

## **MATERIALS REPORT USE STATEMENT**

The information included in the attached Geotechnical Report, Material Site Report, or Material Site Memo is for general information and not for design or construction purposes.

These report(s) indicate surface or subsurface conditions only at specific locations at an individual point in time, and only to depths penetrated or sampled. They do not necessarily reflect variations in soil, rock, or groundwater conditions that may exist between or outside such locations. Actual conditions may differ from what is shown in the records.

The identification of any material sites – and their inclusion in a Geotechnical Report, Material Site Report, or Material Site Memo – does not imply suitability or quantity of material, availability, right of entry, or any permission to use materials from these sites. Rather, we are simply reporting results of exploration in these areas. The identification numbers and portrayed boundaries are preliminary only. If material site boundaries are drawn they are approximate and may not reflect current property boundaries or ownership.

The data presented in the report(s) may contain approximate locations for test sites sampled in the 1960s-90's. The test site locations were not located by GPS and may be off by several hundred feet (or more). Depth of soil samples were approximate and may not be accurate. Unanticipated soil or rock conditions are common at any particular site. Additional and current information should be attained for each individual project.

Contact Central Region Materials (907) 269-6200 if you have questions or comments regarding the attached information.

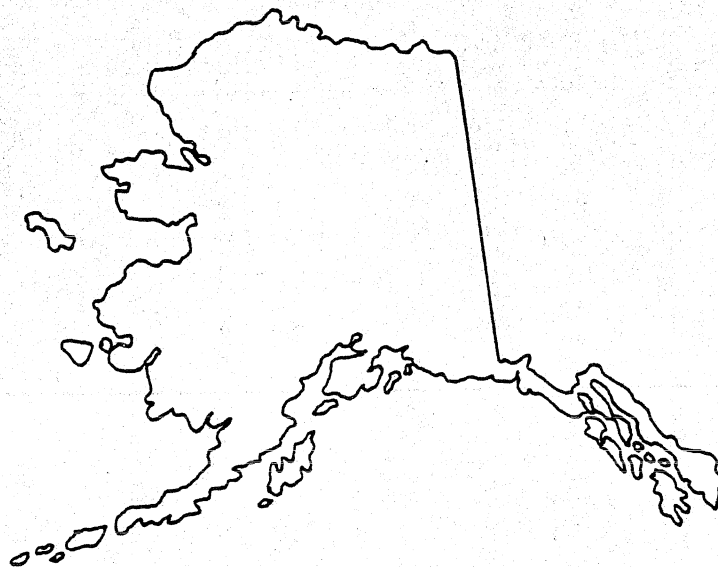
# **ENGINEERING GEOLOGY AND SOILS REPORT**

EKWOK AIRPORT  
MATERIALS INVESTIGATION

May 1983

Central Region

D11512




**PREPARED BY  
ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES  
TECHNICAL SERVICES  
MATERIALS SECTION  
ANCHORAGE, ALASKA**

ENGINEERING GEOLOGY  
AND  
SOILS REPORT  
  
EKWOK AIRPORT  
MATERIALS INVESTIGATION

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Approved by:

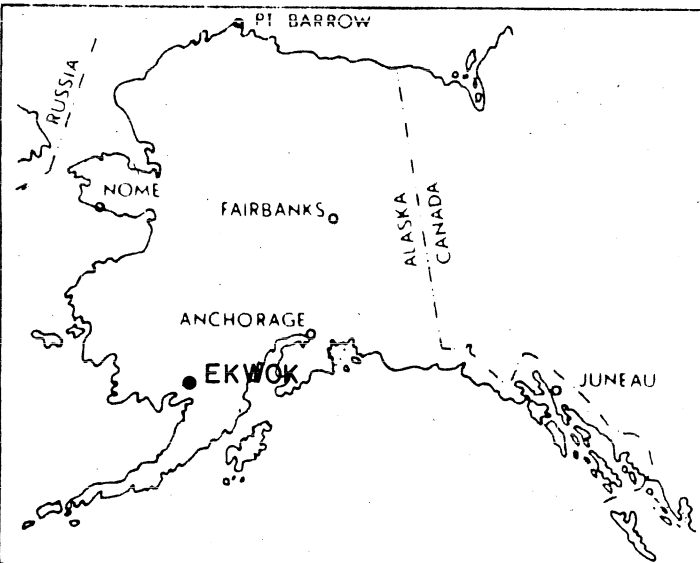
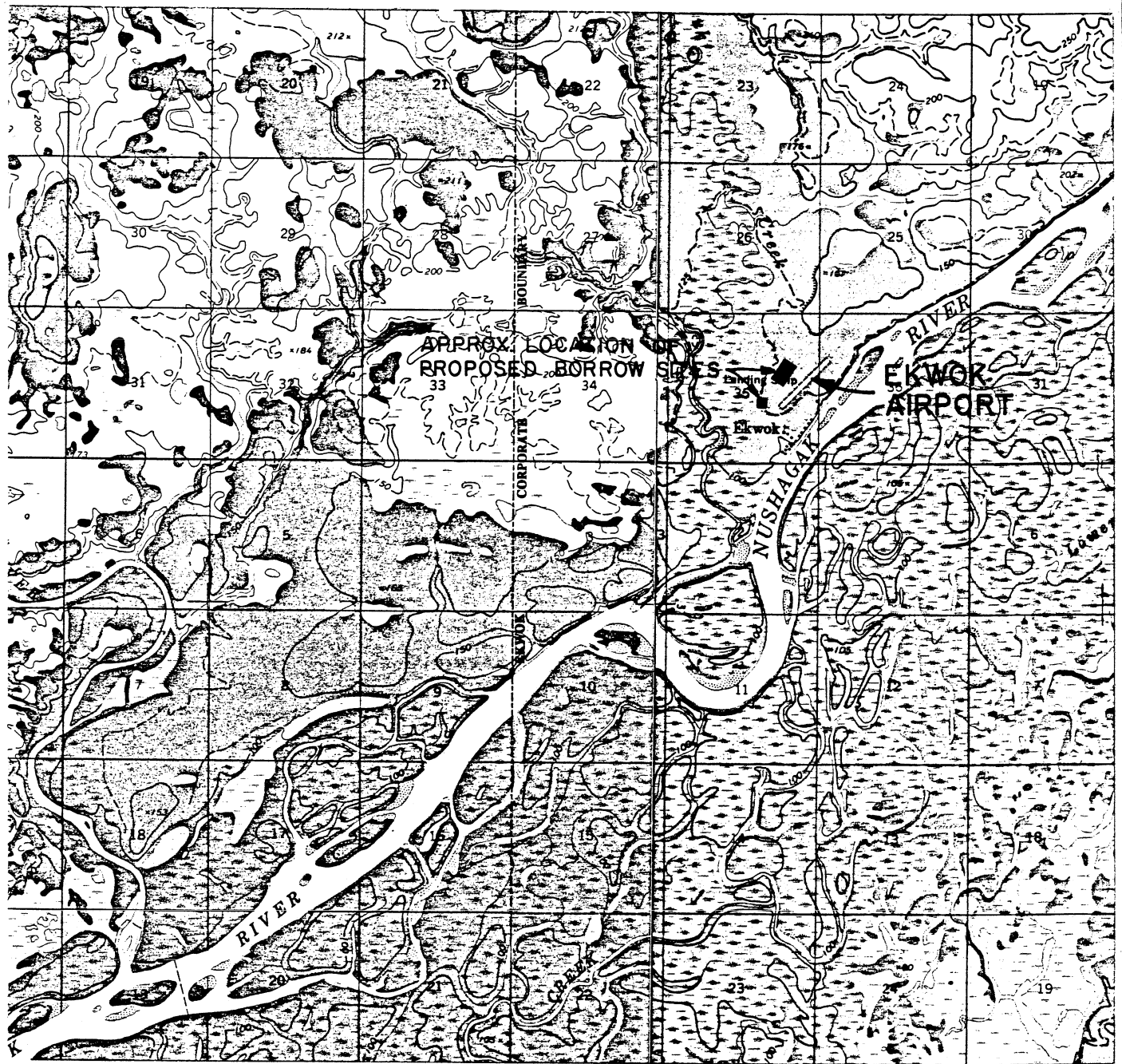
  
\_\_\_\_\_  
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**EKWOK AIRPORT**  
**MATERIALS INVESTIGATION**  
**DEPARTMENT OF TRANSPORTATION**  
**AND**  
**PUBLIC FACILITIES**

**LOCATION MAP**  
**DILLINGHAM**

Scale 1" = 1 MILE

Data B-4 & B-5

## EKWOK AIRPORT

### INTRODUCTION

This report presents the findings and subsequent recommendations obtained from the soils investigation conducted at Ekwok, Alaska between December 1 and 6, 1982. The purpose of the field investigation was to log and sample the soils in the vicinity of the existing runway, parking apron, proposed runway extension, and potential material sites.

### LOCATION

Ekwok is located in southwestern Alaska on the west bank of the Nushagak River, approximately 60 miles upstream from Dillingham.

### FIELD STUDIES

As stated above, the field studies included surface and subsurface investigation of: (1) the existing runway and aircraft parking apron, (2) proposed runway extension section, and (3) potential material sites.

The field crew consisted to Tom Ottley, field geologist, and Tim Langdon and Tim Taylor, drillers.

Sixty-six (66) test holes (TH 1 through TH 66) were advanced using a Mobile Surveyor "600" drill equipped with four inch diameter solid flight auger. Grab samples (either spun to the surface or taken directly from the auger flight) were taken of the various soils encountered.

Twenty-seven (27) samples were taken and placed in either canvas bags or moisture tins. The samples were shipped to Anchorage, where they were submitted to the DOT Central Region Materials Laboratory for testing and analysis.

A test hole location plan, test hole logs and a soils (gradation/classification) analysis sheet accompany this report.

### GENERAL GEOLOGY AND TOPOGRAPHY

Ekwok lies within the Nushagak Lowlands province which is made up largely of glaciofluvial or outwash deposits. These deposits originated as debris eroded by glacial action, but they were reworked and partially sorted by the streams that issued from the ends of the glaciers, and were distributed eastward and southeastward into the Nushagak Valley, largely as a great outwash plain. Sections of these deposits are not in general visible, as the Nushagak Lowland is a gently undulating plain covered by moss or other vegetation. Where such deposits have been dissected by the streams, they are seen to consist of rounded but poorly sorted gravel, sand and silt.

## CLIMATOLOGY

Ekwok is in the Transitional Climatic Zone, and is affected by both marine and continental influences. Summers are cool and humid and winters are moderately cold. Relatively few days have temperatures above 70°F in summer; minimum temperatures are below 0°F about one (1) day in three (3) in midwinter. Maximum precipitation occurs in late summer and autumn, and the driest period is in early spring. There are many windy days; the prevailing winds are from the north and east in winter, and from the southwest in summer.

Average monthly temperatures and precipitation are given in Table 1.

Table 1. Mean monthly temperatures and precipitation, Dillingham, Alaska (27 year record). Dillingham is located approximately 60 miles downstream from Ekwok and was chosen because it is the closest site where a permanent climatological record has been kept.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
Temperatures, °F													
Mean Max	23	27	30	39	52	62	65	63	56	43	31	22	43
Mean Min	9	12	11	23	32	42	46	45	38	28	17	8	26
Mean	16	18	20	31	42	52	55	54	47	35	24	15	34
Precipitation, inches of moisture													
	1.87	1.34	1.60	1.21	1.70	1.69	2.82	3.83	3.71	2.78	1.79	1.49	25.80

## SELECTED REFERENCES

1. Mertie, J.B., Jr.; 1938; the Nushagak District Alaska; U.S. Geological Survey Bulletin No. 903.
2. Hartman, C.W. and Johnson, P.R.; 1978; Environmental Atlas of Alaska, University of Alaska.

## FIELD INVESTIGATION

Test holes drilled on the existing runway and apron and those drilled in the vicinity of the proposed runway and apron extension areas were located in relation to the surveyed centerline. The test hole locations in the vicinity of the two proposed borrow areas were determined by compass traverse methods in relation to the existing pit boundaries (as shown in the Test Hole Location Plan sheet) and are therefore approximate.

I. Existing Runway - Thirteen test holes (T.H.'s 1-13) were drilled through the existing runway embankment into the foundation soils, to a

#### FIELD INVESTIGATION con't.

maximum depth of 18.5'. At the time of the investigation the runway lacked any crown and appeared concave.

Where tested, the embankment material consisted of pit-run brown slightly silty sandy gravel, sandy gravel and gravel, with occasional cobbles and ranged from 1" to 1' thick (average 6.3" thick). Between approximate Station 28+50 and 30+50 the left half (north half) of the existing runway had little or no gravel surfacing and was badly rutted. This area is "soft" during certain parts of the year.

Where tested, the foundation soils consisted of a brown sandy silt and/or silty sand which overlaid sandy gravel to the maximum drilled depth.

Seasonally frozen ground was encountered in each of the 13 runway test holes from the surface down to a maximum depth of 3.5'. These soils appeared wet upon thawing and support the observation that areas of the runway become soft during breakup. Below the seasonally frozen zone the foundation soils were generally dry to damp. A water table was not encountered in any of the test holes located on the runway.

II. Potential Runway Extension Section - Fourteen test holes (T.H.'s 14-27) were drilled off the northeast end of the existing runway and three test holes (T.H.'s 28-30) were drilled off the southwest end of the existing runway.

Northeast Extension - In T.H.'s 14-27, 0"-12" of organic and/or organic silt typically overlaid a brown sandy silt and silty sand. The sandy silt and silty sand overlaid sand, sandy gravel and gravelly sand at depths ranging between 8' - 13'. Visually, the sandy silt and silty sand soils generally appeared dry to damp while the underlying sand and gravels were generally dry. During breakup and early summer the silt soils may be considerably wetter.

A water table was not encountered in any of the fourteen test holes at the time of the investigation. Seasonally frozen ground was encountered in each of these test holes to an average depth of 1.0' (ranged 3" - 24" in depth).

From the east end of the existing runway for a distance of approximately 1,400' the proposed extension lies within the existing clear zone. The vegetation within the clear zone consists of second growth, scattered, small spruce, aspen and brush 3' - 6' in height.



The following paragraph is an excerpt from the ninth weekly report on the Ekwok Airport Project dated 09/26/65.

"Gravel has now been placed on the north end of the runway, Sta. 24 to 32 and is well compacted and useable. Gravel is being stockpiled down the middle of the remaining area to be surfaced, that is Sta. 14 to 24---Sta. 10 to 14 having been done previously, half width. Stockpiling of gravel down the middle is being done to keep the equipment from tearing up the subgrade which has absorbed a great deal of moisture due to the rainy weather. The center area is firm enough for travel and turning off the runway can be done in selected areas. As the surface dries, the gravel will be pushed into place from the center."

Southwest Extension - In T.H.'s 28-30, 1.0' of brown organic (moss) typically overlaid a wet silt. The silt ranged in depth between 5.5' and 9.0'. The silt was underlain by silty sandy gravel and silty gravelly sand to the maximum drilled depth of 14.0'.

A possible water table was encountered in T.H. 28 at a depth of 13.0'. Seasonally frozen ground was encountered in each of the 3 test holes and ranged in depth from 6" to 1.3'.

III. Existing Parking Apron - Two test holes, T.H.'s 38 and 39, were drilled through the existing aircraft parking apron (see attached Test Hole Location Plan).

Where tested, the existing embankment consisted of 10" of sandy gravel fill. The sandy gravel overlaid foundation soils typically consisting of sandy silt and silty sand (a brown organic silt, 2" thick, directly underlaid the embankment material in T.H. 38). The foundation soils were generally dry to the maximum drilled depth of 9.0'.

Seasonally frozen ground was encountered in both T.H.'s 38 and 39 (depth ranged between 2' and 2.2').

IV. Potential Apron Expansion - Test Holes 31-37 and 40-42 were drilled at various locations around the existing apron (see Test Hole Location Plan).

Typically, 10" - 24" of brown organic and organic silty soils overlaid dry to damp silts, sandy silts and silty sands. In T.H.'s 34 and 42 the silty soils overlaid a silty sandy gravel at depths of 10' and 9.5', respectively.

During construction of the existing apron, stripping was pushed into a low berm located immediately southeast of the apron. The berm is approximately 2' high and 20' wide and runs from approximately Sta. 10+00 to 12+50. T.H. 37 was located on top of this berm. A shallow depression

approximately 2.0' deep x 20' wide and 100' long is located northeast of the apron in the vicinity of T.H. 40.

Seasonally frozen ground ranged in depth between 6" and 2.2', in the 10 described test holes.

Scattered small to medium spruce trees and occasional low brush covers most of the area investigated.

#### PROPOSED BORROW SITES

Two proposed borrow sites (see attached Location Map and Test Hole Location Plan sheet) were investigated for the necessary construction materials. Both of these sites were previously used during construction of the existing runway, taxiway and apron embankments.

1. Proposed Borrow Site #1 - This area was investigated with T.H.'s 43-49 and is located approximately 700 feet northwest of the existing parking apron. Vegetation consists of scattered small to medium spruce and some low brush. The site is basically level with the exception of the northwest corner of the site and a low depression running through the center of the area, as depicted on the Test Hole Location Plan. Proposed Borrow Site #1 lies entirely on lands controlled by the Village and Regional Native Corporations.

T.H. 43, drilled above the southern edge of the existing pit, encountered 1.0' of brown organics which overlaid 5.5' of brown, wet silt. The silt was dilatant at its natural moisture content and was underlain by gravel and/or sandy gravel to the maximum tested depth of 14.0'. Due to contamination of the gravel by the overburden soils as it was augered to the surface, it was not possible to estimate the amount of silt naturally present in the gravel. Seasonally frozen ground was encountered to a depth of 1.0'. A water table was encountered at approximately 13' in depth.

T.H.'s 44-47 were drilled northwest of the existing pit. The soils encountered generally consisted of 6" - 1.2', of brown organics which overlaid 1' - 1.5' (T.H. 47 had 6.0') of brown silt. The silts overlaid gravel and sandy gravel to the maximum drilled depth of 15.0'. The maximum size of the gravel and sandy gravel generally appeared to be 1" - 1.5" in diameter increasing to 2" with depth. A water table was encountered in T.H.'s 45 and 47 at depths of 13.0' and 12.0' respectively. Seasonally frozen ground was encountered to shallow depths (8" maximum).

T.H. 48 was drilled above the northern edge of the existing pit. Six inches of brown organics overlaid 1.5' of brown silt. The silt overlaid a brown sandy gravel and a red brown gravel to the maximum drilled depth of 14.0'. Seasonally frozen ground was encountered to a depth of 1.0'.

T.H.'s 49 and 49A were drilled in the floor of the existing pit which is approximately 8' - 10' below original ground. Auger refusal was encountered in the gravel of the pit floor at depths of 3.5' and 1.5' respectively. Construction records from 1965 indicate that some cobbles to 6" in diameter were encountered in this site. Water was standing in the deepest portions of the pit floor (this may indicate the actual depth of the water table). Waste berms are located around the perimeter of the existing pit as shown on the Test Hole Location Plan.

2. Proposed Borrow Site #2 - This site is located approximately 900 feet northwest of midfield and lies entirely on lands controlled by the Village and Regional Native Corporations. This site is vegetated with scattered small to medium spruce and occasional low brush, except for a dense stand of spruce that runs through the center of the site, as shown on the Test Hole Location Plan.

T.H.'s 53, 54 and 62 were drilled into the floor of the existing pit. Portions of the pit have been worked to approximately 10' below original ground. The material encountered generally consisted of a washed gravel (due to augering material up through the water table). Samples 22 and 27 are not indicative of the gradation of the material encountered, due to the fact that the sand and other fines fraction was washed from the sample as it was augered through water to the surface. The material, augered to the surface with 4" auger, was 1" to 2" minus in size. The water table was encountered in each of the 3 test holes, ranging from the surface, down to a depth of 4.0' below the pit floor.

T.H.'s 55-57 were drilled above the northern edge of the existing pit. The depth of the overburden soils (consisting of brown organics and a wet brown silt that was dilatant at natural moisture content) varied considerably (from 1.5' to 7.5' deep). The organics and silt overlaid gravel to the maximum drilled depth of 14.0'. Again, the presence of wet silt overburden prevented an accurate determination of the silt content in the gravel in T.H.'s 55 and 56. A water table was encountered in T.H.'s 55 and 57 at approximate depths of 10' and 14', respectively.

T.H.'s 58 - 61 were drilled to the west of the existing pit. The soils encountered generally consisted of 6" - 1.0' of brown organics which overlaid 2' - 4' of wet silt that was typically dilatant at its natural moisture content. The silt was underlain by gravel to the maximum drilled depth of 14.0'. The gravel-sized material ranged between 1/2" minus and 2" minus. Due to the thickness of overburden and the resultant contamination, it was not possible to accurately estimate the silt content in the gravel in T.H. 61. A water table was encountered in T.H.'s 58 and 59 at depths ranging between 10' and 14'.

Waste berms are located around the perimeter of the existing pit as shown on the Test Hole Location Plan.

## SUMMARY AND RECOMMENDATIONS

Existing Runway - Typically 6" of sandy gravel overlies sandy silt foundation soils. The embankment will not support repeated heavy loading by construction equipment in the spring during breakup. The same would be true during other times of the year if sustained periods of rainfall should occur.

Undercut the left one-half of the runway between Sta. 28+50 and 30+50 and bring back to grade with a minimum 12" of gravel. Use transitions at each end of the cut.

Bring the remainder of the runway back to grade with sandy gravel, then resurface with a minimum of 6" crushed aggregate surfacing.

Any widening of the runway will require minor cuts in the sandy silt foundation soils. These cuts will probably entail moving some berm materials wasted along the sides of the runway during original construction. Waste all cut material, unless some fines are needed for blend purposes during production of the crushed aggregate surfacing. Use the non-organic fines from the deeper portions of the cuts, should additional fines be required.

Runway Extension - Strip and waste the surficial organic and organic silt soils (est. 1' max.). Bring embankment to grade using pit run borrow material. Surface with 6" of crushed aggregate.

It is important that drainage be maintained once the foundation soils are stripped. Improper drainage and ponding of water will lead to construction difficulties.

Parking Apron Expansion - Strip and waste the organic and organic silt soils that lie within the expansion area. Maintain drainage and grading. A berm of waste material lies along the back side (southeast) of the existing apron.

Borrow Areas - Borrow Area 1 and Borrow Area 2 both contain material suitable for use on the proposed project. Based on projected quantity requirements, it will probably be necessary to work both sites.

Topographically the two areas are similar but test holes indicate that Borrow Area 1 may contain less overburden than Area 2.


The gravel size appears to increase with depth up to a 2" minus with occasional cobbles.


It will probably be necessary to screen additional oversize material to meet fracture requirements when producing the crushed aggregate surfacing.

A water table was not encountered in all of the test holes drilled during the borrow exploration. In those holes where it was encountered it was typically 12' - 13' below O.G. at the time of investigation. The drainage ditch leading into Borrow Area 2 from the runway could lead to flooding of the site during periods of high rainfall, and/or spring breakup.

Deeper overburden may be associated with depressions identified in Borrow Area 1, and that area vegetated with the dense spruce cover in Borrow Area 2 (as depicted on the Test Hole Location Plan).

It is highly recommended that the contractor develop only a preliminary mining plan on the basis of this data, and that prior to finalization of a mining plan the contractor perform such investigations as necessary to determine the soil types, gradation, and quantities present at the location he selects to mine.

  
Tom Ottley  
Engineering Geologist II

  
Dan Pavey  
Aviation Geologist

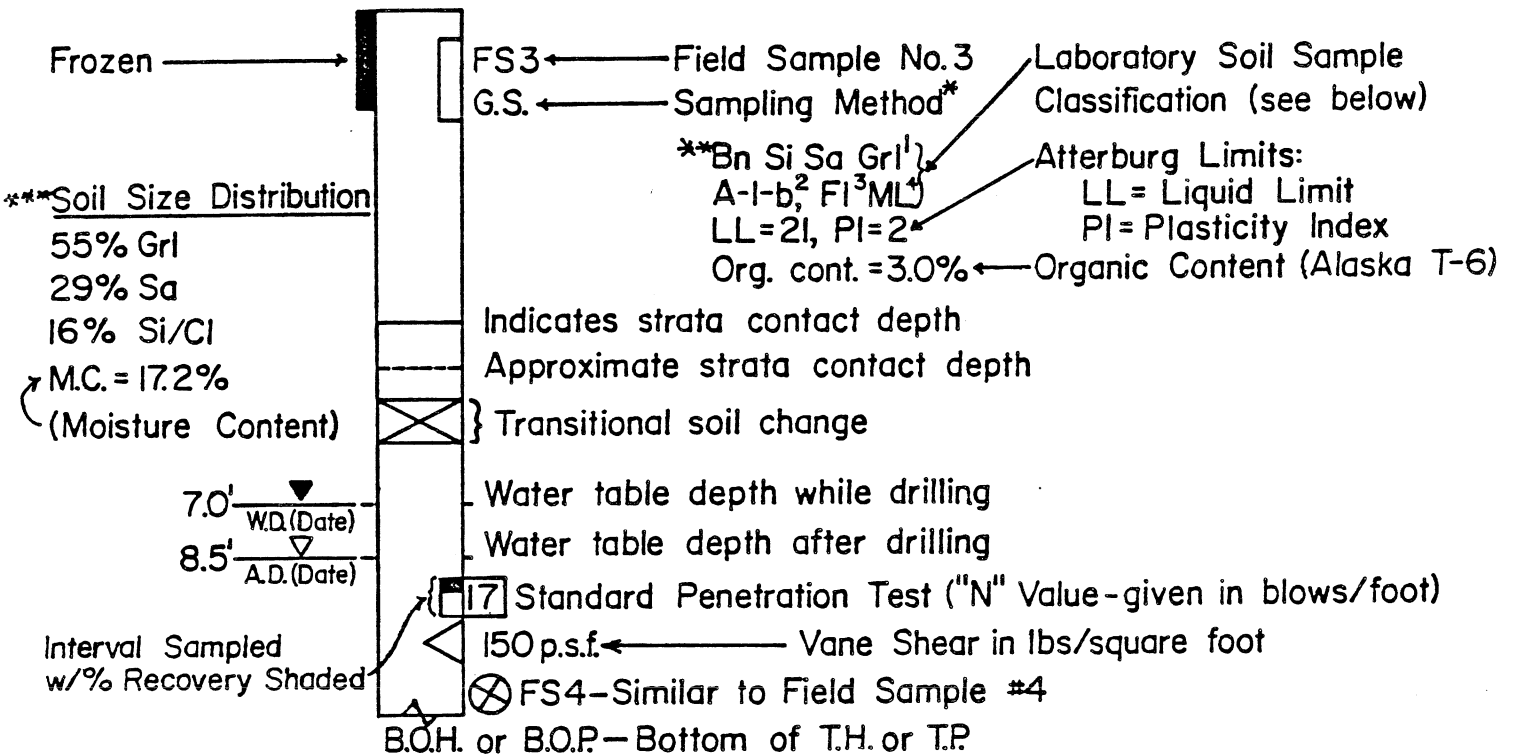
1/15/81

# TEST PIT AND TEST HOLE LOG EXPLANATION

T.H. or T.P. ← Test Hole or Test Pit Number

Sta. 15+00, & ← Location

9/11/80 ← Date drilled or excavated



## Soil Classification Description

1=Alaska DOT&PF Soil Classification

2=AASHTO Classification

3=Frost Classification

4=Unified Classification

## \*Sampling Method

G.S.=Grab sample from auger return

S.S.= Split spoon sample (2" OD)

S.T.= Shelby tube (Standard Method)

M.S.= Modified shelly tube sample

## \*\*Sample Color

Bk= Black

Bn= Brown

Bl= Blue

Gn= Green

Gr= Gray

Or= Orange

Rd= Red

Tn= Tan

## \*\*\*Soil Size Distribution

Based on U.S. Standard Sieve Sizes:

Boulders =>10"

Cobbles =3"-10"

Gravel =#10-3"

Sand =#200-#10

Silt/Clay =<#200

## Abbreviations

w/= with

so.= some

tr.= trace

sl.= slightly

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

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



Organics (Org.)



Gravel (Grl)



Sand (Sa)



Silt (Si)



Clay (Cl)



Ice (Ice)



Bedrock (Bx)

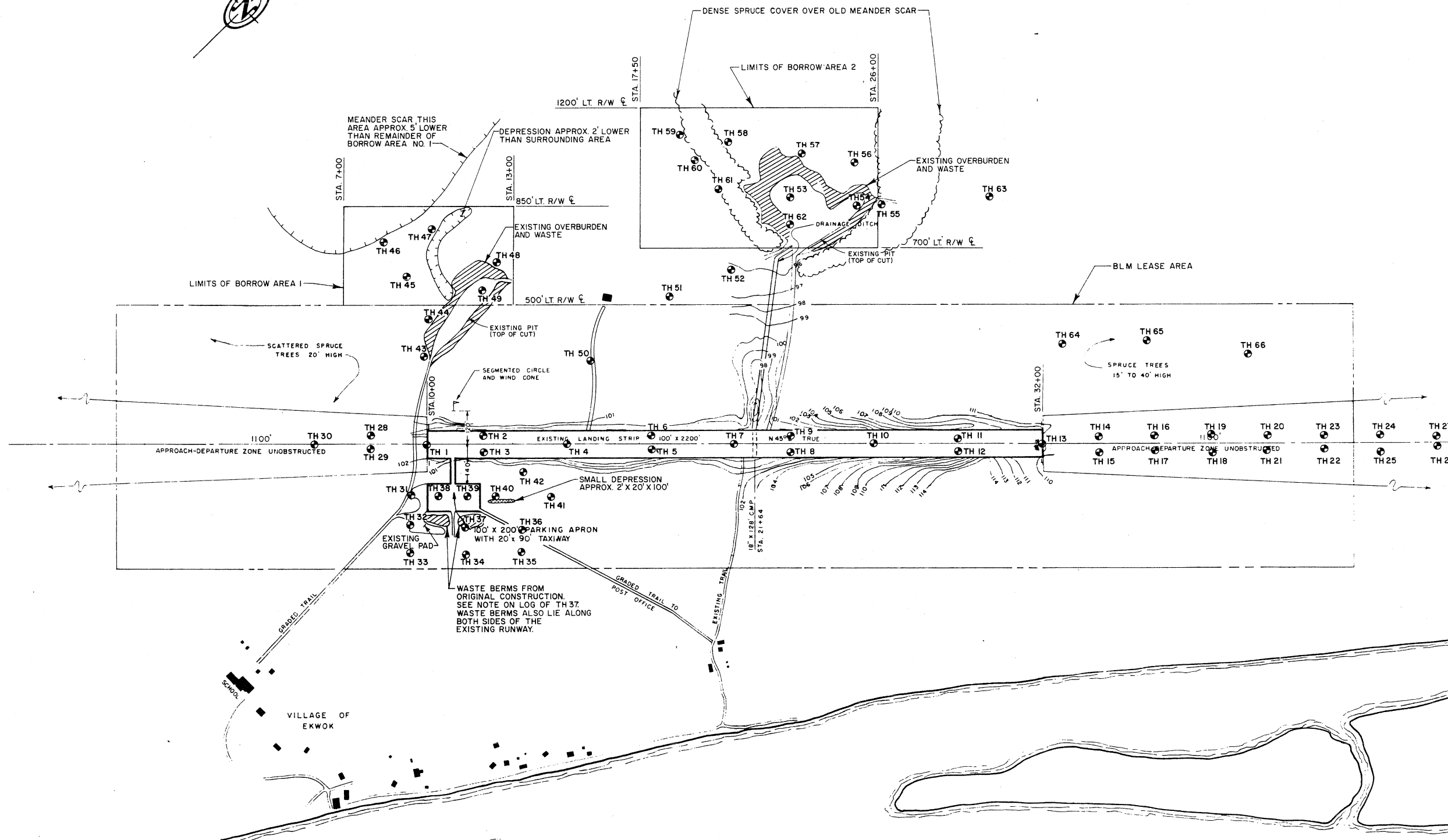
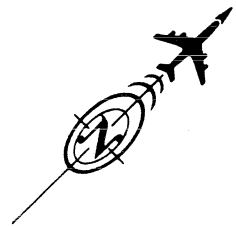


Cobbles and/or Boulders

STATE OF ALASKA

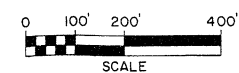
DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES

ENGINEERING GEOLOGY SECTION



LEGEND  
● TEST HOLES

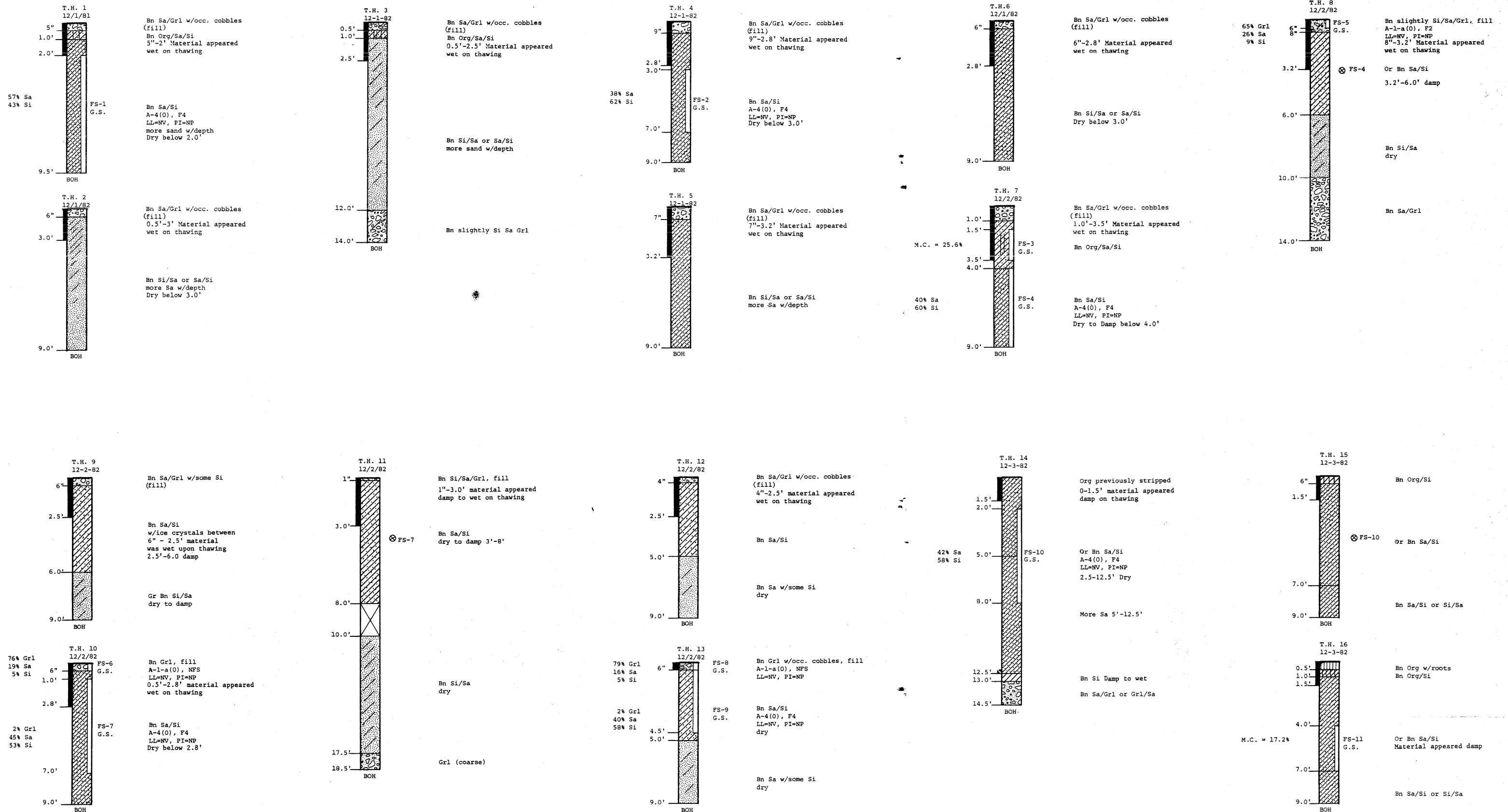
NOTE: TEST HOLE LOCATIONS  
ARE APPROXIMATE.



STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION  
AND PUBLIC FACILITIES

EKWOK AIRPORT  
TEST HOLE LOCATION PLAN

DESIGNED: [Signature] CHECKED: [Signature] DATE: 3/83 SHEET: 04

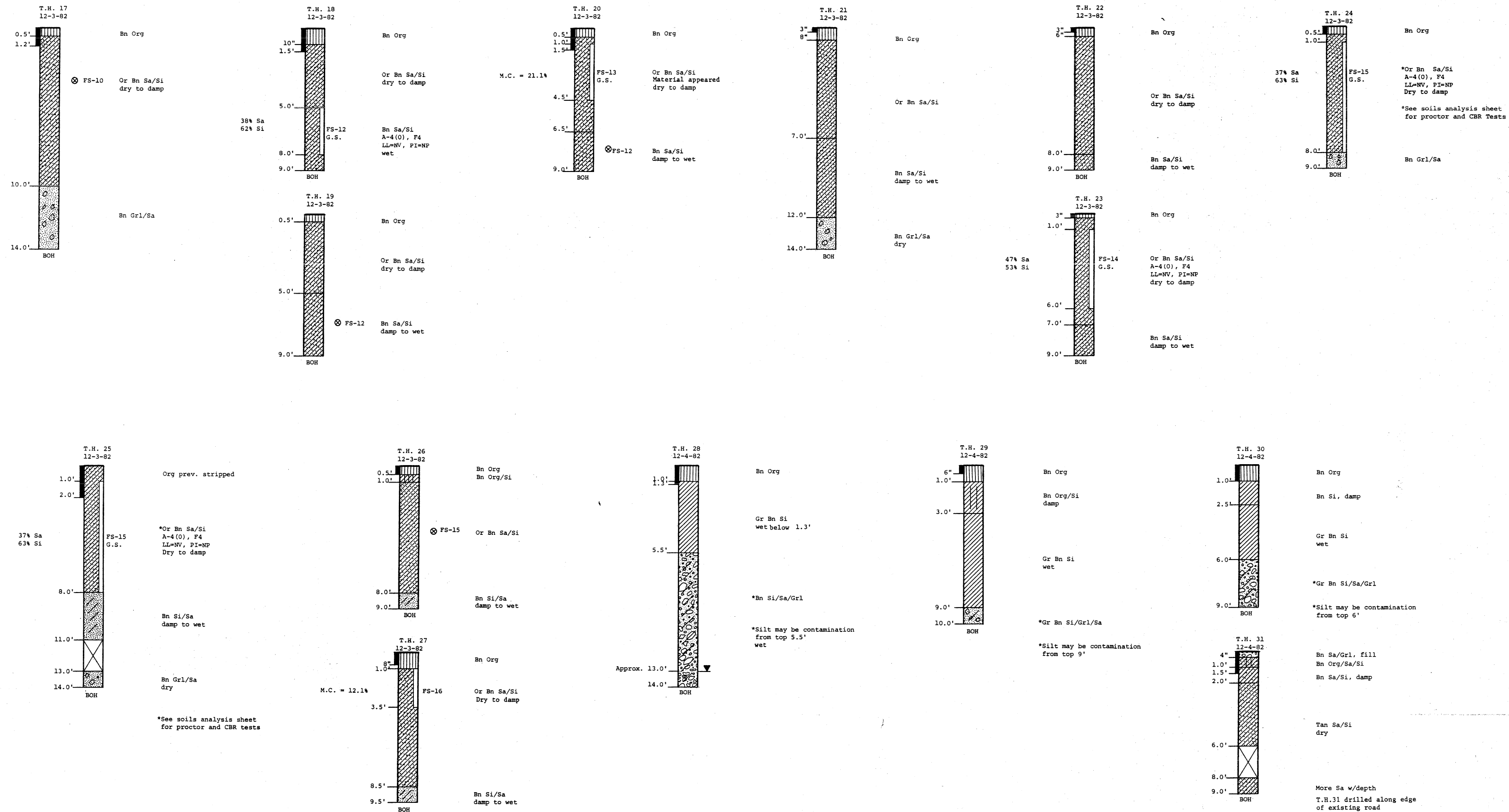


STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION  
AND PUBLIC FACILITIES

EKWOK AIRPORT  
TEST HOLE LOGS

DESIGNED T.O. CHECKED D.P. DATE 3/83 SHEET 1 OF 5

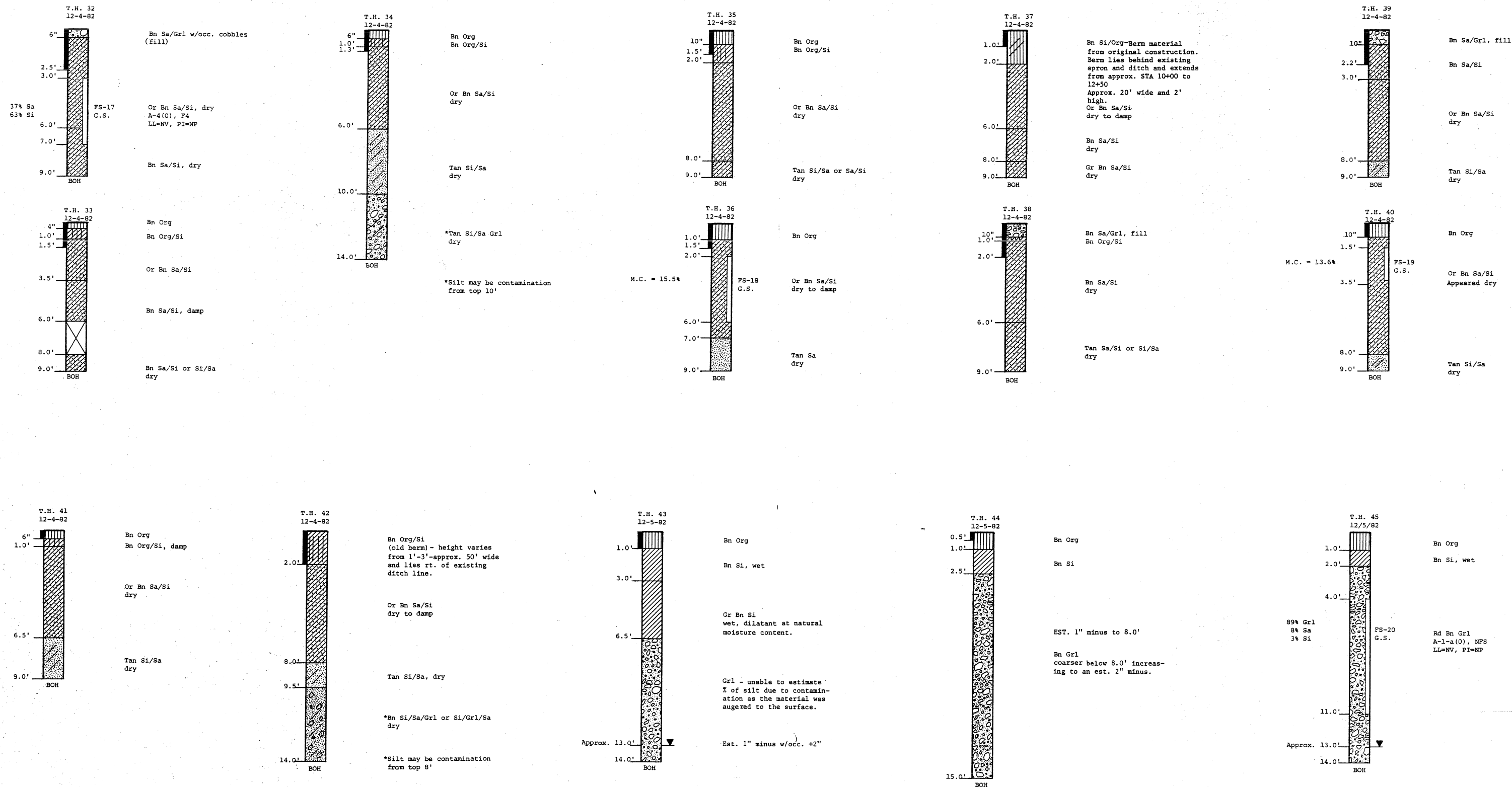




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EKWOK AIRPORT  
TEST HOLE LOGS

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STATE OF ALASKA  
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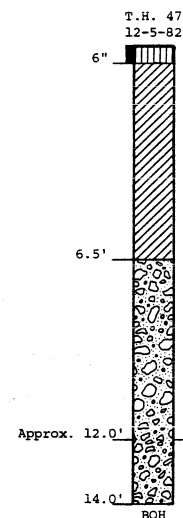
EKWOK AIRPORT  
 TEST HOLE LOGS

DESIGNED T.O. CHECKED D.P. DATE 3/83 SHEET 3 OF 5



Bn Org  
Bn Si

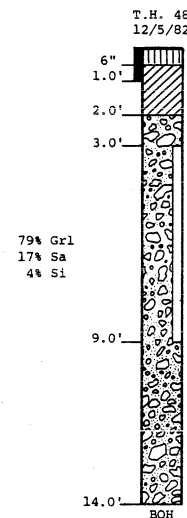
Bn Sa/Grl, est. 1 1/4" minus,  
Coarser w/depth



Bn Org

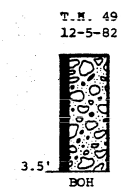
Bn Si  
wet & dilatant at natural  
moisture content.

Sa/Grl, w/silt  
contamination from  
top 6.5' as material was  
augered to surface. Unable  
to estimate amt. of  
naturally occurring fines.



Bn Org  
Bn Si

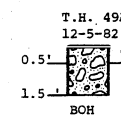
Bn Gr1  
A-1-a(0), NFS  
LL=NV, PI=NP



Located in bottom of  
existing pit approx. 8'-10'  
below O.G.

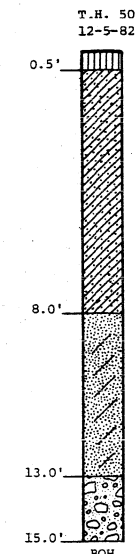
Bn Sa/Grl

Refusal at 3.5'



Located 30' from TH49  
toward center of pit approx  
12.0' below O.G.

Gr1  
Refusal at 1.5'

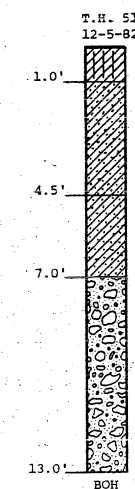


Bn Org

Or Bn Sa/Si  
dry to damp

Tan Si/Sa  
damp

Bn Sa/Grl - unable to  
est. % of fines due  
to amount of overburden.

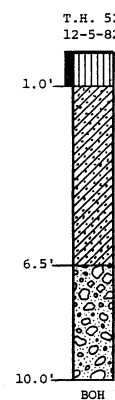


Bn Org/Si

Or Bn Sa/Si  
wet

Tan Sa/Si  
wet

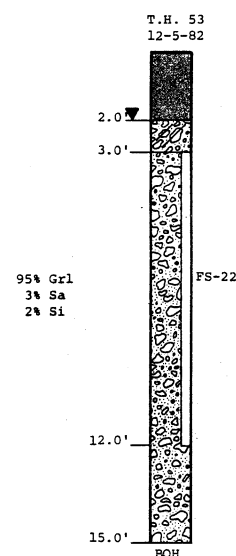
Gr1



Bn Org

Bn Sa/Si  
wet

Gr1 - unable to est.  
% of fines due to amount  
of overburden.  
Refusal at 10.0'.

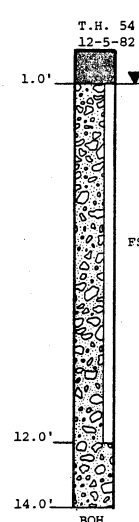


Located in N.W. corner of  
existing pit approx. 10.0'  
below O.G.  
Ice

Si/Gr1

\*Gr1  
A-1-a(0), NFS  
LL=NV, PI=NP

\*FS-22 was taken below  
the water table. The  
Silt and Sand portions  
of the material may not  
have advanced up the  
auger.



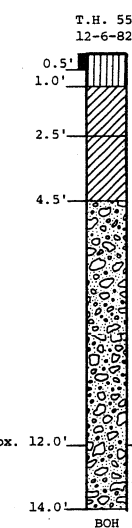
Ice

95% Gr1  
3% Sa  
2% Si

FS-22

\*Gr1 w/occ. cobbles.  
A-1-a(0), NFS  
LL=NV, PI=NP

\* See comment on T.H. 53



Bn Org

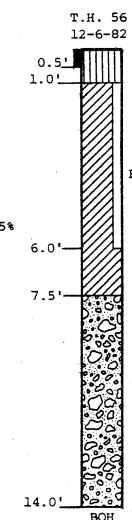
Bn Si  
damp to wet

Gr Bn Si  
wet and dilatant at natural  
moisture content.

EST 1" minus 4.5' to 10.0'

Gr1  
coarse w/depth  
EST 2" minus 10'-14.0'  
Unable to estimate %  
of fines due to contam-  
ination by overburden.

19% Sa  
81% Si  
N.C. = 37.5%



Bn Org

Gr Bn Si  
A-4(0), P4  
LL=NV, PI=NP  
wet and dilatant at natural  
moisture content.

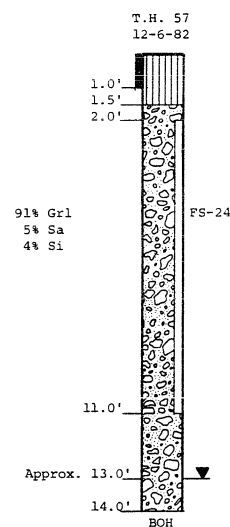
\*Gr1

\*w/silt contamination  
from top 7.5'

STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION  
AND PUBLIC FACILITIES

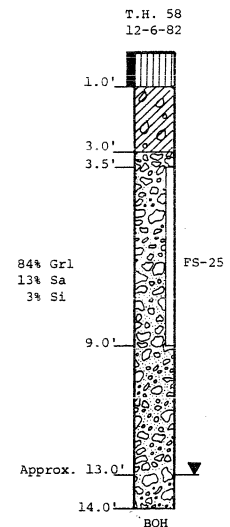
EKWOK AIRPORT  
TEST HOLE LOGS

DESIGNED T.O. CHECKED D.P. DATE 3/83 SHEET 4 OF 5



Bn Org w/silt

Rd Bn Grl w/occ. cobbles  
A-1-a(0), NFS  
LL=NV, PI=NP

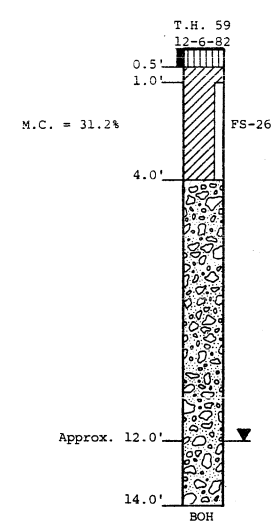


Bn Org

Bn Grl/Si or Si/Grl wet

Bn Grl  
A-1-a(0), NFS  
LL=NV, PI=NP

coarser w/depth  
(EST 1" minus)  
occ. cobbles after 10'



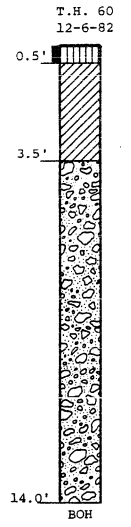
Bn Org

Gr Bn Si wet & dilatant at natural moisture content.

EST 1" minus 4.0-8.0'

Grl

EST 2" minus below 8.0'

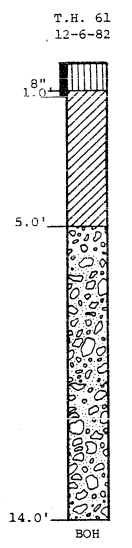


Bn Org

Or Bn Si wet & dilatant at natural moisture content.

EST 3/4" minus 3.5'-9.0'

Bn Sa/Grl dry  
EST 1 1/2" minus below 9.0'



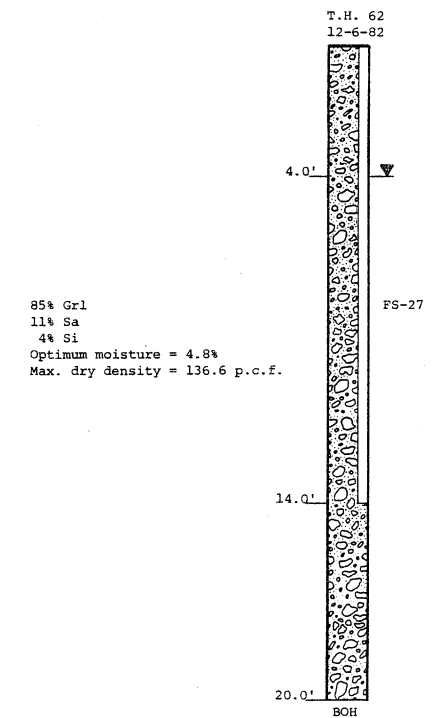
Bn Org

Or Bn Si wet & dilatant at natural moisture content.

EST. 1" minus 5.0-9.0'

Sa/Grl coarser w/depth unable to determine amt. of silt in material due to contamination by overburden.

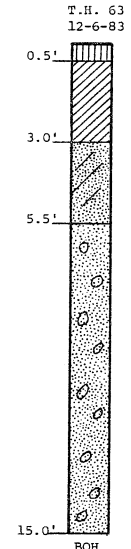
EST. 1 1/2" minus below 9.0'



Located in existing pit approx. 4'-7' below 0.6.

\*Gr1  
A-1-a(0), NFS  
LL=NV, PI=NP

\*most of FS-27 was sampled below the water table. The silt and sand portion of the sample may not be representative

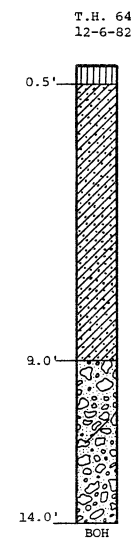


Bn Org

Bn Si damp to wet

Bn Si/Sa damp

Rd Bn Grl/Sa dry

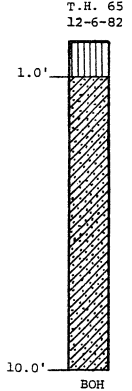


Bn Org

Rd Bn Sa/Si damp

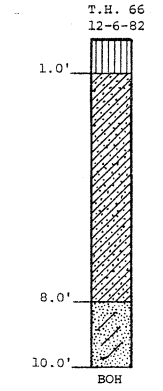
Bn Sa/Gr1

w/some Si (probable contamination from top 9.0')



Bn Org

Rd Bn Sa/Si damp



Bn Org

Rd Bn Sa/Si damp

Gr Bn Si/Sa damp

STATE OF ALASKA  
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EKWOK AIRPORT  
TEST HOLE LOGS

DESIGNED T.O. CHECKED D.P. DATE 3/83 SHEET 5 OF 5

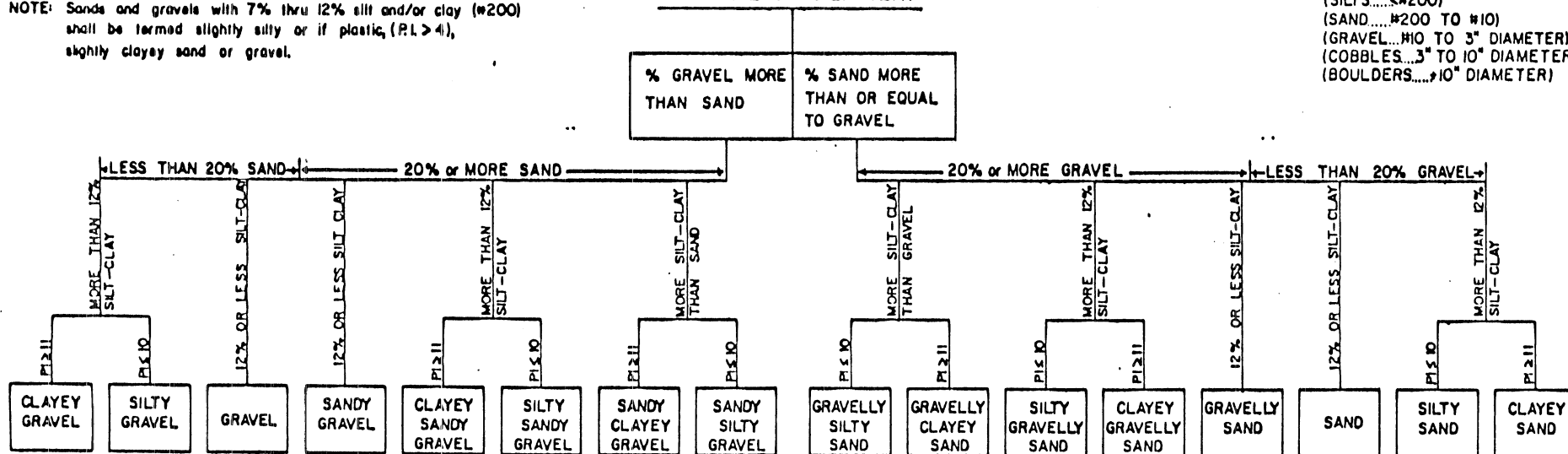
## ALASKA DEPARTMENT OF TRANSPORTATION TEXTURAL SOIL DESCRIPTIONS

**NOTE:** All silts with a plastic index  $> 4$  shall be termed "clayey".

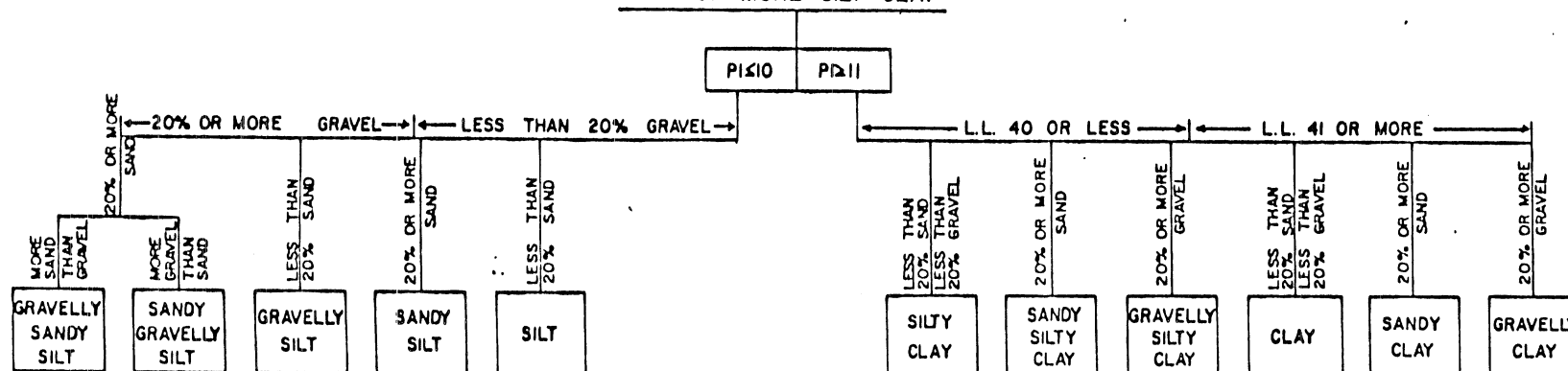
NOTE: Sands and gravels with 7% thru 12% silt and/or clay (#200) shall be termed slightly silty or if plastic, (P.L. > 4), slightly clayey sand or gravel.

COARSE-GRAINED SOILS  
35% OR LESS SILT-CLAY

(CLAYS...<#200)  
(SILTS...<#200)  
(SAND...#200 TO #10)  
(GRAVEL...#10 TO 3" DIAMETER)  
(COBBLES...3" TO 10" DIAMETER)  
(BOULDERS...>10" DIAMETER)



FINE-GRAINED SOILS  
36% OR MORE SILT-CLAY



# SOILS ANALYSIS

PROJECT NAME Ekwok Runway and Apron Expansion

PROJECT NO. D11512

SAMPLE LOCATION	DEPTH IN FEET	FIELD NO.	LAB. NO.	% NAT. MOIST.	% ORG. CONT.	GRAIN SIZE ANALYSIS - % PASSING										ATT. LIM.		SOIL CLASSIFICATION			FROST FSV	
						3"	2"	1"	3/4"	1/2"	#4	#10	#40	#200	#2	L.L.	P.I.	DOT & PF	AASHTO	UNIFIED		
T.H. 1, Sta. 10+00 R/W	2.0-9.5	1	82A-2231									100	96	43		NV	NP	Sa Si	A-4(0)		F4	
T.H. 4, Sta. 15+00 R/W	2.8-9.0	2	82A-2232									100	94	62		NV	NP	Sa Si	A-4(0)		F4	
T.H. 7, Sta. 21+00 R/W	1.5-3.5	3	82A-2233	25.6																		
T.H. 7, Sta. 21+00 R/W	4.0-9.0	4	82A-2234									100	97	60		NV	NP	Sa Si	A-4(0)		F4	
T.H. 8, Sta. 23+00 30' Rt. R/W	0.0-0.5	5	82A-2235				100	99	98	93	60	35	18	9	5	NV	NP	Sl Si Sa Grl	A-1-a(0)		F2	
T.H. 10, Sta. 26+00 R/W	0.2-0.5	6	82A-2236				100	99	96	84	42	24	11	5	3	NV	NP	Grl	A-1-a(0)		NFS	
T.H. 10, Sta. 26+00 R/W	1.0-7.0	7	82A-2237								100	98	94	53		NV	NP	Sa Si	A-4(0)		F4	
T.H. 13, Sta. 32+00 R/W	0.0-0.5	8	82A-2238				100	94	87	77	39	21	10	5	2	NV	NP	Grl	A-1-a(0)		NFS	
T.H. 13, Sta. 32+00 R/W	0.5-4.5	9	82A-2239								100	98	92	58		NV	NP	Sa Si	A-4(0)		F4	
T.H. 14, Sta. 34+00 30' Lt. R/W	2.0-8.0	10	82A-2240									100	96	58		NV	NP	Sa Si	A-4(0)		F4	
T.H. 16, Sta. 36+00 30' Lt. R/W	4.0-7.0	11	82A-2241	17.2																		
T.H. 18, Sta. 38+00 35' Rt. R/W	5.0-8.0	12	82A-2242									100	96	62		NV	NP	Sa Si	A-4(0)		F4	
T.H. 20, Sta. 40+00 30' Lt. R/W	1.0-5.5	13	82A-2243	21.1																		
T.H. 23, Sta. 42+00 30' Lt. R/W	1.0-6.0	14	82A-2244									100	95	53		NV	NP	Sa Si	A-4(0)		F4	
* T.H. 24&25, Sta. 44+00 30' Lt. & 30' Rt. E	1.0-8.0	15	82A-2245									100	97	63		NV	NP	Sa Si	A-4(0)		F4	
T.H. 27, Sta. 46+00 30' Lt. R/W	1.0-3.5	16	82A-2246	12.1																		
T.H. 32, Sta. 9+50 280' Rt. R/W	3.0-7.0	17	82A-2247									100	97	63		NV	NP	Sa Si	A-4(0)		F4	
T.H. 36, Sta. 13+50 280' Rt. R/W	2.0-6.0	18	82A-2248	15.5																		
T.H. 40, Sta. 12+50 180' Rt. R/W	1.5-3.5	19	82A-2249	13.6																		
T.H. 45, See T.H. Location Plan	4.0-11.0	20	82A-2250				100	92	79	54	17	11	6	3		NV	NP	Grl	A-1-a(0)		NFS	
T.H. 48, See T.H. Location Plan	3.0-9.0	21	82A-2251				100	99	93	75	35	21	12	4	2	NV	NP	Grl	A-1-a(0)		NFS	
* T.H. 53&54, See T.H. Location Plan	1.0-12.0	22	82A-2252				100	91	73	41	8	5	3	2		NV	NP	Grl	A-1-a(0)		NFS	
T.H. 56, See T.H. Location Plan	1.0-6.0	23	82A-2253									100	97	81		NV	NP	Si	A-4(0)		F4	
T.H. 57, See T.H. Location Plan	2.0-11.0	24	82A-2254				100	86	75	50	14	9	7	4		NV	NP	Grl	A-1-a(0)		NFS	
T.H. 58, See T.H. Location Plan	3.5-9.0	25	82A-2255					100	97	87	31	16	8	3		NV	NP	Grl	A-1-a(0)		NFS	
T.H. 59, See T.H. Location Plan	1.0-4.0	26	82A-2256	31.2																		
* T.H. 62, See T.H. Location Plan	0.0-14.0	27	82A-2257				100	89	77	57	23	15	8	4		NV	NP	Grl	A-1-a(0)		NFS	
T.H. 62, See T.H. Location Plan	0.0-14.0	27	82A-2257						Optimum Moisture = 4.8%; Maximum Dry Density = 136.6 p.c.f.													
See above		15							Proctor results for FS-15: Optimum Moisture = 13.2%; Maximum Dry Density = 110.4 p.c.f.													
See above		22							Quality results for FS-22: Degradation Value = 39; L.A. Abrasion Loss = 25, Grade A;													
									Sulfate Soundness - Coarse = 9													
* See above									Samples FS-22 & FS-27 are not indicative of the gradation of the material encountered, due to the fact that the sand and other fines fraction was washed from the sample as it was													

STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION  
AND PUBLIC FACILITIES

# LAB REPORT

THE RESULTS OF THIS TESTING ARE ONLY  
REPRESENTATIVE OF THE MATERIAL AS SUBMITTED

PRECONSTRUCTION ☒ CONSTRUCTION ☐

ACCEPTANCE ☐ QUALITY ☐

ASSURANCE ☐ INFORMATION ☐

FINAL RECORD ☐

TEST OF Soil ITEM NO. \_\_\_\_\_

PROJECT NO. D11512 PROJECT NAME Ekwok Runway LABORATORY NO. 82A-2245

SAMPLED FROM TH-25/24 SUBMITTED BY Ottley FIELD NO. FS-15

SOURCE \_\_\_\_\_ QUANTITY REPRESENTED \_\_\_\_\_ DATE 01-05-83

LOCATION (RDWY.) \_\_\_\_\_ DEPTH 1'-8' DATE SAMPLED \_\_\_\_\_

EXAMINED FOR Proctor, Class, Grad, Limits SPECIFICATION \_\_\_\_\_ DATE RECEIVED 12-09-82

% PASSING SIEVE	AS RECEIVED	SPEC.	SPEC.	SPEC.
			OPTIMUM MOISTURE <u>13.2</u>	% + 10" _____
			MAX. DRY DENSITY <u>110.4</u>	% + 3" _____
4"			MAX. DENSITY NUMBER _____	% GRAVEL _____
3"			CORR. MAX. DRY DENSITY _____	% SAND <u>37</u>
2"			FIELD DENSITY _____	% SILT <u>63</u>
1 1/2"			FIELD MOISTURE _____	% CLAY _____
1"			% COMPACTION _____	FSV <u>F4</u>
3/4"			% + 3/4" _____	LL <u>NA</u>
1/2"			% + NO. 4 _____	PL <u>NV</u>
3/8"			AASHTO T180D <input type="checkbox"/> ALASKA T-12 <input type="checkbox"/>	PI <u>NP</u>
#4			% FRACTURE _____	SOIL CLASS <u>A-4(0)</u>
#8			DEGRADATION VALUE _____	<u>Sa Si</u>
#10	<u>100</u>		NATURAL DENSITY _____	
#16			NATURAL MOISTURE _____	
#20			WEIGHT LOOSE _____	
#30	<u>99</u>		WEIGHT RODDED _____	
#40	<u>97</u>		MISCELLANEOUS _____	
#50	<u>94</u>			
#80				
#100	<u>83</u>			
#200	<u>63</u>			
.02MM				
.005MM				
DUST RATIO: _____				

## DELETERIOUS MATERIALS:

MINUS #200 MESH

SOFT FRAGMENTS

COAL & LIG. OR LT. WT. PART.

CLAY LUMPS

STICKS & ROOTS

FRIABLE PARTICLES

SPECIFIC GRAVITY APP

ABSORPTION

FINENESS MODULUS

SULFATE SOUNDNESS

FREEZE-THAW RATIO

L.A. ABRASION LOSS \_\_\_\_\_ GRADE \_\_\_\_\_

THIN-ELONGATED \_\_\_\_\_

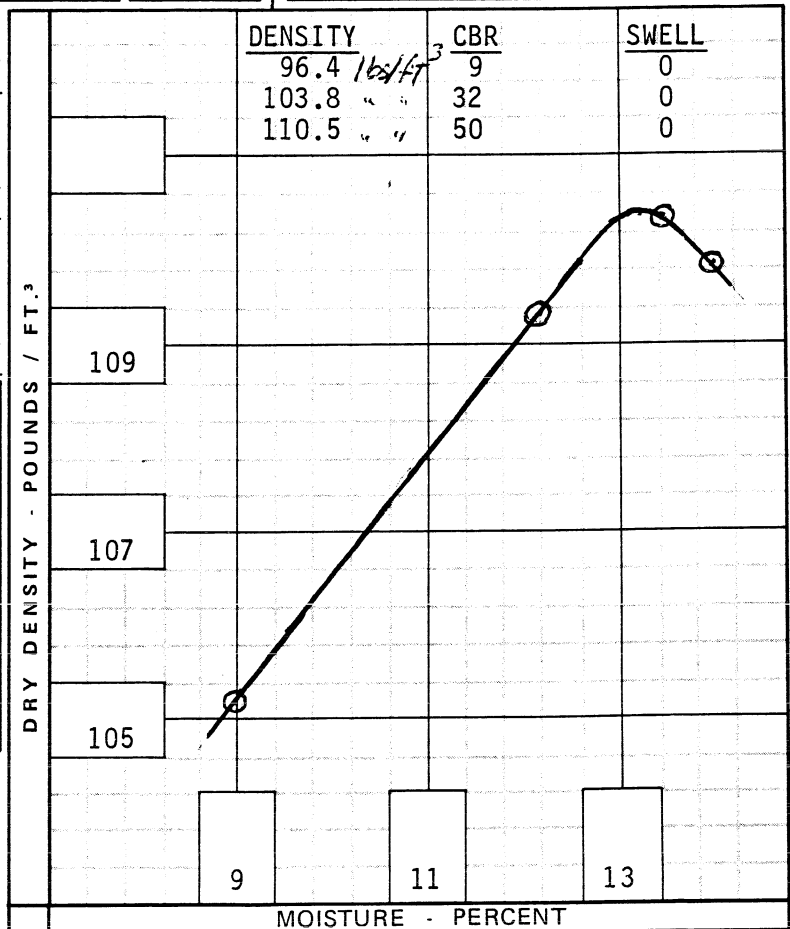
ORGANIC COLOR \_\_\_\_\_ THAN 500 PPM

## MORTAR COMPRESSION STRENGTH:

STANDARD	SAMPLE	RATIO	SPEC
_____ DAY, PSI	_____	_____	_____
_____ DAY, PSI	_____	_____	_____

DESCRIPTION OF MATERIALS:

REMARKS:



FOR ROAD MATERIALS LABORATORY USE ONLY

WHEN PROCESSED TO CONFORM TO GRADING REQUIREMENTS, THIS MATERIAL IS SATISFACTORY FOR:

CONFORM TO SPECIFICATIONS:

YES ☐ NO ☐ N.A. ☒

SIGNATURE

Frank P. Narusch, CRME

TITLE

eam

# LAB REPORT

THE RESULTS OF THIS TESTING ARE ONLY  
REPRESENTATIVE OF THE MATERIAL AS SUBMITTED

PRECONSTRUCTION ☒ CONSTRUCTION ☐  
ACCEPTANCE ☐ QUALITY ☐  
ASSURANCE ☐ INFORMATION ☐  
FINAL RECORD ☐

TEST OF Soil ITEM NO. \_\_\_\_\_  
PROJECT NO. D11512 PROJECT NAME Ekwok Runway LABORATORY NO. 82A-2252  
SAMPLED FROM TH-54/53 SUBMITTED BY Ottley FIELD NO. FS-22  
SOURCE \_\_\_\_\_ QUANTITY REPRESENTED \_\_\_\_\_ DATE 01-05-83  
LOCATION (RDWY.) \_\_\_\_\_ DEPTH 3'-12' DATE SAMPLED \_\_\_\_\_  
EXAMINED FOR Quality, Class, Grad, Limits SPECIFICATION \_\_\_\_\_ DATE RECEIVED 12-09-82

% PASSING SIEVE	AS RECEIVED	SPEC.
4"		
3"		
2"	100	
1 1/2"	98	
1"	91	
3/4"	73	
1/2"	41	
3/8"	22	
#4	8	
#8		
#10	5	
#16		
#20		
#30		
#40	3	
#50		
#80		
#100		
#200	2	
.02MM		
.005MM		
DUST RATIO:		

SPEC.  
OPTIMUM MOISTURE \_\_\_\_\_  
MAX. DRY DENSITY \_\_\_\_\_  
MAX. DENSITY NUMBER \_\_\_\_\_  
CORR. MAX. DRY DENSITY \_\_\_\_\_  
FIELD DENSITY \_\_\_\_\_  
FIELD MOISTURE \_\_\_\_\_  
% COMPACTION \_\_\_\_\_  
% + 3/4" \_\_\_\_\_  
% + NO. 4 \_\_\_\_\_  
AASHO T180D ☐ ALASKA T-12 ☐  
% FRACTURE \_\_\_\_\_  
DEGRADATION VALUE 39

SPEC.  
% + 10" \_\_\_\_\_  
% + 3" \_\_\_\_\_  
% GRAVEL 95  
% SAND 3  
% SILT 2  
% CLAY \_\_\_\_\_  
FSV NFS  
LL NA  
PL NV  
PI NP  
SOIL CLASS A-1-a(0)  
Gr

NATURAL DENSITY \_\_\_\_\_  
NATURAL MOISTURE \_\_\_\_\_  
WEIGHT LOOSE \_\_\_\_\_  
WEIGHT RODDED \_\_\_\_\_  
MISCELLANEOUS \_\_\_\_\_  
STATIC IMMERSION  
BRAND \_\_\_\_\_ 0% \_\_\_\_\_ 1/4%  
1% \_\_\_\_\_ 1 1/4% \_\_\_\_\_ 2%

## DELETERIOUS MATERIALS:

MINUS #200 MESH  
SOFT FRAGMENTS  
COAL & LIG. OR LT. WT. PART.  
CLAY LUMPS  
STICKS & ROOTS  
FRIABLE PARTICLES  
SPECIFIC GRAVITY  
ABSORPTION  
FINENESS MODULUS  
SULFATE SOUNDNESS  
FREEZE-THAW RATIO  
L.A. ABRASION LOSS 25 GRADE A  
THIN-ELONGATED \_\_\_\_\_  
ORGANIC COLOR \_\_\_\_\_ THAN 500 PPM

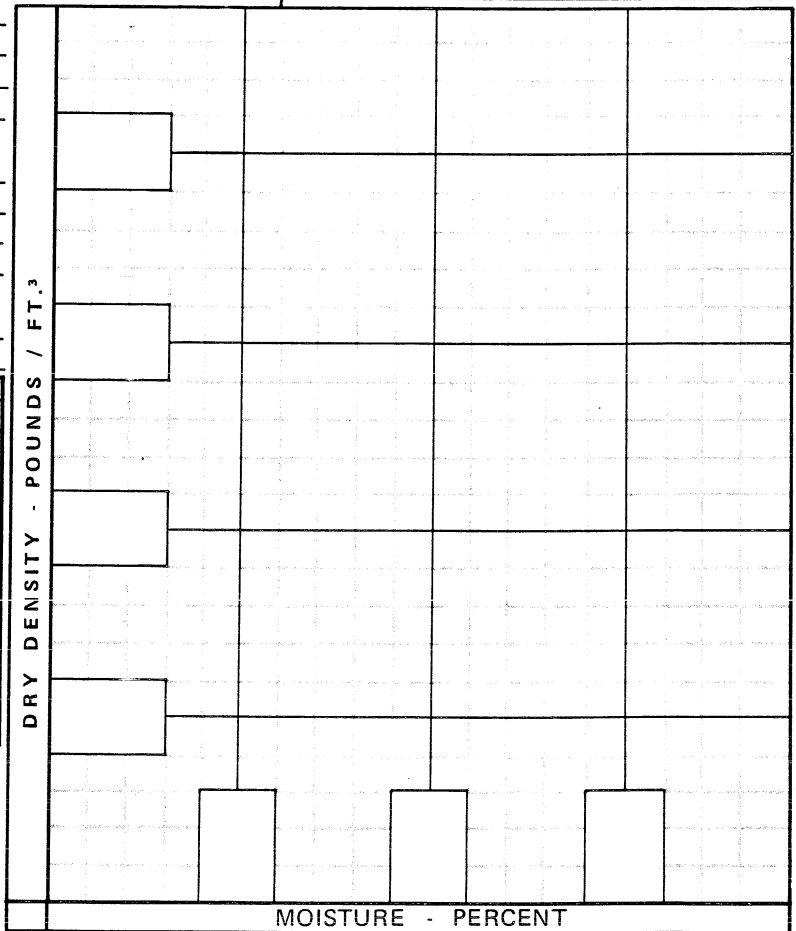
COURSE	SPEC	FINE	SPEC
9			

## MORTAR COMPRESSION STRENGTH:

STANDARD	SAMPLE	RATIO	SPEC
DAY, PSI			
DAY, PSI			

DESCRIPTION OF MATERIALS:

REMARKS:



FOR ROAD MATERIALS LABORATORY USE ONLY

WHEN PROCESSED TO CONFORM TO GRADING REQUIREMENTS, THIS MATERIAL IS SATISFACTORY FOR:

CONFORM TO SPECIFICATIONS:  
YES ☐ NO ☐ N.A. ☒

SIGNATURE Frank P. Narusch  
TITLE Frank P. Narusch, CRME eam



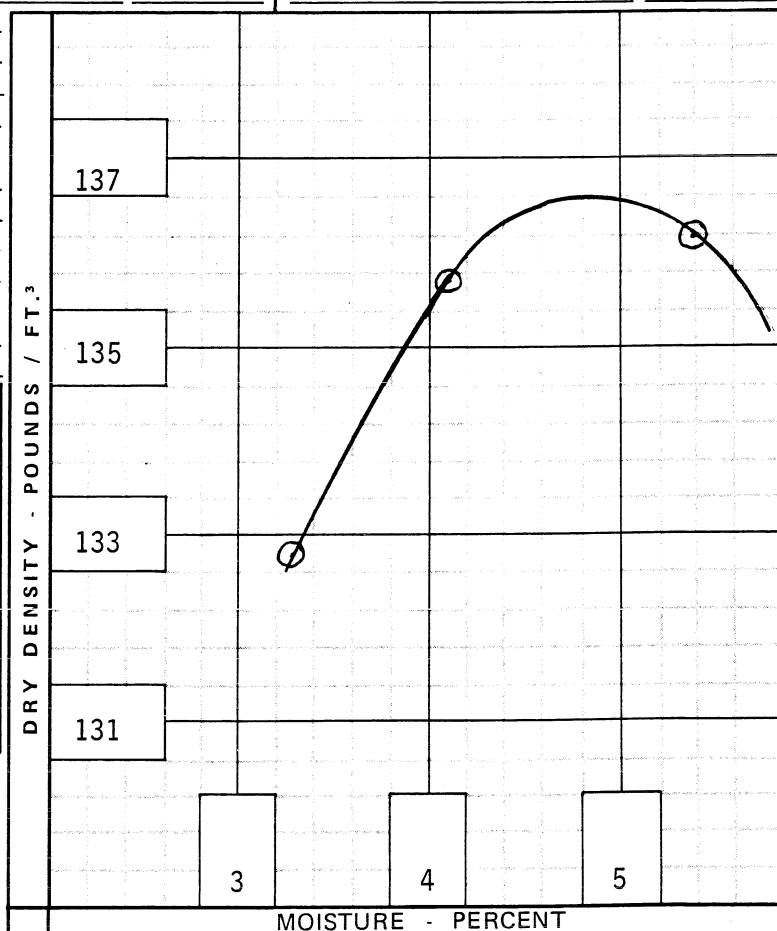
# LAB REPORT

PRECONSTRUCTION	<input checked="" type="checkbox"/>	CONSTRUCTION	<input type="checkbox"/>
ACCEPTANCE	<input type="checkbox"/>	QUALITY	<input type="checkbox"/>
ASSURANCE	<input type="checkbox"/>	INFORMATION	<input type="checkbox"/>
		FINAL RECORD	<input type="checkbox"/>

PROJECT NO.	D11512	PROJECT NAME	Ekwo Runway	LABORATORY NO.	82A-2257
SAMPLED FROM	TH-62	SUBMITTED BY	Ottley	FIELD NO.	FS-27
SOURCE		QUANTITY REPRESENTED		DATE	12/28/82
LOCATION (RDWY.)		DEPTH	0'-14'	DATE SAMPLED	
EXAMINED FOR	Gradation, Class, Proctor	SPECIFICATION		DATE RECEIVED	12/09/82

		SPEC	
% + 10"			
% + 3"			
% GRAVEL	85		
% SAND	11		
% SILT	4		
% CLAY			
FSV	NFS		
LL	NA		
PL	NV		
PI	NP		
SOIL CLASS	A-1-a(0)		
	Gr		

REMARKS:



WHEN PROCESSED TO CONFORM TO GRADING REQUIREMENTS, THIS MATERIAL IS SATISFACTORY FOR:

SIGNATURE Frank P. Narusch  
TITLE Frank P. Narusch CRME sd