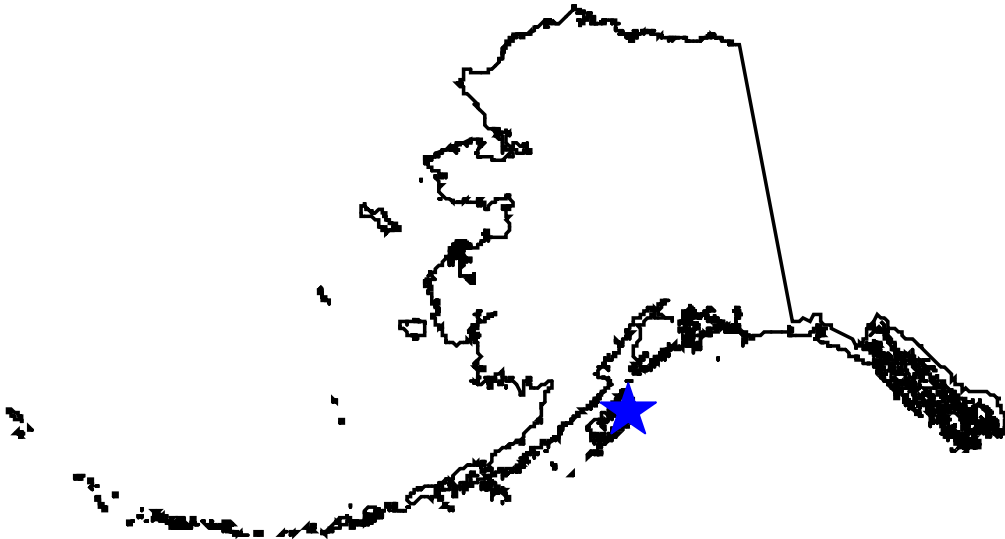


GEOTECHNICAL REPORT

KODIAK RSA EXPANSION

PROJECT # 58579

JANUARY 2013



Prepared By
ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES
Central Region Materials
Anchorage, Alaska



ALASKA
Department of Transportation
& Public Facilities

GEOTECHNICAL REPORT
KODIAK RSA EXPANSION

AKSAS Project # 58579

January 2013

Written By:

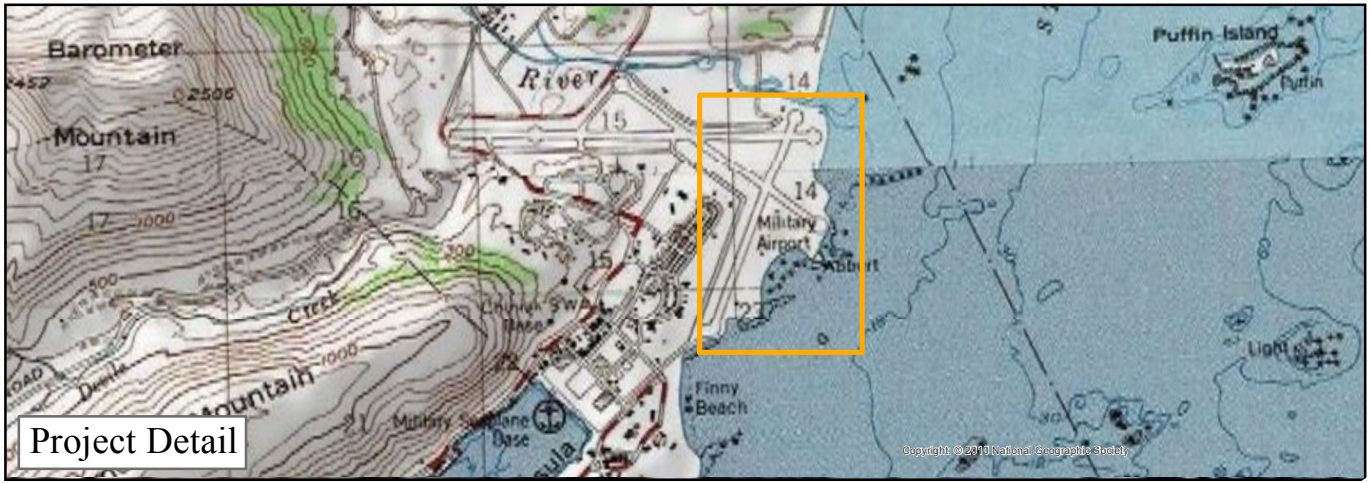
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 Project Area



State of Alaska
Department of Transportation
and Public Facilities

**Kodiak Airport RSA Expansion
Project No 53587**

Vicinity Map
Figure 1

Map Created By CRM Materials Oct 2012

Created with TOPO!, ©2003 National Geographic Maps, All Rights Reserved

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Historic Test Hole Bore Logs.

INTRODUCTION

Project Scope

This project will extend the runway safety areas (RSA) for runways 18/36 and 25 into the Chiniak Bay. The final length of the runway extension will be determined from the results of an environmental impact study (EIS). The lengths of the extension currently under consideration range from 400 to 1200 feet.

Investigation Scope

In September 2012, the Alaska Department of Transportation and Public Facilities Central Region Materials Section (CRM) performed a geotechnical investigation to characterize subsurface conditions on the existing runways, beach, and off-shore within the proposed project limits. Test holes were drilled on the ends of runways 36 and 25, on the beach below the embankments of runways 18/36 and 25 and off-shore of runways 36 and 25. The investigation included classification of soils and characterization of the stiffness of the soil.

Previous Investigations

Several investigations have been conducted in the project area. The reports are available upon request from CRM.

- In May, June, and July of 1975 the State of Alaska Engineering Geology Section conducted a subsurface investigation of runway 7-25 for a proposed overlay project. A summary of conditions observed during the investigation are as follows:
 - The original surfacing material was comprised of 3.5 inches of asphalt over 6.5 inches of Portland cement concrete containing 3/8 inch rebar.
 - Surfacing material of the 1250 foot east end section, which subsided and was subsequently reconstructed following the 1964 earthquake, was comprised of 4 to 5 inches of asphalt over a 0.5 to 2 foot thick layer of crushed base course over a 6 inch layer of concrete.
 - Surfacing material on the 1500 foot extension on the west end of the runway was comprised of Portland cement concrete.
 - The soils underlying the runway were primarily sandy gravel and gravelly sand with a variable silt content ranging from 6% to 18%. An estimated 5% to 10% of oversized particles (3"+) was noted including occasional boulders (10"+).
 - Refusal depths of 10 and 11 feet (bore holes 2A and 19A respectively) were encountered, however, differentiation of bedrock from boulders was not possible.

For further information refer to the report entitled: "*Kodiak Runway Subsurface & Materials Investigation*," dated March 1976.

- In August of 1996, CRM conducted a geotechnical investigation for the proposed improvements to the Kodiak Airport Commercial Aircraft Parking Aprons and Taxiways B, C, D, and E. A total of 24 test holes were advanced for the aprons and 18 were advanced along the four taxiways. For further information refer to the report entitle: “*Kodiak Airport Resurfacing & Improvements (pr. #52228)*,” dated June 1999.
- In July and August of 2010, the Alaska Department of Transportation and Public Facilities Central Region Materials Section (CRM) performed a geotechnical investigation to characterize subsurface conditions and determine pavement type and thickness on runways 18-36 and 7-25. A total of 38 asphalt cores were taken along runways 18-36 and 7-25 and 27 test holes were advanced on runways 18-36 and 7-25, Taxiway B, and Airport Way. Further information can be found in the report titled: “*Kodiak Runway Improvements Project #52739*,” dated February 2011.

A composite Historical Test Hole Map and the associated test hole logs for the above reports have been included as an attachment to the end of this report.

PHYSICAL SETTING

Location

Kodiak Airport is located on the east side of Kodiak Island in the Gulf of Alaska. It is 252 air miles south of Anchorage. The community of Kodiak lies at approximately 57.788890° North Latitude and -152.401900° West Longitude (Sec. 32, T027S, R019W, Seward Meridian). The area encompasses 3.5 sq. miles of land and 1.4 sq. miles of water.

Topography

The topography of the region is, for the most part, rugged, with relief generally on the order of 1300 to 2500 feet. The Kodiak Airport is bound by Chiniak Bay to the east, the Buskin River to the north, Women’s Bay to the south, and steep mountainous terrain to the west. Devil’s Creek flows northward beneath the airport at Taxiway F before draining into the Buskin River.

Geology

The bedrock geology is composed predominantly of marine sediments and volcanics which are intruded by granitic rocks that lie axially along the center of the island. Bedrock in the airport vicinity is composed of slates, shale-argillites and graywackes. Repeated and extensive glaciations during the Pleistocene Epoch strongly influenced the present-day geography. The presence of fiords, U-shaped valleys, and glacial benches reflect these glacial periods, as do the coarse-granular, glacio-fluvial deposits present in the area. Volcanic ash is present as part of the upper soil stratum. Following the eruption of Mt. Katmai in 1912, winds deposited ash across

Kodiak Island. These deposits were subsequently washed from the steep slopes and deposited into the valleys and low lying areas.

Climate

The climate of the Kodiak Islands has a strong marine influence characterized by small daily and annual temperature variations, abundant precipitation, occasional high winds, frequent cloud cover, and fog. Severe storms are common from December through February. Mean annual precipitation is 78 inches with a mean annual snowfall of 75 inches. Mean temperatures and rainfall by month can be found in table 1 below. Additional climate data for the Kodiak Airport can be found on the Western Regional Climate Center website.

Table 1: Average Climate Data 1981-2010 - Kodiak, Alaska

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	35.9	36.3	38.8	43.6	50.5	55.7	60.3	61.7	56.1	47.3	38.5	36.7	46.9
Average Min. Temperature (F)	26.2	26.3	28.1	32.3	38.8	44.7	49.1	48.9	43.2	34.9	27.8	26.5	35.7
Average Total Precipitation (in)	8.63	6.17	5.87	5.61	5.73	5.85	5.10	4.59	7.41	8.08	7.11	8.48	78.63

Source: Western Regional Climate Center: <http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ak4988>

INVESTIGATION PROCEDURES

Field Methods

In September 2012, a CRM Engineering Geologist supervised field explorations and collected samples. The drilling was performed by a contracted drill crew, Geotek Alaska, using a truck mounted CME 75 drill rig and a track mounted Geoprobe 8040DT. Both rigs were equipped with an 8-inch diameter hollow stem auger to acquire soil samples and estimate soil density. Casing was used in place of the hollow stem auger on the 8040 drill rig for off-shore work. A landing craft was subcontracted for the off-shore test holes. See figure 2 on page for test hole locations. Photos of the equipment can be found in Appendix D.

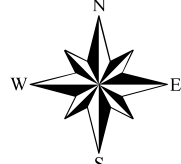
The following field sampling methods and tests were performed:

- Standard penetration tests (*ASTM-1586*) were conducted using a 1.4 inch internal diameter split barrel sampler driven by a 140 pound hammer to collect soil samples and estimate N values. The number of blows required to drive the sampler through undisturbed soil were recorded for each 6 inch increment.
- A modified penetrometer test was used to estimate soil stiffness off-shore when conditions were too bad to perform SPT testing.

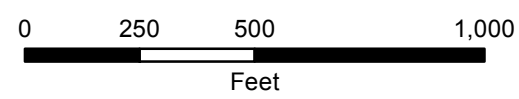


Kodiak Airport
 RSA Expansion #58579
 Fig 2: 2012 Test Holes

Map Created by
 Central Region Materials
 May 2012



 DOT&PF, 2012



Test Hole Locations are Approximate
 Image from USDA, 2004
 Reports referenced by this document: 159, 160, 1670, 2953

Soil Sampling

The field geologist examined and visually classified soil samples in the field following the Unified Soil Classification System (USCS) Visual Manual Method (ASTM D2488). Test hole logs can be found in Appendix B.

Sampling methods consisted solely of standard penetration tests (ASTM-1586). These were conducted using a 1.4 inch internal diameter split barrel sampler driven by a 140 pound hammer to collect soil samples and estimate N values. The number of blows required to drive the sampler through undisturbed soil were recorded for each 6 inch increment for 18 or 24 in intervals.

Laboratory Testing

In addition to the visual inspection by the field geologist, selected samples were tested by the Central Region Materials Laboratory in Anchorage to verify the field soil classification. If needed, field classifications were corrected to reflect laboratory results. In addition, soils containing organic material were further classified by lab methods. Complete lab results can be found in Appendix C.

All lab testing followed specifications issues by the AKDOT&PF Geotechnical Procedures Manual, AASHTO, or ASTM as appropriate. Testing for this project included the following methods and specifications:

- Soils Classification, Unified Soils Classification System (ASTM D2487).
- Atterberg Limits (Liquid Limit, Plastic Limit, and Plasticity Index; ASTM D 4318 or AASHTO T89 and T90).
- Sieve Analysis (AASHTO T27, T11, or T88 or ASTM C136 and C117)
- Moisture Content (AASHTO T255/T265 or ASTM D2216).
- Organic Content (Alaska Test Method ATM 203).

INVESTIGATION FINDINGS

Summary of Site Conditions

The scope of the project included on, near, and off shore drilling. Test holes were drilled on the existing fill embankment, on the beach, and from a landing craft over the water. Site conditions varied from test hole to test hole. The runways associated with the proposed RSA expansions have been repaved over the last two years.

The waters of the Chiniak Bay were observed to be susceptible to producing waves and surges several feet high. This was observed over the duration of the project in September and will vary with the season.

Site Contamination

One contaminated site is located in the vicinity of the project as reported by the State of Alaska, Department of Environmental conservation (DEC). The site is located near the north end of Runway 18 and is reported as being cleaned up. The scope of this geotechnical report does not include determining the effect of this site on construction. More information regarding this site can be found in Appendix E.

Summary of Materials

To generalize, the predominate native material found in the test holes is a silty sand with gravel that yields high N values. A few feet of sand was found in the upper portion of most test holes. Beneath the sand, strata of sand, silt, and gravel were found below the sand. Sand layers tended to yield lower N values. Organic material was uncommon, being found in only one test hole. Gravel found deeper in several test holes is suspected to be highly weathered bedrock. This is based on the knowledge that bedrock is relatively shallow in the area and the bedrock is known to be slates, shale-argillites and graywackes. These rocks tend to be susceptible to weathering and fracturing.

Description by Runway

Runway 36

Three test holes were drilled off the end of Runway 36. Two test holes were drilled on the beach at low tide and one was drilled on the beach above the high tide level. Test holes were drilled using a hollow stem auger and SPT sampling.

On the beach above the high tide level, sands were predominate to approximately 15 feet. Low N values (2-10) were indicated in these sands. At 15 feet, sandy gravel with significantly higher N values (20-70) were indicated.

The two test holes on the beach near the extreme low tide line had similar results. A thin layer (<2') of sand covered gravel with varying amounts of silt. Test hole 12-08 also contained a layer of coarse sand. N values ranged from 22 to 57.

Runway 25

Four test holes were drilled off the end of Runway 25. One test hole was drilled on the existing embankment fill, one on the beach near the extreme low tide line, and two off-shore in approximately 14 feet of water (at high tide). On-shore test holes were drilled using a hollow stem auger and SPT sampling. One off-shore test hole was advanced using a modified penetrometer. The other was drilled using casing to advance the SPT sampler into position.

The test hole in the fill embankment material consisted of 4 feet of a gravel fill overlaying approximately 16 feet of sandy fill. This sandy fill had relatively low N values (6-12). At about

The test hole on the beach near the extreme low tide line consisted of about 2 feet of well graded sand with low N values (10) on top of 9 feet of variable silt, sand, and gravel that had N values ranging from 40 to 100. At approximately 14 feet, the soil was silty gravel with N values of 50.

Two off-shore test holes were drilled using a landing craft off-shore of runway 25. A modified penetrometer (see photos of head used in Appendix D) was performed due to the seas being too rough to perform SPT sampling. In general, the blows per foot increased from 5 at 0 feet to 100+ at 19 feet below the mud line. SPT data was also gathered using casing to advance to the next test site. N values ranged from 50 to 70. Sampling indicated gravel with some sand for the duration of the test hole.

Runway 18

Three test holes were drilled off the end of Runway 18. One test hole was drilled near the runway on the existing embankment fill. Another was drilled amongst the rocks exposed at low tide. The third test hole was drilled in the water off the end of the runway from a landing craft. All test holes utilized SPT sampling to obtain N values. The two on-shore test holes used a hollow stem auger while the off shore test hole was advanced using casing.

The test hole drilled on the existing embankment contained approximately 4 feet of gravel with sand and silt overlaying gravel. N values ranged from 6 to 35.

The test hole on the rocks near the extreme low tide line consisted of gravels with varying silt and sand content. N values ranged from 13 to 38.

The off-shore test hole consisted solely of silty gravel. N values ranged from 62 to 93. The hole was terminated prior to the target depth due to poor weather conditions and associated concerns for the safety of the drill crew.

REFERENCES





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APPENDIX A


PROJECT MAPS



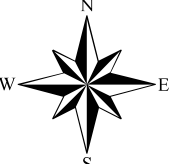
Legend

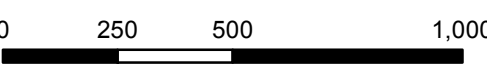
-  DOT&PF, 1976
-  DOT&PF, 1999
-  DOT&PF, 2010
-  DOT&PF, 2012

Kodiak Airport RSA Expansion #58579 Fig 3: Historic Test Holes



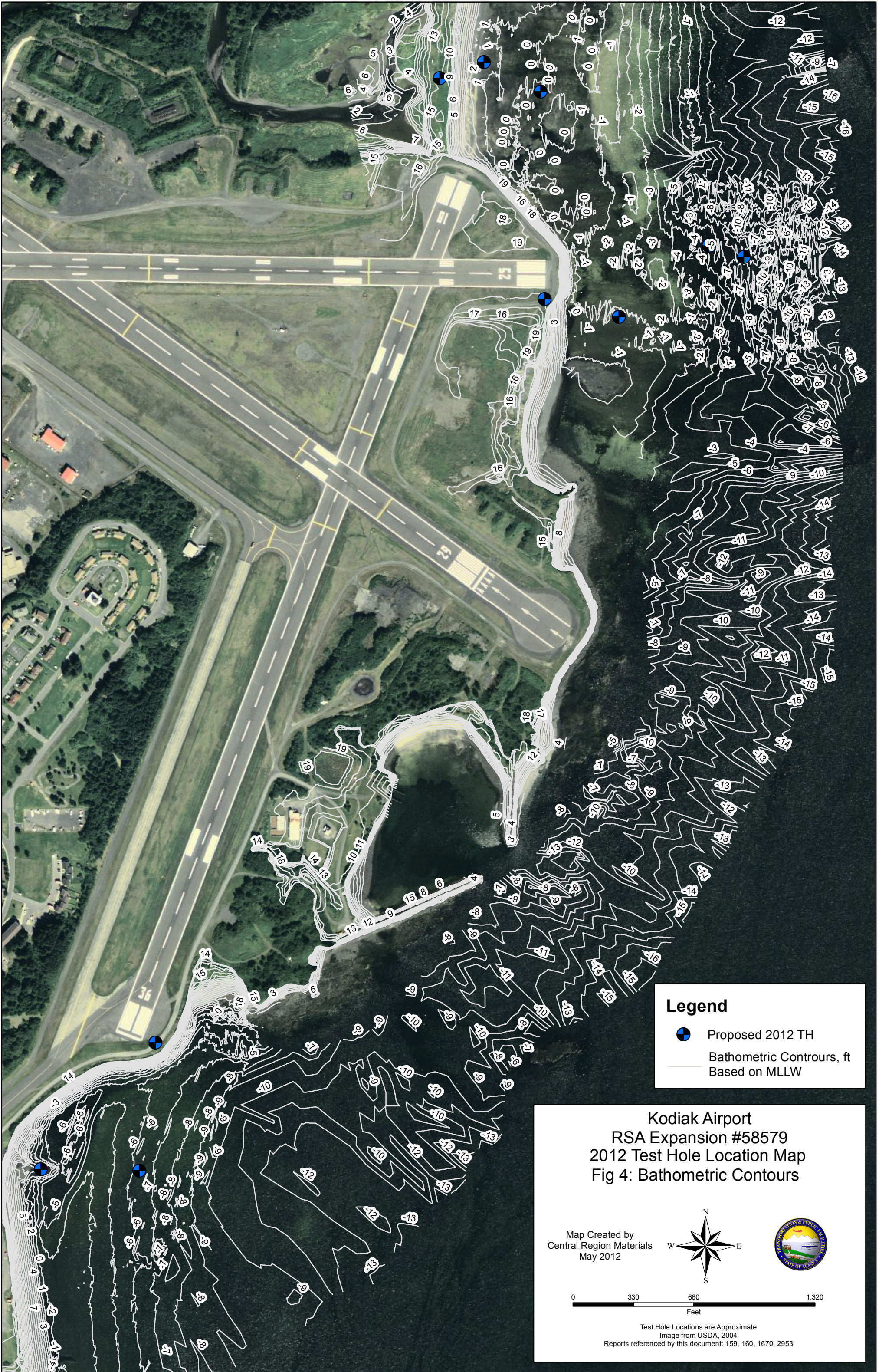
Map Created by
Central Region Materials
May 2012






0 250 500 1,000
Feet

Test Hole Locations are Approximate
 Image from USDA, 2004
 Reports referenced by this document: 159, 160, 1670, 2953

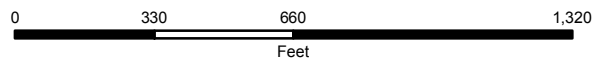
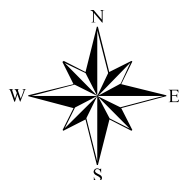


Legend

-  Proposed 2012 TH
- Bathymetric Contours, ft
Based on MLLW

**Kodiak Airport
RSA Expansion #58579
2012 Test Hole Location Map
Fig 4: Bathymetric Contours**

Map Created by
Central Region Materials
May 2012

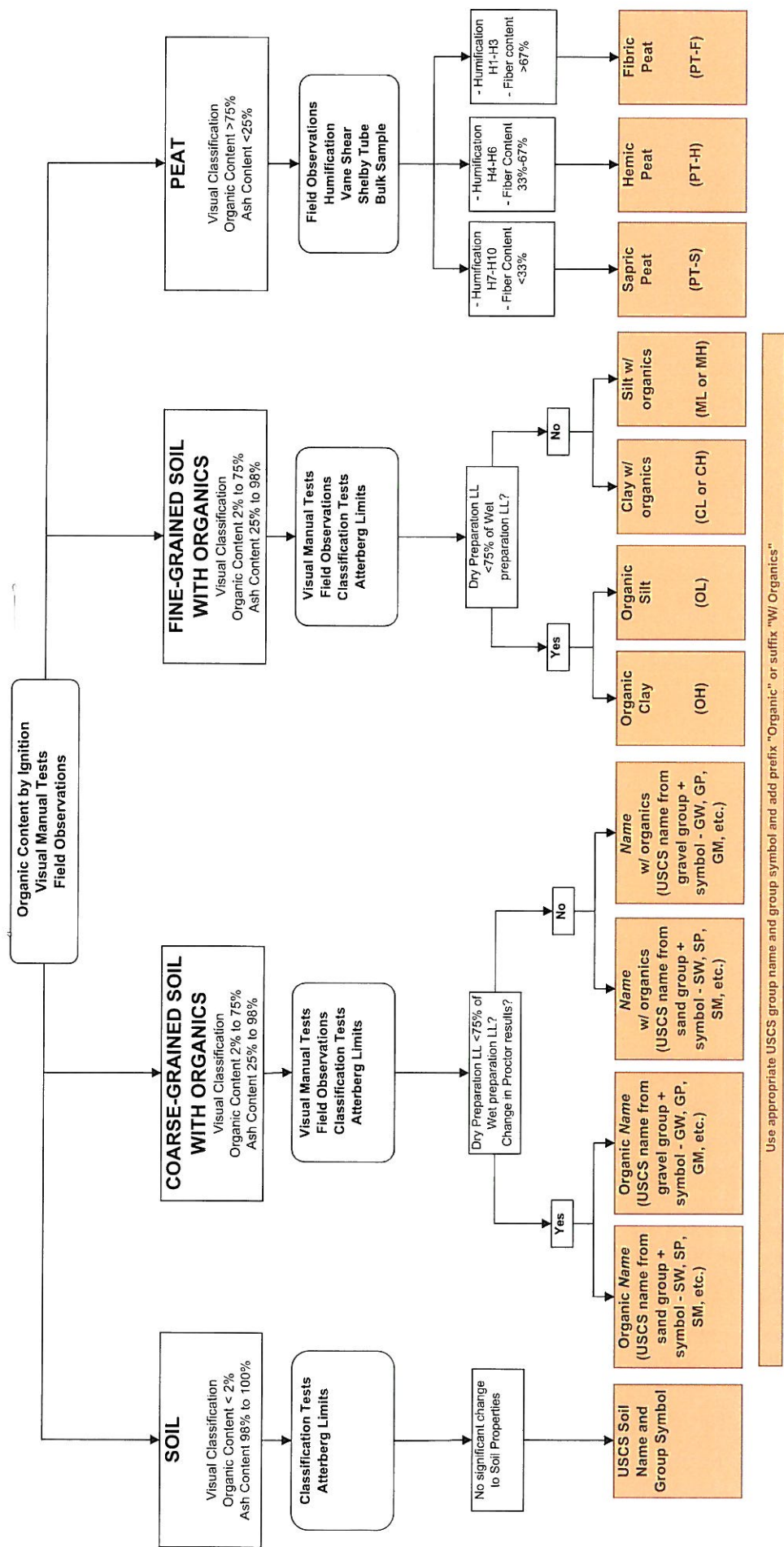


Test Hole Locations are Approximate
Image from USDA, 2004
Reports referenced by this document: 159, 160, 1670, 2953

APPENDIX B

TEST HOLE LOGS

Peat and Organic Soil Classification System



Use appropriate USCS group name and group symbol and add prefix "Organic" or suffix "w/Organics"



INCREASING ORGANIC CONTENT



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # LEGEND

PROJECT NUMBER: TH/TP Year - Sequential Number
PROJECT: TEST HOLE EXPLANATION
NORTHING: 1000, **EASTING:** 2000

Station / Location: Hole Location, Station or Coordinates
 Offset: Offset Location if applicable
 Elevation: Elevation

Equipment Type:
 Drilling Method: Drilling Method
 Field Crew: Driller, Helper

Total Depth: 19.0 feet
 Date: 1/18/2005 -
 Geologist: Geologist

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: This section is for weather notes
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)		
0									15	15.5	
1						GP			10:00	15:05	
2						GW			1/1/04	1/2/04	
3						SP					
4						SW					
5						ML					
6						MH					
7						CL					
8						CH					
9						PT					
10						OL					
11											
12											
13											
14											
15											
16											
17											
18											
19											

A USCS LOG OF TEST HOLE FEB 13 2007 LOG LEGEND.GPJ 2006DATATEMPLATE.GDT 2/13/07



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # 12-01

PROJECT NUMBER : 53587
PROJECT : Kodiak RSA
NORTHING : 1369354.543, EASTING : 1935081.463

Station / Location:
 Offset:
 Elevation:

Equipment_Type: *CME 75 Truck* Total Depth: *27.0 feet*
 Drilling Method: *6.5" Hollow Auger* Date: *9/10/2012 -*
 Field Crew: *Geotek; Driller: Tim, Helpers: Jeff, Elliot* Geologist: *A.Ferntheil*

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Light rain gravel
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0						GP-GM			14.5		
0 - 4.0											GRAVEL with Silt and Sand (GP-GM) Brown, dry to moist
3	SPT	FS01	8								FS01 Moisture=15%
4	SPT	FS02	8			SP					SAND (SP) coarse grained sand, Grey, dry to moist FS02 combined with FS 3, 4 for gradation, p200=3%, Sa=96%, Gr=1%, Moisture=1.7%
5 - 6											
6	SPT	FS03	5		6						
10											FS04 Moisture=4.2%
11	SPT	FS04	3		8						
14 - 14.0						SP					SAND with Gravel (SP) Grey, wet
15											
16	SPT	FS05	7		8						
17											
18											
19											
20											

A USCS LOG OF TEST HOLE_KODIAK_RSA.GPJ_2006DATATEMPLATE.GDT_1/23/13

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 # 12-02

PROJECT NUMBER : 53587
PROJECT : Kodiak RSA
NORTHING : 1374616.315, **EASTING :** 1936632.637

Station / Location:
 Offset:
 Elevation:

Equipment_Type: CME 75 Truck
 Drilling Method: 6.5" Hollow Auger
 Field Crew: Geotek; Driller: Tim, Helpers: Jeff, Elliot
 Total Depth: 32.0 feet
 Date: 9/11/2012 -
 Geologist: A.Ferntheil

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			Weather: overcast gravel
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
SUBSURFACE MATERIAL												
0						SP-SM			SAND with Silt and Gravel (SP-SM) Grey, moist			0.0
1												
2												
3	SPT	FS09	20		30				FS09 Rock stuck in shoe, p200=11%, Sa=46%, Gr=43%, Moisture=3.6%			
4			15									
5			15									
6			12									
5						GP			GRAVEL (GP) Grey, dry to moist, with cobbles			4.5
6	SPT	FS10	10		6				FS10 Moisture=0.2%			
7			4									
8			2									
9			2									
10						SP-SM			SAND with Silt and Gravel (SP-SM) Grey Brown, moist			9.5
10	SPT	FS11	3		8							
11			3									
12			5									
13			4									
15												
15	SPT	FS12	8		8				FS12 Moisture=2.6%			
16			4									
17			4									
18			5									
19												
20												

A USCS LOG OF TEST HOLE_KODIAK_RSA.GPJ_2006DATATEMPLATE.GDT_1/23/13



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # 12-02

PROJECT NUMBER : 53587
PROJECT : Kodiak RSA
NORTHING : 1374616.315, EASTING : 1936632.637

Station / Location:
 Offset:
 Elevation:

Equipment_Type: *CME 75 Truck* Total Depth: *32.0 feet*
 Drilling Method: *6.5" Hollow Auger* Date: *9/11/2012 -*
 Field Crew: *Geotek; Driller: Tim, Helpers: Jeff, Elliot* Geologist: *A.Ferntheil*

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			Weather: overcast gravel
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
20									SUBSURFACE MATERIAL			
21	SPT	FS13	8 7 6 6		13			SAND with Silt and Gravel (SP-SM) Grey Brown, moist (cont.) FS13 p200=11%, Sa=45%, Gr=44%				
25												
26	SPT	FS14	40 21 14 10		35			FS14 p200=8%, Sa=39%, Gr=53%				
30												
31	SPT	FS15	5 5 6 8		11							
32							BOH 32	Notes: Approx 25 foot embankment; no water table observed during drilling				32.0

A USCS LOG OF TEST HOLE_KODIAK_RSA.GPJ_2006DATATEMPLATE.GDT_1/23/13



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # 12-03

PROJECT NUMBER : 53587
PROJECT : Kodiak RSA
NORTHING : 1373409.533, EASTING : 1937204.899

Station / Location:
 Offset:
 Elevation:

Equipment_Type: *Geoprobe 8040*
 Drilling Method: *6.5" Hollow Auger*
 Field Crew: *Geotek; Driller: Elliot, Helpers: Jeff, Tim*
 Total Depth: *27.0 feet*
 Date: *9/11/2012*
 Geologist: *A.Ferntheil*

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: rain sea grass
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)		
0						SW			9.5		
0 - 4.5	SPT	FS16	1, 1, 1, 2	100%	2	SW		SUBSURFACE MATERIAL			
3								FS16 Moisture=3.8%			
4.5 - 9.0	SPT	FS17	2, 3, 5, 4	100%	8	SP		SAND with Gravel (SP) Gap Graded, Gray, dry to moist			
5								FS17 combined with FS 18 for grad, p200=4%, Sa=77%, Gr=19%, Moisture=4.3%			
8								FS18 Moisture=3.9%			
9.0 - 10.5	SPT	FS18	2, 3, 3, 3	100%		SW-OL		SAND with Organics (SW-OL) Brown, wet			
10								FS19 Moisture=24.9%, Org=1.4%			
10.5 - 13.0	SPT	FS20	1, 2, 7, 9	100%		GP		GRAVEL (GP) Gray Brown, wet			
13.0 - 15.5	SPT	FS21	8, 9, 10, 7	100%		SP		SAND (SP) Gray, wet			
15.5 - 20	SPT					SP-SM		SAND with Silt and Gravel (SP-SM) Brown Gray, wet			

A USCS LOG OF TEST HOLE_KODIAK_RSA.GPJ_2006DATATEMPLATE.GDT_1/23/13



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # 12-03

PROJECT NUMBER : 53587
PROJECT : Kodiak RSA
NORTHING : 1373409.533, **EASTING :** 1937204.899

Station / Location:
 Offset:
 Elevation:

Equipment_Type: *Geoprobe 8040* Total Depth: *27.0 feet*
 Drilling Method: *6.5" Hollow Auger* Date: *9/11/2012 -*
 Field Crew: *Geotek; Driller: Elliot, Helpers: Jeff, Tim* Geologist: *A.Ferntheil*

Depth (Feet)	Sample Data						USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			Weather: rain sea grass
	Sample Type	Number	Blow Count	Sample Recovery	N-Value	Depth in (ft.)				Time	Date	Symbol	
20									SUBSURFACE MATERIAL				
20			41			71			SAND with Silt and Gravel (SP-SM) Brown Gray, wet (cont.)				
21	SPT	FS22	34										
22			37										
23			35										
24													
25			13			48			Notes: approx 12 foot embankment				
26	SPT	FS23	18										
27			30										
			37										
27							BOH 27		27.0				

A USCS LOG OF TEST HOLE_KODIAK_RSA.GPJ_2006DATATEMPLATE.GDT_1/23/13



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 Geology Section

LOG OF TEST HOLE

HOLE # 12-04

PROJECT NUMBER : 53587
PROJECT : Kodiak RSA
NORTHING : 1373313.375, EASTING : 1937609.733

Station / Location:
 Offset:
 Elevation:

Equipment_Type: *Geoprobe 8040*
 Drilling Method: *6.5" Hollow Auger*
 Field Crew: *Geotek; Driller: Elliot, Helpers: Jeff, Tim*
 Total Depth: *19.0 feet*
 Date: *9/13/2012*
 Geologist: *A.Ferntheil*

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: clear beach sand
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0						SP					SUBSURFACE MATERIAL
0.0											SAND (SP) Grey Brown
3.0	SPT	FS24	5 4 6			SM					SILTY SAND (SM)
4.0			4			GM					SILTY GRAVEL with Sand (GM) Brown
4.5											FS25 p200=22%, Sa=38%, Gr=40%, PI=NP, LL=NV
5.0	SPT	FS25	13 26 35		61						
6.0			26								
10.0	SPT	FS26	20 21 19		40						
12.0			40			SP					SAND (SP) Grey
13.0	SPT	FS27	26 50								
13.5	SPT	FS28	50			GP-GM					SILTY GRAVEL (GP-GM) Brown
18.0	SPT	FS30	12 24 36		60						
19.0											Notes: Test hole drilled on beach exposed at low tide.

A USCS LOG OF TEST HOLE_KODIAK_RSA.GPJ_2006DATATEMPLATE.GDT_1/23/13



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LOG OF TEST HOLE

HOLE # 12-05

PROJECT NUMBER : 53587
PROJECT : Kodiak RSA
NORTHING : 1374542.513, EASTING : 1937181.899

Station / Location:
 Offset:
 Elevation:

Equipment_Type: *Geoprobe 8040*
 Drilling Method: *6.5" Hollow Auger*
 Field Crew: *Geotek; Driller: Elliot, Helpers: Jeff, Tim*
 Total Depth: *19.0 feet*
 Date: *9/13/2012*
 Geologist: *A.Ferntheil*

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			Weather: sunny beach sand	
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date		Symbol
SUBSURFACE MATERIAL													
0						SW							0.0
1						GP							1.0
4						SP-SM							4.0
5									FS30 combined with FS 31, 32, 33 for gradation, p200=11%, Sa=45%, Gr=44%				
6	SPT	FS30	13	X	30								
10			16	X									
11	SPT	FS31	14	X	56								
12			9	X									
17			17	X									
18	SPT	FS32	29	X									
19			27	X									
19			50	X									
15	SPT	FS32	12	X									
16			50	X									
18	SPT	FS33	12	X	52								
19			17	X									
19			35	X									
19													
									Notes: Test hole drilled on beach exposed at low tide.				

A USCS LOG OF TEST HOLE_KODIAK_RSA.GPJ_2006DATATEMPLATE.GDT_1/23/13

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



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PENETROMETER LOG

HOLE # 12-06

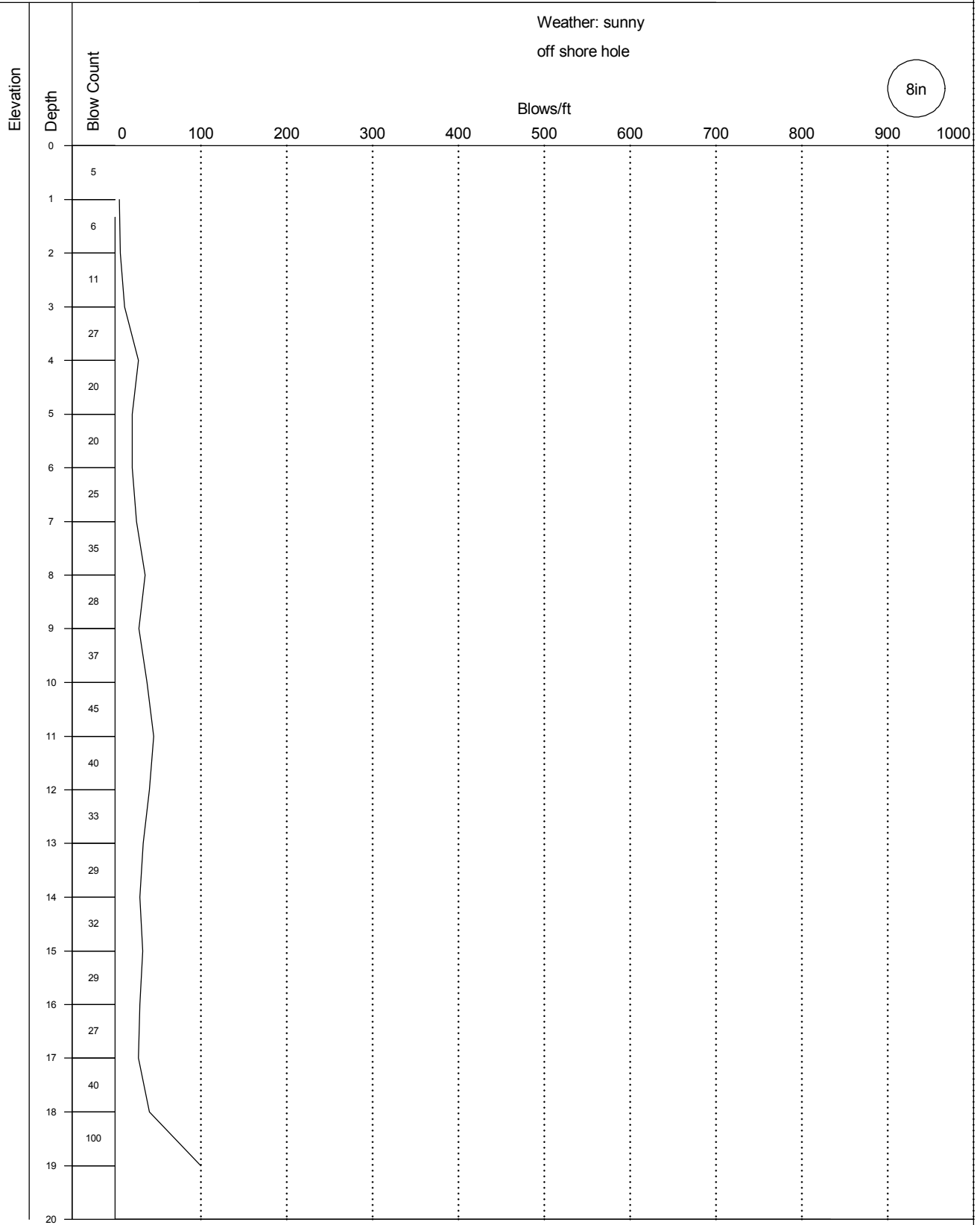
PROJECT NUMBER: 53587
PROJECT: Kodiak RSA
NORTHING: 1373702.03, **EASTING:** 1938100.292

Station / Location:
 Offset:
 Elevation:

Equipment Type: *CME 75 Truck*
 Drilling Method: *Penetrometer*
 Field Crew: *Geotek; Driller: Tim, Helpers: Jeff, Elliot*

Total Depth: *20.0 feet*
 Date: *9/13/2012* -
 Geologist: *A.Ferntheil*

Weather: sunny
 off shore hole



D:\USCS PEN LOG - KODIAK_RSA.GPJ_2006\DATA\TEMPLATE.GDT_12/11/12



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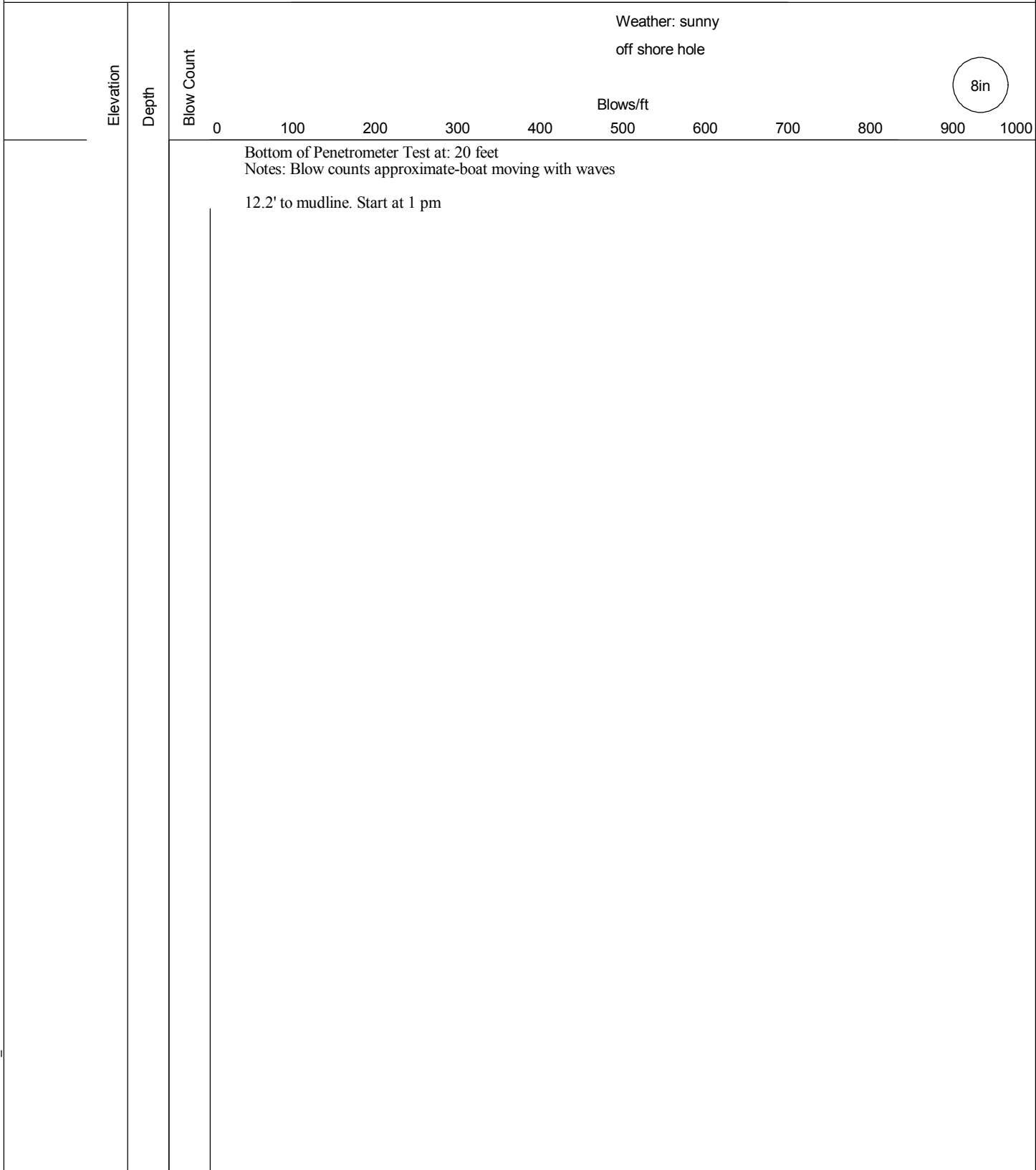
PENETROMETER LOG

HOLE # 12-06

PROJECT NUMBER: 53587
PROJECT: Kodiak RSA
NORTHING: 1373702.03, **EASTING:** 1938100.292

Station / Location:
 Offset:
 Elevation:

Equipment Type: *CME 75 Truck* Total Depth: *20.0 feet*
 Drilling Method: *Penetrometer* Date: *9/13/2012 -*
 Field Crew: *Geotek; Driller: Tim, Helpers: Jeff, Elliot* Geologist: *A.Ferntheil*





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LOG OF TEST HOLE

HOLE # 12-07

PROJECT NUMBER : 53587
PROJECT : Kodiak RSA
NORTHING : 1373640.688, **EASTING :** 1938291.088

Station / Location:
 Offset:
 Elevation:

Equipment_Type: *Geoprobe 8040* Total Depth: *17.0 feet*
 Drilling Method: *Casing Size NQ* Date: *9/14/2012 -*
 Field Crew: *Geotek; Driller: Elliot, Helpers: Jeff, Tim* Geologist: *A.Ferntheil*

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			Weather: overcast off shore hole
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0						SM		SILTY SAND with Gravel (SM) Brown				0.0
5	SPT	FS34	12	[X]	57		[Soil Graphic]	FS34 combined with FS 35, 36 for gradation, p200=14%, Sa=49%, Gr=37%				
6			28									
6			29									
7			25									
10	SPT	FS35	28	[X]			FS35 Could not advance spoon					
11			50									
15	SPT	FS36	20	[X]	71		[Soil Graphic]					
16			31									
16			40									
17			27									
17							BOH 17	Notes: 12.5' to mude line. Start at 12 pm				17.0

A USCS LOG OF TEST HOLE KODIAK_RSA.GPJ 2006DATATEMPLATE.GDT 1/23/13



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LOG OF TEST HOLE

HOLE # 12-08

PROJECT NUMBER : 53587
PROJECT : Kodiak RSA
NORTHING : 1374703.709, EASTING : 1936872.668

Station / Location:
 Offset:
 Elevation:

Equipment_Type: *Geoprobe 8040* Total Depth: *17.0 feet*
 Drilling Method: *6.5" Hollow Auger* Date: *9/16/2012 -*
 Field Crew: *Geotek; Driller: Elliot, Helpers: Jeff, Tim* Geologist: *A.Ferntheil*

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Wind, overcast beach sand
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0						SW		SAND (SW) Grey			
2						GP-GM		SILTY GRAVEL (GP-GM) Brown Grey			
5	SPT	FS37	20 27 16 14		43						
8						SP-SM		SAND with Silt and Gravel (SP-SM)			
10	SPT	FS38	4 9 13 39		22			FS38 p200=8%, Sa=62%, Gr=30%			
13						GP		GRAVEL with Sand (GP) Grey, with coarse sand			
15	SPT	FS39	10 22								
16	SPT	FS40	50 50			GP-GM		SILTY GRAVEL (GP-GM) Brown Grey			
17							BOH 17	Notes: Test hole drilled on beach exposed at low tide.			

A USCS LOG OF TEST HOLE_KODIAK_RSA.GPJ_2006DATATEMPLATE.GDT_1/23/13



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LOG OF TEST HOLE

HOLE # 12-09

PROJECT NUMBER : 53587
PROJECT : Kodiak RSA
NORTHING : 1368664.385, EASTING : 1934455.527

Station / Location:
 Offset:
 Elevation:

Equipment_Type: *Geoprobe 8040* Total Depth: *22.0 feet*
 Drilling Method: *6.5" Hollow Auger* Date: *9/18/2012 -*
 Field Crew: *Geotek; Driller: Elliot, Helpers: Jeff, Tim* Geologist: *A.Ferntheil*

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			Weather: Light wind, overcast Rocks, beach sand
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0						SP-SM			SUBSURFACE MATERIAL			
0									SAND with Silt and Gravel (SP-SM) Brown			0.0
5			9						FS41 combined with FS 42, 43 for gradation, p200=9%, Sa=57%, Gr=34%			
6	SPT	FS41	9									
			19		28							
			16									
10			5									
11	SPT	FS42	6									
			7		13							
			12									
15			16									
16	SPT	FS43	15									
			13		28							
			29									
18						SP			SAND with Gravel (SP) coarse grained sand, Grey			18.0
19												
20												

A USCS LOG OF TEST HOLE_KODIAK_RSA.GPJ_2006DATATEMPLATE.GDT_1/23/13



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # 12-09

PROJECT NUMBER : 53587
PROJECT : Kodiak RSA
NORTHING : 1368664.385, **EASTING :** 1934455.527

Station / Location:
 Offset:
 Elevation:

Equipment_Type: *Geoprobe 8040* Total Depth: *22.0 feet*
 Drilling Method: *6.5" Hollow Auger* Date: *9/18/2012 -*
 Field Crew: *Geotek; Driller: Elliot, Helpers: Jeff, Tim* Geologist: *A.Ferntheil*

Depth (Feet)	Sample Data						USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			Weather: Light wind, overcast
	Sample Type	Number	Blow Count	Sample Recovery	N-Value	Depth in (ft.)				Time	Date	Symbol	
20	SPT	FS44	5		37				SUBSURFACE MATERIAL			Rocks, beach sand	
21			12										
22			25										
			46										
								BOH 22	Notes: Test hole drilled on rocks/beach exposed at low tide.			22.0	

A USCS LOG OF TEST HOLE_KODIAK_RSA.GPJ_2006DATATEMPLATE.GDT_1/23/13



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # 12-10

PROJECT NUMBER : 53587
PROJECT : Kodiak RSA
NORTHING : 1368656.895, **EASTING :** 1934992.391

Station / Location:
 Offset:
 Elevation:

Equipment_Type: *Geoprobe 8040*
 Drilling Method: *Casing Size NQ*
 Field Crew: *Geotek; Driller: Elliot, Helpers: Tim*
 Total Depth: *11.5 feet*
 Date: *9/21/2012* -
 Geologist: *A.Ferntheil*

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			Weather: rain, wind off shore hole
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0						SP-SM			SUBSURFACE MATERIAL			
0									SILTY SAND with Gravel (SP-SM) Grey Brown			0.0
5			25						FS45 combined with FS 46 for gradation, p200=13%, Sa=49%, Gr=38%			
6	SPT	FS45	35									
			27									
			14		62							
10			30									
11	SPT	FS46	45									
			48		93							
11.5								BOH 11.5	Notes: 10.4' to mudline. Start at 1:30 pm Had to end hole at 11.5' due to weather worsening and causing safety concerns.			11.5

A USCS LOG OF TEST HOLE_KODIAK_RSA.GPJ_2006DATATEMPLATE.GDT_1/23/13

APPENDIX C

LABORATORY TEST RESULTS

PRECONSTRUCTION SAMPLE SUMMARY

Project No. 53587 Project Name Kodiak RSA

Station							
Offset (feet)							
Depth (feet)		2.5-3.5'	3.5-4.5'	10-11'	3.5-11.0'	25-26'	2.5-3.5'
Test Site ID		TH12-01	TH12-01	TH12-01	TH12-01	TH12-01	TH12-02
Field No.		FS01	FS02	FS04	FS02, 03, 04	FS08	FS09
Submitted By		A. Ferntheil	A. Ferntheil	A. Ferntheil	A. Ferntheil	A. Ferntheil	A. Ferntheil
Date Sampled		9/10/2012	9/10/2012	9/10/2012	9/10/2012	9/10/2012	9/11/2012
Lab No.		2012A-4131	2012A-4132	2012A-4133	2012A-4134	2012A-4135	2012A-4136
Percent	3"						
	2"						
Passing	1"					100	100
	3/4"					94	97
Sieve	1/2"				100	88	84
	3/8"				100	81	73
Size	#4				99	64	57
	#10				91	49	42
	#40				13	27	23
	#80						
	#200				3.3	15	10.6
	.02mm						
	.002mm						
FSV Class							
AASHTO / DOTTS		/	/	/	/	/	/
Unified Class							
USCSD Class							
Atterburg LL/PL/PI		//	//	//	//	//	//
Sample Prep							
Nat Moist / Organic		15 /	1.7 /	4.2 /	/	/	3.6 /
% Grvl / Snd / Fines		//	//	//	1 / 96 / 3	36 / 49 / 15	43 / 46 / 11
Opt Mois/Max Dry Den		/	/	/	/	/	/
SpG Bulk Coarse/Fine		/	/	/	/	/	/
SpG SSD Coarse/Fine		/	/	/	/	/	/
SpG App Coarse/Fine		/	/	/	/	/	/
Absorption Coarse/Fine		/	/	/	/	/	/
Degradation Value							
LA / LA Low / Nordic		//	//	//	//	//	//
Sulfate Soundness C/F		/	/	/	/	/	/
Comment:							

PRECONSTRUCTION SAMPLE SUMMARY

Project No. 53587 Project Name Kodiak RSA

Station							
Offset (feet)							
Depth (feet)		5-6'	15-16'	20-21'	25-26'	2.5-3.5'	5-6'
Test Site ID		TH12-02	TH12-02	TH12-02	TH12-02	TH12-03	TH12-03
Field No.		FS10	FS12	FS13	FS14	FS16	FS17
Submitted By		A. Ferntheil	A. Ferntheil	A. Ferntheil	A. Ferntheil	A. Ferntheil	A. Ferntheil
Date Sampled		9/11/2012	9/11/2012	9/11/2012	9/11/2012	9/11/2012	9/11/2012
Lab No.		2012A-4137	2012A-4138	2012A-4139	2012A-4140	2012A-4141	2012A-4142
Percent Passing Sieve Size	3"						
	2"						
	1"			100	100		
	3/4"			95	90		
	1/2"			83	77		
	3/8"			75	68		
	#4			56	47		
	#10			40	32		
	#40			21	16		
	#80						
#200			11	7.6			
.02mm							
.002mm							
FSV Class							
AASHTO / DOTTS		/	/	/	/	/	/
Unified Class							
USCSD Class							
Atterburg LL/PL/PI		//	//	//	//	//	//
Sample Prep							
Nat Moist / Organic		0.2 /	2.6 /	/	/	3.8 /	4.3 /
% Grvl / Snd / Fines		//	//	44 / 45 / 11	53 / 39 / 8	//	//
Opt Mois/Max Dry Den		/	/	/	/	/	/
SpG Bulk Coarse/Fine		/	/	/	/	/	/
SpG SSD Coarse/Fine		/	/	/	/	/	/
SpG App Coarse/Fine		/	/	/	/	/	/
Absorption Coarse/Fine		/	/	/	/	/	/
Degradation Value							
LA / LA Low / Nordic		//	//	//	//	//	//
Sulfate Soundness C/F		/	/	/	/	/	/
Comment:							

PRECONSTRUCTION SAMPLE SUMMARY

Project No. 53587 Project Name Kodiak RSA

Station							
Offset (feet)							
Depth (feet)	7.5-8.5'	5.0-8.5'	10.0-10.5'	5-6'	5-19'	5.0-16.5'	
Test Site ID	TH12-03	TH12-03	TH12-03	TH12-04	TH12-05	TH12-07	
Field No.	FS18	FS17 & 18	FS19	FS25	FS30, 31, 32, 33	FS34, 35, 36	
Submitted By	A. Ferntheil	A. Ferntheil	A. Ferntheil	A. Ferntheil	A. Ferntheil	A. Ferntheil	
Date Sampled	9/11/2012	9/11/2012	9/11/2012	9/13/2012	9/13/2012	9/14/2012	
Lab No.	2012A-4143	2012A-4144	2012A-4145	2012A-4146	2012A-4147	2012A-4148	
Percent Passing Sieve Size	3"						
	2"						
	1"		100		88	94	96
	3/4"		97		79	85	92
	1/2"		91		72	76	83
	3/8"		88		69	71	78
	#4		81		60	56	63
	#10		64		48	40	46
	#40		20		34	20	25
	#80						
#200		3.7		21.5	10.7	14	
.02mm							
.002mm							
FSV Class							
AASHTO / DOTTS	/	/	/	A-1-b(0) /	/	/	
Unified Class				GM			
USCSD Class				Silty gravel with sand			
Atterburg LL/PL/PI	//	//	//	NV / NV / NP	//	//	
Sample Prep				Dry			
Nat Moist / Organic	3.9 /	/	24.9 / 1.4	/	/	/	
% Grvl / Snd / Fines	//	19 / 77 / 4	//	40 / 38 / 22	44 / 45 / 11	37 / 49 / 14	
Opt Mois/Max Dry Den	/	/	/	/	/	/	
SpG Bulk Coarse/Fine	/	/	/	/	/	/	
SpG SSD Coarse/Fine	/	/	/	/	/	/	
SpG App Coarse/Fine	/	/	/	/	/	/	
Absorption Coarse/Fine	/	/	/	/	/	/	
Degradation Value							
LA / LA Low / Nordic	//	//	//	//	//	//	
Sulfate Soundness C/F	/	/	/	/	/	/	
Comment:							

PRECONSTRUCTION SAMPLE SUMMARY

Project No. 53587 Project Name Kodiak RSA

Station						
Offset (feet)						
Depth (feet)	10.0-11.5'	5.0-16.5'	5-11'			
Test Site ID	TH12-08	TH12-09	TH12-10			
Field No.	FS38	FS41, 42, 43	FS45 & 46			
Submitted By	A. Ferntheil	A. Ferntheil	A. Ferntheil			
Date Sampled	9/16/2012	9/18/2012	9/21/2012			
Lab No.	2012A-4149	2012A-4150	2012A-4151			
Percent Passing Sieve Size	3"					
	2"					
	1"	95	94	96		
	3/4"	87		93		
	1/2"	82	85	84		
	3/8"	79	81	79		
	#4	70	66	62		
	#10	58	47	44		
	#40	22	22	23		
	#80					
	#200	8.2	8.8	12.8		
	.02mm					
	.002mm					
FSV Class						
AASHTO / DOTTS	/	/	/	/	/	/
Unified Class						
USCSD Class						
Atterburg LL/PL/PI	//	//	//	//	//	//
Sample Prep						
Nat Moist / Organic	/	/	/	/	/	/
% Grvl / Snd / Fines	30 / 62 / 8	34 / 57 / 9	38 / 49 / 13	//	//	//
Opt Mois/Max Dry Den	/	/	/	/	/	/
SpG Bulk Coarse/Fine	/	/	/	/	/	/
SpG SSD Coarse/Fine	/	/	/	/	/	/
SpG App Coarse/Fine	/	/	/	/	/	/
Absorption Coarse/Fine	/	/	/	/	/	/
Degradation Value						
LA / LA Low / Nordic	//	//	//	//	//	//
Sulfate Soundness C/F	/	/	/	/	/	/
Comment:						

APPENDIX D

PHOTO LOG



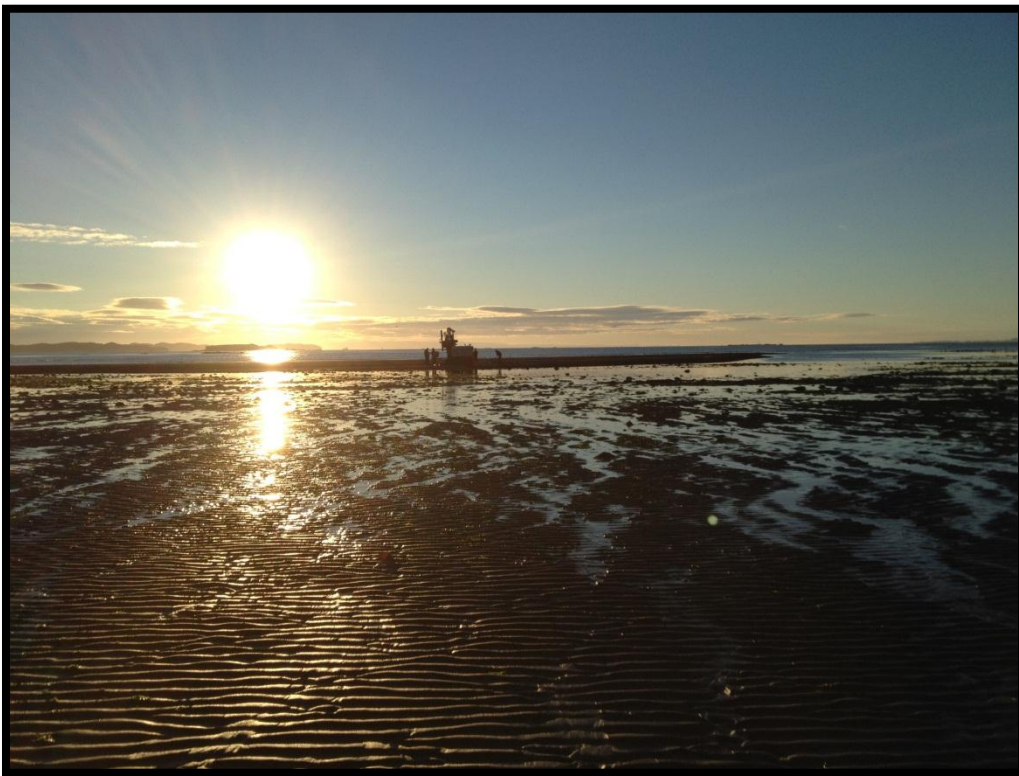
Drill rig set up on TH12-02



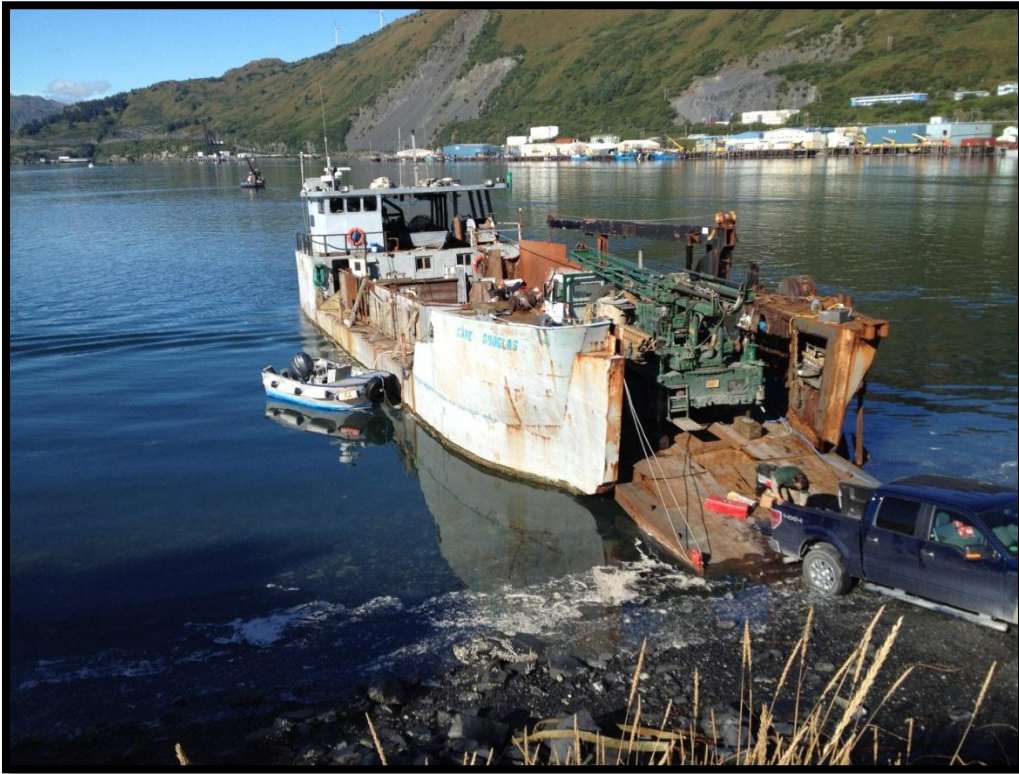
Drilling TH 12-03



Drill rig set up on TH 12-04



TH12-05 from the high tide line



Loading the CME 75 onto the landing craft



CME 75 on landing craft (Cape Douglas)



Casing in hole on landingcraft



Blunt tip used on modified penetrometer (TH12-06)



8040 on landing craft drilling TH12-07



Drill rig set up on TH 12-08



Drill rig set up on TH12-09



Drilling TH12-10

APPENDIX E

CONTAMINATED SITE LIST

The data in this Appendix is taken directly from the State of Alaska Department of Environmental Conservation (DEC) webpage. (<http://dec.alaska.gov/spar/csp/>.) For further information, contact the DEC.



Figure 5: Contaminated Site

Information for Hazard 2610

Site Name: ADOT&PF SREB - Kodiak
Address: Kodiak Airport
 Kodiak, AK 99615
File Number: 2601.38.010
Hazard ID: 2610
Staff: Paul Horwath - 9072625210
Status: Cleanup Complete
Latitude: 57.753056
Longitude: -152.485000
Section: 14
Meridian: Seward
Range: 020
Township: 028

Problem / Comments

During assessment activities in conjunction with the demolition of the Snow Removal Equipment (SRE) building at the Kodiak Airport, petroleum contaminated soils were encountered in association with the heating oil tank at the building. This site is the same as ADOT&PF Sand Shed Kodiak Airport, Reckey:1999-25-01-284-01, file number 2601.38.004 and is being worked under this site, ADOT&PF Kodiak Snow Removal Equipment Building, Reckey:1996-25-01-268-01, file number 2601.38.010.

Action Information

Action Date	Action	Description
12/14/1999	Site Added to Database	Heating Oil/ diesel contamination.
04/24/2000	Site Ranked Using the AHRM	Initial ranking.
03/24/2004	Update or Other Action	File Number assigned and entered into the Fileroom DB and CS DB.
06/27/2005	GIS Position Updated	Using Figure 1 from a Corrective Action Plan, SRE Building Demolition Kodiak Airport, dated July 1998 from Shannon & Wilson in conjunction with TopoZone Pro, entered coordinates for this site. Metadata include USGS Topo Map 1:24K/25K, Black and White Aerial Photo, on a Medium Size Map, View Scale 1:24,000 Coordinate Datum NAD83. Moderate to

		High degree of confidence in accuracy of location.
05/30/2007	Update or Other Action	Allen assumed PM. Term contractor established monitoring wells and sampled stockpile. Cell is ~ 90 cu yds and covered vice 5 cy reported.
05/30/2007	Site Characterization Report Approved	Stockpile approved to be spread. Contractor recommends one more monitoring well between site and the Buskin. One monitoring well sample is above MCL. Site is tidally influenced.
07/01/2007	Update or Other Action	Stockpile spread at ariport.
01/30/2008	Site Closure Approved	the snow removal building has been removed. the heating oil tank and impacted soil were excavated and removed from the site. there was DRO detected in a monitor well but it is expected to attenuate over time. the site is in the flight zone of the Kodaik Airport and land use is restricted to no buildings or obstructions

ATTACHMENTS



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # TH10-39

PROJECT NUMBER :52739
PROJECT : Kodiak Runway Improvements
NORTHING : 1369479.2634, EASTING : 1934976.92184

Station / Location: 10+41
 Offset: 13' Rt
 Elevation: 36.04'

Coordinates: NAD83 State Z5

Equipment_Type: Mobile B-61
 Drilling Method: Hollow-Stem Auger
 Field Crew: (Denali Drilling) Tony & Dave

Total Depth: 16.5 feet
 Date: 7/25/2010 -
 Geologist: S. Evans

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Overcast
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0											
0.0								ASPHALT 9 Inches (extracted core intact), no adhesion to underlying concrete			
0.8								CONCRETE 5.75 Inches			
1.3						SM		SILTY SAND with Gravel & Cobbles (SM) Gray to dark gray with brown patches of silt, dry to moist, sub-angular to angular gravels, moist to wet near surface due to introduction of water during coring FS-1 p200=16%, Sa=46%, Gr=38%			
2	SPT	FS-1	33		90						
3			30								
4			60								
4								Cobble			3.8
5			6								
6	SPT	FS-2	17		37						
7			20								
8											
9											
10	SPT	FS-3	4		49						
11			19								
12			30								
13	SPT	FS-4	18		31						
14			17								
15			14								
15								Cobble			14.5
16	SPT		30		70						
16			50								
16			20								
16.5								BOH 16.5			

A USCS LOG OF TEST HOLE_KODIAK RW IMPROVEMENTS LOGS.GPJ_2006DATATEMPLATE.GDT_2/2/11



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # TH10-40

PROJECT NUMBER :52739
PROJECT : Kodiak Runway Improvements
NORTHING : 1369806.06978, **EASTING** : 1935084.11199

Station / Location: 13+84
 Offset: 5' Lt
 Elevation: 36.35'

Coordinates: NAD83 State Z5

Equipment_Type: Mobile B-61
 Drilling Method: Hollow-Stem Auger
 Field Crew: (Denali Drilling) Tony & Dave

Total Depth: 16.5 feet
 Date: 7/25/2010 -
 Geologist: S. Evans

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Overcast
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0											
0.0								Asphalt 9.5 Inches, top 4.5 inches detached, significant voids in top lift, bottom 5 inches adhered to underlying concrete			
0.8								Concrete 5.75 Inches			
1.3						SM		SILTY SAND with Gravel(SM) Gray with brown silty patches, sub-angular to angular sand and gravel, dry to moist (some water introduced during coring) FS-5 p200=19%, Sa=52%, Gr=29%			
2	SPT	FS-5	20		127						
3			67								
4			60								
5											
6	SPT	FS-6	14		31			FS-6 Moisture=5.6%			
7			18								
8			13					FS-6&7 (combined), p200=15%, Sa=50%, Gr=35%			
9	SPT	FS-7	4		44			FS-7 Moisture=5.9%			
10			13					Dark gray to black sand and gravel in brown silt, moist			
11			31								
10.3	SPT	FS-8	5			SM		Slightly Organic SILTY SAND with Gravel(SM) Greenish gray with dark brown organic silt layers, estimated organic content=3-5%, possibly original ground			
11			18								
12			31			GM		SILTY GRAVEL with Sand & Cobbles(GM)			
12.5								Cobble			
15.5	SPT	FS-9	12		64			Silty gravel recovered, possibly heavily weathered bedrock			
16			28								
16.5			36								
16.5								BOH 16.5			

A USCS LOG OF TEST HOLE_KODIAK RW IMPROVEMENTS LOGS.GPJ_2006DATATEMPLATE.GDT_2/2/11

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 # TH10-41

PROJECT NUMBER :52739
PROJECT : Kodiak Runway Improvements
NORTHING : 1370465.59617, **EASTING** : 1935339.33699

Station / Location: 20+92
 Offset: 3' Lt
 Elevation: 36.33'

Coordinates: NAD83 State Z5

Equipment_Type: *Mobile B-61*
 Drilling Method: *Hollow-Stem Auger*
 Field Crew: (*Denali Drilling*) *Tony & Dave*

Total Depth: 14.0 feet
 Date: 7/25/2010 -
 Geologist: S. Evans

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Partly cloudy N/A
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0											SUBSURFACE MATERIAL
0.0								Asphalt 10 Inches, top 4.5 inches detached (consists of 2 x 2.25" well bonded lifts), bottom 5.5 inches adhered to underlying concrete			
0.8								Concrete 6.5 Inches			
1.3						GP		GRAVEL with Sand(GP)			
2.0						SP-SM		SAND with Silt and Gravel(SP-SM) Dark gray, dry to moist, predominantly composed of angular shale shards, estimated p200=10-15% FS-10 p200=12%, Sa=57%, Gr=31%, Moisture=3.4%			
3.0	SPT	FS-10	10 36 37		73						
4.5						SM		SILTY SAND with Gravel(SM) Similar to above, slight increase in fines, dry to moist FS-11 Moisture=3.8%			
5.5	SPT	FS-11	21 38 44		82						
7.0								FS-11&12 (combined), p200=17%, Sa=51%, Gr=32%, PI=NP, LL=18			
10.0	SPT	FS-12	5 20 18		38			FS-12 Moisture=4.6%			
12.0						GM		Slightly Organic SILTY GRAVEL with Sand(GM) Black gravels in yellowish brown silt matrix, moist, etimated org content=3-5%, possibly original ground			
13.0	SPT	FS-13	24 35 39		74						
14.0								BOH 14			

A USCS LOG OF TEST HOLE_KODIAK RW IMPROVEMENTS LOGS.GPJ_2006DATATEMPLATE.GDT_2/2/11

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
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 Geology Section

LOG OF TEST HOLE

HOLE # TH10-42

PROJECT NUMBER :52739
PROJECT : Kodiak Runway Improvements
NORTHING : 1370872.70258, **EASTING** : 1935495.59728

Station / Location: 25+28
 Offset: 4' Lt
 Elevation: 36.35'

Coordinates: NAD83 State Z5

Equipment_Type: Mobile B-61
 Drilling Method: Hollow-Stem Auger
 Field Crew: (Denali Drilling) Tony & Dave

Total Depth: 11.0 feet
 Date: 7/26/2010 - 7/28/2010
 Geologist: S. Evans

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			Weather: Cloudy N/A
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0									SUBSURFACE MATERIAL			
0 - 1.0								Asphalt 11.25 Inches, top 4.75 detached, bottom 6.5 inches adhered to underlying concrete				0.0
1.0 - 1.5								Concrete 6 Inches				1.0
1.5 - 5.0	SPT	FS-14 A&B	42 54 39		93	GP-GM		GRAVEL with Silt and Sand (GP-GM) Brownish gray, dry to moist, predominantly angular gravels FS-14 A&B p200=12%, Sa=37%, Gr=51%, Moisture=3%				1.5
5.0 - 8.0	SPT	FS-15	18 35 56		91	SM		SILTY SAND with Gravel (SM) Brownish gray, moist FS-15 Moisture=4.5%				5.0
8.0 - 8.5								FS-15&16 (combined), p200=15%, Sa=54%, Gr=31%				
8.5 - 8.8								FS-16 Moisture=4.1%				
8.8 - 11.0	SPT	FS-16	12 39 40		79			Contains patches of pale yellowish brown silt with gray sand and gravels, estimated p200=15-20%				8.0
11.0	SPT	FS-17	2 7 30									11.0
								Notes: Extremely slow auger advance with heavy shaking at 11 feet bgs. Possibly boulder or bedrock.				

A USCS LOG OF TEST HOLE_KODIAK RW IMPROVEMENTS LOGS.GPJ_2006DATATEMPLATE.GDT_2/2/11



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # TH10-43

PROJECT NUMBER :52739
PROJECT : Kodiak Runway Improvements
NORTHING : 1371165.59154, **EASTING** : 1935613.87912

Station / Location: 28+44
 Offset: 1' Rt
 Elevation: 36.01'

Coordinates: NAD83 State Z5

Equipment_Type: Mobile B-61
 Drilling Method: Hollow-Stem Auger
 Field Crew: (Denali Drilling) Tony & Dave

Total Depth: 7.5 feet
 Date: 7/28/2010 -
 Geologist: S. Evans

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Mostly cloudy N/A
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0											SUBSURFACE MATERIAL
0.0								Asphalt 10.25 Inches (extracted core intact), significant voids in top 2.25" lift, no adhesion to underlying concrete			
0.9								Concrete 6 Inches			
1.5						SP-SM		SAND with Silt and Gravel(SP-SM) Gray to brownish gray, dry to moist, gravel up to 2" FS-18&19 p200=6%, Sa=51%, Gr=43%, Moisture=7.7%, Org=1.5%			
2.5								Color shift to brown, contains trace disseminated organics, possibly original ground FS-19 (2.5-2.75'), Org=1.1%			
5.5								Blow counts indicate softer ground, no recovery			
6.5						GM		SILTY GRAVEL with Sand(GM)			
7.5								Notes: Very slow auger advance at 7.5 feet, boulder or bedrock.			

A USCS LOG OF TEST HOLE_KODIAK RW IMPROVEMENTS LOGS.GPJ_2006DATATEMPLATE.GDT_2/2/11



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # TH10-44

PROJECT NUMBER :52739
PROJECT : Kodiak Runway Improvements
NORTHING : 1371426.6481, **EASTING** : 1935708.83751

Station / Location: 31+21
 Offset: 4' Lt
 Elevation: 35.11'

Coordinates: NAD83 State Z5

Equipment_Type: Mobile B-61
 Drilling Method: Hollow-Stem Auger
 Field Crew: (Denali Drilling) Tony & Dave

Total Depth: 8.0 feet
 Date: 7/28/2010 -
 Geologist: S. Evans

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Mostly cloudy N/A
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0											SUBSURFACE MATERIAL
0.0								Asphalt 9.5 Inches (extracted core intact), voids present in top lift, no adhesion to underlying concrete			0.0
0.9								Concrete 6.5 Inches			0.9
1.4						SM		SILTY SAND with Gravel(SM) Black shale in brown silt matrix, wet due to coring procedure FS-20 p200=15%, Sa=58%, Gr=27%			1.4
2.0	SPT	FS-20	15	X							
			64	X							116
			52	X							
5.0											
5.5	SPT	FS-21	16	X							
			26	X							77
			51	X							
6.0								Trace organics in sampler shoe @ 6.5' bgs			6.0
								FS-21&22 (combined), p200=17%, Sa=58%, Gr=25%			
7.0								Hard drilling			7.0
8.0	SPT	FS-22	13	X				FS-22 No advance with 30 blows; bedrock or boulder, Moisture=7.9%			8.0
			40	X							

A USCS LOG OF TEST HOLE_KODIAK RW IMPROVEMENTS LOGS.GPJ_2006DATATEMPLATE.GDT_2/2/11



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 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # TH10-45

PROJECT NUMBER :52739
PROJECT : Kodiak Runway Improvements
NORTHING : 1371823.53682, **EASTING** : 1935867.74632

Station / Location: 35+49
 Offset: 2' Rt
 Elevation: 32.81'

Coordinates: NAD83 State Z5

Equipment_Type: Mobile B-61
 Drilling Method: Hollow-Stem Auger
 Field Crew: (Denali Drilling) Tony & Dave

Total Depth: 4.5 feet
 Date: 7/28/2010 -
 Geologist: S. Evans

Depth (Feet)	Sample Data						USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			Weather: Overcast
	Sample Type	Number	Blow Count	Sample Recovery	N-Value	Depth in (ft.)				Time	Date	Symbol	
0									SUBSURFACE MATERIAL				
0									Asphalt 11 Inches (extracted core intact), voids present in top 2.5" lift, some adhesion to underlying concrete (fragments of concrete remain attached to asphalt core)			0.0	
0.9									Concrete 6.5 Inches			0.9	
1.4							GP-GM		GRAVEL with Silt and Sand(GP-GM) Gray, wet due to coring procedure FS-23 p200=11%, Sa=41%, Gr=48%			1.4	
2	SPT	FS-23	30		116								
2			68										
2			48										
3													
4	SPT								Bedrock Very hard drilling			4.0	
4.5			40						No advance with 40 blows; heavy recoil; recovered trace pulverized shale			4.5	

A USCS LOG OF TEST HOLE_KODIAK RW IMPROVEMENTS LOGS.GPJ_2006DATATEMPLATE.GDT_2/2/11



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # TH10-46

PROJECT NUMBER :52739
PROJECT : Kodiak Runway Improvements
NORTHING : 1372095.33447, EASTING : 1935969.92852

Station / Location: 38+39
 Offset: Centerline
 Elevation: 30.96'

Coordinates: NAD83 State Z5

Equipment_Type: Mobile B-61
 Drilling Method: Hollow-Stem Auger
 Field Crew: (Denali Drilling) Tony & Dave

Total Depth: 10.4 feet
 Date: 7/28/2010 -
 Geologist: S. Evans

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Overcast N/A
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0								SUBSURFACE MATERIAL			
0.0								Asphalt 11.4 Inches, top 2.4" lift delaminated, lower 9 inches intact, no adhesion to underlying concrete		0.0	
0.9								Concrete 5.5 Inches		0.9	
1.4						SP-SM		SAND with Silt and Gravel & Cobbles (SP-SM) Gray to black sand and gravel in brown silt matrix, wet due to coring procedure, sub-angular to angular gravels		1.4	
2.5	SPT	FS-24	32	X	110			FS-24 p200=12%, Sa=52%, Gr=36%		2.5	
3.0			60	X				Cobble			
3.5			50	X							
4.0						GM		SILTY GRAVEL with Sand & Cobbles (GM)		4.0	
5.0								Gravel up to 2", estimated p200=15%, estimated gravel=65%		5.0	
5.5	SPT		33	X	71						
6.0			43	X							
6.5			28	X							
7.5	SPT	FS-25	60	X				Cobble, no advance with 30 blows; dry pulverized gray rock recovered, hard drilling		7.5	
8.0			75	X				FS-25 Moisture=7.8%			
9.5								-----		9.5	
10.4	SPT		49	X				No advance with 30 blows; 3" broken rock recovered; possibly bedrock, boulder, or cobbles		10.4	
			60	X							

A USCS LOG OF TEST HOLE_KODIAK RW IMPROVEMENTS LOGS.GPJ_2008DATATEMPLATE.GDT_2/2/11



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # TH10-47

PROJECT NUMBER :52739
PROJECT : Kodiak Runway Improvements
NORTHING : 1372920.42768, **EASTING** : 1936284.87558

Station / Location: 47+22
 Offset: 4' Lt
 Elevation: 25.08'

Coordinates: NAD83 State Z5

Equipment_Type: Mobile B-61
 Drilling Method: Hollow-Stem Auger
 Field Crew: (Denali Drilling) Tony & Dave

Total Depth: 16.5 feet
 Date: 7/28/2010 - 7/29/2010
 Geologist: S. Evans

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Cloudy, drizzle N/A
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0								SUBSURFACE MATERIAL			
0.0 - 0.8								Asphalt 9.25 Inches, top 2" & 2.75" lifts delaminated, some voids present in top lift, bottom lifts adhered to underlying concrete			
0.8 - 1.4								Concrete 5.75 Inches			
1.4 - 5.0	SPT	FS-26	27 57 47	X	104	SP-SM		SAND with Silt and Gravel(SP-SM) Dark gray, moist, sub-angular to angular gravels FS-26 p200=9%, Sa=52%, Gr=39%			
5.0 - 7.5	SPT	FS-27	14 22 29	X	51			Dark gray to black rock in a brown silt matrix FS-27 p200=9%, Sa=57%, Gr=34%, Moisture=3.8%			
7.5 - 8.0	SPT		33 51	X		GP-GM		Rust colored patches present in silt			
8.0 - 8.1								GRAVEL with Silt and Sand & Cobbles(GP-GM) Estimated p200=10-12%			
8.1 - 9.0								Coarse gravel in cuttings, gravel up to 2"			
9.0 - 9.5								Rust brown in color, increase in sand content			
9.5 - 10.5	SPT	FS-28	5 32 56	X		GM		FS-28 p200=10%, Sa=42%, Gr=48%, Moisture=8.2%			
10.5 - 11.0								Cobble			
11.0 - 11.5								SILTY GRAVEL with Sand & Cobbles(GM)			
11.5 - 13.0	SPT	FS-29	4 25 40	X	65			FS-29 No advance with 30 blows			
13.0 - 13.5								Shale fragments in pale yellow silt, moist			
13.5 - 14.0								Cobble			
14.0 - 15.0	SPT	FS-30	16 30 20	X	50						
15.0 - 16.5											
16.5								BOH 16.5			

A USCS LOG OF TEST HOLE_KODIAK RW IMPROVEMENTS LOGS.GPJ_2006DATATEMPLATE.GDT_2/2/11



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # TH10-48

PROJECT NUMBER :52739
PROJECT : Kodiak Runway Improvements
NORTHING : 1373979.27821, EASTING : 1936694.45854

Station / Location: 58+58
 Offset: 2' Lt
 Elevation: 20.27'

Coordinates: NAD83 State Z5

Equipment_Type: Mobile B-61
 Drilling Method: Hollow-Stem Auger
 Field Crew: (Denali Drilling) Tony & Dave

Total Depth: 11.0 feet
 Date: 7/29/2010 -
 Geologist: S. Evans

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Cloudy, drizzle N/A
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0											
0.0								Asphalt 6 Inches (extracted core intact)			0.0
0.5						GM		SILTY GRAVEL with Sand & Cobbles (GM) Recovered pulverized dark gray to black shale, dry to moist, estimated p200=5-8% FS-31 p200=14%, Sa=43%, Gr=43%, Moisture=3.8%			0.5
1	SPT	FS-31	19		61						
			33								
			28								
2											
3	SPT		40					Concrete, estimated thickness 5-6 inches No advance with 30 blows; hard recoil			2.5
3						SW-SM		SAND with Silt and Gravel (SW-SM) Black shale in brown silt matrix			3.0
4											
5											
5	SPT	FS-32	11		65			FS-32 Moisture=3.6%			
6			25								
6			40								
7								FS-32&33 (combined), p200=7%, Sa=51%, Gr=42%, PI=NP, LL=NV			
8	SPT	FS-33	13		82			FS-33 Moisture=3.5%			
8			39					Grayish brown, dry to moist			8.0
8			43								
9											
10											
10	SPT		28								
11			32								
11			26								11.0
								BOH 11			

A USCS LOG OF TEST HOLE_KODIAK RW IMPROVEMENTS LOGS.GPJ_2006DATATEMPLATE.GDT_2/2/11



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # TH10-49

PROJECT NUMBER :52739
PROJECT : Kodiak Runway Improvements
NORTHING : 1371008.9421, EASTING : 1935195.5287

Station / Location: 25+41
 Offset: 333' Lt
 Elevation: 36.06'

Coordinates: NAD83 State Z5

Equipment_Type: Mobile B-61
 Drilling Method: Hollow-Stem Auger
 Field Crew: (Denali Drilling) Tony & Dave

Total Depth: 16.0 feet
 Date: 7/29/2010 -
 Geologist: S. Evans

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			Weather: Cloudy, drizzle N/A
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0									SUBSURFACE MATERIAL			
0.0 - 0.6						SM		Concrete 7.5 Inches (extracted core intact)				
0.6 - 2.5	SPT	FS-34	23 50 65		115	SM		SILTY SAND with Gravel(SM) FILL , dark gray, moist, predominantly angular shale shards FS-34 p200=14%, Sa=48%, Gr=38%				
2.5 - 6.5	SPT	FS-35	22 29 35		64	SM		Gray, moist, estimated p200=15% FS-35 p200=14%, Sa=53%, Gr=33%, Moisture=4.2%				
6.5 - 7.5						SM		Organic SILTY SAND with Gravel & Cobbles(SM)				
7.5 - 9.0	SPT GRAB	FS-36	6 17 16		33	SM		Cobble Driven cobble, no recovery FS-36 p200=27%, Sa=57%, Gr=16%, Moisture=22%, Org=5.1%, PI=NP, LL=34 Cuttings predominantly brown silt				
9.0 - 9.5	SPT	FS-37	6 34 45		79	SM		SILTY SAND(SM) Gray, moist to wet, contains fine sands and organics FS-37 p200=15%, Sa=74%, Gr=11%, Moisture=17.5%, Org=1.3%, PI=NP, LL=NV				
9.5 - 12.0	SPT	FS-38	8 23 20		43	GP		GRAVEL with Sand(GP) Gray, moist, clean (p200<5%), angular sand and gravel				
12.0 - 14.0						GM		SILTY GRAVEL with Sand(GM) Black shale in pale yellow silt matrix				
14.0 - 15.5	SPT	FS-39&40	10 27 42			GP-GM		GRAVEL with Silt and Sand(GP-GM) Brown to reddish brown, estimated p200=5-8%				
15.5 - 16.0								BOH 16				

A USCS LOG OF TEST HOLE_KODIAK RW IMPROVEMENTS LOGS.GPJ_2006DATATEMPLATE.GDT_2/2/11



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # TH10-50

PROJECT NUMBER :52739
PROJECT : Kodiak Runway Improvements
NORTHING : 1369590.10294, **EASTING** : 1934651.14529

Station / Location: 10+20
 Offset: 330' Lt
 Elevation: 35.21'

Coordinates: NAD83 State Z5

Equipment_Type: Mobile B-61
 Drilling Method: Hollow-Stem Auger
 Field Crew: (Denali Drilling) Tony & Dave

Total Depth: 3.5 feet
 Date: 7/29/2010 -
 Geologist: S. Evans

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Light rain
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0											
0.0											
0.6											
1.8											
3.5											

Sample Type	Number	Blow Count	Sample Recovery	N-Value
SPT	FS-41	12 20 53		73

USCS Classification	Frozen Zone	Soil Graphic
GM		

Ground Water Data
Depth in (ft.)
Time
Date: 7/29/10
Symbol

SUBSURFACE MATERIAL

Concrete 7.5 Inches (extracted core intact) 0.0

SILTY GRAVEL with Sand & Cobbles(GM) Dark gray sand and gravel in brown silt matrix, moist 0.6

Cobble 1.8

Notes: 3.5
 Very hard drilling at 3.5 feet bgs. Auger refusal possibly indicating bedrock or boulders.

A USCS LOG OF TEST HOLE - KODIAK RW IMPROVEMENTS LOGS.GPJ_2006DATATEMPLATE.GDT_2/2/11



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # TH10-51

PROJECT NUMBER :52739
PROJECT : Kodiak Runway Improvements
NORTHING : 1374580.57319, **EASTING** : 1930459.45981

Station / Location: See Test Hole Map
 Offset:
 Elevation: 53.41'

Equipment_Type: Mobile B-61
 Drilling Method: Hollow-Stem Auger
 Field Crew: (Denali Drilling) Tony & Dave

Total Depth: 11.5 feet
 Date: 7/30/2010 -
 Geologist: S. Evans

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			Weather: Rain
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0												
0.0						SM		Asphalt 1.75 Inches (intact)				0.0
0.2												0.2
1.0	SPT	FS-42	36 30 16			SP-SM		SILTY SAND with Gravel(SM) Dark gray, wet due to heavy rainfall, FS-42 p200=17%, Sa=54%, Gr=29%				1.0
1.8						GP-GM		SAND with Silt (SP-SM) Pale yellow, dry, fine sands				1.8
2.0								GRAVEL with Silt and Sand & Cobbles(GP-GM)				2.0
2.5								Cobble				2.5
3.0	SPT		45					Driven cobble				
5.0	SPT		60					Trace recovery of Silty Gravel with Sand, gray, moist No advance with 30 blows				5.0
5.5	GRAB	FS-43	30			SP-SM		SAND with Silt and Gravel(SP-SM) FS-43 Moisture=4%				5.5
7.0								FS-43&44 (combined), p200=12%, Sa=46%, Gr=42%				
8.0	SPT	FS-44	18 30 38		68			FS-44 Moisture=5.3% As above, estimated p200=15%				8.0
10.0	SPT	FS-45	8 29 48		77			Contains rust-orange colored patches, dry to moist, estimated p200=8-12%				10.0
11.5												11.5

A USCS LOG OF TEST HOLE_KODIAK RW IMPROVEMENTS LOGS.GPJ_2006DATATEMPLATE.GDT_2/2/11



STATE OF ALASKA DOT&PF
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LOG OF TEST HOLE

HOLE # TH10-52

PROJECT NUMBER :52739
PROJECT : Kodiak Runway Improvements
NORTHING : 1374572.89032, EASTING : 1930600.72565

Station / Location: See Test Hole Map
 Offset:
 Elevation: 53.89' Coordinates: NAD83 State Z5

Equipment_Type: Mobile B-61
 Drilling Method: Hollow-Stem Auger
 Field Crew: (Denali Drilling) Tony & Dave

Total Depth: 16.5 feet
 Date: 7/30/2010 -
 Geologist: S. Evans

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			Weather: Heavy rain
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0						SM		Asphalt 1.25 Inches asphalt patch				0.0
0.1						SM		SILTY SAND with Gravel(SM) Gray, wet due to heavy rainfall				0.1
1	SPT	FS-46	12 20			SM		FS-46 p200=14%, Sa=49%, Gr=37%				1.0
2	GRAB	FS-47	6					SILTY SAND(SM) Rust brown, moist, contains gravel				
								FS-47 p200=39%, Sa=49%, Gr=12%				
2.5						SP-SM		SAND with Silt and Gravel & Cobbles(SP-SM) Gray, moist, angular sand and gravel				2.5
3	SPT	FS-48	2 16 26		42			FS-48&49 (combined), p200=11%, Sa=49%, Gr=40%				
4								FS-49 Moisture=4.7%				
5												
6	SPT	FS-49	18 36 57		93							
7								Cobble				7.3
8												
9												
10												
10	SPT	FS-50	12 40 42		82			Similar to above, dry to moist				10.0
11												
12												
13												
14												
15												
15	SPT		23 43 34		77			Contains small patches of pale yellow to brown silt, dry to moist				15.0
16												
16.5								BOH 16.5				16.5

A USCS LOG OF TEST HOLE_KODIAK RW IMPROVEMENTS LOGS.GPJ_2006DATATEMPLATE.GDT_2/2/11



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LOG OF TEST HOLE

HOLE # TH10-53

PROJECT NUMBER :52739
PROJECT : Kodiak Runway Improvements
NORTHING : 1374577.26861, EASTING : 1930693.44247

Station / Location: See Test Hole Map
 Offset:
 Elevation: 54.82' Coordinates: NAD83 State Z5

Equipment_Type: Mobile B-61
 Drilling Method: Hollow-Stem Auger
 Field Crew: (Denali Drilling) Tony & Dave

Total Depth: 11.5 feet
 Date: 7/30/2010 -
 Geologist: S. Evans

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			Weather: Rain
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0												
0.0	SPT GRAB	FS-51	50			GP-GM		Asphalt 1.75 inches (extracted core intact)				0.0
0.2								GRAVEL with Silt and Sand(GP-GM) Gray, moist				0.2
0.8								No advance with 30 blows; cobble				0.8
1.0						SM		FS-51 p200=10%, Sa=33%, Gr=57%				1.0
1.0	SPT	FS-52	10					SILTY SAND with Gravel(SM) FS-52 p200=16%, Sa=56%, Gr=28%				
2.0			31									
2.0			21			SP		SAND (SP) Pale yellow, dry-moist, fine sand, may contain ash				2.3
2.5			3			ML		Organic SANDY SILT(ML) Rust brown, moist, contains trace gravel, elasticity may be due to organic content FS-53 p200=57%, Sa=39%, Gr=4%, Moisture=50.9%, Org=14.1%, PI=NP, LL=60				2.5
3.0	SPT	FS-53	10									
3.0			24									
3.8						GM		SILTY GRAVEL with Sand(GM)				3.8
4.0						ML		SANDY SILT (ML) Rust brown, moist				4.0
5.0												
5.0			2			GM		2 Inch sand layer, gray, moist				5.0
5.2	SPT		22					SILTY GRAVEL with Sand & Cobbles(GM) Gray with brown patches, moist				5.2
6.0			40					Cobble				6.0
8.0	SPT	FS-54	11			ML		SANDY SILT with Gravel(ML)				8.0
8.3			27									8.3
8.3			38									
10.0												
10.0	SPT		40					Cobble				10.0
10.0			61		85							
11.5			24									
11.5								BOH 11.5				11.5

A USCS LOG OF TEST HOLE_KODIAK RW IMPROVEMENTS LOGS.GPJ_2006DATATEMPLATE.GDT_2/2/11



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LOG OF TEST HOLE

HOLE # TH10-55

PROJECT NUMBER :52739
PROJECT : Kodiak Runway Improvements
NORTHING : 1375039.64257, **EASTING** : 1930364.92663

Station / Location: See Test Hole Map
 Offset:
 Elevation: 49.01'

Equipment_Type: Mobile B-61
 Drilling Method: Hollow-Stem Auger
 Field Crew: (Denali Drilling) Tony & Dave

Total Depth: 16.5 feet
 Date: 7/30/2010 -
 Geologist: S. Evans

Coordinates: NAD83 State Z5

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Rain
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0											
								SUBSURFACE MATERIAL			
0.0								Asphalt 2.75 Inches			0.0
0.2						SM		3.75 Inches ATB, substantial voids present			0.2
0.5								SILTY SAND with Gravel(SM) Gray, wet due to coring procedure FS-58 p200=15%, Sa=53%, Gr=32%			0.5
1.5						ML		SANDY SILT with Gravel(ML) Brown, moist, estimated p200=40-50%			1.5
2.0						GP-GM		GRAVEL with Silt and Sand & Cobbles (GP-GM) Gray mottled with brown silt, moist FS-59 p200=7%, Sa=42%, Gr=51%, Moisture=4.8%			2.0
3.0	SPT	FS-59	5								
3.0			24								
3.0			37		61						
5.0			16								
5.0	SPT		34					As above, gravel to 2 Inches in diameter			5.3
5.0			33		67						
7.5	SPT		23					No advance with 30 blows; Cobble			7.5
7.5			40								
11.0	SPT	FS-60	13								
11.0			36								
11.0			36		72			Black to gray rock with brown silt, sampler cracked at threads during drive			11.0
15.0	SPT	FS-61	7					Similar to above, gray, moist			15.0
15.0			20								
15.0			27		47						
16.5								BOH 16.5			16.5

A USCS LOG OF TEST HOLE_KODIAK RW IMPROVEMENTS LOGS.GPJ_2006DATATEMPLATE.GDT_2/2/11



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LOG OF TEST HOLE

HOLE # TH10-56

PROJECT NUMBER :52739
PROJECT : Kodiak Runway Improvements
NORTHING : 1374678.50798, **EASTING** : 1930617.37904

Station / Location: See Test Hole Map
 Offset:
 Elevation: 52.17' Coordinates: NAD83 State Z5

Equipment_Type: Mobile B-61
 Drilling Method: Hollow-Stem Auger
 Field Crew: (Denali Drilling) Tony & Dave

Total Depth: 15.5 feet
 Date: 7/30/2010 -
 Geologist: S. Evans

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Cloudy, drizzle N/A
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0											
0.0 - 0.2						SM		Asphalt 2 Inches (extracted core intact)			
0.2 - 2.0						SM		SILTY SAND with Gravel(SM) Gray (changing to brown @ 0.5 feet), moist, angular gravels			
2.0 - 3.0	SPT	FS-63 FS-62	10								
3.0 - 3.5			5		21						
3.5 - 4.0	GRAB		16								
4.0 - 4.5								FS-63 p200=23%, Sa=56%, Gr=21%, Moisture=20.8%, PI=NP, LL=NV			
4.5 - 5.0						GM		SILTY GRAVEL with Sand & Cobbles(GM) Gray, dry to moist			4.5
5.0 - 6.0	SPT	FS-64	4					FS-64 Moisture=3.6%			
6.0 - 6.5			39		93						
6.5 - 7.0			54					FS-64&65 (combined), p200=13%, Sa=39%, Gr=48%			
7.0 - 7.5	SPT	FS-65	25					FS-65 15" hammer throw, blow counts observed were divided by 2 to approximate spt values, Moisture=3.7%			7.5
7.5 - 8.0			37		75			Dark gray sand and gravel in brown to pale yellow silt			
8.0 - 8.5			38								
10.0 - 10.5	SPT		24					Driven cobble			10.0
10.5 - 11.0			44		104						
11.0 - 11.5			60								
15.0 - 15.5	SPT		23					No advance with 40 blows, driven cobble			15.5
			60					Driven cobble			

A USCS LOG OF TEST HOLE_KODIAK RW IMPROVEMENTS LOGS.GPJ_2006DATATEMPLATE.GDT_2/2/11

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 # TH10-57

PROJECT NUMBER :52739
PROJECT : Kodiak Runway Improvements
NORTHING : 1373645.43248, **EASTING** : 1929942.79306

Station / Location: 102+64
 Offset: Centerline
 Elevation: 76.33'

Coordinates: NAD83 State Z5

Equipment_Type: Mobile B-61
 Drilling Method: Hollow-Stem Auger
 Field Crew: (Denali Drilling) Tony & Dave

Total Depth: 16.5 feet
 Date: 7/31/2010 -
 Geologist: S. Evans

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Overcast; light, misty rain N/A
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0											
0.0 - 0.4								Asphalt 4.5 Inches (extracted core intact), no adhesion to underlying concrete, yellow paint on underside of asphalt core at interface with concrete			
0.4 - 0.9								Concrete 6.5 Inches			
0.9 - 1.0						SM		SILTY SAND with Gravel(SM) Dark gray sand and gravel in brown silt matrix FS-66 p200=15%, Sa=53%, Gr=32%			
1.0 - 2.0	SPT	FS-66	40 90 90		180						
2.0 - 5.0	SPT	FS-67	30 90 40		130			FS-67 Moisture=6.9%			
5.0 - 7.0								FS-67,68,&69 (combined), p200=19%, Sa=49%, Gr=32%			
7.0 - 8.0	SPT	FS-68	22 21		37			Moist, estimated p200=20%, gravel up to 1 Inch FS-68 Moisture=4.3%			7.0
8.0 - 9.0	GRAB	FS-69	16								
9.0 - 11.0	SPT	FS-70	10 10 10		20						
11.0 - 12.0						GM		SILTY GRAVEL with Sand & Cobbles(GM) Gray, moist, angular sand and gravel			-12.0
12.0 - 12.5	SPT		50					Refusal, cobble			12.5
12.5 - 15.0											
15.0 - 16.5	SPT	FS-71	10 31 35		66	GP-GM		GRAVEL with Silt and Sand(GP-GM) Gray to dark gray, moist, etimated p200=6-10%			-15.0
16.5								BOH 16.5			16.5

A USCS LOG OF TEST HOLE_KODIAK RW IMPROVEMENTS LOGS.GPJ_2006DATATEMPLATE.GDT_2/2/11



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LOG OF TEST HOLE

HOLE # TH10-58

PROJECT NUMBER :52739
PROJECT : Kodiak Runway Improvements
NORTHING : 1373636.4298, **EASTING** : 1930539.31761

Station / Location: 108+60
 Offset: Centerline
 Elevation: 71.29'

Coordinates: NAD83 State Z5

Equipment_Type: Mobile B-61
 Drilling Method: Hollow-Stem Auger
 Field Crew: (Denali Drilling) Tony & Dave

Total Depth: 13.0 feet
 Date: 7/31/2010 -
 Geologist: S. Evans

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Overcast
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0											
SUBSURFACE MATERIAL											
0.0								Asphalt 6 Inches (extracted core intact), no adhesion to underlying concrete			0.0
0.5								Concrete 7.75 Inches (extracted core intact) small crack running parallel to runway surface (no displacement)			0.5
1.2						SP-SM		SAND with Silt and Gravel (SP-SM) Gray fractured rock with brown silt, estimated p200=10-15% FS-72 p200=12%, Sa=52%, Gr=36%			1.2
2.5	SPT	FS-72	16 37 38								
2.5						GW-GM		GRAVEL with Silt and Sand (GW-GM) Dark gray with rust brown patches, moist			2.5
5.5								FS-73 p200=11%, Sa=42%, Gr=47%, Moisture=6.4%, PI=NP, LL=NV			
6.0	SPT	FS-73	55 60 43		103			Patch of pink sandy material, possibly ash			6.0
7.5								1 Inch sand layer, pale yellow, moist			7.5
7.6						OL		ORGANIC SILT (OL) Reddish brown, moist, strong organic odor, possibly original ground FS-74 Short hammer drop (approximately 20"), Moisture=125%, Org=19.8%			7.6
8.5	SPT	FS-74	9 3 4		7			2 Inch shard of shale in shoe, wet, rust colored			8.5
9.5								Cobbles, Boulders, or Weathered Bedrock			9.5
10.0	SPT		35					No advance with 40 blows, recovered rust orange colored shards of shale			10.0
12.5								Freshly fractured gravel in cuttings No advance with 45 blows			12.5
13.0	SPT		22 45				BOH 13				13.0

A USCS LOG OF TEST HOLE_KODIAK RW IMPROVEMENTS LOGS.GPJ_2006DATATEMPLATE.GDT_2/2/11



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LOG OF TEST HOLE

HOLE # TH10-59

PROJECT NUMBER :52739
PROJECT : Kodiak Runway Improvements
NORTHING : 1373786.84309, EASTING : 1929658.93569

Station / Location: 99+80
 Offset: 139' Lt
 Elevation: 76.88'

Coordinates: NAD83 State Z5

Equipment_Type: Mobile B-61
 Drilling Method: Hollow-Stem Auger
 Field Crew: (Denali Drilling) Tony & Dave

Total Depth: 10.5 feet
 Date: 7/31/2010 -
 Geologist: S. Evans

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Mostly cloudy
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0						SM		SUBSURFACE MATERIAL			
0	SPT	FS-75	12					SILTY SAND with Gravel(SM) Dark gray, moist, predominantly shale fragments, traces of disseminated organics		0.0	
1			19		43						
2			24								
3	SPT	FS-76	15					FS-76 Moisture=4%, Org=1.3%			
4			27		49			Dry to moist, freshly broken shards of shale		3.0	
5			22					FS-75,76,&77 (combined), p200=13%, Sa=49%, Gr=38%			
6	SPT	FS-77	9					FS-77 Moisture=8.7%, Org=2.8%			
7			15		32						
8			17								
9	SPT	FS-78	10								
10			33		71						
10.0			38								
10.3	SPT		22					Recovered flat, freshly broken shale shards		10.0	
10.5			50					BOH 10.5 No advance with 40 blows, bedrock or boulder.		10.3	

A USCS LOG OF TEST HOLE - KODIAK RW IMPROVEMENTS LOGS.GPJ_2006DATATEMPLATE.GDT_2/2/11



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LOG OF TEST HOLE

HOLE # TH10-60

PROJECT NUMBER :52739
PROJECT : Kodiak Runway Improvements
NORTHING : 1373633.10955, **EASTING** : 1930999.64364

Station / Location: 113+20
 Offset: 3' Lt
 Elevation: 67.29'

Coordinates: NAD83 State Z5

Equipment_Type: Mobile B-61
 Drilling Method: Hollow-Stem Auger
 Field Crew: (Denali Drilling) Tony & Dave

Total Depth: 11.5 feet
 Date: 7/31/2010 -
 Geologist: S. Evans

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Partly cloudy N/A
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0											
0.0 - 0.3								Asphalt 3.5 Inches (extracted core intact), no adhesion to underlying concrete			
0.3 - 0.8								Concrete 6 Inches (approximate), concrete was rubblized during removal			
0.8 - 1.0	SPT	FS-79	20		72	SM		SILTY SAND with Gravel(SM) Dark gray, moist, angular sand and gravel, gravel up to 1.5 Inches FS-79 p200=13%, Sa=49%, Gr=38%			
1.0 - 2.0			39								
2.0 - 2.5			33								
2.5 - 5.0											
5.0 - 5.5						GM		SILTY GRAVEL with Sand(GM) Dark gray, moist			
5.5 - 6.0	SPT		13		81			Estimated p200=15%, estimated gravel=50-60%			
6.0 - 7.0			25								
7.0 - 8.0			56								
8.0 - 10.0								Hard drilling			
10.0 - 10.5											
10.5 - 11.0	SPT	FS-80	22		88			Similar to above, dark gray, moist			
11.0 - 11.5			42								
11.5			46								
								BOH 11.5			

A USCS LOG OF TEST HOLE_KODIAK RW IMPROVEMENTS LOGS.GPJ_2006DATATEMPLATE.GDT_2/2/11



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LOG OF TEST HOLE

HOLE # TH10-61

PROJECT NUMBER :52739
PROJECT : Kodiak Runway Improvements
NORTHING : 1373628.57002, **EASTING** : 1931340.30924

Station / Location: 116+61
 Offset: 2' Lt
 Elevation: 64.49'

Coordinates: NAD83 State Z5

Equipment_Type: Mobile B-61
 Drilling Method: Hollow-Stem Auger
 Field Crew: (Denali Drilling) Tony & Dave

Total Depth: 14.0 feet
 Date: 8/1/2010 -
 Geologist: S. Evans

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Overcast, occasional drizzle N/A
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0											
SUBSURFACE MATERIAL											
0.0								Asphalt 4.5 Inches (extracted core intact), good adhesion to underlying concrete			0.0
0.4								Concrete 6.5 Inches			0.4
0.9						SP-SM		SAND with Silt and Gravel (SP-SM) Dark gray, moist (excess water introduced during coring procedure)			0.9
1.5	SPT	FS-81	9 30 45	X	75			FS-81 p200=8%, Sa=59%, Gr=33% Dark gray sand and gravel with brown silt, moist			1.5
4.0								Cuttings dry to moist, sub-angular to angular sand and gravel			4.0
5.5	SPT	FS-82	12 35 17	X	52			FS-82 Moisture=14.4% Gray, sample contains rust colored patches, angular gravels			5.5
9.0	SPT	FS-83	27 60 70	X	130			FS82&83 (combined), p200=10%, Sa=51%, Gr=39% FS-83 Moisture=7.5%			9.0
9.0								Oxidized sand/gravel grains present			9.0
10.0	SPT		60	X				Very hard drilling, auger penetration rate approximately 2 Inches/minute, cuttings predominantly fractured rock (possibly graywacke?) No advance with 40 blows, freshly fractured rock recovered			10.0
12.0	SPT		50	X				Fractured bedrock, boulder, or cobbles			12.0
14.0							BOH 14				14.0

A USCS LOG OF TEST HOLE_KODIAK RW IMPROVEMENTS LOGS.GPJ_2006DATATEMPLATE.GDT_2/2/11

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 # TH10-62

PROJECT NUMBER :52739
PROJECT : Kodiak Runway Improvements
NORTHING : 1373612.22971, **EASTING** : 1932063.01752

Station / Location: 123+84
 Offset: 5' Rt
 Elevation: 55.5'

Coordinates: NAD83 State Z5

Equipment_Type: Mobile B-61
 Drilling Method: Hollow-Stem Auger
 Field Crew: (Denali Drilling) Tony & Dave

Total Depth: 16.5 feet
 Date: 8/1/2010 -
 Geologist: S. Evans

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Overcast N/A
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0								SUBSURFACE MATERIAL			
0.0 - 0.5								Asphalt 6 Inches (extracted core intact), substantial voids between lifts, bottom 1 inch adhered to underlying concrete			
0.5 - 1.0								Concrete 6 Inches			
1.0 - 4.5	SPT	FS-84	17 45 33		78	SP-SM		SAND with Silt and Gravel(SP-SM) Dark gray sand and gravel with brown to rust brown silt, moist, angular sand and gravel FS-84 p200=9%, Sa=49%, Gr=42%			
4.5 - 5.0						ML		SILT with Sand(ML) Rust brown, moist, sand occurs as thin layers, may contain trace organics			
5.0 - 7.0	SPT	FS-85	4 7 14		21	SP-SM		SAND with Silt and Gravel(SP-SM) Dark gray sand and gravel in pale yellowish brown matrix, dry to moist FS-85 p200=8%, Sa=61%, Gr=31%, Moisture=1.5%, PI=NP, LL=NV			
7.0 - 14.5	SPT	FS-86	13 38 28		66	GP-GM		GRAVEL with Silt and Sand(GP-GM) FS-86 p200=9%, Sa=44%, Gr=47%, Moisture=2.8%			
14.5 - 16.5	SPT	FS-87	24 16 27		43	SM		SILTY SAND with Gravel(SM) Pale yellow, moist, estimated p200=15-20%			
16.5							BOH 16.5				

A USCS LOG OF TEST HOLE_KODIAK RW IMPROVEMENTS LOGS.GPJ_2006DATATEMPLATE.GDT_2/2/11

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 # TH10-63

PROJECT NUMBER :52739
PROJECT : Kodiak Runway Improvements
NORTHING : 1373601.86985, **EASTING** : 1933142.23754

Station / Location: 134+63
 Offset: Centerline
 Elevation: 41.65'

Coordinates: NAD83 State Z5

Equipment_Type: Mobile B-61
 Drilling Method: Hollow-Stem Auger
 Field Crew: (Denali Drilling) Tony & Dave

Total Depth: 16.5 feet
 Date: 8/1/2010 -
 Geologist: S. Evans

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Rain
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0											
0.0 - 0.4								Asphalt 5 Inches, rubblized to extract core, top 2 inch lift delaminated from lower 3 inch lift, significant voids in top lift, good adhesion to underlying concrete			
0.4 - 1.0								Concrete 6 Inches			
1.0 - 1.5	SPT	FS-88	22	X				SAND with Silt and Gravel & Cobbles Dark gray sand and gravel in yellowish brown matrix, moist, angular sand and gravel FS-88 p200=9%, Sa=48%, Gr=43%			
1.5 - 2.0			50					No advance with 40 blows, cobble			
2.0 - 3.0			25	X				FS-89 Moisture=3.9%			
3.0 - 4.0	SPT	FS-89	27	X		50		FS-89&90 (combined), p200=10%, Sa=47%, Gr=43%			
4.0 - 5.0			23								
5.0 - 6.0			21	X				Dry to moist, estimated p200=10-15% FS-90 Moisture=1.9%			5.0
6.0 - 7.0	SPT	FS-90	17	X		32					
7.0 - 8.0			15								
8.0 - 9.0			30	X			GP-GM	GRAVEL with Silt and Sand & Cobbles (GP-GM) Cuttings contain gravel up to 2.5 Inches, estimated gravel content=70%			
9.0 - 10.0			50	X		80					
10.0 - 11.0			30								
11.0 - 12.0	SPT	FS-91	23	X		81		Cobble			10.5
12.0 - 13.0			46	X							
13.0 - 14.0			35								
14.0 - 15.0	SPT		40	X				No advance with 20 blows			13.0
15.0 - 16.0			60					Cobble			
16.0 - 16.5	SPT	FS-92	22	X		66		Dark gray sand and gravel in rust brown matrix, estimated p200=10-15%			15.0
			34	X							
			32								
								BOH 16.5			16.5

A USCS LOG OF TEST HOLE_KODIAK RW IMPROVEMENTS LOGS.GPJ_2006DATATEMPLATE.GDT_2/2/11

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 # TH10-64

PROJECT NUMBER :52739
PROJECT : Kodiak Runway Improvements
NORTHING : 1373595.05839, **EASTING** : 1933864.86937

Station / Location: 141+86
 Offset: 1' Lt
 Elevation: 34.26'

Coordinates: NAD83 State Z5

Equipment_Type: Mobile B-61
 Drilling Method: Hollow-Stem Auger
 Field Crew: (Denali Drilling) Tony & Dave

Total Depth: 16.5 feet
 Date: 8/1/2010 -
 Geologist: S. Evans

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Misty, light rain N/A
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0											
0.0								Asphalt 6 Inches, delaminated top lift, lower lift well adhered to underlying concrete			0.0
0.5								Concrete 6 Inches			0.5
1.0	SPT	FS-93	17		84	SP-SM		SAND with Silt and Gravel (SP-SM) Dark gray, moist, angular sand and gravel p200=8%, Sa=51%, Gr=41%, Moisture=3.5%		FS-93	1.0
2			47								
3			37								
5	SPT	FS-94	22		56			FS-94 Moisture=2.5%			
6			26					FS-94&95 (combined), p200=9%, Sa=49%, Gr=42%			
7			30								
10	SPT	FS-95	10		51			FS-95 Moisture=3.8%			
11			25								
12			26								
15	SPT		22		89			Dry to moist			15.0
16			27								
			62								
								BOH 16.5			16.5

A USCS LOG OF TEST HOLE_KODIAK RW IMPROVEMENTS LOGS.GPJ_2006DATATEMPLATE.GDT_2/2/11



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # TH10-65

PROJECT NUMBER :52739
PROJECT : Kodiak Runway Improvements
NORTHING : 1373574.0937, **EASTING** : 1935328.90143

Station / Location: 156+50
 Offset: Centerline
 Elevation: 26.65'

Coordinates: NAD83 State Z5

Equipment_Type: Mobile B-61
 Drilling Method: Hollow-Stem Auger
 Field Crew: (Denali Drilling) Tony & Dave

Total Depth: 2.8 feet
 Date: 8/1/2010 -
 Geologist: S. Evans

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data		Weather: Cloudy N/A
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	
0	SPT	FS-96			73	SP-SM		SUBSURFACE MATERIAL			
0.75									Asphalt 8.25 Inches asphalt, upper lifts (4.5") delaminated, good adhesion of lower lifts to underlying concrete	0.0	
1.2									Concrete 6 Inches concrete (intact)	0.7	
2.0			20						SAND with Silt and Gravel(SP-SM) Dark gray with occasional rust patches, moist to wet (due to coring procedure) FS-96 p200=7%, Sa=55%, Gr=38%	1.2	
2.0	30			No advance with 20 blows, strong recoil, auger refusal (no advance with 10 minutes of drilling), noticeable wear on hard face and teeth of bit	2.0						
2.8	43				2.8						
2.75								Bedrock or boulder	2.75		

A USCS LOG OF TEST HOLE_KODIAK RW IMPROVEMENTS LOGS.GPJ_2006DATATEMPLATE.GDT_2/2/11



STATE OF ALASKA DOT&PF
 Central Region Materials
 Geology Section

LOG OF TEST HOLE

HOLE # TH10-66

PROJECT NUMBER :52739
PROJECT : Kodiak Runway Improvements
NORTHING : 1373555.25704, **EASTING** : 1936843.94849

Station / Location: 172+65
 Offset: Centerline
 Elevation: 21.01'

Coordinates: NAD83 State Z5

Equipment_Type: Mobile B-61
 Drilling Method: Hollow-Stem Auger
 Field Crew: (Denali Drilling) Tony & Dave

Total Depth: 16.5 feet
 Date: 8/1/2010 -
 Geologist: S. Evans

Depth (Feet)	Sample Data					USCS Classification	Frozen Zone	Soil Graphic	Ground Water Data			Weather: Light, misty rain N/A
	Sample Type	Number	Blow Count	Sample Recovery	N-Value				Depth in (ft.)	Time	Date	
0									SUBSURFACE MATERIAL			
0.0								Asphalt 10 Inches (extracted core intact)				
0.8						SP-SM		SAND with Silt and Gravel & Cobbles (SP-SM) Dark gray, moist to wet (due to coring procedure), estimated p200=6-10%, gravel predominantly angular shale				
1.0	SPT	FS-97	32		91			FS-97 p200=10%, Sa=48%, Gr=42%				
2.0			52									
2.5			39					Concrete, estimated thickness 5-6 inches				
3.0						SP-SM		SAND with Silt and Gravel & Cobbles (SP-SM) Dark gray, dry to moist, angular sand and gravel				
5.0								FS-98 Moisture=4.4%				
6.0	SPT	FS-98	17		64							
6.5			33									
7.0			31					FS98&99 (combined), p200=9%, Sa=47%, Gr=44%				
7.5								Slow, steady auger advance				
10.0												
10.5	SPT	FS-99	14		108			FS-99 Moisture=2.4%				
11.0			60									
11.5			48									
12.5								Hard drilling, possibly cobbles present, cuttings consistent with previous samples				
15.0								Similar to above				
15.5	SPT		16		64							
16.0			28									
16.5			36									
16.5								BOH 16.5				

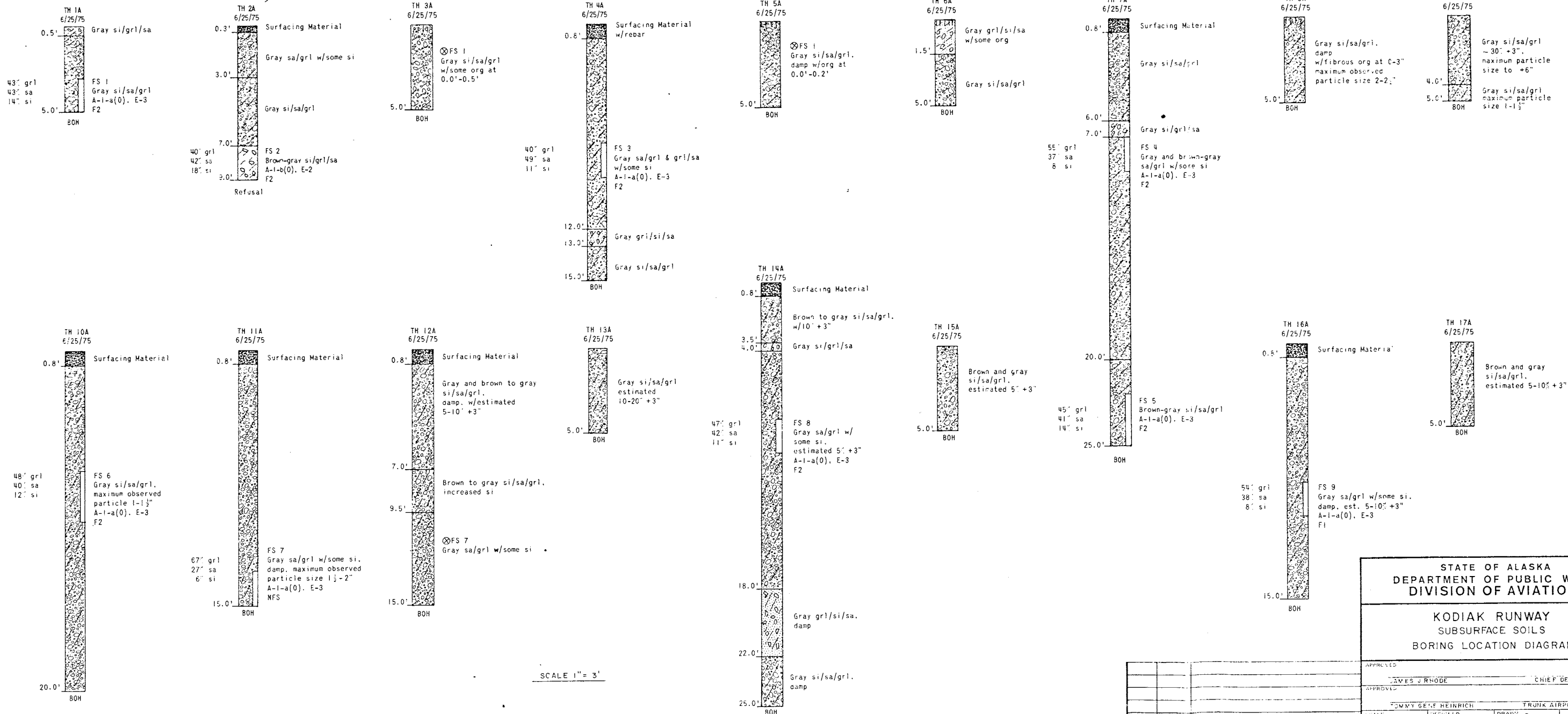
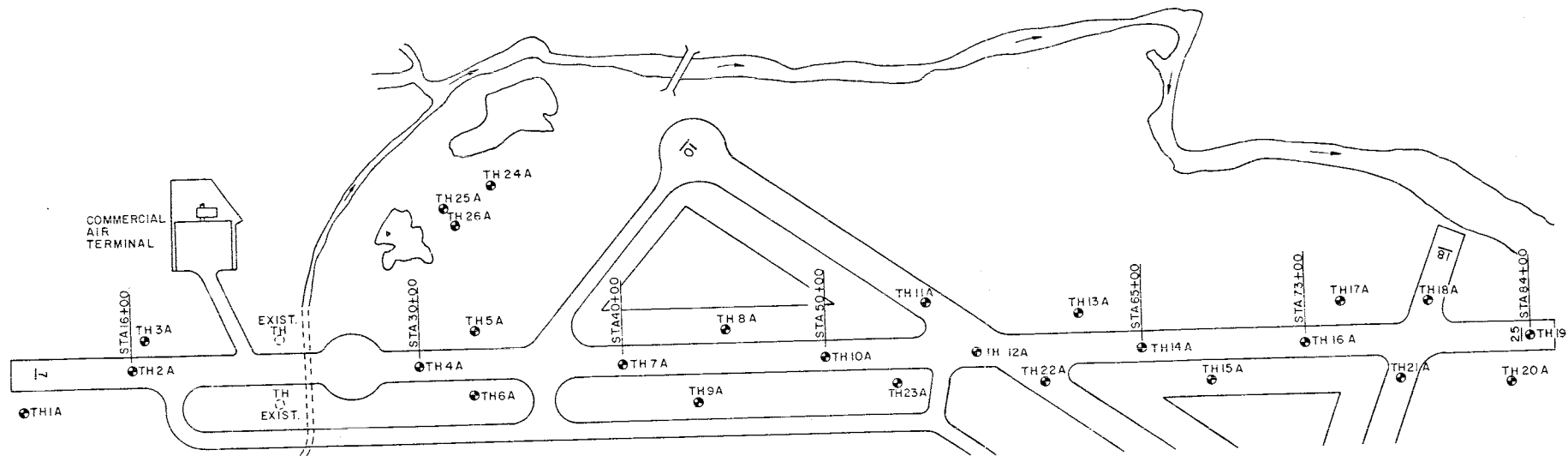
A USCS LOG OF TEST HOLE_KODIAK RW IMPROVEMENTS LOGS.GPJ_2006DATATEMPLATE.GDT_2/2/11

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

1975 TEST HOLE LOGS



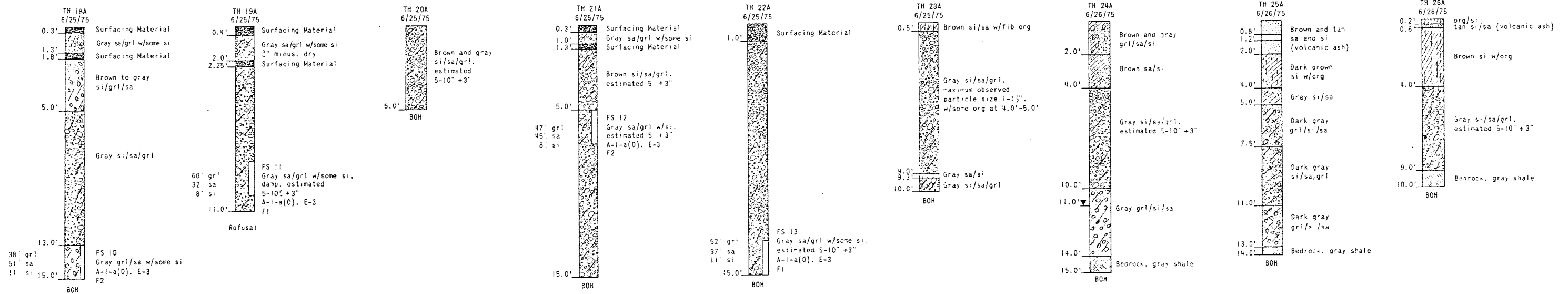
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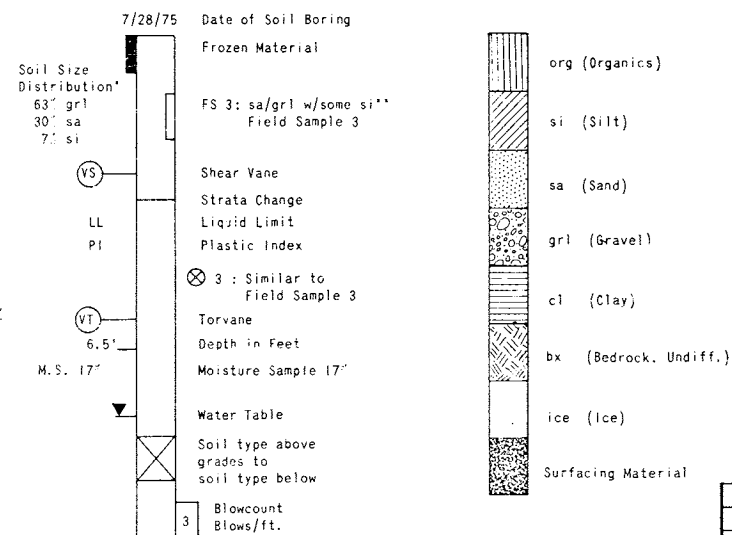
STATE OF ALASKA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF AVIATION

KODIAK RUNWAY
SUBSURFACE SOILS
BORING LOCATION DIAGRAM

APPROVED		APPROVED		APPROVED		APPROVED	
LAVES J. RHODE		TOMMY GUYE HEINRICH		DRE		DRAWN BY	
CHIEF DESIGN ENGINEER		TRUNK AIRPORTS ENGINEER		CHECKED		DATE	
BY	DATE	CHANGE	AS SHOWN	REVISIONS	SHEET	OF	



BORING LOG LEGEND



*Based upon U.S. Standard sieve sizes:
 Gravel: minus 3", plus #4
 Sand: minus #4, plus #200
 Silt: minus #200

**Terms associated with Soil Descriptions:
 Trace: 0-5%
 Some: 6-12%
 Modifier (e.g. silty, sandy or gravelly): >12%
 Modifiers listed in order of occurrence,
 least abundant first.

STATE OF ALASKA
 DEPARTMENT OF PUBLIC WORKS
 DIVISION OF AVIATION

KODIAK RUNWAY
 SUBSURFACE SOILS
 BORING LOCATION DIAGRAM

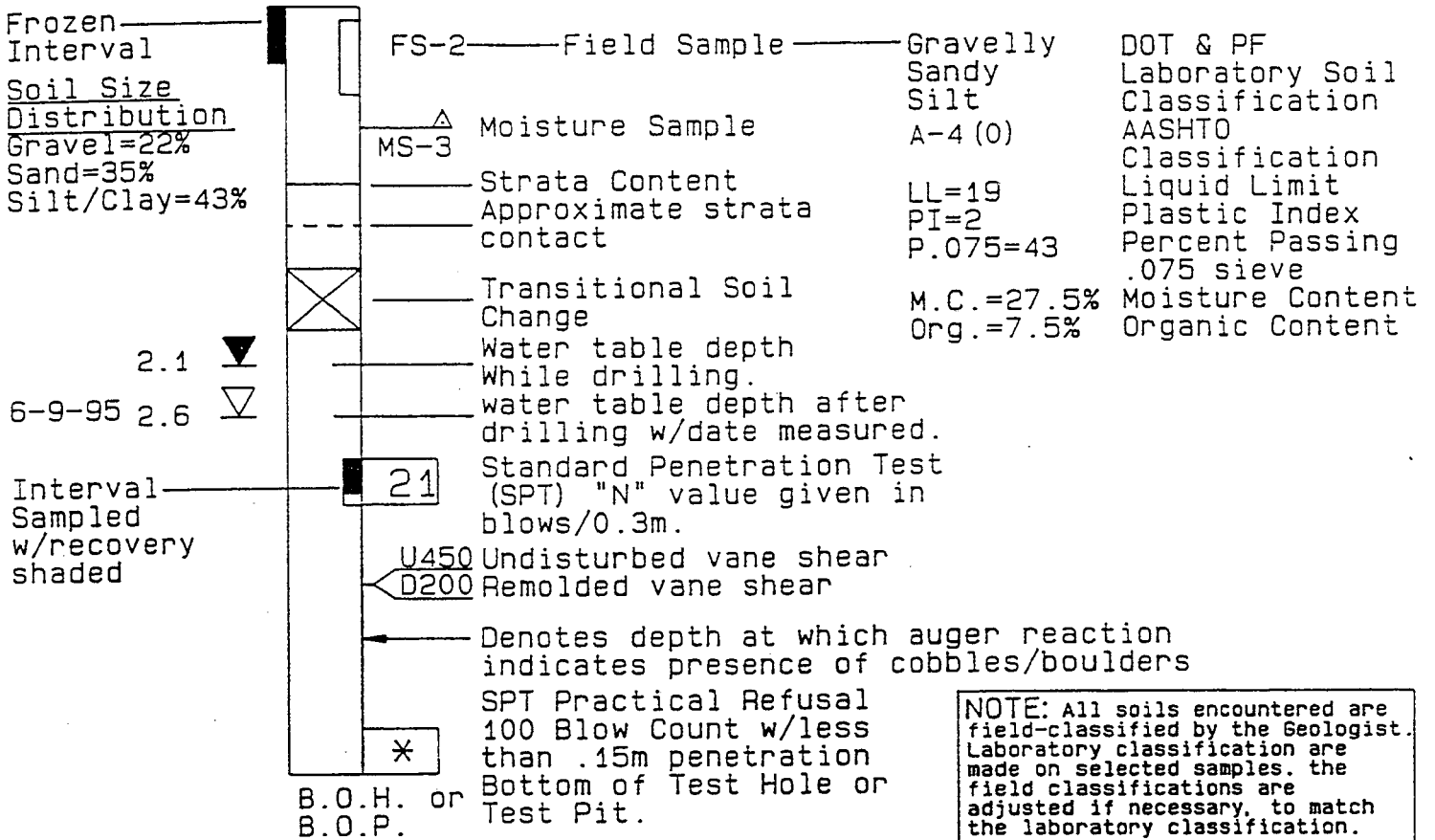
APPROVED		APPROVED	
JAMES J. RHODE		CHIEF DESIGN ENGINEER	
TOMMY GENE HEINRICH		TRUNK AIRPORTS ENGINEER	
BY	DATE	CHANGE	REVISIONS
SCALE	1" = 3'	REVISIONS	SHEET OF

1996 TEST HOLE LOGS

TEST HOLE AND TEST PIT LOG EXPLANATION
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES
MATERIALS SECTION

1/97

Location ——— T.H. or T.P. ——— Test Hole or Test Pit Number
 Sta. 1+500, 4.6 Rt. ——— Offset from Centerline (C)
 Elev. 26.4 ——— Elevation
 6-8-95 ——— Date drilled or excavated



NOTE: All soils encountered are field-classified by the Geologist. Laboratory classification are made on selected samples, the field classifications are adjusted if necessary, to match the laboratory classification.

Abbreviations

Blk=Black Org =Organic (s)
 Bn =Brown Grl =Gravel
 Bl =Blue w/ =with
 Gn =Green tr =trace
 Gr =Gray Sl =Slightly
 Or =Orange G.S.=Grab Sample
 Rd =Red S.S.=Split Spoon
 Tn =Tan S.N.T.=Sample Not Tested
 Sa =Sand
 Si =Silt S.T.=Shelby Tube
 Cl =Clay M.S.=Modified Shelby Tube

Soil Size Distribution

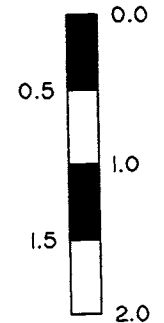
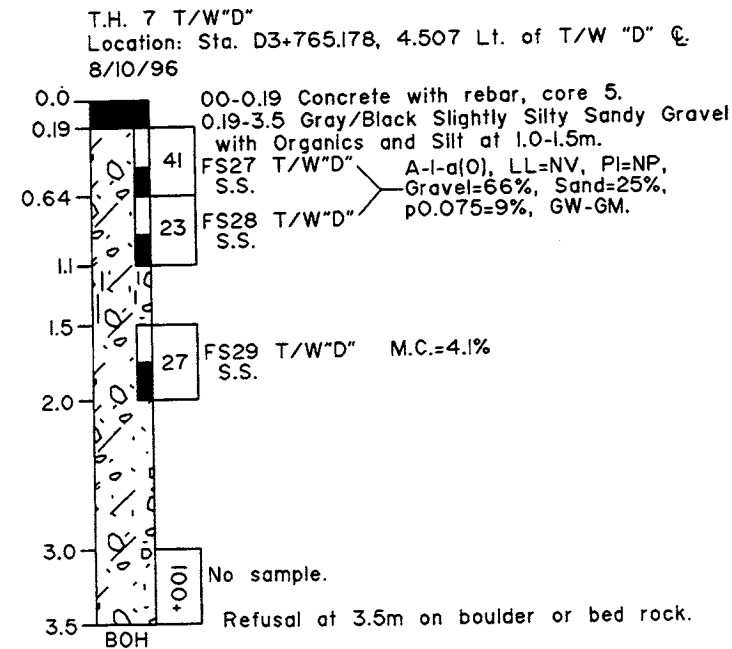
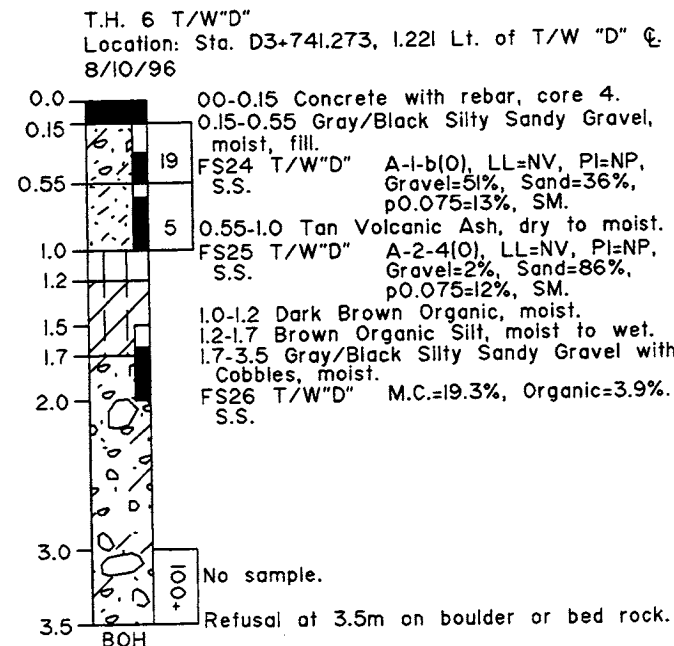
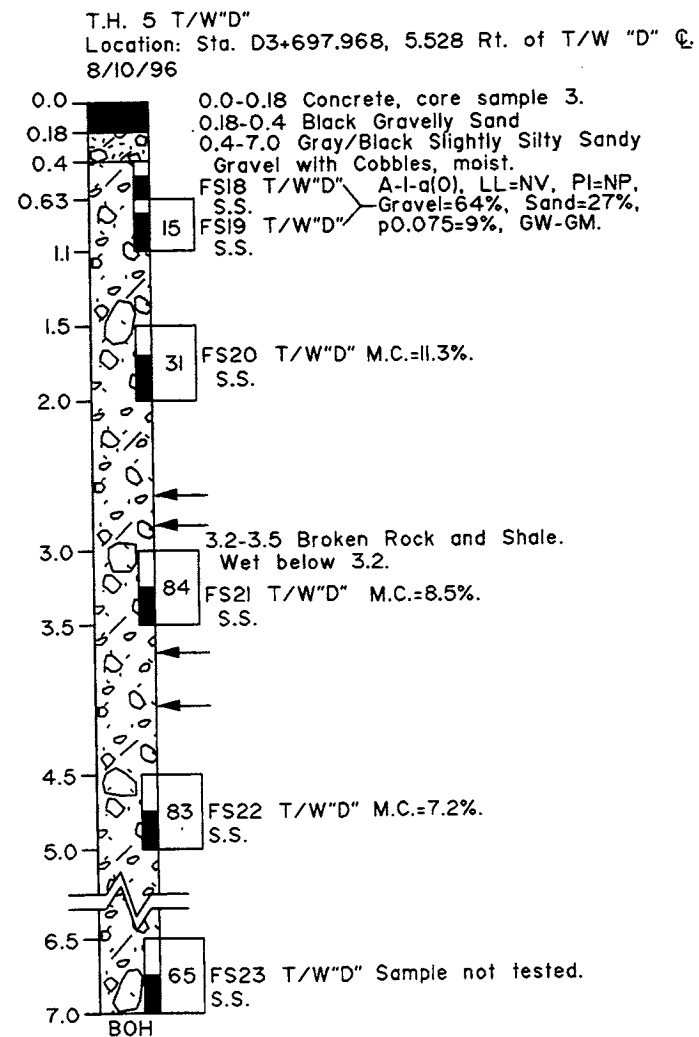
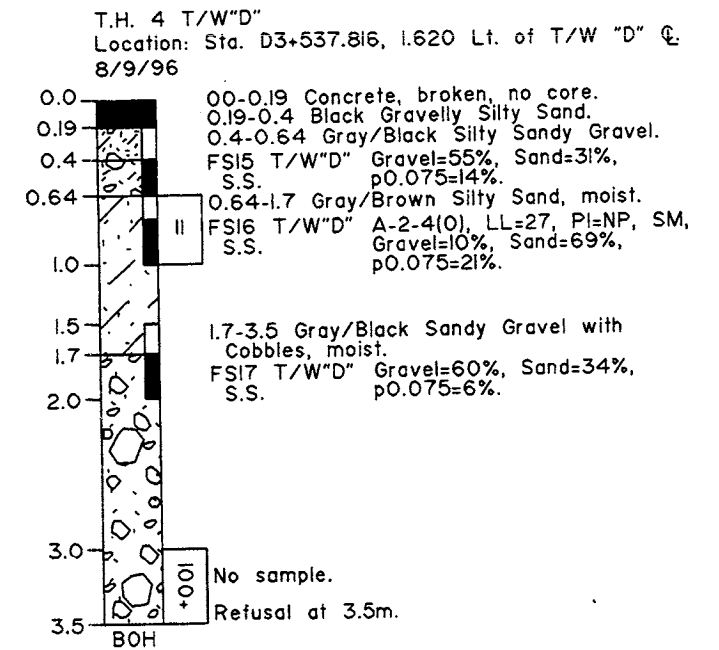
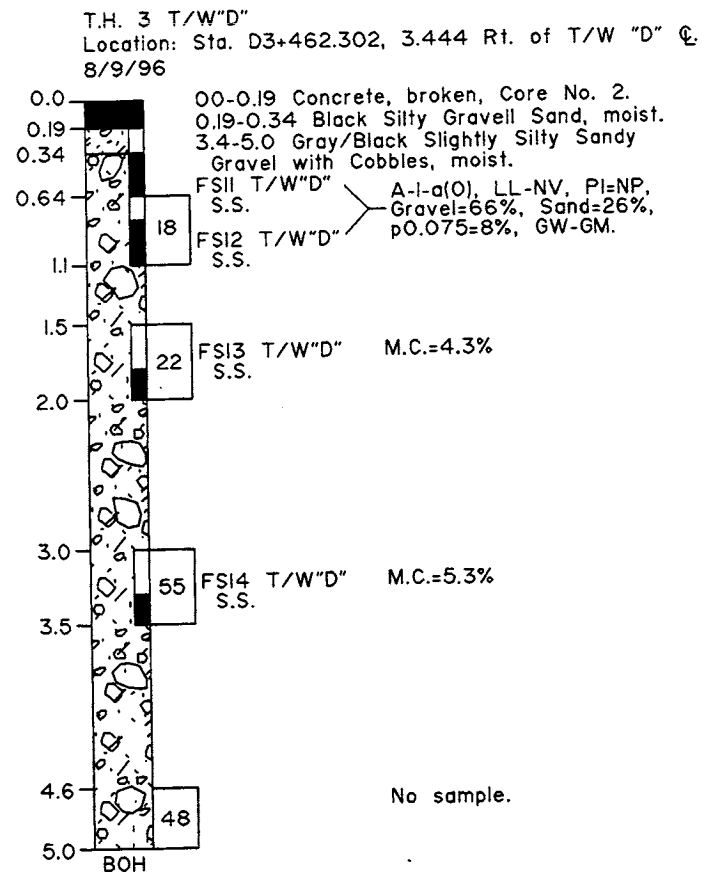
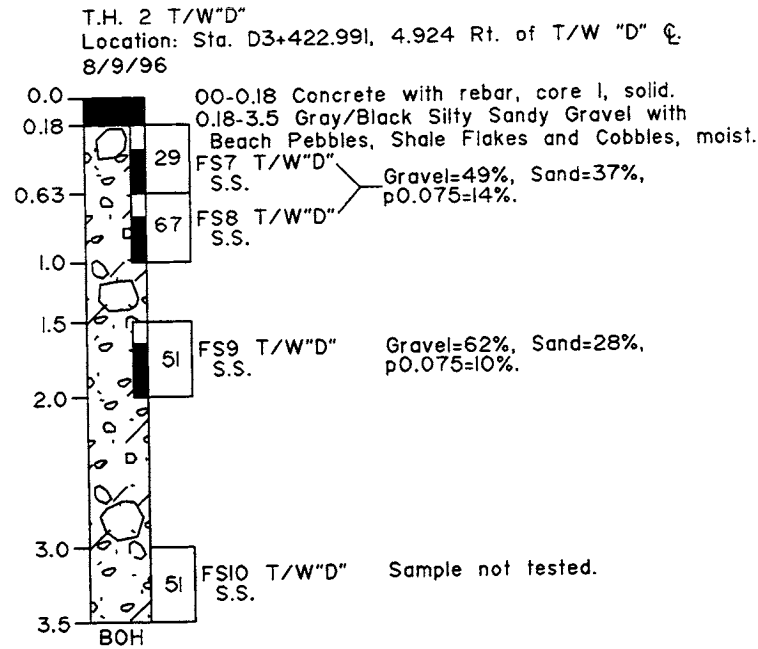
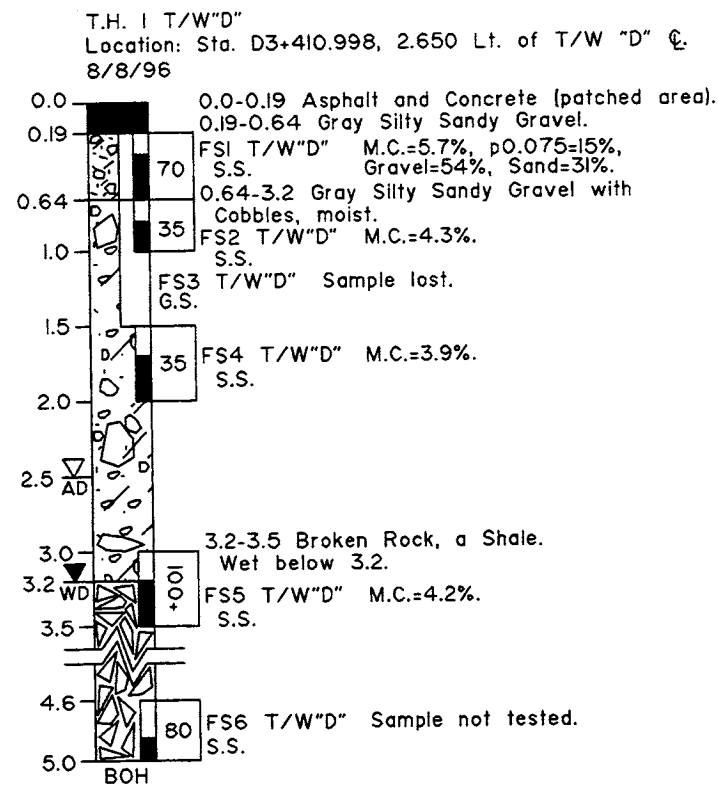
Based on U.S. Standard Sieve sizes:
 Boulders =>305mm
 Cobbles =75-305mm
 Gravel =2.00-75mm
 Sand =.075-2.00mm
 Silt/Clay =<.075mm

Plan View Symbols

Power Auger Test Hole
 Hand Auger Test Hole
 Surface Sample
 Hand Probe Depth & Locations
 Hand Dug Test Pit
 Dozer/Backhoe Pit
 x x x x Berm
 Terrace or Bank
 Swamp

Graphic Symbols (Two or more soil symbols may be used together to indicate a combination of soil types).

Organics (Org.)
 Gravel (Gr1)
 Sand (Sa)
 Silt (Si)
 Clay (Cl)
 Ice (Ice)
 Bedrock (Bx)
 Cobbles and/or Boulders

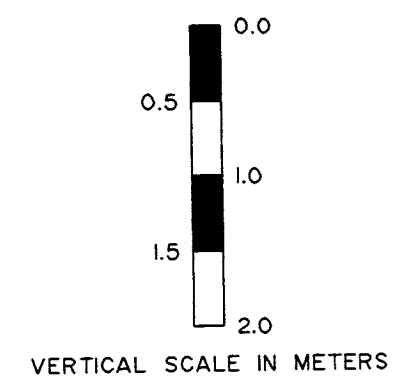
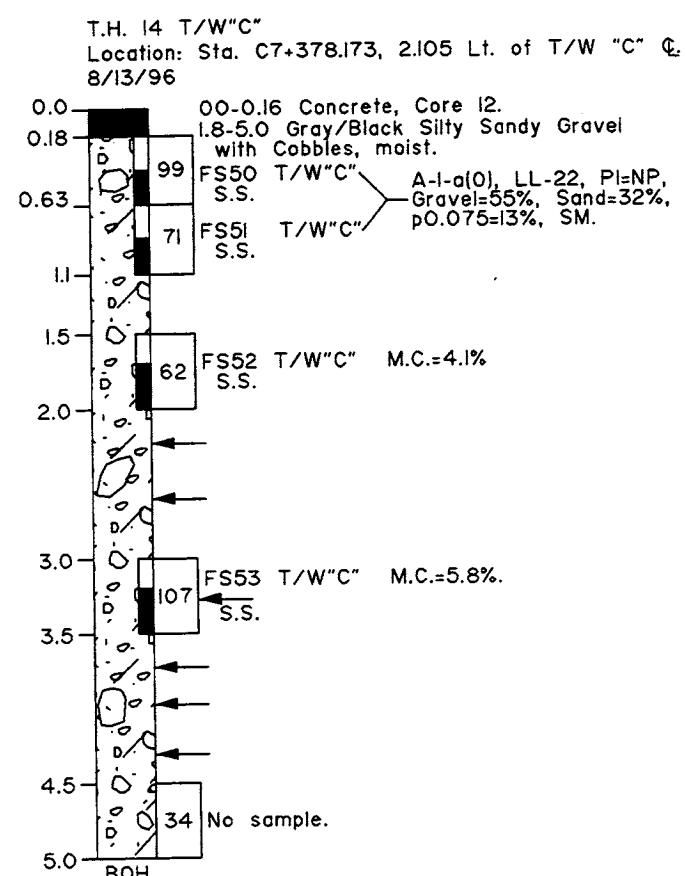
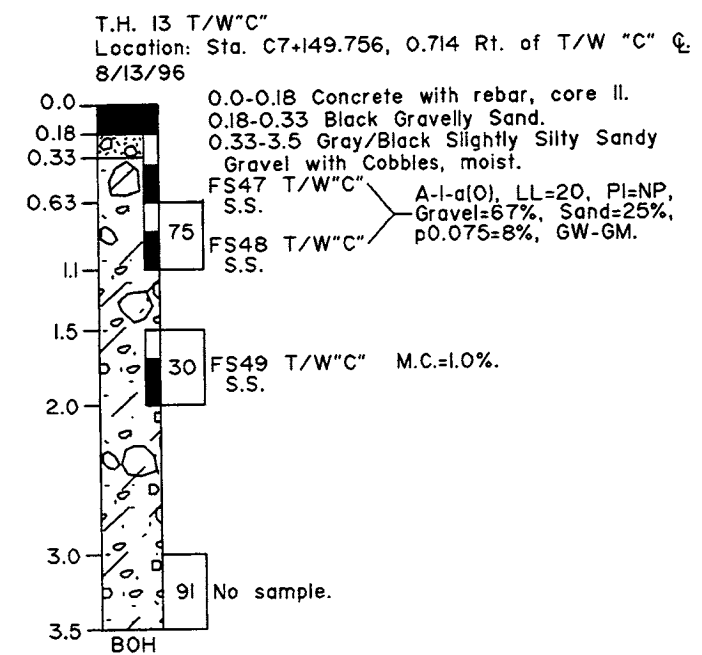
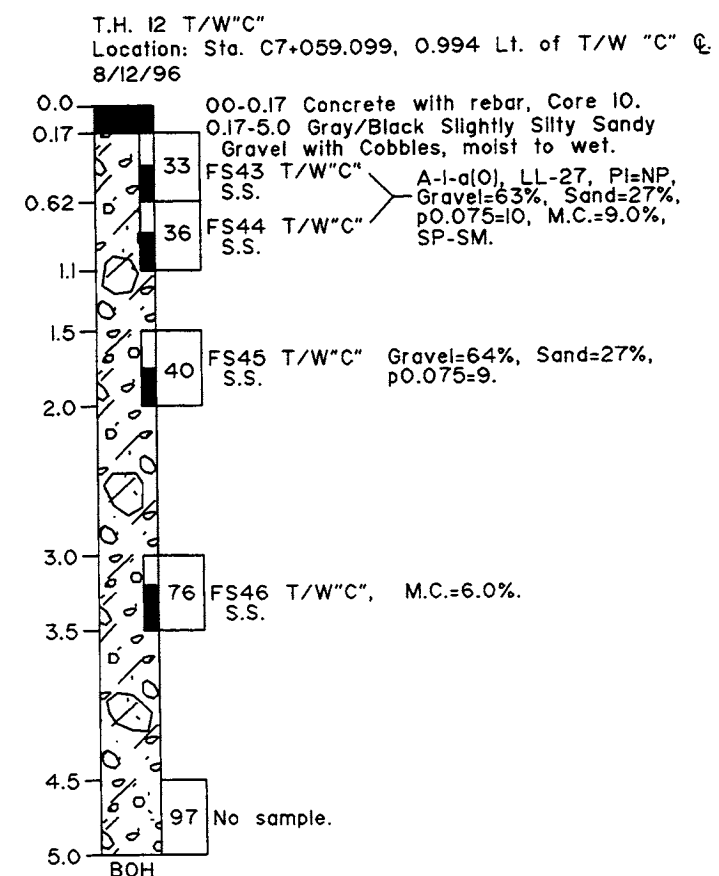
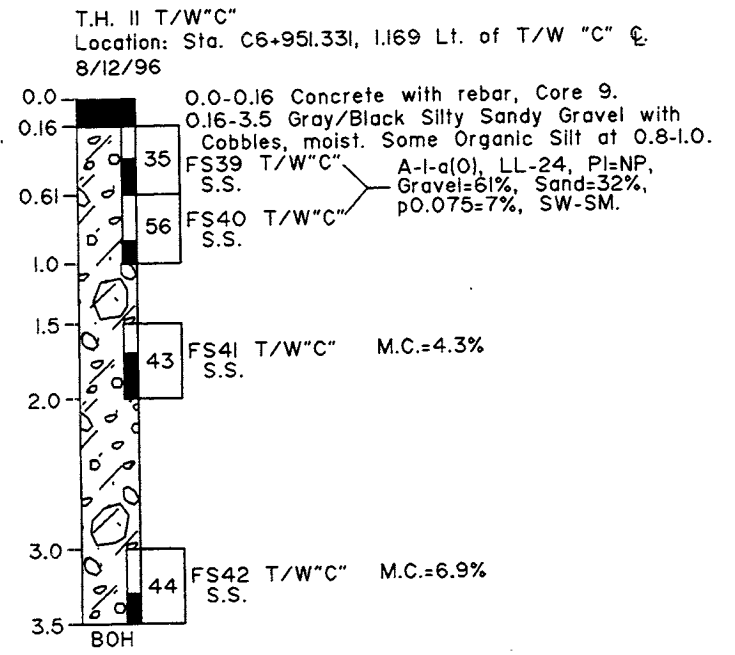
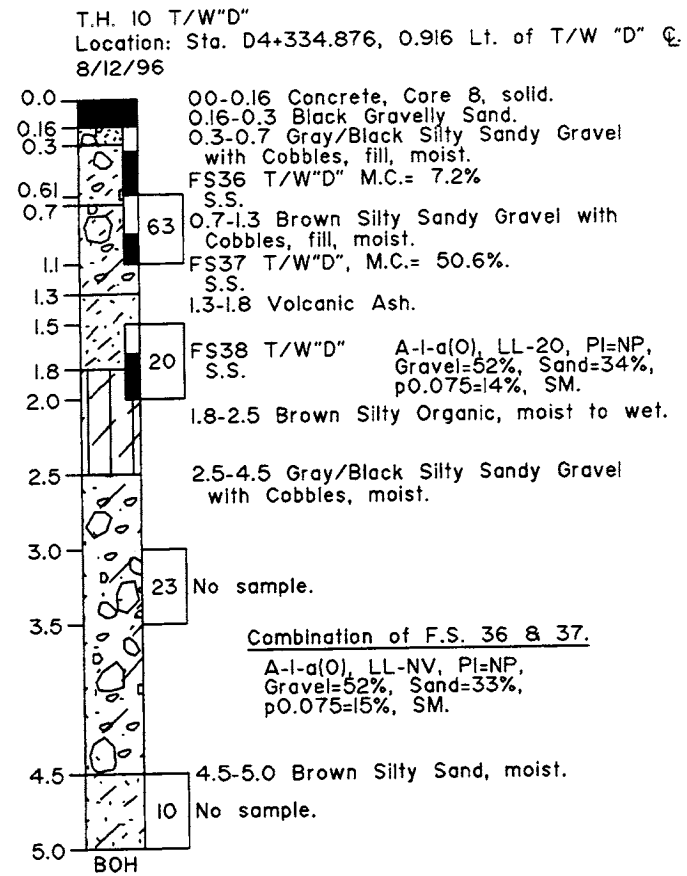
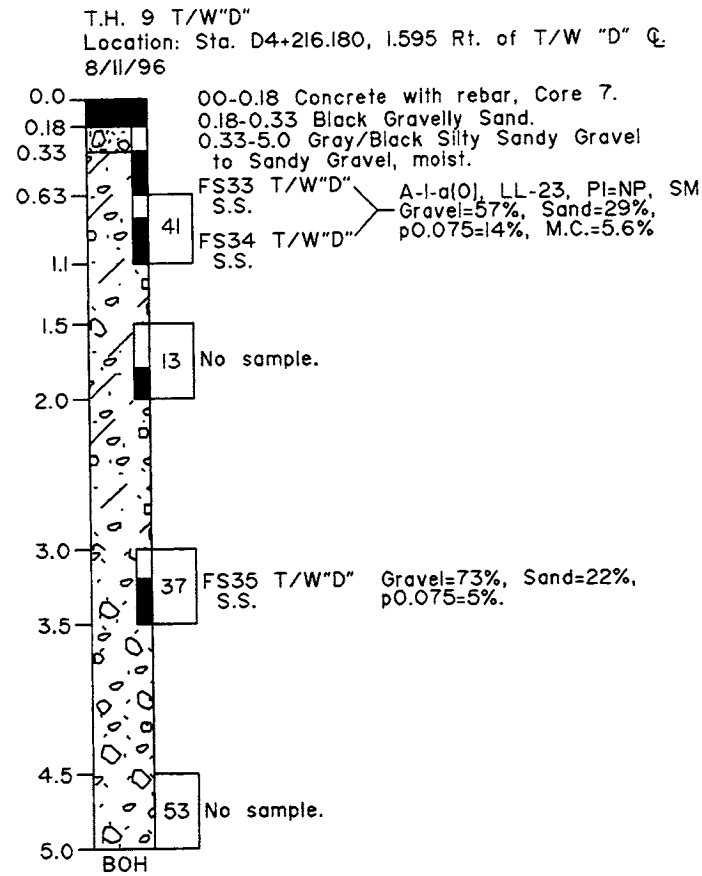
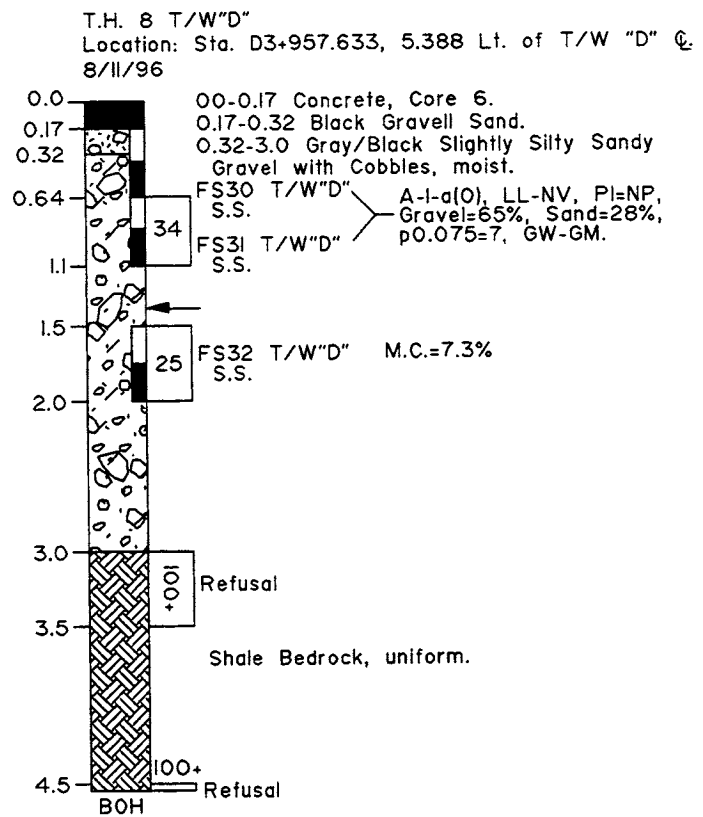


VERTICAL SCALE IN METERS

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND
PUBLIC FACILITIES

KODIAK AIRPORT RESURFACING
TEST HOLE LOGS
TAXIWAY "D"
PROJECT NO. 52228

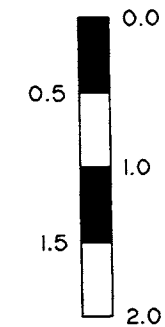
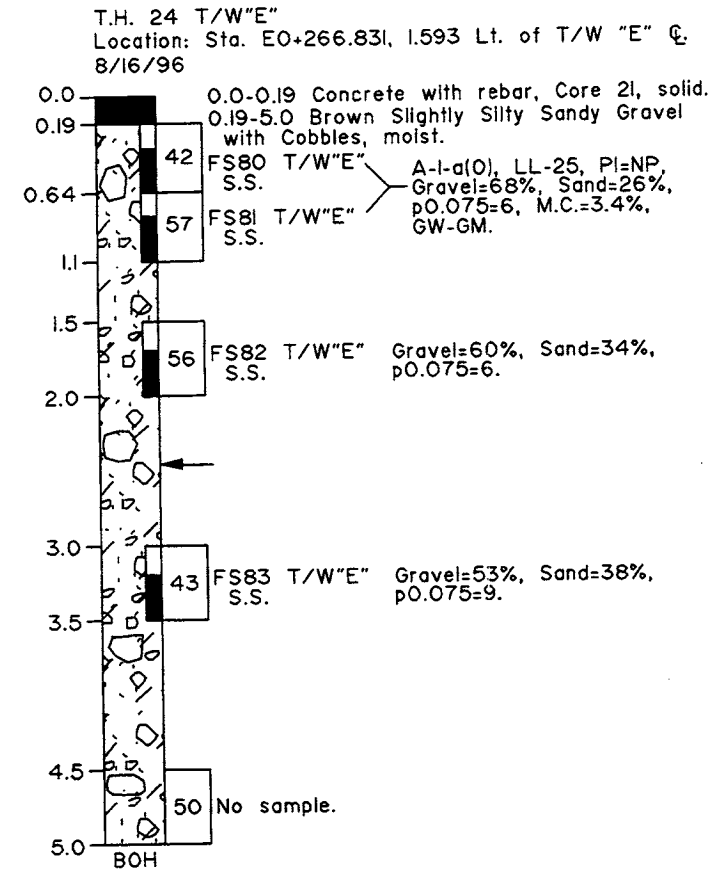
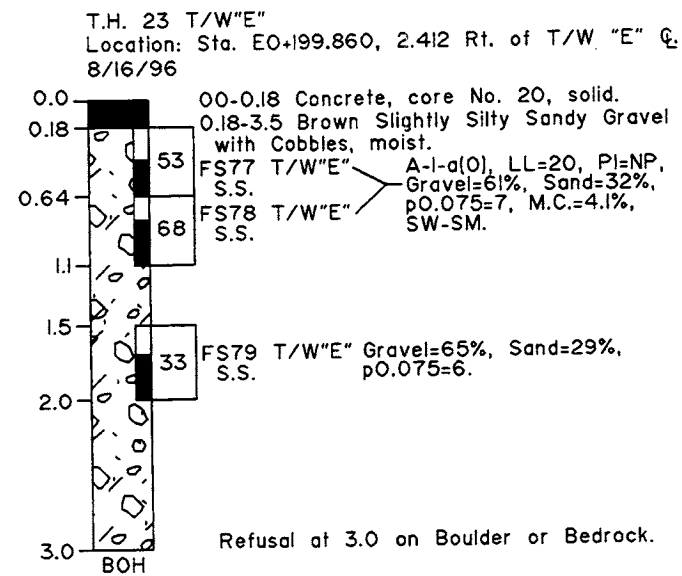
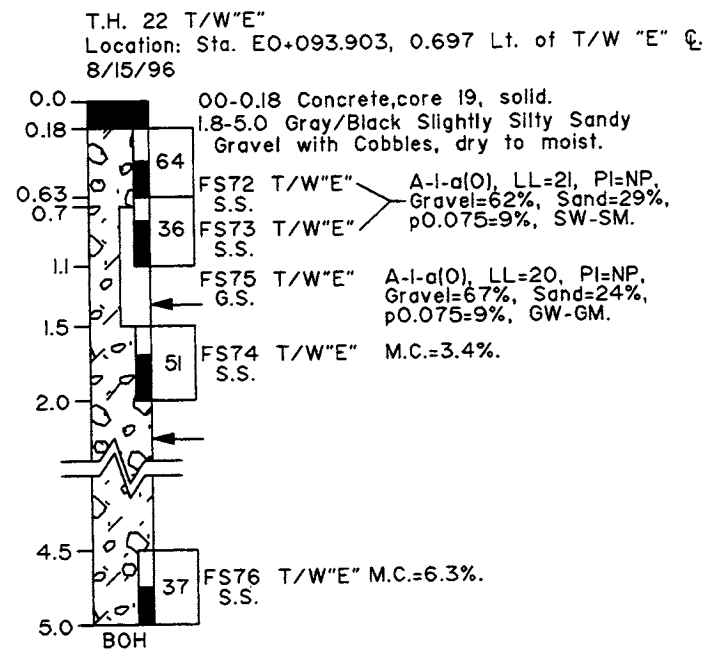
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**STATE OF ALASKA
 DEPARTMENT OF TRANSPORTATION
 AND
 PUBLIC FACILITIES**

**KODIAK AIRPORT RESURFACING
 TEST HOLE LOGS
 TAXIWAY "D" & "C"
 PROJECT NO. 52228**

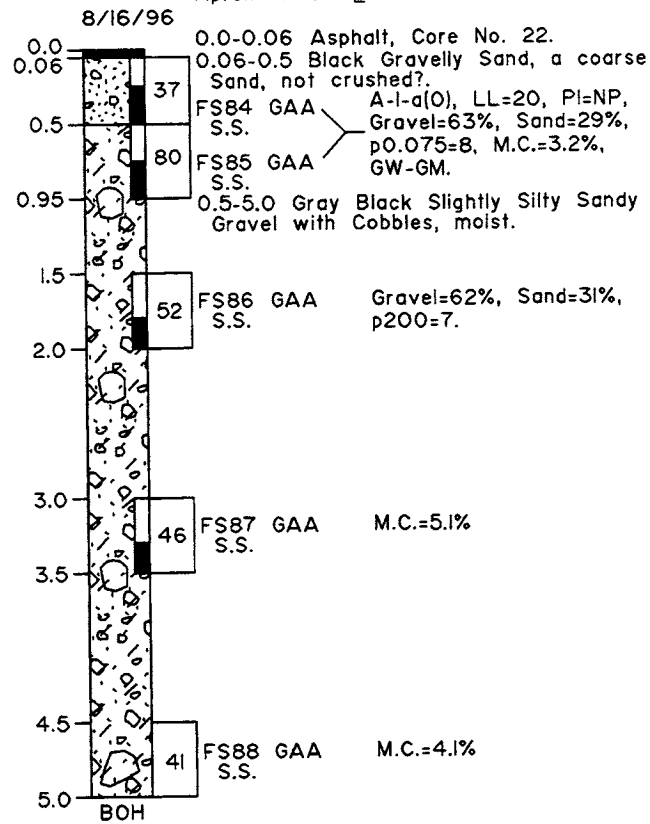
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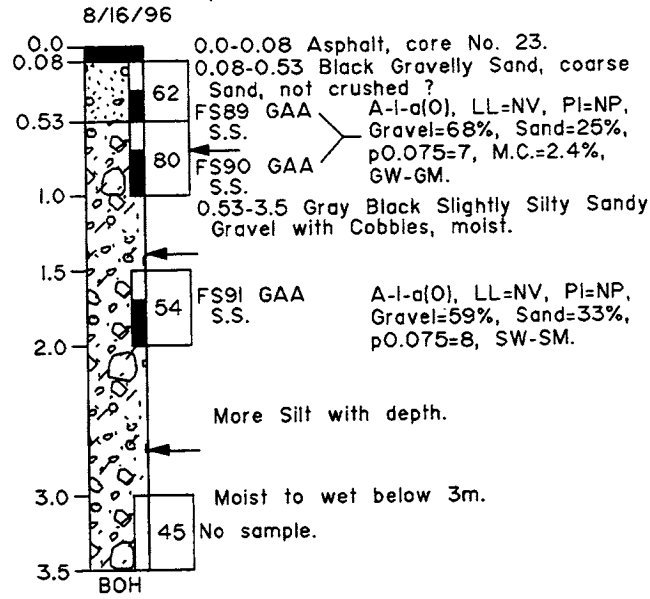
VERTICAL SCALE IN METERS

STATE OF ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES			
KODIAK AIRPORT RESURFACING TEST HOLE LOGS TAXIWAY "E" PROJECT NO. 52228			
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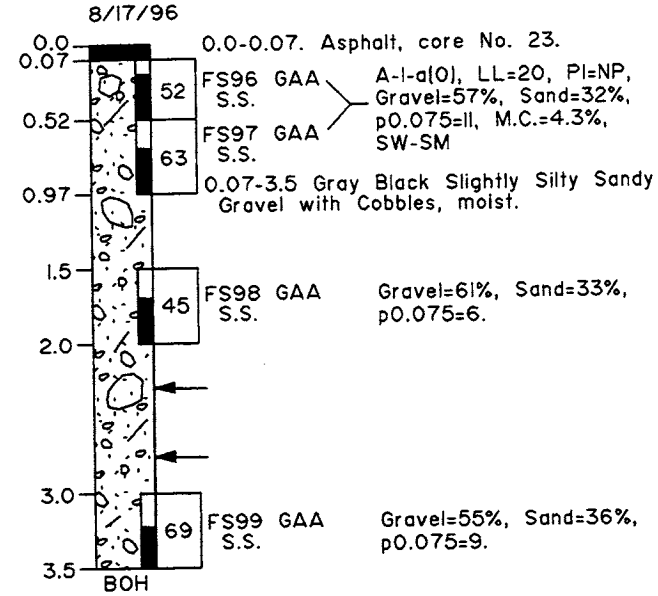
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 Location: Sta. A3+264.543, 74.477 Rt. of
 Apron "A-C" ☺



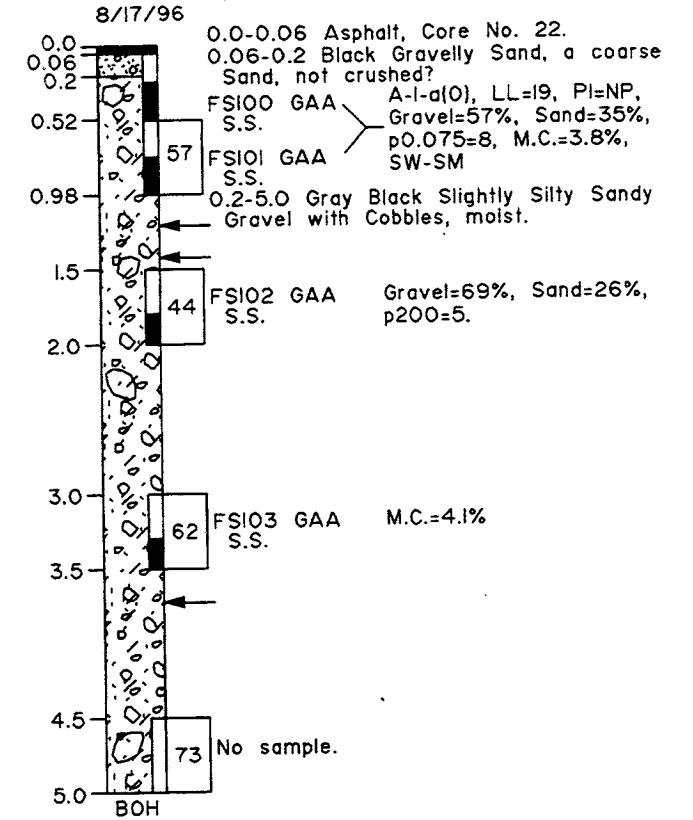
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 Apron "A-C" ☺



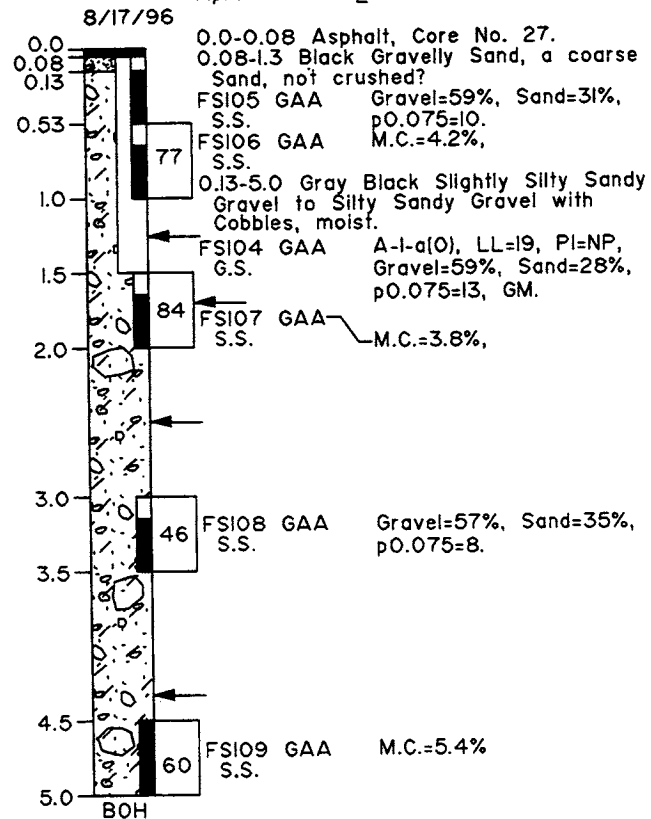
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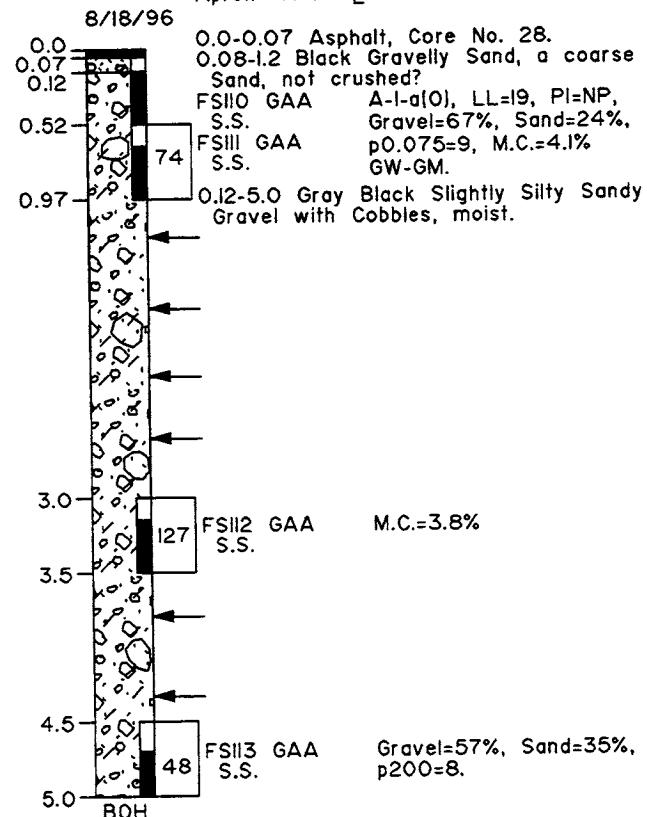
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 Apron "A-C" ☺



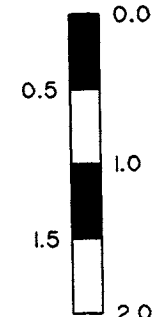
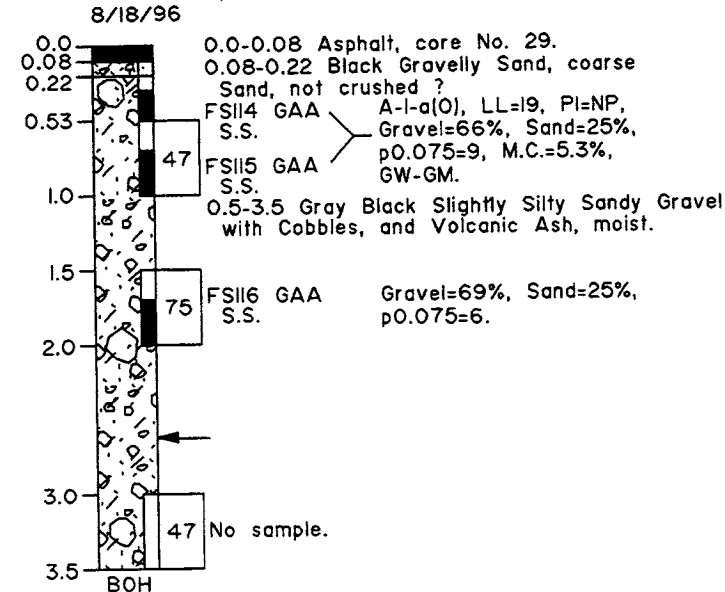
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 Apron "A-C" ☺



T.H. 30 G.A.A. Apron "A"
 Location: Sta. A3+328.633, 67.695 Rt. of
 Apron "A-C" ☺



T.H. 31 G.A.A. Apron "A"
 Location: Sta. A3+359.109, 71.727 Rt. of
 Apron "A-C" ☺



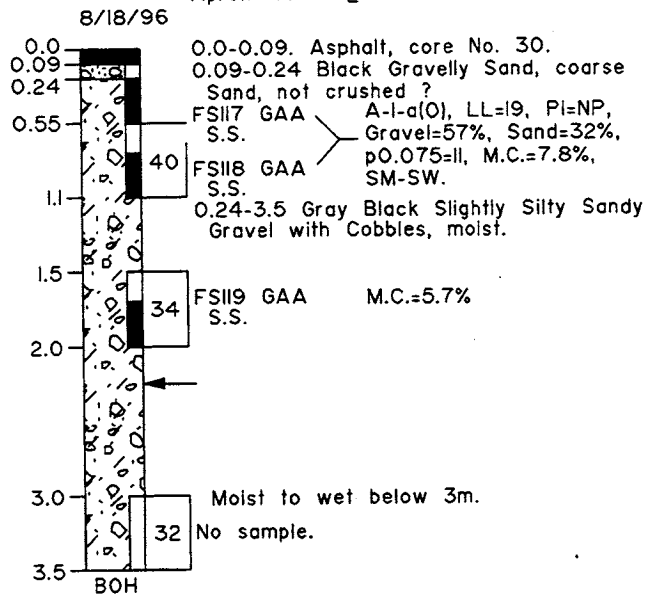
VERTICAL SCALE IN METERS

STATE OF ALASKA
 DEPARTMENT OF TRANSPORTATION
 AND
 PUBLIC FACILITIES

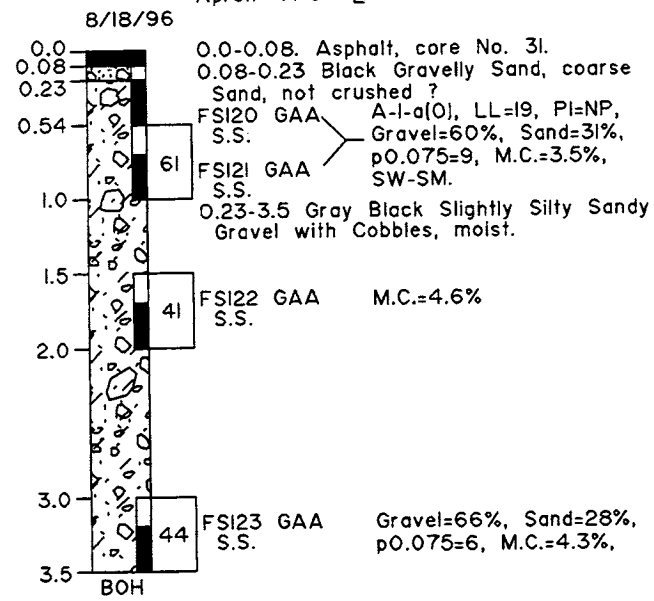
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 TEST HOLE LOGS
 GENERAL AVIATION APRON "A" & "B"
 PROJECT NO. 52228

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CHECKED: T.O.	DATE: 12/98		

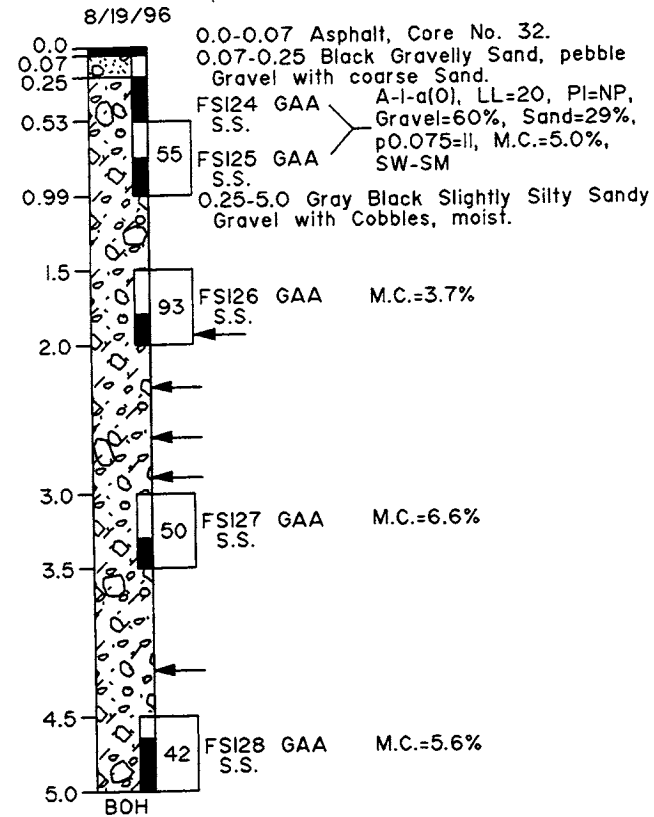
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 Apron "A-C" ☺



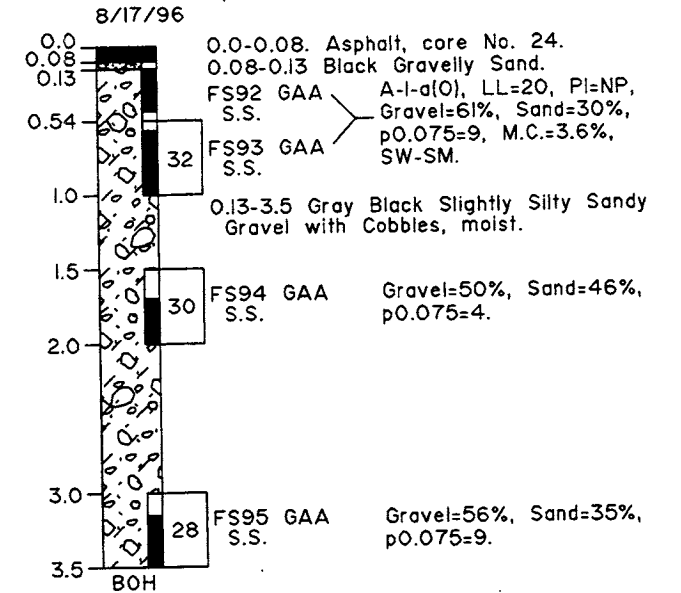
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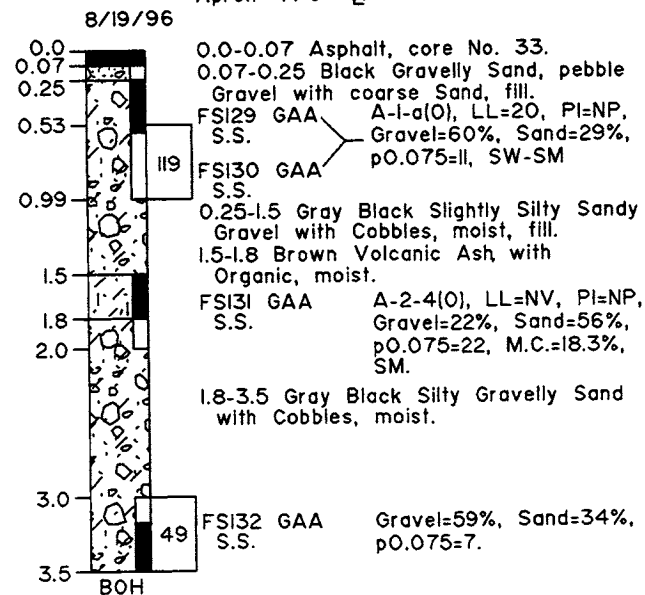
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 Location: Sta. A3+361.158, 15.459 Rt. of
 Apron "A-C" ☺



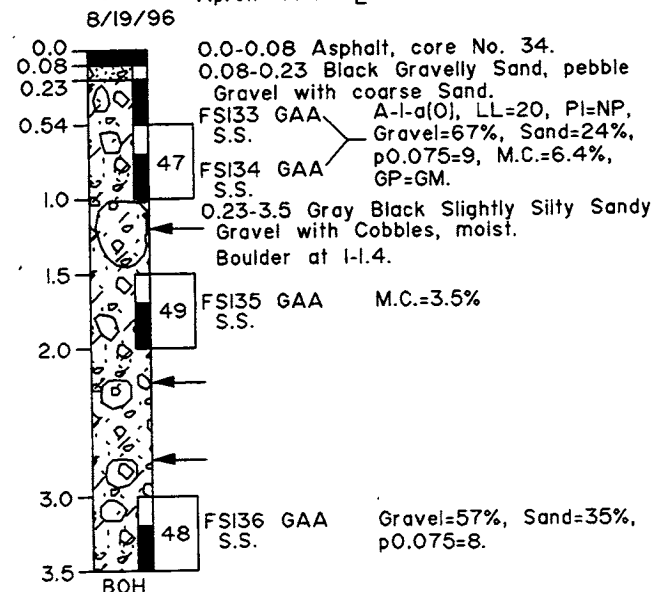
T.H. 35 G.A.A. Apron "A"/"B"
 Location: Sta. A3+398.445, 0.534 Rt. of
 Apron "A-C" ☺



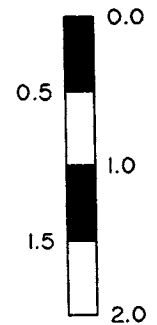
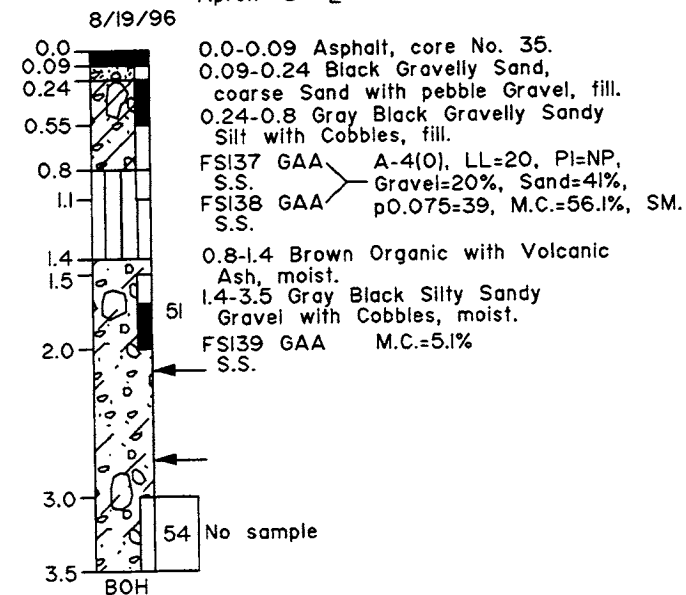
T.H. 36 G.A.A. Apron "A"
 Location: Sta. A3+429.565, 15.590 Rt. of
 Apron "A-C" ☺



T.H. 37 G.A.A. Apron "A"
 Location: Sta. A3+461.791, 28.601 Rt. of
 Apron "A-C" ☺



T.H. 38 G.A.A. Apron "B"
 Location: Sta. B1+057.541, 43.144 Rt. of
 Apron "B" ☺



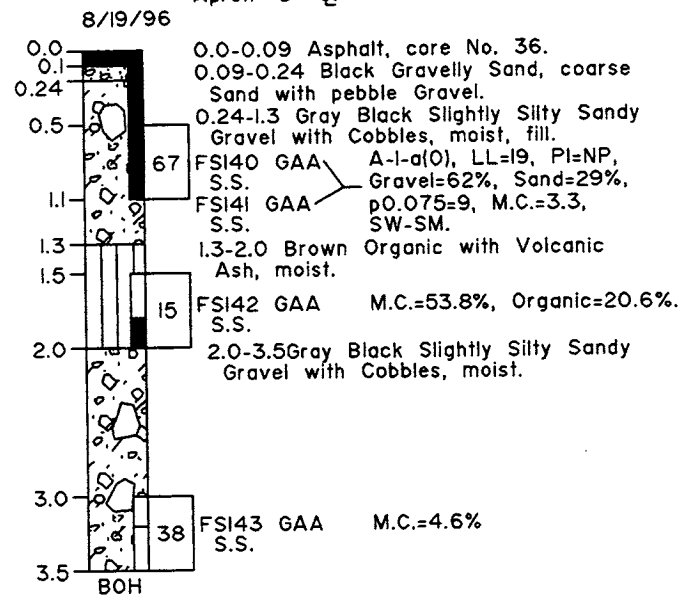
VERTICAL SCALE IN METERS

STATE OF ALASKA
 DEPARTMENT OF TRANSPORTATION
 AND
 PUBLIC FACILITIES

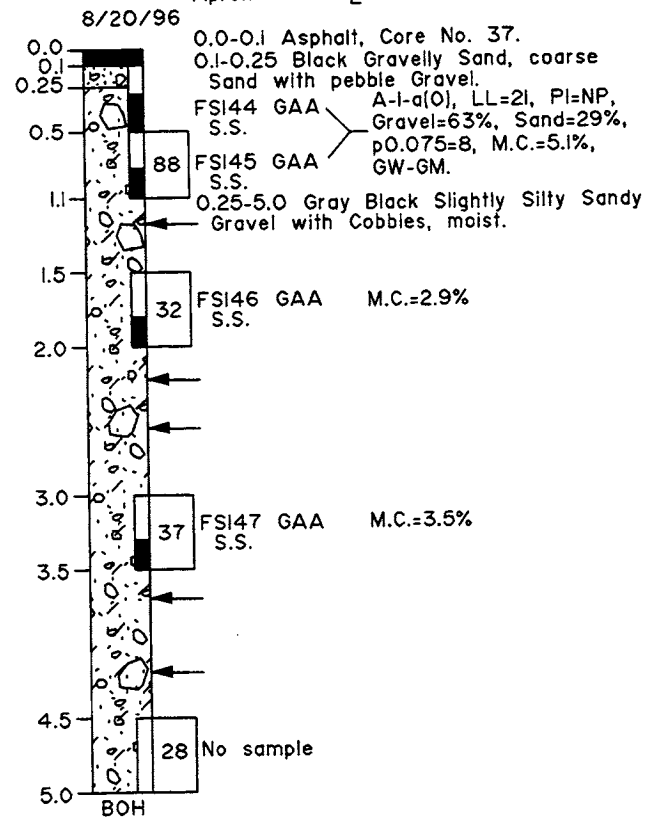
**KODIAK AIRPORT RESURFACING
 TEST HOLE LOGS
 GENERAL AVIATION APRON "A" & "B"
 PROJECT NO. 52228**

SCALE: VERT: As Shown HORZ: None	DESIGNED: T.O. CHECKED: T.O.	DRAWN: NL DATE: 12/98	SHEET 6 OF 7
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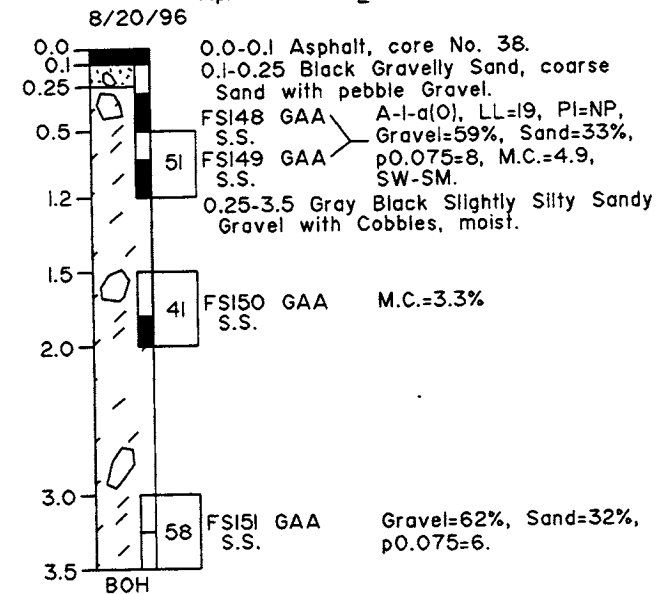
T.H. 39 G.A.A. Apron "B"
 Location: Sta. B1+054.675, 8.402 Lt. of
 Apron "B" ☒



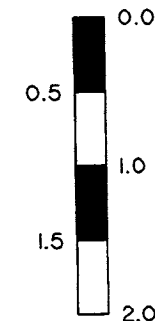
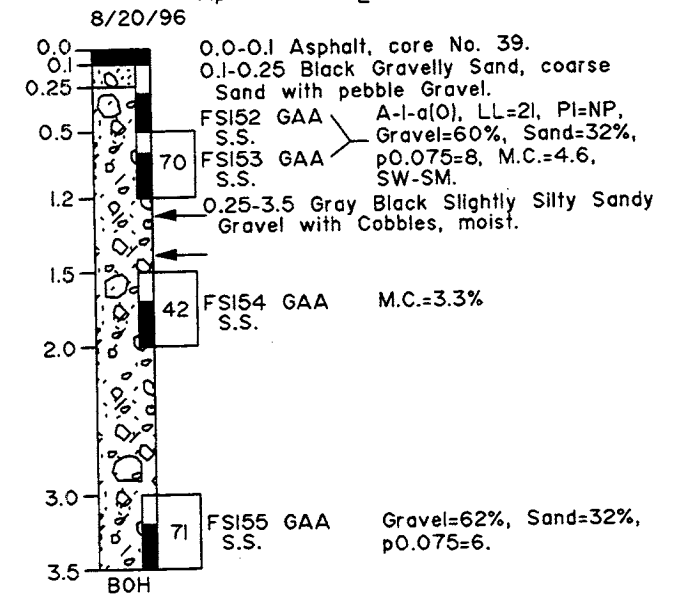
T.H. 40 G.A.A. Apron "C"
 Location: Sta. A3+206.695, 21.345 Rt. of
 Apron "A-C" ☒



T.H. 41 G.A.A. Apron "C"
 Location: Sta. A3+152.239, 4.075 Lt. of
 Apron "A-C" ☒



T.H. 42 G.A.A. Apron "C"
 Location: Sta. A3+150.656, 51.412 Rt. of
 Apron "A-C" ☒



VERTICAL SCALE IN METERS

STATE OF ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES			
KODIAK AIRPORT RESURFACING TEST HOLE LOGS GENERAL AVIATION APRON "B" & "C" PROJECT NO. 52228			
SCALE: VERT: As Shown HORZ: None	DESIGNED: T.O.	DRAWN: N.I.	SHEET 7 OF 7
	CHECKED: T.O.	DATE: 12/98	