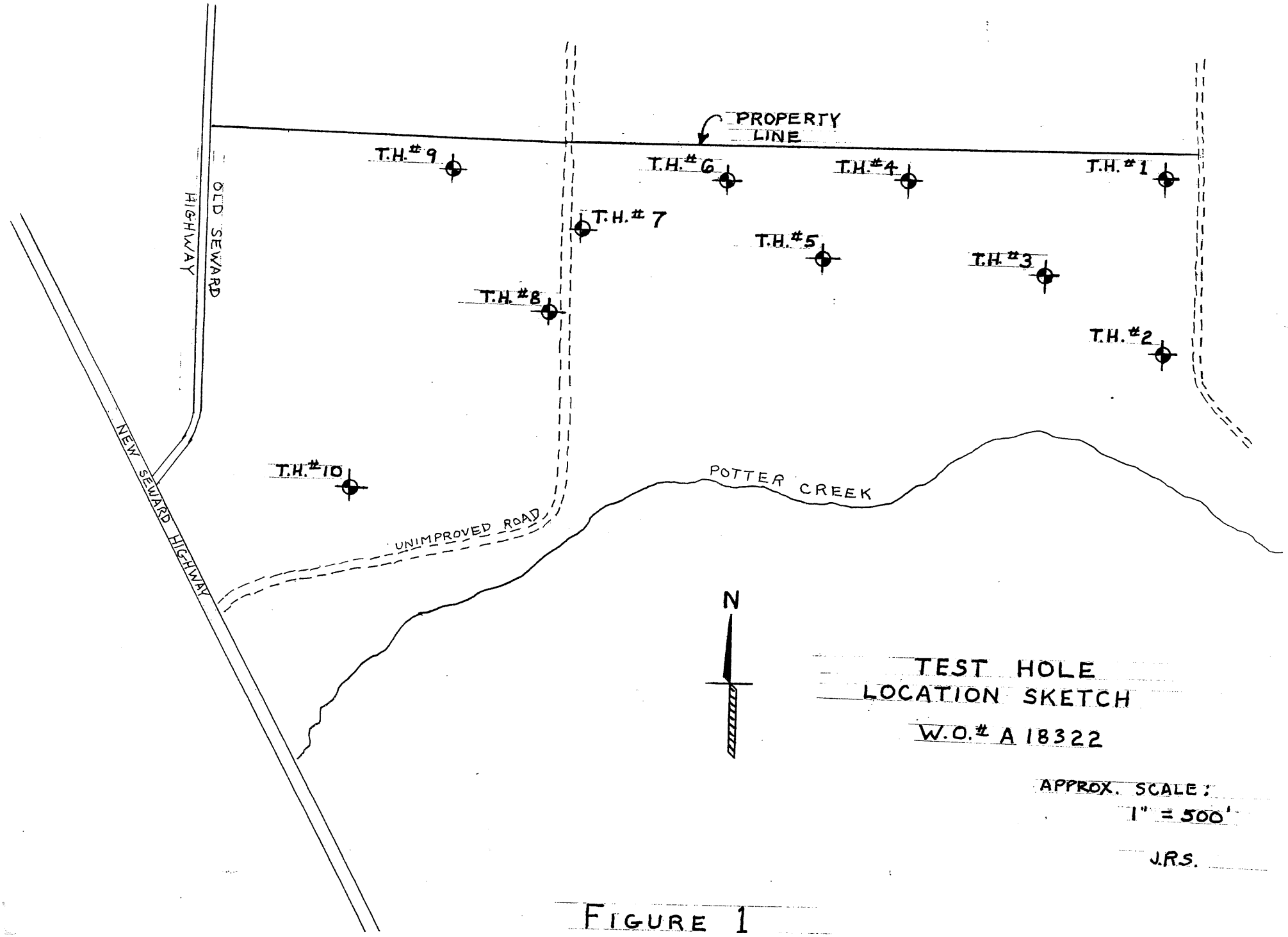

PROPERTY LINE
T.H. # 9
T.H. # 6
T.H. # 4
T.H. # 1
T.H. # 7
T.H. # 5
T.H. # 3
T.H. # 8
T.H. # 2
T.H. # 10
OLD SEWARD HIGHWAY
NEW SEWARD HIGHWAY
UNIMPROVED ROAD
POTTER CREEK
N
TEST HOLE
LOCATION SKETCH
W.O. # A 18322
APPROX. SCALE:
1" = 500'
J.R.S.

FIGURE 1

Date: 12-9-77
Logged by: O.M. Hatch

TABLE A

Test Hole No. 1

WO#A18322

Depth in Feet From	To	SOIL DESCRIPTION
0.0	1.0	Brown Peat, Pt, damp, soft.
1.0	2.5	F-4, brown Sandy Silt, ML, damp, stiff, non-plastic.
2.5	6.0	F-2, brown Gravelly Silty Sand, SM, damp, medium density, subrounded particles to 3".
6.0	10.0	NFS/F-2, brown slightly Silty Sand, SM, with a trace of gravel, damp to saturated, medium density, well graded.
10.0	15.0	F-2, brown Silty Gravelly Sand, SM, saturated, medium to high density, poorly graded, subrounded particles to 12".
15.0	18.0	F-1, brown Silty Sandy Gravel, GM, saturated, high density, poorly graded, subrounded particles to 12", probable fractured bedrock.

Bottom of Test Hole: 18.0 ft.
Frost Line: Trace
Free Water Level: 14.0 ft. while drilling

SA. NO.	Depth	M%	Type of Sample	Dry Strength	Group	Unified Class.
1	5.0	12.5	G	L-M	A	SM
2	10.0	8.7	G	N-L	B	SM
3	15.0	18.4	G	M	C	SM/GM

Remarks:
1) Type of Sample, G=Grab, SP=Standard Penetration.
2) Dry Strength: N=None, L=Low, M=Medium, H=High.
3) Group refers to similar material this study only.
4) General Information, see Sheet 1.
5) Frost & Textural Classification, see Sheet 2.
6) Unified Classification, see Sheet 3.

Date: 12-9-77
Logged by: O.M. Hatch

TABLE A

Test Hole No. 2

WO#A18322

Depth in Feet From	To	SOIL DESCRIPTION
0.0	0.5	Brown Peat, Pt, Damp, Soft, Non-Plastic.
0.5	1.0	F-4, brown Sandy Silt, ML, damp, soft, non-plastic.
1.0	11.0	NFS, brown, Gravelly Sand, SP, SM, a trace of silt, damp, medium denisty, rounded particles to 3".
11.0	16.0	F-4, brown Gravelly Sandy Silt, SM, damp, stiff, non-plastic, poorly graded, subrounded particles to 2".

Bottom of Test Hole: 16.0 ft.
Frost Line: Trace
Free Water Level: Wet at 11.0 ft.

SA. NO.	Depth	M%	Type of Sample	Dry Strength	Group	Unified Class.
1	5.0	5.8	G	N	C	SP-SM
2	10.0	12.2	G	L	C	SP-SM
3	15.0	9.9	G	N-L	D	SM

Remarks:
1) Type of Sample, G=Grab, SP=Standard Penetration.
2) Dry Strength: N=None, L=Low, M=Medium, H=High.
3) Group refers to similar material this study only.
4) General Information, see Sheet 1.
5) Frost & Textural Classification, see Sheet 2.
6) Unified Classification, see Sheet 3.

Date: 12-9-77
Logged by: O.M. Hatch

TABLE A

Test Hole No. 3

WO#A18322

Depth in Feet From	To	SOIL DESCRIPTION
0.0	2.5	Brown Peat, Pt, damp, soft
2.5	5.0	F-2, brown Silty GravellySand, SM, saturated medium density, poorly graded, subrounded particles to 3".
5.0	11.0	F-1, brown Silty Sandy Gravel, GM, saturated, medium density, poorly graded, subrounded particles to 3".
11.0	16.0	F-2, brown Gravelly Silty Sand, SM, damp to saturated, medium to high density, particles to 2".

Bottom of Test Hole: 16.0 ft.
Frost Line: Trace
Free Water Level: 3.0 ft. while drilling

SA. NO.	Depth	M%	Type of Sample	Dry Strength	Group	Unified Class.
1	5.0	29.5	G	L	A	SM
2	10.0	14.0	G	M	C	GM
3	15.0	18.7	G	M-H	A	SM

Remarks:
1) Type of Sample, G=Grab, SP=Standard Penetration.
2) Dry Strength: N=None, L=Low, M=Medium, H=High.
3) Group refers to similar material this study only.
4) General Information, see Sheet 1.
5) Frost & Textural Classification, see Sheet 2.
6) Unified Classification, see Sheet 3.

Date: 12-9-77
Logged by: O.M. Hatch

TABLE A

Test Hole No. 4

WO#A18322

Depth in Feet From	To	SOIL DESCRIPTION
0.0	0.5	Brown Peat, Pt, damp, soft.
0.5	1.0	F-4, brown Sandy Silt, ML, damp, stiff, non-plastic.
1.0	9.0	NFS/F-2, brown slightly Silty Gravelly Sand, SP-SM, damp, medium density, sub-rounded particles to 3".
9.0	15.0	Brown Bedrock (Probable), damp, hard

Bottom of Test Hole: 15.0 ft.
Frost Line: Trace
Free Water Level: None Observed

SA. NO.	Depth	M%	Type of Sample	Dry Strength	Group	Unified Class.
1	5.0	4.9	G	N	C	SP-SM
2	10.0	5.2	G	N	E	-----
3	15.0	3.5	G	N	E	-----

Remarks:
1) Type of Sample, G=Grab, SP=Standard Penetration.
2) Dry Strength: N=None, L=Low, M=Medium, H=High.
3) Group refers to similar material this study only.
4) General Information, see Sheet 1.
5) Frost & Textural Classification, see Sheet 2.
6) Unified Classification, see Sheet 3.

Date: 12-9-77
Logged by: O.M. Hatch

TABLE A

Test Hole No. 5

WO#A18322

Depth in Feet From	To	SOIL DESCRIPTION
0.0	0.5	Brown Peat, Pt, damp, soft.
0.5	6.0	F-2/F-4, brown Gravelly very Silty Sand/ Gravelly Sandy Silt, SM, damp, medium to high denisty, stiff to hard, subrounded particles to 3".
6.0	13.0	NFS/F-2, brown Gravelly Sand, SP-SM, with a trace of silt, damp, medium density, rounded/subrounded particles to 2".
13.0	15.0	Bedrock

Bottom of Test Hole: 15.0 ft.
Frost Line: Trace
Free Water Level: None Observed

SA. NO.	Depth	M%	Type of Sample	Dry Strength	Group	Unified Class.
1	5.0	8.0	G	N	D	SM
2	10.0	4.7	G	N	C	SM
3	15.0	6.2	G	N	E	----

Date: 12-8-77
Logged by: O.M. Hatch

TABLE A

Test Hole No. 6

WO#A18322

Depth in Feet From	To	SOIL DESCRIPTION
0.0	1.0	Brown Peat, Pt, Damp, Soft.
1.0	6.0	F-2, Brown Slightly Silty Gravelly Sand, SM, Damp, Soft, Subrounded 3".
6.0	11.0	NFS/F-1, Slightly Silty Sandy Gravel, GP-GM, Damp, Medium Density, Subrounded Particle to 3".
11.0	16.0	Bedrock

Bottom of Test Hole: 16.0 ft.
Frost Line: Trace
Free Water Level: None Observed

SA. NO.	Depth	M%	Type of Sample	Dry Strength	Group	Unified Class.
1	5.0	7.5	G	N	C	SM
2	10.0	6.7	G	N	C	GP-GM
3	15.0	6.4	G	N	E	----

Remarks:
1) Type of Sample, G=Grab, SP=Standard Penetration.
2) Dry Strength: N=None, L=Low, M=Medium, H=High.
3) Group refers to similar material this study only.
4) General Information, see Sheet 1.
5) Frost & Textural Classification, see Sheet 2.
6) Unified Classification, see Sheet 3.

Date: 12-12-77
Logged by: O.M. Hatch

TABLE A

Test Hole No. 7

WO#A18322

Depth in Feet From	To	SOIL DESCRIPTION
0.0	0.5	Brown Peat, Pt, Damp, Soft
0.5	16.0	F-2, Brown, Silty Gravelly Sand, SM, Damp, Medium Density, Surbrounded Particles to 2".

Bottom of Test Hole: 16.0 ft.
Frost Line: Trace
Free Water Level: None Observed

SA. NO.	Depth	M%	Type of Sample	Dry Strength	Group	Unified Class.
1	5.0	6.1	G	N	C	SM
2	10.0	5.5	G	N	B	SM
3	15.0	8.1	G	N	A	SM

Remarks:
1) Type of Sample, G=Grab, SP=Standard Penetration.
2) Dry Strength: N=None, L=Low, M=Medium, H=High.
3) Group refers to similar material this study only.
4) General Information, see Sheet 1.
5) Frost & Textural Classification, see Sheet 2.
6) Unified Classification, see Sheet 3.

Date: 12-12-77
Logged by: O.M. Hatch

TABLE A

Test Hole No. 8

WO#A18322

Depth in Feet From	To	SOIL DESCRIPTION
0.0	1.0	Brown, Peat, Pt, Damp, Soft.
1.0	14.0	NFS/F-1, Slightly Silty Sandy Gravel, GP-GM/GM, Silt content increases with depth, damp to wet, medium to high density, occasional cobbles to 6".
14.0	16.0	Bedrock (Probable).

Bottom of Test Hole: 16.0 ft.
Frost Line: Trace
Free Water Level: None Observed

SA. NO.	Depth	M%	Type of Sample	Dry Strength	Group	Unified Class.
1	5.0	9.3	G	N	C	GM
2	10.0	8.3	G	L	A	SM(GM)
3	15.0	3.9	G	N	E	---

Remarks:
1) Type of Sample, G=Grab, SP=Standard Penetration.
2) Dry Strength: N=None, L=Low, M=Medium, H=High.
3) Group refers to similar material this study only.
4) General Information, see Sheet 1.
5) Frost & Textural Classification, see Sheet 2.
6) Unified Classification, see Sheet 3.

Date: 12-12-77
Logged by: O.M. Hatch

TABLE A

Test Hole No. 9

WO#A18322

Depth in Feet From	To	SOIL DESCRIPTION
0.0	1.5	Brown Peat, PT, Damp, Soft
1.5	7.0	F-2, Brown Gravelly Silty Sand, SM, Damp, Medium Density, Subrounded Particles to 2".
7.0	9.0	NFS/F-2, Brown Slightly Silty Gravelly Sand, sub-rounded Particles to 2".
9.0	12.0	Bedrock

Bottom of Test Hole: 12.0 ft.
Frost Line: Trace
Free Water Level: None Observed

SA. NO.	Depth	M%	Type of Sample	Dry Strength	Group	Unified Class.
1	5.0	10.1	G	N	C	SM
2	9.0	5.4	G	N	C	SM
3	12.0	5.2	G	N	E	----

Remarks:
1) Type of Sample, G=Grab, SP=Standard Penetration.
2) Dry Strength: N=None, L=Low, M=Medium, H=High.
3) Group refers to similar material this study only.
4) General Information, see Sheet 1.
5) Frost & Textural Classification, see Sheet 2.
6) Unified Classification, see Sheet 3.

Date: 12-12-77
Logged by: O.M. Hatch

TABLE A

Test Hole No. 10

WO#A18322

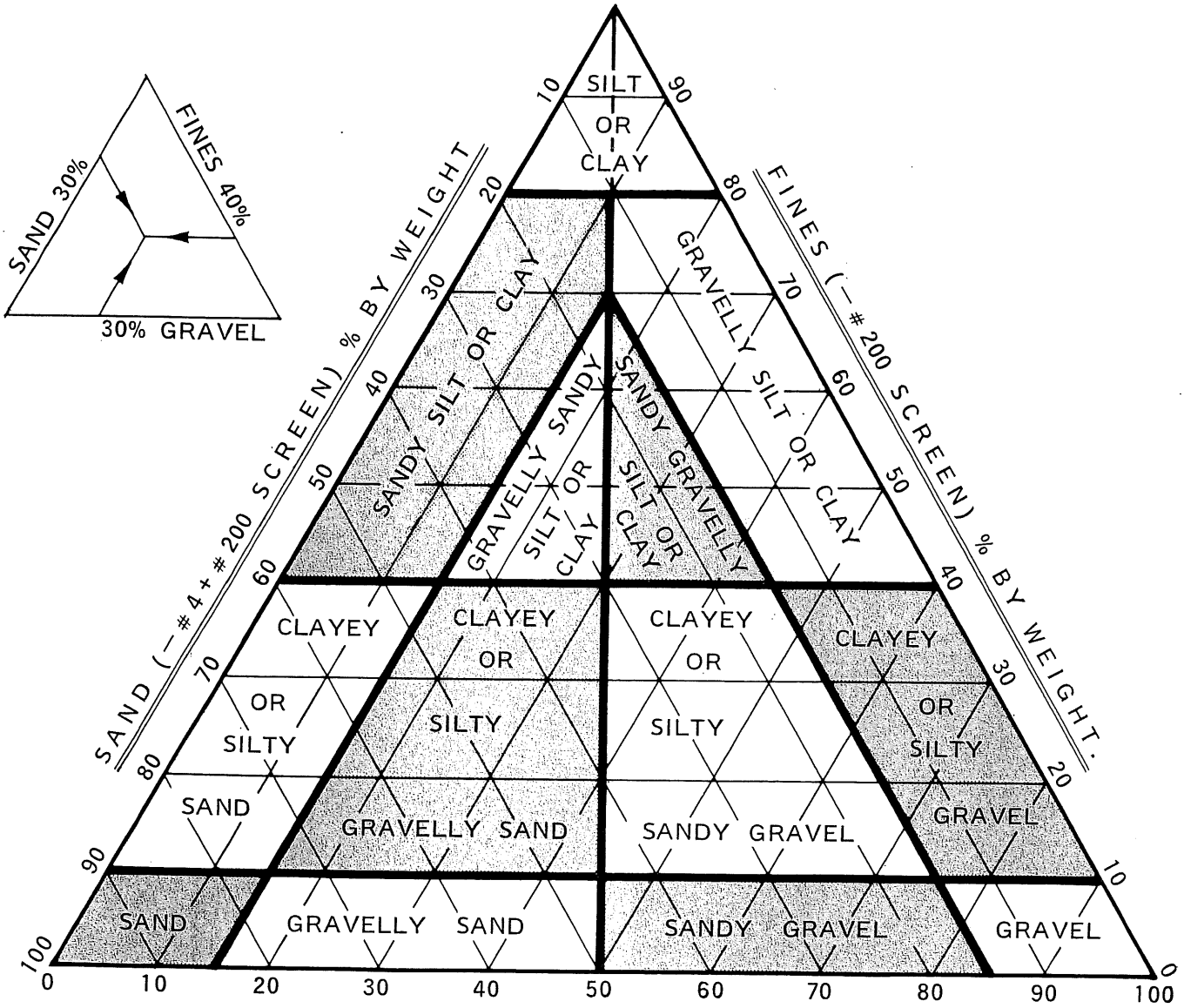
Depth in Feet From	To	SOIL DESCRIPTION
0.0	1.5	F-4, Brown, Sandy Silt, ML, Damp, Stiff, Non-Plastic.
1.5	7.0	F-4, Brown Slightly gravelly Sandy Silt, SM, Damp, Stiff, Non-Plastic, Subrounded Particales to 2".
7.0	16.0	F-1, Brown Silty Sandy Gravel, GM, Damp, Medium Denisty, Sburounded Particles to 3".

Bottom of Test Hole: 16.0 ft.
Frost Line: Trace
Free Water Level: None Observed

SA. NO.	Depth	M%	Type of Sample	Dry Strength	Group	Unified Class.
1	5.0	11.1	G	L	D	SM
2	10.0	8.5	G	N	C	GM
3	15.0	7.1	G	N	C	GM

Remarks:
1) Type of Sample, G=Grab, SP=Standard Penetration.
2) Dry Strength: N=None, L=Low, M=Medium, H=High.
3) Group refers to similar material this study only.
4) General Information, see Sheet 1.
5) Frost & Textural Classification, see Sheet 2.
6) Unified Classification, see Sheet 3.

SOIL CLASSIFICATION CHART



NONFROST SUSCEPTIBLE SOILS ARE INORGANIC SOILS CONTAINING LESS THAN 3% FINER THAN 0.02 mm.
GROUPS OF FROST-SUSCEPTIBLE SOILS:

F1 GRAVELLY SOILS CONTAINING BETWEEN 3 AND 20% FINER THAN 0.02 mm.

F2 SANDY SOILS CONTAINING BETWEEN 3 AND 15% FINER THAN 0.02 mm.

F3
a. GRAVELLY SOILS CONTAINING MORE THAN 20% FINER THAN 0.02 mm. AND SANDY SOILS (EXCEPT FINE SILTY, SANDS) CONTAINING MORE THAN 15% FINER THAN 0.02 mm.
b. CLAYS WITH PLASTICITY INDEXES OF MORE THAN 12. EXCEPT VARVED CLAYS.

F4
a. ALL SILTS INCLUDING SANDY SILTS.
b. FINE SILTY SANDS CONTAINING MORE THAN 15% FINER THAN 0.02 mm.
c. LEAN CLAYS WITH PLASTICITY INDEXES OF LESS THAN 12.
d. VARVED CLAYS.

Test Hole Log – Description Guide

The soil descriptions shown on the logs are the best estimate of the soil's characteristics at the time of field examination and as such do not achieve the precision of a laboratory testing procedure. If the log includes soils samples, those samples receive an independent textural classification in the laboratory to verify the field examination.

The logs often include the following items:

Depth Interval – usually shown to 0.1 foot, within that zone no significant change in soil type was observed through drill action, direct observation or sampling.

Frost Classification – NFS, F1, F2, F3, F4, see "Soil Classification Chart"

Texture of Soil – An engineering classification of the soils by particle size and proportion, see "Soil Classification Chart", note the proportions are approximate and modifications to the soil group due to stratification, inclusions and changes in properties are included.

Moisture Content – this is a qualitative measure:
- dry, no or little apparent surface moisture,
- damp, moisture forms portion of color, less than plastic limit,
- wet, no free water, often soft, if cohesive soil,
- saturated, free water may be squeezed out, if a free draining soil; dilatent at natural moisture content, if a non-plastic silt or fine sand. (The moisture content is further defined by reference to Pl, L_W, NP, M% or dilatency.)

Density – refers to more-or-less non-cohesive soils, such as sand gravel mixtures with or without a fine fraction, derived from drilling action and/or sample data; usually described as: very loose, loose, medium dense, very dense. General intent is to portray earthwork characteristics.

Stiffness – refers to more-or-less cohesive soils and fine grained silts of the clay-silt groups. Derived from drill action and/or sample data. Very soft, soft, stiff, very stiff and hard are commonly used terms.

Particle size – The largest particle recovered by the split spoon is 1-3/8", Shelby tube 3", auger flights (minute-man) 2", Auger flights (B-50 hollow stem) 6"-8". Larger particles are described indirectly by action of the drilling and are referred to as cobbles, 3" to 8", or boulders 8"+. Therefore when reviewing the gradation sheets, if any, the description on the hole log must be considered for an indication of larger particles.

Unified Soil Classification – This is a two letter code. See Unified Classification sheet for further definition. In some cases AASHO and/or FAA soil classifications may be shown as well as the unified.

Atterberg Limits – useful for fine grained and other plastic soils.

Pl; natural moisture content believed to be less than plastic limit

Pl+; natural moisture content believed to be between plastic and liquid limits

Lw+; natural moisture content believed to be greater than liquid limit

NP; non-plastic, useful as a modifying description of some silty materials.

Dilatency – is the ability of water to migrate to the surface of a saturated or nearly saturated soil sample when vibrated or jolted – used as an aid to determine if a fine grained soil is a slightly or non-plastic silt or a volcanic ash.

Rock flour – finely ground soil that is not plastic but otherwise appears similar to a clayey silt.

Organic Content – usually described as Peat, PT, sometimes includes discrete particles such as wood, coal, etc. as a modifier to an inorganic soil. Quantity described as; trace, or an estimate of volume, or, in case of all organic, – as Peat. This may include tundra, muskeg and bog material.

Muck – a modifier used to describe very soft, semi-organic deposits usually occuring below a peat deposit.

Amorphus peat – organic particles nearly or fully disintegrated.

Fibrous Peat – organic particles more-or-less intact.

Bottom of Testhole – includes last sample interval.

Frost Line – seasonal frost depth as described by drilling action and/or samples at the time of drilling.

Frozen Ground – other than frost line, described by samples, usually includes description of ice content, often will include modified Unified Classification for frozen soils – this is a special case related to permafrost studies.

Free Water Level – The free water level noted during drilling. This is not necessarily the static water table at the time of drilling or at other seasons. Static water table determination in other than very permeable soils requires observation wells or piezometer installations, used only in special cases.

Blow/6" – The number of blows of a 140 weight free falling 30" to advance a 2" split spoon 6"; the number of blows for a 12" advance is, by definition, the standard penetration.

M% – natural moisture content of the soil sample, usually not performed on clean sands or gravels below the water table.

Type of Sample –
- SP, refers to 2" split spoon driven into the soil by 140 pound weight, a disturbed sample,
- S, thin wall tube, "Shelby" used to obtain undisturbed samples of fine grained soil,
- G, "grab" disturbed sample from auger flights or wall of trench,
- C, cut sample, undisturbed sample from wall of trench.

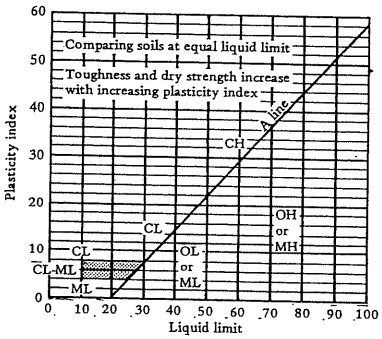
Dry Strength – a useful indicator of a soil's clayey fraction, N=None, L=Low, M=Medium, H=High

Group – The samples are placed into apparently similar groups based on color and texture and are arbitrarily assigned a group letter. Further disturbed tests including Atterberg Limits, grain size, moisture-density relationship, etc. may be performed on the group and are assumed to reflect the general distrubed characteristics of the soils assigned to the group. This is an important phase of the soil analysis and is used to standardize the various qualitative determinations and to reduce the number of quantitative tests necessary to describe the soil mass.

UNIFIED SOIL CLASSIFICATION SYSTEM

Field Identification Procedures (Excluding particles larger than 3 in. and basing fractions on estimated weights)						Group Symbols a	Typical Names	Information Required for Describing Soils	Laboratory Classification Criteria
Coarse-grained soils More than half of material is larger than No. 200 sieve sizeb (The No. 200 sieve size is about the smallest particle visible to naked eye)	Gravels More than half of coarse fraction is larger than No. 4 sieve size (For visual classification, the ¼ in. size may be used as equivalent to the No. 4 sieve size)	Clean gravels (little or no fines)	Wide range in grain size and substantial amounts of all intermediate particle sizes			GW	Well graded gravels, gravel-sand mixtures, little or no fines	Give typical name; indicate approximate percentages of sand and gravel; maximum size; angularity, surface condition, and hardness of the course grains; local or geologic name and other pertinent descriptive information; and symbols in parentheses For undisturbed soils add information on stratification, degree of compactness, cementation, moisture conditions and drainage characteristics Example: Silty sand, gravelly; about 20% hard, angular gravel particles ½-in. maximum size; rounded and subangular sand grains coarse to fine, about 15% nonplastic fines with low dry strength; well compacted and moist in place; alluvial sand; (SM)	Use grain size curve in identifying the fractions as given under field identification Determine percentages of gravel and sand from grain size curve Depending on percentage of fines (fraction smaller than No. 200 sieve size) coarse grained soils are classified as follows: Less than 5% GW, GP, SW, SP More than 12% GM, GC, SM, SC 5% to 12% Borderline cases requiring use of dual symbols
			Predominantly one size or a range of sizes with some intermediate sizes missing			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines		
		Gravels with fines (appreciable amount of fines)	Nonplastic fines (for identification procedures see ML below)			GM	Silty gravels, poorly graded gravel-sand-silt mixtures		
			Plastic fines (for identification procedures, see CL below)			GC	Clayey gravels, poorly graded gravel-sand-clay mixtures		
	Sands More than half of coarse fraction is smaller than No. 4 sieve size	Clean sands (little or no fines)	Wide range in grain sizes and substantial amounts of all intermediate particle sizes			SW	Well graded sands, gravelly sands, little or no fines		
			Predominantly one size or a range of sizes with some intermediate sizes missing			SP	Poorly graded sands, gravelly sands, little or no fines		
		Sands with fines (appreciable amount of fines)	Nonplastic fines (for identification procedures, see ML below)			SM	Silty sands, poorly graded sand-silt mixtures		
			Plastic fines (for identification procedures, see CL below)			SC	Clayey sands, poorly graded sand-clay mixtures		
Fine-grained soils More than half of material is smaller than No. 200 sieve size	Identification Procedures on Fraction Smaller than No. 40 Sieve Size								
			Dry Strength (crushing characteristics)	Dilatancy (reaction to shaking)	Toughness (consistency near plastic limit)				
	Silts and clays liquid limit less than 50		None to slight	Quick to slow	None	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands with slight plasticity	Give typical name; indicate degree and character of plasticity, amount and maximum size of coarse grains; colour in wet condition, odour if any, local or geologic name, and other pertinent descriptive information, and symbol in parentheses For undisturbed soils add information on structure, stratification, consistency in undisturbed and remoulded states, moisture and drainage conditions Example: Clayey silt, brown; slightly plastic; small percentage of fine sand; numerous vertical root holes; firm and dry in place; loess; (ML)	
			Medium to high	None to very slow	Medium	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays		
			Slight to medium	Slow	Slight	OL	Organic silts and organic silt-clays of low plasticity		
	Silts and clays liquid limit greater than 50		Slight to medium	Slow to none	Slight to medium	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts		
			High to very high	None	High	CH	Inorganic clays of high plasticity, fat clays		
			Medium to high	None to very slow	Slight to medium	OH	Organic clays of medium to high plasticity		
Highly Organic Soils			Readily identified by colour, odour, spongy feel and frequently by fibrous texture			Pt	Peat and other highly organic soils		

Laboratory Classification Criteria	
$C_U = \frac{D_{60}}{D_{10}}$ Greater than 4 $C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3	
Not meeting all gradation requirements for GW	
Atterberg limits below "A" line, or PI less than 4	Above "A" line with PI between 4 and 7 are borderline cases requiring use of dual symbols
Atterberg limits above "A" line, with PI greater than 7	
$C_U = \frac{D_{60}}{D_{10}}$ Greater than 6 $C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3	
Not meeting all gradation requirements for SW	
Atterberg limits below "A" line or PI less than 5	Above "A" line with PI between 4 and 7 are borderline cases requiring use of dual symbols
Atterberg limits below "A" line with PI greater than 7	



Plasticity chart
for laboratory classification of fine grained soils

From Wagner, 1957.

a Boundary classifications. Soils possessing characteristics of two groups are designated by combinations of group symbols. For example GW – GC, well graded gravel-sand mixture with clay binder.

b All Sieve sizes on this chart are U. S. standard

Field Identification Procedure for Fine Grained Soils or Fractions

These procedures are to be performed on the minus No. 40 sieve size particles, approximately 1/64 in. For field classification purposes, screening is not intended, simply remove by hand the coarse particles that interfere with the tests.

Dilatancy (Reaction to shaking):

After removing particles larger than No. 40 sieve size, prepare a pat of moist soil with a volume of about one-half cubic inch. Add enough water if necessary to make the soil soft but not sticky.

Place the pat in the open palm of one hand and shake horizontally, striking vigorously against the other hand several times. A positive reaction consists of the appearance of water on the surface of the pat which changes to a livery consistency and becomes glossy. When the sample is squeezed between the fingers, the water and gloss disappear from the surface, the pat stiffens and finally it cracks or crumbles. The rapidity of appearance of water during shaking and of its disappearance during squeezing assist in identifying the character of the fines in a soil.

Very fine clean sands give the quickest and most distinct reaction whereas a plastic clay has no reaction. Inorganic silts, such as a typical rock flour, show a moderately quick reaction.

Dry Strength (Crushing characteristics):

After removing particles larger than No. 40 sieve size, mould a pat of soil to the consistency of putty, adding water if necessary. Allow the pat to dry completely by oven, sun or air drying, and then test its strength by breaking and crumbling between the fingers. This strength is a measure of the character and quantity of the colloidal fraction contained in the soil. The dry strength increases with increasing plasticity.

High dry strength is characteristic for clays of the CH group. A typical inorganic silt possesses only very slight dry strength. Silty fine sands and silts have about the same slight dry strength, but can be distinguished by the feel when powdering the dried specimen. Fine sand feels gritty whereas a typical silt has the smooth feel of flour.

Toughness (Consistency near plastic limit):

After removing particles larger than the No. 40 sieve size, a specimen of soil about one-half inch cube in size, is moulded to the consistency of putty. If too dry, water must be added and if sticky, the specimen should be spread out in a thin layer and allowed to lose some moisture by evaporation. Then the specimen is rolled out by hand on a smooth surface or between the palms into a thread about one-eight inch in diameter. The thread is then folded and re-rolled repeatedly. During this manipulation the moisture content is gradually reduced and the specimen stiffens, finally loses its plasticity, and crumbles when the plastic limit is reached.

After the thread crumbles, the pieces should be lumped together and a slight kneading action continued until the lump crumbles.

The tougher the thread near the plastic limit and the stiffer the lump when it finally crumbles, the more potent is the colloidal clay fraction in the soil. Weakness of the thread at the plastic limit and quick loss of coherence of the lump below the plastic limit indicate either inorganic clay of low plasticity, or materials such as kaolin-type clays and organic clays which occur below the A-line.

Highly organic clays have a very weak and spongy feel at the plastic limit.

SHEET 3

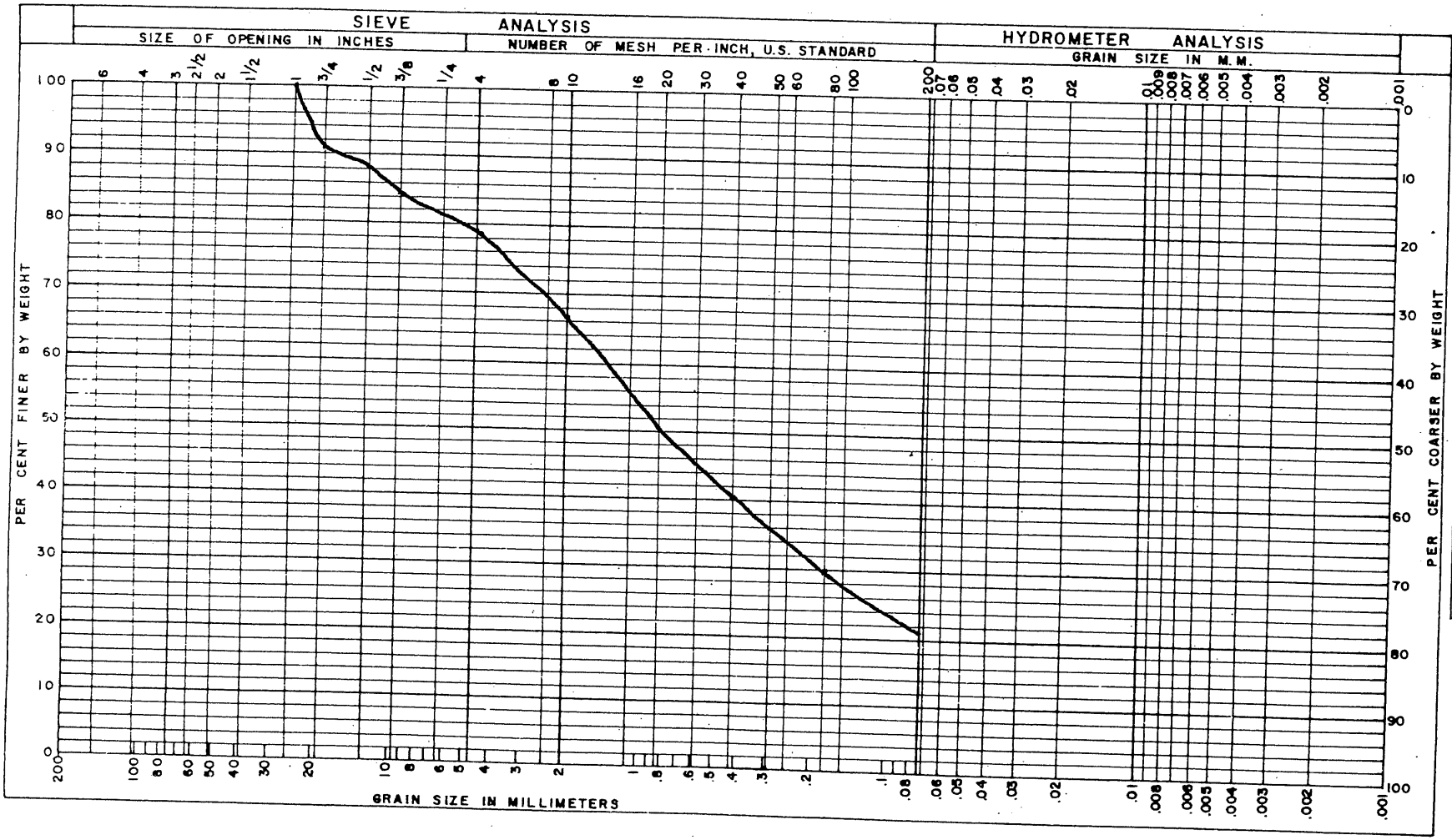
ALASKA TESTLAB

ALASKA TESTLAB
4040 B STREET
ANCHORAGE ALASKA 99503

Sheet 4 of 8
W. O. No. A18322
Date 16 DEC 77
Technician JRS

Textural Class SILTY GRAVELLY SAND
Frost Class F-2 Unified Class SM
Plastic Properties
Date Received

Client BOB KUBICK
Project POTTER PROPERTY
Sample Number GROUP A
Location
Sample Taken By O.M. HATCH



U.S. STD. SIEVE	CUM. % PASS.
2	
1 1/2	
1	100
3/4	91
1/2	88
3/8	85
4	79
10	67
20	51
40	40
80	30
100	—
200	21
0.02 MM	

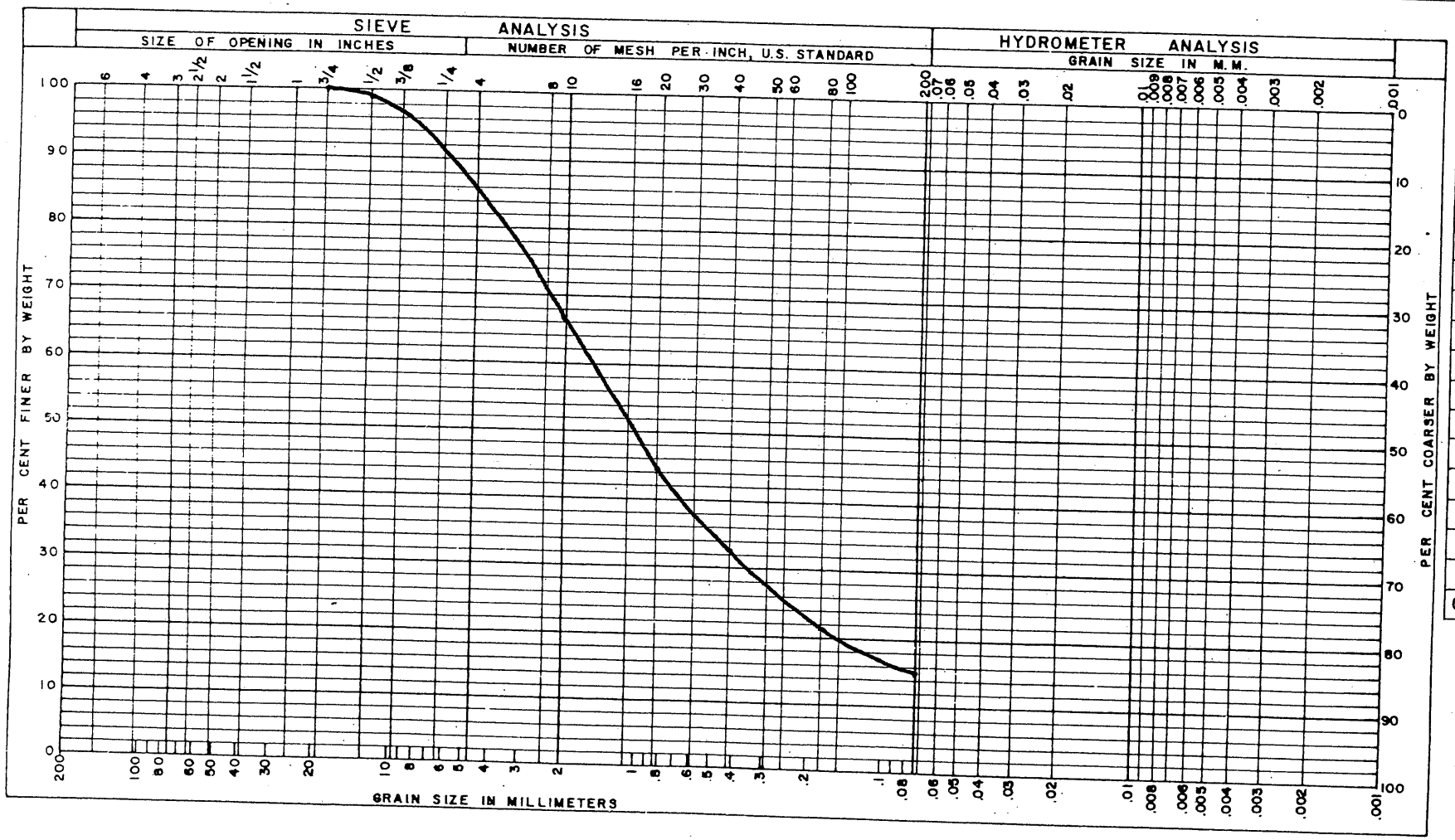
ALASKA TESTLAB

ALASKA TESTLAB
4040 B STREET
ANCHORAGE ALASKA 99503

Sheet 5 of 8
W. O. No. A18322
Date 16 Dec 77
Technician JRS

Textural Class GRAVELLY SILTY SAND
Frost Class F-2 Unified Class SM
Plastic Properties
Date Received

Client BOB KUBICK
Project POTTER PROPERTY
Sample Number GROUP B
Location
Sample Taken By O.M. HATCH



U.S. STD. SIEVE	CUM. % PASS.
2	
1 1/2	
1	
3/4	100
1/2	99
3/8	97
4	86.0
10	66
20	44
40	32
80	22
100	
200	15.0
0.02 MM	

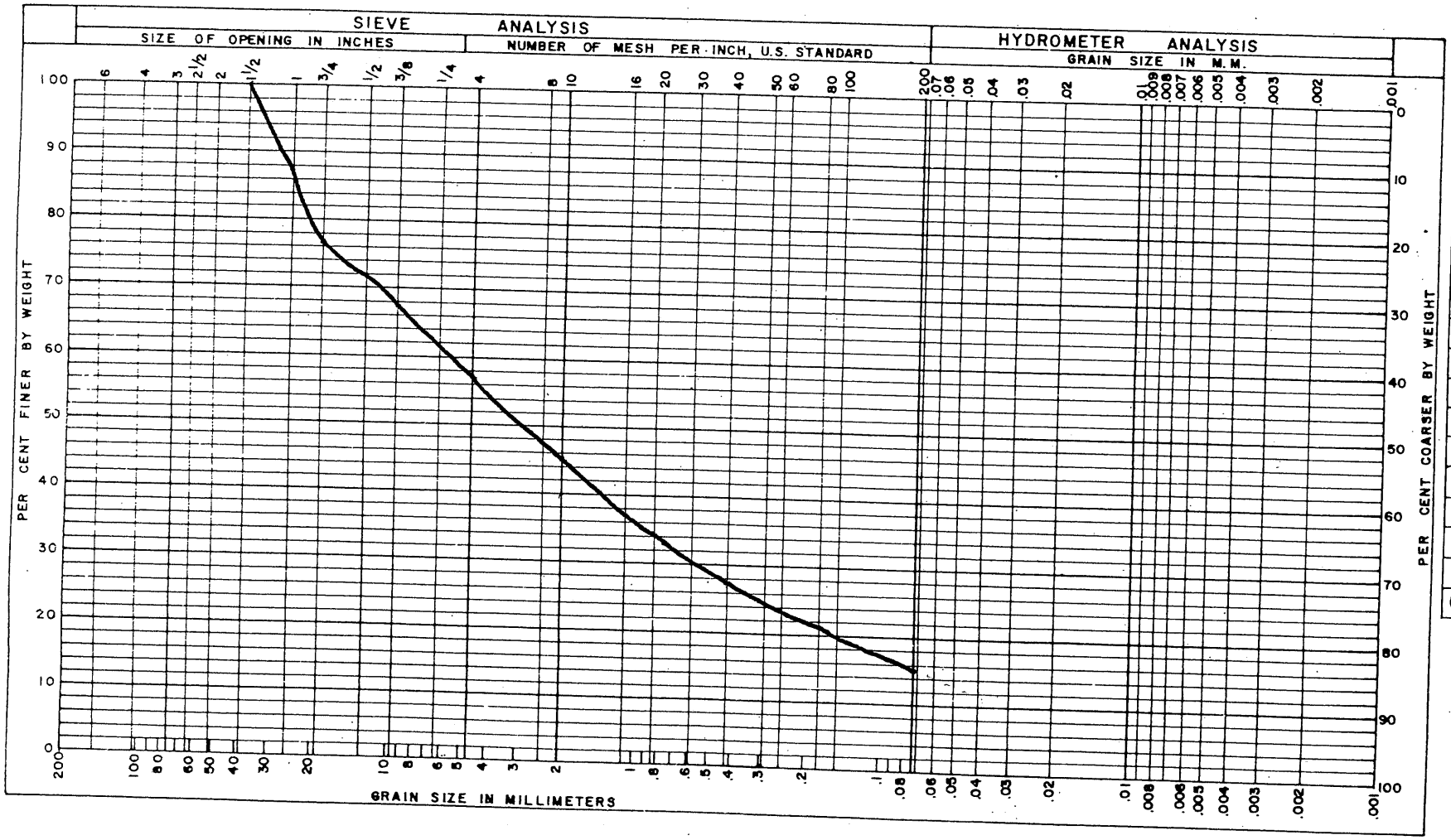
ALASKA TESTLAB

ALASKA TESTLAB
4040 B STREET
ANCHORAGE ALASKA 99503

Sheet 6 of 8
W. O. No. A 18322
Date 16 DEC 77
Technician JRS

Textural Class SILTY SANDY GRAVEL/SILTY GRAVELLY SAND
Frost Class F-1/F-2 Unified Class GM/SM
Plastic Properties
Date Received

Client BOB KUBICK
Project POTTER PROPERTY
Sample Number GROUP C
Location
Sample Taken By O.M. HATCH



U.S. STD. SIEVE	CUM. % PASS.
2	
1 1/2	100
1	88
3/4	77
1/2	72
3/8	68
4	58
10	45
20	34
40	28
80	21
100	—
200	15.7
0.02 MM	

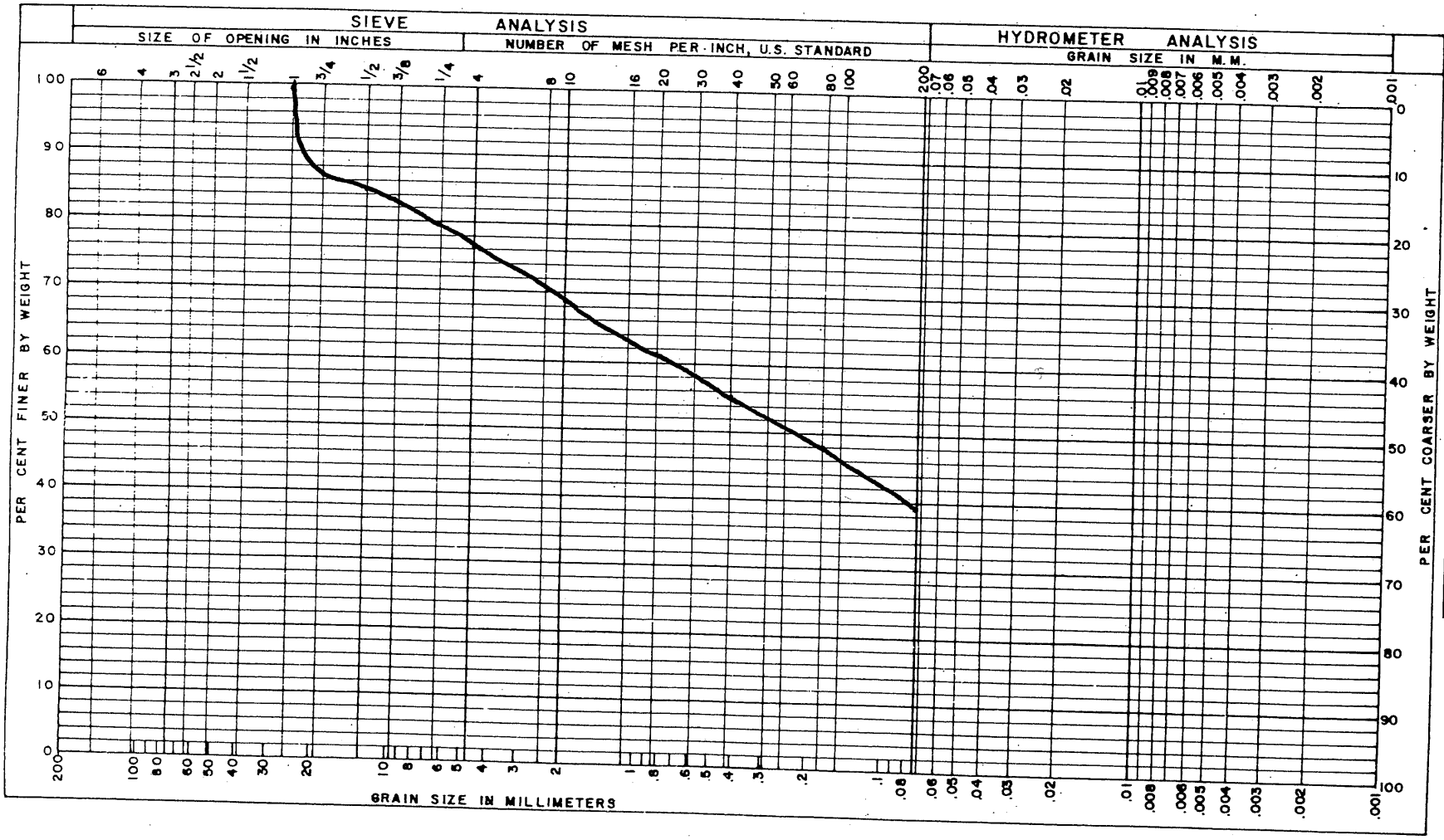
ALASKA TESTLAB

ALASKA TESTLAB
4040 B STREET
ANCHORAGE ALASKA 99503

Sheet 7 of 8
W. O. No. A 18322
Date 16 DEC 77
Technician JRS

Textural Class GRAVELLY SILTY SAND / GRAVELLY SANDY SILT
Frost Class F-4 Unified Class SM
Plastic Properties
Date Received

Client BOB KUBICK
Project PORTER PROPERTY
Sample Number GROUP D
Location
Sample Taken By O.M. HATCH



U.S. STD. SIEVE	CUM. % PASS.
2	
1 1/2	
1	100
3/4	87
1/2	5
3/8	83
4	76
10	69
20	61
40	55
80	48
100	—
200	39
0.02 MM	

23.8 %
S 37.2 %
SAND

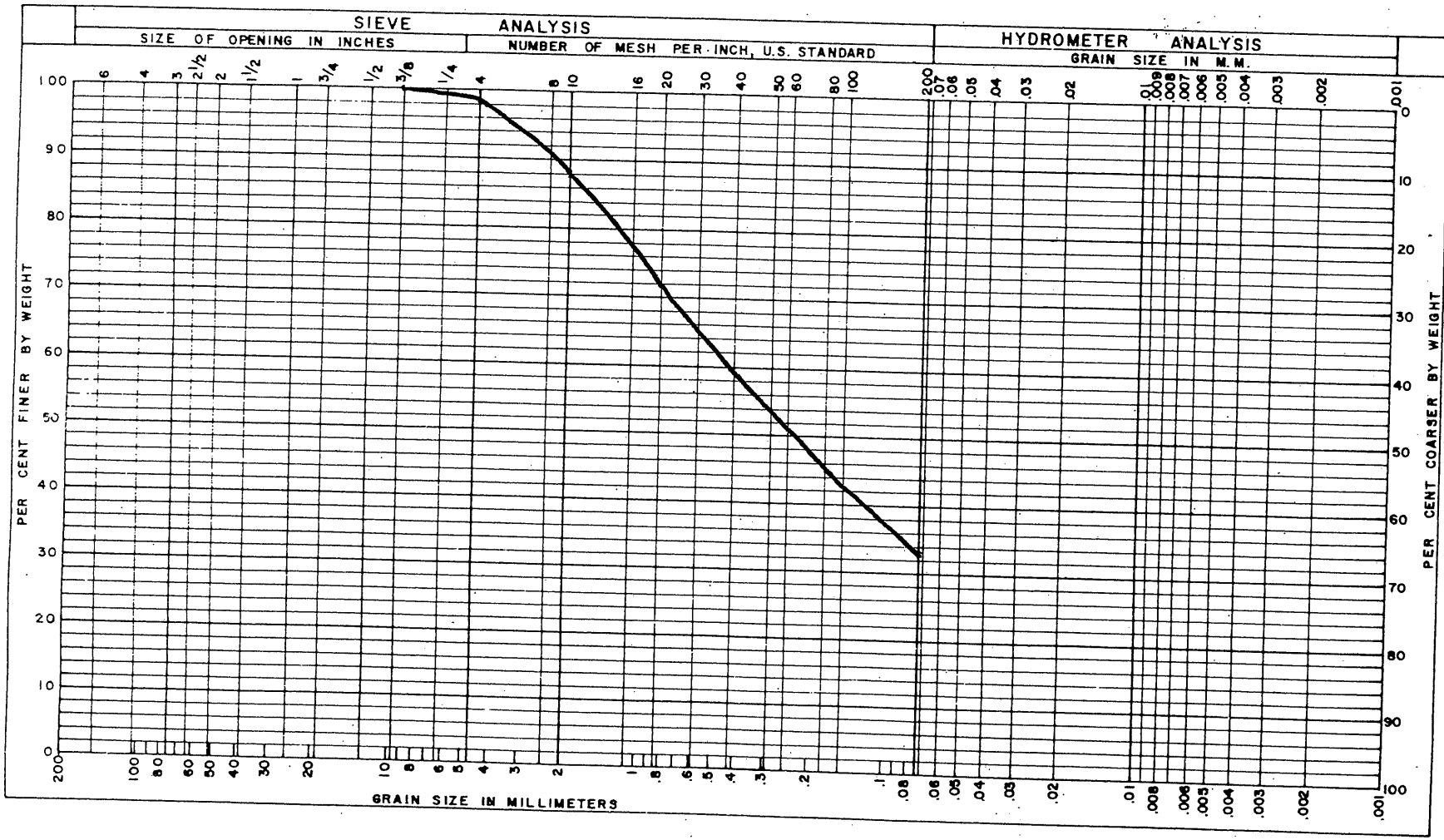
ALASKA TESTLAB

ALASKA TESTLAB
4040 B STREET
ANCHORAGE ALASKA 99503

Sheet 8 of 8
W. O. No. A18322
Date 16 DEC 77
Technician JRS

Textural Class PULVERIZED BEDROCK
Frost Class ____ Unified Class (SM)
Plastic Properties ____
Date Received ____

Client BOB KUBICK
Project POTTER PROPERTY
Sample Number GROUP E
Location ____
Sample Taken By O.M. HATCH



U.S. STD. SIEVE	CUM. % PASS.
2	
1 1/2	
1	
3/4	
1/2	
3/8	100
4	98.5
10	88
20	72
40	59
80	45
100	—
200	33.2
0.02 MM	