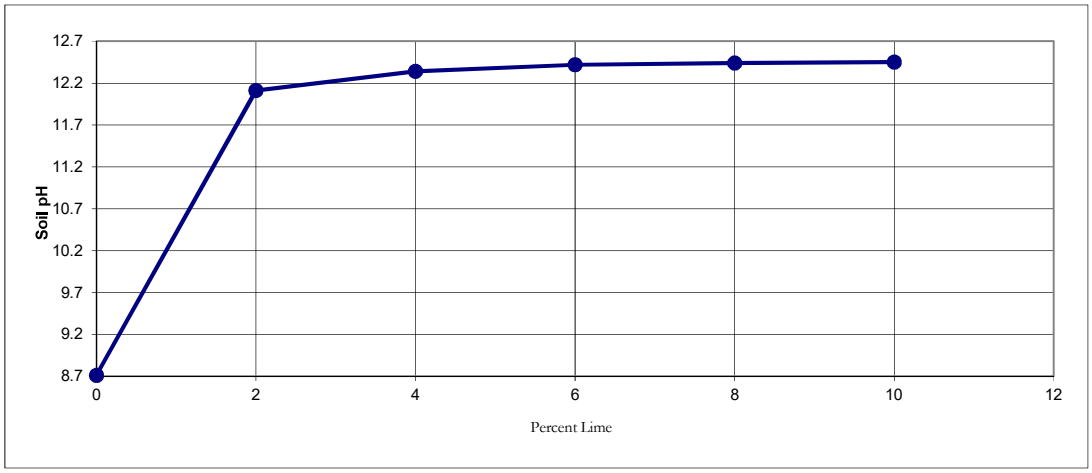
SAMPLE NO. : S-3

TYPE OF MATERIAL: Gray, Lean Clay With Sand

SAMPLED BY : KC

LIME CURVE
ASTM D-6276
(Soil pH vs Percent of Lime)

Percent of Lime	0	2	4	6	8	10
Soil pH	8.71	12.11	12.34	12.42	12.44	12.45



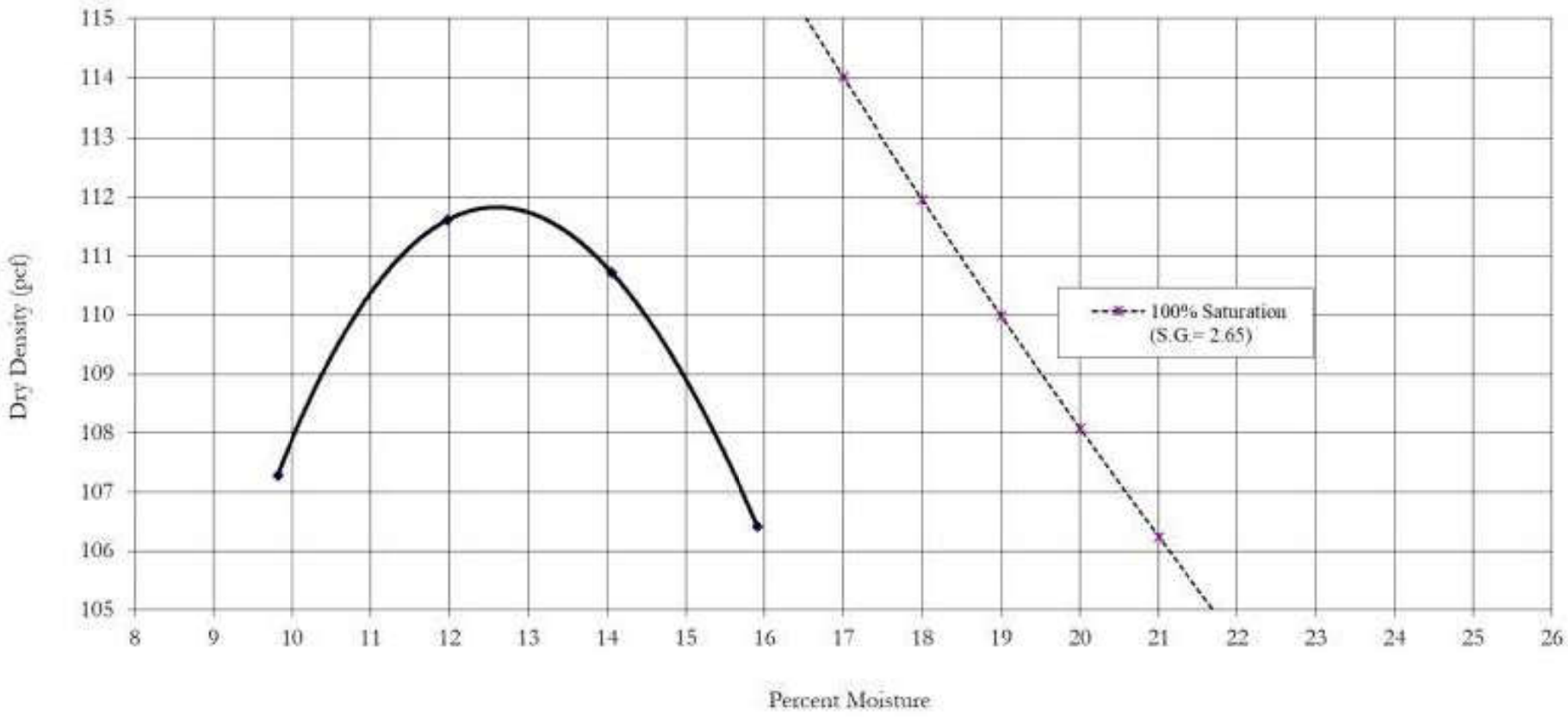
SAMPLE DESCRIPTION: GRAY LEAN CLAY WITH SAND

MIN. % LIME ESTIMATED: 6%

APPENDIX D

STANDARD PROCTOR AND CBR TEST RESULTS

METHOD OF TEST ▪ STANDARD ASTM D-698 ▫ MODIFIED ASTM D-1557



DATE TESTED: 5/2/2020
TYPE OF MATERIAL : Tan Brown Silty Clayey Sand w/ Lime
MAXIMUM DRY DENSITY : 111.8 pcf
OPT. MOISTURE CONTENT : 12.6 %

LIQUID LIMIT : 24
PLASTICITY INDEX : 7
-200 SEIVE % : 42.5%

HVJ ASSOCIATES
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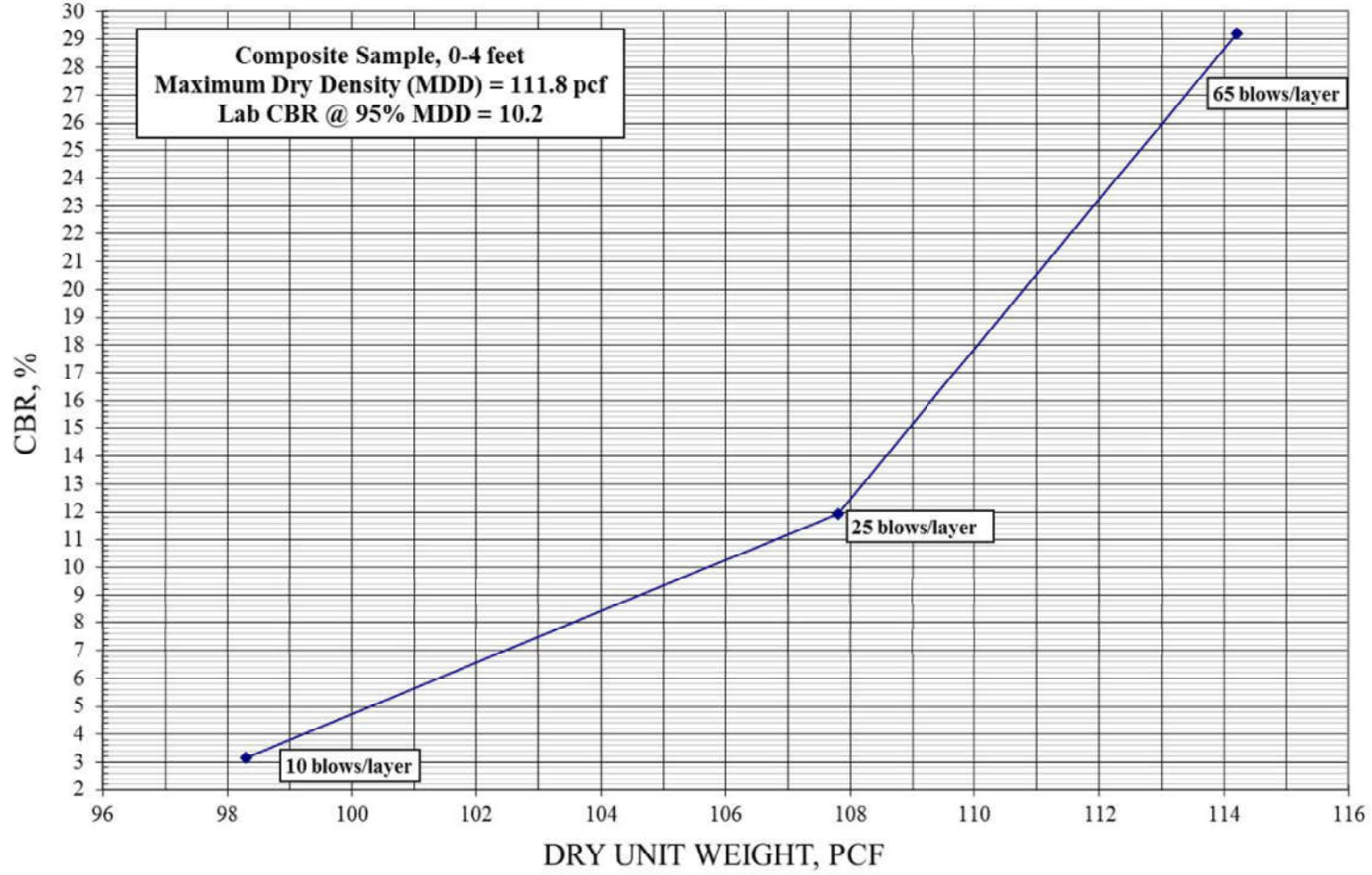
DATE: 06/22/2020	APPROVED BY: SV	PREPARED BY: PD

PROCTOR TEST RESULTS (RA/RB)
REHABILITATION OF TAXIWAY RA, RB, SA AND SB AT GEORGE BUSH INTERCONTINENTAL AIRPORT (IAH)

PROJECT NO.: HG1810124	DRAWING NO.: PLATE D-1A

CALIFORNIA BEARING RATIO TEST RESULT



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281.933.7293 Fax

DATE: 06/22/2020	APPROVED BY: SV	PREPARED BY: PD

CBR TEST RESULTS (RA/RB)
REHABILITATION OF TAXIWAY RA, RB, SA AND SB AT GEORGE BUSH INTERCONTINENTAL AIRPORT (IAH)

PROJECT NO.: HG1810124	DRAWING NO.: PLATE D-1B

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOILS ASTM D-1883

Project: Rehabilitation of Taxiway RA, RB, SA and SB at George Bush International Airport (IAH)

Sample Location: Composite, 0-4 feet

Liquid Limit: 24 **Plastic Limit:** 17 **Plasticity Index:** 7

Method of Compaction: ☒ ASTM D698 ☐ ASTM D1557

Sample Condition: ☒ soaked ☐ unsoaked

No. of Blows:	**10**	**25**	**65**
Dry Density Before Soaking (pcf):	98.3	107.8	114.2
Dry Density After Soaking (pcf):	96.2	105.5	112.0
Moisture Content:			
Before Compaction (%):	13.3	12.9	12.6
Top 1-inch Layer After Soaking (%):	24.0	19.9	17.3
Swell (%):	0.4	0.3	0.1
Bearing Ratio (%): (☒ soaked ☐ unsoaked)	3.17	11.93	29.20

Surcharge: 10 lbs.

HVJ ASSOCIATES
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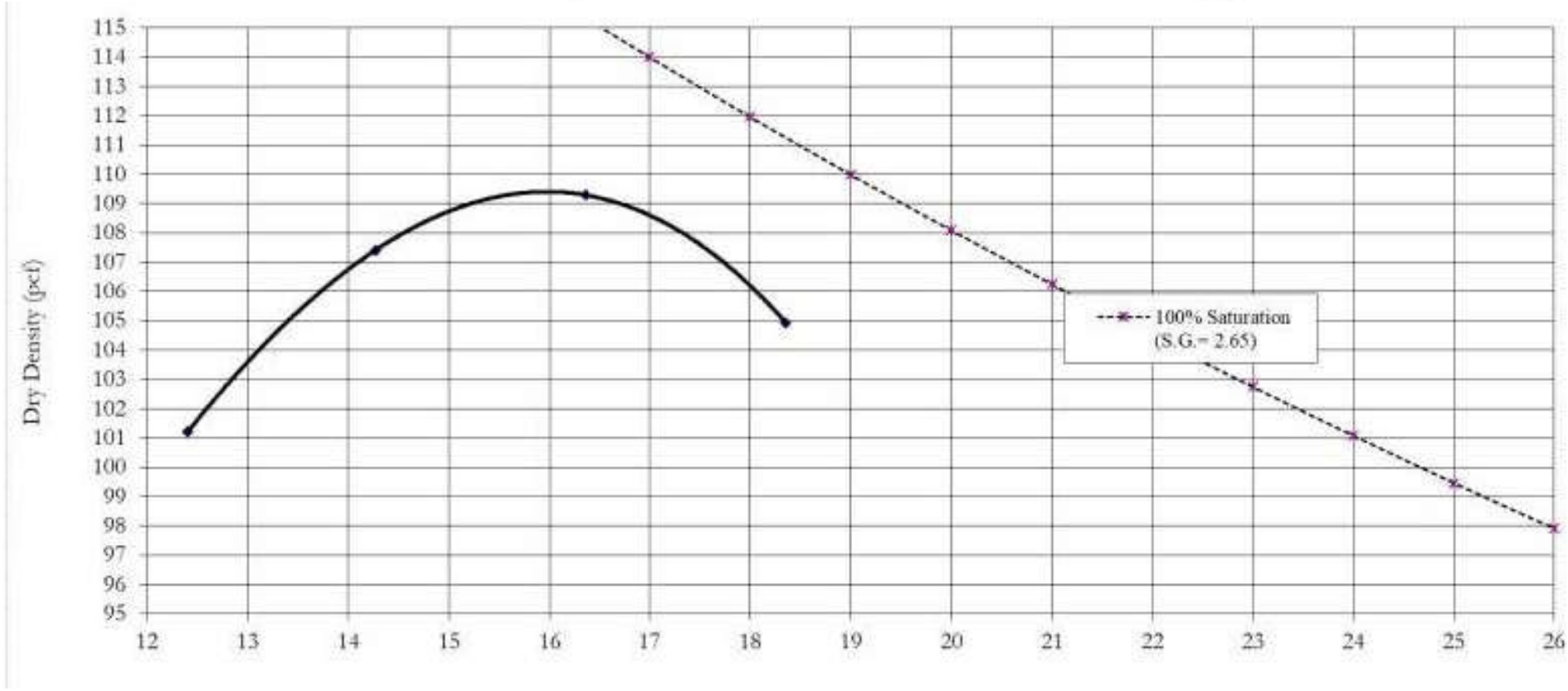
281.933.7293 Fax

DATE: 06/22/2020	APPROVED BY: SV	PREPARED BY: PD

CBR TEST RESULTS (RA/RB)
REHABILITATION OF TAXIWAY RA, RB, SA AND SB AT GEORGE BUSH INTERCONTINENTAL AIRPORT (IAH)

PROJECT NO.: HG1810124	DRAWING NO.: PLATE D-1C

METHOD OF TEST ☑ STANDARD ASTM D-698 ☐ MODIFIED ASTM D-1557



DATE TESTED:	5/2/20	
TYPE OF MATERIAL :	Light Brown Clayey Sand With Lime.	
MAXIMUM DRY DENSITY : 109.4	pcf	
OPT. MOISTURE CONTENT :16.0	%	

LIQUID LIMIT :27
PLASTICITY INDEX :8
-200 SEIVE % : 48.1%

HVJ ASSOCIATES
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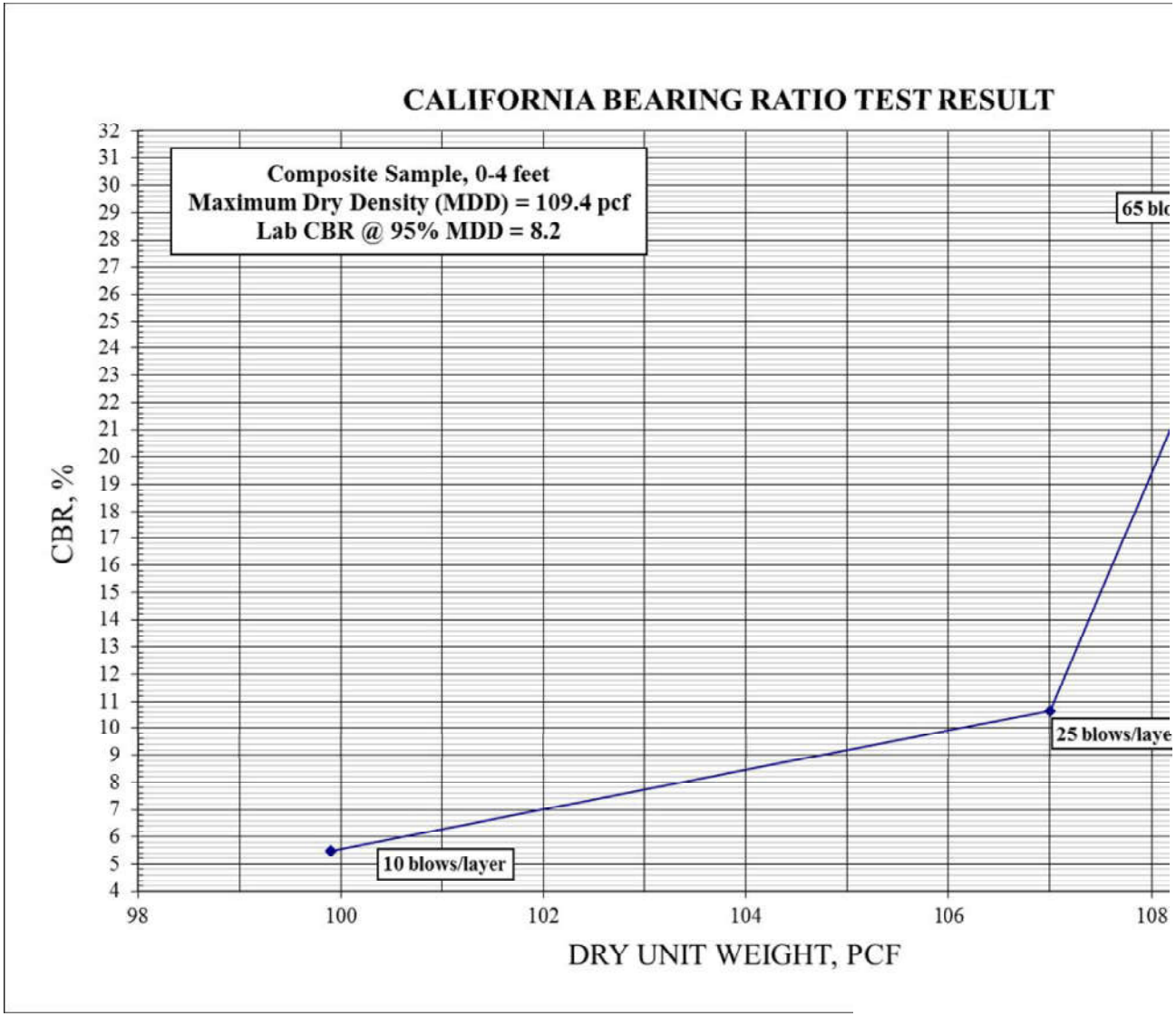
281.933.7388 Ph
281.933.7293 Fax

DATE: 05/18/2020	APPROVED BY: SV	PREPARED BY: PD

PROCTOR TEST RESULTS (SA/SB)
REHABILITATION OF TAXIWAY RA, RB, SA AND SB AT GEORGE BUSH INTERCONTINENTAL AIRPORT (IAH)

PROJECT NO.:	DRAWING NO.:
HG1810124	PLATE D-2A



HVJ ASSOCIATES
6120 S. Dairy Ashford Road
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281.933.7388 Ph
281.933.7293 Fax

DATE: 05/1/2020	APPROVED BY: SV	PREPARED BY: PD

CBR TEST RESULTS (SA/SB)
REHABILITATION OF TAXIWAY RA, RB, SA AND SB AT GEORGE BUSH INTERCONTINENTAL AIRPORT (IAH)

PROJECT NO.: HG1810124	DRAWING NO.: PLATE D-2B

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOILS ASTM D-1883

Project: Rehabilitation of Taxiways RA, RB, SA and SB

Sample Location: Composite, 0-4 feet

Liquid Limit: 27 **Plastic Limit:** 19 **Plasticity Index:** 8

Method of Compaction: ☒ ASTM D698
☐ ASTM D1557

Sample Condition: ☒ soaked ☐ unsoaked

No. of Blows:	**10**	**25**	**65**
Dry Density Before Soaking (pcf):	99.9	107.0	109.2
Dry Density After Soaking (pcf):	97.6	103.1	109.7
Moisture Content:			
Before Compaction (%):	16.7	16.4	17.0
Top 1-inch Layer After Soaking (%):	24.3	21.9	19.6
Swell (%):	0.02	0.07	0.1
Bearing Ratio (%): (☒ soaked ☐ unsoaked)	5.47	10.63	30.00

Surcharge: 10 lbs.

HVJ ASSOCIATES
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Houston, Texas 77072-1010
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281.933.7293 Fax

DATE: 05/18/2020	APPROVED BY: SV	PREPARED BY: PD

CBR TEST RESULTS (SA/SB)
REHABILITATION OF TAXIWAY RA, RB, SA AND SB AT GEORGE BUSH INTERCONTINENTAL AIRPORT (IAH)

PROJECT NO.:	DRAWING NO.:
HG1810124	PLATE D-2C

APPENDIX E

DCP TEST DATA

TEXAS DEPARTMENT OF TRANSPORTATION

Dynamic Cone Penetrometer (DCP) Data Analysis
ASTM - D6951

Refresh Workbook

ASTM - D6951 :: File Version: 10/21/16 07:33:30

SAMPLE ID:	C1	SAMPLED DATE:	4.24.2020
TEST NUMBER:		LETTING DATE:	
SAMPLE STATUS:		CONTROLLING CSJ:	
COUNTY:	Harris	SPEC YEAR:	
SAMPLED BY:	M.P	SPEC ITEM:	
SAMPLE LOCATION:	RA/RB Taxiway IAH	SPECIAL PROVISION:	
MATERIAL CODE:		GRADE:	
MATERIAL NAME:	lime stabilize ,Clay		
PRODUCER:			
AREA ENGINEER:		PROJECT MANAGER:	

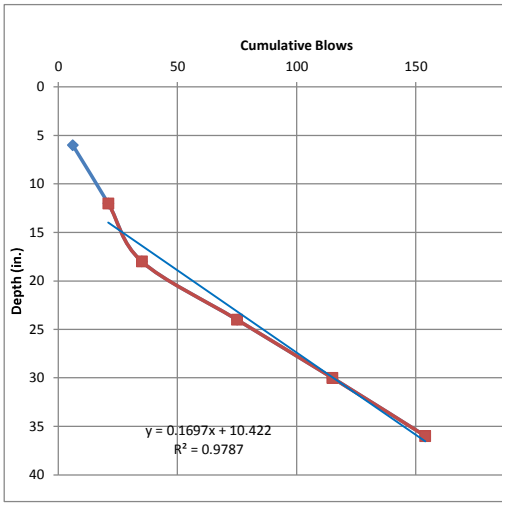
COURSE\LIFT:		STATION:		DIST. FROM CL:	
Long. (x):	95 20'26.3"W	Latitude (y):	29 59'00.7"N	Elev. (z):	

Material Classification:		Weather:	Partly Cloudy
Hammer Weight:	8-KG [17.6-lbs.]	Water Table Depth (ft.):	
Pavement Conditions:	Good	Depth of zero point below surface (in.):	0.50
Design Modulus (E) ksi:			

DCP DATA ANALYSIS

# of Blows	Penetration (6 in. intervals)	Cumulative Blows	Cumulative Penetration	CBR	E (ksi)	E > E (design)?	E > 0.5 E design
6	6.5	6	6.00				
15	12.5	21	12.00	21.8	18.3	YES	YES
14	18.5	35	18.00	20.1	17.4	YES	YES
40	24.5	75	24.00	65.3	37.0	YES	YES
40	30.5	115	30.00	65.3	37.0	YES	YES
39	36.5	154	36.00	63.5	36.3	YES	YES
					29.2	Compare E to 0.5 E design	Additional DCP testing needed

Layer	Eavg.	E (design)	E avg. ≥ E (design)
	29.2		



Remarks:

19" concrete	Test Below24"
5" Aspalth	

Test Method:	Tested By:	Tested Date:
D6951	M.P	04/24/2020

Test Stamp Code:	Omit Test:	Completed Date:	Reviewed By:

Locked By:	TxDOT:	District:	Area:

Authorized By:	Authorized Date:

TEXAS DEPARTMENT OF TRANSPORTATION

Dynamic Cone Penetrometer (DCP) Data Analysis
ASTM - D6951

Refresh Workbook

ASTM - D6951 :: File Version: 10/21/16 07:33:30

SAMPLE ID:	C2	SAMPLED DATE:	4.24.2020
TEST NUMBER:		LETTING DATE:	
SAMPLE STATUS:		CONTROLLING CSJ:	
COUNTY:	Harris	SPEC YEAR:	
SAMPLED BY:	M.P	SPEC ITEM:	
SAMPLE LOCATION:	RA/RB Taxiway IAH	SPECIAL PROVISION:	
MATERIAL CODE:		GRADE:	
MATERIAL NAME:	lime stabilize ,Clay (Hard material , below 32" core)		
PRODUCER:			
AREA ENGINEER:		PROJECT MANAGER:	

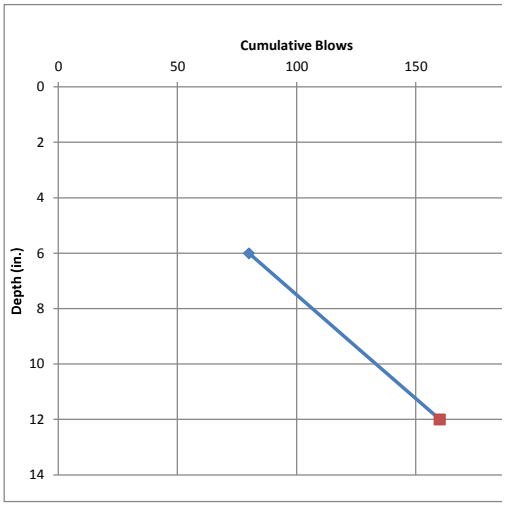
COURSE\LIFT:		STATION:		DIST. FROM CL:	
Long. (x):	95 20'23.9"W	Latitude (y):	29 59'59.6"N	Elev. (z):	

Material Classification:		Weather:	Partly Cloudy
Hammer Weight:	8-KG [17.6-lbs.]	Water Table Depth (ft.):	
Pavement Conditions:	Cracking	Depth of zero point below surface (in.):	0.50
Design Modulus (E) ksi:			

DCP DATA ANALYSIS

# of Blows	Penetration (6 in. intervals)	Cumulative Blows	Cumulative Penetration	CBR	E (ksi)	E > E (design)?	E > 0.5 E design
80	6.5	80	6.00				
80	12.5	160	12.00	141.9	60.8	YES	YES
					60.8	Compare E to 0.5 E design	Additional DCP testing needed

Layer	Eavg.	E (design)	E avg. ≥ E (design)
	60.8		



Remarks:

18" concrete	lime stabilize	Test Below32"
3" Aspalth		

Test Method:	Tested By:	Tested Date:
D6951	M.P	04/24/2020

Test Stamp Code:	Omit Test:	Completed Date:	Reviewed By:

Locked By:	TxDOT:	District:	Area:

Authorized By:	Authorized Date:

TEXAS DEPARTMENT OF TRANSPORTATION

Dynamic Cone Penetrometer (DCP) Data Analysis
ASTM - D6951

Refresh Workbook

ASTM - D6951 :: File Version: 10/21/16 07:33:30

SAMPLE ID:	C5	SAMPLED DATE:	4.27.2020
TEST NUMBER:		LETTING DATE:	
SAMPLE STATUS:		CONTROLLING CSJ:	
COUNTY:	Harris	SPEC YEAR:	
SAMPLED BY:	M.P	SPEC ITEM:	
SAMPLE LOCATION:	RA/RB Taxiway IAH	SPECIAL PROVISION:	
MATERIAL CODE:		GRADE:	
MATERIAL NAME:	lime stabilize ,clay		
PRODUCER:			
AREA ENGINEER:		PROJECT MANAGER:	

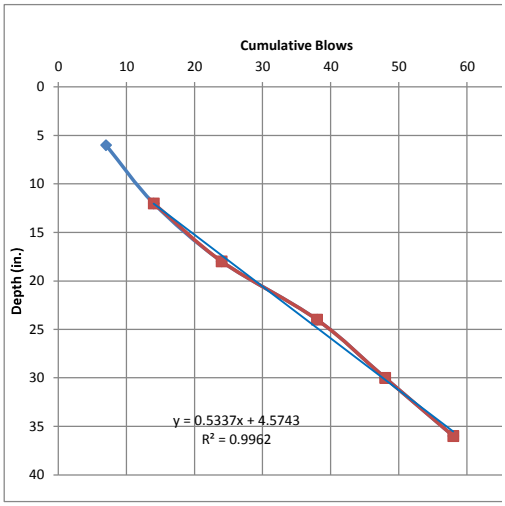
COURSE\LIFT:		STATION:		DIST. FROM CL:	
Long. (x):	95 19'58.0"W	Latitude (y):	29 58'58.4"N	Elev. (z):	

Material Classification:		Weather:	Partly Cloudy
Hammer Weight:	8-KG [17.6-lbs.]	Water Table Depth (ft.):	
Pavement Conditions:	Good	Depth of zero point below surface (in.):	0.50
Design Modulus (E) ksi:			

DCP DATA ANALYSIS

# of Blows	Penetration (6 in. intervals)	Cumulative Blows	Cumulative Penetration	CBR	E (ksi)	E > E (design)?	E > 0.5 E design
7	6.5	7	6.00				
7	12.5	14	12.00	9.3	10.6	YES	YES
10	18.5	24	18.00	13.8	13.7	YES	YES
14	24.5	38	24.00	20.1	17.4	YES	YES
10	30.5	48	30.00	13.8	13.7	YES	YES
10	36.5	58	36.00	13.8	13.7	YES	YES
					13.8	Compare E to 0.5 E design	Additional DCP testing needed

Layer	Eavg.	E (design)	E avg. ≥ E (design)
	13.8		



Remarks:

37" CTB	Test Below24"
3.5" Aspalth	

Test Method:	Tested By:	Tested Date:
D6951	M.P	04/29/2020

Test Stamp Code:	Omit Test:	Completed Date:	Reviewed By:

Locked By:	TxDOT:	District:	Area:

Authorized By:	Authorized Date:

TEXAS DEPARTMENT OF TRANSPORTATION

Dynamic Cone Penetrometer (DCP) Data Analysis
ASTM - D6951

Refresh Workbook

ASTM - D6951 :: File Version: 10/21/16 07:33:30

SAMPLE ID:	C9	SAMPLED DATE:	5.6.2020
TEST NUMBER:		LETTING DATE:	
SAMPLE STATUS:		CONTROLLING CSJ:	
COUNTY:	Harris	SPEC YEAR:	
SAMPLED BY:	M.P	SPEC ITEM:	
SAMPLE LOCATION:	RA/RB Taxiway IAH	SPECIAL PROVISION:	
MATERIAL CODE:		GRADE:	
MATERIAL NAME:	lime stabilize ,Clay		
PRODUCER:			
AREA ENGINEER:		PROJECT MANAGER:	

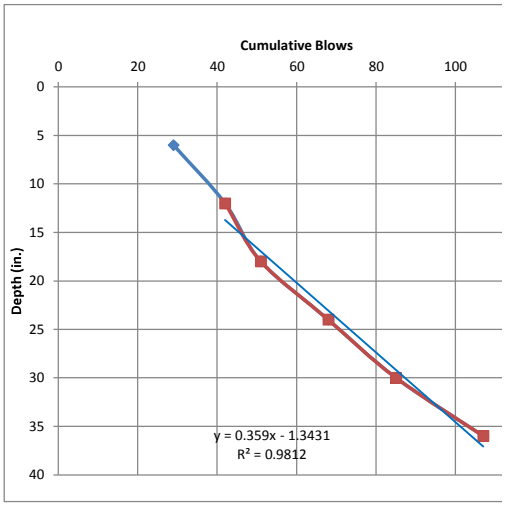
COURSE\LIFT:		STATION:		DIST. FROM CL:	
Long. (x):	95 20'21.09"W	Latitude (y):	29 58'57.02"N	Elev. (z):	

Material Classification:		Weather:	Partly Cloudy
Hammer Weight:	8-KG [17.6-lbs.]	Water Table Depth (ft.):	
Pavement Conditions:	Good	Depth of zero point below surface (in.):	0.50
Design Modulus (E) ksi:			

DCP DATA ANALYSIS

# of Blows	Penetration (6 in. intervals)	Cumulative Blows	Cumulative Penetration	CBR	E (ksi)	E > E (design)?	E > 0.5 E design
29	6.5	29	6.00				
13	12.5	42	12.00	18.5	16.5	YES	YES
9	18.5	51	18.00	12.3	12.7	YES	YES
17	24.5	68	24.00	25.0	20.0	YES	YES
17	30.5	85	30.00	25.0	20.0	YES	YES
22	36.5	107	36.00	33.4	24.1	YES	YES
					18.7	Compare E to 0.5 E design	Additional DCP testing needed

Layer	Eavg.	E (design)	E avg. ≥ E (design)
	18.7		



Remarks:

17" concrete 1" Aspalth	Test Below63"

Test Method:	Tested By:	Tested Date:
D6951	M.P	05/09/2020

Test Stamp Code:	Omit Test:	Completed Date:	Reviewed By:

Locked By:	TxDOT:	District:	Area:

Authorized By:	Authorized Date:

TEXAS DEPARTMENT OF TRANSPORTATION

Dynamic Cone Penetrometer (DCP) Data Analysis
ASTM - D6951

Refresh Workbook

ASTM - D6951 :: File Version: 10/21/16 07:33:30

SAMPLE ID:	C11	SAMPLED DATE:	5.4.2020
TEST NUMBER:		LETTING DATE:	
SAMPLE STATUS:		CONTROLLING CSJ:	
COUNTY:	Harris	SPEC YEAR:	
SAMPLED BY:	M.P	SPEC ITEM:	
SAMPLE LOCATION:	RA/RB Taxiway IAH	SPECIAL PROVISION:	
MATERIAL CODE:		GRADE:	
MATERIAL NAME:	lime stabilize ,Clay		
PRODUCER:			
AREA ENGINEER:		PROJECT MANAGER:	

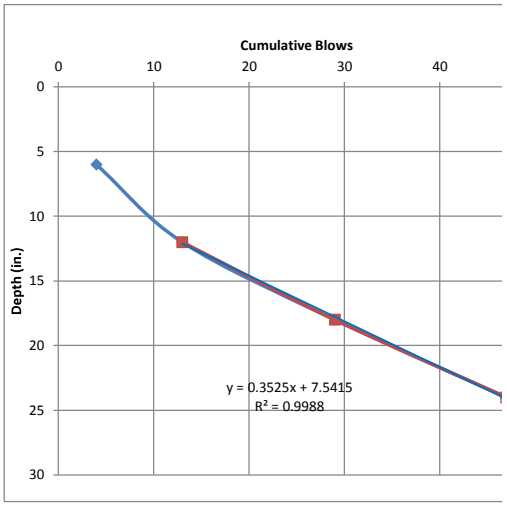
COURSE\LIFT:		STATION:		DIST. FROM CL:	
Long. (x):	95 20'14.9"W	Latitude (y):	29 58'56.3"N	Elev. (z):	

Material Classification:		Weather:	Partly Cloudy
Hammer Weight:	8-KG [17.6-lbs.]	Water Table Depth (ft.):	
Pavement Conditions:	Good	Depth of zero point below surface (in.):	0.50
Design Modulus (E) ksi:			

DCP DATA ANALYSIS

# of Blows	Penetration (6 in. intervals)	Cumulative Blows	Cumulative Penetration	CBR	E (ksi)	E > E (design)?	E > 0.5 E design
4	6.5	4	6.00				
9	12.5	13	12.00	12.3	12.7	YES	YES
16	18.5	29	18.00	23.4	19.2	YES	YES
18	24.5	47	24.00	26.7	20.9	YES	YES
					17.6	Compare E to 0.5 E design	Additional DCP testing needed

Layer	Eavg.	E (design)	E avg. ≥ E (design)
	17.6		



Remarks:

2.5"Asphalt 58.5"base	Test Below61"

Test Method:	Tested By:	Tested Date:
D6951	M.P	05/09/2020

Test Stamp Code:	Omit Test:	Completed Date:	Reviewed By:

Locked By:	TxDOT:	District:	Area:

Authorized By:	Authorized Date:

TEXAS DEPARTMENT OF TRANSPORTATION

Dynamic Cone Penetrometer (DCP) Data Analysis
ASTM - D6951

Refresh Workbook

ASTM - D6951 :: File Version: 10/21/16 07:33:30

SAMPLE ID:	C13	SAMPLED DATE:	5.04.2020
TEST NUMBER:		LETTING DATE:	
SAMPLE STATUS:		CONTROLLING CSJ:	
COUNTY:	Harris	SPEC YEAR:	
SAMPLED BY:	M.P	SPEC ITEM:	
SAMPLE LOCATION:	RA/RB Taxiway IAH	SPECIAL PROVISION:	
MATERIAL CODE:		GRADE:	
MATERIAL NAME:	lime stabilize ,Clay		
PRODUCER:			
AREA ENGINEER:		PROJECT MANAGER:	

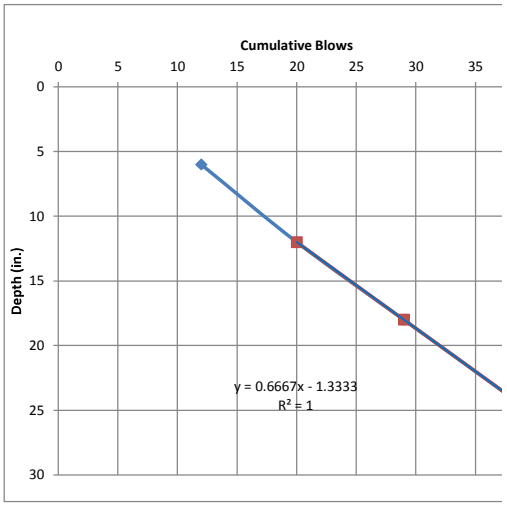
COURSE\LIFT:		STATION:		DIST. FROM CL:	
Long. (x):	95 20'03.6"W	Latitude (y):	29 58'56.2"N	Elev. (z):	

Material Classification:		Weather:	Partly Cloudy
Hammer Weight:	8-KG [17.6-lbs.]	Water Table Depth (ft.):	
Pavement Conditions:	Good	Depth of zero point below surface (in.):	0.50
Design Modulus (E) ksi:			

DCP DATA ANALYSIS

# of Blows	Penetration (6 in. intervals)	Cumulative Blows	Cumulative Penetration	CBR	E (ksi)	E > E (design)?	E > 0.5 E design
12	6.5	12	6.00				
8	12.5	20	12.00	10.8	11.7	YES	YES
9	18.5	29	18.00	12.3	12.7	YES	YES
9	24.5	38	24.00	12.3	12.7	YES	YES
					12.4	Compare E to 0.5 E design	Additional DCP testing needed

Layer	Eavg.	E (design)	E avg. ≥ E (design)
	12.4		



Remarks:

21.5"concret	Test Below68"
47" base	

Test Method:	Tested By:	Tested Date:
D6951	M.P	05/09/2020

Test Stamp Code:	Omit Test:	Completed Date:	Reviewed By:

Locked By:	TxDOT:	District:	Area:

Authorized By:	Authorized Date:

TEXAS DEPARTMENT OF TRANSPORTATION

Dynamic Cone Penetrometer (DCP) Data Analysis
ASTM - D6951

Refresh Workbook

ASTM - D6951 :: File Version: 10/21/16 07:33:30

SAMPLE ID:	C15	SAMPLED DATE:	5.4.2020
TEST NUMBER:		LETTING DATE:	
SAMPLE STATUS:		CONTROLLING CSJ:	
COUNTY:	Harris	SPEC YEAR:	
SAMPLED BY:	M.P	SPEC ITEM:	
SAMPLE LOCATION:	RA/RB Taxiway IAH	SPECIAL PROVISION:	
MATERIAL CODE:		GRADE:	
MATERIAL NAME:	lime stabilize ,Clay		
PRODUCER:			
AREA ENGINEER:		PROJECT MANAGER:	

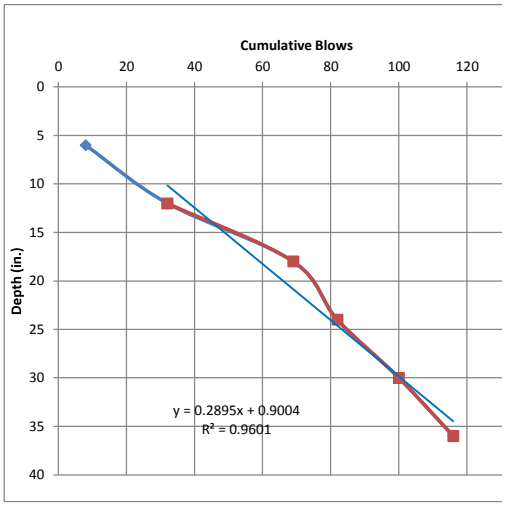
COURSE\LIFT:		STATION:		DIST. FROM CL:	
Long. (x):	95 19'58.6"W	Latitude (y):	29 58'56.5"N	Elev. (z):	

Material Classification:		Weather:	Partly Cloudy
Hammer Weight:	8-KG [17.6-lbs.]	Water Table Depth (ft.):	
Pavement Conditions:	Good	Depth of zero point below surface (in.):	0.50
Design Modulus (E) ksi:			

DCP DATA ANALYSIS

# of Blows	Penetration (6 in. intervals)	Cumulative Blows	Cumulative Penetration	CBR	E (ksi)	E > E (design)?	E > 0.5 E design
8	6.5	8	6.00				
24	12.5	32	12.00	36.8	25.6	YES	YES
37	18.5	69	18.00	59.8	35.0	YES	YES
13	24.5	82	24.00	18.5	16.5	YES	YES
18	30.5	100	30.00	26.7	20.9	YES	YES
16	36.5	116	36.00	23.4	19.2	YES	YES
					23.4	Compare E to 0.5 E design	Additional DCP testing needed

Layer	Eavg.	E (design)	E avg. ≥ E (design)
	23.4		



Remarks:

4" Asphalt	Test Below59"
55" base	

Test Method:	Tested By:	Tested Date:
D6951	M.P	05/09/2020

Test Stamp Code:	Omit Test:	Completed Date:	Reviewed By:

Locked By:	TxDOT:	District:	Area:

Authorized By:	Authorized Date:

TEXAS DEPARTMENT OF TRANSPORTATION

Dynamic Cone Penetrometer (DCP) Data Analysis
ASTM - D6951

Refresh Workbook

ASTM - D6951 :: File Version: 10/21/16 07:33:30

SAMPLE ID:	C-1	SAMPLED DATE:	06/01/2022
TEST NUMBER:		LETTING DATE:	
SAMPLE STATUS:		CONTROLLING CSJ:	
COUNTY:	Harris	SPEC YEAR:	2014
SAMPLED BY:	Jermaine Eaton	SPEC ITEM:	
SAMPLE LOCATION:	SA/SB Taxiway IAH	SPECIAL PROVISION:	
MATERIAL CODE:		GRADE:	
MATERIAL NAME:	Lime Stabilized, Clay		
PRODUCER:			
AREA ENGINEER:		PROJECT MANAGER:	

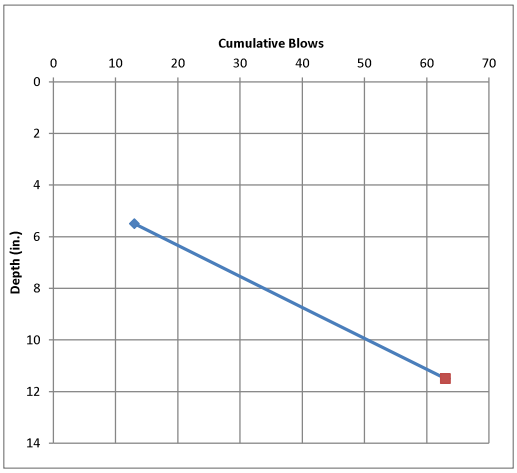
COURSE\LIFT:		STATION:		DIST. FROM CL:	
Long. (x):	95°19'53.93"W	Latitude (y):	29°58'46.56"N	Elev. (z):	

Material Classification:	All other types	Weather:	Cloudy
Hammer Weight:	8-KG [17.6-lbs.]	Water Table Depth (ft.):	
Pavement Conditions:		Depth of zero point below surface (in.):	0.50
Design Modulus (E) ksi:			

DCP DATA ANALYSIS

# of Blows	Penetration (6 in. intervals)	Cumulative Blows	Cumulative Penetration	CBR	E (ksi)	E > E (design)?	E > 0.5 E design
13	6	13	5.50				
50	12	63	11.50	83.8	43.4	YES	YES
					43.4	Compare E to 0.5 E design	Additional DCP testing needed

Layer	Eavg.	E (design)	E avg. ≥ E (design)
	43.4		



Remarks:

6" Asphalt
30" Base

Test Method:	Tested By:	Tested Date:
D6951	Jermaine Eaton	06/07/2022

Test Stamp Code:	Omit Test:	Completed Date:	Reviewed By:
J.E.			

Locked By:	TxDOT:	District:	Area:

Authorized By:	Authorized Date:

TEXAS DEPARTMENT OF TRANSPORTATION

Dynamic Cone Penetrometer (DCP) Data Analysis
ASTM - D6951

Refresh Workbook

ASTM - D6951 :: File Version: 10/21/16 07:33:30

SAMPLE ID:	C-4	SAMPLED DATE:	06/01/2022
TEST NUMBER:		LETTING DATE:	
SAMPLE STATUS:		CONTROLLING CSJ:	
COUNTY:	Harris	SPEC YEAR:	2014
SAMPLED BY:	Jermaine Eaton	SPEC ITEM:	
SAMPLE LOCATION:	SA/SB Taxiway IAH	SPECIAL PROVISION:	
MATERIAL CODE:		GRADE:	
MATERIAL NAME:	Lime Stabilized, Clay		
PRODUCER:			
AREA ENGINEER:		PROJECT MANAGER:	

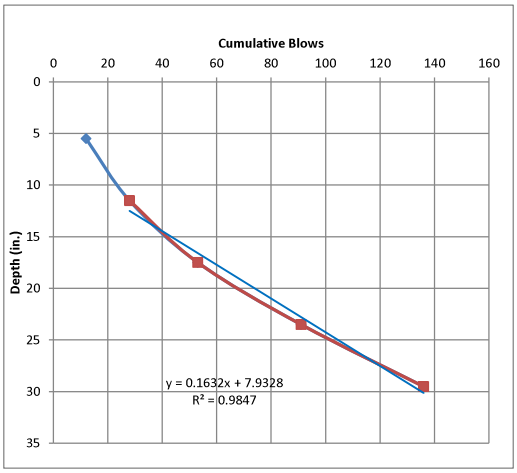
COURSE\LIFT:		STATION:		DIST. FROM CL:	
Long. (x):	95°19'14.95"W	Latitude (y):	29°58'46.81"N	Elev. (z):	

Material Classification:	All other types	Weather:	Cloudy
Hammer Weight:	8-KG [17.6-lbs.]	Water Table Depth (ft.):	
Pavement Conditions:		Depth of zero point below surface (in.):	0.50
Design Modulus (E) ksi:			

DCP DATA ANALYSIS

# of Blows	Penetration (6 in. intervals)	Cumulative Blows	Cumulative Penetration	CBR	E (ksi)	E > E (design)?	E > 0.5 E design
12	6	12	5.50				
16	12	28	11.50	23.4	19.2	YES	YES
25	18	53	17.50	38.6	26.4	YES	YES
38	24	91	23.50	61.6	35.6	YES	YES
45	30	136	29.50	74.5	40.2	YES	YES
					30.4	Compare E to 0.5 E design	Additional DCP testing needed

Layer	Eavg.	E (design)	E avg. ≥ E (design)
	30.4		



Remarks:

6.5" Asphalt
28.5" Base

Test Method:	Tested By:	Tested Date:
D6951	Jermaine Eaton	06/07/2022

Test Stamp Code:	Omit Test:	Completed Date:	Reviewed By:
J.E.			

Locked By:	TxDOT:	District:	Area:

Authorized By:	Authorized Date:

TEXAS DEPARTMENT OF TRANSPORTATION

Dynamic Cone Penetrometer (DCP) Data Analysis
ASTM - D6951

Refresh Workbook

ASTM - D6951 :: File Version: 10/21/16 07:33:30

SAMPLE ID:	C-6	SAMPLED DATE:	06/01/2022
TEST NUMBER:		LETTING DATE:	
SAMPLE STATUS:		CONTROLLING CSJ:	
COUNTY:	Harris	SPEC YEAR:	2014
SAMPLED BY:	Jermaine Eaton	SPEC ITEM:	
SAMPLE LOCATION:	SA/SB Taxiway IAH	SPECIAL PROVISION:	
MATERIAL CODE:		GRADE:	
MATERIAL NAME:	Lime Stabilized, Clay		
PRODUCER:			
AREA ENGINEER:		PROJECT MANAGER:	

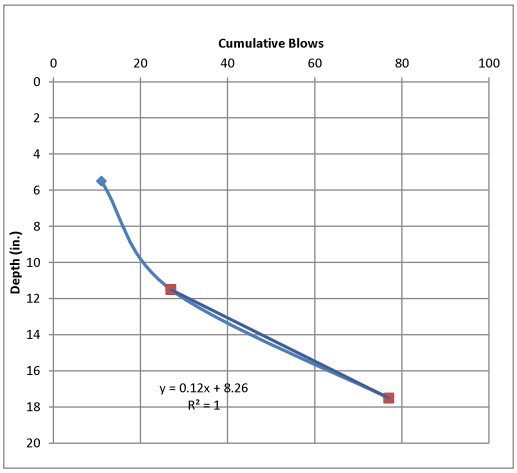
COURSE\LIFT:		STATION:		DIST. FROM CL:	
Long. (x):	95°18'56.09"W	Latitude (y):	29°58'46.65"N	Elev. (z):	

Material Classification:	All other types	Weather:	Cloudy
Hammer Weight:	8-KG [17.6-lbs.]	Water Table Depth (ft.):	
Pavement Conditions:		Depth of zero point below surface (in.):	0.50
Design Modulus (E) ksi:			

DCP DATA ANALYSIS

# of Blows	Penetration (6 in. intervals)	Cumulative Blows	Cumulative Penetration	CBR	E (ksi)	E > E (design)?	E > 0.5 E design
11	6	11	5.50				
16	12	27	11.50	23.4	19.2	YES	YES
50	18	77	17.50	83.8	43.4	YES	YES
					31.3	Compare E to 0.5 E design	Additional DCP testing needed

Layer	Eavg.	E (design)	E avg. ≥ E (design)
	31.3		



Remarks:

7.25" Asphalt
28.25" Base

Test Method:	Tested By:	Tested Date:
D6951	Jermaine Eaton	06/07/2022

Test Stamp Code:	Omit Test:	Completed Date:	Reviewed By:
J.E.			

Locked By:	TxDOT:	District:	Area:

Authorized By:	Authorized Date:

TEXAS DEPARTMENT OF TRANSPORTATION

Dynamic Cone Penetrometer (DCP) Data Analysis
ASTM - D6951

Refresh Workbook

ASTM - D6951 :: File Version: 10/21/16 07:33:30

SAMPLE ID:	C-8	SAMPLED DATE:	06/01/2022
TEST NUMBER:		LETTING DATE:	
SAMPLE STATUS:		CONTROLLING CSJ:	
COUNTY:		SPEC YEAR:	2014
SAMPLED BY:	Jermaine Eaton	SPEC ITEM:	
SAMPLE LOCATION:	SA/SB Taxiway IAH	SPECIAL PROVISION:	
MATERIAL CODE:		GRADE:	
MATERIAL NAME:	Lime Stabilized, Clay		
PRODUCER:			
AREA ENGINEER:		PROJECT MANAGER:	

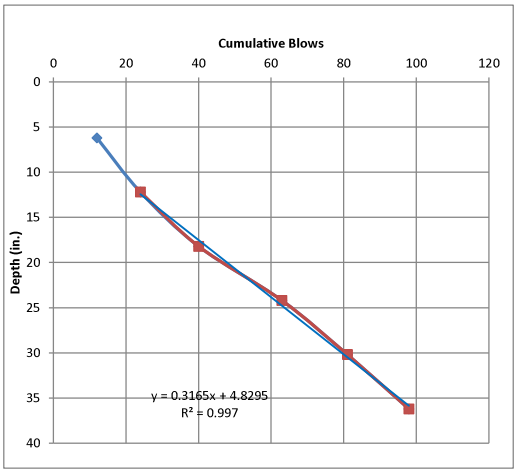
COURSE\LIFT:		STATION:		DIST. FROM CL:	
Long. (x):	95°18'21.35"W	Latitude (y):	29°58'46.88"N	Elev. (z):	

Material Classification:	CH	Weather:	Cloudy
Hammer Weight:	8-KG [17.6-lbs.]	Water Table Depth (ft.):	
Pavement Conditions:		Depth of zero point below surface (in.):	0.50
Design Modulus (E) ksi:			

DCP DATA ANALYSIS

# of Blows	Penetration (6 in. intervals)	Cumulative Blows	Cumulative Penetration	CBR	E (ksi)	E > E (design)?	E > 0.5 E design
12	6.7	12	6.20				
12	12.7	24	12.20	16.9	15.6	YES	YES
16	18.7	40	18.20	23.4	19.2	YES	YES
23	24.7	63	24.20	35.1	24.9	YES	YES
18	30.7	81	30.20	26.7	20.9	YES	YES
17	36.7	98	36.20	25.0	20.0	YES	YES
					20.1	Compare E to 0.5 E design	Additional DCP testing needed

Layer	Eavg.	E (design)	E avg. ≥ E (design)
	20.1		



Remarks:

6.7" Concrete
5" Asphalt 9.5ŁLime Stabilized Base

Test Method:	Tested By:	Tested Date:
D6951	Jermaine Eaton	06/07/2022

Test Stamp Code:	Omit Test:	Completed Date:	Reviewed By:

Locked By:	TxDOT:	District:	Area:

Authorized By:	Authorized Date:

TEXAS DEPARTMENT OF TRANSPORTATION

Dynamic Cone Penetrometer (DCP) Data Analysis
ASTM - D6951

Refresh Workbook

ASTM - D6951 :: File Version: 10/21/16 07:33:30

SAMPLE ID:	C10	SAMPLED DATE:	5.8.2020
TEST NUMBER:		LETTING DATE:	
SAMPLE STATUS:		CONTROLLING CSJ:	
COUNTY:	Harris	SPEC YEAR:	
SAMPLED BY:	George	SPEC ITEM:	
SAMPLE LOCATION:	SA/SB Taxiway IAH	SPECIAL PROVISION:	
MATERIAL CODE:		GRADE:	
MATERIAL NAME:	lime stabilize ,Clay		
PRODUCER:			
AREA ENGINEER:		PROJECT MANAGER:	

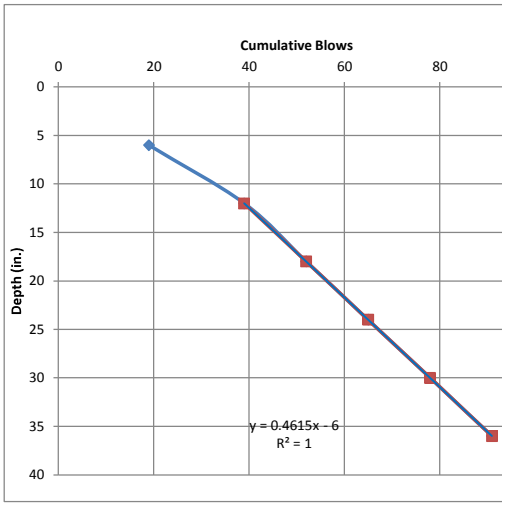
COURSE\LIFT:		STATION:		DIST. FROM CL:	
Long. (x):	95 19'16.4"W	Latitude (y):	29 58'43.3"N	Elev. (z):	

Material Classification:		Weather:	Partly Cloudy
Hammer Weight:	8-KG [17.6-lbs.]	Water Table Depth (ft.):	
Pavement Conditions:	Good	Depth of zero point below surface (in.):	0.50
Design Modulus (E) ksi:			

DCP DATA ANALYSIS

# of Blows	Penetration (6 in. intervals)	Cumulative Blows	Cumulative Penetration	CBR	E (ksi)	E > E (design)?	E > 0.5 E design
19	6.5	19	6.00				
20	12.5	39	12.00	30.0	22.5	YES	YES
13	18.5	52	18.00	18.5	16.5	YES	YES
13	24.5	65	24.00	18.5	16.5	YES	YES
13	30.5	78	30.00	18.5	16.5	YES	YES
13	36.5	91	36.00	18.5	16.5	YES	YES
					17.7	Compare E to 0.5 E design	Additional DCP testing needed

Layer	Eavg.	E (design)	E avg. ≥ E (design)
	17.7		



Remarks:

Test Below68"

Test Method:	Tested By:	Tested Date:
D6951	George	05/09/2020

Test Stamp Code:	Omit Test:	Completed Date:	Reviewed By:

Locked By:	TxDOT:	District:	Area:

Authorized By:	Authorized Date:

TEXAS DEPARTMENT OF TRANSPORTATION

Dynamic Cone Penetrometer (DCP) Data Analysis
ASTM - D6951

Refresh Workbook

ASTM - D6951 :: File Version: 10/21/16 07:33:30

SAMPLE ID:	C-16	SAMPLED DATE:	06/01/2022
TEST NUMBER:		LETTING DATE:	
SAMPLE STATUS:		CONTROLLING CSJ:	
COUNTY:	Harris	SPEC YEAR:	2014
SAMPLED BY:	Jermaine Eaton	SPEC ITEM:	
SAMPLE LOCATION:	SA/SB Taxiway IAH	SPECIAL PROVISION:	
MATERIAL CODE:		GRADE:	
MATERIAL NAME:	Lime Stabilized, Clay		
PRODUCER:			
AREA ENGINEER:		PROJECT MANAGER:	

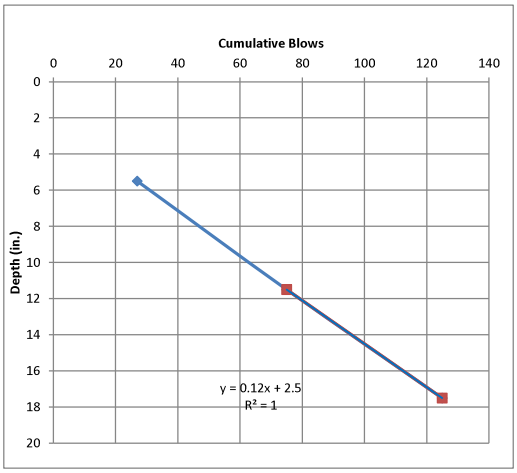
COURSE\LIFT:		STATION:		DIST. FROM CL:	
Long. (x):	95°19'48.80"W	Latitude (y):	29°58'44.86"N	Elev. (z):	

Material Classification:	All other types	Weather:	Cloudy
Hammer Weight:	8-KG [17.6-lbs.]	Water Table Depth (ft.):	
Pavement Conditions:		Depth of zero point below surface (in.):	0.50
Design Modulus (E) ksi:			

DCP DATA ANALYSIS

# of Blows	Penetration (6 in. intervals)	Cumulative Blows	Cumulative Penetration	CBR	E (ksi)	E > E (design)?	E > 0.5 E design
27	6	27	5.50				
48	12	75	11.50	80.1	42.2	YES	YES
50	18	125	17.50	83.8	43.4	YES	YES
					42.8	Compare E to 0.5 E design	Additional DCP testing needed

Layer	Eavg.	E (design)	E avg. ≥ E (design)
	42.8		



Remarks:

11.5" Concrete
1" Asphalt, 23.5" Base

Test Method:	Tested By:	Tested Date:
D6951	Jermaine Eaton	06/07/2022

Test Stamp Code:	Omit Test:	Completed Date:	Reviewed By:
J.E.			

Locked By:	TxDOT:	District:	Area:

Authorized By:	Authorized Date:

TEXAS DEPARTMENT OF TRANSPORTATION

Dynamic Cone Penetrometer (DCP) Data Analysis
ASTM - D6951

Refresh Workbook

ASTM - D6951 :: File Version: 10/21/16 07:33:30

SAMPLE ID:	C18	SAMPLED DATE:	5.6.2020
TEST NUMBER:		LETTING DATE:	
SAMPLE STATUS:		CONTROLLING CSJ:	
COUNTY:	Harris	SPEC YEAR:	
SAMPLED BY:	M.P/George	SPEC ITEM:	
SAMPLE LOCATION:	SA/SB Taxiway IAH	SPECIAL PROVISION:	
MATERIAL CODE:		GRADE:	
MATERIAL NAME:	lime stabilize ,Clay		
PRODUCER:			
AREA ENGINEER:		PROJECT MANAGER:	

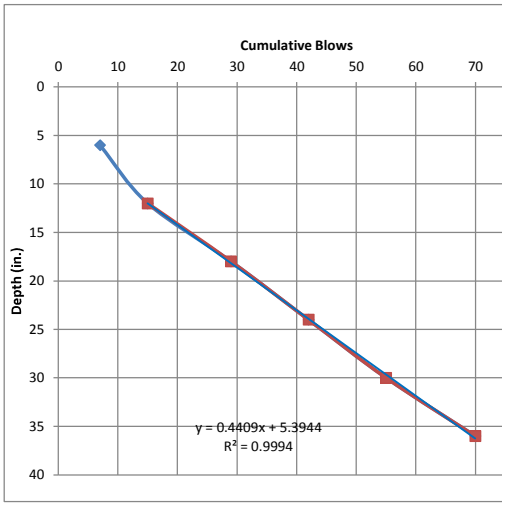
COURSE\LIFT:		STATION:		DIST. FROM CL:	
Long. (x):	95 19'58.7"W	Latitude (y):	29 58'43.3"N	Elev. (z):	

Material Classification:		Weather:	Partly Cloudy
Hammer Weight:	8-KG [17.6-lbs.]	Water Table Depth (ft.):	
Pavement Conditions:	Good	Depth of zero point below surface (in.):	0.50
Design Modulus (E) ksi:			

DCP DATA ANALYSIS

# of Blows	Penetration (6 in. intervals)	Cumulative Blows	Cumulative Penetration	CBR	E (ksi)	E > E (design)?	E > 0.5 E design
7	6.5	7	6.00				
8	12.5	15	12.00	10.8	11.7	YES	YES
14	18.5	29	18.00	20.1	17.4	YES	YES
13	24.5	42	24.00	18.5	16.5	YES	YES
13	30.5	55	30.00	18.5	16.5	YES	YES
15	36.5	70	36.00	21.8	18.3	YES	YES
					16.1	Compare E to 0.5 E design	Additional DCP testing needed

Layer	Eavg.	E (design)	E avg. ≥ E (design)
	16.1		



Remarks:

Test Below65"

Test Method:	Tested By:	Tested Date:
D6951	M.P/George	05/09/2020

Test Stamp Code:	Omit Test:	Completed Date:	Reviewed By:

Locked By:	TxDOT:	District:	Area:

Authorized By:	Authorized Date:

TEXAS DEPARTMENT OF TRANSPORTATION

Dynamic Cone Penetrometer (DCP) Data Analysis
ASTM - D6951

Refresh Workbook

ASTM - D6951 :: File Version: 10/21/16 07:33:30

SAMPLE ID:	C-23	SAMPLED DATE:	06/01/2022
TEST NUMBER:		LETTING DATE:	
SAMPLE STATUS:		CONTROLLING CSJ:	
COUNTY:	Harris	SPEC YEAR:	2014
SAMPLED BY:	Jermaine Eaton	SPEC ITEM:	
SAMPLE LOCATION:	SA/SB Taxiway IAH	SPECIAL PROVISION:	
MATERIAL CODE:		GRADE:	
MATERIAL NAME:	Lime Stabilized, Clay		
PRODUCER:			
AREA ENGINEER:		PROJECT MANAGER:	

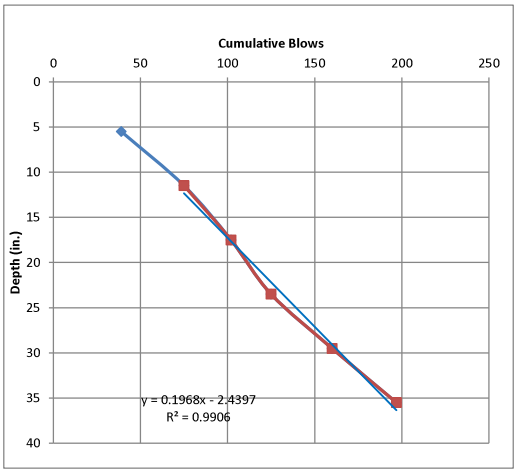
COURSE\LIFT:		STATION:		DIST. FROM CL:	
Long. (x):	95°19'58.99"W	Latitude (y):	29°58'47.28"N	Elev. (z):	

Material Classification:	All other types	Weather:	Cloudy
Hammer Weight:	8-KG [17.6-lbs.]	Water Table Depth (ft.):	
Pavement Conditions:		Depth of zero point below surface (in.):	0.50
Design Modulus (E) ksi:			

DCP DATA ANALYSIS

# of Blows	Penetration (6 in. intervals)	Cumulative Blows	Cumulative Penetration	CBR	E (ksi)	E > E (design)?	E > 0.5 E design
39	6	39	5.50				
36	12	75	11.50	58.0	34.3	YES	YES
27	18	102	17.50	42.0	27.9	YES	YES
23	24	125	23.50	35.1	24.9	YES	YES
35	30	160	29.50	56.2	33.6	YES	YES
37	36	197	35.50	59.8	35.0	YES	YES
					31.1	Compare E to 0.5 E design	Additional DCP testing needed

Layer	Eavg.	E (design)	E avg. ≥ E (design)
	31.1		



Remarks:

9" Asphalt
30" Base

Test Method:	Tested By:	Tested Date:
D6951	Jermaine Eaton	06/07/2022

Test Stamp Code:	Omit Test:	Completed Date:	Reviewed By:
J.E.			

Locked By:	TxDOT:	District:	Area:

Authorized By:	Authorized Date:

TEXAS DEPARTMENT OF TRANSPORTATION

Dynamic Cone Penetrometer (DCP) Data Analysis
ASTM - D6951

Refresh Workbook

ASTM - D6951 :: File Version: 10/21/16 07:33:30

SAMPLE ID:	C-25	SAMPLED DATE:	06/01/2022
TEST NUMBER:		LETTING DATE:	
SAMPLE STATUS:		CONTROLLING CSJ:	
COUNTY:	Harris	SPEC YEAR:	2014
SAMPLED BY:	Jermaine Eaton	SPEC ITEM:	
SAMPLE LOCATION:	SA/SB Taxiway IAH	SPECIAL PROVISION:	
MATERIAL CODE:		GRADE:	
MATERIAL NAME:	Lime Stabilized, Clay		
PRODUCER:			
AREA ENGINEER:		PROJECT MANAGER:	

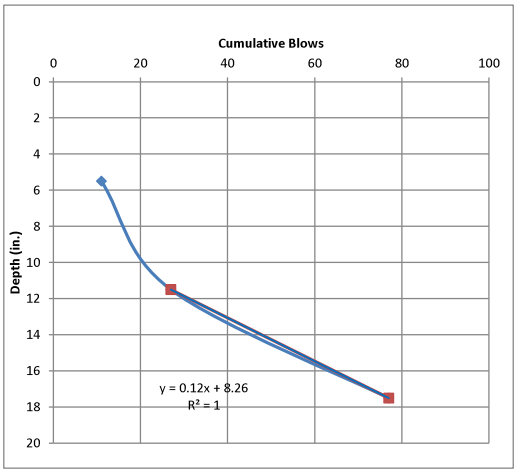
COURSE\LIFT:		STATION:		DIST. FROM CL:	
Long. (x):	95°18'33.00"W	Latitude (y):	29°58'47.11"N	Elev. (z):	

Material Classification:	All other types	Weather:	Cloudy
Hammer Weight:	8-KG [17.6-lbs.]	Water Table Depth (ft.):	
Pavement Conditions:		Depth of zero point below surface (in.):	0.50
Design Modulus (E) ksi:			

DCP DATA ANALYSIS

# of Blows	Penetration (6 in. intervals)	Cumulative Blows	Cumulative Penetration	CBR	E (ksi)	E > E (design)?	E > 0.5 E design
11	6	11	5.50				
16	12	27	11.50	23.4	19.2	YES	YES
50	18	77	17.50	83.8	43.4	YES	YES
					31.3	Compare E to 0.5 E design	Additional DCP testing needed

Layer	Eavg.	E (design)	E avg. ≥ E (design)
	31.3		



Remarks:

7" Asphalt
28" Base

Test Method:	Tested By:	Tested Date:
D6951	Jermaine Eaton	06/07/2022

Test Stamp Code:	Omit Test:	Completed Date:	Reviewed By:

Locked By:	TxDOT:	District:	Area:

Authorized By:	Authorized Date:

TEXAS DEPARTMENT OF TRANSPORTATION

Dynamic Cone Penetrometer (DCP) Data Analysis
ASTM - D6951

Refresh Workbook

ASTM - D6951 :: File Version: 10/21/16 07:33:30

SAMPLE ID:	C26	SAMPLED DATE:	5.7.2020
TEST NUMBER:		LETTING DATE:	
SAMPLE STATUS:		CONTROLLING CSJ:	
COUNTY:	Harris	SPEC YEAR:	
SAMPLED BY:	George	SPEC ITEM:	
SAMPLE LOCATION:	SA/SB Taxiway IAH	SPECIAL PROVISION:	
MATERIAL CODE:		GRADE:	
MATERIAL NAME:	lime stabilize ,Clay		
PRODUCER:			
AREA ENGINEER:		PROJECT MANAGER:	

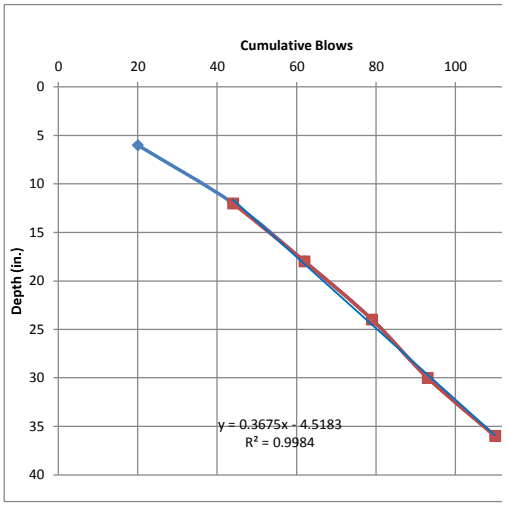
COURSE\LIFT:		STATION:		DIST. FROM CL:	
Long. (x):	95 19'33.5"W	Latitude (y):	29 58'43.8"N	Elev. (z):	

Material Classification:		Weather:	Partly Cloudy
Hammer Weight:	8-KG [17.6-lbs.]	Water Table Depth (ft.):	
Pavement Conditions:	Good	Depth of zero point below surface (in.):	0.50
Design Modulus (E) ksi:			

DCP DATA ANALYSIS

# of Blows	Penetration (6 in. intervals)	Cumulative Blows	Cumulative Penetration	CBR	E (ksi)	E > E (design)?	E > 0.5 E design
20	6.5	20	6.00				
24	12.5	44	12.00	36.8	25.6	YES	YES
18	18.5	62	18.00	26.7	20.9	YES	YES
17	24.5	79	24.00	25.0	20.0	YES	YES
14	30.5	93	30.00	20.1	17.4	YES	YES
17	36.5	110	36.00	25.0	20.0	YES	YES
					20.8	Compare E to 0.5 E design	Additional DCP testing needed

Layer	Eavg.	E (design)	E avg. ≥ E (design)
	20.8		



Remarks:

Test Below68"

Test Method:	Tested By:	Tested Date:
D6951	George	05/09/2020

Test Stamp Code:	Omit Test:	Completed Date:	Reviewed By:

Locked By:	TxDOT:	District:	Area:

Authorized By:	Authorized Date:

TEXAS DEPARTMENT OF TRANSPORTATION

Dynamic Cone Penetrometer (DCP) Data Analysis
ASTM - D6951

Refresh Workbook

ASTM - D6951 :: File Version: 10/21/16 07:33:30

SAMPLE ID:	C28	SAMPLED DATE:	5.8.2020
TEST NUMBER:		LETTING DATE:	
SAMPLE STATUS:		CONTROLLING CSJ:	
COUNTY:	Harris	SPEC YEAR:	
SAMPLED BY:	George	SPEC ITEM:	
SAMPLE LOCATION:	SA/SB Taxiway IAH	SPECIAL PROVISION:	
MATERIAL CODE:		GRADE:	
MATERIAL NAME:	lime stabilize ,Clay		
PRODUCER:			
AREA ENGINEER:		PROJECT MANAGER:	

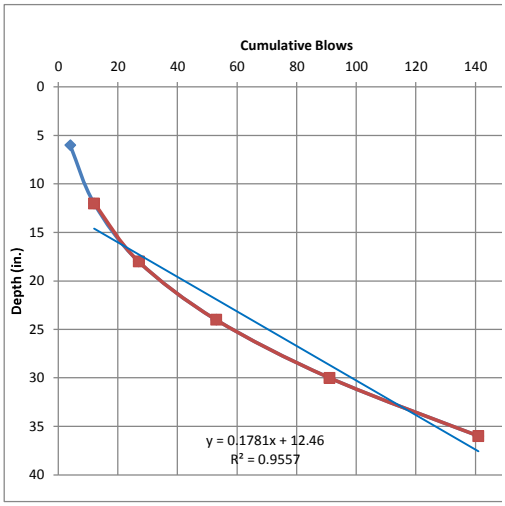
COURSE\LIFT:		STATION:		DIST. FROM CL:	
Long. (x):	95 18'42.9"W	Latitude (y):	29 58'43.9"N	Elev. (z):	

Material Classification:		Weather:	Partly Cloudy
Hammer Weight:	8-KG [17.6-lbs.]	Water Table Depth (ft.):	
Pavement Conditions:	Good	Depth of zero point below surface (in.):	0.50
Design Modulus (E) ksi:			

DCP DATA ANALYSIS

# of Blows	Penetration (6 in. intervals)	Cumulative Blows	Cumulative Penetration	CBR	E (ksi)	E > E (design)?	E > 0.5 E design
4	6.5	4	6.00				
8	12.5	12	12.00	10.8	11.7	YES	YES
15	18.5	27	18.00	21.8	18.3	YES	YES
26	24.5	53	24.00	40.3	27.2	YES	YES
38	30.5	91	30.00	61.6	35.6	YES	YES
50	36.5	141	36.00	83.8	43.4	YES	YES
					27.2	Compare E to 0.5 E design	Additional DCP testing needed

Layer	Eavg.	E (design)	E avg. ≥ E (design)
	27.2		



Remarks:

Test Below24"

Test Method:	Tested By:	Tested Date:
D6951	George	05/09/2020

Test Stamp Code:	Omit Test:	Completed Date:	Reviewed By:

Locked By:	TxDOT:	District:	Area:

Authorized By:	Authorized Date: