

Report on

**GEOTECHNICAL INVESTIGATIONS
MACKENZIE HIGHWAY
MILE 544 to MILE 635**

Prepared for

DEPARTMENT OF PUBLIC WORKS OF CANADA



Volume 4

April 20, 1973



R.M. HARDY & ASSOCIATES LTD.
CONSULTING ENGINEERING & TESTING



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This report is in seven volumes. A Table of Contents is at the front of each volume.

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APPENDIX D

Explanation Sheets

EXPLANATION OF TERMS AND SYMBOLSUSED ON TEST HOLE LOG SHEETSDepth

This column refers to the depth below the ground surface in feet.

Sample Number

Tube and core samples were numbered consecutively from the surface. Grab samples were not numbered.

Sample Type

This column indicates the depth interval and condition of each sample attempted. Undisturbed samples in this program were obtained with Shelby tubes of 18 inches length and 3 inches diameter, manufactured from 11 gauge steel, or by core drilling. Cores were of 2.85 inch diameter and up to 36 inches long.

Disturbed samples were obtained from the returned cuttings.

T indicates tube sample

C indicates core sample

 indicates large grab sample

Note: Grab samples taken for water content and visual examination are not indicated in this column.

Percent Recovery

This column shows the length of sample recovered as a percentage of the length attempted. 100% recovery is not indicated and may be assumed where no value is shown.

Penetration Resistance

No standard penetration tests were performed during this program.

Soil Symbol

The soil symbols used are explained in full on page 5 of this appendix.

Soil Description

Soils of different engineering classification are grouped generically for ease of reference. The system used is the Modified Unified Classification System for Soils.

Frozen Ground

The depth intervals over which frozen and unfrozen ground were encountered are indicated by F and UF respectively. No attempt was made to differentiate between seasonal frost and permafrost.

Ice Description

The ice content of permafrost soils has been classified according to the National Research Council System for describing permafrost. A brief review of the NRC System is contained on page 9 of this appendix. Where no entry is made, the type was not recorded in the field.

The amount of ice contained in a soil sample was estimated in the field laboratory by inspection. The value arrived at by the laboratory technician has been left unchanged.

Water Content

The natural water content of the soil at the time of drilling is plotted against depth on the chart at the right hand side of the log. The water content, which is indicated by a circle, is expressed as a percentage of the dry weight of the soil. It will be observed that water contents in excess of 100% are indicated in the column at the right of the chart by figures.

Volume of Ice

The total volume of ice in undisturbed samples is indicated on the same chart as water contents. The value is indicated by a triangle. This volume is the total volume of ice in an undisturbed sample and includes interstitial ice, as well as excess ice, and is expressed as a percentage of the total volume of the sample.

Grain Size Analysis

The proportions of clay, silt, sand and gravel in a sample are summarized. Grain size curves for each sample so analyzed are on separate sheets.

Wet Density

The wet in situ density of undisturbed samples is the total weight of the sample in pounds (including ice and water) divided by the volume of the sample in cubic feet.



Dry Density

The dry in situ density of undisturbed samples is the weight of dry soil divided by the volume of the sample in cubic feet.

Atterberg Limits

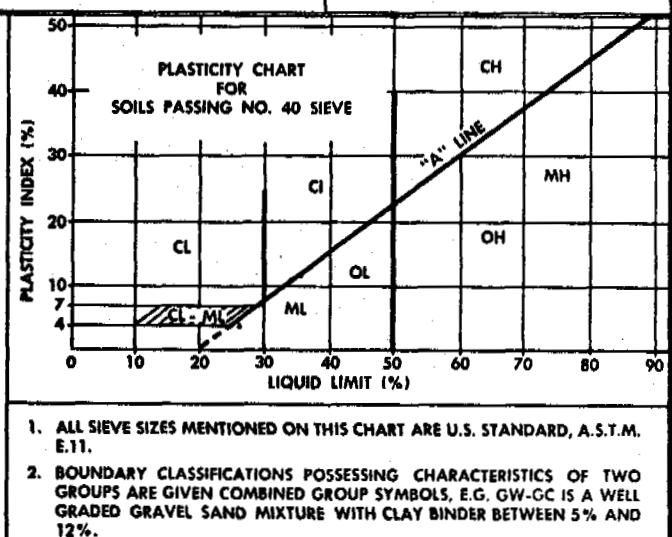
The plastic and liquid limits are shown on the water content chart by a horizontal bar. The Atterberg system is discussed in the following section.

NOTES ON ATTERBERG LIMITS

Soils which possess a significant fraction of clay can exist in liquid, plastic or solid states according to the water content. Where the water content is very high, so that the soil is in the form of a slurry, the soil behaves as a liquid. If the water content is reduced, for example through evaporation, the clay will enter into a plastic state. If the water content is reduced yet further, the clay will become a solid. The transition from one state to another occurs gradually over a range of water content. Atterberg, a Swedish agronomist, developed a method for delineating the boundaries between the three states. If his method is used, the water content which marks the dividing line between the plastic and liquid state is known as the Liquid Limit. These water contents are all expressed as percentages of the dry weight of soil. The range of water content between the plastic

MODIFIED UNIFIED CLASSIFICATION SYSTEM FOR SOILS

MAJOR DIVISION		GROUP SYMBOL	GRAPH SYMBOL	COLOR CODE	TYPICAL DESCRIPTION	LABORATORY CLASSIFICATION CRITERIA	
COARSE-GRAINED SOILS (MORE THAN HALF BY WEIGHT LARGER THAN 200 SIEVE)	GRAVELS MORE THAN HALF GRAINS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)	GW	GRAPH SYMBOL: GW	RED	WELL GRADED GRAVELS, LITTLE OR NO FINES	$C_u = \frac{D_{60}}{D_{10}} > 6 \quad C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}} = 1 \text{ to } 3$
		DIRTY GRAVELS (WITH SOME FINES)	GP	GRAPH SYMBOL: GP	RED	Poorly graded gravels, and gravel-sand mixtures, little or no fines	NOT MEETING ABOVE REQUIREMENTS
		CLEAN SANDS (LITTLE OR NO FINES)	GM	GRAPH SYMBOL: GM	YELLOW	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES	CONTENT OF FINES EXCEEDS 12% ATTERBERG LIMITS BELOW "A" LINE P.I. LESS THAN 4
			GC	GRAPH SYMBOL: GC	YELLOW	CLAYEY GRAVELS, GRAVEL-SAND-(SILT) CLAY MIXTURES	
	SANDS MORE THAN HALF FINE GRAINS SMALLER THAN NO. 4 SIEVE	DIRTY SANDS (WITH SOME FINES)	SW	GRAPH SYMBOL: SW	RED	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	$C_u = \frac{D_{60}}{D_{10}} > 4 \quad C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}} = 1 \text{ to } 3$
			SP	GRAPH SYMBOL: SP	RED	Poorly graded sands, little or no fines	NOT MEETING ABOVE REQUIREMENTS
		CLEAN SANDS (LITTLE OR NO FINES)	SM	GRAPH SYMBOL: SM	YELLOW	SILTY SANDS, SAND-SILT MIXTURES	CONTENT OF FINES EXCEEDS 12% ATTERBERG LIMITS BELOW "A" LINE P.I. LESS THAN 4
			SC	GRAPH SYMBOL: SC	YELLOW	CLAYEY SANDS, SAND-(SILT) CLAY MIXTURES	
		SILTS BELOW "A" LINE NEGIGIBLE ORGANIC CONTENT		WL < 50%	ML	GREEN	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY SANDS OF SLIGHT PLASTICITY
	CLAYS ABOVE "A" LINE ON PLASTICITY CHART NEGIGIBLE ORGANIC CONTENT	WL > 50%	MH	GRAPH SYMBOL: MH	BLUE	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS, FINE SANDY OR SILTY SOILS	CLASSIFICATION IS BASED UPON PLASTICITY CHART (see below)
		WL < 30%	CL	GRAPH SYMBOL: CL	GREEN	INORGANIC CLAYS OF LOW PLASTICITY, GRAVELLY, SANDY, OR SILTY CLAYS, LEAN CLAYS	
		30% < WL < 50%	CI	GRAPH SYMBOL: CI	GREEN-BLUE	INORGANIC CLAYS OF MEDIUM PLASTICITY, SILTY CLAYS	
		WL > 50%	CH	GRAPH SYMBOL: CH	BLUE	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	
ORGANIC SILTS & CLAYS BELOW "A" LINE	WL < 50%	OL	GRAPH SYMBOL: OL	GREEN	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	WHENEVER THE NATURE OF THE FINE CONTENT HAS NOT BEEN DETERMINED, IT IS DESIGNATED BY THE LETTER "F", E.G. SF IS A MIXTURE OF SAND WITH SILT OR CLAY	
	WL > 50%	OH	GRAPH SYMBOL: OH	BLUE	ORGANIC CLAYS OF HIGH PLASTICITY		
HIGHLY ORGANIC SOILS		PI	GRAPH SYMBOL: PI	ORANGE	PEAT AND OTHER HIGHLY ORGANIC SOILS	STRONG COLOR OR ODOR, AND OFTEN FIBROUS TEXTURE	





and liquid limit is known as the plastic range and the numerical difference between the liquid and plastic limits is called the Plasticity Index.

It will be appreciated that where the natural water content is in excess of the liquid limit, the soil mass will be most unstable and will readily flow into excavations or trenches. Such considerations will not apply where the soil mass is kept frozen. However, in cases where the frozen soil is allowed to thaw, the relationship between the natural water content and liquid limit becomes critical.

On page 5 there is a chart showing the relationship between the Plasticity Index, the Liquid Limit and the group symbols of the Unified Classification System. The Atterberg Limit system is extremely useful for identifying and classifying soils.

NOTES ON THE RADFORTH SYSTEM

FOR CLASSIFYING PEAT

The Radforth classification system for describing muskeg (organic terrain) is a method for classifying the three elements of vegetation, topography and organic surface cover using letter and figure symbols. Height and type of vegetation is described by using capital letters (A through I). Topography is described by using lower case letters (a through p) Organic cover type if described by using figures (1 through 16).

Table I outlines these figure symbols and the peat structure and type represented by them. A complete description of the Radforth system is contained in "Guide to a Field Description of Muskeg" published by National Research Council, Ottawa, from which has been copied Table I.



TABLE I
SUBSURFACE CONSTITUTION

Predominant Characteristic	Category	Name
	1.	Amorphous-granular peat
	2.	Non-woody, fine-fibrous peat
	3.	Amorphous-granular peat containing woody fine fibres
	4.	Amorphous-granular peat containing woody fine fibres
	5.	Peat, predominantly amorphous-granular, containing non-woody fine fibres, held in a woody, fine fibrous framework.
	6.	Peat, predominantly amorphous-granular containing woody fine fibres, held in a woody, coarse-fibrous framework.
	7.	Alternate layering of non-woody, fine fibrous peat and amorphous-granular peat containing non-woody fine fibres.
	8.	Non-woody, fine-fibrous peat containing a mound of coarse fibres.
	9.	Wood, fine fibrous peat held in a woody, coarse-fibrous framework.
	10.	Woody particles held in a non-woody, fine-fibrous peat.
	11.	Woody and non-woody particles held in fine-fibrous peat.
	12.	Woody, coarse-fibrous peat.
	13.	Coarse fibres criss-crossing fine-fibrous peat.
	14.	Non-woody and woody fine-fibrous peat held in a coarse-fibrous framework.
	15.	Woody mesh of fibres and particles enclosing amorphous-granular peat containing fine fibres.
	16.	Woody, coarse-fibrous peat containing scattered woody chunks.

NOTES ON THE NATIONAL RESEARCH COUNCIL
SYSTEM FOR DESCRIBING PERMAFROST

Ground ice occurs in three conditions. Non-visible, visible (but less than one inch in thickness) and clear ice. Non-visible ice is designated N with an added suffix of one or two lower case letters. Visible ice is designated V with an added suffix of one lower case letter. Clear ice is designated ICE with notes on ice type.

TABLE IV

<u>Symbol</u>	<u>Description</u>
Nf	Non-visible ice, frozen soil in friable condition.
Nbn	Non-visible ice, frozen soil well bonded, no excess ice.
Nbe	Non-visible ice, frozen soil well bonded, excess ice revealed on melting sample.
Vx	Visible ice crystals.
Vc	Ice coatings on soil particles.
Vr	Ice formations irregularly orientated.
Vs	Stratified ice lenses.
ICE	Clear ice over one inch in thickness.
ICE + soil	Ice over one inch thick with soil inclusions.

A complete description of this system is contained in "Guide to a Field Description of Permafrost" published by National Research Council, Ottawa.

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DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

DOWNE E B		FIELD ENG S.R.	DATE DRILLED: 7/1/73	AIRPHOTO NO: A21253-12	CHAINAGE: 4.5	OFFSET:	TEST HOLE							
CKD:	TECH: O.R.	RIG: FAILING 1000	SURFACE DRAINAGE:	VEGETATION:		ELEV:	MILE	B,C,S	NUMBER					
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNITED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	O = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)	GRAIN-SIZE ANALYSIS	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY % SILT % SAND % GRAVEL %				
1														
2														
4														
6														
8														
10														
12														
14														
16														
18														
20														
22														
24														

PLASTIC LIMIT → ← LIQUID LIMIT

20 40 60 80 100 100+

The diagram shows soil profiles from depths of 1 to 24 feet. At each depth, there are two data points: a circle representing water content (%) and a triangle representing ice content (%). The water content generally decreases with depth, starting around 75% at 1 foot and dropping to near 0% at 24 feet. The ice content is higher at shallower depths (up to ~30%) and becomes negligible at greater depths.

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DWNR E.P. FIELD ENG: G. Mc. DATE DRILLED: 1/1/73 AIRPHOTO NO: A-20575-2S CHAINAGE: 2000' - 2000'

CKD TECH: D.R. RIG: 22-115-170 SURFACE DRAINAGE: VEGETATION:

OFFSET:

TEST HOLE

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DWN: E.B		FIELD ENG: G.Mc.		DATE DRILLED: 7/1/73		AIRPHOTO NO: A22732-24		CHAINAGE: 655 + 25		OFFSET:		TEST HOLE				
CKD:	TECH:	D.R.	RIG:	FAILING 100%	SURFACE DRAINAGE:	VEGETATION: SEE RETURNS	ELEV:	MILE	B.C.S	NUMBER	REMARKS					
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS	CLAY	SILT	SAND	GRAVEL	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)
1	1	T	100		Pt	PEAT: ORGANIC SILT, MED. PLASTIC, BLACK, FIBROUS ORGANICS	1'									
2	2	T	100						2							
3	3	T	100		SM	SAND: SILTY, FINE GRAINED, CLAY LENTILS, GRAY, BROWN		Vx's 25%								
4	4	C	100													
6	5	C	60		CH	CLAY: SILTY, MED. TO HIGH PLASTIC, DARK BROWN	5 1/2	Vx 15%								
8	6	C	100		ML	SILT: CLAYEY, LOAM PLASTIC, TRACE OF FINE SAND, LIGHT TAN, BROWN	6 1/2	Nbo								
10	7	C	100		SM	SAND: HEAVY SILTY, VERY FINE, MED. PLASTIC, GREY	9									
12	8	C	100		CI	CLAY: SILTY, MED. PLASTIC, DARK BROWN	11	Vx vs 10% 1/4"								
14	9	C	100		SM	SAND: SILTY, MED. PLASTIC, HIGH PLASTIC, DARK BROWN	13 1/2	Vx vs 20% 1/8"								
16	10							Vbn								
18																
20																
22																
24																
						END OF HOLE										

SCRUB SURFACE 2" TO
3' & SCATTERED
BIRCH & WILLOW

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DWNE E. B.	FIELD ENG: G. Mc.	DATE DRILLED: 9/1/73	AIRPHOTO NO: A 22233-28	CHAINAGE: STA. 638+00	OFFSET:		TEST HOLE												
CKD:	TECH: D. R.	RIG: FAILING 1000	SURFACE DRAINAGE: SEE SURVEYS	VEGETATION: SEE SURVEYS	ELEV:		GRAIN-SIZE ANALYSIS			MILE	B.C.S	NUMBER							
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	PLASTIC LIMIT 40 LIQUID LIMIT 80									
										%	CLAY	SILT	SAND	GRAVEL	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)			
2					OL	ORGANIC SILT: PEAT INCLUSIONS. LOW PLASTIC PART BROWN	F	70%									569	C	205
4						CLAY: SLIGHTLY SILTY HIGH PLASTIC BROWN		60%									REMARKS		
6					CH			40%									LIGHT BRUSH, SCRUB, SPRUCE, ODD BIRCH & WILLOW		
8								25%											
10																			
12																			
14																			
16					CI	HIGH PLASTIC GREY		15%											
18					CH	END SETTLE													
20																			
22																			
24																			

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OWN: E.B		FIELD ENG: G. Mc.		DATE DRILLED: 10/1/73		AIRPHOTO NO: A22953-28		CHAINAGE: 557+20		OFFSET:		TEST HOLE		
CKD	TECH	D. H.	RIG	FALCON 1000	SURFACE DRAINAGE	VEGETATION	ELEV:	MILE	B.C.S	NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS	WET DENSITY (PCF)	DRY DENSITY (PCF)	REMARKS	
										CLAY	SILT	SAND	GRAVEL	
2					PL	PEAT:	F	90%	2	%	%	%	%	
					SM	SAND: VERY SATIN, FINE GRAINED NON PLASTIC	1 1/2		4	○	△	○		
4	1	C	65		CL	CLAY: MED TO HIGH PLASTIC DARK BROWN	3	VS 65% 1/4"	6	○	△	○		
6	2	C	100		CH				8	○	○			
8	3	C	100						10	○	○			
10	4	C	100						12	○	○			
12	5	C	100						14	○	○			
14	6	C	100						16	○	○			
16									18					
18									20					
20									22					
22									24					
24						END OF HOLE							TAMMERRACK 15'-20' HIGH; OLD BIRCH	

○ = WATER CONTENT (% OF DRY WEIGHT)
 △ = ICE CONTENT (% OF SAMPLE VOLUME)

PLASTIC LIMIT 20 LIQUID LIMIT 80 100+
 20 40 60 80 100 100+

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OWN: E. B. FIELD ENG: G. M. DATE DRILLED 10/1/73 AIRPHOTO NO: A 22783-2S CHAINAGE: STA 634 #02

OFFSET:

CKD: TECH: D.H. RIG: FAILING 1022

SURFACE DRAINAGE

VEGETATION:

1000' ELEVATION

8

TEST - HOLE

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OWNER E.B.	FIELD ENG:	DATE DRILLED:	10/1/73	AIRPHOTO NO:	A2273E-18	CHAINAGE:	670 +00	OFFSET:					TEST HOLE				
CKD:	TECH:	D.H.	RIG: FAILING 1000	SURFACE DRAINAGE:	SWAMPY	VEGETATION:	TREES ROCK & STONE	ELEV:					MILE	B.C.S	NUMBER		
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	WATER CONTENT (% OF DRY WEIGHT)	ICE CONTENT (% OF SAMPLE VOLUME)	PLASTIC LIMIT	LIQUID LIMIT	CLAY	SILT	SAND	GRAVEL
										20	40	60	80	100	100+		
2					VL	PEAT: CAT. # 6 1/2 SILT: FINE SILT / ORGANIC MATTER PRESENT IN SPOTS LAYER 4 FEET DEEP	30%	VS	2								
4	1	C	100		CL	SILT: MEDIUM TO HIGH PLASTIC DARK BROWN	40%	Vs	4	10%	10%	40	60	100	100+	106.4	72.8
6	2	C	100		CH			Vx Vs 20%	6							114.5	86.7
8	3	C	100					Vx 10%	8							122.9	98.4
10	4	C	100						10							124.7	102.3
12	5	C	100						12								
14	6	C	100						14								
16	7	C	100						16								
18	8	C	100						18								
20									20								
22									22								
24									24								
END OF HOLE 15 1/2								REMARKS									

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
OWN: E. B.	FIELD ENG: G. M.	DATE DRILLED: 10/1/73	AIRPHOTO NO: A22933-28	CHAINAGE: STA 676+00			OFFSET:					TEST HOLE					
CKD: 11	TECH: D.H.	RIG: FAILING 1320	SURFACE DRAINAGE	VEGETATION: SEE FIGURE 8			ELEV:					MILE	B.C.S	NUMBER			
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS					WET DENSITY (PCF)	DRY DENSITY (PCF)	TEST HOLE
										CLAY	SILT	SAND	GRAVEL	%			
2		Pt	PEAT: CAT. #11		F	0%											
			SILT: SANDY-FINE LOW TO NON PLASTIC BROWN			0-2%											
4						2%											
6		CH	CLAY: TRACE OF SILT HIGH PLASTIC BROWN			25%											
8			MED PLASTIC			15%											
10		CI				5%											
12						10%											
14						5%											
16																	
18																	
20																	
22																	
24																	
																	REMARKS
																	SPRUCE, OOD BIRCH

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DRILL HOLE REPORT

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MACKENZIE HIGHWAY

OWN: E.S.		FIELD ENG: G.M.	DATE DRILLED: 10/1/75	AIRPHOTO NO: AHD 17 A-28	CHAINAGE: 564.20	OFFSET:	TEST HOLE																
CKD:	TECH: D.H.	RIG: FAILING 1000	SURFACE DRAINAGE:	VEGETATION:	ELEV:	MILE	B.C.S	NUMBER															
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNITED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	PLASTIC LIMIT	LIQUID LIMIT	100	100+	GRAIN-SIZE ANALYSIS	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS						
										20	40	60	80	100	100+	% CLAY	% SILT	% SAND	% GRAVEL				
2						PEAT: CAT. #15	5	PT		20	40	60	80	100	100+						564.2		
4	1	C	93			CAT. #2	3			2											J.C. 185.7		
6	2	C	93			SILT ORGANIC, CLAYET, SANDY, MED PLASTIC, BLACK	6	ML		4													
8	3	C	93			CLAY: MED PLASTIC	8	C1		6													
10	4	C	93				10			8													
12	5	C	100			HIGH PLASTIC SILT ELEMENTS DARK FRESH	12	CH		10													
14	6	C	100				14			12													
16						END OF HOLE	15			14													
18										16													
20										18													
22										20													
24										22													

O = WATER CONTENT (% OF DRY WEIGHT)

△ = ICE CONTENT (% OF SAMPLE VOLUME)

PLASTIC LIMIT LIQUID LIMIT

20 40 60 80 100 100+

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DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWL: E.B. FIELD ENG: G.M. DATE DRILLED: 10/1/73 AIRPHOTO NO: A22923-16 CHAINAGE: 174.380 + 00				OFFSET:		TEST HOLE											
CKD: / / /	TECH: D.R.	RIG: FAILING 1002	SURFACE DRAINAGE	VEGETATION: SEE REMARKS		ELEV:											
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS					MILE	B.C.S	NUMBER
										CLAY	SILT	SAND	GRAVEL	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS	
										%	%	%	%				
2					OL	SILT: ORGANIC TRAIL OF FINE SAND LOW PLASTIC SWELL RESIST	15%		2								SPRUCE, 30' HIGH 4 TO 6 IN Ø, SCATTER BIRCH & WILLOW
4					SM	SAND: VERY SILTY TRAIL OF CLAY HIGH PLASTIC FINE GRAINED GRAYISH	20%		4								
6					SM	SLIGHTLY SMOOTH	10%		6								
8					SM	SLIGHTLY SILTY	15%		8								
10					SM	GREY BROWN			10								
12									12								
14						GREY			14								
16						END OF SAMPLING			16								
20						END OF HOLE EXPOSURE DAY TO 20 FT.	30		20								
22									22								
24									24								

R.M. HARDY AND ASSOCIATES LTD.					DRILL HOLE REPORT			DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY							
DWNR E.E.	FIELD ENG G.S.C.	DATE DRILLED: 10/1/73	AIRPHOTO NO: A814256-28	CHAINAGE: 564.624 + 00	OFFSET:				TEST HOLE						
CKD	TECH	RIG: TAKING 2000	SURFACE DRAINAGE:	VEGETATION: SCATTERED	ELEV:	GRAIN-SIZE ANALYSIS				MILE	B,C,S	NUMBER			
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	CLAY	SILT	SAND	GRAVEL	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)
										%	%	%	%		
2						SAND: FINE GRAINED SILT. MINERALIC PEAT INCLUSIONS --- 2 1/2 WITH ORGANIC LIGHT BROWN	F	2%							
4	1	C	35		SM		Nde		2	○	○	○	○	121.8	94.0
6	2	C	100		SM				4	○	○			121.3	99.4
8	3	C	100						6	○	△			118.6	95.2
10	4	C	100						8	○	△			116.2	89.9
12	5	C	100						10	○	△			117.9	91.9
14									12	○	△			114.8	88.7
16						CLAY: SILT LENSES HIGH PLASTIC LIQUID	CH	10%	14	○	△			122.2	77.8
18						END OF HOLE			16	○	△				
20									18						
22									20						
24									22						
									24						

○ = WATER CONTENT (% OF DRY WEIGHT)
 △ = ICE CONTENT (% OF SAMPLE VOLUME)

PLASTIC LIMIT LIQUID LIMIT
 20 40 60 80 100 100+

REMARKS:
 SURFACE 20' TO 30'
 WITH SCATTERED
 BIRCH & WILLOW

GS = 2.70
 GS = 2.73
 GS = 2.76
 GS = 2.68

R M HARDY AND ASSOCIATES LTD.

DBII I HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
OWN: E. B.		FIELD ENG: G. M.	DATE DRILLED: 10/1/72	AIRPHOTO NO: A22933-28		CHAINAGE: STA. 707+00	OFFSET:	TEST HOLE									
CKD		TECH: D.R.	RIG: FALCON 1000	SURFACE DRAINAGE:		VEGETATION: SEE REMARKS	ELEV:										
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	MILE	B,C,S	NUMBER
									CLAY	SILT	SAND	GRAVEL					
									%	%	%	%					
2				CL	SILT: ORGANIC TRACE OF FINE SAND LOW PLASTIC DARK BROWN	F	70%										
4					SANDY		75%	2									
6				ML	NON PLASTIC		15%	4									
8					SAND:		12%	6									
10				SM	SILTY FINE GRAINED NON PLASTIC SHE: BROWN			10									
12					SLIGHTLY CLAYEY		5%	12									
14				SC			15%	14									
16				CL	CLAY: SLIGHTLY SILTY MED. PLASTIC GEO: IRREGULAR		15%	16									
					END OF HOLE			18									
20								20									
22								22									
24								24									
REMARKS																	

R. M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWN: E.P.		FIELD ENG: S.F.	DATE DRILLED: 1972	AIRPHOTO NO: 1	CHAINAGE: 563.00	OFFSET:	TEST HOLE										
CKD:	TECH: D.R.	RIG: FALCON 1002	SURFACE DRAINAGE:	VEGETATION: BIRCH FOREST	ELEV:		MILE	B.C.S	NUMBER								
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (PCF)	DRY DENSITY (PCF)	REMARKS	
										CLAY	SILT	SAND	GRAVEL				
2						PEAT: SILT: FINE SAND / NON PLASTIC / LIGHT BROWN	1/2	F	30%								563 C 217
4						SAND: FINE GRAINED SILT: / NON PLASTIC LT. BROWN	5		75%	2							DWARF SPRUCE, 20' HIGH, SCATTERED SIREN
6						CLAY: SILT / MED PLASTIC DARK BROWN	7		10%	4							
8						MED TO HIGH PLASTIC TRACE OF FINE SAND GREY	9		20%	6							
10						HIGH PLASTIC	15			8							
12						END OF HOLE	16			10							
14										12							
16										14							
18										16							
20										18							
22										20							
24										22							
										24							

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DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

R.M. HARDY AND ASSOCIATES LTD.					DRILL HOLE REPORT			DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY												
DWNR E.B.	FIELD ENG: G. Mc.	DATE DRILLED: 11/1/73	AIRPHOTO NO: 422933-29	CHAINAGE: STA. 725+00	OFFSET:			TEST HOLE												
CKD	TECH: D. H.	RIG: FAILING 1000	SURFACE DRAINAGE:	VEGETATION: SPRUCE - CED. BLACK	ELEV:			MILE	B.C.S	NUMBER										
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)	PLASTIC LIMIT	LIQUID LIMIT	CLAY	SILT	SAND	GRAVEL	WT. DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS	
										%	20	40	60	80	100	100+				
2						Pt PEAT: SAND: TRACE OF SILT FINE GRAINED NON PLASTIC LIGHT BROWN	1/2	F	15%											
4									2	○										
6						SILT: SLIGHTLY CLAYEY LOW PLASTIC DARK BROWN	5		3%											
8						SAND: CLAYEY TRACE OF SILT LOW PLASTIC DARK BROWN	7		23%											
10						CLAY: SANDY SILTY MED TO HIGH PLASTIC DARK BROWN	9		40%											
12						CLAY: MED PLASTIC	11		20%											
14						SILT: VERY CLAYEY MED PLASTIC DARK BROWN	13		50%											
16						SILT: SLIGHTLY CLAYEY	15		30%											
18						CLAYEY TRACE OF SAND NO PLASTIC	17		15%											
20						NO SAND	19		15%											
22									20											
24									22											
									24											

CONTINUED

SHEET 1 OF 2

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWNR E.B.	FIELD ENG: G. Mc.	DATE DRILLED: 11/1/73	AIRPHOTO NO: A22733-23	CHARGE: 732 + 50		OFFSET:	TEST HOLE										
CKD	TECH: D.H.	RIG: FAILING 1000	SURFACE DRAINAGE	VEGETATION: SPRUCE & BIRCH		ELEV:	GRAIN-SIZE ANALYSIS			MILE	B.C.S	NUMBER					
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	Penetration Resistance	Unified Soil Symbol	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	CLAY	SILT	SAND	GRAVEL	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS	
										%	%	%	%				
2					Pt	PEAT	F	VS 25% 1/8	2								
4	1	C			SM	SANDY, SILTY, LOW TO NON PLASTIC, ORGANIC, BROWN			4	O							
6	2	C			CI	CLAY SANDY, SILTY, MED TO HIGH Plastic GREY BROWN		Vx 20%	6		O	△					
8	3	C						Vx 25%	8								
10	4	C							10								
12	5	C							12								
14	6	C							14								
16	7	C							16								
18	8	C							18								
20						END OF HOLE			20								
22									22								
24									24								

O = WATER CONTENT (% OF DRY WEIGHT)
 △ = ICE CONTENT (% OF SAMPLE VOLUME)

PLASTIC LIMIT ————— LIQUID LIMIT

20 40 60 80 100 100+

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
OWN: E.B.	FIELD ENG: G. P.M.	DATE DRILLED: 11/1/73	AIRPHOTO NO: A22733-23	CHAINAGE: STA. 734 +20		OFFSET:											
CKD	TECH: D.H.	RIG: FAIRLYS 1020	SURFACE DRAINAGE: 0	VEGETATION: SPRUCE, BIRCH		ELEV:							TEST HOLE				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS					MILE	B.C.S	NUMBER
										CLAY	SILT	SAND	GRAVEL	WET DENSITY (PCF)	DRY DENSITY (PCF)		
										%	%	%	%			REMARKS	
2		PT	PEAT		F	NF			20	40	60	80	100	100+			
4			SAND:	SILTY FINE GRAINED NON PLASTIC LIGHT BROWN					2								
6		SM							4								
8				BROWN				Vx 2%	6								
10									8								
12									10								
14									12								
16									14								
18									16								
20									18								
22									20								
24									22								
									24								
CONTINUED																	

R. M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

OWN E. 3/4		FIELD ENG: G. MC	DATE DRILLED: 11/1/73	AIRPHOTO NO: A 2293E - 28	CHAINAGE: 734 + 00	OFFSET:	TEST HOLE SHEET 2 OF 2							
CKD	TECH: D. H.	RIG: 1000	SURFACE DRAINAGE:		VEGETATION: - 5% CROWN	ELEV:	MILE	B,C,S	NUMBER					
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	- REMARKS	
26									26	CLAY	%	%	%	%
28									28	SILT				
30					C1	CLAY; Slightly Silty Medium Spt. Med Plastic Gly		Vx	30	CLAY				
32					NH	SILT; GREY Med Plastic Tense or Sand Gly		Vx	32	SILT				
34					ML	Slightly Clayey No to Low Plastic		Vx	34	SILT				
36					NH	Very Clayey Med Plastic		Vx	36	SILT				
38					CH	CLAY; Slight Med Plastic Grey		Vx	38	SILT				
40								Vx	40	SILT				
42								Vx	42	SILT				
44					NH	SILT; Grey		Vx	44	SILT				
46								Vx	46	SILT				
48								Vx	48	SILT				
50								Vx	50	SILT				

○ = WATER CONTENT (% OF DRY WEIGHT)
 △ = ICE CONTENT (% OF SAMPLE VOLUME)

PLASTIC LIMIT ————— LIQUID LIMIT

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

OWN: E.A.		FIELD ENG: G.M.	DATE DRILLED: 11/1/73	AIRPHOTO NO: A22433-13	CHAINAGE: 737+50	OFFSET:	TEST HOLE									
CKD:	TECH: O.H.	RIG: FAULINA 1000	SURFACE DRAINAGE:	VEGETATION:	ELEV:	MILE	B.C.S	NUMBER								
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS	REMARKS					
										CLAY %	SILT %	SAND %	GRAVEL %	WET DENSITY (I.P.F.)	DRY DENSITY (I.P.F.)	
2																563 C 222
2																
4	1	C	120					Nbe								Gs = 2.74
4	2	C	53													
6	3	C	100													
8	4	C	100													
10	5	C	100													
12	6	C	100													
14	7	C	100													
16	8	C	15													
18	9	C	100													
20	10	C	100													
22	11															
24																

○ = WATER CONTENT (% OF DRY WEIGHT)
△ = ICE CONTENT (% OF SAMPLE VOLUME)

PLASTIC LIMIT 20 40 60 80 100 100+

LIQUID LIMIT

REMARKS

Gs = 2.74

Gs = 2.74

Gs = 2.69

Gs = 2.81

Gs = 2.73

Gs = 2.81

Gs = 2.67

SHEET 1 OF 3

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DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

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DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

DWNE-58/10

FIELD ENG: G. M.

DATE RECORDED: 6/16/00

NOTE NO.

NEW YORK

MACK

KENZIE HIGHWAY'

CANADA

— 1 —

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DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

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MACKENZIE HIGHWAY**

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DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

DWNE E.B

ELD ENG: G. M.

DATE DRILLED: 11/17/73 AIRP

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS,
MACKENZIE HIGHWAY**

OFFSET:

ELEVEN

三十六

CKD

TECH: 6/15

BIG: 5541-VS / 222 SUB

DRAINAGE

ATION:

BUA 1581CE 103-104 ELE

TEST HOLE

R.M.HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

OWN: E. B.

FIELD ENG: S. D.

DATE DRILL

D-11/173 A

PHOTO NO:

१८७३३ -

CHAINAGE STA. 764+00

10 of 10

OFFSET:

— 1 —

1

DATE 10/15

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY											
DW# E.B.	FIELD ENG: G.D.	DATE DRILLED: 4/1/73	AIRPHOTO NO: 22772-20	CHAINAGE: 11374+00	OFFSET: 350'			TEST HOLE											
CKD:	TECH: D.R.	RIG: 1000	SURFACE DRAINAGE:	VEGETATION:	ELEV:					MILE	B.C.S	NUMBER							
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	PLASTIC LIMIT	LIQUID LIMIT	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS					
										20	40	60	80	100	100+	CLAY	SILT	SAND	GRAVEL
2	1	C		PE		FEAT:	F									WGT 552.1			
4	2	C		SM		SAND: SILTY FINE GRAINED NONPLASTIC GLEY	4 1/2									WGT 515.5			
6	3	C														WGT 440.9			
8	4	C														WGT 323.4			
10																			
12																			
14						END OF HOLE	14												
16																			
18																			
20																			
22																			
24																			

○ = WATER CONTENT (% OF DRY WEIGHT)
 △ = ICE CONTENT (% OF SAMPLE VOLUME)

PLASTIC LIMIT — LIQUID LIMIT

20 40 60 80 100 100+

To West of &
 On Seismic Line

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

R. M. HARDY AND ASSOCIATES LTD.					DRILL HOLE REPORT			DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY												
DW: E.B.	FIELD ENG: G. Mc.	DATE DRILLED: 11/17/73	AIRPHOTO NO: A 22753-28	CHAINAGE: STA. 776+00	OFFSET:															
CRD: 12	TECH: D.R.	RIG: FAILING 1000	SURFACE DRAINAGE: FLOOR	VEGETATION: SEE REMARKS		ELEV:	TEST HOLE													
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	○ = WATER CONTENT (% OF DRY WEIGHT)	△ = ICE CONTENT (% OF SAMPLE VOLUME)	PLASTIC LIMIT	LIQUID LIMIT	CLAY	SILT	SAND	GRAVEL	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	MILE B.C.S NUMBER
1						PEAT:						20	40	60	80	100	100+			
2					ML	SILT: FINE SANDY LOW PLASTIC TRACE OF ORGANICS GREY BROWN	1/4	F	20%										567 C 231A	
4					SM	SAND: FINE GRAINED SILTY NON PLASTIC BROWN	3		5%			2							REMARKS	
6									7%			4							SPRUCE, 20 TO 30 FT. HIGH BOD. BIRCH, WILLOW	
8												6								
10												8								
12					SM							10								
14					ML	SILT: SANDY LOW PLASTIC GREY BROWN	11					12								
16					SM	SAND: SILTY NON PLASTIC GREY BROWN	15					14								
18						END OF SAMPLING	16					16								
20						→ SAME SOIL AS ABOVE	30					18								
22						END OF HOLE EXCAVATION						20								
24												22								
												24								

R.M.HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

DWNR: E.A. FIELD ENG: G.Mc. DATE DRILLED: 11/17/73 AIRPHOTO NO: A22933-28 CHAINAGE STA. 156700
LWD: ✓ TECH: D.R. RIG: FAILING 1000 SURFACE DRAINAGE: ✓ VEGETATION: SEE REMARKS
GRAIN

UNRE Z-20 FIELD END SURVEY TFCM: D.B. RIG FAILING 1000 SURFACE DRAINAGE VEGETATION GRAIN

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

OWN: E.B. FIELD ENG: G.M. DATE DRILLED: 11/17/75 AIRPHOTO NO: 790+00 CHAINAGE: 790+00 OFFSET:				TEST HOLE								
CKD:	TECH: D.A.	RIG: FALCON 1000	SURFACE DRAINAGE: FINE	VEGETATION: SPARSE	ELEV:	MILE	B.C.S	NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	DEPTH (FEET)	ICE DESCRIPTION	CLAY %	SILT %	SAND %	GRAVEL %	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
1				16	DEPT							
2		C	55	OL	SILT: SILTY, ORGANIC, GLACIARIC, BLACK							
4	1	C	55	SM	SAND: SILTY, FINE GRAINED, NON PLASTIC, BROWN							
6	2	C	97									
8	3	C	75									
10					END OF HOLE							
12												
14												
16												
18												
20												
22												
24												

○ = WATER CONTENT (% OF DRY WEIGHT)
 △ = ICE CONTENT (% OF SAMPLE VOLUME)

PLASTIC LIMIT 20 40 60 80 100 100+ LIQUID LIMIT

WC = 109.3

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

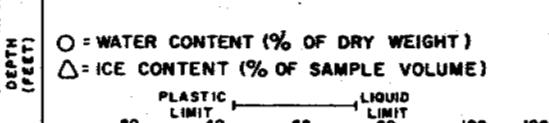
D.W.E. S.		FIELD ENG: G. M.	DATE DRILLED: 15/11/73	AIRPHOTO NO: A22223-24	CHAINAGE: 197 +00	OFFSET:	TEST HOLE						
CKD	TECH	D.H.	RIG: FALLS, 100'	SURFACE DRAINAGE: POOR	VEGETATION: SHrub, 300 ft E	ELEV:	MILE	B.C.S	NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS			
										CLAY	SILT	SAND	GRAVEL
										%	%	%	%
										WET DENSITY (P.C.F.)			
										DRY DENSITY (P.C.F.)			
										REMARKS			
1						FEAT: SILT: ORGANIC NONPLASTIC	1/2	F Nbn	2				
2						GR: CLAYEY	2		4	○			
4						FINE GRAINED, CLAYEY, NON TO LOW PLASTIC BROWN	4		6	○			
6						SILT: FINE GRAINED NON PLASTIC UNIFORM BROWN	6		8	○			
8									10	○			
10									12	○			
12									14				
14									16				
16						END OF HOLE	16		18				
18									20				
20									22				
22									24				
24													

○ = WATER CONTENT (% OF DRY WEIGHT)
 △ = ICE CONTENT (% OF SAMPLE VOLUME)

PLASTIC LIMIT ————— LIQUID LIMIT

20 40 60 80 100 100+ 100+

R. M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
OWN: E.B.	FIELD ENG: G.Mc.	DATE DRILLED: 15/1/73	AIRPHOTO NO: A22733-22	CHAINAGE: 50+00		OFFSET:			TEST HOLE									
CKD:	TECH: D.H.	RIG: FALLING 1000	SURFACE DRAINAGE:	VEGETATION:		ELEV:					MILE	B.C.S	NUMBER					
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	WATER CONTENT (% OF DRY WEIGHT) ICE CONTENT (% OF SAMPLE VOLUME)				GRAIN-SIZE ANALYSIS				
										PLASTIC LIMIT	LIQUID LIMIT			CLAY	SILT	SAND	GRAVEL	
										20	40	60	80	%	%	%	%	
										100	100+			WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS		
2						1/2	F	Nan										
4	1	C	98															
6	2	C	100															
8	3	C	87															
10	4	C	70															
12	5	C	100															
14																		
16						END OF HOLE	16											
18																		
20																		
22																		
24																		



SILTY,
FINE-FR MED,
NONPLASTIC,
GREY BROWN

END OF HOLE

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

OWN: E.B		FIELD ENG: G.M.		DATE DRILLED: 15/1/73		AIRPHOTO NO: A22933-28		CHAINAGE: STA. 818 +00		OFFSET:		TEST HOLE				
CKD: 123		TECH: D.H.		RIG: TALON 3000		SURFACE DRAINAGE: ✓		VEGETATION: SPARSE		ELEV:		MILE	B.C.S	NUMBER		
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY	SILT	SAND	GRAVEL			
1						PEAT: SILT: SANDY FINE NON PLASTIC LIGHT BROWN	1/2	F	Nbr	%	%	%	%	566	C	237+
2									2							
4									4							
6						SAND: FINE NON PLASTIC BROWN	5									
8									6							
10									8							
12						SILT: FINE SANDY NON PLASTIC BROWN	11									
14									10							
16									12							
18									14							
20									16							
22									18							
24						END OF HOLE			20							
									22							
									24							

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWN: E.S.		FIELD ENG: G. S.	DATE DRILLED: 15/1/73	AIRPHOTO NO: A22932-28	CHAINAGE: S25+00	OFFSET:											
CKD: ✓		TECH: O.H.	RIG: FAILING 1000	SURFACE DRAINAGE: ✓	VEGETATION: SURFACE, GOOD BROWN	ELEV:	TEST HOLE										
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS					MILE	B.C.S	NUMBER
										CLAY	SILT	SAND	GRAVEL	WET DENSITY (PCF)			
1										0 = WATER CONTENT (% OF DRY WEIGHT)	PLASTIC LIMIT	LIQUID LIMIT					
2										20	40	60	80	100	100+		
4																	
6																	
8																	
10																	
12																	
14																	
16																	
18																	
20																	
22																	
24																	
REMARKS																	
PEAT: SILT: SANON NONPLASTIC LIGHT-BROWN 12 SAND: SILTY FINE-SKINNED NON PLASTIC BROWN 3 UF END OF HOLE 16																	

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

DWN: E.B		FIELD ENG: G.DA	DATE DRILLED: 15/1/73	AIRPHOTO NO: A22733-24	CHAINAGE: 537+00	OFFSET:	TEST HOLE					
CKD:		TECH: C.H.	RIG: FAIRING 1079	SURFACE DRAINAGE: FRESH	VEGETATION: SPRUCE, BIRCH & MUSK	ELEV:	MILE	B.C.S	NUMBER			
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE UNITED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS			
									CLAY	SILT	SAND	GRAVEL
									%	%	%	%
									WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)		
2		EL:	SILT	1/2	SILTY NON PLASTIC BROWN		F					
4		SM	SAND	2 1/2	SILTY FINE GRAINED NON PLASTIC BROWN		UF					
6												
8												
10												
12												
14												
16					END OF HOLE	16						
18												
20												
22												
24												

○ = WATER CONTENT (% OF DRY WEIGHT)
△ = ICE CONTENT (% OF SAMPLE VOLUME)

PLASTIC LIMIT LIQUID LIMIT

20 40 60 80 100 100+

REMARKS

566 C 239

R.M. HARDY AND ASSOCIATES LTD.						DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY						
OWN: E.B.	FIELD ENG: G. MC.	DATE DRILLED: 15/1/75	AIRPHOTO NO: A20725-04	CHAINAGE: 560+00		OFFSET:					TEST HOLE					
CKD:	TECH: D.H.	RIG: FALLINS 100-1	SURFACE DRAINAGE:	VEGETATION:	ELEV:						MILE	B.C.S	NUMBER			
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY	SILT	SAND	GRAVEL			
1										%	%	%	%			
2																
4																
6																
8																
10																
12																
14																
16																
18																
20																
22																
24																

PEAT: 1/2 F Nbn

SM SAND: SILT / FINE GRAINED NON PLASTIC GRANULAR

END OF HOLE 16

○ = WATER CONTENT (% OF DRY WEIGHT)
△ = ICE CONTENT (% OF SAMPLE VOLUME)

PLASTIC LIMIT → LIQUID LIMIT

20 40 60 80 100 100+

R.M. HARDY AND ASSOCIATES, LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY							
OWNER E.R.		FIELD ENG: G. Mc.	DATE DRILLED: 15/1/73	AIRPHOTO NO: A22732-25		CHAINAGE: 643+00	OFFSET:	ELEV:				TEST HOLE			
CKD:	TECH: D.H.	RIG: FELIX 6-100	SURFACE DRAINAGE:			VEGETATION: SPRUCE						MILE	B.C.S	NUMBER	
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				REMARKS	
										CLAY	SILT	SAND	GRAVEL		
1										%	%	%	%	WET DENSITY (P.C.F.)	
2														DRY DENSITY (P.C.F.)	
4	1	C													
6	2	C													
8															
10															
12															
14															
16															
18															
20															
22															
24															

Soil Description: Pt Silt, organic, non-plastic
SAND: SILTY, ORGANIC, FINE, GRANULAR, NON PLASTIC, LIGHT BROWN

Unified Soil Symbol: SM

Depth: 16 ft

Ice Description: Nbn

Depth (feet): 20 %

Legend:
○ = WATER CONTENT (% OF DRY WEIGHT)
△ = ICE CONTENT (% OF SAMPLE VOLUME)
PLASTIC LIMIT — LIQUID LIMIT
20 40 60 80 100 100+

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
DWNR E.B.	FIELD ENG: G. M.	DATE DRILLED: 15/1/73	AIRPHOTO NO: A22953-13	CHAINAGE: 568 + 07	OFFSET:			TEST HOLE								
CKD:	TECH: D.A.	RIG: FAILING 1000	SURFACE DRAINAGE:	VEGETATION:	ELEV:			MILE	B.C.S	NUMBER						
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.G.F.)	DRY DENSITY (P.G.F.)	REMARKS
										CLAY	SILT	SAND	GRAVEL			
										%	%	%	%			
2				O-	SM	PEAT: SANDY, SAND: FINE GRAINED SILTY MIN PLASTIC BROWN DARKER WITH DEPTH	F	Nbe	2							
4									4							
6									6							
8									8							
10									10							
12									12							
14									14							
16									16							
18									18							
20									20							
22									22							
24									24							
						END OF HOLE										

O = WATER CONTENT (% OF DRY WEIGHT)
△ = ICE CONTENT (% OF SAMPLE VOLUME)

PLASTIC LIMIT 20 40 60 80 100 100+ LIQUID LIMIT

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

OWNER E.B.		FIELD ENG: S.D.		DATE DRILLED: 15/1/75		AIRPHOTO NO: A22753-		CHAINAGE: 88.87 m		OFFSET:		TEST HOLE				
CKD:		TECH: D.R.		RIG: FAILING 1022		SURFACE DRAINAGE: 15 ft		VEGETATION: sparse		ELEV:						
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				MILE	B.C.S	NUMBER
										CLAY	SILT	SAND	GRAVEL			
2					Pt	PEAT:	F	70%	2	%	%	%	%	WET DENSITY (P.C.F.)	TEST HOLE	
4	1	C	65		SM	SAND: SILTY FINE GRAINED MIN PLASTIC GREY	Nbn		4					107.9	75.5	
6	2	C	100						6					122.7	102.3	G5 = 2.71
8	3	C	65						8					124.5	102.8	G5 = 2.71
10	4	C	100						10					122.5	100.1	G5 = 2.68
12									12							
14						END OF HOLE	14		14							
16									16							
18									18							
20									20							
22									22							
24									24							

O = WATER CONTENT (% OF DRY WEIGHT)

△ = ICE CONTENT (% OF SAMPLE VOLUME)

PLASTIC LIMIT

LIQUID LIMIT

80

100

100+

WC-504.2

PEAT:

Pt

SAND:

SM

Nbn

2

65

100

65

100

END OF HOLE

14

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

DWN E. A.

FIELD ENG: S. M.

DATE DRILLED: 5/1/75 AIR

DRILL HOLE REPORT

93-400

OFFSET:

三

TEST HOLE

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

D.W.E.S.		FIELD ENG: G. 74	DATE DRILLED: 15/6/75	AIRPHOTO NO: A 22-73 - 74	CHAINAGE: 5184.80	OFFSET:	TEST HOLE									
CKD	TECH	D.S.	RIG: FALCON 1000	SURFACE DRAINAGE: C 100	VEGETATION: SPRUCE, BIRCH, PINE, BALSAM	ELEV:	MILE	B.C.S	NUMBER							
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS						
										CLAY %	SILT %	SAND %	GRAVEL %	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
2																
4	1	C	97		Pt	PEAT:	60%		2							
6	2	C	100			SM SAND: SILTY FINE GRAINED NON PLASTIC BROWN	6	Nbn	4							
8	3	C	100						6	○	△					
10	4	C	100						8							
12									10	○	△					
14						END OF HOLE	14		12	○	△					
16									14	○	△					
18									16							
20									18							
22									20							
24									22							
									24							

○ = WATER CONTENT (% OF DRY WEIGHT)
 △ = ICE CONTENT (% OF SAMPLE VOLUME)

PLASTIC LIMIT 40' LIQUID LIMIT 80'

20 40 60 80 100 100+

WC = 60.82

WC = 57.69

WC = 71.4

119.5 94.9

120.9 97.8

122.7 99.0

4 = 2.70

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWL: E.E.		FIELD ENG: G. Mc.		DATE DRILLED: 16/1/73		AIRPHOTO NO: A 22773-74		CHAINAGE: 567 ft		OFFSET:		TEST HOLE						
CKD:		TECH: D.H.		RIG: FAILING 1000		SURFACE DRAINAGE: N/A		VEGETATION: SEE REMARKS		ELEV:								
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS					MILE	B,C,S	NUMBER		
									CLAY	SILT	SAND	GRAVEL	WET DENSITY (P.C.F.)				DRY DENSITY (P.C.F.)	
2					SAND: FINE GRAINED, SILT, MIN PLASTIC, REL. STIFF, DRYER w/ DEPTH	F	Nbn	2	○						564	C	251	
4	1	C						4	○									
6	2	C						6										
8	3	C						8										
10	4	C						10										
12								12										
14								14										
16								16										
18								18										
20								20										
22								22										
24								24										
					END OF HOLE	14'												

SMALL SPRUCE, MED
DENSE, SOME
BIRCH

122.5 / 102.2

122.7 / 101.3

121.9 / 93.2

122.0 / 98.8

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

DNW: E.B. FIELD ENG. G.M.C. DATE DRILLED: 16/1/73 AIRPHOTO NO: A 22772-74 CHAINAGE: 9354.0

CKD: **TECH:** D. H. **RIG FAILING** **SURFACE DRAINAGE:** **VEGETATION:**

OFFSET

TEST HOLE

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

OWN: E.P.	FIELD ENG: G.M.	DATE DRILLED: 10/15/74	AIRPHOTO NO: A22773-74	CHAINAGE: 564.00	OFFSET:													
CKD:	TECH: C.H.	RIG: FULING 100	SURFACE DRAINAGE: 100%	VEGETATION: SEE RUMPS	ELEV:													
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS						MILE	B.C.S	NUMBER
										CLAY	SILT	SAND	GRAVEL	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS		
										%	%	%	%					
2		Pt	FEAT.			F	30 m		2							DRILLING SPEED = 1000 CENSE = 5 SPMS EACH		
			SILT						4									
		OL	ORGANIC SALTY NONPLASTIC OILY BROWN						6									
4		SAND	SILTY FINE-GRAINED NONPLASTIC GREY BROWN			Nbr.			8									
6									10									
8									12									
10									14									
12									16									
14									18									
16									20									
18									22									
20									24									
22																		
24																		
END OF SHEET																		

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWN: E.B.		FIELD ENG G.Mc.	DATE DRILLED 16/1/73	AIRPHOTO NO: A-22773 - 74	CHAINAGE:	OFFSET	TEST HOLE SHEET 2							
CKD	TECH	D.H.	RIG FAILING 1000	SURFACE DRAINAGE	VEGETATION:	ELEV.	MILE	B,C,S	NUMBER					
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS					
									CLAY	SILT	SAND	GRAVEL	WET DENSITY (PCF)	DRY DENSITY (pcf)
26								20	PLASTIC LIMIT	40	60	80	100	100+
30								30	LIQUID LIMIT					
32								32						
34								34						
36								36						
38								38						
40								40						
42								42						
44								44						
46								46						
48								48						
50								50						
END OF HOLE 40														

R.M. HARDY AND ASSOCIATES LTD.					DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY													
DW#:	FIELD ENG:	DATE DRILLED:	15/1/75	AIRPHOTO NO:	L-22773-74	CHAINAGE:	15-14-00	OFFSET:	TEST HOLE													
CKD#:	TECH:	RIG:	F-12500	SURFACE DRAINAGE:	GND	VEGETATION:	SEE APPENDIX	ELEV:	MILE	B.C.S	NUMBER											
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS		CLAY	SILT	SAND	GRAVEL	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	MILE	B.C.S	NUMBER		
2						PEAT: CAT #1 FINE, FIBROUS, WOODY & Non-Woody PARTICLES	F	35%		O = WATER CONTENT (% OF DRY WEIGHT)									563	C	254	
4	1	C	75		Pt				2													
6	2	C	100						4													
8	3	C	100						6													
10	4	C	100						8													
12	5	C	100						10													
14	6	C	100						12													
16	7	C	100						14													
18									16													
20									18													
22									20													
24									22													
									24													

O = WATER CONTENT (% OF DRY WEIGHT)
 △ = ICE CONTENT (% OF SAMPLE VOLUME)

PLASTIC LIMIT	20	40	60	80	100	100+	Liquid Limit
---------------	----	----	----	----	-----	------	--------------

LOAM SPANNED
2 INCHES & SOIL & DIRT

AS = 2.87

1

2

AS = 2.70

3

R.M. HARDY AND ASSOCIATES LTD.					DRILL HOLE REPORT			DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY											
DWNR: E. S.	FIELD ENG: G.W.M.	DATE DRILLED: 16/11/73	AIRPHOTO NO: A-22772-74	CHAINAGE: 563.00	OFFSET:						TEST HOLE								
CWD:	TECH: D.H.	RIG: FG-1200	SURFACE DRAINAGE:	VEGETATION:							ELEV:								
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS					MILE	B,C,S	NUMBER		
										CLAY	SILT	SAND	GRAVEL	WET DENSITY (P.C.F.)				DRY DENSITY (P.C.F.)	
										%	%	%	%						
2					FC	PEAT: SILT: ORGANIC OL	1/2	50%	2								563	C	255
4						SAND: SILTY FINE GRAINED NON PLASTIC BROWN	3	N/A	4										
6						GREY BROWN	7		6										
8									8										
10									10										
12									12										
14									14										
16									16										
18									18										
20									20										
22									22										
24									24										
						END OF HOLE	20												

○ = WATER CONTENT (% OF DRY WEIGHT)
△ = ICE CONTENT (% OF SAMPLE VOLUME)

PLASTIC LIMIT ————— LIQUID LIMIT
20 40 60 80 100 100+

DWARF SPRUCE & CEDAR
BLACK & POPLAR

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY											
OWN: E.B.	FIELD ENG: D.L.	DATE DRILLED: 16/7/72	AIRPHOTO NO: A 227773-74	CHAINAGE:	322+134	OFFSET:						TEST HOLE							
CKD: / /	TECH: D.A.	RIG: FALCON 1300	SURFACE DRAINAGE: S	VEGETATION: S		ELEV:													
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	O = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)						GRAIN-SIZE ANALYSIS	MILE	B.C.S	NUMBER
										% CLAY	% SILT	% SAND	% GRAVEL	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)				
2					Pf	PEAT	U.F.		2							563	C	256	
4					DL	SILT DARK BROWN NONPLASTIC HARD	S		4										
6					SM	SAND SILTY NONPLASTIC GRANULAR	S	F Nbr	6										
8									8										
10									10										
12									12										
14									14										
16									16										
18									18										
20									20										
22									22										
24									24										
																REMARKS			

PEAT

2

4

6

8

10

12

14

16

18

20

22

24

PLASTIC LIMIT

LIMIT

LIQUID LIMIT

W.C. = 124.0

W.C. = 124.0

CLAY

SILT

SAND

GRAVEL

WET DENSITY (P.C.F.)

DRY DENSITY (P.C.F.)

R.M. HARDY AND ASSOCIATES LTD.						DRILL HOLE REPORT			DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
DWNR E.P.	FIELD ENG. G.C.	DATE DRILLED 16/1/73	AIRPHOTO NO. A-22-775-74	CHAINAGE 563.140	OFFSET:				TEST HOLE								
CKD	TECH. C.H.	RIG FEET 1500	SURFACE DRAINAGE	VEGETATION	ELEV:							MILE	B.C.S	NUMBER			
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNITED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	O = WATER CONTENT (% OF DRY WEIGHT)	△ = ICE CONTENT (% OF SAMPLE VOLUME)	GRAIN-SIZE ANALYSIS	REMARKS				
										PLASTIC LIMIT	LIQUID LIMIT	CLAY %	SILT %	BAND %	GRAVEL %	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)
2					DL	SAND		N-I-n	2								
4	1	C	88			SAND SILT WATER GLEY			4	○	△					119.9	117.6
6	2	C	85						6	-	-						
8	3	C	85						8	○	△					124.5	122.4
10	4	C	100						10	-	-					124.7	121.9
12									12	-	-						
14									14	○	△					125.0	122.5
16									16	-	-						
18									18	-	-						
20									20	-	-						
22									22	-	-						
24									24	-	-						

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DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

R. M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT			DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DW: E.B.	FIELD ENG: G. Mc.	DATE DRILLED: 15/1/73	AIRPHOTO NO: A-22773-73	CHAINAGE: 10114.70			OFFSET:	TEST HOLE								
CKD: <i>[initials]</i>	TECH: D.R.	RIG: FALCON 1011	SURFACE DRAINAGE: <i>[initials]</i>	VEGETATION: SEE SURFACES			ELEV:									
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION		LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				MILE	B.C.S	NUMBER
% RECOVERY									20	CLAY	SILT	SAND	GRAVEL			
									40	%	%	%	%	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
									60							
									80							
									100							
									100+							
2				H	SAND: ORGANIC SILTY NON ELASTIC FINE GRAINED BROWN GREY		F	Nbn	20							
4	1	C	80	SM					40							
6	2	C	77						60							
8	3	C	100						80							
10	4	C	152						100							
12	5	C	80						100+							
14	6	C	5													
16																
18																
20																
22																
24																

O = WATER CONTENT (% OF DRY WEIGHT)
 △ = ICE CONTENT (% OF SAMPLE VOLUME)
 PLASTIC LIMIT 40 60 80 100 100+ LIQUID LIMIT 80

HEAVY SEDIMENT, 2' TO
 4' WASH & COLD AT
 10' DEPTH

123.3 102.8
 122.3 99.7
 121.0 98.6
 118.3 93.3
 116.5 90.9
 119.1 94.0
 117.5 92.3

SHLFT 1 OF 2

R.M.HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWL: E.P.				FIELD ENG G.V.C.	DATE DRILLED 16/1/73	AIRPHOTO NO: A-22772-73	CHAINAGE	OFFSET	TEST HOLE SHEET 2							
CKD:	TECH	Z.Z.	RIG FUELING /sec	SURFACE DRAINAGE	VEGETATION		ELEV.	MILE	B,C,S	NUMBER						
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS						
										CLAY %	SILT %	SAND %	GRAVEL %	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
26						SAND	F	6%	20							
28								7%	28							
30									30							
32									32							
34									34							
36									36							
38									38							
40									40							
42									42							
44									44							
46									46							
48									48							
50									50							
END OF HOLE																
O = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)																
PLASTIC LIMIT 40 LIQUID LIMIT 80																

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY							
OWN: E.B.	FIELD ENG: G.T.C.	DATE DRILLED: 10/1/73	AIRPHOTO NO: A 22775-73	CHAINAGE: 10224.57		OFFSET:			TEST HOLE						
CKD:	TECH: D.R.	RIG: FALCON 1000	SURFACE DRAINAGE: GOOD	VEGETATION: HEAVY SPRUCE, 10' TO 30' HIGH		ELEV:					MILE	B.C.S	NUMBER		
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS					
										CLAY	SILT	SAND	GRAVEL	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)
%	%	%	%												
2									2						
4									4						
6									6						
8									8						
10									10						
12									12						
14									14						
16									16						
18									18						
20									20						
22									22						
24									24						
REMARKS															
SAND: VERY SILTY / FINE GRAINED NON PLASTIC BROWN SM END OF HOLE 16															

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DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

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MACKENZIE HIGHWAY**

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DW#: E.B.	FIELD ENG: G.M.	DATE DRILLED: 16/1/75	AIRPHOTO NO: A-22772-21	CHAINAGE: 1075000		OFFSET:			TEST HOLE											
CKD:	TECH: D.R.	RIG: FALCON 100	SURFACE DRAINAGE	VEGETATION:		ELEV:				MILE	B.C.S	NUMBER								
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS										
										PEAT	CLAY	SILT	SAND	GRAVEL	WET DENSITY (PCF)	DRY DENSITY (PCF)	REMARKS			
%									%	%	%	%	%							
2	1	C			SM	SAND SILTY FINE GRAINED UNDRAMED CAT. GR. UN	'A	F	Nbn							124.8	102.9			
4	2	C							2	○								123.8	101.7	
6	3	C							4	○								122.9	99.7	
8	4	C							6	○								121.9	98.4	
10	5	C							8	○								121.9	97.9	
12	6	C							10	△								117.7	91.5	
14									12	△								117.6	91.4	
16									14	○										
18									16	○										
20									18	○										
22									20	○										
24									22	○										
									24	○										

R.M. HARDY AND ASSOCIATES LTD

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

OWN: E

FIELD ENG S.M.

DATE DRILLED: 16/11/73 A16

PHOTO NO: 4-355-1

— CHAINAGE

— 1 —

MACK
LOEFE

RAENZIE

TEST HOLE
SHEET 2

MILE	B.C.S	NUMBER
561	C	265

REMARKS

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
DW#	IG	FIELD ENG:	G. Mc.	DATE DRILLED:	6/1/73	AIRPHOTO NO:	A-22772-24	CHAINAGE:	1027 + 37	OFFSET:				TEST HOLE				
CKD#		TECH:	D.R.	RIG:	FAILING 1000	SURFACE DRAINAGE:		VEGETATION:	Spruce - 20' to 30', 2-3' d.	ELEV:								
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS						MILE	B.C.S	NUMBER	
									CLAY	SILT	SAND	GRAVEL	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)				
%	%	%	%	%	%													
2				PT	PEAT : CAT #2	6'	F	Nbn	6%							561	C	266
4				SM	SAND: fine grain, not non-plastic silty brown-grey													
6																		
8																		
10																		
12																		
14																		
16						16'												
18																		
20																		
22																		
24																		
END OF LOG																		

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

DWN: JG

FIELD ENG: G M

DATE DRILLED: 17/1/73 AIRP

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

DWN: JG

FIELD ENG: G M

DATE DRILLED: 17/1/73 AIRP

NO: A-122773-22 CHAINAGE:

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

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DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

DWN: E.B.		FIELD ENG: G.M.C.	DATE DRILLED: 17/1/73	AIRPHOTO NO: A-22772-20	CHAINAGE: 1004.55	OFFSET:			TEST HOLE						
CKD		TECH: D.H.	RIG: FALCON 1000	SURFACE DRAINAGE: 5 ft/min	VEGETATION: SPARSE 30%	ELEV:									
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS					
										CLAY	SILT	SAND	GRAVEL	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)
%	%	%	%	%	%	%	%	%	%	REMARKS					
2															
4															
6															
8															
10															
12															
14															
16															
18															
20															
22															
24															
END OF HOLE 14															
O = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)															
PLASTIC LIMIT 20 40 60 80 100 100+											LIQUID LIMIT				

R.M. HARDY AND ASSOCIATES LTD.						DRILL HOLE REPORT			DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY						
OWN:	J.G.	FIELD ENG:	G Mc	DATE DRILLED:	17/1/73	AIRPHOTO NO:	A-22772-29	CHAINAGE:	1187.3	OFFSET:		TEST HOLE			
CKD:		TECH:	D H	RIG:	FAILING 1000	SURFACE DRAINAGE:	dry	VEGETATION:	90% SPRUCE, 10% BIRCH	ELEV:		MILE	B,C,S	NUMBER	
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	CLAY	SILT	SAND	GRAVEL	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)
2					SM	SAND silty non-plastic lt - brown fine grained ----- grey - brown	3'	Nbr	20					123.8	98.5
4									2					121.2	101.6
6									4	○				122.6	96.5
8									6					122.7	99.1
10									8	○				127.2	104.9
12									10	○				126.6	104.7
14									12	○					
16									14	○					
18									16	○					
20									18						
22									20						
24									22						
									24						

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY												
DW#	I.G.	FIELD ENG	DATE DRILLED 17/1/73	AIRPHOTO NO: A-22772 - 29	CHAINAGE	OFFSET	TEST HOLE SHEET 2													
CKD	TECH	RIG	SURFACE DRAINAGE	VEGETATION				ELEV	MILE	B.C.S	NUMBER									
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNITED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	\circ = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)				GRAIN-SIZE ANALYSIS						
										PLASTIC LIMIT	LIQUID LIMIT		CLAY	SILT	SAND	GRAVEL	WET DENSITY (PCF)	DRY DENSITY (PCF)		
									20	40	60	80	100	100+	%	%	%	%		
28									28											
30									30											
32									32											
34									34											
36									36											
38									38											
40									40											
42									42											
44									44											
46									46											
48									48											
50									50											
END of HOLE																				

R.M. HARDY AND ASSOCIATES LTD.					DRILL HOLE REPORT			DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY											
DW#: E.B.	FIELD ENG: G.A.C.	DATE DRILLED: 17/1/73	AIRPHOTO NO: 222772-25	CHAINAGE: 1131481	OFFSET:		TEST HOLE												
CKD:	TECH: D.H.	RIG: FAILING 1000	SURFACE DRAINAGE: OPEN	VEGETATION: OPEN	ELEV:														
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS					MILE	B,C,S	NUMBER		
										CLAY	SILT	SAND	GRAVEL						
%	%	%	%	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)														
REMARKS																			
2					ML	SILT: SANAY NON PLASTIC LIGHT BROWN	F	Nbn	2								560	C	270
4					SM	SAND: SILTY NON PLASTIC GREY BROWN			4										
6									6										
8									8										
10									10										
12									12										
14									14										
16									16										
18									18										
20									20										
22									22										
24									24										
END OF HOLE																			

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DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

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DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

DWNE J.G F

FIELD ENG: G. Mc

DATE DRILLED:

7/1/73 AIRPHOTO

NO: 今アラウス

CHAINAGE

118-576

0

FFSET:

- 2 -

100-100-6

CKD ✓ T

TECH: D.H.

FIG: FAILING

1000 SURFACE

DRAINAGE:

VB

VEGETATION: DWARF

F SPRUCE, 10% E

S12CH ELEV:

TE

LAST HOLE

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
DW#	E.B.	FIELD ENG:	G.Mc.	DATE DRILLED:	17/1/73	AIRPHOTO NO:	A 22573-23	CHAINAGE:	117.50	OFFSET:					TEST HOLE	
CKD:		TECH:	D.H.D.R.	RIG:	FALCON 1000	SURFACE DRAINAGE:		VEGETATION:	SPRUCE, BALSAM, BIRCH	ELEV:						
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)	PLASTIC LIMIT	LIQUID LIMIT	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	MILE B,C,S	NUMBER
2					Pt	PEAT: ORGANIC SILT, SLIGHTLY SANDY FINE WOOD FIBRES, HAD PLASTIC INDEX 4	N/A	N/A	2	WC = 32.5 - 4	20	40	60	80	100	100+
4	1	C	100		OL				4	WC = 10.5 - 7						
6	2	C	100		SM	SAND: SILT / FINE GRAINED FULLY UNIFORM NON PLASTIC GREY-BROWN-BLACK,	N/A		6	WC = 2.5 - 3						
8	3	C	100						8							
10									10							
12	4	C	75						12							
14	5	C	100						14							
16	6	C	93						16							
18	7	C	100			END OF HOLE	17 1/2		18							
20									20							
22									22							
24									24							

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DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

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DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWNE E.E.	FIELD ENG. S.T.C.	DATE DRILLED 1/22/72	AIRPHOTO NO A-22235-23	CHAINAGE		OFFSET		ELEV.				TEST HOLE					
CKD	TECH. O.R.	RIG # 1000	SURFACE DRAINAGE									MILE	B.C.S	NUMBER			
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION		LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				REMARKS		
						FEAT:				CLAY %	SILT %	SAND %	GRAVEL %	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)		
2					SM	SAND: DARK SILTY SLIGHTLY IRREGULAR IRREGULAR 1/4	F	3%	2								
4						SILTY FINE GRAINED GREY BROWN		5%	4								
6									6								
8									8								
10									10								
12									12								
14									14								
16									16								
18									18								
20									20								
22									22								
24									24								
END OF HOLE																	

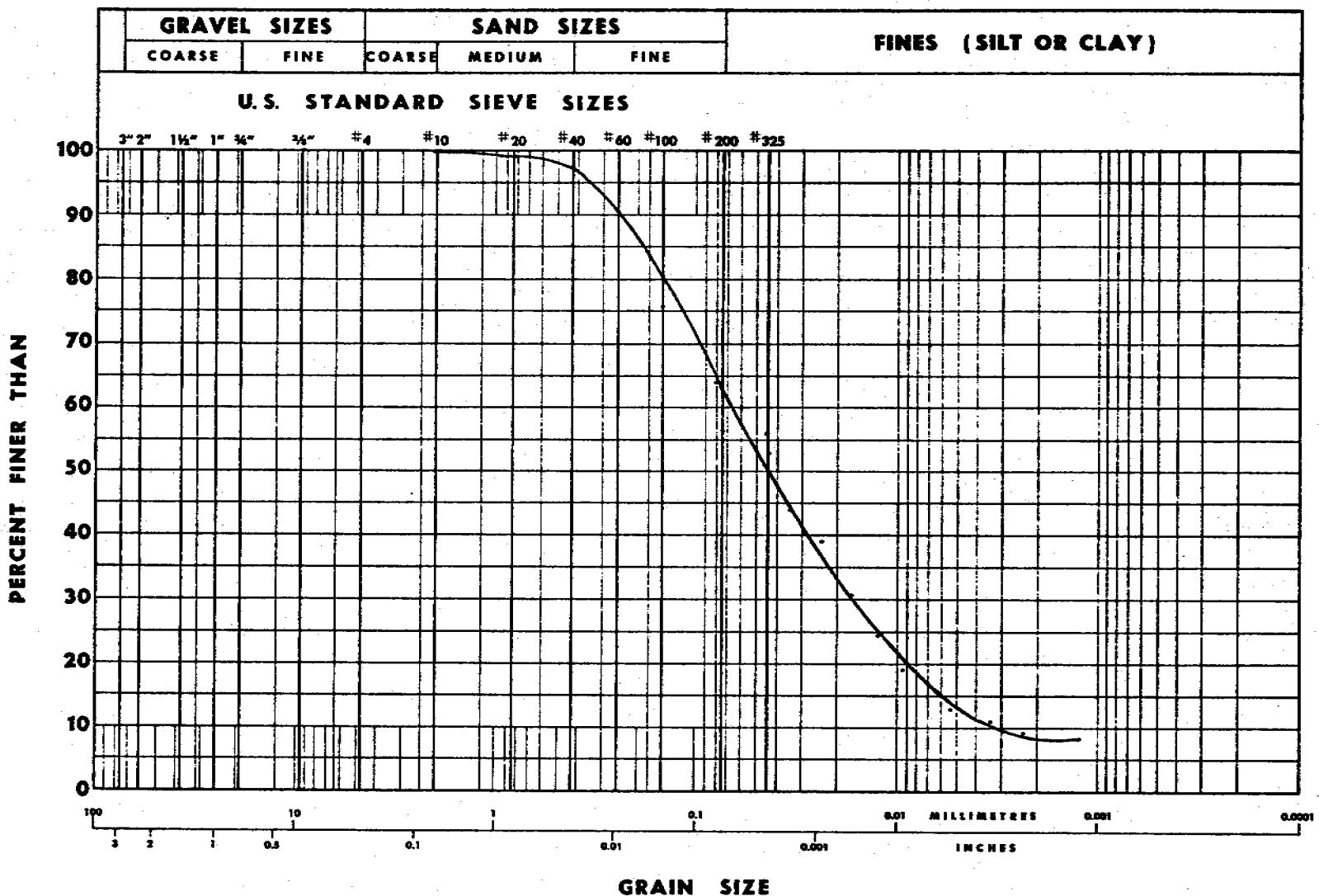
O = WATER CONTENT (% OF DRY WEIGHT)
 △ = ICE CONTENT (% OF SAMPLE VOLUME)
 PLASTIC LIMIT → LIQUID LIMIT
 20 40 60 80 100 100+



MATERIALS TESTING LABORATORIES LTD.

GRAIN SIZE CURVE

LAB ORDER NO. S-1065
 CLIENT E-2510
 SAMPLE
 SOURCE
 HOLE 282 DEPTH 2-6' DATE REC'D.
 TECHNICIAN H.J. DATE TESTED FEB. 21, 19



REMARKS:

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

D_{10}	— MM.
D_{30}	— MM.
D_{60}	— MM.
C_u	—
C_c	—

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DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DRAWR E.B.		FIELD ENG. G.F.	DATE DRILLED-11/1/73	AIRPHOTO NO-A 22716-51	CHAINAGE: 1341+03	OFFSET:	TEST HOLE										
CKD:	TECH: D.R.	RIG: FAILING 1990	SURFACE DRAINAGE: <i>Gravel</i>	VEGETATION: SPRUCE >20' OLD GROWTH	ELEV:	MILE	B,C,S	NUMBER									
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS				
									20	PLASTIC LIMIT	40	60	80	100	100+	% CLAY % SILT % SAND % GRAVEL %	
2						SAND: <i>VERY SILTY</i> <i>SLATELY PLASTIC</i> <i>NON-STRUCTURE</i> <i>BRICK</i>	F	3%									
4						<i>INTERCLAYE</i> <i>SILT</i> <i>FINE-STRUCTURED</i> <i>GRAY BROWN</i>		3%									
6								7%									
8																	
10						<i>VERY FINE</i>											
12																	
14						<i>END OF HOLE</i>											
16																	
18																	
20																	
22																	
24																	

○ = WATER CONTENT (% OF DRY WEIGHT)
 △ = ICE CONTENT (% OF SAMPLE VOLUME)

PLASTIC
LIMIT 20 40 60 80 100 100+

LIQUID
LIMIT 80

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

D.W. E.B.		FIELD ENG: G.M.	DATE DRILLED: 17/1/73	AIRPHOTO NO: A-22776-51	CHAINAGE: 1303+97	OFFSET:	TEST HOLE								
CKD	TECH	D.R.	RIG: FAILING 1227	SURFACE DRAINAGE: <i>Ground</i>	VEGETATION: <i>Shrub</i>	ELEV:	MILE	B.C.S	NUMBER						
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS					
										CLAY %	SILT %	SAND %	GRAVEL %	WET DENSITY (PCF)	DRY DENSITY (PCF)
2					OL	SAND: OAGRIC SALT, FINE GRAINED, NON PLASTIC, BROWN	17	4%	2						
4					SM	INSTANTANEOUS GREY BROWN	3	5%	4	○					
6									6						
8									8						
10									10						
12									12						
14						END OF HOLE	14		14						
16									16						
18									18						
20									20						
22									22						
24									24						
REMARKS															

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY											
DWNR E.B.	FIELD ENG: G.Mc.	DATE DRILLED: 17/1/73	AIRPHOTO NO: A-22776-51	CHAINAGE: 13144-24		OFFSET:			TEST HOLE										
CKD:	TECH: D.R.	RIG: FAILING 1000	SURFACE DRAINAGE: Gravel	VEGETATION: SPRUCE + TO 40' , 000 BUSH		ELEV:					MILE	B.C.S	NUMBER						
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (L.P.C.F.)	DRY DENSITY (L.P.C.F.)	REMARKS			
										CLAY	SILT	SAND	GRAVEL						
2	1	C	90		OL	SAND: ORGANIC SALTY FIN GRAINED NON PLASTIC ----- 2	F	12%	2										
4	2	C	100		SM	INDORGIC GREY BROWN	Nbn		4	○	△								
6	3	C	100						6	○	△								
8	4	C	100						8	○	△								
10	5	C	100						10	○	△								
12	6	C	100						12	○	△								
14									14	○									
16									16	○	△								
18									18	○									
20									20	○	△								
22									22	○									
24									24	○									

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWNR: E.O.	FIELD ENG G.M.	DATE DRILLED 12/1/73	AIRPHOTO NO: A-22776-51	CHAINAGE	OFFSET	TEST HOLE SHEET 2											
CKD	TECH D.L.	RIG	SURFACE DRAINAGE	VEGETATION	ELEV.	MILE	B,C,S	NUMBER									
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS					WET DENSITY (ρ_p CF)	DRY DENSITY (ρ_d CF)	REMARKS
										CLAY	SILT	SAND	GRAVEL				
28							F	Nbn	28	○							
30									30	○							
32									32	○							
34									34	○							
36									36	○							
38									38	○							
40									40	○							
42									42								
44									44								
46									46								
48									48								
50									50								
END OF HOLE 40																	

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DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

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**DEPARTMENT OF PUBLIC WORKS, CANADA
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**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY												
OWNER	FIELD ENG:	DATE DRILLED:	AIRPHOTO NO:	CHAINAGE:	OFFSET:				TEST HOLE											
CKD	TECH:	RIG:	SURFACE DRAINAGE:	VEGETATION:			ELEV:			MILE	B,C,S	NUMBER								
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	○ = WATER CONTENT (% OF DRY WEIGHT)	△ = ICE CONTENT (% OF SAMPLE VOLUME)	PLASTIC LIMIT	LIMIT	LIQUID LIMIT	CLAY %	SILT %	SAND %	GRAVEL %	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)
2												20	40	60	80	100	100+			
4																				
6																				
8																				
10																				
12	1	C																		
14	2	C																		
16	3	C																		
18	4	C																		
20																				
22	5	C																		
24																				

SAND: *VERY SILTY, FINE GRAINED, NON PLASTIC, LIGHT BROWN*
 SM
 3
SILTY BROWN
 UF

F Nbn
 2
 4
 6
 8
 10
 12
 14
 16
 18
 20
 22
 24

○ = WATER CONTENT (% OF DRY WEIGHT)
 △ = ICE CONTENT (% OF SAMPLE VOLUME)

PLASTIC LIMIT 20 40 60 80 100 100+
 LIQUID LIMIT

CLAY %
 SILT %
 SAND %
 GRAVEL %

WET DENSITY (P.C.F.)
 DRY DENSITY (P.C.F.)

MILE C NUMBER
 150 C 290

REMARKS

1193 95.3
 1215 99.1
 1262 103.1
 1237 100.9
 1207 105.2 Gs = 2.74

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DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

OWN: E.B. FIELD ENG: G.N.C. DATE DRILLED 13/1/75 AIRPHOTO NO: A-27776-53 CHAINAGE:				OFFSET:		TEST HOLE SHEET 2									
CKD:	TECH D.H.	RIG:	SURFACE DRAINAGE:	VEGETATION:	ELEV:	MILE	B.C.S	NUMBER							
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS	REMARKS				
										CLAY %	SILT %	SAND %	GRAVEL %	WET DENSITY (PCF)	DRY DENSITY (PCF)
28	6	C	(1)				F Non		20 40 60 80 100 100+					125.2	102.7
28	7	C							20 40 60 80 100 100+					124.3	101.3
30									20 40 60 80 100 100+					120.7	96.7
32	8	C							20 40 60 80 100 100+					121.0	100.2
34	9	C							20 40 60 80 100 100+					123.9	100.6
36									20 40 60 80 100 100+					121.0	96.7
38	10	C							20 40 60 80 100 100+						
40									20 40 60 80 100 100+						
42									20 40 60 80 100 100+						
44									20 40 60 80 100 100+						
46									20 40 60 80 100 100+						
48									20 40 60 80 100 100+						
50									20 40 60 80 100 100+						

END OF HOLE 31%

R.M. HARDY AND ASSOCIATES LTD.					DRILL HOLE REPORT			DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY												
DWNR: E.B.	FIELD ENG: G.Mc	DATE DRILLED: 16/1/75	AIRPHOTO NO: 22776-53	CHAINAGE: 1355 + 44	OFFSET:															
CKD:	TECH: D.H.	RIG: FAILING 1000	SURFACE DRAINAGE: G	VEGETATION: SPRUCE, 25' to 32' 000 P.A.Y.	ELEV:									TEST HOLE						
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)	PLASTIC LIMIT 20 40 60 80 100 100+	LIQUID LIMIT 80	CLAY %	SILT %	SAND %	GRAVEL %	MILE	B,C,S	NUMBER	
2					SM	SAND: VERY SILTY, FINE-SERIVED NON PLASTIC LIGHTER BROWN	F	Nbn	2	○							—G	C	291	
4						SILTY BROWN			4	○										
6									6	○										
8									8	○										
10									10	○										
12									12	○										
14									14	○										
16									16											
18									18											
20									20											
22									22											
24									24											
END OF HOLE 14																	REMARKS			

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DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

OWN: E.B.		FIELD ENG: G.A.		DATE DRILLED: 8/17/73		AIRPHOTO NO: A-22776-53		CHAINAGE: 13654.75		OFFSET:		TEST HOLE			
CKD: 100		TECH: D.H.		RIG: FAILING 1000		SURFACE DRAINAGE: GOOD		VEGETATION: SPARSE, FEW BIRCH		ELEV:		MILE	B.C.S	NUMBER	
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS					
										CLAY	SILT	SAND	GRAVEL	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)
%	%	%	%	%	%										
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															
21															
22															
23															
24															
END OF HOLE															

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DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

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DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

R.M. HARDY AND ASSOCIATES LTD.							DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWNE	FIELD ENG:	G. M.	DATE DRILLED:	10/11/73	AIRPHOTO NO:	A 22 933-21	CHAINAGE:	1000' + 60'	OFFSET:					TEST HOLE						
CKD	TECH:	D.R.	RIG:	FAILING 1000	SURFACE DRAINAGE:	Ground	VEGETATION:	STRUCTURE	ELEV:											
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	O = WATER CONTENT (% OF DRY WEIGHT)	△ = ICE CONTENT (% OF SAMPLE VOLUME)	PLASTIC LIMIT	LIQUID LIMIT	CLAY	SILT	SAND	GRAVEL	MILE	B.C.S	NUMBER
										%	%	20	40	60	80	100	100+	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	
2						PEAT: CAT. #13	F	50%	2									554	C	272
4	1	C	100		Pt	SILT: MOSS FIBRES, SHRELLS, NON PLASTIC, CREAMY WHITE		V 50%	4											
6						ICE		Nbn	6	○										
8	2	C	100			ANALYSIS OF SAND SILTY FINE GRAINED BROWNISH GREY			8	○	△							101.3	66.2	
10	3	C	100						10	○	△							112.5	85.7	
12									12	○	△							113.0	85.7	
14	4	C	100			SAND: STRATIFIED SILT FINE GRAINED NON PLASTIC CREAM			14	○	△							114.9	82.8	
16	5	C	100						16	○	△							115.2	75.7	
18									18	○	△							112.2	83.9	
20	6	C	100						20	○	△							113.0	82.8	
22	7	C	100						22	○	△							113.5	82.8	
24									24	○	△							114.0	82.8	

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DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWL E.B.		FIELD ENG. G.M.	DATE DRILLED: 13/1/73	AIRPHOTO NO:	CHAINAGE:	OFFSET:	TEST HOLE SHEET 2										
CKD	TECH	O.K.	RIG:	SURFACE DRAINAGE	VEGETATION:	ELEV.	MILE	B.C.S	NUMBER								
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNITED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)							
										PLASTIC LIMIT	40	60	80	100	100+	CLAY	SILT
										%	%	%	%			REMARKS	
28	8	C	100						20								
30									28								
32									30								
34									32								
36									34								
38									36								
40									38								
42									40								
44									42								
46									44								
48									46								
50									48								
									50								
<i>END OF HOLE</i> 30																	

R. M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
OWN: E.B		FIELD ENG: G.M.		DATE DRILLED: 12/1/25		AIRPHOTO NO: A-22933-21		CHARGE:		OFFSET:		TEST HOLE					
CKD:		TECH: D.R.		RIG: FAILING 1000		SURFACE DRAINAGE		VEGETATION: HEAVY SPRUCE		ELEV:							
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	O = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)	PLASTIC LIMIT 20 40 60	LIQUID LIMIT 80 100 100+	GRAIN-SIZE ANALYSIS	MILE	B.C.S	NUMBER	
2					PL	PEAT: CATIE	F	50%	2	○			CLAY	SG	B25	299	
4					OL	SAND: ORGANIC			4	○			SILT				
6					SM	SILTY FINE GRAINED NON PLASTIC BROWN			6	○			SAND				
8									8	○			GRAVEL				
10									10	○			WET DENSITY (P.C.F.)				
12									12	○			DRY DENSITY (P.C.F.)				
14									14	○							
16									16	○							
18									18	○							
20					CL	CLAY: SILTY NON PLASTIC GREY	20	12%	20	○							
22						END OF HOLE	22		22	○							
24									24	○							

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DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

DWN: E.B. FIELD ENG: G.M.C. DATE DRILLED: 19/1/73 AIRPHOTO NO: A-22933-21 CHAINAGE: OFFSET:
CKD: TECH: D.H. RIG FALLING 1000 SURFACE DRAINAGE: VEGETATION: SPRUCE - BIRCH ELEV:

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DWNR E.P.	FIELD ENG: G. CO.	DATE DRILLED: 19/1/73	AIRPHOTO NO: A-2293-21	CHAINAGE:					OFFSET:													
CKD-15	TECH: D.R.	RIG: FALCON 1011	SURFACE DRAINAGE: (GND)	VEGETATION: DENSE SEDGE, 10% BROWN GRASS, 3%			ELEV:															
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION (ESTIMATED)	DEPTH (FEET)	GRAIN-SIZE ANALYSIS										TEST HOLE		
										CLAY	SILT	SAND	GRAVEL	%	%	%	%	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.A.)			
0						SAND: SILTY FINE GRAINED NON PLASTIC EGRN SLIGHTLY ORGANIC INORGANIC	F	6%	0												MILE B,C,S NUMBER	
2								7%	2												EG B25 E21	
4								2%	4													
6						----- 6'			6													
8						----- 8'		5%	8													
10								10%	10													
12									12													
14									14													
16									16													
18									18													
20						CLAY: SILTY MEDIUM GRAINED GREY	20	15%	20													
22						SAND: SILTY FINE GRAINED NON PLASTIC GREY	22	10%	22													
24									24													

RECORDED
PC

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DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

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DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWN: E.B.		FIELD ENG: G.D.C.	DATE DRILLED: 12/1/73	AIRPHOTO NO: A-22953-2	CHAINAGE:	OFFSET:	TEST HOLE SHEET 2							
CKD	TECH: D.R.	RIG: FAILING 1600	SURFACE DRAINAGE:	VEGETATION:	ELEV:	MILE	B,C,S	NUMBER						
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION (EST.)	DEPTH (FEET)	GRAIN-SIZE ANALYSIS					
									CLAY	SILT	SAND	GRAVEL	WET DENSITY (I.P.C.F.)	DRY DENSITY (I.P.C.F.)
%	%	%	%											
26						F	5%	26						
28								28						
30								30						
32								32						
					END OF HOLE	32								
34								34						
36								36						
38								38						
40								40						
42								42						
44								44						
46								46						
48								48						
50								50						

○ = WATER CONTENT (% OF DRY WEIGHT)
 △ = ICE CONTENT (% OF SAMPLE VOLUME)
 PLASTIC LIMIT → LIQUID LIMIT
 20 40 60 80 100 100+

REMARKS

B25 302

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DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

DWYM

E. E. FIELD ENG: S

DATE DRILLED

13/173 AIRPHOTO NO

1:A-22233-21

CHARGE:

Digitized by srujanika@gmail.com

OFFSET:

—
—

TEST HOLE

500

TECH 6

BIG FAILING

5/22 SURFACE DRA

IMAGE:

VEO

VEGETATION: Sparse

C. D. 1937

REV:

[View Details](#)

R.M. HARDY AND ASSOCIATES LTD.						DRILL HOLE REPORT			DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN: E.B.		FIELD ENG: S.Mc.	DATE DRILLED 19/11/73	AIRPHOTO NO: A 22933-21	CHAINAGE:				OFFSET:									
CKD: / / /		TECH: D.H.	RIG: FALCON 1000	SURFACE DRAINAGE:	VEGETATION:				ELEV:		TEST HOLE SHEET 2							
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE (SM)	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS						MILE	B.C.S	NUMBER
										CLAY	SILT	SAND	GRAVEL	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)			
26					F	Nbn.			26								B25 303	
28									28									
30									30									
32									32									
34									34									
36									36									
38									38									
40									40									
42									42									
44									44									
46									46									
48									48									
50									50									
(END OF HOLE) 30																		

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DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

OWN: E.B. FIELD ENG: S.D.K. DATE DRILLED: 19/1/73 AIRPHOTO NO: A-22933-21 CHAINAGE:
 CKD: H TECH: D.H. RIG: FAILING 1020 SURFACE DRAINAGE: FLOW VEGETATION: SPRUCE - FIR

GRD. ✓ TECH. ✓ A.H. ✓ RIG ✓ ALTIMETER ✓ SURFACE DRAINAGE ✓ GROUNDS ✓ VEGETATION ✓ BKA ✓ LKA ✓

— 20 —

17

TEST HOLE

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DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWL: E.B.		FIELD ENG G.M.	DATE DRILLED 19/1/73	AIRPHOTO NO: A-22453-2	CHAINAGE:	OFFSET:	TEST HOLE SHEET 2								
CKD:	TECH:	D.H.	RIG: Failing 1000	SURFACE DRAINAGE:	VEGETATION:	ELEV.:	MILE	B.C.S	NUMBER						
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNITED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS					
26									○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)	CLAY %	SILT %	SAND %	GRAVEL %	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)
28									PLASTIC LIMIT 20 40 60 80 100 100+						
30															
32															
34															
36															
38															
40															
42															
44															
46															
48															
50															
END OF HOLE 34										REMARKS					

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

FIELD ENG: G.M.				DATE DRILLED: 17/1/75		AIRPHOTO NO: A-22533-2		CHAINAGE:		OFFSET:		MACMENIE HIGHWAY								
CKD: E		TECH: D.H.		RIG: FAILING 1000		SURFACE DRAINAGE: <i>Ground</i>		VEGETATION: SPRUCE, BIRCH		ELEV:		TEST HOLE								
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	Penetration Resistance	Unified Soil Symol.	Soil Description		Units of Frozen Ground	Ice Description	Depth (feet)	O = Water Content (% of Dry Weight) △ = Ice Content (% of Sample Volume)		Grain-Size Analysis				Wet Density (pcf)	Mile	B,C,S	Number
REMARKS																				
0								F		0	PLASTIC LIMIT	LIQUID LIMIT	CLAY	SILT	SAND	GRAVEL	Dry Density (pcf)			
2										2										
4	1	C	100			<i>CLAY: SANDY, 54% MED TO LOW PLASTIC, LT. BROWN</i>			<i>Nbr-Med. Satin</i>	4										
6										6										
8	2	C	100			<i>SAND: SILTY FINE GRAINED UNIFORM NON PLASTIC BROWN</i>			<i>Nbr-Med. Satin</i>	8										
10										10										
12	3	C	100			<i>ML SILT: SANDY LOW PLASTIC GREY BROWN</i>			<i>Nbr-Med. Satin</i>	12										
14										14										
16										16										
18										18										
20										20										
22										22										
24										24										
END OF HOLE																				

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DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

OWN: E.B.	FIELD ENG: G.Mc.	DATE DRILLED 19/1/73	AIRPHOTO NO: A-22933-2	CHAINAGE:	OFFSET:	TEST HOLE SHEET 2								
CKD:	TECH: D.H.	RIG: FAILING 1600	SURFACE DRAINAGE: <i>Gravel</i>	VEGETATION:	ELEV:	MILE	B,C,S	NUMBER						
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS					
									CLAY	SILT	SAND	GRAVEL	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)
%	%	%	%	%	%	%	REMARKS							
26								26						
28								28						
30								30						
32								32						
34								34						
36								36						
38								38						
40								40						
					<i>END OF HOLE</i>			40						
42								42						
44								44						
46								46						
48								48						
50								50						

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

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**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

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**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
DWNE E.S.	FIELD ENG: S.PK.	DATE DRILLED 20/1/73	AIRPHOTO NO: A-22773-73	CHAINAGE:		OFFSET:		TEST HOLE								
CKD #	TECH: G.C.	RIG: FAILING 1000	SURFACE DRAINAGE: GOOD	VEGETATION: SEE SEPARATE		ELEV:		MILE	B,C,S	NUMBER						
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMIT OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (PCF)	DRY DENSITY (PCF)	REMARKS
										CLAY	SILT	SAND	GRAVEL			
0						SAND: SILTY FINE GRAINED NON PLASTIC BROWN	F	NON-MED. SAT.	0	%	%	%	%			SAND: 30% to 50% 5% to 8% + 5% BLACK
2									2							
4									4							
6									6							
8									8							
10									10							
12									12							
14									14							
16									16							
18									18							
20									20							
22									22							
24									24							
END OF HOLE @ -2'																

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DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

DOWN E. B. F.

FIELD ENG. G. M.

TE DRILLER 2014/2015

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MACKEN

ZIE HIGHWAY

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R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

OWN: E.S.		FIELD ENG: G.M.	DATE DRILLED 20/1/75	AIRPHOTO NO:	CHAINAGE:	OFFSET:	TEST HOLE SHEET 2				
CKD:	TECH:	RIG:	SURFACE DRAINAGE:	VEGETATION:	ELEV:	MILE	B.C.S	NUMBER			
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)	GRAIN-SIZE ANALYSIS	WET DENSITY (PCF)	DRY DENSITY (PCF)
26	8	C	100	SM END OF HOLE 30	71	Nbn - Low Med. SATN.	12	○	CLAY	%	%
28	9	C	100		28		20	PLASTIC LIMIT	SILT	%	%
30					30		40	LIQUID LIMIT	SAND	%	%
32					32		60	80	GRAVEL	%	%
34					34		100	100+			
36					36						
38					38						
40					40						
42					42						
44					44						
46					46						
48					48						
50					50						

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DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

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MACKENZIE HIGHWAY**

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DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWN: E.B.	FIELD ENG: G. Mc.	DATE DRILLED: 2/1/73	AIRPHOTO NO: A-22773-7	CHAINAGE:	OFFSET:													
CKD #	TECH: D. H.	RIG: FA 1000	SURFACE DRAINAGE: 5002	VEGETATION: FOREST > 000 FEET	ELEV:	TEST HOLE												
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS						MILE	B.C.S	NUMBER
										CLAY	SILT	SAND	GRAVEL	WET DENSITY (PC.F.)	DRY DENSITY (PC.F.)			
0					Pt (SM)	PEAT: SAND: FINE, N.P., FINE GRAN. 1 1/2 GRAN. 2 1/2	F	Vx	0	0	0	0	0	0	0	0	B19	315
2							Nbm	MED.SATN	2	0	0	0	0	0	0	0		
4	1	C	100			VERY SALTY NON PLASTIC CHARCOAL SPECIES RUST DISCOLORATIONS, ROOTLET CONCRETIONS, BROWNISH GREY No Root Concretions	Nbe	-- INCLUSIONS	4	0	0	0	0	0	0	0		
6	2	C	100				Nbm-Nbe	--	6	0	0	0	0	0	0	0		
8	3	C	100						8	0	0	0	0	0	0	0		
10	4	C	100						10	0	0	0	0	0	0	0		
12									12	0	0	0	0	0	0	0		
14						END OF HOLE	13 1/2		14	0	0	0	0	0	0	0		
16									16									
18									18									
20									20									
22									22									
24									24									

Legend: O = WATER CONTENT (% OF DRY WEIGHT)
 △ = ICE CONTENT (% OF SAMPLE VOLUME)
 PLASTIC LIMIT LIQUID LIMIT
 20 40 60 80 100 100+

REMARKS: NK = 220.0
 1260/1032
 1260/96
 1225/92

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DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

DWN: EB

FIELD ENG: G.Mc.

DATE DRILLED: 20//73 AIRPHOTO N

0: AC 22 773 - 73

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ISSUE NO. 5

TEST HOLE

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

OWN: E.S.

FIELD ENG: G. m.s.

DATE DRILLED: 20/1/75 AI

PHOTO NO: A-22773

7 > CHAINAGE:

OFFSET

• 10 •

TELEGRAMS

CKD:

TECH: G.C.

RIG: FAILING 1000 SU

FACE DRAINAGE:

VEGE

卷之六

ELEV:

TEST HOLE

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
DW#	E.B.	FIELD ENG:	G.M.	DATE DRILLED:	20/1/73	AIRPHOTO NO:	A-22777	CHAINAGE:					OFFSET:					
CKD		TECH:	G.C.	RIG:	FAILING 1000	SURFACE DRAINAGE:	None	VEGETATION:	SPRUCE	UP TO 25'	ELEV:					TEST HOLE		
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS						MILE	B,C,S	NUMBER
										CLAY	SILT	SAND	GRAVEL	%	%			
0					OL	SILT: ORGANIC, SANDY, MED PLASTIC	F	Nbr	0									
2					SM	SAND: SILTY SLIGHTLY ORGANIC, FINE GRAVELS NON PLASTIC LIGHT BROWN			2									
4						3 INORGANIC GREY BROWN			4									
6						DARK GREY-BROWN	UF	No ICE	6									
8						GREY-BROWN	F	Nbr	8									
10									10									
12									12									
14									14									
16									16									
18									18									
20						END OF Hole	20		20									
22									22									
24									24									

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DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DW#:	E.B.	FIELD ENG:	G.M.	DATE DRILLED:	2/1/73	AIRPHOTO NO.:	A-22772-75	CHAINAGE:		OFFSET:		TEST HOLE SHEET 2		
CKD:		TECH:	D.H.	RIG:		SURFACE DRAINAGE:		VEGETATION:		ELEV.:		MILE	B.C.S	NUMBER
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS					
									CLAY	SILT	SAND	GRAVEL	WET DENSITY (PCF)	DRY DENSITY (PCF)
26								26						
27								27						
28				MD	SILT: SANDY NONPLASTIC BROWN GREY	Nbh		28						
30					END OF HOLE	30		30						
32								32						
34								34						
36								36						
38								38						
40								40						
42								42						
44								44						
46								46						
48								48						
50								50						

R.M. HARDY AND ASSOCIATES LTD.						DRILL HOLE REPORT			DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY												
DWN: E.B.		FIELD ENG: G Mc.		DATE DRILLED: 21/1/73		AIRPHOTO NO: A-22773-75		CHAINAGE:		OFFSET:		TEST HOLE									
CKD: D	TECH: D.H.	RIG: FAILING 1000		SURFACE DRAINAGE: POOR		VEGETATION: SPRUCE, BIRCH		ELEV:													
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION		LIMIT OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)								MILE	B,C,S	NUMBER
0					OL	SAND, SILT; ORGANIC MED GRAINED, NON PLASTIC, WOOD PARTICLES		F		0	PLASTIC LIMIT 20 40 60 80 100 100+								525	B18	321
2										2											
4					SM	SAND; SILTY, FINE GRAINED WET, BROWN		UF	NO ICE	4											
6					ML	(ML) SILT; SANDY(FINE GRAINED) LOW PLASTIC CLAYEY		F	Nbn - OCCASIONAL 46 TO 58 THICK 4-2% (EST) ----- MEDIUM SATN	6											
8	1	C	100		SM	SAND; VERY FINE GRAINED SILTY, NONE PLASTIC, CHARCOAL INCLUSIONS, UNIFORM, MICA FLAKES, GREYISH BROWN				8											
10	2	C	58							10											
12	3	C	73							12											
14					SC	SAND/SILT: GRAY LENSES LOW PLASTIC		14	Nbn - INCLUSION OF Nbe	14											
16						END OF HOLE				16											
18										18											
20										20											
22										22											
24										24											

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DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

OWN: E.B.		FIELD ENG: G.M.	DATE DRILLED: 10/1/73	AIRPHOTO NO: A-22233-21	CHAINAGE:	OFFSET:	TEST HOLE					
CKD: 15		TECH: D.R.	RIG: F211NS 1070	SURFACE DRAINAGE: G-2-2-2	VEGETATION: SPRUCE, SOD BIRCH	ELEV:	MILE	B.C.S	NUMBER			
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	PENETRATION RESISTANCE UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				REMARKS
								% RECOVERY	CLAY	SILT	SAND	
%	%	%	%	%	%							
0	SM	SAND: SILTY ORGANIC 1/2	F	Non-low SATN.			0					
2	(SM)	INORGANIC SILTY FINE GRAINED NON PLASTIC GREY BROWN					2					
4							4					
6							6					
8							8					
10							10					
12							12					
14							14					
16							16					
18							18					
20							20					
22							22					
24							24					

O = WATER CONTENT (% OF DRY WEIGHT)
 △ = ICE CONTENT (% OF SAMPLE VOLUME)

PLASTIC LIMIT ————— LIQUID LIMIT

20 40 60 80 100 100+

Non-MED SATN.
 G-2-2-2

SILT-FR G-2

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DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

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MACKENZIE HIGHWAY**

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DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

DWN: E.B

FIELD ENG: G. D.

[DATE DRILLED 19/1/23] AIRPHOTO NO

CHAINAGE

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WAGNER
OFFSET

121

**TEST HOLE
SHEET 2**

R.M. HARDY AND ASSOCIATES LTD.					DRILL HOLE REPORT			DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWNE E.B.	FIELD ENG: G.H.C.	DATE DRILLED: 19/1/73	AIRPHOTO NO: A-22933-21	CHAINAGE:				OFFSET:					TEST HOLE				
CKD 18	TECH: D.R.	RIG: FAILING 1000	SURFACE DRAINAGE: Good					VEGETATION: HEAVY FOREST, OLD FOLIAGE	ELEV:								
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS					MILE	B,C,S	NUMBER
										CLAY	SILT	SAND	GRAVEL	%			
0						SAND: ORGANIC FINE GRAINED NON PLASTIC	F	Nbn-LOW SATIN.	0							557 B25 325	
2						SAND; INORGANIC, SILTY, N.P. GREY BROWN		MEDIUM SATIN.	2								
4									4								
6									6								
8									8								
10									10								
12									12								
14									14								
16									16								
18									18								
20									20								
22									22								
24									24								

O = WATER CONTENT (% OF DRY WEIGHT)
Δ = ICE CONTENT (% OF SAMPLE VOLUME)

PLASTIC LIMIT ————— LIQUID LIMIT

REMARKS

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

DWNE E.B. FI

FIELD ENG: G.Mc.

DATE DRILLED: 2

2/1/75 AIRPHOTO I

NO: A-22777777

2.7 CHAINAGE:

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DWY: E.S.	FIELD ENG: G.P.L.	DATE DRILLED: 20/1/73	AIRPHOTO NO:		CHAINAGE:		OFFSET:																		
CKD:	TECH: D.H.	RIG:	SURFACE DRAINAGE:		VEGETATION:		ELEV:																		
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	WATER CONTENT (% OF DRY WEIGHT)						GRAIN-SIZE ANALYSIS				TEST HOLE SHEET 2					
										CLAY	SILT	SAND	GRAVEL	WET DENSITY (PCF)	DRY DENSITY (PCF)	MILE	B,C,S	NUMBER							
26										○	△	PLASTIC LIMIT	LIQUID LIMIT	20	40	60	80	100	100+					B22	322
28																									
30																									
32																									
34																									
36																									
38																									
40																									
42																									
44																									
46																									
48																									
50																									

END OF HOLE 30

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

DWN: E.B. FIELD ENG: G.Mc. DATE DRILLED: 20/1/73 AIRPHOTO NO: A-22222-77 CHAINAGE:

~~CKD-44~~ TECH: D.H. RIG: FAILING 1922 SURFACE DRAINAGE: - CHAINAGE: -

OFFSET:

SURFACE DRAINAGE CYCLES VEGETATION STRUCURE ZONE

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TEST HOLE

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DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

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DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

FIELD ENG: G.M.				DATE DRILLED: 20/1/73		AIRPHOTO NO: A-22272-27		CHAINAGE:		OFFSET:		MACMENALIE HIGHWAY							
CKD 55	TECH D.H.	RIG FAILING 1000		SURFACE DRAINAGE: -		VEGETATION: SPRUCE, ODD BIRCH		ELEV:		TEST HOLE									
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION		LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	O = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)						GRAIN-SIZE ANALYSIS				
				% RECOVERY	PENETRATION RESISTANCE				CLAY	SILT	SAND	GRAVEL	%	%	%	%	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	
0				SAND: SILTY FINE GRAINED NONPLASTIC LIGHT BROWN		F	Nbr - Low SATN. N.f.	0	20	40	60	80	100	100+			MILE	B.C.S	NUMBER
2				(SM) BROWN				2											
4								4											
6								6											
8								8											
10								10											
12								12											
14								14											
16								16											
18								18											
20								20											
22								22											
24								24											
REMARKS																			

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
DWNR E.B.	FIELD ENG: G. M.	DATE DRILLED: 20/1/73	AIRPHOTO NO: A-22772-29	CHAINAGE: 1140	OFFSET: 2000'													
CKD 6	TECH: D. H.	RIG: FAILING 1000	SURFACE DRAINAGE: FAIR	VEGETATION: SPRUCE	ELEV:	TEST HOLE												
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS						MILE	B.C.S	NUMBER
										CLAY	SILT	SAND	GRAVEL	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)			
0					OL	CLAY ORGANIC, SILTY, SANDY, LOW PLASTIC	F	Vx - 20% (EST)	0									
2					CL		F		2									
4					SM	SAND: SILTY, FINE GRAINED NON PLASTIC GREY-BROWN LIGHTER WITH DEPTH	F	Nm	4									
6									6									
8									8									
10									10									
12									12									
14									14									
16					C1	CLAY; SILTY, MEDIUM PLASTIC GREY-BROWN END OF HOLE	F		16									
18									18									
20									20									
22									22									
24									24									

○ = WATER CONTENT (% OF DRY WEIGHT)
△ = ICE CONTENT (% OF SAMPLE VOLUME)

PLASTIC LIMIT ————— LIQUID LIMIT

SEE MASCIC
36

R.M. HARDY AND ASSOCIATES LTD

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

OWN: E.B.		FIELD ENG: G Mc	DATE DRILLED: 20/1/75	AIRPHOTO NO:	CHAINAGE:	OFFSET:	TEST HOLE SHEET 2									
CKD	TECH	D.H.	RIG:	SURFACE DRAINAGE	VEGETATION:	ELEV:	MILE	B,C,S	NUMBER							
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY	SILT	SAND	GRAVEL			
										%	%	%	%			
26									26							
28									28							
30			(SM)				F	Nbn	30							
32									32							
34									34							
36									36							
38									38							
40									40							
42									42							
44									44							
46									46							
48									48							
50									50							

○ = WATER CONTENT (% OF DRY WEIGHT)
 △ = ICE CONTENT (% OF SAMPLE VOLUME)

PLASTIC LIMIT ————— LIQUID LIMIT

20 40 60 80 100 100+

END OF HOLE

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

OWN: E.B.		FIELD ENG: G. Mc.	DATE DRILLED: 22/1/73	AIRPHOTO NO: A-22933-12	CHAINAGE:	OFFSET:	TEST HOLE							
CKD 11		TECH: D.H.	RIG: FAILING 1000	SURFACE DRAINAGE: GOOD	VEGETATION: SPRUCE 25' to 35' OD RAIN	ELEV:	MILE	B.C.S	NUMBER					
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				REMARKS
0						SAND: SILTY NON PLASTIC BROWN	(SM)	F Nbn	0	CLAY %	SILT %	SAND %	GRAVEL %	
2									2					
4									4					
6									6					
8									8					
10									10					
12									12					
14									14					
16									16					
18									18					
20									20					
22									22					
24									24					

O = WATER CONTENT (% OF DRY WEIGHT)
 △ = ICE CONTENT (% OF SAMPLE VOLUME)

PLASTIC LIMIT ————— LIQUID LIMIT
 20 40 60 80 100 100+ ←

561 B27 331

R. M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

DWN: E.B.		FIELD ENG: G.D.		DATE DRILLED 22/1/75		AIRPHOTO NO:		CHAINAGE:		OFFSET:		TEST HOLE SHEET 2					
CKD:		TECH D.H.		RIG:		SURFACE DRAINAGE:		VEGETATION:		ELEV:							
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION		LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	O = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)		GRAIN-SIZE ANALYSIS				MILE	B.C.S	NUMBER
26								26									
28								28									
30								30									
32								32									
34								34									
36								36									
38								38									
40								40									
42								42									
44								44									
46								46									
48								48									
50								50									

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

OWNER E.B.

FIELD ENG: G. M.

DATE DRILLED: 23/1/75

AIRPHOTO NO: A-3397

CHAINAGE:

[View Details](#)

OFFENSE

— 1 —

WELLER

• 100 •

CKD:

TECH: D.H.

BIG FAILING 1000

SURFACE DRAINAGE:

YES

STATION: 666 READER

CH 1 SET 1

55

TEST 8

hole

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DW# E.B.	FIELD ENG: G M.	DATE DRILLED: 23/1/73	AIRPHOTO NO: A-22933-2	CHAINAGE: 1425404		OFFSET:						TEST HOLE					
CKD 88	TECH: D.H.	RIG: FAILING 1000	SURFACE DRAINAGE	VEGETATION: SEE REMARKS								ELEV:					
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				MILE	B,C,S	NUMBER	
										CLAY	SILT	SAND	GRAVEL				
%	%	%	%							WET DENSITY (PC.F.)	DRY DENSITY (PC.F.)						
0					CL	CLAY: SILTY, SANDY, ORGANIC, MED. PLASTIC, GREY	F	50% 35%	0								554 C 334
2					C1				2								
4					DL				4								
6									6								
8									8								
10									10								
12									12								
14									14								
16									16								
18									18								
20									20								
22									22								
24									24								
REMARKS: DEEP SOIL FROZEN TO 18' & SCATTERED BIRCH & POPLAR																	

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

OWN: E.B.		FIELD ENG: G.M.		DATE DRILLED: 23/1/73		AIRPHOTO NO: A-22933-21		CHAINAGE: 1487+21		OFFSET:		TEST HOLE		
CKD		TECH:	D.H.	RIG:	FAILING 1000	SURFACE DRAINAGE:	G3352	VEGETATION:	SEE REMARKS	ELEV:	MILE	B,C,S	NUMBER	
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				
										% CLAY	% SILT	% SAND	% GRAVEL	
0						SAND: SILTY/ FINE GRAINED NON PLASTIC LIGHT BROWN	F	Nbn	0					
2									2					
4									4					
6									6					
8									8					
10									10					
12									12					
14									14					
16									16					
18									18					
20									20					
22									22					
24									24					

O = WATER CONTENT (% OF DRY WEIGHT)
 △ = ICE CONTENT (% OF SAMPLE VOLUME)
 PLASTIC LIMIT 40 LIQUID LIMIT 80
 20 60 100 100+

LEASE 1487+21 TO 65K

8-18-78 UNPLANTED
BIRCH

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

DWN: E.B. FIELD ENG: G.Mc. DATE DRILLED: 03/17/73 AIRPHOTO NO: A-22931-21 CHAINAGE: 1443+23 OFFSET:
 CKD: D.H. TECH: D.H. RIG: FAILING 1020 SURFACE DRAINAGE: FAIR VEGETATION: SEE SETBACKS ELEV:

CKD-144 TECH: D.H. RIG FAILING 1020 SURFACE DRAINAGE: FAIR VEGETATION: SEE 6

OFFSET

CKD: *[Signature]* TECH: D.H.

BIG FAILING

PHOTO BY
JEREMY D. BROWN

2531-

CHINA

GETATION: SEE SE

VEGETATION - SEE REFERENCES

OFFSET:

TEST HOLE

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT			DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DW#: E.F.	FIELD ENG: G.Mc.	DATE DRILLED: 23/1/73	AIRPHOTO NO: A-22933-2)	CHAINAGE: 1474.4m	OFFSET:											
CKD: E.F.	TECH: D.H.	RIG FAILING 1000	SURFACE DRAINAGE: Good	VEGETATION: SEE REMARKS	ELEV:											
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				TEST HOLE		
										CLAY	SILT	SAND	GRAVEL	MILE	B,C,S	NUMBER
0					ML	SILT: SANDY LIGHT BROWN	F	Nbr	0	%	%	%	%	WET DENSITY (PC.F.)	DRY DENSITY (PC.F.)	REMARKS
2									2							HEAVY SPRUCE TO GO SCATTERED PINE, OLD BIRCH
4					SM	SAND: SILTY FINE GRAINED NON PLASTIC GREY BROWN			4							
6									6							
8									8							
10									10							
12									12							
14									14							
16									16							
18									18							
20									20							
22									22							
24									24							

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

DWN: EB		FIELD ENG: GND.	DATE DRILLED:	AIRPHOTO NO:	CHAINAGE:	OFFSET:	TEST HOLE SHEET 2						
CKD:	TECH: 14.	RIG:	SURFACE DRAINAGE:	VEGETATION:		ELEV:	MILE	B.C.S	NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS			
26							F	N/A	26	% CLAY	% SILT	% SAND	% GRAVEL
28									28				
30									30				
32									32				
34									34				
36									36				
38									38				
40									40				
42									42				
44									44				
46									46				
48									48				
50									50				
										WET DENSITY (PCF)	DRY DENSITY (PCF)		
										C 339	REMARKS		

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

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DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWN E.B. FIELD ENG: G. Mc. DATE DRILLED: 22/1/72 AIRPHOTO NO: A-22933-2) CHAINAGE: 1452 + 1/2				OFFSET:		TEST HOLE												
CKD: CK TECH: D.H. RIG: FAILING 1000 SURFACE DRAINAGE: <i>Gravel</i> VEGETATION: SEE RUMPKAS				ELEV:														
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS						MILE	B.C.S	NUMBER
										CLAY	SILT	SAND	GRAVEL	WET DENSITY (IP CF)	DRY DENSITY (IP CF)			
0						SAND: <i>SILTY FINE GRAINED NONPLASTIC DRY LIGHT BROWN</i>	F	N _f -N _{dm}	0								353 C 341	
2									2									
4									4									
6						<i>GREYISH</i>			6									
8									8									
10									10									
12									12									
14									14									
16									16									
18									18									
20									20									
22									22									
24									24									
REMARKS																		
<i>DENSE SPRUCE UPT. 15' TALL. SOME RED BIRCHES AND PAPER</i>																		

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DW#:	E-8.	FIELD ENG:	G.M.	DATE DRILLED:	23/1/75	AIRPHOTO NO:		CHAINAGE:		OFFSET:		TEST HOLE SHEET 2		
CKD:		TECH:	D.H.	RIG:		SURFACE DRAINAGE:		VEGETATION:		ELEV:		MILE	B,C,S	NUMBER
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				
										CLAY	SILT	SAND	GRAVEL	WET DENSITY (PC.F.)
%	%	%	%						REMARKS					
26						F Nbn			26					
28									28					
30									30					
32									32					
34									34					
36									36					
38									38					
40									40					
42									42					
44									44					
46									46					
48									48					
50									50					

○ = WATER CONTENT (% OF DRY WEIGHT)
△ = ICE CONTENT (% OF SAMPLE VOLUME)
PLASTIC LIMIT — LIQUID LIMIT

20 40 60 80 100 100+

END OF HOLE 30

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

OWN: E.B.		FIELD ENG: G.Mc.		DATE DRILLED: 23/1/75		AIRPHOTO NO: A-22933-21		CHAINAGE: 1518+17		OFFSET:		TEST HOLE						
CKD: H		TECH: D.H.		RIG: FAILING 1000		SURFACE DRAINAGE: GOOD		VEGETATION: SEE REFERENS		ELEV:								
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (PC.F.)	DRY DENSITY (PC.F.)	MILE	B.C.S	NUMBER
										CLAY	SILT	SAND	GRAVEL					
0									0	%	%	%	%					
2									2									
4									4									
6									6									
8									8									
10									10									
12									12									
14									14									
16									16									
18									18									
20									20									
22									22									
24									24									
O = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)													REMARKS					
SAND: SILTY FINE GRAINED NONPLASTIC LIGHT BROWN (SM) ----- 3 BROWN													DENSE STONE - 45° PARTICLES OF BURCH'S ENDLESS					

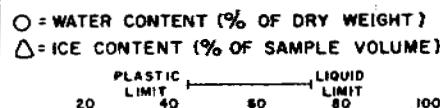
R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

OWN: E.B. FIELD ENG: G.R.C. DATE DRILLED: 2/1/73 AIRPHOTO NO:				CHAINAGE:				OFFSET:									
CKD	TECH:	D.H.	RIG:	SURFACE DRAINAGE:				VEGETATION:				ELEV:					
												TEST HOLE SHEET 2					
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				MILE	B,C,S	NUMBER	
										CLAY	SILT	SAND	GRAVEL				
										%	%	%	%	WET DENSITY (PCF)	DRY DENSITY (PCF)		
26									26								
28									28								
30									30								
									32								
									34								
									36								
									38								
									40								
									42								
									44								
									46								
									48								
									50								
END OF HOLE 30												REMARKS					

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
DW# E.B.	FIELD ENG: G.M.	DATE DRILLED: 25/1/73	AIRPHOTO NO: A-22935-2	CHAINAGE: 15287.93		OFFSET:					TEST HOLE							
CKD: 18	TECH: D.H.	RIG: FAILINS 1000	SURFACE DRAINAGE: GOOD	VEGETATION: SEE REPORT		ELEV:					MILE	B,C,S	NUMBER					
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PERENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				CLAY	SILT	SAND	GRAVEL	
										%	%	%	%	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)		REMARKS	
0						SAND: SM OL	F	Nbn	0									553 C 346
2									2									BURNED AREA WITH PATCHES OF DENSE SCREW SPENCE UP TO 35' TALL.
4						INORGANIC GREY BROWN		Nbk-Nd.	4									
6									6									
8									8									
10									10									
12									12									
14									14									
16									16									
18									18									
20									20									
22									22									
24									24									



R.M.HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWY: E.B.		FIELD ENG: G.M.	DATE DRILLED: 25/1/73	AIRPHOTO NO:	CHAINAGE:	OFFSET:	TEST HOLE SHEET 2								
CKD		TECH D.H.	RIG:	SURFACE DRAINAGE	VEGETATION	ELEV:	MILE	B.C.S	NUMBER						
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS					
										CLAY	SILT	SAND	GRAVEL		
26							UF	WATER	26	%	%	%	%		
28									28						
30						END OF HOLE	30		30						
32									32						
34									34						
36									36						
38									38						
40									40						
42									42						
44									44						
46									46						
48									48						
50									50						
REMARKS															

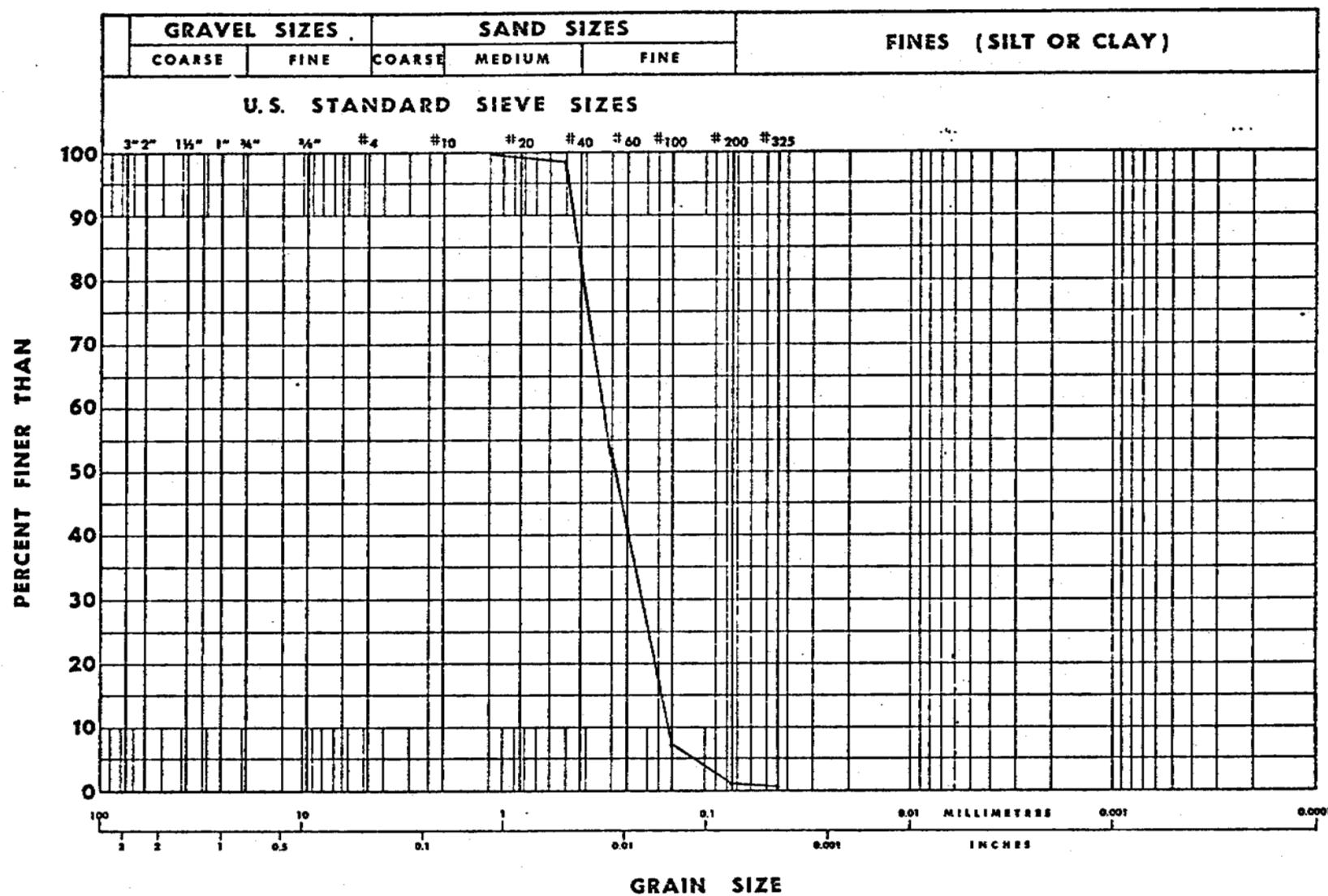
○ = WATER CONTENT (% OF DRY WEIGHT)
 △ = ICE CONTENT (% OF SAMPLE VOLUME)
 PLASTIC LIMIT 20 40 60 80 100 100+ LIQUID LIMIT



MATERIALS TESTING
LABORATORIES LTD.

GRAIN SIZE CURVE

LAB ORDER NO.	E-2510
CLIENT	
SAMPLE	TH. #316
SOURCE	
HOLE	
TECHNICIAN	D.R.
DEPTH 6'-10'	
DATE REC'D.	1/26/73



REMARKS:

D ₁₀ = _____ MM.
D ₃₀ = _____ MM.
D ₆₀ = _____ MM.
C _u = _____
C _c = _____

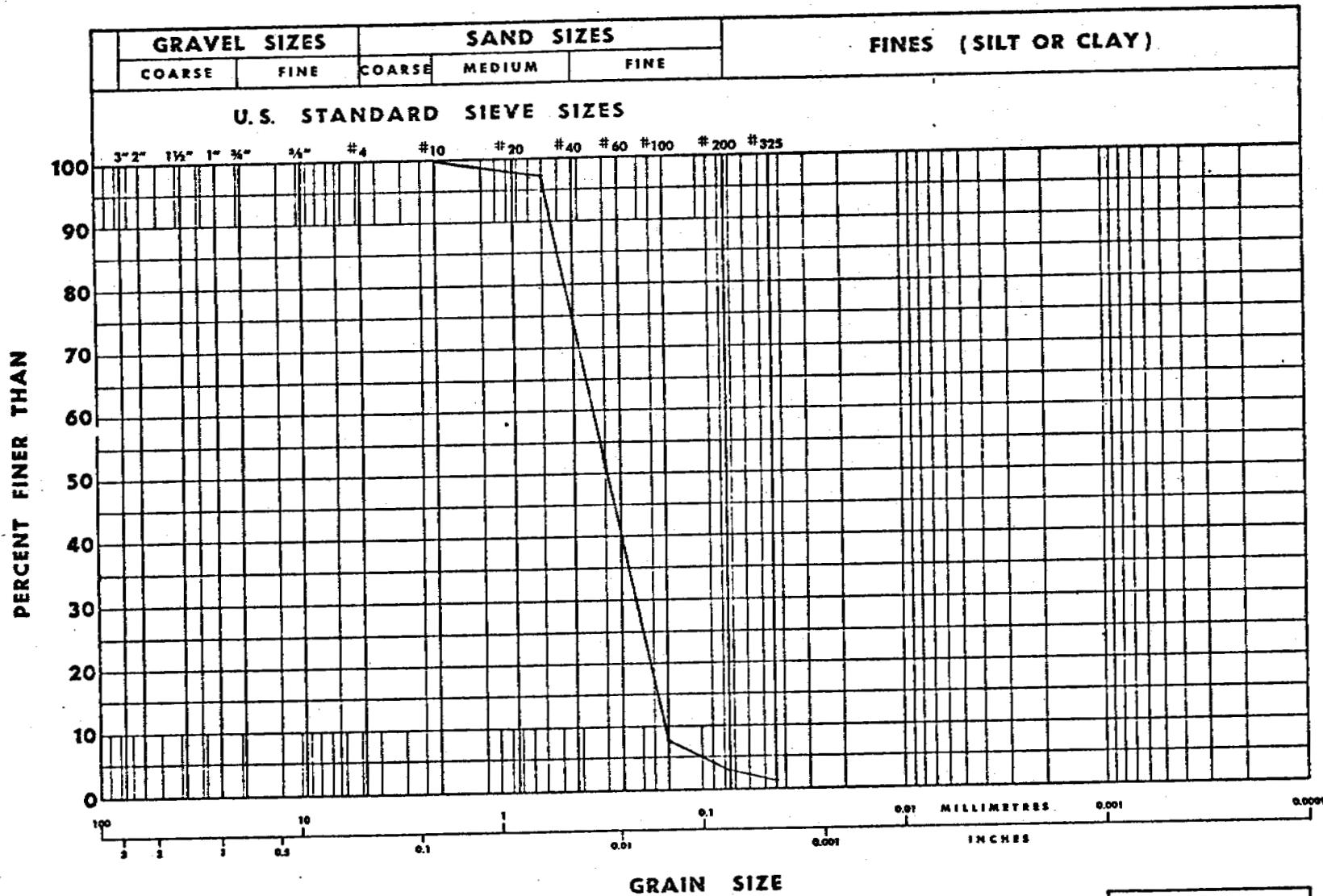
NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM



**MATERIALS TESTING
LABORATORIES LTD.**

GRAIN SIZE CURVE

LAB ORDER NO.	E-2510
CLIENT	
SAMPLE	TH # 346
SOURCE	
HOLE	DEPTH 12'-16'
TECHNICIAN	DATE REC'D. D.R. DATE TESTED 1/26/73



REMARKS:

D ₁₀ =	MM.
D ₃₀ =	MM.
D ₆₀ =	MM.
C _u =	
C _c =	

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM



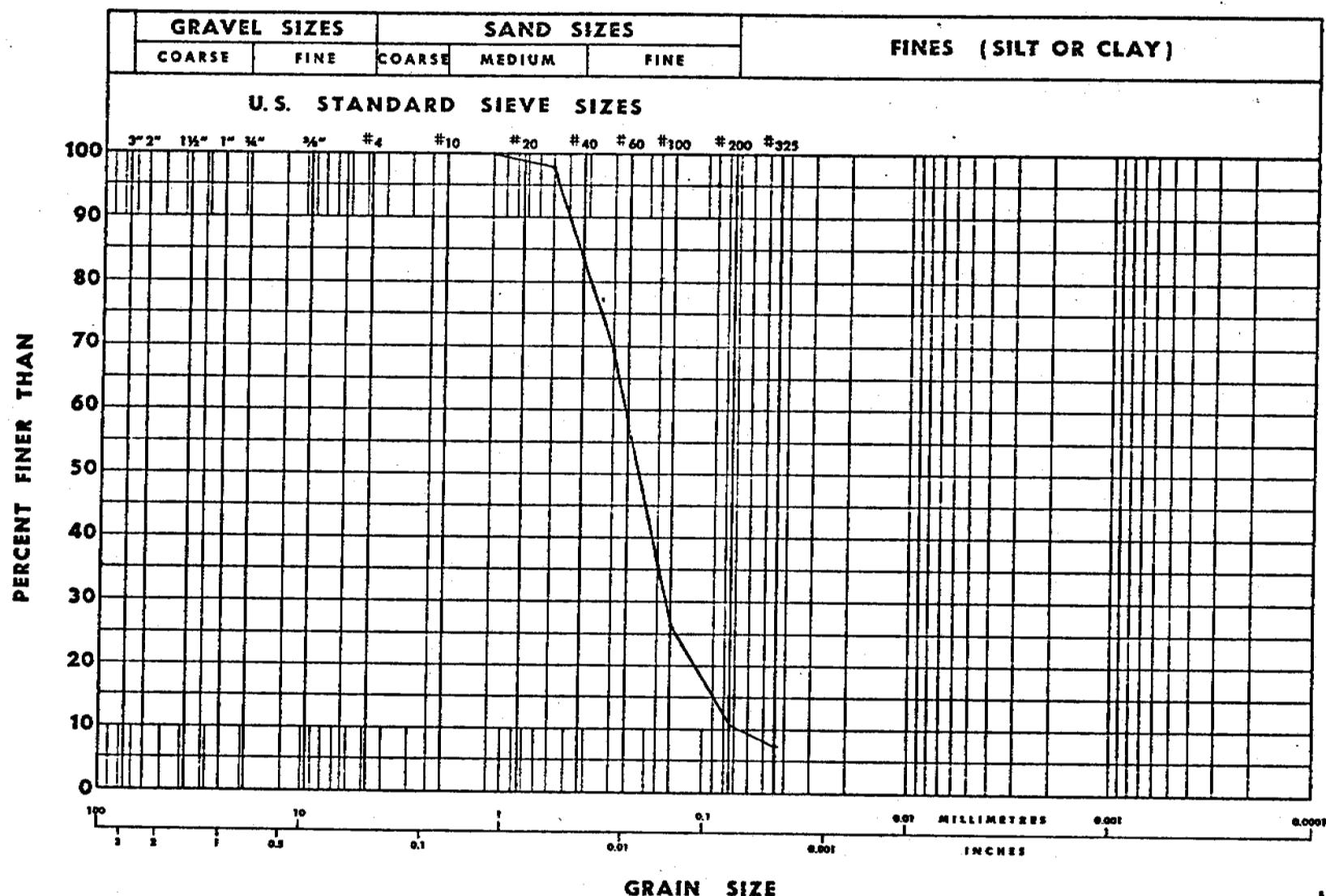
MATERIALS TESTING LABORATORIES LTD.

LAB ORDER NO. E-2510

SAMPLE TH. # 346
SOURCE

TECHNICIAN D.R. HOLE BIRTH 8-24

卷之三



REMARKS:

D₁₀ = _____ MM.
D₃₀ = _____ MM.
D₆₀ = _____ MM.
C_u = _____
C_c = _____

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

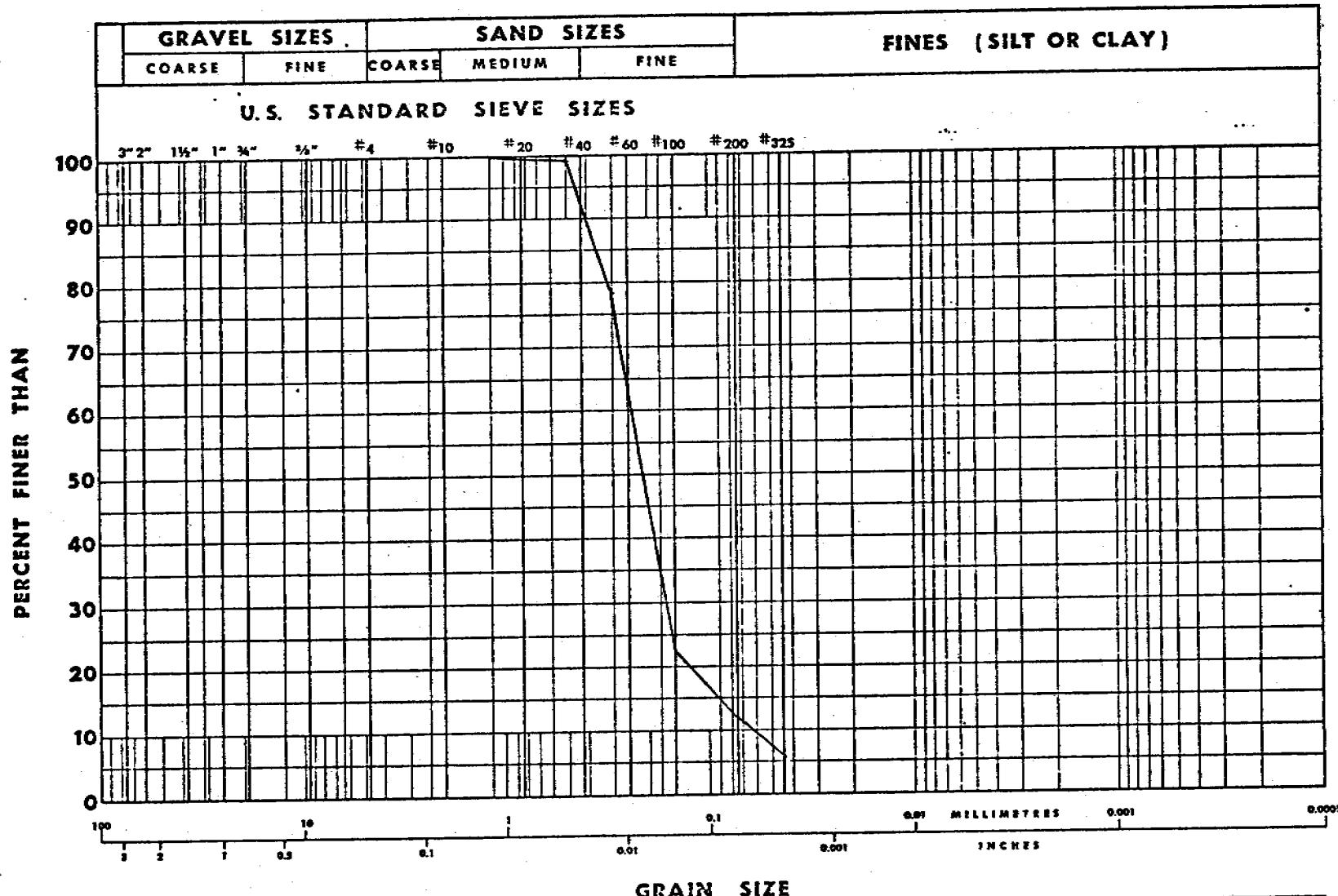
OWN: E.H.	FIELD ENG: G. M.	DATE DRILLED: 25/1/73	AIRPHOTO NO: A-22933-21	CHAINAGE: 15354-82	OFFSET:													
CKD	TECH: D.H.	RIG: FAILING 1000	SURFACE DRAINAGE: Collected	VEGETATION: High, sparse vegetation	ELEV:													
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS						MILE	B.C.S	TEST HOLE NUMBER
										CLAY	SLY	SAND	GRAVEL	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)			
										%	%	%	%					
0									0									
2									2									
4									4									
6									6									
8									8									
10									10									
12									12									
14									14									
16									16									
18									18									
20									20									
22									22									
24									24									
END OF HOLE AT - 20'																		
3-87																		



**MAIERMILL'S TESTING
LABORATORIES LTD.**

GRAIN SIZE CURVE

LAB ORDER NO. E-2510
 CLIENT _____
 SAMPLE # 347
 SOURCE _____
 HOLE DEPTH 20'-26' DATE REC'D.
 TECHNICIAN D.R. DATE TESTED 1/25/73



REMARKS: _____

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

D ₁₀ =	MM.
D ₃₀ =	MM.
D ₆₀ =	MM.
C _u =	
C _c =	

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

OWN: E.B.		FIELD ENG: G.M.	DATE DRILLED: 2-11-73	AIRPHOTO NO: L-22933-2	CHAINAGE: 15483 + 10	OFFSET:	TEST HOLE												
CKD: 116		TECH: D.H.	RIG: FAIRCHILD 1000	SURFACE DRAINAGE: GOOD	VEGETATION: CEMETERY LAWN - 200 YRS	ELEV:	MILE	B.C.S	NUMBER										
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNITED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)	GRAIN-SIZE ANALYSIS	CLAY	SILT	SAND	GRAVEL	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS	
0						SAND: SILTY FINE GRAINED NON PLASTIC GREY BROWN	1	1/4" - MED. SAND	0										
2									2										
4									4										
6									6										
8									8										
10									10										
12								JF NO ICE	12										
14									14										
16									16										
18									18										
20									20										
22									22										
24									24										

PLASTIC LIMIT ————— LIQUID LIMIT

20 40 60 80 100 100+

6634

18 B2

9 0

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
DWN: E.S.	FIELD ENG: G.N.	DATE DRILLED: 25/1/75	AIRPHOTO NO:	CHAINAGE:		OFFSET:		TEST HOLE SHEET 2										
CKD:	TECH: D.H.	RIG:	SURFACE DRAINAGE:	VEGETATION:		ELEV:												
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS						MILE	B.C.S	NUMBER
										CLAY	SILT	SAND	GRAVEL	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)			
26									26								C 348	
28									28									
30									30									
32									32									
34									34									
36									36									
38									38									
40									40									
42									42									
44									44									
46									46									
48									48									
50									50									
REMARKS																		
END OF HOLE 30' (sm) F Nbr-MED. SATN.																		

O = WATER CONTENT (% OF DRY WEIGHT)
 △ = ICE CONTENT (% OF SAMPLE VOLUME)

PLASTIC LIMIT — LIQUID LIMIT

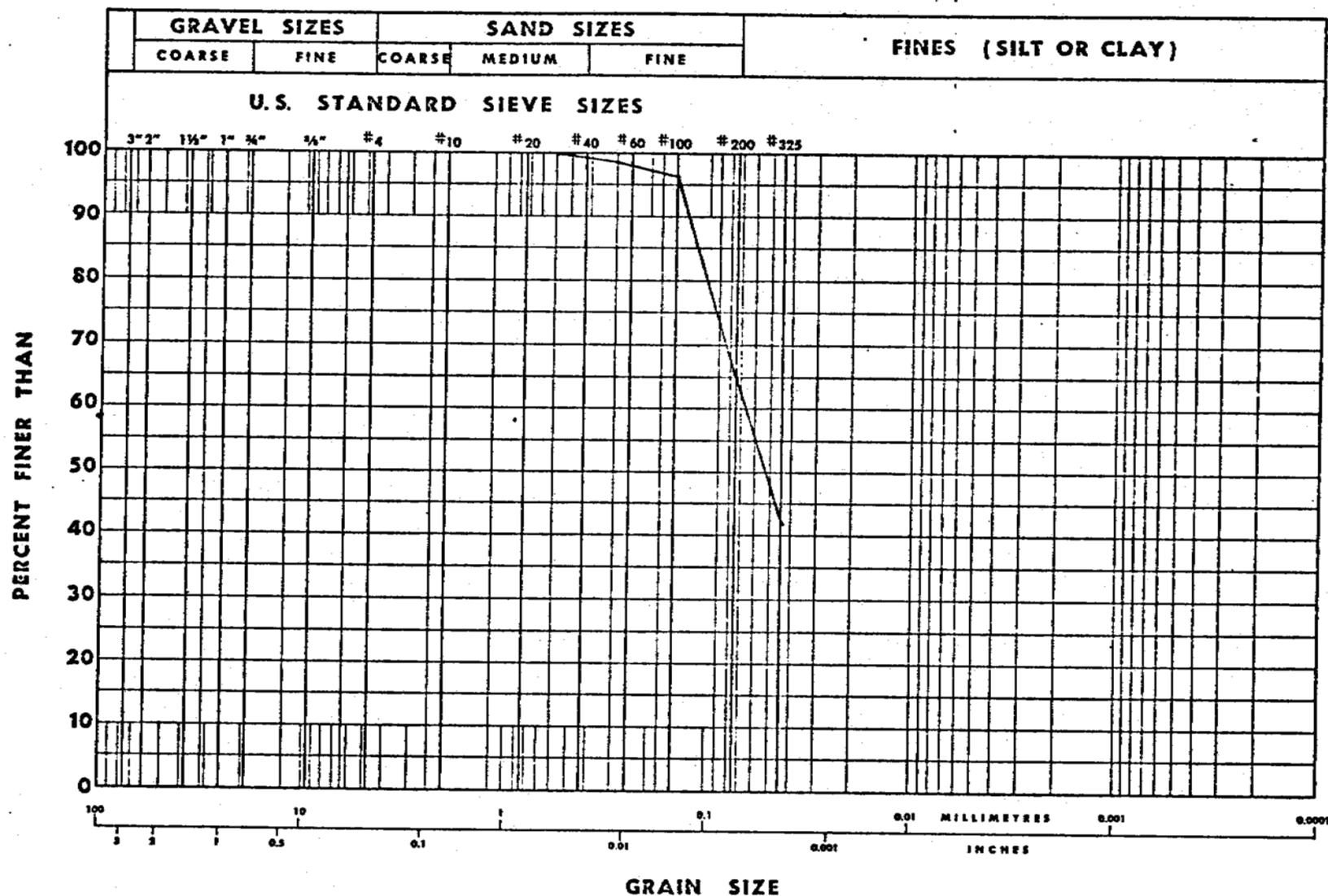
20 40 60 80 100 100+



**MATERIALS TESTING
LABORATORIES LTD.**

GRAIN SIZE CURVE

LAB ORDER NO. E-2510
CLIENT
SAMPLE #348
SOURCE
HOLE
TECHNICIAN D.R.
DEPTH 4'-6'
DATE REC'D.
DATE TESTED 1/23/73



REMARKS:

D ₁₀ = _____ mm.
D ₃₀ = _____ mm.
D ₅₀ = _____ mm.
C _s = _____
C _c = _____

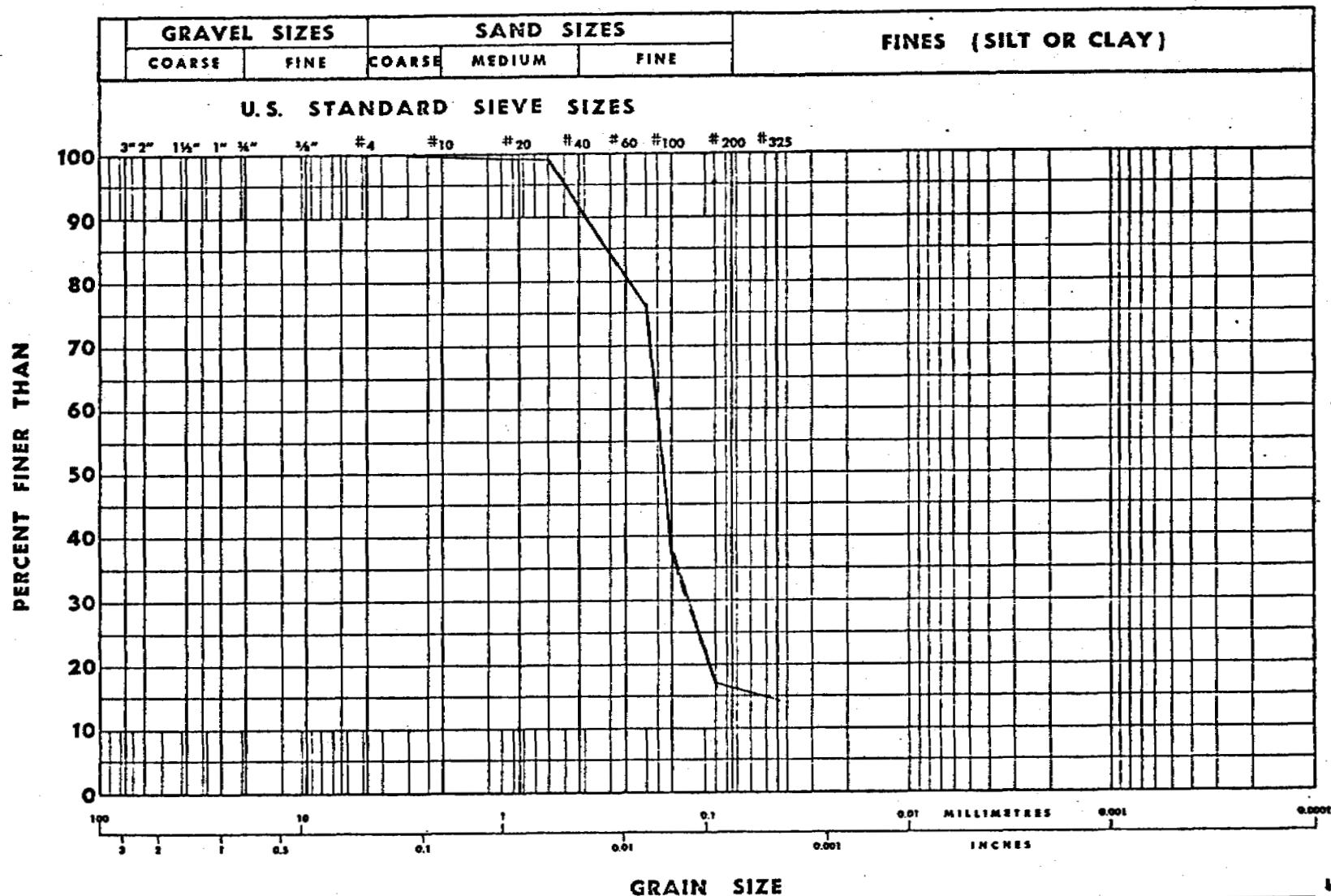
NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM



MATERIALS TESTING
LABORATORIES LTD.

GRAIN SIZE CURVE

LAB ORDER NO. E-2510
 CLIENT
 SAMPLE #348
 SOURCE
 HOLE DEPTH 10'-1/4' DATE REC'D.
 TECHNICIAN D.R. DATE TESTED 1/26/73



REMARKS: _____

D ₁₀ =	MM.
D ₃₀ =	MM.
D ₆₀ =	MM.
C _u =	
C _c =	

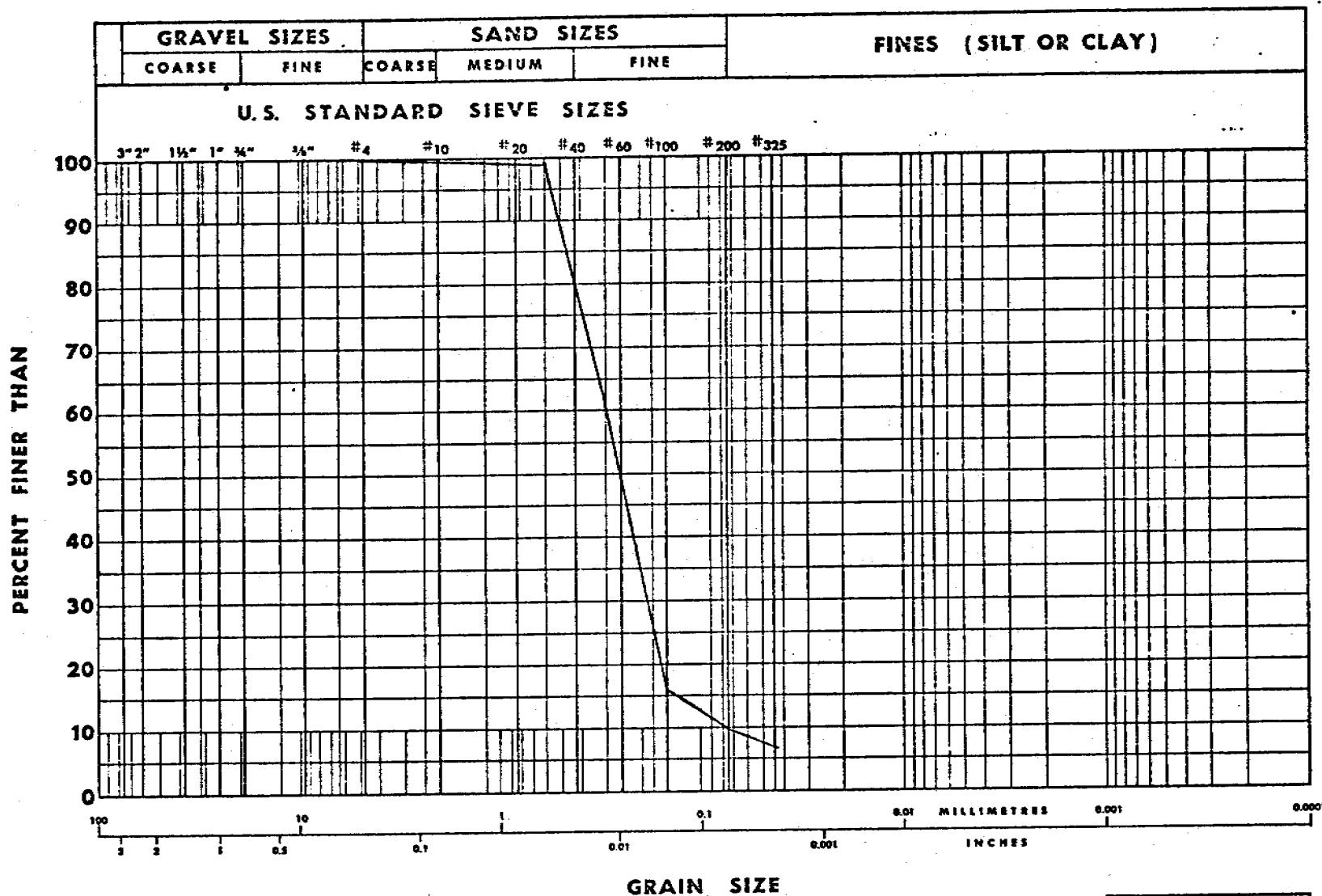
NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM



**MATERIALS TESTING
LABORATORIES LTD.**

GRAIN SIZE CURVE

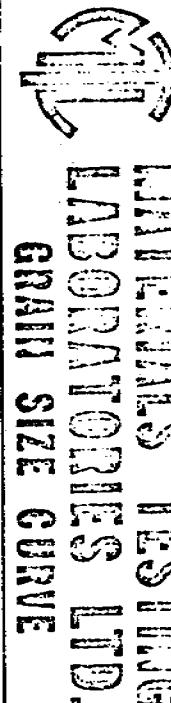
LAB ORDER NO. E-2510
 CLIENT _____
 SAMPLE # 348
 SOURCE _____
 HOLE DEPTH 16'-22' DATE REC'D. _____
 TECHNICIAN D.R. DATE TESTED 1/26/73



REMARKS: _____

$D_{10} =$ _____ MM.
$D_{30} =$ _____ MM.
$D_{60} =$ _____ MM.
$C_u =$ _____
$C_c =$ _____

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

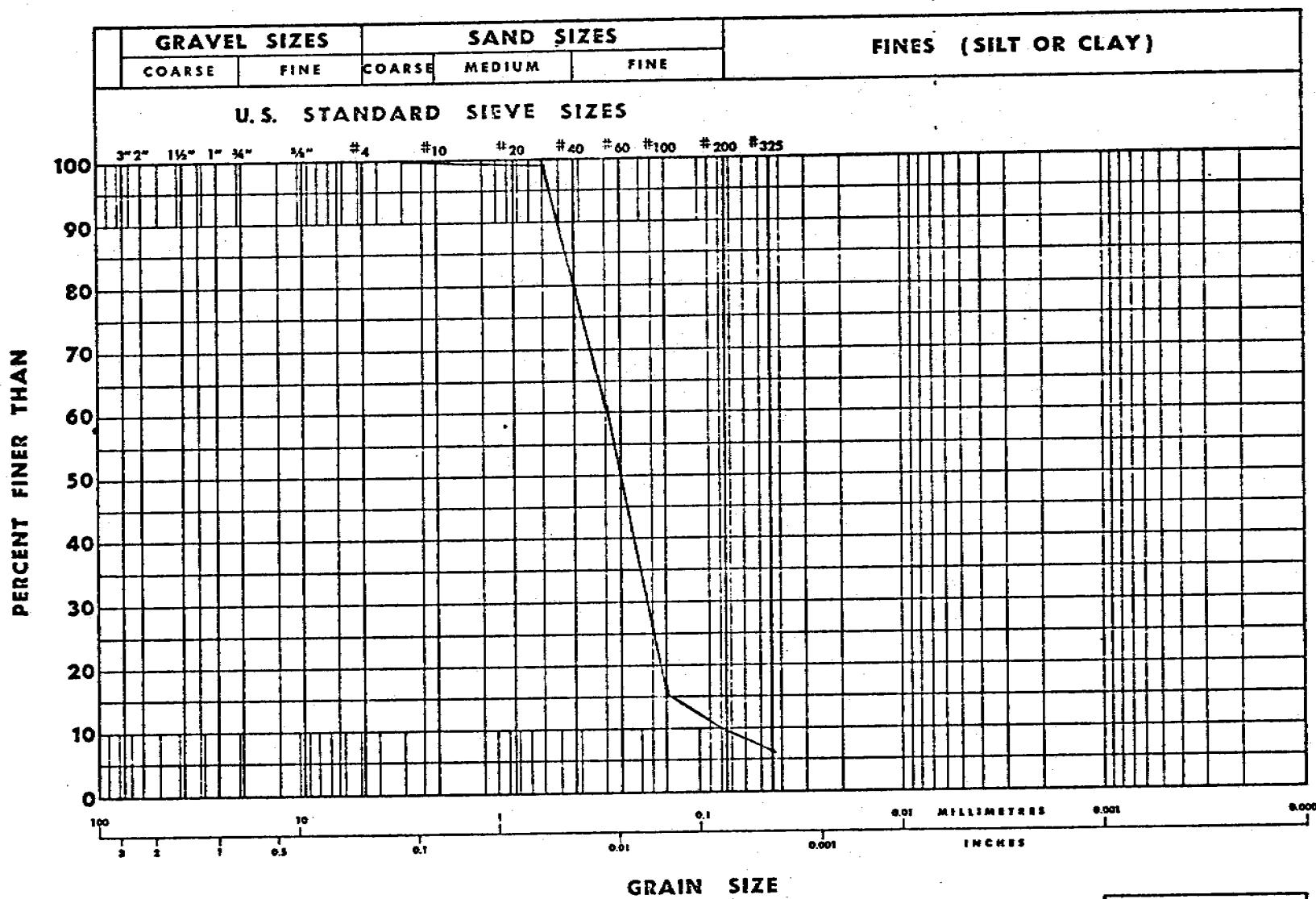


MATERIALS TESTING
LABORATORIES LTD.

GRAIN SIZE CURVE

LAB ORDER NO. E-2510

CLIENT
SAMPLE #348
SOURCE
HOLE DEPTH 24' 30' DATE REC'D.
TECHNICIAN D.R. DATE TESTED 1/26/73



REMARKS:

D_{10} = _____ MM.
D_{30} = _____ MM.
D_{60} = _____ MM.
C_s = _____
C_c = _____

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

OWN: E.A.		FIELD ENG: G.N.		DATE DRILLED: 2/1/75		AIRPHOTO NO: A-22233-21		CHAINAGE:		OFFSET:		TEST HOLE					
CKD: C		TECH: G.C.		RIG: FAILING 1900		SURFACE DRAINAGE: C-FINE		VEGETATION: SOOTY GROVE		ELEV:		MILE	B,C,S	NUMBER			
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS							
										CLAY	SILT	SAND	GRAVEL	%	%	%	%
0						SAND	F	NO	0								
2						SILTY, FINE GRAINED, NONPLASTIC, BROWN, ORGANICS.	UF	VERY WET SLUFWING.	2								
4									4								
6									6								
8									8								
10									10								
12									12								
14									14								
16									16								
18									18								
20									20								
22									22								
24									24								
O = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)														REMARKS			
<p>PLASTIC LIMIT LIQUID LIMIT</p> <p>20 40 60 80 100 100+</p>																	
END OF HOLE																	

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
DWNR E.B.	FIELD ENG: G.M.	DATE DRILLED: 20/1/75	AIRPHOTO NO: A-22933-21	CHAINAGE:		OFFSET:		TEST HOLE								
CKD: 111	TECH: G.C.	RIG: FAILING 1000	SURFACE DRAINAGE: G-022	VEGETATION: SPRUCE 30'-50', 5% BIRTH		ELEV:		MILE	B,C,S	NUMBER						
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	CLAY	SILT	SAND	GRAVEL	WET DENSITY (IP CF)	DRY DENSITY (IP CF)	REMARKS
									20 40 60 80 100 100+	%	%	%	%			
0						FT PEAT: CAT. #4	F	70% (EST)	0							
2						SAND: SILTY FINE GRAINED MED PLASTIC MED TO LIGHT DARK BROWN 3	SM	Nbn - MED SATIN	2							
4									4							
6									6							
8									8							
10									10							
12									12							
14									14							
16									16							
18									18							
20									20							
22									22							
24									24							

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY											
OWN: E.R.	FIELD ENG: G.R.	DATE DRILLED: 11/17/73	AIRPHOTO NO: A-22932-2	CHAINAGE:		OFFSET:		TEST HOLE SHEET 2											
CKD: 1/2	TECH: G.C.	RIG:	SURFACE DRAINAGE:	VEGETATION:		ELEV:		MILE	B,C,S	NUMBER									
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	O = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)						GRAIN-SIZE ANALYSIS			
										CLAY	SILT	SAND	GRAVEL	PLASTIC LIMIT	LIQUID LIMIT	20	40	60	80
%	%	%	%																
26							F	Nor	26										
28									28										
30									30										
32									32										
34									34										
36									36										
38									38										
40						CL CLAY, SILTY 40		Nee	40										
						SLIGHTLY SANDY LOW TO MED PLASTIC BANDS													
42									42										
44									44										
46									46										
48									48										
50									50										

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWN: E.B. FIELD ENG: G.P.C. DATE DRILLED: 22/1/73 AIRPHOTO NO: A-22523-21 CHAINAGE:				OFFSET:														
CKD: TECH: G.C. RIG: SURFACE DRAINAGE: VEGETATION:				ELEV:														
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS						TEST HOLE		
										CLAY	SILT	SAND	GRAVEL	MILE	B.C.S	NUMBER		
										%	%	%	%	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS		
57				C		F	N63		50									
52									2									
54									4									
56				C1	CLAY: VERY SILTY MED PLASTIC				6									
					END OF HOLE				8									
10									10									
12									12									
14									14									
16									16									
18									18									
20									20									
22									22									
24									24									

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

OWN: E.B. FIELD ENG: G.M. DATE DRILLED: 24/11/75 AIRPHOTO NO: A-22533-19 CHAINAGE: 1550 + 62 OFFSET:
 CKD: B TECH: G.C. RIG: FAILING 1000 SURFACE DRAINAGE: FAIR VEGETATION: PINE 30 - 45

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

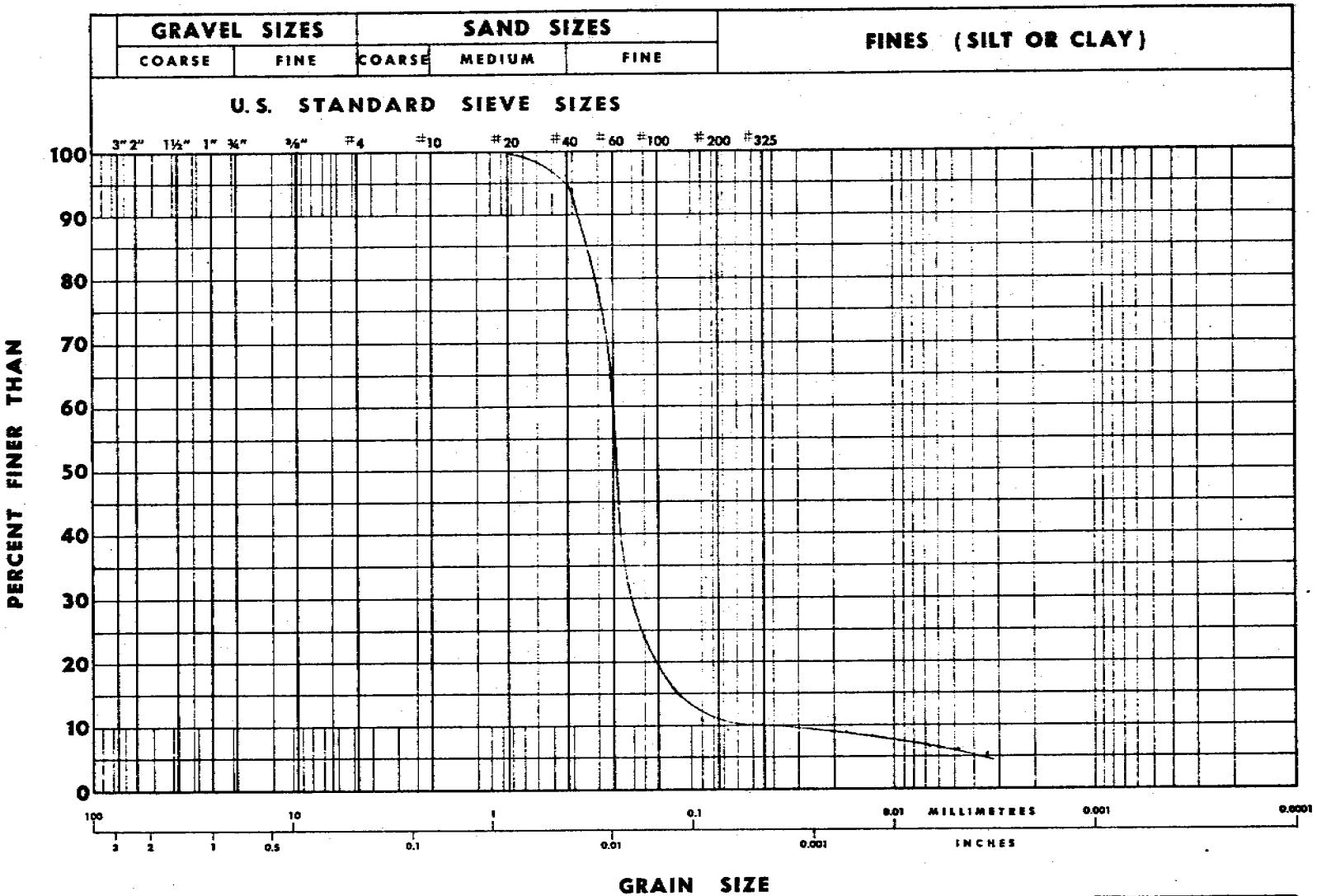
OWN: E 8.	FIELD ENG G. Mc.	DATE DRILLED 24/1/73	AIRPHOTO NO: A 22933-19	CHAINAGE:	OFFSET:	TEST HOLE SHEET 2										
CKD: 12	TECH G. C.	RIG: FAILING 1000	SURFACE DRAINAGE FAIR	VEGETATION:	ELEV:	MILE	B.C.S	NUMBER								
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE (CM)	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	CLAY %	SILT %	SAND %	GRAVEL %	WET DENSITY (PCF)	DRY DENSITY (PCF)	REMARKS
26									26							
26									28							
30									30							END OF HOLE
32									32							
34									34							
36									36							
38									38							
40									40							
42									42							
44									44							
46									46							
48									48							
50									50							

O = WATER CONTENT (% OF DRY WEIGHT)
 △ = ICE CONTENT (% OF SAMPLE VOLUME)
 PLASTIC LIMIT ————— LIQUID LIMIT
 20 40 60 80 100 100+

**MATERIALS TESTING
LABORATORIES LTD.**

GRAIN SIZE CURVE

LAB ORDER NO. S-1065
 CLIENT E-2510
 SAMPLE
 SOURCE
 HOLE #351 DEPTH 2'
 TECHNICIAN G.
 DATE TESTED FEB. 15/73



REMARKS:

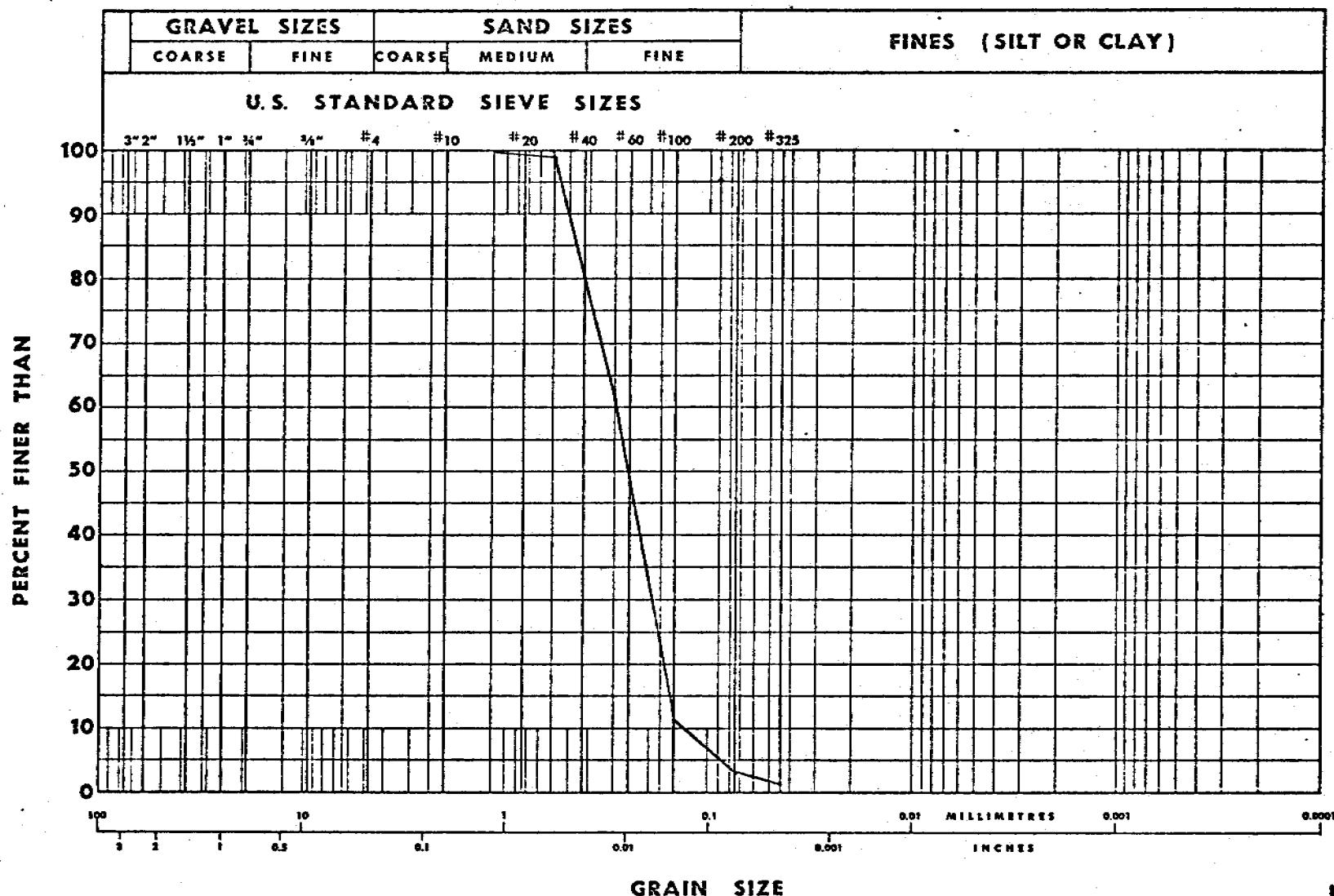
D₁₀ = _____ MM.
 D₃₀ = _____ MM.
 D₆₀ = _____ MM.
 C_u = _____
 C_c = _____

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM



MATERIALS TESTING
LABORATORIES LTD.

LAB. ORDER NO. E-2510
CLIENT _____
SAMPLE #351
SOURCE _____
HOLE DEPTH 4'-10' DATE REC'D.
TECHNICIAN D.R. DATE TESTED 1/29/73



REMARKS: _____

D₁₀ = _____ MM.
D₃₀ = _____ MM.
D₆₀ = _____ MM.
C_u _____
C_c _____

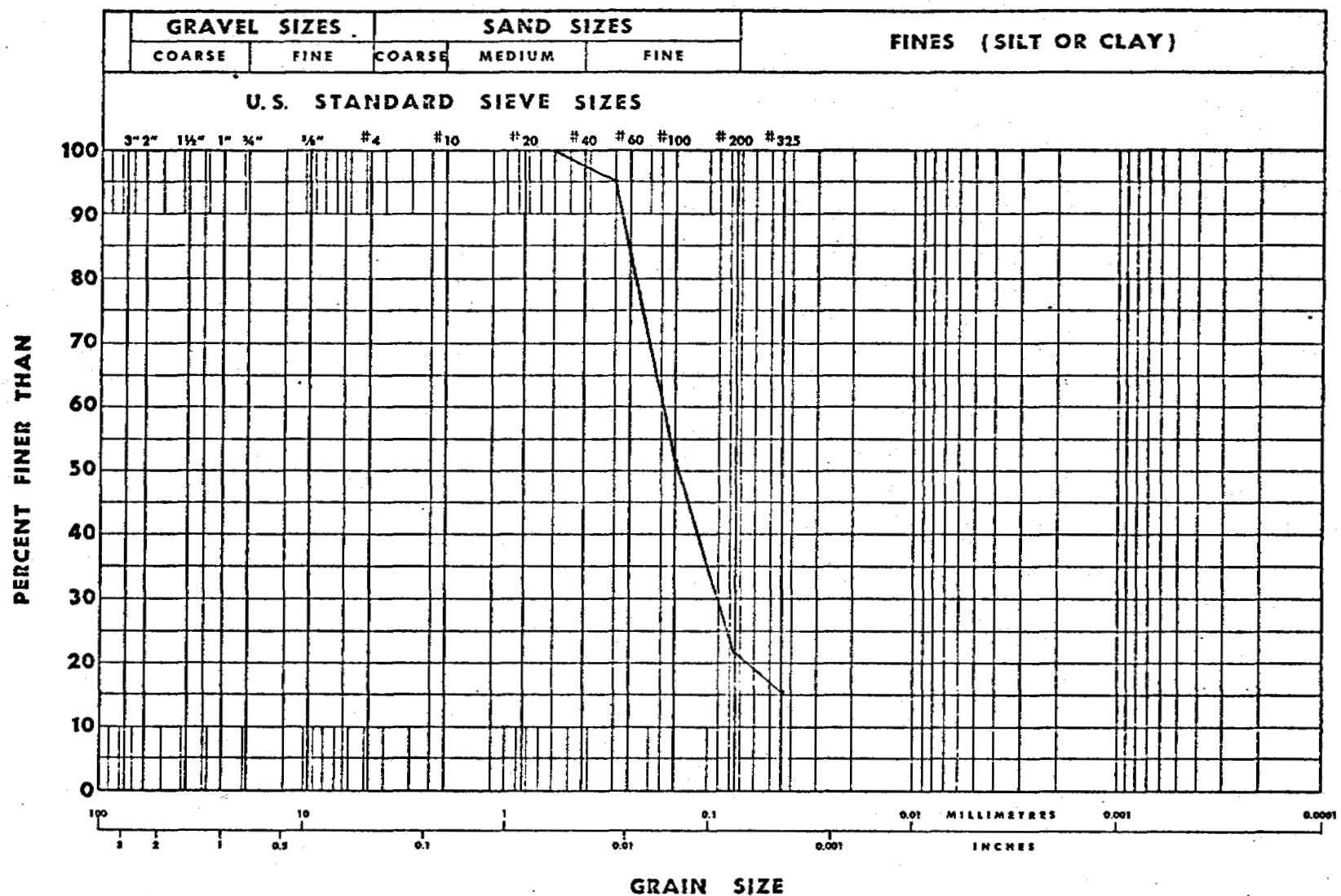
NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM



MATERIALS TESTING
LABORATORIES LTD.

GRAIN SIZE CURVE

LAB ORDER NO. E-2510
 CLIENT _____
 SAMPLE TH. # 351
 SOURCE _____
 HOLE DEPTH 12'-18' DATE REC'D.
 TECHNICIAN D.R. DATE TESTED 1/29/73



REMARKS: _____

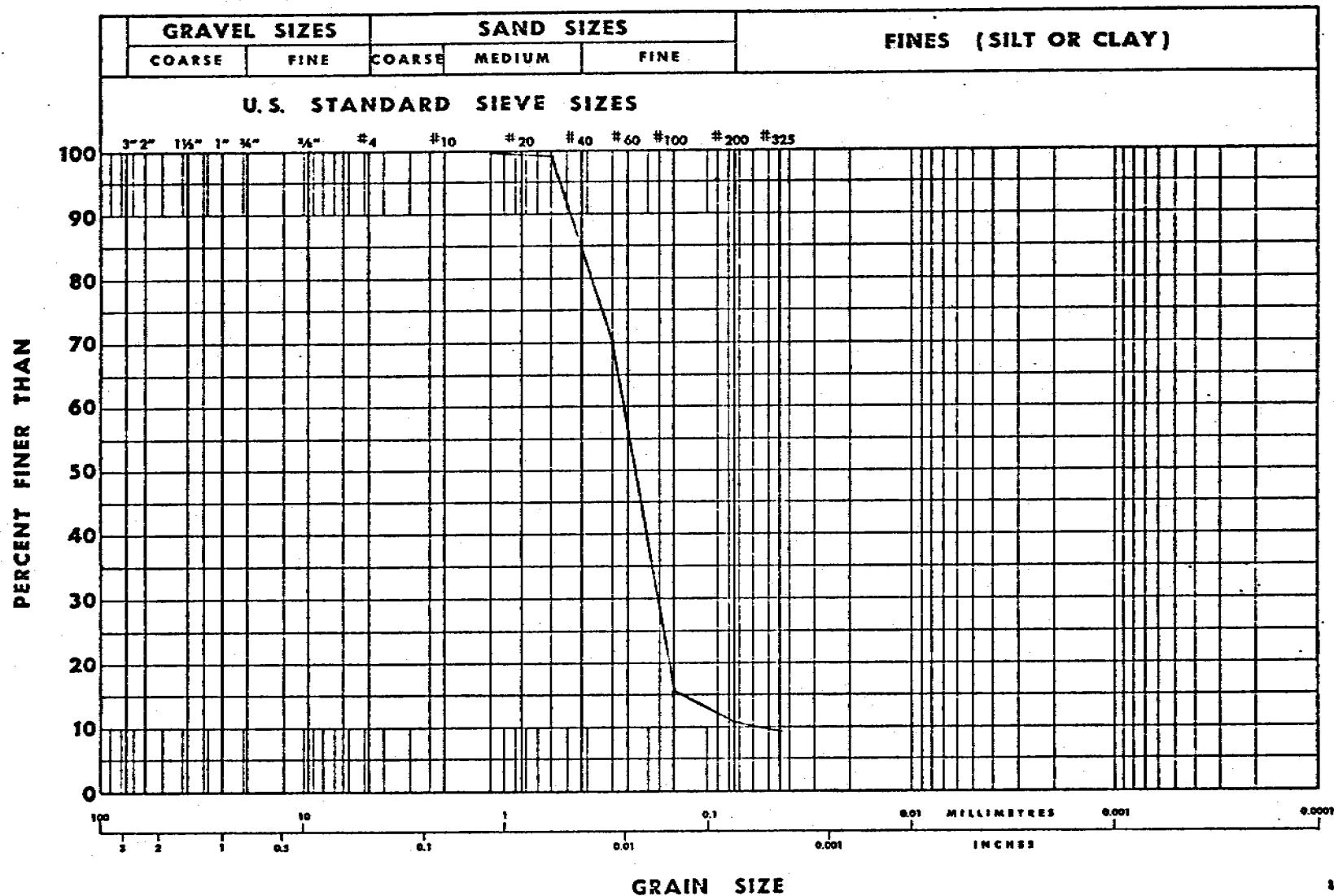
D ₁₀ = _____	MM.
D ₃₀ = _____	MM.
D ₆₀ = _____	MM.
C _u = _____	
C _c = _____	

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM



MATERIALS TESTING
LABORATORIES LTD.
GRAIN SIZE CURVE

LAB ORDER NO. E-2510
CLIENT _____
SAMPLE TH-351
SOURCE _____
HOLE DEPTH 20'-30'
TECHNICIAN D.R. DATE TESTED 1/29/73



REMARKS: _____

D_{10} =	MM.
D_{30} =	MM.
D_{60} =	MM.
C_u =	_____
C_c =	_____

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWNR E.S.	FIELD ENG: G.I.R.	DATE DRILLED: 24/1/73	AIRPHOTO NO: A 22053-19	CHAINAGE: 15-354-50		OFFSET:			TEST HOLE								
CKD: 78	TECH: G.C.	RIG: FAILING 1000	SURFACE DRAINAGE: FAIR	VEGETATION: PINE; 1-3' ft up to 3' TALL.		ELEV:											
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS						MILE	B,C,S	NUMBER
									CLAY	SILT	SAND	GRAVEL	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)			
%	%	%	%	%													
0					SAND	F	Nb - Low SATURATION	0									
2					SILTY FINE GRAINED NON PLASTIC SLIGHTLY ORGANIC POORLY GRADED			2	○							352 C 352	
4							MEDIUM SATURATION	4	○								
6					BROWN WITH BITTER SPECIES			6	○								
8								8	○								
10								10	○								
12								12	○								
14								14	○								
16								16	○								
18								18									
20								20									
22								22									
24								24									
																REMARKS	

PLASTIC LIMIT 20 40 60 80 100 100+ LIQUID LIMIT 80

UF WET IN ICE

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWY: E.B		FIELD ENG: G.H.C.	DATE DRILLED: 24/1/75	AIRPHOTO NO:	CHAINAGE:	OFFSET:	TEST HOLE SHEET 2									
CKD	TECH	G.C.	RIG: FAILING 1000	SURFACE DRAINAGE:	VEGETATION:	ELEV:	MILE	B.C.S	NUMBER							
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS						
										CLAY	SILT	SAND	GRAVEL			
										%	%	%	%			
										WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)					
26							UF	L.G.Y.	26							
28									28							
30									30							
32									32							
34									34							
36									36							
38									38							
40									40							
42									42							
44									44							
46									46							
48									48							
50									50							
REMARKS																
END OF HOLE																

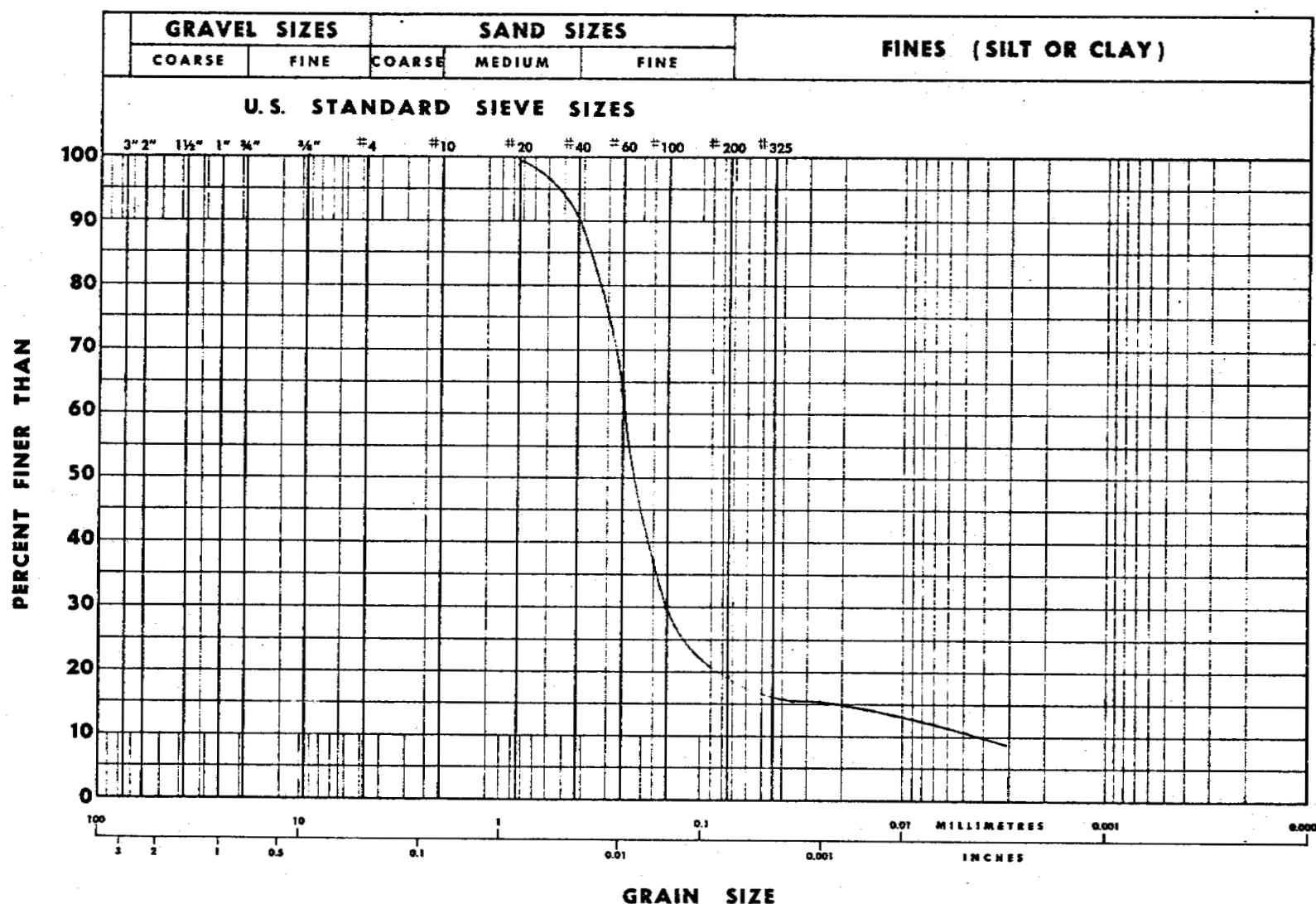
O = WATER CONTENT (% OF DRY WEIGHT)
 △ = ICE CONTENT (% OF SAMPLE VOLUME)
 PLASTIC LIMIT 40 60 80 100 100+
 LIQUID LIMIT



MATERIALS TESTING LABORATORIES LTD.

GRAIN SIZE CURVE

LAB ORDER NO. S-1065
 CLIENT E-2510
 SAMPLE
 SOURCE
 HOLE# 352 DEPTH 2'
 TECHNICIAN G.F. DATE REC'D.
 DATE TESTED FEB 15/77



REMARKS:

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

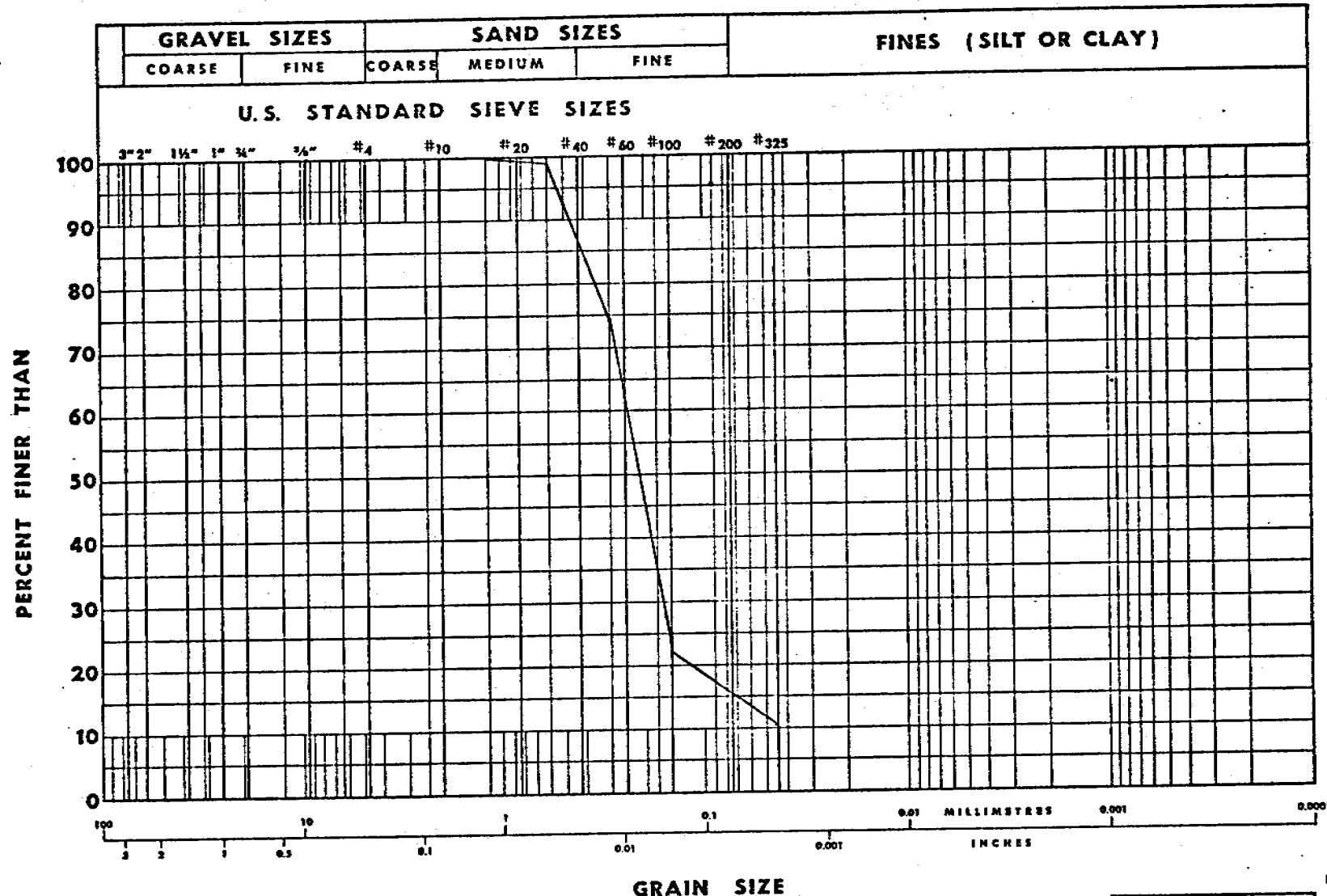
D ₁₀ =	MM.
D ₃₀ =	MM.
D ₆₀ =	MM.
C _u	
C _c	



MATERIALS TESTING LABORATORIES LTD.

GRAIN SIZE CURVE

LAB ORDER NO. E-2510
 CLIENT
 SAMPLE TH. # 352
 SOURCE
 HOLE DEPTH 18'-24'
 TECHNICIAN D.R. DATE TESTED 1/29/73



REMARKS:

D_{10} = _____ MM.
D_{30} = _____ MM.
D_{60} = _____ MM.
C_u = _____
C_c = _____

R.M. HARDY AND ASSOCIATES LTD.					DRILL HOLE REPORT			DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
DW#	E.B.	FIELD ENG:	G.M.	DATE DRILLED:	24/1/73	AIRPHOTO NO:	A 22933-10	CHAINAGE:	1576 + 52 Z	OFFSET:				TEST HOLE				
CKD	/	TECH:	S.C.	RIG:	FAILING 1000	SURFACE DRAINAGE:	FAIR	VEGETATION:	PINE - 20' TO 30' TALL	ELEV:				MILE	B,C,S	NUMBER		
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS			CLAY	SILT	SAND	GRAVEL	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)
										%	%	%	%	%	%			
0																		
2																		
4																		
6																		
8																		
10																		
12																		
14																		
16																		
18																		
20																		
22																		
24																		

SAND:
FINE GRAINED
SALT/
NONPLASTIC
LIGHT BROWN

(cm)

F NAMED
SAND

0

2

4

6

8

10

12

14

16

18

20

22

24

GLEY PATTERN

20

40

60

80

100

100+

PLASTIC LIMIT

LIQUID LIMIT

12 88

12 88

15 82

DENSE FINE

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

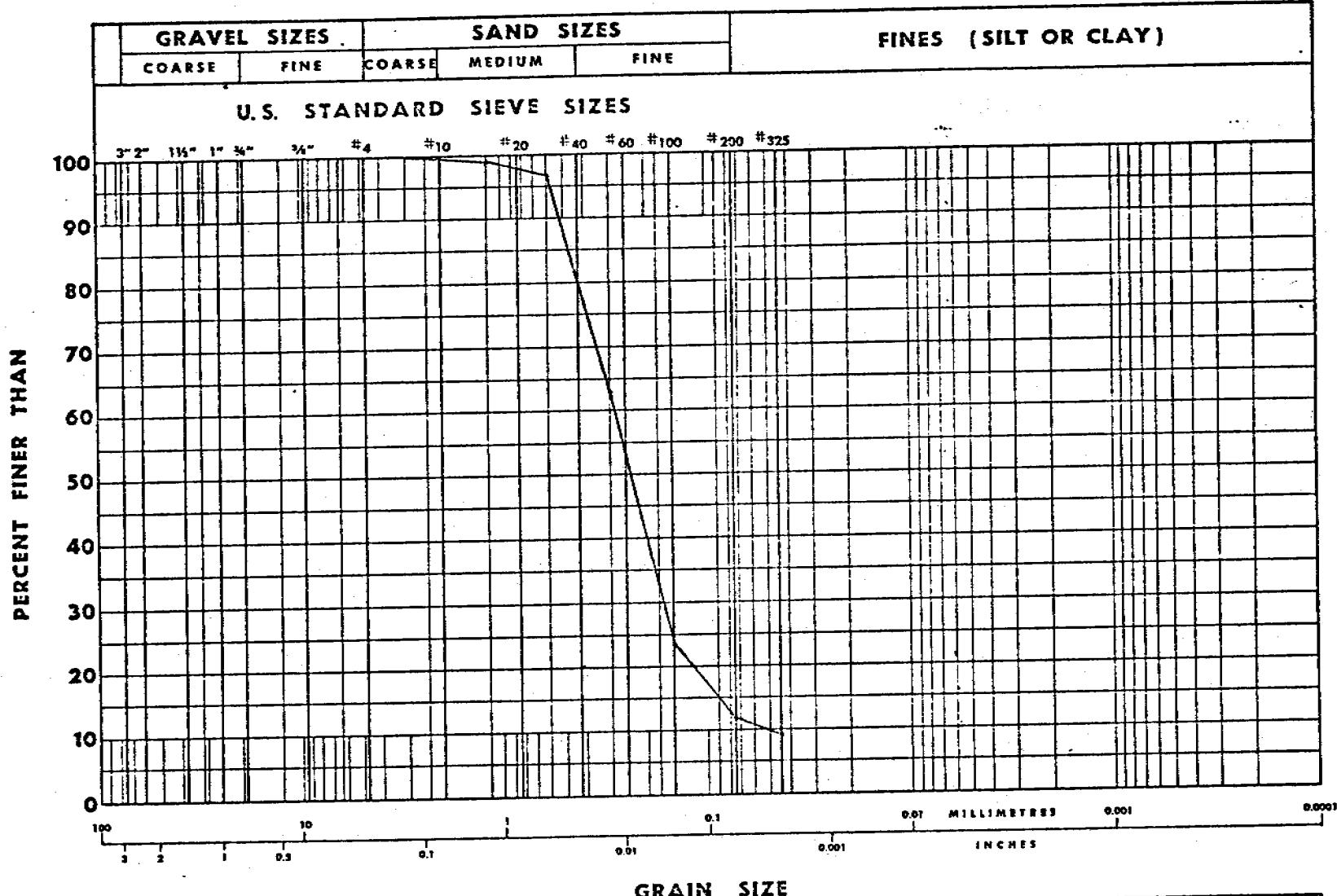
**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**



MATERIALS TESTING
LABORATORIES LTD.

GRAIN SIZE CURVE

LAB ORDER NO. E-2510
CLIENT _____
SAMPLE TH # 353
SOURCE _____
HOLE DEPTH 2'-6"
TECHNICIAN D.R. DATE TESTED 1/25/73



REMARKS: _____

D₁₀ = _____ MM.
D₃₀ = _____ MM.
D₆₀ = _____ MM.
C_u = _____
C_c = _____

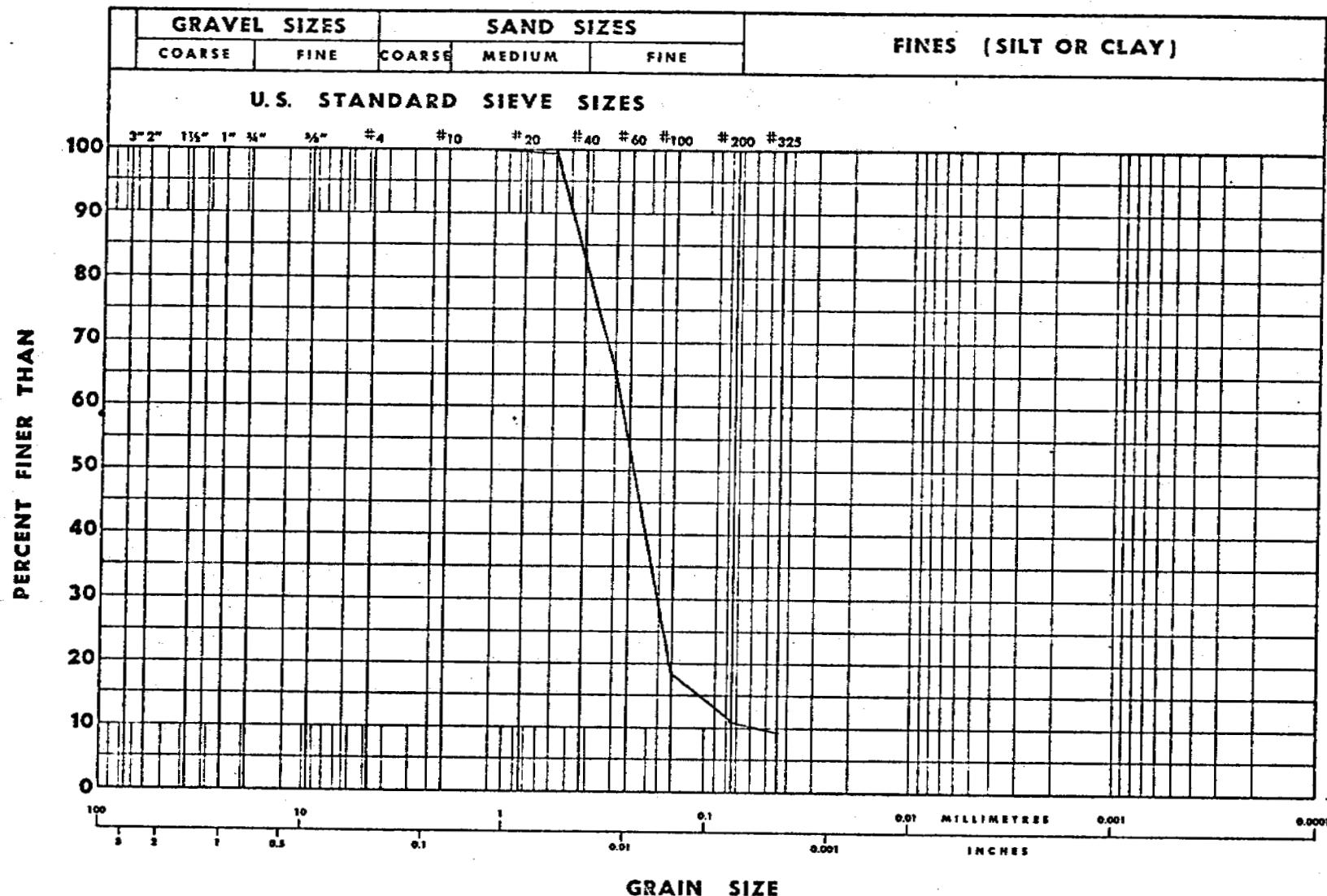
NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM



MATERIALS TESTING
LABORATORIES LTD.

GRAIN SIZE CURVE

LAB. ORDER NO.	E-2510
CLIENT	
SAMPLE NO.	TH # 353
SOURCE	
HOLE	
TECHNICIAN	D.R.
DEPTH S-16'	
DATE TESTED	1/29/73



REMARKS:

D_{10} = _____ MM.
D_{30} = _____ MM.
D_{60} = _____ MM.
C_u = _____
C_c = _____

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

R.M. HARDY AND ASSOCIATES LTD.

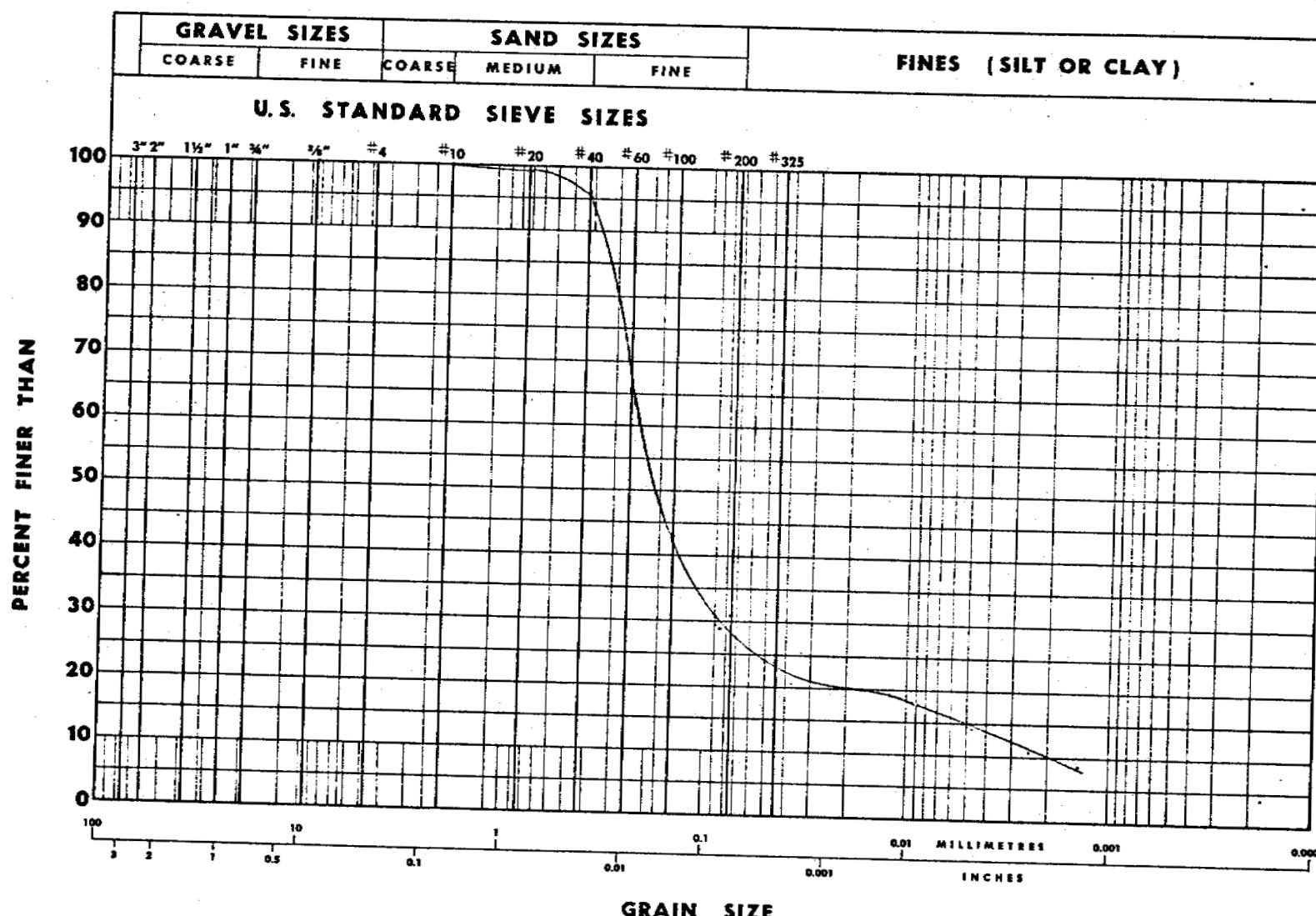
DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**



**MATERIALS TESTING
LABORATORIES LTD.
GRAIN SIZE CURVE**

LAB ORDER NO. S-1065
CLIENT E. 2510
SAMPLE
SOURCE
HOLE #354 DEPTH 2' DATE REC'D.
TECHNICIAN G/F DATE TESTED FEB. 15/68

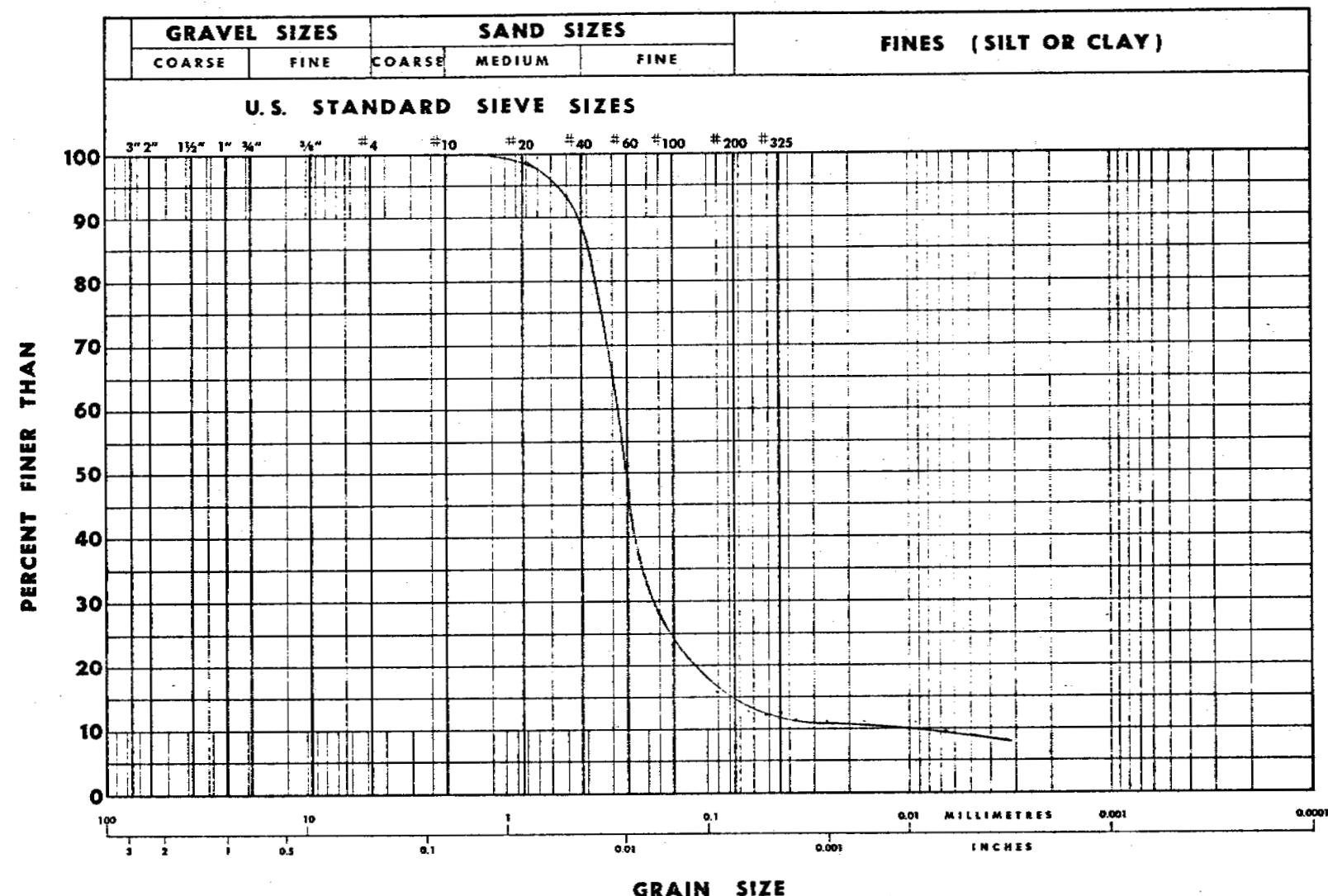


REMARKS:

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

D_{10} = _____ MM.
D_{30} = _____ MM.
D_{60} = _____ MM.
C_u = _____
C_c = _____

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
OWN: EB.	FIELD ENG: G. M.	DATE DRILLED 24/73	AIRPHOTO NO: A 22933-1	CHAINAGE:		OFFSET:		TEST HOLE SHEET 2									
CKD: / /	TECH: G. C.	RIG:	SURFACE DRAINAGE: FAIR	VEGETATION:		ELEV:		MILE	B,C,S	NUMBER							
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS					WET DENSITY (PCF)	DRY DENSITY (PCF)	
										CLAY	GILT	SAND	GRAVEL				
26									26	%	%	%	%				
28									28								
30									30								
32									32								
34									34								
36									36								
38									38								
40									40								
42									42								
44									44								
46									46								
48									48								
50									50								
REMARKS																	
SAND; CLAYEY LOW PLASTIC GREY BROWN WITH BLACK SPECIES																	
END OF HOLE																	



REMARKS:

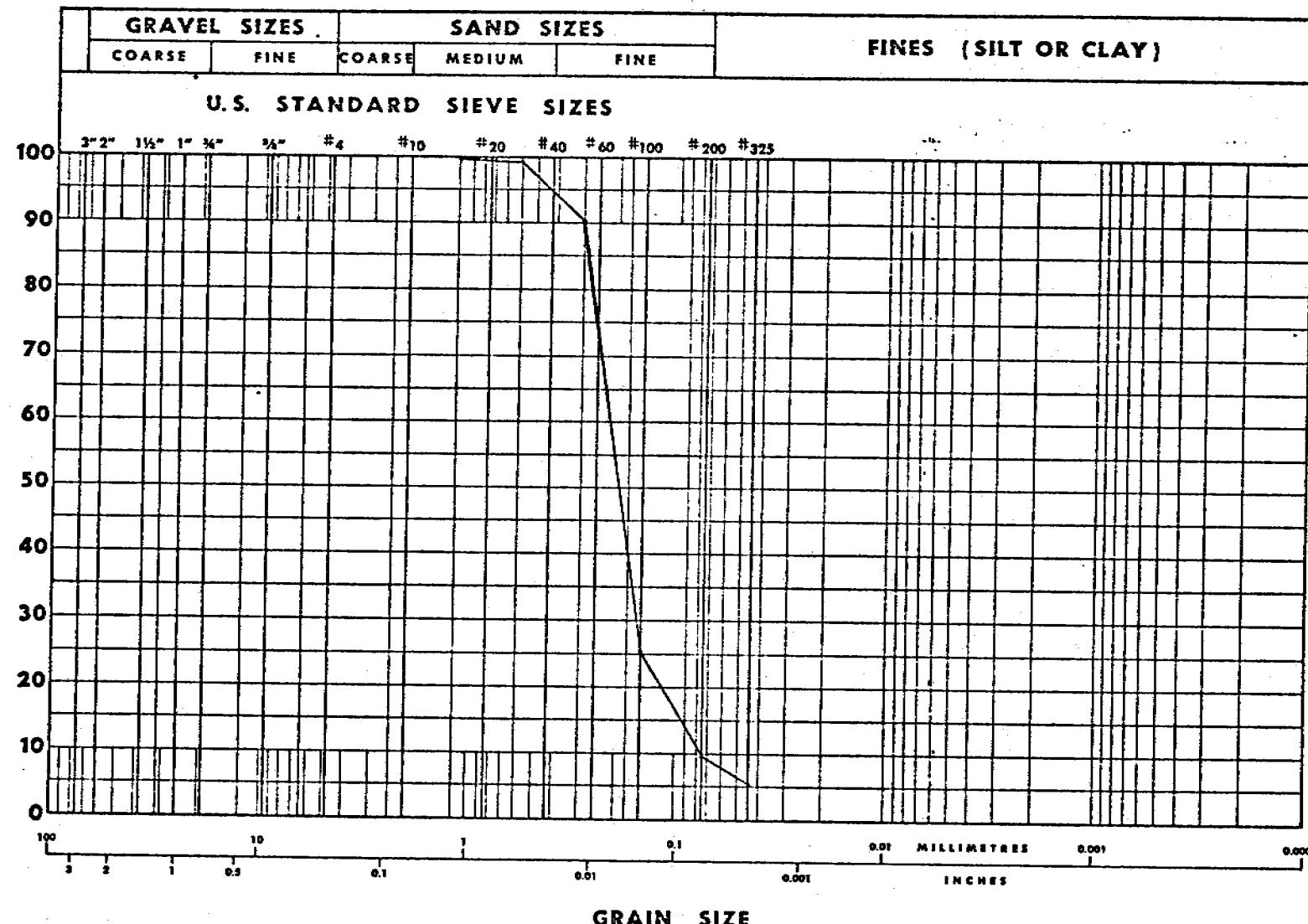
D₁₀ = _____ MM.
D₃₀ = _____ MM.
D₆₀ = _____ MM.
C_u _____
C_c _____

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM



MATERIALS TESTING
LABORATORIES LTD.
GRAIN SIZE CURVE

PERCENT FINER THAN

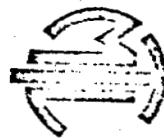


REMARKS: _____

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

D ₁₀ =	MM.
D ₃₀ =	MM.
D ₆₀ =	MM.
Cu =	
Cc =	

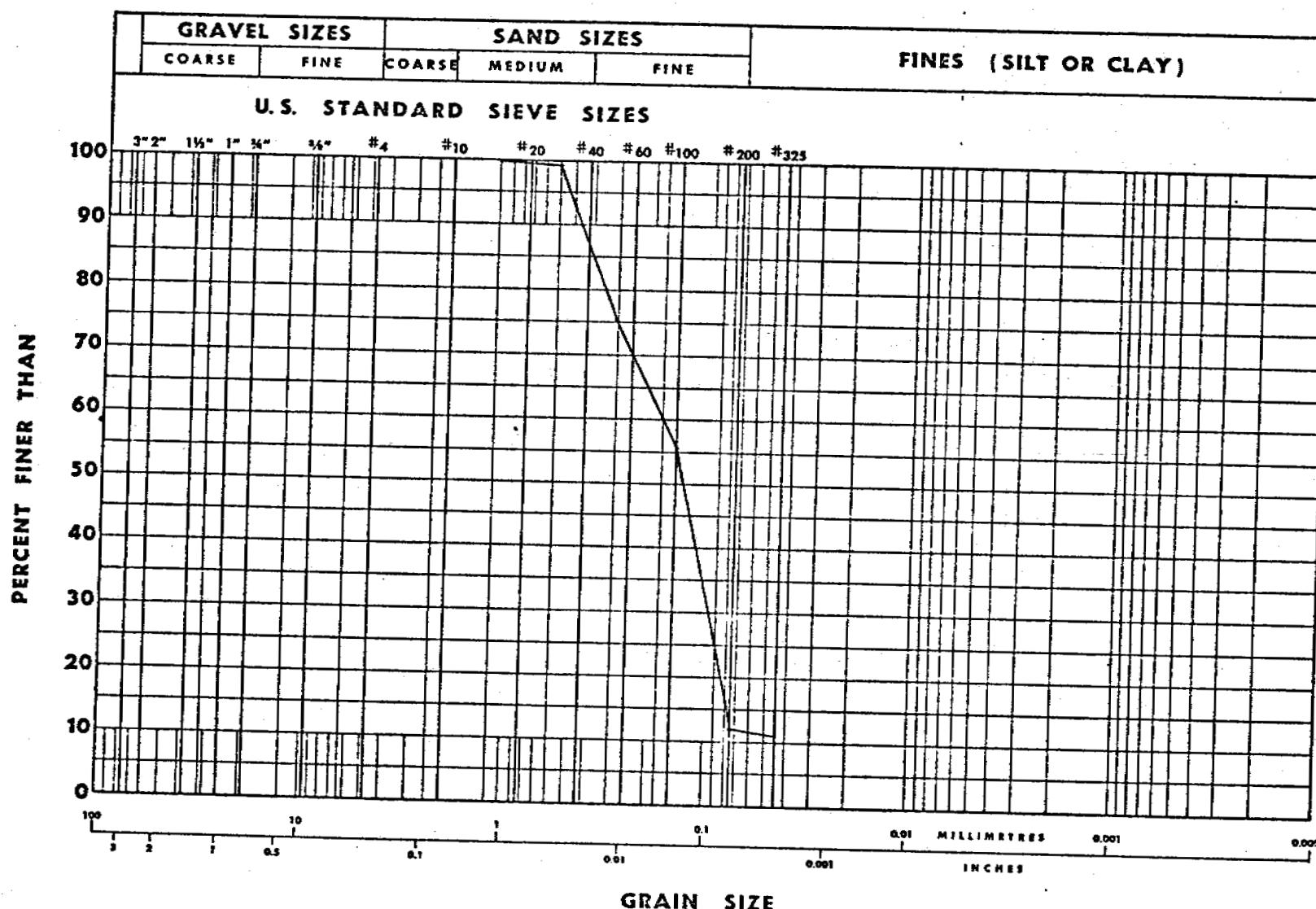
LAB ORDER NO. E-2510
CLIENT _____
SAMPLE TH #355
SOURCE _____
HOLE DEPTH 4'-1/4' DATE REC'D. _____
TECHNICIAN D.R. DATE TESTED 1/29/73



MATERIALS TESTING
LABORATORIES LTD.

GRAIN SIZE CURVE

LAB ORDER NO.	E-2510
CLIENT	
SAMPLE	TH # 355
SOURCE	
HOLE	DEPTH 16'-26' DATE REC'D.
TECHNICIAN	D.R. DATE TESTED 1/25/73



REMARKS:

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

D_{10} = _____ MM.
D_{30} = _____ MM.
D_{60} = _____ MM.
C_u = _____
C_c = _____

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

DWNE E.B.

6-09 DATE DRILLED: 24/07/23 AIRBL

AIRPHOTO NO. 1 - 1950

12 CHAINAGE: 1608 ± 55

WACKER

GVD

G. W. C.

DATE DRILLED: 24/7/73 AIRPHOTO NO: A 22933-1
BIG CREEK, WISCONSIN SURFACE FEATURES

SE: 1608456

FSET:

TEST HOLE

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

DWNE E.B.

D ENG: 6 fm

DATE DRILLED: 3-4-1973 AIRP

Q NO: A-725

CHAINAGE: 156

Page 76

OFFSET

1

10 of 10

— 1 —

1

CKD 23

EN: 65

1G-FADING 4222 SUR

DRAINAGE:

VEGETAT

5567-561

卷之三

VII

T

HOLE

1



MATERIALS TESTING
LABORATORIES LTD.
GRAIN SIZE CURVE

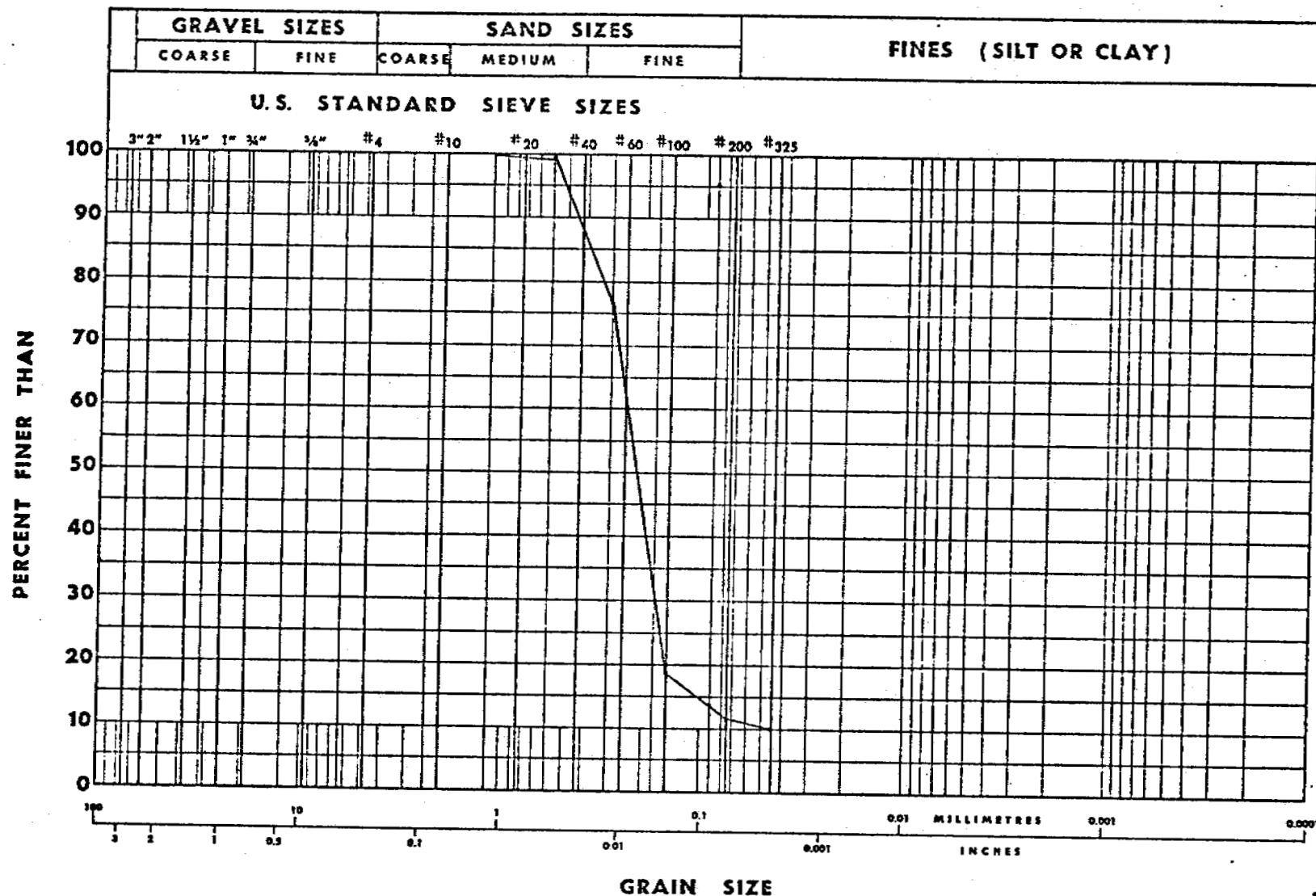
LAB ORDER NO. E-2510

SAMPLE TH. H 357

SOURCE

TECHNICIAN D.R.

卷之三



REMARKS.

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

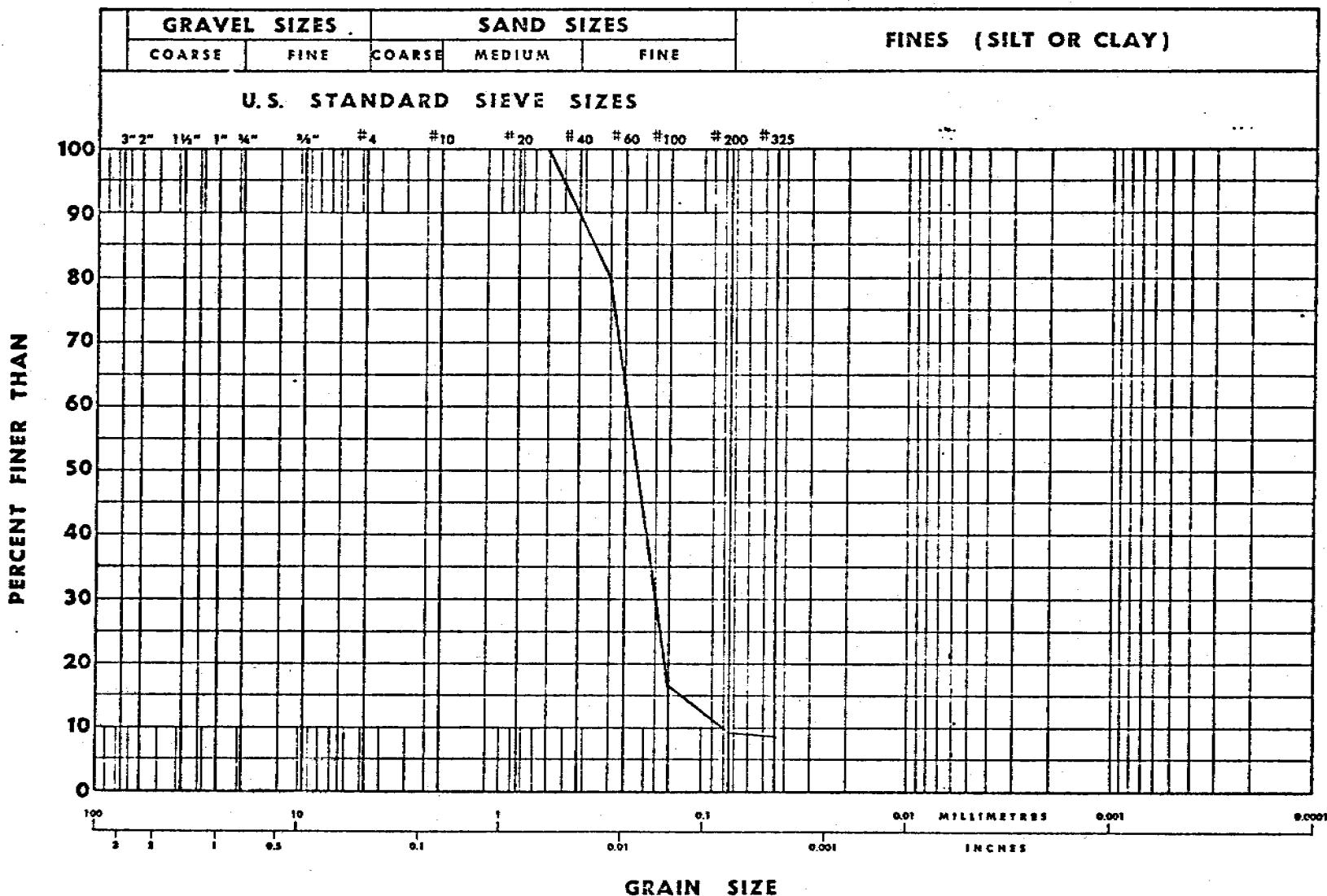
D₁₀ = _____ MM.
D₃₀ = _____ MM.
D₆₀ = _____ MM.
C_U = _____
C_C = _____



MATERIALS TESTING
LABORATORIES LTD.

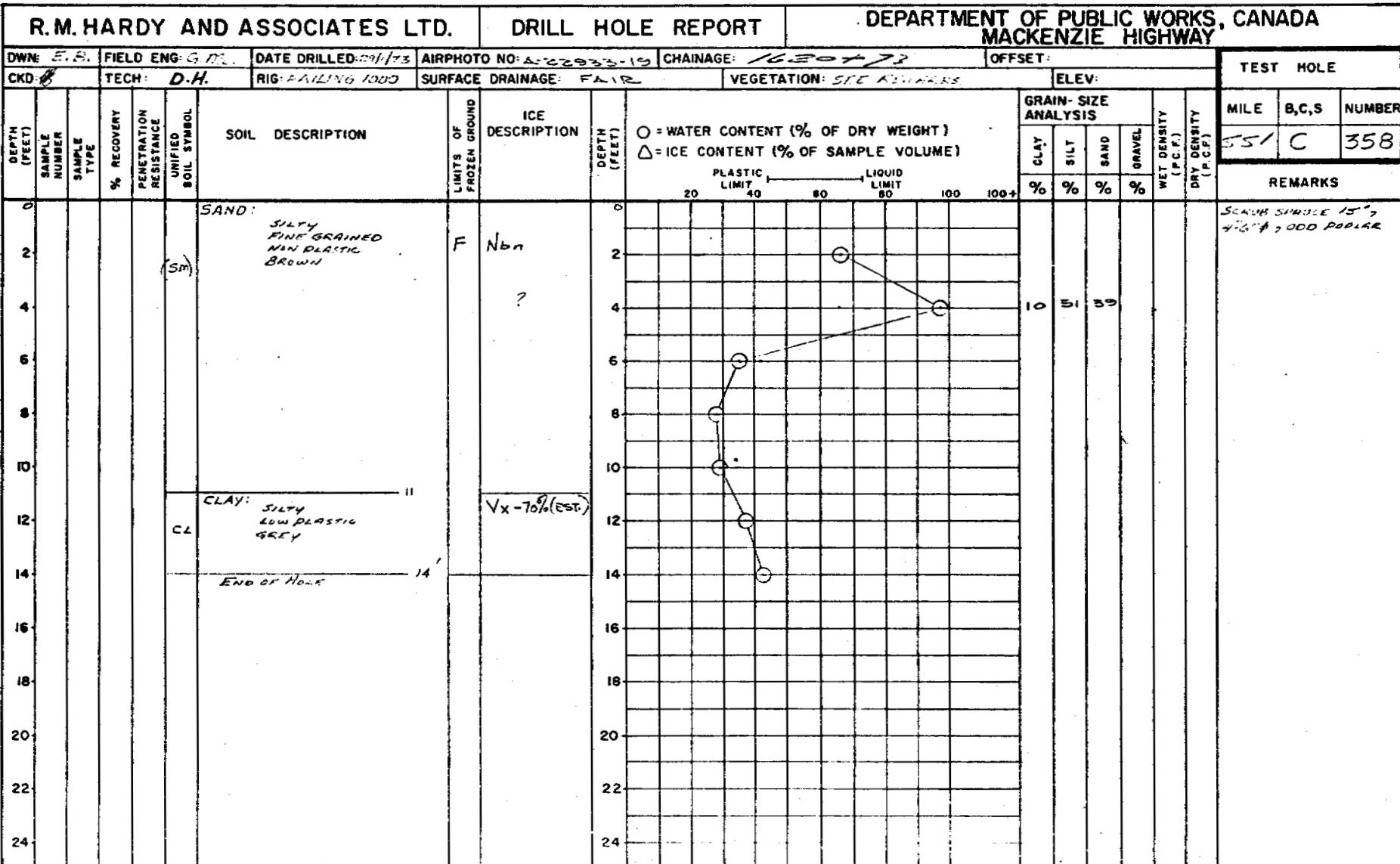
GRAIN SIZE CURVE

LAB ORDER NO. E-2510
 CLIENT _____
 SAMPLE TH #357
 SOURCE _____
 HOLE DEPTH 1/2-22' DATE REC'D.
 TECHNICIAN D.R. DATE TESTED 1/23/73



REMARKS: _____

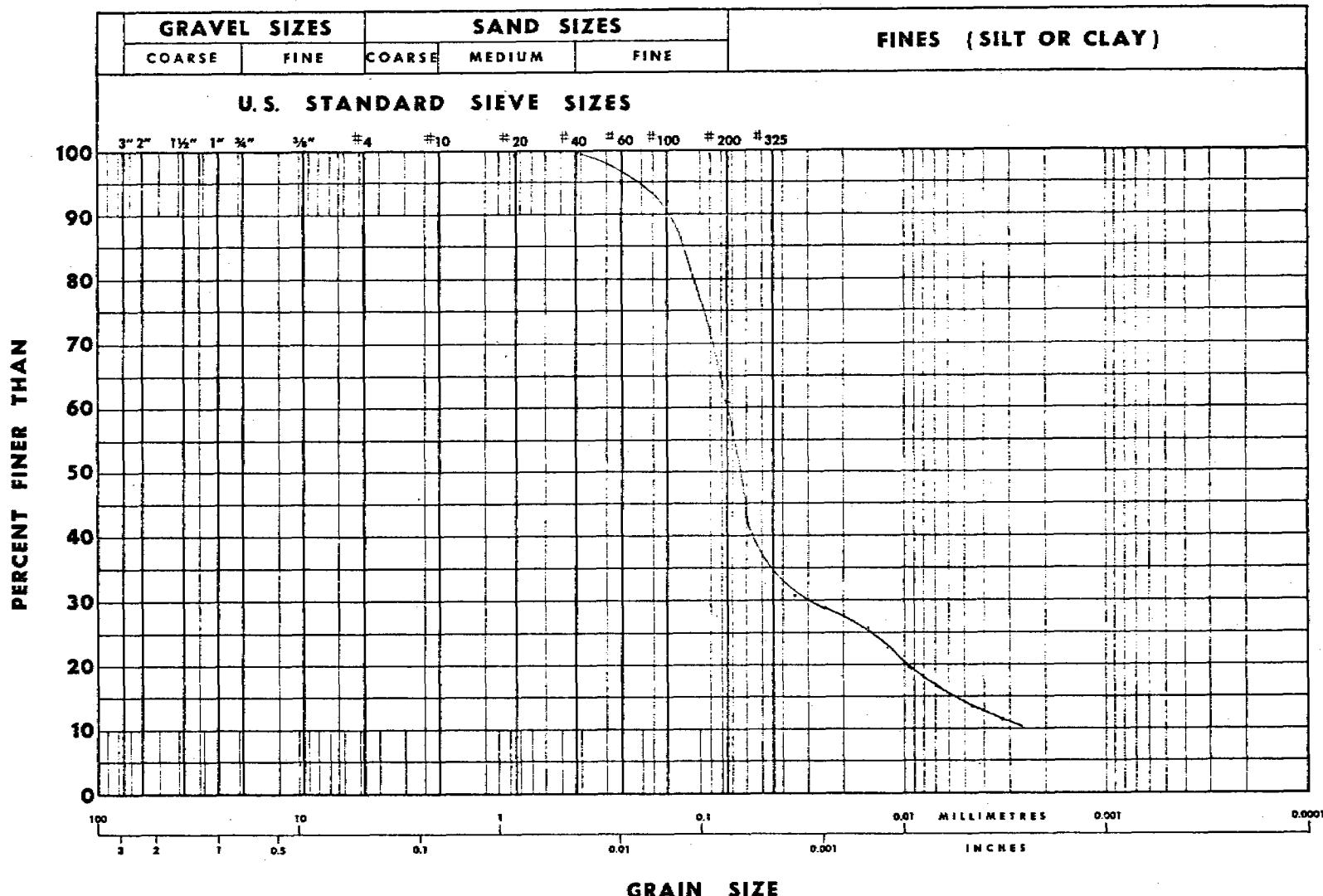
$D_{10} =$	MM
$D_{30} =$	MM
$D_{60} =$	MM
C_u	
C_c	





**MATERIALS TESTING
LABORATORIES LTD.
GRAIN SIZE CURVE**

LAB ORDER NO. S-1065
CLIENT E-2510
SAMPLE
SOURCE
HOLE #358 DEPTH 4'
TECHNICIAN G.F. DATE TESTED FEB 15/57



REMARKS:

D_{10} =	MM.
D_{30} =	MM.
D_{60} =	MM.
C_u	
C_c	

R.M. HARDY AND ASSOCIATES LTD.					DRILL HOLE REPORT			DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY															
DW#	FIELD ENG:	G.M.	DATE DRILLED: 29/1/73	AIRPHOTO NO: A 22335-15	CHAINAGE:	1632 + 51	OFFSET:					TEST HOLE											
CKD #	TECH:	O.H.	RIG FALLING 1000	SURFACE DRAINAGE:	FALSE	VEGETATION:	SEE REMARKS				ELEV:	MILE			B.C.S			NUMBER					
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	O = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)				GRAIN-SIZE ANALYSIS				CLAY	SILT	SAND	GRAVEL	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)
0						CLAY: ORGANIC INCLUSIONS SILTY	F	Nbs - MED. SATIN	0					%	%	%	%						
2						SILT: SANDY NONPLASTIC LIGHT BROWN		Nbe - - - -	2	○													
4						SAND: SILTY FINE GRAINED BROWN			4		○												
6									6	○													
8									8	○													
10						CLAY: SILTY LOW PLASTIC GREY		Vx - 50% (EST)	10	○													
12									12	○													
14						END OF HOLE			14	○													
16									16														
18									18														
20									20														
22									22														
24									24														

DENSE SPRUCE 40%
8-10% SCATTERED
BIRCH

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**



**MATERIALS TESTING
LABORATORIES LTD.**

GRAIN SIZE CURVE

LAB ORDER NO. E-2510

CLIENT

SAMPLE TH # 260

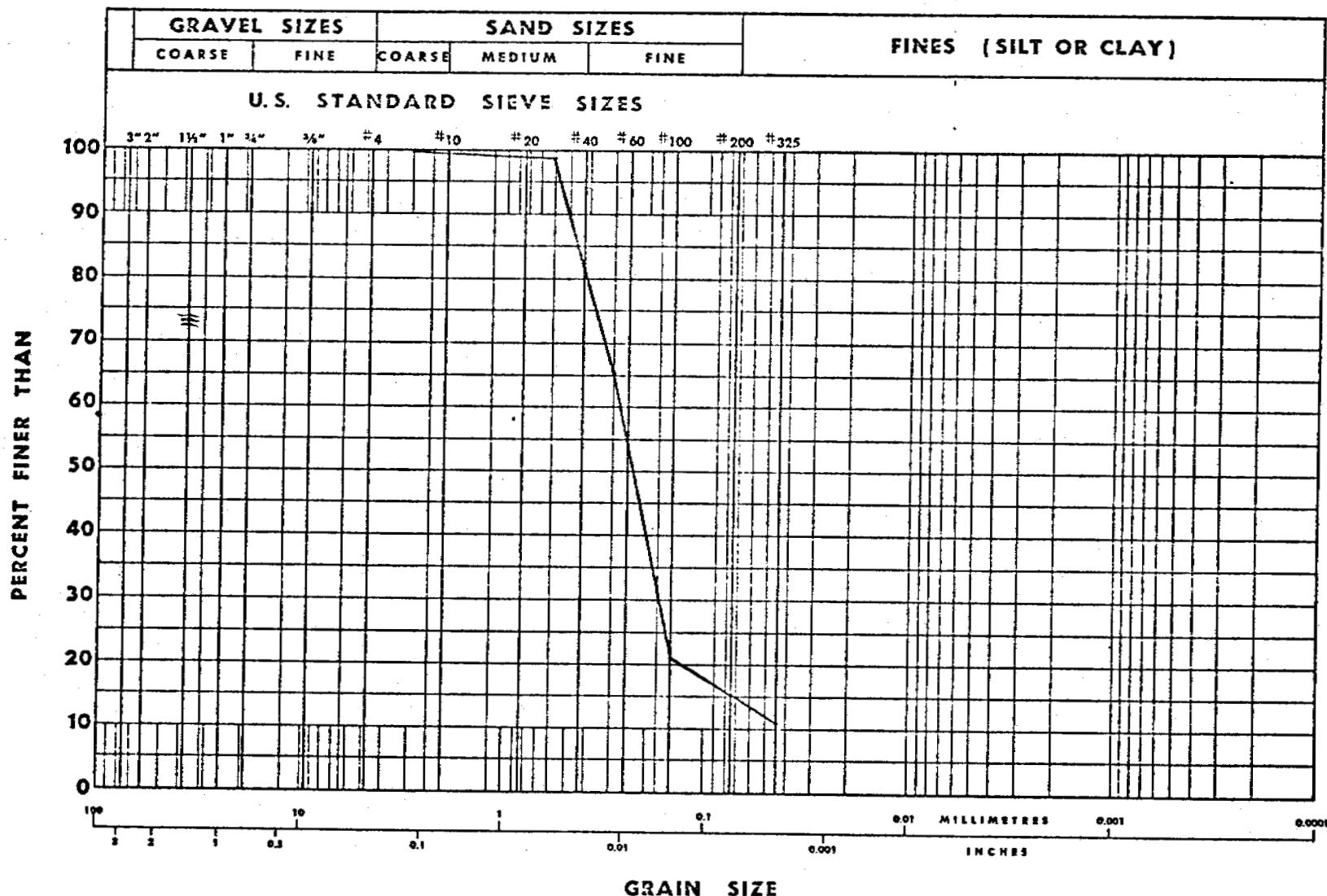
SOURCE

HOLE

DEPTH 6'-8' D.R.

DATE REC'D.

1/27/75



REMARKS:

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

D ₁₀ =	MM.
D ₂₀ =	MM.
D ₆₀ =	MM.
C _u =	
C _c =	

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

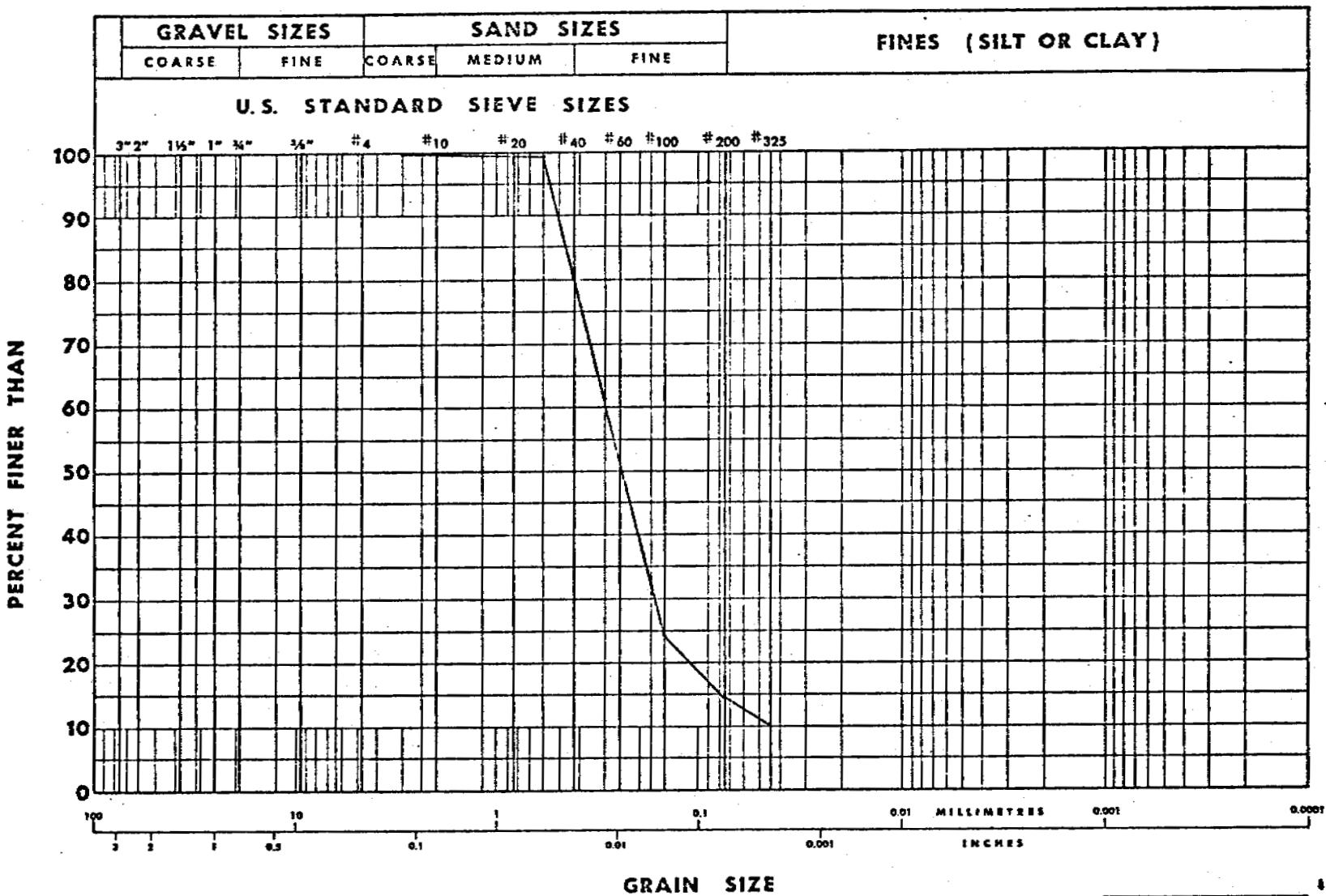
R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

OWN: E.B. FIELD ENG: G.M. DATE DRILLED 24/11/73 AIRPHOTO NO: A 222533-15 CHAINAGE: OFFSET:
 CKD: TECH: G.C. RIG: FALLING 100 SURFACE DRAINAGE: FAIR VEGETATION: ELEV:

TEST HOLE
SHEET 2



REMARKS:

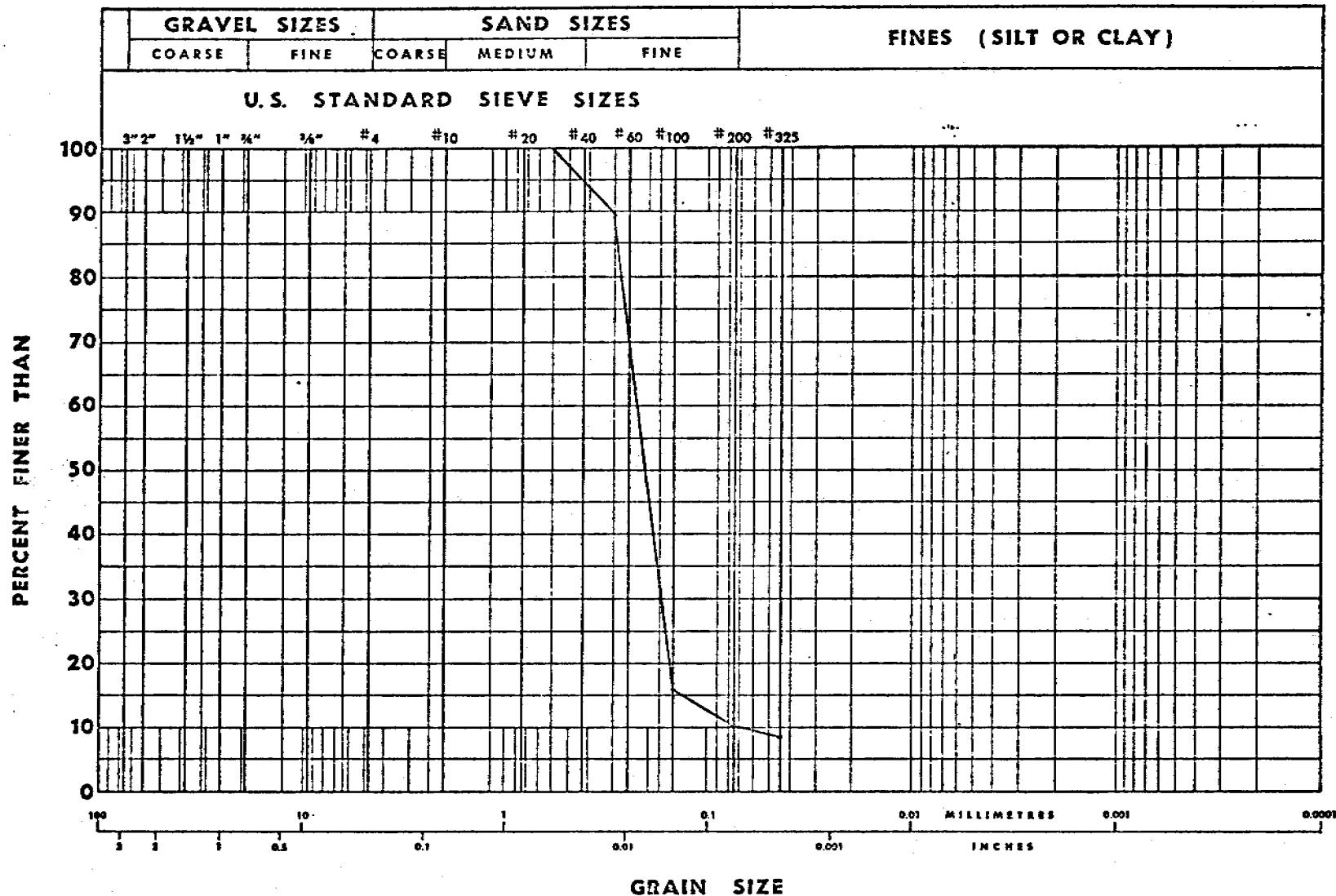
10

— 1 —

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D₁₀= _____ MM.
D₅₀= _____ MM.
D₆₀= _____ MM.
C_U _____
C_C _____

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM



REMARKS:

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

D₁₀ = _____ MM.
D₃₀ = _____ MM.
D₆₀ = _____ MM.
C_u _____
C_c _____

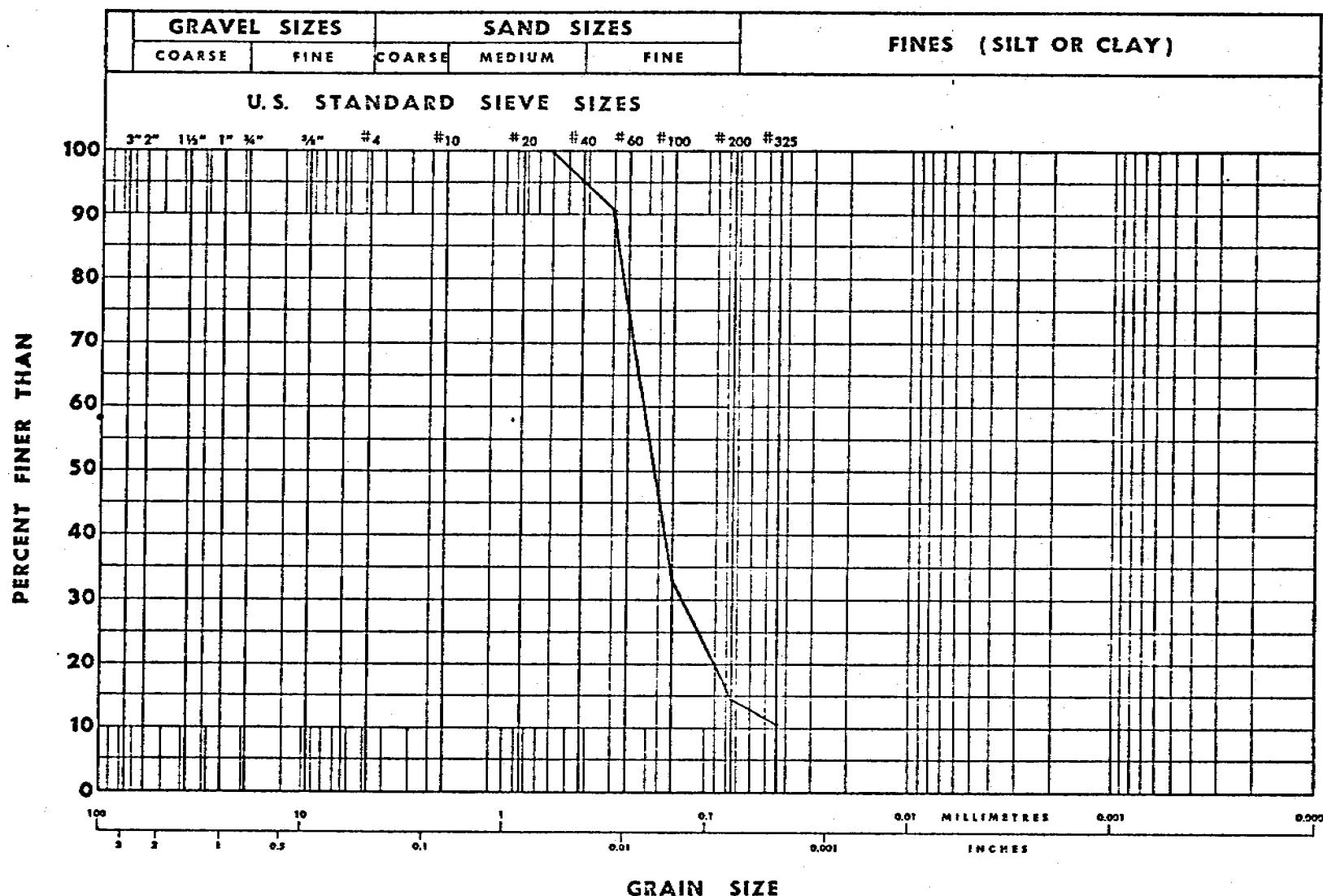
LAB ORDER NO. E-2510
 CLIENT
 SAMPLE TH. #361
 SOURCE
 HOLE DEPTH 20'-32' DATE REC'D.
 TECHNICIAN D.R. DATE TESTED 1/25/73



**WATERMILLS TESTING
LABORATORIES LTD**

GRAIN SIZE CURVE

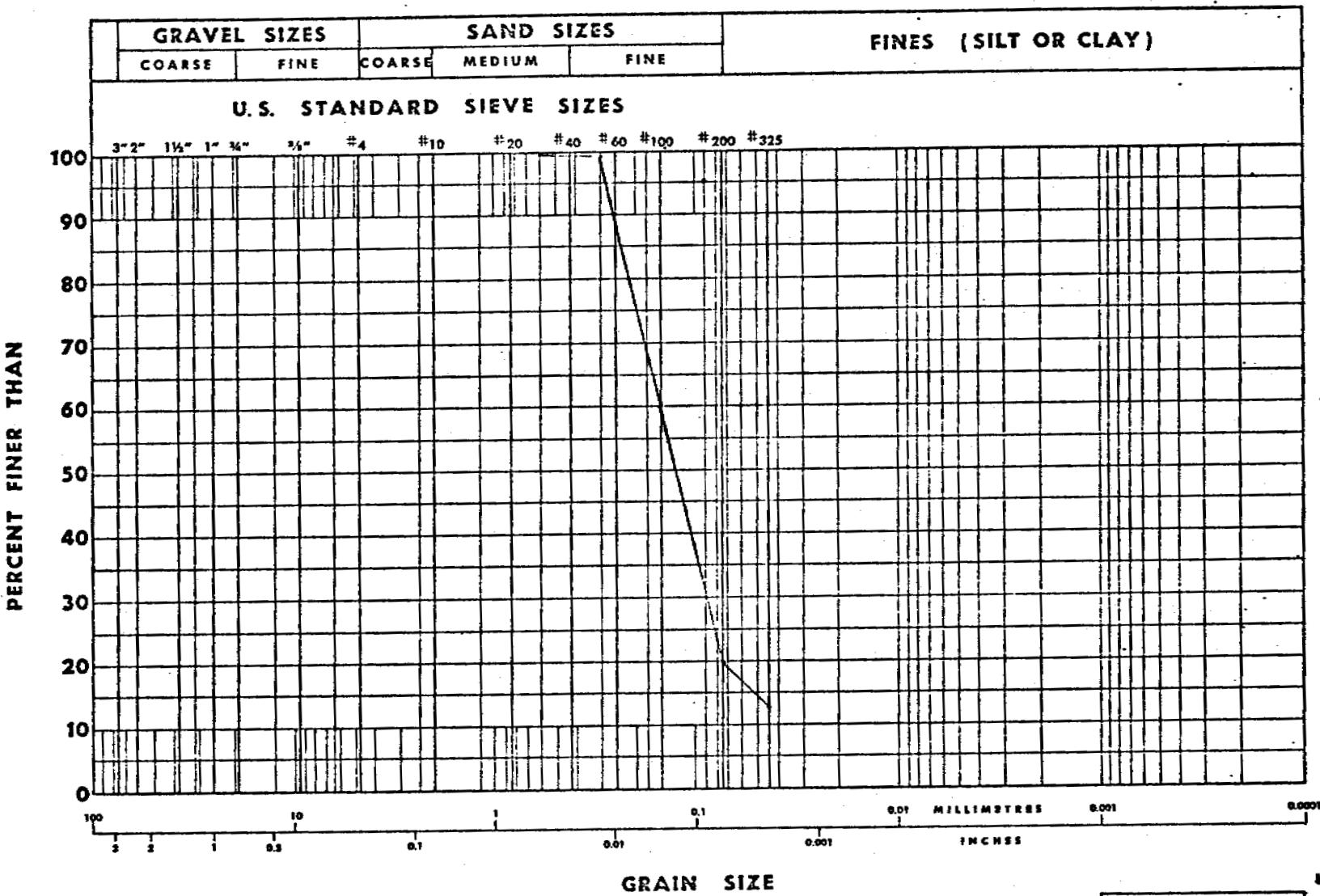
LAB ORDER NO. E-2510
 CLIENT _____
 SAMPLE TH. #361
 SOURCE _____
 HOLE DEPTH 34'-14' DATE REC'D.
 TECHNICIAN D.R. DATE TESTED 1/29/73



REMARKS: _____

D_{10} = _____ MM.
D_{30} = _____ MM.
D_{60} = _____ MM.
C_u = _____
C_c = _____

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM



REMARKS.

D₁₀ = _____ MM.
D₃₀ = _____ MM.
D₆₀ = _____ MM.
C_u _____
C_c _____

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

R.M. HARDY AND ASSOCIATES LTD.

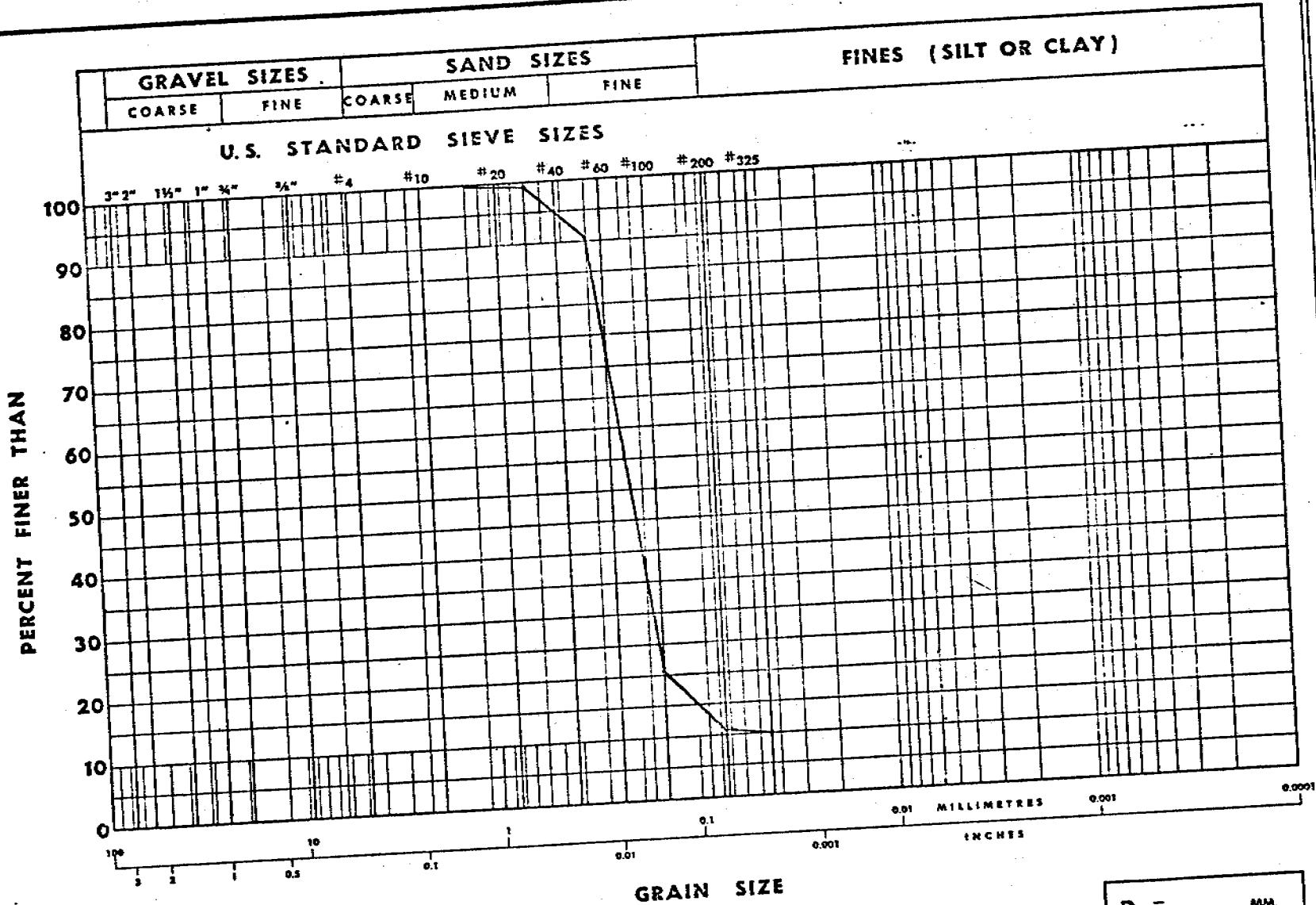
DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

OWN: E.B.		FIELD ENG: G.M.	DATE DRILLED: 24/1/73	AIRPHOTO NO: A-22033-19	CHAINAGE: 1653	TOP	OFFSET:	TEST HOLE						
CKD: ✓		TECH: G.C.	RIG: FALLING 1000	SURFACE DRAINAGE: FAIR	VEGETATION: TALL GRASS, 20' to 30'	ELEV:		MILE	B,C,S	NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	
								% RECOVERY	PENETRATION RESISTANCE	O = WATER CONTENT (% OF DRY WEIGHT)	△ = ICE CONTENT (% OF SAMPLE VOLUME)			CLAY
0			'CL'	SILT: ORGANIC	F	Nbe	0							
2							2							
4			'SM'	SAND: SILTY FINE GRAINED NON PLASTIC SLIGHTLY ORGANIC (10%) INORGANIC GREY	3	Nbn	4							
6							6							
8							8							
10							10							
12							12							
14				C1	CLAY, SILTY, TRACE OF SAND END OF HOLE	14	14							
16							16							
18							18							
20							20							
22							22							
24							24							
REMARKS												550	C	362



MATERIALS TESTING
LABORATORIES LTD.
GRAIN SIZE CURVE



REMARKS:

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

$D_{10} =$	MM.
$D_{30} =$	MM.
$D_{60} =$	MM.
C_u	
C_c	

LAB ORDER NO.	E-2510
CLIENT	
SAMPLE	TH. # 362
SOURCE	
HOLE	DEPTH 6'-4"
TECHNICIAN	DATE REC'D.
D.R.	DATE TESTED 1/23/73

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

D.W.E. E.B.		FIELD ENG: G.M.	DATE DRILLED: 2-1-73	AIRPHOTO NO: A-22933-19	CHAINAGE: 1661+30	OFFSET:	TEST HOLE														
CKD:	TECH: G.C.	RIG: FAILING 1000	SURFACE DRAINAGE: FAIR	VEGETATION: SPRUCE, 20' TO 30', OLD BIRCH	ELEV:	MILE	B.C.S	NUMBER													
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	PLASTIC LIMIT	LIQUID LIMIT	CLAY	SILT	SAND	GRAVEL	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS			
										20	40	60	80	100	100+	%	%	%	%		
0					OL	SILT: ORGANIC SILTY	F	NbG													
2																					
4					SM	SAND: SILTY FINE GRAINED NON PLASTIC POORLY GRADED GREY	3	Nbn-MEO SATN													
6																					
8																					
10																					
12					ML	SILT: SLIGHTLY CLAYEY LOW PLASTIC GREY	11														
14																					
16																					
18																					
20																					
22																					
24																					

R.M. HARDY AND ASSOCIATES LTD.					DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
OWN: E.B.		FIELD ENG: G.N.L.		DATE DRILLED: 3/1/73		AIRPHOTO NO: A2233-15		CHAINAGE:		OFFSET:		TEST HOLE							
CKD: B		TECH: D.H.		RIG: FAILING 1000		SURFACE DRAINAGE: FINE		VEGETATION: SEE REMARKS		ELEV:		MILE		B,C,S		NUMBER			
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	Penetration Resistance	Unified Soil Symbol	SOIL DESCRIPTION		LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	WATER CONTENT (% OF DRY WEIGHT) ICE CONTENT (% OF SAMPLE VOLUME)								
											PLASTIC LIMIT 40	LIQUID LIMIT 80	20	40	60	80	100	100+	
0						SAND: SILTY FINE GRAINED NON PLASTIC MOTTLED 2-30% BROWN		F	Nbn - LOW SATIN	0									
2										2									
4										4									
6										6									
8										8									
10										10									
12										12									
14										14									
16										16									
18										18									
20										20									
22										22									
24										24									

SPRING 50' 8" - 11' 0"
POWER 45', 6"-8" #
ON RIDGE

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
DWNR E.S.	FIELD ENG G.R.	DATE DRILLED 30/1/75	AIRPHOTO NO: A-22033-15	CHAINAGE:		OFFSET:						TEST HOLE				
CKD	TECH D.H.	RIG FAILINS 1000	SURFACE DRAINAGE: FAIR	VEGETATION: SEE APPENDIX		ELEV:						MILE	B.C.S	NUMBER		
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				WET DENSITY (P.C.F.)	DRY DENSITY (P.C.P.)	REMARKS
										CLAY	SILT	SAND	GRAVEL			
0									0	%	%	%	%			555 B22 365
2									2							
4									4							
6									6							
8									8							
10									10							
12									12							
14									14							
16									16							
18									18							
20									20							
22									22							
24									24							

0-2' SILTY FINE GRAINED NON PLASTIC MOTTLED LIGHT BROWN DARK BROWN
 2'-10' Nbn - nf
 10'-24' Nbn - Lwn MED. SATIN

PLASTIC LIMIT 20 40 60 80 100 100+ LIQUID LIMIT

60% MAPLE 45' x 4' 6" ft
 30% SPRUCE 45' x 8' 10" ft
 10% BIRCH 45' x 4' 6" ft
 ON RIDGE

R.M.HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

D.W.N. E.B.		FIELD ENG. G.M.	DATE DRILLED 30/1/75	AIRPHOTO NO:	CHAINAGE:	OFFSET:				TEST HOLE SHEET 2								
CKD		TECH D.H.	RIG:	SURFACE DRAINAGE:	VEGETATION:	ELEV:				MILE	B,C,S	NUMBER						
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	O = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)			CLAY %	SILT %	SAND %	GRAVEL %	WET DENSITY (PCF)	DRY DENSITY (PCF)
									20	PLASTIC LIMIT	40	60	80	100	100+			
28									26									
30									28									
32									30									
34									32									
36									34									
38									36									
40									38									
42									40									
44									42									
46									44									
48									46									
50									48									
									50									
END OF HOLE 44												REMARKS						

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

R.M. HARDY AND ASSOCIATES LTD.

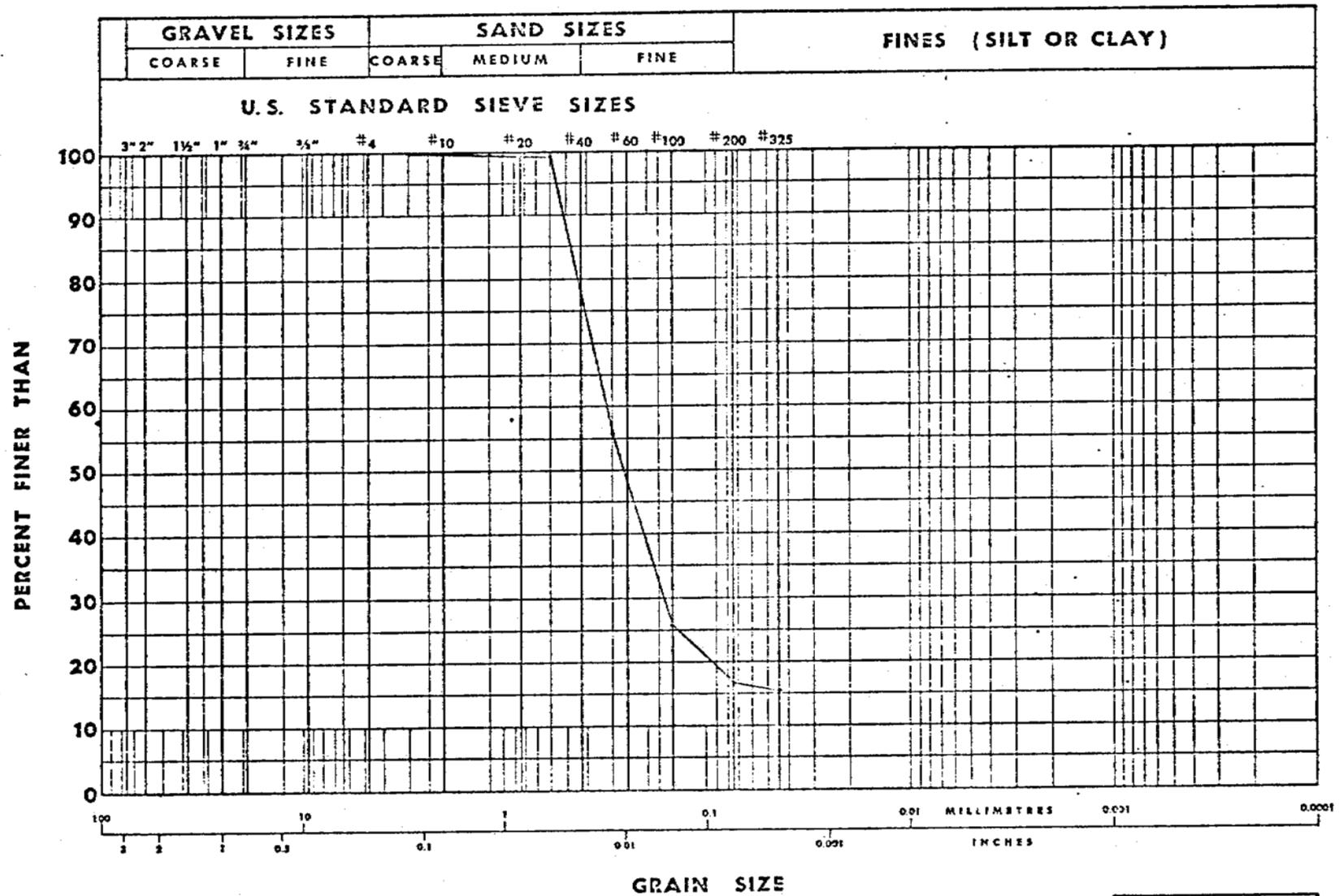
DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY														
DW# E.B.	FIELD ENG: G.H.	DATE DRILLED: 2/1/73	AIRPHOTO NO: A-1200-100	CHAINAGE:	1574.22	OFFSET:				TEST HOLE												
CKD#	TECH: D.H.	RIG: #1200	SURFACE DRAINAGE:	VEGETATION:		ELEV:																
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	O = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)						GRAIN-SIZE ANALYSIS						
										PLASTIC LIMIT	LIQUID LIMIT	20	40	60	80	100	100+	CLAY	SILT	SAND	GRAVEL	
												%	%	%	%			WET DENSITY (PC.F.)	DRY DENSITY (PC.F.)			
0				Dr		PEAT; CAT # 15, ORGANIC SILT.	F	Vx														
2				SM		SAND, SMOOTH GRAINED, N.P., GREY GREY BROWN (CL), TRACE OF CLAY	F	N.D. - MED SAT?														
4																						
6																						
8																						
10					CL CI	CLAY: SILT; LOW TO MEDIUM PLASTIC GREY BROWN																
12																						
14						END OF HOLE																
16																						
18																						
20																						
22																						
24																						

COHESIVE STRATUM TO 45'
EXPOSED ON FROZEN
SOIL SURFACE

19.81



REMARKS: _____

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

D_{10} =	MM
D_{30} =	MM
D_{60} =	MM
C_u	
C_c	

LAB ORDER NO. E-2510
 CLIENT
 SAMPLE TH. #319
 SOURCE
 HOLE DEPTH 4'-8'
 TECHNICIAN D.R.
 DATE TESTED 1/29/75



R.M. HARDY AND ASSOCIATES LTD.					DRILL HOLE REPORT			DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWNR E.E.	FIELD ENG: G.M.	DATE DRILLED: 27/11/73	AIRPHOTO NO: A-22533-12	CHAINAGE: 1635 + 90	OFFSET:												
CKD: //	TECH: D.H.	RIG: FAILING 1000	SURFACE DRAINAGE: FAIR	VEGETATION: SEE ATTACHMENT		ELEV:		TEST HOLE									
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS					MILE	B,C,S	NUMBER
										CLAY	SILT	SAND	GRAVEL	WET DENSITY (PCF)			
0									0	%	%	%	%				
2									2								
4									4								
6									6								
8									8								
10									10								
12									12								
14									14								
16									16								
18									18								
20									20								
22									22								
24									24								
REMARKS															SANDY FINE WITH SCRUB SPRUCE ON EAST SIDE & DENSE SPRUCE TO 45'-8" & WITH OLD BIRCH IN PINE TO WEST		
END OF HOLE 14																	

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY												
DW#	FIELD ENG:	DATE DRILLED: 27/1/73	AIRPHOTO NO: 22532-10	CHAINAGE:	651.400	OFFSET:														
CKD #	TECH:	D.H.	RIG FAULTING 1000	SURFACE DRAINAGE:	FAIR	VEGETATION:	SCATTERED BIRCH & PINE	ELEV:												
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS						MILE	B.C.S	NUMBER		
										CLAY	SILT	SAND	GRAVEL	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)					
0						(ML) SILT; SAND TERRIC LICHEN BROWN	F	Npe	0											
2						SAND;		Nbn - Con - SATU	2											
4						(SM) SILTY FINE GRAINED NON PLASTIC GREY BROWN		Non-Npe	4											
6									6											
8									8											
10						(C) CLAY; SILTY, MED. PLASTIC GREY BROWN. SAND INCLUSIONS.			10											
12									12											
14						END OF HOLE	14		14											
16									16											
18									18											
20									20											
22									22											
24									24											

O = WATER CONTENT (% OF DRY WEIGHT)
Δ = ICE CONTENT (% OF SAMPLE VOLUME)

PLASTIC LIMIT ————— LIQUID LIMIT

20 40 60 80 100 100+

REMARKS

EARTH SURFACE TO 50'
SCATTERED BIRCH &
PINE

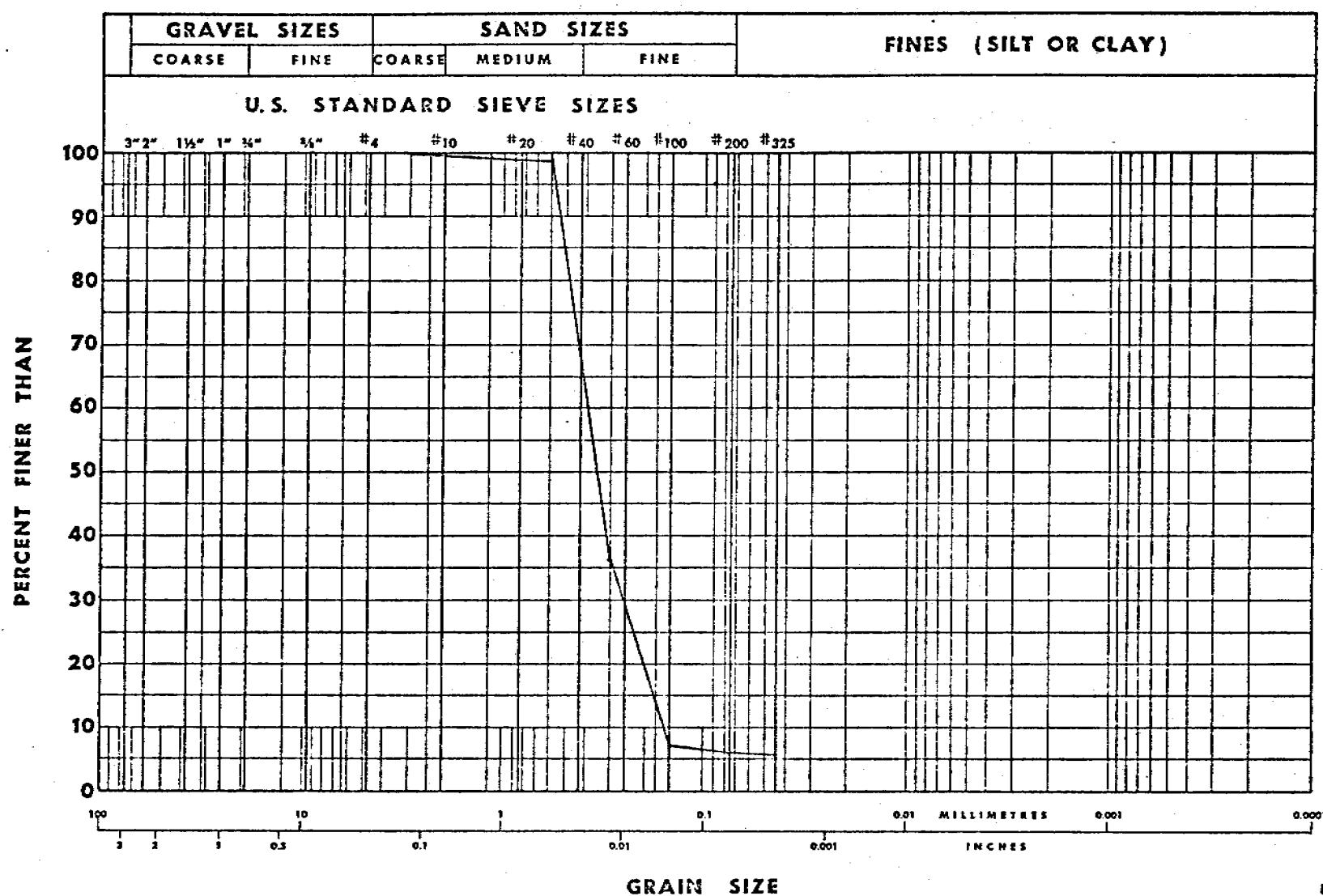
4 96



MATERIALS TESTING
LABORATORIES LTD.

GRAIN SIZE CURVE

LAB ORDER NO. E - RATIO
CLIENT _____
SAMPLE No. 371
SOURCE _____
HOLE DEPTH A' - 8' DATE REC'D.
TECHNICIAN D.R. DATE TESTED 11/29/73



REMARKS:

D_{10} =	MM.
D_{30} =	MM.
D_{60} =	MM.
C_u =	
C_c =	

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY								
DW: E-6	FIELD ENG: G.D.	DATE DRILLED: 2/1/73	AIRPHOTO NO: A 24-33-16	CHAINAGE: 175 + 46		OFFSET:					TEST HOLE					
CKD: 11	TECH: D.H.	RIG: FAIRBURN 1020	SURFACE DRAINAGE: FLAT	VEGETATION: SPARSE FOREST		ELEV:					MILE	B.C.S	NUMBER			
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	CLAY	SILT	SAND	GRAVEL	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
0						SAND: SILTY FINE GRAINED NON PLASTIC LIGHT BROWN	F	NDF - MEO SATIN	20	0%	0%	0%	0%			0' TO 5' SILT SCATTERED BROWN & PLAGUE
2							JF		40							
4									60							
6									80							
8									100							
10									100+							
12																
14																
16																
18																
20																
22																
24																

O = WATER CONTENT (% OF DRY WEIGHT)
 △ = ICE CONTENT (% OF SAMPLE VOLUME)

PLASTIC LIMIT ————— LIQUID LIMIT
 20 40 60 80 100 100+

C 372

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWL: 58		FIELD ENG G.M.	DATE DRILLED 27/1/73	AIRPHOTO NO:	CHAINAGE:	OFFSET:	TEST HOLE SHEET 2												
CKD	TECH D.H.	RIG:	SURFACE DRAINAGE:	VEGETATION:	ELEV:	MILE	B,C,S	NUMBER											
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNITED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	O = WATER CONTENT (% OF DRY WEIGHT) Δ = ICE CONTENT (% OF SAMPLE VOLUME)	PLASTIC LIMIT 20 40 60	LIQUID LIMIT 80 80 100	CLAY %	SILT %	SAND %	GRAVEL %	WET DENSITY (PCF)	DRY DENSITY (PCF)	REMARKS
26					F	Nbr - MCO. SATN			26									C 372	
28									28										
30									30										
32									32										
34									34										
36									36										
38									38										
40									40										
42									42										
44									44										
46									46										
48									48										
50									50										

END OF HOLE 50

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY												
DWN: E.B.	FIELD ENG: G.D.	DATE DRILLED: 27/1/73	AIRPHOTO NO: A-22237-13	CHAINAGE: 1717 400		OFFSET:			TEST HOLE											
CKD-1	TECH: C.H.	RIG: FAILING 1000	SURFACE DRAINAGE: FAIR	VEGETATION: SEE APPENDIX		ELEV:					MILE	B,C,S	NUMBER							
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS					WET DENSITY (PCF)	DRY DENSITY (PCF)	REMARKS			
										CLAY	SILT	SAND	GRAVEL	%				%	%	%
0						MOSS	1/3	F	Nbn-MEO											
2						SAND			SAT											
4						SILTY FINE GRAINED NON PLASTIC GREY BROWN														
6						SLAUGHING			WET											
10																				
14						END OF HOLE	14													
16																				
18																				
20																				
22																				
24																				

O = WATER CONTENT (% OF DRY WEIGHT)
 △ = ICE CONTENT (% OF SAMPLE VOLUME)

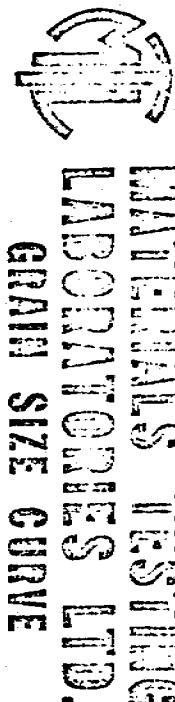
PLASTIC LIMIT ————— LIQUID LIMIT

20 40 60 80 100 100+

1090
 Z BE

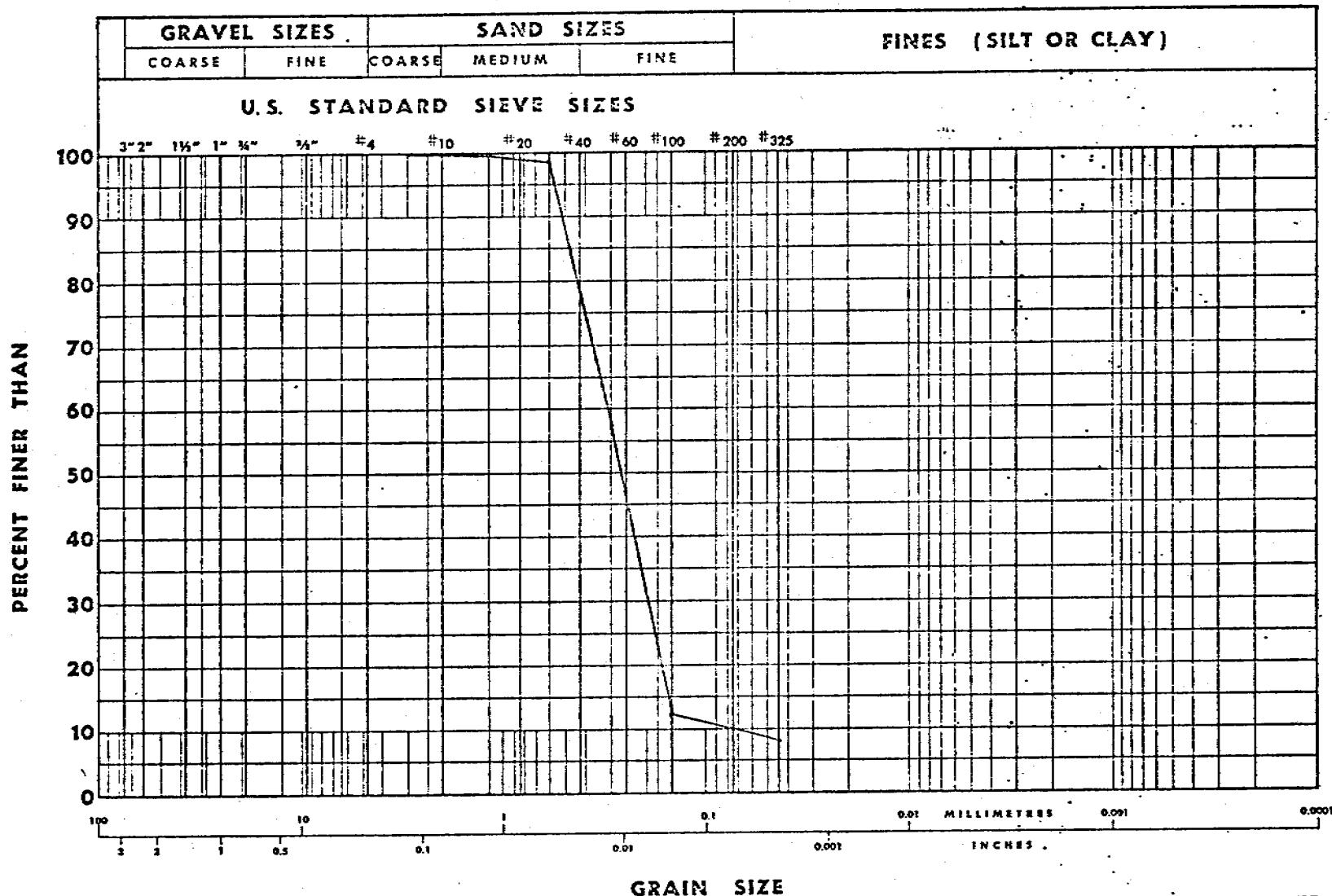
573 C 373

LEADS SPRUCE 40' to
 30' HIGH & BY 10' &
 SCATTERED BIRCH &
 PINE



GRAIN SIZE CURVE

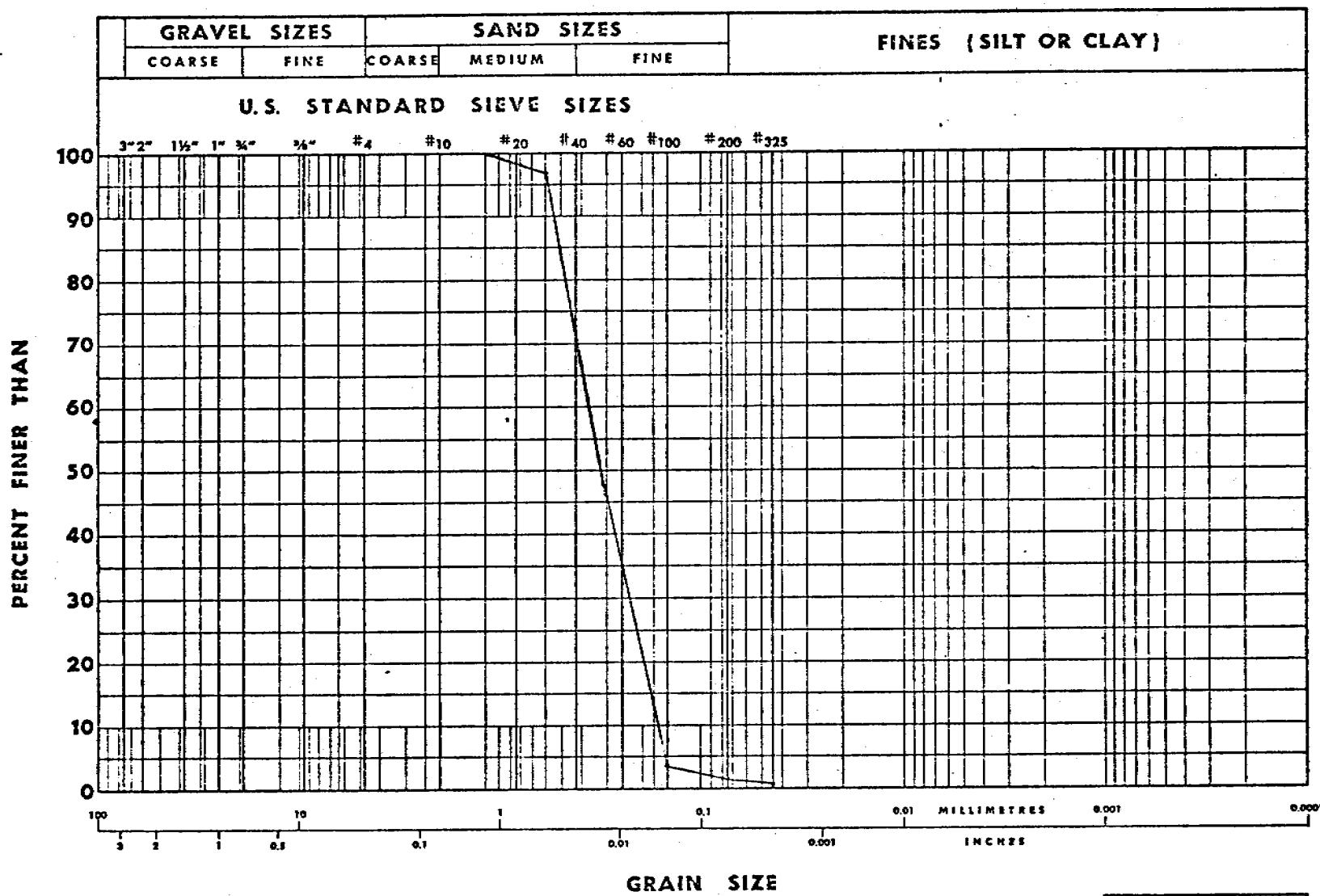
LAB ORDER NO. E-2510
CLIENT _____
SAMPLE TH. #373
SOURCE _____
HOLE DEPTH 2'-4' DATE REC'D.
TECHNICIAN DR. DATE TESTED 1/29/73



REMARKS: _____

D ₁₀ =	MM.
D ₃₀ =	MM.
D ₅₀ =	MM.
D ₆₀ =	MM.

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

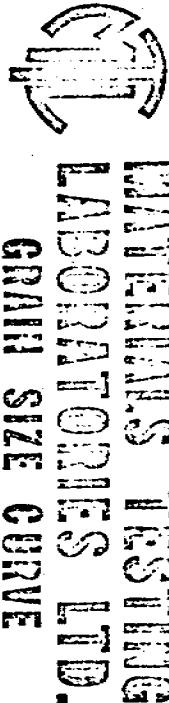


REMARKS:

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

D_{10} =	mm
D_{30} =	mm
D_{60} =	mm
C_u =	
C_c =	

LAB ORDER NO. E-2510
CLIENT
SAMPLE TH #373
SOURCE
HOLE DEPTH 6'-1/4" DATE REC'D.
TECHNICIAN D.R. DATE TESTED 1/28/73



R.M. HARDY AND ASSOCIATES LTD.						DRILL HOLE REPORT			DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY														
DWN: E.B.	FIELD ENG: G.M.	DATE DRILLED: 27/1/75	AIRPHOTO NO: A22333-15	CHAINAGE: 1723 400	OFFSET:											TEST HOLE							
CKD: 15	TECH: D.H.	RIG: FAILING 1000	SURFACE DRAINAGE: FAIR	VEGETATION: SEE KEYHOLE	ELEV:											MILE	B.C.S	NUMBER					
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION		LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS										REMARKS		
										CLAY	SILT	SAND	GRAVEL	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)								
										%	%	%	%										
0					PL	PEAT: CAT. #8	F	Nbn-MED. SATN	0														
2									2														
4					(Sm)	SAND: SILTY FINE GRAINED NON PLASTIC GREY BROWN			4														
6									6														
8									8														
10									10														
12									12														
14									14														
16									16														
18									18														
20									20														
22									22														
24									24														

O = WATER CONTENT (% OF DRY WEIGHT)
 △ = ICE CONTENT (% OF SAMPLE VOLUME)
 PLASTIC LIMIT → ← LIQUID LIMIT
 20 40 60 80 100 100+

DENSE SPAREN, 40' TO
 50' > 6 TO 8" D
 SCATTERED BIRCHES,
 PINEAR

R. M. HARDY AND ASSOCIATES LTD

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
DWNE E.S.	FIELD ENG: G.M.C.	DATE DRILLED: 27/1/73	AIRPHOTO NO: A-22033-19	CHAINAGE: 1737+00	OFFSET:				TEST HOLE									
CKD:	TECH: D.H.	RIG: FAILING 1000	SURFACE DRAINAGE: FAIR	VEGETATION: SEE REMARKS	ELEV:				MILE	B,C,S	NUMBER							
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNITED SOIL SYMBOL	SOIL DESCRIPTION		LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)					GRAIN-SIZE ANALYSIS			
															CLAY %	SILT %	SAND %	GRAVEL %
0						SM SAND:			F Nbr-MED SATN	0								
2						SILTY FINE GRAINED NON PLASTIC TRACE OF ORGANICS GREY BROWN ----- INORGANIC			F UF WET	2								
4									F PERMA FROST Nbr-MED SATN	4								
6										6								
8										8								
10										10								
12										12								
14										14								
16										16								
18										18								
20										20								
22										22								
24										24								

O = WATER CONTENT (% OF DRY WEIGHT)
 △ = ICE CONTENT (% OF SAMPLE VOLUME)

PLASTIC LIMIT 40 LIQUID LIMIT 80

DENSE, SPRUCE,
40'-50' TALL, 6-8";
SCATTERED BIRCH
AND POPLAR.

10 90

7 93

9 91

R.M. HARDY AND ASSOCIATES LTD.					DRILL HOLE REPORT			DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN E.B.	FIELD ENG G.M.	DATE DRILLED 27/1/73	AIRPHOTO NO.		CHAINAGE		OFFSET				TEST HOLE SHEET 2						
CKD	TECH D.H.	RIG	SURFACE DRAINAGE		VEGETATION		ELEV				MILE	B.C.S	NUMBER				
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS					REMARKS		
										CLAY	SILT	SAND	GRAVEL				
										%	%	%	%	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)		
26							F	Non-MCD SATW	26								
28									28								
30									30								
32									32								
34									34								
36									36								
38									38								
40									40								
42									42								
44									44								
46									46								
48									48								
50									50								

○ = WATER CONTENT (% OF DRY WEIGHT)
△ = ICE CONTENT (% OF SAMPLE VOLUME)

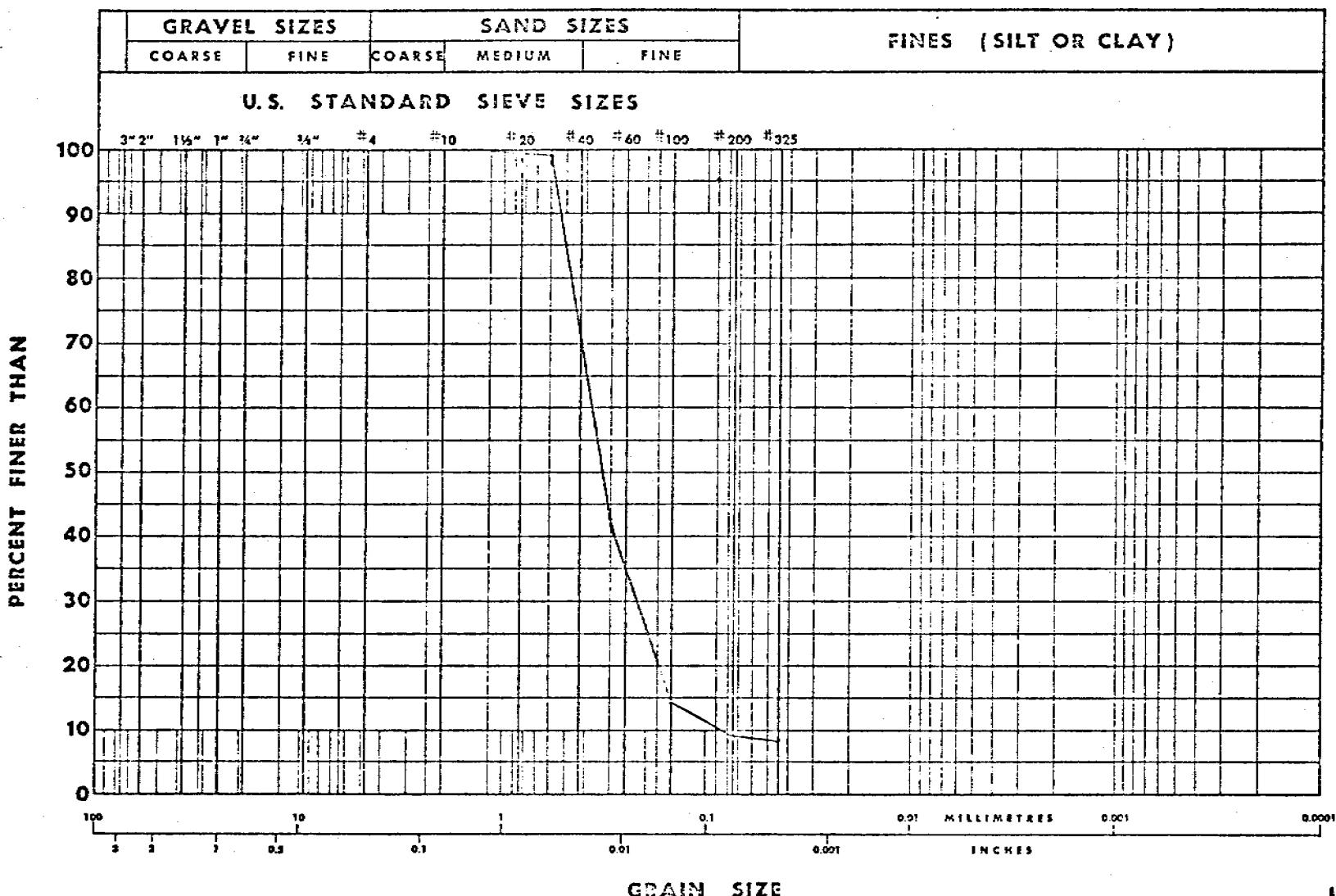
PLASTIC LIMIT 20 40 60 80 100 100+ LIQUID LIMIT

END OF HOLE 30

**MATERIALS TESTING
LABORATORIES LTD.**

GRAIN SIZE CURVE

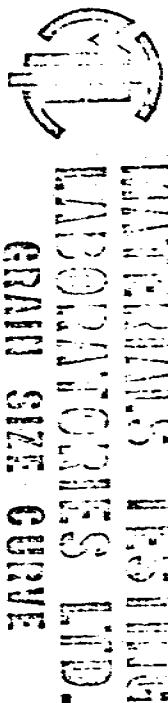
LAB ORDER NO. E-2510
 CLIENT _____
 SAMPLE THA 375
 SOURCE _____
 HOLE DEPTH 2' 10" DATE REC'D.
 TECHNICIAN D.P. DATE TESTED 1/29/77



REMARKS: _____

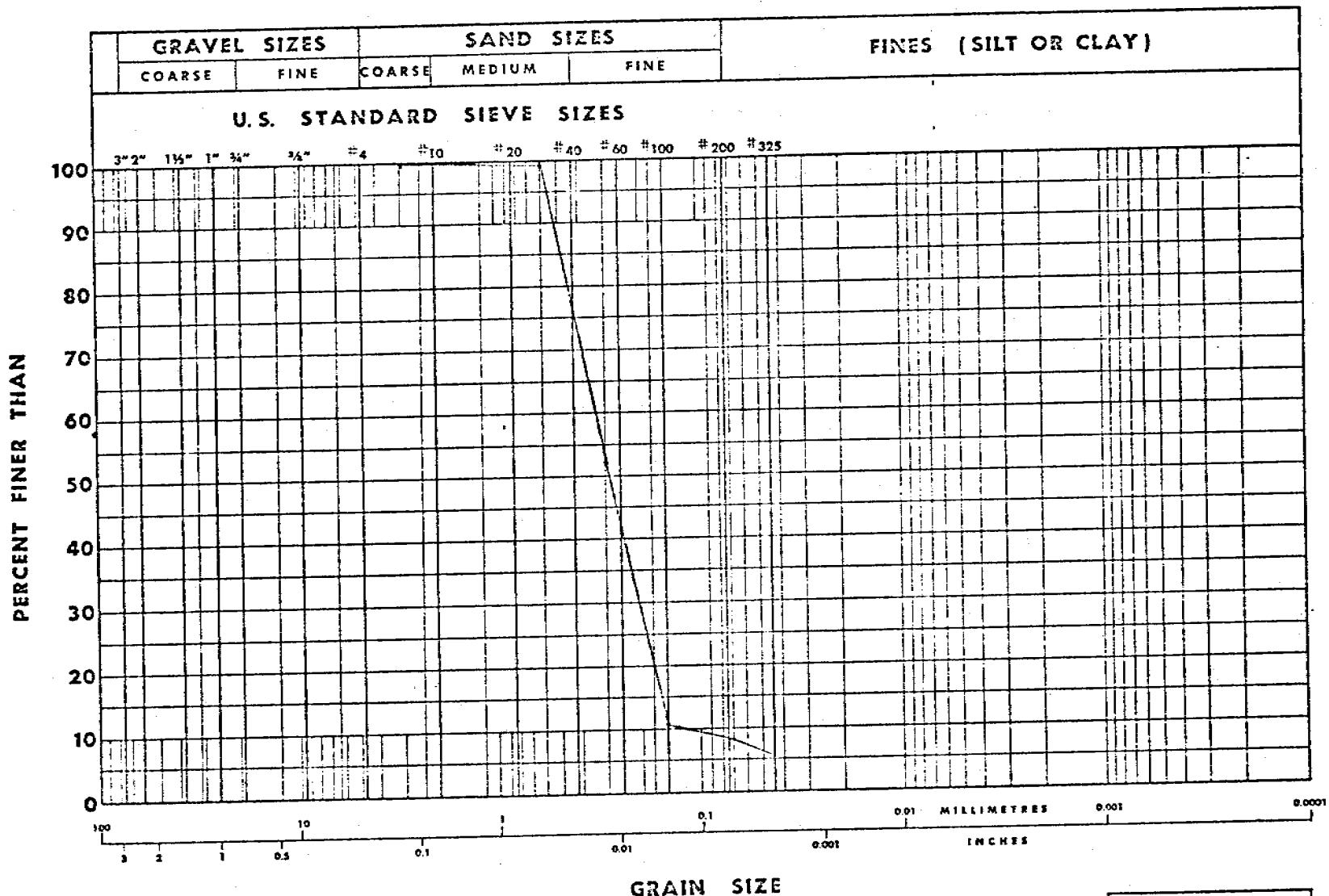
D ₁₀ =	MM.
D ₃₀ =	MM.
D ₆₀ =	MM.
Cu	_____
Cc	_____

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM



ENGINEERING TESTING
LABORATORY LTD.
GRAIN SIZE CURVE

LAB ORDER NO.	E-2510
CLIENT	
SAMPLE	TH 4-275
SOURCE	
HOLE	DEPTH 12'-18'
TECHNICIAN	REC'D.
DATE TESTED 1/29/68	



REMARKS:

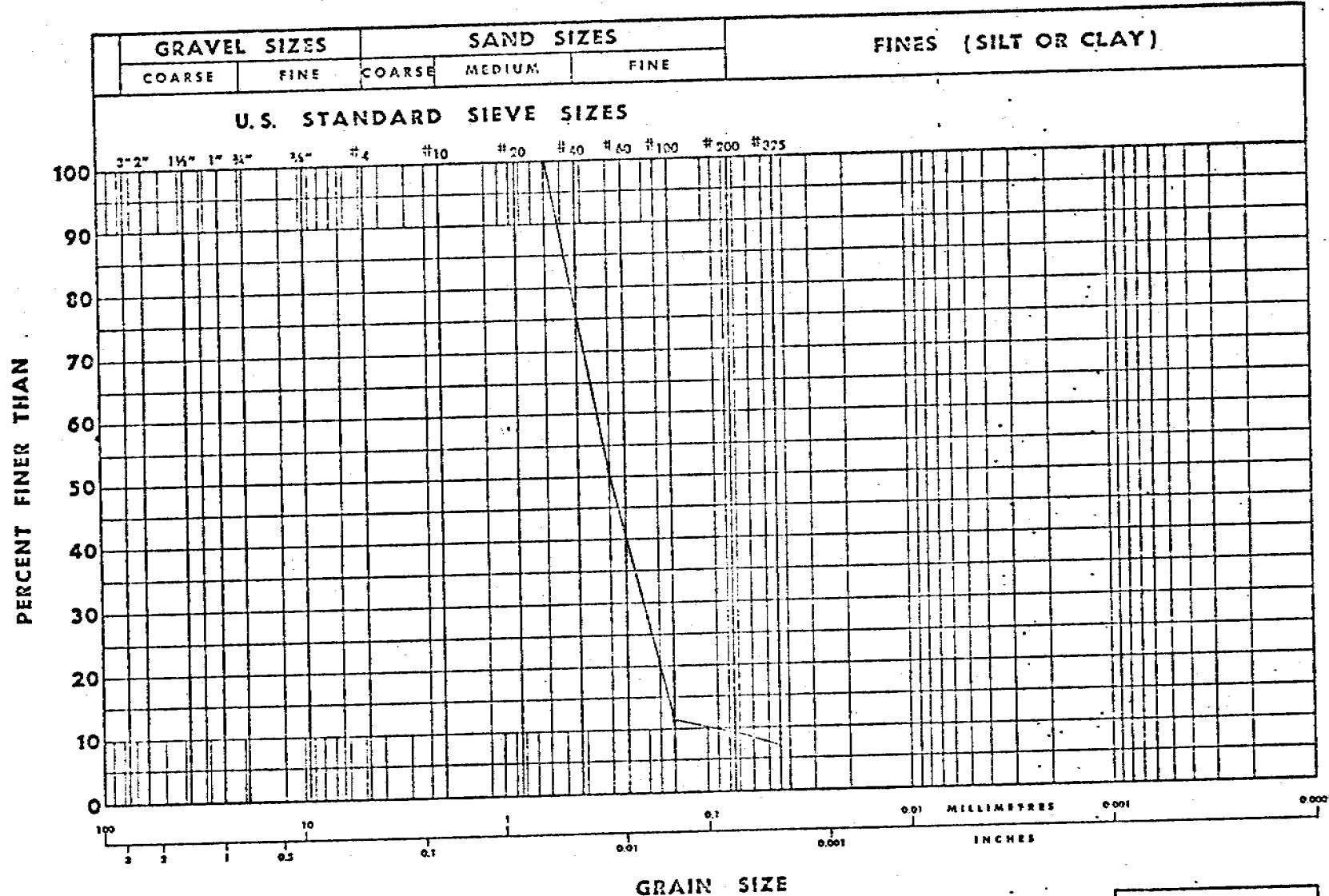
NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

D ₁₀ =	MM.
D ₃₀ =	MM.
D ₆₀ =	MM.
D ₁₀₀ =	MM.



HARDING TESTING
LABORATORIES LTD.

GRAIN SIZE CURVE



REMARKS:

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

D ₁₀ =	MM
D ₃₀ =	MM
D ₆₀ =	MM
CUC	

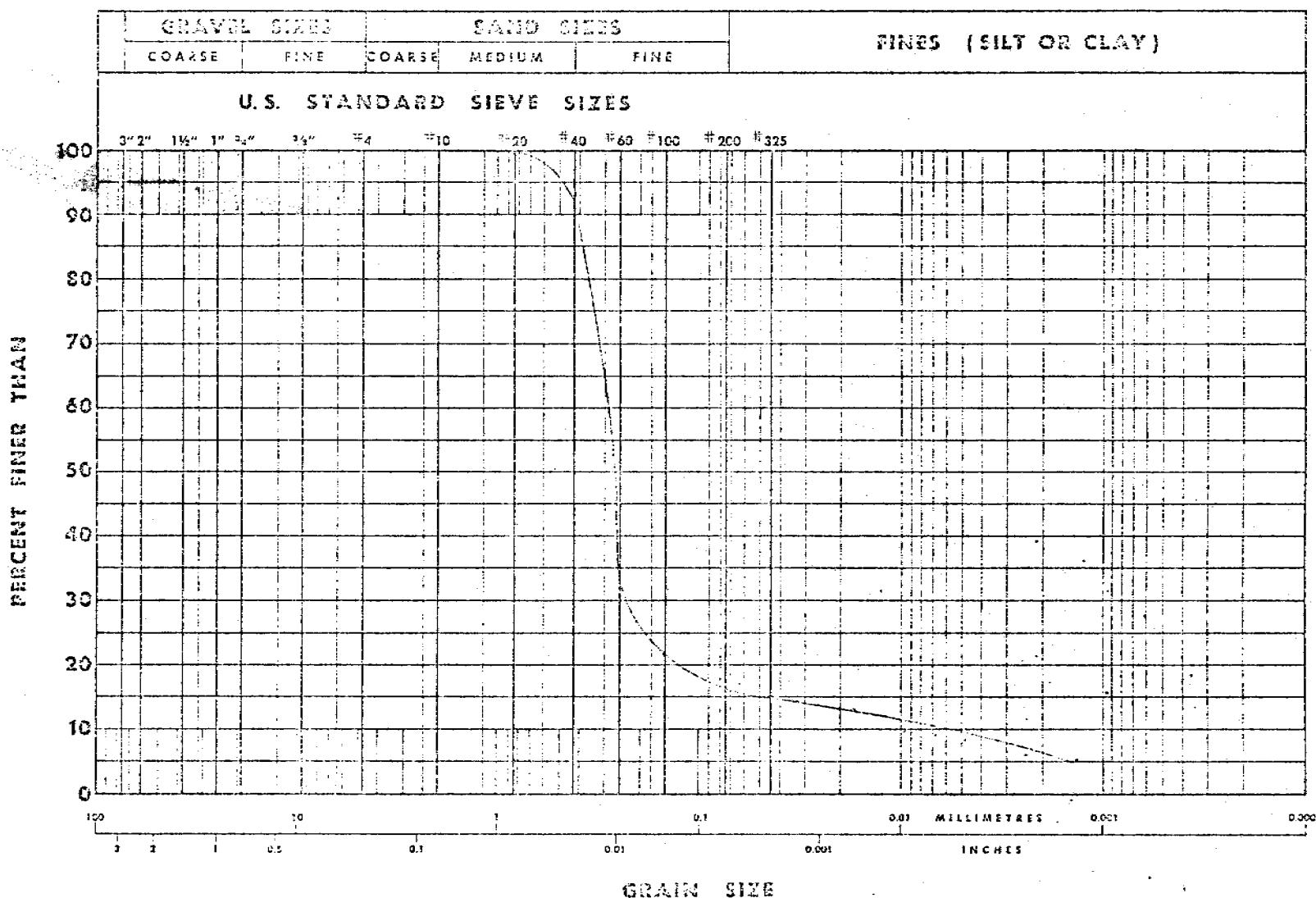
LAB ORDER NO. E-25/0
CLIENT
SAMPLE TH. #375
SOURCE
HOLE DEPTH 20'-30' DATE REC'D.
TECHNICIAN D.R., DATE TESTED 1/22/73

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

OWN: E.3		FIELD ENG: G.M.	DATE DRILLED: 2/1/72	AIRPHOTO NO: L-22032-10	CHAINAGE: 1725.00	OFFSET:	TEST HOLE											
CKD R		TECH: D.H.	RIG: FAIRING 4000	SURFACE DRAINAGE: FAIR	VEGETATION: Sedge & Sphagnum	ELEV:												
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	O = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)		GRAIN-SIZE ANALYSIS				MILE	B,C,S	NUMBER
										PLASTIC LIMIT	LIQUID LIMIT	CLAY	SILT	SAND	GRAVEL	WET DENSITY (PC.F.)	DRY DENSITY (PC.F.)	
0						PEAT; CAT. #16	F	Vx-50/50, est.	0			%	%	%	%			
2		PL				ORGANIC SAND; SILTY, NON PLASTIC.		Nbn - MEd	2									
4						(SM) SAND; FINE GRAINED, NON PLASTIC, MILK COLOR, BATHY, BROWN, SILTY.		CATN.	4									
6							JF	WET	6									
8									8									
10									10									
12								PERMAFROST	12									
14		CL				CLAY; SILT, SANDY, ANTHRACITE, BROWN, FRESH	F	Nbn - MEd	14									
16						END OF HOLE		CATN.	16									
18									18									
20									20									
22									22									
24									24									
REMARKS																		
DENSE SOILS & SEDIMENTS, BATHY & DEEPER, BETWEEN TWO SWAMPS																		



REMARKS:

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

D ₁₀ =	A.U.
D ₅₀ =	A.U.
D ₆₀ =	A.U.
Cu =	
Cc =	



GRAIN SIZE CURVE

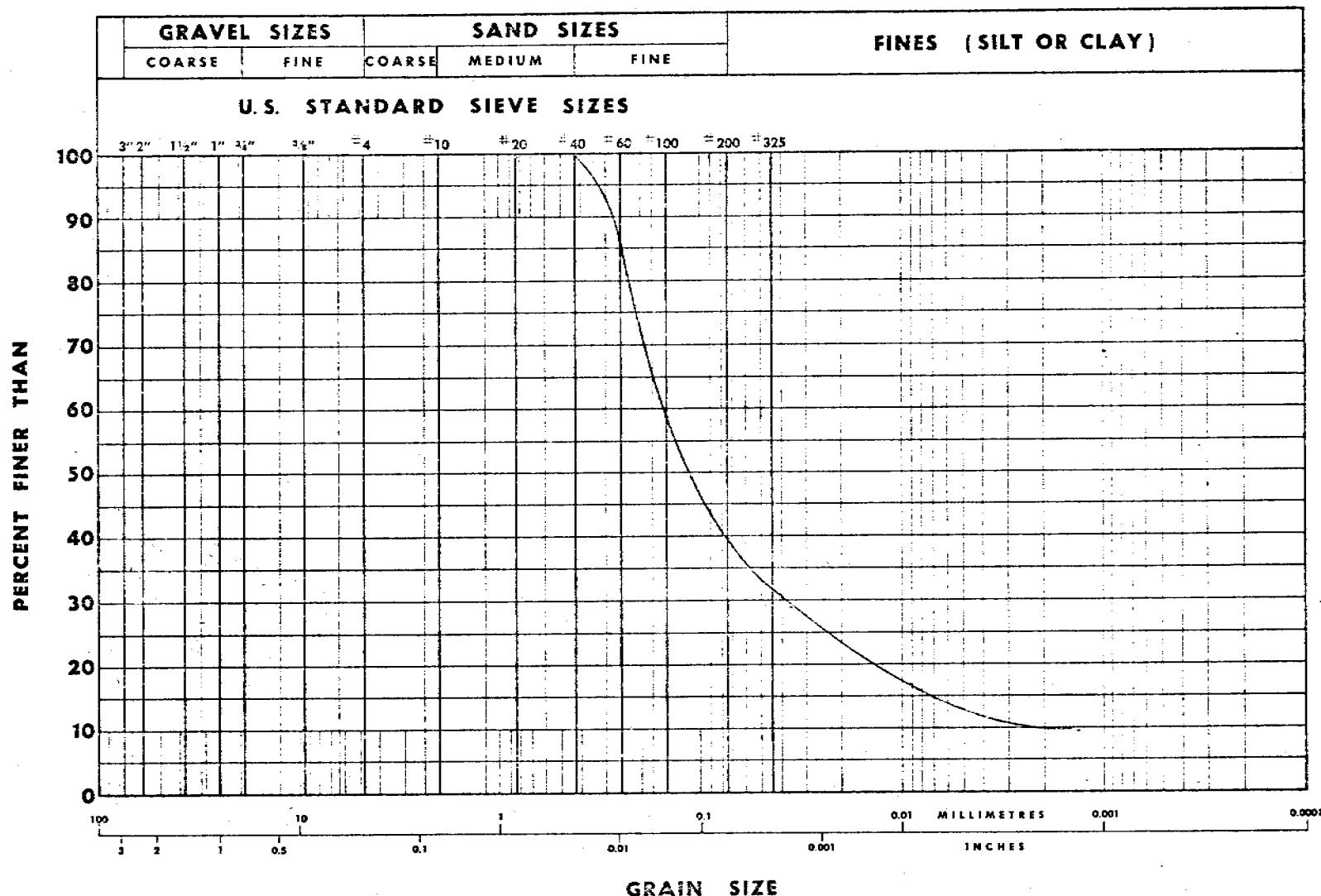
LAB ORDER NO. S-1025
 CLIENT E-25452
 SAMPLE SOURCE
 HOLE # 35 DEPTH 27 DATE REC'D.
 TECHNICIAN 16 DATE TEST'D. 10/10/67



**MATERIALS TESTING
LABORATORIES LTD.**

GRAIN SIZE CURVE

LAB ORDER NO. S-1065
CLIENT E. 2510
SAMPLE
SOURCE
HOLE # 376 DEPTH 12' DATE REC'D.
TECHNICIAN J. F. DATE TESTED 1/1/65

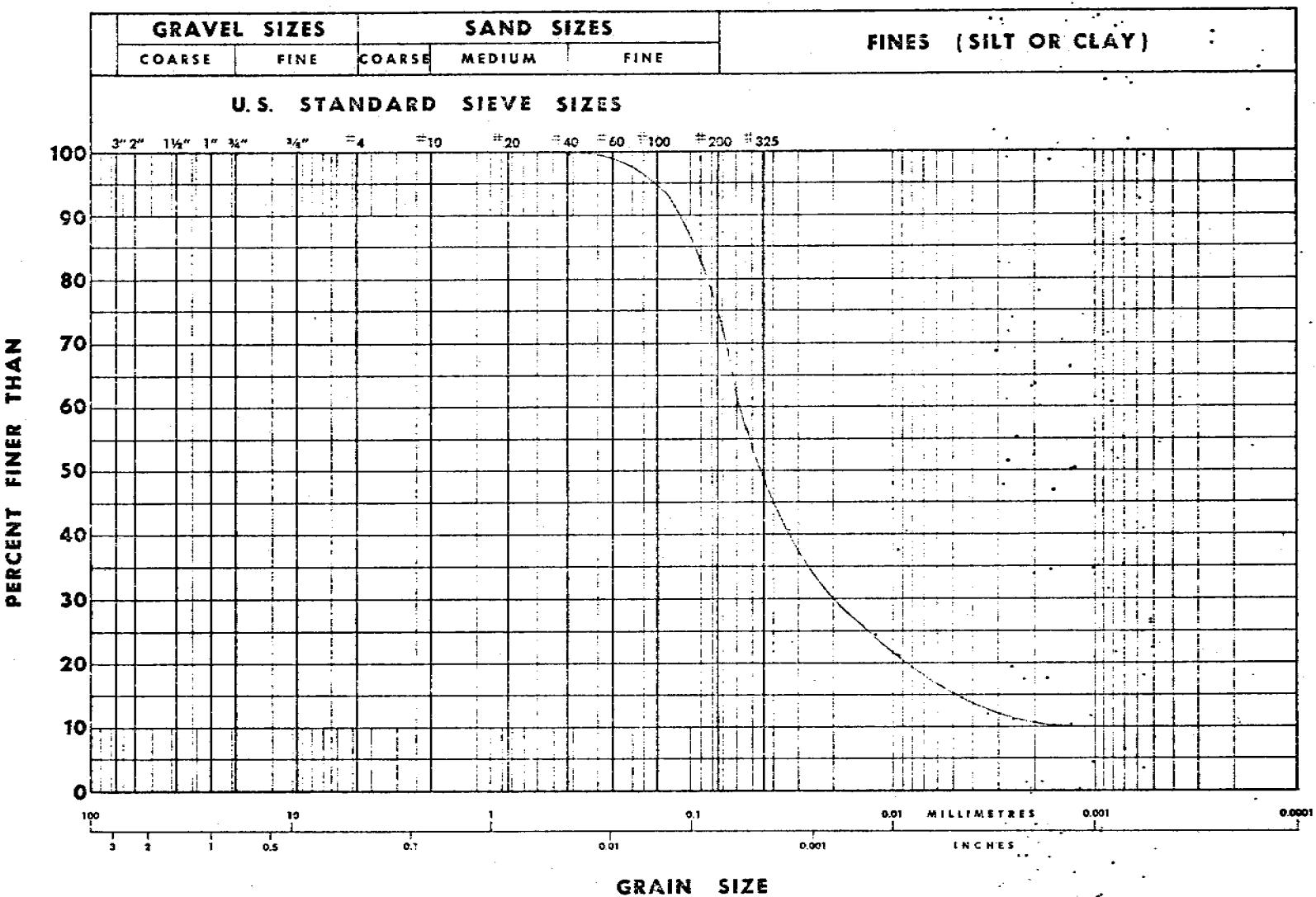


REMARKS:

D ₁₀ =	MM.
D ₃₀ =	MM.
D ₅₀ =	MM.
D ₁₀₀ =	MM.


**MATERIALS TESTING
LABORATORIES LTD.**
GRAIN SIZE CURVE

LAB ORDER NO. S-1065
 CLIENT E-2510
 SAMPLE
 SOURCE
 HOLE #376 DEPTH 14' DATE REC'D.
 TECHNICIAN G.F. DATE TESTED 16/1/65



REMARKS:

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

D ₁₀	MM.
D ₃₀	MM.
D ₆₀	MM.
C	INCHES

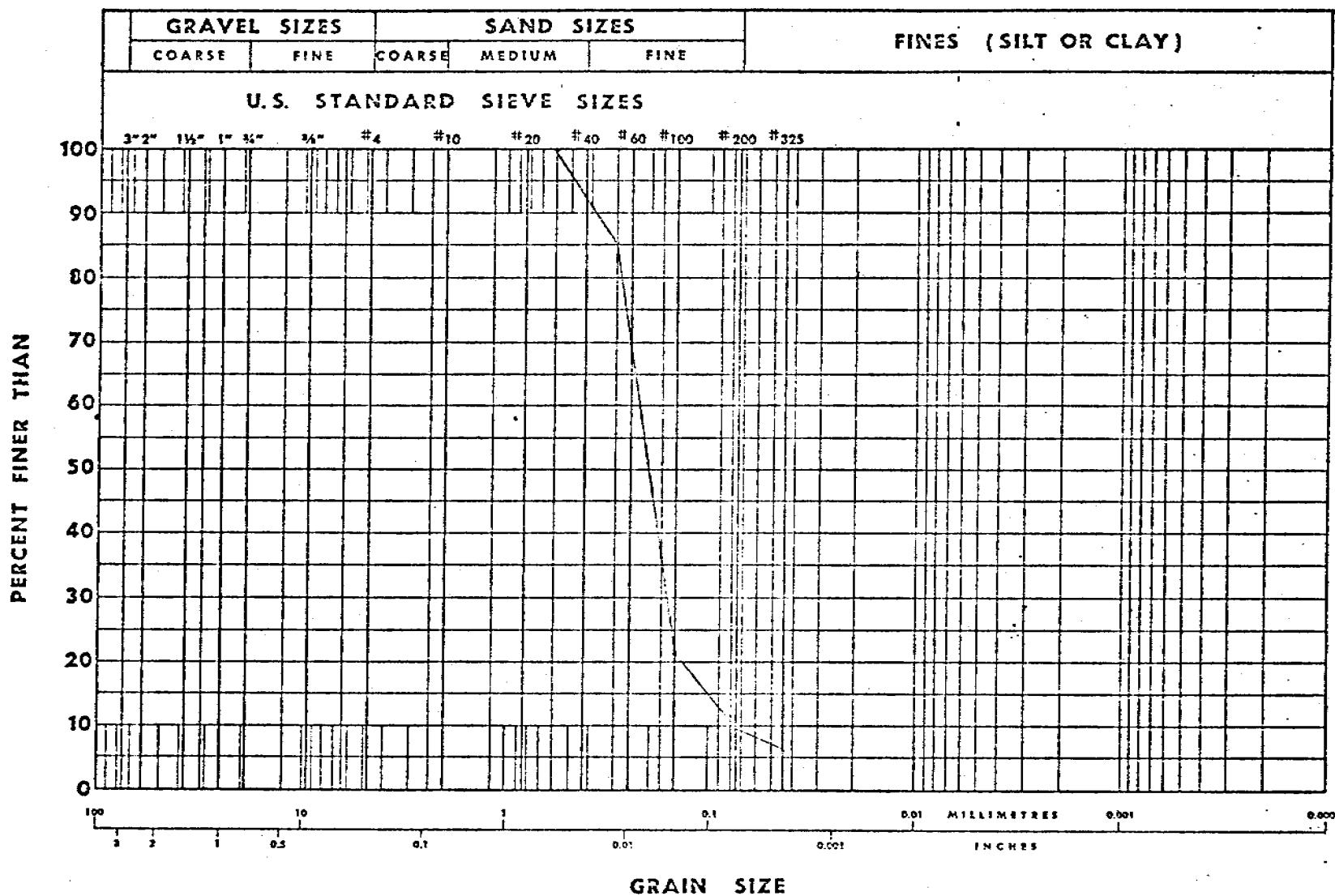
R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY											
DWNR E.B.	FIELD ENG G.D.	DATE DRILLED 27/1/75	AIRPHOTO NO: A-22933-19	CHAINAGE: 175.5 ± 3'		OFFSET:						TEST HOLE							
CKD	TECH D.H.	RIG: FAILING 1000	SURFACE DRAINAGE: FAIR	VEGETATION: SCRUB 1/4 - 1/2 M. 25% BARE		ELEV:													
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	Penetration Resistance	Unified Soil Symbol	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)	PLASTIC LIMIT	LIQUID LIMIT	% CLAY	% SILT	% SAND	% GRAVEL	MILE	B.C.S	NUMBER
										20 40 80 80 100 100+			WET DENSITY (PCF)	DRY DENSITY (PCF)					
0					OL	SILT: ORGANIC	F		0				10	90			53.25	C	377
2						SAND: SILTY / FINE GRAINED NON PLASTIC GREY BROWN	1 1/2	Non-frozen SAND	2	○									
4									4	○									
6									6	○									
8									8	○									
10									10	○									
12									12	○									
14									14	○									
16									16	○									
18					CL	CLAY: SILTY / LOW PLASTIC END OF HOLE	17		18	○			7	23					
20									20										
22									22										
24									24										

CLAY: SILTY /
LOW PLASTIC
END OF HOLE



MATERIALS TESTING
LABORATORIES LTD.

LAB ORDER NO. E-2510
CLIENT _____
SAMPLE NO. 377
SOURCE _____
HOLE DEPTH 4'-10' DATE REC'D. _____
TECHNICIAN D.R. DATE TESTED 1/20/72



REMARKS: _____

D ₁₀ =	MM.
D ₃₀ =	MM.
D ₅₀ =	MM.
Cu	-
Cc	-

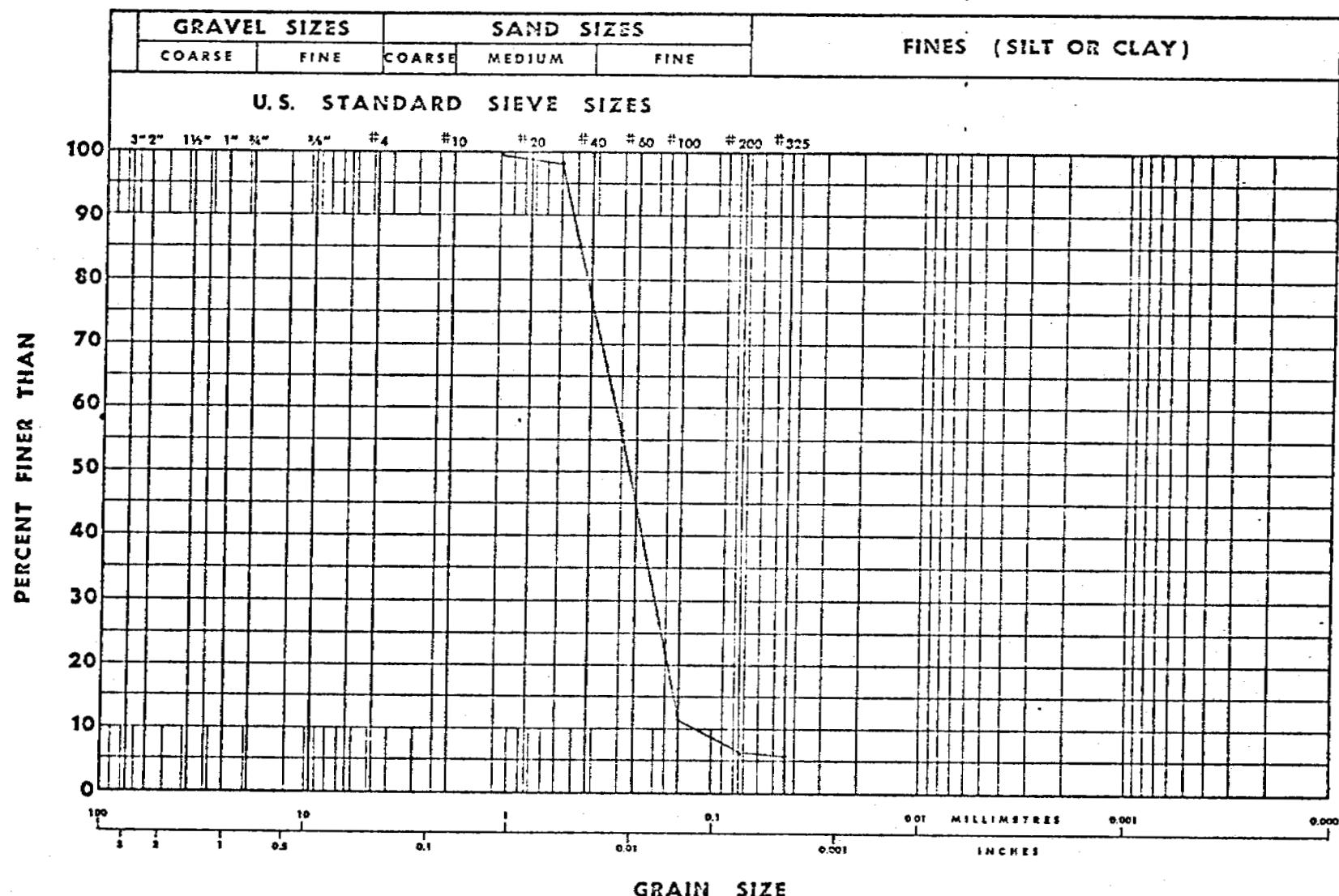
NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM



WATERMANS TESTING
LABORATORIES LTD.

GRAIN SIZE CURVE

LAB ORDER NO. E-2510
CLIENT
SAMPLE T.R. # 377
SOURCE
HOLE DEPTH 12 1/4', DATE REC'D.
TECHNICIAN DR. DATE TESTED 7/27/53

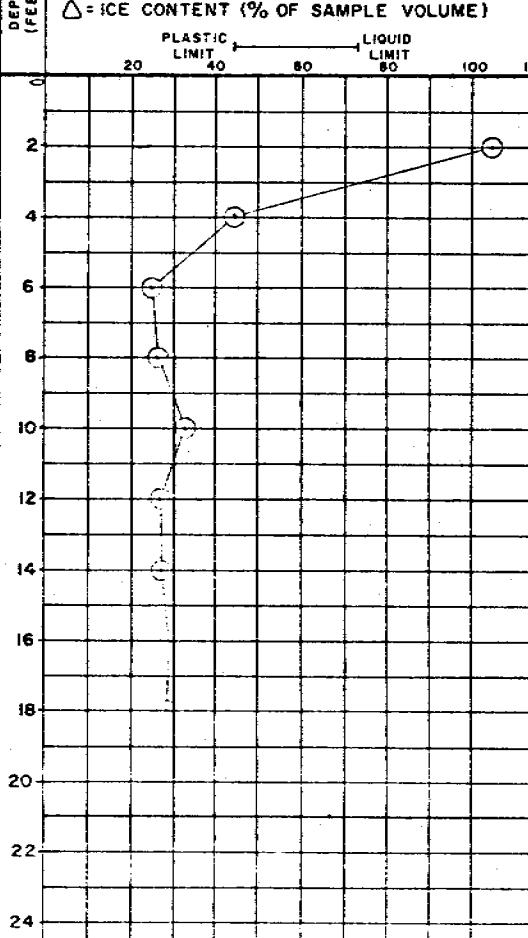


REMARKS:

D ₁₀ =	MM.
D ₃₀ =	MM.
D ₅₀ =	MM.
C _c	

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
OWN: E.B		FIELD ENG: G. Mc.		DATE DRILLED: 27/11/73		AIRPHOTO NO: A-22933-19		CHAINAGE: 11634+77		OFFSET:		TEST HOLE						
CKD	TECH	D.H.	RIG FAILING 1000	SURFACE DRAINAGE: FAIR		VEGETATION: SPARSE 245 to 500 ft		ELEV:										
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	O = WATER CONTENT (% OF DRY WEIGHT)	△ = ICE CONTENT (% OF SAMPLE VOLUME)	CLAY	SILT	SAND	GRAVEL	MILE	S.C.S	NUMBER
0					OL	SILT: CLAYEY, LOW PLASTIC ORGANIC BLACK	F	NbN-MED SATIN	0							TEST	C	378
2					SM	SAND: SILTY FINE GRAINED NOT PLASTIC GREY BROWN			2									
4									4									
6									6									
8									8									
10									10									
12									12									
14									14									
16					CL	CLAY: SILTY LOW PLASTIC GREY BROWN			16									
18						END OF HOLE			18									
20									20									
22									22									
24									24									



REMARKS

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

DWN:

FIELD ENG:

DATE DR

ED-212/75 AIR

PHOTO NO: A-53

Page 16

IMAGE: 122

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OFFENSES

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www.nature.com/scientificreports/

CKD 2

TECH. G.

BIG FAIL

卷二

WATER DRAINAGE

三

VEGETATION

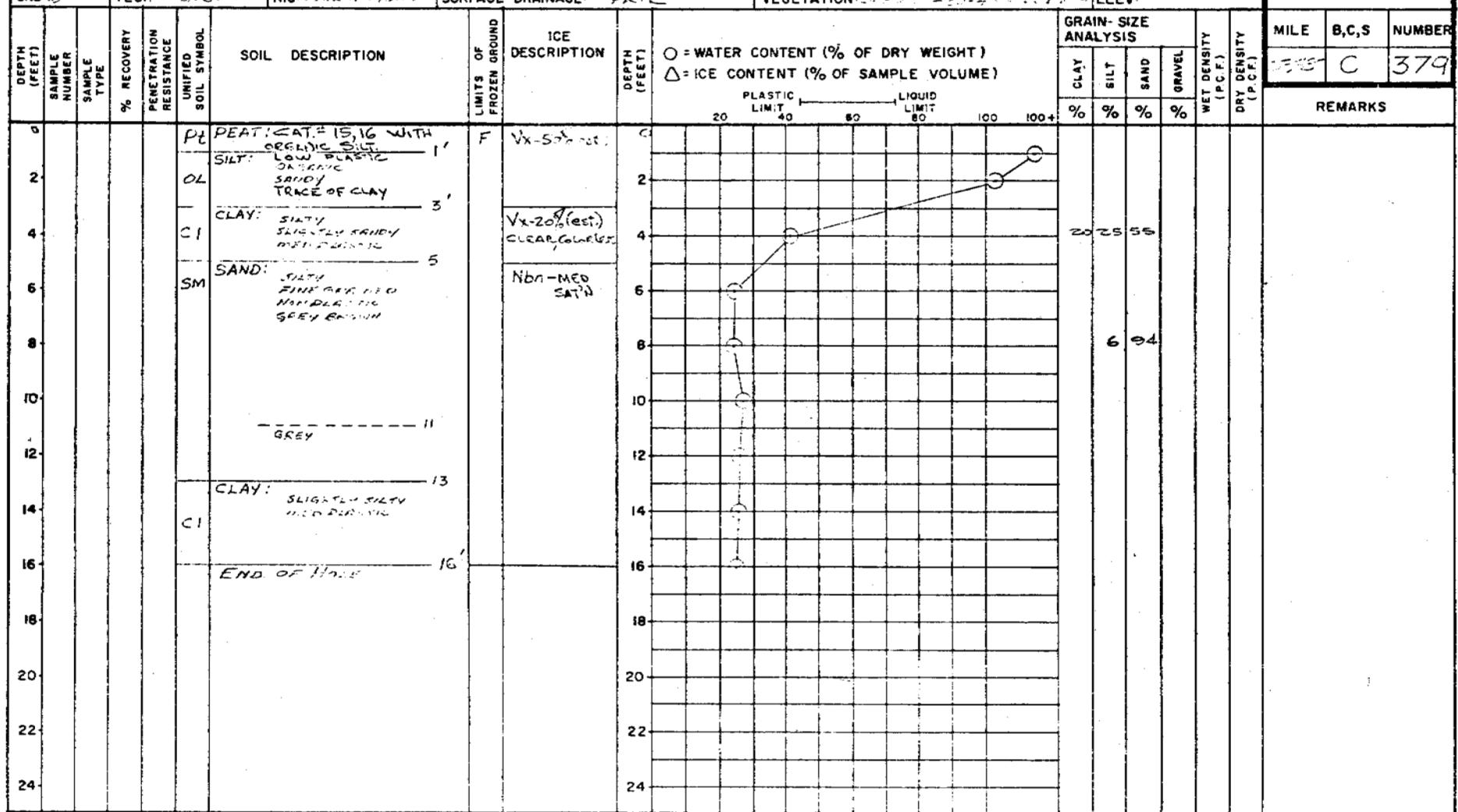
卷之三

卷之三

ELEM:

TEST

HOLE

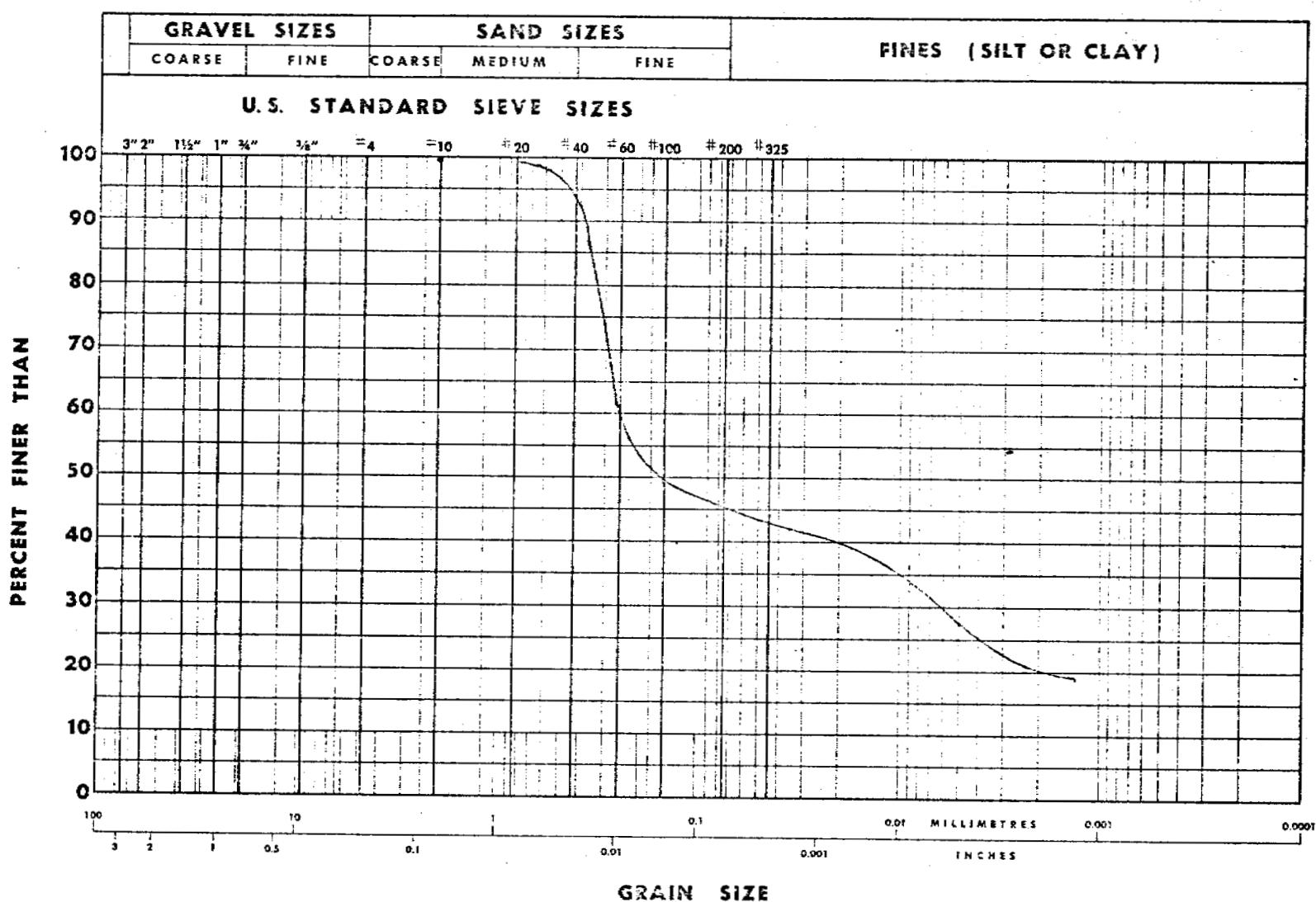




**MATERIALS TESTING
LABORATORIES LTD.**

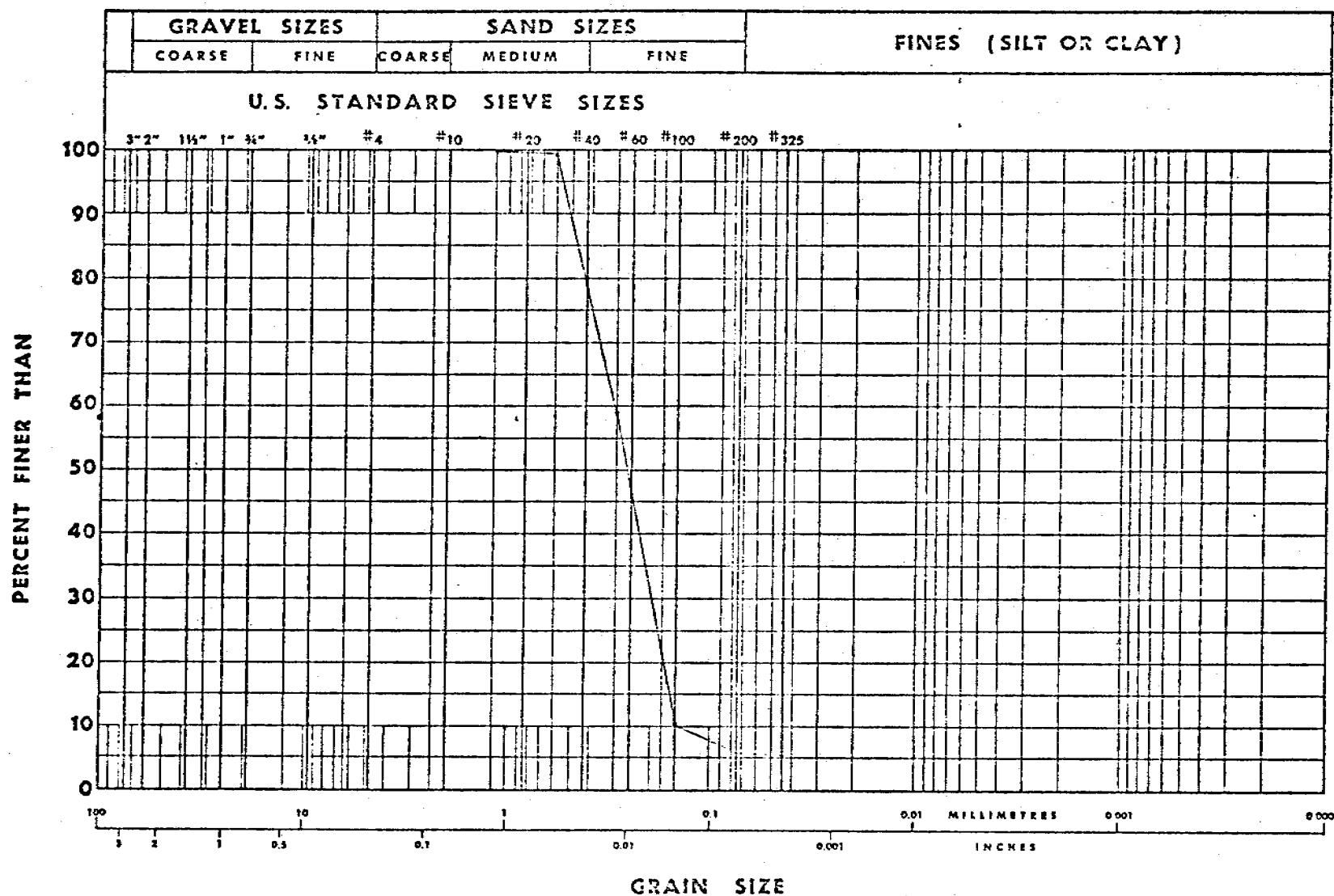
GRAIN SIZE CURVE

LAB ORDER NO.	S-1065
CLIENT	C. S. I.O.
SAMPLE	
SOURCE	
HOLE #	37
DEPTH	4'
DATE REC'D.	15/10/68
TECHNICIAN	J.G.
DATE TESTED	15/10/68



REMARKS:

D ₁₀ =	MM.
D ₆₀ =	MM.
D ₁₀₀ =	MM.
Cu =	
Cc =	



REMARKS.

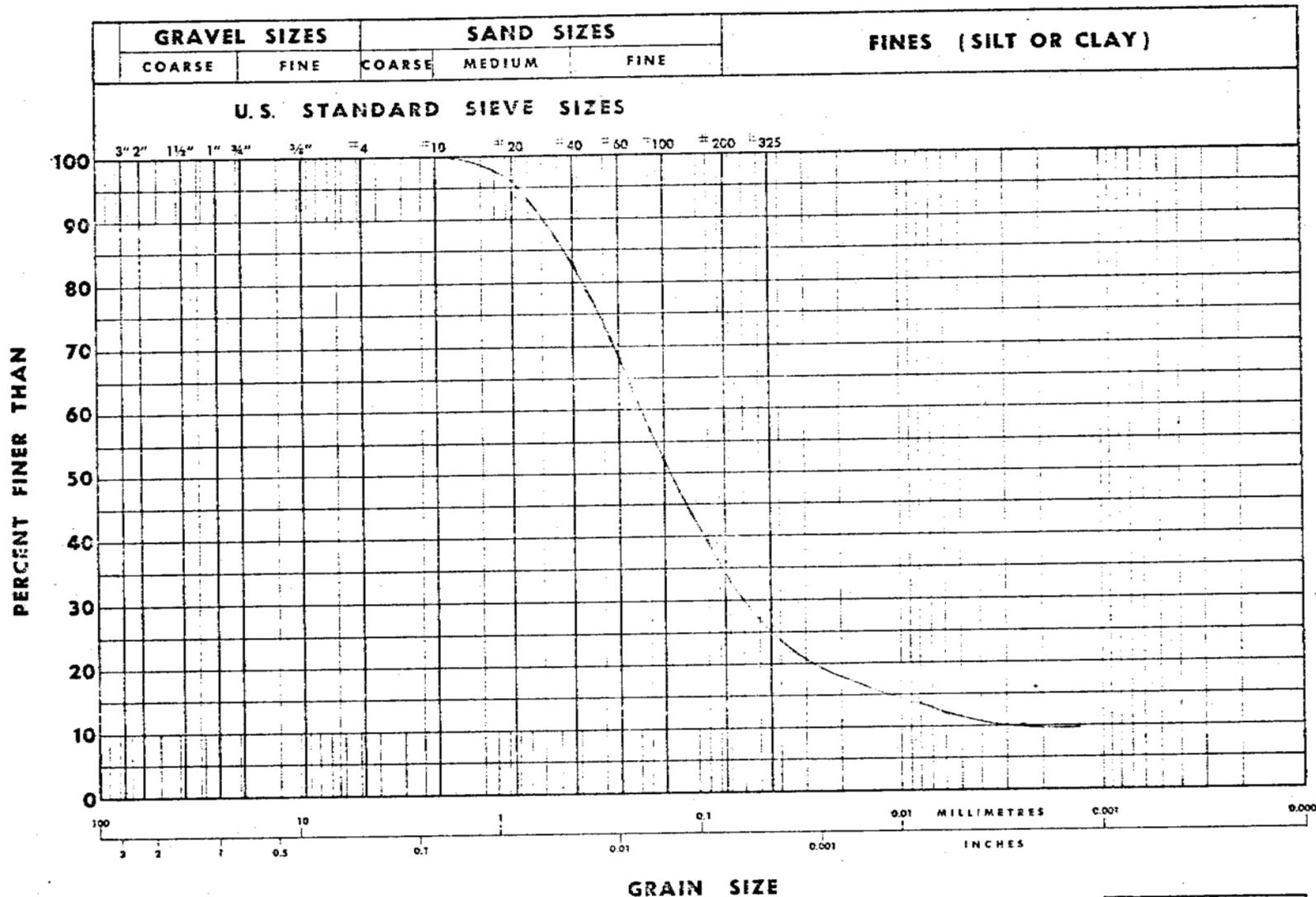
D₁₀ = _____ MM
D₃₀ = _____ MM
D₆₀ = _____ MM
C_v = _____
C_c = _____

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY



REMARKS:

D₁₀ = _____ MM.
D₃₀ = _____ MM.
D₆₀ = _____ MM.
C_U = _____
C_C = _____

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

DW# E.B. FIELD ENG. G.Mc. DATE DRILLED 23/1/73 AIRPHOTO NO 422923-16 CHAINAGE 20214.13
CMD TECH G.S. RIG SAWING 100' SURFACE BOOMER

OFFSET:

FIELD ENG: G. C.		DATE DRILLED: 28/1/73		AIRPHOTO NO: A-22923-16		CHAINAGE: 2021 + 13		OFFSET:		TEST HOLE							
CKD	TECH: G. C.	RIG: FAILING 1000	SURFACE DRAINAGE: GOOD	VEGETATION: FAIRLY DENSE SHRUBS - BUSHES				ELEV:									
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				MILE	B,C,S	NUMBER	
										CLAY	SILT	SAND	GRAVEL				
										%	%	%	%	WET DENSITY (PCF)	DRY DENSITY (PCF)		
0						SILT: TRACE OF CLAY ORGANIC SNOW OCCASIONAL PEBBLE	F	NONE	2								
2									4								
4						SAND: SILTY FINE GRAINED OCCASIONAL DEBRAL LIGHT BROWN ND	3		6								
6						-- NO PIPELES CHARCOAL SPECKS BROWN NON PLASTIC	5		8								
8						CLAY: SNOW/ NON PLASTIC OCCASIONAL PEBBLE GREY BROWN	7		10								
10						END OF HOLE	10		12								
12									14								
14									16								
16									18								
18									20								
20									22								
22									24								
24																	

○ = WATER CONTENT (% OF DRY WEIGHT)
△ = ICE CONTENT (% OF SAMPLE VOLUME)

PLASTIC LIMIT 20 40 60 80 100 100+ LIQUID LIMIT

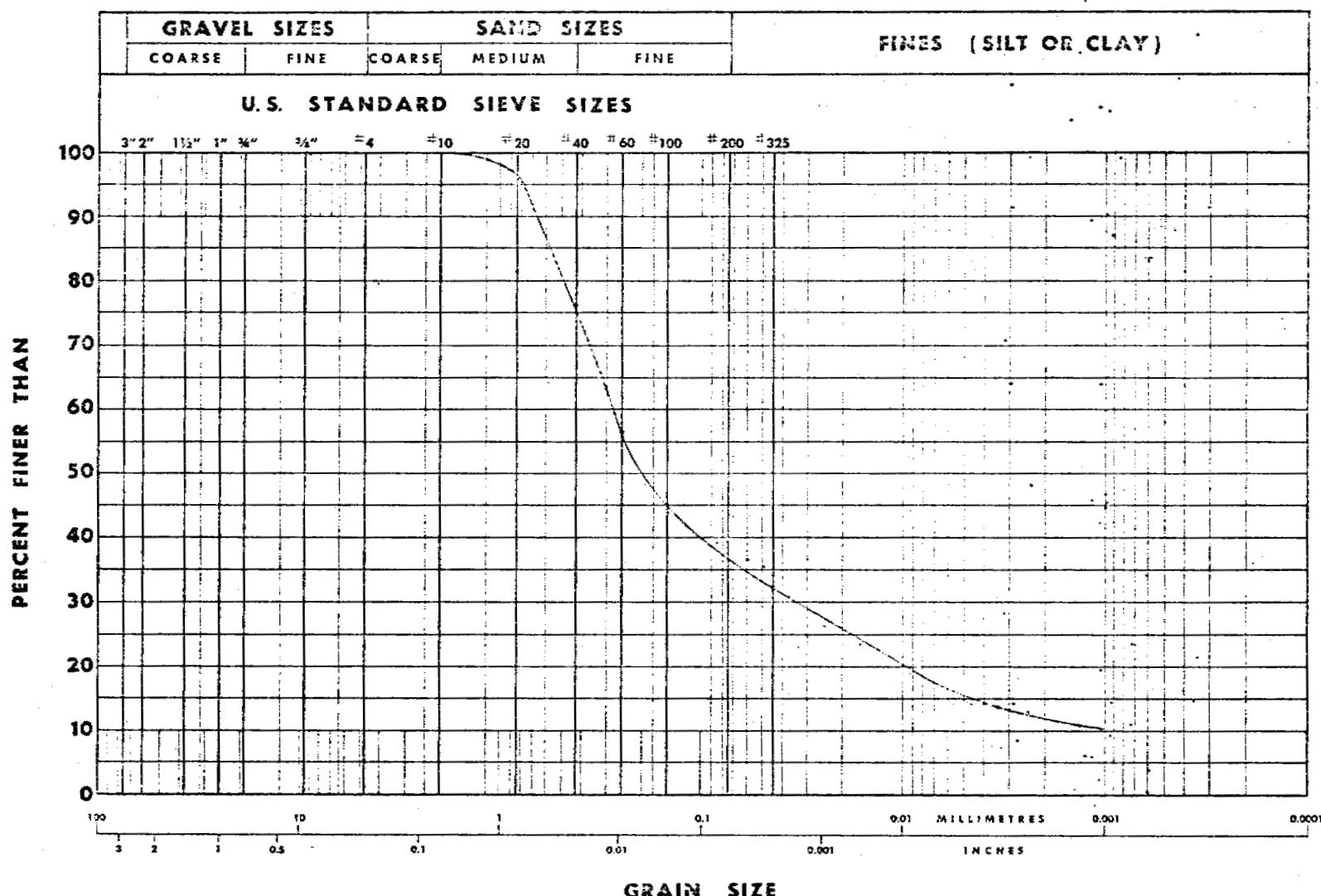
REMARKS



**MINERALS TESTING
LABORATORIES LTD.**

GRAIN SIZE CURVE

LAB ORDER NO. 51045
CLIENT E. & L. G.
SAMPLE
SOURCE
HOLE #38/DEPTH 4' DATE REC'D.
TECHNICIAN J. S. DATE TESTED 1/3



REMARKS:

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM.

D ₁₀ =	MM.
D ₃₀ =	MM.
D ₆₀ =	MM.
D ₉₀ =	MM.
C =	

13

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

OWNER E.B.	FIELD ENG: G.D.	DATE DRILLED 20/7/75	AIRPHOTO NO: A-22532-16	CHAINAGE 1000' + 2	OFFSET:	TEST HOLE													
CKD:	TECH: G.C.	RIG: FRICTION 1000	SURFACE DRAINAGE: GOOD	VEGETATION: TALL HERB, Sedge, etc.	ELEV:														
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	○ = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)	PLASTIC LIMIT	LIQUID LIMIT	REMARKS	MILE	B.C.S	NUMBER			
										%	%	%	%	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)				
0					MH	SILT: SLIGHTLY SNOWY	F	NON		0	20	40	60	80	100	100+			
2										2									
4										4									
6										6									
8					SM	SAND: FINE GRAINED SILTY SAND, SLIGHTLY FROZEN, UNIFORM GRAVEL, FINE PEbbLES CHARCOAL SPECKS BROWN	F	NON-MED SATIN	- MED SATIN	8									
10										10									
12										12									
14										14									
16										16									
18										18									
20										20									
22										22									
24										24									

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY										
DWRE E.S.	FIELD ENG: G.Mc	DATE DRILLED: 2-1-75	AIRPHOTO NO: L-22933-16	CHAINAGE: 15-27 + 42		OFFSET:					TEST HOLE							
CKD:	TECH: G.C.	RIG: FAILING 1000	SURFACE DRAINAGE: GOOD	VEGETATION: SEE REMARKS		ELEV:												
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS						MILE	B.C.S	NUMBER
										CLAY	SILT	SAND	GRAVEL	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)			
0						PEAT: CATEGORY #4	F	Vx - 40% (est.)	0									
2						SAND: SILTY ORGANIC 1 1/2	F	Vx - 10% (est.)	2									
4						SILTY ORGANIC FINE TO MEDIUM GRAINED NO PLASTIC, BROWN TO DARK BROWN 3	F	NO ICE	4									
6						GRANULAR PEAT SILTY 4	F	Vx - 20% (est.)	6									
8						CLAY: SILTY WITH PLASTIC 5	F	CLEAR, COARSE	8									
10						GRAVEL: VERY SILTY, SANDY 7	F	NO ICE	10									
12						SLIGHTLY CLAYEY			12									
14						END OF HOLE			14									
16									16									
18									18									
20									20									
22									22									
24									24									

○ = WATER CONTENT (% OF DRY WEIGHT)
△ = ICE CONTENT (% OF SAMPLE VOLUME)

PLASTIC LIMIT 20 40 60 80 100 100+ LIQUID LIMIT

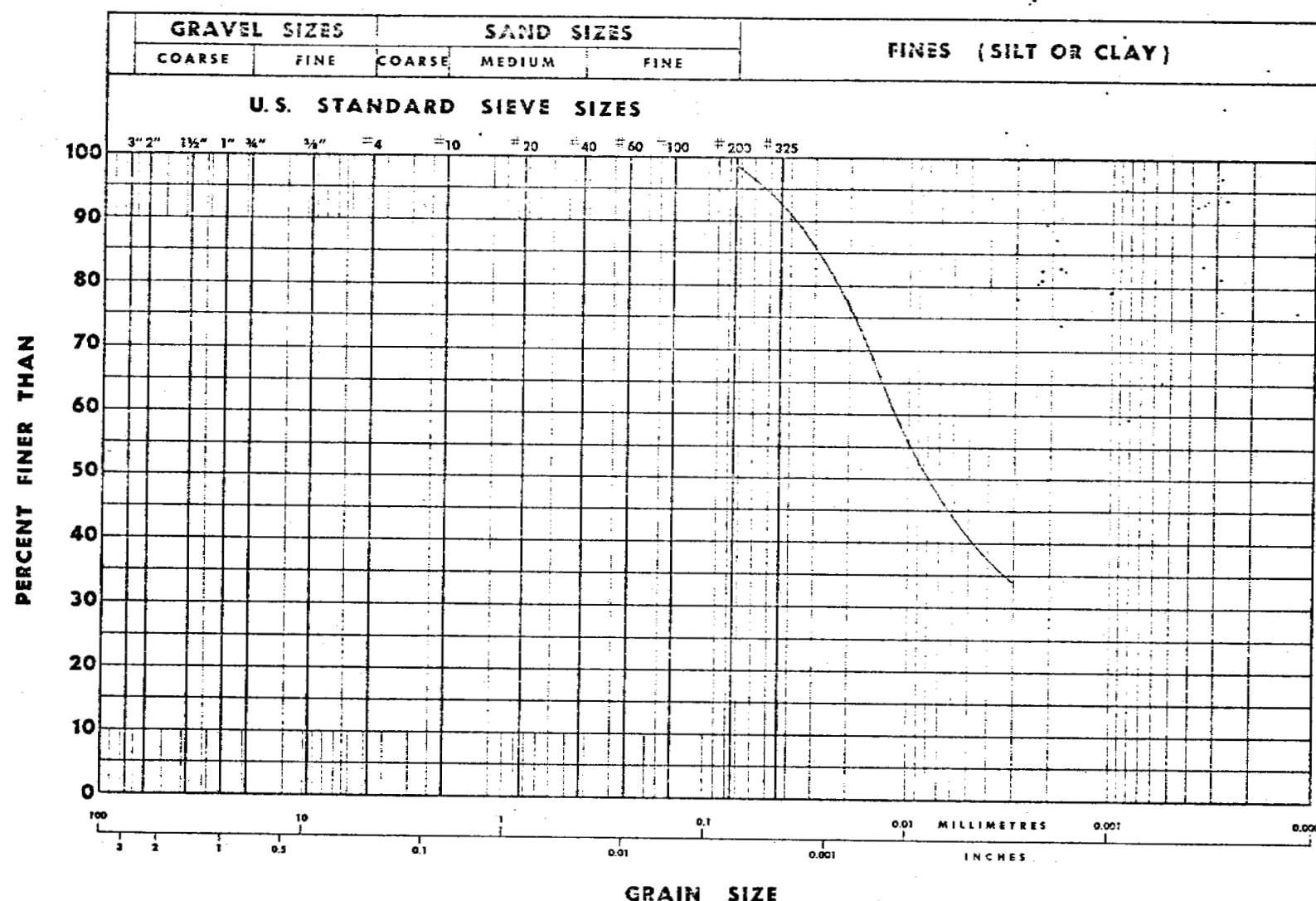
REMARKS: SCATTERED SPURKS TO 10' OFF DRAINS IN LOW BOGgy AREA

32 66 2



LABORATORY TESTS LTD.
GRAIN SIZE CURVE

LAB ORDER NO. S-1065
CLIENT F-2512
SAMPLE
SOURCE
MOLE 38 DEPTH 6' DATE REC'D.
TECHNICIAN JG. DATE TESTED 1/1/68



REMARKS:

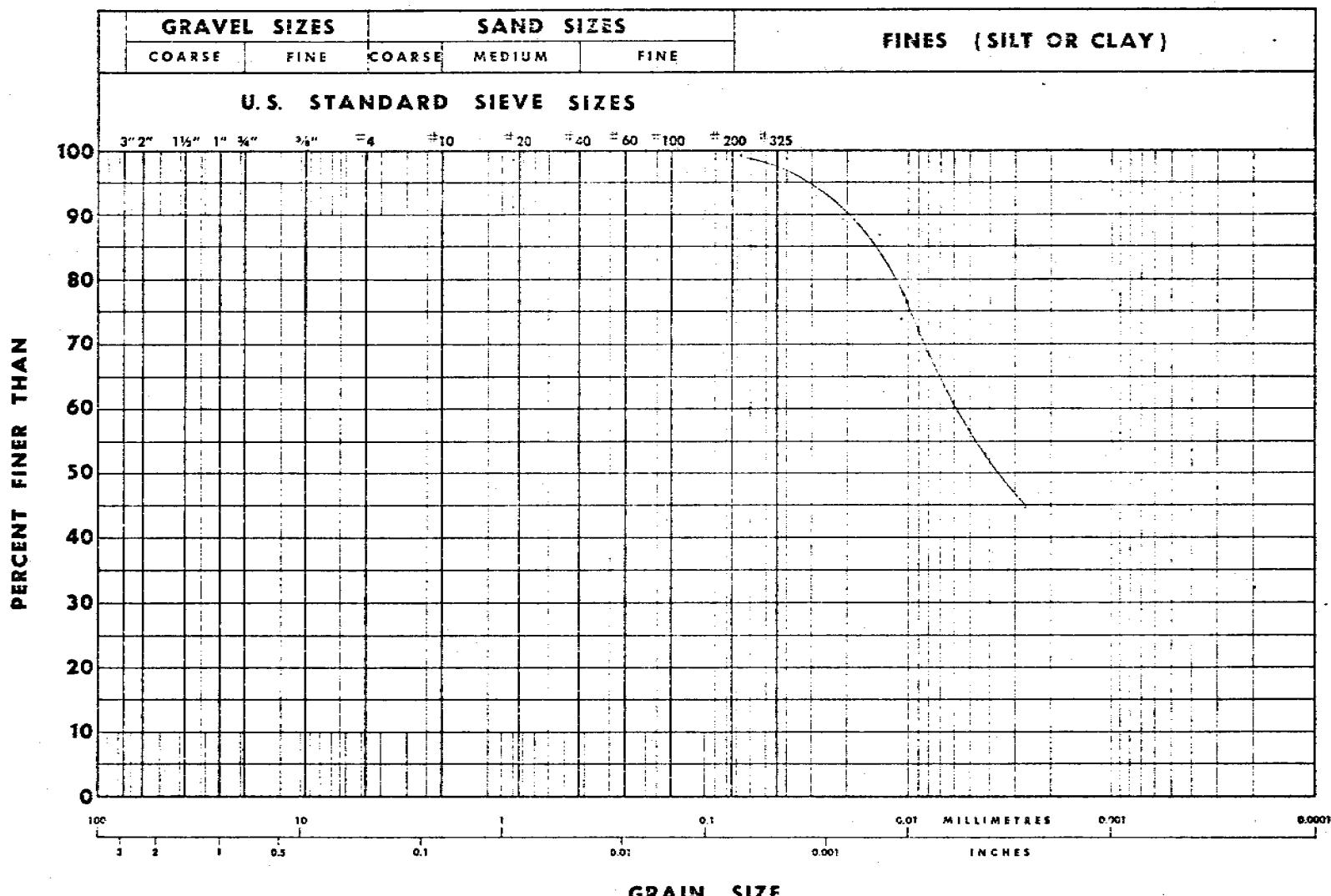
NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

D ₁₀ =	MM.
D ₃₀ =	MM.
D ₅₀ =	MM.
Cu =	
Cc =	

R. M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

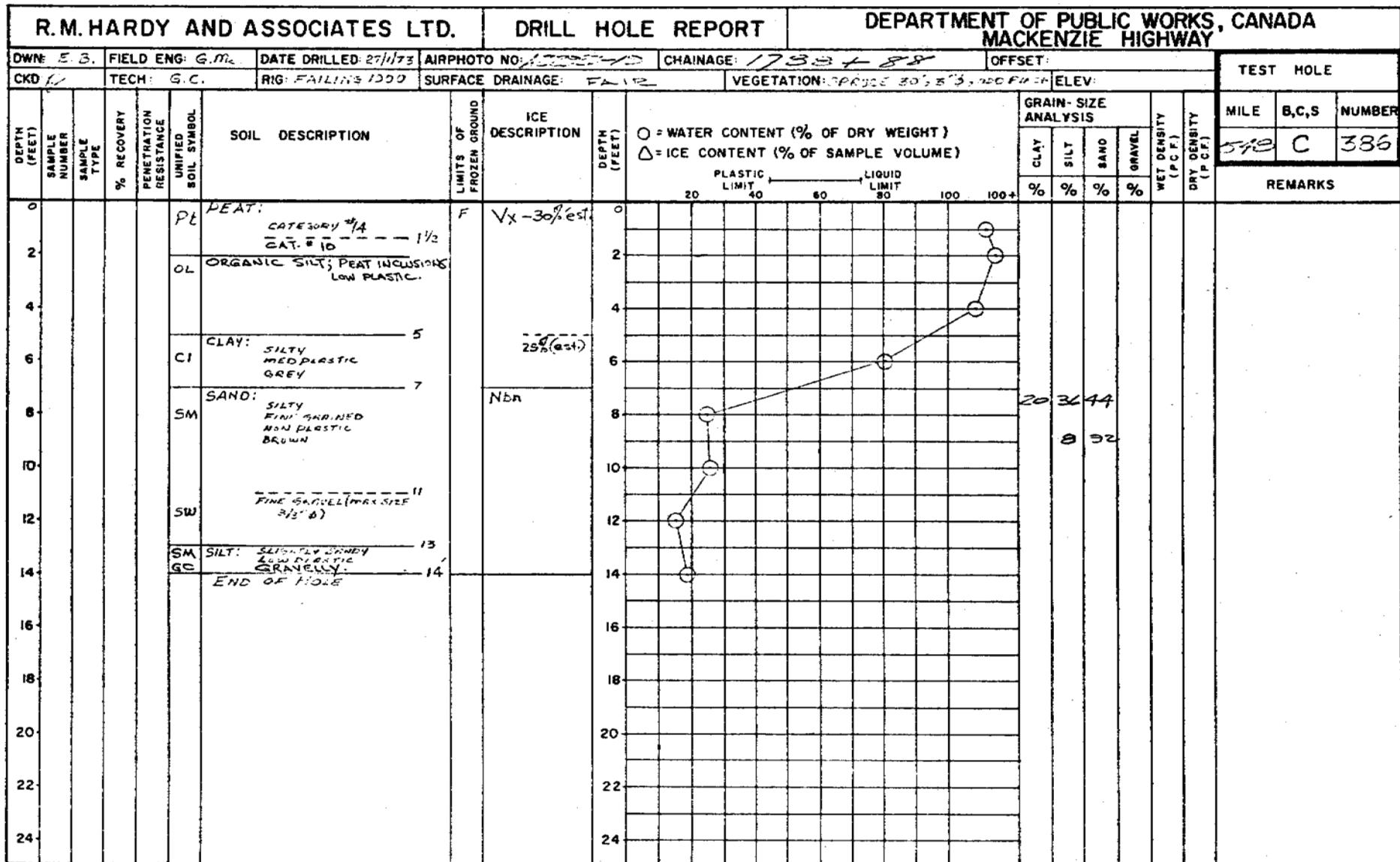
**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**



REMARKS:

D₁₀ = _____ MM.
D₃₀ = _____ MM.
D₆₀ = _____ MM.
C_U _____
C_S _____

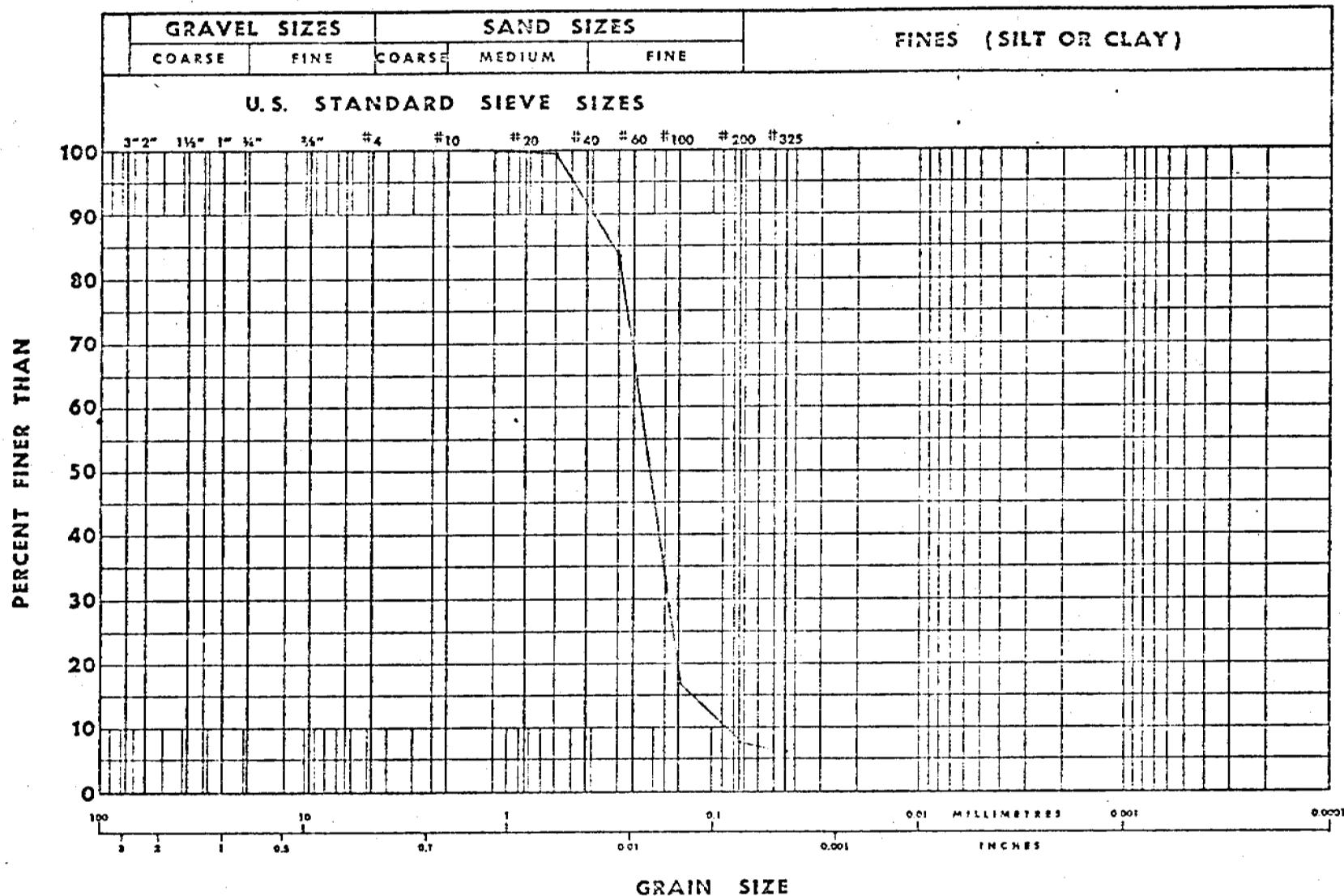
NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM





GEMEINSAM

LAAN ORDER NO. 11-2510
CLIENT



REMARKS.

D₁₀ = _____ MM
D₃₀ = _____ MM
D₆₀ = _____ MM
C_u = _____
C_c = _____

NOTE: UNITED SOIL CLASSIFICATION SYSTEM

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWN E.B.		FIELD ENG: G.M.C.	DATE DRILLED: 27/1/73	AIRPHOTO NO: A22933-10	CHAINAGE: 1732 + 5.0	OFFSET:	TEST HOLE							
CKD		TECH: G.C.	RIG FAILING 1000	SURFACE DRAINAGE: FAIR	VEGETATION: SPRUCE, 20-30' ; 0000 B.A.L.	ELEV:	MILE	B,C,S	NUMBER					
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS	
2		Pt	PEAT: CATEGORY 4		F	30%			2					
4									4					
6		C1	CLAY: SILTY SLIGHTLY SANDY MED PLASTIC GREY			25%			6					
8									8					
10									10					
12									12					
14									14					
16									16					
18									18					
20									20					
22									22					
24									24					

○ = WATER CONTENT (% OF DRY WEIGHT)
 △ = ICE CONTENT (% OF SAMPLE VOLUME)
 PLASTIC LIMIT → LIQUID LIMIT
 20 40 60 80 100 100+

END OF HOLE

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

OWN: E.R.		FIELD ENG: G.Mc.		DATE DRILLED 6/1/77		AIRPHOTO NO: A-22533-10		CHAINAGE: 1500.8 + 21		OFFSET:		TEST HOLE		
CKD #		TECH: G.C.		RIG: FALCON 1000		SURFACE DRAINAGE: FAIR		VEGETATION: SPARSE - 15-30' TALL		ELEV:		MILE	B,C,S	NUMBER
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNITED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS		REMARKS		
										CLAY	SILT	SAND	GRAVEL	
										%	%	%	%	WET DENSITY (P.C.F.)
														DRY DENSITY (P.C.F.)
0					CL	SILT: ORGANIC DEBT INCLUSIONS	F	VK	2					
2					SC	SAND: VERY SILTY FINE GRAINED SLIGHTLY PLASTIC GREY	1/2	Nbr	4					
4					SM	GREY BROWN		-MED SATN	6					
6									8					
8									10					
10									12					
12					C1	CLAY: SLIGHTLY SILTY MEDIUM PLASTIC GREY	12		14					
14						END OF HOLE	14		16					
16									18					
18									20					
20									22					
22									24					
24														

○ = WATER CONTENT (% OF DRY WEIGHT)
 △ = ICE CONTENT (% OF SAMPLE VOLUME)

PLASTIC LIMIT 20 40 60 80 100 100+ LIQUID LIMIT

18 28 54

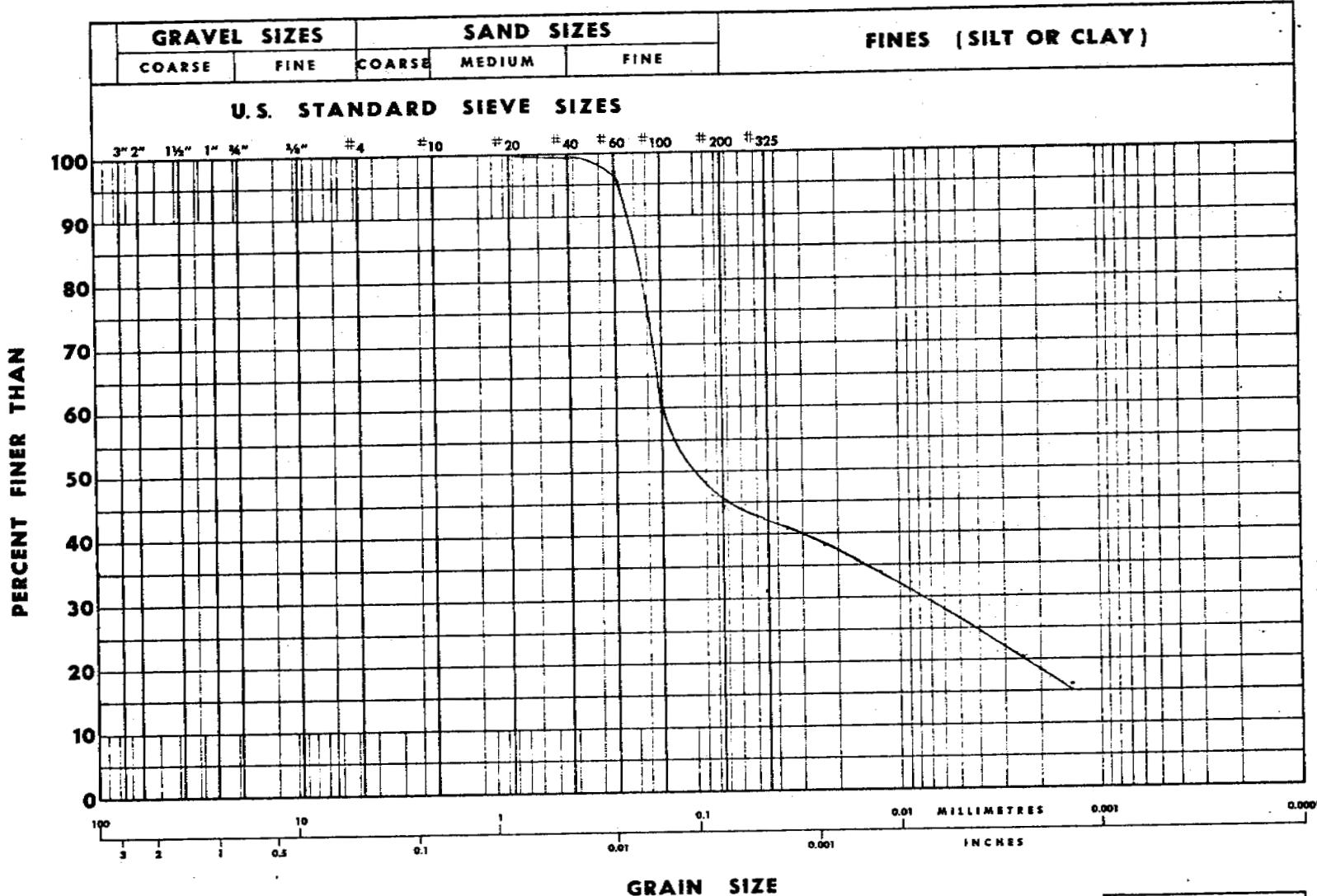
20 36 44
20 40 40

8 20 72



MATERIALS TESTING LABORATORIES LTD. GRAIN SIZE CURVE

LAB ORDER NO. S-1065
 CLIENT E-2510
 SAMPLE
 SOURCE
 HOLE# 388 DEPTH 6' DATE REC'D.
 TECHNICIAN J.G. DATE TESTED FEB 3 1972



REMARKS:

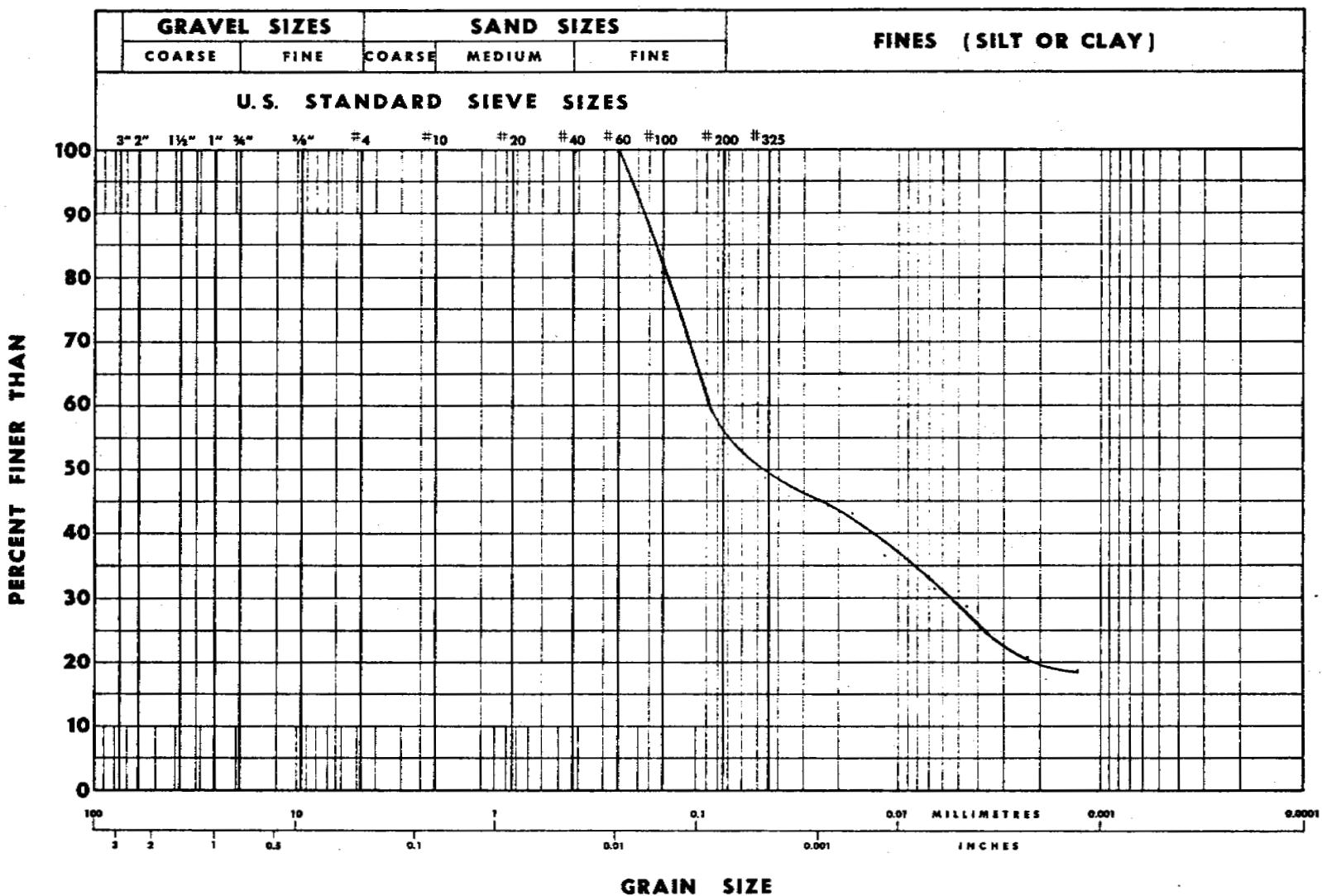
D_{10} =	MM.
D_{30} =	MM.
D_{60} =	MM.
C_u	
C_c	



MATERIALS TESTING LABORATORIES LTD.

GRAIN SIZE CURVE

LAB ORDER NO. S-1065
 CLIENT E-2510
 SAMPLE
 SOURCE
 NOTE 388 DEPTH 8' DATE REC'D.
 TECHNICIAN H.J. DATE TESTED FEB 21/73



REMARKS:

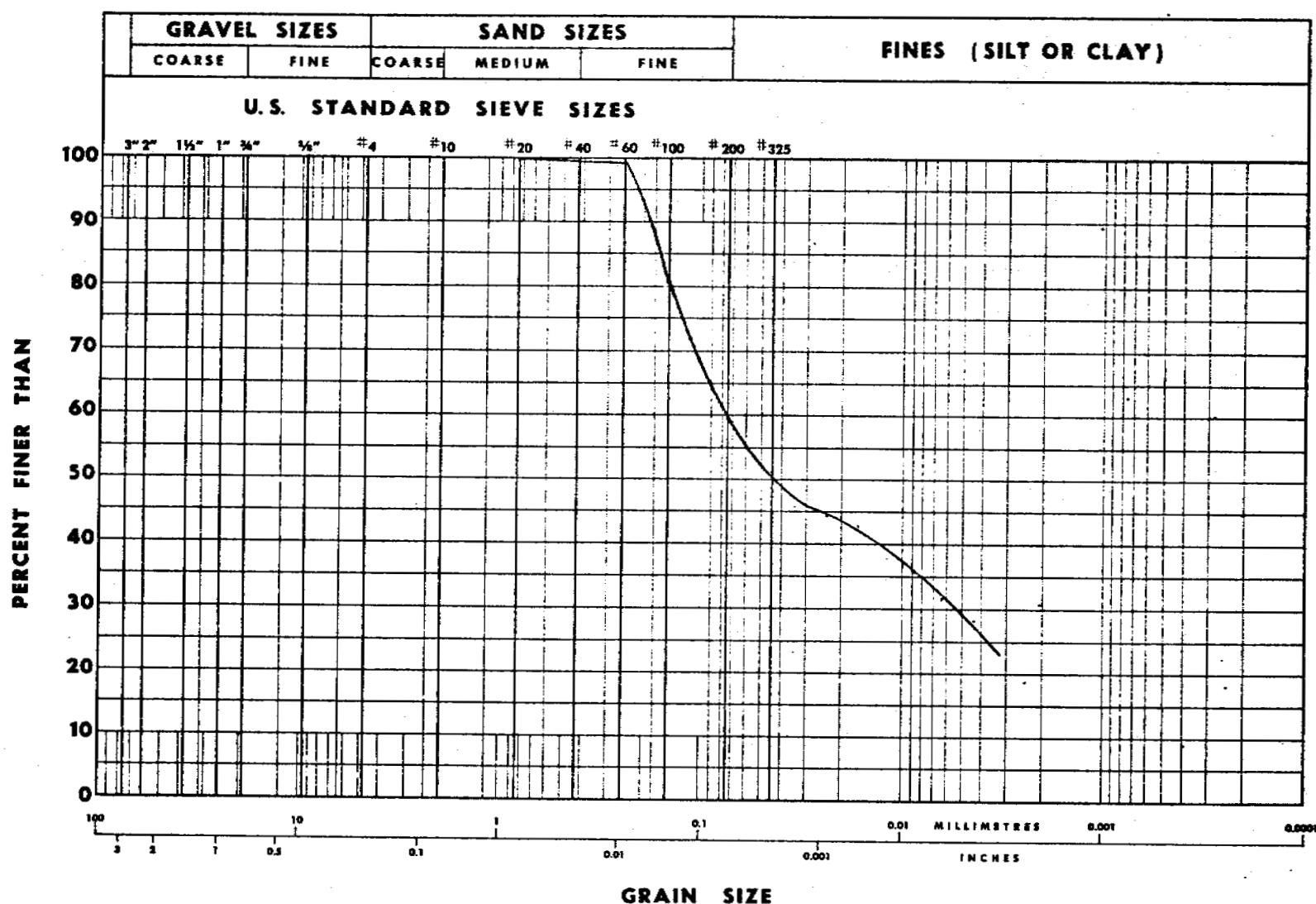
D ₁₀ =	MM.
D ₃₀ =	MM.
D ₆₀ =	MM.
Cu =	
Cc =	

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM



**MATERIALS TESTING
LABORATORIES LTD.
GRAIN SIZE CURVE**

LAB ORDER NO.	S-1065
CLIENT	E - 2510
SAMPLE	
SOURCE	
HOLE	388
DEPTH	8'
TECHNICIAN / G.	
DATE TESTED	1/13/68
REC'D.	



REMARKS:

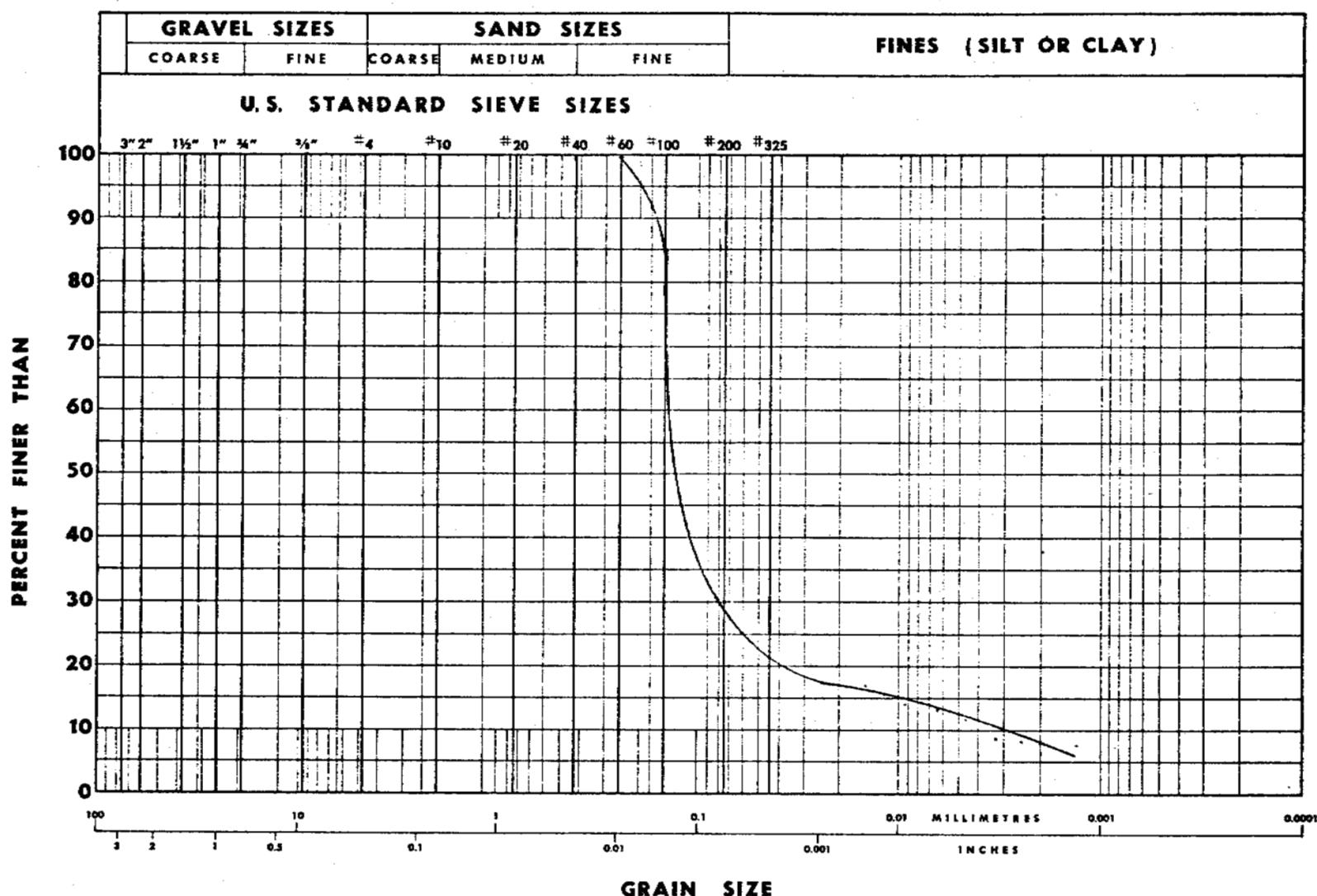
NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

D ₁₀ =	MM.
D ₃₀ =	MM.
D ₆₀ =	MM.
C _u =	
C _c =	



**MATERIALS TESTING
LABORATORIES LTD.
GRAIN SIZE CURVE**

LAB ORDER NO. S-1065
CLIENT E-2510
SAMPLE
SOURCE
HOLE 388 DEPTH 10' DATE REC'D.
TECHNICIAN J.G. DATE TESTED FEB 1973



REMARKS:

D ₁₀ =	MM.
D ₃₀ =	MM.
D ₆₀ =	MM.
C _u =	
C _c =	

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

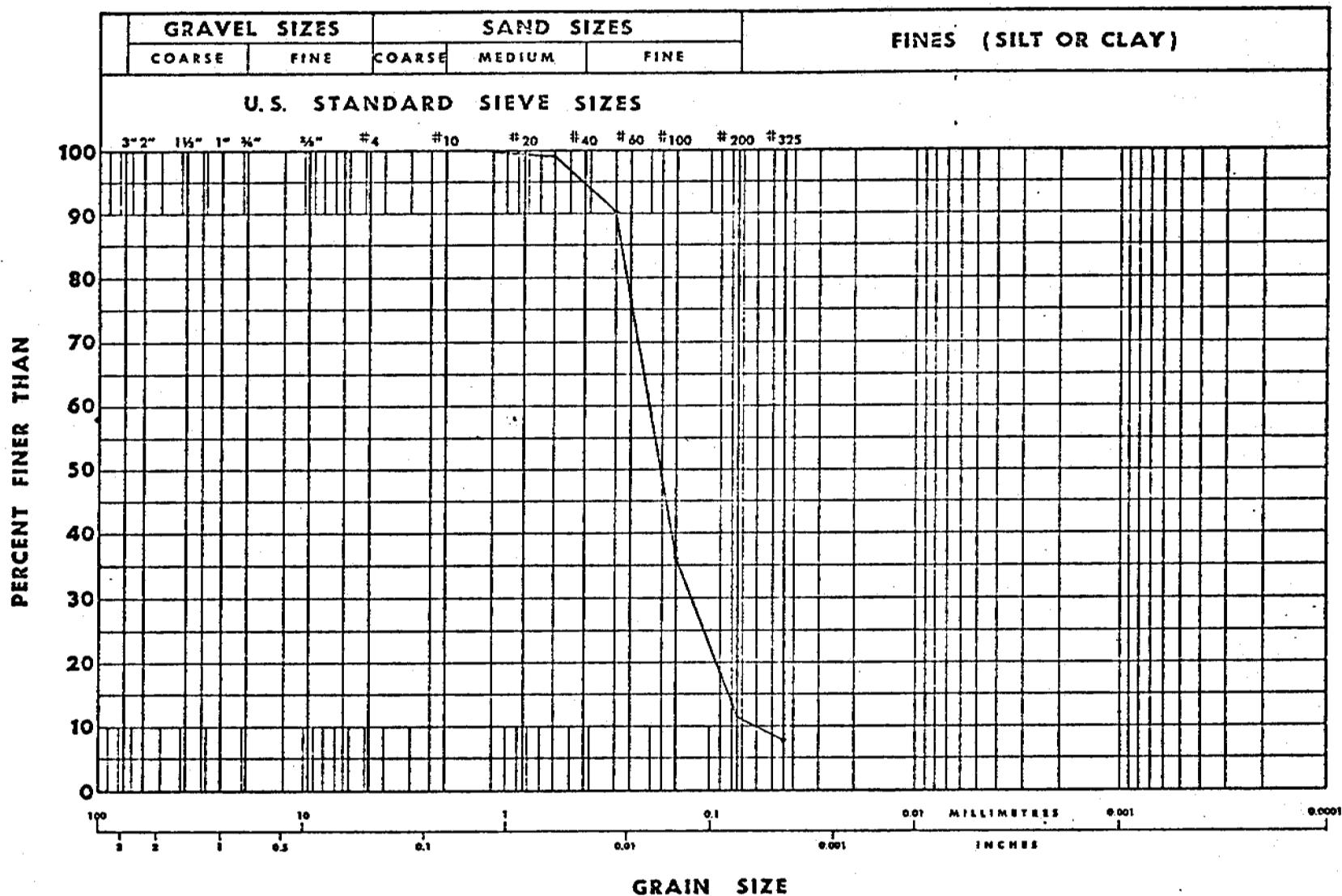
R.M. HARDY AND ASSOCIATES LTD.					DRILL HOLE REPORT			DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWN: E.B.	FIELD ENG: G. Mc.	DATE DRILLED: 27/1/73	AIRPHOTO NO: A-22933-19	CHAINAGE: 1817400	OFFSET:				TEST HOLE								
CKD ✓	TECH: G.C.	RIG: FAILING 1000	SURFACE DRAINAGE: FAIR	VEGETATION: SPRUCE, 20 m. so.	ELEV:				MILE	B,C,S	NUMBER						
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS					WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)	REMARKS
										CLAY	SILT	SAND	GRAVEL				
2					SM	SAND: SILTY FINE GRAINED NON PLASTIC LIGHT BROWN OCCASIONAL PEBBLE ----- LIGHT GREY BROWN	F	Nbn	2								
4									4								
6									6								
8									8								
10									10								
12									12								
14					C1	CLAY: SLIGHTLY SILTY GREEN PLASTIC GREY END OF HOLE			13								
16									14								
18									16								
20									18								
22									20								
24									22								
									24								



**MATERIALS TESTING
LABORATORIES LTD.**

GRAIN SIZE CURVE

LAB. ORDER NO. E-2510
 CLIENT _____
 SAMPLE TH. # 389
 SOURCE _____
 HOLE DEPTH 4'-8' DATE REC'D.
 TECHNICIAN D.R. DATE TESTED 1/29/73



REMARKS: _____

D_{10} = _____ MM.
D_{30} = _____ MM.
D_{60} = _____ MM.
C_u = _____
C_c = _____

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY													
DWNR E.R.	FIELD ENG: G. Mc.	DATE DRILLED: 27/1/73	AIRPHOTO NO: A-22933-19	CHAINAGE: 1825+36	OFFSET:					TEST HOLE											
CKD	TECH: G.C.	RIG: FALCON 1000	SURFACE DRAINAGE: FAIR	VEGETATION: TALL GRASS 15'-25', 2-3' H	ELEV:					MILE	B,C,S	NUMBER									
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION			LIMIT OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	O = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)				CLAY	SILT	SAND	GRAVEL	WET DENSITY (P.C.F.)	DRY DENSITY (P.C.F.)
2					OL	SILT: ORGANIC ----- VERY SANDY NON PLASTIC DARK BROWN			F	Nbn	2										
4					SM	SAND: SILTY(ORGANIC) FINE GRAINED NON PLASTIC 0.00 PEERLE TO 3/8" #5 ----- VERY SILTY SLIGHTLY CLAYEY FINE SKINNED SLIGHTLY PLASTIC GREY					4										
6					SC						6										
8											8										
10											10										
12											12										
14											14										
16					CJ	CLAY: MED PLASTIC GLEY END OF HOLE					16										
18											18										
20											20										
22											22										
24											24										

R.M. HARDY AND ASSOCIATES LTD.

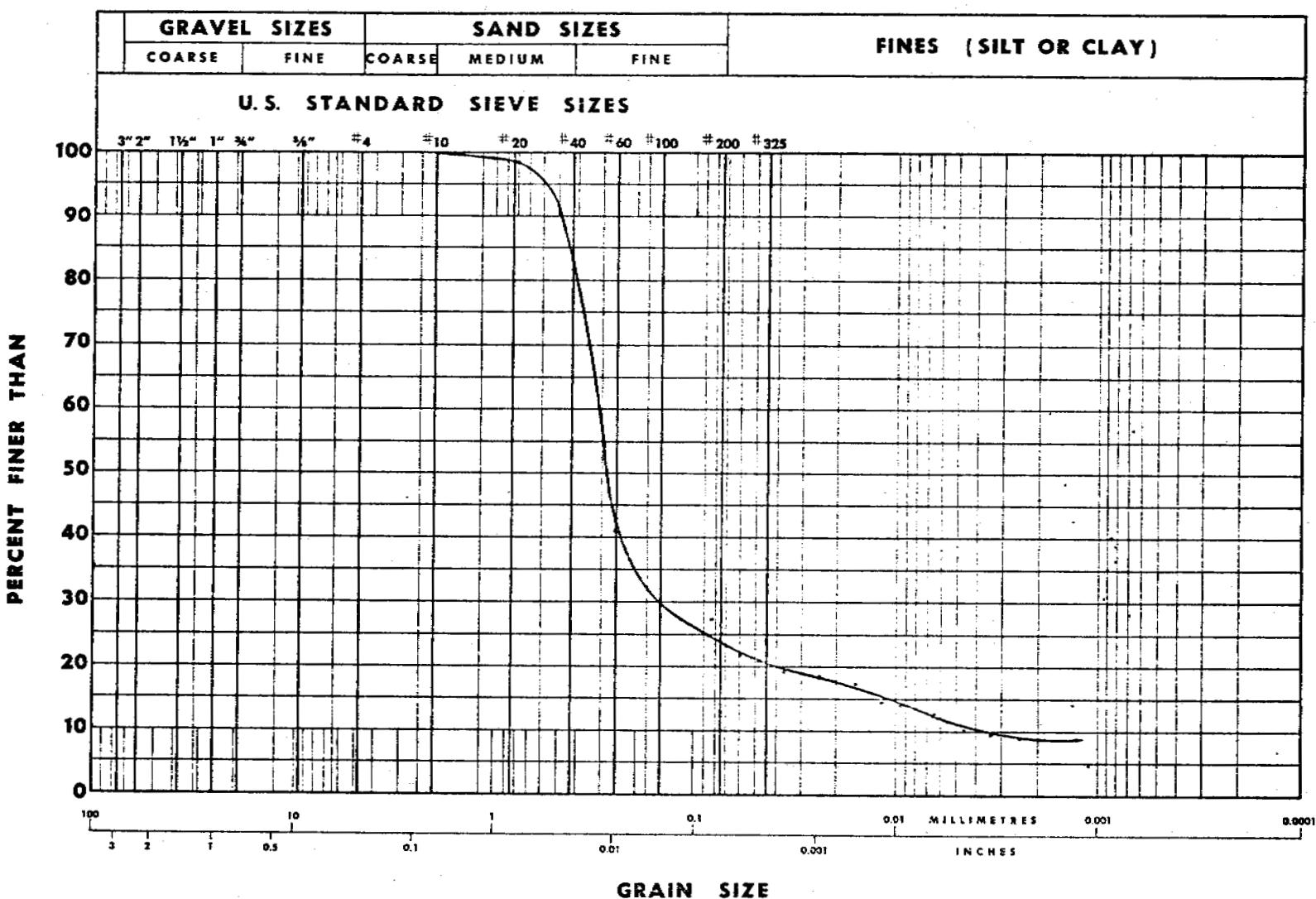
DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**



MATERIALS TESTING LABORATORIES LTD.

GRAIN SIZE CURVE



REMARKS:

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

D_{10} =	MM.
D_{30} =	MM.
D_{60} =	MM.
C_u	
C_c	

LAB ORDER NO.	2-1065
CLIENT	E - 2510
SAMPLE	
SOURCE	
HOLE 391 DEPTH 2'	
TECHNICIAN G.	
DATE TESTED 17/12/54	

R.M.HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

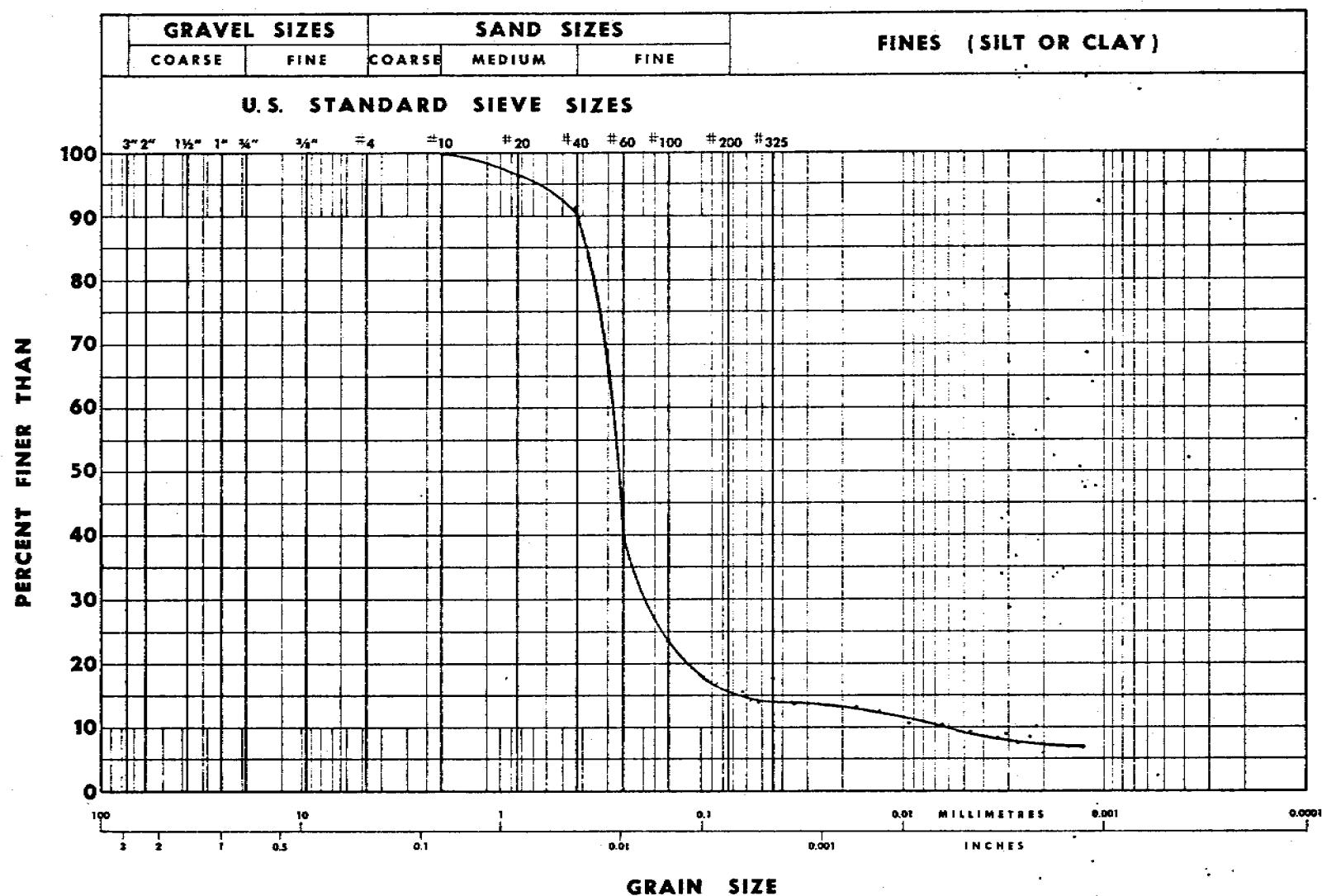
**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**



**MATERIALS TESTING
LABORATORIES LTD.**

GRAIN SIZE CURVE

LAB ORDER NO.	S-1065
CLIENT	E-2510
SAMPLE	
SOURCE	
HOLE	3/2
DEPTH	2'
TECHNICIAN	I.G.
DATE TESTED	1/2/68



REMARKS:

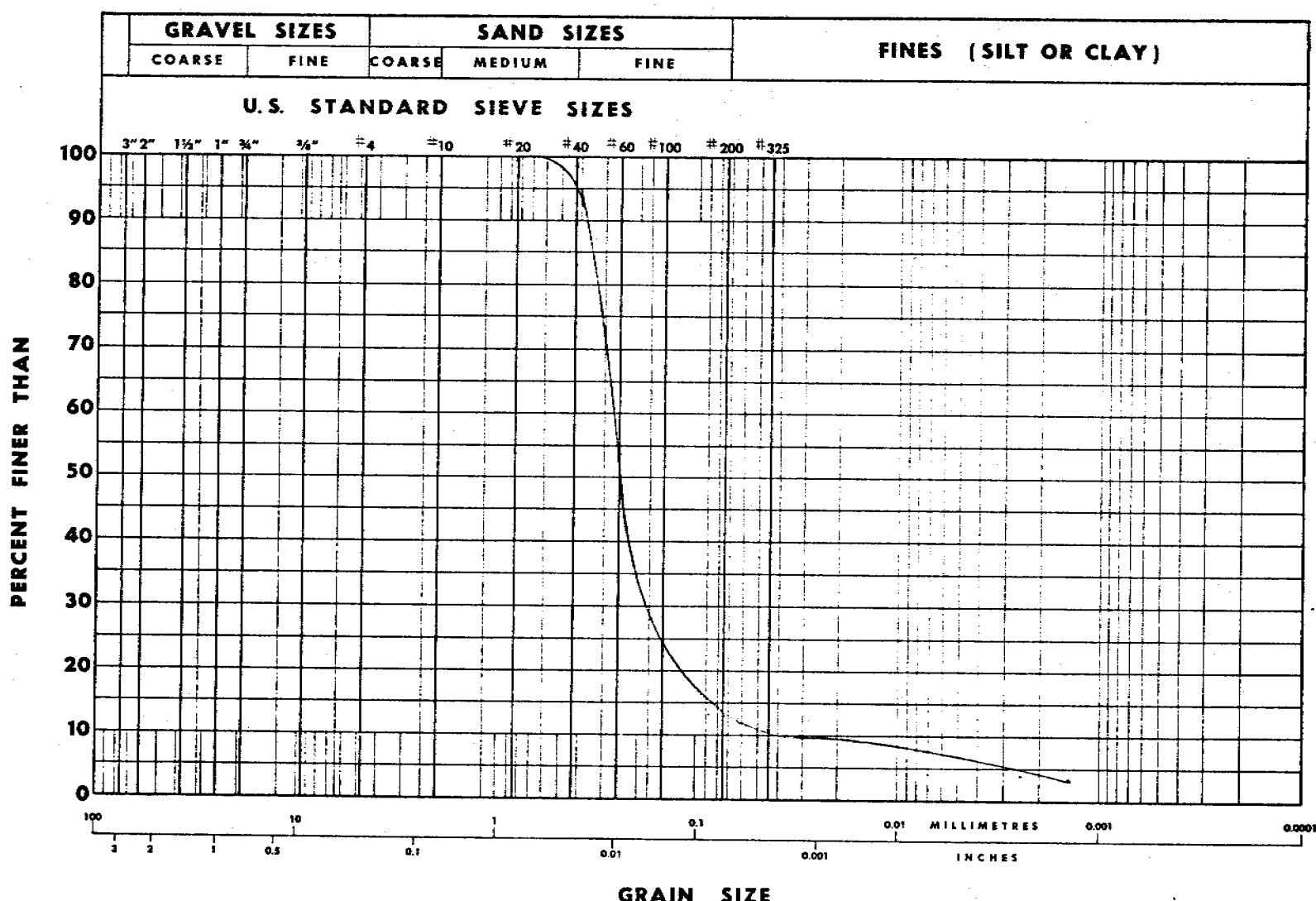
D ₁₀ =	MM.
D ₃₀ =	MM.
D ₆₀ =	MM.
D ₁₀₀ =	MM.

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM



**MATERIALS TESTING
LABORATORIES LTD.
GRAIN SIZE CURVE**

LAB ORDER NO. S-1065
 CLIENT E-2510
 SAMPLE
 SOURCE
 HOLE 392 DEPTH 4' DATE REC'D.
 TECHNICIAN LG. DATE TESTED FEB 1965



REMARKS:

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

D ₁₀ =	mm.
D ₃₀ =	mm.
D ₆₀ =	mm.
C _u =	
C _c =	

R.M.HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

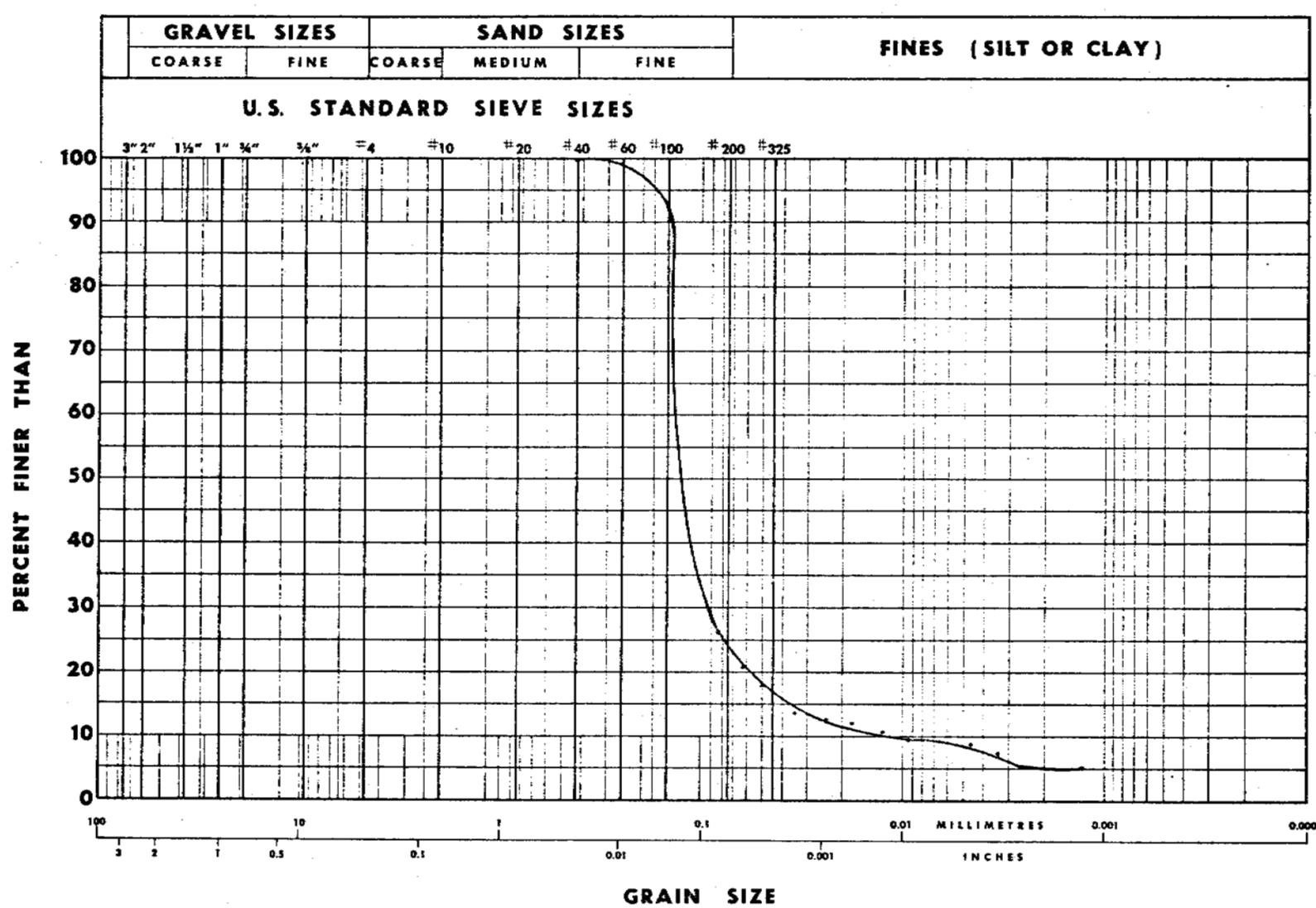
FIELD ENG.				DATE DRILLED		AIRPHOTO NO:		CHAINAGE:		OFFSET:		TEST HOLE SHEET 2						
CKD		TECH		RIG		SURFACE DRAINAGE		VEGETATION:		ELEV:		MILE		B,C,S	NUMBER			
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION		LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS					REMARKS		
28					CL	CLAY: SILTY LOW PLASTIC GEY		F	Non	20	O = WATER CONTENT (% OF DRY WEIGHT) △ = ICE CONTENT (% OF SAMPLE VOLUME)							
30						END OF HOLE 30				28	PLASTIC LIMIT	40	60	80	100	100+		
32										30								
34										32								
36										34								
38										36								
40										38								
42										40								
44										42								
46										44								
48										46								
50										48								
										50								

R.M. HARDY AND ASSOCIATES LTD.						DRILL HOLE REPORT			DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY							
DW#: E.B.	FIELD ENG: G. Mc.	DATE DRILLED: 25/1/73	AIRPHOTO NO: A 22335-17	CHAINAGE: 1864 ft + 80	OFFSET:					TEST HOLE						
CKD: 111	TECH: D. H.	RIG: FALCON 1000	SURFACE DRAINAGE: FAIR	VEGETATION: TALL SPRUCE - 5' - 6' - 8'	ELEV:											
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				MILE	B,C,S	NUMBER
										CLAY	SILT	SAND	GRAVEL			
										%	%	%	%			
2					SM	SAND: SILTY FINE GRAINED NON PLASTIC BROWN ORGANIC INCLUSIONS NO ORGANICS	F	Nfr	2							
4									4							
6									6							
8									8							
10									10							
12									12							
14									14							
16									16							
18									18							
20						CLAY: SILTY LOW PLASTIC GRAY	19		20							
22					CL				22							
24						END OF HOLE	24		24							



MATERIALS TESTING LABORATORIES LTD.

GRAIN SIZE CURVE



REMARKS:

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

D_{10} =	MM.
D_{30} =	MM.
D_{60} =	MM.
C_u	
C_c	

LAB ORDER NO.	S - 1065
CLIENT	E - 2510
SAMPLE	
SOURCE	
TECHNICIAN / G.	
DATE TESTED	10/15

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

DWNR: E.S.	FIELD ENG: G.M.C.	DATE DRILLED: 28/1/73	AIRPHOTO NO: A-2203-3-17	CHAINAGE: 18244.31	OFFSET:				TEST HOLE						
CKD: / /	TECH: D.H.	RIG: FAILING 1000	SURFACE DRAINAGE: FAIR	VEGETATION: SEE SURVEYS	ELEV:										
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS				MILE	B.C.S	NUMBER
									CLAY	SILT	SAND	GRAVEL			
									%	%	%	%			
2				Pt	PEAT:	F	N.B.A.	2							
4				SM	SAND: SILTY FINE GRAINED NON-FRACTIC GREY BROWN			4							
6								6							
8								8							
10								10							
12								12							
14								14							
16								16							
18								18							
20								20							
22				CL	CLAY: SILTY FINE GRAINED NON-FRACTIC GREY BROWN			22							
24					END OF HOLE			24							

R.M. HARDY AND ASSOCIATES LTD.				DRILL HOLE REPORT				DEPARTMENT OF PUBLIC WORKS, CANADA MACKENZIE HIGHWAY									
DWNR E.S.	FIELD ENG: G.M.	DATE DRILLED: 08/1/73	AIRPHOTO NO: A-22932-17	CHAINAGE: 185.6 + 72		OFFSET:		TEST HOLE									
CKD. No.	TECH: D.H.	RIG: FALCON 1000	SURFACE DRAINAGE: GOOD	VEGETATION: SOIL RUMBLE		ELEV:											
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNIFIED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS					MILE	B.C.S	NUMBER
										CLAY	SILT	SAND	GRAVEL	WET DENSITY (PCF)			
										%	%	%	%				
2					Pt	PEAT: SILT INCLUSIONS	F	Nbn		2							
4										4							
6										6							
8					SM	SAND: SILTY FINE GRAINED NON PLASTIC GREY				8					13	37	50
10										10							
12										12							
14						END OF HOLE				14							
16										16							
18										18							
20										20							
22										22							
24										24							

O = WATER CONTENT (% OF DRY WEIGHT)
△ = ICE CONTENT (% OF SAMPLE VOLUME)

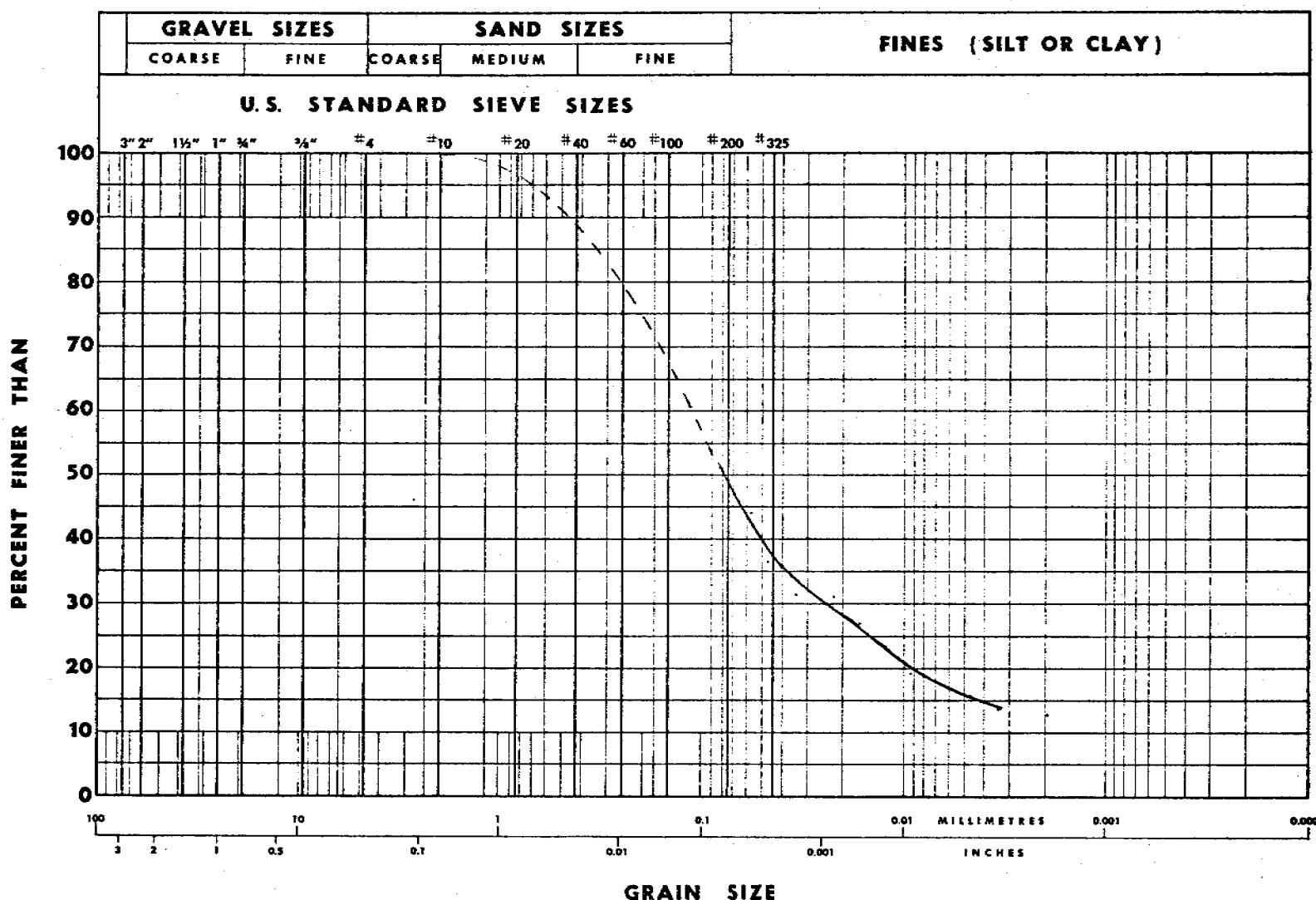
PLASTIC LIMIT ————— LIQUID LIMIT
20 40 60 80 100 100+

REMARKS
DENSE STAG'S STRIKE
BET 6" TO 8" /



MATERIALS TESTING LABORATORIES LTD. GRAIN SIZE CURVE

19/11/68
 LAB ORDER NO. S-1065
 CLIENT E-2510
 SAMPLE
 SOURCE
 HOLE 396 DEPTH 8' DATE REC'D.
 TECHNICIAN I.G. DATE TESTED FRI 1/12/68



REMARKS:

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

D ₁₀ =	MM.
D ₃₀ =	MM.
D ₆₀ =	MM.
CU	
CC	

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY

OWNER: E.B.		FIELD ENG: G.M.	DATE DRILLED: 28/1/73	AIRPHOTO NO: A 22933-17	CHAINAGE: 1223+01	OFFSET:	TEST HOLE				
CKD:	TECH:	D.H.	RIG: FAILING 1000	SURFACE DRAINAGE: GOOD	VEGETATION: SEE SKETCH	ELEV:	MILE	B.C.S	NUMBER		
DEPTH (FEET)	SAMPLE NUMBER	SAMPLE TYPE	% RECOVERY	PENETRATION RESISTANCE	UNITED SOIL SYMBOL	SOIL DESCRIPTION	LIMITS OF FROZEN GROUND	ICE DESCRIPTION	DEPTH (FEET)	GRAIN-SIZE ANALYSIS	REMARKS
2					OL	SILT: ORGANIC SANDY	F	Nbn	2	CLAY %	
4					SM	SAND: SILTY, FINE GRAINED, NON PLASTIC, GREY			4	SILT %	
6					CL	CLAY: SILTY, LOW PLASTIC, GREY BROWN		60%	6	SAND %	
8									8	GRAVEL %	
10									10	WET DENSITY (lb/cf)	
12									12	DRY DENSITY (lb/cf)	
14						END OF HOLE			14		
16									16		
18									18		
20									20		
22									22		
24									24		

O = WATER CONTENT (% OF DRY WEIGHT)
 Δ = ICE CONTENT (% OF SAMPLE VOLUME)

NARROW STREAM BED
 BETWEEN TWO SLUGHS?
 MAINLY BIRCH - ODO
 SPRUCE

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

DWN: E

3. FIELD ENG: S. M.

DATE DRILL FG 23/4/23 AIRPHOTO NO: 1 - 2 - 3 - 4

— SHUNESS — 17 — 2. 1

100

CREW

ZIEHT

HIGHWAY

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— 1 —

5

TECH: B.H.

BIG: E441113-4300 SURFACE: BRUNNAGE

7 CHAINAGE: 1513728

OFFS

SET:

[View Details](#)

100

TEST HS

OLE

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

R.M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

DWNE E.S. FIELD ENG: G.Mc. DATE DRILLED-28/1/73 AIRPHOTO NO: A 222933-17 CHAINAGE: 1932 + 98
OKD/173 TECH: D.H. RIG: FAILING 1000 SURFACE DRAINAGE: GOOD VEGETATION: SEE REMARKS

5

ELEV

TEST HOLE

R. M. HARDY AND ASSOCIATES LTD.

DRILL HOLE REPORT

**DEPARTMENT OF PUBLIC WORKS, CANADA
MACKENZIE HIGHWAY**

DWNE E.S. FIELD ENG: G.M. DATE DRILLED: 28/1/73 AIRPHOTO NO: A 22933-17 CHAINAGE: 1932 + 98
 CKD / / / TECH: D.H. RIG: FAILING 1000 SURFACE DRAINAGE: GOOD VEGETATION: SEE REMARKS

OFFSET:

TEST HOLE