

GEOTECHNICAL REPORT

Dillingham Airport Runway Improvements
Dillingham, Alaska
IRIS CFAPT00353

May 2020
Prepared by:



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Submitted to:
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For:
Alaska Department of Transportation & Public Facilities

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**GEOTECHNICAL REPORT
DILLINGHAM AIRPORT RUNWAY IMPROVEMENTS
IRIS CFAPT00353
DILLINGHAM, ALASKA**

1.0 INTRODUCTION

This report presents the results of subsurface explorations and laboratory testing conducted by Shannon & Wilson, Inc. for the proposed improvements to the Dillingham Airport runway in Dillingham, Alaska. The purpose of this geotechnical study was to observe and document subsurface conditions to support engineering recommendations for the project improvements. To accomplish this, we advanced 26 geotechnical borings within or near the project area. Selected soil samples recovered from the borings were tested in our Anchorage and Seattle laboratories. Presented in this report are descriptions of the site and project, subsurface exploration and laboratory test results, and an interpretation of subsurface conditions.

This report consists of data presentation and subsurface interpretation; engineering recommendations are provided under separate cover. This report was prepared for the exclusive use of Stantec and the Alaska Department of Transportation & Public Facilities (DOT&PF) for the design of the proposed runway improvements. It should be made available to prospective contractors for information of factual data only, and not as a warranty of the subsurface conditions, such as those interpreted from the test hole logs and discussions of subsurface conditions included in this report.

Authorization to proceed with this work was received in the form of a subconsultant agreement signed by Mr. Zane Shanklin, Civil Engineering Manager for Stantec on September 5, 2017. Our work was conducted in general accordance with our June 2, 2017 proposal. The IRIS Project Number is CFAPT00143 and the Federal Project Number is to be determined (TBD).

2.0 SITE AND PROJECT DESCRIPTION

Dillingham Airport is located near the mouth of the Nushagak River where the river empties into Nushagak Bay. The Dillingham airport runway is within the airport lease area, a low-lying muskeg swamp. Tussock grasses and sphagnum moss are the primary vegetation features, with patches of alder, spruce, and willow trees in the area as well. Surface water was also observed in several areas across the native ground surface, which was approximately 10 to 12 feet below the

existing runway and embankment. Snow cover was patchy, thin, and receding during the investigation, with minimal precipitation encountered during our explorations.

We understand that the project improvements will include construction of a new runway, adjacent to the existing runway, and construction of new embankments for expansion of the runway safety area (RSA). New embankments will be placed over existing embankment material as well as in undeveloped areas over native ground which includes organic material and saturated areas. This project will also include lighting and drainage improvements and will require property acquisition of adjacent parcels for new Obstacle Free Zone (OFZ) and Runway Protection Zone (RPZ) boundaries. Additionally, a portion of Wood River Road will be realigned to the east to accommodate the new OFZ. A vicinity map is included as Figure 1.

The existing facilities have been constructed over several different construction events and the existing embankments have experienced ongoing differential settlement. Since original construction, settlement of the runway surface on either ends of the runway has been experienced, likely due to consolidation of underlying organic and soft mineral soils. At least one iteration of embankment widening has taken place, the most recent having occurred in the last several years. As a result the new embankment fills for this project will span over a native soils with at least three different stress histories including those that have not experienced prior loading, those that have experienced embankment loads for approximately five years, and those that have experienced embankment loading since original construction. Because of the variable support conditions, development of this project will need to accommodate expected significant differential settlement.

3.0 CLIMATE

The project area is located in a subarctic oceanic climate with long, cold winters and mild summers. The design freezing index is about 3,500-degree days, while the design thawing index is about 3,500-degree days (Hartman, 1984). The following table of climate data for Dillingham Airport was retrieved from the Western Regional Climate Center website for the period of record: February 1, 1919 to May 31, 2005.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (°F)	22.1	23.0	29.3	38.2	50.3	58.7	62.5	60.6	53.9	39.7	28.7	20.7	40.6
Average Min. Temperature (°F)	10.1	9.8	14.9	24.6	34.9	43.2	47.4	46.6	40.3	26.5	16.7	8.1	26.9
Average Total Precipitation (in)	1.79	1.35	1.49	1.01	1.47	1.93	2.79	3.92	3.47	2.21	2.19	1.87	25.48
Average Total Snowfall (in)	17.1	11.2	13.2	5.4	0.3	0.0	0.0	0.0	0.1	2.1	15.5	18.1	82.9
Average Snow Depth (in)	17	18	18	12	1	0	0	0	0	0	4	12	7

4.0 REGIONAL GEOLOGY

Dillingham Airport is in the low-lying, relatively flat floodplain of Nushagak River. It sits just southwest of the southern terminus of the Ahklun mountains at the mouth of the river where it empties into Nushagak Bay, and the terrain is characterized as low rolling hills and muskeg underlain with peat bogs. The peat bogs at the surface are estimated to cover 7300+ acres in the southwestern Dillingham A-7 quadrangle and reach depths of up to 24 feet (Rawlinson, Huck, Hardy, 1982).

The geology of the area consists of unconsolidated Quaternary alluvial and glacial deposits of silt, sand, gravel and boulders. The glacial deposits are Wisconsinan age but may include older pre-Wisconsinan drift at Dillingham Airport, and were deposited during at least three glacial advances (Hoare, Coonrad, 1978). These Quaternary deposits are overlain with an intermingled layer of silt and organic silt at the surface. This mingled silt layer varies in thickness and is likely a product of estuarine and alluvial deposition at the project location. Additionally, aeolean deposits blanket much of the lowlands near the Nushagak River. Although not encountered in our test holes, Dillingham lies within the sporadic permafrost zone (Hopkins, 1955). Depth to bedrock is unknown and estimated at over 200 feet (Mertie, 1938).

5.0 PREVIOUS EXPLORATIONS

In 2011, subsurface explorations were conducted along the runway and within the surrounding area by DOT&PF Central Region Materials (CRM). Test holes were advanced through the existing runway and adjacent in the undeveloped areas. DOT&PF/CRM explorations were conducted prior to the additional embankment that currently exists west of the paved runway and at both ends. Subsurface data from these explorations was reviewed prior to our mobilization for this field effort. Approximate test hole locations are shown on the site plan in Figure 2 and DOT&PF/CRM test hole logs are included in Appendix D.

6.0 SUBSURFACE EXPLORATIONS

Subsurface explorations consisted of drilling and sampling 26 borings between March 26 and April 3, 2019. Borings are designated Test Hole TH19-01 through TH19-26 and were advanced to depths of between 16.5 and 41.5 feet below ground surface (bgs). Boring locations were selected to provide even coverage across the project area and were advanced as close as practicable to planned locations. However, several planned boring locations were not able to be accessed due to soft and saturated ground. Elevations shown on the test hole logs were estimated from the plan and profile drawings provided by Stantec on July 25, 2019. Test hole locations and elevations should be considered approximate. Test hole logs are included in Appendix A.

Drilling services for this project were provided by Denali Drilling using a Geoprobe 7822DT mounted on tracks. An experienced representative from our firm was present during drilling to locate the test holes, observe drill action, collect samples, log subsurface conditions, and observe groundwater conditions. Test holes were advanced with a 3 ¼-inch inner diameter (ID), continuous flight, hollow-stem auger. As the test holes were advanced, samples were typically recovered using standard penetration test (SPT) methods outlined in ASTM International (ASTM) D1586. In the SPT method, samples were recovered by driving a 2-inch outer diameter (OD) split-spoon sampler into the bottom of the advancing hole with blows of a 140-pound hammer free falling 30 inches onto the drill rod within the hollow-stem auger. The number of blows required to advance the sampler the final 12 inches of an 18-inch penetration is termed the penetration resistance and this number was recorded as the blow count. Blow counts are on the test hole log figures as 'N-values' and are displayed adjacent to sample depth. The penetration resistance values give a measure of the relative density (compactness) or consistency (stiffness) of cohesionless or cohesive soils, respectively. In addition to the split-spoon samples, a grab

sample of the near-surface soils was collected from the auger cuttings in the upper 2 feet of each test hole.

Samples of predominantly fine-grained soils were occasionally collected using 3-inch OD by 30-inch long, thin wall (Shelby) tubes to obtain relatively undisturbed samples for laboratory testing. These samples were recovered by attaching the Shelby tube to the end of the drill rods and pushing the rods (and sampler) using hydraulic ram pressure from the rig into the soil at the bottom of the advancing boring. The sampling device was allowed to stay in the hole for approximately 5 to 10 minutes to allow the sample to adhere to the tube at which point it was removed from the bottom of the boring. The ends of the tubes were sealed with plastic caps, labeled, and fixed in an upright position for transporting to our Anchorage laboratory. The samples were extracted from the tubes in our laboratory and described in general accordance with the Unified Soil Classification System (USCS). Logs of the Shelby tube samples are included in Appendix A.

For samples recovered in cohesive soil, pocket vane shear tests were performed as per ASTM D4648 and pocket penetrometer penetration readings were recorded to supplement blow counts as an estimation of that sample's stiffness. The soils encountered were observed and described in the field in general accordance with the classification system described by ASTM D2488. Selected samples recovered during drilling were tested in our laboratory to refine our soil descriptions in general accordance with the Unified Soil Classification System (USCS).

7.0 LABORATORY TESTING

Laboratory tests were performed on selected soil samples recovered from the test holes to support our soil descriptions and to estimate the index properties of the typical materials encountered within the project area. The laboratory testing was formulated with emphasis on determining gradation properties, natural water content, and plasticity.

Water content tests were performed on the samples returned to our laboratory. Water content tests were performed in general accordance with ASTM D2216. The results of the water content measurements are presented on the test hole logs in Appendix A.

One dimensional consolidation tests were performed on eight undisturbed samples (Shelby tube samples) of fine-grained soils to estimate preconsolidation pressures and consolidation properties on these soils. The tests were performed in accordance with Method B of ASTM D2435. In this

test, performed in a consolidometer, samples extruded from Shelby tubes were first trimmed to fit into a rigid ring. Porous stones were then placed on the top and bottom of the specimen to allow drainage. The specimen is then loaded in increments and the axial deflection is observed at specific time intervals. The deflection at the end of each load increment was used to plot the void ratio versus log of the actual pressure. The results of this testing are presented in Appendix B.

Grain size classification (gradation) testing was performed to estimate the particle size distribution of selected samples from the test holes. The gradation testing generally followed the procedures described in ASTM C117/C136 and ASTM D421/422. The test results are presented on Table C-1 in Appendix C and summarized on the test hole logs as percent gravel, percent sand, and percent fines (indicated by P200). Tests were also conducted on selected samples to estimate the amount of material passing the Number 200 sieve (P200). This test was performed in general accordance with ASTM C117. The P200 test provides an estimate of the fines (silt and/or clay) content. The results of this test are presented on the test hole logs, indicated as P200. Note that hydrometer testing indicates particle size only and visual classification under USCS designates the entire fraction of soil finer than the number 200 sieve as silt. Plasticity characteristics (Atterberg Limits results) are required to differentiate between silt and clay soils under USCS.

Atterberg Limits were evaluated for samples of cohesive/fine-grained soil encountered during drilling to estimate plasticity characteristics. This test generally followed procedures described in ASTM D4318. The plasticity index (PI) and liquid limit (LL) results of these tests are presented on the test hole logs in Appendix A and on the Laboratory Summary Table in Appendix C.

Organic content was evaluated by ignition method for several samples in which organic material was observed or suspected. This test generally followed procedures described in Alaska Test Method (ATM) 203. The results are presented as a percentage (by weight) of organic material and are included on the test hole logs in Appendix A and on the Laboratory Summary Table in Appendix C.

Strength testing was performed on samples of the fine-grained soils recovered from the borings. The procedures used to estimate the strength of the silt and/or clay soils included pocket penetrometer (PP) tests, torvane (TV) tests, and unconfined compression tests. PP and TV tests were performed on most of the fine-grained soil specimens in the field and the laboratory on

relatively undisturbed Shelby tube samples. These tests provide an estimate of the unconfined compressive strength and undrained shear strength of the sample, respectively. Remolded TV tests were also performed in the laboratory to estimate the sensitivity of the samples to disturbance by remolding the samples by hand and performing a TV test on a new flat surface. Tests were performed at horizontal and vertical orientations where possible. The results of the PP and TV measurements are presented on the test hole logs as well as on the Shelby tube logs presented in Appendix A. PP and TV measurements on Shelby tube samples were taken after extrusion of the soil from the tube in the laboratory.

8.0 SUBSURFACE CONDITIONS

The subsurface conditions encountered in our explorations are depicted graphically on the test hole logs in Appendix A. In general, our explorations near the runway area encountered granular fill material overlying interbedded fine-grained soils and organic material followed by granular native material. In the Wood River Road area, we generally encountered fine-grained material (silt, organic silt, clay/clayey silt) overlying silty sand.

In addition to our explorations, we reviewed the existing test hole data accomplished by DOT&PF/CRM in 2011. The previous test hole locations are shown on the site plan in Figure 2 and the test hole logs are included in Appendix D. In general, the subsurface conditions concurred with our test hole data. Fill was encountered in the runway area followed by organic material, silt, and occasionally granular native material.

8.1 Runway Area

Test Holes advanced through the existing runway embankment encountered granular fill that typically ranged in thickness between 12 and 15.5 feet. However, in Test Holes TH19-06, TH19-08, TH19-09, TH19-11, and TH19-20, the fill was between 2 and 5 feet thick. The fill material consisted of gravel with varying amounts of silt and sand as well as silty sand with gravel. The fill was loose to very dense and contained 7 to 21 percent fines content for the samples tested. Moisture contents within the fill ranged from approximately 2 to 17 percent with the average at about 6.5 percent.

Native soils generally consisted of fine-grained materials, organic rich material, and occasional granular soils. The native fine-grained materials were dominated by silt, however, silt with sand, clayey silt, and clay were also encountered. Moisture contents in the silt ranged from approximately 19 to 46 percent, with the higher percentages likely due to the presence of organic

material. Atterberg limits results indicated that more than half of the samples tested were non plastic indicating that much of the silt encountered will not likely exhibit cohesive properties. The remainder were classified as silt with a plasticity index (PI) of between 2 and 10 and a liquid limit (LL) between 21 and 35 or clay/clayey silt with a PI between 5 and 17 and a LL between 24 and 39. Interbedded with the fine-grained native materials encountered were organic (peat) or organic rich (organic silt) soils ranging in thickness from one to 13 feet. Organic material was encountered at the surface of several test holes (TH19-17, TH19-21, TH19-25, and TH19-26), however most of the organic layers found were buried beneath fill or interbedded with native mineral soils. Organic material was generally very soft to medium stiff with occasional stiff zones and organic contents for samples tested ranged from 25.5 to 58.1 percent for the material classified as peat and between 7.6 and 22.1 for the material classified as organic silt. Moisture contents for the organic material were generally high and ranged from approximately 33 to 129 percent.

Pocket penetrometer tests performed on field and laboratory samples typically estimate the unconfined compressive strength of the materials encountered in our test holes at 0.1 to 4.0 tons per square foot (tsf). Field TV tests suggested the undrained shear strength of the fine-grained materials is estimated to range between 0.1 and 0.7 tsf; while laboratory TV test results (conducted on the samples extruded from the Shelby tubes) ranged from 0.05 to about 0.55 tsf. It should be noted that strength test results may be vary widely due to the low to non-plastic characteristics of the silt encountered.

Results from one dimensional consolidation tests conducted were analyzed graphically using the Casagrande construction. The test results and analyses are presented in the table below. Calculated overconsolidation ratios (OCR) shown on the table below are greater than one suggesting that the material is overconsolidated. However, it is likely that the higher OCR results are due to the low plasticity of the silt that the tests were conducted on. It is our opinion that the soils at the Dillingham airport site should be considered normally consolidated based on the consistency/cohesive data and our experience of the stress histories associated with the surrounding area.

Boring	Sample ID	Depth (bgs)	C _v	C _c	PL	LL	PI	OCR	USCS Classification	Moisture
B-07	S6	23.2	0.00148	0.1388	25	35	10	1.7	ML	24%
B-08	S6	26.3	0.01227	0.1212	19	21	2	2.7	ML	21%
B-11	S4	16.4	0.03157	0.1214	20	25	5	1.4	CL-ML	22%
B-14	S6	16.4	0.00712	0.1625	33	34	1	2.2	ML	33%
B-15	S8	26.2	0.02218	0.1003	18	21	3	1.4	ML	21%
B-17	S6	16.5	0.00782	0.0884	Non Plastic			3.4	ML	28%
B-19	S8	25.6	0.00797	0.0644	Non Plastic			1.4	ML	26%
B-24	S7	19.3	0.01520	0.0648	Non Plastic			3.8	ML	25%

Native granular material was encountered beneath the native fine-grained and organic materials in about half of the test holes at depths ranging from approximately 15 to 40 feet bgs. Native granular material consisted of sand and gravel with varying amounts of silt and was dominated by silty sand with gravel.

Groundwater was generally perched atop fine-grained soils over peat. Water depths shown on the test hole logs were estimated based on the shallowest observance of water with the understanding that water did not saturate the boring during drilling due to the low permeability of the soils encountered. Note that water levels may fluctuate by several feet seasonally or during periods of high precipitation or rapid snow melt.

8.2 Wood River Road Area

Four test holes designated Test Holes TH19-12 through TH19-15 were advanced in support of the potential Wood River Road realignment portion of the project. The Wood River Road test holes found approximately 2 feet of organic silt at the surface overlying silt or clay. Test Holes TH19-13 and TH19-15 found native granular material consisting of silty sand with gravel at 19 and 35 feet bgs, respectively. The organic silt at the surface was soft and the silt found below ranged from very soft to very stiff. Moisture contents in the fine-grained material (silt, sandy silt, and clay) ranged from approximately 19 to 37 percent. Atterberg limits testing indicated that the clay layer found in Test Hole TH19-14 from about 30 feet bgs to the bottom of the hole

(41.5 feet bgs) had a PI of 10 and a LL of 29. Additionally, Atterberg limits results indicated a PI of 3 and a LL of 21 for Sample S8 from Test Hole TH19-15. The remaining four samples that were tested for Atterberg Limits were found to be non plastic. Groundwater was encountered between 15 and 30 feet bgs during drilling. Note that water levels, especially as observed during drilling may be influenced by low permeability soils (such as silt) and may also fluctuate by several feet seasonally or during periods of high precipitation or rapid snow melt.

9.0 CLOSURE AND LIMITATIONS

This report was prepared for the exclusive use of our client and their representatives for evaluating the site as it relates to the geotechnical aspects discussed herein. The conclusions and interpretation contained in this report are based on site conditions as they presently exist. It is assumed that the exploratory test holes are representative of the subsurface conditions throughout the site, i.e., the subsurface conditions everywhere are not significantly different from those disclosed by the explorations.

If there is a substantial lapse of time between the submittal of this report and the start of work at the site, or if conditions have changed due to natural causes or construction operations at or adjacent to the site, it is recommended that this report be reviewed to determine the applicability of the conclusions considering the changed conditions and time lapse. Unanticipated soil conditions are commonly encountered and cannot fully be determined by merely taking soil samples or advancing test holes. Shannon & Wilson has prepared the attachments in Appendix E *Important Information About Your Geotechnical/Environmental Report* to assist you and others in understanding the use and limitations of the reports.

Copies of documents that may be relied upon by our client are limited to the printed copies (also known as hard copies) that are signed or sealed by Shannon & Wilson with a wet, blue ink signature. Files provided in electronic media format are furnished solely for the convenience of the client. Any conclusion or information obtained or derived from such electronic files shall be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, or you question the authenticity of the report please contact the undersigned.

The preparation of this document is supported in part with financial assistance through the Airport Improvement Program from the Federal Aviation Administration (AIP Grant Number 3-02-0078-017-2018) as provided under Title 49 USC § 47104. The contents do not necessarily reflect the official views or policy of the FAA. Acceptance of this report by the FAA does not in

any way constitute a commitment on the part of the United States to participate in any development depicted therein, nor does it indicate that the proposed development is environmentally acceptable in accordance with the appropriate public laws.

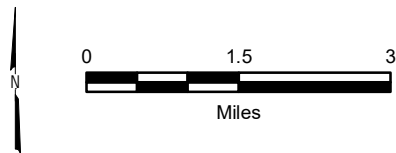
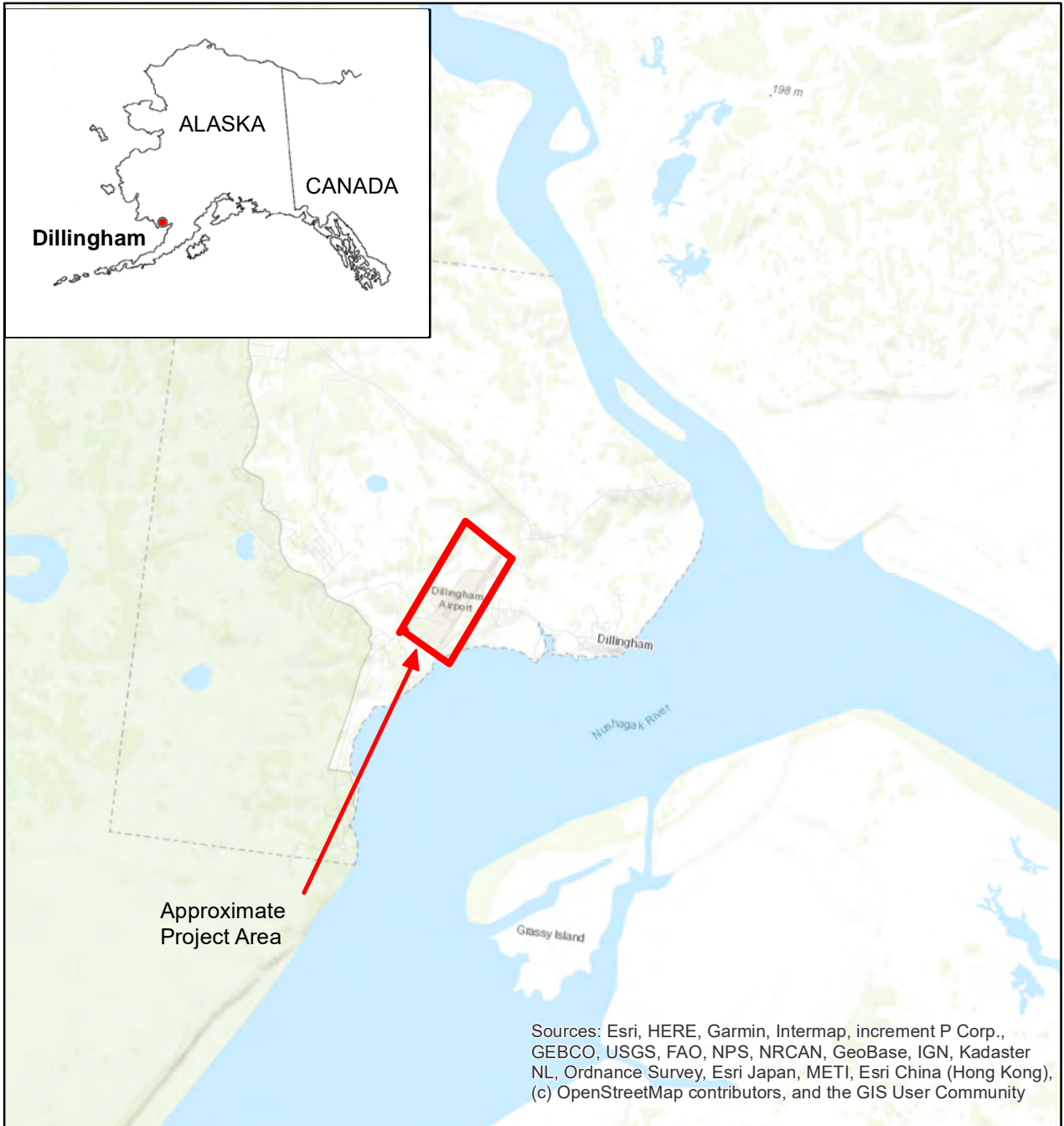
We appreciate this opportunity to be of service. Please contact the undersigned at (907) 561-2120 with questions or comments concerning the contents of this report.

SHANNON & WILSON, INC.

Katra Wedeking, CPG
Senior Geologist

10.0 REFERENCES

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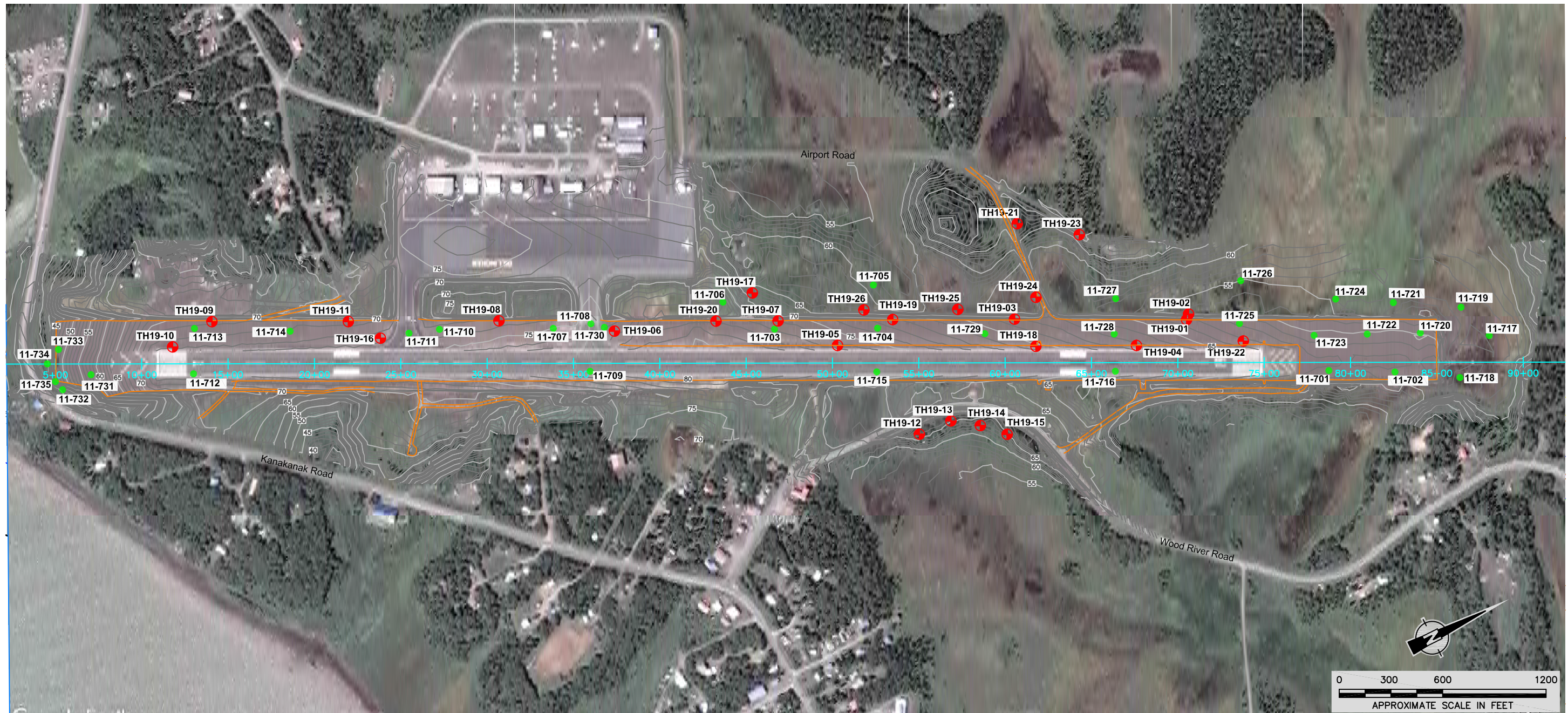
VICINITY MAP

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GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 1



LEGEND

- TH19-01 Approximate Location of Boring TH19-01, Advanced by Shannon & Wilson, March and April 2019.
- 11-701 Approximate Location of Boring 11-701, Advanced by Alaska DOT&PF/CRM, 2011.
- Topographic Contours. 1-foot interval
- Approximate existing embankment limits
- Existing Runway Centerline Stationing

NOTES

1. Map adapted from aerial imagery provided by Google Earth Pro, reproduced by permission granted by Google Earth™ Mapping Service.
2. Contours and stationing provided by Stantec on July 25 and 26, 2019.
3. Project features and line work representative of the project conditions on July 25 and 26, 2019 and may not be representative of the project configuration at later dates.

Dillingham Airport Runway Improvements
Dillingham, Alaska

SITE PLAN

May 2020

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Geotechnical and Environmental Consultants












FIG. 2

APPENDIX A

TEST HOLE AND SHELBY TUBE LOGS

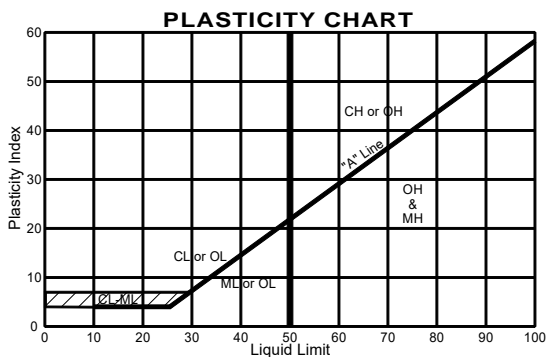
- Figure A-1 Soil Classification Legend
Log of Test Holes TH19-01 through TH19-26 (26 Sheets)
- Figure A-2 Shelby Tube Classification Test Hole TH19-02 S5
- Figure A-3 Shelby Tube Classification Test Hole TH19-03 S6
- Figure A-4 Shelby Tube Classification Test Hole TH19-06 S8
- Figure A-5 Shelby Tube Classification Test Holes TH19-07 S6; TH19-08 S6
- Figure A-6 Shelby Tube Classification Test Hole TH19-09 S5
- Figure A-7 Shelby Tube Classification Test Hole TH19-11 S4
- Figure A-8 Shelby Tube Classification Test Hole TH19-12 S9
- Figure A-9 Shelby Tube Classification Test Hole TH19-13 S6
- Figure A-10 Shelby Tube Classification Test Holes TH19-14 S6; TH19-15 S8
- Figure A-11 Shelby Tube Classification Test Holes TH19-17 S6; TH19-19 S8
- Figure A-12 Shelby Tube Classification Test Holes TH19-20 S6; TH19-24 S7
- Figure A-13 Shelby Tube Classification Test Hole TH19-25 S5
- Figure A-14 Shelby Tube Classification Test Hole TH19-26 S8


Unified Soil Classification System

GROUP NAME Criteria for Assigning Group Names and Group Symbols			Soil Classification Group Symbol with Generalized Group Descriptions			
COARSE-GRAINED SOILS more than 50% retained on No. 200 sieve	GRAVELS 50% or more of coarse fraction retained on No. 4 sieve	Clean GRAVELS Less than 5% fines		GW	Well-graded Gravels	
		GRAVELS with fines More than 12% fines		GP	Poorly-graded Gravels	
		SANDS More than 50% of coarse fraction passes No. 4 sieve	Clean SANDS Less than 5% fines		GM	Gravel & Silt Mixtures
			SANDS with fines More than 12% fines		GC	Gravel & Clay Mixtures
	FINE-GRAINED SOILS 50% or more passes the No. 200 sieve	SILTS AND CLAYS Liquid limit 50% or less	INORGANIC		ML	Non-plastic & Low-plasticity Silts
			ORGANIC		OL	Non-plastic and Low-plasticity Organic Clays Non-plastic and Low-plasticity Organic Silts
		SILTS AND CLAYS Liquid limit greater than 50%	INORGANIC		CH	High-plasticity Clays
			ORGANIC		MH	High-plasticity Silts
INORGANIC				OH	High-plasticity Organic Clays	
ORGANIC				OH	High-plasticity Organic Silts	
HIGHLY ORGANIC SOILS	Primarily organic matter, dark in color, and organic odor		PT	Organic Soil		

NOTES:

1. No. 4 size = 4.75mm; No. 200 size = 0.075mm
2. Dual symbols (symbols separated by a hyphen, i.e., SP-SM, Sand with Silt) and used for soils with between 5% and 12% fines or when the liquid limit and plasticity index values plot in the CL-ML area of the plasticity chart. Graphics shown on the logs for these soil types are a combination of the two graphic symbols (e.g., SP and SM).
3. Borderline symbols (symbols separated by a slash, i.e., CL/ML, Lean Clay to Silt; SP-SM/SM, Sand with Silt to Silty Sand) indicate that the soil properties are close to the defining boundary between two groups.
4. PP (Pocket Penetrometer) tests estimate unconfined compressive strength of cohesive soils. TV (Torvane) tests estimate the undrained shear strength of cohesive soils. All measurements in tons per square foot.



Dillingham Airport Runway Improvements Dillingham, Alaska	
SOIL CLASSIFICATION LEGEND	
May 2020	102964-001
 SHANNON & WILSON, INC. Geotechnical & Environmental Consultants	FIG. A-1



STATE OF ALASKA DOT&PF
Central Region Materials

LOG OF TEST HOLE

HOLE # TH19-01

PROJECT NUMBER : 102964-001

PROJECT : Dillingham Airport Runway Improvements

Station / Location: 70+50
Offset: 250 feet LOC
Elevation: 63 feet

Equipment_Type: Geoprobe 7720
Drilling Method: 8" hollow stem auger
Field Crew: Denali Drilling

Total Depth: 16.5 feet
Date: 3/26/2019
Geologist: FED, Shannon & Wilson Inc.

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Sunny, 40° F
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0						GM		SUBSURFACE MATERIAL			
	GRAB	S1						SILTY GRAVEL with Sand (GM) Brown to black, moist, loose to medium dense, [FILL] 0.0 S1: p200 =12%, Sa =42%, Gr =46%, Moisture =7.9%			
5	SPT	S2	15 23 21		44			S2: Moisture =5.8%			
10	SPT	S3	3 6 4		10			S3: Moisture =11.5%			
						ML		SILT with Sand (ML) Grey, moist, very stiff -----12.0			
15	SPT	S4	7 8 9		17			S4: p200 =76%, Sa =19%, Gr =5%, Moisture =21.8% -----16.5			
							BOH 16.5				

A USCS LOG OF TEST HOLE_DILLINGHAM AIRPORT DOT STYLE.GPJ 2006DATATEMPLATE.GDT 5/20/20



STATE OF ALASKA DOT & PF
Central Region Materials

LOG OF TEST HOLE

HOLE # TH19-02

PROJECT NUMBER : 102964-001

PROJECT : Dillingham Airport Runway Improvements

Station / Location: 70+63
Offset: 285 feet LOC
Elevation: 55 feet

Equipment_Type: Geoprobe 7720
Drilling Method: 8" hollow stem auger
Field Crew: Denali Drilling

Total Depth: 21.5 feet
Date: 3/26/2019
Geologist: FED, Shannon & Wilson Inc.

Depth (Feet)	Sample Data						USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Sunny, 40° F
	Sample Type	Number	Blow Count	Sample Recovery	N-Value	Depth in (ft.)				Time		
0	GRAB	S1					GM			2.5	07:25	
										3/26/19		
										▼		
SUBSURFACE MATERIAL												
0.0									SILTY GRAVEL with Sand (GM) Greyish brown, moist, medium dense, [FILL]			0.0
									S1: Moisture =6.6%			
4.0							PT		Peat (PT) Reddish brown, wet, soft			4.0
									S2: Moisture =77.2%			
9.5							ML		SILT (ML) Grey, wet, stiff, contains zones of trace organics			9.5
									S3: PP = 0.5 tsf, Moisture =28.0%			
12									S4: PP = 0.5 tsf, Non-Plastic, Moisture =28.9%			
15									S5: See Shelby Tube Log, Figure A-2			
21.5									S6: PP = 0.5 tsf, TVh = 0.10 tsf, p200 =98.6%, Moisture =23.6%			21.5
21.5									BOH 21.5			

A USCS LOG OF TEST HOLE_DILLINGHAM AIRPORT DOT STYLE.GPJ 2006DATATEMPLATE.GDT 5/20/20



STATE OF ALASKA DOT & PF
Central Region Materials

LOG OF TEST HOLE

HOLE # TH19-03

PROJECT NUMBER : 102964-001

PROJECT : Dillingham Airport Runway Improvements

Station / Location: 60+54
Offset: 250 feet LOC
Elevation: 68 feet

Equipment_Type: Geoprobe 7720
Drilling Method: 8" hollow stem auger
Field Crew: Denali Drilling

Total Depth: 41.5 feet
Date: 3/27/2019
Geologist: FED, Shannon & Wilson Inc.

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Sunny, 40° F
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0	GRAB	S1				GW-GM		GRAVEL with Silt and Sand (GW-GM) well graded, Brown, moist, medium dense, [FILL] S1: p200 =7%, Sa =41%, Gr =52%, Moisture =6.1%			0.0
5	SPT	S2	21 51	X				S2: Moisture =3.9%			
10	SPT	S3	7 6 6	X				S3: Moisture =7.3%			
12					12	PT		Peat (PT) Reddish brown, moist, soft			-12.0
15	SPT	S4	2 1 2	X		OL		ORGANIC SILT (OL) Reddish brown, moist, soft S4: Moisture =33.7%, Org =8.1%			-15.0
20	SPT	S5	4 8 8	X		ML		SILT (ML) Grey, moist, medium stiff to stiff, contains zones of trace organics S5: PP = 1.25 tsf, TVh = 0.10 tsf, Moisture =29.6%			-20.0
25	ST	S6						S6: See Shelby Tube Log, Figure A-3			
25	SPT	S7	5 7 7	X				S7: PP = 1.5 tsf, TVh = 0.10 tsf, Non-Plastic, Moisture =26.9%			
30	SPT	S8	3 3 3	X				S8: p200 =98.1%, Moisture =42.3%			
35	SPT	S9	2 4 6	X				S9: Moisture =46.1% Organic Silt observed approx 35 feet bgs			36.0
38						CL-ML		CLAYEY SILT (CL-ML) Greyish brown, moist, very stiff			-38.0
40	SPT	S10	7 11 13	X				S10: PP = 1.7 tsf, TVh = 0.17 tsf, Moisture =22.6%, PI =6, LL=24			41.5
41.5							BOH 41.5				

A USCS LOG OF TEST HOLE_DILLINGHAM AIRPORT DOT STYLE.GPJ 2006DATATEMPLATE.GDT 5/20/20

CME Auto Hammer
 Cathead Rope Method
 140 lb. hammer with 30 in. drop
 340 lb. hammer with 30 in. drop



STATE OF ALASKA DOT & PF
Central Region Materials

LOG OF TEST HOLE

HOLE # TH19-04

PROJECT NUMBER : 102964-001

PROJECT : Dillingham Airport Runway Improvements

Station / Location: 67+59
Offset: 100 feet LOC
Elevation: 67 feet

Equipment_Type: Geoprobe 7720
Drilling Method: 8" hollow stem auger
Field Crew: Denali Drilling

Total Depth: 26.5 feet
Date: 3/27/2019
Geologist: FED, Shannon & Wilson Inc.

Depth (Feet)	Sample Data						USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			Weather: Sunny, 40° F
	Sample Type	Number	Blow Count	Sample Recovery	N-Value	Depth in (ft.)				Time	Date	Symbol	
0	GRAB	S1					SM		SUBSURFACE MATERIAL				
									SILTY SAND with Gravel (SM) Brown, moist, medium dense to dense, [FILL] S1: Moisture =8.7%			0.0	
5	SPT	S2	21 52 50	X		102			S2: Blow counts not likely representative due to fractured rock, p200 =15%, Sa =50%, Gr =34%, Moisture =4.4%				
10	SPT	S3	26 50/5.5"	X					S3: Moisture =4.2%				
15	SPT	S4	2 3 4	X		7	PT		Peat (PT) Reddish brown, moist, very dense S4: Moisture =71.6%, Org =25.5%			14.0	
20	SPT	S5	3 4 4	X		8	ML		SILT (ML) Grey, moist, medium stiff S5: PP = 0.25 tsf, Non-Plastic, Moisture =18.9%			18.0	
25	SPT	S6	6 7 10	X		17			S6: Moisture =29.2%			26.5	
								BOH 26.5					

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STATE OF ALASKA DOT&PF
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LOG OF TEST HOLE

HOLE # TH19-05

PROJECT NUMBER : 102964-001

PROJECT : Dillingham Airport Runway Improvements

Station / Location: 50+28
Offset: 100 feet LOC
Elevation: 77 feet

Equipment_Type: Geoprobe 7720
Drilling Method: 8" hollow stem auger
Field Crew: Denali Drilling

Total Depth: 36.5 feet
Date: 3/28/2019
Geologist: FED, Shannon & Wilson Inc.

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Rain, 38° F
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)		
0	SPT	S1		X		GP-GM			34		SUBSURFACE MATERIAL
									13:07		
									3/28/19		
									▼		
0	SPT	S1		X		GP-GM		GRAVEL with Silt and Sand (GP-GM) poorly graded, Brown, moist, medium dense, [FILL] S1: sample contains asphalt particles, p200 =11%, Sa =43%, Gr =46%, Moisture =5.9%			0.0
5	SPT	S2	12 13 7	X				S2: Moisture =6.2%			
10	SPT	S3	5 6 7	X				S3: Moisture =5.0%			
12.0						OL		ORGANIC SILT (OL) Brown, moist, stiff			12.0
15	SPT	S4	4 6 4	X				S4: Moisture =37.2%			
16.3						PT		Peat (PT) Reddish brown, moist, medium stiff			16.3
20	SPT	S5	2 3 4	X		ML		SILT (ML) no to low plasticity, Reddish grey to grey, moist, stiff S5: Moisture =27.6%			20.0
25	SPT	S6	1 3 3	X				S6: Non-Plastic, Moisture =23.6%			
30	SPT	S7	3 8 10	X		SM		S7: Moisture =20.2%			
31.0								SILTY SAND with Gravel (SM) Greyish brown, moist to wet, dense			31.0
35	SPT	S8	14 24 24	X				S8: p200 =13%, Sa =56%, Gr =31%, Moisture =11.0%			
36.5							BOH				36.5

A USCS LOG OF TEST HOLE_DILLINGHAM AIRPORT DOT STYLE.GPJ 2006DATATEMPLATE.GDT 5/20/20



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Central Region Materials

LOG OF TEST HOLE

HOLE # TH19-06

PROJECT NUMBER : 102964-001

PROJECT : Dillingham Airport Runway Improvements

Station / Location: 37+36
Offset: 185 feet LOC
Elevation: 77 feet

Equipment_Type: Geoprobe 7720
Drilling Method: 8" hollow stem auger
Field Crew: Denali Drilling

Total Depth: 41.5 feet
Date: 3/28/2019
Geologist: FED, Shannon & Wilson Inc.

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Cloudy, 39° F
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0	GRAB	S1				GP-GM			35	17:04	
5	SPT	S2	1		2	OL					
10	SPT	S3	2 2		4	ML					
15	SPT	S4	4 3 4		7						
20	ST	S5									
25	SPT	S6	3 2 3		5						
30	SPT	S7	3 3 3		10						
35	ST	S8									
40	SPT	S9	3 2 4		6						
41.5	SPT	S10	4 16 9		25	SM					

A USCS LOG OF TEST HOLE - DILLINGHAM AIRPORT DOT STYLE.GPJ 2006DATATEMPLATE.GDT 5/20/20

☒ CME Auto Hammer ☐ Cathead Rope Method ☒ 140 lb. hammer with 30 in. drop ☐ 340 lb. hammer with 30 in. drop



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LOG OF TEST HOLE

HOLE # TH19-07

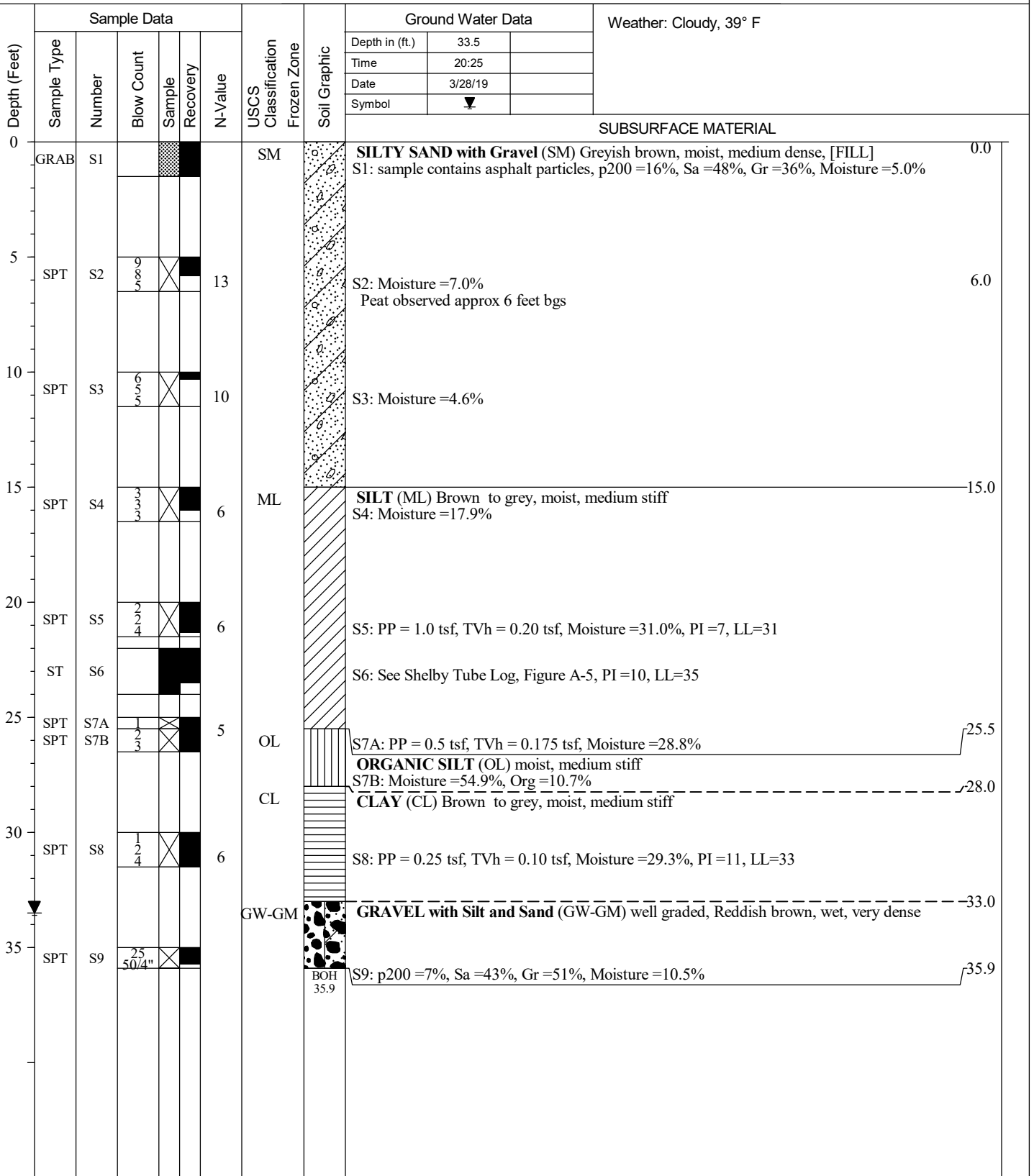
PROJECT NUMBER : 102964-001

PROJECT : Dillingham Airport Runway Improvements

Station / Location: 46+83
Offset: 245 feet LOC
Elevation: 76 feet

Equipment_Type: Geoprobe 7720
Drilling Method: 8" hollow stem auger
Field Crew: Denali Drilling

Total Depth: 35.9 feet
Date: 3/28/2019
Geologist: FED, Shannon & Wilson Inc.



A USCS LOG OF TEST HOLE_DILLINGHAM AIRPORT DOT STYLE.GPJ 2006DATATEMPLATE.GDT 5/20/20

CME Auto Hammer
 Cathead Rope Method
 140 lb. hammer with 30 in. drop
 340 lb. hammer with 30 in. drop



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Central Region Materials

LOG OF TEST HOLE

HOLE # TH19-08

PROJECT NUMBER : 102964-001

PROJECT : Dillingham Airport Runway Improvements

Station / Location: 30+62
Offset: 250 feet LOC
Elevation: 73 feet

Equipment_Type: Geoprobe 7720
Drilling Method: 8" hollow stem auger
Field Crew: Denali Drilling

Total Depth: 31.5 feet
Date: 3/29/2019
Geologist: FED, Shannon & Wilson Inc.

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Cloudy, 39° F
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0	SPT	S1		X		SM			20		SUBSURFACE MATERIAL
0.0											SILTY SAND with Gravel (SM) Brown, moist, loose, [FILL]; interbedded with silt and organic material S1: Moisture =24.0%
2.5						PT					Peat (PT) Reddish brown, moist, medium stiff
5	SPT	S2	4	X							S2: No Recovery
10	SPT	S3	2 4	X		ML					SILT (ML) Brown to grey, moist, stiff, occasional organics observed S3: Non-Plastic, Moisture =24.9%
15	SPT	S4	3 6	X							S4: Moisture =28.2%
20	SPT	S5	2 9	X							S5: Moisture =45.9%
25	ST	S6									S6: See Shelby Tube Log, Figure A-5, PI =2, LL=21
30	SPT	S7	4 10 12	X		CL					CLAY (CL) Bluish gray, moist, very stiff S7: PP = 3.0 tsf, TVh = 0.70 tsf, p200 =93%, Sa =3%, Gr =4%, Moisture =24.7%, PI =13, LL=38
31.5											BOH 31.5

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STATE OF ALASKA DOT&PF
Central Region Materials

LOG OF TEST HOLE

HOLE # TH19-09

PROJECT NUMBER : 102964-001

PROJECT : Dillingham Airport Runway Improvements

Station / Location: 14+06
Offset: 245 feet LOC
Elevation: 70 feet

Equipment_Type: Geoprobe 7720
Drilling Method: 8" hollow stem auger
Field Crew: Denali Drilling

Total Depth: 26.5 feet
Date: 3/29/2019
Geologist: FED, Shannon & Wilson Inc.

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Cloudy, 39° F
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)		
0	GRAB	S1				GP-GM			22		SUBSURFACE MATERIAL
								Time	14:19		
								Date	3/29/19		
								Symbol	▼		
0.0								GRAVEL with Silt and Sand (GP-GM) poorly graded, Brown, moist, medium dense, [FILL]		0.0	
								S1: p200 =10%, Sa =37%, Gr =53%, Moisture =6.9%			
5	SPT	S2	2 4 3		7	ML		SILT (ML) no to low plasticity, Light brown to dark brown, moist, medium stiff to hard, occasional organic lenses		4.0	
								S2: Non-Plastic, Moisture =24.0%			
10	SPT	S3	3 4 4		8			S3: Moisture =25.3%			
15	SPT	S4	2 2 3		5			S4: p200 =94.7%, Moisture =25.1%			
20	ST	S5						S5: See Shelby Tube Log, Figure A-6, Org =20.0%			
25	SPT	S6	13 30 50/4"					S6: Moisture =23.9%		26.5	
								BOH 26.5			

A USCS LOG OF TEST HOLE_DILLINGHAM AIRPORT DOT STYLE.GPJ 2006DATATEMPLATE.GDT 5/20/20



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LOG OF TEST HOLE

HOLE # TH19-10

PROJECT NUMBER : 102964-001

PROJECT : Dillingham Airport Runway Improvements

Station / Location: 11+78
Offset: 95 feet LOC
Elevation: 73 feet

Equipment_Type: Geoprobe 7720
Drilling Method: 8" hollow stem auger
Field Crew: Denali Drilling

Total Depth: 26.5 feet
Date: 3/29/2019
Geologist: FED, Shannon & Wilson Inc.

Depth (Feet)	Sample Data						USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			Weather: Cloudy, 39° F
	Sample Type	Number	Blow Count	Sample Recovery	N-Value	Depth in (ft.)				Time	Date	Symbol	
0	SPT	S1		☒	■		GM		SUBSURFACE MATERIAL				
									SILTY GRAVEL with Sand (GM) Brown, moist, medium dense to very dense, [FILL] 0.0 S1: sample contains asphalt particles, p200 =12%, Sa =42%, Gr =46%, Moisture =3.8%				
5	SPT	S2	16 27 25	☒	■	52			S2: Moisture =3.5%				
10	SPT	S3	10 8 6	☒	■	14			S3: Moisture =4.5%				
15	SPT	S4	4 4 4	☒	■	8	ML		SILT (ML) Grey, moist, medium stiff -14.0 S4: p200 =89%, Sa =9%, Gr =2%, Moisture =25.5%				
20	SPT ST	S5 S5	3 2 1	☒	■	3	SM		S5: No Recovery for Shelby Tube, oversampled with split spoon, blow counts not representative, Moisture =27.4% -22.0 SILTY SAND with Gravel (SM) Grey, moist, dense				
25	SPT	S6	15 16 16	☒	■	32			S6: p200 =27%, Sa =40%, Gr =33%, Moisture =7.9% -26.5				
								BOH 26.5					

A USCS LOG OF TEST HOLE_DILLINGHAM AIRPORT DOT STYLE.GPJ 2006DATATEMPLATE.GDT 5/20/20



STATE OF ALASKA DOT & PF
Central Region Materials

LOG OF TEST HOLE

HOLE # TH19-11

PROJECT NUMBER : 102964-001

PROJECT : Dillingham Airport Runway Improvements

Station / Location: 21+96
Offset: 240 feet LOC
Elevation: 71 feet

Equipment_Type: Geoprobe 7720
Drilling Method: 8" hollow stem auger
Field Crew: Denali Drilling

Total Depth: 21.5 feet
Date: 3/29/2019
Geologist: FED, Shannon & Wilson Inc.

Depth (Feet)	Sample Data						USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			Weather: Cloudy, 39° F
	Sample Type	Number	Blow Count	Sample Recovery	N-Value	Depth in (ft.)				Time	Date	Symbol	
0	GRAB	S1					SM		SUBSURFACE MATERIAL				
									SILTY SAND with Gravel (SM) Brown, moist, medium dense, [FILL] S1: Moisture =10.6%			0.0	
5	SPT	S2	1			4	CL-ML		CLAYEY SILT (CL-ML) Brown, moist, medium stiff, contains zones of trace gravel S2: Moisture =22.5%			5.0	
10	SPT	S3	3			6			S3: Moisture =23.3%				
15	ST	S4							S4: See Shelby Tube Log, Figure A-7, PI =5, LL=25				
18							SM		SILTY SAND with Gravel (SM) Reddish brown, moist, very dense			18.0	
20	SPT	S5	28 15/1"						S5: Moisture =9.0%			21.5	
								BOH 21.5					

A USCS LOG OF TEST HOLE_DILLINGHAM AIRPORT DOT STYLE.GPJ_2006DATATEMPLATE.GDT_5/20/20



STATE OF ALASKA DOT & PF
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LOG OF TEST HOLE

HOLE # TH19-12

PROJECT NUMBER : 102964-001

PROJECT : Dillingham Airport Runway Improvements

Station / Location: 55+05
Offset: 410 feet ROC
Elevation: 66 feet

Equipment_Type: Geoprobe 7720
Drilling Method: 8" hollow stem auger
Field Crew: Denali Drilling

Total Depth: 31.5 feet
Date: 3/30/2019
Geologist: FED, Shannon & Wilson Inc.

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Sunny, 38° F
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)		
0	GRAB	S1				OL			18		SUBSURFACE MATERIAL
								Time	11:33		
								Date	3/30/19		
								Symbol	▼		
0											ORGANIC SILT (OL) Reddish brown, moist, soft S1: Moisture =46.4% 0.0
2											SILT (ML) no to low plasticity, Brown to grey, moist to wet, medium stiff to very stiff, contains zones of trace to few organics ---2.0
3	SPT	S2	2 3	X		ML					S2: Moisture =27.6%
4	SPT	S3	2 4 4	X							S3: Moisture =28.5%
5	SPT	S4	2 5 4	X							S4: Moisture =22.4%
8	SPT	S5	4 4 5	X							S5: Non-Plastic, Moisture =25.4%
15	SPT	S6	3 4 4	X							S6: Moisture =24.7%
20	SPT	S7	4 6 9	X							S7: Moisture =22.9%
25	SPT	S8	4 5 5	X							S8: p200 =84%, Sa =14%, Gr =2%, Moisture =24.5%
30	ST	S9									S9: See Shelby Tube Log, Figure A-8
31.5	SPT	S10	4 13 16	X							S10: Moisture =22.1% 31.5
											BOH 31.5

A USCS LOG OF TEST HOLE_DILLINGHAM AIRPORT DOT STYLE.GPJ_2006DATATEMPLATE.GDT_5/20/20



STATE OF ALASKA DOT&PF
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LOG OF TEST HOLE

HOLE # TH19-13

PROJECT NUMBER : 102964-001

PROJECT : Dillingham Airport Runway Improvements

Station / Location: 56+85
Offset: 340 feet ROC
Elevation: 65 feet

Equipment_Type: Geoprobe 7720
Drilling Method: 8" hollow stem auger
Field Crew: Denali Drilling

Total Depth: 21.5 feet
Date: 3/30/2019
Geologist: FED, Shannon & Wilson Inc.

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Sunny, 42° F
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)		
0	GRAB	S1				OL			17.5		
									15:20		
									3/30/19		
									▼		
SUBSURFACE MATERIAL											
0						OL		ORGANIC SILT (OL) Brown, moist, soft			0.0
								S1: Moisture =50.7%			
2.0						ML		SILT (ML) Brown, moist to wet, soft to medium stiff, contains zones of trace organics			2.0
	SPT	S2	1		2			S2: Moisture =25.4%			
5											
	SPT	S3	1		2			S3: Non-Plastic, Moisture =23.7%			
	SPT	S4	2 2 3		5			S4: Moisture =25.7%			
10											
	SPT	S5	2 4 3		7			S5: Moisture =22.0%			
15											
	ST	S6						S6: See Shelby Tube Log, Figure A-9			
19.0						SM		SILTY SAND with Gravel (SM) Grey, wet, very dense			19.0
	SPT	S7	7 45 39		84			S7: p200 =21%, Sa =59%, Gr =20%, Moisture =12.6%			21.5
21.5											

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LOG OF TEST HOLE

HOLE # TH19-14

PROJECT NUMBER : 102964-001

PROJECT : Dillingham Airport Runway Improvements

Station / Location: 58+59
Offset: 365 feet ROC
Elevation: 62 feet

Equipment_Type: Geoprobe 7720
Drilling Method: 8" hollow stem auger
Field Crew: Denali Drilling

Total Depth: 41.5 feet
Date: 3/30/2019
Geologist: FED, Shannon & Wilson Inc.

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Sunny, 42° F
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)		
0	GRAB	S1				OL			15		SUBSURFACE MATERIAL
									17:10		
									3/30/19		
									▼		
0.0						OL		ORGANIC SILT (OL) Brown, moist, soft, root material upper 3 inches		0.0	
								S1: Moisture =43.6%			
2.0						ML		SILT (ML) no to low plasticity, Brown, moist, soft		2.0	
	SPT	S2	2 2					S2: Moisture =29.8%			
5.0	SPT	S3	1		2			S3: Non-Plastic, Moisture =25.9%			
7.0	SPT	S4	1		2	OL		ORGANIC SILT (OL) Brown, moist, soft		7.0	
								S4: Moisture =31.5%			
9.5	SPT	S5	2 2 3		5	ML		SILT (ML) Brown to grey, moist to wet, medium stiff, little organics		9.5	
								S5: Moisture =24.0%			
15.0	ST	S6						S6: See Shelby Tube Log, Figure A-10, PI =1, LL=34			
20.0	SPT	S7	5 4 9		13	ML		SANDY SILT (ML) medium plasticity, Grey, wet, stiff to hard		20.0	
								S7: Moisture =16.7%			
25.0	SPT	S8	7 14 16		30			S8: p200 =71%, Sa =15%, Gr =15%, Moisture =20.5%			
30.0	SPT	S9	5 3		6	CL		CLAY (CL) Grey, wet, medium stiff to hard		30.0	
								S9: Moisture =22.9%, PI =10, LL=29			
35.0	SPT	S10	5 7 12		19			S10: Moisture =21.6%			
40.0	SPT	S11	14 26 15		41			S11: p200 =77.2%, Moisture =19.2%		41.5	
							BOH			41.5	

A USCS LOG OF TEST HOLE_DILLINGHAM AIRPORT DOT STYLE.GPJ_2006DATATEMPLATE.GDT_5/20/20

CME Auto Hammer
 Cathead Rope Method
 140 lb. hammer with 30 in. drop
 340 lb. hammer with 30 in. drop



STATE OF ALASKA DOT & PF
Central Region Materials

LOG OF TEST HOLE

HOLE # TH19-15

PROJECT NUMBER : 102964-001

PROJECT : Dillingham Airport Runway Improvements

Station / Location: 60+13
Offset: 415 feet ROC
Elevation: 65 feet

Equipment_Type: Geoprobe 7720
Drilling Method: 8" hollow stem auger
Field Crew: Denali Drilling

Total Depth: 36.5 feet
Date: 3/30/2019
Geologist: FED, Shannon & Wilson Inc.

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Sunny, 37° F
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)		
0	GRAB	S1				OL			30		SUBSURFACE MATERIAL
								Time	20:58		
								Date	3/30/19		
								Symbol	▼		
0						OL		ORGANIC SILT (OL) Brown, moist, soft, root material upper 4 inches		0.0	
								S1: Moisture =47.7%			
2						ML		SILT (ML) Brown Grey, moist to wet, very soft to medium stiff, few organics observed		2.0	
	SPT	S2	2	X	5			S2: p200 =97.4%, Moisture =37.1%			
5	SPT	S3	3	X	5			S3: Non-Plastic, Moisture =29.2%			
	SPT	S4	2	X	5			S4: Moisture =24.9%			
10	SPT	S5	2	X	3			S5: Moisture =22.8%			
15	SPT	S6	2 1 0	X	1			S6: Moisture =24.3%			
20	SPT	S7	1 3 4	X	7			S7: p200 =93.0%, Moisture =35.2%			
25	ST	S8						S8: See Shelby Tube Log, Figure A-10, PI =3, LL=21			
30	SPT	S9	4	X	8			S9: Moisture =22.1%			
35	SPT	S10	8 13 10	X	23	SM		SILTY SAND with Gravel (SM) Grey, wet, medium dense		35.0	
								S10: Moisture =17.2%		36.5	
							BOH			36.5	

A USCS LOG OF TEST HOLE_DILLINGHAM AIRPORT DOT STYLE.GPJ 2006DATATEMPLATE.GDT 5/20/20



STATE OF ALASKA DOT & PF
Central Region Materials

LOG OF TEST HOLE

HOLE # TH19-16

PROJECT NUMBER : 102964-001

PROJECT : Dillingham Airport Runway Improvements

Station / Location: 23+83
Offset: 140 feet LOC
Elevation: 74 feet

Equipment_Type: Geoprobe 7720
Drilling Method: 8" hollow stem auger
Field Crew: Denali Drilling

Total Depth: 26.0 feet
Date: 3/31/2019
Geologist: FED, Shannon & Wilson Inc.

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Sunny, 40° F
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0	GRAB	S1				SM		SILTY SAND with Gravel (SM) Brown, moist, medium dense to very dense, [FILL] S1: p200 =15%, Sa =54%, Gr =31%, Moisture =5.4%			0.0
5	SPT	S2	16 39 28					S2: Moisture =5.3%			
	SPT	S3	9 7 7					S3: Moisture =3.6%			
	SPT	S4	20 16 23					S4: Moisture =2.4%			
10	SPT	S5	14 19 19					S5: Moisture =7.6%			
12.0						ML		SILT (ML) Greyish brown, moist, stiff, occasional gravel observed			-12.0
15	SPT	S6	6 7 7					S6: Moisture =23.0%			
18.0						GW-GM		GRAVEL with Silt and Sand (GW-GM) well graded, Greyish brown, moist, very dense			-18.0
20	SPT	S7	15 21 48					S7: Moisture =17.9%			
25	SPT	S8	39 50/6"					S8: p200 =6%, Sa =46%, Gr =48%, Moisture =3.0%			26.0
							BOH 26				

A USCS LOG OF TEST HOLE - DILLINGHAM AIRPORT DOT STYLE.GPJ 2006DATATEMPLATE.GDT 5/20/20



STATE OF ALASKA DOT&PF
Central Region Materials

LOG OF TEST HOLE

HOLE # TH19-17

PROJECT NUMBER : 102964-001

PROJECT : Dillingham Airport Runway Improvements

Station / Location: 45+37
Offset: 405 feet LOC
Elevation: 67 feet

Equipment_Type: Geoprobe 7720
Drilling Method: 8" hollow stem auger
Field Crew: Denali Drilling

Total Depth: 31.5 feet
Date: 3/31/2019
Geologist: FED, Shannon & Wilson Inc.

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Sunny, 43° F
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0	GRAB	S1				OL			5		SUBSURFACE MATERIAL
	SPT	S2	100		0						
5	SPT	S3	112		3	ML			3/31/19		
	SPT	S4	232		5						
10	SPT	S5	245		9						
	ST	S6									
20	SPT	S7	456		11						
	SPT	S8	249		13						
30	SPT	S9	469		15						
											BOH 31.5

A USCS LOG OF TEST HOLE - DILLINGHAM AIRPORT DOT STYLE.GPJ 2006DATATEMPLATE.GDT 5/20/20



STATE OF ALASKA DOT & PF
Central Region Materials

LOG OF TEST HOLE

HOLE # TH19-18

PROJECT NUMBER : 102964-001
PROJECT : Dillingham Airport Runway Improvements

Station / Location: 61+76
Offset: 95 feet LOC
Elevation: 70 feet

Equipment_Type: Geoprobe 7720
Drilling Method: 8" hollow stem auger
Field Crew: Denali Drilling

Total Depth: 41.5 feet
Date: 3/31/2019
Geologist: FED, Shannon & Wilson Inc.

Depth (Feet)	Sample Data						USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			Weather: Sunny, 43° F
	Sample Type	Number	Blow Count	Sample Recovery	N-Value	Depth in (ft.)				Time	Date	Symbol	
0	GRAB	S1					SM	SUBSURFACE MATERIAL					
								SILTY SAND with Gravel (SM) Brown, moist, very dense, [FILL]			0.0		
								S1: Moisture =5.0%					
	SPT	S2	24 50/4"					S2: Moisture =3.2%					
5	SPT	S3	20 36 41			77		S3: Moisture =3.6%					
	SPT	S4	17 32 34			66		S4: p200 =14%, Sa =49%, Gr =37%, Moisture =4.7%					
10	SPT	S5	15 29 24			53		S5: Moisture =3.0%					
15	SPT	S6	1 2 6			8	ML	SILT (ML) Grey, moist, stiff			14.0		
								S6: Non-Plastic, Moisture =29.6%					
20	SPT	S7	4 6 8			14		S7: Moisture =25.3%					
25	ST	S8						S8: No Recovery					
30	SPT	S9	4 6 6			12	CL-ML	CLAYEY SILT (CL-ML) Grey, moist, stiff to very stiff			28.0		
35	SPT	S10	6 10 11			21		S10: Moisture =23.4%					
40	SPT	S11	7 9 11			20	SM	SILTY SAND (SM) Grey, wet, medium dense			38.0		
								S11: p200 =38%, Sa =62%, Gr =0%, Moisture =23.3%			41.5		
								BOH 41.5					

A USCS LOG OF TEST HOLE - DILLINGHAM AIRPORT DOT STYLE.GPJ 2006DATATEMPLATE.GDT 5/20/20

CME Auto Hammer
 Cathead Rope Method
 140 lb. hammer with 30 in. drop
 340 lb. hammer with 30 in. drop



STATE OF ALASKA DOT & PF
Central Region Materials

LOG OF TEST HOLE

HOLE # TH19-19

PROJECT NUMBER : 102964-001

PROJECT : Dillingham Airport Runway Improvements

Station / Location: 53+48
Offset: 250 feet LOC
Elevation: 72 feet

Equipment_Type: Geoprobe 7720
Drilling Method: 8" hollow stem auger
Field Crew: Denali Drilling

Total Depth: 36.5 feet
Date: 4/1/2019
Geologist: FED, Shannon & Wilson Inc.

Depth (Feet)	Sample Data						USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			Weather: Cloudy, 38° F
	Sample Type	Number	Blow Count	Sample Recovery	N-Value	Depth in (ft.)				Time	Date	Symbol	
0	GRAB	S1					GW-GM		SUBSURFACE MATERIAL				
									GRAVEL with Silt and Sand (GW-GM) well graded, Brown, moist, medium dense to very dense, [FILL]			0.0	
									S1: Moisture =3.4%				
	SPT	S2	15 14 14	X		28			S2: p200 =9%, Sa =41%, Gr =50%, Moisture =4.5%				
5	SPT	S3	21 50/4"	X					S3: Moisture =5.2%				
	SPT	S4	17 26 25	X		51			S4: Moisture =4.3%				
10	SPT	S5	16 21 19	X		40			S5: Moisture =4.4%				
15	SPT	S6	2 6 8	X		14	PT		Peat (PT) Brown, moist, stiff			14.0	
							ML		S6: Moisture =58.9%			16.0	
									SILT (ML) Greyish brown, wet, very stiff				
20	SPT	S7	5 6 9	X		15			S7: Non-Plastic, Moisture =21.5%				
25	ST	S8							S8: See Shelby Tube Log, Figure A-11; Non-Plastic				
30	SPT	S9	4 8 11	X		19			S9: Moisture =40.2%				
35	SPT	S10	9 9 12	X		21	ML		SANDY SILT with Gravel (ML) Greyish brown, wet, very stiff			33.0	
									S10: p200 =57%, Sa =28%, Gr =15%, Moisture =24.5%			36.5	
									BOH 36.5				

A USCS LOG OF TEST HOLE_DILLINGHAM AIRPORT DOT STYLE.GPJ 2006DATATEMPLATE.GDT 5/20/20



STATE OF ALASKA DOT&PF
Central Region Materials

LOG OF TEST HOLE

HOLE # TH19-20

PROJECT NUMBER : 102964-001

PROJECT : Dillingham Airport Runway Improvements

Station / Location: 43+24
Offset: 240 feet LOC
Elevation: 77 feet

Equipment_Type: Geoprobe 7720
Drilling Method: 8" hollow stem auger
Field Crew: Denali Drilling

Total Depth: 18.5 feet
Date: 4/1/2019
Geologist: FED, Shannon & Wilson Inc.

Depth (Feet)	Sample Data						USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			Weather: Cloudy, 40° F
	Sample Type	Number	Blow Count	Sample Recovery	N-Value	Depth in (ft.)				Time	Date	Symbol	
0	GRAB	S1					GM		SUBSURFACE MATERIAL				
0.0									SILTY GRAVEL with Sand (GM) Brown, moist, medium dense, [FILL] S1: p200 =21%, Sa =34%, Gr =45%, Moisture =8.1%			0.0	
2.0							ML		SILT (ML) Brown, moist, medium stiff to stiff, contains zones of gravel			2.0	
3.0	SPT	S2	2	4	4	6			S2: Moisture =25.0%				
5.0	SPT	S3	2	4	4	8			S3: Moisture =23.3%				
7.0	SPT	S4	2	4	4	8			S4: Non-Plastic, Moisture =25.1%				
10.0	SPT	S5	4	6	6	11			S5: Moisture =24.9%				
15.0	ST	S6					SM		S6: See Shelby Tube Log, Figure A-12			16.0	
18.5	SPT	S7	29	50	5.5"				SILTY SAND with Gravel (SM) Reddish brown, moist, very dense S7: p200 =12%, Sa =50%, Gr =38%, Moisture =5.2%			18.5	

A USCS LOG OF TEST HOLE_DILLINGHAM AIRPORT DOT STYLE.GPJ_2006DATATEMPLATE.GDT_5/20/20



STATE OF ALASKA DOT&PF
Central Region Materials

LOG OF TEST HOLE

HOLE # TH19-21

PROJECT NUMBER : 102964-001

PROJECT : Dillingham Airport Runway Improvements

Station / Location: 60+66
Offset: 800 feet LOC
Elevation: 68 feet

Equipment_Type: Geoprobe 7720
Drilling Method: 8" hollow stem auger
Field Crew: Denali Drilling

Total Depth: 16.5 feet
Date: 4/1/2019
Geologist: FED, Shannon & Wilson Inc.

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Cloudy, 40° F
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0	GRAB	S1				OL		SUBSURFACE MATERIAL			0.0
								ORGANIC SILT (OL) Dark brown, moist, very soft			
								S1: Moisture =97.9%, Org =22.1%			
	SPT	S2	1 0 0		0			S2: Moisture =52.1%			
5	SPT	S3A	2 3		7	PT		Peat (PT) Brown, moist, soft			4.5
	SPT	S3B	3 4		7	ML		SILT (ML) Brown, moist, soft to medium stiff			5.5
								S3B: Moisture =37.0%			
	SPT	S4	3 4 4		8			S4: Moisture =25.1%			
10	SPT	S5	2 1 2		3			S5: Moisture =28.5%, PI =2, LL=26			
15	SPT	S6A	6 8		21	GM		S6A: Moisture =23.9%			15.5
	SPT	S6B	13		21			SILTY GRAVEL with Sand (GM) Grey, moist, medium dense			16.5
								S6B: Moisture =8.1%			
								BOH 16.5			

A USCS LOG OF TEST HOLE_DILLINGHAM AIRPORT DOT STYLE.GPJ_2006DATATEMPLATE.GDT_5/20/20



Station / Location: 64+25
Offset: 740 feet LOC
Elevation: 71 feet

Equipment_Type: Geoprobe 7720
Drilling Method: 8" hollow stem auger
Field Crew: Denali Drilling

Total Depth: 31.5 feet
Date: 4/2/2019
Geologist: FED, Shannon & Wilson Inc.

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			Weather: Cloudy, 39° F
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0	GRAB	S1				SM			SUBSURFACE MATERIAL			
									SILTY SAND with Gravel (SM) Brown, moist, medium dense, [FILL]			0.0
									S1: trace organics, Moisture =10.4%			
									-----			2.0
	SPT	S2	3	X		ML			SILT (ML) Brown, moist, soft to medium stiff			
									S2: No Recovery, rock obstructing sampler, Moisture =6.7%			
5	SPT	S3	3	X					S3: p200 =66.6%, Moisture =29.1%			
	SPT	S4	7	X					S4: Moisture =23.9%			
10	SPT	S5	6	X					S5: Non-Plastic, Moisture =23.6%			
15	ST	S6							S6: dent in side of Shelby tube observed when pulled			
									-----			18.0
						CL			CLAY (CL) Grey, soft to stiff			
20	SPT	S7	8	X					S7: Moisture =34.5%			
25	SPT	S8	2	X					S8: Moisture =31.8%			
30	SPT	S9	14	X					S9: Moisture =33.6%, PI =17, LL=39			
									BOH			
									31.5			31.5

A USCS LOG OF TEST HOLE_DILLINGHAM AIRPORT DOT STYLE.GPJ 2006DATATEMPLATE.GDT 5/20/20



STATE OF ALASKA DOT & PF
Central Region Materials

LOG OF TEST HOLE

HOLE # TH19-24

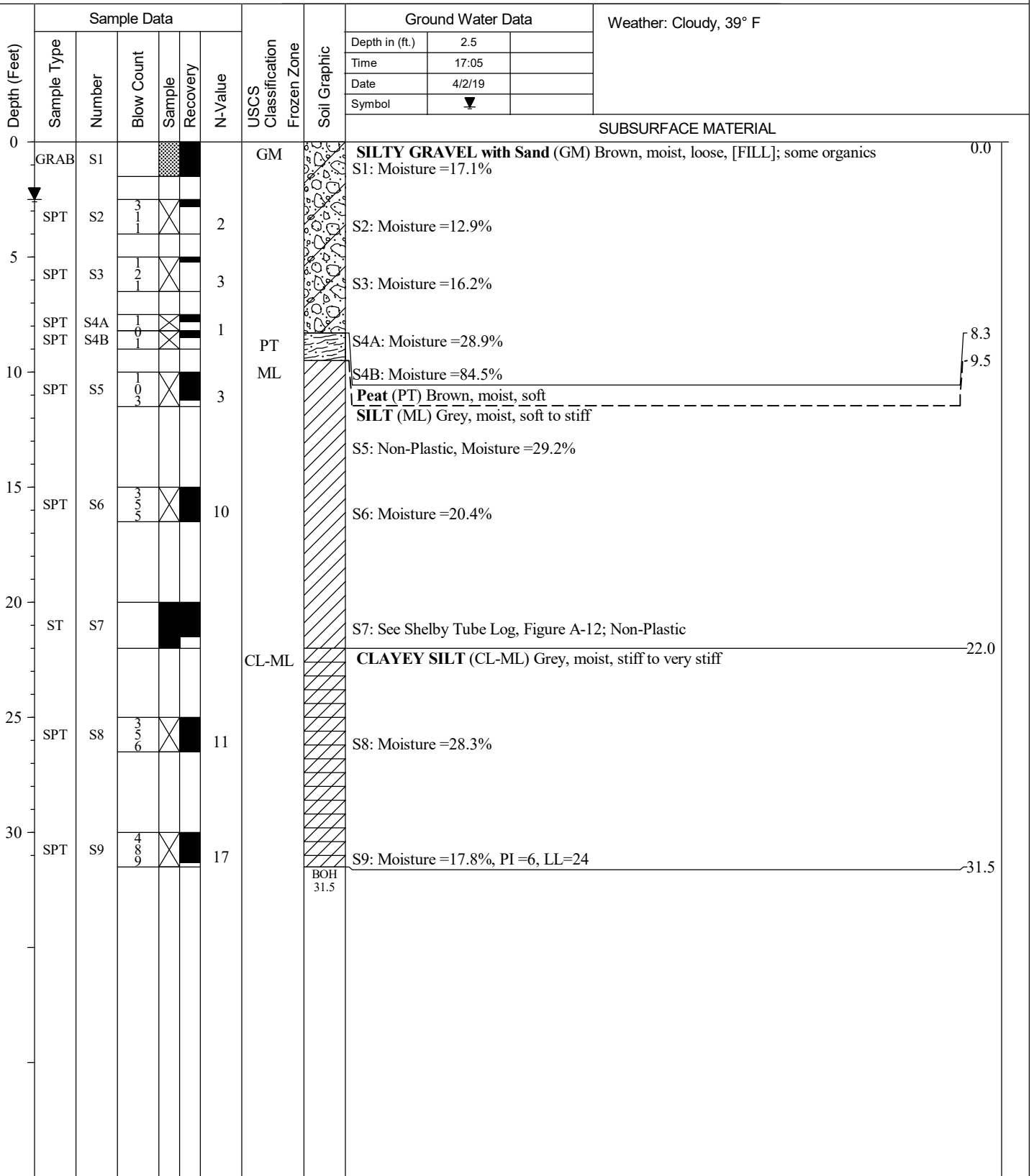
PROJECT NUMBER : 102964-001

PROJECT : Dillingham Airport Runway Improvements

Station / Location: 61+76
Offset: 380 feet LOC
Elevation: 60 feet

Equipment_Type: Geoprobe 7720
Drilling Method: 8" hollow stem auger
Field Crew: Denali Drilling

Total Depth: 31.5 feet
Date: 4/2/2019
Geologist: FED, Shannon & Wilson Inc.



A USCS LOG OF TEST HOLE_DILLINGHAM AIRPORT DOT STYLE.GPJ 2006DATATEMPLATE.GDT 5/20/20



STATE OF ALASKA DOT & PF
Central Region Materials

LOG OF TEST HOLE

HOLE # TH19-25

PROJECT NUMBER : 102964-001

PROJECT : Dillingham Airport Runway Improvements

Station / Location: 57+22
Offset: 305 feet LOC
Elevation: 62 feet

Equipment_Type: Geoprobe 7720
Drilling Method: 8" hollow stem auger
Field Crew: Denali Drilling

Total Depth: 26.5 feet
Date: 4/3/2019
Geologist: FED, Shannon & Wilson Inc.

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Sunny, clear, 40° F
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0	GRAB	S1				PT			3	08:55	SUBSURFACE MATERIAL
3.8	SPT	S2	1		2	ML			08:55		
5	SPT	S3	2 4		6				4/3/19		
7	SPT	S4	3 4		6						
10	ST	S5									
15	SPT	S6	5 6		13						
20	SPT	S7	5 6		11	ML					
22.0											
25	SPT	S8	4 6 18		24						
26.5											

A USCS LOG OF TEST HOLE_DILLINGHAM AIRPORT DOT STYLE.GPJ 2006DATATEMPLATE.GDT 5/20/20



STATE OF ALASKA DOT&PF
Central Region Materials

LOG OF TEST HOLE

HOLE # TH19-26

PROJECT NUMBER : 102964-001

PROJECT : Dillingham Airport Runway Improvements

Station / Location: 51+80
Offset: 310 feet LOC
Elevation: 62 feet

Equipment_Type: Geoprobe 7720
Drilling Method: 8" hollow stem auger
Field Crew: Denali Drilling

Total Depth: 27.5 feet
Date: 4/3/2019
Geologist: FED, Shannon & Wilson Inc.

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			Weather: Sunny, clear, 44° F
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0	GRAB	S1				OL		ORGANIC SILT (OL) Brown, moist, soft, organic soil with gravel S1: Moisture =21.5%				0.0
2.0	SPT	S2	0	X	1	PT		Peat (PT) Brown, moist, very soft to medium stiff S2: Moisture =52.5%				2.0
5	SPT	S3	1 0 0	X	0			S3: No Recovery				
10	SPT	S4	1 0	X	1			S4: Moisture =129.3%, Org =58.1%				
13.0	SPT	S5	1 2 3	X	5			S5: Moisture =109.3%				
15						ML		SILT (ML) Grey, moist, stiff to very stiff, contains zones of trace organics				13.0
15	SPT	S6	3 5 4	X	9			S6: Non-Plastic, Moisture =25.9%				
20	SPT	S7	4 6 7	X	13			S7: PP = 1.75 tsf, TVh = 0.15 tsf, Moisture =28.7%				
26.0	ST	S8						S8: See Shelby Tube Log, Figure A-14				26.0
27.5	SPT	S9	11 15 11	X	26	SW-SM		SAND with Silt and Gravel (SW-SM) well graded, Grey, moist to wet, medium dense S9: p200 =9%, Sa =59%, Gr =32%, Moisture =11.7%				27.5
								BOH 27.5				

A USCS LOG OF TEST HOLE_DILLINGHAM AIRPORT DOT STYLE.GPJ_2006DATATEMPLATE.GDT_5/20/20

CLASSIFICATION OF SHELBY TUBE SAMPLE

TEST HOLE: TH19-02 SAMPLE: S5

DEPTH: 17 TO 19 FEET BELOW GROUND SURFACE
SAMPLE QUALITY: GOOD

DEPTH (FT)	TORVANE				POCKET PEN	M%	DESCRIPTION	
	LENGTH	V	H	R				
17.0								Slough
17.0 - 17.5	0.5'	0.10	0.11	0.09	1.11	<0.1	25.3	SILT (ML) Grey, moist to wet, trace fibrous organics
17.5 - 18.0	0.5'	0.07	0.06	0.08	0.88	0 - 0.2	26.6	SILT (ML) Grey, moist to wet, trace fibrous organics
18.0 - 18.5	0.5'	0.1	0.12	0.08	1.25	0.2	25.0	PEAT (PT) Light brown, moist SILT (ML) Grey, organic odor, moist to wet
18.5 - 19.0	0.5'	0.13	0.17	0.13	1.0	1.0	21.7	SILT (ML) Grey, moist to wet, trace organics
								Bottom of Sample

NOTES

1. V, H, and R represent Vertical, Horizontal, and Remolded Torvane measurements, respectively.
2. Clay sensitivity is shown in the column labeled S and is a ratio of Tv to Tr.
3. Torvane and Pocket Pen results are reported in tons per square foot (tsf).
4. Reported Pocket Pen measurements are an average of the values representing each 6-inch section of the sample.
5. Moisture content for each interval is recorded in the column labeled M%.
6. -- Not Tested

Dillingham Airport Runway Improvements
Dillingham, Alaska

SHELBY TUBE CLASSIFICATION TEST HOLE TH19-02 S5

May 2020

102964-001



FIG. A-2

CLASSIFICATION OF SHELBY TUBE SAMPLE

TEST HOLE: TH19-03 SAMPLE: S6

DEPTH: 22.5 TO 24.5 FEET BELOW GROUND SURFACE
SAMPLE QUALITY: GOOD

DEPTH (FT)	TORVANE				POCKET PEN	M%	DESCRIPTION	
	LENGTH	V	H	R				
22.5								Slough
23.0	0.5'	0.12	0.1	0.1	1.2	0.2	21.8	SILT (ML) Grey, moist to wet, trace bubbles ($\frac{1}{16}$")
23.5	0.5'	0.1	0.09	0.12	0.83	0.2	22.9	SILT (ML) Grey, moist to wet, trace organics
24.0	0.5'	0.14	0.16	0.12	1.17	1.0	21.0	SILT (ML) Grey, moist, trace organics
24.5	0.5'	0.23	0.2	0.1	2.3	2.7	20.5	SILT with fine sand (ML) Grey, moist, trace to few organics

Bottom of Sample

NOTES

1. V, H, and R represent Vertical, Horizontal, and Remolded Torvane measurements, respectively.
2. Clay sensitivity is shown in the column labeled S and is a ratio of Tv to Tr.
3. Torvane and Pocket Pen results are reported in tons per square foot (tsf).
4. Reported Pocket Pen measurements are an average of the values representing each 6-inch section of the sample.
5. Moisture content for each interval is recorded in the column labeled M%.
6. -- Not Tested

Dillingham Airport Runway Improvements
Dillingham, Alaska

SHELBY TUBE CLASSIFICATION TEST HOLE TH19-03 S6

May 2020

102964-001



SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-3

CLASSIFICATION OF SHELBY TUBE SAMPLE

TEST HOLE: TH19-06 SAMPLE: S8

DEPTH: 35 TO 36.4 FEET BELOW GROUND SURFACE
SAMPLE QUALITY: GOOD

DEPTH (FT)	TORVANE				POCKET PEN	M%	DESCRIPTION	
	LENGTH	V	H	R				S
35.0							Slough	
	0.3'	0.38	0.28	--	--	2.5	17.6	SILT (ML) Orange-brown to grey, moist to wet, trace organics, trace to few gravel
35.5	0.2'							SILT (ML) Grey, moist
								gravel lens
36.0	0.5'	--	--	--	--	--	8.1	Silty GRAVEL (GM) to gravelly SILT (ML) Grey, moist
36.5	0.4'	--	--	--	--	--	11.0	Gravelly SILT (ML) Grey, moist
36.5								Bottom of Sample

NOTES

1. V, H, and R represent Vertical, Horizontal, and Remolded Torvane measurements, respectively.
2. Clay sensitivity is shown in the column labeled S and is a ratio of Tv to Tr.
3. Torvane and Pocket Pen results are reported in tons per square foot (tsf).
4. Reported Pocket Pen measurements are an average of the values representing each 6-inch section of the sample.
5. Moisture content for each interval is recorded in the column labeled M%.
6. -- Not Tested

Dillingham Airport Runway Improvements
Dillingham, Alaska

SHELBY TUBE CLASSIFICATION TEST HOLE TH19-06 S8

May 2020

102964-001

CLASSIFICATION OF SHELBY TUBE SAMPLE

TEST HOLE: TH19-07 SAMPLE: S6

DEPTH: 23.0 TO 24.0 FEET BELOW GROUND SURFACE
SAMPLE QUALITY: GOOD

DEPTH (FT)	TORVANE					POCKET PEN	M%					DESCRIPTION
	LENGTH	V	H	R	S							
23.0	0.1'	0.5	0.55	0.25	2	3.25	24.4					SILT (ML) Brown to grey, moist, fine organics
	0.2'											SILT (ML) Brown to grey, moist, interbedded with silt with fine sand
23.5	0.4'	--	--	--	--	--						RESERVED for consolidation test (See Appendix B for consolidation results)
24.0	0.3'	--	--	--	--	--						SILT (ML) Brown to grey, moist, interbedded with silt with fine sand

Bottom of Sample

TEST HOLE: TH19-08 SAMPLE: S6

DEPTH: 26.0 TO 27.0 FEET BELOW GROUND SURFACE
SAMPLE QUALITY: GOOD

DEPTH (FT)	TORVANE					POCKET PEN	M%					DESCRIPTION
	LENGTH	V	H	R	S							
26.0	0.3'	--	--	--	--	3.5						SILT (ML) Grey, moist
26.5	0.3'	--	--	--	--	--	20.9					RESERVED for consolidation test (See Appendix B for consolidation results)
	0.1'	SILT (ML) Grey, moist, lenses of silt with fine sand										
27.0	0.3'	0.375	0.05	0.125	3	--						SILT (ML) Grey, moist

Bottom of Sample

NOTES

1. V, H, and R represent Vertical, Horizontal, and Remolded Torvane measurements, respectively.
2. Clay sensitivity is shown in the column labeled S and is a ratio of Tv to Tr.
3. Torvane and Pocket Pen results are reported in tons per square foot (tsf).
4. Reported Pocket Pen measurements are an average of the values representing each 6-inch section of the sample.
5. Moisture content for each interval is recorded in the column labeled M%.
6. -- Not Tested

Dillingham Airport Runway Improvements
Dillingham, Alaska

SHELBY TUBE CLASSIFICATION TEST HOLES TH19-07 S6; TH19-08 S6

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FIG. A-5

CLASSIFICATION OF SHELBY TUBE SAMPLE


TEST HOLE: TH19-09 SAMPLE: S5

DEPTH: 20 TO 22 FEET BELOW GROUND SURFACE
SAMPLE QUALITY: GOOD

DEPTH (FT)	TORVANE				POCKET PEN	M%	DESCRIPTION	
	LENGTH	V	H	R				
20.0								Slough
20.5	0.5'	0	0	0.05	0	20.9		SILT (ML) Grey, wet, trace organics, trace sand
21.0	0.5'	1.5	2.8	2.0	0.75	0.9		SILT (ML) Orange-brown to brown, moist to wet, trace gravel thin organic layer
21.5	0.5'	0.21	0.13	0.18	4	1.17		SILT (ML) Brown, moist, mottled with high organic lenses
22.0	0.1'	0.0	0.2	0.15	0	1.3		SILT (ML) Grey, moist
22.0	0.1'						Bottom of Sample	

NOTES

1. V, H, and R represent Vertical, Horizontal, and Remolded Torvane measurements, respectively.
2. Clay sensitivity is shown in the column labeled S and is a ratio of Tv to Tr.
3. Torvane and Pocket Pen results are reported in tons per square foot (tsf).
4. Reported Pocket Pen measurements are an average of the values representing each 6-inch section of the sample.
5. Moisture content for each interval is recorded in the column labeled M%.
6. -- Not Tested

Dillingham Airport Runway Improvements Dillingham, Alaska	
SHELBY TUBE CLASSIFICATION TEST HOLE TH19-09 S5	
May 2020	102964-001
 SHANNON & WILSON, INC. <small>Geotechnical and Environmental Consultants</small>	FIG. A-6

CLASSIFICATION OF SHELBY TUBE SAMPLE

TEST HOLE: TH19-II SAMPLE: S4

DEPTH: 16.0 TO 17.0 FEET BELOW GROUND SURFACE
SAMPLE QUALITY: GOOD

DEPTH (FT)	TORVANE					POCKET PEN	M%	DESCRIPTION
	LENGTH	V	H	R	S			
16.0	0.4'	0.45	0.5	0.125	3.6	2.75	21.6	CLAYEY-SILT (CL-ML) Brown, moist, trace coarse grained sand
16.5	0.3'	--	--	--	--	--		RESERVED for consolidation test (See Appendix B for consolidation results)
17.0	0.3'	--	--	--	--	--		CLAYEY-SILT (CL-ML) Brown, trace fine gravel

Bottom of Sample

NOTES

1. V, H, and R represent Vertical, Horizontal, and Remolded Torvane measurements, respectively.
2. Clay sensitivity is shown in the column labeled S and is a ratio of Tv to Tr.
3. Torvane and Pocket Pen results are reported in tons per square foot (tsf).
4. Reported Pocket Pen measurements are an average of the values representing each 6-inch section of the sample.
5. Moisture content for each interval is recorded in the column labeled M%.
6. -- Not Tested

Dillingham Airport Runway Improvements
Dillingham, Alaska

SHELBY TUBE CLASSIFICATION TEST HOLE TH19-11 S4

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FIG. A-7

CLASSIFICATION OF SHELBY TUBE SAMPLE

TEST HOLE: TH19-12 SAMPLE: S9

DEPTH: 28 TO 29.5 FEET BELOW GROUND SURFACE
SAMPLE QUALITY: GOOD

DEPTH (FT)	TORVANE				POCKET PEN	M%	DESCRIPTION	
	LENGTH	V	H	R				
28.0								Slough
	0.45'	0.19	0.16	0.15	1.27	0.9	19.6	SILT (ML) Mottled orange-brown to gray-brown to gray, moist, trace to few organics
28.5	0.05'							
	0.1'							SAND (SM) Grey, wet
	0.1'							SILT (ML) Grey, moist, trace organics
	0.2'	--	--	--	--	--	21.4	SAND (SM) Grey, wet
29.0	0.1'							SILT (ML) Grey, moist, trace coarse sand
29.5	0.5	0.47	0.44	--	--	4.0	19.8	SILT (ML) and CLAY (CL), Grey, moist

Bottom of Sample

NOTES

1. V, H, and R represent Vertical, Horizontal, and Remolded Torvane measurements, respectively.
2. Clay sensitivity is shown in the column labeled S and is a ratio of Tv to Tr.
3. Torvane and Pocket Pen results are reported in tons per square foot (tsf).
4. Reported Pocket Pen measurements are an average of the values representing each 6-inch section of the sample.
5. Moisture content for each interval is recorded in the column labeled M%.
6. -- Not Tested

Dillingham Airport Runway Improvements
Dillingham, Alaska

SHELBY TUBE CLASSIFICATION TEST HOLE TH19-12 S9

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FIG. A-8

CLASSIFICATION OF SHELBY TUBE SAMPLE

TEST HOLE: TH19-13 SAMPLE: S6

DEPTH: 15 TO 17 FEET BELOW GROUND SURFACE
SAMPLE QUALITY: GOOD

DEPTH (FT)	TORVANE				POCKET PEN	M%	DESCRIPTION	
	LENGTH	V	H	R			S	
15.0							Slough	
15.5	0.5'	0.18	0.16	0.20	0.9	1.5	19.8	SILT (ML) Grey, moist to wet, mottled with several to many organics, roots in upper 3 inches
16.0	0.5'	0.32	0.33	0.14	2.29	0.5 - 2.5	25.6	SILT (ML) Grey, moist to wet, trace coal, trace gravel, trace organics
16.5	0.5'	0.3	0.26	0.16	1.88	1.25	24.7	SILT (ML) Grey, moist, trace gravel, trace organics
17.0	0.5'	0.2	0.21	0.22	0.91	0.6	22.7	SILT (ML) Grey, moist, few to some gravel, trace organics, organic odor

Bottom of
Sample

NOTES

1. V, H, and R represent Vertical, Horizontal, and Remolded Torvane measurements, respectively.
2. Clay sensitivity is shown in the column labeled S and is a ratio of Tv to Tr.
3. Torvane and Pocket Pen results are reported in tons per square foot (tsf).
4. Reported Pocket Pen measurements are an average of the values representing each 6-inch section of the sample.
5. Moisture content for each interval is recorded in the column labeled M%.
6. -- Not Tested

Dillingham Airport Runway Improvements
Dillingham, Alaska

SHELBY TUBE CLASSIFICATION TEST HOLE TH19-13 S6

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FIG. A-9

CLASSIFICATION OF SHELBY TUBE SAMPLE

TEST HOLE: TH19-14 SAMPLE: S6

DEPTH: 16.0 TO 17.0 FEET BELOW GROUND SURFACE
SAMPLE QUALITY: GOOD

DEPTH (FT)	TORVANE					POCKET PEN	M%	DESCRIPTION
	LENGTH	V	H	R	S			
16.0	0.4'	0.25	0.2	0.1	2.5	1.25	33.5	SILT (ML) Grey, moist to wet, trace fine sand, trace organics
16.5	0.3'	--	--	--	--	--		RESERVED for consolidation test (See Appendix B for consolidation results)
17.0	0.3'	--	--	--	--	--		SILT (ML) Grey, moist to wet, trace fine sand, trace organics

Bottom of Sample

TEST HOLE: TH19-15 SAMPLE: S8

DEPTH: 26.0 TO 27.0 FEET BELOW GROUND SURFACE
SAMPLE QUALITY: FAIR

DEPTH (FT)	TORVANE					POCKET PEN	M%	DESCRIPTION
	LENGTH	V	H	R	S			
26.0	0.1'	--	--	--	--	--	21.2	SILT w/ sand (ML) Grey, moist to wet
	0.3'	--	--	--	--	--		RESERVED for consolidation test (See Appendix B for consolidation results)
26.5	0.25'	--	--	--	--	--		SILT (ML) Grey, moist to wet, trace fine organics
	0.3'	0.15	0.15	0.05	3	1.5		RESERVED for potential consolidation test
27.0	0.05'	--	--	--	--	--		SILT with sand (ML) Grey, moist to wet

Bottom of Sample

NOTES

1. V, H, and R represent Vertical, Horizontal, and Remolded Torvane measurements, respectively.
2. Clay sensitivity is shown in the column labeled S and is a ratio of Tv to Tr.
3. Torvane and Pocket Pen results are reported in tons per square foot (tsf).
4. Reported Pocket Pen measurements are an average of the values representing each 6-inch section of the sample.
5. Moisture content for each interval is recorded in the column labeled M%.
6. -- Not Tested

Dillingham Airport Runway Improvements
Dillingham, Alaska

SHELBY TUBE CLASSIFICATION
TEST HOLE TH19-14 S6;
TEST HOLE TH19-15 S8

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FIG. A-10

CLASSIFICATION OF SHELBY TUBE SAMPLE

TEST HOLE: TH19-17 SAMPLE: S6

DEPTH: 16.0 TO 17.0 FEET BELOW GROUND SURFACE
SAMPLE QUALITY: GOOD

DEPTH (FT)	TORVANE					POCKET PEN	M%					DESCRIPTION
	LENGTH	V	H	R	S							
16.0	0.3'	0.125	0.15	0.05	2.5	1.25	27.6					SILT (ML) Brown to grey, moist
16.5	0.4'	--	--	--	--	--						RESERVED for consolidation test (See Appendix B for consolidation results)
17.0	0.3'	--	--	--	--	--						SILT (ML) Brown to grey, moist

Bottom of Sample

TEST HOLE: TH19-19 SAMPLE: S8

DEPTH: 25.6 TO 26.6 FEET BELOW GROUND SURFACE
SAMPLE QUALITY: GOOD

DEPTH (FT)	TORVANE					POCKET PEN	M%					DESCRIPTION
	LENGTH	V	H	R	S							
25.6	0.4'	0.12	0.1	0.05	2.4	0.5	26.0					SILT with fine sand (ML), Grey, moist
26.1	0.25'	--	--	--	--	--						RESERVED for consolidation test (See Appendix B for consolidation results)
26.6	0.35'	--	--	--	--	--						SILT with fine sand (ML) Grey, moist

Bottom of Sample

NOTES

1. V, H, and R represent Vertical, Horizontal, and Remolded Torvane measurements, respectively.
2. Clay sensitivity is shown in the column labeled S and is a ratio of Tv to Tr.
3. Torvane and Pocket Pen results are reported in tons per square foot (tsf).
4. Reported Pocket Pen measurements are an average of the values representing each 6-inch section of the sample.
5. Moisture content for each interval is recorded in the column labeled M%.
6. -- Not Tested

Dillingham Airport Runway Improvements
Dillingham, Alaska

SHELBY TUBE CLASSIFICATION TEST HOLE TH19-17 S6; TEST HOLE TH19-19 S8

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

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FIG. A-11

CLASSIFICATION OF SHELBY TUBE SAMPLE

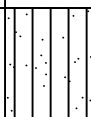
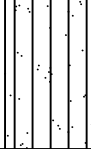
TEST HOLE: TH19-20 SAMPLE: S6

DEPTH: 15.0 TO 16.0 FEET BELOW GROUND SURFACE
SAMPLE QUALITY: GOOD

DEPTH (FT)	TORVANE				POCKET PEN	M%	DESCRIPTION	
	LENGTH	V	H	R				S
15.0	0.5'	0.20	0.26	0.12	1.67	1.0	18.9	 SILT with gravel (ML) Orange-brown to dark brown, moist
15.5	0.2'	0.25	0.26	--	--	1.1	21.1	 SILT (ML) Orange-brown to gray-brown, moist
	0.1'							 SILT with gravel (ML) Gray-brown, moist
	0.2'							 GRAVEL with silt (GP-GM), Grey, moist
16.0	Bottom of Sample							

TEST HOLE: TH19-24 SAMPLE: S7

DEPTH: 19.0 TO 20.0 FEET BELOW GROUND SURFACE
SAMPLE QUALITY: GOOD

DEPTH (FT)	TORVANE				POCKET PEN	M%	DESCRIPTION	
	LENGTH	V	H	R				S
19.0	0.3'	--	0.1	--	--	--	24.8	 SILT with fine sand (ML), Grey, moist
19.5	0.3'	--	--	--	--	--	24.8	RESERVED for consolidation test
20.0	0.4'	0.12	--	0.1	2.5	1.25		 SILT with fine sand (ML) Grey, moist
20.0	Bottom of Sample							

NOTES

1. V, H, and R represent Vertical, Horizontal, and Remolded Torvane measurements, respectively.
2. Clay sensitivity is shown in the column labeled S and is a ratio of Tv to Tr.
3. Torvane and Pocket Pen results are reported in tons per square foot (tsf).
4. Reported Pocket Pen measurements are an average of the values representing each 6-inch section of the sample.
5. Moisture content for each interval is recorded in the column labeled M%.
6. -- Not Tested

Dillingham Airport Runway Improvements
Dillingham, Alaska

SHELBY TUBE CLASSIFICATION TEST HOLE TH19-20 S6; TEST HOLE TH19-24 S7

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CLASSIFICATION OF SHELBY TUBE SAMPLE

TEST HOLE: TH19-25 SAMPLE: S5

DEPTH: 10 TO 12 FEET BELOW GROUND SURFACE
SAMPLE QUALITY: FAIR

DEPTH (FT)	TORVANE				POCKET PEN	M%	DESCRIPTION	
	LENGTH	V	H	R				S
10.0							Slough	
10.5	0.3'	0.22	0.22	0.09	2.44	1.2	19.2	SILT to SILT with sand (ML) Grey, moist to wet
11.0	0.5'	0.18	0.12	0.08	2.25	1.2	19.5	SILT (ML) Grey, moist to wet
11.5	0.5'	0.2	0.1	0.05	4	1.7	19.5	SILT with sand (ML) Grey, moist
12.0	0.5'	--	--	--	--	--	19.1	SILT with sand (ML) Grey, moist

Bottom of Sample

NOTES

1. V, H, and R represent Vertical, Horizontal, and Remolded Torvane measurements, respectively.
2. Clay sensitivity is shown in the column labeled S and is a ratio of Tv to Tr.
3. Torvane and Pocket Pen results are reported in tons per square foot (tsf).
4. Reported Pocket Pen measurements are an average of the values representing each 6-inch section of the sample.
5. Moisture content for each interval is recorded in the column labeled M%.
6. -- Not Tested

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Dillingham, Alaska

SHELBY TUBE CLASSIFICATION TEST HOLE TH19-25 S5

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FIG. A-13

CLASSIFICATION OF SHELBY TUBE SAMPLE

TEST HOLE: TH19-26 SAMPLE: S8

DEPTH: 25.0 TO 26.0 FEET BELOW GROUND SURFACE
SAMPLE QUALITY: GOOD

DEPTH (FT)	TORVANE				POCKET PEN	M%		DESCRIPTION
	LENGTH	V	H	R				
25.0	0.5'	0.28	0.27	0.14	2	2.5	21.2	SILT (ML) Brown, moist, with trace fibrous organics, organic odor <i>Sandy SILT (ML) Light brown, moist</i>
25.5	0.4'	0.36	0.26	0.2	1.8	1.7	27.2	SILT with gravel (ML) Dark brown, moist, organic odor
26.0								Bottom of Sample

NOTES

1. V, H, and R represent Vertical, Horizontal, and Remolded Torvane measurements, respectively.
2. Clay sensitivity is shown in the column labeled S and is a ratio of Tv to Tr.
3. Torvane and Pocket Pen results are reported in tons per square foot (tsf).
4. Reported Pocket Pen measurements are an average of the values representing each 6-inch section of the sample.
5. Moisture content for each interval is recorded in the column labeled M%.
6. -- Not Tested

Dillingham Airport Runway Improvements
Dillingham, Alaska

SHELBY TUBE CLASSIFICATION TEST HOLE TH19-26 S8

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FIG. A-14

APPENDIX B

ONE-DIMENSIONAL CONSOLIDATION TEST RESULTS

Dillingham Airport Runway Shift
 Dillingham, Alaska

TEST SUMMARY
 Boring B-07, Sample S-6, 23.2 ft

SPECIMEN DATA AND TEST RESULTS

Sample Classification:
 Silt (ML)

			Pre- Inundation	Final Load
Specific Gravity, G_s (Assumed)	2.7	Height, in	0.788	0.724
Liquid Limit, LL	35	Diameter, in	2.498	2.498
Plastic Limit, PL	25	Specimen Volume, in ³	3.861	3.549
Plasticity Index, PI (LL - PL)	10	Wet Unit Weight, pcf	118.4	125.5
Fines Content	---	Dry Unit Weight, pcf	95.2	103.6
Organic Content	---	Water Content	24%	21%
Initial Seating Load, g	50	Void Ratio	0.77	0.63
Final Seating Load, g	50	Degree of Saturation	85%	91%
ASTM Test Method	Method B			
Coefficient of Consolidation Interpretation	Procedure 1			

Load Increment Number	Applied Stress, tsf	t_{load} , min	t_{50} , min	ΔH_{load} , in	ΔH at t_{100} , in	$\Delta H/H_0$	Void Ratio	a_v , Mpa ⁻¹	c_v , cm ² /s	k , cm/s
Seating										
1	0.03	124	0.3	0.000	0.000	0%	0.770	1.43E-01	1.08E-02	8.53E-08
2	0.06	975	0.7	0.001	0.001	0.1%	0.769	2.86E-01	5.03E-03	7.96E-08
3	0.13	930	0.1	0.003	0.001	0.2%	0.768	2.57E-01	4.68E-02	6.68E-07
4	0.23	1410	0.6	0.005	0.003	0.4%	0.764	4.10E-01	5.28E-03	1.20E-07
5	0.45	315	0.1	0.009	0.005	0.6%	0.761	1.59E-01	2.58E-02	2.29E-07
6	0.94	1110	0.2	0.015	0.009	1.1%	0.751	2.02E-01	1.40E-02	1.58E-07
7	1.87	124	0.1	0.021	0.013	1.7%	0.741	1.15E-01	2.15E-02	1.39E-07
8	3.72	405	0.2	0.033	0.021	2.6%	0.724	9.48E-02	2.09E-02	1.12E-07
9	7.43	570	0.2	0.049	0.034	4.4%	0.694	8.58E-02	1.43E-02	6.97E-08
10	14.87	690	0.2	0.070	0.051	6.5%	0.655	5.37E-02	1.58E-02	4.91E-08
11	29.73	495	0.2	0.095	0.071	9.1%	0.610	3.18E-02	1.65E-02	3.12E-08
12	7.43	930	0.2	0.087	0.073	9.3%	0.606	-1.99E-03	1.32E-02	1.59E-09
13	1.87	2805	0.2	0.079	0.070	8.9%	0.614	1.50E-02	1.13E-02	1.04E-08
14	0.45	1425	2.0	0.071	0.065	8.2%	0.626	8.64E-02	1.40E-03	7.34E-09
15	0.13	10096	82.3	0.064	0.058	7.4%	0.640	4.69E-01	3.39E-05	9.61E-10

Specimen trimmed using a trimming turntable and inundated with distilled water.
 Tested by AKV in accordance with ASTM D2435-11. Test initiated on 05/06/2019. Finalized by .

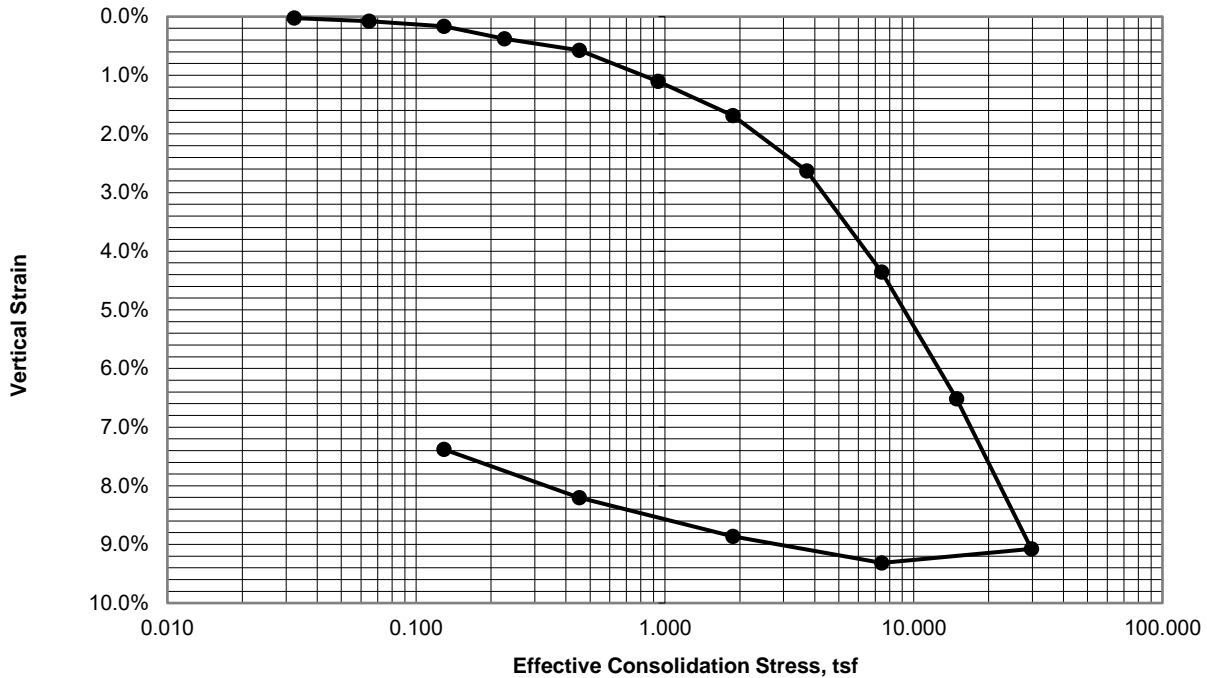
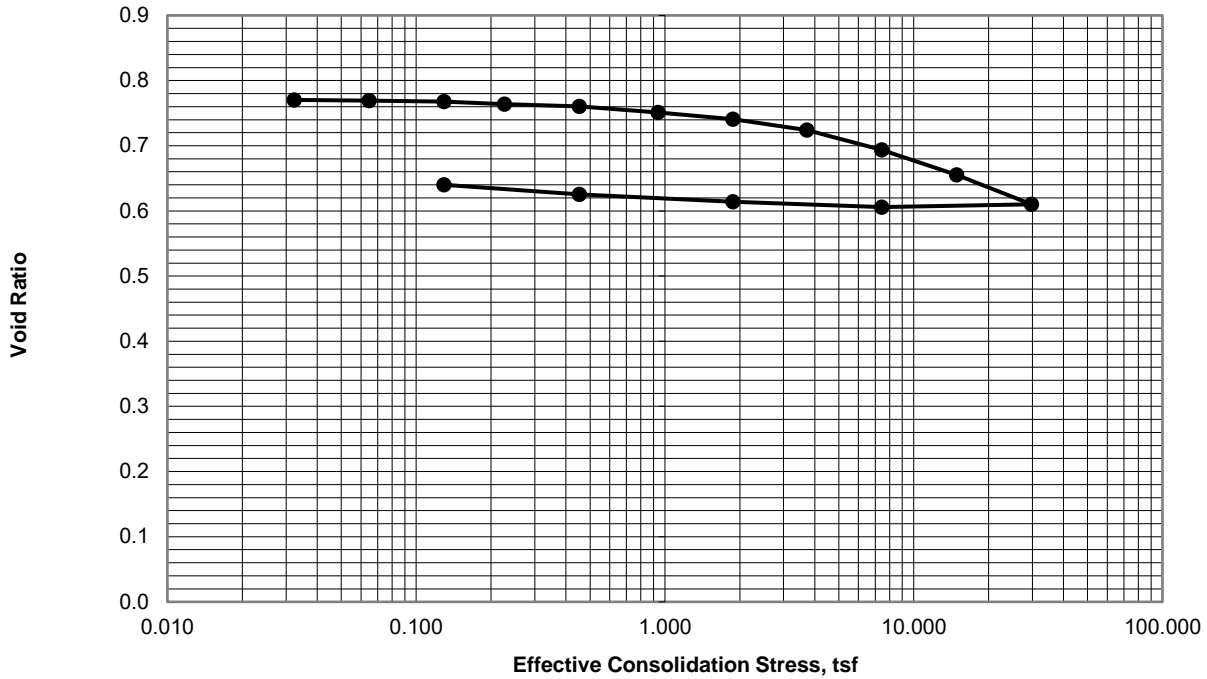
06/06/19

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Dillingham Airport Runway Shift
 Dillingham, Alaska

CONSOLIDATION CURVES
 Boring B-07, Sample S-6, 23.2 ft



Maximum Applied Effective Consolidation Stress, tsf = 29.73

Specimen trimmed using a trimming turntable and indundated with distilled water.
 Tested by AKV in accordance with ASTM D2435-11. Test initiated on 05/06/2019. Finalized by .

CONSOL_v3.0_NOTB_B-07_s-6_23.2.xlsm 06/06/19

102964-001

Dillingham Airport Runway Shift
 Dillingham, Alaska

TEST SUMMARY
 Boring B-08, Sample S-6, 26.3 ft

SPECIMEN DATA AND TEST RESULTS

Sample Classification:
 Silt (ML)

			Pre- Inundation	Final Load
Specific Gravity, G_s (Assumed)	2.7	Height, in	0.785	0.726
Liquid Limit, LL	21	Diameter, in	2.496	2.496
Plastic Limit, PL	19	Specimen Volume, in ³	3.839	3.552
Plasticity Index, PI (LL - PL)	2	Wet Unit Weight, pcf	129.5	134.8
Fines Content	---	Dry Unit Weight, pcf	107.2	115.8
Organic Content	---	Water Content	21%	16%
Initial Seating Load, g	50	Void Ratio	0.57	0.46
Final Seating Load, g	50	Degree of Saturation	98%	97%
ASTM Test Method	Method B			
Coefficient of Consolidation Interpretation	Procedure 1			

Load Increment Number	Applied Stress, tsf	t_{load} , min	t_{50} , min	ΔH_{load} , in	ΔH at t_{100} , in	$\Delta H/H_0$	Void Ratio	a_v , Mpa ⁻¹	c_v , cm ² /s	k , cm/s
Seating										
1	0.03	124	0.1	0.000	0.000	0%	0.573	7.64E-02	2.94E-02	1.40E-07
2	0.06	975	15.3	0.000	0.000	0%	0.573	-5.09E-02	2.13E-04	6.75E-10
3	0.13	930	0.1	0.002	0.001	0.1%	0.571	3.18E-01	4.46E-02	8.84E-07
4	0.23	1410	0.4	0.004	0.002	0.3%	0.568	2.80E-01	8.82E-03	1.54E-07
5	0.45	1440	0.1	0.007	0.004	0.5%	0.565	1.78E-01	2.36E-02	2.63E-07
6	0.94	540	3.1	0.012	0.009	1.1%	0.556	1.88E-01	1.02E-03	1.20E-08
7	1.88	1275	0.1	0.019	0.012	1.5%	0.549	7.72E-02	2.23E-02	1.09E-07
8	3.72	7126	0.1	0.027	0.017	2.2%	0.539	5.72E-02	2.20E-02	7.97E-08
9	7.45	2925	19.1	0.039	0.030	3.9%	0.512	7.39E-02	1.59E-04	7.50E-10
10	14.89	5730	18.2	0.059	0.047	6%	0.479	4.70E-02	1.61E-04	4.90E-10
11	29.79	1680	5.6	0.080	0.066	8.4%	0.441	2.68E-02	5.02E-04	8.93E-10
12	7.45	138	0.1	0.075	0.064	8.2%	0.444	1.81E-03	2.08E-02	2.56E-09
13	1.88	1440	0.4	0.069	0.060	7.7%	0.452	1.46E-02	6.44E-03	6.40E-09
14	0.45	810	0.8	0.064	0.057	7.3%	0.459	4.63E-02	3.71E-03	1.16E-08
15	0.13	1815	7.2	0.059	0.054	6.9%	0.465	2.11E-01	3.92E-04	5.58E-09

Specimen trimmed using a trimming turntable and inundated with distilled water.
 Tested by AKV in accordance with ASTM D2435-11. Test initiated on 05/06/2019. Finalized by .

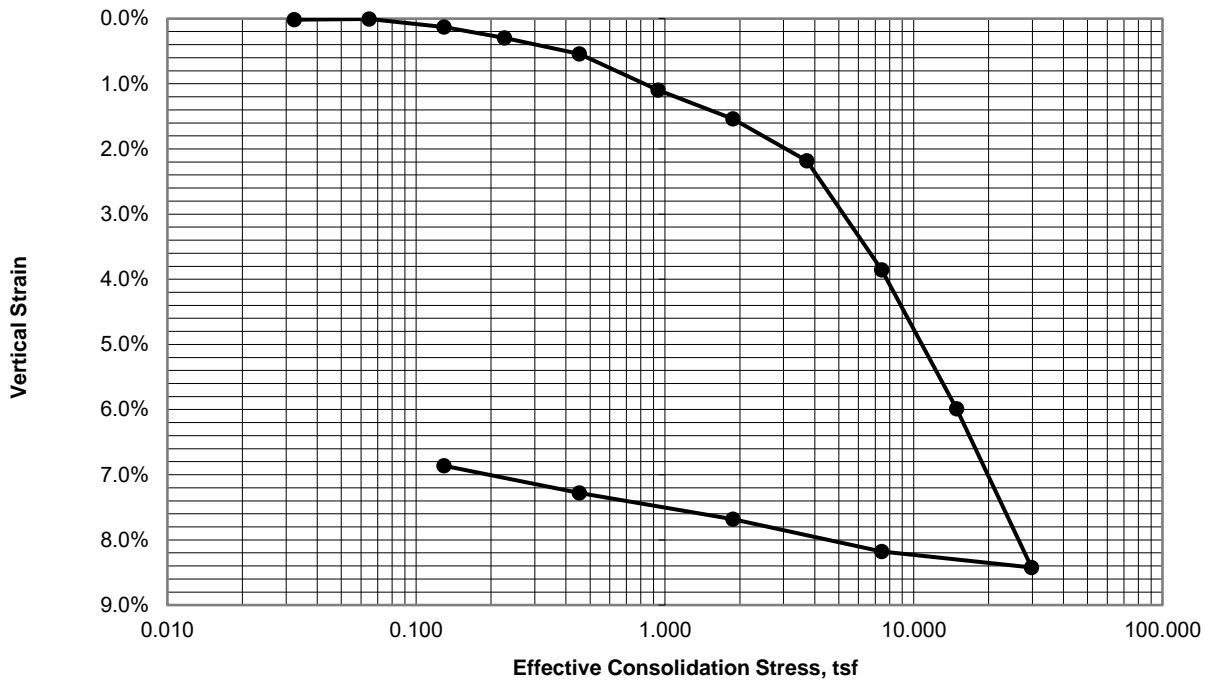
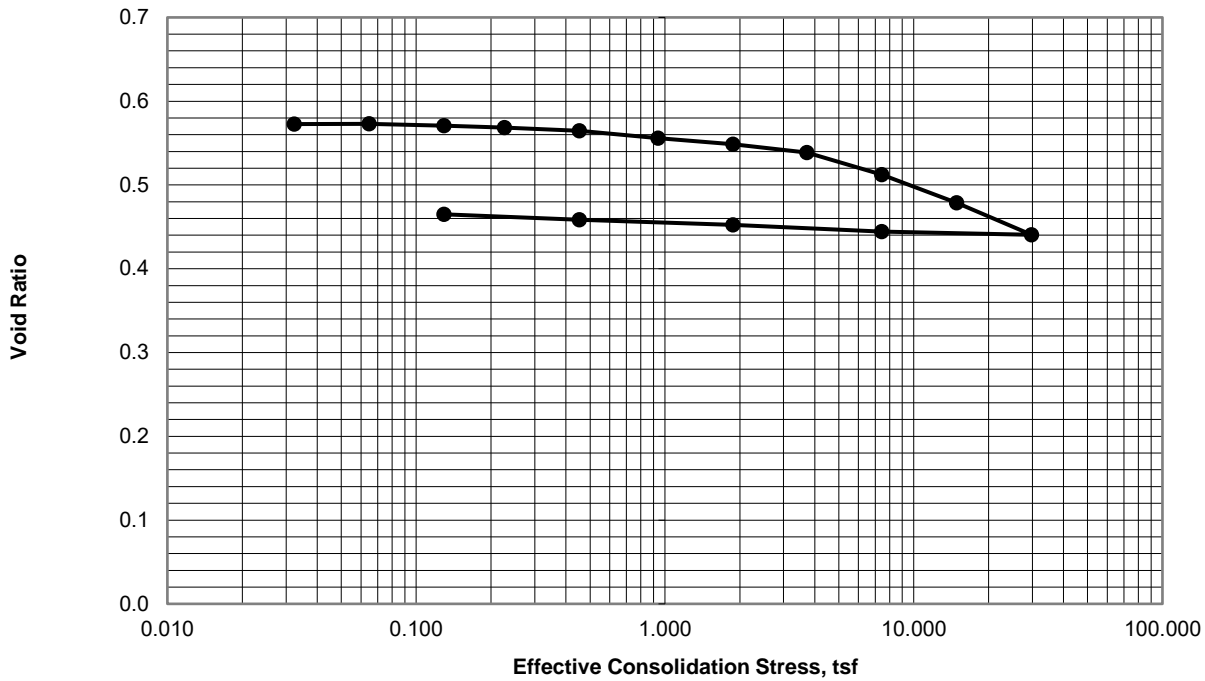
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102964-001

Dillingham Airport Runway Shift
 Dillingham, Alaska

CONSOLIDATION CURVES
 Boring B-08, Sample S-6, 26.3 ft



Maximum Applied Effective Consolidation Stress, tsf = 29.79

Specimen trimmed using a trimming turntable and indundated with distilled water.
 Tested by AKV in accordance with ASTM D2435-11. Test initiated on 05/06/2019. Finalized by .

102964-001
 CONSOL_v3.0_NOTB_B-08_s-6_26.3.xlsm 06/06/19

Dillingham Airport Runway Shift
 Dillingham, Alaska

TEST SUMMARY
 Boring B-11, Sample S-4, 16.4 ft

SPECIMEN DATA AND TEST RESULTS

Sample Classification:
 Silty Clay (CL-ML)

			Pre- Inundation	Final Load
Specific Gravity, G_s (Assumed)	2.7	Height, in	0.777	0.696
Liquid Limit, LL	25	Diameter, in	2.500	2.500
Plastic Limit, PL	20	Specimen Volume, in ³	3.812	3.417
Plasticity Index, PI (LL - PL)	5	Wet Unit Weight, pcf	125.6	136.0
Fines Content	---	Dry Unit Weight, pcf	103.3	115.3
Organic Content	---	Water Content	22%	18%
Initial Seating Load, g	50	Void Ratio	0.63	0.46
Final Seating Load, g	50	Degree of Saturation	92%	100%
ASTM Test Method	Method B			
Coefficient of Consolidation Interpretation	Procedure 1			

Load Increment Number	Applied Stress, tsf	t_{load} , min	t_{50} , min	ΔH_{load} , in	ΔH at t_{100} , in	$\Delta H/H_0$	Void Ratio	a_v , Mpa ⁻¹	c_v , cm ² /s	k , cm/s
Seating										
1	0.06	122	0.0	0.000	0.000	0%	0.631	6.69E-02	7.26E-02	2.92E-07
2	0.13	975	0.5	0.002	0.001	0.2%	0.629	3.34E-01	5.85E-03	1.18E-07
3	0.23	930	0.6	0.004	0.003	0.4%	0.626	3.66E-01	5.04E-03	1.11E-07
4	0.45	1410	0.1	0.010	0.007	0.9%	0.618	3.71E-01	4.49E-02	1.01E-06
5	0.94	315	0.1	0.018	0.012	1.6%	0.606	2.57E-01	4.77E-02	7.44E-07
6	1.87	1125	0.1	0.030	0.021	2.7%	0.587	2.06E-01	3.75E-02	4.72E-07
7	3.71	1410	0.1	0.045	0.033	4.2%	0.563	1.37E-01	3.94E-02	3.32E-07
8	7.42	570	0.1	0.063	0.048	6.2%	0.531	9.03E-02	4.57E-02	2.59E-07
9	14.85	690	0.1	0.084	0.066	8.5%	0.494	5.29E-02	3.87E-02	1.31E-07
10	29.69	1425	0.1	0.108	0.085	10.9%	0.454	2.81E-02	4.29E-02	7.91E-08
11	7.42	2805	0.2	0.101	0.088	11.3%	0.446	-3.37E-03	1.34E-02	3.05E-09
12	1.87	555	0.1	0.094	0.085	10.9%	0.453	1.31E-02	3.16E-02	2.80E-08
13	0.45	870	0.2	0.087	0.080	10.3%	0.464	7.54E-02	1.25E-02	6.37E-08
14	0.13	6135	4.2	0.081	0.075	9.6%	0.475	3.64E-01	6.17E-04	1.50E-08

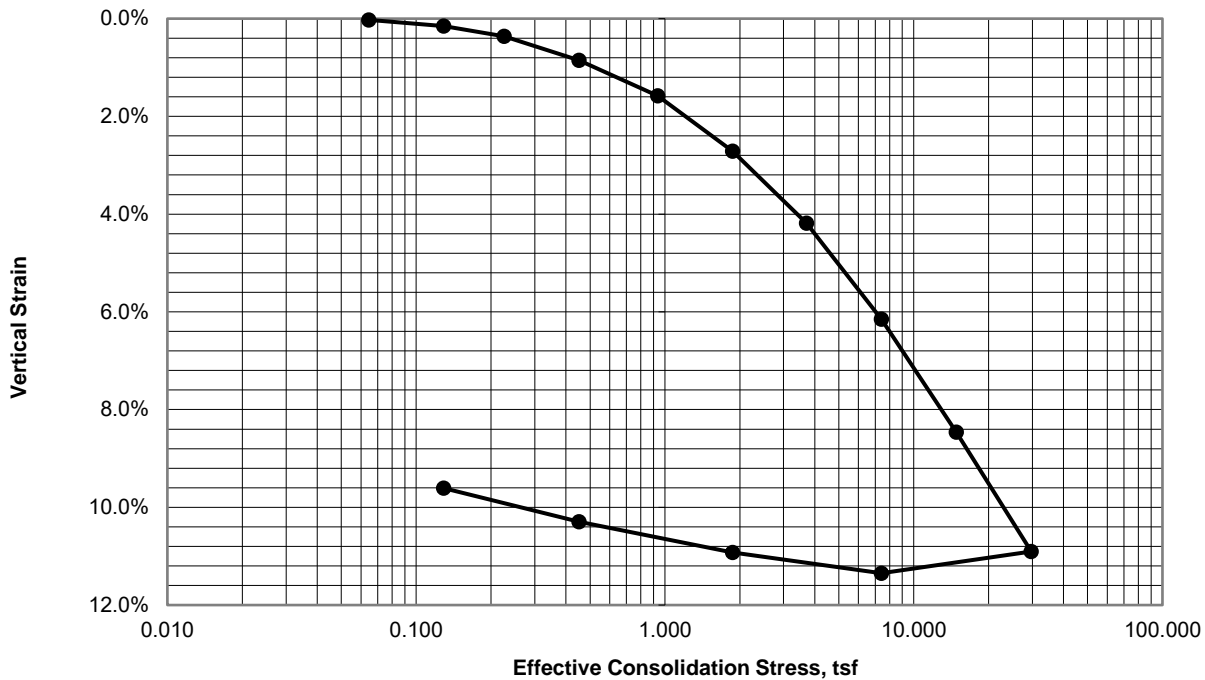
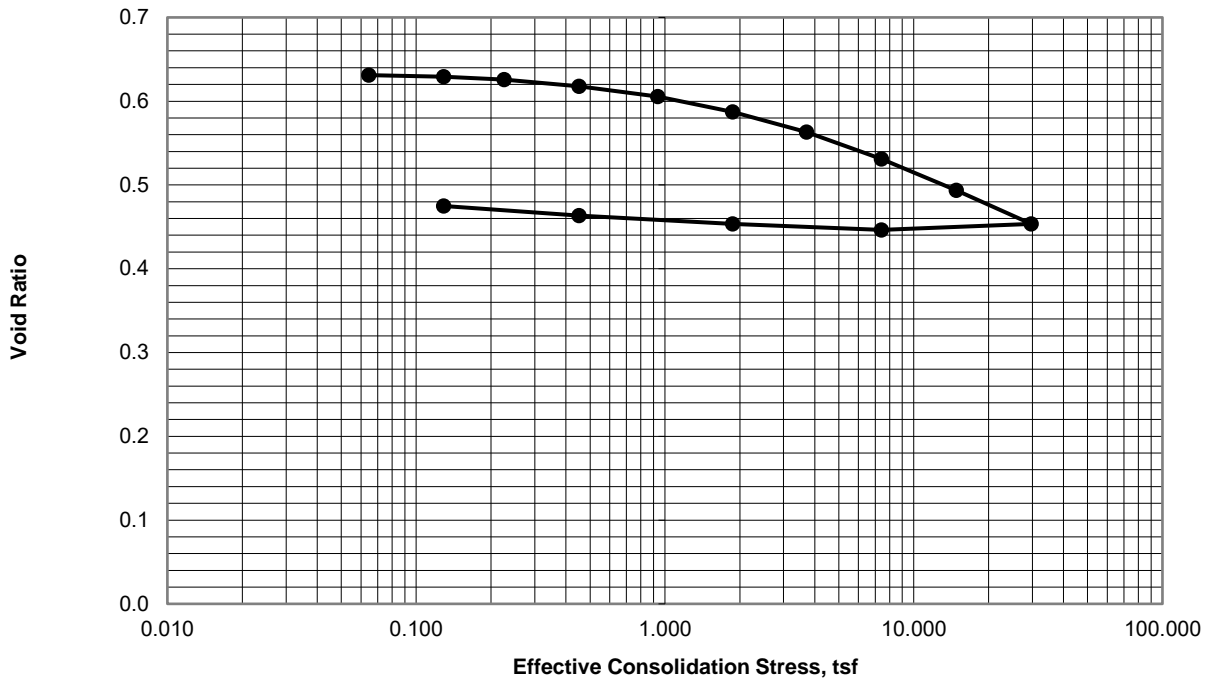
Specimen trimmed using a trimming turntable and inundated with distilled water.
 Tested by AKV in accordance with ASTM D2435-11. Test initiated on 05/06/2019. Finalized by .

CONSOL_v3.0_NOTB_B-11_s-4_16.4.xlsm 06/06/19

102964-001

Dillingham Airport Runway Shift
 Dillingham, Alaska

CONSOLIDATION CURVES
 Boring B-11, Sample S-4, 16.4 ft



Maximum Applied Effective Consolidation Stress, tsf = 29.69

Specimen trimmed using a trimming turntable and indudated with distilled water.
 Tested by AKV in accordance with ASTM D2435-11. Test initiated on 05/06/2019. Finalized by .

CONSOL_v3.0_NOTB_B-11_s-4_16.4.xlsm 06/06/19

102964-001

Dillingham Airport Runway Shift
 Dillingham, Alaska

TEST SUMMARY
 Boring B-14, Sample S-6, 16.4 ft

SPECIMEN DATA AND TEST RESULTS

Sample Classification:

Silt with trace of fine sand and organics (ML)

			Pre- Inundation	Final Load
Specific Gravity, G_s (Assumed)	2.7	Height, in	0.784	0.697
Liquid Limit, LL	0	Diameter, in	2.493	2.493
Plastic Limit, PL	0	Specimen Volume, in ³	3.827	3.403
Plasticity Index, PI (LL - PL)	0	Wet Unit Weight, pcf	115.7	124.7
Fines Content	---	Dry Unit Weight, pcf	86.7	97.5
Organic Content	---	Water Content	33%	28%
Initial Seating Load, g	50	Void Ratio	0.94	0.73
Final Seating Load, g	100	Degree of Saturation	96%	100%
ASTM Test Method	Method B			
Coefficient of Consolidation Interpretation	Procedure 1			

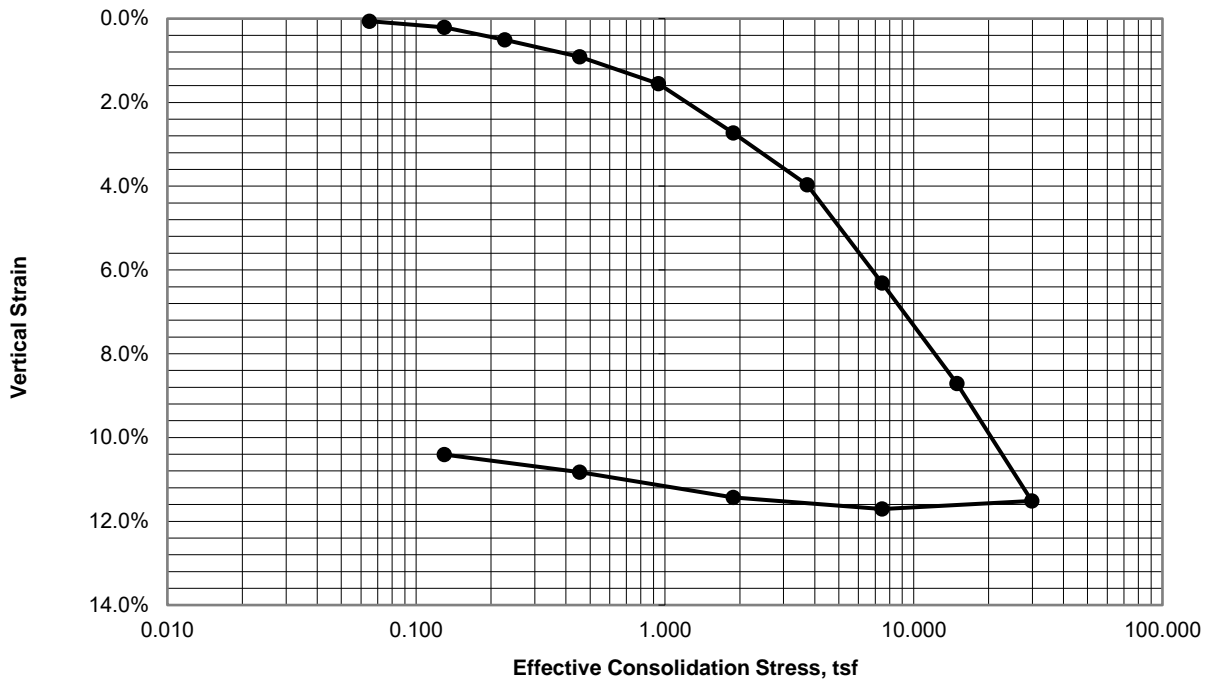
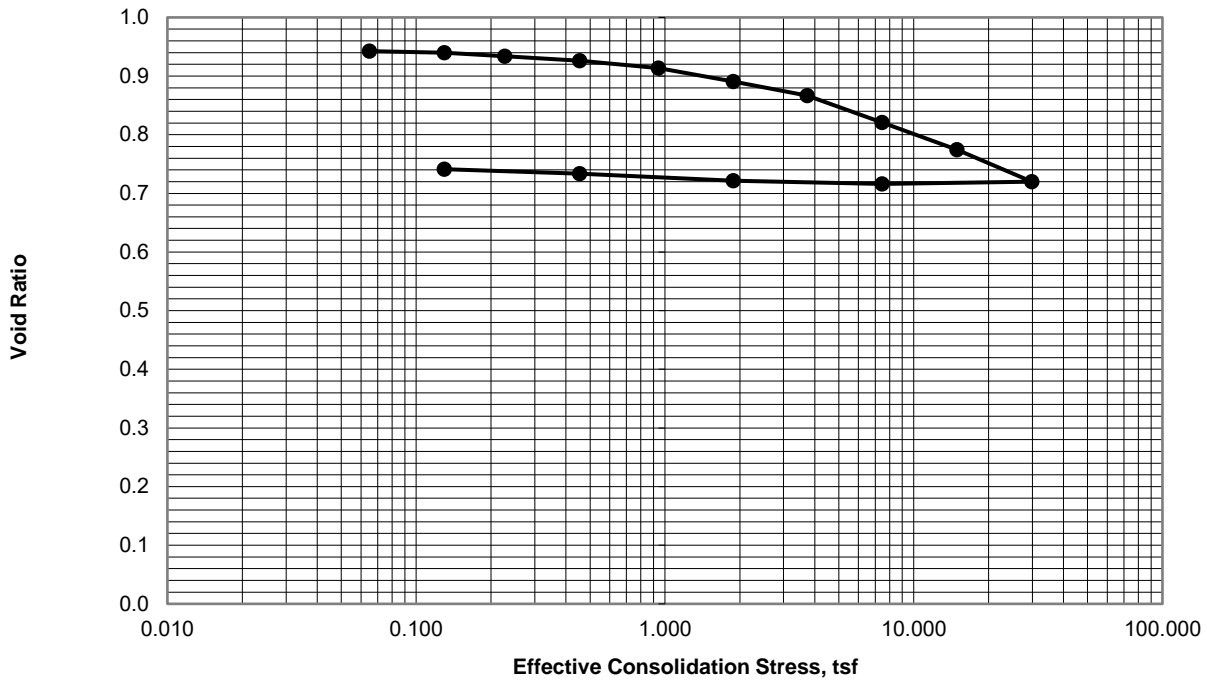
Load Increment Number	Applied Stress, tsf	t_{load} , min	t_{50} , min	ΔH_{load} , in	ΔH at t_{100} , in	$\Delta H/H_0$	Void Ratio	a_v , Mpa ⁻¹	c_v , cm ² /s	k , cm/s
Seating										
1	0.06	120	0.3	0.001	0.000	0.1%	0.943	1.89E-01	1.03E-02	9.82E-08
2	0.13	975	0.3	0.003	0.002	0.2%	0.940	4.56E-01	9.86E-03	2.27E-07
3	0.23	930	1.9	0.006	0.004	0.5%	0.934	6.28E-01	1.69E-03	5.36E-08
4	0.45	1410	0.4	0.011	0.007	0.9%	0.926	3.59E-01	8.53E-03	1.55E-07
5	0.94	1440	0.1	0.019	0.012	1.6%	0.914	2.68E-01	2.45E-02	3.35E-07
6	1.88	2685	0.8	0.030	0.021	2.7%	0.891	2.55E-01	3.72E-03	4.86E-08
7	3.73	7126	0.3	0.045	0.031	4%	0.867	1.36E-01	9.73E-03	6.84E-08
8	7.46	1440	2.1	0.060	0.049	6.3%	0.821	1.28E-01	1.36E-03	9.15E-09
9	14.92	1470	1.6	0.081	0.068	8.7%	0.774	6.53E-02	1.74E-03	6.12E-09
10	29.85	5730	1.6	0.108	0.090	11.5%	0.720	3.81E-02	1.59E-03	3.35E-09
11	7.46	1560	0.8	0.102	0.092	11.7%	0.716	-1.73E-03	3.18E-03	3.14E-10
12	1.88	130	0.1	0.097	0.090	11.4%	0.721	1.00E-02	2.32E-02	1.33E-08
13	0.45	1590	9.2	0.091	0.085	10.8%	0.733	8.64E-02	2.79E-04	1.37E-09
14	0.13	810	42.7	0.087	0.082	10.4%	0.741	2.61E-01	6.09E-05	8.99E-10

Specimen trimmed using a trimming turntable and inundated with distilled water.
 Tested by AKV in accordance with ASTM D2435-11. Test initiated on 05/06/2019. Finalized by .

102964-001
 CONSOL_v3.0_NOTB_B-14_s-6_16.4_xlsm
 06/06/19

Dillingham Airport Runway Shift
 Dillingham, Alaska

CONSOLIDATION CURVES
 Boring B-14, Sample S-6, 16.4 ft



Maximum Applied Effective Consolidation Stress, tsf = 29.85

Specimen trimmed using a trimming turntable and indudated with distilled water.
 Tested by AKV in accordance with ASTM D2435-11. Test initiated on 05/06/2019. Finalized by .

CONSOL_v3.0_NOTB_B-14_s-6_16.4.xlsm 06/06/19

102964-001

Dillingham Airport Runway Shift
 Dillingham, Alaska

TEST SUMMARY
 Boring B-15, Sample S-8, 26.2 ft

SPECIMEN DATA AND TEST RESULTS

Sample Classification:
 Sandy Silt (ML)

			Pre-Inundation	Final Load
Specific Gravity, G_s (Assumed)	2.7	Height, in	0.786	0.716
Liquid Limit, LL	21	Diameter, in	2.505	2.505
Plastic Limit, PL	18	Specimen Volume, in ³	3.874	3.526
Plasticity Index, PI (LL - PL)	3	Wet Unit Weight, pcf	126.1	134.9
Fines Content	---	Dry Unit Weight, pcf	104.0	114.3
Organic Content	---	Water Content	21%	18%
Initial Seating Load, g	50	Void Ratio	0.62	0.47
Final Seating Load, g	50	Degree of Saturation	92%	100%
ASTM Test Method	Method B			
Coefficient of Consolidation Interpretation	Procedure 1			

Load Increment Number	Applied Stress, tsf	t_{load} , min	t_{50} , min	ΔH_{load} , in	ΔH at t_{100} , in	$\Delta H/H_0$	Void Ratio	a_v , Mpa^{-1}	c_v , cm^2/s	k , cm/s
Seating										
1	0.03	59	58.2	0.000	0.002	0.2%	0.617	1.08E+00	5.61E-05	3.67E-09
2	0.06	1005	192.7	0.001	0.001	0.1%	0.618	-3.95E-01	1.70E-05	4.07E-10
3	0.13	1410	33.6	0.003	0.002	0.3%	0.616	4.48E-01	9.69E-05	2.63E-09
4	0.23	2880	3.2	0.006	0.004	0.5%	0.613	3.07E-01	1.01E-03	1.88E-08
5	0.45	450	2.6	0.010	0.007	0.8%	0.607	2.75E-01	1.24E-03	2.07E-08
6	0.93	2415	2.1	0.017	0.012	1.5%	0.597	2.23E-01	1.54E-03	2.09E-08
7	1.86	1425	3.0	0.025	0.018	2.2%	0.584	1.36E-01	1.06E-03	8.91E-09
8	3.70	1440	3.1	0.036	0.026	3.3%	0.567	9.89E-02	9.81E-04	6.01E-09
9	7.39	4305	5.0	0.052	0.038	4.8%	0.542	7.01E-02	6.06E-04	2.66E-09
10	14.79	4335	6.3	0.071	0.054	6.9%	0.509	4.70E-02	4.55E-04	1.36E-09
11	29.58	615	0.6	0.091	0.070	8.9%	0.476	2.30E-02	4.75E-03	7.09E-09
12	29.58	1455	29.6	0.095	0.076	9.6%	0.465		9.07E-05	
13	7.39	240	0.4	0.089	0.074	9.4%	0.468	1.72E-03	7.22E-03	8.32E-10
14	1.86	230	0.0	0.082	0.071	9.1%	0.474	9.81E-03	3.32E-01	2.18E-07
15	0.45	930	0.6	0.075	0.067	8.5%	0.483	7.13E-02	4.61E-03	2.19E-08
16	0.13	1485	30.0	0.071	0.064	8.2%	0.488	1.50E-01	9.16E-05	9.10E-10

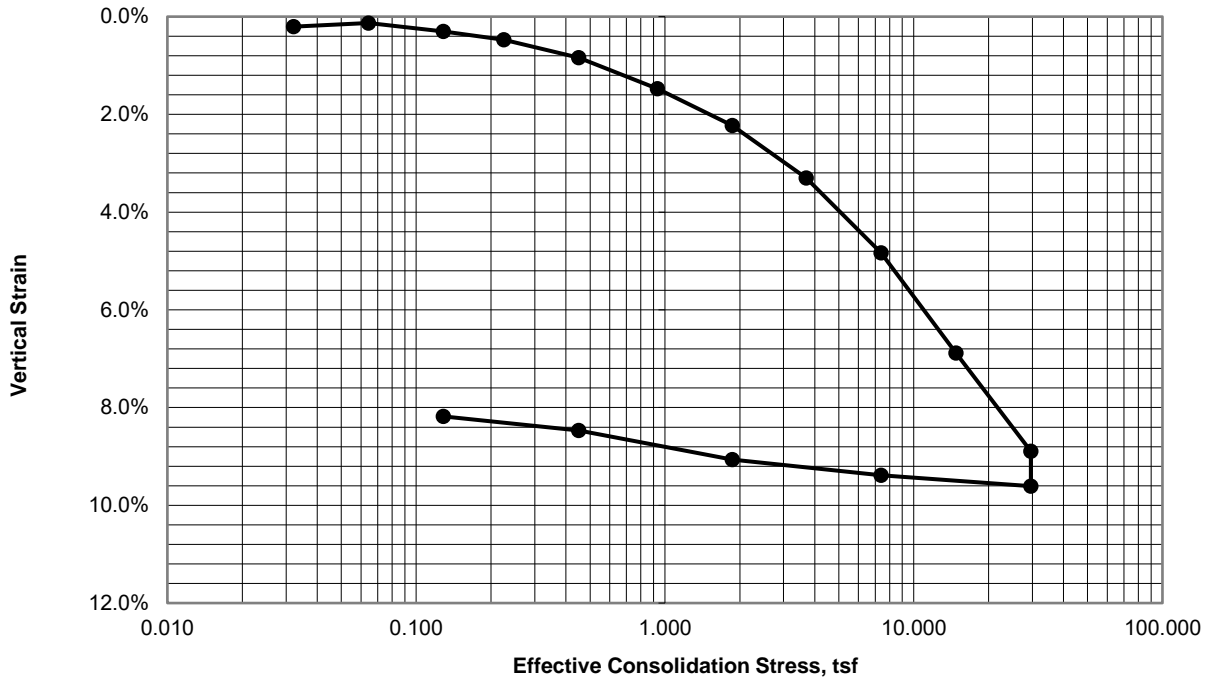
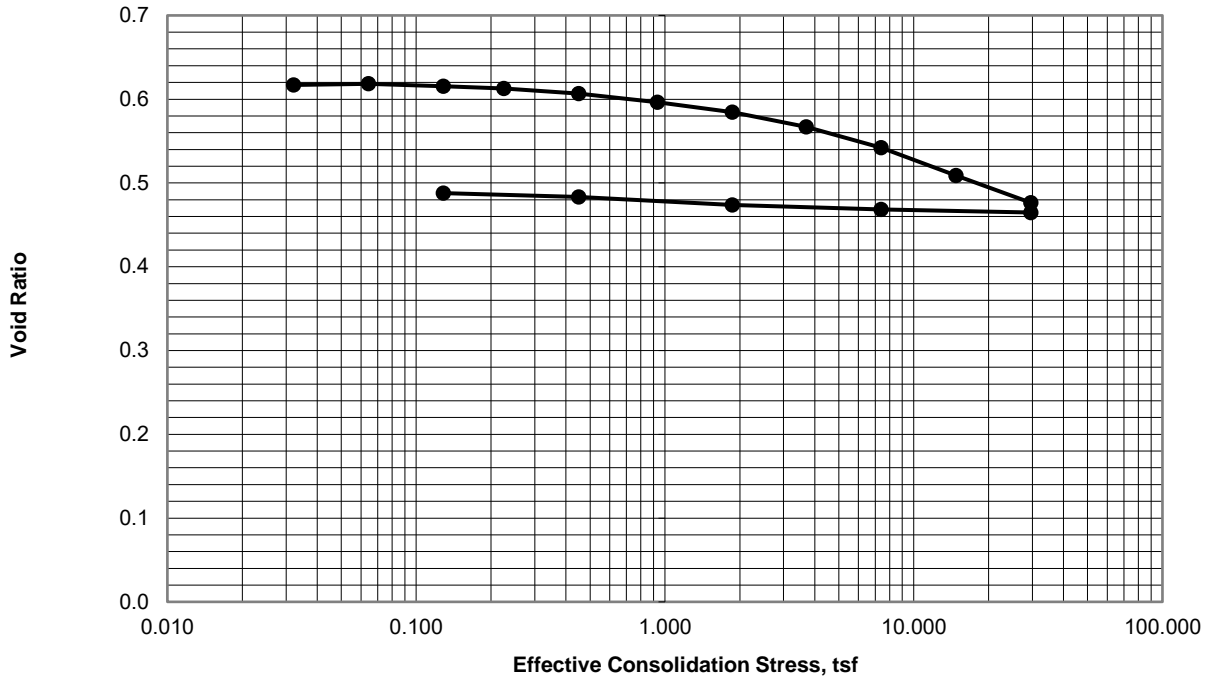
Specimen trimmed using a trimming turntable and inundated with distilled water.
 Tested by AKV in accordance with ASTM D2435-11. Test initiated on 05/29/2019. Finalized by .

CONSOL_v3.0_NOTB_102964-001_B-15_S-8_26.2.xlsm 07/01/19

102964-001

Dillingham Airport Runway Shift
 Dillingham, Alaska

CONSOLIDATION CURVES
 Boring B-15, Sample S-8, 26.2 ft



Maximum Applied Effective Consolidation Stress, tsf = 29.58

Specimen trimmed using a trimming turntable and indundated with distilled water.
 Tested by AKV in accordance with ASTM D2435-11. Test initiated on 05/29/2019. Finalized by .

CONSOL_v3.0_NOTB_102964-001_B-15_S-8_26.2.xlsm 07/01/19

102964-001

**Dillingham Airport Runway Shift
 Dillingham, Alaska**

**TEST SUMMARY
 Boring B-17, Sample S-6, 16.5 ft**

SPECIMEN DATA AND TEST RESULTS

Sample Classification:
 Silt (ML)

			Pre- Inundation	Final Load
Specific Gravity, G_s (Assumed)	2.7	Height, in	0.777	0.730
Liquid Limit, LL	25	Diameter, in	2.508	2.508
Plastic Limit, PL	26	Specimen Volume, in ³	3.841	3.609
Plasticity Index, PI (LL - PL)	-1	Wet Unit Weight, pcf	122.6	127.2
Fines Content	---	Dry Unit Weight, pcf	96.1	102.2
Organic Content	---	Water Content	28%	24%
Initial Seating Load, g	50	Void Ratio	0.75	0.65
Final Seating Load, g	50	Degree of Saturation	99%	100%
ASTM Test Method	Method B			
Coefficient of Consolidation Interpretation	Procedure 1			

Load Increment Number	Applied Stress, tsf	t_{load} , min	t_{50} , min	ΔH_{load} , in	ΔH at t_{100} , in	$\Delta H/H_0$	Void Ratio	a_v , Mpa ⁻¹	c_v , cm ² /s	k , cm/s
Seating										
1	0.03	58	0.0	0.000	0.000	0%	0.755	-1.16E-01	7.11E-02	4.61E-07
2	0.06	1005	59.3	0.001	0.000	0%	0.755	1.16E-01	5.40E-05	3.49E-10
3	0.13	1410	25.7	0.003	0.002	0.2%	0.750	7.09E-01	1.24E-04	4.91E-09
4	0.22	2880	7.3	0.006	0.004	0.5%	0.747	4.25E-01	4.36E-04	1.04E-08
5	0.45	450	2.2	0.009	0.006	0.8%	0.741	2.65E-01	1.44E-03	2.15E-08
6	0.93	2415	3.1	0.014	0.010	1.3%	0.732	1.83E-01	1.01E-03	1.04E-08
7	1.86	1425	1.1	0.021	0.014	1.8%	0.723	1.08E-01	2.94E-03	1.80E-08
8	3.69	420	0.4	0.028	0.020	2.5%	0.710	7.06E-02	6.81E-03	2.74E-08
9	7.37	1020	1.3	0.038	0.028	3.6%	0.692	5.19E-02	2.29E-03	6.81E-09
10	14.75	525	1.4	0.050	0.037	4.8%	0.670	3.11E-02	2.14E-03	3.85E-09
11	29.49	3765	5.2	0.067	0.051	6.6%	0.639	2.22E-02	5.39E-04	7.02E-10
12	7.37	1425	0.1	0.061	0.049	6.4%	0.643	2.01E-03	2.12E-02	2.56E-09
13	1.86	1425	0.4	0.055	0.047	6%	0.650	1.21E-02	6.36E-03	4.60E-09
14	0.45	1470	5.1	0.051	0.044	5.6%	0.656	4.80E-02	5.54E-04	1.58E-09
15	0.13	6256	10.9	0.047	0.042	5.4%	0.660	1.30E-01	2.63E-04	2.03E-09

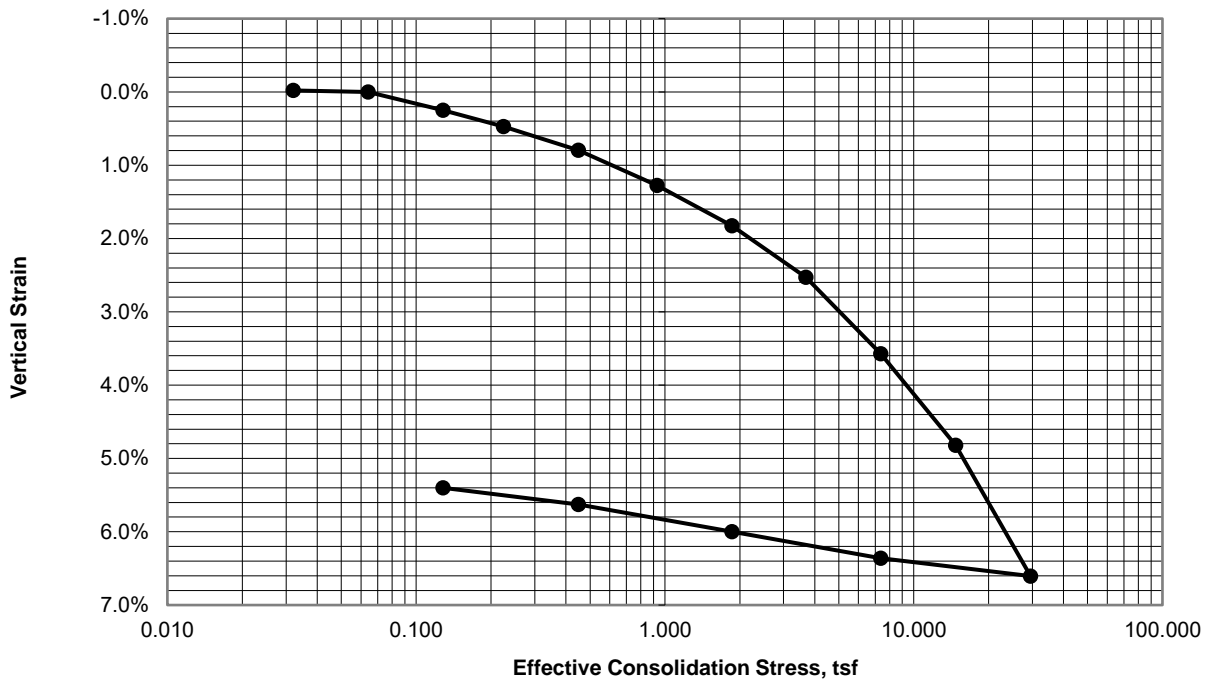
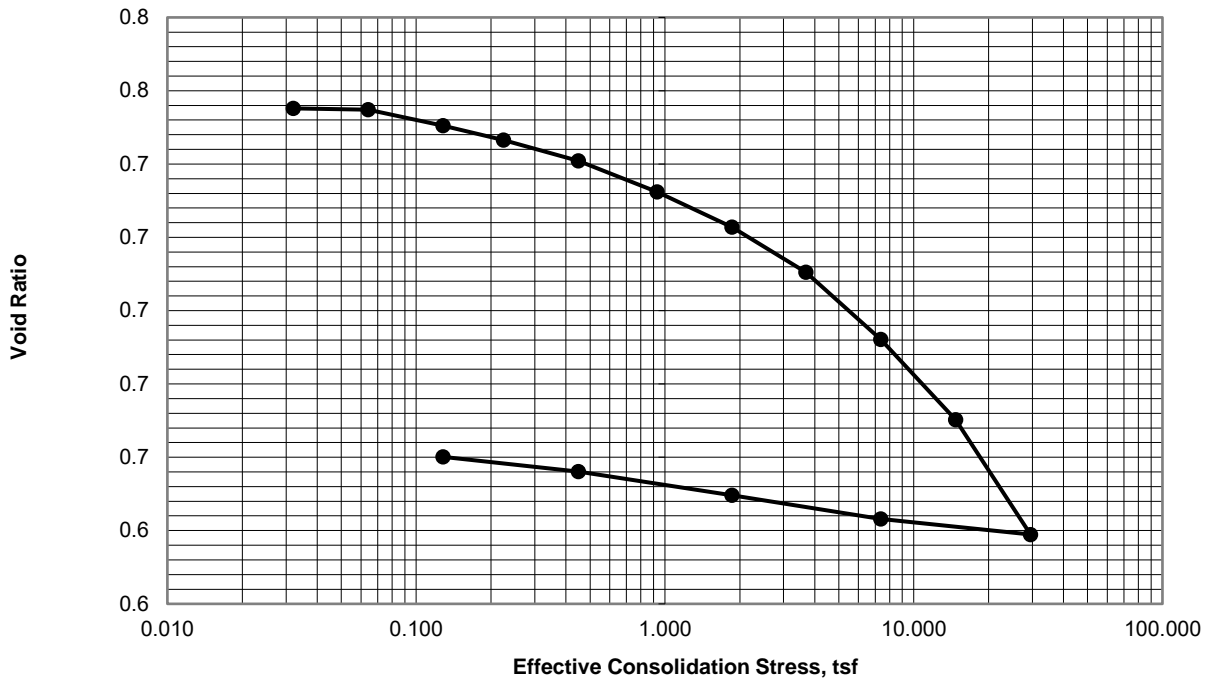
Specimen trimmed using a trimming turntable and inundated with distilled water.
 Tested by AKV in accordance with ASTM D2435-11. Test initiated on 05/29/2019. Finalized by .

CONSOL_v3.0_NOTB_102964-001_B-17_S-6_16.5.xlsm 07/01/19

102964-001

Dillingham Airport Runway Shift
 Dillingham, Alaska

CONSOLIDATION CURVES
 Boring B-17, Sample S-6, 16.5 ft



Maximum Applied Effective Consolidation Stress, tsf = 29.49

Specimen trimmed using a trimming turntable and indundated with distilled water.
 Tested by AKV in accordance with ASTM D2435-11. Test initiated on 05/29/2019. Finalized by .

CONSOL_v3.0_NOTB_102964-001_B-17_S-6_16.5.xlsm 07/01/19

102964-001

**Dillingham Airport Runway Shift
Dillingham, Alaska**

**TEST SUMMARY
Boring B-19, Sample S-8, 25.6 ft**

SPECIMEN DATA AND TEST RESULTS

Sample Classification:
SILT with sand (ML)

			Pre- Inundation	Final Load
Specific Gravity, G_s (Assumed)	2.7	Height, in	0.788	0.748
Liquid Limit, LL	25	Diameter, in	2.504	2.504
Plastic Limit, PL	27	Specimen Volume, in ³	3.879	3.680
Plasticity Index, PI (LL - PL)	-2	Wet Unit Weight, pcf	124.5	129.0
Fines Content	---	Dry Unit Weight, pcf	98.8	104.1
Organic Content	---	Water Content	26%	24%
Initial Seating Load, g	50	Void Ratio	0.71	0.62
Final Seating Load, g	50	Degree of Saturation	99%	100%
ASTM Test Method	Method B			
Coefficient of Consolidation Interpretation	Procedure 1			

Load Increment Number	Applied Stress, tsf	t_{load} , min	t_{50} , min	ΔH_{load} , in	ΔH at t_{100} , in	$\Delta H/H_0$	Void Ratio	a_v , Mpa ⁻¹	c_v , cm ² /s	k , cm/s
Seating										
1	0.03	315	0.1	0.000	0.000	0%	0.706	8.30E-02	4.63E-02	2.21E-07
2	0.06	1110	2.0	0.002	0.001	0.2%	0.703	9.41E-01	1.62E-03	8.77E-08
3	0.13	495	7.4	0.005	0.004	0.5%	0.698	7.89E-01	4.38E-04	1.99E-08
4	0.23	915	1.1	0.007	0.006	0.7%	0.694	4.34E-01	2.86E-03	7.17E-08
5	0.45	1440	3.1	0.011	0.008	1.1%	0.688	2.85E-01	1.03E-03	1.70E-08
6	0.93	4306	11.2	0.016	0.012	1.5%	0.681	1.64E-01	2.86E-04	2.73E-09
7	1.87	1425	3.6	0.021	0.015	1.9%	0.674	7.25E-02	8.71E-04	3.69E-09
8	3.70	2895	4.6	0.028	0.019	2.4%	0.665	5.05E-02	6.90E-04	2.04E-09
9	7.40	5731	4.1	0.036	0.024	3.1%	0.654	3.32E-02	7.55E-04	1.48E-09
10	14.80	1440	5.4	0.045	0.032	4.1%	0.637	2.37E-02	5.62E-04	7.90E-10
11	29.60	3330	3.8	0.059	0.042	5.4%	0.615	1.55E-02	7.79E-04	7.24E-10
12	7.40	1035	0.1	0.054	0.041	5.2%	0.617	1.24E-03	4.92E-02	3.72E-09
13	1.87	4230	0.2	0.048	0.039	4.9%	0.622	9.49E-03	1.34E-02	7.70E-09
14	0.45	1425	4.3	0.044	0.036	4.6%	0.627	3.71E-02	6.93E-04	1.55E-09
15	0.13	2025	43.6	0.040	0.033	4.2%	0.634	2.19E-01	6.90E-05	9.09E-10

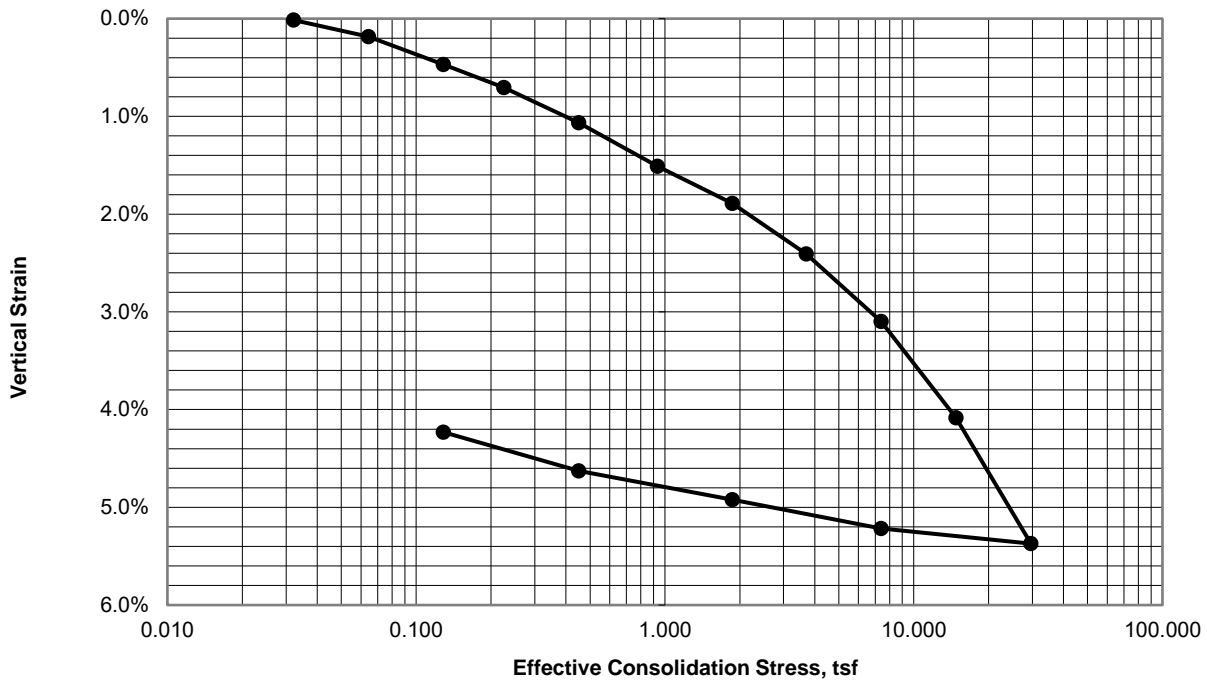
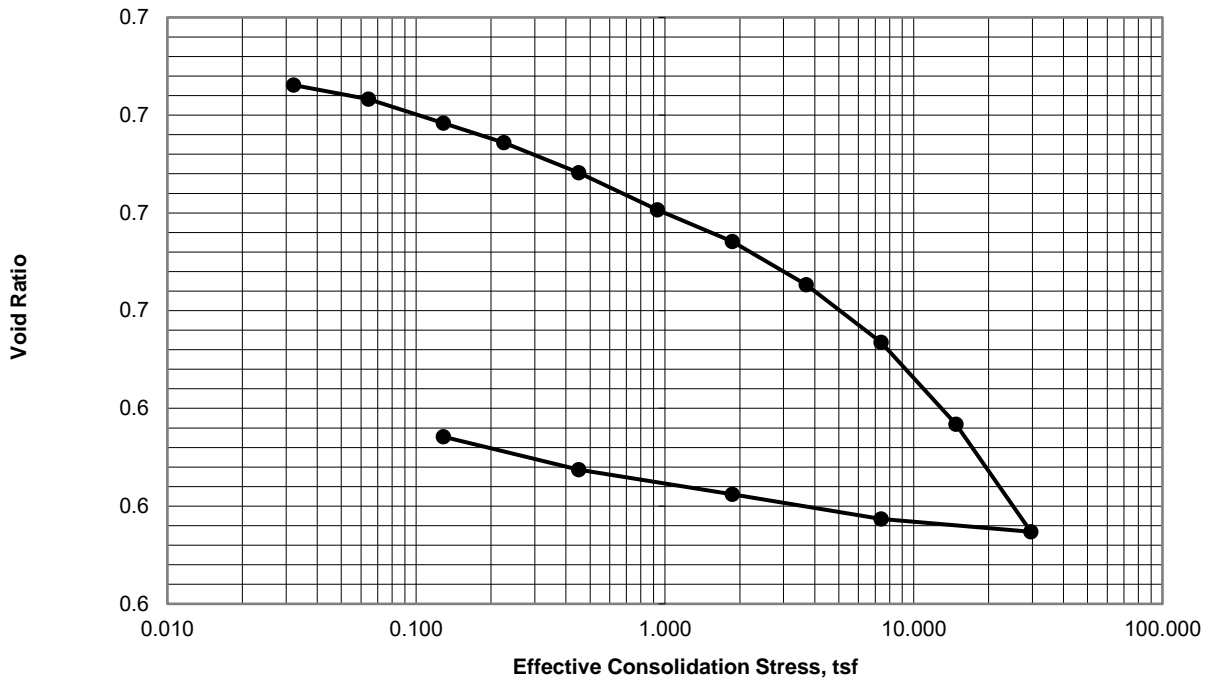
Specimen trimmed using a trimming turntable and inundated with distilled water.
Tested by AKV in accordance with ASTM D2435-11. Test initiated on 05/29/2019. Finalized by .

CONSOL_v3.0_NOTB_102964-001_B-19_S-8_25.6.xlsm 07/01/19

102964-001

Dillingham Airport Runway Shift
 Dillingham, Alaska

CONSOLIDATION CURVES
 Boring B-19, Sample S-8, 25.6 ft



Maximum Applied Effective Consolidation Stress, tsf = 29.6

Specimen trimmed using a trimming turntable and indundated with distilled water.
 Tested by AKV in accordance with ASTM D2435-11. Test initiated on 05/29/2019. Finalized by .

CONSOL_v3.0_NOTB_102964-001_B-19_S-8_25.6.xlsm 07/01/19

102964-001

**Dillingham Airport Runway Shift
 Dillingham, Alaska**

**TEST SUMMARY
 Boring B-24, Sample S-7, 19.3 ft**

SPECIMEN DATA AND TEST RESULTS

Sample Classification:
 SILT with sand (ML)

			Pre- Inundation	Final Load
Specific Gravity, G_s (Assumed)	2.7	Height, in	0.785	0.747
Liquid Limit, LL	24	Diameter, in	2.504	2.504
Plastic Limit, PL	26	Specimen Volume, in ³	3.868	3.680
Plasticity Index, PI (LL - PL)	-2	Wet Unit Weight, pcf	124.9	129.9
Fines Content	---	Dry Unit Weight, pcf	100.0	105.1
Organic Content	---	Water Content	25%	24%
Initial Seating Load, g	50	Void Ratio	0.69	0.60
Final Seating Load, g	50	Degree of Saturation	98%	100%
ASTM Test Method	Method B			
Coefficient of Consolidation Interpretation	Procedure 1			

Load Increment Number	Applied Stress, tsf	t_{load} , min	t_{50} , min	ΔH_{load} , in	ΔH at t_{100} , in	$\Delta H/H_0$	Void Ratio	a_v , Mpa ⁻¹	c_v , cm ² /s	k , cm/s
Seating										
1	0.03	1110	0.0	0.000	0.000	0%	0.685	1.37E-01	1.92E-01	1.53E-06
2	0.06	510	62.9	0.003	0.003	0.3%	0.679	1.76E+00	5.16E-05	5.27E-09
3	0.13	915	7.5	0.007	0.006	0.7%	0.673	1.07E+00	4.27E-04	2.67E-08
4	0.23	420	0.9	0.009	0.007	1%	0.669	3.93E-01	3.50E-03	8.07E-08
5	0.45	1005	9.0	0.012	0.010	1.3%	0.664	2.39E-01	3.54E-04	4.97E-09
6	0.93	4305	13.2	0.016	0.013	1.6%	0.658	1.30E-01	2.40E-04	1.84E-09
7	1.87	1425	2.8	0.020	0.015	1.9%	0.652	6.34E-02	1.11E-03	4.16E-09
8	3.70	570	1.1	0.025	0.019	2.4%	0.644	4.57E-02	2.81E-03	7.64E-09
9	7.40	840	3.6	0.033	0.025	3.2%	0.632	3.48E-02	8.46E-04	1.76E-09
10	14.80	1470	2.3	0.042	0.032	4.1%	0.617	2.12E-02	1.31E-03	1.68E-09
11	29.59	5731	11.2	0.056	0.043	5.5%	0.593	1.69E-02	2.63E-04	2.70E-10
12	7.40	525	0.7	0.051	0.042	5.3%	0.596	1.31E-03	3.91E-03	3.16E-10
13	1.87	900	0.1	0.046	0.040	5%	0.600	8.29E-03	2.02E-02	1.03E-08
14	0.45	1410	3.7	0.042	0.037	4.7%	0.606	4.36E-02	8.06E-04	2.16E-09
15	0.13	10651	12.9	0.038	0.035	4.5%	0.610	1.34E-01	2.32E-04	1.90E-09

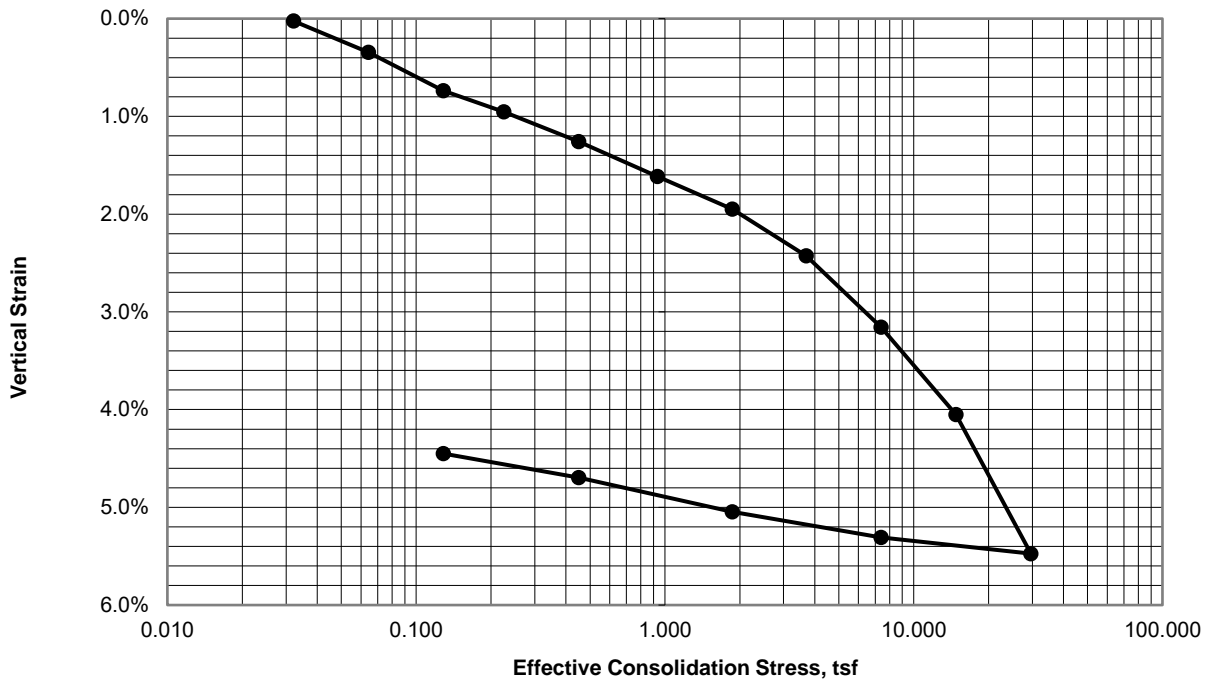
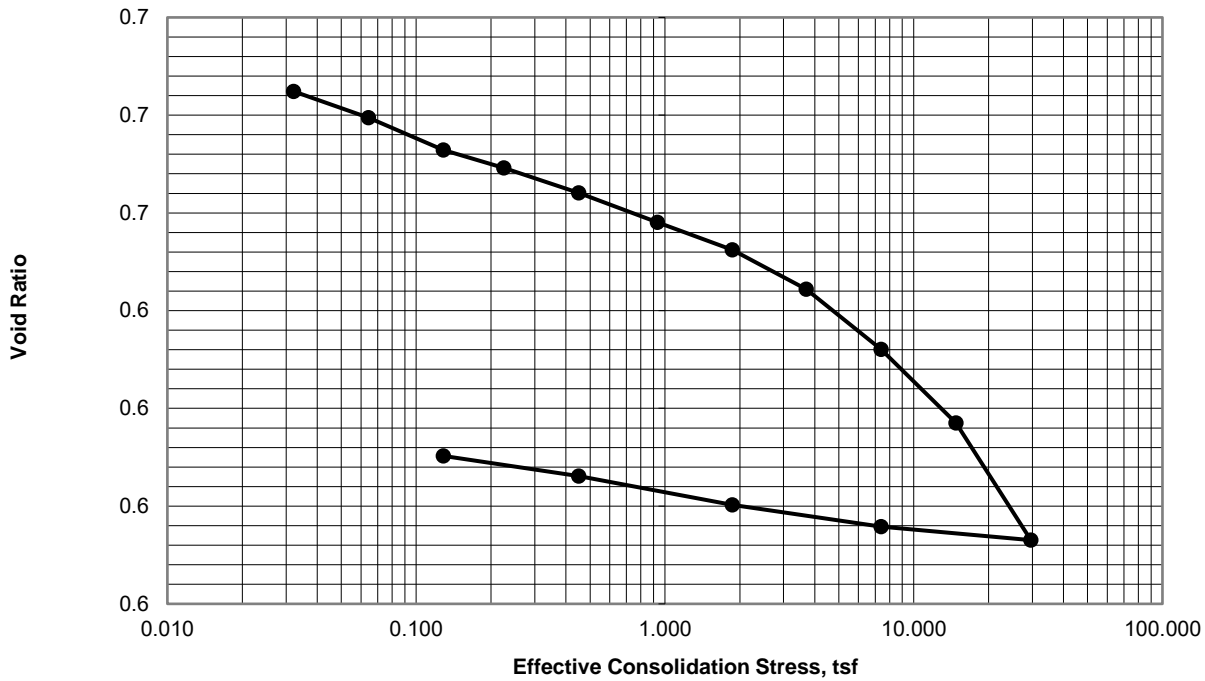
Specimen trimmed using a trimming turntable and inundated with distilled water.
 Tested by AKV in accordance with ASTM D2435-11. Test initiated on 05/29/2019. Finalized by .

CONSOL_v3.0_NOTB_102964-001_B-24_S-7_19.3.xlsm 07/01/19

102964-001

Dillingham Airport Runway Shift
 Dillingham, Alaska

CONSOLIDATION CURVES
 Boring B-24, Sample S-7, 19.3 ft



Maximum Applied Effective Consolidation Stress, tsf = 29.59

Specimen trimmed using a trimming turntable and indudated with distilled water.
 Tested by AKV in accordance with ASTM D2435-11. Test initiated on 05/29/2019. Finalized by .

CONSOL_v3.0_NOTB_102964-001_B-24_S-7_19.3.xlsm 07/01/19

102964-001

APPENDIX C

SUMMARY TABLE OF LABORATORY TEST RESULTS

**Appendix C
Summary of Laboratory Soil Test Data**

Project Name: Dillingham Airport Runway Improvements

Project No.: 102964-001

Sampled By: Forrest Dobson

Station	70+50	70+50	70+50	70+50	70+63	70+63	70+63	70+63	70+63	70+63
Offset (feet)	250 ft LOC	250 ft LOC	250 ft LOC	250 ft LOC	285 ft LOC	285 ft LOC	285 ft LOC	285 ft LOC	285 ft LOC	285 ft LOC
Depth (feet below ground surface)	0.5	5	10	15	2	5	9.5	15	17	17.5
Test Hole Number	TH19-01	TH19-01	TH19-01	TH19-01	TH19-02	TH19-02	TH19-02	TH19-02	TH19-02	TH19-02
Sample Number	S1	S2	S3	S4	S1	S2	S3	S4	S5	S5
Date Sampled (mm/dd/yy)	03/26/19	03/26/19	03/26/19	03/26/19	03/26/19	03/26/19	03/26/19	03/26/19	03/26/19	03/26/19
Field Boring Number	B-01	B-01	B-01	B-01	B-02	B-02	B-02	B-02	B-02	B-02
Percent Passing Sieve Size	3"	75mm								
	2"	50mm	100							
	1.5"	37.5mm	93							
	1"	25mm	89							
	0.75"	19mm	87							
	0.5"	12.5mm	82		100					
	0.375"	9.5mm	77		99					
	0.25"	6.3mm								
	#4	4.75mm	54		95					
	#8	2.36mm	37		90					
	#10	2mm								
	#16	1.18mm	28		86					
	#30	0.6mm	21		83					
	#40	0.425mm								
	#50	0.3mm	17		80					
	#100	0.15mm	14		78					
#200	0.075mm	11.9		76.3						
DOTTSD										
AASHTO Class										
FSV Class										
Liquid Limit										
Plastic Index										
Moisture Content %	7.9	5.8	11.5	21.8	6.6	77.2	28.0	28.9	25.3	26.6
Organic Content %										
% Gravel	46			5						
% Sand	42			19						
% Silt & Clay (Fines or p200)	12			76						
Max. Dry Density										
Opt. Moisture %										
Sp.G. Fine										
Compression Index C _c										
Coeff. Of Consolidation C _v										
Sulfate Soundness										

**Appendix C
Summary of Laboratory Soil Test Data**

Project Name: Dillingham Airport Runway Improvements

Project No.: 102964-001

Sampled By: Forrest Dobson

Station	70+63	70+63	70+63	60+54	60+54	60+54	60+54	60+54	60+54	60+54
Offset (feet)	285 ft LOC	285 ft LOC	285 ft LOC	250 ft LOC	250 ft LOC	250 ft LOC	250 ft LOC	250 ft LOC	250 ft LOC	250 ft LOC
Depth (feet below ground surface)	18	18.5	20	0.5	5	10	15	20	22.5	23
Test Hole Number	TH19-02	TH19-02	TH19-02	TH19-03	TH19-03	TH19-03	TH19-03	TH19-03	TH19-03	TH19-03
Sample Number	S5	S5	S6	S1	S2	S3	S4	S5	S6	S6
Date Sampled (mm/dd/yy)	03/26/19	03/26/19	03/26/19	03/27/19	03/27/19	03/27/19	03/27/19	03/27/19	03/27/19	03/27/19
Field Boring Number	B-02	B-02	B-02	B-03	B-03	B-03	B-03	B-03	B-03	B-03
Percent Passing Sieve Size	3"	75mm								
	2"	50mm								
	1.5"	37.5mm								
	1"	25mm		100						
	0.75"	19mm		99						
	0.5"	12.5mm		87						
	0.375"	9.5mm		75						
	0.25"	6.3mm								
	#4	4.75mm		48						
	#8	2.36mm		33						
	#10	2mm								
	#16	1.18mm		23						
	#30	0.6mm		16						
	#40	0.425mm								
	#50	0.3mm		11						
#100	0.15mm		9							
#200	0.075mm		98.6	7.2						
DOTTSD										
AASHTO Class										
FSV Class										
Liquid Limit										
Plastic Index										
Moisture Content %	25.0	21.7	23.6	6.1	3.9	7.3	33.7	29.6	21.8	22.9
Organic Content %							8.1			
% Gravel				52						
% Sand				41						
% Silt & Clay (Fines or p200)			99	7						
Max. Dry Density										
Opt. Moisture %										
Sp.G. Fine										
Compression Index C _c										
Coeff. Of Consolidation C _v										
Sulfate Soundness										

**Appendix C
Summary of Laboratory Soil Test Data**

Project Name: Dillingham Airport Runway Improvements

Project No.: 102964-001

Sampled By: Forrest Dobson

Station	60+54	60+54	60+54	60+54	60+54	60+54	67+59	67+59	67+59	67+59
Offset (feet)	250 ft LOC	250 ft LOC	250 ft LOC	250 ft LOC	250 ft LOC	250 ft LOC	100 ft LOC	100 ft LOC	100 ft LOC	100 ft LOC
Depth (feet below ground surface)	23.5	24	25	30	35	40	0	5	10	15
Test Hole Number	TH19-03	TH19-03	TH19-03	TH19-03	TH19-03	TH19-03	TH19-04	TH19-04	TH19-04	TH19-04
Sample Number	S6	S6	S7	S8	S9	S10	S1	S2	S3	S4
Date Sampled (mm/dd/yy)	03/27/19	03/27/19	03/27/19	03/27/19	03/27/19	03/27/19	03/27/19	03/27/19	03/27/19	03/27/19
Field Boring Number	B-03	B-03	B-03	B-03	B-03	B-03	B-04	B-04	B-04	B-04
Percent Passing Sieve Size	3"									
	2"									
	1.5"									
	1"							100		
	0.75"							98		
	0.5"							89		
	0.375"							82		
	0.25"									
	#4								66	
	#8								50	
	#10									
	#16								39	
	#30								29	
	#40									
	#50								23	
	#100								18	
#200				98.1				15.2		
DOTTSD										
AASHTO Class										
FSV Class										
Liquid Limit						24				
Plastic Index						6				
Moisture Content %	21.0	20.5	26.9	42.3	46.1	22.6	8.7	4.4	4.2	71.6
Organic Content %										25.5
% Gravel								34		
% Sand								50		
% Silt & Clay (Fines or p200)				98				15		
Max. Dry Density										
Opt. Moisture %										
Sp.G. Fine										
Compression Index C _c										
Coeff. Of Consolidation C _v										
Sulfate Soundness										

**Appendix C
Summary of Laboratory Soil Test Data**

Project Name: Dillingham Airport Runway Improvements

Project No.: 102964-001

Sampled By: Forrest Dobson

Station	67+59	67+59	50+28	50+28	50+28	50+28	50+28	50+28	50+28	50+28
Offset (feet)	100 ft LOC	100 ft LOC	100 ft LOC	100 ft LOC	100 ft LOC	100 ft LOC	100 ft LOC	100 ft LOC	100 ft LOC	100 ft LOC
Depth (feet below ground surface)	20	25	2	5	10	15	20	25	30	35
Test Hole Number	TH19-04	TH19-04	TH19-05	TH19-05	TH19-05	TH19-05	TH19-05	TH19-05	TH19-05	TH19-05
Sample Number	S5	S6	S1	S2	S3	S4	S5	S6	S7	S8
Date Sampled (mm/dd/yy)	03/27/19	03/27/19	03/28/19	03/28/19	03/28/19	03/28/19	03/28/19	03/28/19	03/28/19	03/28/19
Field Boring Number	B-04	B-04	B-05	B-05	B-05	B-05	B-05	B-05	B-05	B-05
Percent Passing Sieve Size	3"	75mm								
	2"	50mm								
	1.5"	37.5mm		100						
	1"	25mm		99						100
	0.75"	19mm		97						99
	0.5"	12.5mm		88						91
	0.375"	9.5mm		77						84
	0.25"	6.3mm								
	#4	4.75mm		54						69
	#8	2.36mm		38						59
	#10	2mm								
	#16	1.18mm		28						51
	#30	0.6mm		20						40
	#40	0.425mm								
	#50	0.3mm		16						25
#100	0.15mm		13						17	
#200	0.075mm		11.2						13.0	
DOTTSD										
AASHTO Class										
FSV Class										
Liquid Limit										
Plastic Index										
Moisture Content %	18.9	29.2	5.9	6.2	5.0	37.2	27.6	23.6	20.2	11.0
Organic Content %										
% Gravel			46							31
% Sand			43							56
% Silt & Clay (Fines or p200)			11							13
Max. Dry Density										
Opt. Moisture %										
Sp.G. Fine										
Compression Index C _c										
Coeff. Of Consolidation C _v										
Sulfate Soundness										

**Appendix C
Summary of Laboratory Soil Test Data**

Project Name: Dillingham Airport Runway Improvements

Project No.: 102964-001

Sampled By: Forrest Dobson

Station	37+36	37+36	37+36	37+36	37+36	37+36	37+36	37+36	37+36	37+36
Offset (feet)	185 ft LOC	185 ft LOC	185 ft LOC	185 ft LOC	185 ft LOC	185 ft LOC	185 ft LOC	185 ft LOC	185 ft LOC	185 ft LOC
Depth (feet below ground surface)	2	5	10	15	25	30	35	35.5	36	37
Test Hole Number	TH19-06	TH19-06	TH19-06	TH19-06	TH19-06	TH19-06	TH19-06	TH19-06	TH19-06	TH19-06
Sample Number	S1	S2	S3	S4	S6	S7	S8	S8	S8	S9
Date Sampled (mm/dd/yy)	03/28/19	03/28/19	03/28/19	03/28/19	03/28/19	03/28/19	03/28/19	03/28/19	03/28/19	03/28/19
Field Boring Number	B-06	B-06	B-06	B-06	B-06	B-06	B-06	B-06	B-06	B-06
Percent Passing Sieve Size	3"									
	2"									
	1.5"									
	1"									
	0.75"									
	0.5"									
	0.375"									
	0.25"									
	#4									
	#8									
	#10									
	#16									
	#30									
	#40									
	#50									
	#100									
#200					92.4					
DOTTSD										
AASHTO Class										
FSV Class										
Liquid Limit						31				
Plastic Index						6				
Moisture Content %	5.3	33.0	30.6	26.3	27.6	27.3	17.6	8.1	11.0	22.1
Organic Content %		7.6								
% Gravel										
% Sand										
% Silt & Clay (Fines or p200)					92					
Max. Dry Density										
Opt. Moisture %										
Sp.G. Fine										
Compression Index C _c										
Coeff. Of Consolidation C _v										
Sulfate Soundness										

**Appendix C
Summary of Laboratory Soil Test Data**

Project Name: Dillingham Airport Runway Improvements

Project No.: 102964-001

Sampled By: Forrest Dobson

Station	37+36	46+83	46+83	46+83	46+83	46+83	46+83	46+83	46+83	46+83
Offset (feet)	185 ft LOC	245 ft LOC	245 ft LOC	245 ft LOC	245 ft LOC	245 ft LOC	245 ft LOC	245 ft LOC	245 ft LOC	245 ft LOC
Depth (feet below ground surface)	40	2	5	10	15	20	23	25	25.5	30
Test Hole Number	TH19-06	TH19-07	TH19-07	TH19-07	TH19-07	TH19-07	TH19-07	TH19-07	TH19-07	TH19-07
Sample Number	S10	S1	S2	S3	S4	S5	S6	S7A	S7B	S8
Date Sampled (mm/dd/yy)	03/28/19	03/28/19	03/28/19	03/28/19	03/28/19	03/28/19	03/28/19	03/28/19	03/28/19	03/28/19
Field Boring Number	B-06	B-07	B-07	B-07	B-07	B-07	B-07	B-07	B-07	B-07
Percent Passing Sieve Size	3"	75mm								
	2"	50mm								
	1.5"	37.5mm								
	1"	25mm	100							
	0.75"	19mm	96							
	0.5"	12.5mm	90							
	0.375"	9.5mm	84							
	0.25"	6.3mm								
	#4	4.75mm	64							
	#8	2.36mm	47							
	#10	2mm								
	#16	1.18mm	36							
	#30	0.6mm	28							
	#40	0.425mm								
	#50	0.3mm	22							
#100	0.15mm	19								
#200	0.075mm	16.1								
DOTTSD										
AASHTO Class										
FSV Class										
Liquid Limit						31	35			33
Plastic Index						7	10			11
Moisture Content %	12.3	5.0	7.0	4.6	17.9	31.0	24.4	28.8	54.9	29.3
Organic Content %									10.7	
% Gravel		36								
% Sand		48								
% Silt & Clay (Fines or p200)		16								
Max. Dry Density										
Opt. Moisture %										
Sp.G. Fine										
Compression Index C _c							0.1388			
Coeff. Of Consolidation C _v							0.00148			
Sulfate Soundness										

**Appendix C
Summary of Laboratory Soil Test Data**

Project Name: Dillingham Airport Runway Improvements

Project No.: 102964-001

Sampled By: Forrest Dobson

Station	46+83	30+62	30+62	30+62	30+62	30+62	30+62	30+62	14+06	14+06	14+06
Offset (feet)	245 ft LOC	250 ft LOC	250 ft LOC	250 ft LOC	250 ft LOC	250 ft LOC	250 ft LOC	250 ft LOC	245 ft LOC	245 ft LOC	245 ft LOC
Depth (feet below ground surface)	35	0	10	15	20	26	30	0	5	10	
Test Hole Number	TH19-07	TH19-08	TH19-08	TH19-08	TH19-08	TH19-08	TH19-08	TH19-09	TH19-09	TH19-09	
Sample Number	S9	S1	S3	S4	S5	S6	S7	S1	S2	S3	
Date Sampled (mm/dd/yy)	03/28/19	03/29/19	03/29/19	03/29/19	03/29/19	03/29/19	03/29/19	03/29/19	03/29/19	03/29/19	
Field Boring Number	B-07	B-08	B-08	B-08	B-08	B-08	B-08	B-09	B-09	B-09	
Percent Passing Sieve Size	3"										
	2"										
	1.5"	100									
	1"	95						100			
	0.75"	90						100	94		
	0.5"	76						98	78		
	0.375"	64						97	68		
	0.25"										
	#4	49						96	47		
	#8	38						95	34		
	#10										
	#16	29						94	26		
	#30	19						94	19		
	#40										
	#50	13						93	14		
	#100	9						93	12		
#200	6.9						92.6	10.1			
DOTTSD											
AASHTO Class											
FSV Class											
Liquid Limit						21	38				
Plastic Index						2	13				
Moisture Content %	10.5	24.0	24.9	28.2	45.9	20.9	24.7	6.9	24.0	25.3	
Organic Content %											
% Gravel	51						4	53			
% Sand	43						3	37			
% Silt & Clay (Fines or p200)	7						93	10			
Max. Dry Density											
Opt. Moisture %											
Sp.G. Fine											
Compression Index C _c							0.1212				
Coeff. Of Consolidation C _v							0.01227				
Sulfate Soundness											

**Appendix C
Summary of Laboratory Soil Test Data**

Project Name: Dillingham Airport Runway Improvements

Project No.: 102964-001

Sampled By: Forrest Dobson

Station	14+06	14+06	14+06	14+06	14+06	14+06	11+78	11+78	11+78	11+78
Offset (feet)	245 ft LOC	245 ft LOC	245 ft LOC	245 ft LOC	245 ft LOC	245 ft LOC	95 ft LOC	95 ft LOC	95 ft LOC	95 ft LOC
Depth (feet below ground surface)	15	20	20.5	21	21.5	25	2	5	10	15
Test Hole Number	TH19-09	TH19-09	TH19-09	TH19-09	TH19-09	TH19-09	TH19-10	TH19-10	TH19-10	TH19-10
Sample Number	S4	S5	S5	S5	S5	S6	S1	S2	S3	S4
Date Sampled (mm/dd/yy)	03/29/19	03/29/19	03/29/19	03/29/19	03/29/19	03/29/19	03/29/19	03/29/19	03/29/19	03/29/19
Field Boring Number	B-09	B-09	B-09	B-09	B-09	B-09	B-10	B-10	B-10	B-10
Percent Passing Sieve Size	3"	75mm								
	2"	50mm								
	1.5"	37.5mm								
	1"	25mm					100			
	0.75"	19mm					99			
	0.5"	12.5mm					91			100
	0.375"	9.5mm					79			100
	0.25"	6.3mm								
	#4	4.75mm					54			98
	#8	2.36mm					40			97
	#10	2mm								
	#16	1.18mm					29			95
	#30	0.6mm					21			93
	#40	0.425mm								
	#50	0.3mm					17			92
#100	0.15mm					14			91	
#200	0.075mm	94.7				12.2			89.4	
DOTTSD										
AASHTO Class										
FSV Class										
Liquid Limit										
Plastic Index										
Moisture Content %	25.1	20.9	21.6	35.9	41.0	23.9	3.8	3.5	4.5	25.5
Organic Content %				20.0						
% Gravel							46			2
% Sand							42			9
% Silt & Clay (Fines or p200)	95						12			89
Max. Dry Density										
Opt. Moisture %										
Sp.G. Fine										
Compression Index C _c										
Coeff. Of Consolidation C _v										
Sulfate Soundness										

**Appendix C
Summary of Laboratory Soil Test Data**

Project Name: Dillingham Airport Runway Improvements

Project No.: 102964-001

Sampled By: Forrest Dobson

Station	11+78	11+78	21+96	21+96	21+96	21+96	21+96	21+96	55+05	55+05	55+05
Offset (feet)	95 ft LOC	95 ft LOC	240 ft LOC	240 ft LOC	240 ft LOC	240 ft LOC	240 ft LOC	240 ft LOC	410 ft ROC	410 ft ROC	410 ft ROC
Depth (feet below ground surface)	20	25	0	5	10	16	20	0	2.5	5	5
Test Hole Number	TH19-10	TH19-10	TH19-11	TH19-11	TH19-11	TH19-11	TH19-11	TH19-11	TH19-12	TH19-12	TH19-12
Sample Number	S5	S6	S1	S2	S3	S4	S5	S1	S2	S3	S3
Date Sampled (mm/dd/yy)	03/29/19	03/29/19	03/29/19	03/29/19	03/29/19	03/29/19	03/29/19	03/29/19	03/30/19	03/30/19	03/30/19
Field Boring Number	B-10	B-10	B-11	B-11	B-11	B-11	B-11	B-11	B-12	B-12	B-12
Percent Passing Sieve Size	3"	75mm									
	2"	50mm									
	1.5"	37.5mm									
	1"	25mm									
	0.75"	19mm									
	0.5"	12.5mm						100			
	0.375"	9.5mm						90			
	0.25"	6.3mm						85			
	#4	4.75mm									
	#8	2.36mm							67		
	#10	2mm							56		
	#16	1.18mm									
	#30	0.6mm							49		
	#40	0.425mm							43		
	#50	0.3mm									
	#100	0.15mm							35		
#200	0.075mm							29			
		26.6									
DOTTSD											
AASHTO Class											
FSV Class											
Liquid Limit								25			
Plastic Index								5			
Moisture Content %	27.4	7.9	10.6	22.5	23.3	21.6	9.0	46.4	27.6	28.5	
Organic Content %											
% Gravel		33									
% Sand		40									
% Silt & Clay (Fines or p200)		27									
Max. Dry Density											
Opt. Moisture %											
Sp.G. Fine											
Compression Index C _c								0.1214			
Coeff. Of Consolidation C _v								0.03157			
Sulfate Soundness											

**Appendix C
Summary of Laboratory Soil Test Data**

Project Name: Dillingham Airport Runway Improvements

Project No.: 102964-100

Sampled By: Forrest Dobson

Station	55+05	55+05	55+05	55+05	55+05	55+05	55+05	55+05	55+05	55+05	56+85
Offset (feet)	410 ft ROC	410 ft ROC	410 ft ROC	410 ft ROC	410 ft ROC	410 ft ROC	410 ft ROC	410 ft ROC	410 ft ROC	410 ft ROC	340 ft ROC
Depth (feet below ground surface)	7.5	10	15	20	25	28	28.5	29	40		0
Test Hole Number	TH19-12	TH19-12	TH19-12	TH19-12	TH19-12	TH19-12	TH19-12	TH19-12	TH19-12	TH19-12	TH19-13
Sample Number	S4	S5	S6	S7	S8	S9	S9	S9	S9	S10	S1
Date Sampled (mm/dd/yy)	03/30/19	03/30/19	03/30/19	03/30/19	03/30/19	03/30/19	03/30/19	03/30/19	03/30/19	03/30/19	03/30/19
Field Boring Number	B-12	B-12	B-12	B-12	B-12	B-12	B-12	B-12	B-12	B-12	B-13
Percent Passing Sieve Size	3"										
	2"										
	1.5"										
	1"										
	0.75"										
	0.5"										
	0.375"					100					
	0.25"					100					
	#4										
	#8					98					
	#10					96					
	#16										
	#30					95					
	#40					94					
	#50										
	#100					93					
#200					90						
					84.2						
DOTTSD											
AASHTO Class											
FSV Class											
Liquid Limit											
Plastic Index											
Moisture Content %	22.4	25.4	24.7	22.9	24.5	19.6	21.4	19.8	22.1	50.7	
Organic Content %											
% Gravel					2						
% Sand					14						
% Silt & Clay (Fines or p200)					84						
Max. Dry Density											
Opt. Moisture %											
Sp.G. Fine											
Compression Index C _c											
Coeff. Of Consolidation C _v											
Sulfate Soundness											

**Appendix C
Summary of Laboratory Soil Test Data**

Project Name: Dillingham Airport Runway Improvements

Project No.: 102964-001

Sampled By: Forrest Dobson

Station	56+85	56+85	56+85	56+85	56+85	56+85	56+85	56+85	56+85	58+59
Offset (feet)	340 ft ROC	340 ft ROC	340 ft ROC	340 ft ROC	340 ft ROC	340 ft ROC	340 ft ROC	340 ft ROC	340 ft ROC	365 ft ROC
Depth (feet below ground surface)	2.5	5	7.5	10	15	15.5	16	16.5	20	0
Test Hole Number	TH19-13	TH19-13	TH19-13	TH19-13	TH19-13	TH19-13	TH19-13	TH19-13	TH19-13	TH19-14
Sample Number	S2	S3	S4	S5	S6	S6	S6	S6	S7	S1
Date Sampled (mm/dd/yy)	03/30/19	03/30/19	03/30/19	03/30/19	03/30/19	03/30/19	03/30/19	03/30/19	03/30/19	03/30/19
Field Boring Number	B-13	B-13	B-13	B-13	B-13	B-13	B-13	B-13	B-13	B-14
Percent Passing Sieve Size	3"									
	2"									
	1.5"									
	1"									
	0.75"								100	
	0.5"								99	
	0.375"								94	
	0.25"									
	#4									
	#8									80
	#10									68
	#16									
	#30									60
	#40									50
	#50									
	#100									38
#200									27	
									20.5	
DOTTSD										
AASHTO Class										
FSV Class										
Liquid Limit										
Plastic Index										
Moisture Content %	25.4	23.7	25.7	22.0	19.8	25.6	24.7	22.7	12.6	43.6
Organic Content %										
% Gravel									20	
% Sand									59	
% Silt & Clay (Fines or p200)									21	
Max. Dry Density										
Opt. Moisture %										
Sp.G. Fine										
Compression Index C _c										
Coeff. Of Consolidation C _v										
Sulfate Soundness										

**Appendix C
Summary of Laboratory Soil Test Data**

Project Name: Dillingham Airport Runway Improvements

Project No.: 102964-001

Sampled By: Forrest Dobson

Station	58+59	58+59	58+59	58+59	58+59	58+59	58+59	58+59	58+59	58+59
Offset (feet)	365 ft ROC	365 ft ROC	365 ft ROC	365 ft ROC	365 ft ROC	365 ft ROC	365 ft ROC	365 ft ROC	365 ft ROC	365 ft ROC
Depth (feet below ground surface)	2.5	5	7.5	10	16	20	25	30	35	40
Test Hole Number	TH19-14	TH19-14	TH19-14	TH19-14	TH19-14	TH19-14	TH19-14	TH19-14	TH19-14	TH19-14
Sample Number	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11
Date Sampled (mm/dd/yy)	03/30/19	03/30/19	03/30/19	03/30/19	03/30/19	03/30/19	03/30/19	03/30/19	03/30/19	03/30/19
Field Boring Number	B-14	B-14	B-14	B-14	B-14	B-14	B-14	B-14	B-14	B-14
Percent Passing Sieve Size	3"									
	2"									
	1.5"									
	1"									
	0.75"									
	0.5"									
	0.375"							100		
	0.25"							92		
	#4									
	#8							85		
	#10							81		
	#16									
	#30							77		
	#40							76		
	#50									
	#100							74		
#200							73			
							70.9			
									77.2	
DOTTSD										
AASHTO Class										
FSV Class										
Liquid Limit					34			29		
Plastic Index					1			10		
Moisture Content %	29.8	25.9	31.5	24.0	33.5	16.7	20.5	22.9	21.6	19.2
Organic Content %										
% Gravel							15			
% Sand							15			
% Silt & Clay (Fines or p200)							71			77
Max. Dry Density										
Opt. Moisture %										
Sp.G. Fine										
Compression Index C _c					0.1625					
Coeff. Of Consolidation C _v					0.00712					
Sulfate Soundness										

**Appendix C
Summary of Laboratory Soil Test Data**

Project Name: Dillingham Airport Runway Improvements

Project No.: 102964-001

Sampled By: Forrest Dobson

Station	60+13	60+13	60+13	60+13	60+13	60+13	60+13	60+13	60+13	60+13
Offset (feet)	415 ft ROC	415 ft ROC	415 ft ROC	415 ft ROC	415 ft ROC	415 ft ROC	415 ft ROC	415 ft ROC	415 ft ROC	415 ft ROC
Depth (feet below ground surface)	0	2.5	5	7.5	10	15	20	26	30	35
Test Hole Number	TH19-15	TH19-15	TH19-15	TH19-15	TH19-15	TH19-15	TH19-15	TH19-15	TH19-15	TH19-15
Sample Number	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
Date Sampled (mm/dd/yy)	03/30/19	03/30/19	03/30/19	03/30/19	03/30/19	03/30/19	03/30/19	03/30/19	03/30/19	03/30/19
Field Boring Number	B-15	B-15	B-15	B-15	B-15	B-15	B-15	B-15	B-15	B-15
Percent Passing Sieve Size	3"									
	2"									
	1.5"									
	1"									
	0.75"									
	0.5"									
	0.375"									
	0.25"									
	#4									
	#8									
	#10									
	#16									
	#30									
	#40									
	#50									
	#100									
	#200		97.4					93.0		
DOTTSD										
AASHTO Class										
FSV Class										
Liquid Limit								21		
Plastic Index								3		
Moisture Content %	47.7	37.1	29.2	24.9	22.8	24.3	35.2	21.2	22.1	17.2
Organic Content %										
% Gravel										
% Sand										
% Silt & Clay (Fines or p200)		97					93			
Max. Dry Density										
Opt. Moisture %										
Sp.G. Fine										
Compression Index C _c								0.1003		
Coeff. Of Consolidation C _v								0.02218		
Sulfate Soundness										

**Appendix C
Summary of Laboratory Soil Test Data**

Project Name: Dillingham Airport Runway Improvements

Project No.: 102964-001

Sampled By: Forrest Dobson

Station	23+83	23+83	23+83	23+83	23+83	23+83	23+83	23+83	45+37	45+37
Offset (feet)	140 ft LOC	140 ft LOC	140 ft LOC	140 ft LOC	140 ft LOC	140 ft LOC	140 ft LOC	140 ft LOC	405 ft LOC	405 ft LOC
Depth (feet below ground surface)	1	3	5	7.5	10	15	20	25	0	2.5
Test Hole Number	TH19-16	TH19-16	TH19-16	TH19-16	TH19-16	TH19-16	TH19-16	TH19-16	TH19-17	TH19-17
Sample Number	S1	S2	S3	S4	S5	S6	S7	S8	S1	S2
Date Sampled (mm/dd/yy)	03/31/19	03/31/19	03/31/19	03/31/19	03/31/19	03/31/19	03/31/19	03/31/19	03/31/19	03/31/19
Field Boring Number	B-16	B-16	B-16	B-16	B-16	B-16	B-16	B-16	B-17	B-17
Percent Passing Sieve Size	3"									
	2"									
	1.5"							100		
	1"	100						90		
	0.75"	99						87		
	0.5"	95						81		
	0.375"	91						73		
	0.25"									
	#4	69						52		
	#8	49						37		
	#10									
	#16	37						26		
	#30	27						20		
	#40									
	#50	22						13		
#100	18						8			
#200	14.9						6.2			
DOTTSD										
AASHTO Class										
FSV Class										
Liquid Limit										
Plastic Index										
Moisture Content %	5.4	5.3	3.6	2.4	7.6	23.0	17.9	3.0	67.6	74.2
Organic Content %										11.5
% Gravel	31							48		
% Sand	54							46		
% Silt & Clay (Fines or p200)	15							6		
Max. Dry Density										
Opt. Moisture %										
Sp.G. Fine										
Compression Index C _c										
Coeff. Of Consolidation C _v										
Sulfate Soundness										

**Appendix C
Summary of Laboratory Soil Test Data**

Project Name: Dillingham Airport Runway Improvements

Project No.: 102964-001

Sampled By: Forrest Dobson

Station	45+37	45+37	45+37	45+37	45+37	45+37	45+37	61+76	61+76	61+76
Offset (feet)	405 ft LOC	405 ft LOC	405 ft LOC	405 ft LOC	405 ft LOC	405 ft LOC	405 ft LOC	95 ft LOC	95 ft LOC	95 ft LOC
Depth (feet below ground surface)	5	7.5	10	16	20	25	30	0	2.5	5
Test Hole Number	TH19-17	TH19-17	TH19-17	TH19-17	TH19-17	TH19-17	TH19-17	TH19-18	TH19-18	TH19-18
Sample Number	S3	S4	S5	S6	S7	S8	S9	S1	S2	S3
Date Sampled (mm/dd/yy)	03/31/19	03/31/19	03/31/19	03/31/19	03/31/19	03/31/19	03/31/19	03/31/19	03/31/19	03/31/19
Field Boring Number	B-17	B-17	B-17	B-17	B-17	B-17	B-17	B-18	B-18	B-18
Percent Passing Sieve Size	3"	75mm								
	2"	50mm								
	1.5"	37.5mm								
	1"	25mm								
	0.75"	19mm				100				
	0.5"	12.5mm				98				
	0.375"	9.5mm				98				
	0.25"	6.3mm								
	#4	4.75mm				94				
	#8	2.36mm				92				
	#10	2mm								
	#16	1.18mm				91				
	#30	0.6mm				89				
	#40	0.425mm								
	#50	0.3mm				87				
	#100	0.15mm				85				
#200	0.075mm				83.7					
DOTTSD										
AASHTO Class										
FSV Class										
Liquid Limit				25						
Plastic Index				-1						
Moisture Content %	36.5	29.7	27.8	27.6	28.7	22.9	14.9	5.0	3.2	3.6
Organic Content %										
% Gravel						6				
% Sand						11				
% Silt & Clay (Fines or p200)						84				
Max. Dry Density										
Opt. Moisture %										
Sp.G. Fine										
Compression Index C _c				0.0644						
Coeff. Of Consolidation C _v				0.00797						
Sulfate Soundness										

Appendix C
Summary of Laboratory Soil Test Data

Project Name: Dillingham Airport Runway Improvements

Project No.: 102964-001

Sampled By: Forrest Dobson

Station	61+76	61+76	61+76	61+76	61+76	61+76	61+76	61+76	53+48	53+48	53+48
Offset (feet)	95 ft LOC	95 ft LOC	95 ft LOC	95 ft LOC	95 ft LOC	95 ft LOC	95 ft LOC	95 ft LOC	250 ft LOC	250 ft LOC	250 ft LOC
Depth (feet below ground surface)	7.5	10	15	20	30	35	40	0	2.5	5	
Test Hole Number	TH19-18	TH19-18	TH19-18	TH19-18	TH19-18	TH19-18	TH19-18	TH19-18	TH19-19	TH19-19	TH19-19
Sample Number	S4	S5	S6	S7	S9	S10	S11	S1	S2	S3	
Date Sampled (mm/dd/yy)	03/31/19	03/31/19	03/31/19	03/31/19	03/31/19	03/31/19	03/31/19	04/01/19	04/01/19	04/01/19	
Field Boring Number	B-18	B-18	B-18	B-18	B-18	B-18	B-18	B-18	B-19	B-19	B-19
Percent Passing Sieve Size	3"	75mm									
	2"	50mm									
	1.5"	37.5mm	100						100		
	1"	25mm	97						85		
	0.75"	19mm	94						81		
	0.5"	12.5mm	87						72		
	0.375"	9.5mm	81				100		66		
	0.25"	6.3mm									
	#4	4.75mm	64				100		50		
	#8	2.36mm	49				100		37		
	#10	2mm									
	#16	1.18mm	37				99		27		
	#30	0.6mm	29				99		19		
	#40	0.425mm									
#50	0.3mm	21				98		14			
#100	0.15mm	17				75		11			
#200	0.075mm	14.3				38.2		8.9			
DOTTSD											
AASHTO Class											
FSV Class											
Liquid Limit					24						
Plastic Index					5						
Moisture Content %	4.7	3.0	29.6	25.3	23.7	23.4	23.3	3.4	4.5	5.2	
Organic Content %											
% Gravel	37						0		50		
% Sand	49						62		41		
% Silt & Clay (Fines or p200)	14						38		9		
Max. Dry Density											
Opt. Moisture %											
Sp.G. Fine											
Compression Index C _c											
Coeff. Of Consolidation C _v											
Sulfate Soundness											

**Appendix C
Summary of Laboratory Soil Test Data**

Project Name: Dillingham Airport Runway Improvements

Project No.: 102964-001

Sampled By: Forrest Dobson

Station	53+48	53+48	53+48	53+48	53+48	53+48	53+48	43+24	43+24	43+24
Offset (feet)	250 ft LOC	250 ft LOC	250 ft LOC	250 ft LOC	250 ft LOC	250 ft LOC	250 ft LOC	240 ft LOC	240 ft LOC	240 ft LOC
Depth (feet below ground surface)	7.5	10	15	20	25.6	30	35	0	2.5	5
Test Hole Number	TH19-19	TH19-19	TH19-19	TH19-19	TH19-19	TH19-19	TH19-19	TH19-20	TH19-20	TH19-20
Sample Number	S4	S5	S6	S7	S8	S9	S10	S1	S2	S3
Date Sampled (mm/dd/yy)	04/01/19	04/01/19	04/01/19	04/01/19	04/01/19	04/01/19	04/01/19	04/01/19	04/01/19	04/01/19
Field Boring Number	B-19	B-19	B-19	B-19	B-19	B-19	B-19	B-20	B-20	B-20
Percent Passing Sieve Size	3"									
	2"									
	1.5"							100		
	1"						100	96		
	0.75"						97	93		
	0.5"						95	81		
	0.375"						93	72		
	0.25"									
	#4									
	#8						85	55		
	#10						78	43		
	#16									
	#30						73	36		
	#40						69	30		
	#50									
	#100						66	25		
	#200						62	23		
						56.7	21.2			
DOTTSD										
AASHTO Class										
FSV Class										
Liquid Limit					25					
Plastic Index					-2					
Moisture Content %	4.3	4.4	58.9	21.5	26.0	40.2	24.5	8.1	25.0	23.3
Organic Content %										
% Gravel							15	45		
% Sand							28	34		
% Silt & Clay (Fines or p200)							57	21		
Max. Dry Density										
Opt. Moisture %										
Sp.G. Fine										
Compression Index C _c					0.0644					
Coeff. Of Consolidation C _v					0.00797					
Sulfate Soundness										

**Appendix C
Summary of Laboratory Soil Test Data**

Project Name: Dillingham Airport Runway Improvements

Project No.: 102964-001

Sampled By: Forrest Dobson

Station	43+24	43+24	43+24	43+24	43+24	60+66	60+66	60+66	60+66	60+66
Offset (feet)	240 ft LOC	240 ft LOC	240 ft LOC	240 ft LOC	240 ft LOC	800 ft LOC	800 ft LOC	800 ft LOC	800 ft LOC	800 ft LOC
Depth (feet below ground surface)	7.5	10	15	15.5	17.5	0	2.5	5	7.5	10
Test Hole Number	TH19-20	TH19-20	TH19-20	TH19-20	TH19-20	TH19-21	TH19-21	TH19-21	TH19-21	TH19-21
Sample Number	S4	S5	S6	S6	S7	S1	S2	S3B	S4	S5
Date Sampled (mm/dd/yy)	04/01/19	04/01/19	04/01/19	04/01/19	04/01/19	04/01/19	04/01/19	04/01/19	04/01/19	04/01/19
Field Boring Number	B-20	B-20	B-20	B-20	B-20	B-21	B-21	B-21	B-21	B-21
Percent Passing Sieve Size	3"									
	2"									
	1.5"									
	1"									
	0.75"					100				
	0.5"					88				
	0.375"					82				
	0.25"									
	#4					62				
	#8					47				
	#10									
	#16					36				
	#30					28				
	#40									
	#50					22				
#100					16					
#200					12.2					
DOTTSD										
AASHTO Class										
FSV Class										
Liquid Limit										26
Plastic Index										2
Moisture Content %	25.1	24.9	18.9	21.1	5.2	97.9	52.1	37.0	25.1	28.5
Organic Content %						22.1				
% Gravel						38				
% Sand						50				
% Silt & Clay (Fines or p200)						12				
Max. Dry Density										
Opt. Moisture %										
Sp.G. Fine										
Compression Index C _c										
Coeff. Of Consolidation C _v										
Sulfate Soundness										

**Appendix C
Summary of Laboratory Soil Test Data**

Project Name: Dillingham Airport Runway Improvements

Project No.: 102964-001

Sampled By: Forrest Dobson

Station	60+66	60+66	73+79	73+79	73+79	73+79	73+79	73+79	73+79	73+79
Offset (feet)	800 ft LOC	800 ft LOC	125 ft LOC	125 ft LOC	125 ft LOC	125 ft LOC	125 ft LOC	125 ft LOC	125 ft LOC	125 ft LOC
Depth (feet below ground surface)	15	15.5	0	2.5	5	7.5	10	15	15.5	20
Test Hole Number	TH19-21	TH19-21	TH19-22	TH19-22	TH19-22	TH19-22	TH19-22	TH19-22	TH19-22	TH19-22
Sample Number	S6A	S6B	S1	S2	S3	S4	S5	S6A	S6B	S7A
Date Sampled (mm/dd/yy)	04/01/19	04/01/19	04/02/19	04/02/19	04/02/19	04/02/19	04/02/19	04/02/19	04/02/19	04/02/19
Field Boring Number	B-21	B-21	B-22	B-22	B-22	B-22	B-22	B-22	B-22	B-22
Percent Passing Sieve Size	3"	75mm								
	2"	50mm								
	1.5"	37.5mm								
	1"	25mm		100			100			
	0.75"	19mm		99			95			
	0.5"	12.5mm		90			83			
	0.375"	9.5mm		85			76			
	0.25"	6.3mm								
	#4	4.75mm		59			60			
	#8	2.36mm		39			47			
	#10	2mm								
	#16	1.18mm		28			37			
	#30	0.6mm		22			29			
	#40	0.425mm								
	#50	0.3mm		17			23			
#100	0.15mm		14			18				
#200	0.075mm		11.4			14.9				
DOTTSD										
AASHTO Class										
FSV Class										
Liquid Limit										
Plastic Index										
Moisture Content %	23.9	8.1	4.6	4.6	4.4	4.3	4.8	6.4	6.1	7.9
Organic Content %										
% Gravel			41				40			
% Sand			48				46			
% Silt & Clay (Fines or p200)			11				15			
Max. Dry Density										
Opt. Moisture %										
Sp.G. Fine										
Compression Index C _c										
Coeff. Of Consolidation C _v										
Sulfate Soundness										

**Appendix C
Summary of Laboratory Soil Test Data**

Project Name: Dillingham Airport Runway Improvements

Project No.: 102964-001

Sampled By: Forrest Dobson

Station	73+79	73+79	73+79	73+79	64+25	64+25	64+25	64+25	64+25	64+25
Offset (feet)	125 ft LOC	125 ft LOC	125 ft LOC	125 ft LOC	740 ft LOC	740 ft LOC	740 ft LOC	740 ft LOC	740 ft LOC	740 ft LOC
Depth (feet below ground surface)	21.3	25	25.4	30	0	2.5	5	7.5	10	20
Test Hole Number	TH19-22	TH19-22	TH19-22	TH19-22	TH19-23	TH19-23	TH19-23	TH19-23	TH19-23	TH19-23
Sample Number	S7B	S8A	S8B	S9	S1	S2	S3	S4	S5	S7
Date Sampled (mm/dd/yy)	04/02/19	04/02/19	04/02/19	04/02/19	04/02/19	04/02/19	04/02/19	04/02/19	04/02/19	04/02/19
Field Boring Number	B-22	B-22	B-22	B-22	B-23	B-23	B-23	B-23	B-23	B-23
Percent Passing Sieve Size	3"	75mm								
	2"	50mm								
	1.5"	37.5mm								
	1"	25mm								
	0.75"	19mm								
	0.5"	12.5mm								
	0.375"	9.5mm								
	0.25"	6.3mm								
	#4	4.75mm								
	#8	2.36mm								
	#10	2mm								
	#16	1.18mm								
	#30	0.6mm								
	#40	0.425mm								
	#50	0.3mm								
	#100	0.15mm								
#200	0.075mm					66.6				
DOTTSD										
AASHTO Class										
FSV Class										
Liquid Limit										
Plastic Index										
Moisture Content %	58.1	13.3	127.7	25.3	10.4	6.7	29.1	23.9	23.6	34.5
Organic Content %			43.4							
% Gravel										
% Sand										
% Silt & Clay (Fines or p200)							67			
Max. Dry Density										
Opt. Moisture %										
Sp.G. Fine										
Compression Index C _c										
Coeff. Of Consolidation C _v										
Sulfate Soundness										

**Appendix C
Summary of Laboratory Soil Test Data**

Project Name: Dillingham Airport Runway Improvements

Project No.: 102964-001

Sampled By: Forrest Dobson

Station	64+25	64+25	61+76	61+76	61+76	61+76	61+76	61+76	61+76	61+76
Offset (feet)	740 ft LOC	740 ft LOC	380 ft LOC	380 ft LOC	380 ft LOC	380 ft LOC	380 ft LOC	380 ft LOC	380 ft LOC	380 ft LOC
Depth (feet below ground surface)	25	30	0	2.5	5	7.5	8.3	10	15	19
Test Hole Number	TH19-23	TH19-23	TH19-24	TH19-24	TH19-24	TH19-24	TH19-24	TH19-24	TH19-24	TH19-24
Sample Number	S8	S9	S1	S2	S3	S4A	S4B	S5	S6	S7
Date Sampled (mm/dd/yy)	04/02/19	04/02/19	04/02/19	04/02/19	04/02/19	04/02/19	04/02/19	04/02/19	04/02/19	04/02/19
Field Boring Number	B-23	B-23	B-24	B-24	B-24	B-24	B-24	B-24	B-24	B-24
Percent Passing Sieve Size	3"	75mm								
	2"	50mm								
	1.5"	37.5mm								
	1"	25mm								
	0.75"	19mm								
	0.5"	12.5mm								
	0.375"	9.5mm								
	0.25"	6.3mm								
	#4	4.75mm								
	#8	2.36mm								
	#10	2mm								
	#16	1.18mm								
	#30	0.6mm								
	#40	0.425mm								
	#50	0.3mm								
	#100	0.15mm								
#200	0.075mm									
DOTTSD										
AASHTO Class										
FSV Class										
Liquid Limit		39								24
Plastic Index		17								-2
Moisture Content %	31.8	33.6	17.1	12.9	16.2	28.9	84.5	29.2	20.4	24.8
Organic Content %										
% Gravel										
% Sand										
% Silt & Clay (Fines or p200)										
Max. Dry Density										
Opt. Moisture %										
Sp.G. Fine										
Compression Index C _c										0.0648
Coeff. Of Consolidation C _v										0.0152
Sulfate Soundness										

**Appendix C
Summary of Laboratory Soil Test Data**

Project Name: Dillingham Airport Runway Improvements

Project No.: 102964-001

Sampled By: Forrest Dobson

Station	61+76	61+76	57+22	57+22	57+22	57+22	57+22	57+22	57+22	57+22
Offset (feet)	380 ft LOC	380 ft LOC	305 ft LOC	305 ft LOC	305 ft LOC	305 ft LOC	305 ft LOC	305 ft LOC	305 ft LOC	305 ft LOC
Depth (feet below ground surface)	25	30	0	2.5	5	7.5	10.3	10.5	11	11.5
Test Hole Number	TH19-24	TH19-24	TH19-25	TH19-25	TH19-25	TH19-25	TH19-25	TH19-25	TH19-25	TH19-25
Sample Number	S8	S9	S1	S2	S3	S4	S5	S5	S5	S5
Date Sampled (mm/dd/yy)	04/02/19	04/02/19	04/03/19	04/03/19	04/03/19	04/03/19	04/03/19	04/03/19	04/03/19	04/03/19
Field Boring Number	B-24	B-24	B-25	B-25	B-25	B-25	B-25	B-25	B-25	B-25
Percent Passing Sieve Size	3"	75mm								
	2"	50mm								
	1.5"	37.5mm								
	1"	25mm								
	0.75"	19mm								
	0.5"	12.5mm								
	0.375"	9.5mm								
	0.25"	6.3mm								
	#4	4.75mm								
	#8	2.36mm								
	#10	2mm								
	#16	1.18mm								
	#30	0.6mm								
	#40	0.425mm								
	#50	0.3mm								
	#100	0.15mm								
	#200	0.075mm								
DOTTSD										
AASHTO Class										
FSV Class										
Liquid Limit		24								
Plastic Index		6								
Moisture Content %	28.3	17.8	119.6	38.2	30.3	28.3	19.2	19.5	19.5	19.1
Organic Content %										
% Gravel										
% Sand										
% Silt & Clay (Fines or p200)										
Max. Dry Density										
Opt. Moisture %										
Sp.G. Fine										
Compression Index C _c										
Coeff. Of Consolidation C _v										
Sulfate Soundness										

**Appendix C
Summary of Laboratory Soil Test Data**

Project Name: Dillingham Airport Runway Improvements

Project No.: 102964-001

Sampled By: Forrest Dobson

Station	57+22	57+22	57+22	51+80	51+80	51+80	51+80	51+80	51+80	51+80
Offset (feet)	305 ft LOC	305 ft LOC	305 ft LOC	310 ft LOC	310 ft LOC	310 ft LOC	310 ft LOC	310 ft LOC	310 ft LOC	310 ft LOC
Depth (feet below ground surface)	15	20	25	0	2.5	5	10	15	20	25
Test Hole Number	TH19-25	TH19-25	TH19-25	TH19-26	TH19-26	TH19-26	TH19-26	TH19-26	TH19-26	TH19-26
Sample Number	S6	S7	S8	S1	S2	S4	S5	S6	S7	S8
Date Sampled (mm/dd/yy)	04/03/19	04/03/19	04/03/19	04/03/19	04/03/19	04/03/19	04/03/19	04/03/19	04/03/19	04/03/19
Field Boring Number	B-25	B-25	B-25	B-26	B-26	B-26	B-26	B-26	B-26	B-26
Percent Passing Sieve Size	3"	75mm								
	2"	50mm								
	1.5"	37.5mm								
	1"	25mm								
	0.75"	19mm								
	0.5"	12.5mm								
	0.375"	9.5mm								
	0.25"	6.3mm								
	#4	4.75mm								
	#8	2.36mm								
	#10	2mm								
	#16	1.18mm								
	#30	0.6mm								
	#40	0.425mm								
	#50	0.3mm								
	#100	0.15mm								
#200	0.075mm		62.1							
DOTTSD										
AASHTO Class										
FSV Class										
Liquid Limit										
Plastic Index										
Moisture Content %	28.3	36.1	21.1	21.5	52.5	129.3	109.3	25.9	28.7	21.2
Organic Content %						58.1				
% Gravel										
% Sand										
% Silt & Clay (Fines or p200)			62							
Max. Dry Density										
Opt. Moisture %										
Sp.G. Fine										
Compression Index C _c										
Coeff. Of Consolidation C _v										
Sulfate Soundness										

**Appendix C
Summary of Laboratory Soil Test Data**

Project Name: Dillingham Airport Runway Improvements

Project No.: 102964-001

Sampled By: Forrest Dobson

Station		51+80	51+80								
Offset (feet)		310 ft LOC	310 ft LOC								
Depth (feet below ground surface)		25.5	26								
Test Hole Number		TH19-26	TH19-26								
Sample Number		S8	S9								
Date Sampled (mm/dd/yy)		04/03/19	04/03/19								
Field Boring Number		B-26	B-26								
Percent Passing Sieve Size	3"	75mm									
	2"	50mm									
	1.5"	37.5mm									
	1"	25mm		100							
	0.75"	19mm		97							
	0.5"	12.5mm		92							
	0.375"	9.5mm		87							
	0.25"	6.3mm									
	#4	4.75mm		68							
	#8	2.36mm		51							
	#10	2mm									
	#16	1.18mm		37							
	#30	0.6mm		28							
	#40	0.425mm									
	#50	0.3mm		20							
	#100	0.15mm		12							
#200	0.075mm		8.5								
DOTSD											
AASHTO Class											
FSV Class											
Liquid Limit											
Plastic Index											
Moisture Content %		27.2	11.7								
Organic Content %											
% Gravel			32								
% Sand			59								
% Silt & Clay (Fines or p200)			9								
Max. Dry Density											
Opt. Moisture %											
Sp.G. Fine											
Compression Index C _c											
Coeff. Of Consolidation C _v											
Sulfate Soundness											

APPENDIX D

Alaska DOT&PF/CRM 2011 TEST HOLE LOGS



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # [Legend]

PROJECT NUMBER :
PROJECT : TEST HOLE EXPLANATION
NORTHING : 1841632.13162, **EASTING :** 1544278.71613

Station / Location: [coord. syst: Equipment_Type: Drill Rig Total Depth: 19.0 feet
 Offset: NAD83_StatePlane_AK_6_FIPS_5006_Ft] Drilling Method: Drilling Method Date: 1/18/2005 -
 Elevation: Elevation Field Crew: Driller, Helper Geologist: Geologist

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Observed weather conditions	
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	15		15.5
									Time	10:00		13:00
									Date	1/1/04		1/2/04
								Symbol	▼	▽	Surface Vegetation: Observed vegetation conditions in TH vicinity.	

SUBSURFACE MATERIAL

0								MATERIAL NAME (USCS Symbol) -- see Appendix B for complete USCS naming convention	0.0
1						GP		ASPHALT	0.5
2						GW		GRAVEL (GW) , well graded	1.0
3						SP		SAND (SP) , poorly graded	1.5
4						SW		SAND (SW) , well graded	2.0
5						ML		SILT (ML)	2.5
6						OL		ORGANIC SILT (OL)	3.0
7						CL		Lean CLAY (CL)	3.5
8						PT		Peat (PT)	4.0
9								[frozen material]	4.5
10									5.0

11									
12									
13									
14									
15									
16									
17									
18									
19									

SAMPLE DATA EXPLANATION 7.4

8	SPT	1	X		5			Standard Penetration Test Sample 1.4" ID x 2" OD with Uncorrected N-Value	
9	SS	2	X					Split Spoon Sample 2.0" ID x 2.5" OD	
10	MC	3	X					Split Spoon Sample 2.5" ID x 3" OD	
11	GRAB							Grab Sample	
12	AUGER							Auger Cuttings Grab Sample	
13	VANE							Vane Shear Test	
14	ST							Shelby Tube	
15	NR							No Recovery	
16	MS							SNT Sample Not Tested	

Groundwater level while drilling 15.0
 Groundwater level after drilling 15.5

LABORATORY TEST RESULTS EXPLANATION

4308 p200=(passing the #200 sieve)%, Sa=(retained between #200 - #4 sieve)%,
 Gr=(retained between #4 - 3" sieve)%, +3"=(retained between 3" -12" sieve)%,
 +12"=(>12" sieve)%, Moisture=(raw)%, Org=(organic content)%, PI=(Plastic Index,
 NP=nonplastic), LL=(Liquid Limit, NV=No Value), Degradation=#, LA Abrasion=#%,
 Max. Dry Dens=#pcf, Opt. Moisture=#%, Sodium Sulfate Soundness (coarse)=#%,
 Sodium Sulfate Soundness (fine)=#%, p0.0075μ=(from hydrometer smaller than
 0.0075μ)%

Notes: 19.0

This section is for drilling notes and additional equipment descriptions

BOH 19									
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A USCS LOG OF TEST HOLE_59304_LOG_LEGEND.GPJ_2006DATATEMPLATE.GDT_2/27/12



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # 11-701

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1846299.58826, **EASTING** : 1546895.84242

Station / Location:
 Offset:
 Elevation: 57.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 35.0 feet
 Date: 3/2/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			SUBSURFACE MATERIAL
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0									0			G.S. covered by 0.6 ft snowmachine-packed snow over 0.8 ft ice
0									▼			
0												Peat 0.0
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18			0									
19	SPT	BB1 623	0									
20			0			OL						ORGANIC SILT(OL) -19.5

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # 11-701

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1846299.58826, **EASTING** : 1546895.84242

Station / Location:
 Offset:
 Elevation: 57.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 35.0 feet
 Date: 3/2/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			G.S. covered by 0.6 ft snowmachine-packed snow over 0.8 ft ice
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
20									0			SUBSURFACE MATERIAL
21												
22												
23												
24	SPT	BB1624	0 0 1 2			ML		ORGANIC SILT (OL) (cont.) BB1623 (19.6 - 20.1 ft), Moisture=101.1%				-21.0
25								ORGANIC SILT w/ Peat				
26								SILT with Organics (ML)				
27						SM		BB1624 (24.1 - 24.6 ft), Org=3.8%				
28								SILTY SAND (SM)				-26.5
29	SPT	BB1625 [SNT]	2 4 4 6			ML		SILT (ML)				29.0
30												
31												
32												
33						GP		GRAVEL with Sand (GP)				-32.5
34	SPT		3 4 3 4		7							
35								BOH 35				35.0

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # 11-701-A

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
 Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 19.2 feet
 Date: 3/9/2011 -
 Geologist: B. Benko

Station / Location:
 Offset:
 Elevation: 57.0 feet

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			TH objective: VSTs; location: 14.5 ft W of TH 701; G.S. covered by 0.6 ft snowmachine-packed snow over 0.8 ft ice
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0									SUBSURFACE MATERIAL			
0								Peat [REPRODUCTION OF LOG FOR TH 701]				0.0
4	VANE	VST 701-A-1							VST 701-A-1 3.7 - 4.3 ft [3.5-inch diam. vane]: intact undrained shear strength=247 psf; remolded undrained shear strength = 76 psf			
5	VANE	701-A-2							701-A-2 5.1 - 5.6 ft [3.5-inch diam. vane]: intact undrained shear strength=164 psf; remolded undrained shear strength = 153 psf			
8	VANE	VST 701-A-3							VST 701-A-3 7.4 - 7.9 ft [3.5-inch diam. vane]: intact undrained shear strength=200 psf; remolded undrained shear strength = 53 psf			
11	VANE	VST 701-A-4							VST 701-A-4 10.2 - 10.7 ft [3.5-inch diam. vane]: intact undrained shear strength=316 psf; remolded undrained shear strength = 69 psf			
13	VANE	VST 701-A-5							VST 701-A-5 12.8 - 13.3 ft [2.5-inch diam. vane]: intact undrained shear strength=257 psf; remolded undrained shear strength = 69 psf			
16	VANE	VST 701-A-6							VST 701-A-6 15.2 - 15.7 ft [2.5-inch diam. vane]: intact undrained shear strength=276 psf; remolded undrained shear strength = 152 psf			
19	VANE	VST 701-A-7							VST 701-A-7 18.7 - 19.2 ft [2.5-inch diam. vane]: intact undrained shear strength=542 psf; remolded undrained shear strength = 232 psf			19.2
								BOH 19.2				

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

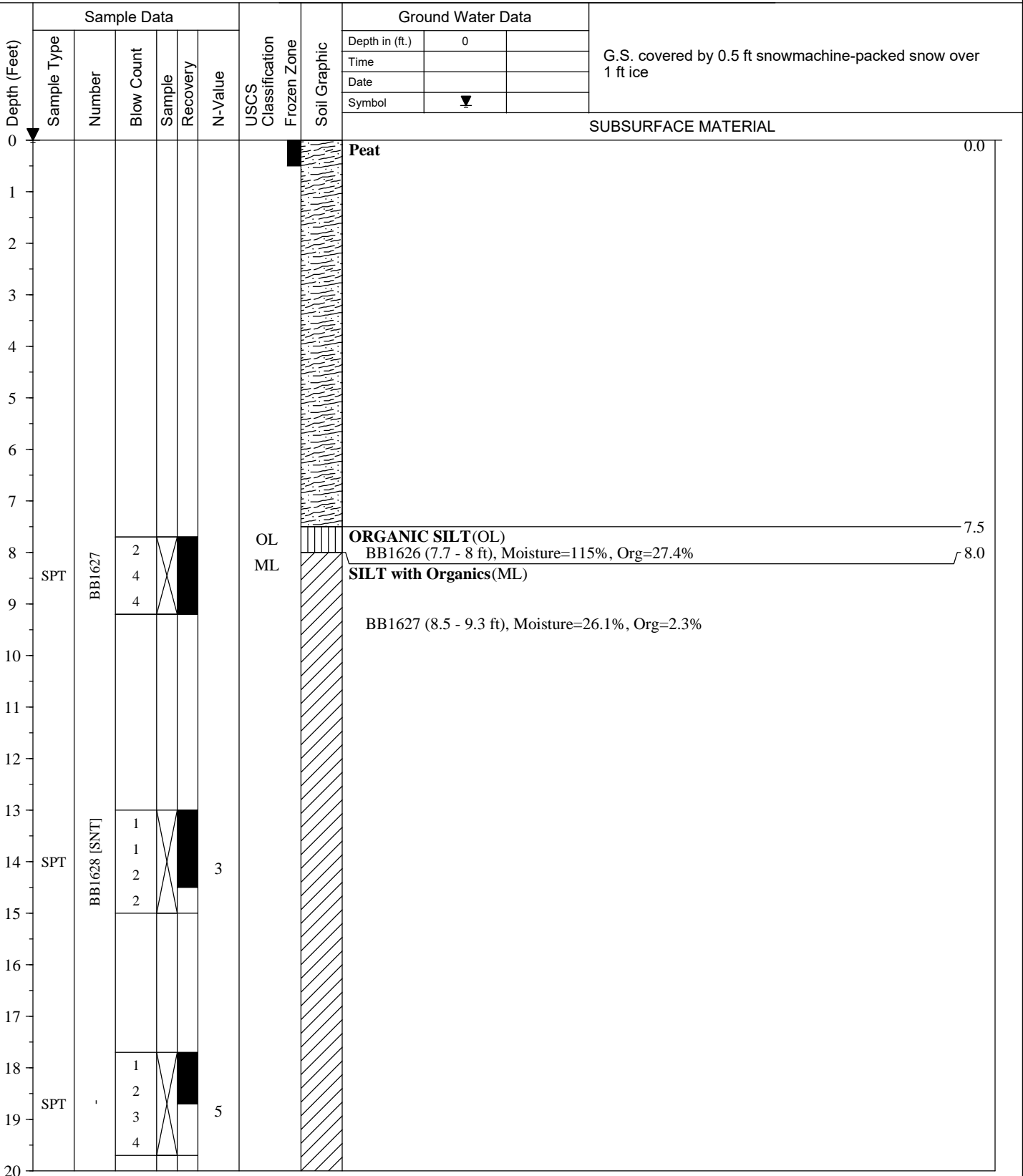
HOLE # 11-702

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1846638.06593, **EASTING** : 1547072.6462

Station / Location:
 Offset:
 Elevation: 59.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 48.0 feet
 Date: 3/2/2011 -
 Geologist: B. Benko



A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12

CME Auto Hammer
 Cathead Rope Method
 140 lb. hammer with 30 in. drop
 340 lb. hammer with 30 in. drop



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # 11-702

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1846638.06593, **EASTING** : 1547072.6462

Station / Location:
 Offset:
 Elevation: 59.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 48.0 feet
 Date: 3/2/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			SUBSURFACE MATERIAL
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
20									0			G.S. covered by 0.5 ft snowmachine-packed snow over 1 ft ice
20-26.5	SPT	BB1629	1 2 3 5	100% 100% 100% 100%	5							SILT with Organics(ML) (cont.)
26.5-28.5						OL						ORGANIC SILT(OL)
28.5-29.5	SPT	BB1630	1 1 3 4	100% 100% 100% 100%	4							BB1630 (28.5 - 29.5 ft) wet prep, Moisture=98.8%, Org=23.1%, PI=NP, LL=NV
29.5-34.5	SPT	BB1632, -1631 [SNT]	2 4 7 9	100% 100% 100% 100%								
34.5-35.5												SILTY ORGANICS
35.5-39						CL-ML						SILTY CLAY (CL-ML)
39-40	SPT	BB1633	0 0 1	100% 100% 100%	1							BB1633 (39 - 40 ft), Moisture=29.7%, PI=7, LL=27

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12

CME Auto Hammer
 Cathead Rope Method
 140 lb. hammer with 30 in. drop
 340 lb. hammer with 30 in. drop



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 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # 11-702

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1846638.06593, **EASTING** : 1547072.6462

Station / Location:
 Offset:
 Elevation: 59.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 48.0 feet
 Date: 3/2/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			SUBSURFACE MATERIAL
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
40			2	X					0			G.S. covered by 0.5 ft snowmachine-packed snow over 1 ft ice
41												
42												
43												
44	SPT	BB1634	1	X								SILTY CLAY (CL-ML) (cont.)
45			1	X	2							
46			1	X								
47			2	X								
48	SPT	BB1635 [SNT]	3	X								GRAVEL with Sand(GW)
			5	X	9							
			4	X								

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ 2006DATATEMPLATE.GDT 2/24/12



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 Geology Section

LOG OF TEST HOLE

HOLE # 11-702-A

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements

Station / Location:
 Offset:
 Elevation: 59.0 feet

Equipment_Type: *Geoprobe 6620DT*
 Drilling Method: *Hollow Stem Auger (8-in.)*
 Field Crew: *[GeoTek AK]*

Total Depth: 40.7 feet
 Date: 3/9/2011 -
 Geologist: *B. Benko*

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			TH objective: targeted intervals for VSTs; location: <5 ft from TH 702; G.S. covered by 0.5 ft snowmachine-packed snow over 1 ft ice; G.S. covered by 0.5 ft snowmachine-packed snow over 1 ft ice	
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date		Symbol
0													
0.0								Peat [REPRODUCTION OF LOG FOR TH 702]					
4.6 - 5.1	VANE	VST702-A-1											VST702-A-1 4.6 - 5.1 ft [2.5-inch diam. vane]: intact undrained shear strength=470 psf; remolded undrained shear strength = 176 psf
7.5						OL		ORGANIC SILT(OL)					
8.0						ML		SILT with Organics(ML)					
12.2 - 12.7	VANE	VST702-A-2											VST702-A-2 12.2 - 12.7 ft [2.5-inch diam. vane]: intact undrained shear strength=>2172 psf ,no shear
15.2 - 15.7	VANE	VST702-A-3											VST702-A-3 15.2 - 15.7 ft [2.5-inch diam. vane]: intact undrained shear strength=865 psf; remolded undrained shear strength = 214 psf
20													

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12

CME Auto Hammer
 Cathead Rope Method
 140 lb. hammer with 30 in. drop
 340 lb. hammer with 30 in. drop



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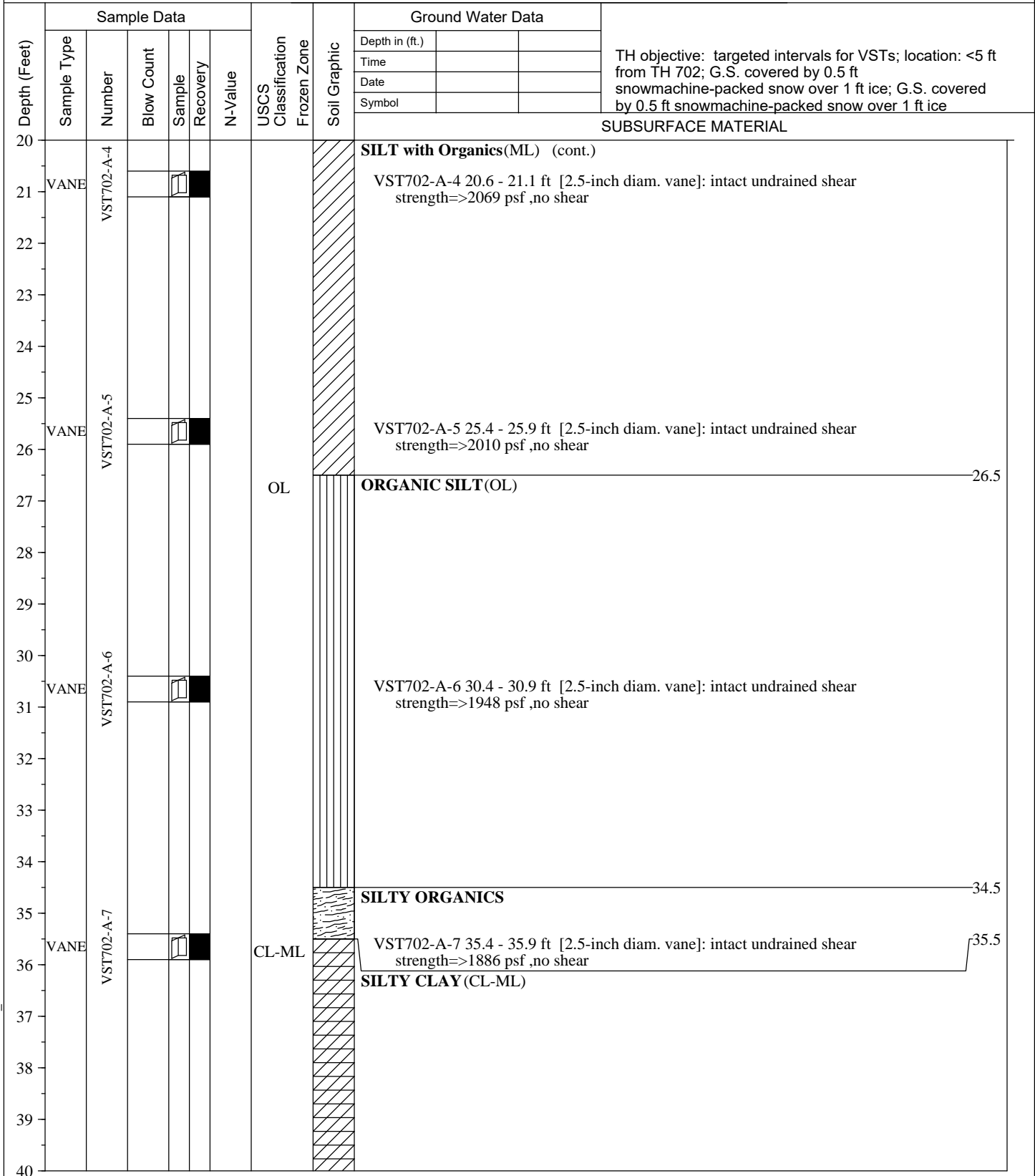
LOG OF TEST HOLE

HOLE # 11-702-A

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
 Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 40.7 feet
 Date: 3/9/2011 -
 Geologist: B. Benko

Station / Location:
 Offset:
 Elevation: 59.0 feet



A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12

CME Auto Hammer
 Cathead Rope Method
 140 lb. hammer with 30 in. drop
 340 lb. hammer with 30 in. drop



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LOG OF TEST HOLE

HOLE # 11-702-A

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements

Station / Location:
 Offset:
 Elevation: 59.0 feet

Equipment_Type: *Geoprobe 6620DT*
 Drilling Method: *Hollow Stem Auger (8-in.)*
 Field Crew: *[GeoTek AK]*

Total Depth: *40.7 feet*
 Date: *3/9/2011* -
 Geologist: *B. Benko*

Depth (Feet)	Sample Data						USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			TH objective: targeted intervals for VSTs; location: <5 ft from TH 702; G.S. covered by 0.5 ft snowmachine-packed snow over 1 ft ice; G.S. covered by 0.5 ft snowmachine-packed snow over 1 ft ice
	Sample Type	Number	Blow Count	Sample Recovery	N-Value	Depth in (ft.)				Time	Date	Symbol	
40	VANE	VST702-A-8							SUBSURFACE MATERIAL				
								BOH 40.7	SILTY CLAY (CL-ML) (cont.) VST702-A-8 40.2 - 40.7 ft [2.5-inch diam. vane]: intact undrained shear strength=>1826 psf ,no shear			40.7	

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ 2006DATATEMPLATE.GDT 2/24/12

- CME Auto Hammer
- Cathead Rope Method
- 140 lb. hammer with 30 in. drop
- 340 lb. hammer with 30 in. drop



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LOG OF TEST HOLE

HOLE # 11-703

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1843538.20107, **EASTING** : 1545218.96323

Station / Location:
 Offset:
 Elevation: 79.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 13.8 feet
 Date: 3/3/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			G.S. covered by 3 ft wind packed snow
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0						ML			7			
0.0												
1												
2			2									
2.3			4			ML						
3	SPT	BB1636	6									
4.0			6									
4.0						ML						
5			6									
5	SPT	BB1637	6									
6			6		12							
6			5									
7			2									
7	SPT	BB1638	2									
8			2		4							
8			3									
9												
10			1									
10	SPT	BB1639	2		4							
11			2									
11			3									
12			1									
12	SPT	BB1640 [SNT]	2		4							
13			2									
13			2									
13.8												
13.8								BOH 13.8				

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ 2006DATATEMPLATE.GDT 2/24/12



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LOG OF TEST HOLE

HOLE # 11-704

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1844076.39553, EASTING : 1545490.2304

Station / Location:
 Offset:
 Elevation: 65.0 feet

Equipment_Type: *Geoprobe 6620DT*
 Drilling Method: *Hollow Stem Auger (8-in.)*
 Field Crew: *[GeoTek AK]*

Total Depth: 25.0 feet
 Date: 3/3/2011 -
 Geologist: *B. Benko*

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			SUBSURFACE MATERIAL
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0						OL			4			G.S. covered by 1.5 ft snow over 0.5 ft ice
0.0 - 3.5						OL						ORGANIC SILT(OL)
3.5 - 5.0	SPT	BB1641	1 1 1 0			ML						SILT with Organics(ML) BB1641 (3.5 - 4.5 ft) wet prep, PI=NP, LL=NV
5.0 - 10.0	SPT	BB1642 [SNT]	1 1 3 3		5	ML						SILT (ML)
10.0 - 13.0	SPT	BB1643	2 2 4 6		4	ML						SILT with Organics(ML) BB1643 (10.5 - 12 ft), Moisture=32.8%, Org=2.1%
13.0 - 16.0	SPT	BB1644 [SNT]	2 3 4 6		6	ML						SILT (ML)
16.0 - 19.5	SPT	BB1645	1 3 4 5		7	OL						ORGANIC SILT(OL) BB1645 (18 - 19.5 ft), Moisture=56.3%, PI=NP, LL=NV

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ 2006DATATEMPLATE.GDT 2/24/12



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LOG OF TEST HOLE

HOLE # 11-704

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1844076.39553, **EASTING** : 1545490.2304

Station / Location:
 Offset:
 Elevation: 65.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 25.0 feet
 Date: 3/3/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		G.S. covered by 1.5 ft snow over 0.5 ft ice
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
20									4		
21						ML					
22											
23											
24	SPT	BB1646/-1647 [SNT]	8 11 13 15			SM					
25											
SUBSURFACE MATERIAL ORGANIC SILT(OL) (cont.) SILT (ML) SILTY SAND with Gravel(SM)											
Notes: Location is offset left of safety area embankment-toe.											

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ 2006DATATEMPLATE.GDT 2/24/12



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LOG OF TEST HOLE

HOLE # 11-705

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1844167.78905, **EASTING** : 1545252.88147

Station / Location:
 Offset:
 Elevation: 65.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 24.5 feet
 Date: 3/3/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			SUBSURFACE MATERIAL
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0									9			G.S. covered by 3 ft snow
0.0												Vegetative Mat
0.5						OL						ORGANIC SILT(OL)
3.6	SPT	BB1648 [SNT]	0 0 0 0									SILTY ORGANICS
4.5						PT						Peat (PT)
6.0	SPT	BB1649 [SNT]	0 0 0 0		0							
8.5	SPT	BB1650 [SNT]	1 1 1 2		2							
10.5	SPT		2 2 3 4		5							
12.0						ML						SILT (ML)
13.5	SPT		1 2 2 3		4							
16.0						ML						SILT with Organics(ML)
17.5 - 19 ft	SPT	BB1651	1 1 2 3		3							BB1651 (17.5 - 19 ft), Org=9.2%
20												

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12



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LOG OF TEST HOLE

HOLE # 11-706

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1843343.55546, **EASTING** : 1544945.34895

Station / Location:
 Offset:
 Elevation: 84.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 15.5 feet
 Date: 3/4/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			SUBSURFACE MATERIAL
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0									11			G.S. covered by 2 ft snow
0.0 - 0.1						ML		Vegetative Mat				
0.1 - 2.3	SPT	BB1653	9 6 3 2			ML		SILT with Organics(ML) BB1653 (1 - 2 ft), Moisture=27.6%, Org=3.5%				
2.3 - 3.0						ML		SILT (ML)				
3.0 - 4.0						OL		ORGANIC SILT(OL)				
4.0 - 5.0	SPT	-	1 0 1 2			ML		SILTY ORGANICS				
5.0 - 6.5						ML		SILT with Organics(ML)				
6.5 - 7.5	SPT	BB1654	2 2 1 1		3			BB1654 (6 - 6.5 ft) wet prep, Moisture=17.5%, Org=3.5%, PI=NP, LL=NV				
7.5 - 9.0												
9.0 - 10.5	SPT	BB1655 [SNT]	2 3 2 2		5							
10.5 - 11.5												
11.5 - 14.0	SPT	BB1656 [SNT]	2 2 3 4		5							
14.0 - 15.5												
15.5								BOH 15.5				

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12



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 Geology Section

LOG OF TEST HOLE

HOLE # 11-707

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1842392.36773, **EASTING** : 1544635.19569

Station / Location:
 Offset:
 Elevation: 81.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 14.5 feet
 Date: 3/4/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			SUBSURFACE MATERIAL
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0						ML			6			G.S. covered by 3 ft snow
0.0												SILT with Organics(ML)
1												
2			2									
3	SPT	BB1657	2									
4			2									
4.0			4		6							
5			4			ML						
5												SILT (ML)
6			2									
6	SPT	BB1658 [SNT]	3									
7			4									
7			4									
8			2									
8	SPT	BB1659	2									
9			2									
9			2		4							
10												
11												
12												
13			2									
13	SPT		4									
14			5									
14			5		9							
14.5								BOH 14.5				

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12



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LOG OF TEST HOLE

HOLE # 11-708

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1842600.79054, **EASTING** : 1544707.76806

Station / Location: *Taxiway B*
 Offset: *centerline*
 Elevation: *82.0 feet*

Equipment_Type: *Geoprobe 6620DT*
 Drilling Method: *Hollow Stem Auger (8-in.)*
 Field Crew: *[GeoTek AK]*

Total Depth: *6.5 feet*
 Date: *3/4/2011* -
 Geologist: *B. Benko*

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			SUBSURFACE MATERIAL
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0	AUGER					SM						Asphalt Pavement - 2.25 in. thick
0.2	AUGER					SM						SILTY SAND with Gravel(SM) [Embankment Fill] BB1660 (0.4 - 0.5 ft), Moisture=8.5% BB1661 (0.5 - 0.7 ft), p200=2%, Sa=70%, Gr=28%
2	SPT		37			SP-SM						SAND with Silt and Gravel(SP-SM) [Embankment Fill]
2.5						SP-SM						BB1662 (3.5 - 4 ft), p200=11%, Sa=58%, Gr=31%, Moisture=3.5%
4	AUGER	BB1662										
5	SPT		50									
5.0						ML						SILT (ML)
5.5	SPT	BB1663	20									
6			23									
6.3			23									
6.5												BOH 6.5 BB1663 (6 - 6.3 ft), Moisture=29.6%, Org=3.6%

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ 2006DATATEMPLATE.GDT 2/24/12



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LOG OF TEST HOLE

HOLE # 11-709

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1842472.93581, **EASTING** : 1544949.58975

Station / Location: Runway
 Offset: 51 ft rt
 Elevation: 85.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Solid Stem Auger (9-in.)
 Field Crew: [GeoTek AK]

Total Depth: 4.2 feet
 Date: 3/4/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			SUBSURFACE MATERIAL
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0												Asphalt Pavement - 5 in. thick; grooved. 0.0
0.4	AUGER	BB1664		█		GP-GM						GRAVEL with Silt and Sand(GP-GM) [Embankment Fill] 0.4
1												BB1664 (0.5 - 0.7 ft), p200=2%, Sa=59%, Gr=39%, Moisture=6.2%
2	AUGER	BB1665		█								BB1665 (2.2 - 2.5 ft), p200=8%, Sa=47%, Gr=45%, Moisture=3.2%
3												
4	AUGER	BB1666		█								BB1666 (3.5 - 4 ft), p200=8%, Sa=43%, Gr=49%, Moisture=2.9%
4.2								BOH 4.2				

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ 2006DATATEMPLATE.GDT 2/24/12



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 Geology Section

LOG OF TEST HOLE

HOLE # 11-710

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1841802.09004, **EASTING** : 1544337.88658

Station / Location:
 Offset:
 Elevation: 79.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 18.0 feet
 Date: 3/4/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			SUBSURFACE MATERIAL
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0						ML						G.S. covered by 4 ft snow, drifted
0.0						ML						SILT with Organics(ML)
1.0						ML						SILT (ML)
1.0 - 2.0	SPT		1 2		3							
2.0 - 3.5			1 1									
3.5 - 4.5	SPT	BB1667	2 3 3 5		6							BB1667 (3.5 - 4.5 ft), Moisture=24.8%, Org=1.9%, PI=NP, LL=NV
4.5 - 6.0												
6.0 - 7.0	SPT	BB1668 [SNT]	3 4 3 2		7							
7.0 - 11.0												
11.0 - 12.5	SPT	BB1669	3 4 6 8		10							BB1669 (11 - 12.5 ft), Moisture=24.4%, Org=4.4%, PI=NP, LL=NV
12.5 - 14.0												
14.0						ML						SILT with Organics(ML) - ranges to Organic Silt
14.0 - 16.0												
16.0 - 17.0	SPT	BB1670 [SNT]	2 2 3 5		5							
17.0 - 18.0												
18.0								BOH 18				

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12



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 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # 11-711

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1841632.13172, **EASTING** : 1544278.71609

Station / Location: *Taxiway A*
 Offset: *centerline*
 Elevation: *81.0 feet*

Equipment_Type: *Geoprobe 6620DT*
 Drilling Method: *Solid Stem Auger (9-in.)*
 Field Crew: *[GeoTek AK]*

Total Depth: *4.1 feet*
 Date: *3/5/2011* -
 Geologist: *B. Benko*

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			SUBSURFACE MATERIAL
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0												Asphalt Pavement - 2.25 in. thick
0.2						SP						SILTY SAND with Gravel (SP) [Embankment Fill] -71 (0.8 - 0.9 ft), Moisture=6.2% -72 (0.9 - 1.3 ft), p200=14%, Sa=60%, Gr=26%, PI=NP, LL=NV, SM 1673 (1.5 - 2 ft), Moisture=3.9%
1	AUGER	1673 -7271										
2	AUGER	1673 -7271										
2.5						SP-SM						SAND with Silt and Gravel (SP-SM) [Embankment Fill] BB1674 (2.5 - 4 ft), p200=10%, Sa=51%, Gr=39%, PI=NP, LL=NV, SW-SM
3	AUGER	BB1674										
4												
4.1								BOH 4.1				

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ 2006DATATEMPLATE.GDT 2/24/12



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LOG OF TEST HOLE

HOLE # 11-712

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1840411.2713, EASTING : 1543918.71484

Station / Location: *Runway*
 Offset: *60 ft rt*
 Elevation: *79.0 feet*

Equipment_Type: *Geoprobe 6620DT*
 Drilling Method: *Solid Stem Auger (9-in.)*
 Field Crew: *[GeoTek AK]*

Total Depth: *4.2 feet*
 Date: *3/5/2011* -
 Geologist: *B. Benko*

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			SUBSURFACE MATERIAL
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0												Asphalt Pavement - 4.5 to 5 in. thick; grooved. 0.0
0.4	AUGER	1675				SP						SAND with Gravel (SP) [Embankment Fill] 0.4
1	AUGER	-76										1675 (0.6 - 0.7 ft), Moisture=4.4%
1.5												-76 (0.8 - 1.5 ft), p200=1%, Sa=57%, Gr=42%
2	AUGER	-77										-77 (1.5 - 2 ft), p200=4%, Sa=55%, Gr=41%
2.5	AUGER	-78										-78 (2 - 2.5 ft), Moisture=3.1%
2.5						GP-GM						GRAVEL with Silt and Sand (GP-GM) [Embankment Fill] 1679 (2.5 - 4 ft), p200=5%, Sa=29%, Gr=66%, PI=NP, LL=NV, GP-GM 2.5
3	AUGER	1679										
4.2												BOH 4.2

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ 2006DATATEMPLATE.GDT 2/24/12



STATE OF ALASKA DOT&PF
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LOG OF TEST HOLE

HOLE # 11-713

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1840534.295, **EASTING** : 1543686.1218

Station / Location:
 Offset:
 Elevation: 78.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 14.0 feet
 Date: 3/5/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	Symbol
0						ML			7.5			G.S. covered by 2.5 ft snow
1	SPT	BB1680	20			ML						
			23									
			18									
2			2									SUBSURFACE MATERIAL
3	SPT	BB1681	3		7							
			4									
			4									
5			3									BB1681 (2.5 - 3.5 ft), p200=94%, Sa=6%, Gr=0%
6	SPT		3		5							
			2									
			3									
7			2									Notes: Location: offset position is near top of runway ditch backslope.
8	SPT		3		6							
			3									
			3									
9												BOH 14
10												
11												
12			2									
13	SPT		2		6							14.0
			4									
14			5									

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12



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LOG OF TEST HOLE

HOLE # 11-714

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1841023.01023, EASTING : 1543953.77219

Station / Location:
 Offset:
 Elevation: 78.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 14.0 feet
 Date: 3/5/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	Symbol
0						ML			5			G.S. covered by 3 ft snow
SUBSURFACE MATERIAL												
0						ML						SILT with Organics(ML) 0.0
2.3	SPT	BB1682	3		3							BB1682 (2.3 - 3.3 ft), Moisture=22.6%, Org=3.6%
5.3	SPT	BB1683	2		4							BB1683 (5.3 - 6.3 ft) 4% clay, p200=99%, Sa=1%, Gr=0%, Org=2.4%
7.3	SPT	BB1684	2		4	ML						SILT (ML) BB1684 (7.3 - 8.3 ft), Moisture=28.1%, PI=NP, LL=NV 7.0
10.0						ML						SILT with Organics(ML) 10.0
12.3	SPT	BB1685	2		4							BB1685 (12.3 - 13.3 ft), p200=96%, Sa=4%, Gr=0%
14.0								BOH 14				Notes: Location: offset position is near top of runway ditch backslope. Approximately 100 ft back-station from PAPI lights.

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12



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LOG OF TEST HOLE

HOLE # 11-715

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1843956.7501, **EASTING** : 1545711.80082

Station / Location: Runway
 Offset: 51 ft rt
 Elevation: 82.0 feet

Equipment_Type:
 Drilling Method: Solid Stem Auger (9-in.)
 Field Crew: [GeoTek AK]

Total Depth: 4.1 feet
 Date: 3/5/2011 -
 Geologist:

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			SUBSURFACE MATERIAL
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0												Asphalt Pavement - 5 in. thick; grooved. 0.0
1	AUGER	BB1686				SP-SM						SAND with Silt and Gravel(SP-SM) [Embankment Fill] 0.4 BB1686 (0.8 - 1 ft), p200=8%, Sa=58%, Gr=34%, Moisture=6.2%
2	AUGER	BB1687				SM						SILTY SAND with Gravel(SM) [Embankment Fill] BB1687 (2 - 2.5 ft), p200=15%, Sa=62%, Gr=23%, Moisture=5.2% 2.0
3	AUGER	BB1688										BB1688 (3 - 4 ft), p200=12%, Sa=48%, Gr=40%, Moisture=5.4%
4												BOH 4.1 4.1

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ 2006DATATEMPLATE.GDT 2/24/12



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LOG OF TEST HOLE

HOLE # 11-716

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1845194.16823, **EASTING** : 1546340.20508

Station / Location: Runway
 Offset: ~-50 ft Rt
 Elevation: 75.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Solid Stem Auger (9-in.)
 Field Crew: [GeoTek AK]

Total Depth: 4.1 feet
 Date: 3/5/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	Symbol
0									SUBSURFACE MATERIAL			
0.0									Asphalt Pavement - 4 in. thick; grooved.			
0.3						SW-SM			SAND with Silt and Gravel(SW-SM) [Embankment Fill]			
1	AUGER	BB1689							BB1689 (0.7 - 0.8 ft), p200=7%, Sa=56%, Gr=37%, Moisture=5.5%			
2												
3												
4	AUGER	BB1690							BB1690 (3 - 4 ft), p200=9%, Sa=51%, Gr=40%, Moisture=3.3%, PI=NP, LL=NV, SW-SM			
4.1								BOH 4.1				

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ 2006DATATEMPLATE.GDT 2/24/12



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LOG OF TEST HOLE

HOLE # 11-717

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1847220.1294, **EASTING** : 1547142.55682

Station / Location:
 Offset:
 Elevation: 62.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]
 Total Depth: 28.0 feet
 Date: 3/6/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	Symbol
0									0			G.S. covered by 2 ft snow
SUBSURFACE MATERIAL												
0.0								Vegetative Mat				0.0
0.5								Peat				0.5
1												
2												
3												
4	SPT		0		0			- pushed				
5			0									
6			0			OL		ORGANIC SILT(OL)				6.0
7			0			ML		SILT (ML)				7.0
8												
9	SPT		0		0			- pushed				
10			0									
11			0			ML		SILT (ML)				11.0
12												
13												
14	SPT	BB1691						BB1691 (13 - 14 ft), p200=98%, Sa=2%, Gr=0%, PI=NP, LL=NV, ML				
15												
16												
17												
18												
19	SPT		1		7							
20			4									
			3									

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12



STATE OF ALASKA DOT&PF
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LOG OF TEST HOLE

HOLE # 11-717

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1847220.1294, **EASTING** : 1547142.55682

Station / Location:
 Offset:
 Elevation: 62.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 28.0 feet
 Date: 3/6/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			SUBSURFACE MATERIAL
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
20			4	X					0			G.S. covered by 2 ft snow
21						SP-SM						SILT (ML) (cont.)
22						ML						SAND with Silt (SP-SM)
23												SILT with Organics (ML)
24			1	X		OL						ORGANIC SILT (OL)
25	SPT	BB1692	2	X								
26			1	X								
27			3	X		ML						BB1692 (24 - 24.8 ft), Moisture=77.9%, Org=14.3%, PI=NP, LL=NV
28	SPT			X		SP						SILT (ML)
												SAND (SP) - [2 ft heave]
												BOH 28

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LOG OF TEST HOLE

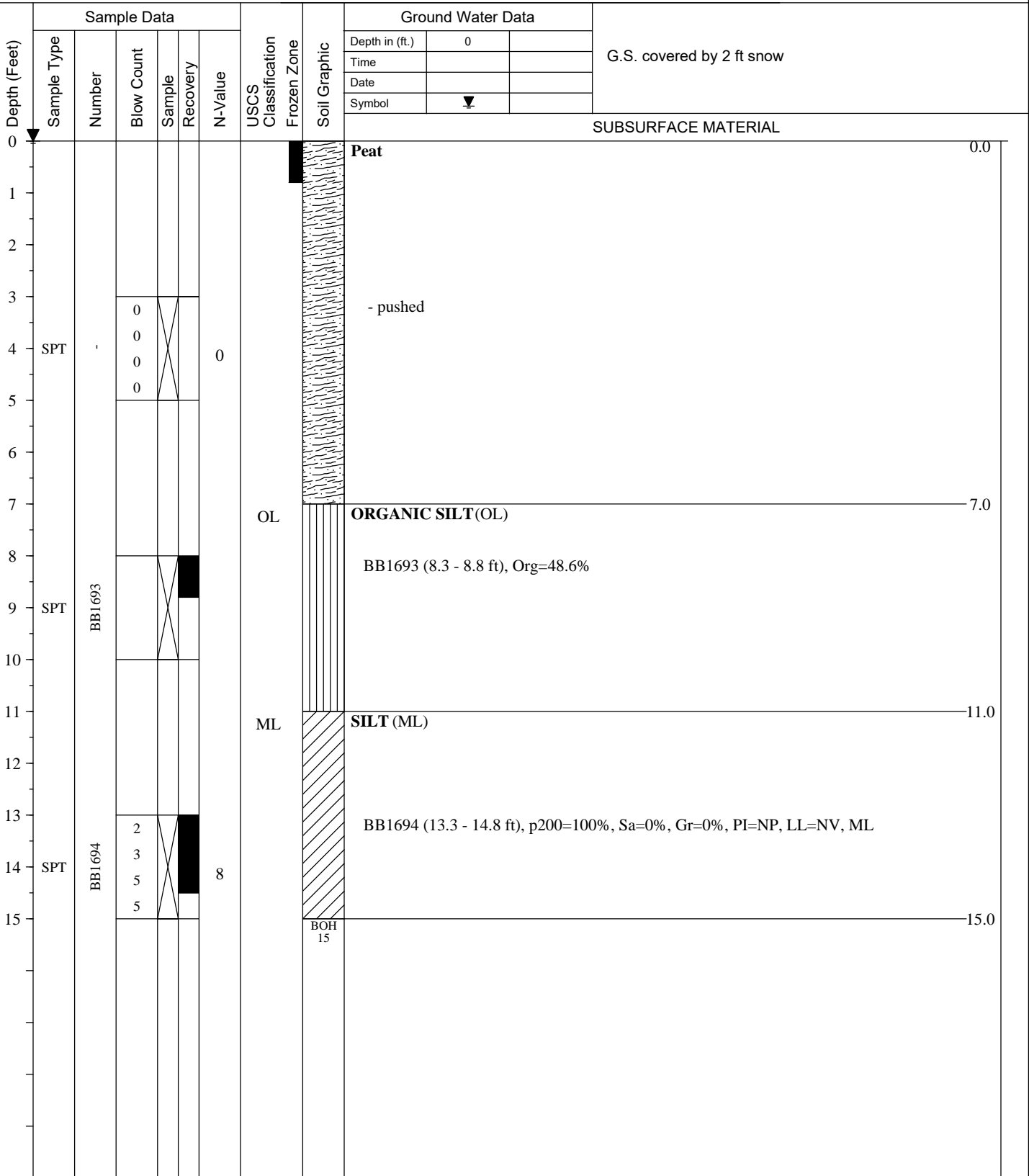
HOLE # 11-718

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1846957.03281, **EASTING** : 1547278.34854

Station / Location:
 Offset:
 Elevation: 61.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 15.0 feet
 Date: 3/6/2011 -
 Geologist: B. Benko



A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12



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LOG OF TEST HOLE

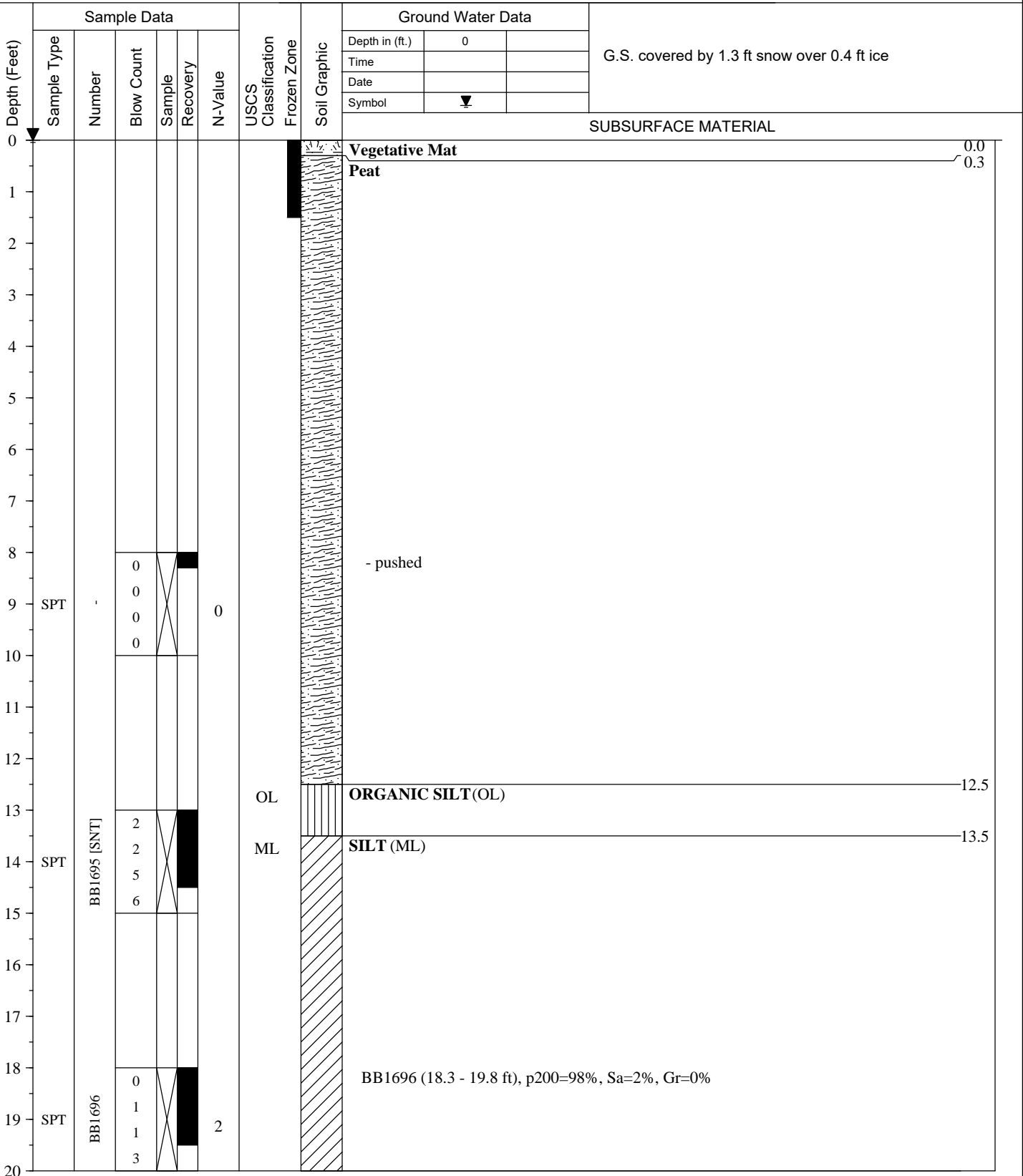
HOLE # 11-719

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1847151.14069, **EASTING** : 1546919.05235

Station / Location:
 Offset:
 Elevation: 63.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 30.0 feet
 Date: 3/6/2011 -
 Geologist: B. Benko



A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12



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LOG OF TEST HOLE

HOLE # 11-719

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1847151.14069, **EASTING** : 1546919.05235

Station / Location:
 Offset:
 Elevation: 63.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 30.0 feet
 Date: 3/6/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			G.S. covered by 1.3 ft snow over 0.4 ft ice
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
20												
20.0						OL		ORGANIC SILT(OL)				
21												
22												
23												
23.8 - 24.8			1 2 3 4	█	5			BB1697 (23.8 - 24.8 ft), Moisture=70.8%, PI=NP, LL=NV				
24	SPT	BB1697										
25												
26												
27												
27.5						GM		SILTY GRAVEL with Sand(GM)				
28.3 - 29.3			3 14 14 12	█	28			BB1698 (28.3 - 29.3 ft), p200=20%, Sa=40%, Gr=40%				
28	SPT	BB1698										
29												
30								BOH 30				
30.0												

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ 2006DATATEMPLATE.GDT 2/24/12



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LOG OF TEST HOLE

HOLE # 11-720

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1846874.35319, **EASTING** : 1546947.08215

Station / Location:
 Offset:
 Elevation: 61.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 40.5 feet
 Date: 3/6/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			SUBSURFACE MATERIAL
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0									0			G.S. covered by 1.1 ft snow over 0.4 ft ice
0												Vegetative Mat 0.0
0.5												Peat 0.5
1												
2												
3												
4												
5												
6												
7												
8												
9	SPT		0		0							- pushed
10			0									
11												
12												
13												
14	SPT		0		0							- pushed
15			0									
16												
17												
18												
19												
20												

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12



STATE OF ALASKA DOT&PF
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 Geology Section

LOG OF TEST HOLE

HOLE # 11-720

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1846874.35319, **EASTING** : 1546947.08215

Station / Location:
 Offset:
 Elevation: 61.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 40.5 feet
 Date: 3/6/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			SUBSURFACE MATERIAL
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
20									0			G.S. covered by 1.1 ft snow over 0.4 ft ice
21						ML						Peat (cont.)
22						ML						SILT with Organics(ML)
24	SPT	BB1699	1	X	5							BB1699 (24 - 25 ft), Moisture=31.7%, Org=2.1%, PI=NP, LL=27
25			2	X								
26			3	X								
27			4	X								
28						OL						ORGANIC SILT(OL)
29	SPT	BB1700	1	X	4							BB1700 (29 - 30 ft), Moisture=88.8%, Org=17.6%
30			2	X								
31			2	X								
32			2	X								
34	SPT	BB1701	1	X								
35			3	X								
36			5	X		GW-GM						GRAVEL with Silt and Sand(GW-GM)
37			7	X								
39	SPT		6	X	19							- 20 blows for 4.5 in. advance - - suspect boulder
40			9	X								
			10	X								

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12



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LOG OF TEST HOLE

HOLE # 11-720

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1846874.35319, **EASTING** : 1546947.08215

Station / Location:
 Offset:
 Elevation: 61.0 feet

Equipment_Type: *Geoprobe 6620DT*
 Drilling Method: *Hollow Stem Auger (8-in.)*
 Field Crew: *[GeoTek AK]*

Total Depth: 40.5 feet
 Date: 3/6/2011 -
 Geologist: *B. Benko*

Depth (Feet)	Sample Data						USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			G.S. covered by 1.1 ft snow over 0.4 ft ice
	Sample Type	Number	Blow Count	Sample Recovery	N-Value	Depth in (ft.)				Time	Date	Symbol	
40			20	X									
										SUBSURFACE MATERIAL			
	GRAVEL with Silt and Sand(GW-GM) (cont.)										40.5		
	BOH 40.5												

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ 2006DATATEMPLATE.GDT 2/24/12



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LOG OF TEST HOLE

HOLE # 11-720-A

PROJECT NUMBER :59304
 PROJECT : Dillingham AP Improvements

Station / Location:
 Offset:
 Elevation: 61.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 30.7 feet
 Date: 3/9/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			TH objective: targeted intervals for VSTs; location: to 720: ~7 FT, @ 133°; G.S. covered by 1.1 ft snow over 0.4 ft ice
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0									SUBSURFACE MATERIAL			
0.0									Vegetative Mat [REPRODUCTION OF LOG FOR TH 720]			0.0
0.5									Peat			0.5
5.2 - 5.7	VANE	VST 720-A-1							VST 720-A-1 5.2 - 5.7 ft [2.5-inch diam. vane]: intact undrained shear strength=524 psf; remolded undrained shear strength = 168 psf			
15.2 - 15.7	VANE	VST 720-A-2							VST 720-A-2 15.2 - 15.7 ft [2.5-inch diam. vane]: intact undrained shear strength=369 psf; remolded undrained shear strength = 152 psf			

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12



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LOG OF TEST HOLE

HOLE # 11-720-A

PROJECT NUMBER :59304
 PROJECT : Dillingham AP Improvements

Station / Location:
 Offset:
 Elevation: 61.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 30.7 feet
 Date: 3/9/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			TH objective: targeted intervals for VSTs; location: to 720: ~7 FT, @ 133°; G.S. covered by 1.1 ft snow over 0.4 ft ice
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
20	VANE	VST 720-A-3				ML		SUBSURFACE MATERIAL				
21								Peat (cont.) VST 720-A-3 20.2 - 20.7 ft [2.5-inch diam. vane]: intact undrained shear strength=1299 psf; remolded undrained shear strength = 152 psf				
22						ML					21.5	
23								SILT with Organics(ML)				
24						OL					27.5	
25	VANE	VST 720-A-4						VST 720-A-4 25.2 - 25.7 ft [2.5-inch diam. vane]: intact undrained shear strength=741 psf; remolded undrained shear strength = 183 psf				
26						OL					30.7	
27								ORGANIC SILT(OL)				
28						OL					30.7	
29	VANE	VST 720-A-5						VST 720-A-5 30.2 - 30.7 ft [2.5-inch diam. vane]: intact undrained shear strength=>1950 psf ,no shear				
30							BOH 30.7					

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ 2006DATATEMPLATE.GDT 2/24/12



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LOG OF TEST HOLE

HOLE # 11-721

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1846812.52326, **EASTING** : 1546712.81851

Station / Location:
 Offset:
 Elevation: 61.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 38.5 feet
 Date: 3/6/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			SUBSURFACE MATERIAL
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0									0			G.S. covered by 1.5 ft snowmachine-packed snow and ice
0.0												Vegetative Mat
0.5												Peat
1												
2												
3												
4												
5												
6												
7												
8												
9			0									- pushed
10	SPT		0			0						
11												
12												
13												
14			0									BB1702 [SNT] pushed
15	SPT	BB1702 [SNT]	0			0						
16												
17												
18												
19			0									
19.0	SPT	BB1703 [SNT]	0				ML					SILT with Organics(ML)
20			0									

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12



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LOG OF TEST HOLE

HOLE # 11-721

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1846812.52326, **EASTING** : 1546712.81851

Station / Location:
 Offset:
 Elevation: 61.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 38.5 feet
 Date: 3/6/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			G.S. covered by 1.5 ft snowmachine-packed snow and ice
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
20			1	X					0			SUBSURFACE MATERIAL
21						ML						
22												
23												
24	SPT		2	X								SILT with Organics(ML) (cont.)
25			3	X								
26			4	X								
27			6	X	7							
28												SILT (ML)
29												
30	SPT	BB1704 [SNT]	2	X								
31			3	X								
32			3	X		OL						ORGANIC SILT(OL)
33			3	X								
34						ML						SANDY SILT with Gravel and Organics(ML)
35												
36						ML						SANDY SILT with Organics(ML)
37												
38	SPT		5	X								SAND with Gravel(SP) strong heave encountered between 35 and 40 ft
39			4	X								
40			4	X	8							
41												SAND with Gravel(SP)
42												
43						SP						
44			10	X								
45												BOH 38.5
46												

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12

CME Auto Hammer
 Cathead Rope Method
 140 lb. hammer with 30 in. drop
 340 lb. hammer with 30 in. drop



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 Geology Section

LOG OF TEST HOLE

HOLE # 11-721-A

PROJECT NUMBER :59304
 PROJECT : Dillingham AP Improvements

Station / Location:
 Offset:
 Elevation: 61.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 30.5 feet
 Date: 3/10/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			TH objective: targeted intervals for VSTs; location: TH objective: targeted intervals for VSTs; location: 721 to 721-A: ~7 ft, at 300 °
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0												
SUBSURFACE MATERIAL												
0												Vegetative Mat [REPRODUCTION OF LOG FOR TH 721] 0.0
0.5												Peat 0.5
5.2 - 5.7	VANE	VST 721-A-1										VST 721-A-1 5.2 - 5.7 ft [2.5-inch diam. vane]: intact undrained shear strength=416 psf; remolded undrained shear strength = 199 psf
10.2 - 10.7	VANE	VST 721-A-2										VST 721-A-2 10.2 - 10.7 ft [2.5-inch diam. vane]: intact undrained shear strength=468 psf; remolded undrained shear strength = 96 psf
16 - 16.5	VANE	VST 721-A-3										VST 721-A-3 16 - 16.5 ft [2.5-inch diam. vane]: intact undrained shear strength=700 psf; remolded undrained shear strength = 235 psf
19.0						ML						SILT with Organics (ML) 19.0

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # 11-721-A

PROJECT NUMBER :59304
 PROJECT : Dillingham AP Improvements

Station / Location:
 Offset:
 Elevation: 61.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 30.5 feet
 Date: 3/10/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			TH objective: targeted intervals for VSTs; location: TH objective: targeted intervals for VSTs; location: 721 to 721-A: ~7 ft, at 300 °
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
20									SUBSURFACE MATERIAL			
21	VANE	VST 721-A-4				ML		SILT with Organics(ML) (cont.) VST 721-A-4 20.5 - 21 ft [2.5-inch diam. vane]: intact undrained shear strength=832 psf; remolded undrained shear strength = 305 psf				21.0
22								SILT (ML)				
23												
24												
25	VANE	VST 721-A-5						VST 721-A-5 25 - 25.5 ft [2.5-inch diam. vane]: intact undrained shear strength=1085 psf; remolded undrained shear strength = 155 psf				
26												
27												
28												
29												
30	VANE	VST 721-A-6				OL		ORGANIC SILT(OL) VST 721-A-6 30 - 30.5 ft [2.5-inch diam. vane]: intact undrained shear strength=>1953 psf ,no shear				29.5
30.5								BOH 30.5				30.5

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ 2006DATATEMPLATE.GDT 2/24/12



STATE OF ALASKA DOT&PF
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 Geology Section

LOG OF TEST HOLE

HOLE # 11-722

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1846594.39804, **EASTING** : 1546808.00106

Station / Location:
 Offset:
 Elevation: 59.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 34.0 feet
 Date: 3/7/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			SUBSURFACE MATERIAL
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0									0			G.S. covered by 3 ft snow and ice
0.0												Vegetative Mat
0.5												Peat
7.0			0									- pushed
8.0	SPT		0									
9.0			0									
12.0			0									- pushed
13.0	SPT		0									
14.0			0									
16.0												SILTY ORGANICS
17.5												ORGANIC SILT(OL)
18.5	SPT	BB1705										BB1705 (18 - 18.5 ft), Org=13.4%
19.5												SILT with Organics(ML)
20.0												

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12



STATE OF ALASKA DOT&PF
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LOG OF TEST HOLE

HOLE # 11-722

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1846594.39804, **EASTING** : 1546808.00106

Station / Location:
 Offset:
 Elevation: 59.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 34.0 feet
 Date: 3/7/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			SUBSURFACE MATERIAL
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
20									0			G.S. covered by 3 ft snow and ice
21												
22												
23	SPT		2 2 2 3		4							
24												SILT with Organics(ML) (cont.)
25												
26												SILT (ML) BB1706 (28 - 28.5 ft), Moisture=32%, PI=NP, LL=NV
27						ML						
28	SPT	BB1706	2 2 3 4		5							
29												SANDY SILT with Gravel(ML) BB1707 (32.5 - 33.5 ft), p200=66%, Sa=19%, Gr=15%, PI=NP, LL=NV, ML
30												
31												SANDY SILT with Gravel(ML) BB1707 (32.5 - 33.5 ft), p200=66%, Sa=19%, Gr=15%, PI=NP, LL=NV, ML
32						ML						
33	SPT	BB1707	2 4 4 4									
34								BOH 34				

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12



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LOG OF TEST HOLE

HOLE # 11-722-A

PROJECT NUMBER :59304
 PROJECT : Dillingham AP Improvements

Station / Location:
 Offset:
 Elevation: 59.0 feet

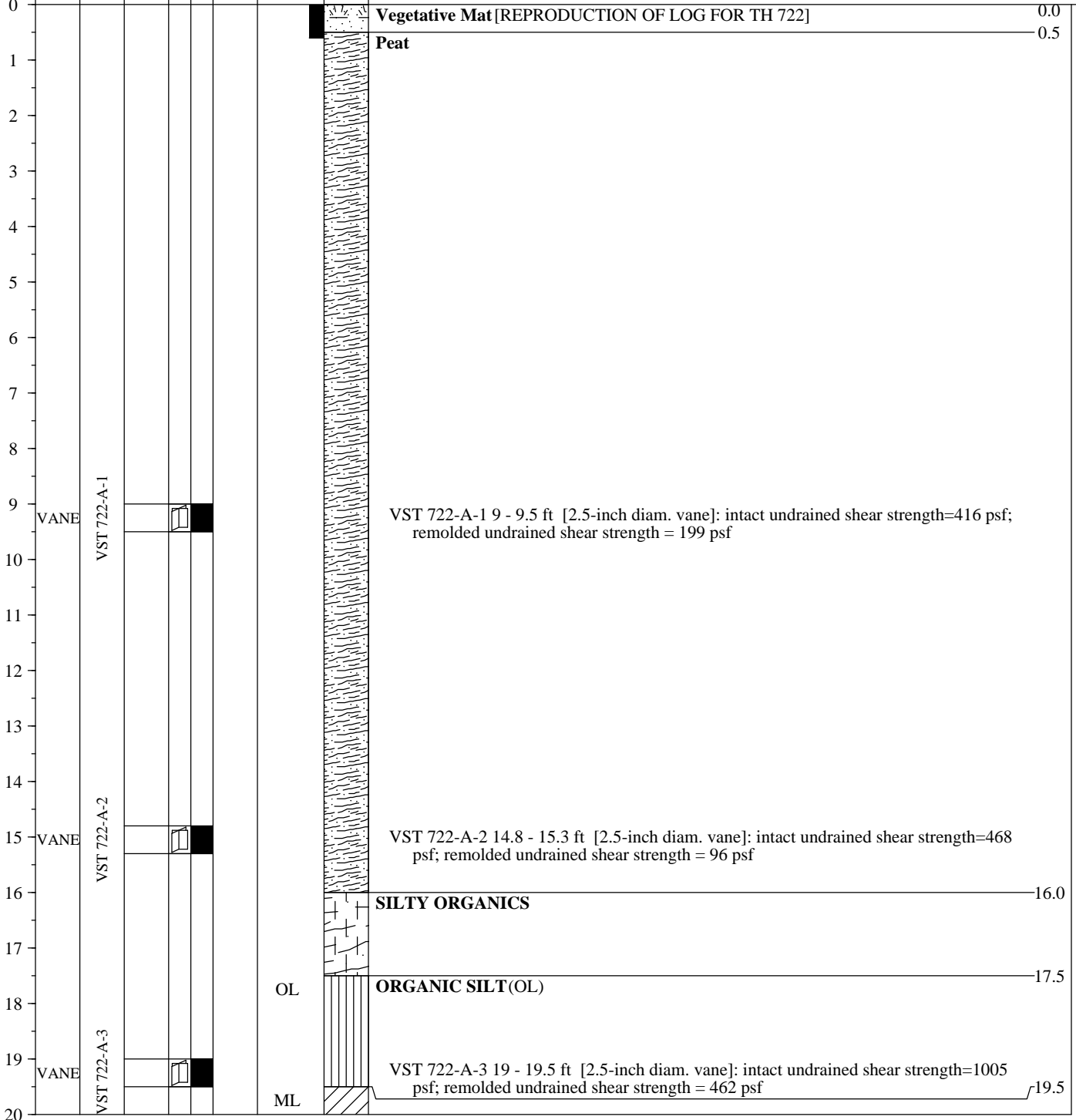
Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 27.3 feet
 Date: 3/10/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data						USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			
	Sample Type	Number	Blow Count	Sample Recovery	N-Value	Depth in (ft.)							
						Time							
						Date							

TH objective: targeted intervals for VSTs; location: TH objective: targeted intervals for VSTs; location: 722 to 722-A: ~5 ft, @ 306°; G.S. covered by 3 ft snow and ice

SUBSURFACE MATERIAL



A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12

CME Auto Hammer Cathead Rope Method 140 lb. hammer with 30 in. drop 340 lb. hammer with 30 in. drop



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LOG OF TEST HOLE

HOLE # 11-722-A

PROJECT NUMBER :59304
 PROJECT : Dillingham AP Improvements

Station / Location:
 Offset:
 Elevation: 59.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 27.3 feet
 Date: 3/10/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data						USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			TH objective: targeted intervals for VSTs; location: TH objective: targeted intervals for VSTs; location: 722 to 722-A: ~5 ft, @ 306°; G.S. covered by 3 ft snow and ice
	Sample Type	Number	Blow Count	Sample Recovery	N-Value	Depth in (ft.)				Time	Date	Symbol	
20									SUBSURFACE MATERIAL				
21									SILT with Organics(ML)				
22									SILT with Organics(ML) (cont.)				
23													
24	VANE	VST 722-A-4							VST 722-A-4 23.8 -24.3 ft [2.5-inch diam. vane]: intact undrained shear strength=1348 psf; remolded undrained shear strength = 511 psf				
25													
26													
27	VANE	VST 722-A-5					ML		SILT (ML) VST 722-A-5 26.8 -27.3 ft [2.5-inch diam. vane]: intact undrained shear strength=>1992 psf ,no shear			26.5	
								BOH 27.3				27.3	

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ 2006DATATEMPLATE.GDT 2/24/12



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LOG OF TEST HOLE

HOLE # 11-722-B

PROJECT NUMBER :59304
 PROJECT : Dillingham AP Improvements

Station / Location:
 Offset:
 Elevation: 59.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 22.1 feet
 Date: 3/10/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		TH objective: targeted intervals for Shelby Tube sample collection; location: midway between TH 722 and 722-A; 722 to 722-A: ~5 ft, @ 306°; G.S. covered by 3 ft snow and ice
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0									0		
SUBSURFACE MATERIAL											
0								Vegetative Mat [REPRODUCTION OF LOG FOR TH 722]			0.0
0.5								Peat			0.5
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13	ST										
14											
15											
16											
17											
18	ST	ST722-B-4				OL		SILTY ORGANICS			16.0
19								ST722-B-4 ST722-B-4 (17 - 18.9 ft) See one dimensional consolidation test report, lab no. 2011A-0444			17.0
20								ORGANIC SILT(OL)			17.5
21								BB1735 (18.8 - 18.9 ft), Org=48.2%			19.5
22						ML		SILT with Organics(ML)			

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12

CME Auto Hammer
 Cathead Rope Method
 140 lb. hammer with 30 in. drop
 340 lb. hammer with 30 in. drop



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LOG OF TEST HOLE

HOLE # 11-722-B

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements

Station / Location:
 Offset:
 Elevation: 59.0 feet

Equipment_Type: *Geoprobe 6620DT*
 Drilling Method: *Hollow Stem Auger (8-in.)*
 Field Crew: *[GeoTek AK]*

Total Depth: 22.1 feet
 Date: 3/10/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data						USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			TH objective: targeted intervals for Shelby Tube sample collection; location: midway between TH 722 and 722-A; 722 to 722-A: ~5 ft, @ 306°; G.S. covered by 3 ft snow and ice
	Sample Type	Number	Blow Count	Sample Recovery	N-Value	Depth in (ft.)				Time	Date	Symbol	
20													
21	ST	ST722-B-5						BOH 22.1					
22													

SILT with Organics(ML) (cont.) 20.1
 ST722-B-5 BB1736 (20.1 - 20.2 ft), Moisture=61.7%, Org=9.1%
 ST722-B-5 ST722-B-5 (20.1 - 22.1 ft) See one dimensional consolidation test report, lab no. 2011A-0445
 BB1737 (22 - 22.1 ft), Moisture=125.3%, Org=16.8% 22.1

SUBSURFACE MATERIAL

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ 2006DATATEMPLATE.GDT 2/24/12



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LOG OF TEST HOLE

HOLE # 11-723

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1846314.39237, **EASTING** : 1546678.38091

Station / Location:
 Offset:
 Elevation: 61.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 33.5 feet
 Date: 3/7/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			SUBSURFACE MATERIAL
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0									0			G.S. covered by 3.5 ft snowmachine-packed snow and ice
0												Vegetative Mat 0.0
0.5												Peat 0.5
1												
2												
3												
4												
5												
6												
7			0									- pushed
8	SPT		0									
9												
10												
11												
12			0									
13	SPT		0			OL						ORGANIC SILT(OL) - pushed 11.5
14												
15												
16						ML						SILT with Organics(ML) 15.0
17			2									
18	SPT	BB1708	3									
19			5									
20			4									
20					8							BB1708 (16.5 - 17 ft) wet prep, p200=99%, Sa=1%, Gr=0%, PI=NP, LL=NV, ML

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ 2006DATATEMPLATE.GDT 2/24/12



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LOG OF TEST HOLE

HOLE # 11-723-A

PROJECT NUMBER :59304
 PROJECT : Dillingham AP Improvements

Station / Location:
 Offset:
 Elevation: 61.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 19.0 feet
 Date: 3/11/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		TH objective: targeted intervals for Shelby Tube sample collection and VSTs; location: TH723 to TH 723-A -- 14 FT @~150 degrees; G.S. covered by 3.5 ft snowmachine-packed snow and ice
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0									0		
0.0								Vegetative Mat [REPRODUCTION OF LOG FOR TH 723]			0.0
0.5								Peat			0.5
3.2 - 3.7	VANE	VST 723-A-1						VST 723-A-1 3.2 - 3.7 ft [2.5-inch diam. vane]: intact undrained shear strength=302 psf; remolded undrained shear strength = 147 psf			
6.5	ST	ST723-A-1						ST723-A-1			6.5
6.5 - 7.3								ST723-A-1 (6.5 - 7.3 ft) See one dimensional consolidation test report, lab no. 2011A-0446			
11.5						OL		ORGANIC SILT(OL)			11.5
13.2 - 13.7	VANE	VST 723-A-2						VST 723-A-2 13.2 - 13.7 ft [2.5-inch diam. vane]: intact undrained shear strength=984 psf; remolded undrained shear strength = 364 psf			
15.0						ML		SILT (ML)			15.0
17.0	ST	ST723-A-2						ST723-A-2 ST723-A-2 (17 - 19 ft) See one dimensional consolidation test report, lab no. 2011A-0447, Moisture=26.2%			17.0
19.0							BOH 19				19.0

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12

CME Auto Hammer
 Cathead Rope Method
 140 lb. hammer with 30 in. drop
 340 lb. hammer with 30 in. drop



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LOG OF TEST HOLE

HOLE # 11-724

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1846522.11144, **EASTING** : 1546541.9409

Station / Location:
 Offset:
 Elevation: 61.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 33.0 feet
 Date: 3/7/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			SUBSURFACE MATERIAL
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0									0			G.S. covered by 1 ft snow over 1 ft ice
0.0												Vegetative Mat
0.5												Peat
8			0									- pushed
9	SPT		0									
10			0									
11			0		0							
11.0						ML						SILT (ML)
13			2									
14	SPT	BB1711	4									BB1711 (13 - 14 ft) wet prep, p200=99%, Sa=1%, Gr=0%, Moisture=27%, PI=NP, LL=Nv, ML
15			4									
16			4		8							
17			5									
18			0									
19	SPT		2									
20			2		4							
21			2									
22			3									

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12



STATE OF ALASKA DOT&PF
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LOG OF TEST HOLE

HOLE # 11-724

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1846522.11144, **EASTING** : 1546541.9409

Station / Location:
 Offset:
 Elevation: 61.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 33.0 feet
 Date: 3/7/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			SUBSURFACE MATERIAL
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
20									0			G.S. covered by 1 ft snow over 1 ft ice
21												
22												
23												
24	SPT	BB1712	0 2 3 3		5							SILT (ML) (cont.) BB1712 (23 - 24 ft), Moisture=30.4%, PI=NP, LL=NV
25												
26												
27						OL						ORGANIC SILT(OL) 27.0
28												
29	SPT	BB1713	2 2 2 4			ML						SILT with Organics(ML) 28.5
30												BB1713 (28.5 - 29.5 ft), Moisture=45.7%, Org=11%
31						SP						SAND with Gravel(SP) heave encountered between 30-33 ft 31.0
32												
33												BOH 33 33.0

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ 2006DATATEMPLATE.GDT 2/24/12



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LOG OF TEST HOLE

HOLE # 11-724-A

PROJECT NUMBER :59304
 PROJECT : Dillingham AP Improvements

Station / Location:
 Offset:
 Elevation: 61.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 18.3 feet
 Date: 3/11/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			TH objective: targeted intervals for VSTs; location: TH724 to TH 724-A -- 16 ft @~165 degrees; G.S. covered by 1 ft snow over 1 ft ice
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
SUBSURFACE MATERIAL												
0								Vegetative Mat [REPRODUCTION OF LOG FOR TH 724]				0.0
0.5								Peat				0.5
4.3 - 4.8	VANE	VST 724-A-1						VST 724-A-1 4.3- 4.8 ft [2.5-inch diam. vane]: intact undrained shear strength=132 psf; remolded undrained shear strength = 70 psf				
9.8 - 10.3	VANE	VST 724-A-2						VST 724-A-2 9.8 - 10.3 ft [2.5-inch diam. vane]: intact undrained shear strength=592 psf; remolded undrained shear strength = 220 psf				
11.0						ML		SILT (ML)				11.0
14.5 - 15	VANE	VST 724-A-3						VST 724-A-3 14.5 - 15 ft [2.5-inch diam. vane]: intact undrained shear strength=594 psf; remolded undrained shear strength = 98 psf				
17.8 - 18.3	VANE	VST 724-A-4						VST 724-A-4 17.8 - 18.3 ft [2.5-inch diam. vane]: intact undrained shear strength=1020 psf; remolded undrained shear strength = 307 psf				18.3
18.3								BOH 18.3				

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12

CME Auto Hammer
 Cathead Rope Method
 140 lb. hammer with 30 in. drop
 340 lb. hammer with 30 in. drop



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LOG OF TEST HOLE

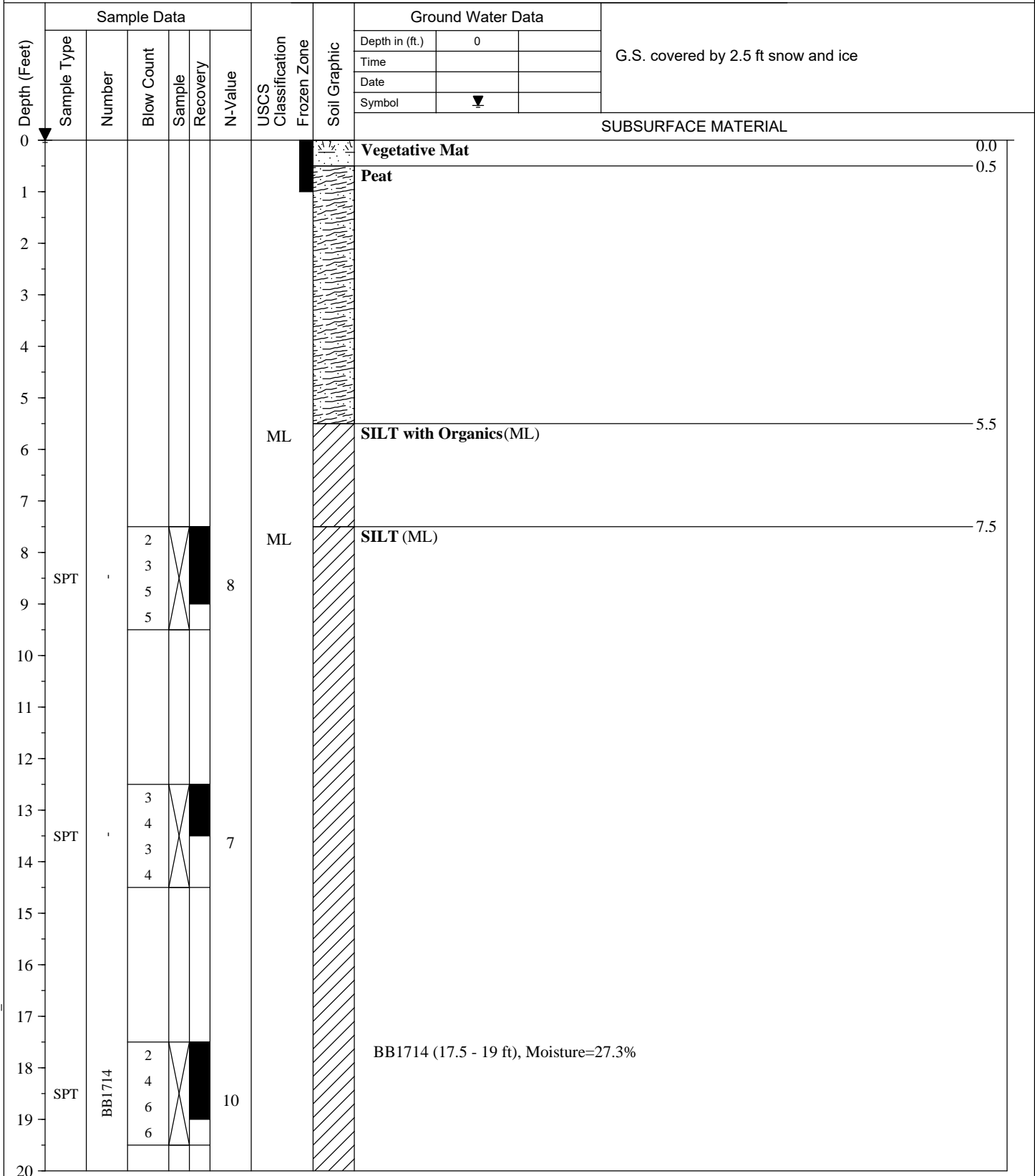
HOLE # 11-725

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1845959.51381, **EASTING** : 1546422.28825

Station / Location:
 Offset:
 Elevation: 60.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 29.5 feet
 Date: 3/8/2011 -
 Geologist: B. Benko



A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12



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 Geology Section

LOG OF TEST HOLE

HOLE # 11-725

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1845959.51381, **EASTING** : 1546422.28825

Station / Location:
 Offset:
 Elevation: 60.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 29.5 feet
 Date: 3/8/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			G.S. covered by 2.5 ft snow and ice
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
20									0			
SUBSURFACE MATERIAL												
21								SILT (ML) (cont.)				
22												
23	SPT		1		7							
24			3									
25			4									
26			4									
27						OL		ORGANIC SILT(OL)				25.0
28												
29	SPT	BB1715	3		9			BB1715 (28 - 29 ft), Moisture=87.9%, Org=25.3%, PI=NP, LL=NV				
			5									
			4									
			13									
								BOH 29.5				29.5

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ 2006DATATEMPLATE.GDT 2/24/12



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LOG OF TEST HOLE

HOLE # 11-726

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1846077.05524, **EASTING** : 1546199.89138

Station / Location:
 Offset:
 Elevation: 61.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]
 Total Depth: 28.5 feet
 Date: 3/8/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			SUBSURFACE MATERIAL
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0									0			G.S. covered by 1.5 ft snow and ice
0.0												Vegetative Mat
0.5												Peat
4.5						ML						SILT (ML)
9.0	SPT	BB1716	1 3 2 4		5							BB1716 (9 - 10 ft) 5% clay, p200=99%, Sa=1%, Gr=0%
14.0	SPT	BB1717	2 5 5 6		10							BB1717 (14 - 14.5 ft), Moisture=27.9%, Org=1.6%
19.5	SPT	BB1718 [SNT]	2 3 5			OL						ORGANIC SILT(OL)

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12



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 Central Region Materials
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LOG OF TEST HOLE

HOLE # 11-726

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1846077.05524, **EASTING** : 1546199.89138

Station / Location:
 Offset:
 Elevation: 61.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 28.5 feet
 Date: 3/8/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			SUBSURFACE MATERIAL	
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date		Symbol
20			6	X					0			G.S. covered by 1.5 ft snow and ice	
21													
22													
23													
24	SPT	BB1719 [SNT]	2	X									
25			5	X									
26			7	X									
27			6	X									
25.0						OL						ORGANIC SILT (OL) (cont.)	
25.5						GP-GM						ORGANIC SILT w/ Gravel(OL)	
26												GRAVEL with Silt and Sand(GP-GM)	
27	SPT	BB1720 [SNT]	5	X									
27.0			9	X									
27.5			8	X									
28			4	X		SM						SILTY SAND(SM)	
28.5												BOH 28.5	

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ 2006DATATEMPLATE.GDT 2/24/12



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LOG OF TEST HOLE

HOLE # 11-727

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1845383.98937, **EASTING** : 1545961.9729

Station / Location:
 Offset:
 Elevation: 63.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 24.0 feet
 Date: 3/8/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			SUBSURFACE MATERIAL
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0									0			G.S. covered by 1.5 ft snow over 1.5 ft ice
0.0												Vegetative Mat
0.5												Peat
1.5						OL						ORGANIC SILT(OL)
2.0						ML						SILT (ML)
2.5 - 3 ft	SPT	BB1721	2, 3, 3, 4		6							BB1721 (2.5 - 3 ft), Moisture=22.9%, Org=2%
7.5 - 8.5 ft	SPT		1, 2, 4, 4		6							
12.5 - 13.5 ft	SPT	BB1722	3, 4, 5, 4		9							BB1722 (12.5 - 13.5 ft), p200=97%, Sa=3%, Gr=0%
18.0 - 18.5 ft	SPT	BB1723	2, 3, 4, 6			ML						SILT with Organics(ML)
18 - 18.5 ft												BB1723 (18 - 18.5 ft), Moisture=41%, Org=7.7%

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ 2006DATATEMPLATE.GDT 2/24/12



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LOG OF TEST HOLE

HOLE # 11-727

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1845383.98937, **EASTING** : 1545961.9729

Station / Location:
 Offset:
 Elevation: 63.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 24.0 feet
 Date: 3/8/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data						USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			SUBSURFACE MATERIAL		
	Sample Type	Number	Blow Count	Sample Recovery	N-Value	Depth in (ft.)				0	Time	Date		Symbol	
						G.S. covered by 1.5 ft snow over 1.5 ft ice									
20						SM			SILTY SAND with Gravel(SM)			20.0			
21															
22			7						BB1724 (22 - 23 ft), p200=31%, Sa=35%, Gr=34%						
23	SPT	BB1724	10		18										
			8												
			7												
24								BOH 24				24.0			

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ 2006DATATEMPLATE.GDT 2/24/12



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

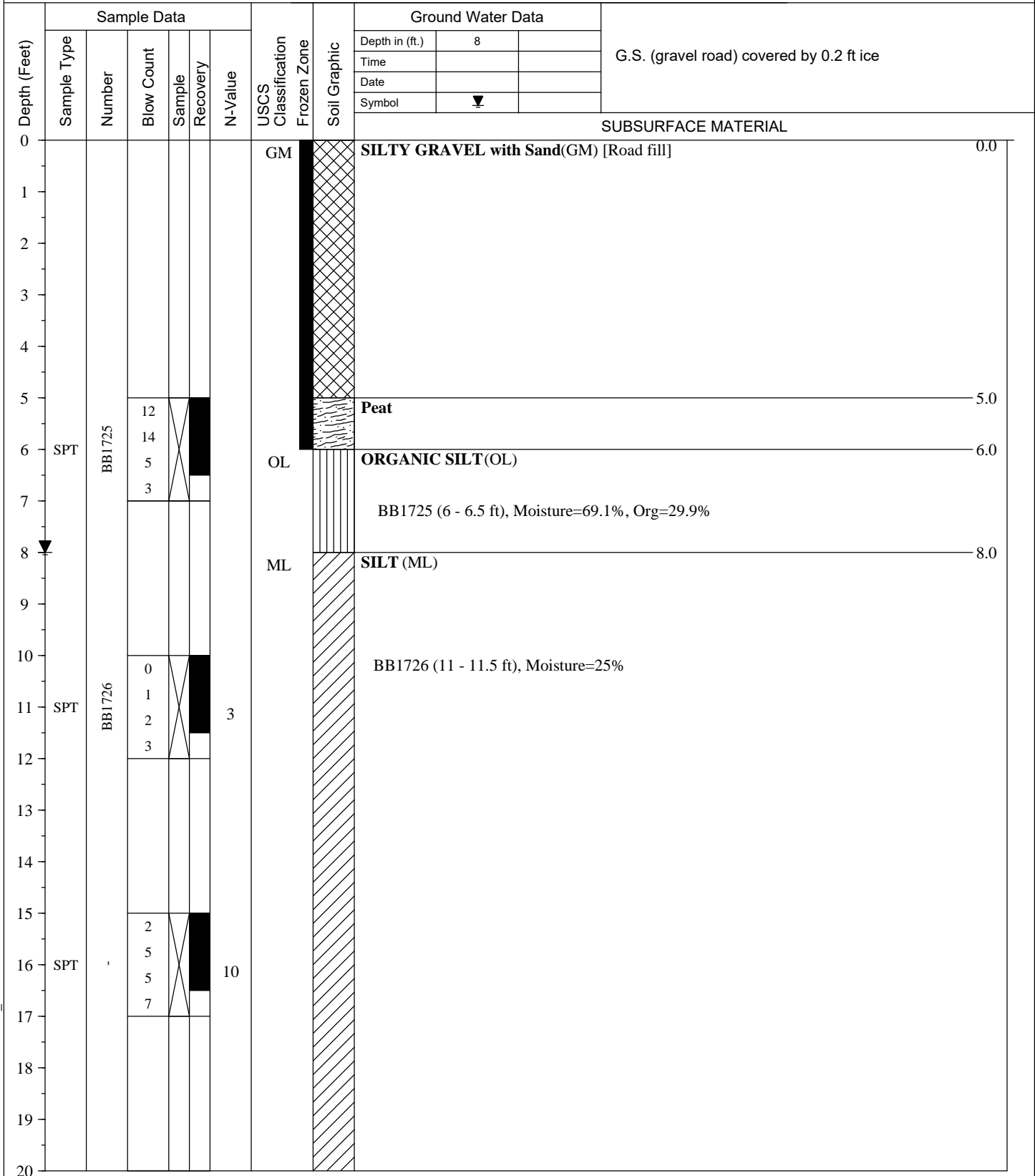
HOLE # 11-728

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1845281.05454, **EASTING** : 1546143.71203

Station / Location:
 Offset:
 Elevation: 64.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 37.0 feet
 Date: 3/8/2011 -
 Geologist: B. Benko



A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12



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LOG OF TEST HOLE

HOLE # 11-728

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1845281.05454, **EASTING** : 1546143.71203

Station / Location:
 Offset:
 Elevation: 64.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 37.0 feet
 Date: 3/8/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		G.S. (gravel road) covered by 0.2 ft ice
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
20											
21	SPT	BB1727 [SNT]	3		10						
22			4								
23			6			OL					
24			6								
25											
26	SPT	BB1728 [SNT]	2		8						
27			3								
28			5								
29			6								
30						ML					
31	SPT	BB1729 [SNT]	3		11						
32			6								
33			5								
34			7			SM					
35			7								
36	SPT		7		14						
37			10								

Notes:
 Location: perimeter road surface

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12



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LOG OF TEST HOLE

HOLE # 11-729

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1844618.51945, **EASTING** : 1545798.68779

Station / Location:
 Offset:
 Elevation: 67.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 29.0 feet
 Date: 3/11/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			SUBSURFACE MATERIAL	
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date		Symbol
0						SM		XXXX	6			ORGANIC SILTY SAND w/ GRAVEL(SM) [Fill]	0.0
0.5						OL						ORGANIC SILT(OL)	0.5
2												BB1740 (2 - 3 ft), Moisture=72%, Org=20.1%	
3	SPT	BB1740	0 0 1 1	X X X X	1								
4						ML						SILT with Organics(ML)	4.0
5						ML						SILT (ML)	5.0
6	SPT	BB1741	0 1 2 1	X X X X								BB1741 (5 - 5.5 ft), Moisture=31.6%	
7													
8	SPT		1 3 3 4	X X X X	6								
9													
12	SPT	BB1742	3 4 5 7	X X X X	9							BB1742 (12.5 - 13 ft), Moisture=27.4%, PI=NP, LL=Nv	
13													
14													
15													
16													
17													
18	SPT		2 4 3 4	X X X X	7								
19													
20													

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LOG OF TEST HOLE

HOLE # 11-729

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1844618.51945, **EASTING** : 1545798.68779

Station / Location:
 Offset:
 Elevation: 67.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 29.0 feet
 Date: 3/11/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			G.S. covered by 3.5 ft snow
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
20												
SUBSURFACE MATERIAL												
20								SILT (ML) (cont.)				
21												
22			3									
23	SPT	BB1743	4			SM		SILTY SAND with Gravel(SM)				22.5
24			9									
25			16									
26												
27												
28	SPT	BB1744, -1745 [SNT]	1									
29			5									
			6									
			3			CL-ML		SANDY SILTY CLAY(CL-ML)				28.5
												29.0

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LOG OF TEST HOLE

HOLE # 11-730

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1842662.10407, **EASTING** : 1544762.21644

Station / Location:
 Offset:
 Elevation: 80.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 18.5 feet
 Date: 3/11/2011 -
 Geologist: B. Benko

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			SUBSURFACE MATERIAL
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0						GM			8			G.S. covered by 4 ft snow
0 - 4.0	SPT		12 9 6 4		15							SILTY GRAVEL with Sand(GM) [Fill]
4.0 - 14.5	SPT	BB1746	3 3 5 5		8	ML						SILT (ML) BB1746 (4.5 - 5.5 ft), Moisture=23.9% BB1747 (7.5 - 8 ft), Moisture=24.2%, Org=2.2% BB1748 (12 - 12.8 ft), Moisture=30%
14.5 - 18.5	SPT	BB1749	2 4 6 7		10	ML						SILT with Sand (ML) BB1749 (16.5 - 18 ft), p200=76%, Sa=24%, Gr=0%, PI=NP, LL=NV, ML
18.5								BOH	18.5			

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12



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LOG OF TEST HOLE

HOLE # 11-731

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1839876.02204, **EASTING** : 1543652.97489

Station / Location: Refer to Boring Location Map
 Offset:
 Elevation: 51.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 41.5 feet
 Date: 10/27/2011 -
 Geologist: S. Browne

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Overcast and light snow, 25F Recently mowed, willow, alder, birch and spruce with grass
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)		
0									14		
SUBSURFACE MATERIAL											
0						ML		Vegetative Mat			0.0
0.2								SANDY SILT (ML) Brown, moist to wet, soft to firm			0.2
5			2					1750 (5 - 7 ft), Moisture=30.5%			
6	SPT	1750	3		6						
7			3								
8			4								
8						ML		SILT (ML) gray brown to gray, moist to wet, firm to stiff			8.0
10			3					1751 (10 - 12 ft), Moisture=25.7%			
11	SPT	1751	4		8						
12			4								
13			5								
14											
15			2					1752 (15 - 17 ft), Moisture=32.6%			
16	SPT	1752	3		7						
17			4								
18			4								
19											
20											

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # 11-731

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1839876.02204, **EASTING** : 1543652.97489

Station / Location: Refer to Boring Location Map
 Offset:
 Elevation: 51.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 41.5 feet
 Date: 10/27/2011 -
 Geologist: S. Browne

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Overcast and light snow, 25F Recently mowed, willow, alder, birch and spruce with grass
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
20									14		
21	SPT	1753	1			7					
22			3								
23			4								
24			6								
25							SW				-24.0
26	SPT	1754	19			63					
27			23								
28			40								
29			50				SM				-28.0
30											
31	SPT	1755	6			19					
32			9								
33			10								
34			12								
35											
36	SPT	1756	4			17					
37			5								
38			12								
39			16								
40											

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12

CME Auto Hammer Cathead Rope Method 140 lb. hammer with 30 in. drop 340 lb. hammer with 30 in. drop



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LOG OF TEST HOLE

HOLE # 11-731

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1839876.02204, **EASTING** : 1543652.97489

Station / Location: Refer to Boring Location Map
 Offset:
 Elevation: 51.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]
 Total Depth: 41.5 feet
 Date: 10/27/2011 -
 Geologist: S. Browne

Depth (Feet)	Sample Data						USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			Weather: Overcast and light snow, 25F Recently mowed, willow, alder, birch and spruce with grass
	Sample Type	Number	Blow Count	Sample Recovery	N-Value	Depth in (ft.)				Time	Date	Symbol	
40	SPT	1757	5	[REDACTED]	35				14				
41			11										
			24										
SUBSURFACE MATERIAL													
								[Dotted Pattern]	SILTY SAND (SM) gray, moist to wet, fined to medium sand alternating with seams of silt, medium dense (cont.) 1757 (40 - 41.5 ft) [Rods stuck in auger when initially trying to remove rod from auger. 2.5' of heave when split spoon set at 40'.], Moisture=20.7%			41.5	
								BOH 41.5	Notes: Southern end of Runway				

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ 2006DATATEMPLATE.GDT 2/24/12



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 Geology Section

LOG OF TEST HOLE

HOLE # 11-732

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1839689.36001, **EASTING** : 1543654.84562

Station / Location: Refer to Boring Location Map
 Offset:
 Elevation: 36.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 50.0 feet
 Date: 10/28/2011 -
 Geologist: S. Browne

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Light Rain, 34F Willow, alder, birch and spruce with moss and grass
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0									1.5		
0						PTh					
0.3											
1											
2											
3											
4											
5						ML					
5.0											
6	SPT	1758	0		1						
6			0								
6			1								
7											
8											
9											
10											
10			0								
11	SPT	1759	0		0						
11			0								
11			0								
11			0								
12											
13											
14											
15											
15			1								
16	SPT	1760	2		5						
16			3								
17											
18											
19											
20											

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12

- CME Auto Hammer
- Cathead Rope Method
- 140 lb. hammer with 30 in. drop
- 340 lb. hammer with 30 in. drop



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # 11-732

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1839689.36001, **EASTING** : 1543654.84562

Station / Location: Refer to Boring Location Map
 Offset:
 Elevation: 36.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 50.0 feet
 Date: 10/28/2011 -
 Geologist: S. Browne

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Light Rain, 34F Willow, alder, birch and spruce with moss and grass
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
20									1.5		
21	SPT	1761	1		6			SILT with Sand (ML) Silt with sand grading to SILT, blue-gray grading to gray brown with depth, wet, very soft to firm with depth 1758 (5 - 6.5 ft), Moisture=32.5% (cont.) 1761 (20 - 22 ft), p200=72%, Sa=26%, Gr=2%, Moisture=44.2%, PI=NP, LL=31			
22			2								
23			4								
24			4								
25			1								
26	SPT	1762	4			ML		1762 (25 - 27 ft), Moisture=17.2%			
27			5			ML		GRAVELLY SILT with Sand (ML) 25.5			
28			6			ML		SILT (ML) gray-brown 25.7			
29								GRAVELLY SILT with Sand (ML) 26.8			
30						SW-SM		SAND with Silt and Gravel (SW-SM) 29.0			
31	SPT	1763	5		28			1763 (30 - 32 ft), p200=8%, Sa=66%, Gr=26%, Moisture=13.6%			
32			11								
33			17			ML		SILT (ML) gray-brown 32.0			
34			12					SAND (SP) Medium SAND, wet 33.0			
35								1764 (35 - 37 ft) [2' of heave when splitspoon set at 35' feet, lifted auger and spoon feel into place.], Moisture=15.4%			
36	SPT	1764	7		27						
37			11								
38			16								
39			21								
40											

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12



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 Geology Section

LOG OF TEST HOLE

HOLE # 11-732

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1839689.36001, **EASTING** : 1543654.84562

Station / Location: Refer to Boring Location Map
 Offset:
 Elevation: 36.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 50.0 feet
 Date: 10/28/2011 -
 Geologist: S. Browne

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Light Rain, 34F Willow, alder, birch and spruce with moss and grass
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
40	SPT	1765	3	[X]	6	SW-SM	[Soil Graphic: Sand with Clay and Gravel]	1.5		SUBSURFACE MATERIAL	
41			3								
42			3								
43	GRAB	1766									
44											
45											
46						SP					
47											
48											
49											
50											

SAND (SP) Medium SAND, wet (cont.)
 1765 (40 - 42 ft) [Rod stuck in augers at 40' due to heave inside auger. Pulled all auger, cleaned out and] redrilled to 40' the next day. 2.5' of heave at 40' at new location, able to lift auger and spoon fell into place., Moisture=19.2%

SAND with Clay and Gravel(SW-SM) gray, moist to wet, slightly plastic
 1766 (43.5 - 45 ft), p200=15%, Sa=58%, Gr=27%, Moisture=13.9%, PI=NP, LL=NV

SAND (SP) Medium SAND, wet

BOH 50
 6' of heave when split spoon set at 50'. Spoon filled with medium sand when recovered.

Notes:
 Southern end of Runway, surface water present

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LOG OF TEST HOLE

HOLE # 11-733

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1839774.88445, **EASTING** : 1543435.61443

Station / Location: Refer to Boring Location Map
 Offset:
 Elevation: 41.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 36.5 feet
 Date: 10/29/2011 -
 Geologist: S. Browne

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Light snow, 33F Recently mowed, willow, alder, birch and spruce with grass
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Symbol	
0									8.5	▼	SUBSURFACE MATERIAL
0						ML		Vegetative Mat			0.0 0.2
0.2								SILT (ML) brown grading to gray with depth, moist to wet, soft, 1-2" lenses of gravelly sand observed beginning at 25'			
5			3					1768 (5 - 7 ft) [Water coming up augers at 5.5'], p200=95%, Sa=5%, Moisture=32.1%			
6	SPT	1768	3		6						
7			3								
8			3								
9			3								
10			1					1769 (10 - 12 ft), Moisture=30.6%			
11	SPT	1769	2		4						
12			2								
13			2								
14			2								
15			1					1770 (15 - 17 ft), Moisture=32.7%			
16	SPT	1770	2		5						
17			3								
18			2								
19											
20											

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # 11-733

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1839774.88445, **EASTING** : 1543435.61443

Station / Location: Refer to Boring Location Map
 Offset:
 Elevation: 41.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 36.5 feet
 Date: 10/29/2011 -
 Geologist: S. Browne

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Light snow, 33F Recently mowed, willow, alder, birch and spruce with grass
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Symbol	
20									8.5		
21	SPT	1771	1 4 7 8		11						
22											
23											
24											
25											
26	SPT	1772	5 5 6 12		11						
27											
28						SW-SM					
29											
30											
31	SPT	1773	4 9 13 13		22						
32											
33						SP					
34											
35											
36	SPT	1774	9 10 15		25						
36.5						BOH					

SUBSURFACE MATERIAL

SILT (ML) brown grading to gray with depth, moist to wet, soft, 1-2" lenses of gravelly sand observed beginning at 25' (cont.)
 1771 (20 - 22 ft), Moisture=23.2%

1772 (25 - 27 ft), Moisture=16.5%

SAND with Silt and Gravel(SW-SM) gray, wet, medium to fine gravel
 1773 (30 - 32 ft), p200=8%, Sa=58%, Gr=34%, Moisture=12%

SAND (SP) gray, wet, alternating layers of SP and SW, with less than 5% silt
 1774 (35 - 36.5 ft) [2' of heave when splitspoon set at 35', repeatedly lifted and dropped rods until spoon fell into place.]
 5' of heave when rods returned to 35', couldn't set correctly and pulled out of hole., Moisture=19.3%

Notes:
 Southern end of Runway

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # 11-734

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1839679.82755, **EASTING** : 1543480.74853

Station / Location: Refer to Boring Location Map
 Offset:
 Elevation: 35.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 52.0 feet
 Date: 10/30/2011 -
 Geologist: S. Browne

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Clear skies, 20F Willow, alder, birch and spruce with moss and grass
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)		
0											
0						PTh		Vegetative Mat			0.0
0.2								Peat (PTh) red-brown, wet			0.2
4						ML		SILT (ML) gray, moist to wet, sof to firm, decreaseing sand with depth			4.0
5								1775 (5 - 7 ft), Moisture=26%			
5.5	SPT	1775	0		5						
6			3								
6.5			2								
7			4								
10								1776 (10 - 12 ft), Moisture=29.3%			
10.5	SPT	1776	1		5						
11			2								
11.5			3								
12			4								
13											
13.5											
15								1777 (15 - 17 ft), p200=97%, Sa=3%, Moisture=29.1%			
15.5	SPT	1777	2		8						
16			3								
16.5			5								
17			4								
17.5											
18											
19											
20											

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # 11-734

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1839679.82755, **EASTING** : 1543480.74853

Station / Location: Refer to Boring Location Map
 Offset:
 Elevation: 35.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]
 Total Depth: 52.0 feet
 Date: 10/30/2011 -
 Geologist: S. Browne

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Clear skies, 20F Willow, alder, birch and spruce with moss and grass
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)		
20											SUBSURFACE MATERIAL
20-21	SPT	1778	3			ML		13.5			SILT (ML) gray, moist to wet, sof to firm, decreaseing sand with depth (cont.) 1778 (21.5 - 22 ft), Moisture=10.6%
21-22			4								21.5
22-23			5								
23-24			7			SP-SM					
24-25											23.0
25-26	SPT	1779	5			SM					
26-27			7								
27-28			7								
28-29			8			ML					
29-30											26.5
30-31	SPT	1780	6			SW-SM					
31-32			11								
32-33			10								
33-34			10								
34-35											31.5
35-36	SPT	1781	3								
36-37			6								
37-38			8		14						
38-39			8			ML					
39-40											38.0
40											

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CME Auto Hammer Cathead Rope Method 140 lb. hammer with 30 in. drop 340 lb. hammer with 30 in. drop



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 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # 11-734

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1839679.82755, **EASTING** : 1543480.74853

Station / Location: Refer to Boring Location Map
 Offset:
 Elevation: 35.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]
 Total Depth: 52.0 feet
 Date: 10/30/2011 -
 Geologist: S. Browne

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Clear skies, 20F Willow, alder, birch and spruce with moss and grass
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
40									13.5		
41	SPT	1782	2 5 5 6		10						
44						SP-SM					44.0
45											
46	SPT	1783	5 7 14 11		21						
50											
51	SPT	1784	1 1 4 6		5						
52							BOH 52				52.0

SUBSURFACE MATERIAL

SILT with Sand (ML) gray with some gravel (cont.)
 1782 (40 - 42 ft), Moisture=11.5%

SAND with Silt (SP-SM)
 1783 (45 - 47 ft) [2' of heave when split spoon set at 45', augers lifted and splitspoon feel into place.], p200=10%, Sa=89%, Gr=1%, Moisture=21.9%

1784 10' of heave when split spoon set at 50', blow counts not representative

Notes:
 Southern end of Runway, surface water present

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ 2006DATATEMPLATE.GDT 2/24/12



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # 11-735

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1839672.78229, **EASTING** : 1543593.02619

Station / Location: Refer to Boring Location Map
 Offset:
 Elevation: 35.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 40.0 feet
 Date: 10/31/2011 -
 Geologist: S. Browne

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Light snow and wind, 23F Willow, alder, birch and spruce with moss and grass
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)		
0											
0.0 - 0.2						ML		Vegetative Mat SILT (ML) brown			
0.2 - 1.5						PT		Peat (PT) red-brown			
1.5 - 4.5						ML		SILT (ML) brown-gray, wet, soft to firm 1785 (5 - 7 ft), Moisture=40.5%			
4.5 - 10	SPT	1785	0 0 1 2		1						
10 - 12	SPT	1786	0 0 0 3		0			1786 (10 - 12 ft), p200=96%, Sa=4%, Moisture=25.4%			
12 - 15											
15 - 17	SPT	1787	1 3 5 6		8			1787 (15 - 17 ft) [Water coming up augers at 17'], Moisture=28.9%			
17 - 20											

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # 11-735

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1839672.78229, **EASTING** : 1543593.02619

Station / Location: Refer to Boring Location Map
 Offset:
 Elevation: 35.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 40.0 feet
 Date: 10/31/2011 -
 Geologist: S. Browne

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Light snow and wind, 23F Willow, alder, birch and spruce with moss and grass
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)		
20											
21	SPT	1788	1 4 5 4		9						
22											
23											
24											
25											
26	SPT	1789	2 3 5 7		8						
27											
28											
29											
30											
31	SPT	1790	2 6 9 11		15						
32											
33											
34											
35						SP					
36	SPT	1791	5 6 17			SP					
37			10/1"								
38											
39											
40											

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ_2006DATATEMPLATE.GDT_2/24/12



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # 11-735

PROJECT NUMBER :59304
PROJECT : Dillingham AP Improvements
NORTHING : 1839672.78229, **EASTING** : 1543593.02619

Station / Location: Refer to Boring Location Map
 Offset:
 Elevation: 35.0 feet

Equipment_Type: Geoprobe 6620DT
 Drilling Method: Hollow Stem Auger (8-in.)
 Field Crew: [GeoTek AK]

Total Depth: 40.0 feet
 Date: 10/31/2011 -
 Geologist: S. Browne

Depth (Feet)	Sample Data						USCS Classification Frozen Zone	Soil Graphic	Ground Water Data			Weather: Light snow and wind, 23F Willow, alder, birch and spruce with moss and grass
	Sample Type	Number	Blow Count	Sample Recovery	N-Value	Depth in (ft.)			14	1.0		
						Time						
						Date			10/31/11	11/1/11		
						Symbol			▼	▽		
SUBSURFACE MATERIAL												
							BOH 40	9' of heave when split spoon set at 40'. Spoon full of med sand when recovered.			40.0	
Notes: Southern end of Runway, surface water present												

A USCS LOG OF TEST HOLE_59304_FORFINALVERSION.GPJ 2006DATATEMPLATE.GDT 2/24/12

APPENDIX E

**IMPORTANT INFORMATION ABOUT YOUR
GEOTECHNICAL/ENVIRONMENTAL REPORT**



Date: May 2020
To: Stantec
Dillingham Airport Runway Improvements,
Dillingham, Alaska

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL/ENVIRONMENTAL REPORT

CONSULTING SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

Consultants prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for the purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the consultant.

THE CONSULTANT'S REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

A geotechnical/environmental report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include: the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask the consultant to evaluate how any factors that change subsequent to the date of the report may affect the recommendations. Unless your consultant indicates otherwise, your report should not be used: (1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); (2) when the size, elevation, or configuration of the proposed project is altered; (3) when the location or orientation of the proposed project is modified; (4) when there is a change of ownership; or (5) for application to an adjacent site. Consultants cannot accept responsibility for problems that may occur if they are not consulted after factors which were considered in the development of the report have changed.

SUBSURFACE CONDITIONS CAN CHANGE.

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary.

MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your consultant can work together to help reduce their impacts. Retaining your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

A REPORT'S CONCLUSIONS ARE PRELIMINARY.

The conclusions contained in your consultant's report are preliminary because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in their contracts, reports, and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

The preceding paragraphs are based on information provided by the
ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland