

Investigation of Subsurface Conditions at King Point Yukon Territory

Volume II
Appendices

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M.J. O'CONNOR & ASSOCIATES LTD.

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INVESTIGATION OF SUBSURFACE CONDITIONS
AT KING POINT, YUKON TERRITORY

VOLUME II

10-300

Submitted to:

Indian and Northern Affairs Canada

Submitted by:

M. J. O'Connor & Associates Ltd.

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TERMS AND SYMBOLS USED IN THE REPORT

CLASSIFICATION BY PARTICLE SIZE

BOULDERS - greater than 300 mm	SAND - 0.075 mm to 5 mm
COBBLES - 75 mm to 300 mm	SILT - 0.002 mm to 0.075 mm
GRAVEL - 5 mm to 75 mm	CLAY - finer than 0.002 mm

(1.)

DESCRIPTION OF CONSTITUENT PARTS OF A SOIL

<u>Descriptive Term</u>	<u>Range of Proportion</u>
Trace	1 - 10%
Some	11 - 20%
Adjective (sandy, silty)	21 - 35%
and	36 - 50%

CONSISTENCY OF FINE-GRAINED SOILS

<u>Descriptive Term</u>	<u>Undrained Shear Strength (kPa)</u>
Very soft	Less than 12.5
Soft	12.5 - 25
Firm	25 - 50
Stiff	50 - 100
Very stiff	100 - 200
Hard	Over 200

CONSISTENCY OF COARSE-GRAINED SOILS

<u>Descriptive Term</u>	<u>Density Index</u>	<u>Equivalent Blows per 300 mm Standard Penetration Test</u>
Very loose	0 - 20%	0 - 4
Loose	20 - 40%	5 - 10
Medium dense	40 - 70%	11 - 30
Dense	70 - 90%	31 - 50
Very dense	90 - 100%	Over 50

PLASTICITY

<u>Descriptive Term</u>	<u>Liquid Limit</u>
Low	Less than 50
High	Greater than or equal to 50

CLASS Terrain type symbols (see Table H-2 for descriptions)

Footnote: 1. Clays and silts are classified according to the U.S.C. chart presented on the following page.

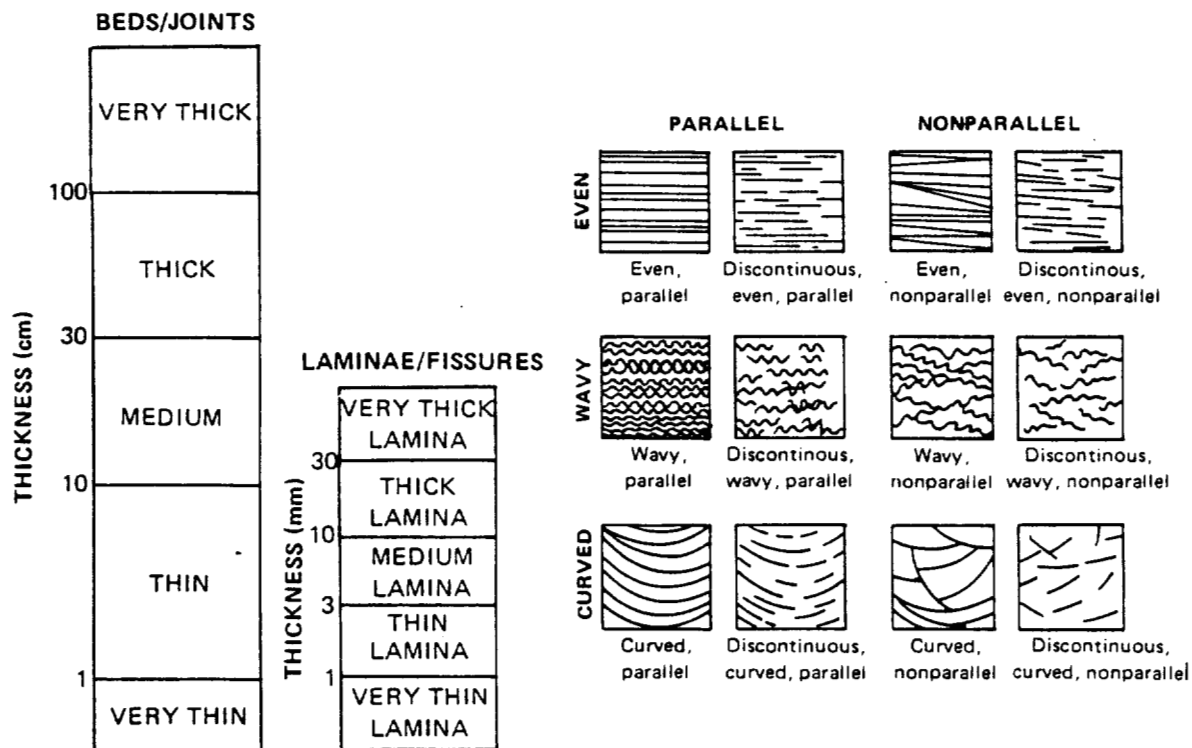
CRITERIA FOR ASSIGNING GROUP SYMBOLS AND GROUP NAMES USING LABORATORY TESTS ^a				SOIL CLASSIFICATION	
				GROUP SYMBOL	GROUP NAME ^b
COARSE-GRAINED SOILS More than 50% retained on No. 200 sieve	GRAVELS More than 50% of coarse fraction retained on No. 4 sieve	CLEAN GRAVELS Less than 5% fines ^c	$C_u > 4$ and $1 < C_c < 3$ ^e	GW	Well-graded gravel ^f
			$C_u < 4$ and/or $1 > C_c > 3$ ^e	GP	Poorly graded gravel ^f
		GRAVELS WITH FINES More than 12% fines ^d	Fines classify as ML or MH	GM	Silty gravel ^{f,g,h}
			Fines classify as CL or CH	GC	Clayey gravel ^{f,g,h}
	SANDS 50% or more of coarse fraction passes No. 4 sieve	CLEAN SANDS Less than 5% fines ^d	$C_u > 6$ and $1 < C_c < 3$ ^e	SW	Well-graded sand ⁱ
			$C_u < 6$ and/or $1 > C_c > 3$ ^e	SP	Poorly graded sand ⁱ
		SANDS WITH FINES More than 12% fines ^d	Fines classify as ML or MH	SM	Silty sand ^{g,h,i}
			Fines classify as CL or CH	SC	Clayey sand ^{g,h,i}
FINE-GRAINED SOILS 50% or more passed the No. 200 sieve	SILTS AND CLAYS Liquid limit less than 50%	Inorganic	$PI > 7$ and plots on or above "A" line ^j	CL	Lean clay ^{k,l,m}
			$PI < 4$ or plots below "A" line ^j	ML	Silt ^{k,l,m}
		Organic	$\frac{\text{Liquid limit - oven dried}}{\text{Liquid limit - not dried}} < 0.75$	OL	Organic clay ^{k,l,m,n} Organic silt ^{k,l,m,o}
	SILTS AND CLAYS Liquid limit 50% or more	Inorganic	PI plots on or above "A" line	CH	Fat clay ^{k,l,m}
			PI plots below "A" line	MH	Elastic silt ^{k,l,m}
		Organic	$\frac{\text{Liquid limit - oven dried}}{\text{Liquid limit - not dried}} < 0.75$	OH	Organic clay ^{k,l,m,p} Organic silt ^{k,l,m,q}
Highly organic soils		Primarily organic matter, dark in color, and organic odor		PT	Peat

- Based on the material passing the 3 in. (75 mm) sieve.
- If field sample contained cobbles and/or boulders, add "with cobbles and/or boulders" to group name.
- Gravels with 5 to 12% fines require dual symbols:
 - GW-GM well graded gravel with silt
 - GM-GC well graded gravel with clay
 - GP-GM poorly graded gravel with silt
 - GP-GC poorly graded gravel with clay
- Sands with 5 to 12% fines require dual symbols:
 - SW-SM well graded sand with silt
 - SW-SC well graded sand with clay
 - SP-SM poorly graded sand with silt
 - SP-SC poorly graded sand with clay
- $C_u = D_{60}/D_{10}$ $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$
- If soil contains $\geq 15\%$ sand, add "with sand" to group name.
- If fines classify as CL-ML, use dual symbol GC-GM, SC-SM.
- If fines are organic, add "with organic fines" to group name.
- If soil contains $\geq 15\%$ gravel, add "with gravel" to group name.
- If Atterberg limits plot in hatched area, soil is a CL-ML, silty clay.
- If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel", whichever is predominant.
- If soil contains $\geq 30\%$ plus No. 200, predominantly sand, add "sandy" to group name.
- If soil contains $\geq 30\%$ plus No. 200, predominantly gravel, add "gravelly" to group name.
- PI ≥ 4 and plots on or above "A" line.
- PI < 4 or plots below "A" line.
- PI plots on or above "A" line.
- PI plots below "A" line.

DESCRIPTION OF SEDIMENTARY STRUCTURES

BEDS SEDIMENTATION UNITS DEPOSITED UNDER ESSENTIALLY CONSTANT PHYSICAL CONDITIONS, SEPARATED BY BEDDING PLANES WHICH ARE RECOGNIZABLE BY TEXTURAL OR COMPOSITIONAL CHANGES RESULTING FROM PERIODS OF NON-DEPOSITION OR EROSION, OR ABRUPT CHANGES IN DEPOSITIONAL CONDITIONS. BEDS MAY BE INTERNALLY HOMOGENEOUS, OR COMPOSED OF SMALLER UNITS- LAMINAE

LAMINAE THE SMALLEST MEGASCOPIC LAYERS IN A SEDIMENTARY SEQUENCE, REPRESENTING MINOR FLUCTUATIONS IN PHYSICAL CONDITIONS DURING THE DEPOSITION OF BEDS. LAMINAE ARE RELATIVELY UNIFORM IN TEXTURE AND COMPOSITION AND GENERALLY LACK MEGASCOPIC INTERNAL LAYERING.



e.g. Thick bed
Thickly spaced joint

e.g. Thin lamina
Thinly spaced fissures

(After Campbell, 1967)

(Modified after Ingram, 1954
and Campbell, 1967)

DESCRIPTION AND CLASSIFICATION OF FROZEN SOILS
(Adapted from Linnell and Kaplan, 1960)

I. Description of Soil Phase (Independent of frozen state)	Classify Soil Phase by the Unified Soil Classification System								
II. Description of Frozen Soil	Major Group		Subgroup				Field Identification	Pertinent properties of frozen materials which can be measured by physical tests to supplement field identification	Thaw Characteristics
	Description	Designation	Description		Designation				
	Segregated ice not visible by eye	N	Poorly bonded or friable		Nf		Identify by visual examination; to determine presence of excess ice, use procedure under note (1) and hand magnifying lens as necessary; for soils not fully saturated estimate degree of ice saturation (medium, low); note presence of crystals or of ice coatings around larger particles	In-place temperature Density and void ratio a. In frozen state b. After thawing in place Water content (total H ₂ O, including ice) a. Average b. Distribution Strength a. Compressive b. Tensile c. Shear d. Adfreeze Elastic properties Plastic properties Thermal properties Ice crystal structure (using optical instruments) a. Orientation of axes b. Crystal size c. Crystal shape d. Pattern of arrangement	Usually thaw-stable
			Well bonded	No excess ice	Nb	n			
				Excess ice		e			
Segregated ice visible by eye (ice 25 mm or less thick)	V	Individual ice crystals or inclusions		Vx		For ice phase, record the following as applicable: Location Size Shape Orientation Thickness Pattern of Spacing Length arrangement Hardness Color Structure (as per Part III below) Estimate volume of visible segregated ice present as percent of total sample volume		Usually thaw-stable	
		Ice coatings on particles		Vc					
		Random or irregularly oriented ice formations		Vr					
		Stratified or distinctly oriented ice formations		Vs					
III. Description of Substantial Ice Strata	Ice greater than 25 mm thick	ICE	Ice with soil inclusions		ICE+soil type		Designate material as ice and use descriptive terms as follows, usually one item from each group as applicable: Hardness: hard, soft (of mass, not of individual crystals) Structure: clear, cloudy, porous, andled, granular, stratified Color: colorless, gray, blue Admixtures: contains few thin silt inclusions	Same as Part II above, as applicable, with special emphasis on ice crystal structure	
			Ice without soil inclusions		ICE				

Note 1: When visual methods may be inadequate, a simple field test to aid evaluation of volume of excess ice can be made by placing some frozen soil in a small jar, allowing it to melt and observing the quantity of supernatant water as a percent of total volume.

APPENDIX A-1

Offshore Borehole Logs

LOCATION: KING POINT UTM COORDINATES: N 7669092 E 381335				ELEVATION: -3.35 m ZONE: 8		UNIT WEIGHT (kN/m ³) 15 18 20 22		UNDRAINED SHEAR STRENGTH (kPa)		LABORATORY TESTS	
DEPTH IN METRES (bsh)	SAMPLE	SOIL DESCRIPTION	CLASS	T °C	GROUND ICE DESCRIPTION	EXCESS (kN)	WATER CONTENT (%)		UNDRAINED SHEAR STRENGTH (kPa)		LABORATORY TESTS
							PLASTIC LIMIT	LIQUID LIMIT	20	40	
0	1	SAND (SP) - black (7.5 YR 2/0)			Sample Temp. °C +0.1						
	2	- fine to medium									
	3	- trace silt									
		- trace gravel									
		- loose			Unknown						
	4										
	5	CLAY (CL-ML)			Core						
	6	- very dark grey (7.5 YR 3/0) to black (7.5 YR 2/0)			thermally disturbed						
5	7	- silty to SILT and CLAY			+0.1						
	8	- trace pebbles (subangular to 10 mm)									
	9	- massive									
	10	- stiff when thawed (pp=215 kPa)									
	11	- slightly calcareous									
	12	- some sand									
	13	- occasional shell fragments and small pieces of wood from 8.7 m to 10.7 m			N _{be} -0.3						
10	14				V _x in N _{be}						
	15	- clear ice crystals (12 mm to 30 mm in thickness)			-0.8						
	16				-0.8						
	17	- vertical ice lens 15 mm thick			-0.3						
	18				-0.9						
	19				-0.6						
15	20				-0.7						
	21	GRAVEL (GC) - dark grey, clayey			N _{be}						
	22										
	23	SILT (ML-CL)			V _x -1.0						
	24	- black to very dark grey (2.5 YR 3/0)									
	25	- some clay			N _{be} -1.4						
	26	- trace sand									
	27	- occasional shell fragments									
20	28	- thin parallel beds of dark brown peat at 21.0-21.1 m, 21.5-21.7 m and 21.9-22.1 m			N _{be} -1.0						
	29										
	30										
	31	SAND (SM-ML)									
	32	- very dark grey (7.5 YR 3/0)									
	33	- fine to medium									
	34	- silty									
	35	- trace subangular pebbles									
25	36	- becoming gravelly with occasional cobbles			N _{bn} -0.9						
	37										
	38										
	END OF HOLE 26.0 m										
	NOTE: Core thermally disturbed during extrusion										
30											

JOB NUMBER: 10-300		SAMPLE TYPE		SHEAR STRENGTH		TEST IDENTIFICATION				BOREHOLE NUMBER	
DATE DRILLED: 85/03/24		Thin Wall Tube		+ Torvane		C Consolidation		T Triaxial Test		F85-KM1	
DRILLING RIG: Rotosonic		Split Spoon		x Mini Vane		TS Thaw Strain		S Salinity			
LOGGED BY: RM/ACM/SRD/RT/WC		Thick Wall Tube		Δ Picon Vane		DS Direct Shear		GA Gas Analysis			
		No Recovery		Δ UU Triaxial		GSA Grain Size Analysis					

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LOCATION: KING POINT UTM COORDINATES: N 7669364 E 381787			ELEVATION: -10.97 m ZONE: 8			UNIT WEIGHT (kN/m³) 1p 1b 2p 2b		PLASTIC LIMIT LIQUID LIMIT		UNDRAINED SHEAR STRENGTH (kPa)		LABORATORY TESTS			
DEPTH IN METRES (b.b.)	SAMPLE	SOIL DESCRIPTION	CLASS	T°C	GROUND ICE DESCRIPTION	EXCESS PORE WATER (%)	WATER CONTENT (%)				UNDRAINED SHEAR STRENGTH (kPa)				LABORATORY TESTS
							20	40	60	80	20	40	60	80	
0	1	CLAY (CL) - very dark grey (7.5 YR 3/0) - silty - some gravel (subangular to 30 mm) - low plasticity - massive - stiff to hard when thawed - well ice bonded - occasional thin silt beds (to 10 cm thick)			Sample Temp. °C										
				-0.3	-0.1										
	2				Nbn										
	3														
	4														
	5														
	6														
5															
	7			-1.5	Nbe	-0.6									
	8														
	9														
	10	SILT (OL) - black (7.5 YR 2/0) - organic - trace clay - low plasticity - segregated ice (Vs/Vx) clear, crystalline, generally < 25 mm			Vs (15%)										
	11/12				Vx (10%)	-0.8									
10	13														
	13a														
	14/22			-1.3	Vs (15%)	-0.9									
	15				occasional Vx										
	16	- medium peat laminae below 12.5 m depth, dark brown, curved, parallel (blocky) laminations (3-5 mm)													
	17														
	18/19			-1.4	Vr in Nbn	-0.8									
	20/23				Nbn										
	21/24	SILT and CLAY (ML-CL) - very dark grey (2.5 YR 3/0) - varies from clayey SILT to SILT and CLAY - well ice-bonded - trace organics with wood chips - trace sand			Nbn	-0.9									
20	25														
	26	- thin grey and black laminae		-1.3	Nbe	-0.7									
	27/30	PEAT layer (0.3 m), dark brown													
	28	- sandy from 22.3 m to 23.5 m		-1.0	Nbe	-0.8									
	29														
	30														
25	END OF HOLE at 24.4 m														
	Note: Thermistor cable #329 installed in borehole. Temperatures recorded on 85/03/25.														
30															
JOB NUMBER: 10-300 DATE DRILLED: 85/03/24 DRILLING RIG: Rotasonic LOGGED BY: RT/RH/WC/SD			SAMPLE TYPE Thin Wall Tube Split Spoon Thick Wall Tube			SHEAR STRENGTH + Torvane x Mini Vane Δ Pilcan Vane ▲ UU Triaxial			TEST IDENTIFICATION C Consolidation TS Thaw Strain DS Direct Shear			T Triaxial Test S Salinity GA Gas Analysis GSA Grain Size Analysis			BOREHOLE NUMBER F85-KM2
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LOCATION: KING POINT UTM COORDINATES: N 7669313 E 381811				ELEVATION: -10.4 m ZONE: 8		UNIT WEIGHT (kN/m ³) 16 18 20 22		PLASTIC LIMIT LIQUID LIMIT		UNDRAINED SHEAR STRENGTH (kPa)		LABORATORY TESTS
DEPTH IN METRES (b.b.)	SAMPLE	SOIL DESCRIPTION	CLASS	T°C	GROUND ICE DESCRIPTION	EXCESS ICE (%)	WATER CONTENT (%)	20 40 60 80	20 40 60 80	20 40 60 80		
0		CLAY (CL) - very dark grey - silty - some gravel - low plasticity - massive			Sample Temp. °C							
		- sandy SILT bed (15 cm thick)			Unknown							
5												
		CLAY (CL-ML) - dark brown to black (7.5YR 3/0) - silty - some sand - trace gravel - well ice bonded										
1					-0.9							
1					V _x (<5%)							
1					+0.1							
2												
10					-0.3							
3												
3					0.0							
4		CLAY (CL) - dark grey - some silt - occasional pebbles - low to medium plasticity - ice bonded			V _r (<5%) some V _x							
4					+0.8							
5												
15					-0.3							
6		SILT (ML-OL) - black - trace sand - trace clay - occasional pebbles - low plasticity - well ice bonded - trace fibrous peat			N _{bn} -0.3							
6												
7												
20												
		END OF HOLE at 20.1 m No sample recovery in Shelby tubes from seabed to -8.0 m										
25												
30												

JOB NUMBER: 10-300 DATE DRILLED: 85/03/22 DRILLING RIG: Foundex HT 700 LOGGED BY: RH/ACM/DCD		SAMPLE TYPE Thin Wall Tube Core Split Spoon Disturbed Thick Wall Tube No Recovery		SHEAR STRENGTH + Terrene x Mini Vane Δ Pilcon Vane ▲ UU Triaxial		TEST IDENTIFICATION C Consolidation TS Thaw Strain DS Direct Shear T Triaxial Test S Salinity GA Gas Analysis GSA Grain Size Analysis		BOREHOLE NUMBER F85-KF1
---	--	--	--	--	--	--	--	----------------------------

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LOCATION: KING POINT
UTM COORDINATES: N 7669015

E 382161

ELEVATION: -10.3 m
ZONE: 8

UNIT WEIGHT (kN/m³)
16 18 20 22

PLASTIC LIMIT LIQUID LIMIT

WATER CONTENT (%)

UNDRAINED
SHEAR STRENGTH
(kPa)

LABORATORY
TESTS

DEPTH IN METRES (b.s.b.)

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
25
30

SAMPLE	SOIL DESCRIPTION	CLASS	T°C	GROUND ICE DESCRIPTION	EXCESS ICE (%)
1	CLAY and SILT (CL-ML) - dark grey (2.5 YR 3/0) - parallel, discontinuous laminae			Sample Temp. °C -0.7 0.0	
2	SAND (SM) - dark brown to dark grey - some silt, trace gravel - medium to fine grained			Nbn +0.2	
3	CLAY (CL) - dark grey to black - silty - trace sand - thin, parallel laminae			-0.3	
4	SILT (ML) - dark grey (7.5 YR 2/0) - some clay - medium, curved parallel laminae - low plasticity			+0.7	
5	SAND (SM) - dark grey 7.5 YR 2/0 - fine to medium - silty				
6	GRAVEL (GM) - dark grey - medium to coarse grained - silty, some sand			V _x -0.5	
7	SILT (GL) - dark brown to black - some clay - trace to some subrounded pebbles - trace organics (wood pieces) - low plasticity			V _r (95 mm) -0.4	
8	CLAY (CL) - dark grey (7.5YR 3/0) - some silt - trace gravel - trace organics - ice lens 95 mm thick at 11.6 m, cloudy white			V _s (20 mm) +0.1	
9					
10					
11					
12	CLAY (CL) (Till) - dark grey (7.5 YR 2/0) - sandy - silty - trace gravel - well ice bonded			V _s (20 mm) -0.6	
13				-0.6	
14				V _r (<5%) (10 mm) -0.7	
15				V _r (<5%) (10 mm) -0.7	
16	SILT (ML) (Till) - dark grey (7.5 YR 2/0) - some clay - some sand - trace subrounded gravel - ice bonded			V _r (10mm) -0.8	
17				V _r (7mm) -0.8	
18	- driller noted harder drilling below 26.8 m			V _r (3mm to V _s 30 mm) -0.5	
19	- fewer pebbles below 29.9 m			V _r -0.8	
	END OF HOLE at 30.6 m				

JOB NUMBER: 10-300
DATE DRILLED: 85/03/23
DRILLING RIG: Foundex HT 700
LOGGED BY: ACM

SAMPLE TYPE

Thin Wall Tube
Split Spoon
Thick Wall Tube

Core
Disturbed
No Recovery

SHEAR STRENGTH

+ Torvane
x Mini Vane
Δ Pilcon Vane
▲ UU Triaxial

TEST IDENTIFICATION

C Consolidation
TS Thaw Strain
DS Direct Shear
T Triaxial Test
S Salinity
GA Gas Analysis
GSA Grain Size Analysis

BOREHOLE
NUMBER
FB5-KF2

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LOCATION: KING POINT UTM COORDINATES: N 7670498 E 383551				ELEVATION: -20.0 m ZONE: 8		UNIT WEIGHT (kN/m³) 16 18 20 22		PLASTIC LIMIT — LIQUID LIMIT		UNDRAINED SHEAR STRENGTH (kPa)		LABORATORY TESTS
DEPTH IN METRES (b.b.)	SAMPLE	SOIL DESCRIPTION	CLASS	T°C	GROUND ICE DESCRIPTION	EXCESS ICE (%)	WATER CONTENT (%)					
							20 40 60 80	20 40 60 80	20 40 60 80			
0	1	CLAY (CH-OH)			Sample Temp. °C	0.0						
	2	- grey - very soft - organic - trace to some silt - high plasticity - bioturbated				+1.2						
	3				Unfrozen							
	4					+0.4						
	5											
	6	CLAY (OH) - black, high plastic with wood fragments up to 40 mm in length - shell fragments				-0.5						
	7	CLAY (CL) - grey - some silt - soft to firm				+0.4						
	8					-0.1						
	9	- shell fragment - even thin parallel laminae from 11.9 to 12.3 m				-0.9						
	10					-0.7						
	11	- becoming sandy below 14.8 m				+2.2						
		END OF HOLE at 15.05 m										

JOB NUMBER: 10-300		DATE DRILLED: 85/03/25		DRILLING RIG: Foundex HT 700		LOGGED BY: MJO	
SAMPLE TYPE		SHEAR STRENGTH		TEST IDENTIFICATION		BOREHOLE NUMBER	
Thin Wall Tube	Core	+ Tervane	▽ Fall Cone	C Consolidation	T Triaxial Test		FB5-KF7
Split Spoon	Disturbed	x Mini Vane		TS Thaw Strain	S Salinity		
Thick Wall Tube	No Recovery	△ Picon Vane		DS Direct Shear	GA Gas Analysis		
		▲ UU Triaxial			GSA Grain Size Analysis		

M. J. O'CONNOR & ASSOCIATES LTD.

LOCATION: KING POINT UTM COORDINATES: N 7669449 E 382667				ELEVATION: -9.4 m ZONE: B		UNIT WEIGHT (kN/m ³) 16 18 20 22 w		UNDRAINED SHEAR STRENGTH (kPa)		LABORATORY TESTS		
SAMPLE	SOIL DESCRIPTION	CLASS	T °C	GROUND ICE DESCRIPTION	EXCESS ICE (%)	PLASTIC LIMIT	LIQUID LIMIT	WATER CONTENT (%)				
						20	40	60	80		20	40
0												
1	SAND (SM) - dark grey (2.5YR 3/0) - some silt - trace clay and gravel - shell fragments within clay/silt laminae		-1.7	Sample Temp. °C +1.4 N _{bn}								
2	SILT (ML) - very dark grey (7.5YR/N3) - some sand to sandy - massive, but samples display preference for horizontal partings			+1.3								
3	GRAVEL (GM) - dark grey, medium, well sorted - trace sand and silt			+0.8								
4	SILT (ML-OL) - very dark grey (7.5 Y/N3) - some sand to sandy - trace clay			+0.8								
5	GRAVEL (GP-GM) - dark grey, medium, well sorted - trace sand and silt			0.0								
6	SILT (ML-OL) - very dark grey (7.5 Y/N3) - some sand to sandy - trace clay			+0.5								
7	thin discontinuous, non-parallel beds of organic silt and sand wood fragments		-1.6	+0.4								
8	SAND (SM) - very dark grey (7.5Y/N3) - fine grained, massive - non-calcareous - silty - trace to some clay			+0.7								
9	GRAVEL (GP-GM) - very dark grey (7.5Y/N3) - subangular - sandy - trace silt - driller noted gravel becoming denser		-0.9									
10												
15	END OF HOLE at 15.2 m											
20	Note: Thermistor cable #312 installed in borehole. Temperatures recorded on 85/03/28.											
25												
30												

JOB NUMBER: 10-300 DATE DRILLED: 85/03/26 DRILLING RIG: Foundex HT 700 LOGGED BY: MJO/DCD		SAMPLE TYPE ☒ Thin Wall Tube ☐ Core ☒ Split Spoon ☐ Disturbed ☐ Thick Wall Tube ☒ No Recovery		SHEAR STRENGTH + Torvane ▽ Fall Cone x Mini Vane Δ Pilon Vane ▲ UU Triaxial		TEST IDENTIFICATION C Consolidation T Triaxial Test TS Thaw Strain S Salinity DS Direct Shear GA Gas Analysis GSA Grain Size Analysis		BOREHOLE NUMBER F85-KFB
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M.J. O'CONNOR & ASSOCIATES LTD.

APPENDIX A-2

Coastal Borehole Logs

LOCATION : KING POINT UTM COORDINATES : N 7668632 E 381521						ELEVATION : -3.3 m ZONE : B		UNIT WEIGHT (kN/m³) 1p 1q 20 22 ▾		PLASTIC LIMIT LIQUID LIMIT		UNDRAINED SHEAR STRENGTH (kPa)		LABORATORY TESTS
SAMPLE	SOIL DESCRIPTION	CLASS	T °C	GROUND ICE DESCRIPTION	EXCESS ICE (%)	WATER CONTENT (%)								
0														
1	CLAY (CL) - very dark grey (2.5Y 3/0) - silty													
2	- trace fine sand													
3	- soft - massive													
4	CLAY (CL) - very dark grey (2.5Y 3/1) - some organics and wood chips													
5	- trace to some silt - firm to stiff			unfrozen										
6														
7	SILT and SAND (MH-SM) - very dark grey (5Y 3/1) - curved, parallel laminae (thin to medium)													
8	- stiff when thawed													
9	SILT (ML-CL) - very dark grey (2.5Y 3/1) - sandy - some clay													
10	- some subangular to subrounded gravel (10-20 mm) - very stiff to hard when thawed													
11														
12	- shell fragments and coal pebbles below 12.1 m													
13														
14														
15														
16	END OF HOLE 13.8 m													
17	Note: Driller noted significant resistance to drill penetration below 12 m depth													
18														
19														
20														
21														
22														
23														
24														
25														
26														
27														
28														
29														
30														
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42														
43														
44														
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48														
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51														
52														
53					</									

LOCATION: KING POINT UTM COORDINATES: N 7668126 E 381521				ELEVATION: -1.8 m ZONE: 8		UNIT WEIGHT (kN/m ³) 1p 1b 2p 2b		PLASTIC LIMIT		LIQUID LIMIT		UNDRAINED SHEAR STRENGTH (kPa)		LABORATORY TESTS	
DEPTH IN METRES (b.b.)	SAMPLE	SOIL DESCRIPTION	CLASS	T°C	GROUND ICE DESCRIPTION	EXCESS METRE	WATER CONTENT (%)								
							20	40	60	80	20	40	60		80
0		CLAY (CL-ML) - dark grey (7.5 YR 3/0) - silty to CLAY and SILT - some sand - occasional subrounded pebbles (1-5 mm) - firm to stiff			Unfrozen										
1															
2															
3															
4		- thin curved parallel laminae of silt and clay													
5		SAND (SP-SM) - very dark grey (2.5 Y 3/0) - fine grained - trace to some silt													
6															
7		CLAY and SILT (CL-ML) - very dark grey (2.5 Y 3/1) - trace medium sand - trace to some pebbles (subrounded to 10 mm) - massive - stiff to very stiff													
8															
9		END OF HOLE at 12.2 m													
10															
15															
20															
25															
30															

JOB NUMBER: 10-300 DATE DRILLED: 85/03/23 DRILLING RIG: Rotasonic LOGGED BY: JGA/MAO/JN		SAMPLE TYPE Thin Wall Tube Core Split Spoon Disturbed Thick Wall Tube No Recovery		SHEAR STRENGTH + Torvane x Mini Vane Δ Pilcon Vane ▲ UU Triaxial		TEST IDENTIFICATION C Consolidation TS Thaw Strain DS Direct Shear T Triaxial Test S Salinity GA Gas Analysis GSA Grain Size Analysis		BOREHOLE NUMBER FB5-KM4
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M. J. O'CONNOR & ASSOCIATES LTD.

LOCATION: KING POINT UTM COORDINATES: N 7667824 E 381703				ELEVATION: -4.2 m ZONE: 8		UNIT WEIGHT (kN/m ³) 10 15 20 25		PLASTIC LIMIT LIQUID LIMIT		UNDRAINED SHEAR STRENGTH (kPa)		LABORATORY TESTS
SAMPLE	SOIL DESCRIPTION	CLASS	T°C	GROUND ICE DESCRIPTION	WATER CONTENT (%)	UNDRAINED SHEAR STRENGTH (kPa)	WATER CONTENT (%)		UNDRAINED SHEAR STRENGTH (kPa)			
0												
1	SILT (ML-OL) - very dark grey (2.5Y 3/0) - some clay - thin, even and parallel laminae - occasional wood pieces - soft, wet, highly plastic - trace sand			Unfrozen								
2												
3	- becoming firm below 4.1 m											
4												
5	- becoming stiff below 7.0 m - thin, even parallel laminae of dark grey silt and dark brown peat											
6												
10	END OF HOLE at 9.8 m											
15												
20												
25												
30												

JOB NUMBER: 10-300		SAMPLE TYPE		SHEAR STRENGTH		TEST IDENTIFICATION		BOREHOLE NUMBER FB5-KM5
DATE DRILLED: 85/03/23		Core		+ Torvane ▽ Fall Cone		C Consolidation T Triaxial Test		
DRILLING RIG: Rotasonic		Disturbed		x Mini Vane		TS Thaw Strain S Salinity		
LOGGED BY: JGA/WAO/JN		No Recovery		△ Pilcon Vane		DS Direct Shear GA Gas Analysis		
M. J. O'CONNOR & ASSOCIATES LTD.		Thin Wall Tube		UU Triaxial		GSA Grain Size Analysis		

LOCATION: KING POINT UTM COORDINATES: N 7667769 E 381628					ELEVATION: -3.3 m ZONE: 8		UNIT WEIGHT (kN/m ³) 10 15 20 22 PLASTIC LIMIT — LIQUID LIMIT WATER CONTENT (%) 20 40 60 80		UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80		LABORATORY TESTS	
DEPTH IN METRES (b.b.)	SAMPLE	SOIL DESCRIPTION	CLASS	T°C	GROUND ICE DESCRIPTION	EXCESS ICE (%)						
0		SILT (ML-OL) - very dark grey to black (2.5 Y 3/1) - very soft to soft - clayey - trace fine sand - low plasticity										
1												
2												
3												
4		- becoming stiff below 6.0 m										
5												
6		- very soft			Unfrozen							
7		- stiff with a trace of angular gravel										
8		CLAY and SILT (CL-ML) - dark grey (7.5 YR 3/0) - trace sand and gravel - stiff										
9		CLAY (CL-OH) - dark grey (5 Y 3/1) - silty - trace sand - stiff - medium to high plasticity										
10												
11		- trace gravel										
20		END OF HOLE at 19.1 m										
25												
30												

JOB NUMBER: 10-300 DATE DRILLED: 85/03/26 DRILLING RIG: Foundex HT 700 LOGGED BY: AOM/Julie/DCD		SAMPLE TYPE ☒ Thin Wall Tube ☒ Split Spoon ☒ Thick Wall Tube		SHEAR STRENGTH ☒ Torsion ☒ Mini Vane ☒ Picon Vane ☒ UU Triaxial		TEST IDENTIFICATION ☒ Consolidation ☒ Thaw Strain ☒ Direct Shear ☒ Triaxial Test ☒ Salinity ☒ Gas Analysis ☒ Grain Size Analysis		BOREHOLE NUMBER FB5-KF10
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M.J. O'CONNOR & ASSOCIATES LTD.

LOCATION: KING POINT
UTM COORDINATES: N 7667567

E 381779

ELEVATION: 1.1 m
ZONE: 8

UNIT WEIGHT (kN/m³)
16 18 20 22

PLASTIC LIMIT LIQUID LIMIT

WATER CONTENT (%)
20 40 60 80

UNDRAINED
SHEAR STRENGTH
(kPa)
20 40 60 80

LABORATORY
TESTS

DEPTH IN METRES (b.b.)

0

SAND, coarse and GRAVEL, fine (SW-GW)
- brown, subrounded and subangular (to 30 mm)
- trace silt
- well ice bonded

GW

V_x (30-40%)

V_r (10%)

SAND (SP)
- dark grey, fine to medium
- trace silt, ice bonded

SW

V_x (20-30%)

V_x (30%)

SAND and SILT (SM-ML)
- dark grey, ice bonded
- curved, parallel, thin and medium laminae
- light grey (gypsum?) inclusions

mpw

V_r (40%)

SILT (ML) and PEAT (PT)

- dark grey and dark brown
- woody peat
- trace wood chips
- ice bonded

END OF HOLE at 4.9 m

10

15

20

25

30

JOB NUMBER: 10-300
DATE DRILLED: 85/03/23
DRILLING RIG: Rotasonic
LOGGED BY: JGA/WAO/JN

SAMPLE TYPE

Thin Wall Tube Core
Split Spoon Disturbed
Thick Wall Tube No Recovery

SHEAR STRENGTH

+ Torvane ▽ Fall Cone
x Mini Vane
△ Pileon Vane
▲ UU Triaxial

TEST IDENTIFICATION

C Consolidation T Triaxial Test
TS Thaw Strain S Salinity
DS Direct Shear GA Gas Analysis
GSA Grain Size Analysis

BOREHOLE
NUMBER

F85-KM6

M. J. O'CONNOR & ASSOCIATES LTD.

LOCATION: KING POINT
UTM COORDINATES: N 7667816 E 382085
ELEVATION: 1.3 m
ZONE: 8

UNIT WEIGHT (kN/m³)
16 18 20 22

PLASTIC LIMIT LIQUID LIMIT
WATER CONTENT (%)

UNDRAINED
SHEAR STRENGTH
(kPa)

LABORATORY
TESTS

DEPTH IN METRES (b.b.)	SAMPLE	SOIL DESCRIPTION	CLASS	T°C	GROUND ICE DESCRIPTION	EXCESS ICE (%)	UNIT WEIGHT (kN/m ³)	PLASTIC LIMIT	LIQUID LIMIT	WATER CONTENT (%)	UNDRAINED SHEAR STRENGTH (kPa)	LABORATORY TESTS
0												
1		GRAVEL (GP-GM) - dark grey - medium to coarse, subrounded - trace to some sand - trace silt - becoming sandy with some silt and very dark grey	gh		V _x /V _c (20%)							
2												
3												
4												
5					V _x (40%)							
6		SILT (ML-OL) - very dark grey with black peat laminae - thin, curved, parallel laminae	mw		V _r V _c							
7		PEAT - black, woody, ice bonded SAND and SILT (SP and ML) - grey and dark grey laminae - thin, curved, parallel laminae	mw		V _r (30%) V _r (50%) V _r							
8		SILT (OL-CL) and ICE - black - some clay to clayey - some amorphous peat - ice lenses to 6 mm										
9		SILT (ML) - very dark grey - some clay - trace to some fine sand										
10		END OF HOLE at 7.9 m										
15												
20												
25												
30												

JOB NUMBER: 10-300
DATE DRILLED: 85/03/23
DRILLING RIG: Rotasonic
LOGGED BY: JGA/WAO/JN

SAMPLE TYPE

SHEAR STRENGTH

TEST IDENTIFICATION

BOREHOLE
NUMBER

M. J. O'CONNOR & ASSOCIATES LTD.

Thin Wall Tube
Split Spoon
Thick Wall Tube
Core
Disturbed
No Recovery

+ Torvane
x Mini Vane
Δ Pilcon Vane
▲ UU Triaxial
▽ Fall Cone

C Consolidation
TS Shear Strain
DS Direct Shear
T Triaxial Test
S Salinity
GA Gas Analysis
GSA Grain Size Analysis

F85-KM7

LOCATION: KING POINT UTM COORDINATES: N 7667975 E 381848				ELEVATION: -2.6 m ZONE: 8		UNIT WEIGHT (kN/m ³) 16 18 20 22		PLASTIC LIMIT — LIQUID LIMIT		UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80		LABORATORY TESTS
DEPTH IN METRES (b.b.)	SAMPLE	SOIL DESCRIPTION	CLASS	T°C	GROUND ICE DESCRIPTION	EXCESS ICE (%)	WATER CONTENT (%) 20 40 60 80					
							0	1	SAND (SP) - greyish brown - medium to coarse - some fine gravel - trace silt	SW		Nbe
2	2	SILT (OL) - very dark grey - organic - some fine sand - pieces of splintered wood - becoming sandy - black organic peat laminae (even, parallel, medium to very thick)	mw		V _c /V _r							
3												
4				V _s in Nbe								
5												
6				V _c								
7	8	PEAT (PT) - black, organic with medium silt laminae	ptw		V _s in Nbe (10%)							
8	9											
10	END OF HOLE at 8.3 m											
	Note: Core samples were thermally disturbed by vibratory extrusion											
15												
20												
25												
30												

JOB NUMBER: 10-300 DATE DRILLED: 85/03/23 DRILLING RIG: Rotasonic LOGGED BY: JGA/WAO		SAMPLE TYPE ☒ Thin Wall Tube ☐ Core ☒ Split Spoon ☐ Disturbed ☐ Thick Wall Tube ☒ No Recovery		SHEAR STRENGTH + Torvane ▽ Fall Cone x Mini Vane Δ Pilcon Vane ▲ UU Triaxial		TEST IDENTIFICATION C Consolidation T Triaxial Test TS True Strain S Salinity DS Direct Shear GA Gas Analysis GSA Grain Size Analysis		BOREHOLE NUMBER F85-KM8
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M. J. O'CONNOR & ASSOCIATES LTD.

LOCATION: KING POINT
UTM COORDINATES: N 7668070 E 381954

ELEVATION: 1.6 m
ZONE: 8

UNIT WEIGHT (kN/m³)
10 18 20 22
PLASTIC LIMIT LIQUID LIMIT
WATER CONTENT (%)
20 40 60 80

UNDRAINED
SHEAR STRENGTH
(kPa)
20 40 60 80

LABORATORY
TESTS

DEPTH IN METRES (b.b.)

0
1
2
3
4
5
6
7
8
9
10
15
20
25
30

SAMPLE

SOIL DESCRIPTION

CLASS

T°C

GROUND ICE DESCRIPTION

EXCESS
ICE (%)

GRAVEL (GP-GW)
- dark greyish brown (2.5Y 4/2)
- coarse, well sorted, subrounded
- some sand
- well ice bonded

gw

V_c (8%)

SAND and GRAVEL (SW-GW)
- dark greyish brown (2.5Y 4/2)
- trace silt
- clear crystalline ice lense (32 mm thick)

sgw

V_s

V_c (10-15%)

V_c (20%)

SAND (SP-SM)
- black (5Y 2.5/2)
- trace silt, trace organics
- medium to coarse (grading upward)

mw

V_r (5%) (1-2 mm
clear, crystalline)

SILT (ML-CL)
- very dark grey
- medium plastic
- thin black, organic peat laminae
(curved, parallel)

END OF HOLE at 7.9 m

JOB NUMBER: 10-300
DATE DRILLED: 85/03/23
DRILLING RIG: Rotasonic
LOGGED BY: JGA/WAQ/JN

SAMPLE TYPE

SHEAR STRENGTH

TEST IDENTIFICATION

BOREHOLE
NUMBER
F85-KM9

M.J. O'CONNOR & ASSOCIATES LTD.

Thin Wall Tube
Split Spoon
Thick Wall Tube
Core
Disturbed
No Recovery

+ Torvane
x Mini Vane
Δ Pilcan Vane
▲ UU Triaxial
▽ Fall Cone

C Consolidation
TS Thaw Strain
DS Direct Shear
T Triaxial Test
S Salinity
GA Gas Analysis
GSA Grain Size Analysis

LOCATION: KING POINT UTM COORDINATES: N 7668193 E 382091				ELEVATION: -3.8 m ZONE: 8		UNIT WEIGHT (kN/m³) 16 18 20 22		PLASTIC LIMIT — LIQUID LIMIT		UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80		LABORATORY TESTS
DEPTH IN METRES (b.s.b.)	SAMPLE	SOIL DESCRIPTION	CLASS	T°C	GROUND ICE DESCRIPTION	EXCESS ICE (%)	WATER CONTENT (%)					
							20 40 60 80					
0	1	GRAVEL (GW) - brown	GW		N _{bn}							
	2	- fine to medium, subrounded										
	3	- sandy										
	4	SILT (ML-OL) - black	mW		V _r							
		- thin organic laminae (even, parallel)										
	5	- low plasticity			V _c							
		- firm to stiff										
		- occasional pebbles, wood pieces										
5	6	SILT and CLAY (ML-CL) - very dark grey to dark brown	mcW		V _c							
	7	- some sand										
		- curved, parallel laminae (thin to medium)										
		- low plasticity										
		- occasional subrounded pebbles										
		- stiff										
10		END OF HOLE at 7.4 m										
		Note: Core samples thermally disturbed by vibratory extrusion										
15												
20												
25												
30												

JOB NUMBER: 10-300 DATE DRILLED: 85/03/23 DRILLING RIG: Rotasonic LOGGED BY: JGA/WAO/PH		SAMPLE TYPE ☒ Thin Wall Tube ☒ Core ☒ Split Spoon ☒ Disturbed ☒ Thick Wall Tube ☒ No Recovery		SHEAR STRENGTH + Torvane ∇ Fall Cone x Mini Vane Δ Pilcon Vane ▲ UU Triaxial		TEST IDENTIFICATION C Consolidation T Triaxial Test TS Thaw Strain S Salinity DS Direct Shear GA Gas Analysis GSA Grain Size Analysis		BOREHOLE NUMBER FB5-KM10
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M.J. O'CONNOR & ASSOCIATES LTD.

LOCATION: KING POINT UTM COORDINATES: N 7668453 E 381814				ELEVATION: -3.4 m ZONE: 8		UNIT WEIGHT (kN/m ³) 16 18 20 22		PLASTIC LIMIT LIQUID LIMIT		UNDRAINED SHEAR STRENGTH (kPa)		LABORATORY TESTS	
SAMPLE		SOIL DESCRIPTION		CLASS	T °C	GROUND ICE DESCRIPTION		WATER CONTENT (%)		UNDRAINED SHEAR STRENGTH (kPa)		LABORATORY TESTS	
DEPTH IN METRES (b.b.)													
0													
1		SAND (SW) - dark brown - fine to medium		SW		Unknown							
2		- some gravel and pebbles (0.2 to 0.9 m) then becoming finer with depth											
3				CW									
4		CLAY (CL) - dark grey (2.5Y 3/0) - silty, trace organics											
5		- medium to high plasticity - firm											
6		- massive											
7													
8													
9		- trace peat (fibres)											
10		- blocky structure below 7.0 m											
11													
12													
13													
14													
15		- shell fragments											
16													
17		- becoming stiff											
18													
		END OF HOLE at 11.0 m											
		Note: Core thermally disturbed during vibratory extrusion											
15													
20													
25													
30													

JOB NUMBER: 10-300		SAMPLE TYPE		SHEAR STRENGTH		TEST IDENTIFICATION		BOREHOLE NUMBER	
DATE DRILLED: 85/03/23		Core		+ Torvane		C Consolidation		FB5-KM11	
DRILLING RIG: Rotasonic		Disturbed		x Mini Vane		TS Thaw Strain			
LOGGED BY: MJO/WC/PH		No Recovery		Δ Pilcon Vane		DS Direct Shear			
				▲ UU Triaxial		T Triaxial Test			
						S Salinity			
						GA Gas Analysis			
						GSA Grain Size Analysis			

M. J. O'CONNOR & ASSOCIATES LTD.

LOCATION: KING POINT UTM COORDINATES: N 7668392 E 381750				ELEVATION: 1.4 m ZONE: 8		UNIT WEIGHT (kN/m³) 16 18 20 22		PLASTIC LIMIT LIQUID LIMIT		UNDRAINED SHEAR STRENGTH (kPa)		LABORATORY TESTS						
DEPTH IN METRES (b.b.)	SAMPLE	SOIL DESCRIPTION	CLASS	T°C	GROUND ICE DESCRIPTION	EXCESS ICE(%)	WATER CONTENT(%)				UNDRAINED SHEAR STRENGTH (kPa)				LABORATORY TESTS			
							20	40	60	80	20	40	60	80				
0	1	SAND and GRAVEL (SP-GP)	sgw		Nbn													
	2	- brown with greyish brown pebbles and cobbles (subangular to subrounded)																
	3/6	- thin discrete layer of silty clay at 1.75 m																
	4/7																	
	5/8																	
	9																	
	10																	
	11																	
	12	- dry to damp																
	13																	
5	14																	
	15	SAND and GRAVEL (SP-GP)					mw		N _{be} (5%) V _r (40-60%)									
	16	- brown, coarse, well sorted																
	17																	
	18	medium to fine grained sand from 6.3 to 6.5 m																
	19																	
	20	SILT (ML)																
	21	- dark grey and brown (mottled)																
		- some clay																
		- stiff when thawed																
		- massive																
		- well ice bonded																
10		ICE and SILT																
		- white granular ice crystals to 4 mm diameter																
		END OF HOLE at 7.9 m																
15																		
20																		
25																		
30																		

JOB NUMBER: 10-300
 DATE DRILLED: 85/03/23
 DRILLING RIG: Rotasonic
 LOGGED BY: MJO/WC/PH

SAMPLE TYPE

☒ Thin Wall Tube ☒ Core
☒ Split Spoon ☒ Disturbed
☒ Thick Wall Tube ☒ No Recovery

SHEAR STRENGTH

☒ Torvane ☒ Fall Cone
☒ Mini Vane ☒ Pilcon Vane
☒ UU Triaxial

TEST IDENTIFICATION

C Consolidation T Triaxial Test
 TS Thaw Strain S Salinity
 DS Direct Shear GA Gas Analysis
 GSA Grain Size Analysis

BOREHOLE
NUMBER
F85-KM12

M. J. O'CONNOR & ASSOCIATES LTD.

LOCATION: KING POINT UTM COORDINATES: N 7668761 E 381593				ELEVATION: -1.1 m ZONE: 8		UNIT WEIGHT (kN/m ³) 1p 1b 2p 2b		UNDRAINED SHEAR STRENGTH (kPa)		LABORATORY TESTS
DEPTH IN METRES (b.b.)	SAMPLE	SOIL DESCRIPTION	CLASS	T°C	GROUND ICE DESCRIPTION	WATER CONTENT (%)				
						PLASTIC LIMIT	LIQUID LIMIT	20	40	
0		SAND (SM) - brown - silty, trace gravel	SW		V _r (10%) in N _{bn}					
1										
2a		GRAVEL (GM-GC)	GW							
2b		- dark grey, subrounded - silty with some medium sand - trace of clay	GMW							
3					N _{bn}					
4		CLAY and SILT (CL-ML) - very dark grey - some fine to medium sand - trace subangular pebbles			N _{bn}					
5		- massive			N _{bn}					
6		- firm to stiff when thawed			N _{bn}					
7										
8										
9/10										
11/12										
10		END OF HOLE at 9.7 m								
15										
20										
25										
30										

JOB NUMBER: 10-300	DATE DRILLED: 85/03/22	DRILLING RIG: Rotasonic	LOGGED BY: JGA/WAO/MJO	SAMPLE TYPE	SHEAR STRENGTH	TEST IDENTIFICATION	BOREHOLE NUMBER
				Thin Wall Tube	+ Torvane	C Consolidation	
				Split Spoon	X Mini Vane	T5 Thaw Strain	
				Thick Wall Tube	Δ Plican Vane	DS Direct Shear	
					Δ UU Triaxial	GA Gas Analysis	
						GSA Grain Size Analysis	
M. J. O'CONNOR & ASSOCIATES LTD.							F85-KM14

LOCATION: KING POINT UTM COORDINATES: N 7668724 E 381530				ELEVATION: 1.6 m ZONE: 8		UNIT WEIGHT (kN/m ³) 1p 1B 20 22 PLASTIC LIMIT LIQUID LIMIT		UNDRAINED SHEAR STRENGTH (kPa)		LABORATORY TESTS
SOIL DESCRIPTION		CLASS	T °C	GROUND ICE DESCRIPTION		WATER CONTENT (%)				
0	1/5 SAND (SP) - dark greyish brown (2.5Y 4/2) - trace clay and subangular pebbles	gsW		Nbn						
2	GRAVEL (GW) - dark greyish brown - sandy with some cobbles									
4	SAND (SP-SC) - dark greyish brown - gravelly - thick layers (50 cm) containing trace to some clay									
6	GRAVEL (GP) - dark grey, subrounded - trace to some sand									
8	CLAY (CL) - very dark grey (2.5Y 3/0) with black organic streaks - laminae (very thin, discontinuous, curved, non-parallel) - rootlets evident near stratigraphic boundary (5.5 m)	cW		V _x (5%)						
10	END OF HOLE at 7.9 m									
12										
14										
16										
18										
20										
22										
24										
26										
28										
30										

JOB NUMBER: 10-300		DATE DRILLED: 85/03/23		DRILLING RIG: Rotasonic		LOGGED BY: MJO/MC/PH		SAMPLE TYPE		SHEAR STRENGTH		TEST IDENTIFICATION		BOREHOLE NUMBER	
☐	Thin Wall Tube	☐	Core	☐	Mini Vane	☐	Triaxial	☐	Consolidation	☐	Thaw Strain	☐	Salinity	F85-KM15	
☐	Split Spoon	☐	Disturbed	☐	Pilcon Vane	☐	Direct Shear	☐	Gas Analysis	☐	Grain Size Analysis				
☐	Thick Wall Tube	☐	No Recovery	☐	UU Triaxial										

M. J. O'CONNOR & ASSOCIATES LTD.

LOCATION: KING POINT			UTM COORDINATES: N 7668674 E 381484		ELEVATION: -3.2 m ZONE: 8		UNIT WEIGHT (kN/m³) 16 18 20 22		PLASTIC LIMIT — LIQUID LIMIT		UNDRAINED SHEAR STRENGTH (kPa)		LABORATORY TESTS	
SAMPLE		SOIL DESCRIPTION	CLASS	T°C	GROUND ICE DESCRIPTION	EXCESS (kN)	WATER CONTENT (%) 20 40 60 80		20 40 60 80					
0		CLAY (CL-CH) - very dark grey - trace silt - high plasticity, very soft	CW		Unknown									
1		CLAY and SILT (CL-ML) - very dark grey and black (marbled) - soft to firm at 5.5 m becoming firm to stiff with depth when thawed	cmw											
2														
3														
4		- no visible laminations but breaks along curved, non-parallel, discontinuous planes												
5														
6		thin to medium silt laminae												
7														
8		CLAY (CL) - very dark grey	CW											
9		- some silt and gravel												
10		- subangular to subrounded pebbles												
11		- occasional cobbles												
12		- blocky structure - stiff to hard - wood pieces in sample no. 12 (7.4 m)												
END OF HOLE at 7.4 m														
Note: Core samples thermally disturbed by vibratory extrusion														
15														
20														
25														
30														

JOB NUMBER: 10-300
 DATE DRILLED: 85/03/23
 DRILLING RIG: Rotasonic
 LOGGED BY: MJO

SAMPLE TYPE

☐ Thin Wall Tube ☐ Core
☒ Split Spoon ☐ Disturbed
☐ Thick Wall Tube ☐ No Recovery

SHEAR STRENGTH

☐ Terrene ☐ Fall Cone
☒ Mini Vane
☐ Pilon Vane
☐ UU Triaxial

TEST IDENTIFICATION

☐ Consolidation ☐ Triaxial Test
☐ TS Thaw Strain ☐ Salinity
☐ DS Direct Shear ☐ Gas Analysis
☐ GSA Grain Size Analysis

BOREHOLE NUMBER
F85-KM16

M. J. O'CONNOR & ASSOCIATES LTD.

[illegible]

APPENDIX A-3

Onshore Borehole Logs

LOCATION: KING POINT UTM COORDINATES: N 7668057 E 381221				ELEVATION: 6.1 m ZONE: 8		UNIT WEIGHT (kN/m ³) 16 18 20 22		UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80		LABORATORY TESTS
SAMPLE	SOIL DESCRIPTION	CLASS	T°C	GROUND ICE DESCRIPTION	EXCESS ICE (%)	WATER CONTENT (%)		UNDRAINED SHEAR STRENGTH (kPa)		
						PLASTIC LIMIT	LIQUID LIMIT			
0	1 PEAT (PT) - dark brown, fibrous			V _r (25%)						
	2b SILT (ML) (Colluvial) - very dark greyish brown (2.5Y 3/2) - some clay, trace fine sand - random ice (clear, crystalline)	mCg		V _r (30%) V _r (40%)						
	3b SILT and CLAY (ML-CL) (Alluvial) - very dark grey - some sand, trace gravel - trace pebbles (subrounded to 3 mm)		-11.5	N _t N _b						
5	4 - damp - stiff when thawed - wet sand layer from 4.75 to 4.85 m			N _t						
	4b GRAVEL (GW) (Alluvial)	gMaP?		N _b						
	4c - black (2.5Y 2/0)			N _t						
	4d - some silt and sand			N _b						
	4e - some organic peat									
	4f - well ice bonded		-8.0	N _b						
	5b SILT (ML-OL) (TILL) - very dark grey (2.5Y 3/0) - some clay and organics			N _t (some N _b zones)						
10	5c - trace fine sand									
	5d - occasional subangular pebbles (to 2 mm diameter)	mM								
	6a - slightly calcareous									
	6b - very stiff when thawed			N _b						
	6c - ice bonded									
	6d - shell fragments									
	6e SILT (OL) (Perimarine) - very dark grey		-7.1	N _b						
	6f - thin organic laminae (discontinuous, curved, parallel) from 12.0 to 14.7 m									
15	6g - thin sand and organic silt laminae (curved, parallel) from 16.1 to 17.6 m			N _b N _t						
	7a - subrounded pebbles to 25 mm		-7.2	N _b						
	7b - ice bonded									
	7c - very stiff to hard when thawed									
	7d - silty sand layer from 23.8 to 23.9 m									
20	8 - ice bonded			V _x						
	8b - very stiff to hard when thawed									
	8c - silty sand layer from 23.8 to 23.9 m			V _x						
25	8d - silty sand layer from 23.8 to 23.9 m									
	END OF HOLE at 25.0 m									
	Note: Thermistor cable #328 installed in open borehole. Temperatures recorded on 85/03/28.									
30										

JOB NUMBER: 10-300	DATE DRILLED: 85/03/22	DRILLING RIG: Rotosonic	LOGGED BY: JGA/WAO/PH	SAMPLE TYPE	SHEAR STRENGTH	TEST IDENTIFICATION	BOREHOLE NUMBER
				Thin Wall Tube	Core	+ Torvane	
				Split Spoon	Disturbed	TS Thaw Strain	
				Thick Wall Tube	No Recovery	DS Direct Shear	
						T Triaxial Test	
						S Salinity	
						GA Gas Analysis	
						GSA Grain Size Analysis	
M. J. O'CONNOR & ASSOCIATES LTD.							F85-KM13

LOCATION: KING POINT UTM COORDINATES: N 7667441 E 382097				ELEVATION: 20.00 m ZONE: 8		UNIT WEIGHT (kN/m³) 16 18 20 22 ▽ PLASTIC LIMIT LIQUID LIMIT WATER CONTENT (%) 20 40 60 80		UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80	LABORATORY TESTS	
SAMPLE	SOIL DESCRIPTION	CLASS	T°C	GROUND ICE DESCRIPTION	EXCESS ICE (%)					
0										
1	PEAT (PT) (Organic)	pOv								
2/11	- very dark brown									
3/13	- fibrous, non-woody	mCB		V _s (50%)						
4	SILT (OL) (Colluvium)									
5/14	- very dark greyish brown									
6	- organic			V _s (50%)						
7/15	ICE and SILT (OL) (Colluvium)			V _c						
8	- cloudy ice and dark greyish brown silt			V _x						
9/16	PEAT (PT) - dark brown, woody	dM		V _c						
10	ICE and CLAY (CL)									
17	- cloudy, crystalline ice		-10.0	V _r (15%)						
18	- dark greyish brown clay with some sand and trace pebbles									
19	CLAY (CL)									
20	- very dark grey									
21	- trace to some silt									
22	- trace pebbles to pebbly									
23	- massive, blocky									
24	- firm to stiff when thawed									
25	- inclusion of fine decayed sandstone									
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40	GRAVEL (GC) (Perimarine)									
41	- dark grey, clayey, trace silt and fine sand	gsP	-7.4							
42	- black, silty									
43	- some gravel									
44	- occasional sandy zones									
45	- PEAT bed, woody									
46										
47										
48										
49										
50										
51										
52										
53										
END OF HOLE at 29.3 m										
Note: Thermistor cable #317 installed in open borehole. Temperatures recorded on 85/03/28.										
JOB NUMBER: 10-300 DATE DRILLED: 85/03/24 DRILLING RIG: Rotasonic LOGGED BY: ACM/JN/JB/SD				SAMPLE TYPE Thin Wall Tube Core Split Spoon Disturbed Thick Wall Tube No Recovery		SHEAR STRENGTH + Torvane ▽ Fall Cone x Mini Vane △ Pilcan Vane ▲ UU Triaxial		TEST IDENTIFICATION C Consolidation T Triaxial Test TS Thaw Strain S Salinity DS Direct Shear GA Gas Analysis GSA Grain Size Analysis		BOREHOLE NUMBER FB5-KM18
M.J. O'CONNOR & ASSOCIATES LTD.										

LOCATION : KING POINT UTM COORDINATES : N 7669288 E 381879				ELEVATION : 29.00 m ZONE : B		UNIT WEIGHT (kN/m³) 16 18 20 22 ▽ PLASTIC LIMIT LIQUID LIMIT WATER CONTENT (%) 20 40 60 80		UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80		LABORATORY TESTS	
SAMPLE	SOIL DESCRIPTION	CLASS	T°C	GROUND ICE DESCRIPTION	EXCESS ICE (%)						
0											
2/3	PEAT (PT) (Organic)	pLv									
7	- dark brown (10YR 4/3)			ICE							
1/4	- amorphous granular with fine fibres			ICE + CL							
8	ICE - cloudy, crystalline			V _x (3% well bonded)							
8	ICE and CLAY (CL) (Lacustrine)	CL		ICE							
9	- cloudy ice and very dark grey clay										
9	- trace silt and organics										
5/10	CLAY (CL) (Lacustrine)										
6	- very dark grey (7.5YR 3/0)			V _s (20%)							
6	- soft to firm when thawed			V _s (50%)							
11/12	ICE - crystalline and granular			V _x /V _s (20%)							
12				V _x (some V _r)							
13	CLAY (CL) (Till)	CM									
13	- very dark grey (2.5Y 3/2)										
14	- trace to some silt										
14	- trace sand										
14	- trace subangular pebbles										
15	- firm when thawed										
16	- shell fragments										
10											
17	SILT (ML-OL) (Perimarine)	MP		V _x (10% some V _r)							
18	- black (2.5Y 2/0)										
19	- some clay and organics										
19	- trace sand										
20	- occasional subrounded pebbles			V _s (20%)							
20	- blocky structure										
21	- well ice bonded										
22	- firm to stiff when thawed										
23	- shell fragments and organic fibres			N _{bn}							
24											
25											
26	wood chips			V _r							
27	- shell fragments and organics			V _r /N _{be}							
31	- thin laminae (parallel, discontinuous)			V _s in N _{be}							
32				V _r (10% in N _{be})							
33	- organic peat inclusions										
	- well ice bonded										
	END OF HOLE at 20.1 m										
25											
30											

JOB NUMBER : 10-300
DATE DRILLED : 85/03/24
DRILLING RIG : Rotasonic
LOGGED BY : ADM/RH/JN/JB/SD

SAMPLE TYPE

Thin Wall Tube Core
Split Spoon Disturbed
Thick Wall Tube No Recovery

SHEAR STRENGTH

+ Torvane ▽ Fall Cone
x Mini Vane
△ Pilcon Vane
▲ UU Triaxial

TEST IDENTIFICATION

C Consolidation T Triaxial Test
TS Thaw Strain S Salinity
DS Direct Shear GA Gas Analysis
GSA Grain Size Analysis

BOREHOLE NUMBER
F85-KM19

M.J.O'CONNOR & ASSOCIATES LTD.

LOCATION: KING POINT UTM COORDINATES: N 7666768 E 381917				ELEVATION: 29.00 m ZONE: 8		UNIT WEIGHT (kN/m ³) 16 18 20 22		PLASTIC LIMIT		LIQUID LIMIT		WATER CONTENT (%)		UNDRAINED SHEAR STRENGTH (kPa)		LABORATORY TESTS	
SAMPLE		SOIL DESCRIPTION	CLASS	T°C	GROUND ICE DESCRIPTION	EXCESS ICE (%)	WATER CONTENT (%)		UNDRAINED SHEAR STRENGTH (kPa)		LABORATORY TESTS		LABORATORY TESTS		LABORATORY TESTS		
0	1	PEAT (PT) - dark brown, fibrous (Organic)	pOv		N _{be} (occasional V _x)												
	2	cloudy ICE and PEAT			V _x 35% and V _s												
		ICE - cloudy, massive			Ice												
		SILT and PEAT (OL-PT) (Lacustrine)			V _x 10%												
		- very dark brown			Ice												
		- ice bonded			V _x (25%)												
3/4		ICE			V _x (15%)												
5		- cloudy bonded with crystalline ice			N _{be} (occasional V _s 5% to 5 mm)												
		- 10 mm thick ice layers			N _{be}												
6		SILT and PEAT (OL-PT) (Lacustrine)															
		- dark grey and black															
		- ice rich															
7/8		CLAY and SILT (CL-ML) (TILL)															
9		- dark yellowish brown															
		- sandy, medium															
		- trace gravel (subangular and subrounded pebbles to 15 mm)															
		- low to medium plasticity															
		- well ice bonded															
		- firm when thawed															
10																	
12/13																	
14		GRAVEL (GC) (Perimarine)			N _{bn}												
		- dark greyish brown			N _{bn}												
		- subrounded pebbles to 40 mm															
		- sandy															
		- some clay															
		- very dense or hard when thawed															
16																	
17		CLAY (CL-OL) (Perimarine)			N _{be}												
		- black			V _x 30%												
		- silty															
		- trace to some organics															
		- dark brown PEAT bed (0.3 m thick)															
		- clear ice crystals															
		- thin silty SAND (SM) bed (well ice bonded)															
		- thin, horizontal laminae of PEAT and silty SAND															
21/22																	
22A																	
23																	
24																	
25																	
26		GRAVEL and SILT (GP-ML) (Perimarine)			N _{bn}												
		- greyish brown															
		- subrounded pebbles to 20 mm															
		- some clay															
		- very dense when thawed															
		END OF HOLE at 20.1 m															

JOB NUMBER: 10-300 DATE DRILLED: 85/03/25 DRILLING RIG: Rotasonic LOGGED BY: RT/RH/SRD		SAMPLE TYPE Thin Wall Tube Split Spoon Thick Wall Tube		SHEAR STRENGTH Core Disturbed No Recovery		TEST IDENTIFICATION C Consolidation TS Thaw Strain DS Direct Shear T Triaxial Test S Salinity GA Gas Analysis GSA Grain Size Analysis		BOREHOLE NUMBER F85-KM20	
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M.J. O'CONNOR & ASSOCIATES LTD.

LOCATION: KING POINT UTM COORDINATES: N 7666380 E 382460				ELEVATION: 21.00 m ZONE: 8		UNIT WEIGHT (kN/m³) 16 18 20 22		PLASTIC LIMIT LIQUID LIMIT		UNDRAINED SHEAR STRENGTH (kPa)		LABORATORY TESTS				
SOIL DESCRIPTION				CLASS	T°C	GROUND ICE DESCRIPTION	EXCESS ICE (%)	WATER CONTENT (%)								
								20	40	60	80					
0	1	PEAT (PT) (Organic) - very dark brown (10YR 2/2)			pOB+	I	V _x (25%)					612.1				
	2	- amorphous-granular with woody fine fibres					Ice (90%) + PT					206.1				
	3	ICE with PEAT inclusions (Organic) - cloudy and crystalline ice - 5% to 10% PEAT with woody fibres					V _s 15%					241.4				
	4	CLAY (CL) (Lacustrine) - dark olive grey (5Y 3/2) - some silt, soft when thawed			V _s /V _r 25%											
	5/6	ICE and CLAY (CL) inclusions (Lacustrine) - 3% to 10% dark grey clay			CL		V _s /V _r 8%									
	7	- cloudy, granular and crystalline ice matrix					Ice + CL									
	8	CLAY (CL) - dark grey - traces of fine sand and silt					N _{be} (occ. V _x incl.)									
	9	SAND (SM) - very dark greyish brown (2.5Y 3/2) - some silt - well ice bonded			SM		V _x (15%)									
	10						N _{bn} (occ. V _x)									
	11						N _{bn} (V _r /V _x 3%)									
10	12	SILT (ML) (Till) - very dark greyish brown (2.5Y 3/2) with black mottling			CM		N _{be}					563.8				
	13/14	- some sand to sandy, fine					V _r (5%)									
	15	- traces of clay and pebbles					N _{be} (occ. V _x 2-20 mm)									
	16	- very stiff when thawed			CM											
	17/18	- reticulated and random clear ice (often on inclined planes)														
	19	SILT (ML) (Perimarine) - rootlets and wood particles														
	20															
	21						N _{bn} (occ. V _r 1%)									
	22	- thin clay layer (CL)														
	23	ICE and GRAVEL (GM) - dark greyish brown - some sand, trace silt			GS	P	V _r /V _x 20%									
24				Ice + GM												
25	GRAVEL (GM) - dark greyish brown (2.5Y 3/2) - sandy to sand and gravel - some silt - subrounded pebbles to 35 mm			N _{be}												
26				N _{be}												
27				N _{be}												
20	28	SAND (SP-SM) - very dark grey (2.5Y 3/0) - some gravel to gravelly - some silt			MP		N _{be}									
	29	SILT (OL) - black (10YR 2/1) - some sand to sandy, some organics - thin, even, parallel laminae					V _x /V _s (2%)									
	30	- wood particles					N _{be}									
	31															
	32															
	33	GRAVEL (GM) - black (7.5YR 2/0) - silty, some sand - subrounded pebbles to 25 mm - well ice bonded			GS	P	N _{be} (occ. V _x)									
	34						N _{be}									
	35															
	36	SAND (SM) - black, silty														
	37	GRAVEL (GP-GM) - black (7.5YR 2/0) - some silt to silty - some sand														
30	38	SILT and GRAVEL (ML-GP) - black (7.5YR 2/0) - trace sand - subrounded, subangular pebbles to 50 mm														
	39															
	40															
	41															
	42															
	43															
	44															
	45															
	46															
	47															
48																
END OF HOLE at 29.3 m																
JOB NUMBER: 10-300				DATE DRILLED: 85/03/25			DRILLING RIG: Rotasonic		LOGGED BY: RT/RH/WC/SD		SAMPLE TYPE		SHEAR STRENGTH		TEST IDENTIFICATION	
M. J. O'CONNOR & ASSOCIATES LTD.				Thin Wall Tube		Core		Disturbed		No Recovery		+ Torvane		▽ Fall Cone		
				Split Spoon								x Mini Vane		C Consolidation		
				Thin Wall Tube								△ Pilon Vane		TS Thaw Strain		
												a UU Triaxial		DS Direct Shear		
														S Salinity		
														GA Gas Analysis		
														GSA Grain Size Analysis		

LOCATION: KING POINT UTM COORDINATES: N 7666559 E 381148				ELEVATION: 17.50 m ZONE: 8		UNIT WEIGHT (kN/m ³) 16 18 20 22		PLASTIC LIMIT LIQUID LIMIT		UNDRAINED SHEAR STRENGTH (kPa)		LABORATORY TESTS
DEPTH IN METRES (bub)	SAMPLE	SOIL DESCRIPTION	CLASS	T °C	GROUND ICE DESCRIPTION	EXCESS ICE (%)	WATER CONTENT (%)					
							20	40	60	80		
0	1	PEAT (PT) (Organic) - very dark brown - amorphous with trace fine fibres	pOB		Nbe (10% V _x)							γ = 12.5
		ICE with PEAT inclusions (10%)			Nbe							
	2	PEAT (PT) (Organic) - dark brown	cL		Vs 15%							
	3	- some clay, well ice bonded			Ice + CL							
	4	CLAY and SILT (CL-OL) (Lacustrine) - dark greyish brown and black			Nbe (occ. V _x and V _s)							
	5	- trace peat and wood pieces										
	6	- low plastic										
	7	ICE and CLAY and SILT		Nbe								
	8	CLAY (CL) (Lacustrine) - very dark grey		Nbn								
	9	- some organic silt to silty										
	10	- trace of sand		Nbn								
	11	- massive										
	12	- blocky										
	13	- occasional peat inclusions and partially decayed wood fragments										
	14	discontinuous laminae (even, parallel)										
	15	CLAY (CL) (Till) - very dark grey	cM									
	16	- trace to some gravel			Vc							
	17	- subrounded pebbles (5 to 10 mm) and larger flat, subangular pebbles to 50 mm										
	18	- well ice bonded										
	19	- stiff when thawed (pp=190 kPa)										
	20	CLAY (CL) (Perimarine) - dark grey	cP									
	21	- trace peat and wood particles										
	22	- becoming very stiff (when thawed)										
	23	- silty										
	24	- very stiff (when thawed)										
	25	GRAVEL (GM-GC) - very dark grey			Nbn							
	26	- silty										
	27	- some clay										
	28	- trace sand										
	29	- subrounded pebbles to 30 mm and some subangular pebbles to 12 mm										
	30	- yellowish brown sandstone fragments										
	31	END OF HOLE at 23.2 m										
	32	Note: Some thermal disturbance of core samples due to vibration										

JOB NUMBER: 10-300		SAMPLE TYPE		SHEAR STRENGTH		TEST IDENTIFICATION				BOREHOLE NUMBER F85-KM22
DATE DRILLED: 85/03/25		Thin Wall Tube		+ Torvane		C Consolidation				
DRILLING RIG: Rotasonic		Split Spoon		x Mini Vane		TS Thaw Strain				
LOGGED BY: RH/RT/JGA/SRD		Thick Wall Tube		Δ Pilcon Vane		DS Direct Shear				
		Core		▽ Fall Cone		T Triaxial Test				
		Disturbed		▲ UU Triaxial		S Salinity				
		No Recovery				GA Gas Analysis				
						GSA Grain Size Analysis				

M. J. O'CONNOR & ASSOCIATES LTD.

LOCATION: KING POINT UTM COORDINATES: N 766595 E 379632				ELEVATION: 32.00 m ZONE: 8		UNIT WEIGHT (kN/m³) 16 18 20 22		UNDRAINED SHEAR STRENGTH (kPa)		LABORATORY TESTS
SAMPLE	SOIL DESCRIPTION	CLASS	T°C	GROUND ICE DESCRIPTION	EXCESS ICE (%)	PLASTIC LIMIT	LIQUID LIMIT	WATER CONTENT (%)		
						20 40 60 80	20 40 60 80			
1	PEAT (PT) - very dark brown, fibrous, silty	POV								
2	ICE - cloudy, segregated with peat and silt laminae	mC _x		V _s (90%) V _s (15%) V _s (85%)						
3	SILT - dark greyish brown, some peat		-13.0	V _r -V _s V _r (10-20%) V _s (95%)						
4	ICE - cloudy with dark grey SILT laminae									
5	SILT (OL) - dark greyish brown, peaty									
5	ICE - massive, segregated with occasional silt inclusions		-10.8	V _r (10-20%)						
6	SILT (CL-ML) (Surface Complex)									
6	- very dark grey (5Y 3/1)		-8.6	V _x V _s (40%) V _x						
7	- some fine sand to sandy									
8	- trace clay and organics		-8.1							
8	- very well ice bonded									
9	- stratified ice (horizontal to 10 cm, crystalline)		-7.7							
10	CLAY (CL) (Till)		-7.4	V _r V _x /V _r						
11	- dark grey	mM								
11	- some silt									
12	- trace to some sand									
12	- occasional pebbles									
12	- stiff when thawed									
13	- subrounded pebbles to 5 mm									
13	- very stiff to hard when thawed									
14	- subangular pebbles to 50 mm and sandstone fragments									
15	ICE to ICE + SILT (ML)	mi	-7.6	Ice (95%) + Silt						
	- cloudy white		-7.7							
	- massive with silt inclusions									
	- soft									
	- becoming stratified cloudy granular ice and hard crystalline			Ice (100%)						
	- occasional silt inclusions									
	- increasing silt content (10-15%)			Ice (85-90%) + Silt						
16	ICE and SILT (ML)	mM	-8.1	V _s (60%) - Silt				102.1		
	- closely spaced stratified ice lenses and thin silt laminae (5 to 20 mm)		-6.1							
	SILT (ML) (TILL)			V _r (20%)						
	- very dark grey									
	- some clay									
	- trace sand and subrounded pebbles									
	- well ice bonded									
	- randomly oriented ice formations									
	- firm to stiff when thawed									
17	END OF HOLE at 26.2 m									
Note: Thermistor cable #311 installed in borehole. Temperatures recorded on 85/03/28.										
JOB NUMBER: 10-300 DATE DRILLED: 85/03/25 DRILLING RIG: Rotasonic LOGGED BY: WAO/JN/JGA				SAMPLE TYPE		SHEAR STRENGTH		TEST IDENTIFICATION		BOREHOLE NUMBER F85-KM23
				Thin Wall Tube	Care	+ Torvane	Full Cone	C Consolidation	T Triaxial Test	
				Split Spoon	Disturbed	x Mini Vane		TS Thaw Strain	S Salinity	
				Thick Wall Tube	No Recovery	Δ Pilcon Vane		DS Direct Shear	GA Gas Analysis	
						▲ UU Triaxial		GSA Grain Size Analysis		

M. J. O'CONNOR & ASSOCIATES LTD.

LOCATION: KING POINT
UTM COORDINATES: N 7667869 E 378551
ELEVATION: 26.00 m
ZONE: 8

UNIT WEIGHT (kN/m³)
16 18 20 22

PLASTIC LIMIT LIQUID LIMIT
WATER CONTENT (%)
20 40 60 80

UNDRAINED
SHEAR STRENGTH
(kPa)
20 40 60 80

LABORATORY
TESTS

SAMPLE	SOIL DESCRIPTION	CLASS	T ^o C	GROUND ICE DESCRIPTION	EXCESS ICE (%)	UNIT WEIGHT (kN/m ³)	PLASTIC LIMIT	LIQUID LIMIT	WATER CONTENT (%)	UNDRAINED SHEAR STRENGTH (kPa)	LABORATORY TESTS
0											
1	PEAT (PT) (Organic) - dark brown, amorphous with woody fibres	pOv		V _x V _s /V _r (20-30%)					74.9		
3	SILT (ML) and PEAT (PT) (Alluvial) - dark grey and dark brown laminae (4-17 mm thick, even, parallel)	xAT ptAT		V _s (25-40%)							
4	PEAT (PT) (Alluvial) - dark brown - fine fibrous, silty - well ice bonded	mA _T		V _s (15%)							
5	SILT (OL) (Alluvial) - very dark grey - some clay and organics - trace fine sand	SA _T		V _c /V _r V _c /V _x (10-15%)							
6											
7											
8											
9											
10	SAND (SP) (Alluvial) - light brown - some gravel - trace silt - subrounded black and white pebbles (to 10 mm) - well ice bonded - becoming dark grey below 5.3 m			N _{be}							
11											
12	SAND (SM) (Alluvial) - very dark grey - silty - some clay, trace organics - massive, well ice bonded	cm		N _{bn}							
13											
15	CLAY (CL) (TILL) - very dark grey - some silt and gravel - subrounded pebbles to 20 mm - sandstone fragments - massive - well ice bonded - stiff when thawed										
17	END OF HOLE at 14.0 m										
20											
25											
30											

JOB NUMBER: 10-300
DATE DRILLED: 85/03/25
DRILLING RIG: Rotasonic
LOGGED BY: JGA/WAO

SAMPLE TYPE
Thin Wall Tube
Split Spoon
Thick Wall Tube
Core
Disturbed
No Recovery

SHEAR STRENGTH
+ Torvane
x Mini Vane
Δ Pileon Vane
▲ UU Triaxial
▽ Fall Cone

TEST IDENTIFICATION
C Consolidation
TS Thaw Strain
DS Direct Shear
T Triaxial Test
S Salinity
GA Gas Analysis
GSA Grain Size Analysis

BOREHOLE
NUMBER
FB5-KM24

M.J. O'CONNOR & ASSOCIATES LTD.

LOCATION: KING POINT UTM COORDINATES: N 7667507 E 379991				ELEVATION: 34.00 m ZONE: B		UNIT WEIGHT (kN/m³) 16 18 20 22 ▽ PLASTIC LIMIT LIQUID LIMIT		UNDRAINED SHEAR STRENGTH (kPa)				LABORATORY TESTS	
SAMPLE	SOIL DESCRIPTION	CLASS	T°C	GROUND ICE DESCRIPTION	EXCESS ICE (%)	WATER CONTENT (%)							
						20	40	60	80	20	40	60	80
0	PEAT (PT) (Organic) - dark reddish brown (5YR 3/2) - fine fibrous - occasional V _s to 5 mm	pOb		V _x /V _r (10%)									
1													
2	ICE with PEAT inclusions (10%) (Surface Complex) - clear, crystalline ice - dark brown fibrous peat	mC/A		ICE (90%) + PT									
	SILT (OL) and PEAT (PT) (Surface Complex) - very dark brown			N _{be} (occ. V _x 5%) N _{be} (occ. V _x 10%)									
5													
3	SILT (OL) (Surface Complex) - dark brown - clayey, organic			ICE (90%) + SILT									
4													
5	ICE (Surface Complex) - clear, crystalline with silt inclusions (10%)	mH		N _{bn} - occ. V _r 5% - occ. V _r 1%									
6/7													
8	SILT (ML-CL) (Colluviated Till) - black to very dark grey - some clay - trace subrounded pebbles and organics - massive, blocky structure - stiff to hard when thawed - shell fragments			V _r (5%) near vertical orientation									
10													
10	ICE and CLAY (CL) (Perimarine) - clear, crystalline ice and very dark grey clay	mL+I		ICE (80%) + CL N _{bn} occ. V _r									
11													
12	CLAY (CL) (Perimarine) - very dark grey (2.5Y 3/0) - some silt - trace subrounded pebbles - thin laminae (even, parallel) - ice bonded (firm to stiff when thawed)			N _{bn}									
13													
14													
15	SILT (OL) (Perimarine) - black (5Y 2/2) - trace to some clay and organics - stiff when thawed	mP											
16													
17													
18													
19	- vertical ICE fissure (35 mm wide)			N _{be} ICE + CLAY									
20													
20	- GRAVEL (GP) bed (10 cm thick) - GRAVEL (GP) bed (7 cm thick)			N _{be} N _t N _{be} (1% V _r)									
21													
22													
23													
24	- ICE and SILT (10 cm thick) - ICE (10-15 cm thick)			N _{be} ICE + SILT									
25													
25	- ICE and SILT (15 cm thick)			N _{bn} occ. V _r									
26													
27	GRAVEL (GP-GM) (Perimarine) - very dark greyish brown (2.5Y 3/2) - sandy - trace to some silt - well ice bonded	gP		V _c /V _x (8%)									
28													
29													
30	SILT (ML-CL) (Perimarine) - black - sandy - some clay - low plasticity	mP		N _{bn}									
31													
30	END OF HOLE at 29.3 m												

JOB NUMBER: 10-300
DATE DRILLED: 85/03/26
DRILLING RIG: Rotasonic
LOGGED BY: RT/RH/WC

SAMPLE TYPE
☒ Thin Wall Tube ☒ Core
☒ Split Spoon ☒ Disturbed
☒ Thick Wall Tube ☒ No Recovery

SHEAR STRENGTH
☒ Torvane ☒ Fall Cone
☒ Mini Vane
☒ Pilcon Vane
☒ UU Triaxial

TEST IDENTIFICATION
C Consolidation T Tri
TS Thaw Strain S Salinity
DS Direct Shear GA Gas Analysis
GSA Grain Size Analysis

BOREHOLE NUMBER
FB5-KM25

M. J. O'CONNOR & ASSOCIATES LTD.

LOCATION: KING POINT UTM COORDINATES: N 7668635 E 380270				ELEVATION: 70.00 m ZONE: 8		UNIT WEIGHT (kN/m ³) 16 18 20 22 PLASTIC LIMIT LIQUID LIMIT WATER CONTENT (%) 20 40 60 80		UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80	LABORATORY TESTS
DEPTH IN METRES (b.s.b.)	SAMPLE	SOIL DESCRIPTION	CLASS	T ^o C	GROUND ICE DESCRIPTION	EXCESS ICE (%)			
0	1	PEAT (PT) (Organic) - dark brown	pOb		Nbe (5%)				
	2	- amorphous, fine fibrous ICE and PEAT (PT) - clear crystalline ice			ICE (95%) + PT				
	3	CLAY (CL-ML) (TILL) - very dark greyish brown	cM		Nbn				
	4	- some silt, some sand			ICE + CL				
	5	- occasional yellowish-brown sandstone fragments (to 100 mm)			Nbe				
	6				ICE + CL				
5	7	- rust colour (oxidized)	gSP		Nbe (occ. V _x)				
	8								
	9								
	10	- ICE (90%) and CLAY			ICE + CL				
	11				Nbe				
10	12				V _x (30%)				
	13	GRAVEL (GP) - dark greyish brown			ICE				
	14	- sand			V _c /V _x (10%)				
	15	ICE BED (40 cm thick) - crystalline							
	16	GRAVEL and SAND (GM-SM) - dark greyish brown			Nbe				
	17	- silty, trace clay	mP		Nbn				
	18	- subrounded pebbles to 2 mm			Nbn				
	19	SILT (OL) (Perimarine) - black, organic							
	20	- some clay							
	21	- occasional peat inclusions							
	22	- trace subrounded pebbles and sandstone fragments			Nbn				
	23	- well ice bonded							
	24	- thin laminae (curved, parallel)							
	25	- PEAT bed (10 cm thick)							
20	26				Nbn				
	27	- black to very dark brown							
	28	- organic							
	29	- trace fine sand and dispersed medium sand particles							
	30	- thin to medium clay laminae (discontinuous, curved, parallel)			Nbn				
	31								
25	32								
	33								
	34	- occasional peat fibres							
	35								
	36	- becoming gravelly with some coarse sand			Nbn				
	37				Nbn				
30		END OF HOLE at 29.3 m							
JOB NUMBER: 10-300 DATE DRILLED: 85/03/26 DRILLING RIG: Rotasonic LOGGED BY: RT/RH/WC				SAMPLE TYPE Thin Well Tube Core Split Spoon Disturbed Thick Well Tube No Recovery		SHEAR STRENGTH + Torvane x Mini Vane Δ Pilon Vane ▲ UU Triaxial		TEST IDENTIFICATION C Consolidation TS Thaw Strain DS Direct Shear T Triaxial Test S Salinity GA Gas Analysis GSA Grain Size Analysis	
M.J. O'CONNOR & ASSOCIATES LTD.								BOREHOLE NUMBER FB5-KM26	

LOCATION: KING POINT UTM COORDINATES: N 7669785 E 379714				ELEVATION: 53.00 m ZONE: 8		UNIT WEIGHT (kN/m³) 1p 18 20 22		PLASTIC LIMIT LIQUID LIMIT		UNDRAINED SHEAR STRENGTH (kPa)		LABORATORY TESTS
SAMPLE	SOIL DESCRIPTION	CLASS	T°C	GROUND ICE DESCRIPTION	EXCESS ICE(%)	WATER CONTENT(%) 20 40 60 80	20 40 60 80	20 40 60 80	20 40 60 80			
0	1 PEAT (PT) (Organic) - very dark brown - fine fibrous, silty - ice rich	pOb		V _x (10%) V _x (35%) V _x (15%) V _x (35%)								
	2 ICE (85%) + SILT											
	3 ICE and SILT (OL) - crystalline ice - very dark brown organic silt - trace pebbles and sandstone fragments	gG		N _{be}								
	4 SAND (SP-SM) (Glaciofluvial) - dark brown - subrounded to subangular - some gravel - clayey, trace to some silt			N _{be}								
5	5 - well ice bonded			N _{bn}								
	6 CLAY (CL-ML) (TILL) - brown - silty, some sand - trace subrounded pebbles to 20 mm	cM		V _x								
	7 GRAVEL (GW-GM) (Perimarine) - dark greyish brown - sandy - some silt - ice bonded - subrounded pebbles - well graded - sandstone and limonite pebbles	gSP		V _x (15%) V _x (40%) N _{bn} V _x (25%) N _{be}								
10	8 SAND (SP-SM) - very dark grey - gravelly, medium to coarse - subrounded and subangular - some silt - well ice bonded			V _x -V _c (10-20%) V _x								
	9 ICE - cloudy, crystalline with silt inclusions			V _x (10%)								
	10 SAND (SW) - dark grey - trace silt											
	11 SILT (ML) (Perimarine) - very dark grey - trace fine sand - thin to medium laminae (wavy, discontinuous) - ice bonded	mP		ICE (95%) + SILT V _s (30%) N _{bn}								
20	END OF HOLE at 20.1 m											

JOB NUMBER: 10-300 DATE DRILLED: 85/03/26 DRILLING RIG: Rotasonic LOGGED BY: RH/RT/JGA		SAMPLE TYPE Thin Wall Tube Core Split Spoon Disturbed Thick Wall Tube No Recovery		SHEAR STRENGTH + Torvane x Mini Vane Δ Pilcan Vane Δ UU Triaxial		TEST IDENTIFICATION C Consolidation TS Thaw Strain DS Direct Shear T Triaxial Test S Salinity GA Gas Analysis GSA Grain Size Analysis		BOREHOLE NUMBER F85-KM27
M. J. O'CONNOR & ASSOCIATES LTD.								

LOCATION: KING POINT UTM COORDINATES: N 7669785 E 378987				ELEVATION: 50.00 m ZONE: 8		UNIT WEIGHT (kN/m ³) 16 18 20 22		UNDRAINED SHEAR STRENGTH (kPa)	LABORATORY TESTS	
DEPTH IN METRES (b.b.)	SAMPLE	SOIL DESCRIPTION	CLASS	T ^o C	GROUND ICE DESCRIPTION	EXCESS ICE (%)	PLASTIC LIMIT			LIQUID LIMIT
							WATER CONTENT (%) 20 40 60 80			
0		PEAT (PT) - dark brown (Organic) - fine fibrous	pOB		ICE 100% ICE + SAND 80-90% ICE 100%					
1		ICE - cloudy white - massive, hard	I		ICE 100%					
2		- sand and silt inclusions			V _x /V _c 20%					
3		PEAT (PT) - dark brown (Organic) - amorphous with fine fibres - some organic silt	sG		V _x /V _c (10-15%)					
4		ICE - granular, white and clear, stratified laminae (2-5 mm)								
5		SAND (SM-GM) (Glaciofluvial) - reddish brown to dark grey - gravelly with some silt and trace to some clay	sgG		N _{bn}					
6		- well ice bonded								
7		SAND and GRAVEL (SM-GM) (Glaciofluvial) - dark greyish brown			V _c 10%					
8		- trace to some silt	sG		V _c 10% V _x /V _c 10%					
9		- subrounded to subangular pebbles to 15 mm			V _c 15%					
10		- well graded								
11		- ice bonded			V _x 10%					
12		SAND (SP) (Glaciofluvial) - dark grey	gsG		N _{bn}					
13		- fine to medium			V _r 15-20%					
14		- trace silt								
15		- trace gravel								
16		GRAVEL and SAND (GC and SW) (Glaciofluvial) - dark brown and very dark grey								
17		- interbedded (medium to thick beds)								
18		- trace to some silt								
19		- well ice bonded and ice rich								
20										
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JOB NUMBER: 10-300	DATE DRILLED: 85/03/26	DRILLING RIG: Rotasonic	LOGGED BY: JGA/WAD/JN/SO	SAMPLE TYPE	SHEAR STRENGTH	TEST IDENTIFICATION	BOREHOLE NUMBER
				Thin Wall Tube	+ Torvane	C Consolidation	
				Split Spoon	x Mini Vane	TS Thaw Strain	
				Thick Wall Tube	Δ Pilcon Vane	DS Direct Shear	
					Δ UU Triaxial	GA Gas Analysis	
						GSA Grain Size Analysis	
M. J. O'CONNOR & ASSOCIATES LTD.							FB5-KM28

LOCATION: KING POINT UTM COORDINATES: N 7667967 E 377332			ELEVATION: 8 ZONE: 8		UNIT WEIGHT (kN/m³) 16 18 20 22		PLASTIC LIMIT LIQUID LIMIT		UNDRAINED SHEAR STRENGTH (kPa)		LABORATORY TESTS				
DEPTH IN METRES (b.b.b.)	SAMPLE	SOIL DESCRIPTION	CLASS	T°C	GROUND ICE DESCRIPTION	EXCESS ICE (%)	WATER CONTENT (%)				UNDRAINED SHEAR STRENGTH (kPa)				LABORATORY TESTS
							20	40	60	80	20	40	60	80	
0	1	PEAT (PT) - very dark brown (Organic) - amorphous with fine fibres	pOv		V _x (30%) V _r /V _g (20%)										
	2	SILT (OL-ML) (Alluvial) - very dark greyish brown - trace to some fine sand	mA		V _x /V _r (10%) V _x /V _r (15-20%)										
	3	- some organics - well ice bonded	sA												
	4	SAND (SM) (Alluvial) - very dark greyish brown - fine to medium	pA		V _r (30%)										
	5	- some organic silt, trace pebbles PEAT (PT) (Alluvial) - black to very dark brown - amorphous, fine fibrous - silty - occasional reddish brown staining (oxidized)	cM		N _{bn}										
	5	CLAY (CL) (Till) - very dark grey - some silt, trace subrounded pebbles - medium plasticity - massive, blocky - very stiff when thawed			N _{bn}										
10															
	6	GRAVEL (GM) (Perimarine) - very dark greyish brown - rounded and subrounded pebbles to 25 mm - some fine to medium sand - some organic silt - well ice bonded	gP		V _c /V _x (10%)										
	7														
	8	CLAY (CL) - very dark grey (Perimarine) - some silt, trace subrounded gravel to 20 mm	cP		V _x (15%) N _{bn} N _{bn}										
	9														
	10	GRAVEL (GM-GC) (Perimarine) - very dark grey - subrounded to 40 mm - some sand - some silt and clay - ice rich	gP		ICE + GRAVEL V _x /V _r (30%)										
	11														
20		END OF HOLE at 20.1 m													
25															
30															

JOB NUMBER: 10-300
 DATE DRILLED: 85/03/26
 DRILLING RIG: Rotasonic
 LOGGED BY: JGA/WAO/JN

SAMPLE TYPE
 Thin Wall Tube Core
 Split Spoon Disturbed
 Thick Wall Tube No Recovery

SHEAR STRENGTH
 + Torvane
 X Mini Vane
 Δ Pilcon Vane
 ▲ UU Triaxial

TEST IDENTIFICATION
 C Consolidation
 TS Thaw Strain
 DS Direct Shear
 T Triaxial Test
 S Salinity
 GA Gas Analysis
 GSA Grain Size Analysis

BOREHOLE NUMBER
 F85-KM29

M. J. O'CONNOR & ASSOCIATES LTD.

LOCATION: KING POINT UTM COORDINATES: N 7666233 E 377025				ELEVATION: 8 ZONE: 8		UNIT WEIGHT (kN/m ³) 16 18 20 22		UNDRAINED SHEAR STRENGTH (kPa)		LABORATORY TESTS	
DEPTH IN METRES (bsh)	SAMPLE	SOIL DESCRIPTION	CLASS	T °C	GROUND ICE DESCRIPTION	EXCESS (%E)	WATER CONTENT (%)		UNDRAINED SHEAR STRENGTH (kPa)		LABORATORY TESTS
							PLASTIC LIMIT	LIQUID LIMIT	20 40 60 80	20 40 60 80	
0	1	PEAT (PT) - dark brown (Organic) - fibrous, amorphous	POV		Nnn V _p (40%) V _c (10%) ICE						
	2	CLAY (CL) - greyish brown - silty, trace medium sand and pebbles - trace woody peat at 0.45 m ICE - clear, crystalline layers (1 to 10 mm) and white granular ice	I								
5	3	CLAY (CL) (Till) - dark grey - some silt	mM		V _c (15%) V _s V _c /V _s (less than 15%) V _r (10-20%)						
	4	- massive, blocky - trace subrounded pebbles - ice rich ICE - massive, white, granular CLAY (CL) - as above			ICE V _r /V _c (20%) ICE + SILT V _r /V _c (10%)						
10		ICE - with silt inclusions			ICE (98%) V _r /V _c (10%) ICE (60%) - SILT						
	5	SILT (ML) (Perimarine) - very dark grey - ice rich - some clay to clayey - some medium to coarse sand	mP		V _r /V _c (10-20%)						
	6	- stratified ice at 11.4 m and 15.8 to 16.0 m			ICE (70%) + SILT V _r /V _s (less than 10%)						
15											
	7	- occasional inclusions of reddish brown, friable sandstone (to 25 mm)			V _x						
20		END OF HOLE at 20.5 m									
25											
30											

JOB NUMBER: 10-300 DATE DRILLED: 85/03/26 DRILLING RIG: Rotasonic LOGGED BY: JGA/WAD/JN		SAMPLE TYPE Thin Wall Tube ☒ Core Split Spoon ☒ Disturbed Thick Wall Tube ☒ No Recovery		SHEAR STRENGTH + Torvane ☒ Fall Cone x Mini Vane Δ Pilon Vane ▲ UU Triaxial		TEST IDENTIFICATION C Consolidation T Triaxial Test TS Thaw Strain S Salinity DS Direct Shear GA Gas Analysis GSA Grain Size Analysis		BOREHOLE NUMBER FB5-KM30
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M.J. O'CONNOR & ASSOCIATES LTD.

LOCATION: KING POINT UTM COORDINATES: N 7669371 E 378496				ELEVATION: 44.00 m ZONE: B		UNIT WEIGHT (kN/m ³) 16 18 20 22		PLASTIC LIMIT — LIQUID LIMIT		UNDRAINED SHEAR STRENGTH (kPa)		LABORATORY TESTS
SOIL DESCRIPTION		CLASS	T °C	GROUND ICE DESCRIPTION		WATER CONTENT (%)						
0	1/2 PEAT (PT) - dark brown, amorphous (Organic) - some organic silt ICE and SILT (ML) - cloudy ice and grey silt ICE - clear, crystalline, massive	poV mC+		ICE + SILT		233.6						
3	SAND (SP-SM) (Glaciofluvial) - dark greyish brown - gravelly - subrounded and platy to 25 mm - some silt to silty - ice rich, well ice bonded	sgG		occ. V _x in N _{de} (3%)								
5				V _x 5%								
6												
7												
8	- grades to cleaner gravelly SAND (SP) below 6.5 m - trace silt											
9	- reddish stains (oxidized)											
10				V _s /V _x 35%								
11	SAND (SP-SM) (Glaciofluvial) - very dark grey - medium - trace to some silt and organic silt - trace subangular pebbles	sg		V _x 10%								
12				V _x 15%								
13				V _x 20%								
14	- thin to medium clayey SILT laminae (even, parallel)			V _x 15%								
15	SAND (SM) (Glaciofluvial) - dark grey - coarse - some silt - inclusion of amber - black, shiny coal pebbles - occasional pieces of decayed wood			V _x 25%								
16				ICE								
17	ICE - cloudy, soft - massive	I										
18												
19	ICE and dark grey silty CLAY (CL)			ICE (80%) + CLAY		379.8						
20	ICE - cloudy soft - massive			ICE								
25	- clear, crystalline stratification below 25.0 m											
26	ICE with SILT (ML) inclusions			ICE (95%) + SILT								
27	ICE - massive			ICE								
28	ICE with SILT inclusions			ICE (>95%) + SILT								
29	ICE - cloudy, massive											
30	END OF HOLE at 29.3 m											

JOB NUMBER: 10-300 DATE DRILLED: 85/03/26 DRILLING RIG: Rotasonic LOGGED BY: RH/RT		SAMPLE TYPE Thin Wall Tube Core Split Spoon Disturbed Thick Wall Tube No Recovery		SHEAR STRENGTH + Torvane ▽ Fall Cone x Mini Vane Δ Pilon Vane ▲ UU Triaxial		TEST IDENTIFICATION C Consolidation T Triaxial Test TS Thaw Strain S Salinity DS Direct Shear GA Gas Analysis GSA Grain Size Analysis		BOREHOLE NUMBER F85-KM31
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M.J. O'CONNOR & ASSOCIATES LTD.

LOCATION: KING POINT UTM COORDINATES: N 7669813 E 377802				ELEVATION: 45.00 m ZONE: 8		UNIT WEIGHT (kN/m ³) 10 15 20 25 PLASTIC LIMIT LIQUID LIMIT WATER CONTENT (%) 20 40 60 80		UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80		LABORATORY TESTS		
DEPTH IN METRES (b.b.)	SAMPLE	SOIL DESCRIPTION	CLASS	T°C	GROUND ICE DESCRIPTION	EXCESS ICE (%)	WATER CONTENT (%)		UNDRAINED SHEAR STRENGTH (kPa)		LABORATORY TESTS	
0	1	PEAT (PT) - dark brown (Organic) - amorphous, fine fibrous	pOv		Nbe		74.2					
		ICE - massive, clear, crystalline - soft			ICE							
		ICE with SILT (ML) inclusions (Colluvial) - cloudy ice - very dark grey SILT - trace organics and fine sand	mpC		ICE (95%) + SILT ICE (98%) + SILT							
5	2				ICE (85%) + SILT ICE + SILT							
	3	SILT (ML-OL) - very dark grey (Colluvial) - trace sand and organics - trace gravel - ice rich			V _x (40%) Nbe							
	4	SAND (SP) (Glaciofluvial) - brown, fine - gravelly - trace silt - subrounded to 15 mm - ice rich	sG		Nbe (occ. V _x) Nbe - V _x (50%) Nbe							
	5											
	6											
	7	SAND (SW-SM) (Glaciofluvial) - dark grey - medium with some silt - occasional subangular pebbles to 20 mm - well ice bonded - silty below 11.5 m			Nbe							
	8											
	9				V _x (25%)							
	10	GRAVEL (GW-GM) (Glaciofluvial) - dark grey - subrounded to 35 mm - sandy to some medium sand - trace to some silt - ice rich - well ice bonded	gG		V _x (20%)							
	11											
	12											
	13											
	14											
	15	- GRAVEL and SILT (ML) - ice rich			V _x (20%) Nbe (occ. V _r)							
	16	SILT (ML-OL) - very dark greyish brown - trace to some sand	mG									
	17	SILT (ML) - very dark greyish brown - some fine sand - thin to medium laminae (even, parallel) - trace organics			Nbn							
	18											
	19											
	20	SAND (SP-SM) (Glaciofluvial) - dark grey - fine to medium - well ice bonded	sG		Nbn							
	21											
	22	ICE - soft, massive - cloudy and clear, crystalline stratification ICE with SILT (ML) inclusions - cloudy ice - dark silt with a trace of sand ICE - massive - cloudy, soft	I+M		ICE ICE (85%) + SILT ICE ICE + SILT ICE							
30		END OF HOLE at 29.3 m										

JOB NUMBER: 10-300		SAMPLE TYPE		SHEAR STRENGTH		TEST IDENTIFICATION				BOREHOLE NUMBER	
DATE DRILLED: 85/03/27		Thin Wall Tube		+ Torvane		C Consolidation		T Triaxial Test		F85-KM32	
DRILLING RIG: Rotasonic		Split Spoon		X Mini Vane		TS Thaw Strain		S Salinity			
LOGGED BY: RH/RT/WC		Thick Wall Tube		Δ Pilcon Vane		DS Direct Shear		GA Gas Analysis			
		No Recovery		▲ UU Triaxial				GSA Grain Size Analysis			

M. J. O'CONNOR & ASSOCIATES LTD.

LOCATION: KING POINT
UTM COORDINATES: N 7670498 E 376800

ELEVATION: 24.00 m
ZONE: 8

UNIT WEIGHT (kN/m³)

PLASTIC LIMIT LIQUID LIMIT

UNDRAINED SHEAR STRENGTH (kPa)

LABORATORY TESTS

DEPTH IN METRES (m)

0
5
10
15
20
25
30

SAMPLE

SOIL DESCRIPTION

CLASS

γ°

GROUND ICE DESCRIPTION

EXCESS ICE (%)

WATER CONTENT (%)

UNDRAINED SHEAR STRENGTH (kPa)

1 PEAT (PT) - dark brown (Organic)
- amorphous, fine fibrous
- trace to some organic silt
2/3
4 ICE and SILT (Alluvial)
- cloudy ice (stratified 50%-90%)
- trace sand
5
6 SAND (SM) - dark grey (Alluvial)
- fine to medium, some silt
- well ice bonded
7 ICE and SILT (Alluvial)
- clayey with some peat
8 SAND (SM-SC) (Alluvial)
- dark brown to very dark grey
- silty with trace to some clay
- trace gravel (less than 6 mm)
CLAY (CL) (Till)
- very dark grey
- silty
- trace pebbles
- massive
- firm to stiff when thawed
- well ice bonded

MA

SA

CM

V_s/V_r (40%)
V_r/V_s (50%)
V_x/V_s (50-60%)
N_{bn}/V_c (5%)
V_r/V_s (less than 20%)

N_{be}

N_{be}

N_{bn}

N_{bn}

END OF HOLE at 11.0 m

JOB NUMBER: 10-300
DATE DRILLED: 85/03/27
DRILLING RIG: Rotasonic
LOGGED BY: WAO/JN/SRD

SAMPLE TYPE

SHEAR STRENGTH

TEST IDENTIFICATION

BOREHOLE NUMBER

M. J. O'CONNOR & ASSOCIATES LTD.

Thin Wall Tube
Split Spoon
Thick Wall Tube
Core
Disturbed
No Recovery

+ Torvane
x Mini Vane
Δ Pilcon Vane
Δ UU Triaxial

C Consolidation
TS Thaw Strain
DS Direct Shear
T Triaxial Test
S Salinity
GA Gas Analysis
GSA Grain Size Analysis

F85-KM33

APPENDIX B-1

Offshore Samples - Test Data

SUMMARY OF TEST RESULTS

Sample Number	Sample Type	Depth (metres)	Unified Soil Classification	Ground Ice Description (%)	Temp. (°C)	Moisture Content (%)	Unit Weight (kN/m³)	Salinity (%)	ATTERBERG LIMITS		GRAIN SIZE DISTRIBUTION					SHEAR STRENGTH				Remarks
									Liquid Limit (%)	Plastic Limit (%)	Clay (%)	Silt (%)	Sand (%)	Gravel (%)	D ₅₀ (µm)	Test	Shear Strength (kPa)	Failure Strain (%)	Consistency	
1	B	0			+0.1	17.6														
2	B	1.2				17.0														
3	B	1.4				15.5														
4	B	3.2				14.6														
5	B	3.7				15.1														
6	B	4.2			+0.1	13.3														
7	B	5.2				15.1														
8	B	6.2				13.4														
9	B	7.2				18.4														
10	B	7.2				16.7														
11	B	8.2				15.1														
12	B	8.8	CL	0		15.4			28	20	33.5	50.9	15.6	—						LI=0.613 A=0.239
13	B	9.3		0	-0.3	23.2														
14	B	10.1				16.7														
15	B	11.2		0	-0.8	20.4														
16	B	12.0			-0.8	24.2														
17	B	13.1			-0.3	15.3														
18	B	13.3			-0.9	15.3														
19	B	14.2			-0.6	18.5														
20	B	15.2			-0.7	20.3														
21	B	15.7				16.0														

B - Bag Sample
G - Gas Sample
L - Liner Sample
P - Piston Sample
NR - No Recovery

NS - No Sample Remaining
PF - Permafrost Sample
PW - Porewater Sample
T - Sample Stored in Tube
W - Waxed Sample

RC - Radiocarbon Sample
MV - Minivane
FC - Fall Cone
TV - Torvane
PV - Pilcon Vane

RV - Remote Vane
PP - Pocket Penetrometer
UU - Unconsolidated Undrained Triaxial
UUP - UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial
CU_p - CU Triaxial with Pore Pressure Measurements
CD - Consolidated Drained Triaxial

O - Organic Content
S - Salinity
TS - Thaw Strain
SG - Specific Gravity

SUMMARY OF TEST RESULTS

Sample Number	Sample Type	Depth (metres)	Unified Soil Classification	Ground Ice Description (%)	Temp. (°C)	Moisture Content (%)	Unit Weight (kN/m³)	Salinity (%)	ATTERBERG LIMITS		GRAIN SIZE DISTRIBUTION					SHEAR STRENGTH				Remarks
									Liquid Limit (%)	Plastic Limit (%)	Clay (%)	Silt (%)	Sand (%)	Gravel (%)	D ₅₀ (µm)	Test	Shear Strength (kPa)	Failure Strain (%)	Consistency	
22	B	16.1				15.2														
23	B	16.9			-1.0	23.5														
24	B	17.7		0		23.1														
25	B	18.6			-1.4	27.9														
26	B	19.2				31.3														
27	B	19.2				36.8														
28	B	19.5				23.7														
29	B	20.6			-1.0	45.1														
30	B	21.4				36.4														
31	B	21.7				19.6														
32	B	22.4																		
33	B	23.3				17.2														
34	B	23.6				11.0														
35	B	24.2				10.1														
36	B	24.6				10.9														
37	B	25.4			-0.9	9.0														
38	B	25.8				22.8														

B - Bag Sample
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 P - Piston Sample
 NR - No Recovery

NS - No Sample Remaining
 PF - Permafrost Sample
 PW - Porewater Sample
 T - Sample Stored in Tube
 W - Waxed Sample

RC - Radiocarbon Sample
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RV - Remote Vane
 PP - Pocket Penetrometer
 UU - Unconsolidated Undrained Triaxial
 UUp - UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial
 CU_p - CU Triaxial with Pore Pressure Measurements
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SUMMARY OF TEST RESULTS

Sample Number	Sample Type	Depth (metres)	Unified Soil Classification	Ground Ice Description (%)	Temp. (°C)	Moisture Content (%)	Unit Weight (kN/m³)	Salinity (%)	ATTERBERG LIMITS		GRAIN SIZE DISTRIBUTION					SHEAR STRENGTH				Remarks
									Liquid Limit (%)	Plastic Limit (%)	Clay (%)	Silt (%)	Sand (%)	Gravel (%)	D ₅₀ (µm)	Test	Shear Strength (kPa)	Failure Strain (%)	Consistency	
1	B	0				20.4														
2	B	2.5			-0.1	10.7														
3	B	3.0				12.8														
4	B	3.0				11.9														
5	B	4.0	CL			14.6			27	18										LI=-0.126
6	B	4.0				17.2														
7	B				-0.6															
8	B	6.2				15.5														
9	B	7.0				17.5														
10	B	8.0				22.4														
11	B	9.0				58.3														
12	B	9.0			-0.8	23.2														
13	B	10.0				36.8														
14	B	11.5			-0.9	28.7														
15	B	12.0				30.9														
16	B	13.5				27.6														
17	B	14.5				32.1														
18	B	16.0			-0.8	29.2														
19	B	16.0				29.2														
20	B	17.5				43.7														
21	E	18.3	CL			33.0			35	23	20.5	79.5	4.0	—						LI=0.286 A= 0.585

B - Bag Sample
G - Gas Sample
L - Liner Sample
P - Piston Sample
NR - No Recovery

NS - No Sample Remaining
PF - Permafrost Sample
PW - Porewater Sample
T - Sample Stored in Tube
W - Waxed Sample

RC - Radiocarbon Sample
MV - Minivane
FC - Fall Cone
TV - Torvane
PV - Pilcon Vane

RV - Remote Vane
PP - Pocket Penetrometer
UU - Unconsolidated Undrained Triaxial
UUU - UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial
CUU - CU Triaxial with Pore Pressure Measurements
CD - Consolidated Drained Triaxial

O - Organic Content
S - Salinity
TS - Thaw Strain
SG - Specific Gravity

SUMMARY OF TEST RESULTS

[illegible]

B - Bag Sample

G - Gas Sample

L - Liner Sample

P - Piston Sample

NR-No Recovery

NS - No Sample Remaining

PF - Permafrost Sample

PW - Porewater Sample

T - Sample Stored in Tube

W - Waxed Sample

RC - Radiocarbon Sample

MV - Minivane

FC - Fall Cone

TV - Torvane

PV - Pilcon Vane

RV - Remote Vane

PP - Pocket Penetrometer

UU - Unconsolidated Undrained Triaxial

UU_p-UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial

CUp - CU Triaxial with Pore Pressure Measurements

CD - Consolidated Drained Triaxial

O - Organic Content

S - Salinity

TS - Thaw Strain

SG - Specific Gravity

SUMMARY OF TEST RESULTS

Sample Number	Sample Type	Depth (metres)	Unified Soil Classification	Ground Ice Description (%)	Temp. (°C)	Moisture Content (%)	Unit Weight (kN/m³)	Salinity (%)	ATTERBERG LIMITS		GRAIN SIZE DISTRIBUTION					SHEAR STRENGTH				Remarks
									Liquid Limit (%)	Plastic Limit (%)	Clay (%)	Silt (%)	Sand (%)	Gravel (%)	D ₅₀ (µm)	Test	Shear Strength (kPa)	Failure Strain (%)	Consistency	
1A	B				-0.9															
1B	B	8.32-8.4	CL						31	13						PV	69			
1C	B	8.32-8.4				23.2														
1D	B	7.9																		
2A	shelby		CL-ML		+0.1	36.6			25	19										
2B	B	9.6-9.66	CL						28	12										
2C	B																			
3A	shelby		ML		-0.3				22	19						PV	44			
3B	B	11.55-11.57	CL			28.7			28	16	17.5	66.7	15.8	—						A=0.686
3C	B																			
4A	shelby		CL		0.0				27	16						PV	112			
4B	B	12.9-13.16	CL						26	18										
4C	B	12.9-13.16				27.6														
5A	shelby	14.33	CL		+0.8				30	19						MV	99			
5B	B	14.53	CL			32.1			30	14						PV	66			
5C	B																			
5D	B	14.4																		
5E	B																			
6A	shelby		ML-OL		-0.3				33	27						PV	+140			
6B	B	15.8-15.88	OL			29.2			31	25										
6C	B																			

B - Bag Sample
G - Gas Sample
L - Liner Sample
P - Piston Sample
NR - No Recovery

NS - No Sample Remaining
PF - Permafrost Sample
PW - Porewater Sample
T - Sample Stored in Tube
W - Waxed Sample

RC - Radiocarbon Sample
MV - Minivane
FC - Fall Cone
TV - Torvane
PV - Pilcon Vane

RV - Remote Vane
PP - Pocket Penetrometer
UU - Unconsolidated Undrained Triaxial
UUp - UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial
CU_p - CU Triaxial with Pore Pressure Measurements
CD - Consolidated Drained Triaxial

O - Organic Content
S - Salinity
TS - Thaw Strain
SG - Specific Gravity

SUMMARY OF TEST RESULTS

[illegible]

B - Bag Sample

G - Gas Sample

L - Liner Sample

P - Piston Samp

NR-No Recovery

NS - No Sample Remaining

PF - Permafrost Sample

PW - Porewater Sample

T - Sample Stored in Tube

W - Waxed Sample

RC - Radiocarbon Sample

MV - Minivane

FC - Fall Cone

TV - Torvane

PV - Pilcon Var

RV - Remote Vane

PP - Pocket Penetrometer

UU - Unconsolidated Undrained Triaxial

UUp- UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial

CUp - CU Triaxial with Pore Pressure Measurements

CD - Consolidated Drained Triaxial

O - Organic Content

S - Salinity

TS - Thaw Strain

SG - Specific Gravity

Project Number 10-300 Borehole Number F85-KF1 Page 2 of 2

SUMMARY OF TEST RESULTS

Sample Number	Sample Type	Depth (metres)	Unified Soil Classification	Ground Ice Description (%)	Temp. (°C)	Moisture Content (%)	Unit Weight (kN/m³)	Salinity (%)	ATTERBERG LIMITS		GRAIN SIZE DISTRIBUTION						SHEAR STRENGTH				Remarks
									Liquid Limit (%)	Plastic Limit (%)	Clay (%)	Silt (%)	Sand (%)	Gravel (%)	D ₅₀ (µm)	Test	Shear Strength (kPa)	Failure Strain (%)	Consistency		
1A	B				-0.7												PV	46			
1B	B		ML						48	29	43.0	54.5	2.5	—							A=0.442
1C	B																				
1D	B																				
1E	B	0-0.2																			
1F	B	0.2-0.36																			
2A	shelby		CL		0.0				39	23							MV	69			
2B	B	1.47-1.53	CL						41	21							PV	64			
2C	B																				
2D	B	1.5																			
3A	shelby		CL		+0.2				34	21							MV	30			
3B	B	2.92-3.03	ML						35	24							PV	22			
3C	B	2.92-3.03																			
3D	B	2.92-3.03																			
3E	B	3.0																			
4A	shelby				-0.3																
4B	B	4.2-4.32																			
4C	B	4.0-4.35																			
4E	B	4.0-4.2																			
4F	B	3.95-4.0	CL						34	22											
5A	shelby				+0.7												PV	78			

B - Bag Sample
G - Gas Sample
L - Liner Sample
P - Piston Sample
NR - No Recovery

NS - No Sample Remaining
PF - Permafrost Sample
PW - Porewater Sample
T - Sample Stored in Tube
W - Waxed Sample

RC - Radiocarbon Sample
MV - Minivane
FC - Fall Cone
TV - Torvane
PV - Pilcon Vane

RV - Remote Vane
PP - Pocket Penetrometer
UU - Unconsolidated Undrained Triaxial
UUU - UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial
CU_p - CU Triaxial with Pore Pressure Measurements
CD - Consolidated Drained Triaxial

O - Organic Content
S - Salinity
TS - Thaw Strain
SG - Specific Gravity

SUMMARY OF TEST RESULTS

Sample Number	Sample Type	Depth (metres)	Unified Soil Classification	Ground Ice Description (%)	Temp. (°C)	Moisture Content (%)	Unit Weight (kN/m³)	Salinity (%)	ATTERBERG LIMITS		GRAIN SIZE DISTRIBUTION					SHEAR STRENGTH				Remarks
									Liquid Limit (%)	Plastic Limit (%)	Clay (%)	Silt (%)	Sand (%)	Gravel (%)	D ₅₀ (µm)	Test	Shear Strength (kPa)	Failure Strain (%)	Consistency	
5B	B	5.4-5.48	CL						29	20		58.6	29.8	11.6						
5C	B	5.47-5.8																		
5D	B	5.4-5.5																		
5E	B																			
6A	shelby																			
6B	B	7.0-7.05	CL						31	21										
6C	B	7.02-7.05																		
6D	B	7.0																		
7A	shelby		CL		-0.5				38	24						MV	46			
7B	B	8.85-8.9	CL						35	20						PV	70			
7C	B	8.9																		
8A	shelby		ML						28	23										
8B	B	10.65	CL						27	17										
9A	split spoon				-0.4															
9B	B	11.55-12.04	CL						31	20										
9C	B	11.55-11.6																		
9D	B																			
9E	B	11.6																		
10A	split spoon				+0.1															
10B	B	13.37-13.57	CL						27	16										
10C	B	13.07-13.5																		

B - Bag Sample G - Gas Sample L - Liner Sample P - Piston Sample NR - No Recovery	NS - No Sample Remaining PF - Permafrost Sample PW - Porewater Sample T - Sample Stored in Tube W - Waxed Sample	RC - Radiocarbon Sample MV - Minivane FC - Fall Cone TV - Torvane PV - Pilcon Vane	RV - Remote Vane PP - Pocket Penetrometer UU - Unconsolidated Undrained Triaxial UUU - UU Triaxial with Pore Pressure Measurements	CU - Consolidated Undrained Triaxial CUU - CU Triaxial with Pore Pressure Measurements CD - Consolidated Drained Triaxial	O - Organic Content S - Salinity TS - Thaw Strain SG - Specific Gravity
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Project Number 10-300 Borehole Number F85-KF2 Page 2 of 4

SUMMARY OF TEST RESULTS

Sample Number	Sample Type	Depth (metres)	Unified Soil Classification	Ground Ice Description (%)	Temp. (°C)	Moisture Content (%)	Unit Weight (kN/m ³)	Salinity (%)	ATTERBERG LIMITS		GRAIN SIZE DISTRIBUTION					SHEAR STRENGTH				Remarks
									Liquid Limit (%)	Plastic Limit (%)	Clay (%)	Silt (%)	Sand (%)	Gravel (%)	D ₅₀ (µm)	Test	Shear Strength (kPa)	Failure Strain (%)	Consistency	
10D	B	13.50-13.52																		
11A	B																			
12A	shelby		CL-ML		-0.6	14.0	21.4		27	20	23.0	37.1	30.7	9.2						LI=-0.857 A=0.304
12B	B	16.52-16.62	CL						26	18										
12C	B	16.52-16.62																		
12D	B	16.42-16.52																		
13A	shelby	17.63-17.77	CL		-0.6	14.9	20.8		26	17	28.5	29.1	34.5	7.9						LI=0.233 A=0.316
13B	B	17.77-17.81																		
14A	HW shelby				-0.7															
14B	B	19.68-19.74	CL						33	21										
14C	B	19.74-19.83																		
14D	B	19.15-19.32	CL			20.2	20.0		30	18						MV	76			LI=0.183
14E	B	19.32-19.68				17.6	20.5				26.6	56.8	16.6	—						
15A	shelby		CL		-0.7				28	18						MV	153			
16A	HW shelby		ML-OL		-0.8	17.2	20.9		32	28	20.5	58.9	18.6	2.0		MV	107			LI=-2.7 A=0.195
16B	B	22.75-22.79																		
16C	B	22.73																		
17A	HW shelby		ML		-0.8	17.1	21.0		34	29						MV	93			LI=-2.38
17B	B	24.36-24.40																		
18A	B		CL			17.7	20.9		31	20						MV	100			LI=0.209
18B	B	27.47-27.51														FC	+140			

B - Bag Sample
G - Gas Sample
L - Liner Sample
P - Piston Sample
NR - No Recovery

NS - No Sample Remaining
PF - Permafrost Sample
PW - Porewater Sample
T - Sample Stored in Tube
W - Waxed Sample

RC - Radiocarbon Sample
MV - Minivane
FC - Fall Cone
TV - Torvane
PV - Pilcon Vane

RV - Remote Vane
PP - Pocket Penetrometer
UU - Unconsolidated Undrained Triaxial
UUp - UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial
CU_p - CU Triaxial with Pore Pressure Measurements
CD - Consolidated Drained Triaxial

O - Organic Content
S - Salinity
TS - Thaw Strain
SG - Specific Gravity

SUMMARY OF TEST RESULTS

[illegible]

B - Bag Sample
G - Gas Sample
L - Liner Sample
P - Piston Sample
NR - No Recovery

NS - No Sample Remaining
PF - Permafrost Sample
PW - Porewater Sample
T - Sample Stored in Tube
W - Waxed Sample

RC - Radiocarbon Sample
MV - Minivan
FC - Fall Cone
TV - Torvane
PV - Pilcon Vane

RV - Remote Vane
PP - Pocket Penetrometer
UU - Unconsolidated Undrained Triaxial
UUp- UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial
CU_p - CU Triaxial with Pore Pressure
Measurements
CD - Consolidated Drained Triaxial

O - Organic Content
S - Salinity
TS - Thaw Strain
SG - Specific Gravity

SUMMARY OF TEST RESULTS

Sample Number	Sample Type	Depth (metres)	Unified Soil Classification	Ground Ice Description (%)	Temp. (°C)	Moisture Content (%)	Unit Weight (kN/m³)	Salinity (%)	ATTERBERG LIMITS		GRAIN SIZE DISTRIBUTION					SHEAR STRENGTH				Remarks
									Liquid Limit (%)	Plastic Limit (%)	Clay (%)	Silt (%)	Sand (%)	Gravel (%)	D ₅₀ (µm)	Test	Shear Strength (kPa)	Failure Strain (%)	Consistency	
1A	shelby	0-0.72			0.0											PV	8			
1A		0.18				56.5														
1A		0.32				57.7	18.7													
1A		0.45				70.0														
1A		0.55				70.2		35												
1B	bottle	0.72				37.7	16.0													
1C	B	0.70-0.72	CH-OH						54	29										
2A	shelby	0.6-0.81			+1.2															
2A		0.66				59.5	18.4	28												
2B	bottle	0.81																		
3A	shelby	3.5-4.2			+0.4											PV	20			
3A		3.54				46.8	19.7	29												
3A		3.65				46.8	19.6	27												
3A		3.87				44.8	19.9	35												
3A		3.97				48.0	19.6	34												
3A		4.10				47.5	19.6	32												
3B	bottle	4.2				39.4														
3C	B		MH-OH						54	29										
4A	B	4.2-4.6							53	34										
5A	shelby	6.0-6.23			-0.5											PV	22			
5A		6.11				51.2	19.3	46												

B - Bag Sample G - Gas Sample L - Liner Sample P - Piston Sample NR - No Recovery	NS - No Sample Remaining PF - Permafrost Sample PW - Porewater Sample T - Sample Stored in Tube W - Waxed Sample	RC - Radiocarbon Sample MV - Minivane FC - Fall Cone TV - Torvane PV - Pilcon Vane	RV - Remote Vane PP - Pocket Penetrometer UU - Unconsolidated Undrained Triaxial UUup - UU Triaxial with Pore Pressure Measurements	CU - Consolidated Undrained Triaxial CUup - CU Triaxial with Pore Pressure Measurements CD - Consolidated Drained Triaxial	O - Organic Content S - Salinity TS - Thaw Strain SG - Specific Gravity
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SUMMARY OF TEST RESULTS

Sample Number	Sample Type	Depth (metres)	Unified Soil Classification	Ground Ice Description (%)	Temp. (°C)	Moisture Content (%)	Unit Weight (kN/m³)	Salinity (%)	ATTERBERG LIMITS		GRAIN SIZE DISTRIBUTION					SHEAR STRENGTH				Remarks
									Liquid Limit (%)	Plastic Limit (%)	Clay (%)	Silt (%)	Sand (%)	Gravel (%)	D ₅₀ (µm)	Test	Shear Strength (kPa)	Failure Strain (%)	Consistency	
5A		6.17				46.1	19.7	37												
5B	bottle	6.21-6.23				28.0														
5C	B	6.23																		
5D	B	6.21-6.23	MH-OH						55	30										
6A	shelby	7.01-7.68			+0.4											PV	29			
6B	bottle	7.68				24.7	18.0													
6C	B																			
6D	B																			
7A	shelby	9.0-9.7			+0.4											MV	44			
7A		9.25				43.1	20.0	27												
7A		9.35				44.0	20.1	54												
7A		9.56				47.6	19.6	42												
7A		9.67				51.8	19.3	46												
7B	bottle						17.6									PV	14			
7C	B		CL						46	24										
8A	shelby	10.6-11.3			-0.1											PV	17			
9A	shelby	11.8-12.5			-0.9											PV	32			
9A		12.03				39.3	18.0	40												
9A		12.22				37.7	18.2	48												
10A	shelby				-0.7															
10A		11.95				33.7	18.2	36												

B - Bag Sample
G - Gas Sample
L - Liner Sample
P - Piston Sample
NR - No Recovery

NS - No Sample Remaining
PF - Permafrost Sample
PW - Porewater Sample
T - Sample Stored in Tube
W - Waxed Sample

RC - Radiocarbon Sample
MV - Minivane
FC - Fall Cone
TV - Torvane
PV - Pilcon Vane

RV - Remote Vane
PP - Pocket Penetrometer
UU - Unconsolidated Undrained Triaxial
UUU - UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial
CU_p - CU Triaxial with Pore Pressure Measurements
CD - Consolidated Drained Triaxial

O - Organic Content
S - Salinity
TS - Thaw Strain
SG - Specific Gravity

SUMMARY OF TEST RESULTS

[illegible]

B - Bag Sample

G - Gas Sample

L - Liner Sample

P - Piston Sample

NR-No Recovery

NS - No Sample Remaining

PF - Permafrost Sample

PW - Porewater Sample

T - Sample Stored in Tube

W - Waxed Sample

RC - Radiocarbon Sample

MV - Minivane

FC – Fall Cone**TV - Torvane**

PV - Pilcon Vane

RV - Remote Vane

PP - Pocket Penetrometer

UU - Unconsolidated Undrained Triaxial

UU_p-UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial

CUp - CU Triaxial with Pore Pressure Measurements

CD - Consolidated Drained Triaxial

O - Organic Content

\$ - Salinity

TS - Thaw Strain

SG - Specific Gravity

Project Number 10-300

Borehole Number F85-KF7

Page 3 of 3

SUMMARY OF TEST RESULTS

Sample Number	Sample Type	Depth (metres)	Unified Soil Classification	Ground Ice Description (%)	Temp. (°C)	Moisture Content (%)	Unit Weight (kN/m³)	Salinity (%)	ATTERBERG LIMITS		GRAIN SIZE DISTRIBUTION					SHEAR STRENGTH				Remarks
									Liquid Limit (%)	Plastic Limit (%)	Clay (%)	Silt (%)	Sand (%)	Gravel (%)	D ₅₀ (µm)	Test	Shear Strength (kPa)	Failure Strain (%)	Consistency	
1A	B	0.18			+1.4							13.1	86.9	—						
2A	TW shelby	1.52-1.86			+1.3											PV	+140			
2B	bottle	1.80				15.2	15.0													
2C	—	1.55				26.0														
2D	B	1.52-1.86									15.0	61.2	23.8	—						
3A	TW shelby	3.05-3.75			+0.8											PV	20			
3B	B	3.65-3.75							N	P	12.7	66.1	21.2	—						
3C	B	3.20-3.28																		
3D	bottle	3.74-3.75				19.3														
3E	B	3.10-3.15																		
3F	B	3.05-3.10																		
4A	TW shelby	4.6-5.2			+0.8											PV	30			
4B	B	4.65-4.85									8.8	74.6	16.6	—						
5A	shelby	4.49-5.95			0.0											MV	46			
5B	B	5.85-5.87					18.3									PV	63			
5C	B	5.87-5.95																		
6A	shelby	7.62-8.32			+0.5											MV	43			
6B	B	8.24-8.26					18.7													
6C	B	8.26-8.32																		
7A	shelby	9.1-9.885			+0.4											PV	27			
7B	B	9.84-9.885																		

B - Bag Sample
G - Gas Sample
L - Liner Sample
P - Piston Sample
NR - No Recovery

NS - No Sample Remaining
PF - Permafrost Sample
PW - Porewater Sample
T - Sample Stored in Tube
W - Waxed Sample

RC - Radiocarbon Sample
MV - Minivane
FC - Fall Cone
TV - Torvane
PV - Pilcon Vane

RV - Remote Vane
PP - Pocket Penetrometer
UU - Unconsolidated Undrained Triaxial
UUup - UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial
CUup - CU Triaxial with Pore Pressure Measurements
CD - Consolidated Drained Triaxial

O - Organic Content
S - Salinity
TS - Thaw Strain
SG - Specific Gravity

SUMMARY OF TEST RESULTS

[illegible]

3 - Bag Sample

G - Gas Sample

L - Liner Sample

P - Piston Sample

NR-No Recovery

NS - No Sample Remaining

PF - Permafrost Sample

PW - Porewater Sample

T - Sample Stored in Tube

W - Waxed Sample

RC - Radiocarbon Sample

MV - Minivane

FC - Fall Cone

TV - Torvane

PV - Pilcon Vane

RV - Remote Vane

PP - Pocket Penetrometer

UU - Unconsolidated Undrained Triaxial

UU_p-UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial

CUp - CU Triaxial with Pore Pressure Measurements

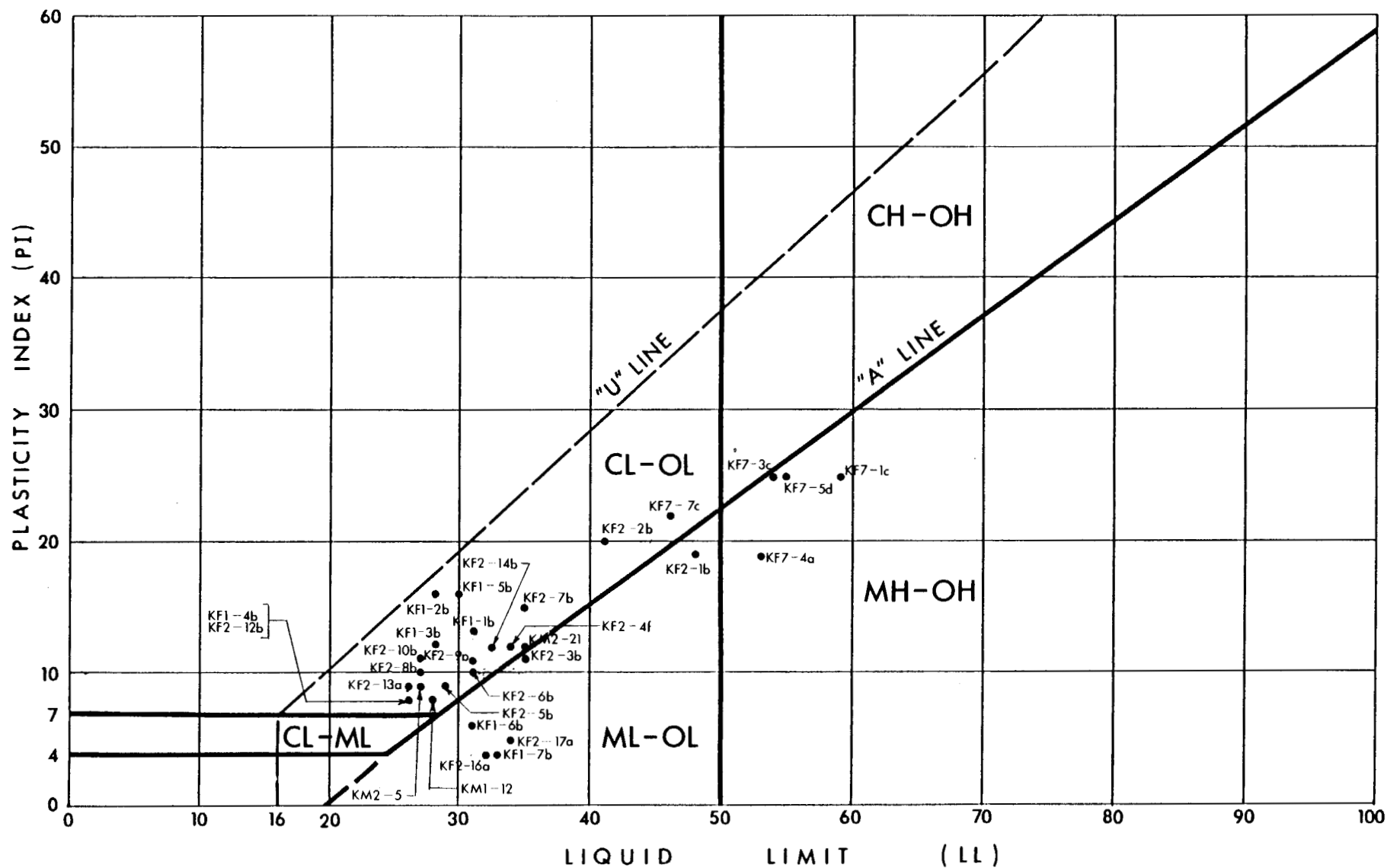
CD - Consolidated Drained Triaxial

O - Organic Content

S - Salinity

TS - Thaw Strain

SG – Specific Gravity



ATTERBERG LIMITS - OFFSHORE

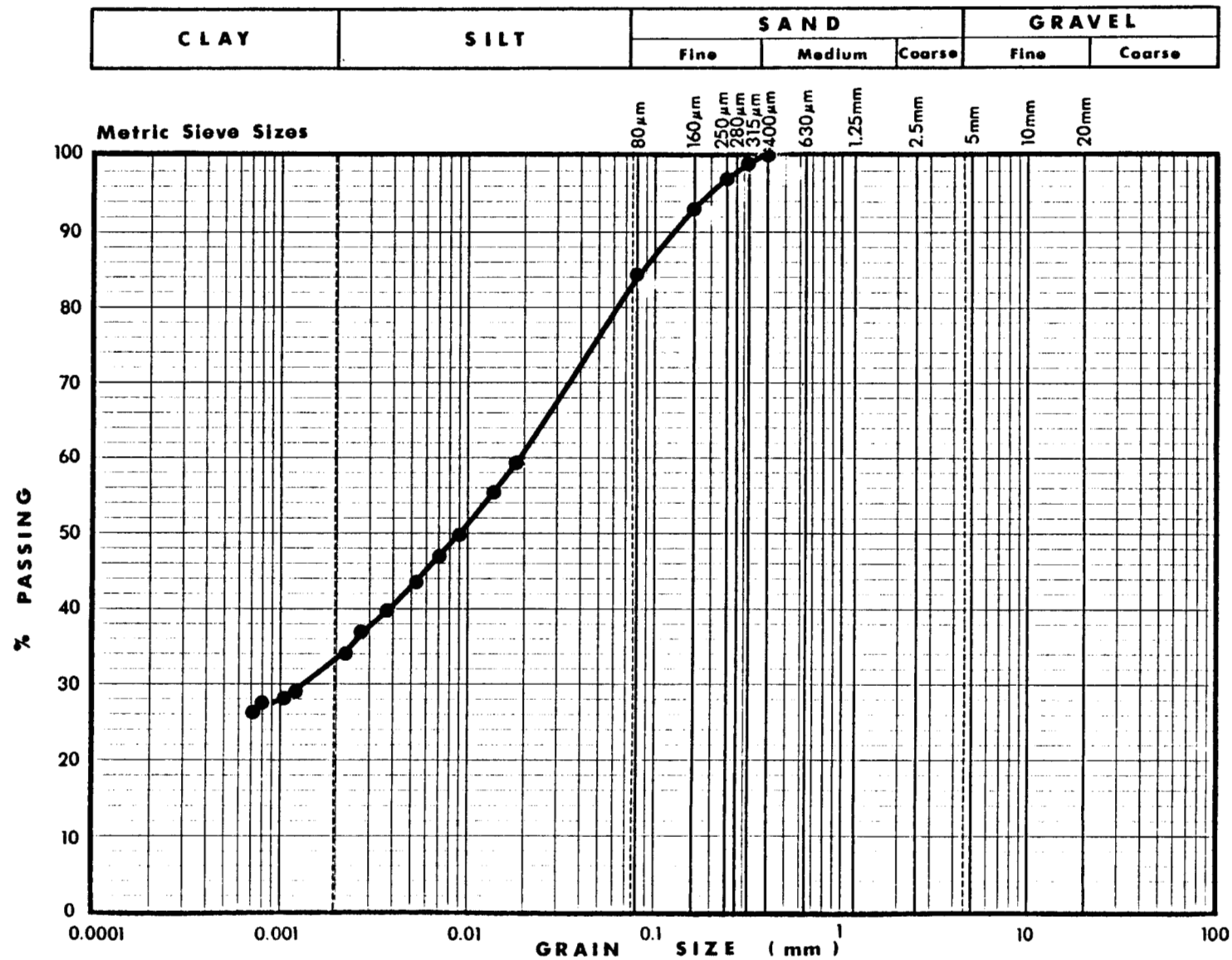
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/06/03

DRAWN BY: MG

DWG. No.: B-1



Borehole Number F85-KM1
Sample Number 12

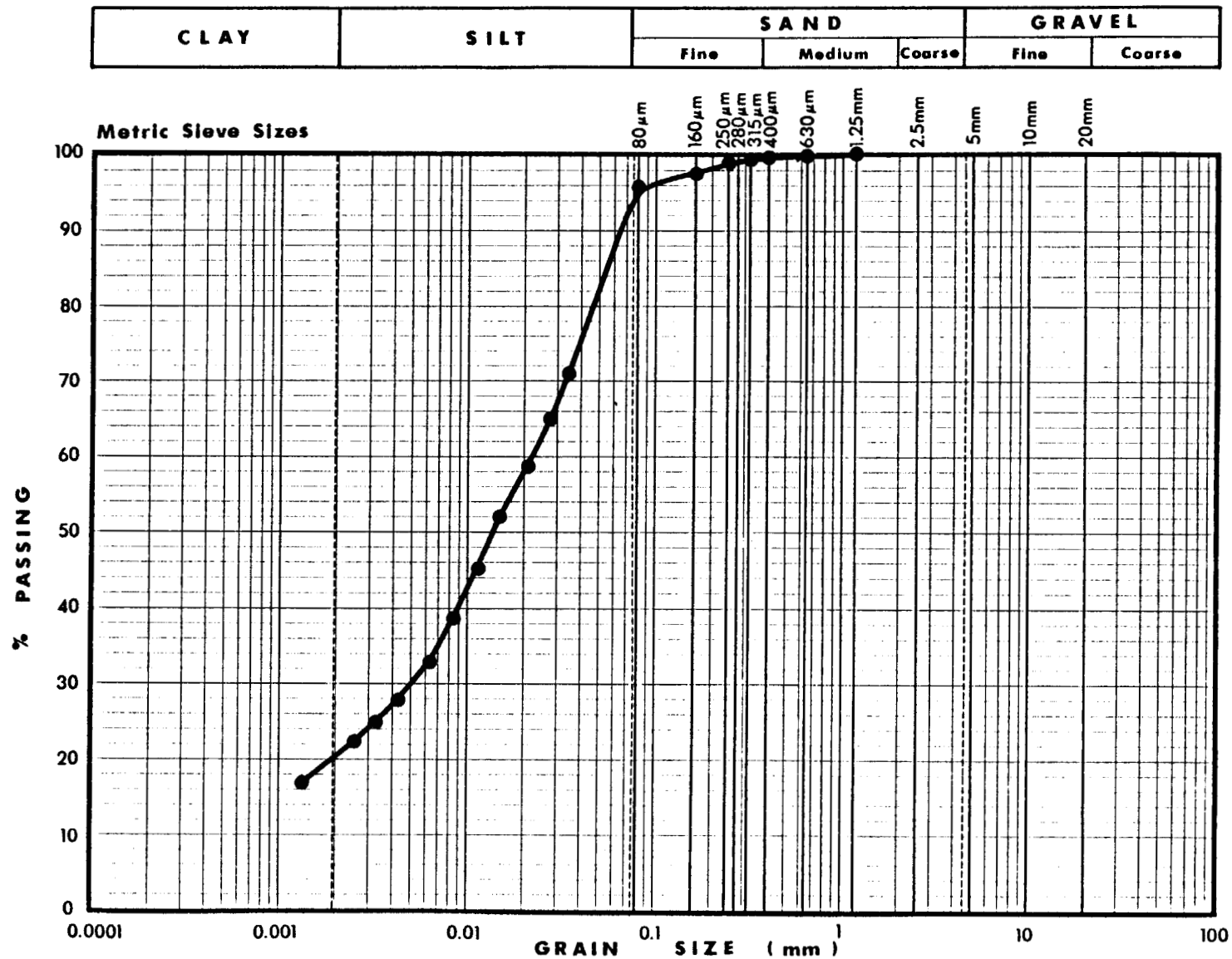
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/06/03

DRAWN BY: GJB

DWG. No.: B-2



Borehole Number F85-KM2
Sample Number 21

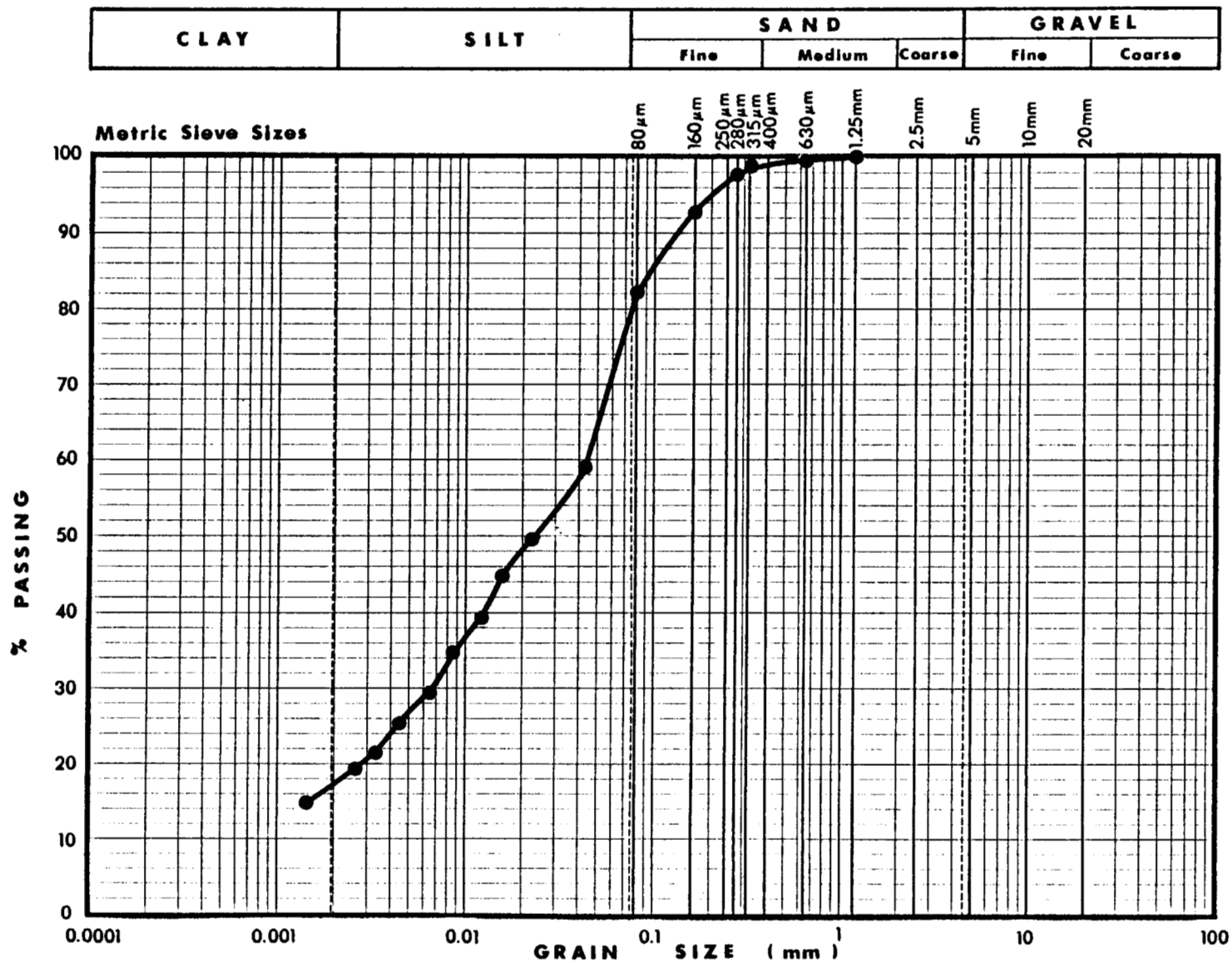
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/30

DRAWN BY: GJB

DWG. No.: B-3



Borehole Number F85-KF1
Sample Number 3B

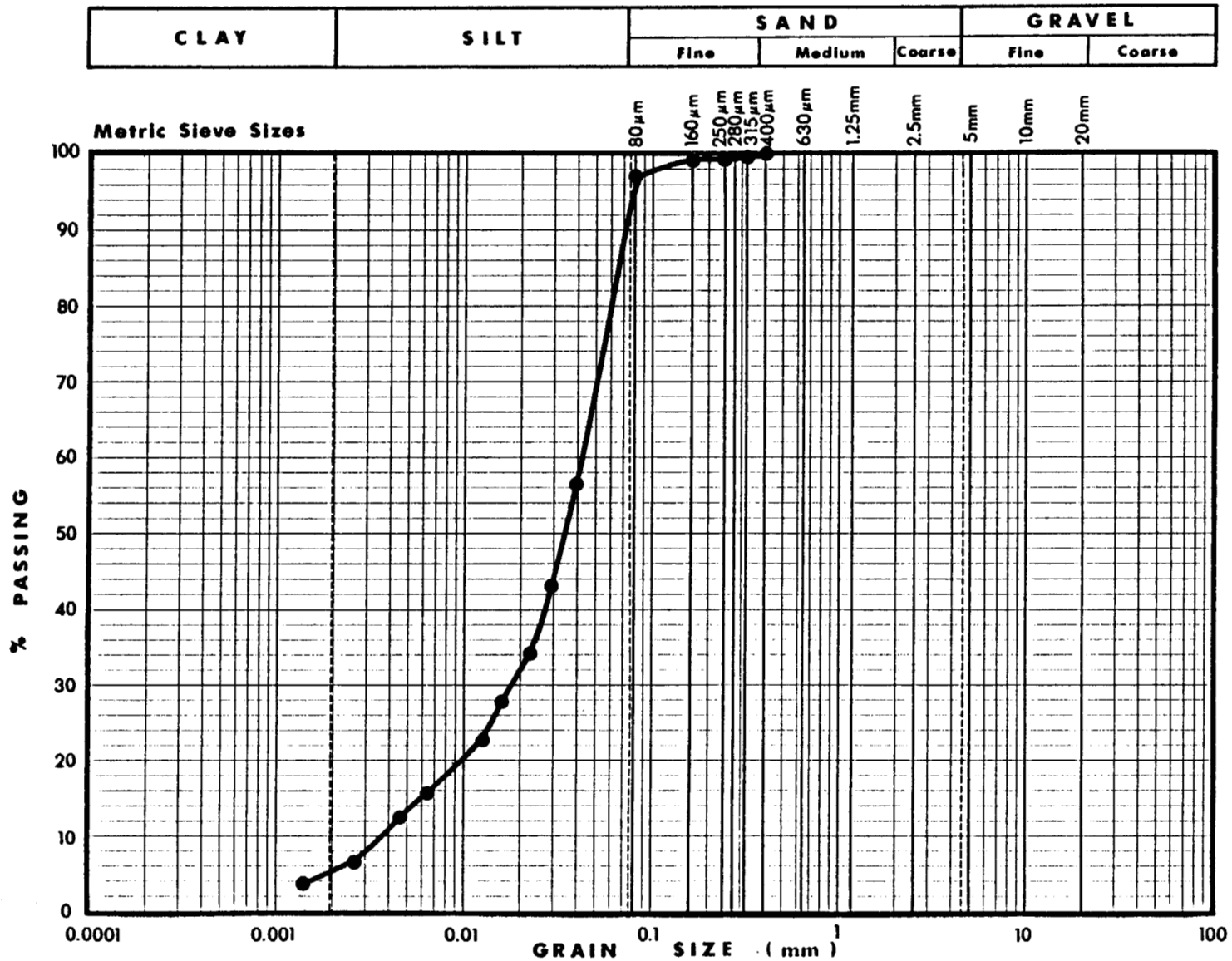
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/17

DRAWN BY: GJB

DWG. No.: B-4



Borehole Number F85-KF1
Sample Number 7B

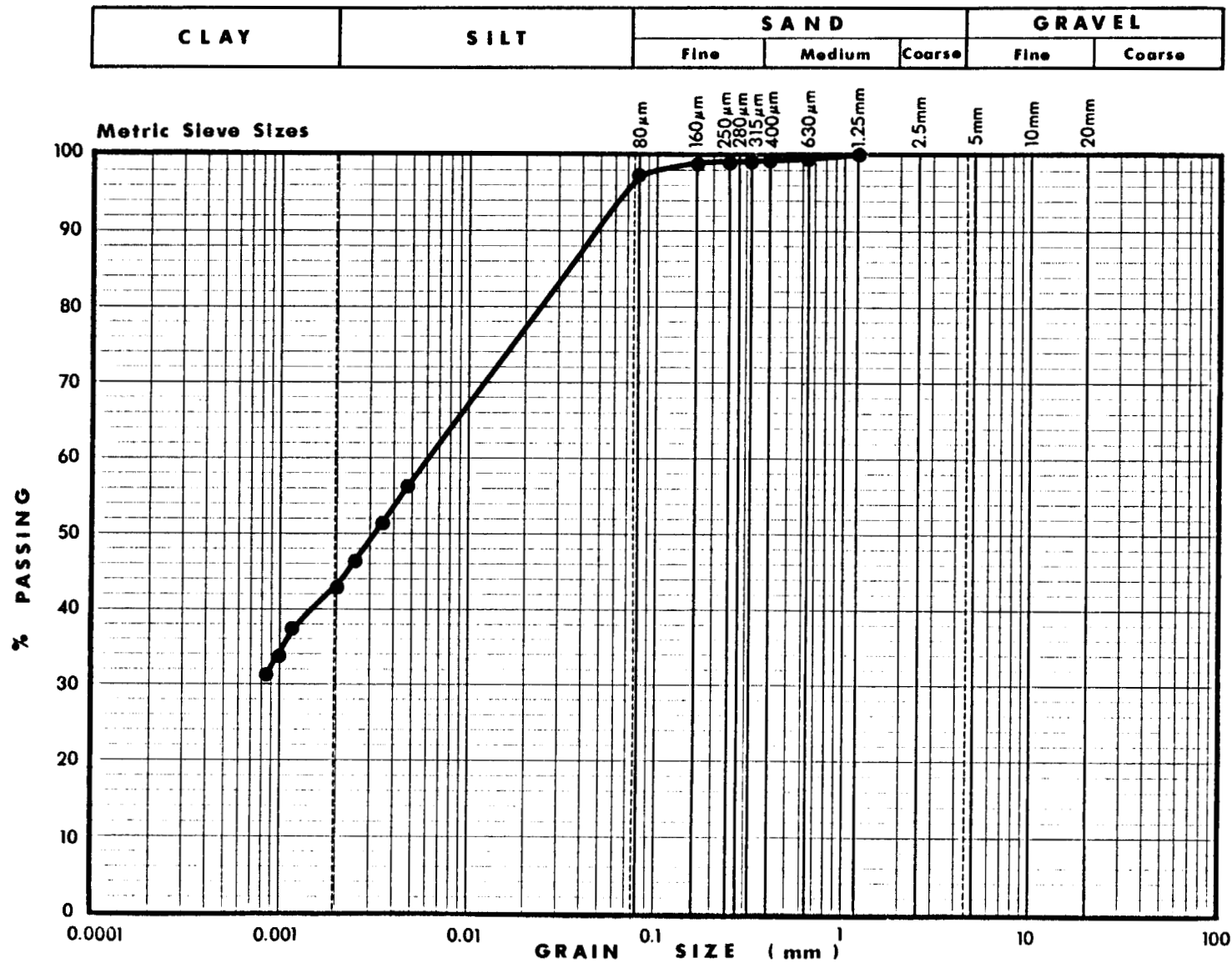
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/23

DRAWN BY: GJB

DWG. No.: B-5



Borehole Number F85-KF2
Sample Number 1B

M. J. O'CONNOR & ASSOCIATES LTD.

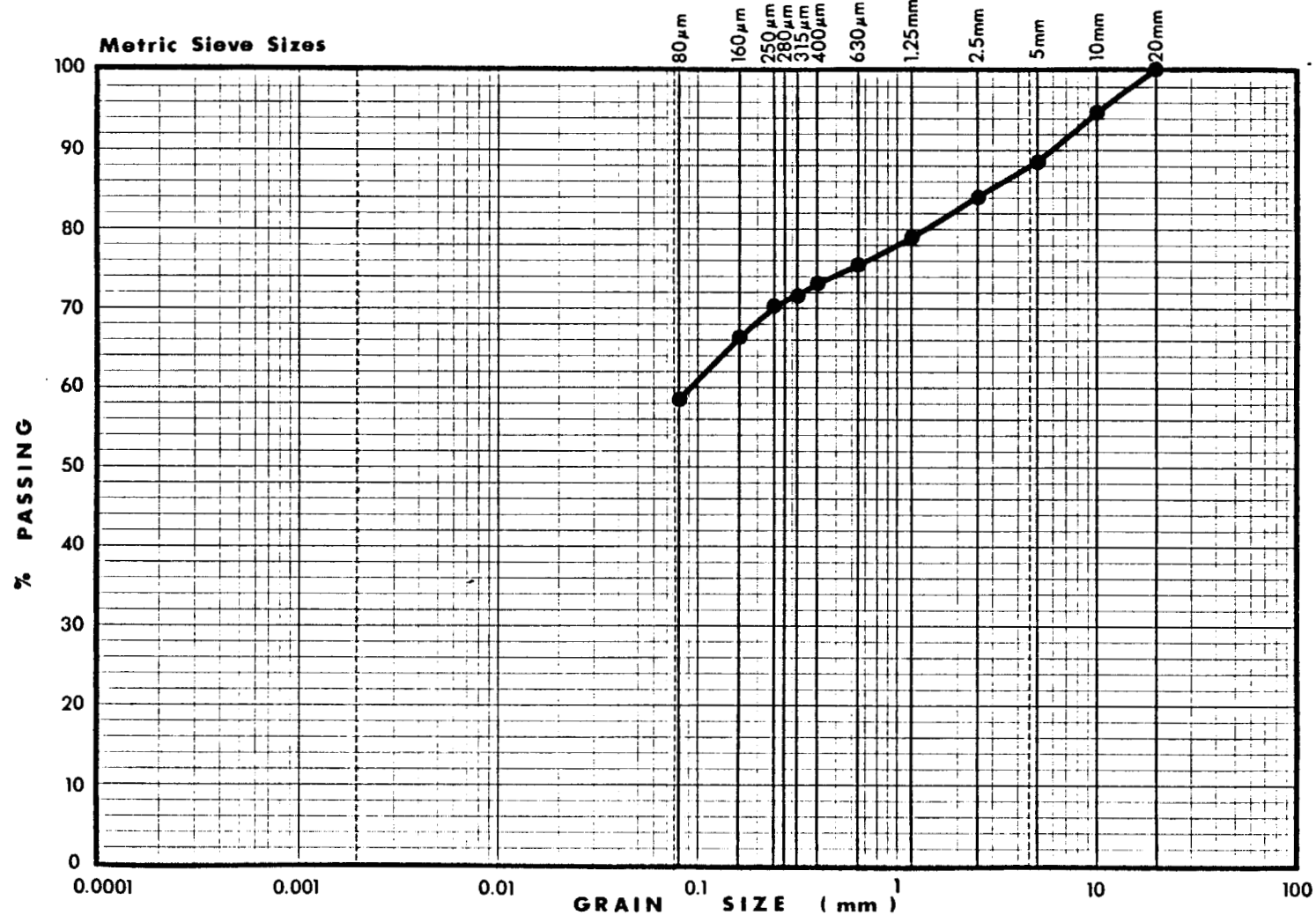
JOB No.: 10-300

DATE: 85/06/03

DRAWN BY: GJB

DWG. No.: B-6

CLAY	SILT	SAND			GRAVEL	
		Fine	Medium	Coarse	Fine	Coarse



Borehole Number F85-KF2
Sample Number 5B

M.J. O'CONNOR & ASSOCIATES LTD.

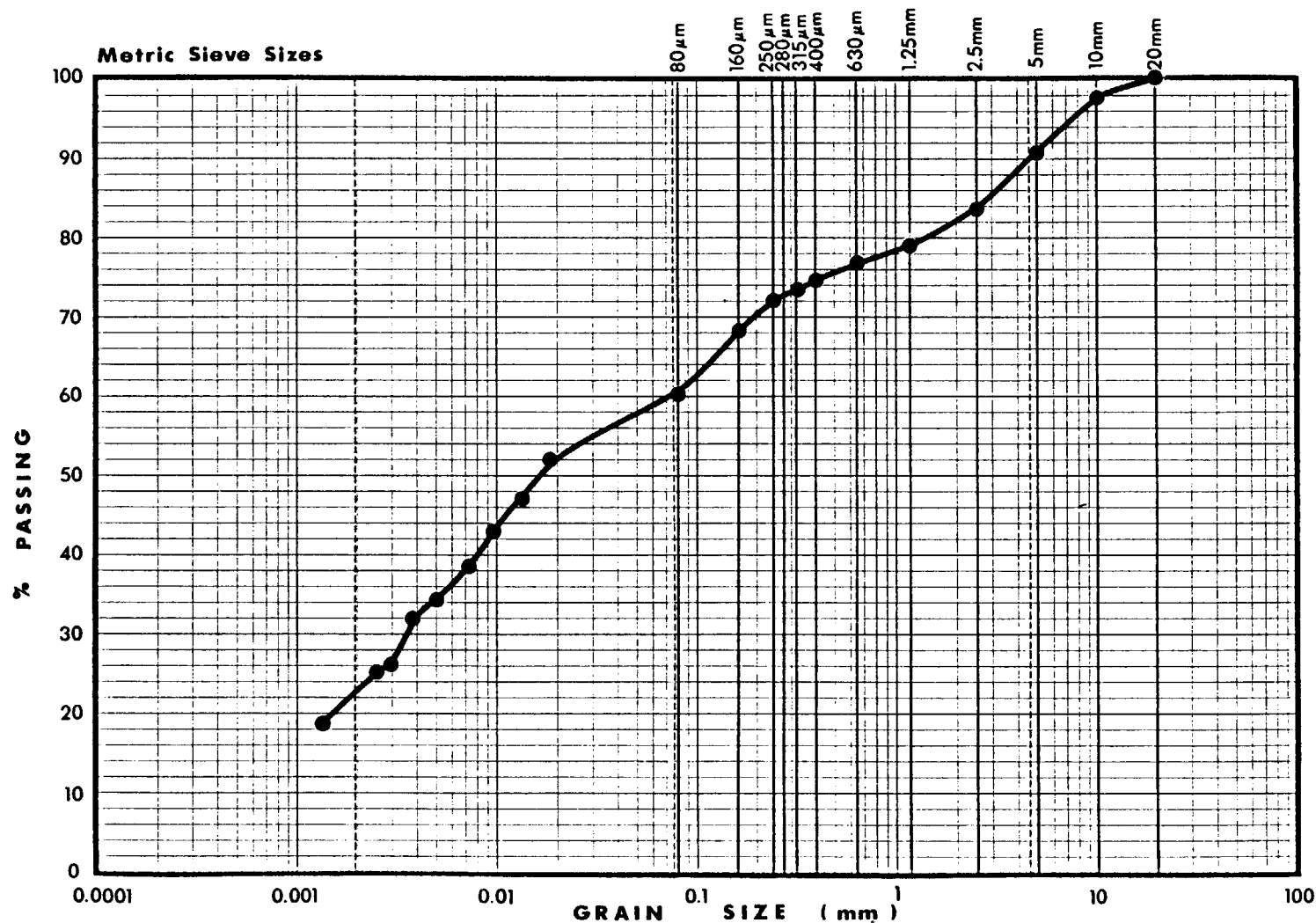
JOB No.: 10-300

DATE: 85/06/05

DRAWN BY: GJB

DWG. No.: B-7

CLAY	SILT	SAND			GRAVEL	
		Fine	Medium	Coarse	Fine	Coarse



Borehole Number F85-KF2
Sample Number 12A

M. J. O'CONNOR & ASSOCIATES LTD.

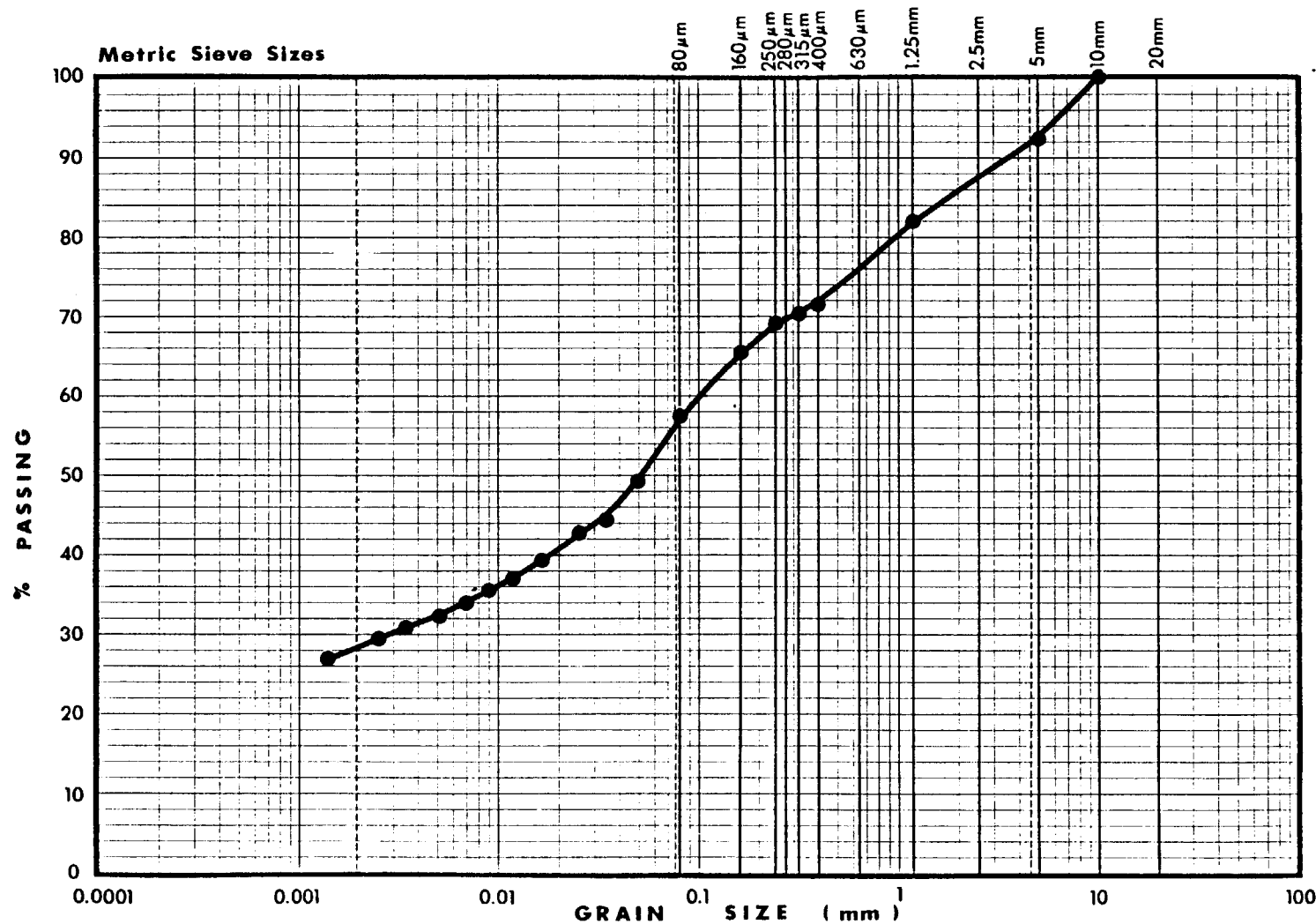
JOB No.: 10-300

DATE: 85/06/05

DRAWN BY: GJB

DWG. No.: B-8

CLAY	SILT	SAND			GRAVEL	
		Fine	Medium	Coarse	Fine	Coarse



Borehole Number F85-KF2
Sample Number 13A

M. J. O'CONNOR & ASSOCIATES LTD.

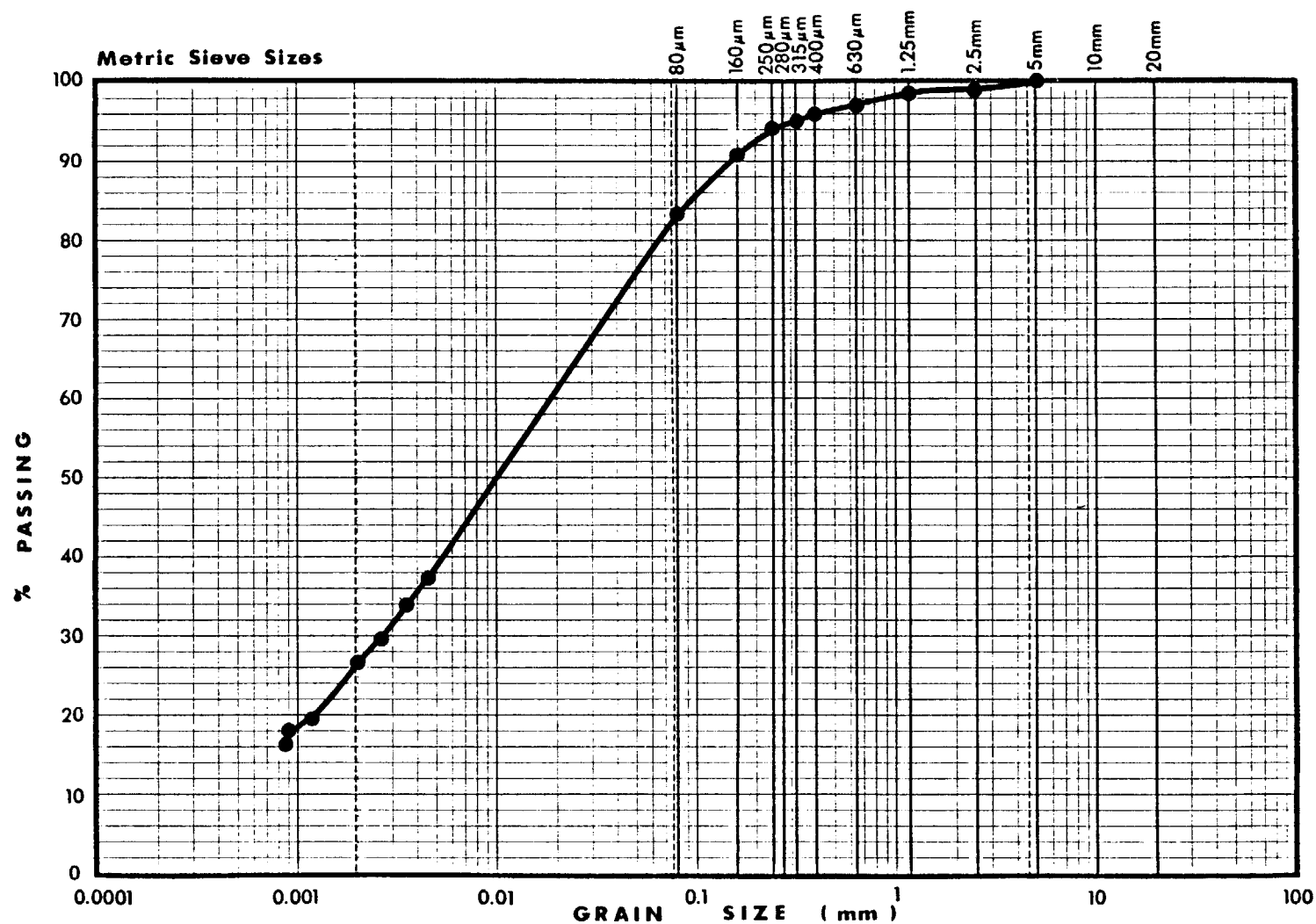
JOB No.: 10-300

DATE: 85/06/03

DRAWN BY: GJB

DWG. No.: B-9

CLAY	SILT	SAND			GRAVEL	
		Fine	Medium	Coarse	Fine	Coarse



Borehole Number F85-KF2
Sample Number 14E

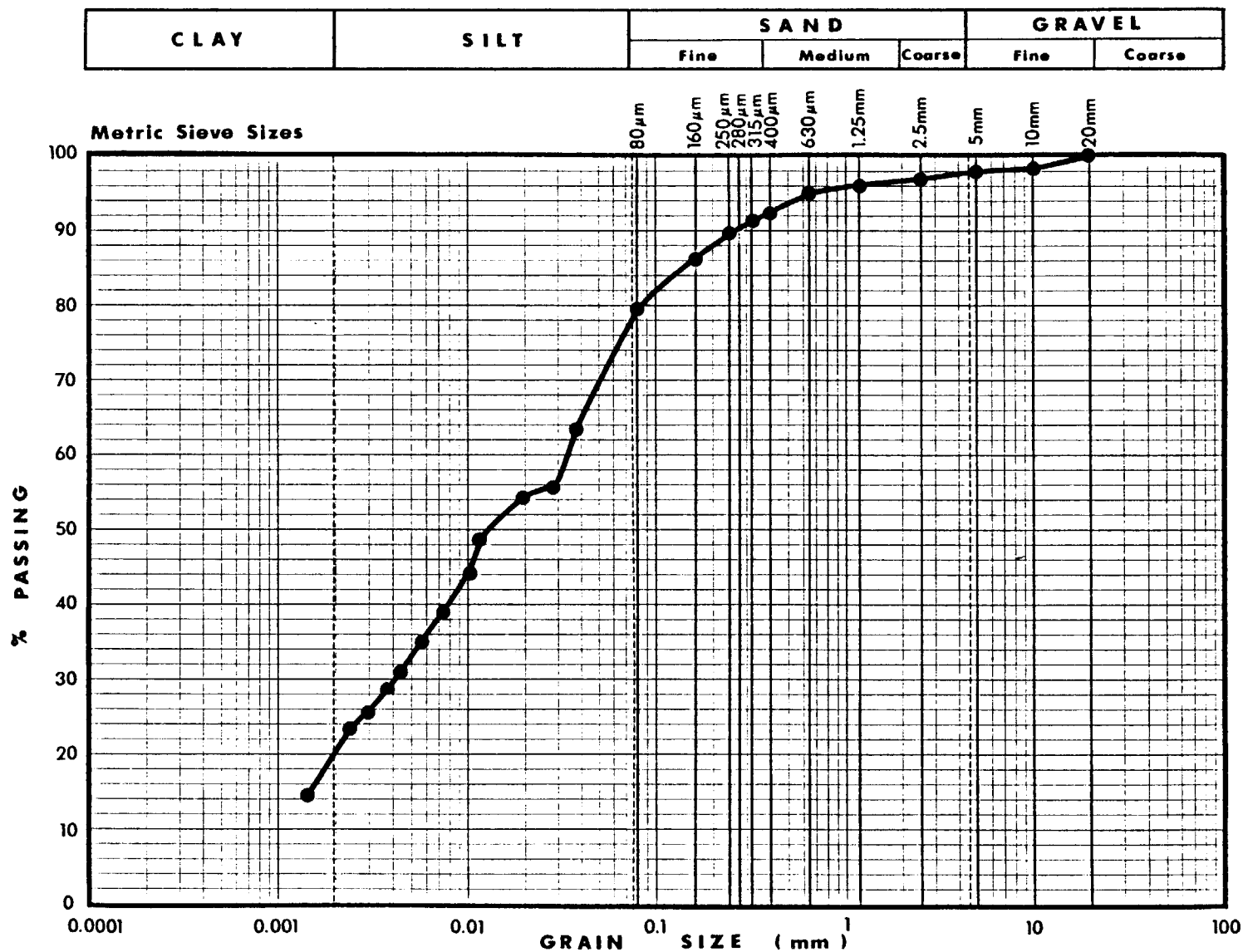
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/30

DRAWN BY: GJB

DWG. No.: B-10



Borehole Number F85-KF2
Sample Number 16A

M. J. O'CONNOR & ASSOCIATES LTD.

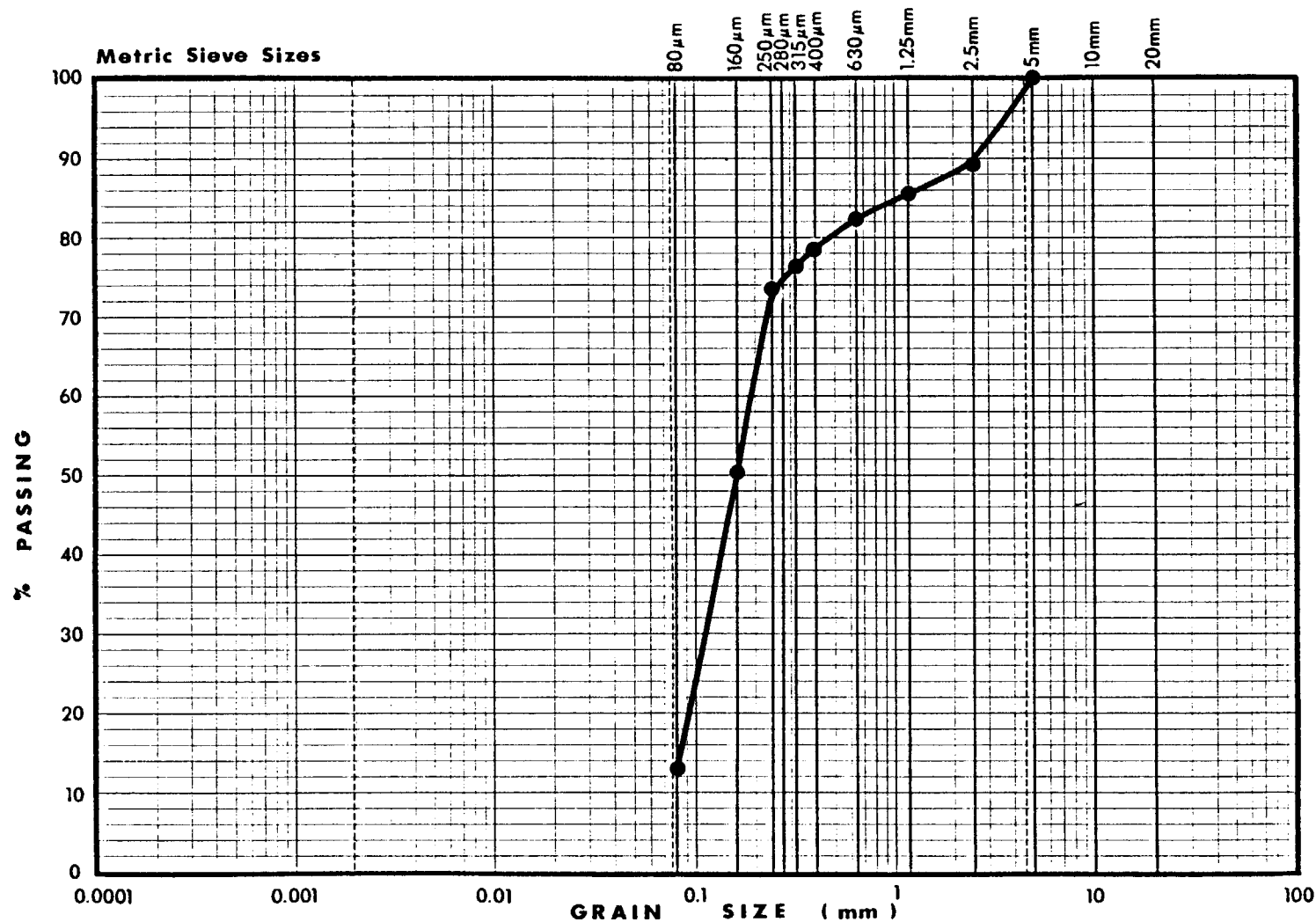
JOB No.: 10-300

DATE: 85/05/17

DRAWN BY: GJB

DWG. No.: B-11

CLAY	SILT	SAND			GRAVEL	
		Fine	Medium	Coarse	Fine	Coarse



Borehole Number F85-KF8
Sample Number 1A

M. J. O'CONNOR & ASSOCIATES LTD.

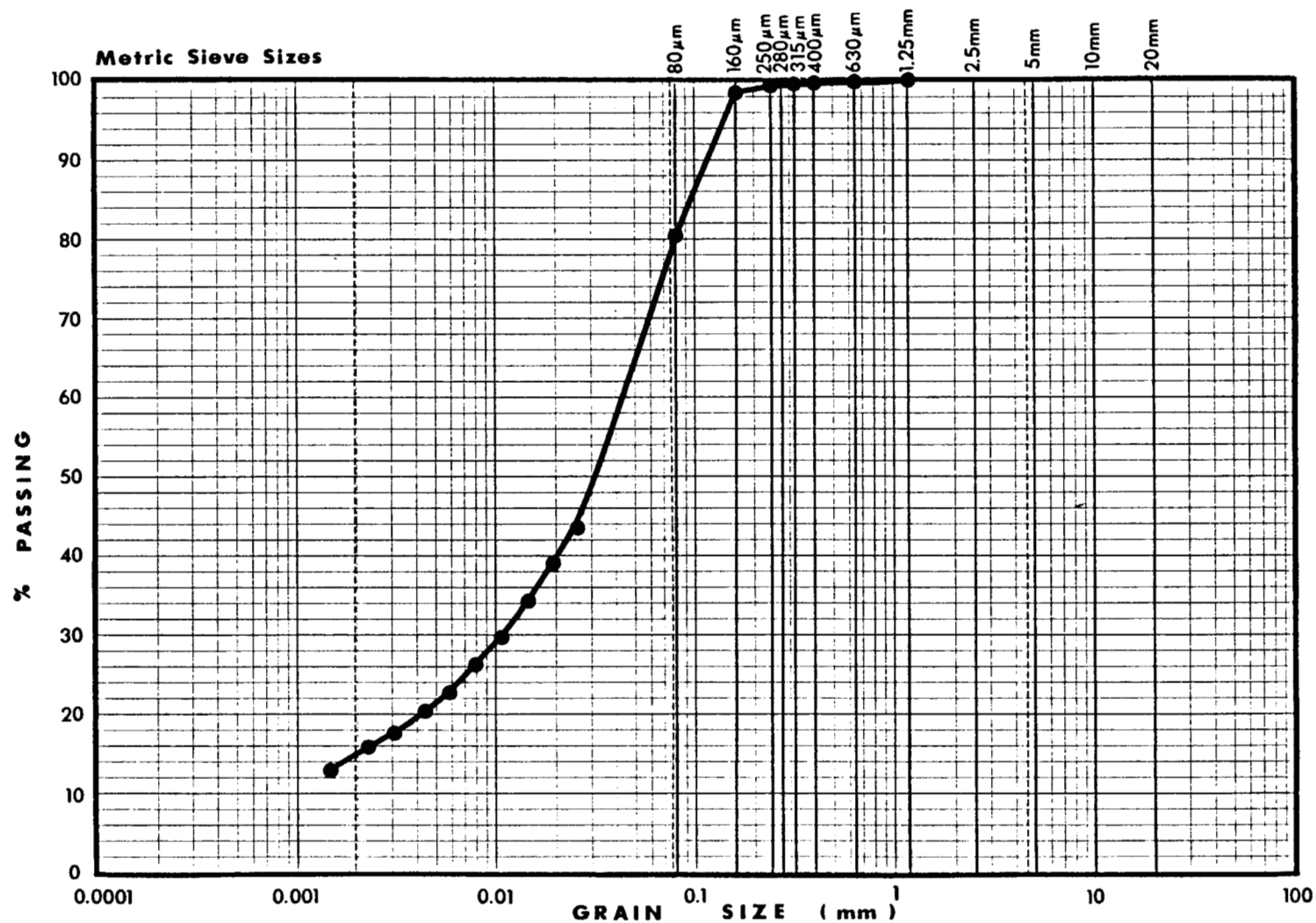
JOB No.: 10-300

DATE: 85/06/05

DRAWN BY: GJB

DWG. No.: B-12

CLAY	SILT	SAND			GRAVEL	
		Fine	Medium	Coarse	Fine	Coarse



Borehole Number F85-KF8
Sample Number 2D

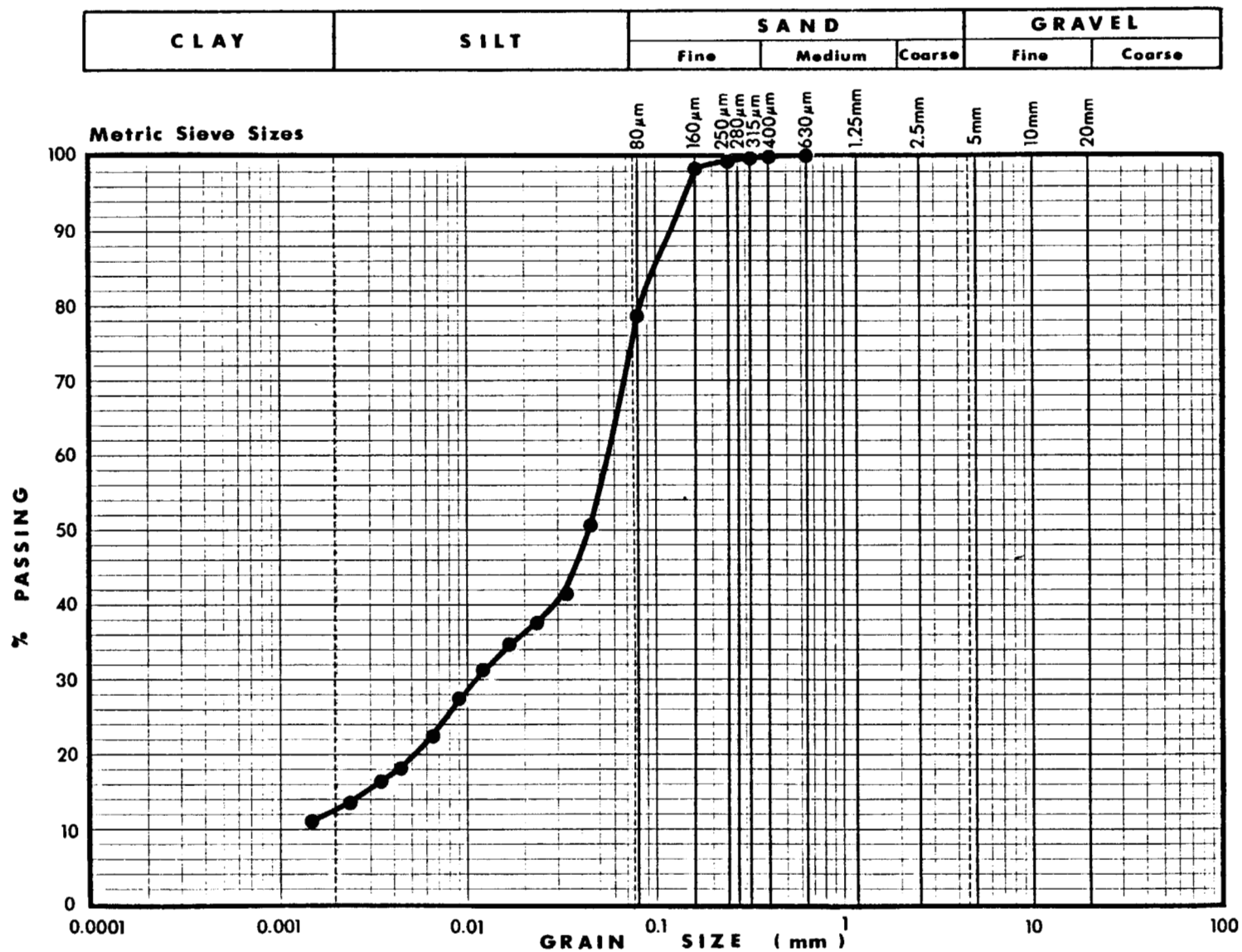
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/09

DRAWN BY: GJB

DWG. No.: B-13



Borehole Number F85-KF8
Sample Number 3B

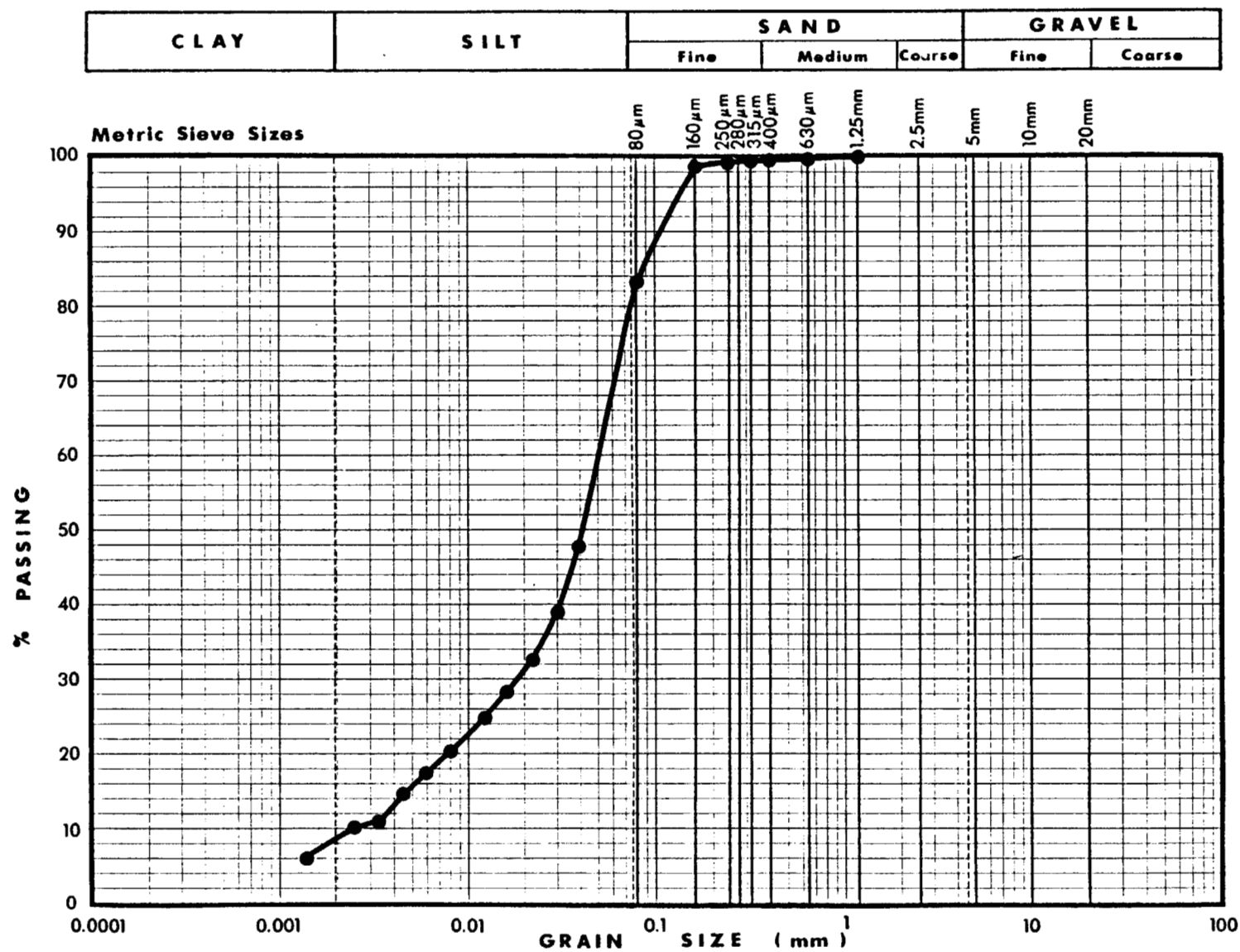
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/08

DRAWN BY: GJB

DWG. No.: B-14



Borehole Number F85-KF8
Sample Number 4B

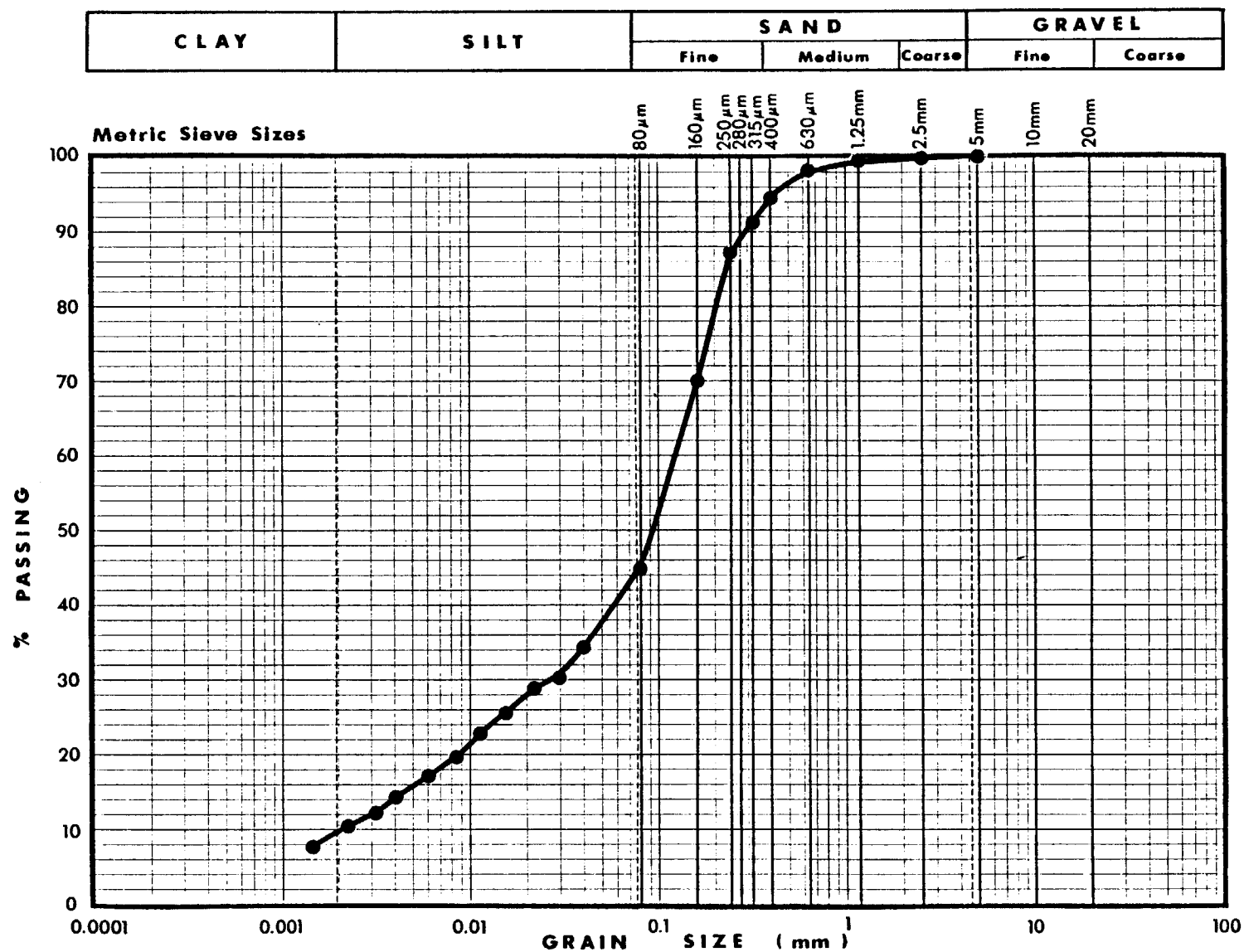
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/06/03

DRAWN BY: GJB

DWG. No.: B-15



Borehole Number F85-KF8
Sample Number 7C

M. J. O'CONNOR & ASSOCIATES LTD.

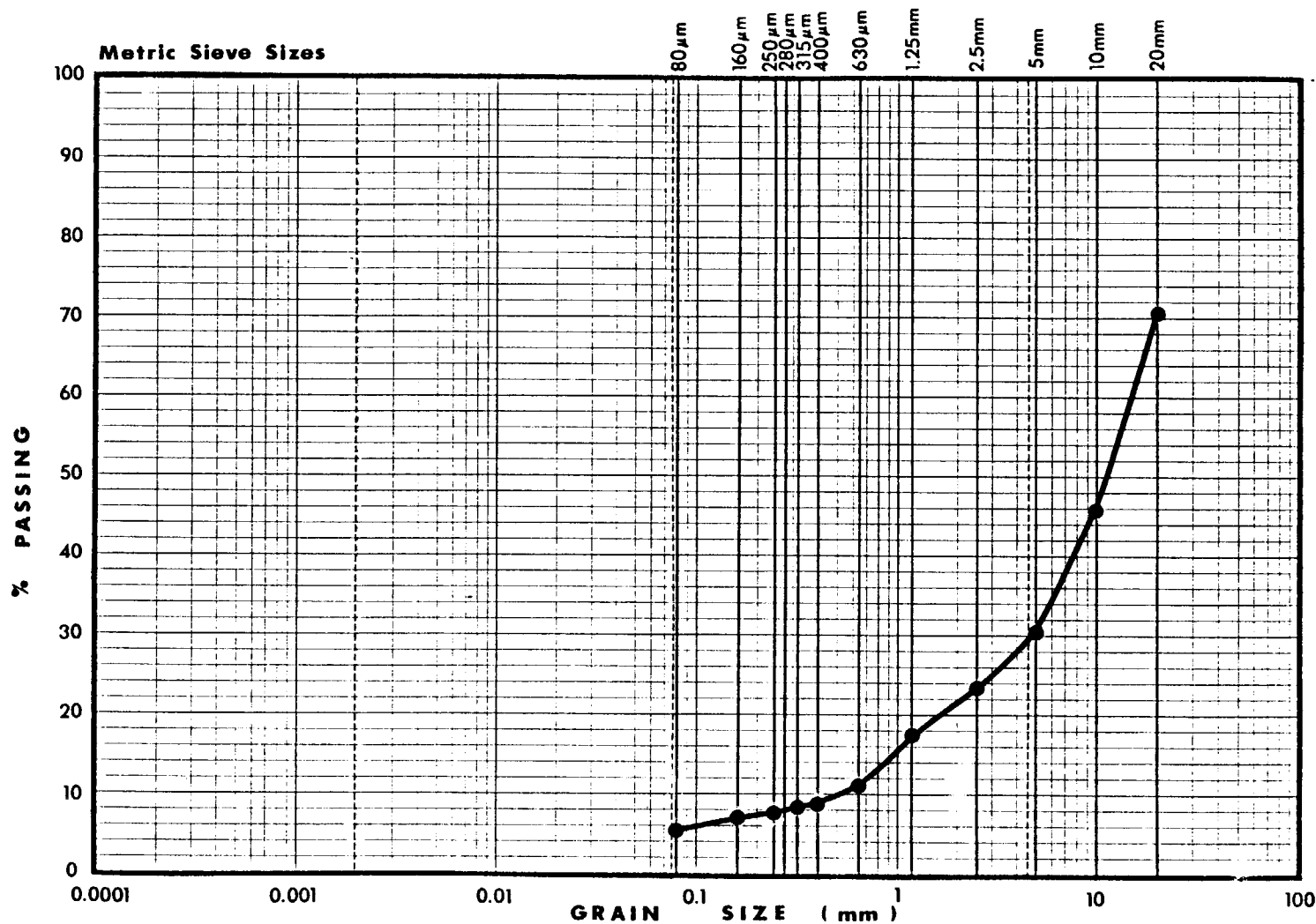
JOB No.: 10-300

DATE: 85/05/09

DRAWN BY: GJB

DWG. No.: B-16

CLAY	SILT	SAND			GRAVEL	
		Fine	Medium	Coarse	Fine	Coarse



Borehole Number F85-KF8
Sample Number 8A

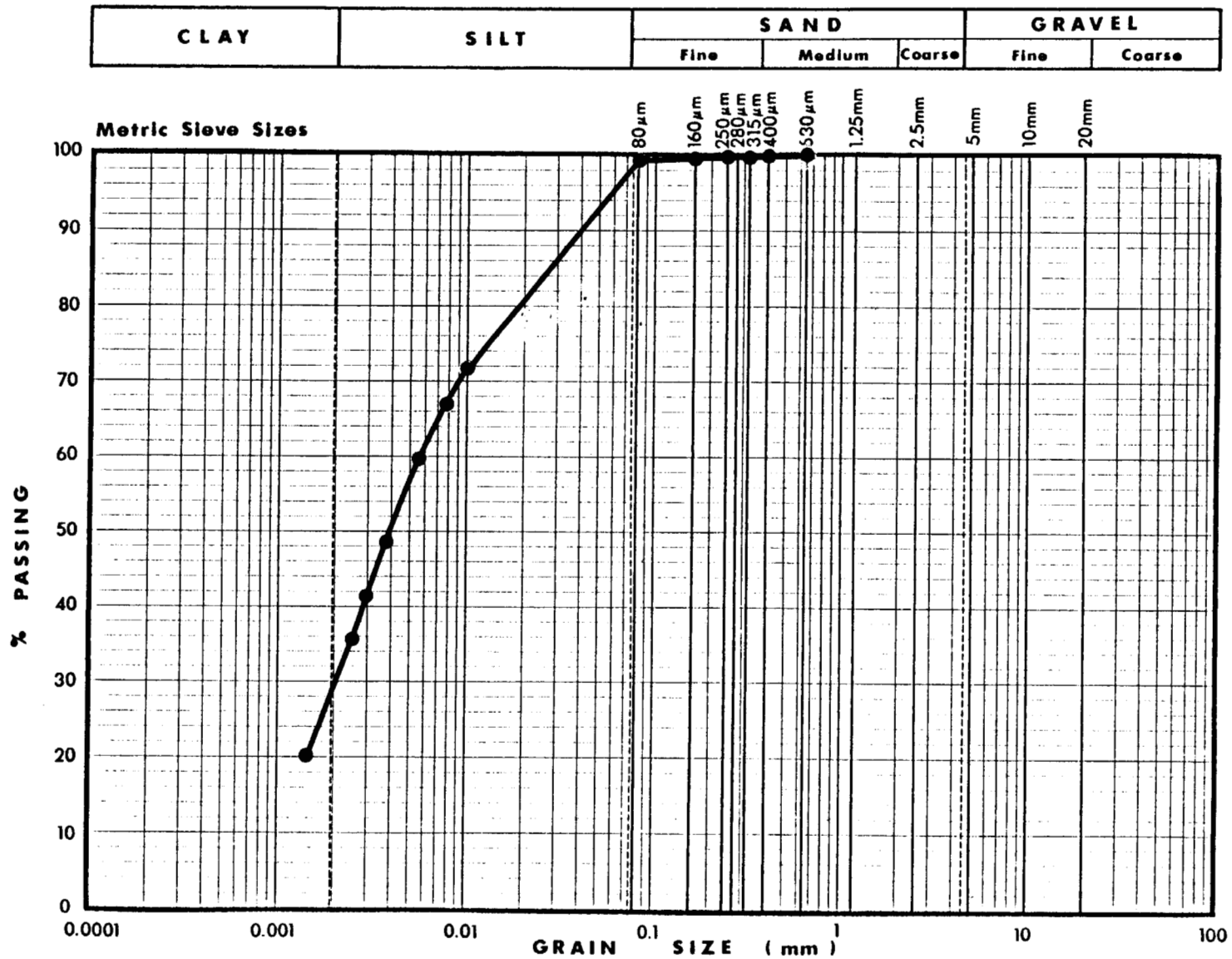
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/06/05

DRAWN BY: GJB

DWG. No.: B-17



Borehole Number F85-KF10
Sample Number 5A

M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/17

DRAWN BY: GJB

DWG. No.: B-18

APPENDIX B-2

Coastal Samples - Test Data

SUMMARY OF TEST RESULTS

[illegible]

B - Bag Sample

G - Gas Sample

L - Liner Sample

P - Piston Samp

NR- No Recovery

NS - No Sample Remaining

PF - Permafrost Sample

PW - Porewater Sample

T - Sample Stored in Tu

W - Waxed Sample

RC - Radiocarbon Sample

MV - Miniyane

FC - Fall Cono

TV - Torvane

PV - Pilcon Var

RV - Remote Vane

PP - Pocket Penetrometer

UU - Unconsolidated Undrained Triaxial

UUp- UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial

CUp - CU Triaxial with Pore Pressure Measurements

CD - Consolidated Drained Triaxial

O - Organic Content

S - Salinity

TS ~ Thaw Strain

SG - Specific Gravity

Project Number 10-300 Borehole Number F85-KM3 Page 1 of 1

SUMMARY OF TEST RESULTS

[illegible]

B - Bag Sample

G - Gas Sample

L - Liner Sample

P - Piston Sample

NR-No Recovery

NS - No Sample Remaining

PF - Permafrost Sample

PW – Porewater Sample

T - Sample Stored in Tube

W - Waxed Sample

RC - Radiocarbon Sample

MV - Minivane

FC - Fall Cone

TV - Torvane

PV - Pilcon Vane

RV - Remote Vane

PP - Pocket Penetrometer

UU - Unconsolidated Undrained Triaxial

UU_p-UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial

CU_p - CU Triaxial with Pore Pressure Measurements

CD - Consolidated Drained Triaxial

O - Organic Content

S - Salinity

TS - Thaw Strain**SG – Specific Gravity**

Project Number 10-300 · Borehole Number F85-KM4 Page 1 of 1

SUMMARY OF TEST RESULTS

[illegible]

B - Bag Sample

G - Gas Sample

L - Liner Sample

P - Piston Sample

NR-No Recovery

NS - No Sample Remaining

PF - Permafrost Sample

PW – Porewater Sample

T - Sample Stored in Tube

W - Waxed Sample

RC - Radiocarbon Sample

MV - Minivano

FC - Fall Cone

TV - Torvane

PV - Pilcon Vane

RV - Remote Vane

PP - Pocket Penetrometer

UU - Unconsolidated Undrained Triaxial

UUp- UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial

CU_p - CU Triaxial with Pore Pressure Measurements

CD - Consolidated Drained Triaxial

O - Organic Content

S - Salinity

TS - Thaw Strain**SG - Specific Gravity**

Project Number 10-300 Borehole Number F85-KM5 Page 1 of 1

SUMMARY OF TEST RESULTS

[illegible]

B - Bag Sample

G - Gas Sample

L - Liner Sample

P - Piston Sample

NR-No Recovery

NS - No Sample Remaining

PF - Permafrost Sample

PW - Porewater Sample

T - Sample Stored in Tube

W - Waxed Sample

RC - Radiocarbon Sample

MV - Minivane

FC – Fall Cone

TV - Torvane

PV - Pilcon Vane

RV - Remote Vane

PP - Pocket Penetrometer

UU - Unconsolidated Undrained Triaxial

UU_p-UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial

CUp - CU Triaxial with Pore Pressure Measurements

CD - Consolidated Drained Triaxial

O - Organic Content

S - Salinity

TS - Thaw Strain**SG - Specific Gravity**

Project Number 10-300 **Borehole Number** F85-KM6 **Page** 1 **of** 1

SUMMARY OF TEST RESULTS

[illegible]

B - Bag Sample

G - Gas Sample

L ~ Liner Sample

P - Piston Sample

NR- No Recovery

NS - No Sample Remaining

PF - Permafrost Sample

PW - Porewater Sample

T - Sample Stored in Tube

W - Waxed Sample

RC - Radiocarbon Sample

MV - Minivane**FC - Fall Cone****TV - Torvane**

PV - Pilcon Vane

RV - Remote Vane

PP - Pocket Penetrometer

UU - Unconsolidated Undrained Triaxial

UU_p-UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial

CUp - CU Triaxial with Pore Pressure Measurements

CD - Consolidated Drained Triaxial

O - Organic Content

S - Salinity

TS - Thaw Strain

SG - Specific Gravity

Project Number 10-300 Borehole Number F85-KM7 Page 1 of 1

SUMMARY OF TEST RESULTS

[illegible]

B - Bag Sample

NS - No Sample Remaining

RC - Radiocarbon Sample

RV - Remote Vane

CU - Consolidated Undrained Triaxial

O - Organic Content

G - Gas Sample

PF - Permafrost Sample

MV - Minivano

PP - Pocket Penetrometer

CU_p - CU Triaxial with Pore Pressure Measurements

5 - Salinity

L - Liner Sample

PW - Porewater Sample

FC - Fall Cone

UU - Unconsolidated Undrained Triaxial

TS - Thaw Strain

P - Piston Sample

T - Sample Stored in Tube

TV - Torvane

UU_p-UU Triaxial with Pore Pressure Measurements

CD - Consolidated Drained Triaxial

SG – Specific Gravity

NR-No Recovery

W - Waxed Sample

PV - Pilcon Vane

SUMMARY OF TEST RESULTS

[illegible]

B - Bag Sample

G - Gas Sample

L - Liner Sample

P - Piston Sample

NR-No Recovery

NS - No Sample Remaining

PF - Permafrost Sample

PW - Porewater Sample

T - Sample Stored in Tube

W - Waxed Sample

RC - Radiocarbon Sample

MV - Minivano

FC - Fall Cone

TV - Torvane

PV - Pilcon Vane

RV - Remote Vane

PP - Pocket Penetrometer

UU - Unconsolidated Undrained Triaxial

UU_p - UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial

CUp - CU Triaxial with Pore Pressure Measurements

CD - Consolidated Drained Triaxial

O - Organic Content

S - Salinity

TS - Thaw Strain**SG – Specific Gravity**

Project Number 10-300 Borehole Number F85-KM9 Page 1 of 1

SUMMARY OF TEST RESULTS

[illegible]

B - Bag Sample

G - Gas Sample

L ~ Liner Sample

P - Piston Sample

NR-No Recovery

NS - No Sample Remaining

PF - Permafrost Sample

PW - Porewater Sample

T - Sample Stored in Tube

W - Waxed Sample

RC - Radiocarbon Sample

MV - Minivane

FC – Fall Cone

TV - Torvane

PV - Pilcon Vane

RV - Remote Vane

PP - Pocket Penetrometer

UU - Unconsolidated Undrained Triaxial

UUp- UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial

CUp - CU Triaxial with Pore Pressure Measurements

CD - Consolidated Drained Triaxial

O - Organic Content

\$ - Salinity

TS - Thaw Strain

SG - Specific Gravity

Project Number 10-300 Borehole Number F85-KM10 Page 1 of 1

SUMMARY OF TEST RESULTS

Sample Number	Sample Type	Depth (metres)	Unified Soil Classification	Ground Ice Description (%)	Temp. (°C)	Moisture Content (%)	Unit Weight (kN/m³)	Salinity (%)	ATTERBERG LIMITS		GRAIN SIZE DISTRIBUTION					SHEAR STRENGTH				Remarks
									Liquid Limit (%)	Plastic Limit (%)	Clay (%)	Silt (%)	Sand (%)	Gravel (%)	D ₅₀ (µm)	Test	Shear Strength (kPa)	Failure Strain (%)	Consistency	
1	sonic core	0-1.0	}																	
2	sonic core	1.0-2.2																		
3	sonic core	2.2-2.5		All core taken by GSC for geological analysis																
4	sonic core	2.5-3.7																		
5	sonic core	3.7-4.9																		
6	sonic core	5.1	CL			45.1			43	23										LI=1,105
7	sonic core	5.5				27.8														
8	sonic core	6.0				38.1														
9	sonic core	6.5				30.6														
10	sonic core	7.0				35.8														
11	sonic core	7.5		15																
12	sonic core	8.0				35.3														
13	sonic core	8.5				31.1					45.0	53.8	1.2	—						
14	sonic core	9.0				30.7														
15	sonic core	9.5				31.9														
16	sonic core	10.0	CL			31.6			39	24										LI=0,507
17	sonic core	10.5				28.7														
18	sonic core	10.9				27.2														

B - Bag Sample
 G - Gas Sample
 L - Liner Sample
 P - Piston Sample
 NR - No Recovery

NS - No Sample Remaining
 PF - Permafrost Sample
 PW - Porewater Sample
 T - Sample Stored in Tube
 W - Waxed Sample

RC - Radiocarbon Sample
 MV - Minivane
 FC - Fall Cone
 TV - Torvane
 PV - Pilcon Vane

RV - Remote Vane
 PP - Pocket Penetrometer
 UU - Unconsolidated Undrained Triaxial
 UUP - UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial
 CU_p - CU Triaxial with Pore Pressure Measurements
 CD - Consolidated Drained Triaxial

O - Organic Content
 S - Salinity
 TS - Thaw Strain
 SG - Specific Gravity

SUMMARY OF TEST RESULTS

Sample Number	Sample Type	Depth (metres)	Unified Soil Classification	Ground Ice Description (%)	Temp. (°C)	Moisture Content (%)	Unit Weight (kN/m³)	Salinity (%)	ATTERBERG LIMITS		GRAIN SIZE DISTRIBUTION					SHEAR STRENGTH				Remarks
									Liquid Limit (%)	Plastic Limit (%)	Clay (%)	Silt (%)	Sand (%)	Gravel (%)	D ₅₀ (µm)	Test	Shear Strength (kPa)	Failure Strain (%)	Consistency	
1	B	0.5			-0.1	16.8						5.6	57.0	37.4						1 & 2 combined
2	B	0.6				16.5														
3	B	1.0				16.5						10.3	63.6	26.1						3 & 4 combined
4	B	1.5				16.9														
5	B	1.9				16.5						10.4	31.6	58.0						5 & 6 combined
6	B	1.1				16.6														
7	B	1.6				16.5						5.1	56.7	38.2						7 & 8 combined
8	B	2.0				16.7														
9	B	2.2			-0.5	16.6						12.4	37.4	50.2						9,10,11,12,13
10	B	3.0				16.6														combined
11	B	3.5				17.0														
12	B	4.0				16.8														
13	B	4.5				16.6														
14	B	5.0				16.5						8.8	88.2	3.0						
15	B	5.5				16.7														
16	B	6.0				16.6						3.4	51.0	45.6						16&17 combined
17	B	6.1				16.4														
18	B	6.5	ML			16.5			45	30										LI=-0.9
19	B	7.0			-2.1	16.5														
20	B	7.5			-1.6	16.9														
21	B	7.9			-0.5	16.5														

B - Bag Sample
 G - Gas Sample
 L - Liner Sample
 P - Piston Sample
 NR - No Recovery

NS - No Sample Remaining
 PF - Permafrost Sample
 PW - Porewater Sample
 T - Sample Stored in Tube
 W - Waxed Sample

RC - Radiocarbon Sample
 MV - Minivane
 FC - Fall Cone
 TV - Torvane
 PV - Pilcon Vane

RV - Remote Vane
 PP - Pocket Penetrometer
 UU - Unconsolidated Undrained Triaxial
 UUp - UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial
 CU_p - CU Triaxial with Pore Pressure Measurements
 CD - Consolidated Drained Triaxial

O - Organic Content
 S - Salinity
 TS - Thaw Strain
 SG - Specific Gravity

SUMMARY OF TEST RESULTS

[illegible]

B - Bag Sample

G - Gas Sample

L - Liner Sample

P - Piston Sample

NR- No Recovery

NS - No Sample Remaining

PF - Permafrost Sample

PW - Porewater Sample

T - Sample Stored in Tube

W - Waxed Sample

RC - Radiocarbon Sample

MV - Minivane

FC - Fall Cone

TV - Torvane

PV - Pilcon Vane

RV - Remote Vane

PP - Pocket Penetrometer

UU - Unconsolidated Undrained Triaxial

UU_p-UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial

CUp - CU Triaxial with Pore Pressure Measurements

CD - Consolidated Drained Triaxial

O - Organic Content

S - Salinity

TS - Thaw Strain

SG – Specific Gravity

Project Number 10-300 Borehole Number F85-KM14 Page 1 of 1

SUMMARY OF TEST RESULTS

Sample Number	Sample Type	Depth (metres)	Unified Soil Classification	Ground Ice Description (%)	Temp. (°C)	Moisture Content (%)	Unit Weight (kN/m³)	Salinity (%)	ATTERBERG LIMITS		GRAIN SIZE DISTRIBUTION					SHEAR STRENGTH				Remarks
									Liquid Limit (%)	Plastic Limit (%)	Clay (%)	Silt (%)	Sand (%)	Gravel (%)	D ₅₀ (µm)	Test	Shear Strength (kPa)	Failure Strain (%)	Consistency	
1	B	0.2				10.6														
2	B	0.8				4.0														
3	B	1.2				8.0														
4	B	1.3				—														
5	B	0.5				3.6														
6	B	3.0				—														
7	B	5.0	SP			—						0.7	66.4	32.9						
8	B	5.1				—														
9	B	5.5				—														
10	B	5.6				37.2														
11	B	5.7				26.1														
12	B	6.0			-1.2	27.9														
13	B	6.5				30.1														
14	B	7.0				14.7														
15	B	7.4	CL		-0.8	13.4			25	16										LI=-0.289
16	B	7.8				17.3														

B - Bag Sample
G - Gas Sample
L - Liner Sample
P - Piston Sample
NR - No Recovery

NS - No Sample Remaining
PF - Permafrost Sample
PW - Porewater Sample
T - Sample Stored in Tube
W - Waxed Sample

RC - Radiocarbon Sample
MV - Minivane
FC - Fall Cone
TV - Torvane
PV - Pilcon Vane

RV - Remote Vane
PP - Pocket Penetrometer
UU - Unconsolidated Undrained Triaxial
UUp - UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial
CU_p - CU Triaxial with Pore Pressure Measurements
CD - Consolidated Drained Triaxial

O - Organic Content
S - Salinity
TS - Thaw Strain
SG - Specific Gravity

SUMMARY OF TEST RESULTS

[illegible]

B - Bag Sample

G - Gas Sample

L - Liner Sample

P - Piston Sample

NR-No Recovery

NS - No Sample Remaining

PF - Permafrost Sample

PW - Porewater Sample

T -Sample Stored in Tube

W - Waxed Sample

RC - Radiocarbon Sample

MV - Minivane

FC - Fall Cone

TV - Torvane

PV - Pilcon Vane

RV - Remote Vane

PP - Pocket Penetrometer

UU - Unconsolidated Undrained Triaxial

UUp-UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial

CU_p - CU Triaxial with Pore Pressure Measurements

CD - Consolidated Drained Triaxial

O - Organic Content

S - Salinity

TS - Thaw Strain

SG - Specific Gravity

Project Number 10-300 Borehole Number F85-KM16 Page 1 of 1

SUMMARY OF TEST RESULTS

Sample Number	Sample Type	Depth (metres)	Unified Soil Classification	Ground Ice Description (%)	Temp. (°C)	Moisture Content (%)	Unit Weight (kN/m³)	Salinity (%)	ATTERBERG LIMITS		GRAIN SIZE DISTRIBUTION					SHEAR STRENGTH				Remarks
									Liquid Limit (%)	Plastic Limit (%)	Clay (%)	Silt (%)	Sand (%)	Gravel (%)	D ₅₀ (µm)	Test	Shear Strength (kPa)	Failure Strain (%)	Consistency	
1	B	0				45.0														
2	B	1.0				35.5														
3	B	2.0				58.3														
4	B	3.0	CL-CH			51.0			50	27										LI=1.043
5	B	3.9				48.7														
6	B	5.0			+0.4	31.0														
7	B	6.0				33.0														
8	B	7.0				30.3														
9	B	0.1				—														
10	B	1.1	SM-SC			28.9						47.7	52.3	—						
11	B	2.1				—														
12	B	3.1				48.8														
13	B	4.1				51.6														
14	B	5.1				29.7														
15	B	6.1				30.7														
16	B	7.1				31.2														
17	B	8.1				29.5														
18	B	8.2				—														
19	B	9.1				—														
20	B	9.2				16.4														
21	B	9.9	CL			20.2			28	16	15.0	52.0	50.9	2.1						sandy lean clay LI=0.35 A=0.8

B - Bag Sample
G - Gas Sample
L - Liner Sample
P - Piston Sample
NR - No Recovery

NS - No Sample Remaining
PF - Permafrost Sample
PW - Porewater Sample
T - Sample Stored in Tube
W - Waxed Sample

RC - Radiocarbon Sample
MV - Minivane
FC - Fall Cone
TV - Torvane
PV - Pilcon Vane

RV - Remote Vane
PP - Pocket Penetrometer
UU - Unconsolidated Undrained Triaxial
UUU - UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial
CU_p - CU Triaxial with Pore Pressure Measurements
CD - Consolidated Drained Triaxial

O - Organic Content
S - Salinity
TS - Thaw Strain
SG - Specific Gravity

SUMMARY OF TEST RESULTS

[illegible]

B - Bag Sample

G - Gas Sample

L - Liner Sample

P - Piston Sample

NR- No Recovery

NS - No Sample Remaining

PF - Permafrost Sample

PW - Porewater Sample

T - Sample Stored in Tube

W - Waxed Sample

RC - Radiocarbon Sample

MV - Minivane

FC - Fall Cone

TV - Torvane

PV - Pilcon Vane

RV - Remote Vane

PP - Pocket Penetrometer

UU - Unconsolidated Undrained Triaxial

UUp- UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial

CUp - CU Triaxial with Pore Pressure Measurements

CD - Consolidated Drained Triaxial

O - Organic Content

S - Salinity

TS - Thaw Strain

SG - Specific Gravity

Project Number 10-300 **Borehole Number** F85-KM17 **Page** 2 **of** 2

SUMMARY OF TEST RESULTS

Sample Number	Sample Type	Depth (metres)	Unified Soil Classification	Ground Ice Description (%)	Temp. (°C)	Moisture Content (%)	Unit Weight (kN/m³)	Salinity (%)	ATTERBERG LIMITS		GRAIN SIZE DISTRIBUTION						SHEAR STRENGTH				Remarks
									Liquid Limit (%)	Plastic Limit (%)	Clay (%)	Silt (%)	Sand (%)	Gravel (%)	D ₅₀ (µm)	Test	Shear Strength (kPa)	Failure Strain (%)	Consistency		
1A	shelby				+0.9											MV	3				
1B	B	1.4-1.5														PV	7				
2A	shelby				+1.3																
2B	B	3.24-3.27																			
3A	shelby				+1.34											PV	13				
3B	B																				
4A	shelby				+1.4											MV	38				
4B	B															PV	58				
5A	shelby		CL		+1.4	43.2	17.4		46	29	29.5	598	0.7	—		MV	28			LI=0.835 A=0.576	
5B	B															PV	40				
5C	B					28.8															
6A	shelby				+0.1											MV	20				
6B	B															PV	5				
7A	shelby		CL-ML		+0.9	17.7	20.4		24	17						MV	44			LI=0.1	
7B	B															PV	61				
8A	shelby				+1.1											MV	68				
8B	B	14.38-14.40														PV	54				
9A	shelby				+0.7											MV	65				
10A	shelby															MV	69				
10B	B	17.33-17.35			+0.9											PV	50				
11A	shelby				+0.8											MV	43				

B - Bag Sample
 G - Gas Sample
 L - Liner Sample
 P - Piston Sample
 NR - No Recovery

NS - No Sample Remaining
 PF - Permafrost Sample
 PW - Porewater Sample
 T - Sample Stored in Tube
 W - Waxed Sample

RC - Radiocarbon Sample
 MV - Minivane
 FC - Fall Cone
 TV - Torvane
 PV - Pilcon Vane

RV - Remote Vane
 PP - Pocket Penetrometer
 UU - Unconsolidated Undrained Triaxial
 UUP - UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial
 CUP - CU Triaxial with Pore Pressure Measurements
 CD - Consolidated Drained Triaxial

O - Organic Content
 S - Salinity
 TS - Thaw Strain
 SG - Specific Gravity

Project Number 10-300 Borehole Number F85-KF10 Page 1 of 2

SUMMARY OF TEST RESULTS

[illegible]

B - Bag Sample

G - Gas Sample

L - Liner Sample

P - Piston Sample

NR- No Recovery

NS - No Sample Remaining

PF - Permafrost Sample

PW - Porewater Sample

T - Sample Stored in Tube

W - Waxed Sample

RC - Radiocarbon Sample

MV - Minivane

FC - Fall Cone

TV - Torvane

PV - Pilcon Vane

RV - Remote Vane

PP - Pocket Penetrometer

UU - Unconsolidated Undrained Triaxial

UUp- UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial

CUp - CU Triaxial with Pore Pressure Measurements

CD - Consolidated Drained Triaxial

O - Organic Content

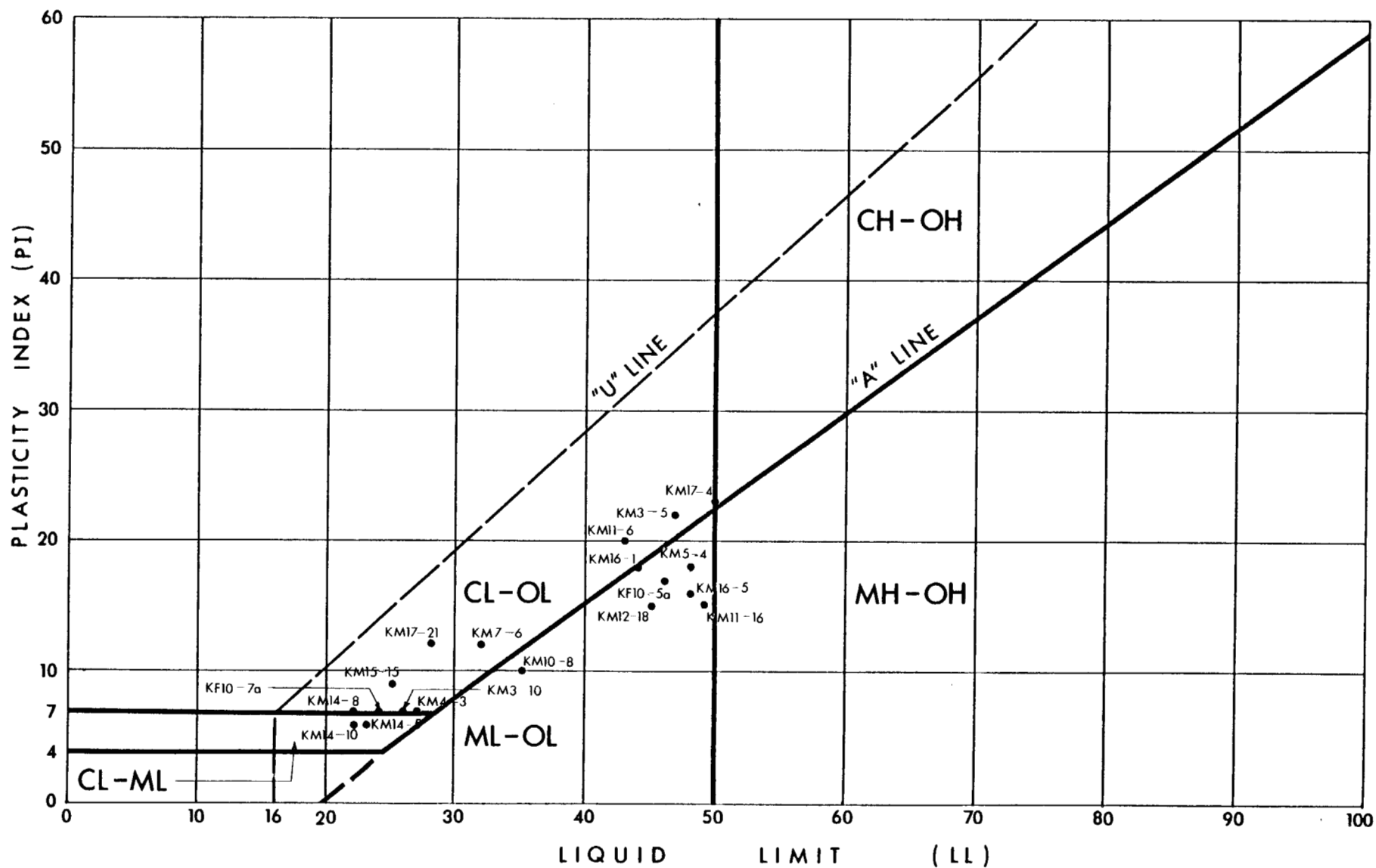
S - Salinity

TS - Thaw Strain

SG - Specific Gravity

Project Number 10-300

Borehole Number F85-KF10 **Page** 2 **of** 2



ATTERBERG LIMITS - COASTAL

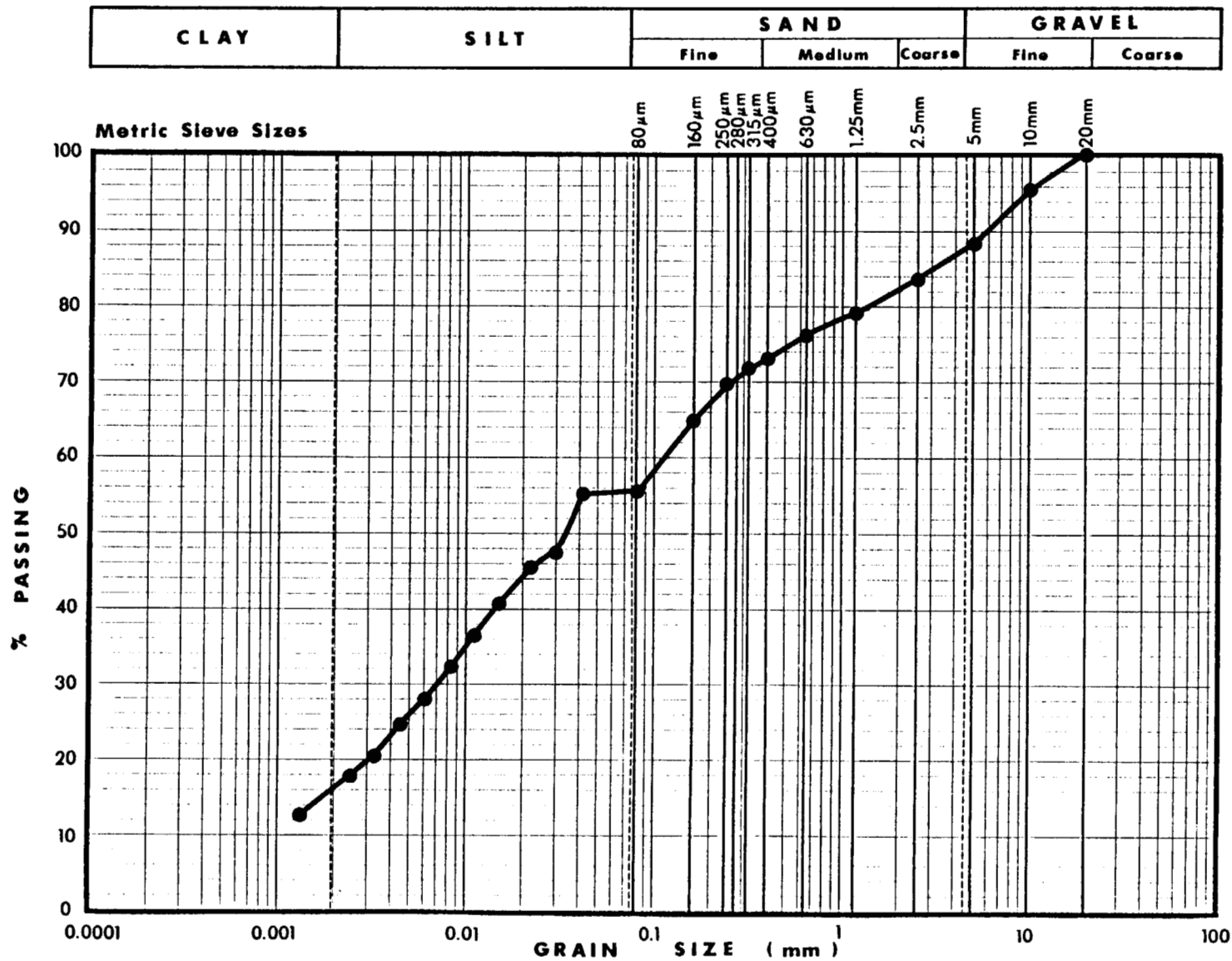
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/29

DRAWN BY: MG

DWG. No.: B-19



Borehole Number F85-KM3
Sample Number 10

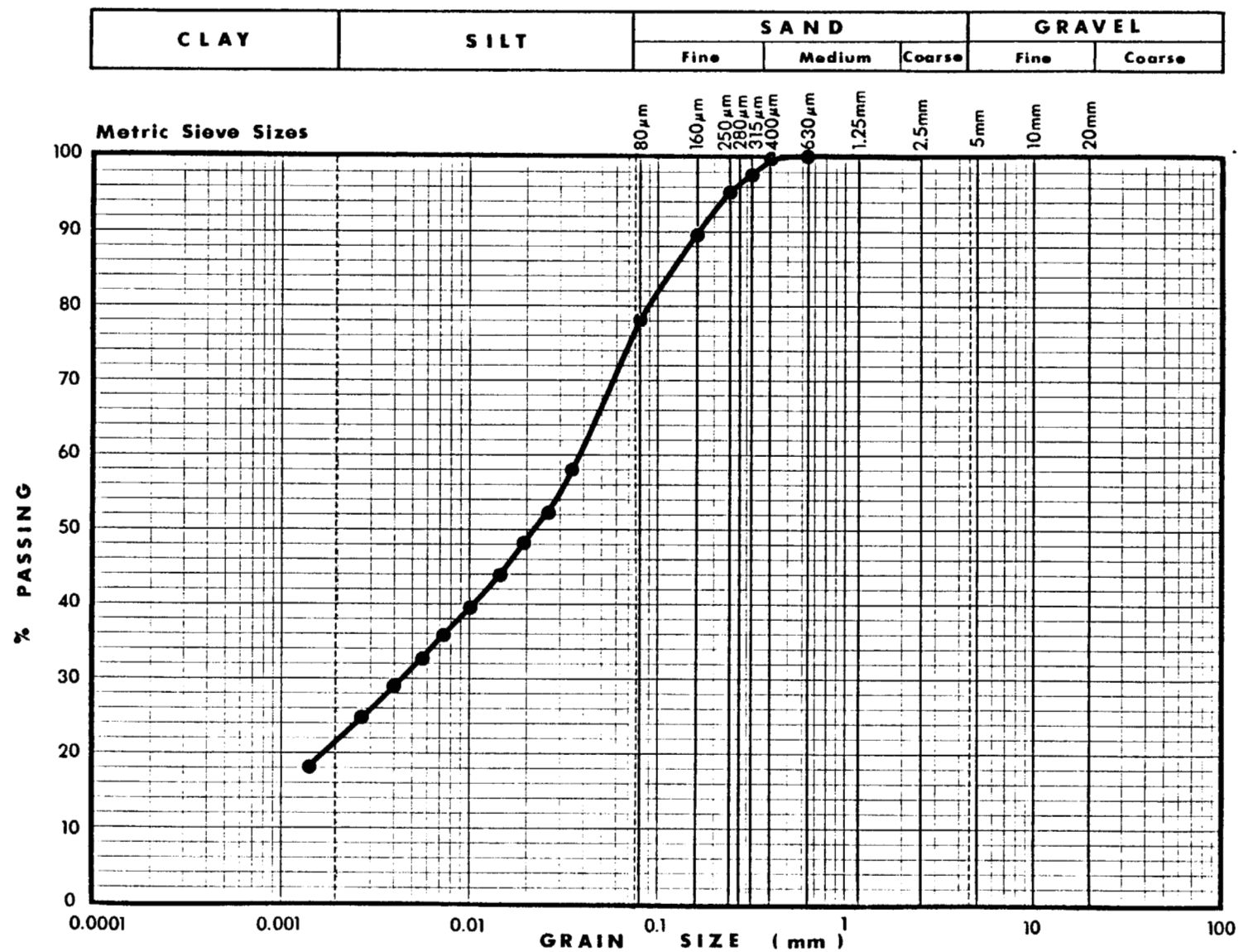
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/29

DRAWN BY: GJB

DWG. No.: B-20



Borehole Number F85-KM4
Sample Number 3

M. J. O'CONNOR & ASSOCIATES LTD.

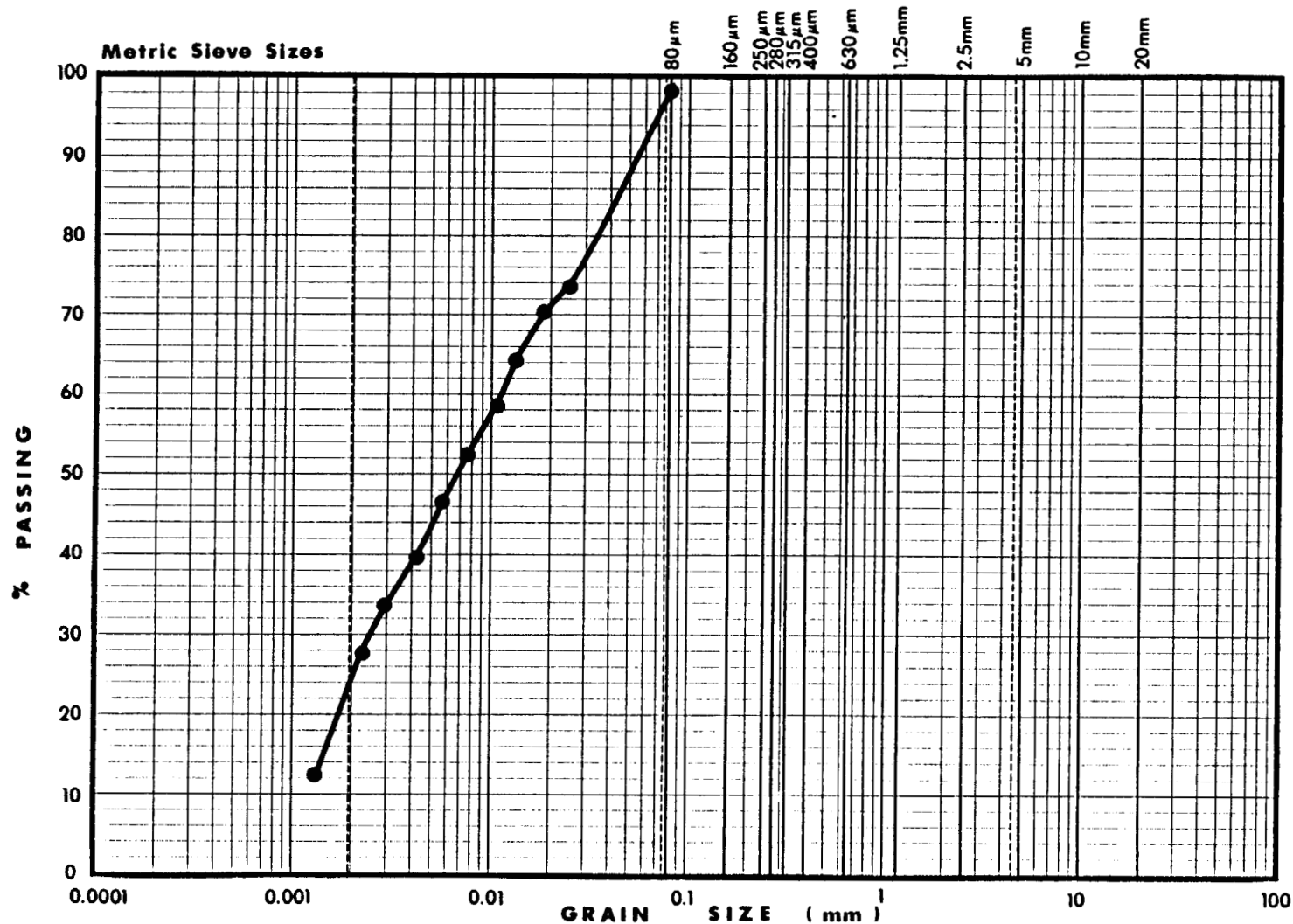
JOB No.: 10-300

DATE: 85/06/03

DRAWN BY: GJB

DWG. No.: B-21

CLAY	SILT	SAND			GRAVEL	
		Fine	Medium	Coarse	Fine	Coarse



Borehole Number F85-KM5
Sample Number 4

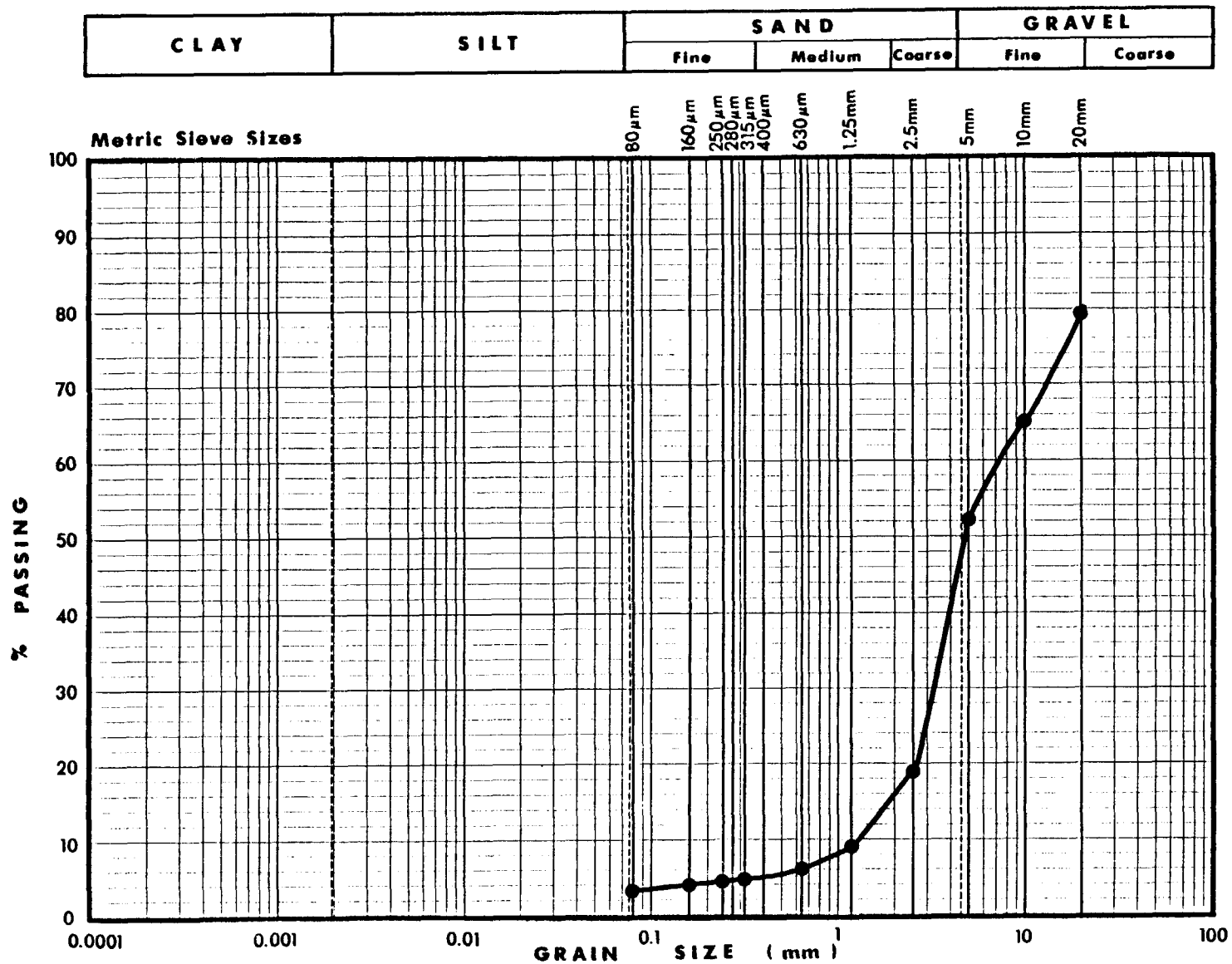
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/29

DRAWN BY: GJB

DWG. No.: B-22



Borehole Number F85-KM6
Sample Number 1

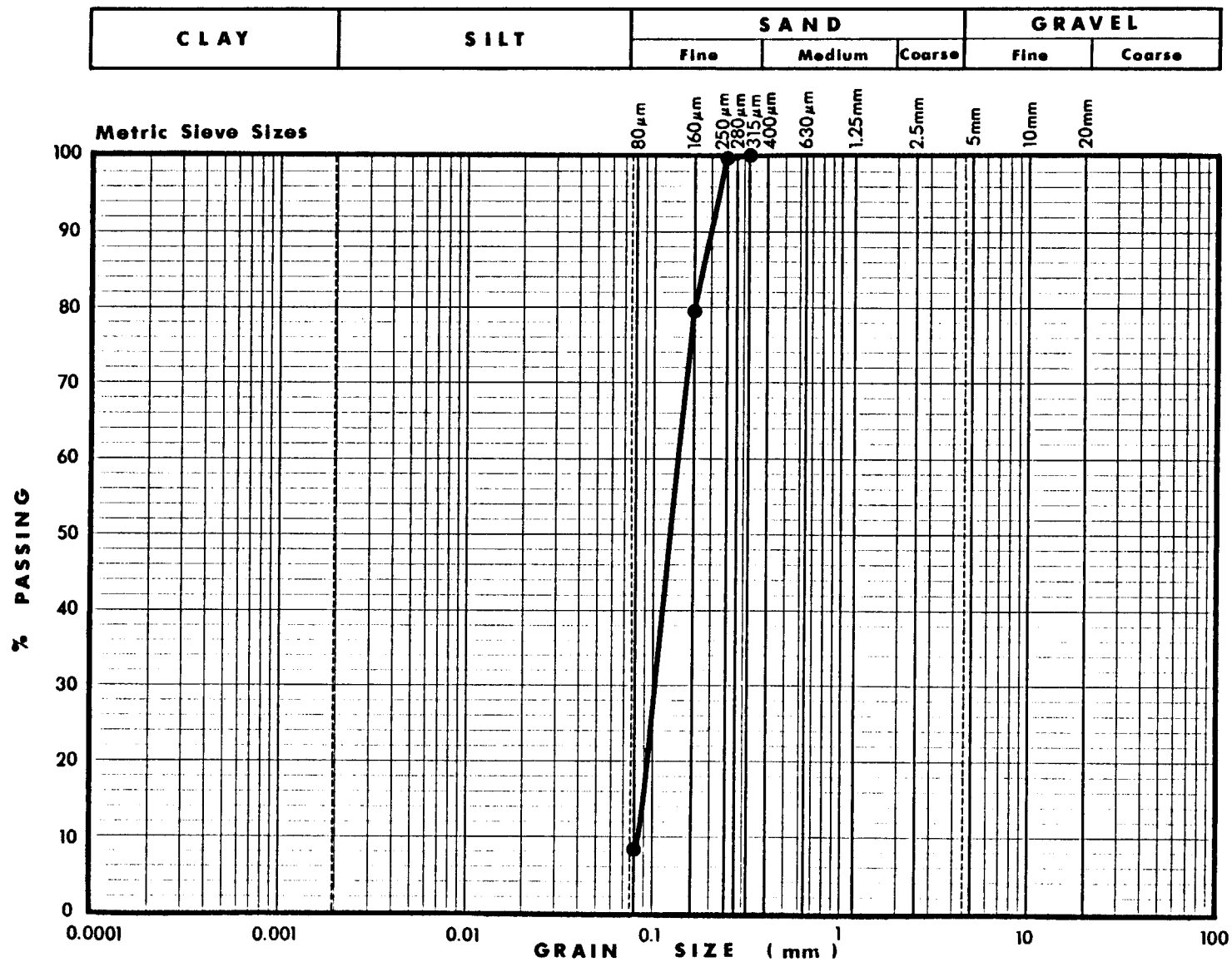
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/29

DRAWN BY: GJB

DWG. No.: B-23



Borehole Number F85-KM6
Sample Number 3

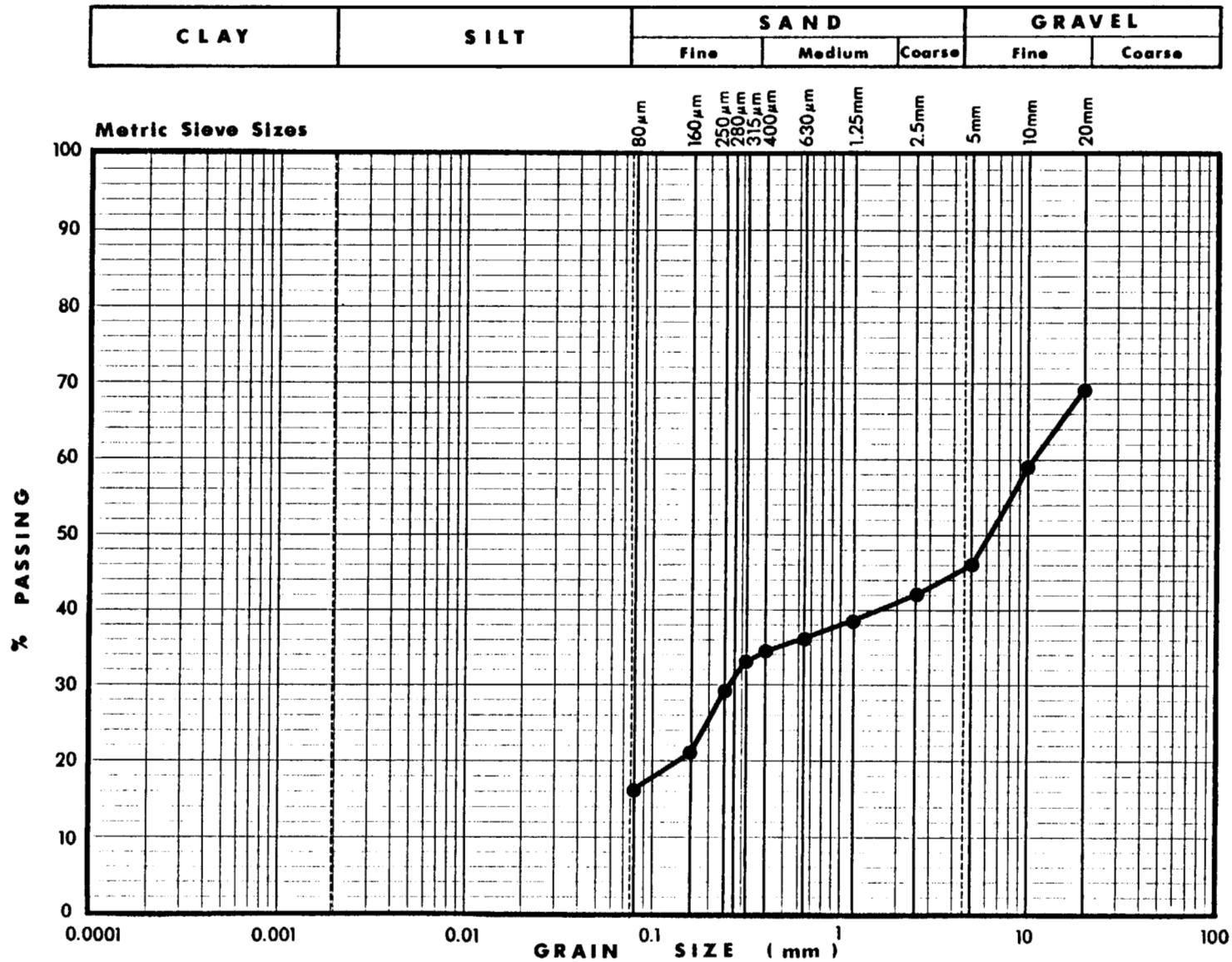
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/29

DRAWN BY: GJB

DWG. No.: B-24



Borehole Number F85-KM7
Sample Number 3

M. J. O'CONNOR & ASSOCIATES LTD.

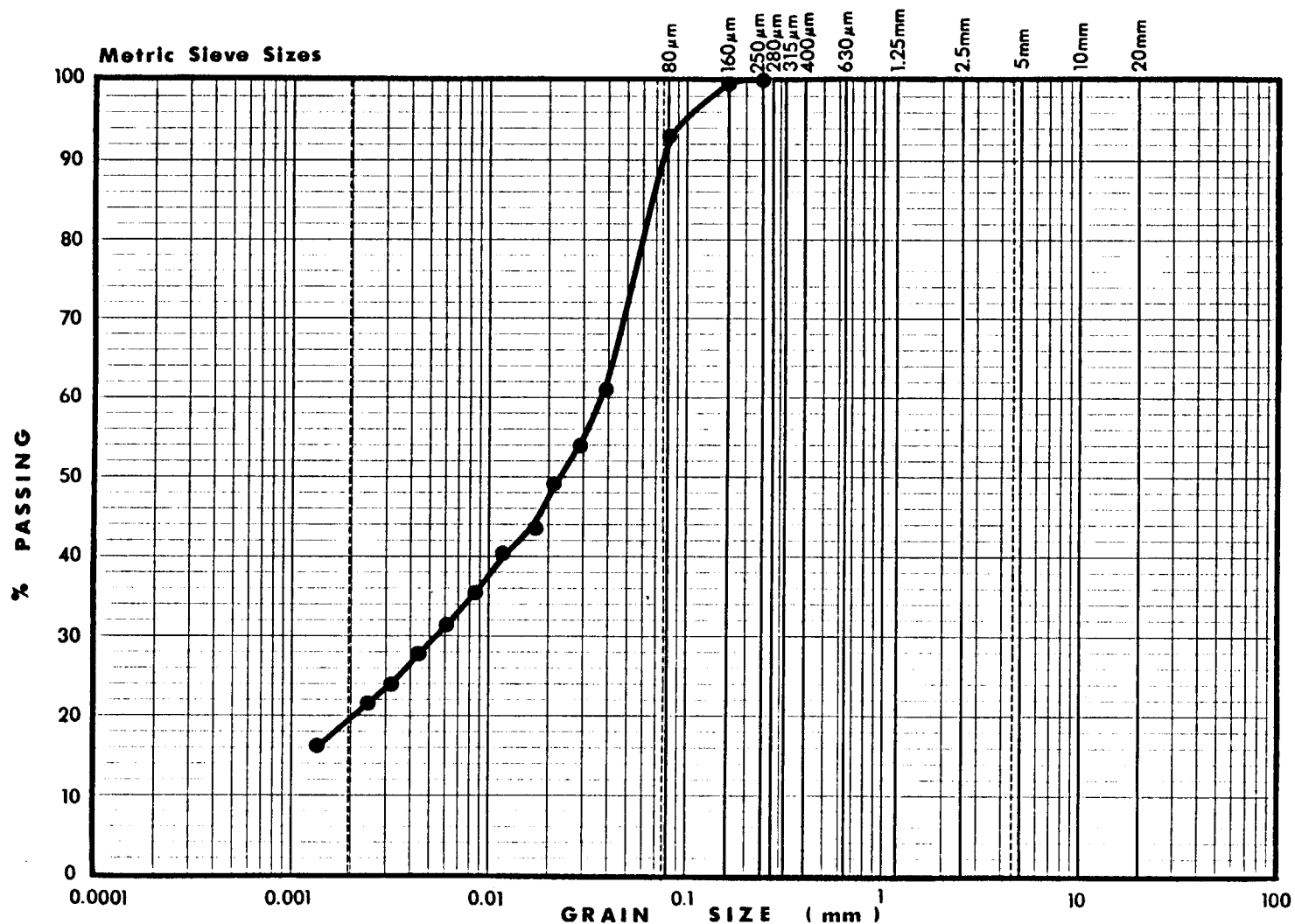
JOB No.: 10-300

DATE: 85/05/23

DRAWN BY: GJB

DWG. No.: B-25

CLAY	SILT	SAND			GRAVEL	
		Fine	Medium	Coarse	Fine	Coarse



Borehole Number K85-KM7
Sample Number 6

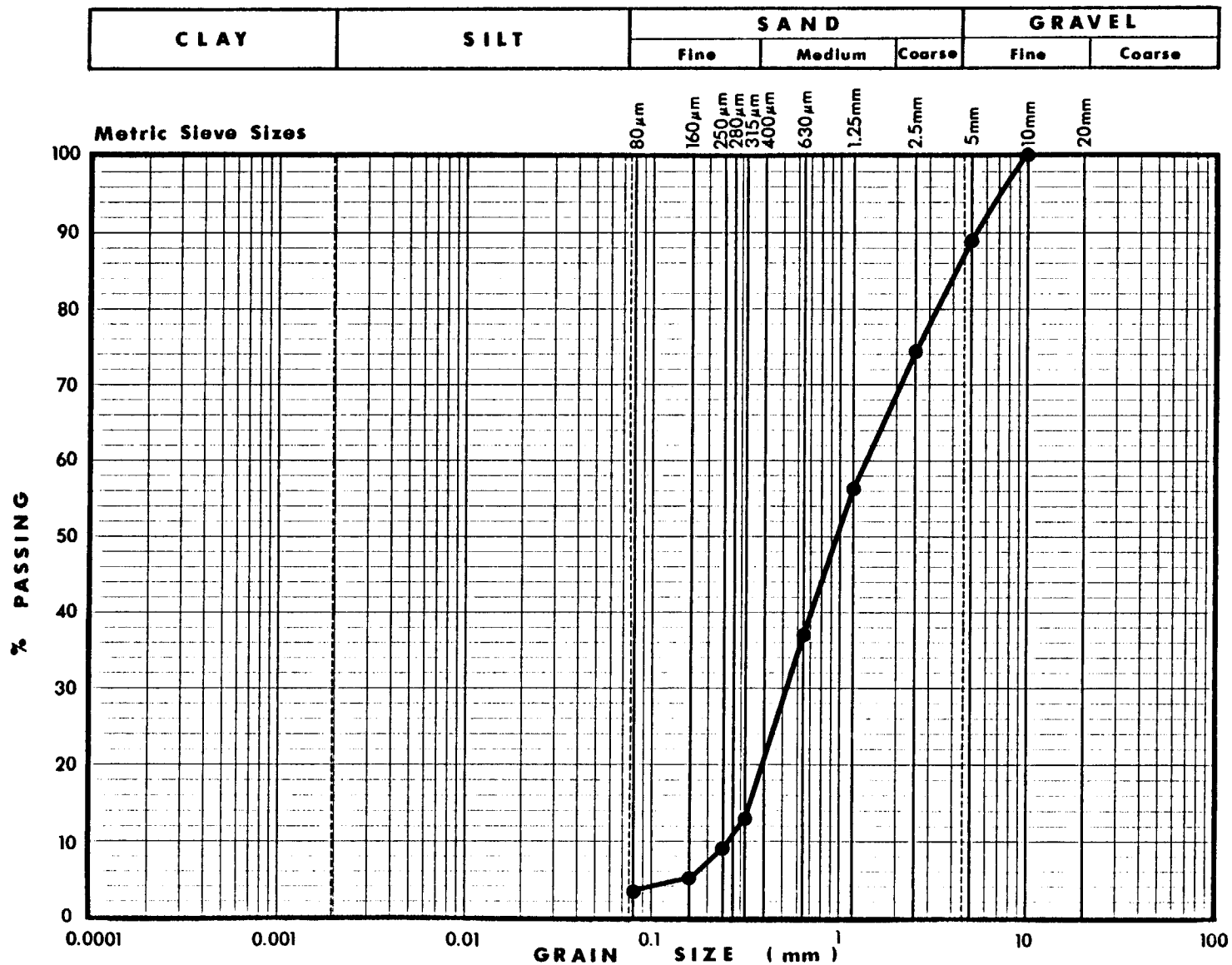
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/29

DRAWN BY: GJB

DWG. No.: B-26



Borehole Number F85-KM8
Sample Number 1

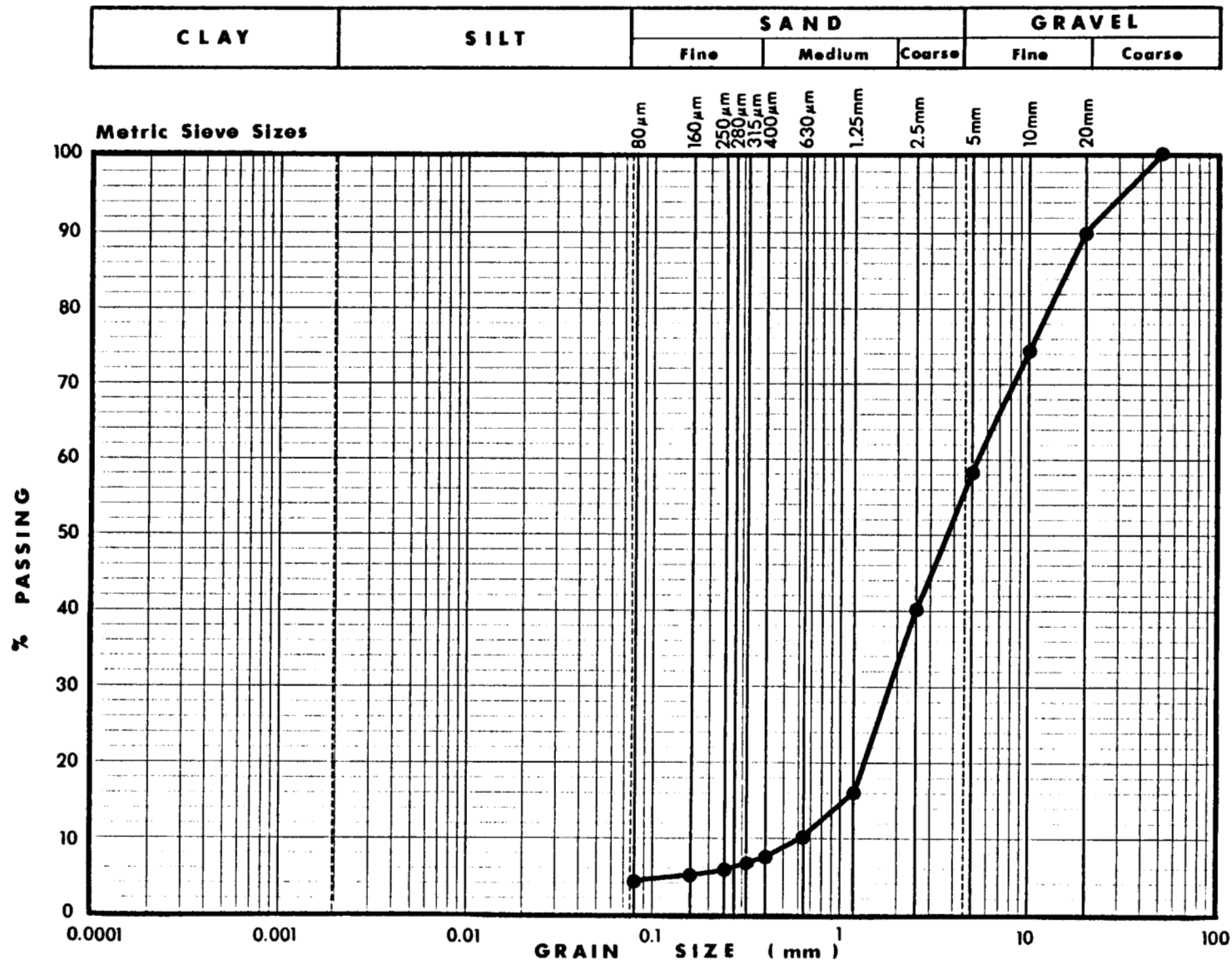
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/29

DRAWN BY: GJB

DWG. No.: B-27



Borehole Number F85-KM9
Sample Number 5

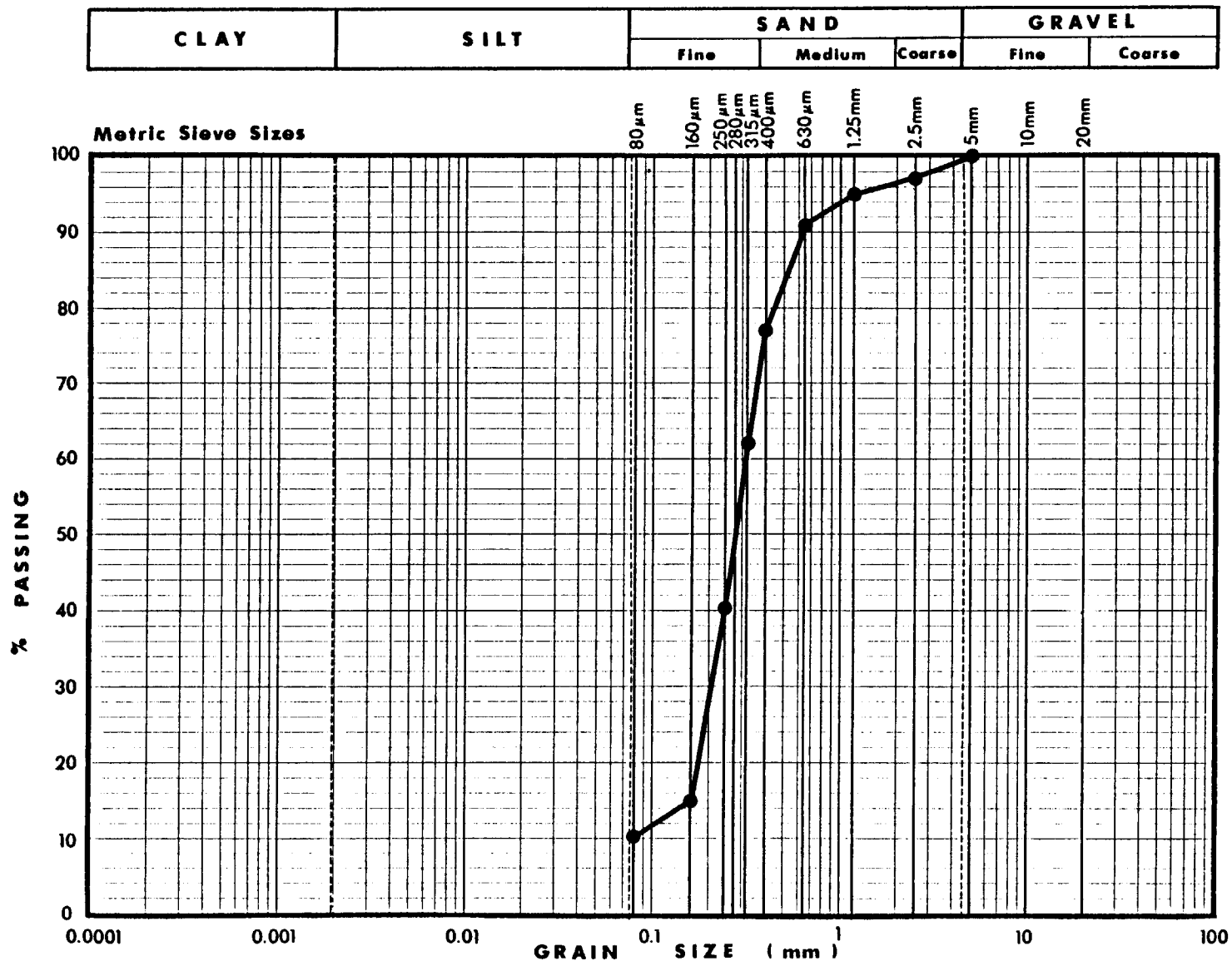
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/06/04

DRAWN BY: GJB

DWG. No.: B-28



Borehole Number F85-KM9
Sample Number 8

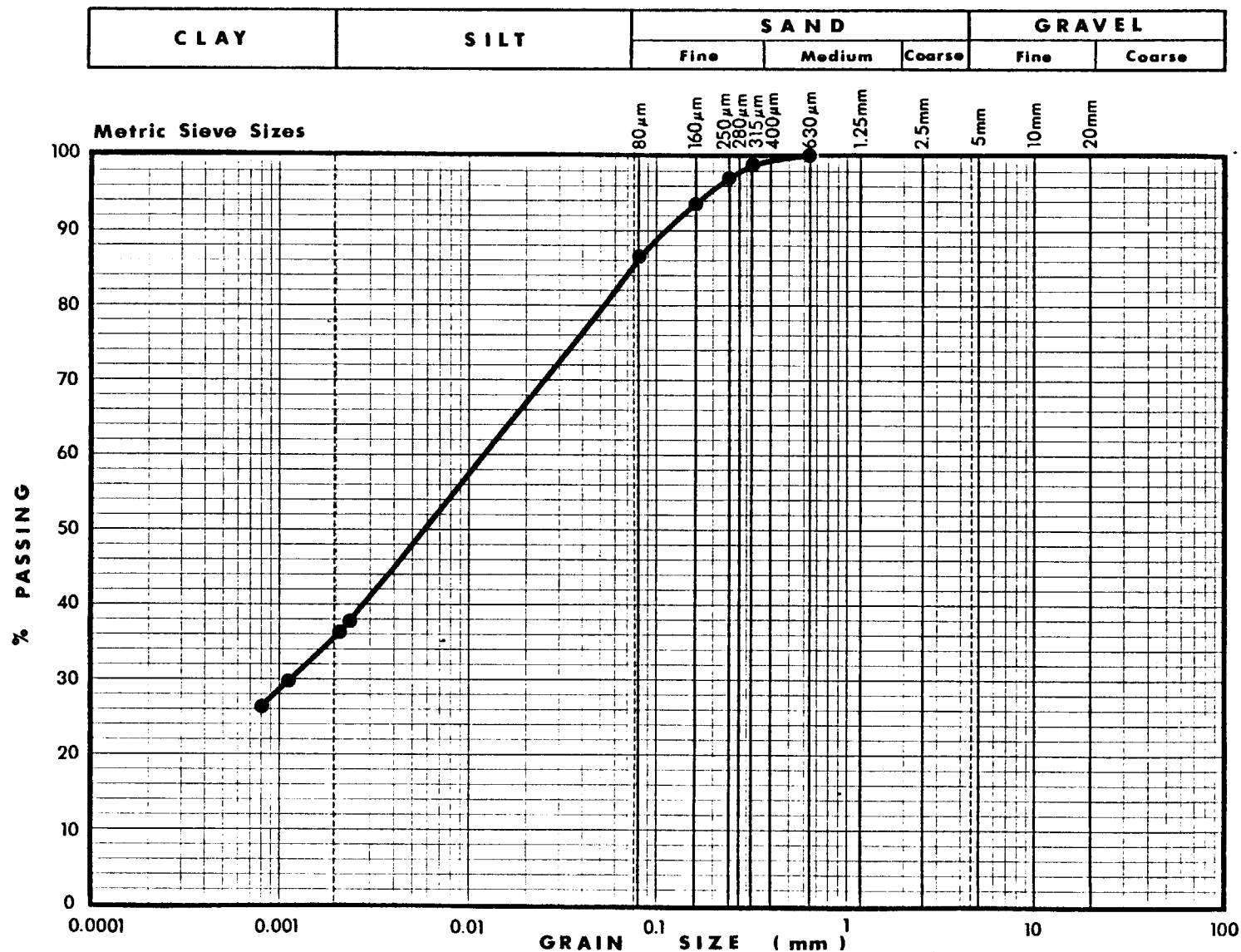
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/24

DRAWN BY: GJB

DWG. No.: B-29



Borehole Number F85-KM10
Sample Number 8

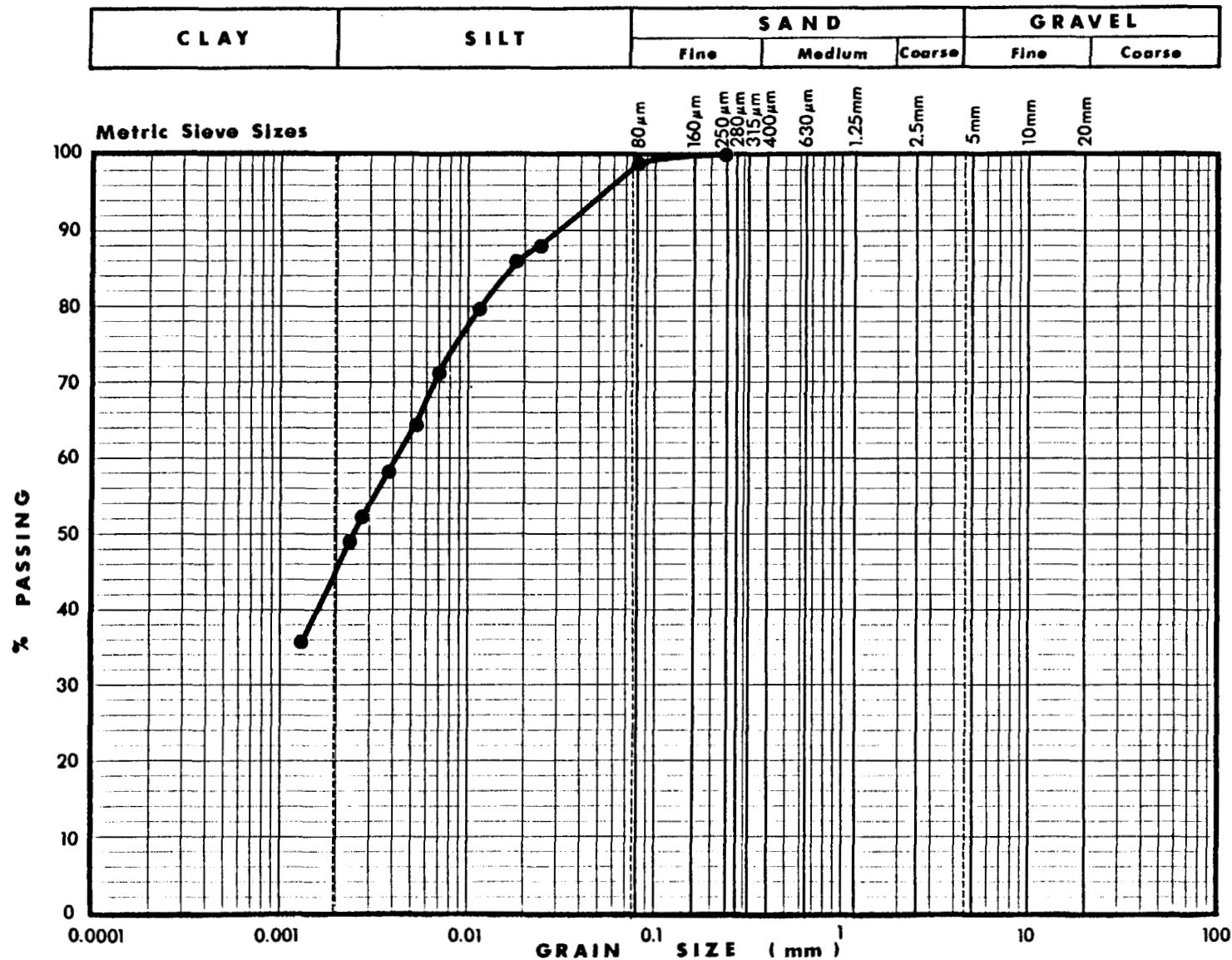
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/29

DRAWN BY: GJB

DWG. No.: B-30



Borehole Number F85-KM11
Sample Number 13

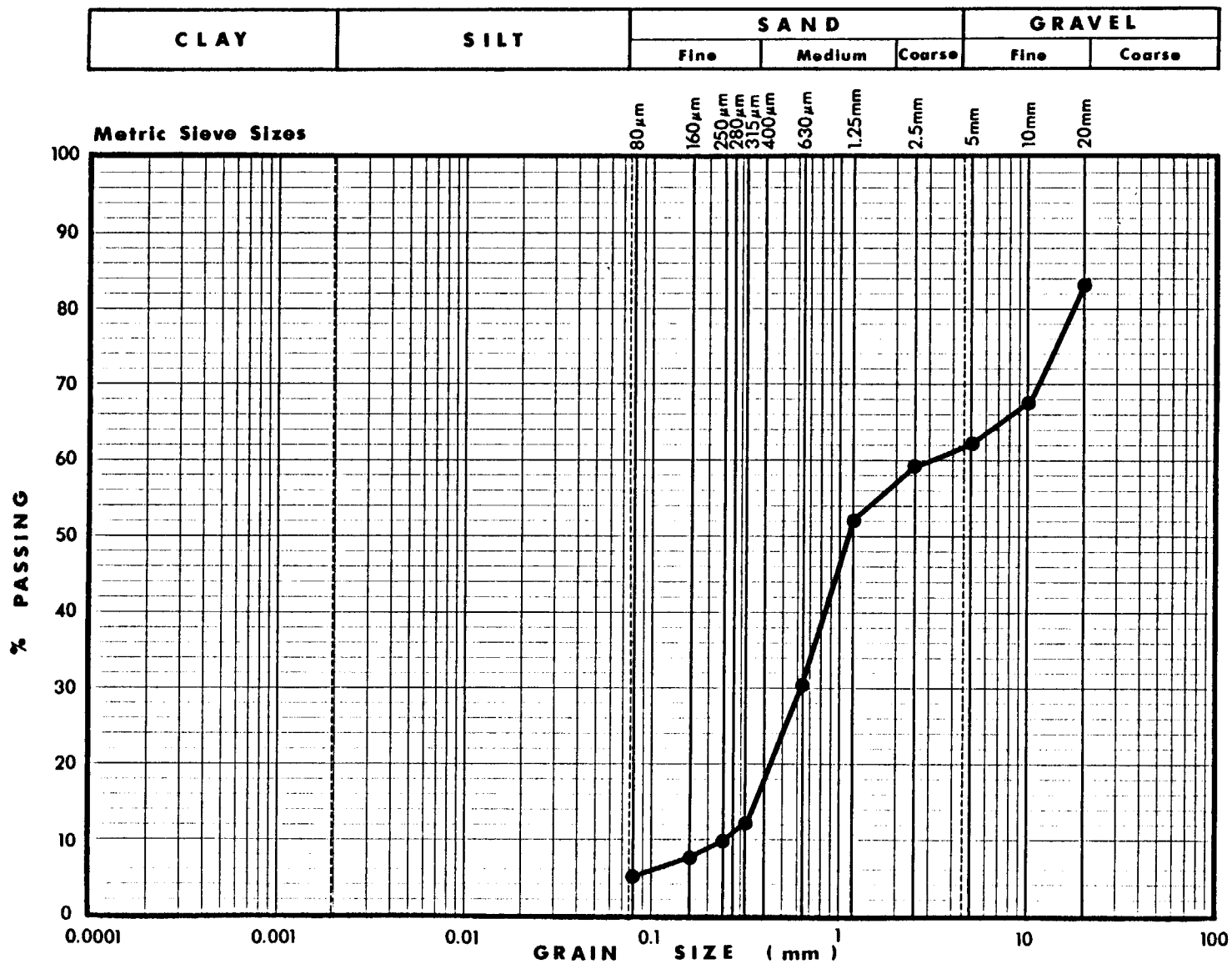
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/06/03

DRAWN BY: GJB

DWG. No.: B-31



Borehole Number F85-KM12
Sample Number 1,2 combined

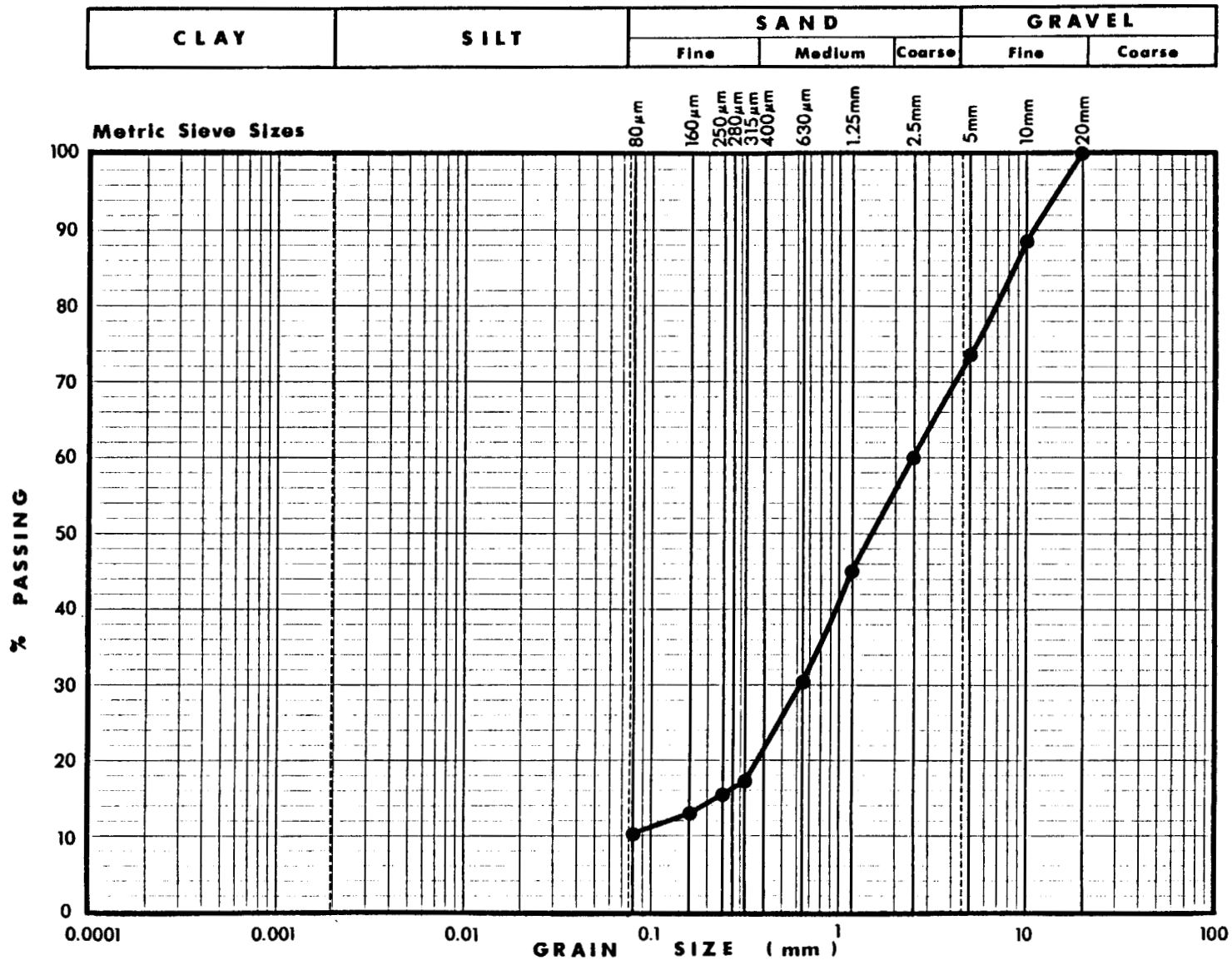
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/06/03

DRAWN BY: GJB

DWG. No.: B-32



Borehole Number F85-KM12
Sample Number 3,4 combined

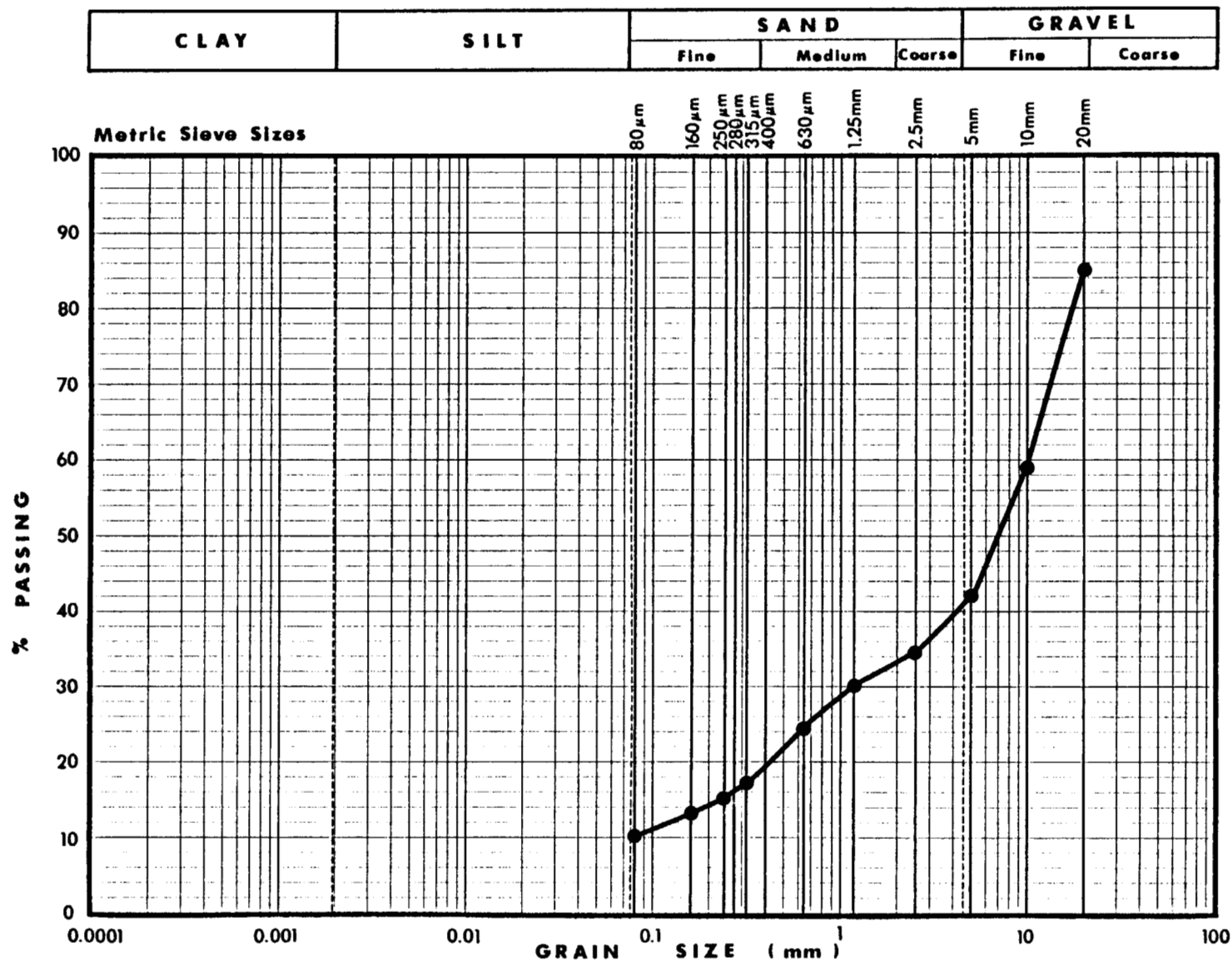
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/06/03

DRAWN BY: GJB

DWG. No.: B-33



Borehole Number F85-KM12
Sample Number 5,6 combined

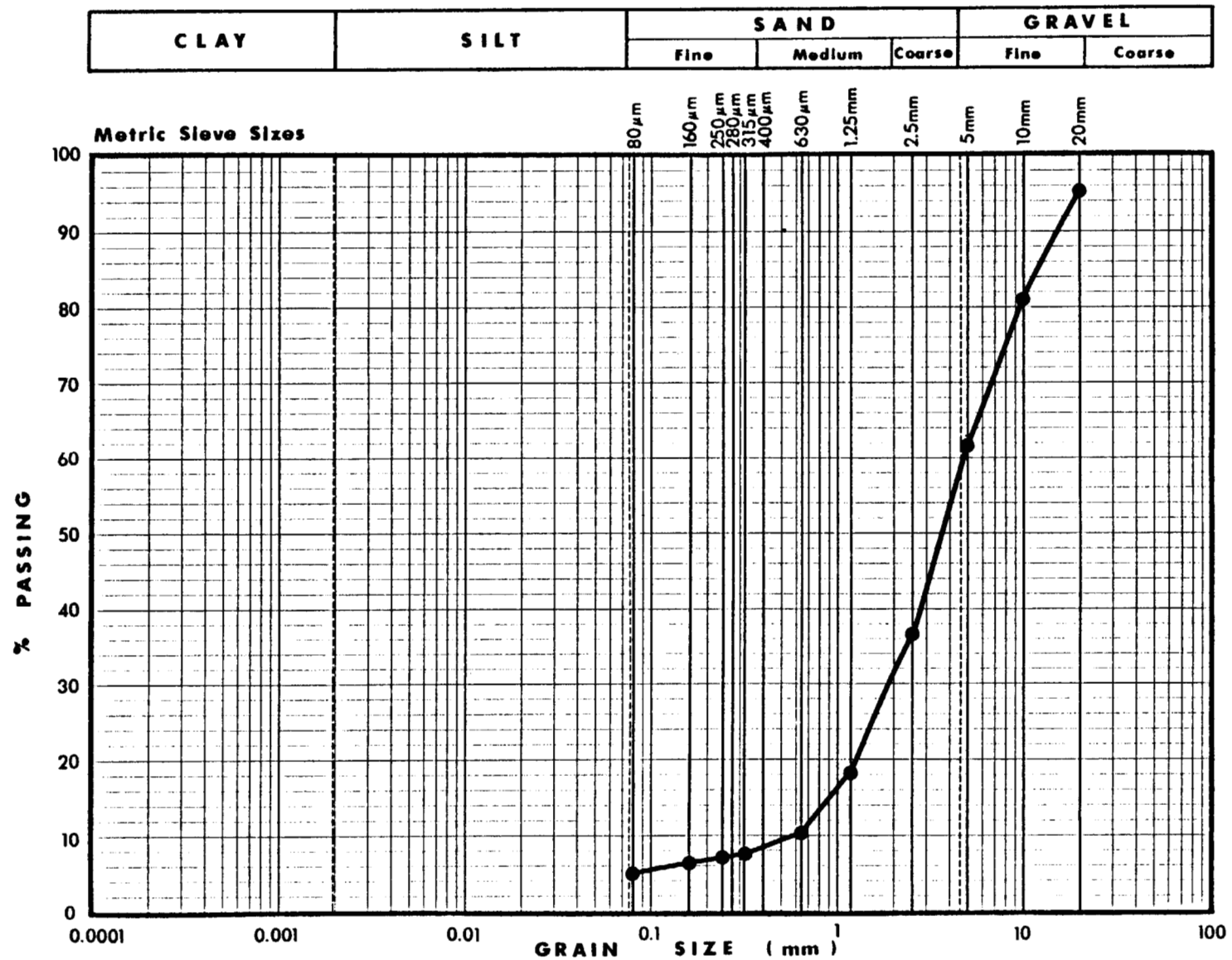
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/06/03

DRAWN BY: GJB

DWG. No.: B-34



Borehole Number F85-KM12
Sample Number 7,8 combined

M. J. O'CONNOR & ASSOCIATES LTD.

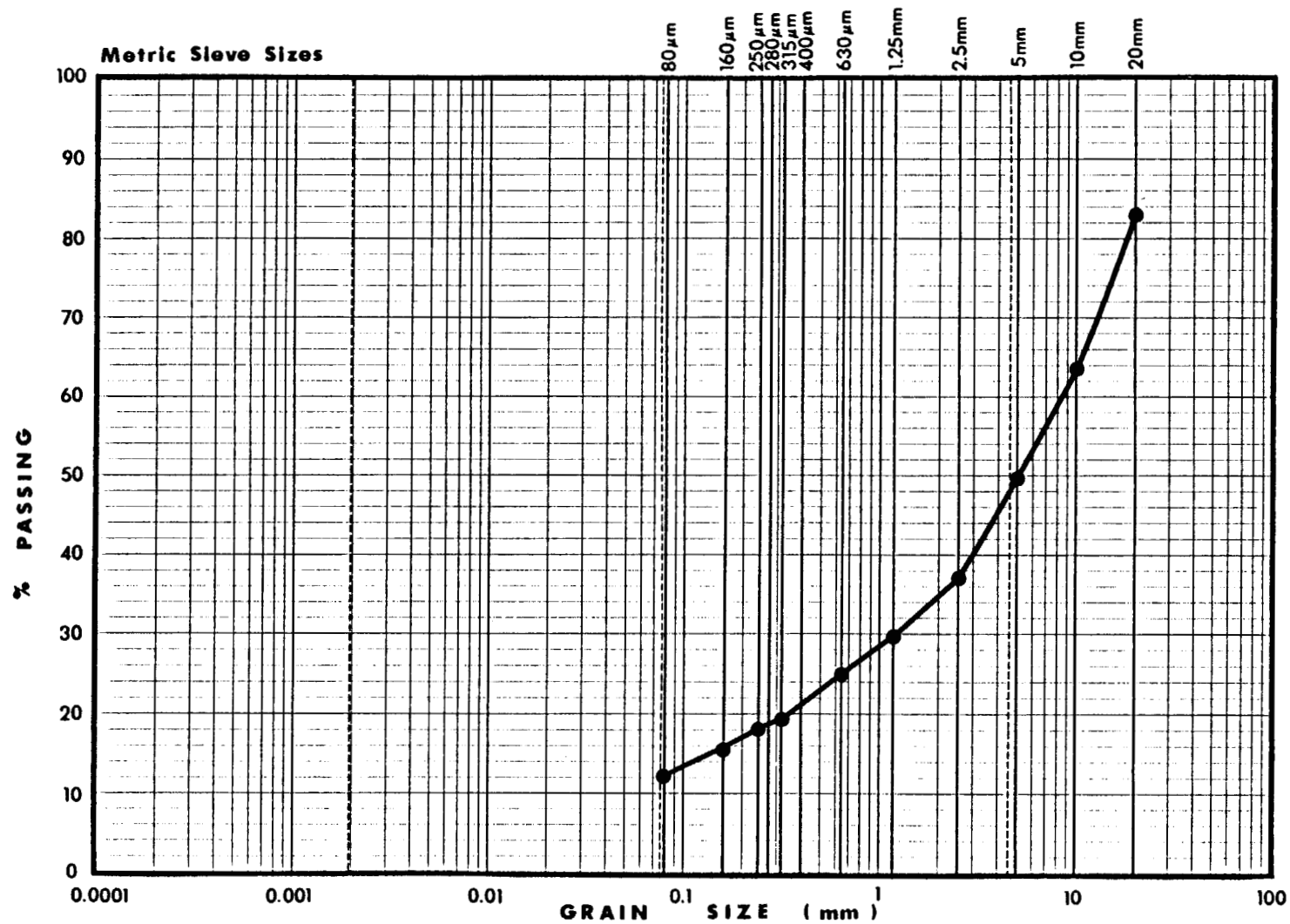
JOB No.: 10-300

DATE: 85/06/03

DRAWN BY: GJB

DWG. No.: B-35

CLAY	SILT	SAND			GRAVEL	
		Fine	Medium	Coarse	Fine	Coarse



Borehole Number F85-KM12
Sample Number 9,10,11,12,13
combined

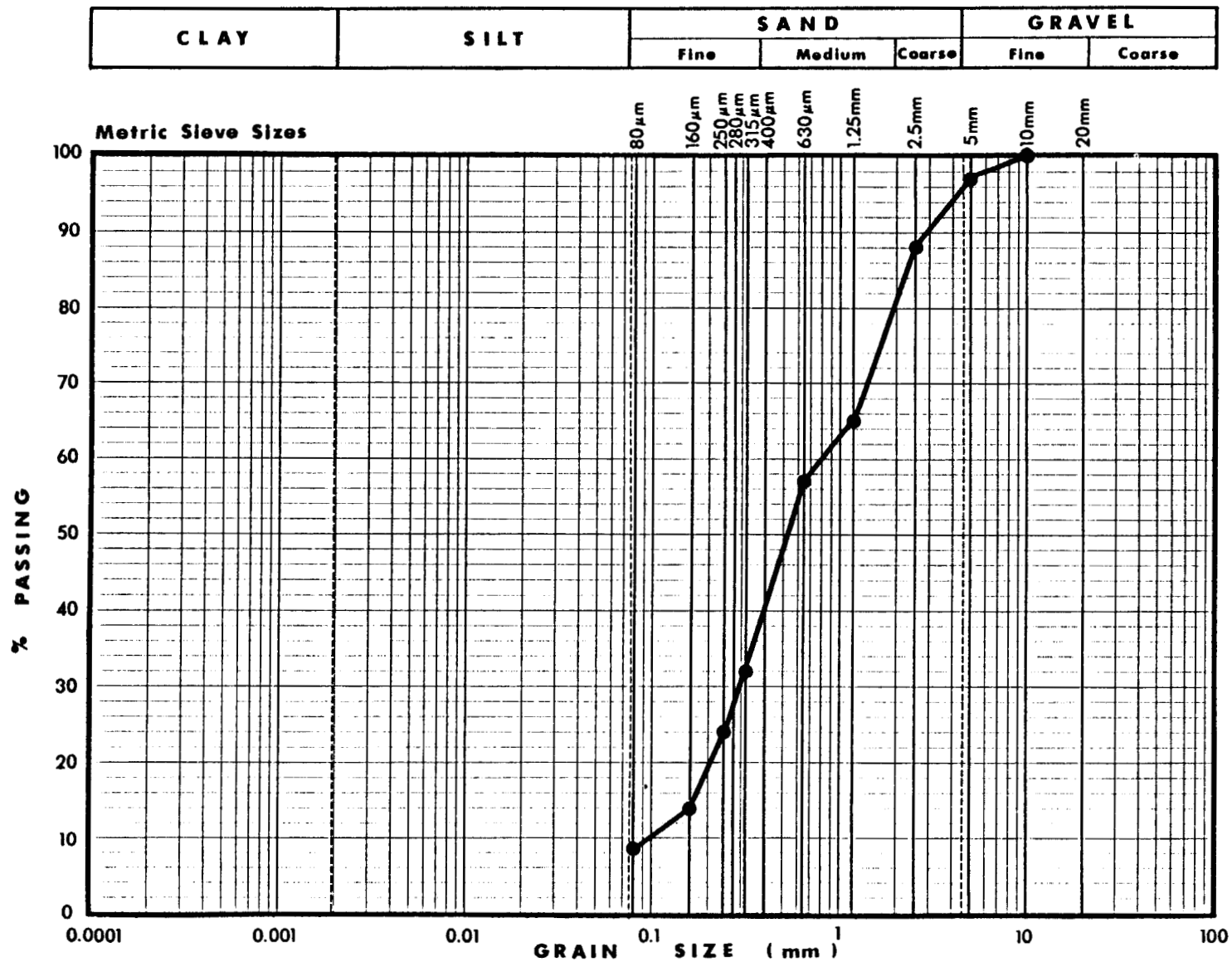
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/06/03

DRAWN BY: GJB

DWG. No.: B-36



Borehole Number F85-KM12
Sample Number 14

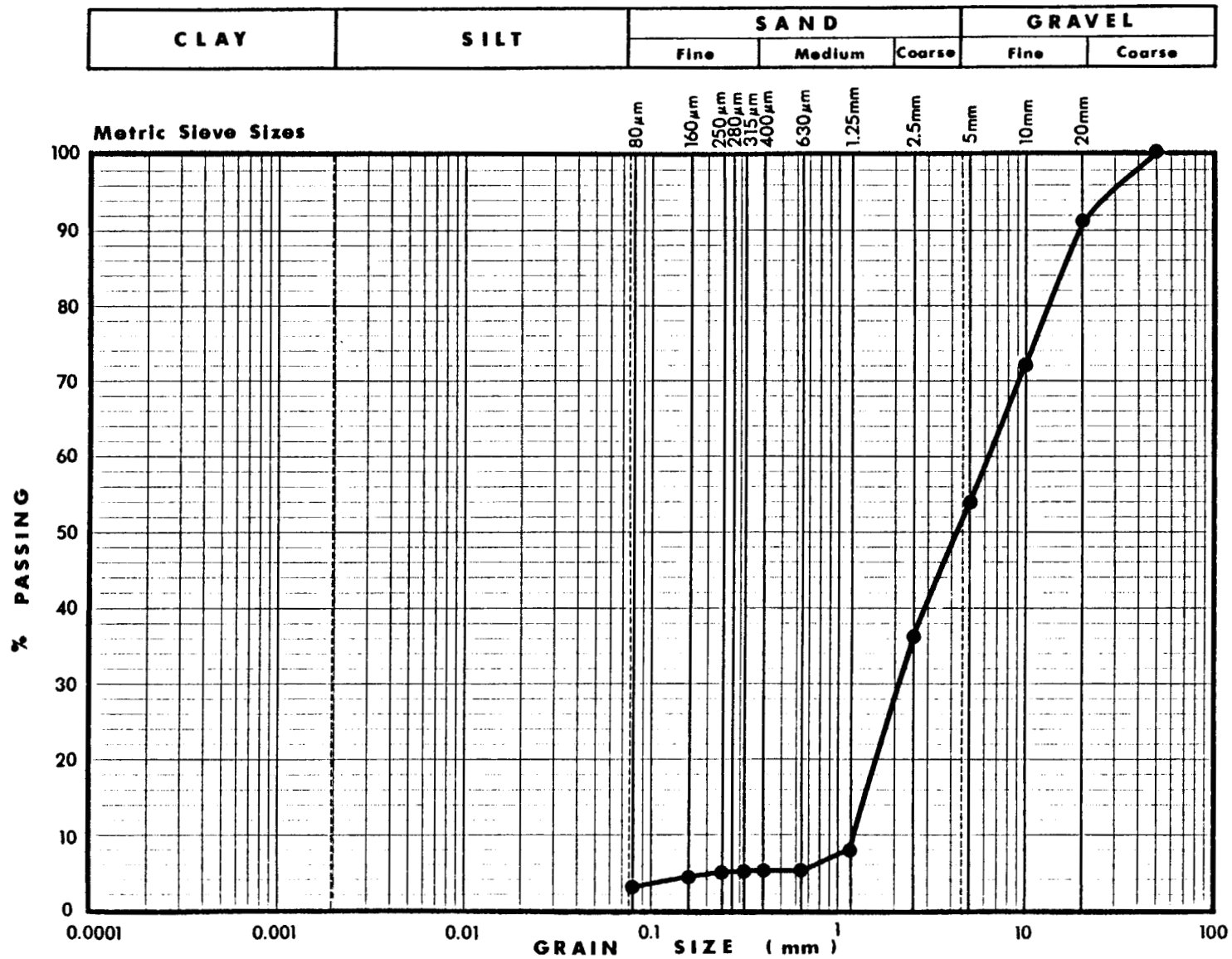
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/06/03

DRAWN BY: GJB

DWG. No.: B-37



Borehole Number F85-KM12
Sample Number 16,17 combined

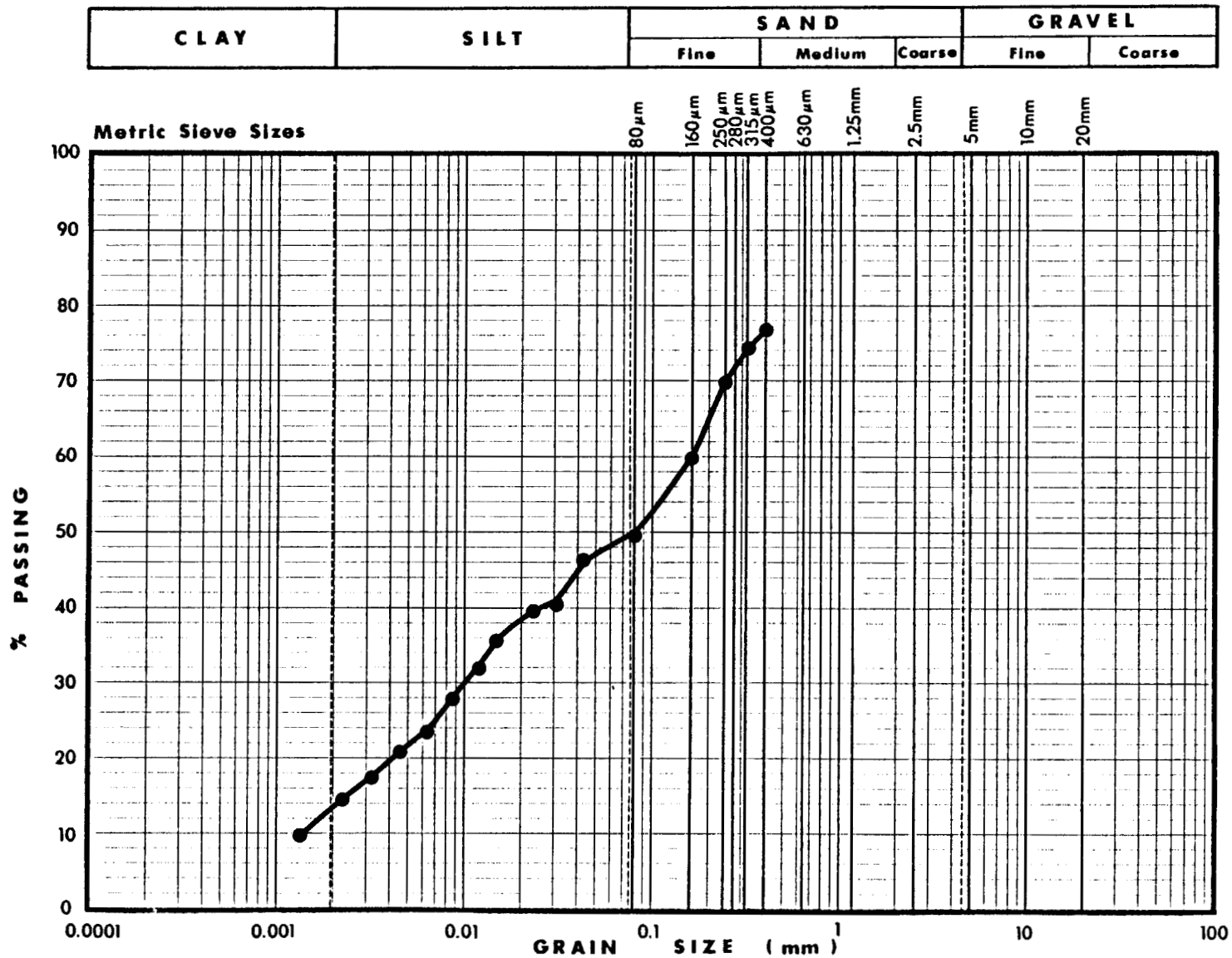
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/06/04

DRAWN BY: GJB

DWG. No.: B-38



Borehole Number F85-KM14
Sample Number 10

M. J. O'CONNOR & ASSOCIATES LTD.

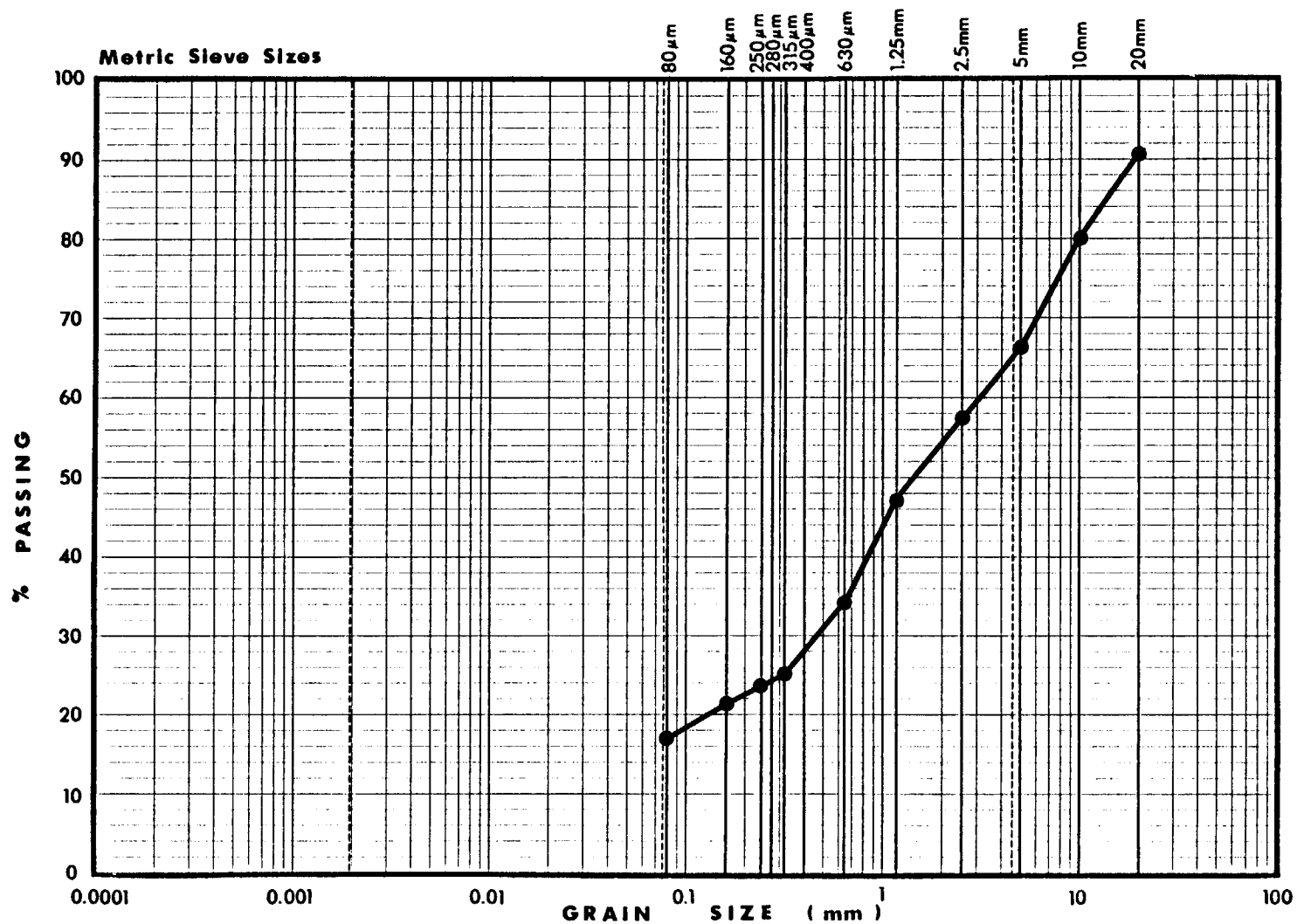
JOB No.: 10-300

DATE: 85/05/14

DRAWN BY: GJB

DWG. No.: B-39

CLAY	SILT	SAND			GRAVEL	
		Fine	Medium	Coarse	Fine	Coarse



Borehole Number F85-KM15
Sample Number 6

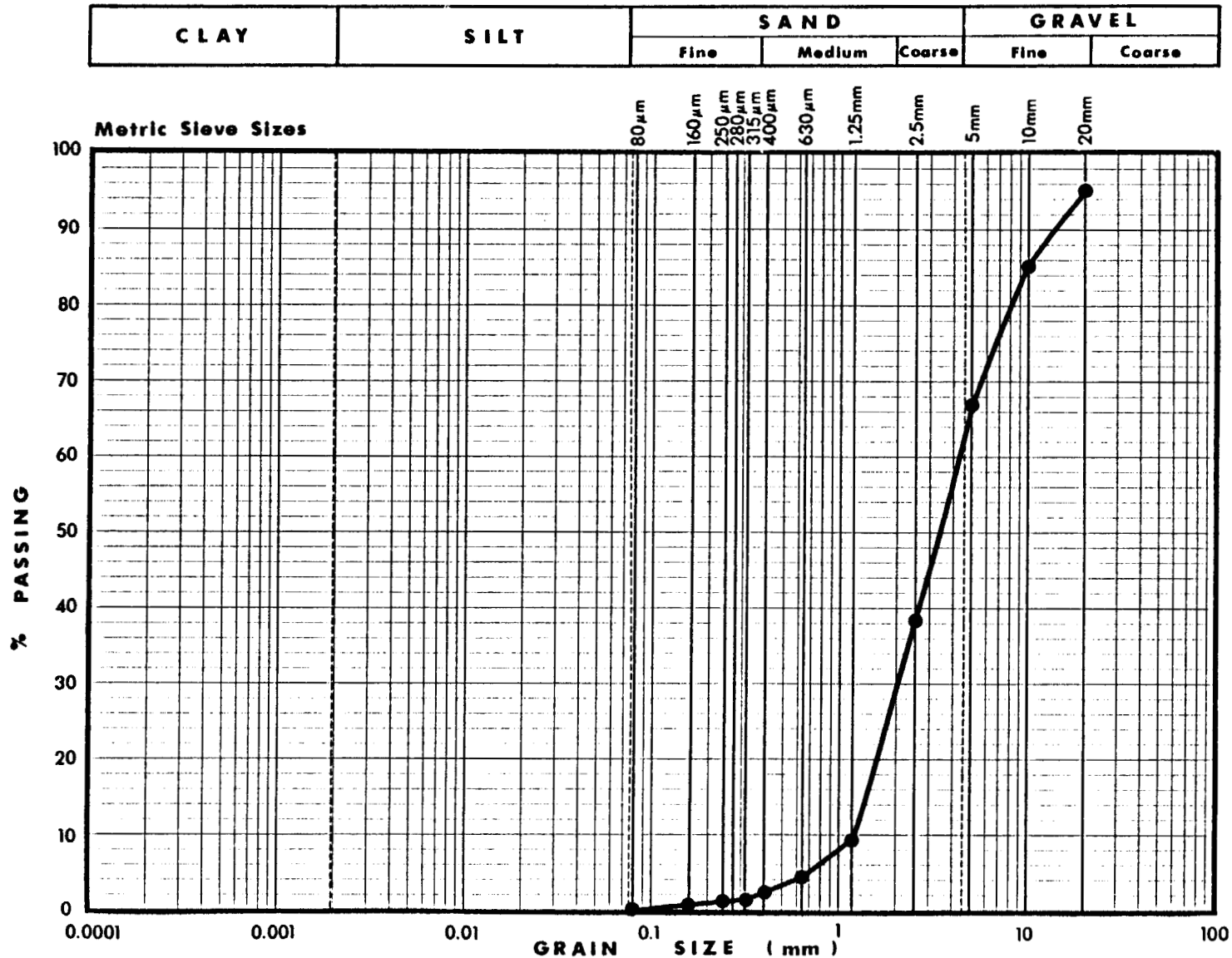
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/14

DRAWN BY: GJB

DWG. No.: B-40



Borehole Number F85-KM15
Sample Number 7

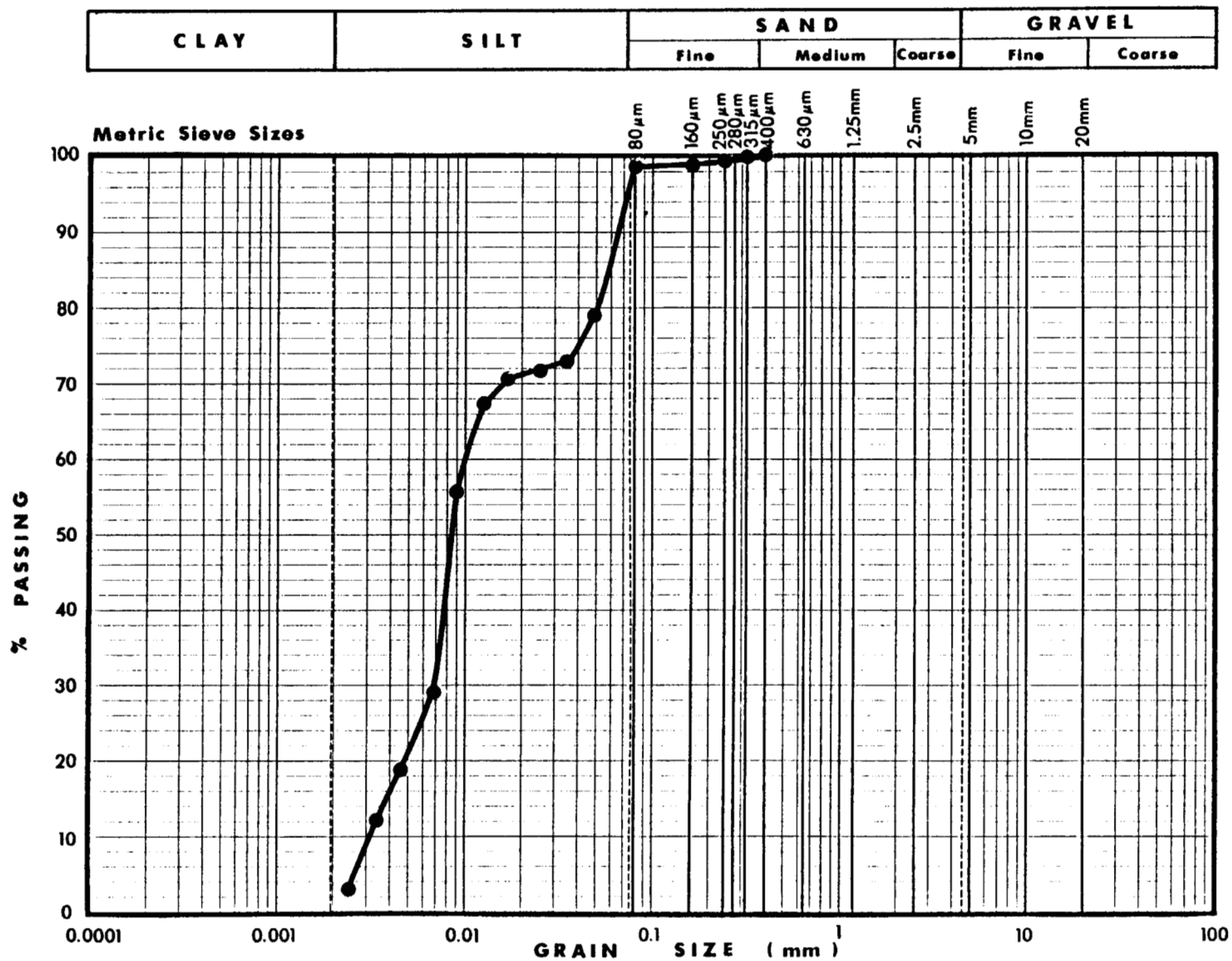
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/06/07

DRAWN BY: GJB

DWG. No.: B-41



Borehole Number F85-KM16
Sample Number 5

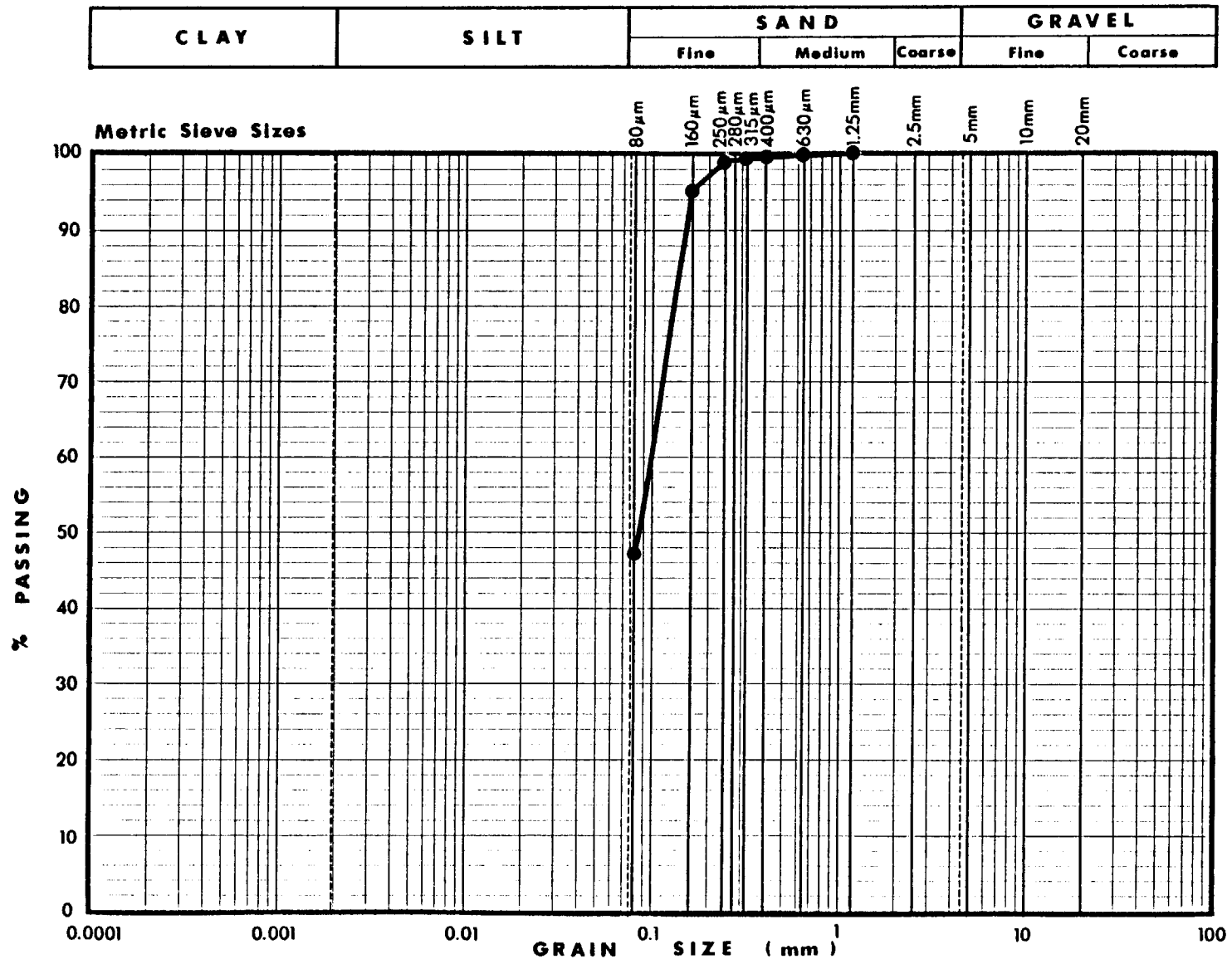
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/14

DRAWN BY: GJB

DWG. No.: B-42



Borehole Number F85-KM17
Sample Number 10

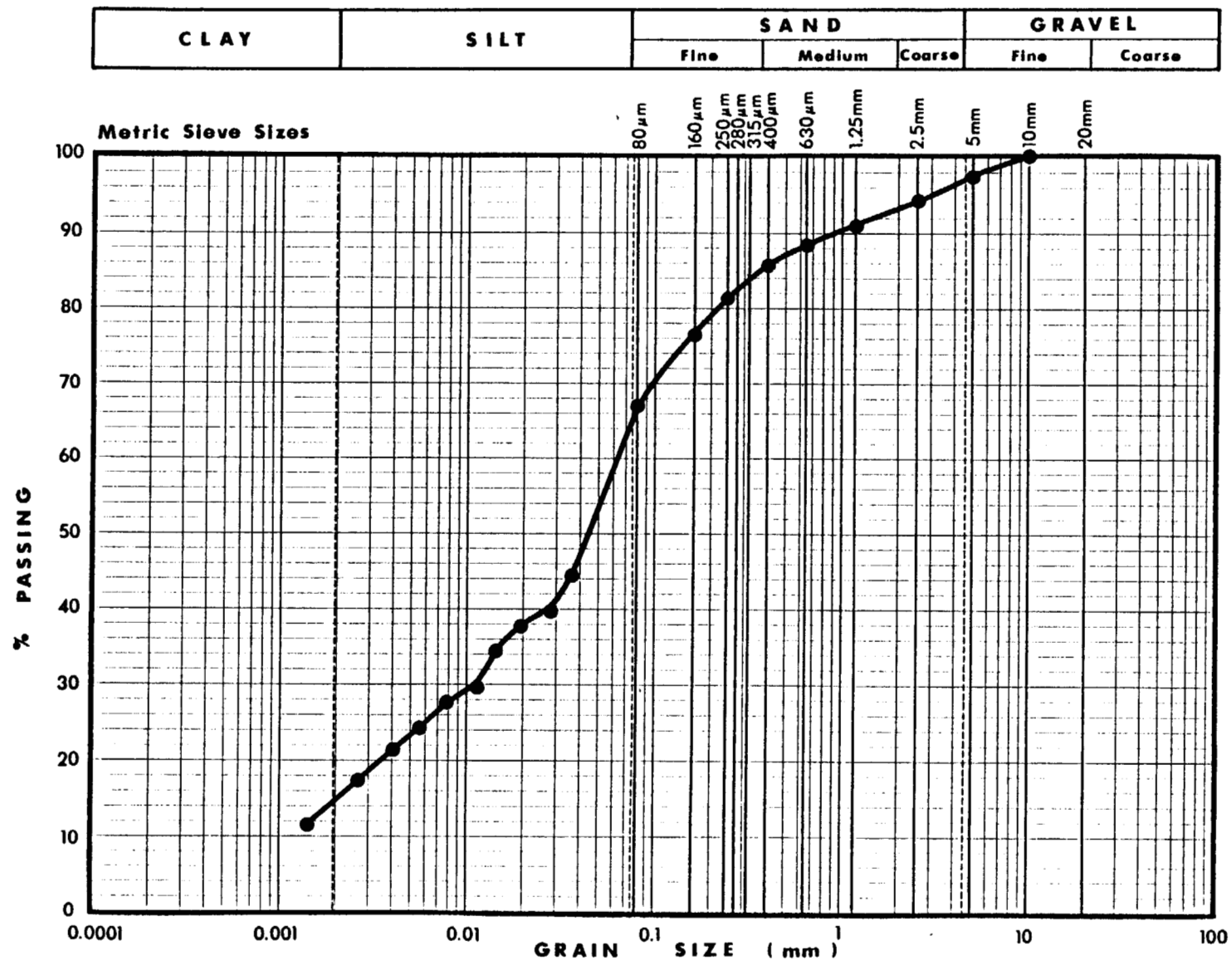
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/30

DRAWN BY: GJB

DWG. No.: B-43



Borehole Number F85-KM17
Sample Number 21

M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/21

DRAWN BY: GJB

DWG. No.: B-44

APPENDIX B-3

Onshore Samples - Test Data

SUMMARY OF TEST RESULTS

Sample Number	Sample Type	Depth (metres)	Unified Soil Classification	Ground Ice Description (%)	Temp. (°C)	Moisture Content (%)	Unit Weight (kN/m³)	Salinity (%)	ATTERBERG LIMITS		GRAIN SIZE DISTRIBUTION					SHEAR STRENGTH				Remarks
									Liquid Limit (%)	Plastic Limit (%)	Clay (%)	Silt (%)	Sand (%)	Gravel (%)	D ₅₀ (µm)	Test	Shear Strength (kPa)	Failure Strain (%)	Consistency	
1	B	0.1		2.5	-2.6	120														
2	B	1.0		2.3	-2.5	40.2														
2b	B	1.5			-2.1	32.7														
3/3b	B	3.0	CL	0	+2.6	22.9			29	17	19.5	56.2	21.2	3.1						LI= 0.492 A= 0.615
3c	B	3.3			-0.5	25.1														
4	B	4.8		0	-0.5	19.8														
4b	B	6.2				10.1														
4c	B	6.6				—														
4d	B	7.0				15.7														
4e	B	8.0				12.0														
5b	B	8.5		0	-8.5	21.2														
5c	B	9.0			-0.5	17.7														
5d	B	9.7				10.2														
6	B	10.8		0		17.5														
6a	B	10.5				10.6														
6c	B	11.4				10.1														
6d	B	12.1				19.7														
6e	B	12.8				28.7														
6f	B	14.0				22.2														
6g	B	14.7				20.3														
6h	B	15.0				12.2														

B - Bag Sample
G - Gas Sample
L - Liner Sample
P - Piston Sample
NR - No Recovery

NS - No Sample Remaining
PF - Permafrost Sample
PW - Porewater Sample
T - Sample Stored in Tube
W - Waxed Sample

RC - Radiocarbon Sample
MV - Minivane
FC - Fall Cone
TV - Torvane
PV - Pilcon Vane

RV - Remote Vane
PP - Pocket Penetrometer
UU - Unconsolidated Undrained Triaxial
UUUp - UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial
CUUp - CU Triaxial with Pore Pressure Measurements
CD - Consolidated Drained Triaxial

O - Organic Content
S - Salinity
TS - Thaw Strain
SG - Specific Gravity

Project Number 10-300 Borehole Number F85-KM13 Page 1 of 2

SUMMARY OF TEST RESULTS

[illegible]

O - Organic Content

S - Salinity

TS - Thaw Strain

SG - Specific Gravity

Measurements

SUMMARY OF TEST RESULTS

Sample Number	Sample Type	Depth (metres)	Unified Soil Classification	Ground Ice Description (%)	Temp. (°C)	Moisture Content (%)	Unit Weight (kN/m³)	Salinity (%)	ATTERBERG LIMITS		GRAIN SIZE DISTRIBUTION					SHEAR STRENGTH				Remarks
									Liquid Limit (%)	Plastic Limit (%)	Clay (%)	Silt (%)	Sand (%)	Gravel (%)	D ₅₀ (µm)	Test	Shear Strength (kPa)	Failure Strain (%)	Consistency	
1	B	0.1			+0.5	98.3														
2	B	0.5				157.9														
3	B	1.0			-3.6	56.0														
4	B	1.5		65	-1.8	30.1														
5	B	2.0	CL	38		37.8			33	19										LI=1.343
6	B	2.5				30.8														
7	B	3.0		0		25.4														
8	B	3.5	CL		-1.3	24.0			30	16										LI=0.571
9	B	4.0		0		7.8														
10	B	4.5				18.3														
11	B	1.4				—														
12	B	1.5				—														
13	B	3.0				486.7														
14	B	2.0				83.3														
15	B	3.0				25.5														
16	B	4.0				11.2														
17	B	5.1			-1.5	23.0														
18	B	6.2	CL			18.3			27	16	12.0	522	29.6	6.2						LI=0.209 A=0.917
19	B	7.5				13.8														
20	B	8.5				21.6														
21	B	9.5				17.5														

B - Bag Sample
G - Gas Sample
L - Liner Sample
P - Piston Sample
NR - No Recovery

NS - No Sample Remaining
PF - Permafrost Sample
PW - Porewater Sample
T - Sample Stored in Tube
W - Waxed Sample

RC - Radiocarbon Sample
MV - Minivane
FC - Fall Cone
TV - Torvane
PV - Pilcon Vane

RV - Remote Vane
PP - Pocket Penetrometer
UU - Unconsolidated Undrained Triaxial
UUUp - UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial
CUUp - CU Triaxial with Pore Pressure Measurements
CD - Consolidated Drained Triaxial

O - Organic Content
S - Salinity
TS - Thaw Strain
SG - Specific Gravity

SUMMARY OF TEST RESULTS

Sample Number	Sample Type	Depth (metres)	Unified Soil Classification	Ground Ice Description (%)	Temp. (°C)	Moisture Content (%)	Unit Weight (kN/m³)	Salinity (%)	ATTERBERG LIMITS		GRAIN SIZE DISTRIBUTION					SHEAR STRENGTH				Remarks
									Liquid Limit (%)	Plastic Limit (%)	Clay (%)	Silt (%)	Sand (%)	Gravel (%)	D ₅₀ (µm)	Test	Shear Strength (kPa)	Failure Strain (%)	Consistency	
22	B	10.5				19.4														
23	B	11.5				13.5														
24	B	12.5				16.5														
25	B	13.5				10.7														
26	B	15.5				15.2														
27	B	16.1				12.7														
28	B	16.4				13.9														
29	B	16.8				—														
30	B	16.9				9.7														
31	B	17.4	SP-SM	0	-0.2	18.8					14.0	30.2	55.8	—						
32	B	17.4				19.1														
33	B	17.3			-0.2	—														
34	B	18.5				18.3														
35	B	18.5				6.6														
36	B	18.7				9.1														
37	B	19.2				8.2														
38	B	19.6				8.4														
39	B	19.9				13.1														
40	B	20.6				7.5														
41	B	21.0				12.2														
42	B	21.5				—														

B - Bag Sample
G - Gas Sample
L - Liner Sample
P - Piston Sample
NR - No Recovery

NS - No Sample Remaining
PF - Permafrost Sample
PW - Porewater Sample
T - Sample Stored in Tube
W - Waxed Sample

RC - Radiocarbon Sample
MV - Minivane
FC - Fall Cone
TV - Torvane
PV - Pilcon Vane

RV - Remote Vane
PP - Pocket Penetrometer
UU - Unconsolidated Undrained Triaxial
UUP - UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial
CUP - CU Triaxial with Pore Pressure Measurements
CD - Consolidated Drained Triaxial

O - Organic Content
S - Salinity
TS - Thaw Strain
SG - Specific Gravity

SUMMARY OF TEST RESULTS

[illegible]

B - Bag Sample

G - Gas Sample

L - Liner Sample

P - Piston Sample

NR-No Recovery

NS - No Sample Remaining

PF - Permafrost Sample

PW - Porewater Sample

T - Sample Stored in Tube

W - Waxed Sample

RC - Radiocarbon Sample

MV - Minivane

FC – Fall Cone

TV - Torvane

PV - Pilcon Vane

RV - Remote Vane

PP - Pocket Penetrometer

UU - Unconsolidated Undrained Triaxial

UUp-UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial

CUp - CU Triaxial with Pore Pressure Measurements

CD - Consolidated Drained Triaxial

O - Organic Content

S - Salinity

TS - Thaw Strain

SG - Specific Gravity

Project Number 10-300 Borehole Number F85-KM18 Page 3 of 3

SUMMARY OF TEST RESULTS

Sample Number	Sample Type	Depth (metres)	Unified Soil Classification	Ground Ice Description (%)	Temp. (°C)	Moisture Content (%)	Unit Weight (kN/m³)	Salinity (%)	ATTERBERG LIMITS		GRAIN SIZE DISTRIBUTION					SHEAR STRENGTH				Remarks
									Liquid Limit (%)	Plastic Limit (%)	Clay (%)	Silt (%)	Sand (%)	Gravel (%)	D ₅₀ (µm)	Test	Shear Strength (kPa)	Failure Strain (%)	Consistency	
1	B	1.3		29	-1.8	137.6														
2	B	0.1			-2.1	668.9														
3	B	0.3				56.4														
4	B	1.3			-3.8	55.1														
5	B	4.0			-2.5	33.9														
6	B	4.5	CL		-1.5	28.3			26	16										LI=1.23
7	B	1.1		55	-2.5	215.3														
8	B	2.0		47		180.2														
9	B	3.0		42		187.8														
10	B	4.0		8		45.3														
11	B	5.1		2		24.9														
12	B	5.1				32.1														
13	B	6.1				16.8														
14	B	7.0				16.4														
15	B	8.0				22.3														
16	B	9.0			-0.5	26.4														
17	B	10.0				18.5														
18	B	11.0			-0.7	22.9														
19	B	11.7				16.3														
20	B	12.5				16.7														
21	B	13.1		0		28.3														

B - Bag Sample
G - Gas Sample
L - Liner Sample
P - Piston Sample
NR - No Recovery

NS - No Sample Remaining
PF - Permafrost Sample
PW - Porewater Sample
T - Sample Stored in Tube
W - Waxed Sample

RC - Radiocarbon Sample
MV - Minivane
FC - Fall Cone
TV - Torvane
PV - Pilcon Vane

RV - Remote Vane
PP - Pocket Penetrometer
UU - Unconsolidated Undrained Triaxial
UUU - UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial
CU_p - CU Triaxial with Pore Pressure Measurements
CD - Consolidated Drained Triaxial

O - Organic Content
S - Salinity
TS - Thaw Strain
SG - Specific Gravity

SUMMARY OF TEST RESULTS

[illegible]

NS - No Sample Remaining

RC - Radiocarbon Sample

CU - Consolidated Undrained Triaxial

PF - Permafrost Sample

MV - Minivane

PP - Pocket Penetrometer

CUp - CU Triaxial with Pore Pressure Measurements

S - Salinity

PW - Porewater Sample

FC - Fall Cone

UU - Unconsolidated Undrained Triaxial

Measurements

TS - Thaw Strain

T - Sample Stored in Tube

TV - Torvane

UUp-UU Triaxial with Pore Pressure Measurements

CD - Consolidated Drained Triaxial

SG - Specific Gravity

W - Waxed Sample

PV - Pilcon Vane

SUMMARY OF TEST RESULTS

Sample Number	Sample Type	Depth (metres)	Unified Soil Classification	Ground Ice Description (%)	Temp. (°C)	Moisture Content (%)	Unit Weight (kN/m³)	Salinity (%)	ATTERBERG LIMITS		GRAIN SIZE DISTRIBUTION					SHEAR STRENGTH				Remarks
									Liquid Limit (%)	Plastic Limit (%)	Clay (%)	Silt (%)	Sand (%)	Gravel (%)	D ₅₀ (µm)	Test	Shear Strength (kPa)	Failure Strain (%)	Consistency	
1	B	0.1				—														
2	B	1.0				125.2														
3	B	3.5		7		25.1														
4	B	3.5				30.3														
5	B	4.0				22.9														
6	B	5.0			-0.9	9.0														
7	B	6.0	CL			15.1			25	16	19.0	51.3	29.3	0.4						lean clay with sand LI=-0.100 A=0.474
8	B	6.0				14.9														
9	B	7.0				17.2														
10	B	8.0				15.7														
11	B	9.0	CL			14.3			26	16										LI=-0.17
12	B	10.0				15.1														
13	B	10.0				16.2														
14	B	11.0				7.0														
15	B	12.0	GC			7.2						163	34.2	50.5						
16	B	13.0	CL			27.2			34	23										LI=0.382
17	B	13.5				28.9														
18	B	14.0				29.6														
19	B	14.5			-2.6	—														
20	B	15.0				24.8														

B - Bag Sample
G - Gas Sample
L - Liner Sample
P - Piston Sample
NR - No Recovery

NS - No Sample Remaining
PF - Permafrost Sample
PW - Porewater Sample
T - Sample Stored in Tube
W - Waxed Sample

RC - Radiocarbon Sample
MV - Minivane
FC - Fall Cone
TV - Torvane
PV - Pilcon Vane

RV - Remote Vane
PP - Pocket Penetrometer
UU - Unconsolidated Undrained Triaxial
UUup - UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial
CUup - CU Triaxial with Pore Pressure Measurements
CD - Consolidated Drained Triaxial

O - Organic Content
S - Salinity
TS - Thaw Strain
SG - Specific Gravity

SUMMARY OF TEST RESULTS

[illegible]

B - Bag Sample

G - Gas Sample

L - Liner Sample

P - Piston Sample

NR-No Recovery

NS - No Sample Remaining

PF - Permafrost Sample

PW - Porewater Sample

T - Sample Stored in Tube

W - Waxed Sample

RC - Radiocarbon Sample

MV - Minivane

FC - Fall Cone

TV - Torvane

PV - Pilcon Vane

RV - Remote Vane

PP - Pocket Penetrometer

UU - Unconsolidated Undrained Triaxial

UU_p - UU Triaxial with Pore Pressure

Measurements

CU - Consolidated Undrained Triaxial

CUp - CU Triaxial with Pore Pressure Measurements

CD - Consolidated Drained Triaxial

O - Organic Content

S - Salinity

TS - Thaw Strain

SG - Specific Gravity

SUMMARY OF TEST RESULTS

Sample Number	Sample Type	Depth (metres)	Unified Soil Classification	Ground Ice Description (%)	Temp. (°C)	Moisture Content (%)	Unit Weight (kN/m³)	Salinity (%)	ATTERBERG LIMITS		GRAIN SIZE DISTRIBUTION					SHEAR STRENGTH				Remarks
									Liquid Limit (%)	Plastic Limit (%)	Clay (%)	Silt (%)	Sand (%)	Gravel (%)	D ₅₀ (µm)	Test	Shear Strength (kPa)	Failure Strain (%)	Consistency	
1	B	0.1				612.1														
2	B	1.0		28	-3.6	206.1														
2	E	1.2		60		159.1														
3	B	2.0				241.4														
3	E	3.0		33		94.5														
4	B	4.0				44.1														
4	E	5.0		30		74.5														
5	B	5.0	CL		-3.6	46.2			36	18										LI=1,567
6	B	5.1				43.6														
7	B	6.0				27.3														
7	E	6.5		<1		30.0														
8	B	7.0				23.3														
8	E	7.5		0		19.9														
9	B	8.0			-1.5	22.7					14.5	56.4	25.9	3.2						
9	E	8.2				317.3														
10	B	8.3				553.8														
11	B	9.0			-2.0	25.3														
11	E	9.5		0		21.3														
12	B	10.0				21.2														
13	B	11.0			-2.3	22.0														
14	B	11.0				21.9														

B - Bag Sample
G - Gas Sample
L - Liner Sample
P - Piston Sample
NR - No Recovery

NS - No Sample Remaining
PF - Permafrost Sample
PW - Porewater Sample
T - Sample Stored in Tube
W - Waxed Sample

RC - Radiocarbon Sample
MV - Minivane
FC - Fall Cone
TV - Torvane
PV - Pilcon Vane

RV - Remote Vane
PP - Pocket Penetrometer
UU - Unconsolidated Undrained Triaxial
UUU - UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial
CU_p - CU Triaxial with Pore Pressure Measurements
CD - Consolidated Drained Triaxial

O - Organic Content
S - Salinity
TS - Thaw Strain
SG - Specific Gravity

SUMMARY OF TEST RESULTS

Sample Number	Sample Type	Depth (metres)	Unified Soil Classification	Ground Ice Description (%)	Temp. (°C)	Moisture Content (%)	Unit Weight (kN/m³)	Salinity (%)	ATTERBERG LIMITS		GRAIN SIZE DISTRIBUTION					SHEAR STRENGTH				Remarks
									Liquid Limit (%)	Plastic Limit (%)	Clay (%)	Silt (%)	Sand (%)	Gravel (%)	D ₅₀ (µm)	Test	Shear Strength (kPa)	Failure Strain (%)	Consistency	
14	E	11.5		1		41.9														
15	B	12.0				26.1														
16	B	13.0				19.0														
16	E	13.5		0		17.9														
17	B	14.0	ML			22.8			19	16	21.5	54.0	24.5	—						silt with sand LI=2.267 A=0.140
18	B	14.0			-1.4	—														
19	B	15.0				21.1														
19	E	15.5		0		14.3														
20	B	16.0				15.8														
21	B	17.0			-1.8	15.8														
22	B	18.0				20.4														
22	E	18.5		0		24.4														
23	B	19.0	CL			28.0			33	15										LI=0.722
24	B	20.0	GP			9.4					10.7	25.3	64.0							
24	E	25.0		0		8.0														
25	B	25.0				8.4														
26	B	21.0	SP-SM		-0.5	9.6					22.8	45.8	31.4							
27	B	22.0	SP-SM			9.1					14.1	60.8	25.1							
28	B	23.0			-0.3	16.1														
28	E	23.5		0		23.8														

B - Bag Sample
G - Gas Sample
L - Liner Sample
P - Piston Sample
NR - No Recovery

NS - No Sample Remaining
PF - Permafrost Sample
PW - Porewater Sample
T - Sample Stored in Tube
W - Waxed Sample

RC - Radiocarbon Sample
MV - Minivane
FC - Fall Cone
TV - Torvane
PV - Pilcon Vane

RV - Remote Vane
PP - Pocket Penetrometer
UU - Unconsolidated Undrained Triaxial
UUUp - UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial
CUUp - CU Triaxial with Pore Pressure Measurements
CD - Consolidated Drained Triaxial

O - Organic Content
S - Salinity
TS - Thaw Strain
SG - Specific Gravity

SUMMARY OF TEST RESULTS

[illegible]

B - Bag Sample

G - Gas Sample

L - Liner Sample

P - Piston Sample

NR-No Recovery

NS - No Sample Remaining

PF - Permafrost Sample

PW - Porewater Sample

T -Sample Stored in Tube

W - Waxed Sample

RC - Radiocarbon Sample

MV - Minivane

FC - Fall Cone

TV - Torvane

PV - Pilcon Vane

RV - Remote Vane

PP - Pocket Penetrometer

UU - Unconsolidated Undrained Triaxial

UUp- UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial

CUp - CU Triaxial with Pore Pressure Measurements

CD - Consolidated Drained Triaxial

O - Organic Content

S - Salinity

TS - Thaw Strain

SG - Specific Gravity

Project Number 10-300 Borehole Number F85-KM21 Page 3 of 3

SUMMARY OF TEST RESULTS

Sample Number	Sample Type	Depth (metres)	Unified Soil Classification	Ground Ice Description (%)	Temp. (°C)	Moisture Content (%)	Unit Weight (kN/m³)	Salinity (%)	ATTERBERG LIMITS		GRAIN SIZE DISTRIBUTION					SHEAR STRENGTH				Remarks
									Liquid Limit (%)	Plastic Limit (%)	Clay (%)	Silt (%)	Sand (%)	Gravel (%)	D ₅₀ (µm)	Test	Shear Strength (kPa)	Failure Strain (%)	Consistency	
1	B	0.1																		
1	E	1.0		20		689.1														
2	B	2.0			-4.3	138.7	12.4													
3	B	3.0		7		96.4														
4	B	4.0																		
5	B	4.5																		
6	B	5.0				34.4														
7	B	6.0	CL						35	24	38.0	52.0	10.0							A=0.289
8	B	7.0				20.2														
9	B	8.0			-1.0															
10	B	9.0																		
11	B	10.0																		
12	B	10.5																		
13	B	11.0																		
14	B	12.0																		
15	B	12.5			-1.2															
16	B	13.0																		
17	B	14.2																		
18	B	16.7																		
19	B	15.5																		
19b	B	17.1																		

B - Bag Sample
G - Gas Sample
L - Liner Sample
P - Piston Sample
NR - No Recovery

NS - No Sample Remaining
PF - Permafrost Sample
PW - Porewater Sample
T - Sample Stored in Tube
W - Waxed Sample

RC - Radiocarbon Sample
MV - Minivane
FC - Fall Cone
TV - Torvane
PV - Pilcon Vane

RV - Remote Vane
PP - Pocket Penetrometer
UU - Unconsolidated Undrained Triaxial
UUp - UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial
CU_p - CU Triaxial with Pore Pressure Measurements
CD - Consolidated Drained Triaxial

O - Organic Content
S - Salinity
TS - Thaw Strain
SG - Specific Gravity

SUMMARY OF TEST RESULTS

[illegible]

B ~ Bag Sample

G - Gas Sample

1 ~ Liner Sample

P - Piston Sample

NR-No Recovery

NS - No Sample Remaining

PF - Permafrost Sample

PW - Porewater Sample

T ~ Sample Stored in Tube

W - Waxed Sample

RC - Radiocarbon Sample

MV - Minivane

FC - Fall Cone

TV - Torvane

PV - Pilcon Vane

RV - Remote Vane

PP - Pocket Penetrometer

UU - Unconsolidated Undrained Triaxial

UUp-UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial

CUp - CU Triaxial with Pore Pressure Measurements

CD - Consolidated Drained Triaxial

O - Organic Content

S - Salinity

TS - Thaw Strain

SG - Specific Gravity

Project Number 10-300 Borehole Number F85-KM22 Page 2 of 2

SUMMARY OF TEST RESULTS

Sample Number	Sample Type	Depth (metres)	Unified Soil Classification	Ground Ice Description (%)	Temp. (°C)	Moisture Content (%)	Unit Weight (kN/m³)	Salinity (%)	ATTERBERG LIMITS		GRAIN SIZE DISTRIBUTION						SHEAR STRENGTH			Remarks
									Liquid Limit (%)	Plastic Limit (%)	Clay (%)	Silt (%)	Sand (%)	Gravel (%)	D ₅₀ (µm)	Test	Shear Strength (kPa)	Failure Strain (%)	Consistency	
1	B	0.1			-0.5	39.1														
2	B	0.2			-1.4	29.7														
3	B	1.9		52	-4.8	48.1														
4	B	2.4			-0.3	—														
5	B	3.7			-0.8	—														
6	B	4.8			-0.6	—														
7	B	5.3		22	-0.8	55.7														
8	B	5.7			-0.3	48.6														
9	B	6.8			-0.5	29.2														
10	B	7.9		5	-0.4	47.6														
11	B	8.5			-0.4	43.9														
12	B	9.7			-0.8	43.6														
13	B	11.6	CL			29.4			35	18										LI=0.671
14	B	12.8	CL			18.0			29	15	25.0	34.6	28.9	11.5						LI=0.214 A=0.56 sandy lean clay
15	B	13.6		55	-0.2	337.4														
16	B	21.5		35	-0.5	102.1														
17	B	25.5		3	-1.7	44.8														

B - Bag Sample
G - Gas Sample
L - Liner Sample
P - Piston Sample
NR - No Recovery

NS - No Sample Remaining
PF - Permafrost Sample
PW - Porewater Sample
T - Sample Stored in Tube
W - Waxed Sample

RC - Radiocarbon Sample
MV - Minivane
FC - Fall Cone
TV - Torvane
PV - Pilcon Vane

RV - Remote Vane
PP - Pocket Penetrometer
UU - Unconsolidated Undrained Triaxial
UUup - UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial
CUup - CU Triaxial with Pore Pressure Measurements
CD - Consolidated Drained Triaxial

O - Organic Content
S - Salinity
TS - Thaw Strain
SG - Specific Gravity

Project Number 10-300 Borehole Number F85-KM23 Page 1 of 1

SUMMARY OF TEST RESULTS

[illegible]

B - Bag Sample

NS - No Sample Remaining

RC - Radiocarbon Sample

RV - Remote Vane

CU - Consolidated Undrained Triaxial

O - Organic Content

G - Gas Sample

PF - Permafrost Sample

MV - Minivane

PP - Pocket Penetrometer

CUp - CU Triaxial with Pore Pressure Measurements

S - Salinity

L - Liner Sample

PW - Porewater Sample

FC - Fall Cone

UU - Unconsolidated Undrained Triaxial

TS - Thaw Strain

P - Piston Sample

T -Sample Stored in Tube

TV - Torvane

UU_p - UU Triaxial with Pore Pressure Measurements

CD - Consolidated Drained Triaxial

SG - Specific Gravity

NR-No Recovery

W - Waxed Sample

PV - Pilcon Vane

SUMMARY OF TEST RESULTS

Sample Number	Sample Type	Depth (metres)	Unified Soil Classification	Ground Ice Description (%)	Temp. (°C)	Moisture Content (%)	Unit Weight (kN/m³)	Salinity (%)	ATTERBERG LIMITS		GRAIN SIZE DISTRIBUTION					SHEAR STRENGTH				Remarks
									Liquid Limit (%)	Plastic Limit (%)	Clay (%)	Silt (%)	Sand (%)	Gravel (%)	D ₅₀ (µm)	Test	Shear Strength (kPa)	Failure Strain (%)	Consistency	
1	B	1.0				499.6														
2	B	2.0			-6.8	86.7														
2	E	3.0		32	-1.4	174.9														
3	B	5.0				15.0														
4	B	6.0				19.4														
5	B	7.0				22.1														
6	B	8.0			-1.5	20.8														
7	B	8.0				23.2														
8	B	9.0				18.7														
9	B	10.0				28.8														
10	B	11.0			-2.5	23.2														
11	B	12.0				26.5														
12	B	13.0				27.9														
13	B	14.0			-2.2	18.5														
14	B	15.0				30.1														
15	B	16.0				31.9														
16	B	17.0			-2.5	44.4														
17	B	17.5				68.6														
18	B	18.0				40.9														
19	B	19.0		23		50.3														
20	B	20.0			-3.4	51.0														

B - Bag Sample
G - Gas Sample
L - Liner Sample
P - Piston Sample
NR - No Recovery

NS - No Sample Remaining
PF - Permafrost Sample
PW - Porewater Sample
T - Sample Stored in Tube
W - Waxed Sample

RC - Radiocarbon Sample
MV - Minivane
FC - Fall Cone
TV - Torvane
PV - Pilcon Vane

RV - Remote Vane
PP - Pocket Penetrometer
UU - Unconsolidated Undrained Triaxial
UUp - UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial
CUp - CU Triaxial with Pore Pressure Measurements
CD - Consolidated Drained Triaxial

O - Organic Content
S - Salinity
TS - Thaw Strain
SG - Specific Gravity

SUMMARY OF TEST RESULTS

[illegible]

B - Bag Sample

G - Gas Sample

L - Liner Sample

P - Piston Sample

NR-No Recovery

NS - No Sample Remaining

PF - Permafrost Sample

PW - Porewater Sample

T - Sample Stored in Tube

W - Waxed Sample

RC - Radiocarbon Sample

MV - Minivane

FC - Fall Cone

TV - Torvane

PV - Pilcon Vane

RV - Remote Vane

PP - Pocket Penetrometer

UU - Unconsolidated Undrained Triaxial

UUp-UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial

CU_p - CU Triaxial with Pore Pressure Measurements

CD - Consolidated Drained Triaxial

O - Organic Content

S - Salinity

TS - Thaw Strain

SG - Specific Gravity

Project Number 10-300 Borehole Number F85-KM25 Page 2 of 2

SUMMARY OF TEST RESULTS

Sample Number	Sample Type	Depth (metres)	Unified Soil Classification	Ground Ice Description (%)	Temp. (°C)	Moisture Content (%)	Unit Weight (kN/m³)	Salinity (%)	ATTERBERG LIMITS		GRAIN SIZE DISTRIBUTION						SHEAR STRENGTH				Remarks
									Liquid Limit (%)	Plastic Limit (%)	Clay (%)	Silt (%)	Sand (%)	Gravel (%)	D ₅₀ (µm)	Test	Shear Strength (kPa)	Failure Strain (%)	Consistency		
1	B	0.1				482.9															
2	B	1.0				36.0															
3	B	2.0			-6.2	26.5															
4	B	3.0		55		67.4															
5	B	4.0				38.2															
6	B	5.0				58.1															
7	B	6.0	ML			44.1	16.1				16.0	61.8	22.2	—							
8	B	6.5	CL			50.4			32	20										LI=2.533	
9	B	7.0				96.7															
10	B	8.0				—															
11	B	9.0				—															
12	B	10.0			-5.8	—															
13	B	10.5				61.1															
14	B	10.75				8.2						6.3	21.5	72.2							
15	B	12.0				23.1															
16	B	13.0				8.3															
17	B	13.5				8.4															
18	B	14.0				15.4															
19	B	15.0				23.7															
20	B	16.0				25.4															
21	B	16.5				21.9															

B - Bag Sample
G - Gas Sample
L - Liner Sample
P - Piston Sample
NR - No Recovery

NS - No Sample Remaining
PF - Permafrost Sample
PW - Porewater Sample
T - Sample Stored in Tube
W - Waxed Sample

RC - Radiocarbon Sample
MV - Minivane
FC - Fall Cone
TV - Torvane
PV - Pilcon Vane

RV - Remote Vane
PP - Pocket Penetrometer
UU - Unconsolidated Undrained Triaxial
UUP - UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial
CU_p - CU Triaxial with Pore Pressure Measurements
CD - Consolidated Drained Triaxial

O - Organic Content
S - Salinity
TS - Thaw Strain
SG - Specific Gravity

SUMMARY OF TEST RESULTS

[illegible]

B - Bag Sample

G - Gas Sample

L - Liner Sample

P - Piston Sample

NR-No Recovery

NS - No Sample Remaining

PF - Permafrost Sample

PW - Porewater Sample

T - Sample Stored in Tube

W - Waxed Sample

RC - Radiocarbon Sample

MV - Minivane

FC - Fall Cone

TV - Torvane

PV - Pilcon Vane

RV - Remote Vane

PP - Pocket Penetrometer

UU - Unconsolidated Undrained Triaxial

UU_p-UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial

CU_p - CU Triaxial with Pore Pressure Measurements

CD - Consolidated Drained Triaxial

O - Organic Content

S - Salinity

TS - Thaw Strain

SG - Specific Gravity

Project Number 10-300 Borehole Number F85-KM26 Page 2 of 2

SUMMARY OF TEST RESULTS

Sample Number	Sample Type	Depth (metres)	Unified Soil Classification	Ground Ice Description (%)	Temp. (°C)	Moisture Content (%)	Unit Weight (kN/m³)	Salinity (%)	ATTERBERG LIMITS		GRAIN SIZE DISTRIBUTION					SHEAR STRENGTH				Remarks
									Liquid Limit (%)	Plastic Limit (%)	Clay (%)	Silt (%)	Sand (%)	Gravel (%)	D ₅₀ (µm)	Test	Shear Strength (kPa)	Failure Strain (%)	Consistency	
1	B	0.1				336.8														
2	B	1.0				234.0														
3	B	2.0			-2.8	76.3														
4	B	3.0				9.4														
5	B	4.0	SP-SM			10.9			NP			10.7	59.6	29.7						poorly graded sand with silt & gravel
6	B	5.0			-0.6	11.7														
7	B	6.0				17.3														
8	B	7.0				8.7														
9	B	7.5				8.3														
10	B	8.0				8.4														
11	B	9.0				27.3														
12	B	10.0				13.1														
13	B	10.5				19.2														
14	B	11.0	GP-GM	27	-1.6	25.8						12.9	35.2	51.9						#14, 15, 16 combined
15	B	12.0				16.9														
16	B	13.0				8.2														
17	B	13.5	SP-SM			24.0														
18	B	14.0			-0.8	18.5						14.5	59.1	26.4						18,19,20 combined
19	B	14.5				21.1														
20	B	15.3				16.8														
21	B	16.8			-1.0	8.0														

B - Bag Sample
G - Gas Sample
L - Liner Sample
P - Piston Sample
NR - No Recovery

NS - No Sample Remaining
PF - Permafrost Sample
PW - Porewater Sample
T - Sample Stored in Tube
W - Waxed Sample

RC - Radiocarbon Sample
MV - Minivane
FC - Fall Cone
TV - Torvane
PV - Pilcon Vane

RV - Remote Vane
PP - Pocket Penetrometer
UU - Unconsolidated Undrained Triaxial
UUup - UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial
CUup - CU Triaxial with Pore Pressure Measurements
CD - Consolidated Drained Triaxial

O - Organic Content
S - Salinity
TS - Thaw Strain
SG - Specific Gravity

Project Number 10-300 Borehole Number F85-KM27 Page 1 of 2

SUMMARY OF TEST RESULTS

[illegible]

B - Bag Sample

G - Gas Sample

L - Liner Sample

P - Piston Sample

NR-No Recovery

NS - No Sample Remaining

PF - Permafrost Sample

PW - Porewater Sample

T -Sample Stored in Tube

W - Waxed Sample

RC - Radiocarbon Sample

MV - Minivane

FC - Fall Cone

TV - Torvane

PV - Pilcon Vane

RV - Remote Vane

PP - Pocket Penetrometer

UU - Unconsolidated Undrained Triaxial

UUp- UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial

CUp - CU Triaxial with Pore Pressure Measurements

CD - Consolidated Drained Triaxial

O - Organic Content

S - Salinity

TS - Thaw Strain**SG - Specific Gravity**

Project Number 10-300 Borehole Number F85-KM27 Page 2 of 2

SUMMARY OF TEST RESULTS

[illegible]

B - Bag Sample

G - Gas Sample

L - Liner Sample

P - Piston Sample

NR- No Recovery

NS - No Sample Remaining

PF - Permafrost Sample

PW - Porewater Sample

T - Sample Stored in Tube

W - Waxed Sample

RC - Radiocarbon Sample

MV - Minivane

FC - Fall Cone

TV - Torvane

PV - Pilcon Vane

RV - Remote Vane

PP - Pocket Penetrometer

UU - Unconsolidated Undrained Triaxial

UUp- UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial

CUp - CU Triaxial with Pore Pressure Measurements

CD - Consolidated Drained Triaxial

O - Organic Content

S - Salinity

TS - Thaw Strain

SG - Specific Gravity

Project Number 10-300 Borehole Number F85-KM28 Page 1 of 1

SUMMARY OF TEST RESULTS

[illegible]

B - Bag Sample

NS - No Sample Remaining

RC - Radiocarbon Sample

RV - Remote Vane

CU - Consolidated Undrained Triaxial

O - Organic Content

G - Gas Sample

PF - Permafrost Sample

MV - Minivane

PP - Pocket Penetrometer

CUp - CU Triaxial with Pore Pressure Measurements

S - Salinity

L - Liner Sample

PW - Porewater Sample

FC - Fall Cone

UU - Unconsolidated Undrained Triaxial

TS - Thaw Strain

P - Piston Sample

T - Sample Stored in Tube

TV - Torvane

UU_p - UU Triaxial with Pore Pressure Measurements

CD - Consolidated Drained Triaxial

SG - Specific Gravity

NR-No Recovery

W - Waxed Sample

PV - Pilcon Vane

SUMMARY OF TEST RESULTS

[illegible]

B - Bag Sample

NS - No Sample Remaining

RC - Radiocarbon Sample

RV - Remote Vane

CU - Consolidated Undrained Triaxial

O - Organic Content

G - Gas Sample

PF - Permafrost Sample

MV - Minivano

PP - Pocket Penetrometer

CUp - CU Triaxial with Pore Pressure Measurements

S - Salinity

L - Liner Sample

PW - Porewater Sample

FC - Fall Cone

UU - Unconsolidated Undrained Triaxial

MEASUREMENTS

TS - Thaw Strain

P - Piston Sample

T - Sample Stored in Tube

TV - Torvane

UUp- UU Triaxial with Pore Pressure Measurements

CD - Consolidated Drained Triaxial

SG - Specific Gravity

NR-No Recovery

W - Waxed Sample

PV - Pilcon Vane

SUMMARY OF TEST RESULTS

Sample Number	Sample Type	Depth (metres)	Unified Soil Classification	Ground Ice Description (%)	Temp. (°C)	Moisture Content (%)	Unit Weight (kN/m³)	Salinity (%)	ATTERBERG LIMITS		GRAIN SIZE DISTRIBUTION					SHEAR STRENGTH				Remarks
									Liquid Limit (%)	Plastic Limit (%)	Clay (%)	Silt (%)	Sand (%)	Gravel (%)	D ₅₀ (µm)	Test	Shear Strength (kPa)	Failure Strain (%)	Consistency	
1	B	0.1				233.6														
2	B	0.1				321.2														
3	B	2.0			-0.4	12.7														
4	B	3.0				10.0														
5	B	4.0				10.1					6.0	6.2	48.4	39.4						5, 6, & 7 combined
6	B	5.0				12.5														
7	B	6.0				11.5														
8	B	7.0				15.4														
9	B	8.0			-0.2	11.1														
10	B	9.0				11.8														
11	B	10.0				21.4														
	B	10.7		9		26.8														
12	B	11.0			-1.0	31.2														
13	B	12.0				25.8														
14	B	13.0				24.5														
15	B	14.0		11	-1.2	27.0														
16	B	15.0				23.3														
17	B	16.0				27.3														
18	B	14.6				20.7														
19	B	21.5			-2.1	319.8														

B - Bag Sample
G - Gas Sample
L - Liner Sample
P - Piston Sample
NR - No Recovery

NS - No Sample Remaining
PF - Permafrost Sample
PW - Porewater Sample
T - Sample Stored in Tube
W - Waxed Sample

RC - Radiocarbon Sample
MV - Minivane
FC - Fall Cone
TV - Torvane
PV - Pilcon Vane

RV - Remote Vane
PP - Pocket Penetrometer
UU - Unconsolidated Undrained Triaxial
UUU - UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial
CU_p - CU Triaxial with Pore Pressure Measurements
CD - Consolidated Drained Triaxial

O - Organic Content
S - Salinity
TS - Thaw Strain
SG - Specific Gravity

SUMMARY OF TEST RESULTS

Sample Number	Sample Type	Depth (metres)	Unified Soil Classification	Ground Ice Description (%)	Temp. (°C)	Moisture Content (%)	Unit Weight (kN/m³)	Salinity (%)	ATTERBERG LIMITS		GRAIN SIZE DISTRIBUTION					SHEAR STRENGTH				Remarks
									Liquid Limit (%)	Plastic Limit (%)	Clay (%)	Silt (%)	Sand (%)	Gravel (%)	D ₅₀ (µm)	Test	Shear Strength (kPa)	Failure Strain (%)	Consistency	
1	B	0.1				374.2														
2	B	5.0			-1.0	79.7														
3	B	6.0				86.4														
4	B	7.0			-0.4	51.7														
5	B	8.0				15.4														
6	B	9.0				21.1														
7	B	10.0				25.1														
8	B	11.0				17.9														
9	B	12.0				17.3														
10	B	13.0				25.5														
11	B	14.0			-1.1	10.1														
12	B	15.0				16.6														
13	B	16.0				17.8														
14	B	17.0				21.7														
15	B	18.0				33.8														
16	B	19.0				29.9														
17	B	20.0			-1.6	24.6														
18	B	21.0				22.3														
19	B	22.0				45.3														
20	B	23.0			-0.9	23.7														
21	B	24.0			-1.5	28.3														

B - Bag Sample
 G - Gas Sample
 L - Liner Sample
 P - Piston Sample
 NR - No Recovery

NS - No Sample Remaining
 PF - Permafrost Sample
 PW - Porewater Sample
 T - Sample Stored in Tube
 W - Waxed Sample

RC - Radiocarbon Sample
 MV - Minivane
 FC - Fall Cone
 TV - Torvane
 PV - Pilcon Vane

RV - Remote Vane
 PP - Pocket Penetrometer
 UU - Unconsolidated Undrained Triaxial
 UUp - UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial
 CU_p - CU Triaxial with Pore Pressure Measurements
 CD - Consolidated Drained Triaxial

O - Organic Content
 S - Salinity
 TS - Thaw Strain
 SG - Specific Gravity

SUMMARY OF TEST RESULTS

[illegible]

O - Organic Content

S - Salinity

TS - Thaw Strain

SG - Specific Gravity

Measurements

SUMMARY OF TEST RESULTS

[illegible]

B - Bag Sample

G - Gas Sample

L - Liner Sample

P - Piston Sample

NR-No Recovery

NS - No Sample Remaining

PF - Permafrost Sample

PW - Porewater Sample

T - Sample Stored in Tube

W - Waxed Sample

RC - Radiocarbon Sample

MV - Minivane

FC – Fall Cone

TV - Torvane

PV - Pilcon Vane

RV - Remote Vane

PP - Pocket Penetrometer

UU - Unconsolidated Undrained Triaxial

UUp- UU Triaxial with Pore Pressure Measurements

CU - Consolidated Undrained Triaxial

CU_p - CU Triaxial with Pore Pressure Measurements

CD - Consolidated Drained Triaxial

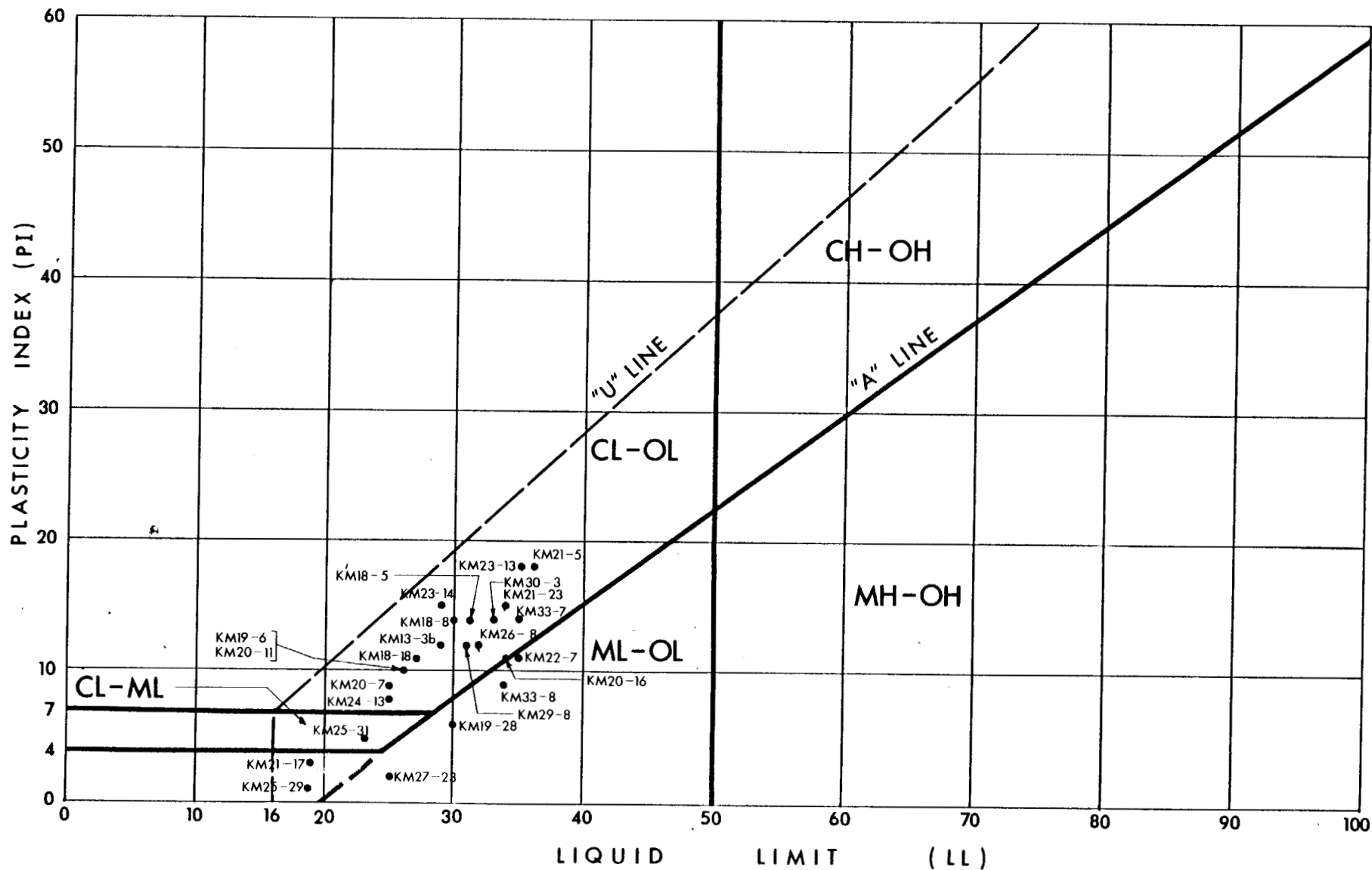
O - Organic Content

S - Salinity

TS - Thaw Strain

SG – Specific Gravity

Project Number 10-300 Borehole Number F85-KM33 Page 1 of 1



ATTERBERG LIMITS - ONSHORE

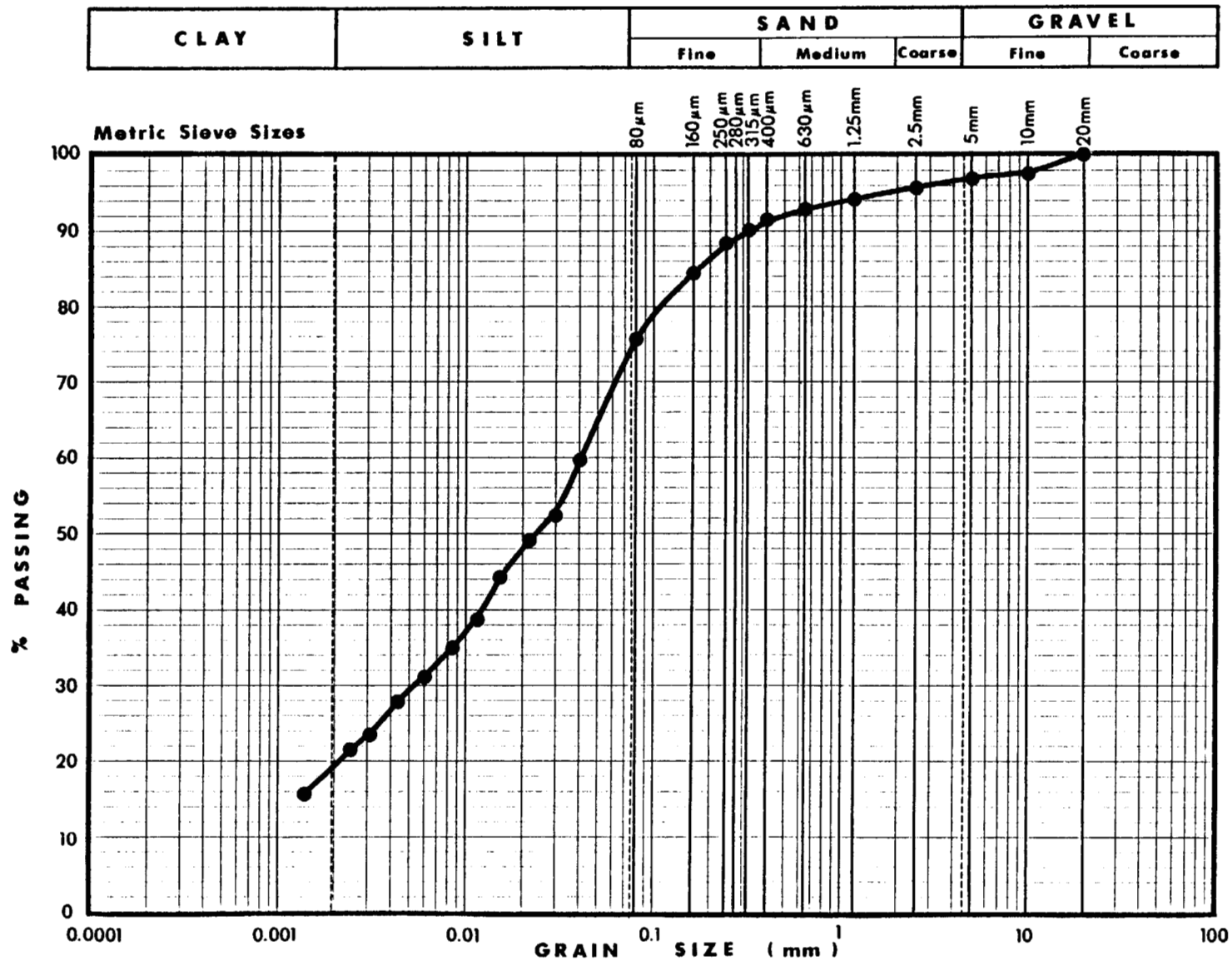
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/29

DRAWN BY: GJB

DWG. No.: B-45



Borehole Number F85-KM13
Sample Number 3B

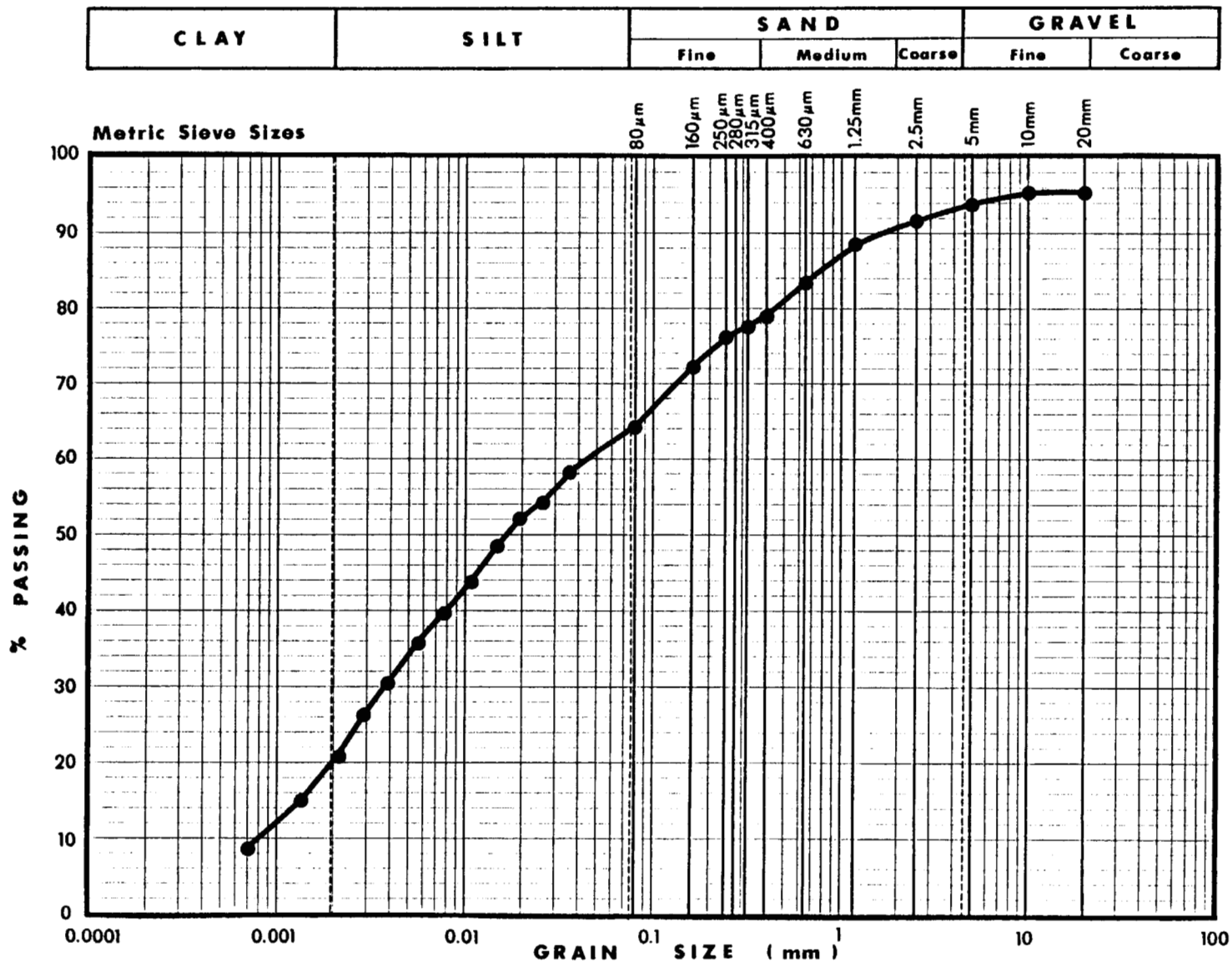
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/29

DRAWN BY: GJB

DWG. No.: B-46



Borehole Number F85-KM18
Sample Number 18

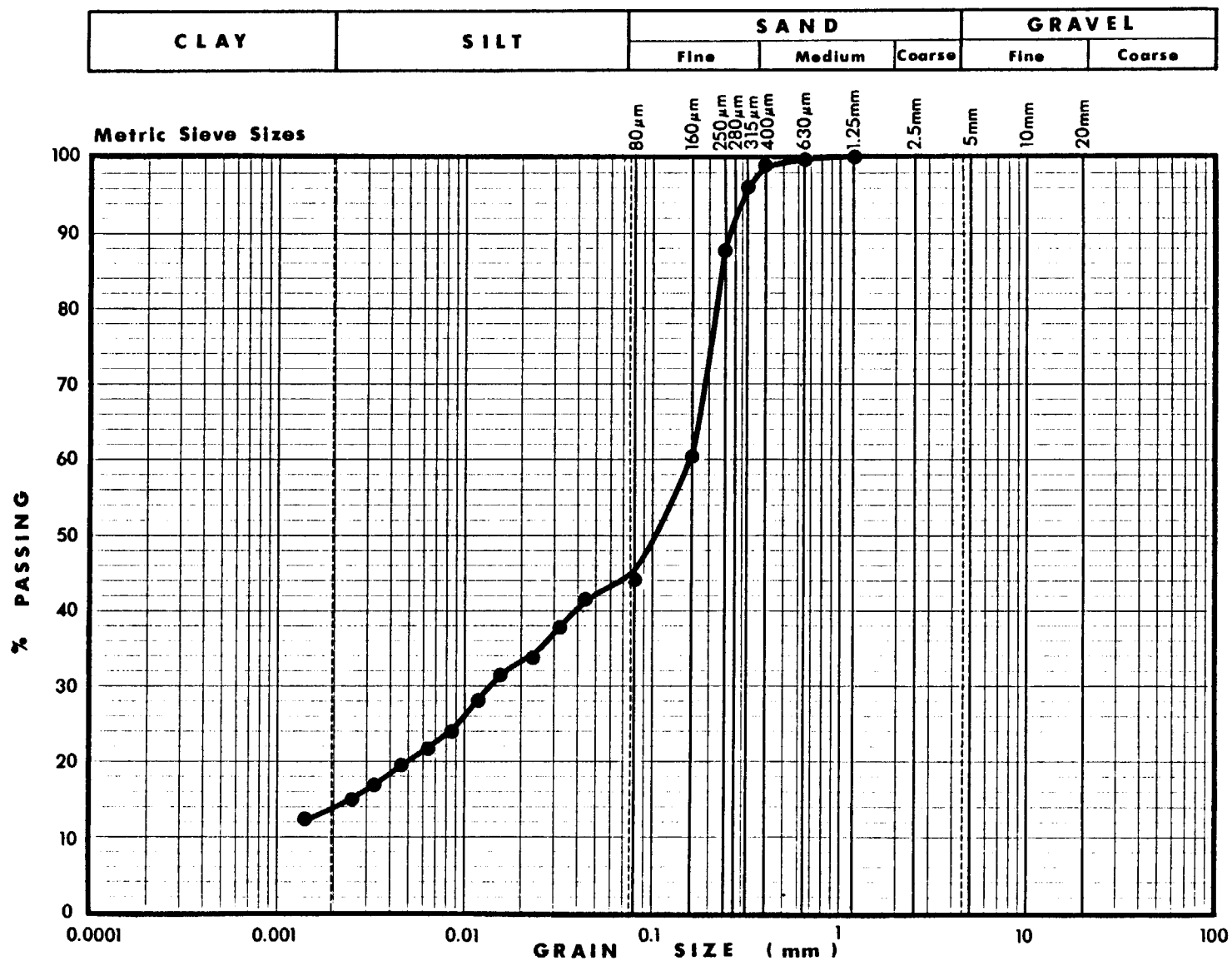
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/17

DRAWN BY: GJB

DWG. No.: B-47



Borehole Number F85-KM18
Sample Number 31

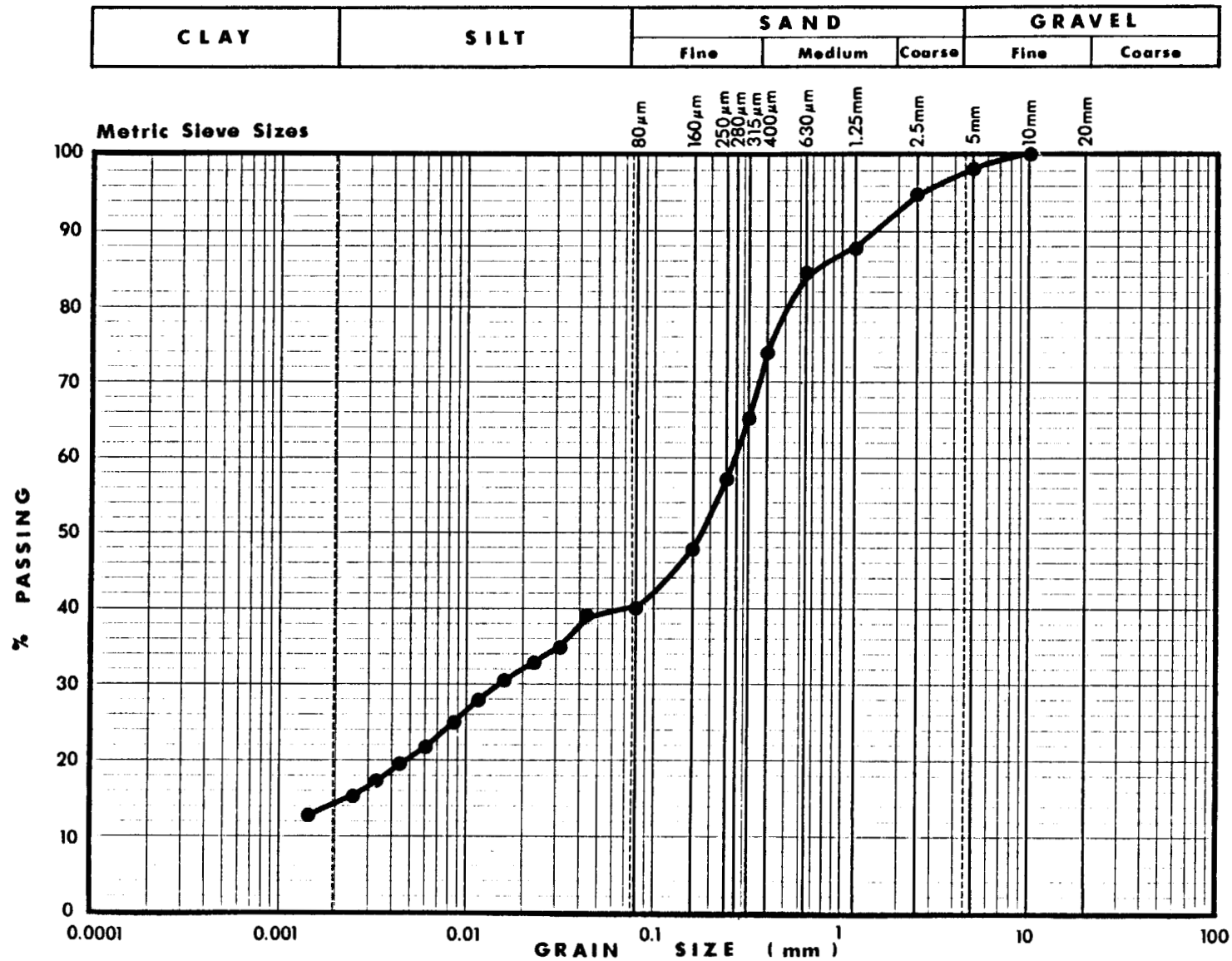
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/06/04

DRAWN BY: GJB

DWG. No.: B-48



Borehole Number F85-KM18
Sample Number 43

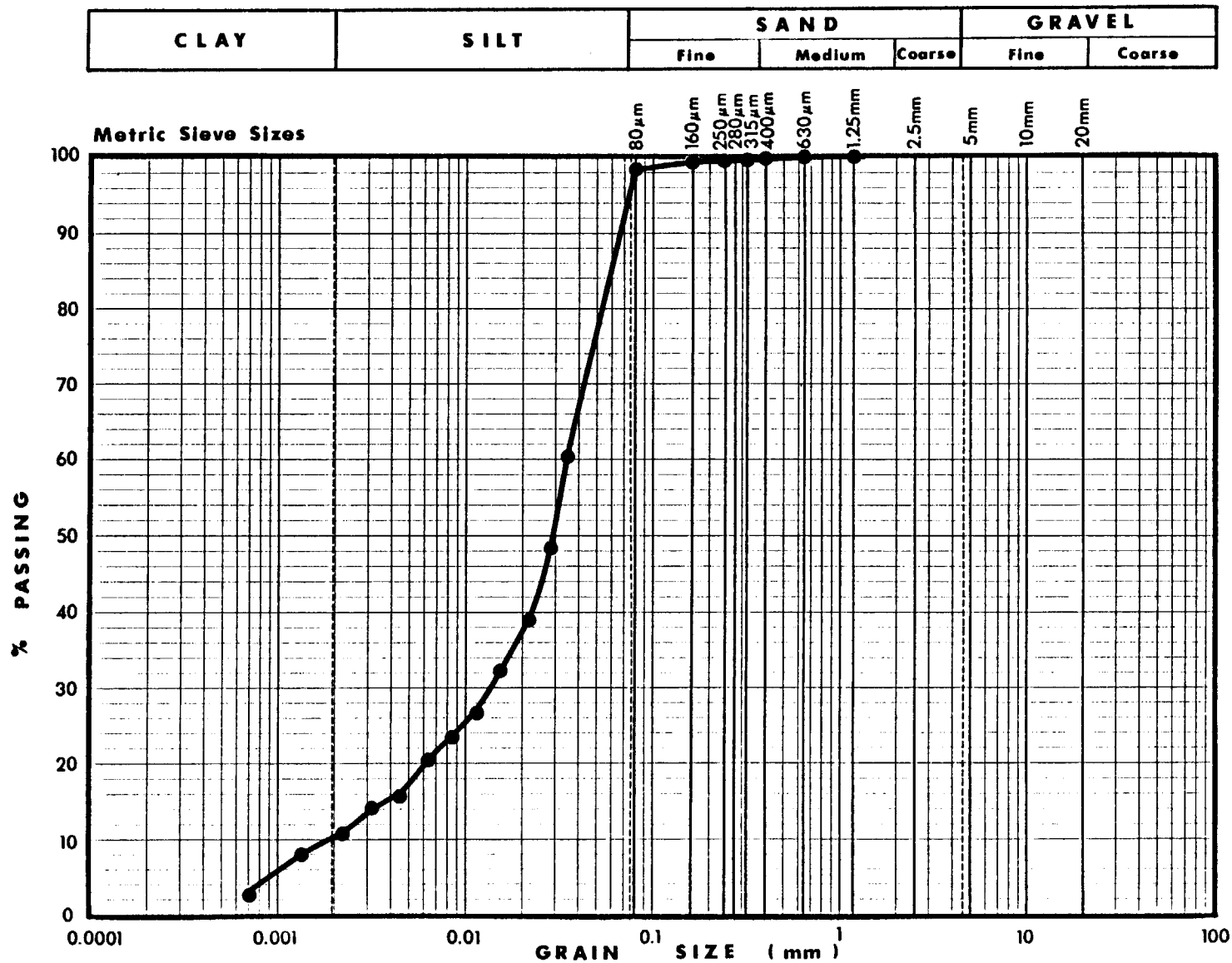
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/06/04

DRAWN BY: GJB

DWG. No.: B-49



Borehole Number F85-KM19
Sample Number 29

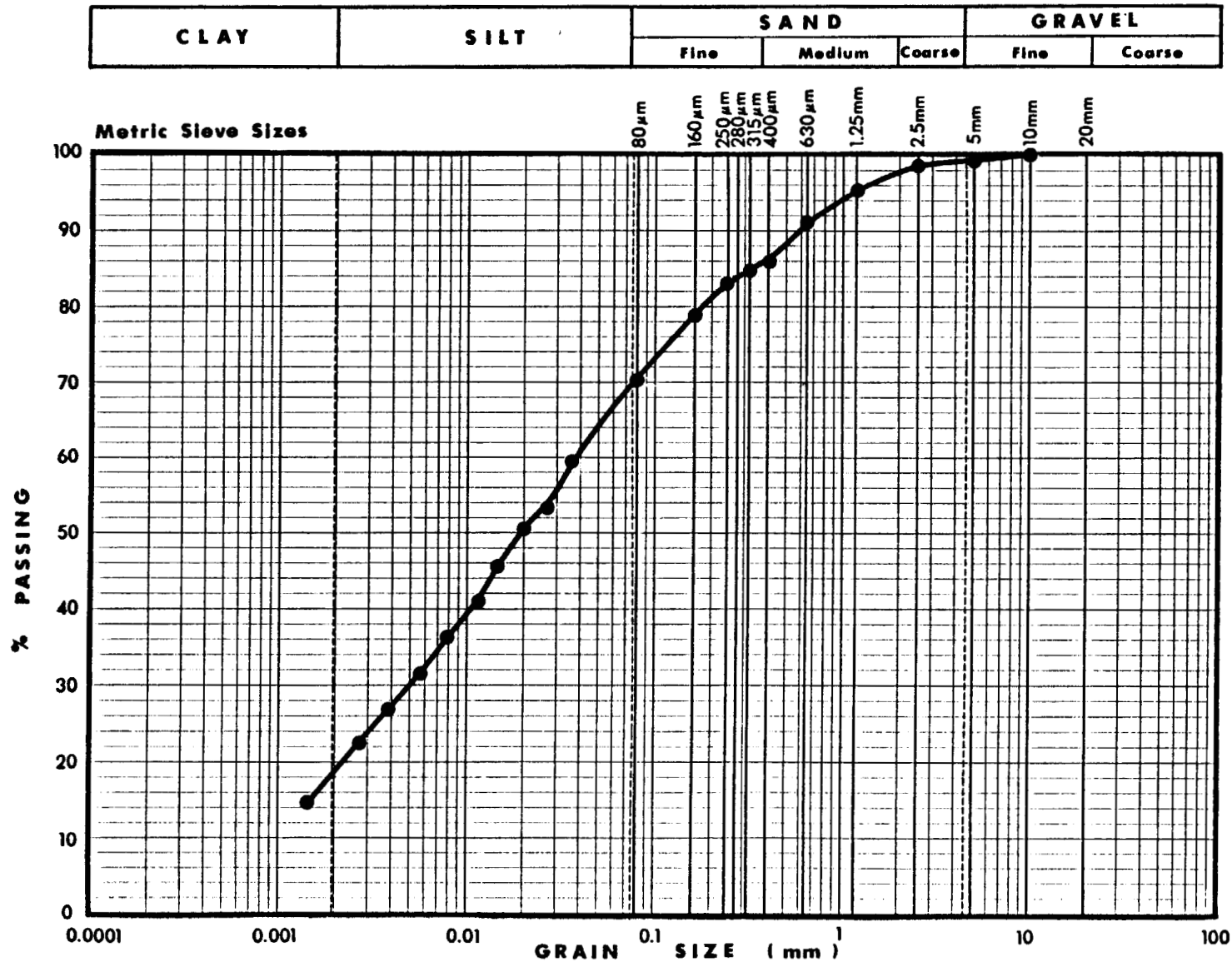
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/14

DRAWN BY: GJB

DWG. No.: B-50



Borehole Number F85-KM20
Sample Number 7

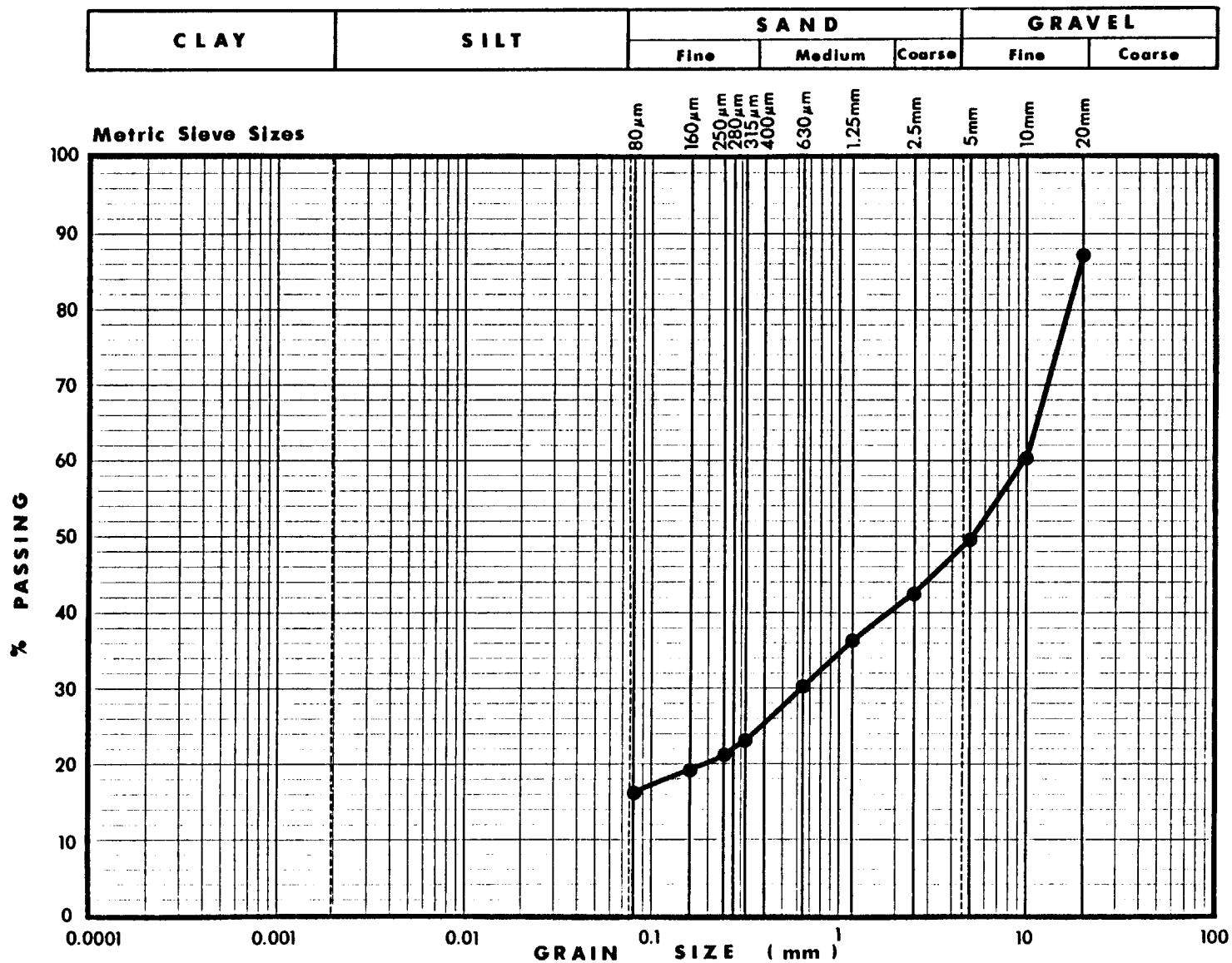
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/21

DRAWN BY: GJB

DWG. No.: B-51



Borehole Number F85-KM20
Sample Number 15

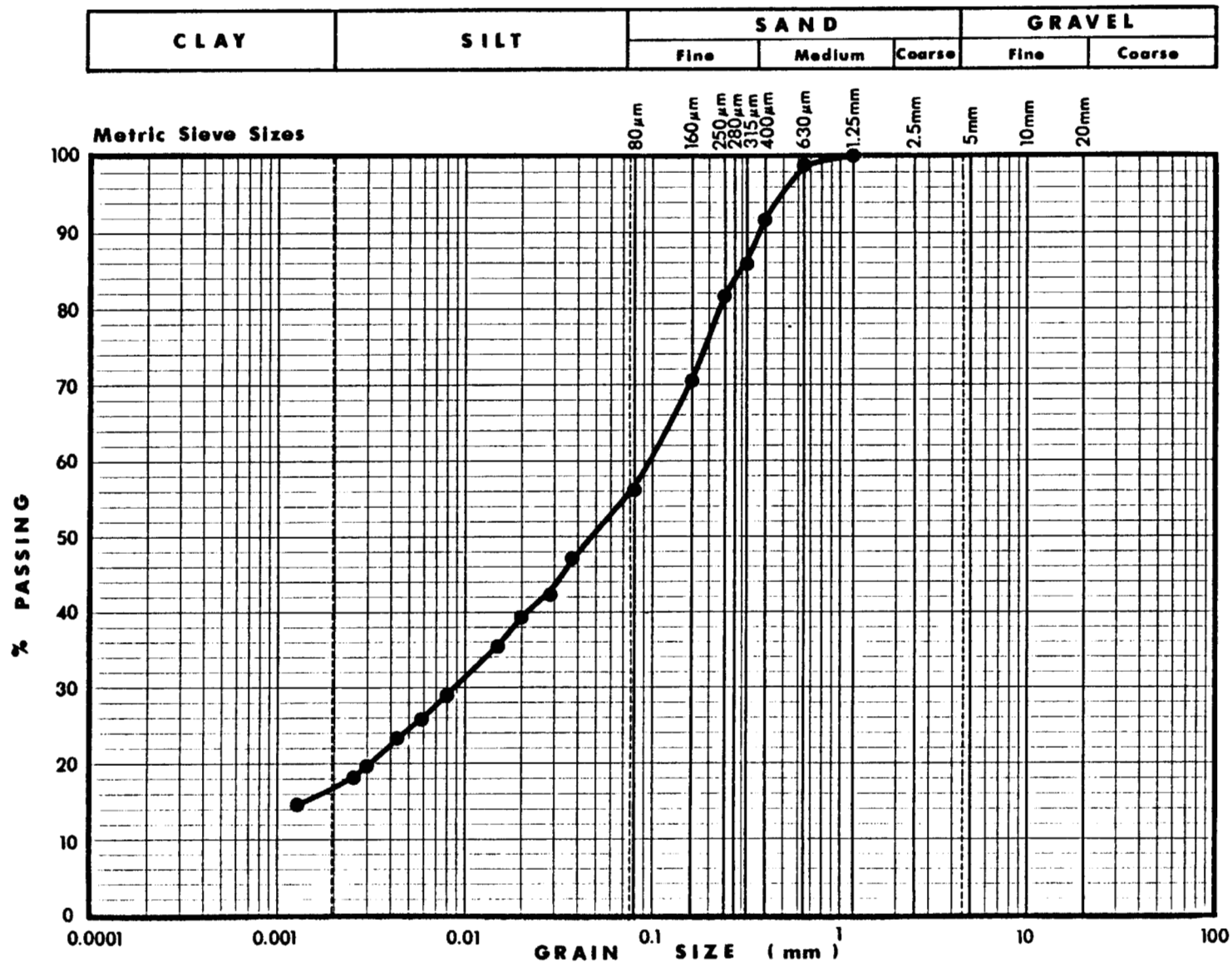
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/21

DRAWN BY: GJB

DWG. No.: B-52



Borehole Number F85-KM20
Sample Number 21

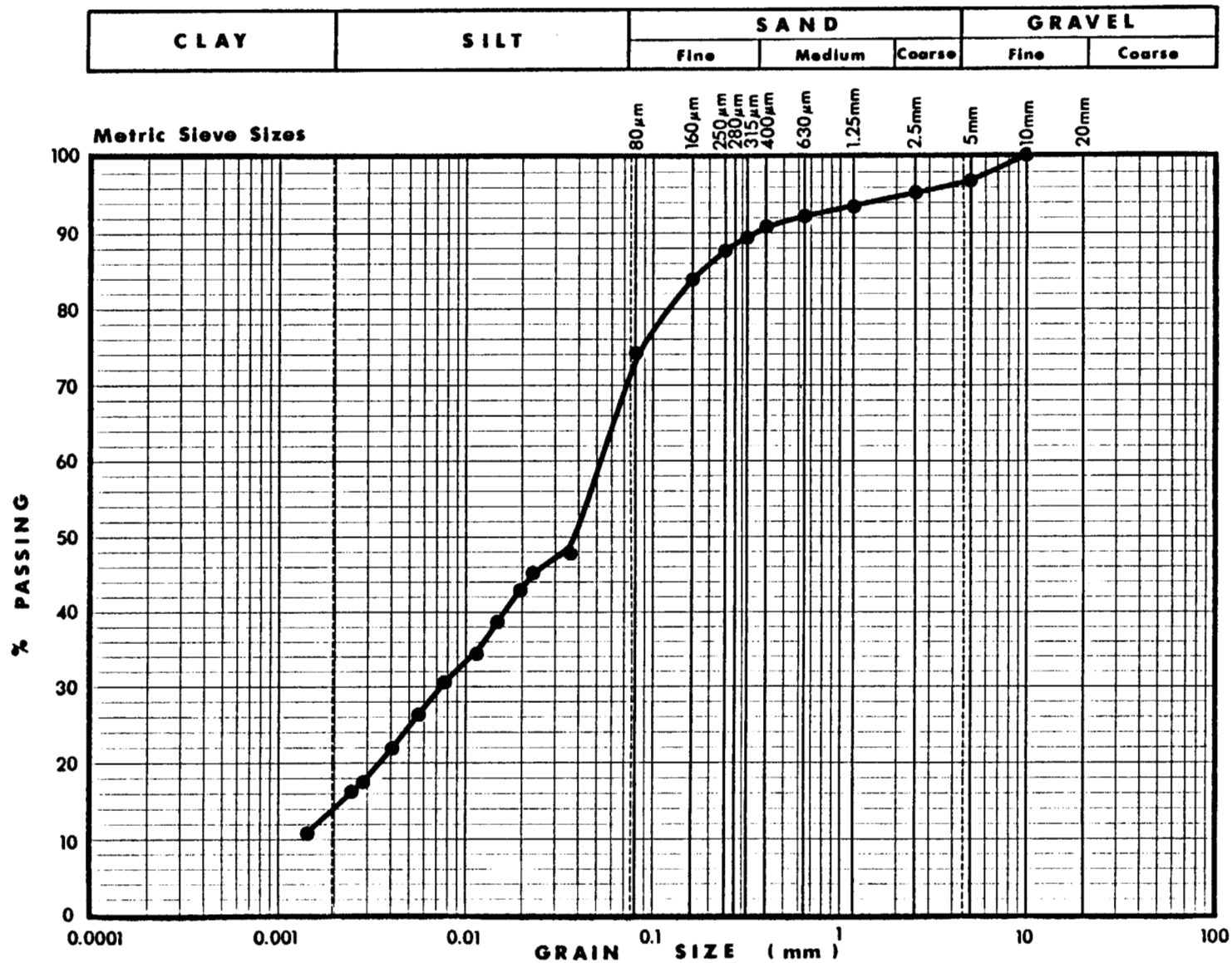
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/06/07

DRAWN BY: GJB

DWG. No.: B-53



Borehole Number F85-KM21
Sample Number 9

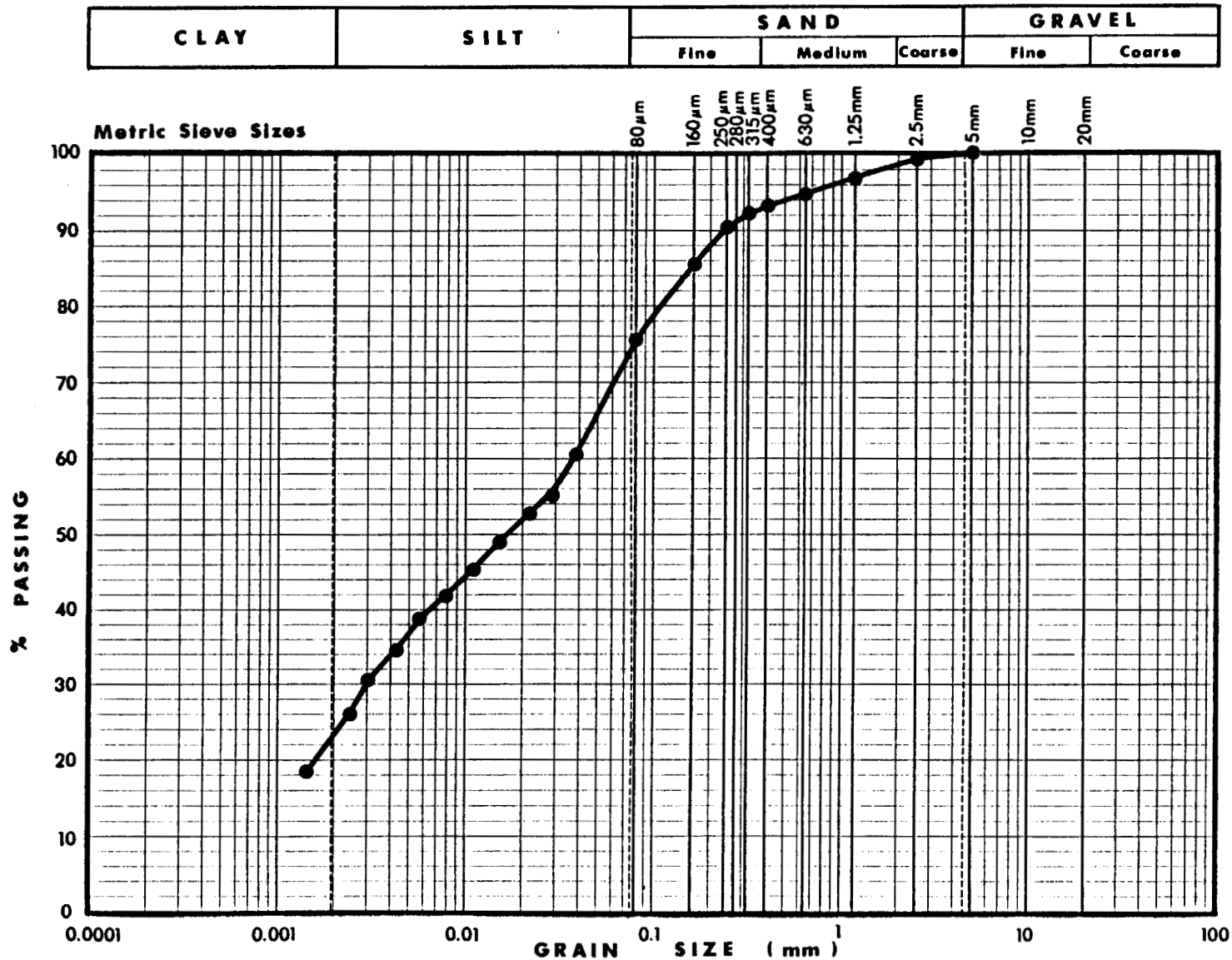
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/17

DRAWN BY: GJB

DWG. No.: B-54



Borehole Number F85-KM21
Sample Number 17

M. J. O'CONNOR & ASSOCIATES LTD.

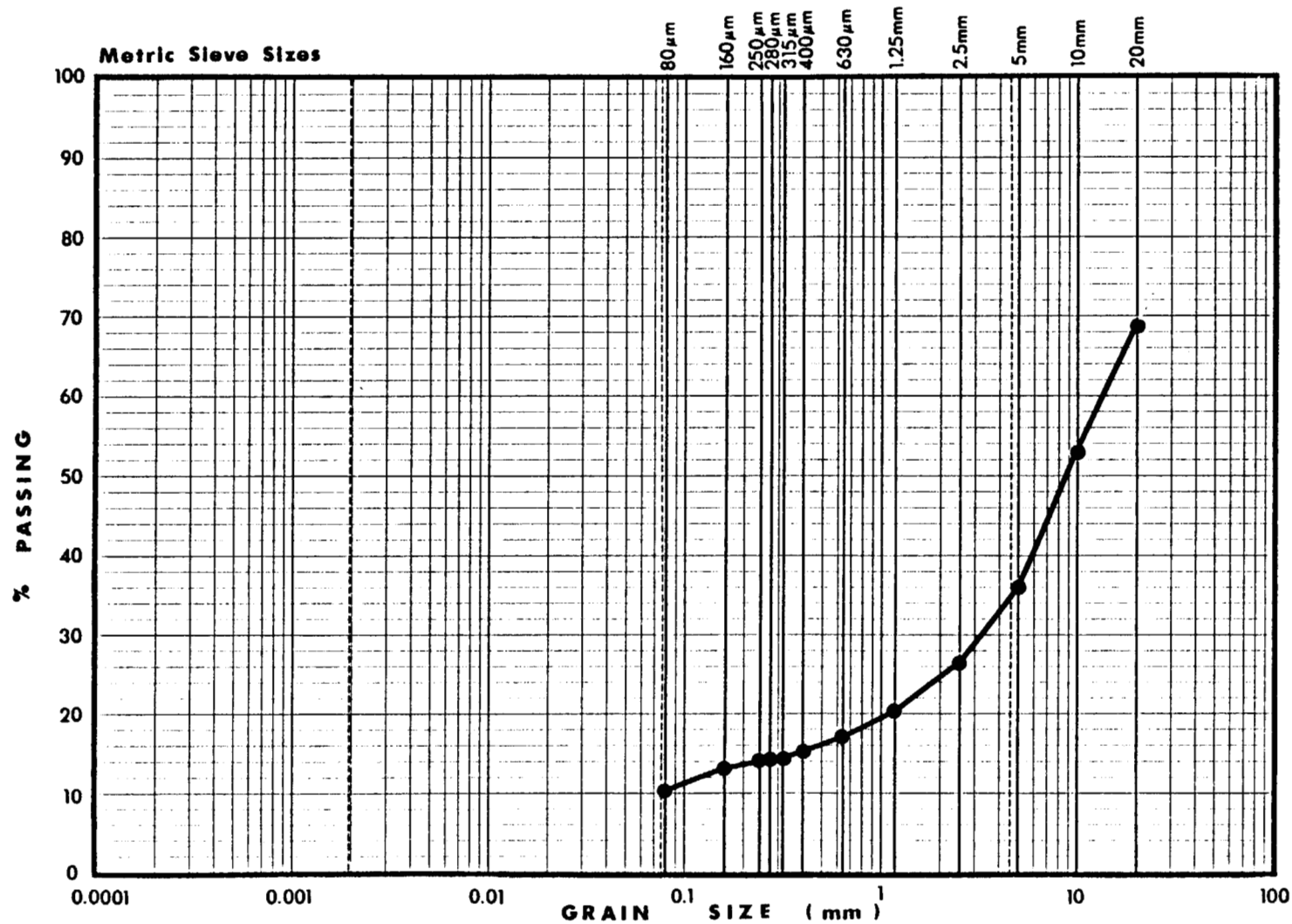
JOB No.: 10-300

DATE: 85/05/29

DRAWN BY: GJB

DWG. No.: B-55

CLAY	SILT	SAND			GRAVEL	
		Fine	Medium	Coarse	Fine	Coarse



Borehole Number F85-KM21
Sample Number 24

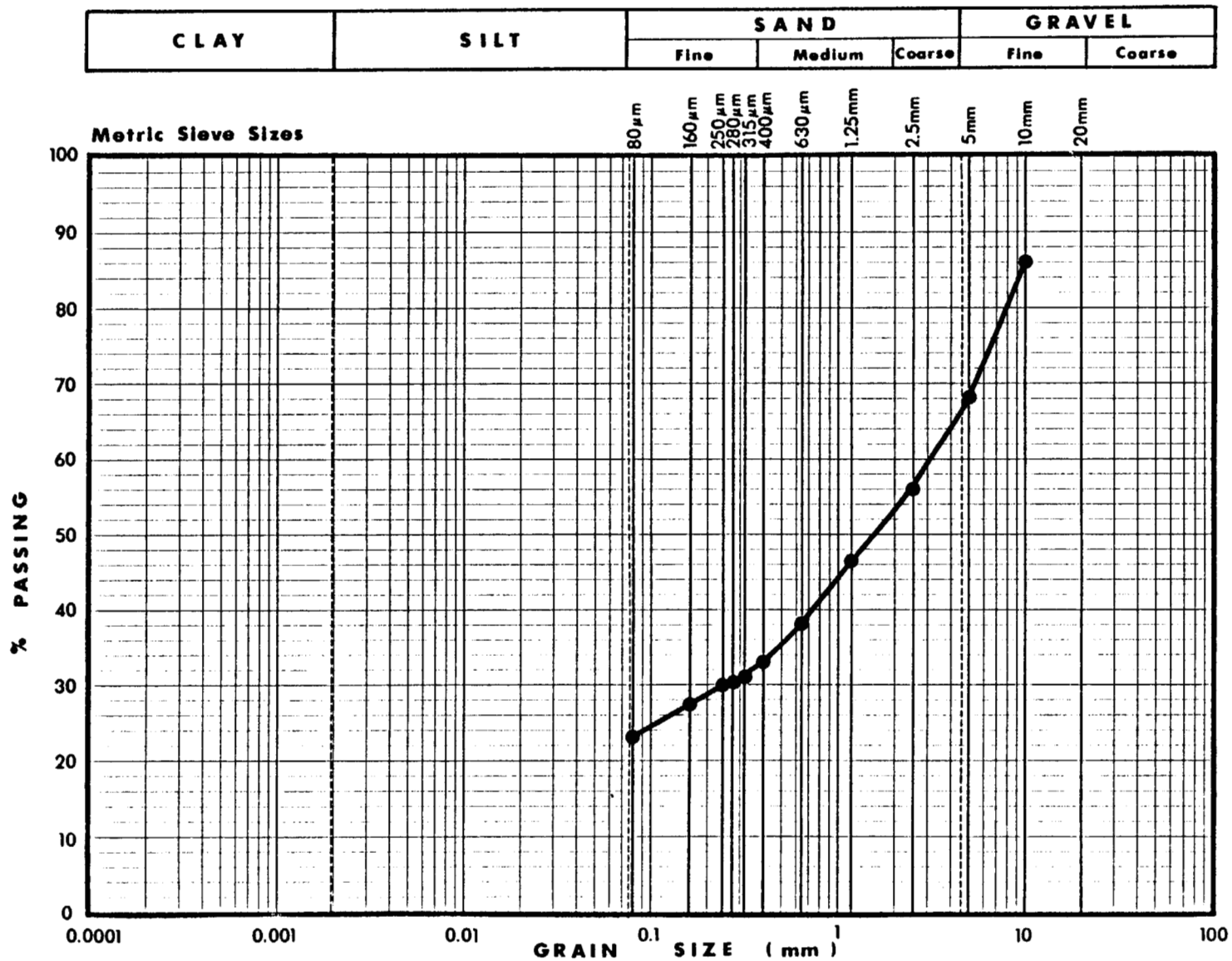
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/04/18

DRAWN BY: GJB

DWG. No.: B-56



Borehole Number F85-KM21
Sample Number 26

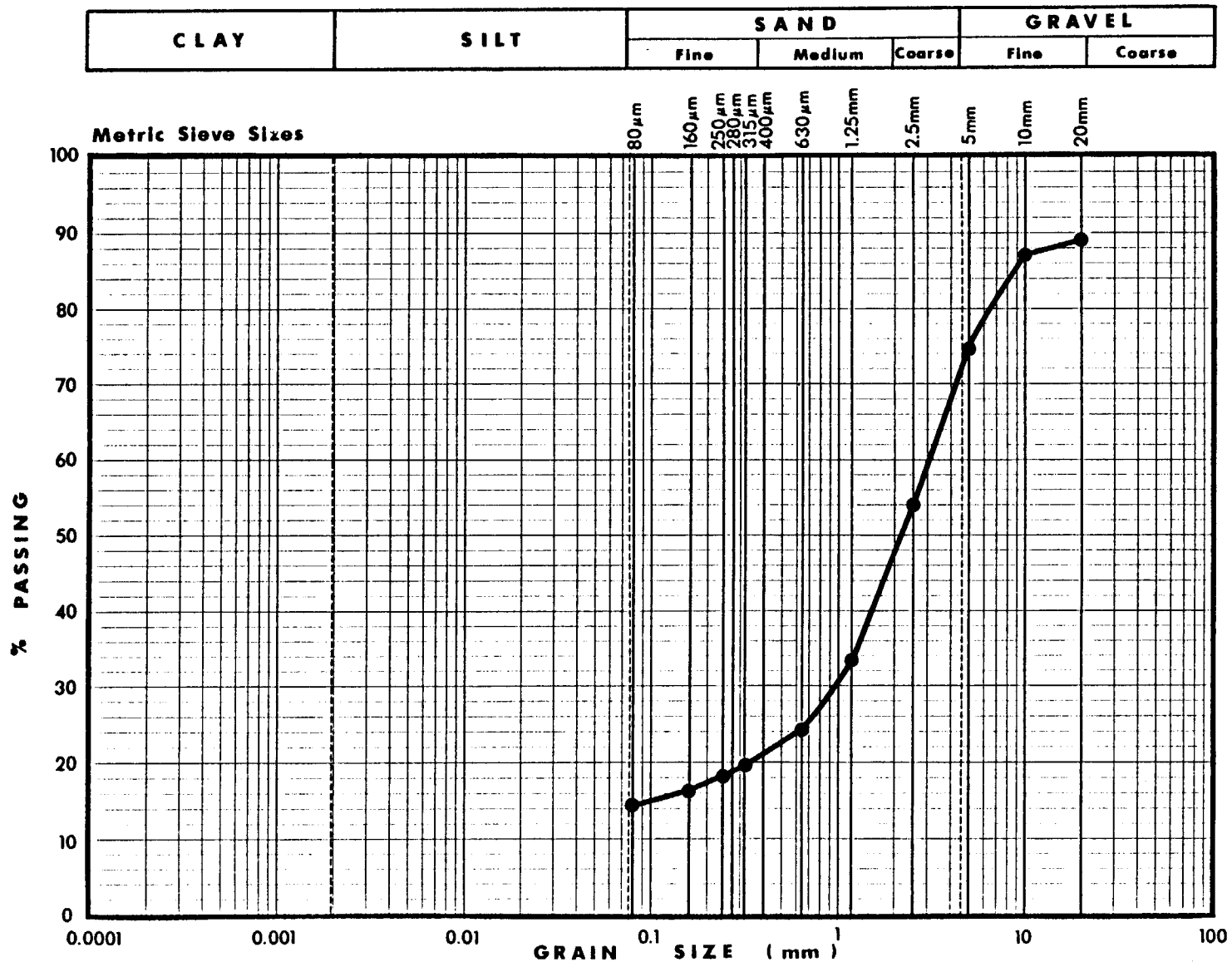
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/04/19

DRAWN BY: GJB

DWG. No.: B-57



Borehole Number F85-KM21
Sample Number 27

M. J. O'CONNOR & ASSOCIATES LTD.

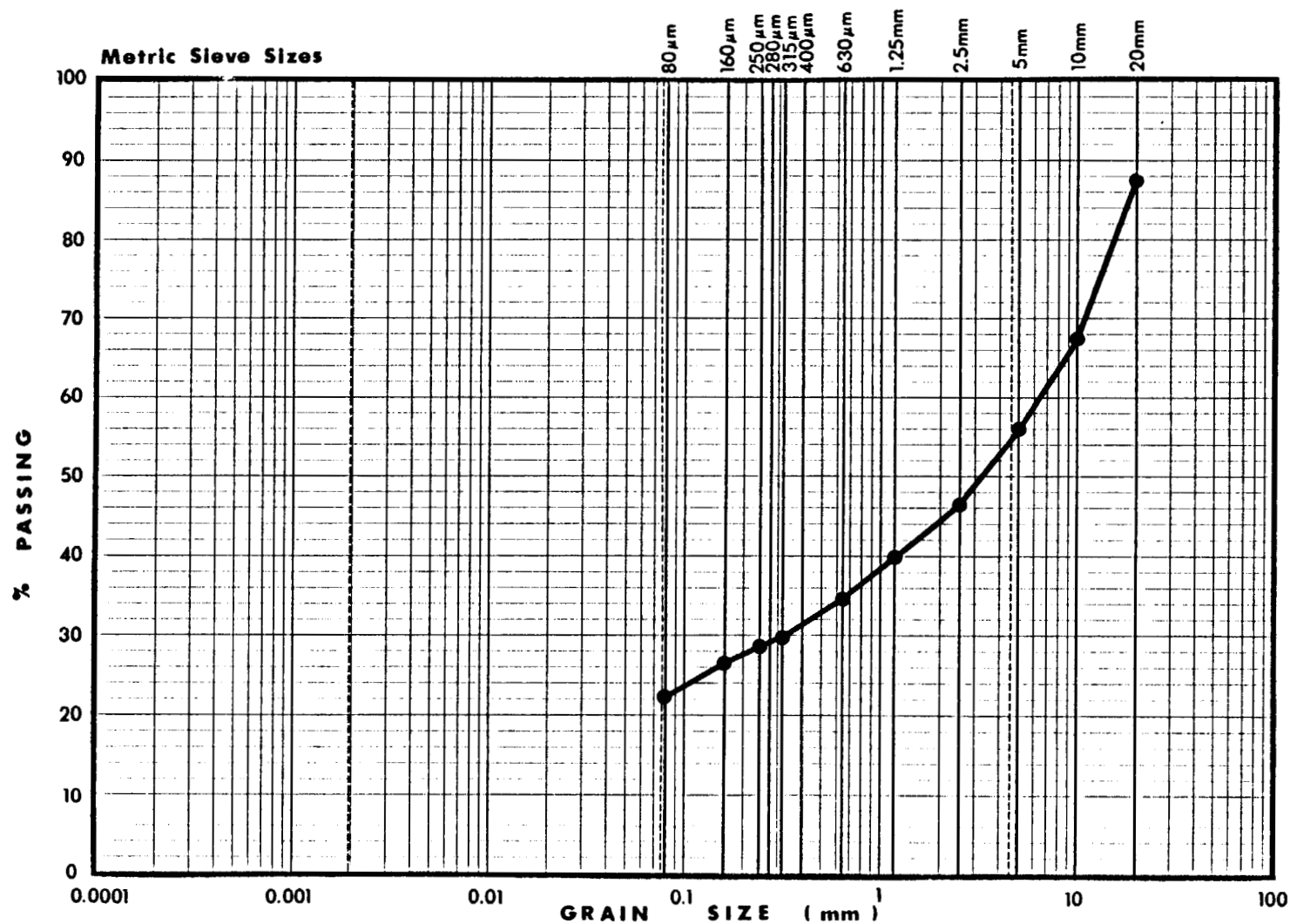
JOB No.: 10-300

DATE: 85/04/19

DRAWN BY: GJB

DWG. No.: B-58

CLAY	SILT	SAND			GRAVEL	
		Fine	Medium	Coarse	Fine	Coarse



Borehole Number F85-KM21
Sample Number 35

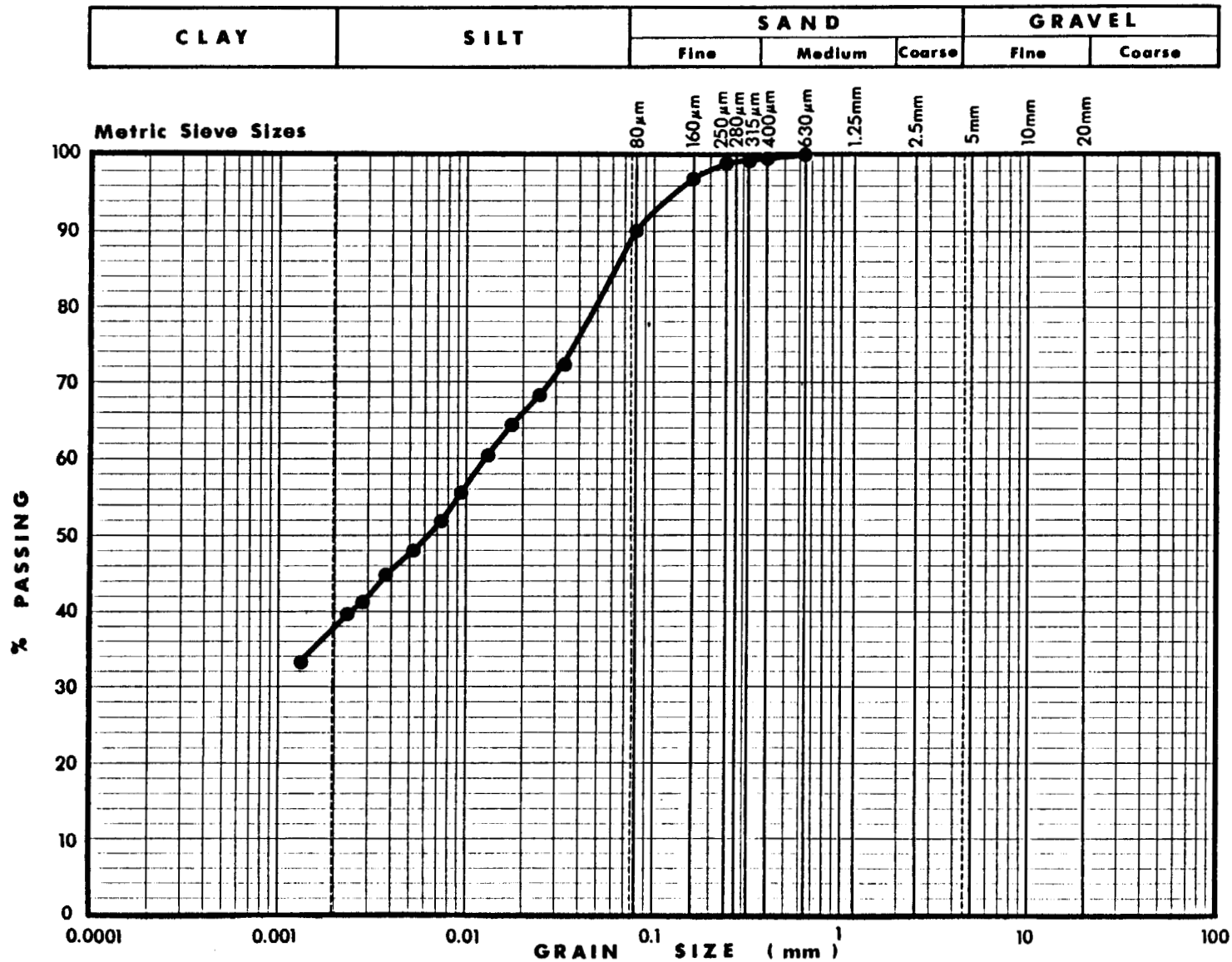
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/04/19

DRAWN BY: GJB

DWG. No.: B-59



Borehole Number F85-KM22
Sample Number 7

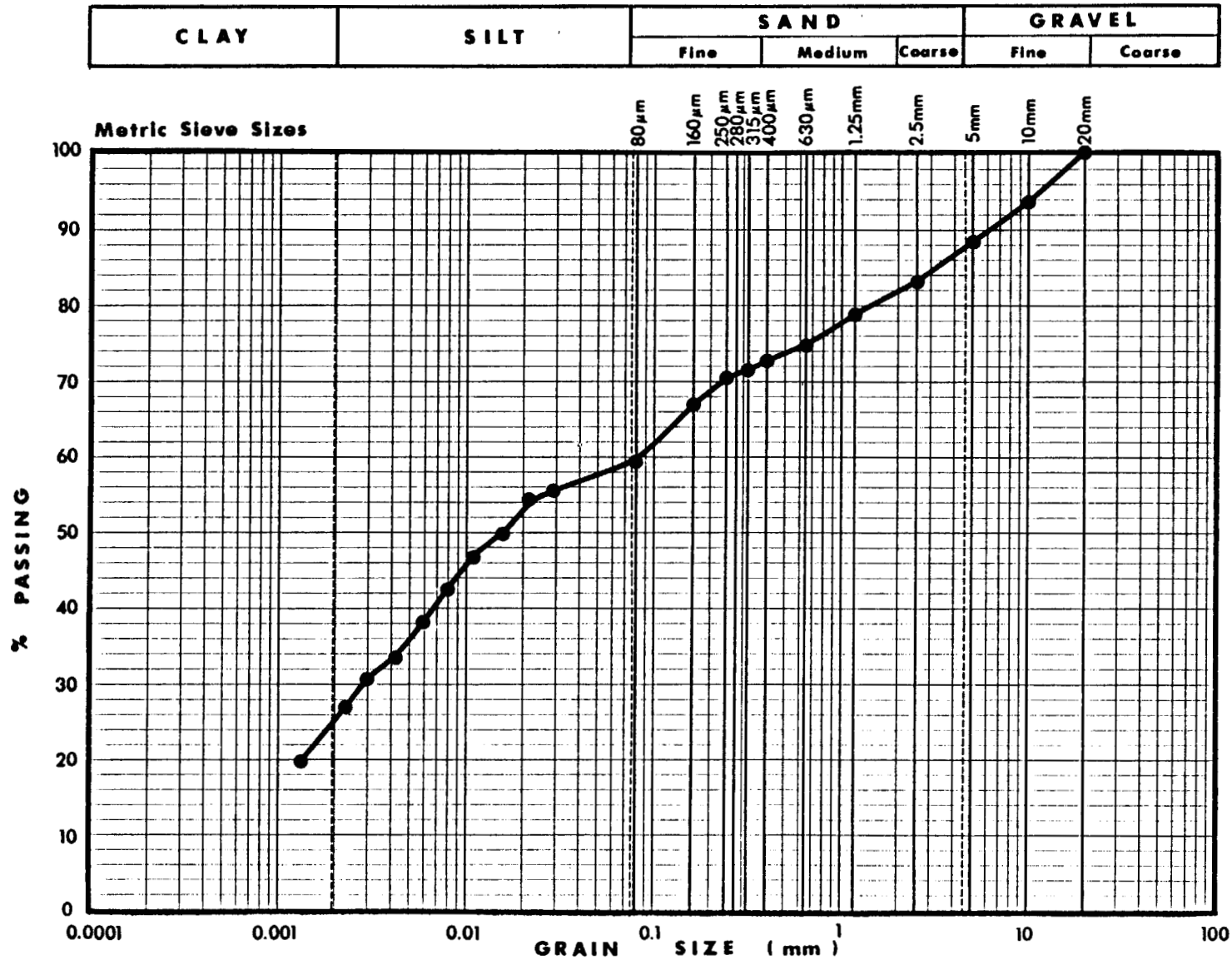
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/06/06

DRAWN BY: GJB

DWG. No.: B-60



Borehole Number F85-KM23
Sample Number 14

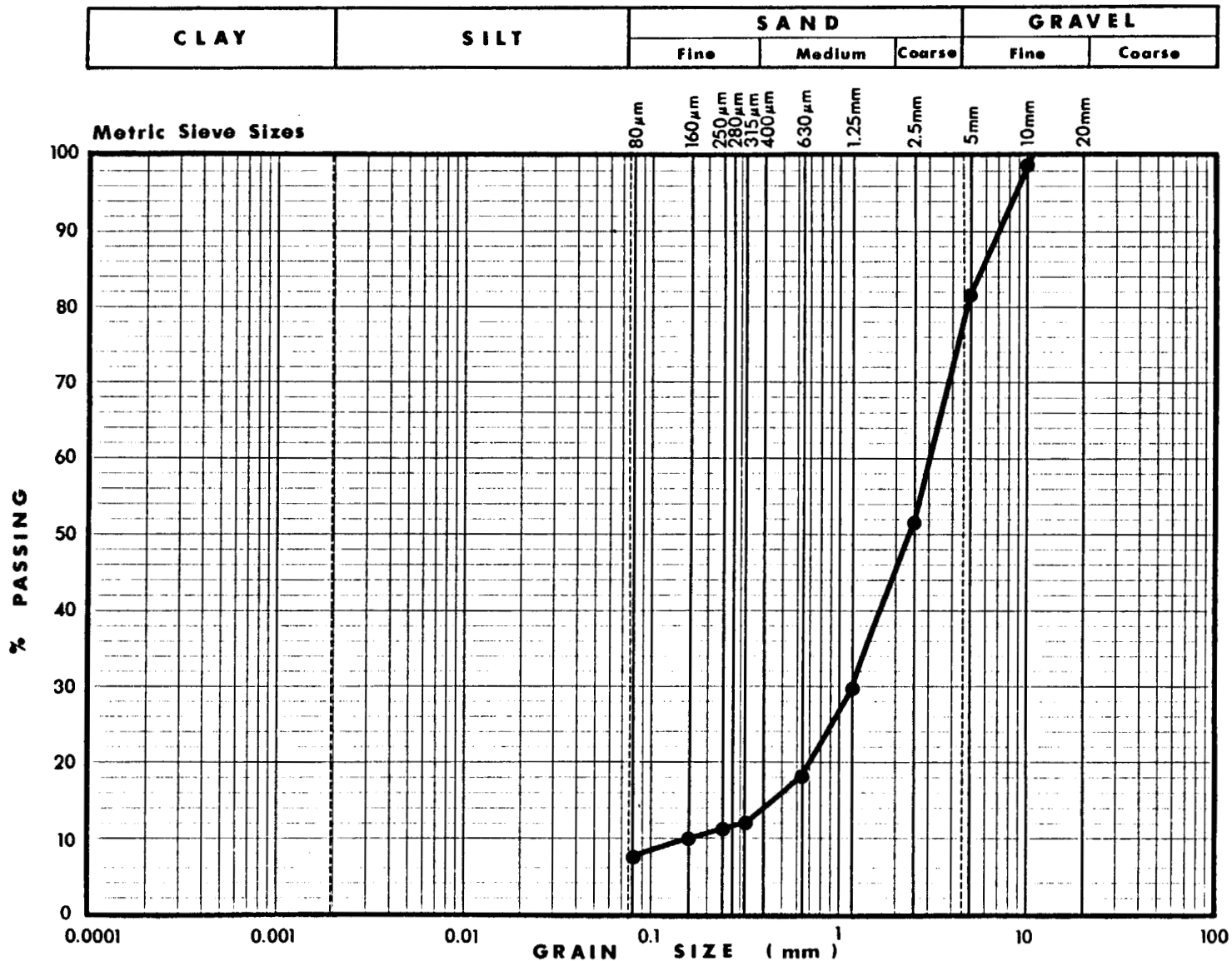
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/29

DRAWN BY: GJB

DWG. No.: B-61



Borehole Number F85-KM24
Sample Number 6

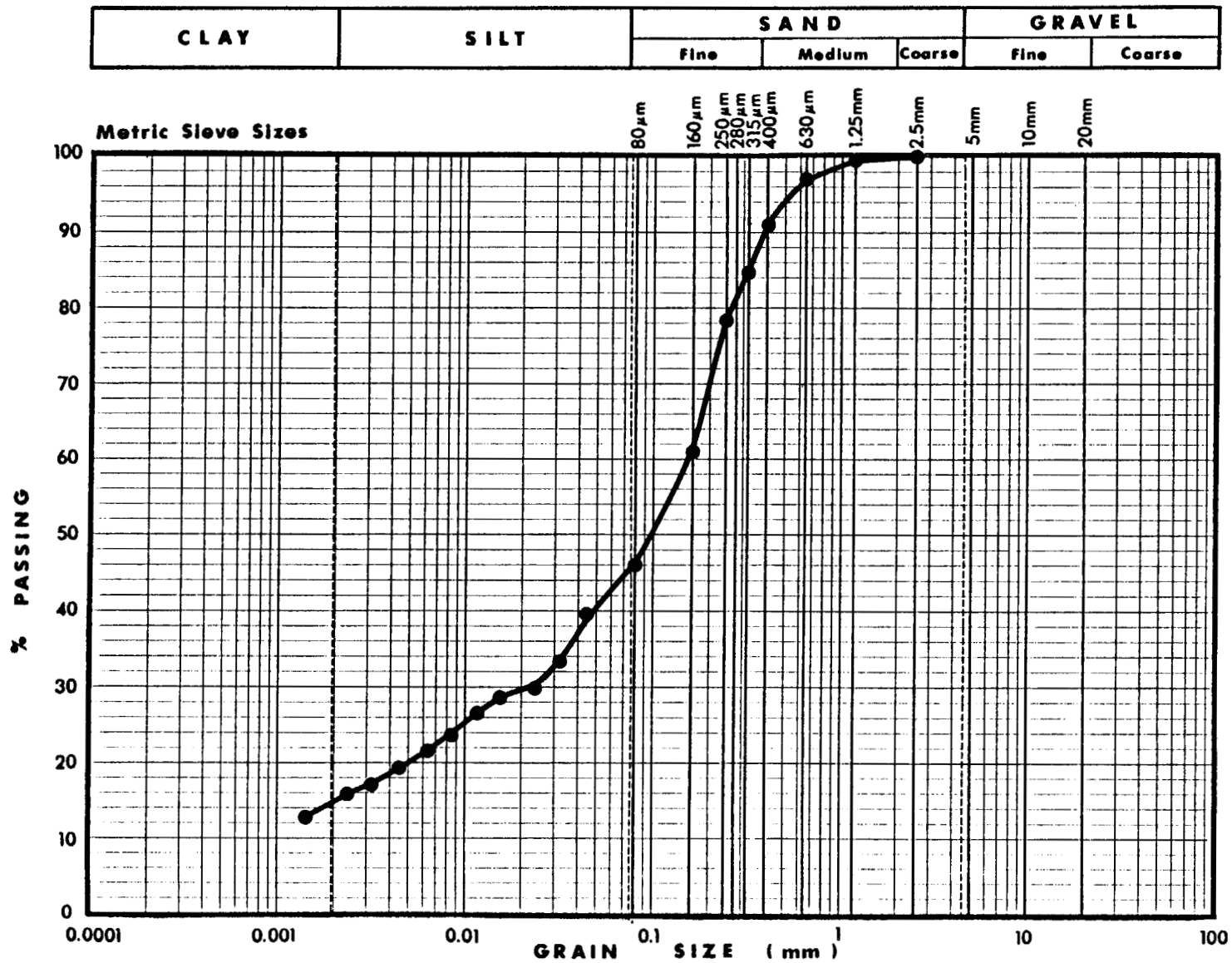
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/29

DRAWN BY: GJB

DWG. No.: B-62



Borehole Number F85-KM24
Sample Number 8

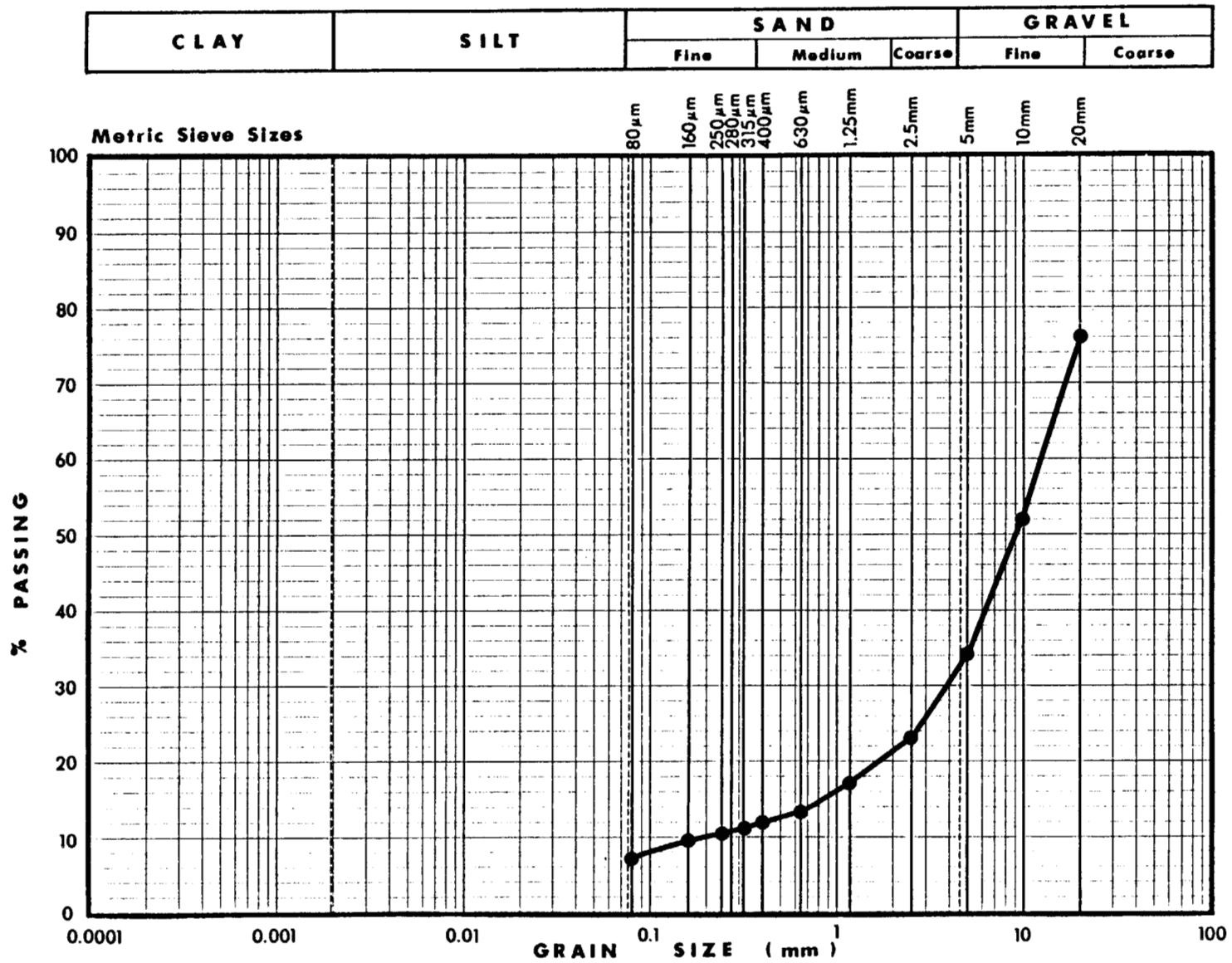
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/06/05

DRAWN BY: GJB

DWG. No.: B-63



Borehole Number F85-KM25
Sample Number 27

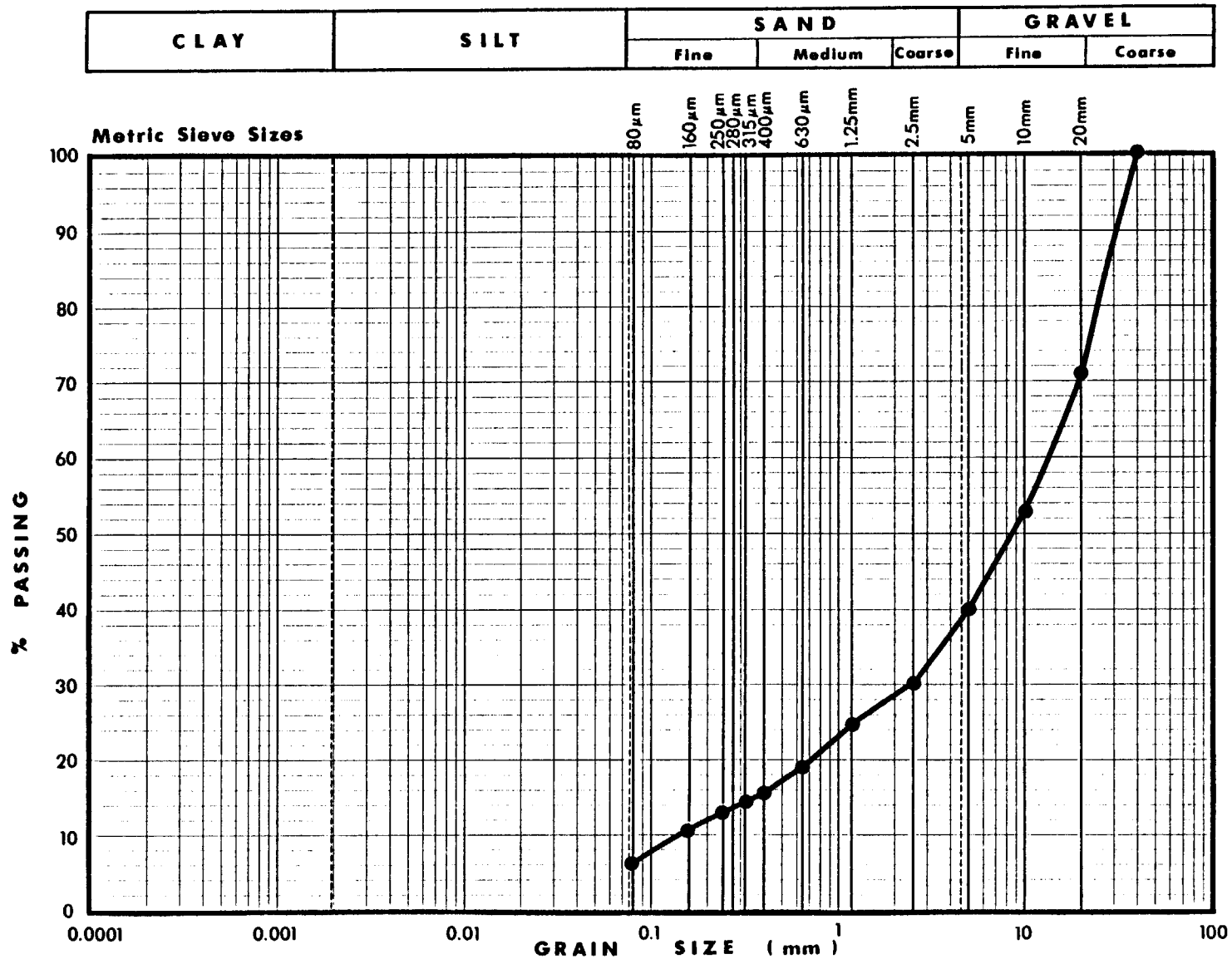
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/06/05

DRAWN BY: GJB

DWG. No.: B-64



Borehole Number F85-KM25
Sample Number 29

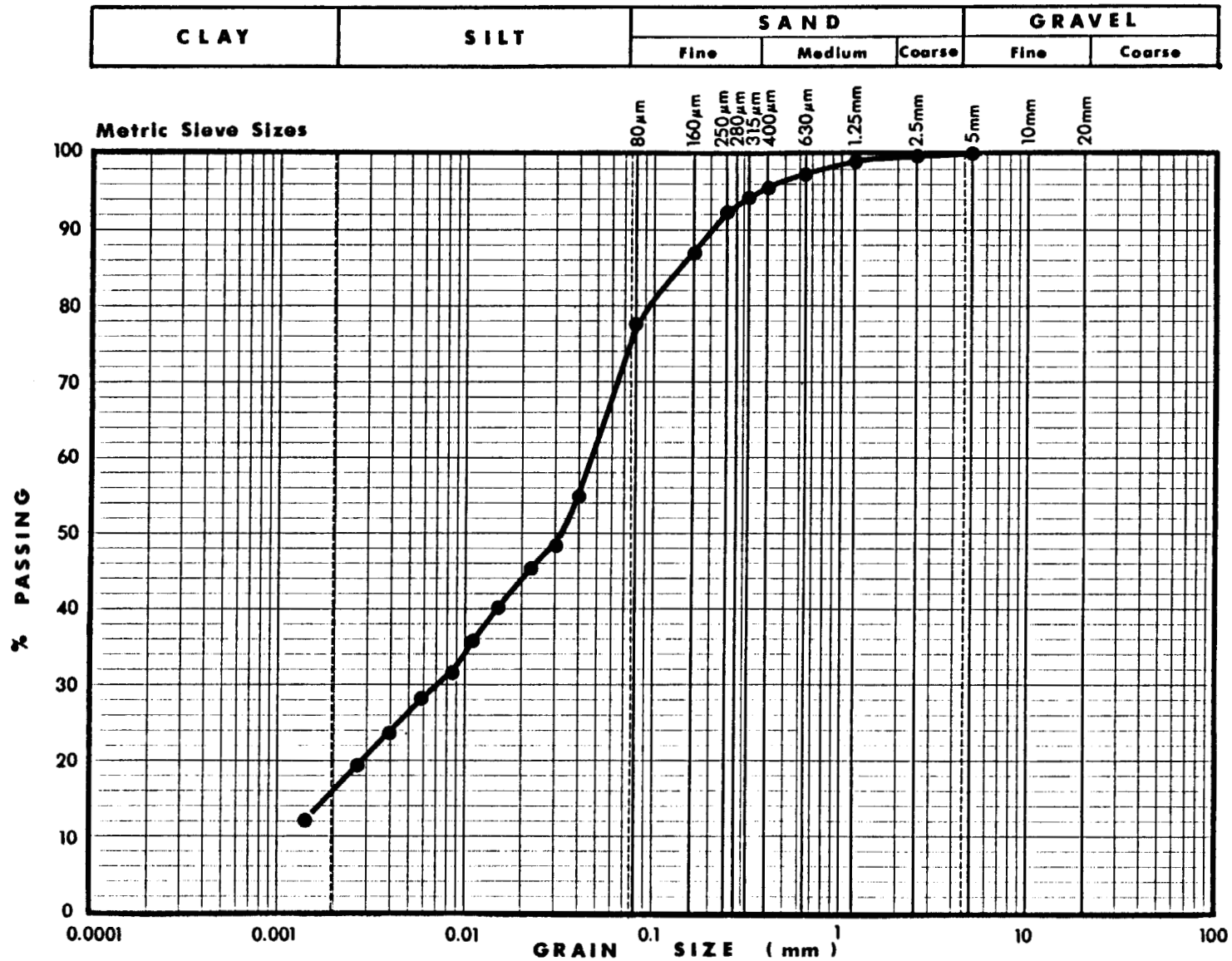
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/06/05

DRAWN BY: GJB

DWG. No.: B-65



Borehole Number F85-KM26
Sample Number 7

M. J. O'CONNOR & ASSOCIATES LTD.

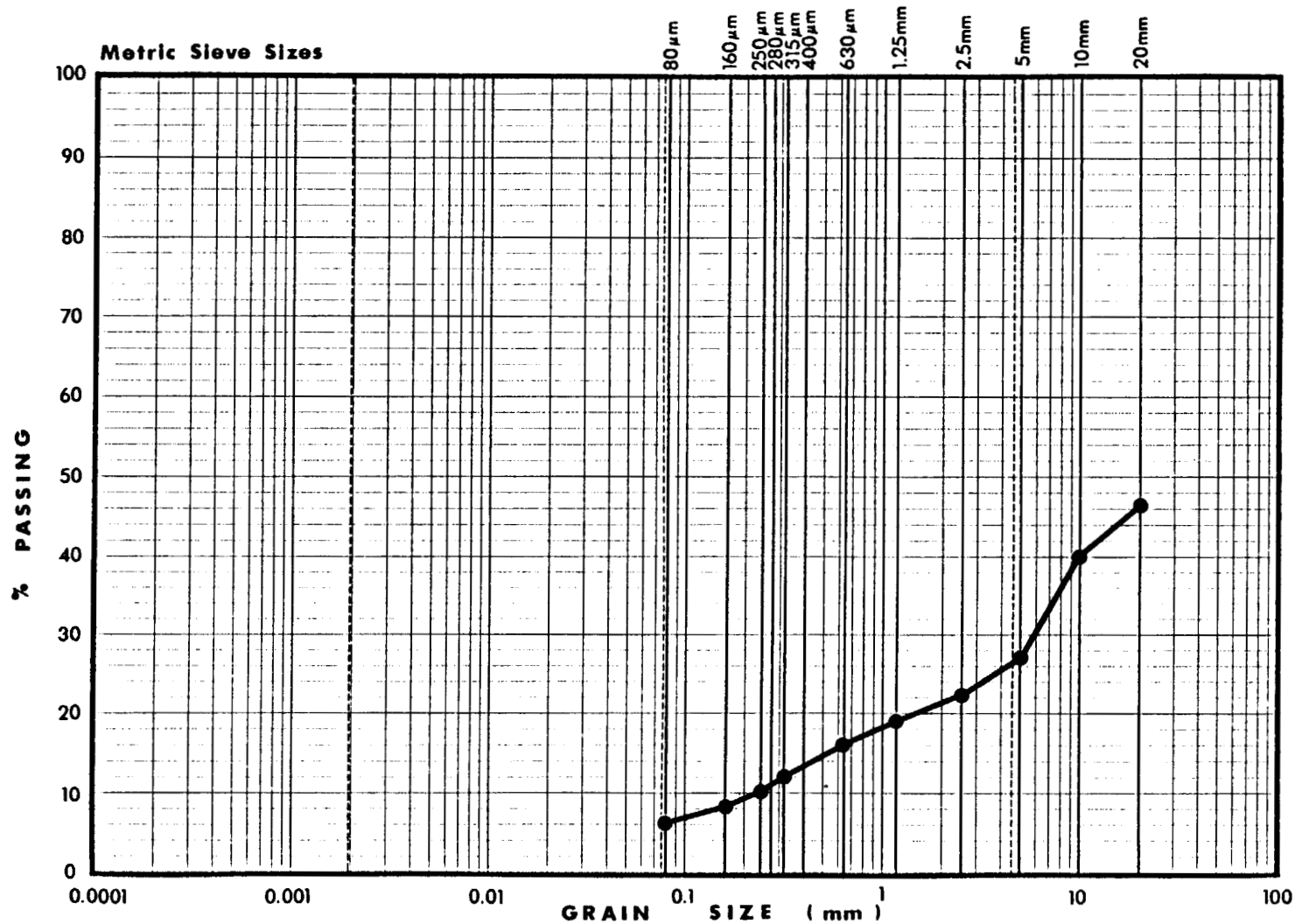
JOB No.: 10-300

DATE: 85/05/21

DRAWN BY: GJB

DWG. No.: B-66

CLAY	SILT	SAND			GRAVEL	
		Fine	Medium	Coarse	Fine	Coarse



Borehole Number F85-KM26
Sample Number 14

M. J. O'CONNOR & ASSOCIATES LTD.

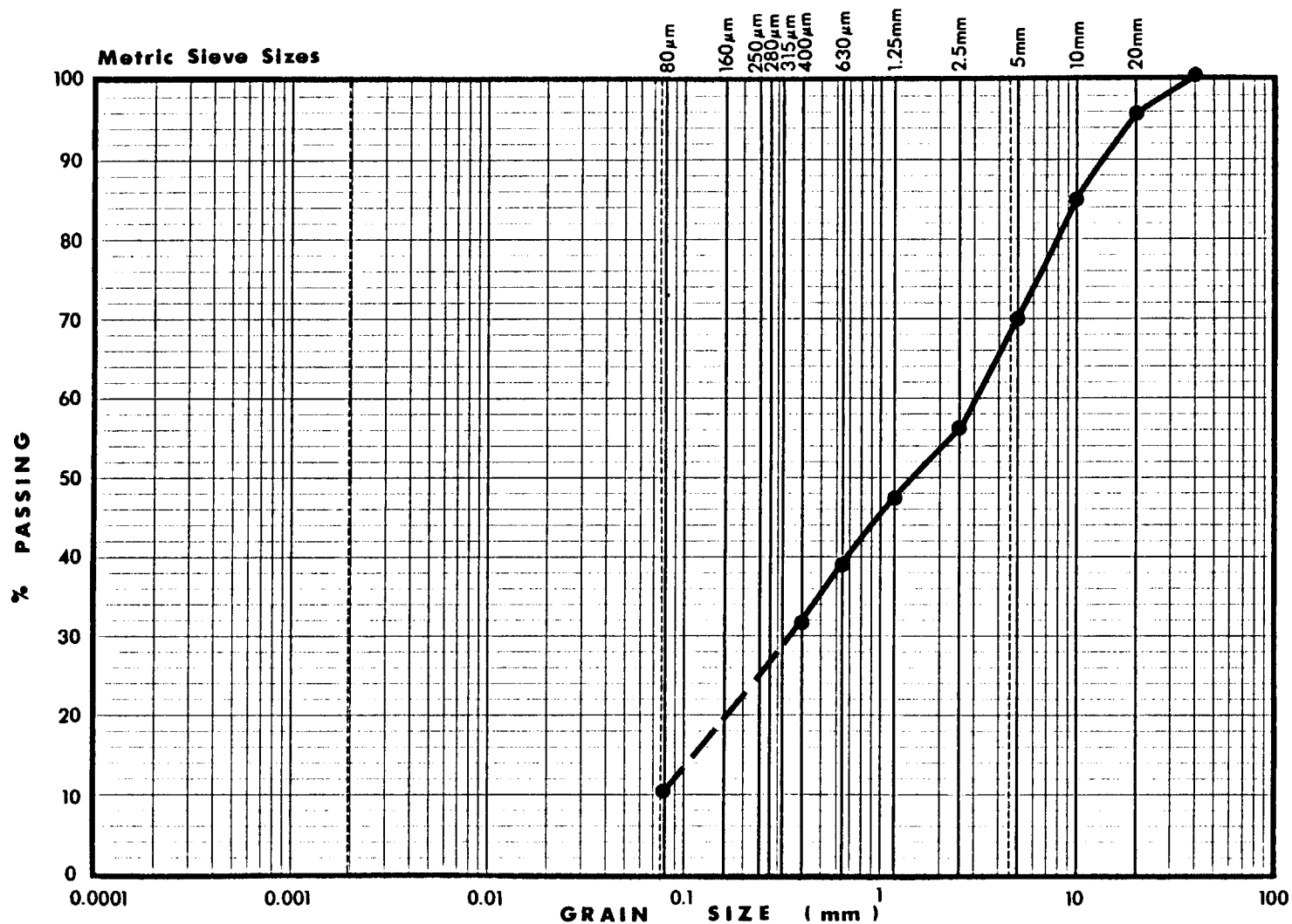
JOB No.: 10-300

DATE: 85/05/21

DRAWN BY: GJB

DWG. No.: B-67

CLAY	SILT	SAND			GRAVEL	
		Fine	Medium	Coarse	Fine	Coarse



Borehole Number F85-KM27
Sample Number 5

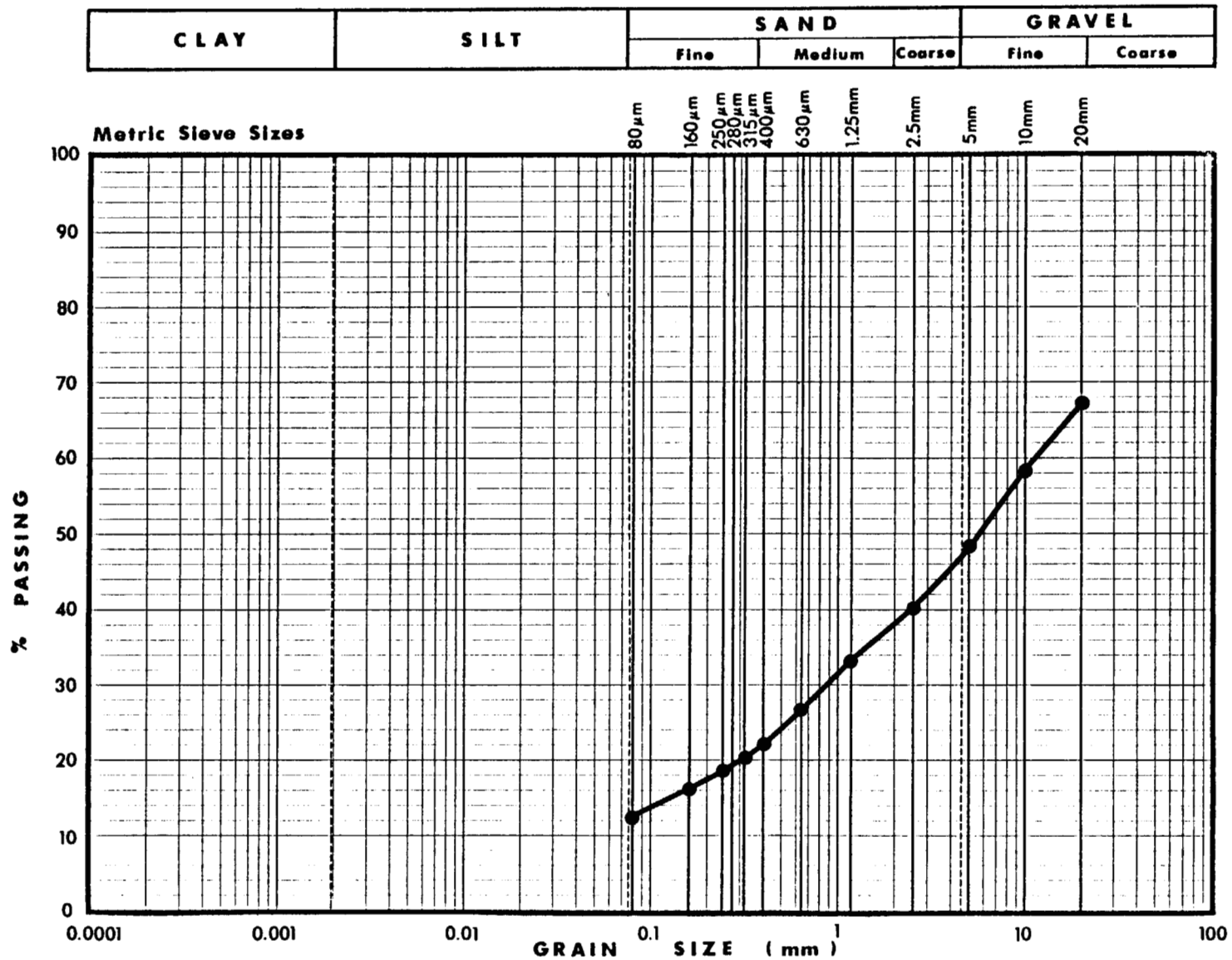
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/06/05

DRAWN BY: GJB

DWG. No.: B-68



Borehole Number F85-KM27
Sample Number 14,15,16 combined

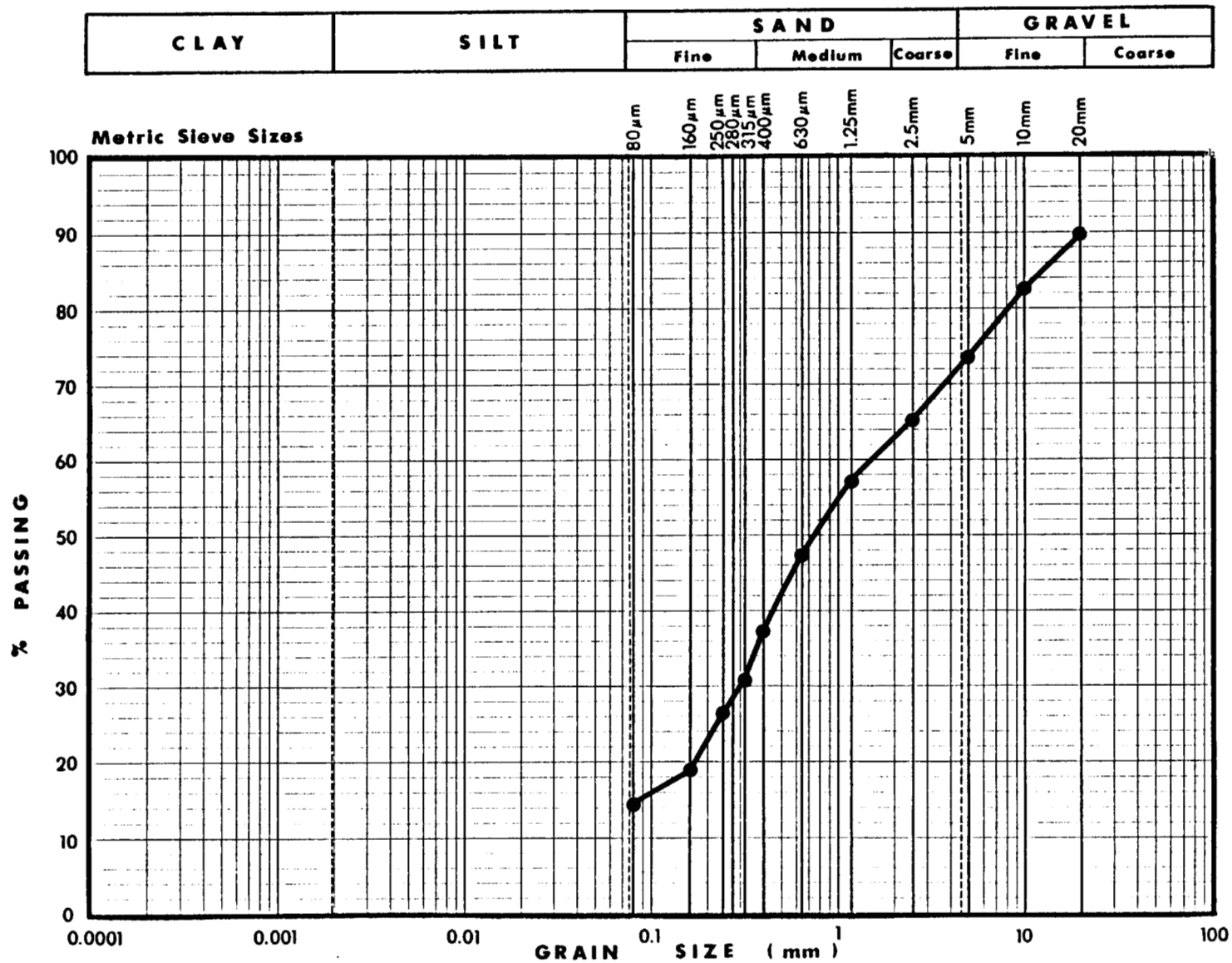
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/06/05

DRAWN BY: GJB

DWG. No.: B-69



Borehole Number F85-KM27
Sample Number 18,19,20 combined

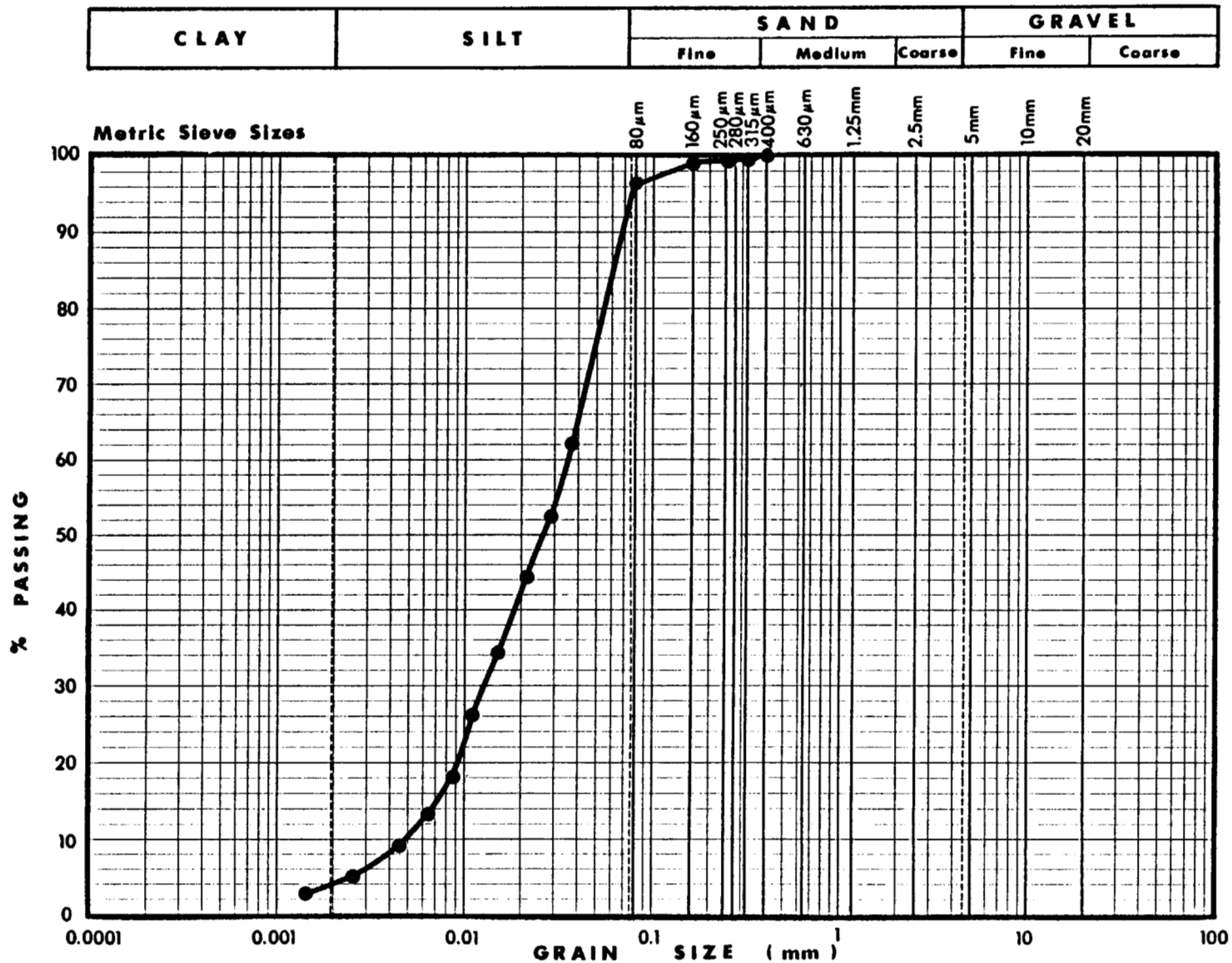
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/06/06

DRAWN BY: GJB

DWG. No.: B-70



Borehole Number F85-KM27
Sample Number 23

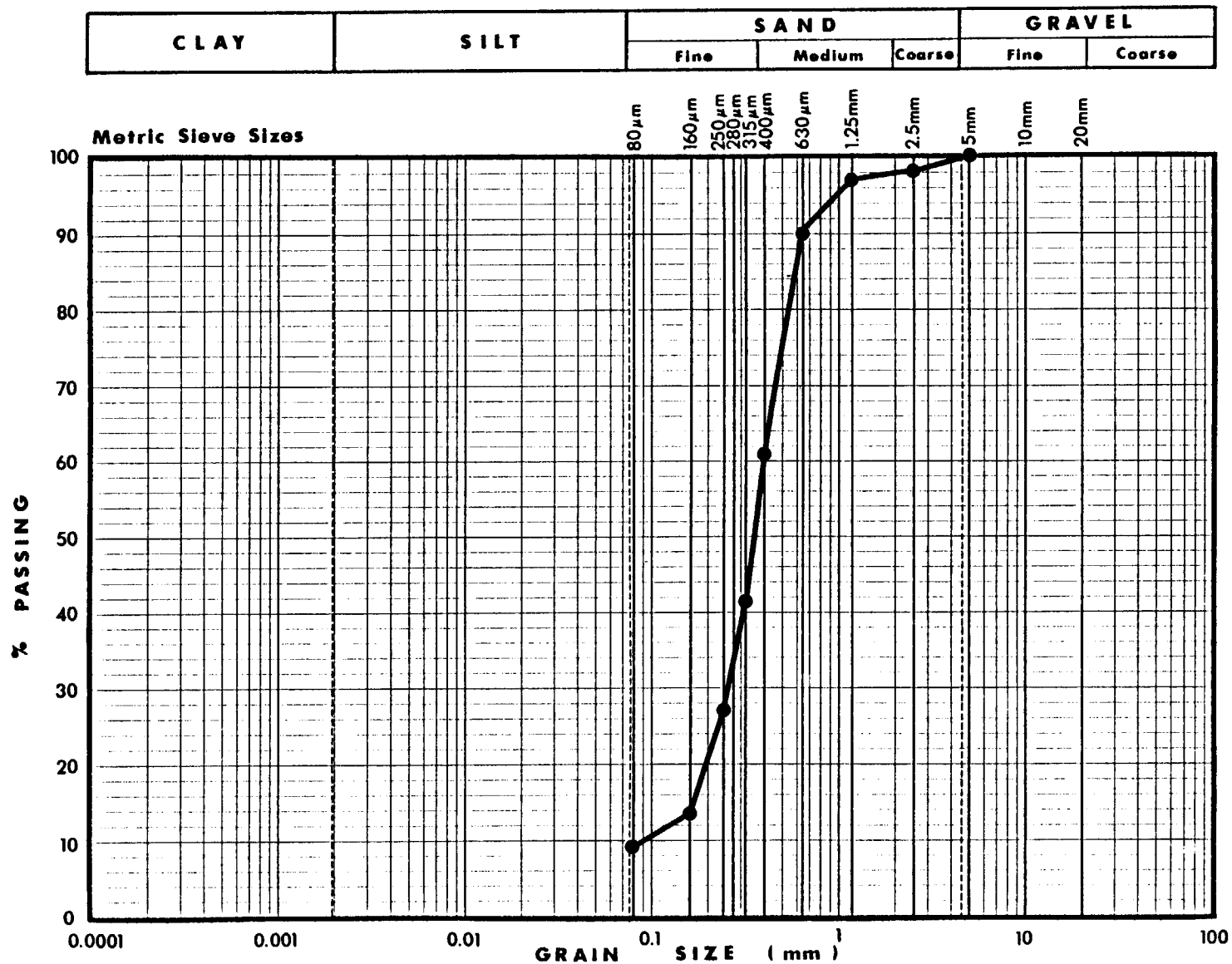
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/22

DRAWN BY: GJB

DWG. No.: B-71



Borehole Number F85-KM27
Sample Number 27

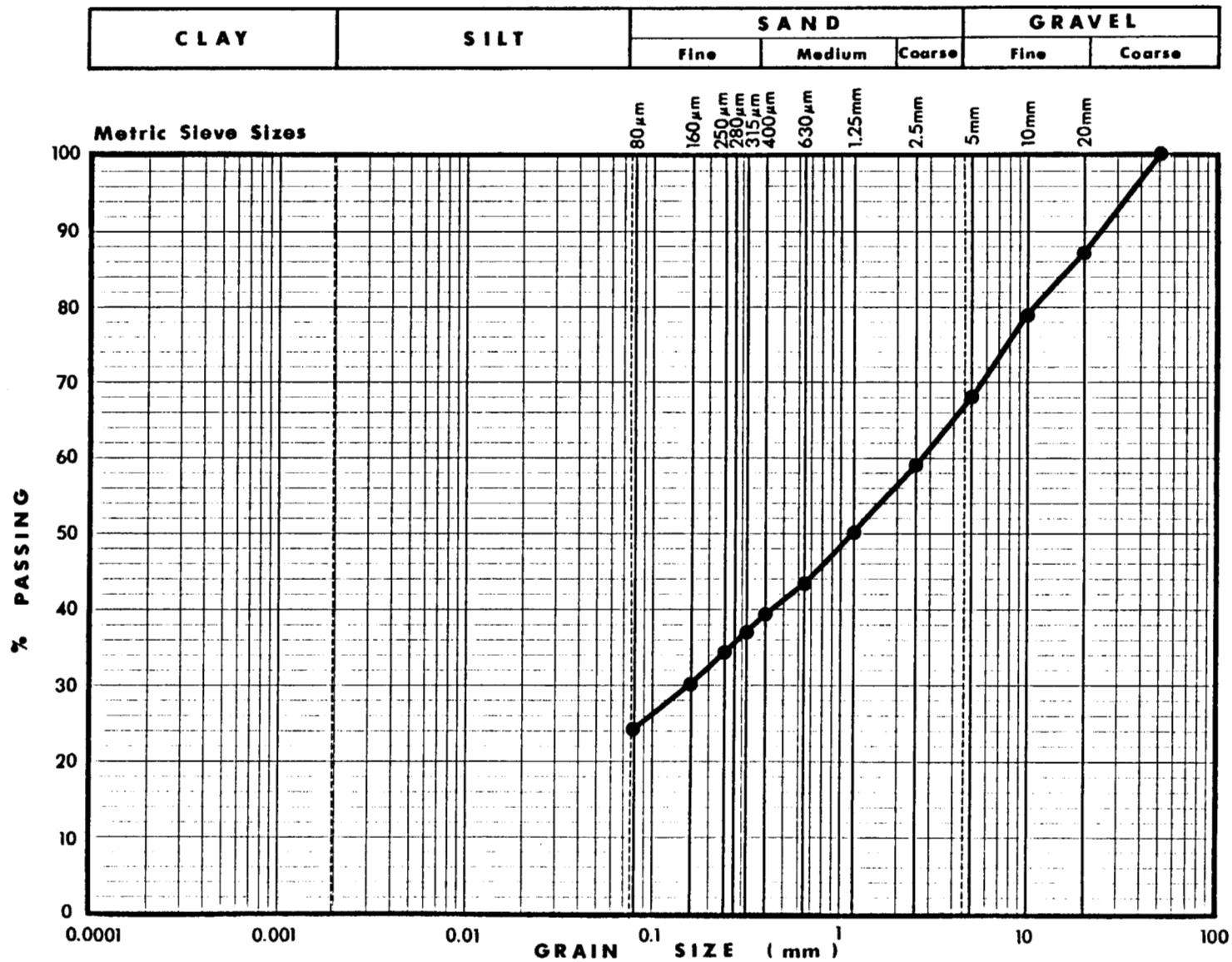
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/06/05

DRAWN BY: GJB

DWG. No.: B-72



Borehole Number F85-KM28
Sample Number 2,3 combined

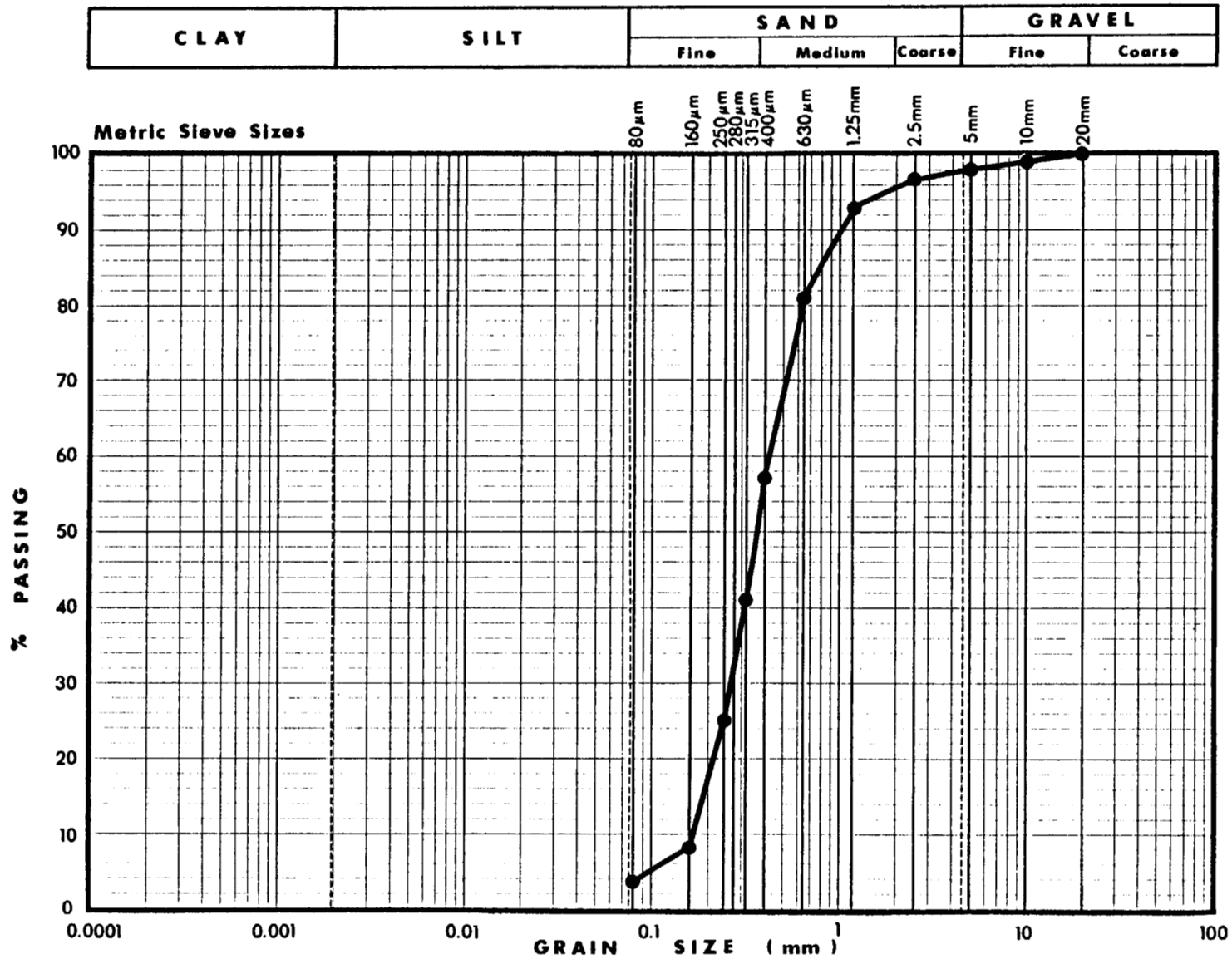
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/06/04

DRAWN BY: GJB

DWG. No.: B-73



Borehole Number F85-KM28
Sample Number 6

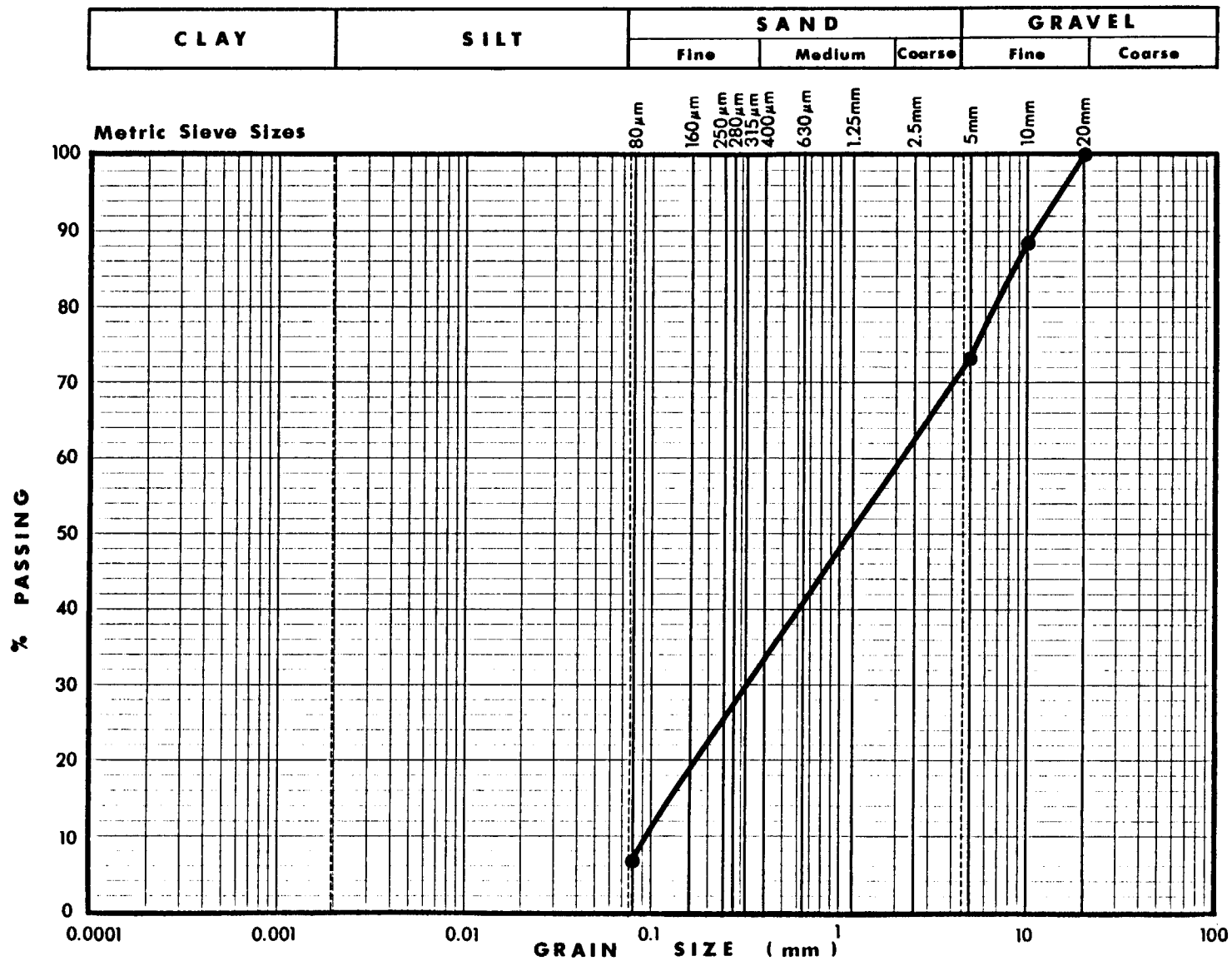
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/06/04

DRAWN BY: GJB

DWG. No.: B-74



Borehole Number F85+KM28
Sample Number 7,8 combined

M. J. O'CONNOR & ASSOCIATES LTD.

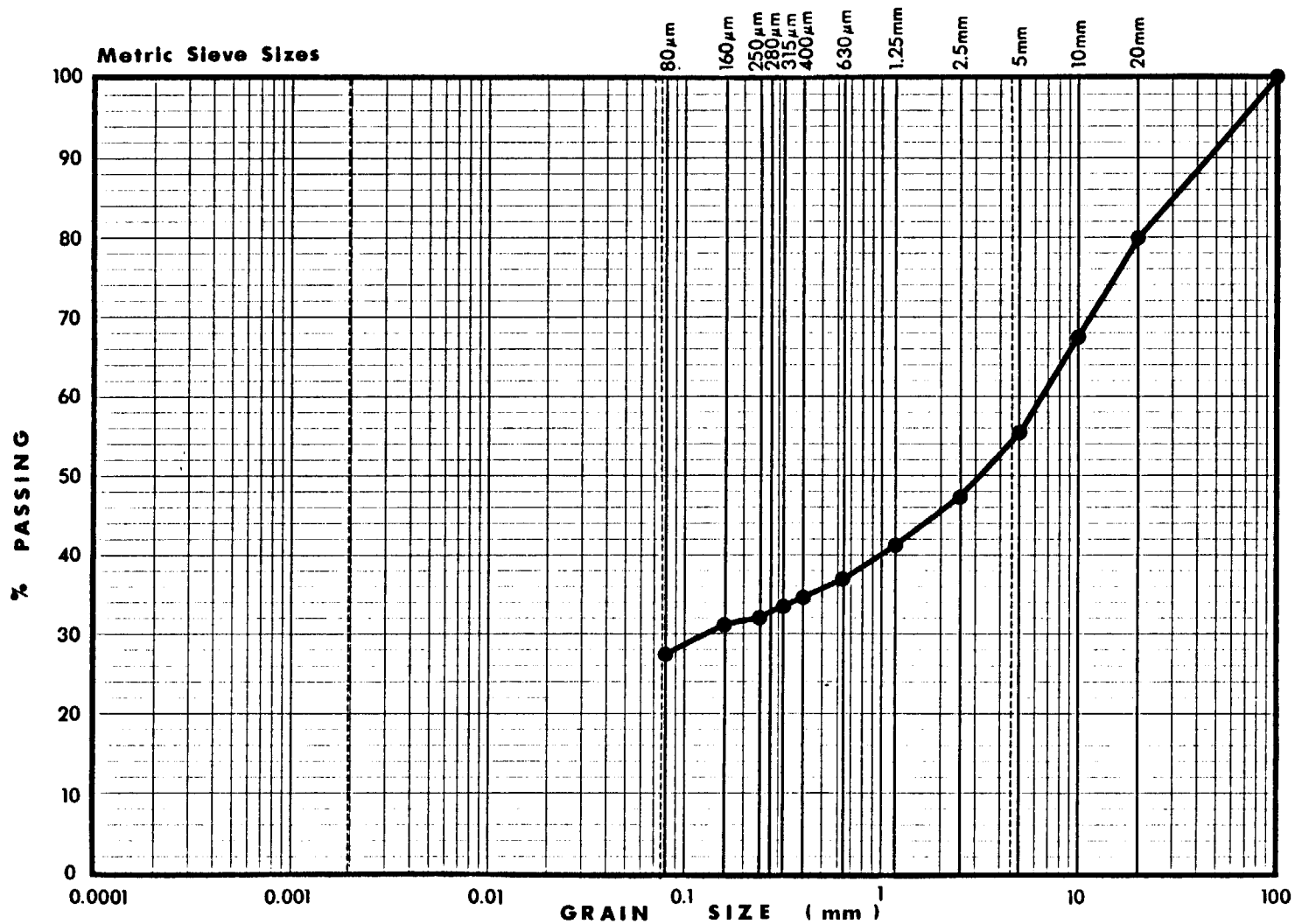
JOB No.: 10-300

DATE: 85/06/04

DRAWN BY: GJB

DWG. No.: B-75

CLAY	SILT	SAND			GRAVEL	
		Fine	Medium	Coarse	Fine	Coarse



Borehole Number F85-KM29
Sample Number 9,10,11 combined

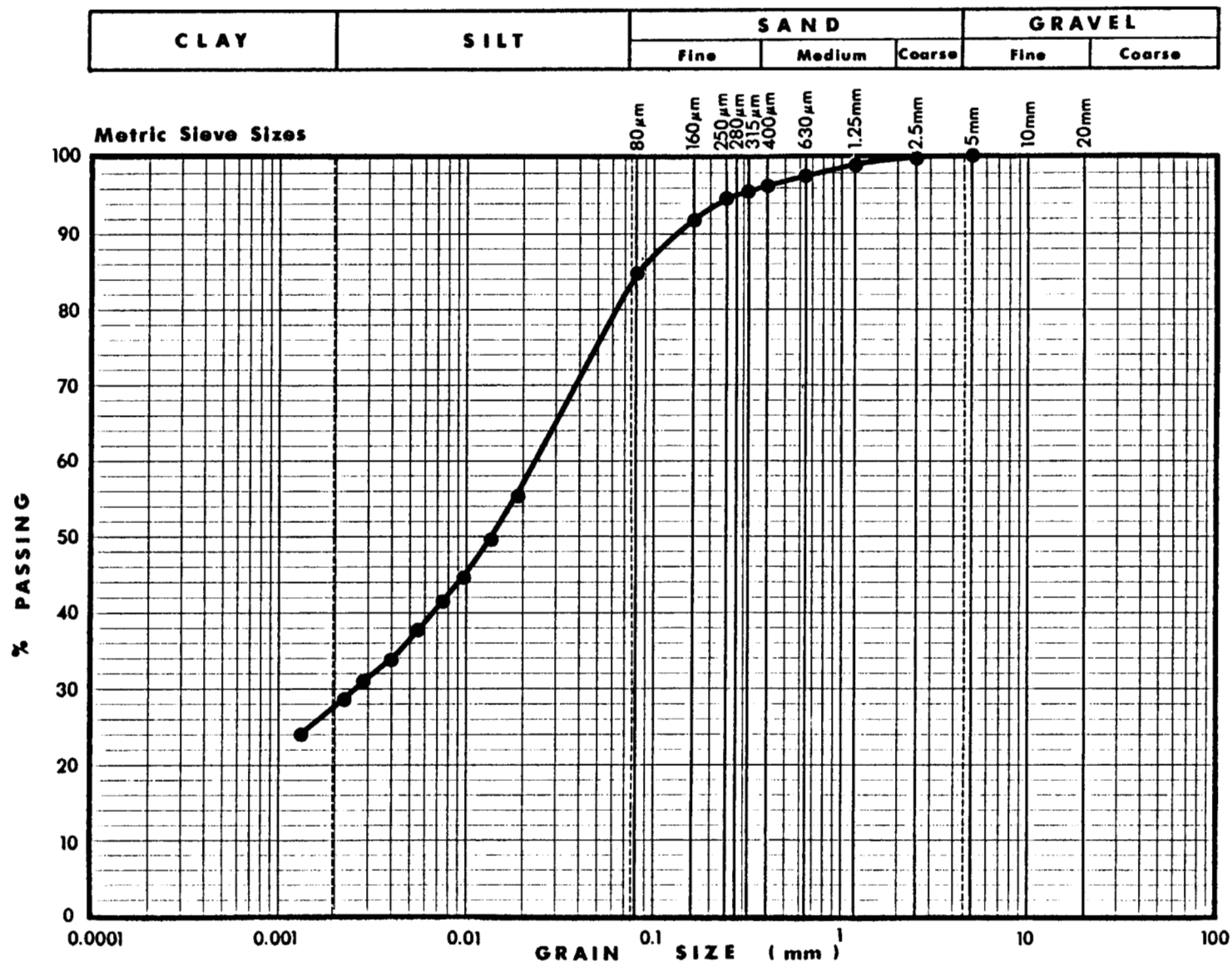
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/06/06

DRAWN BY: GJB

DWG. No.: B-76



Borehole Number F85-KM30
Sample Number 5

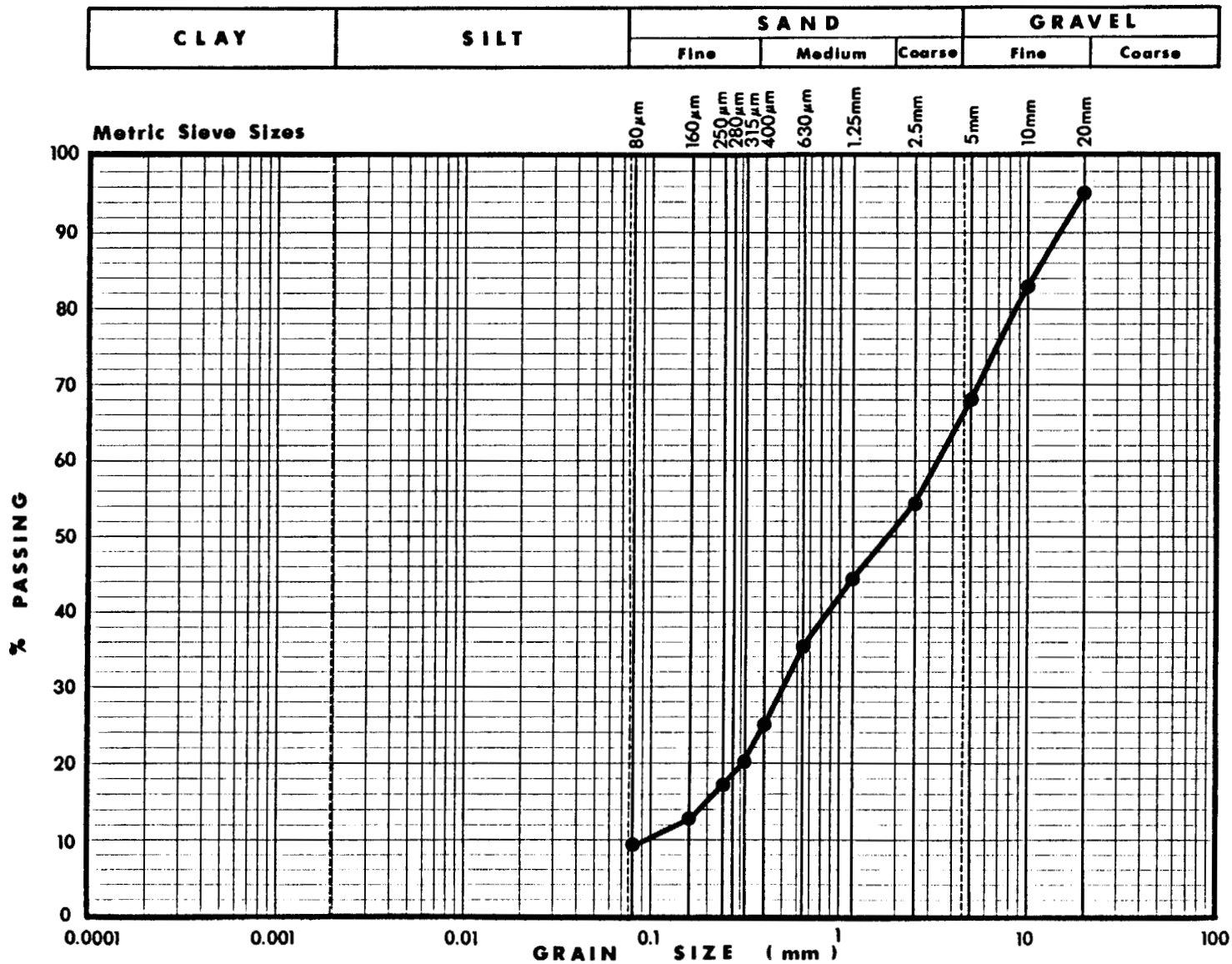
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/06/06

DRAWN BY: GJB

DWG. No.: B-77



Borehole Number F85-KM31
Sample Number 3

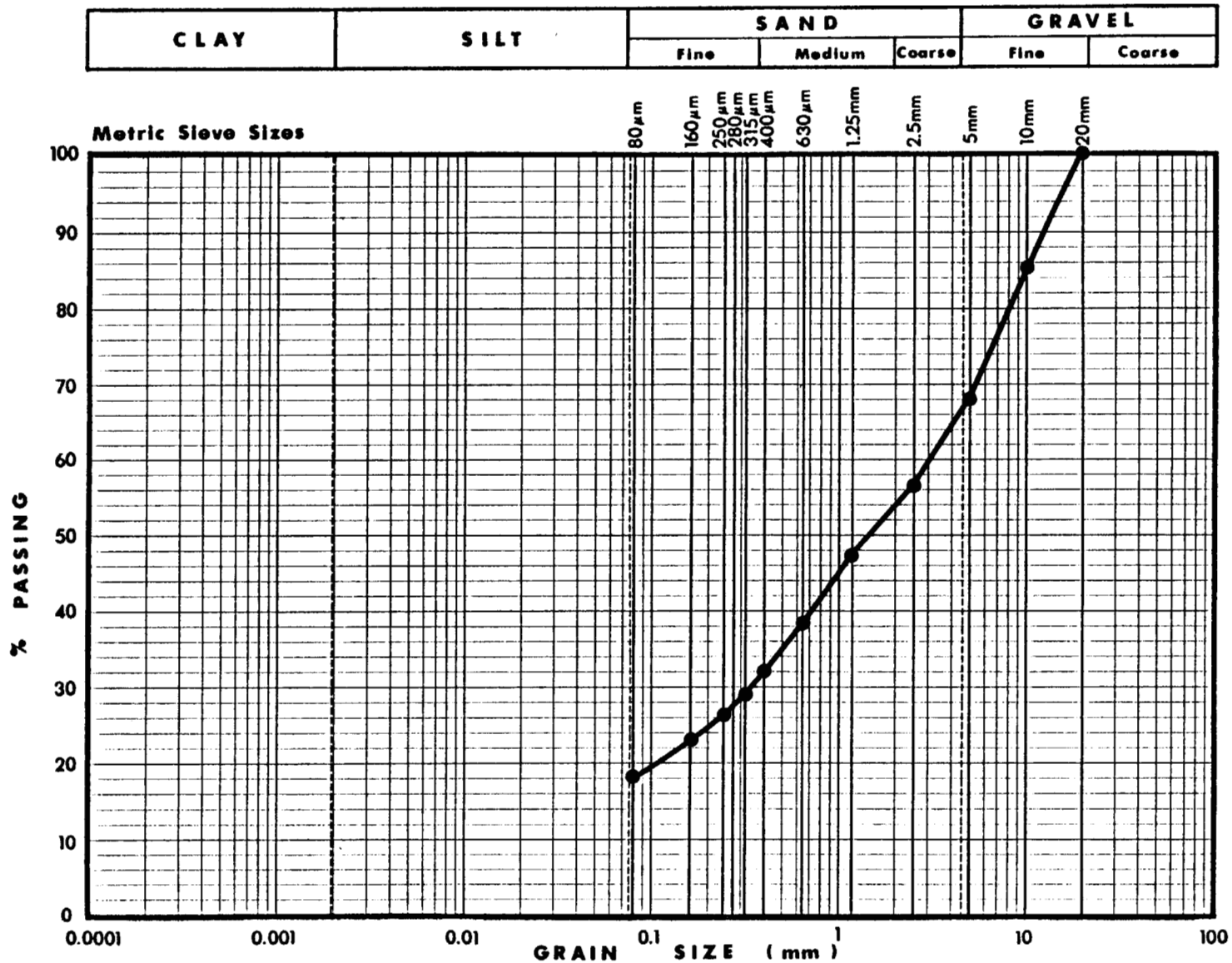
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/06/06

DRAWN BY: GJB

DWG. No.: B-78



Borehole Number F85-KM31
Sample Number 4

M. J. O'CONNOR & ASSOCIATES LTD.

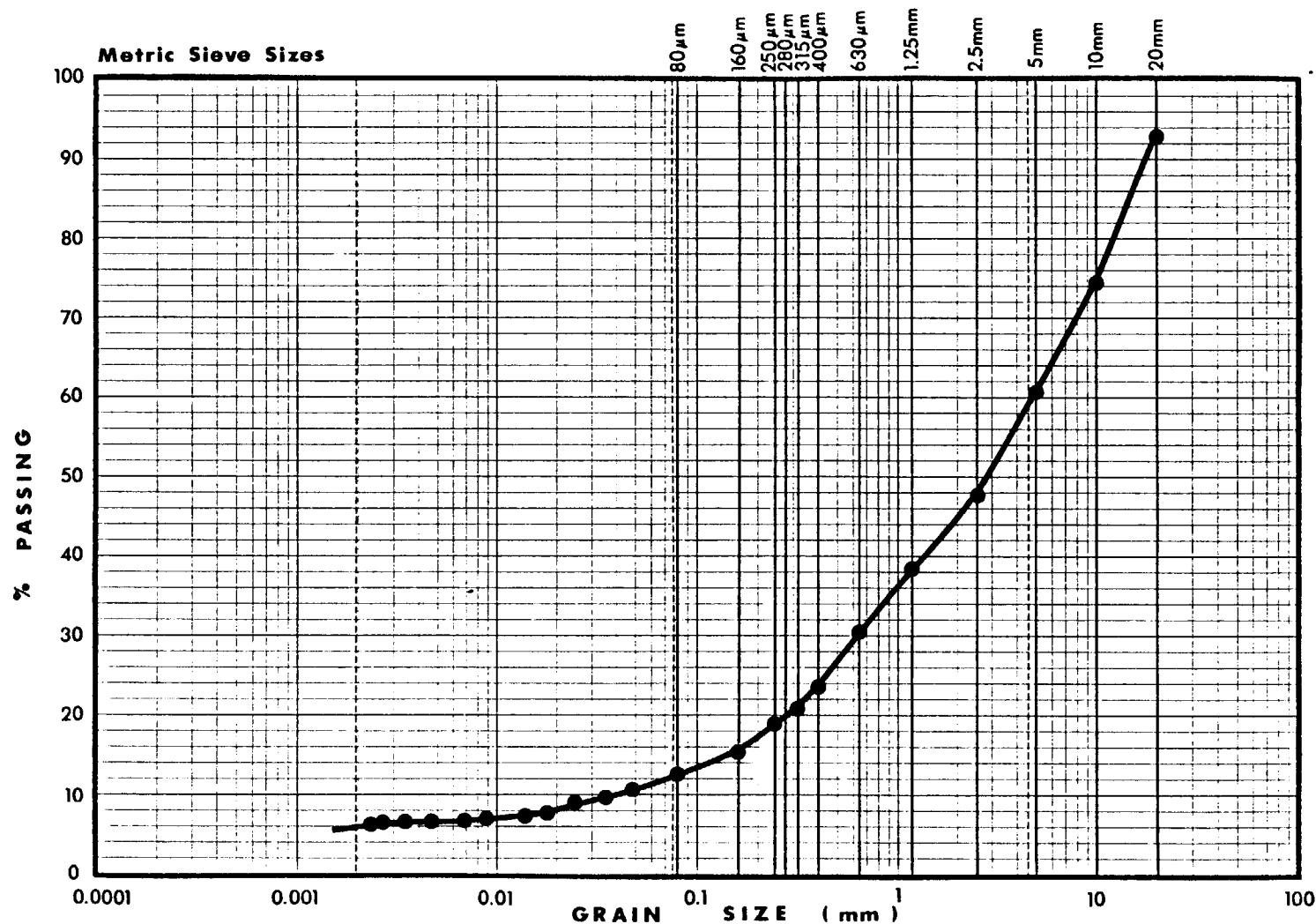
JOB No.: 10-300

DATE: 85/06/06

DRAWN BY: GJB

DWG. No.: B-79

CLAY	SILT	SAND			GRAVEL	
		Fine	Medium	Coarse	Fine	Coarse



Borehole Number F85-KM31
Sample Number 5,6,7 combined

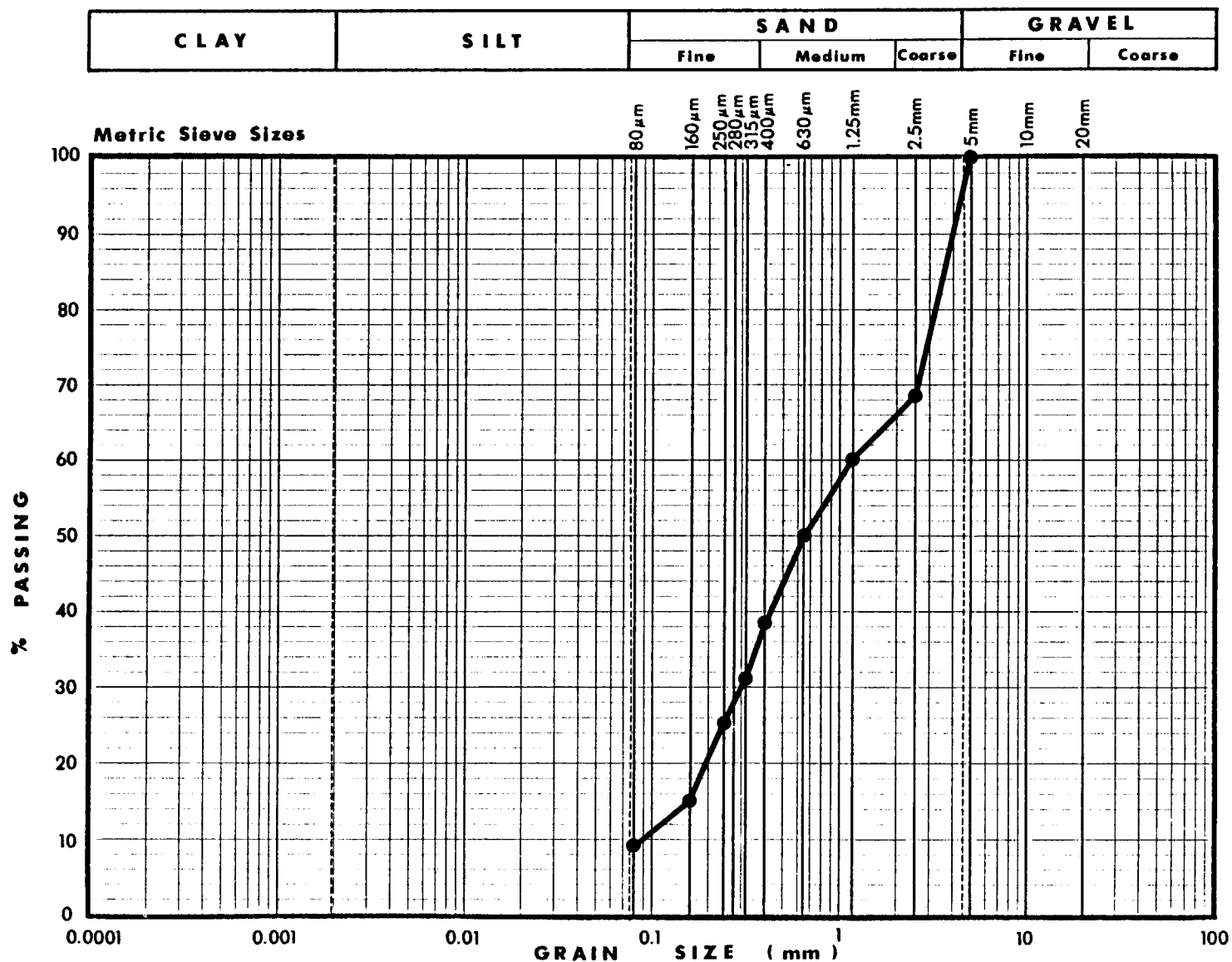
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/08

DRAWN BY: GJB

DWG. No.: B-80



Borehole Number F85-KM31
Sample Number 8

M. J. O'CONNOR & ASSOCIATES LTD.

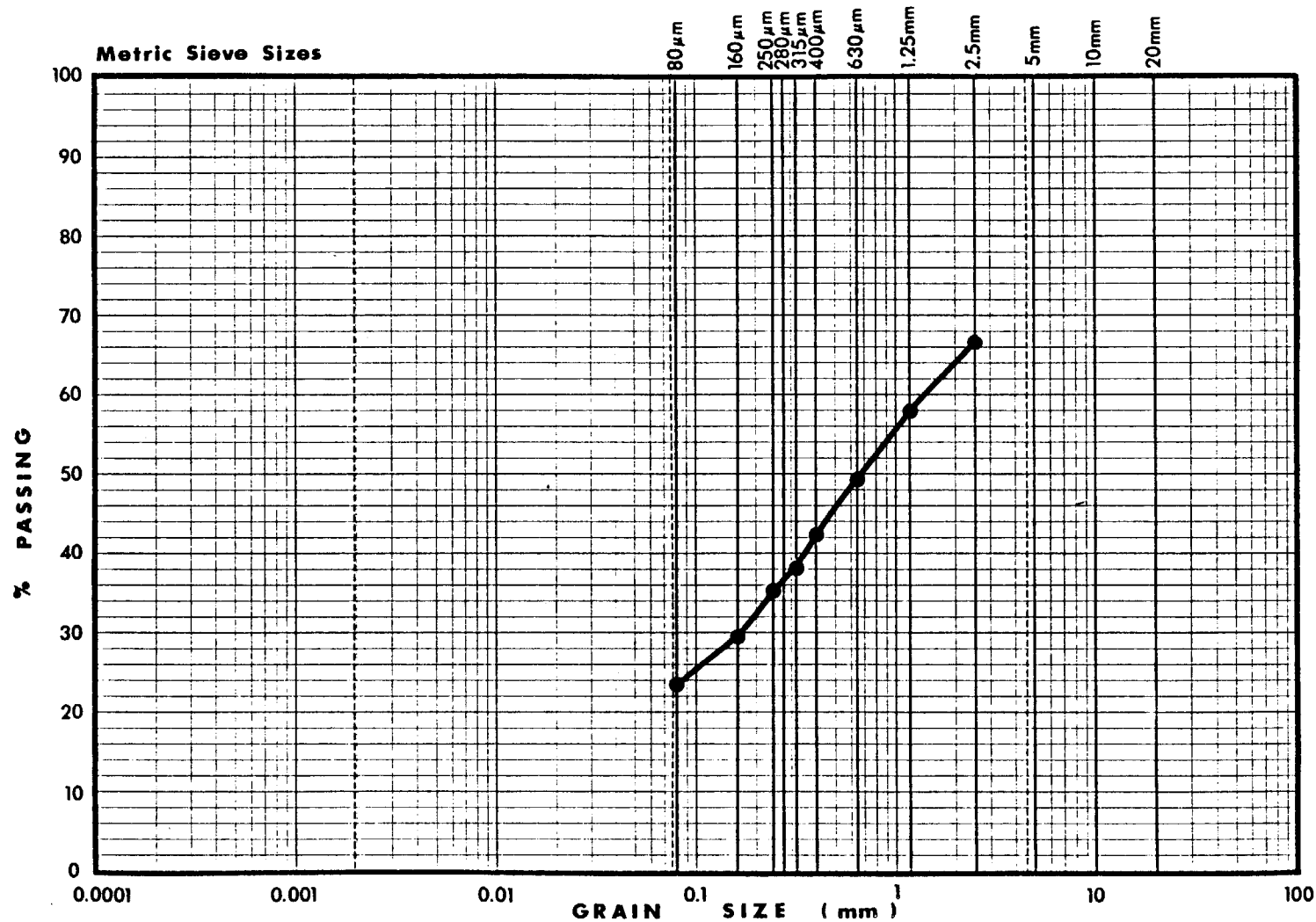
JOB No.: 10-300

DATE: 85/05/08

DRAWN BY: GJB

DWG. No.: B-81

CLAY	SILT	SAND			GRAVEL	
		Fine	Medium	Coarse	Fine	Coarse



Borehole Number F85-KM31
Sample Number 9

M. J. O'CONNOR & ASSOCIATES LTD.

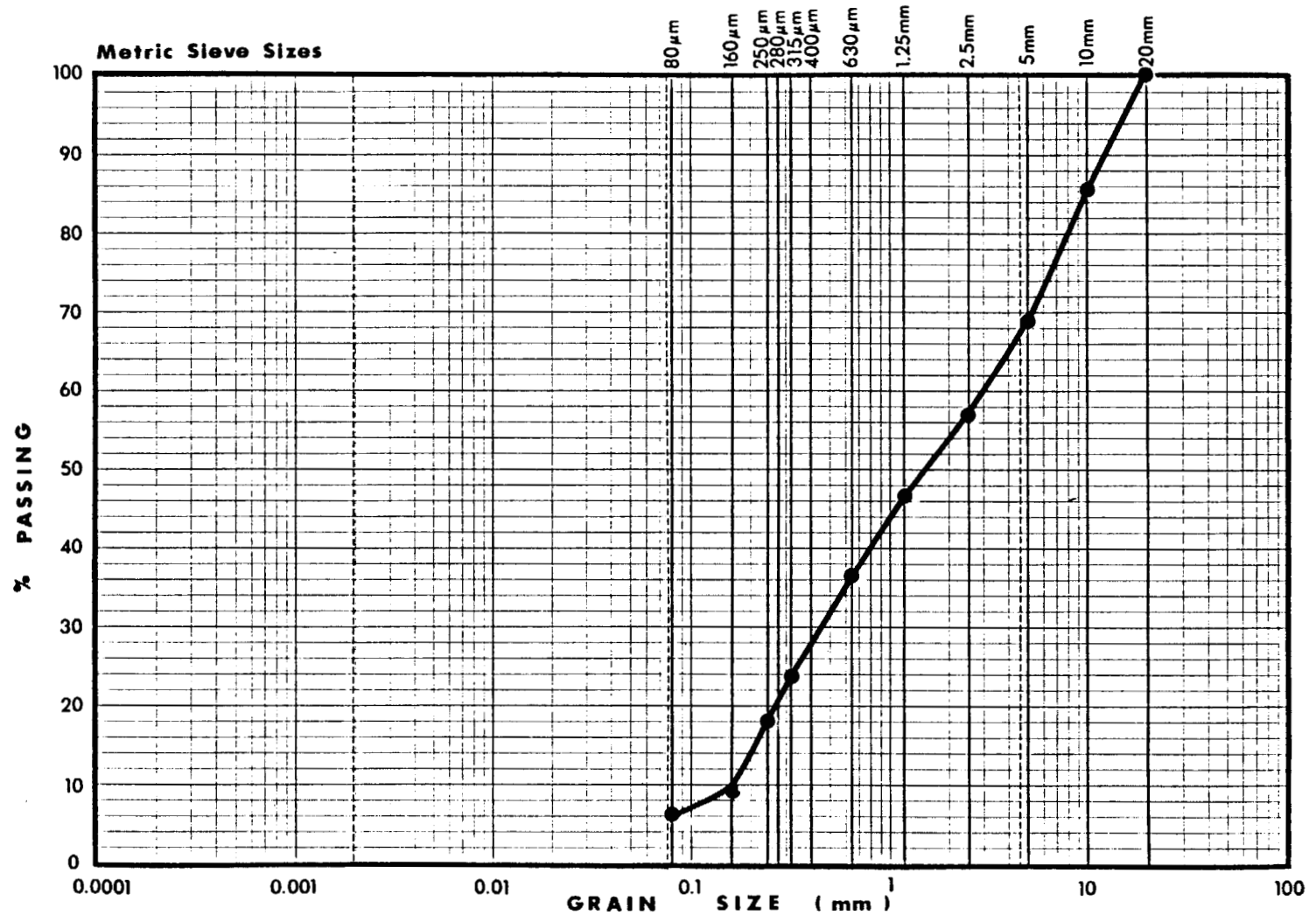
JOB No.: 10-300

DATE: 85/05/08

DRAWN BY: GJB

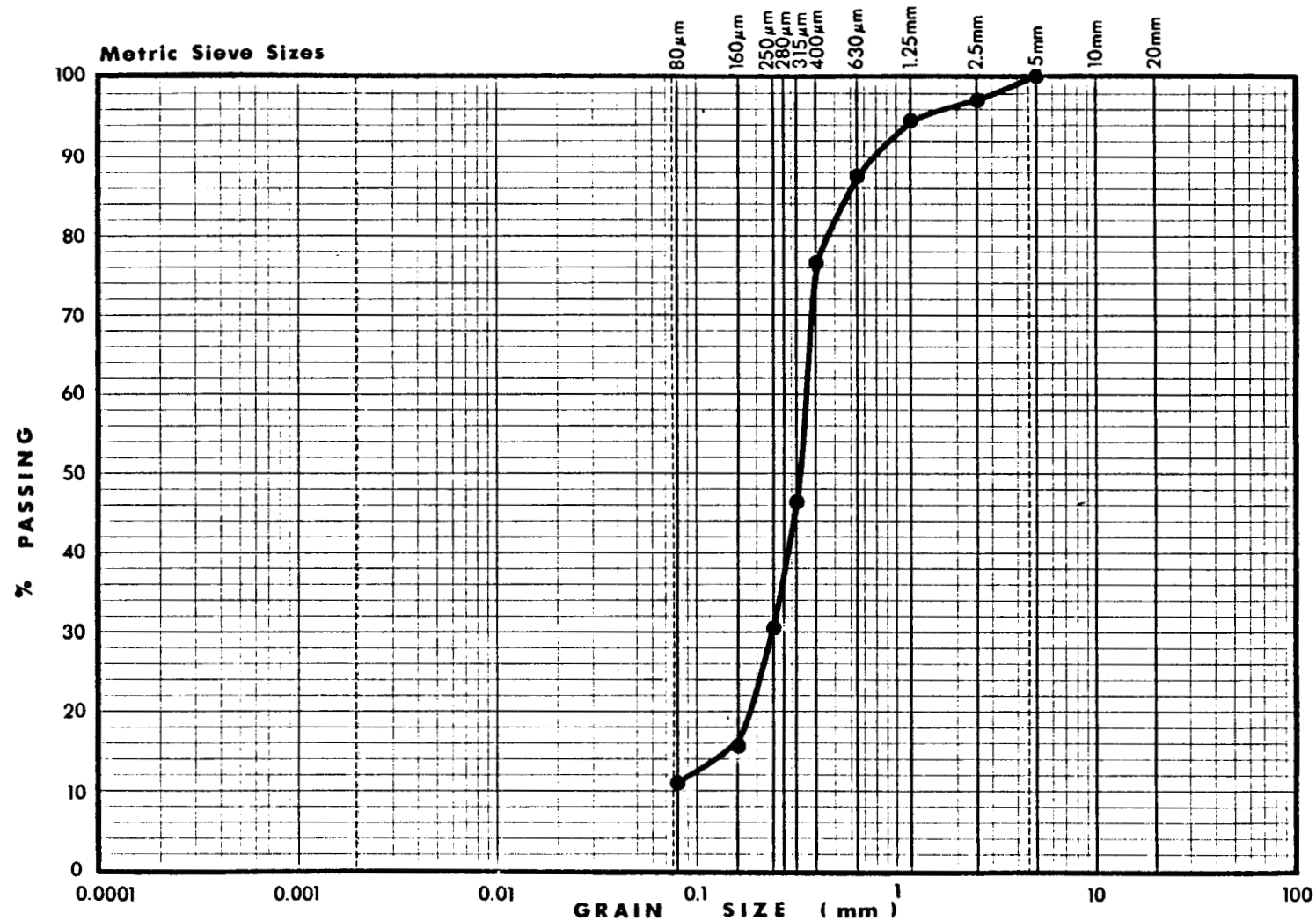
DWG. No.: B-82

CLAY	SILT	SAND			GRAVEL	
		Fine	Medium	Coarse	Fine	Coarse



Borehole Number F85-KM31 Sample Number 10,11 combined	M. J. O'CONNOR & ASSOCIATES LTD.	
	JOB No.: 10-300	DATE: 85/05/08
	DRAWN BY: GJB	DWG. No.: B-83

CLAY	SILT	SAND			GRAVEL	
		Fine	Medium	Coarse	Fine	Coarse



Borehole Number F85-KM31
Sample Number 12

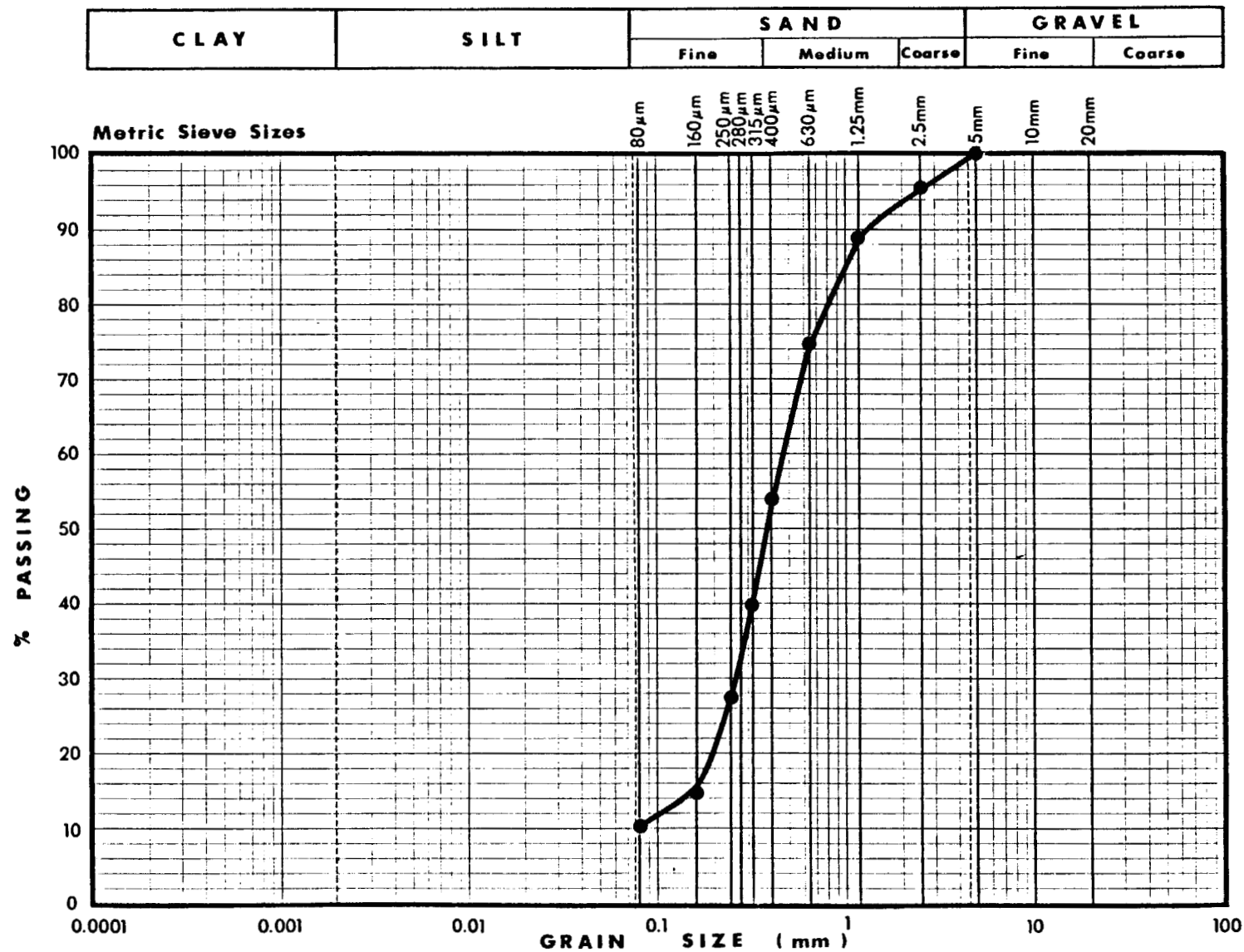
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/08

DRAWN BY: GJB

DWG. No.: B-84



Borehole Number F85-KM31
Sample Number 13

M. J. O'CONNOR & ASSOCIATES LTD.

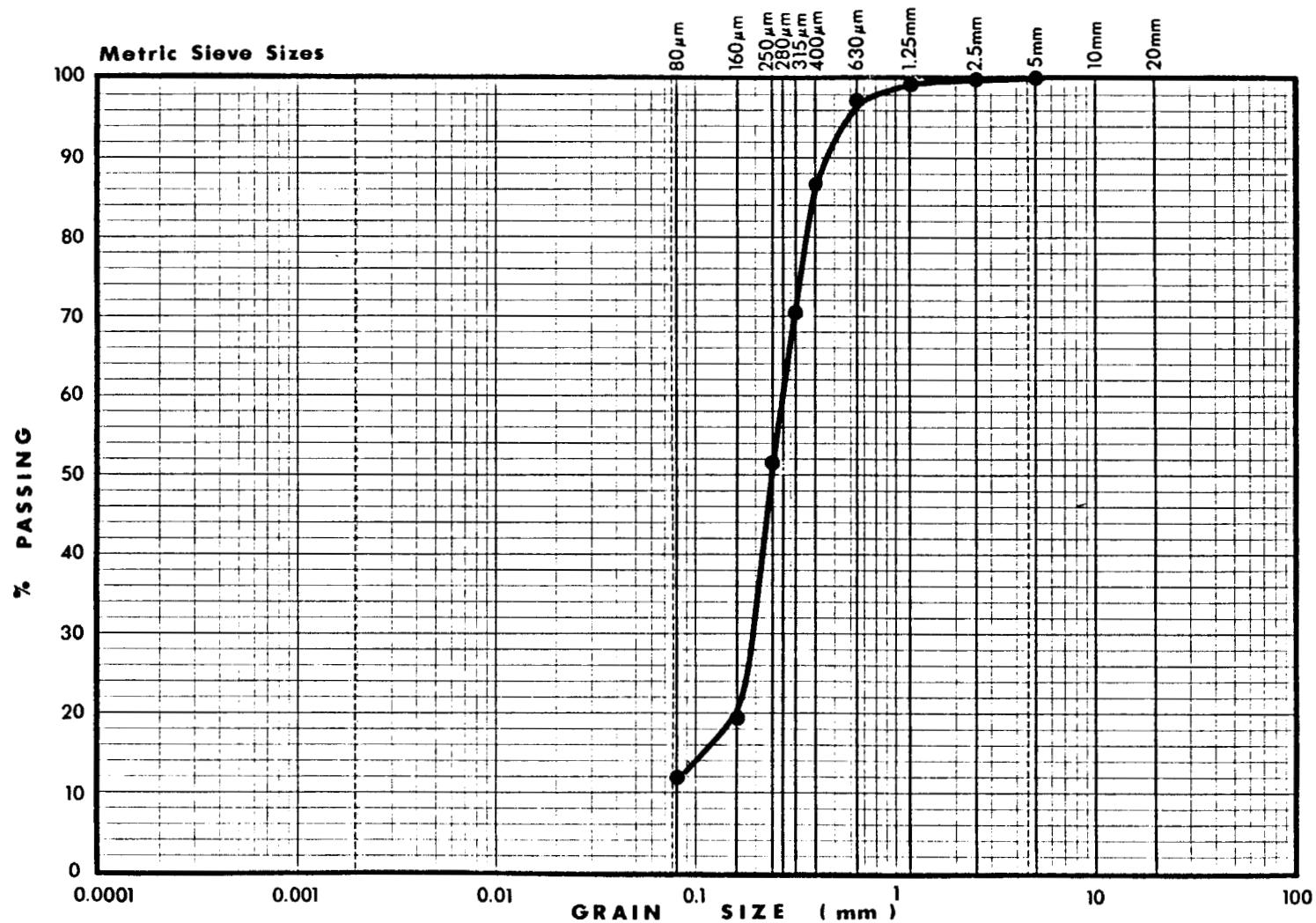
JOB No.: 10-300

DATE: 85/05/08

DRAWN BY: GJB

DWG. No.: B-85

CLAY	SILT	SAND			GRAVEL	
		Fine	Medium	Coarse	Fine	Coarse



Borehole Number F85-KM31
Sample Number 14

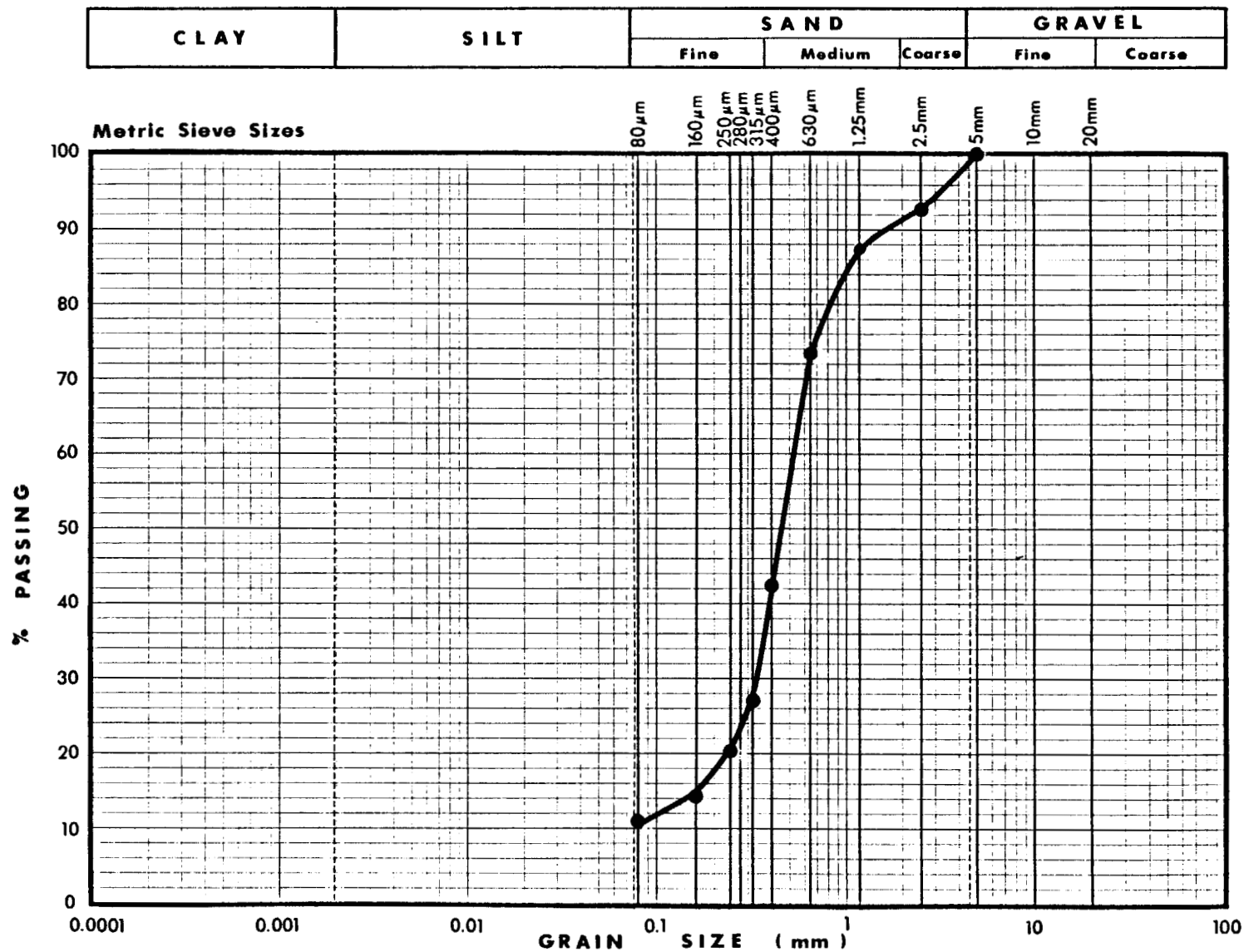
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/08

DRAWN BY: GJB

DWG. No.: B-86



Borehole Number F85-KM31
Sample Number 15

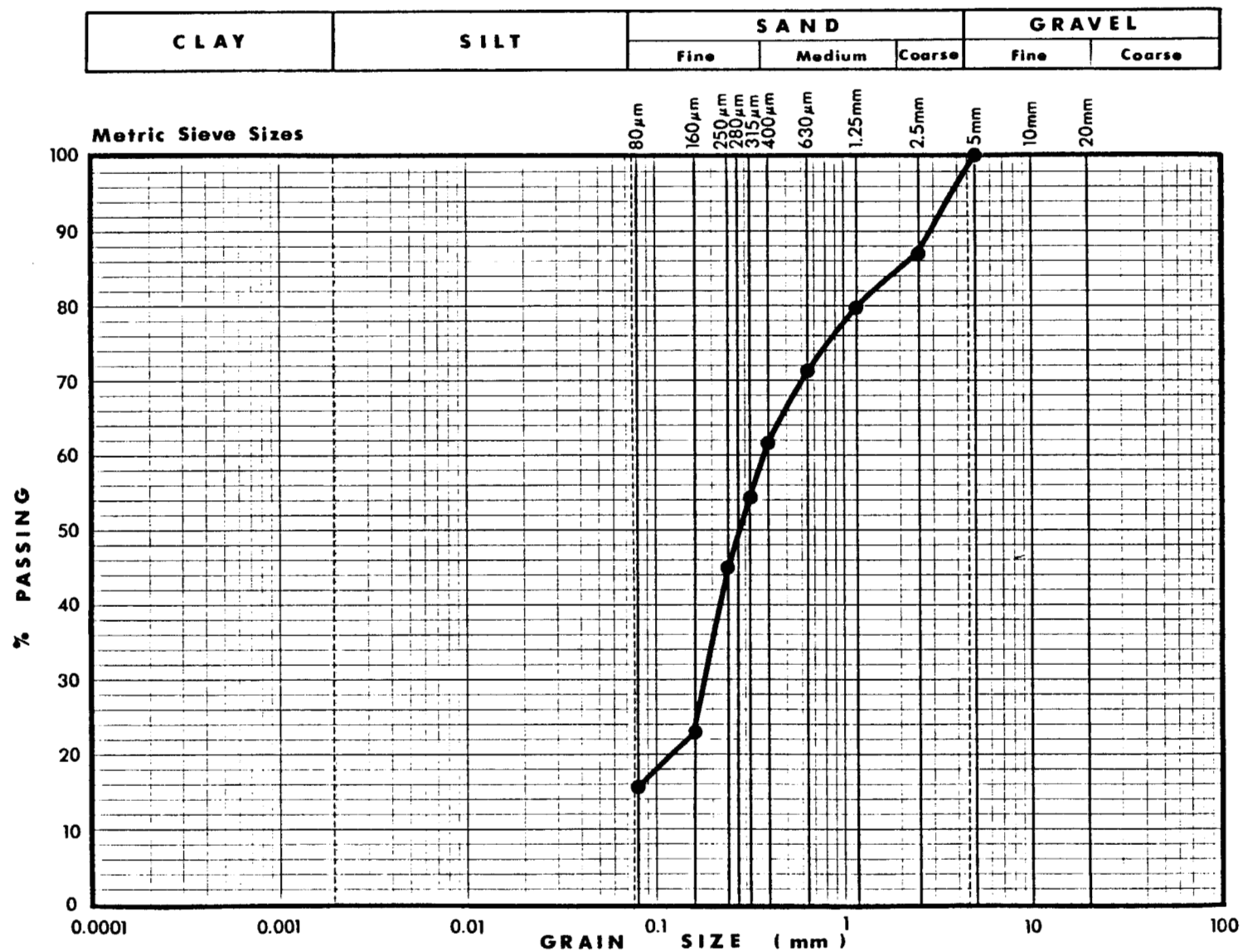
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/08

DRAWN BY: GJB

DWG. No.: B-87



Borehole Number F85-KM31
Sample Number 16

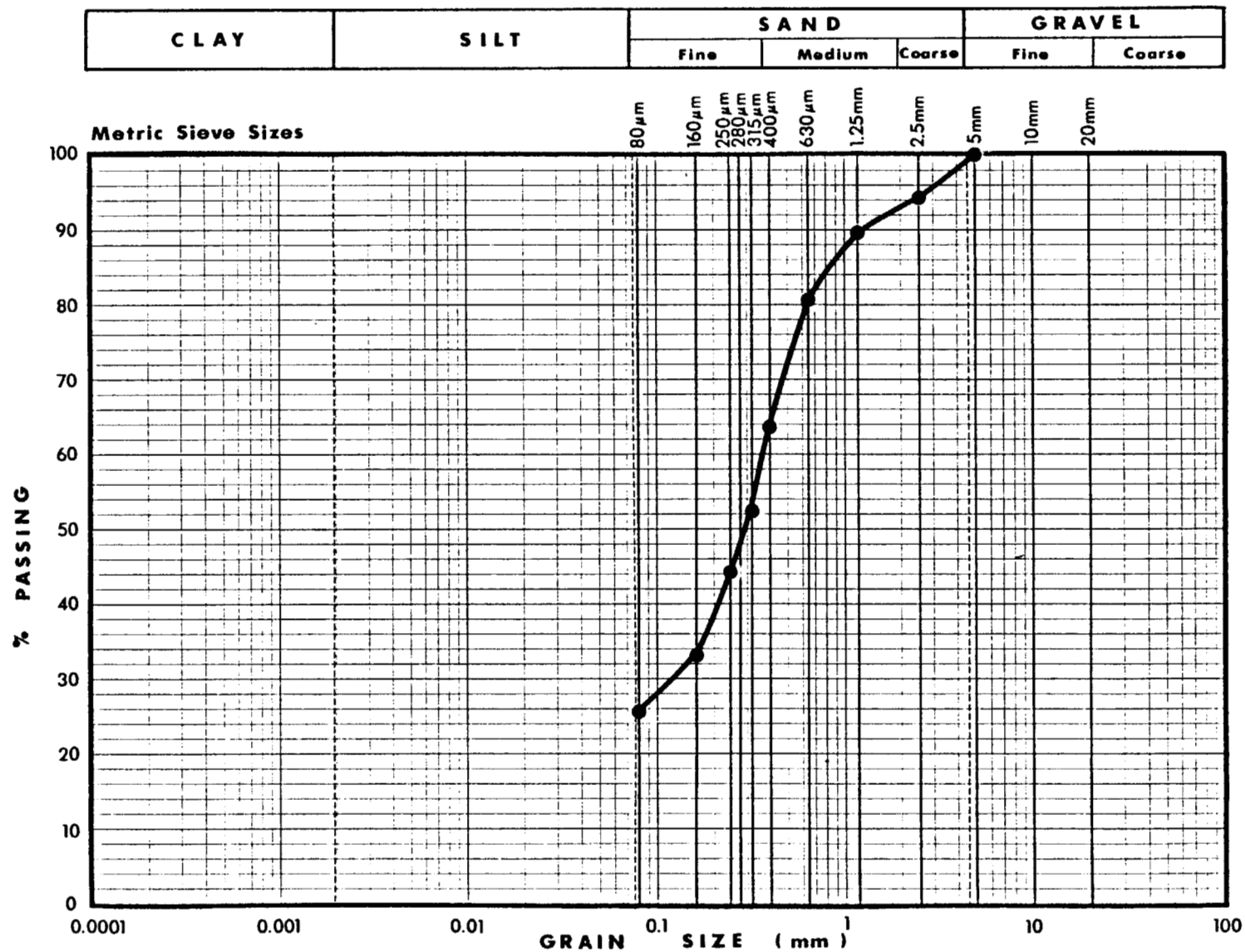
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/08

DRAWN BY: GJB

DWG. No.: B-88



Borehole Number F85-KM31
Sample Number 17

M. J. O'CONNOR & ASSOCIATES LTD.

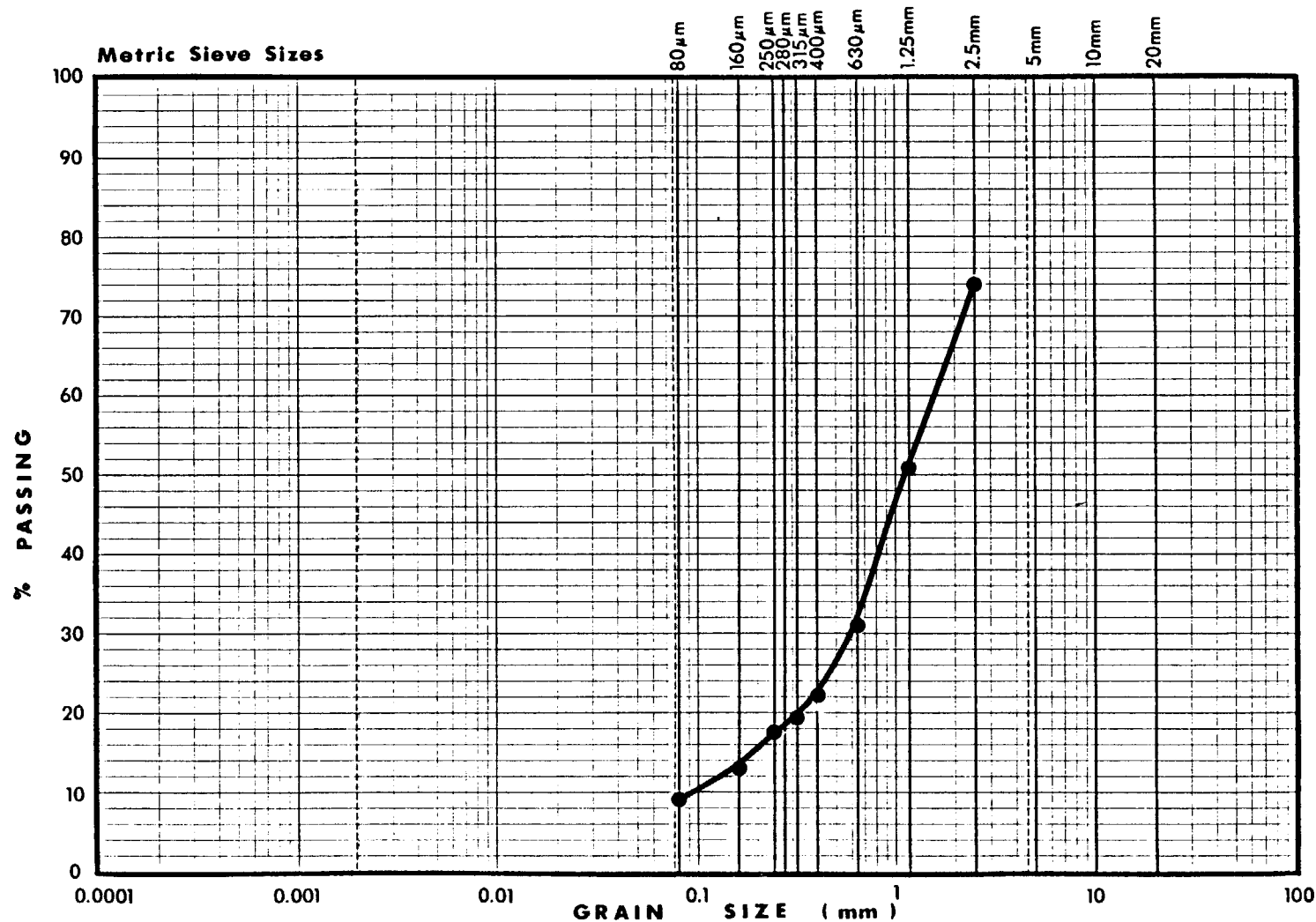
JOB No.: 10-300

DATE: 85/05/08

DRAWN BY: GJB

DWG. No.: B-89

CLAY	SILT	SAND			GRAVEL	
		Fine	Medium	Coarse	Fine	Coarse



Borehole Number F85-KM31
Sample Number 18

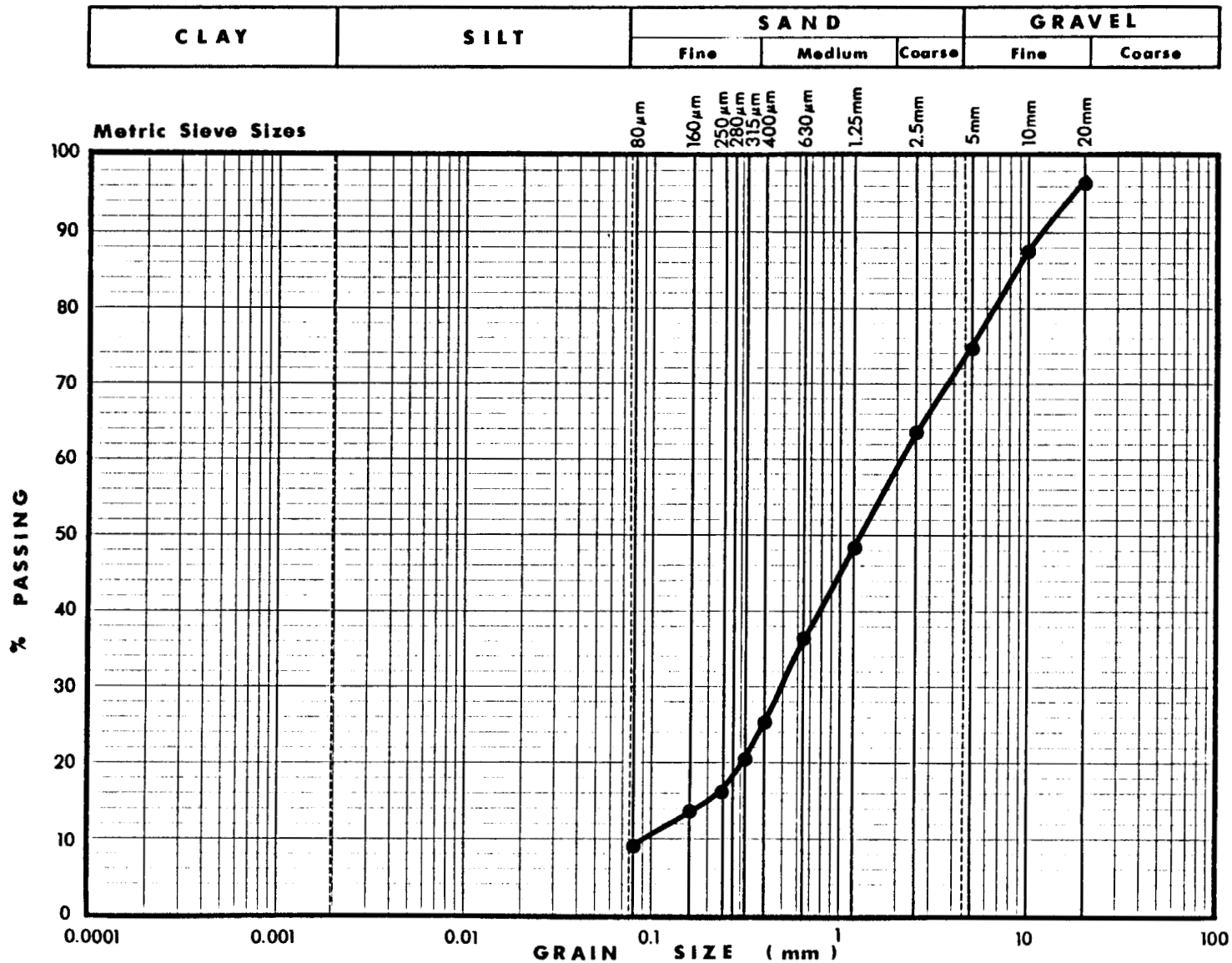
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/08

DRAWN BY: GJB

DWG. No.: B-90



Borehole Number F85-KM32
Sample Number 4,5 combined

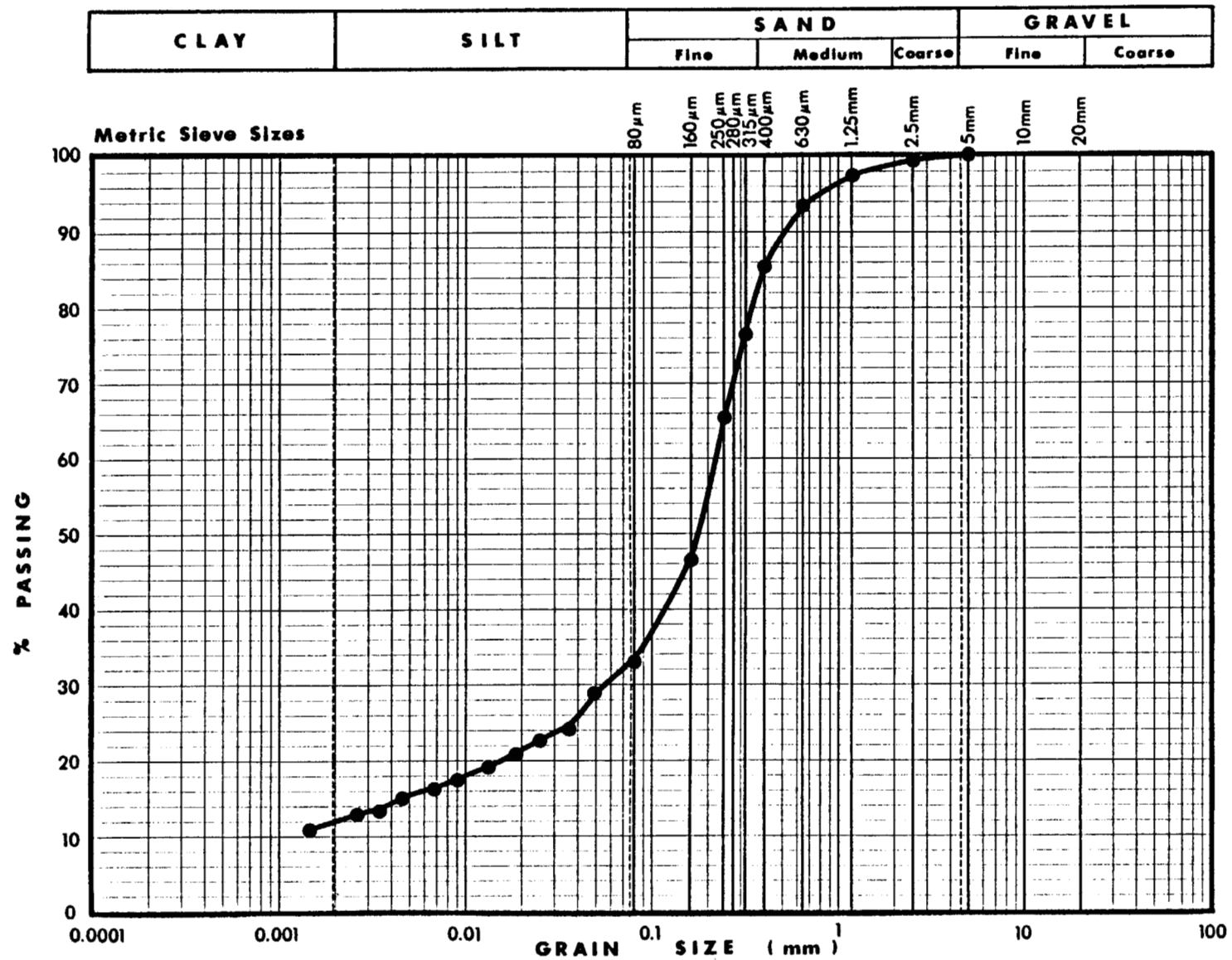
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/08

DRAWN BY: GJB

DWG. No.: B-91



Borehole Number F85-KM33
Sample Number 6

M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/05/08

DRAWN BY: GJB

DWG. No.: B-92

TABLE C-1

ESTIMATED OVERCONSOLIDATION RATIOS IN F85KF4

Depth Below Seabed (m)	(C_u / σ_v')	$I_p (\%)$	$\left(\frac{C_u}{\sigma_v'}\right)_{N.C.}^1$	OCR ^{2.}
0	0.0	---	---	---
2.6	0.391	25	0.203	2.3
4.4	0.231	19	0.180	1.3
4.8	0.442	20	0.184	2.7
5.3	0.735	20	0.184	5.0
6.3	0.595	25	0.203	3.9
10.0	0.390	22	0.191	2.3
11.3	0.385	20	0.184	2.5
12.3	0.182	19	0.180	1.0
13.3	0.269	19	0.180	1.6
14.3	0.237	19	0.180	1.5
15.3	0.233	19	0.180	1.5
16.3	0.230	19	0.180	1.5
17.3	0.295	19	0.180	1.7
17.5	3.7	19	0.180	>10.0

1. Based on empirical correlation presented by Skempton (1957)

2. Empirical correlation from Schmertmann (1978).

TABLE C-2

ESTIMATED OVERCONSOLIDATION RATIOS IN F85KF9

Depth Below Seabed (m)	(C_u / σ_v')	$I_p(\%)$	$\left(\frac{C_u}{\sigma_v'}\right)_{N.C.}^1$	OCR ²
0.0	0.0	--	--	--
1.65	0.336	20	0.184	2.0
2.65	0.126	19	0.180	<1.0
3.67	0.001	18	0.177	<1.0
4.64	0.072	18	0.177	<1.0
5.64	0.177	18	0.177	1.0
6.66	0.167	17	0.173	1.0
7.66	0.841	17	0.173	8.0
8.69	0.537	17	0.173	4.0
9.74	0.502	16	0.169	3.9
10.72	0.363	7	0.136	3.1
11.76	0.255	6	0.132	2.1
12.73	0.742	18	0.177	6.2
13.74	0.647	17	0.173	5.0
14.67	0.485	15	0.166	3.8
14.69	0.431	15	0.166	3.0
15.72	0.438	15	0.166	3.0
16.74	0.378	14	0.162	2.9
17.72	0.433	15	0.166	3.0
18.72	0.487	15	0.166	3.8
19.72	0.473	15	0.166	3.6
20.7	0.558	17	0.173	4.5
21.7	0.430	15	0.166	3.0
22.69	0.784	18	0.177	7.0
23.7	0.727	18	0.177	6.0
24.67	0.757	18	0.177	6.9
25.71	1.439	20	0.184	>10.0
26.52	3.356	20	0.184	>10.0
26.53	3.367	20	0.184	>10.0

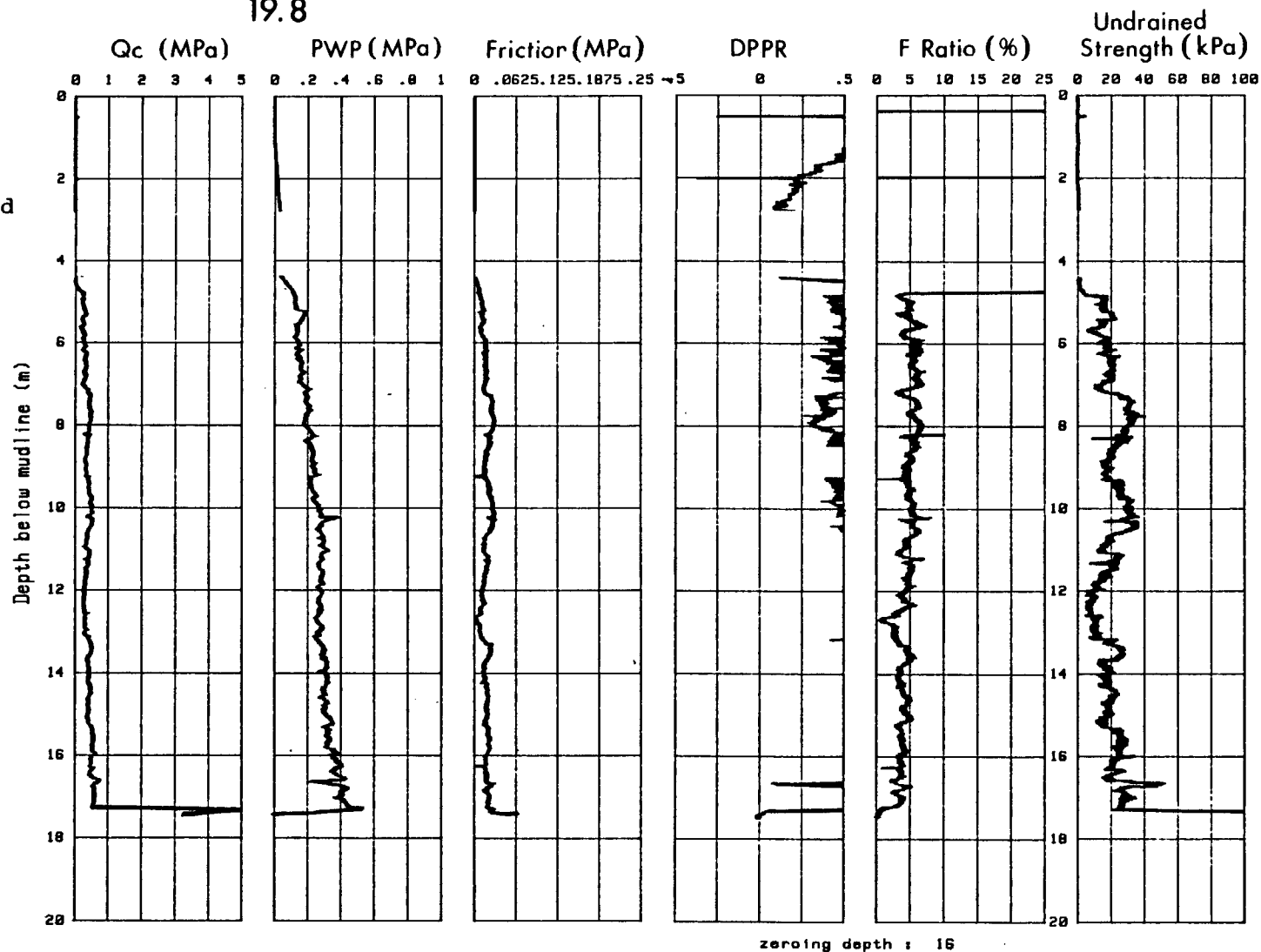
1. Skempton (1957)

2. Schmertmann (1978)

KPHH
19.8

F85KF4

Note:
Cone penetrated
under weight
of rods from
2.8 to 4.4 m



CPT Data for
Test hole F85KF4

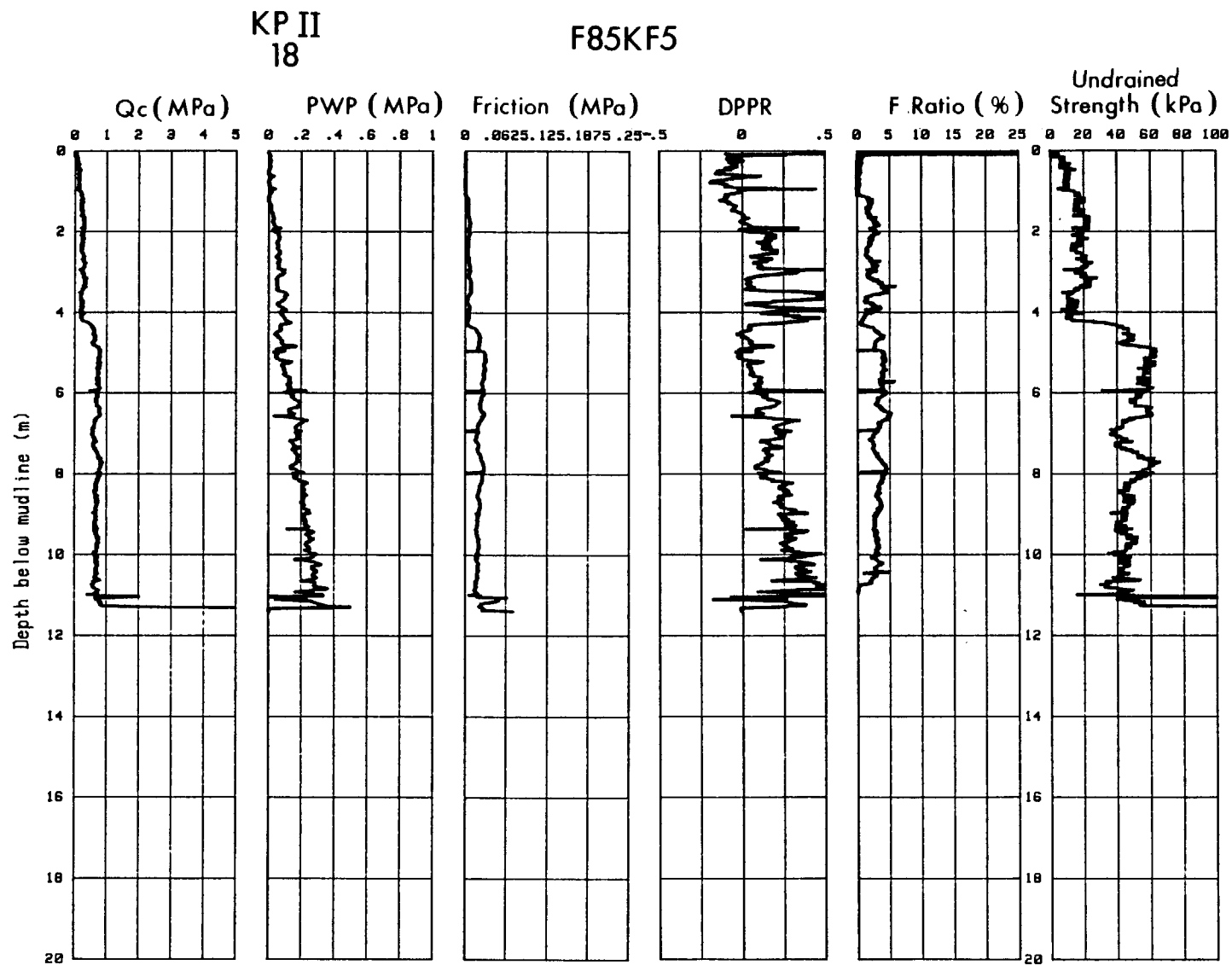
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/08/02

DRAWN BY: MG

DWG. No.: C-1



zeroing depth : 17

CPT Data for
Test hole F85KF5

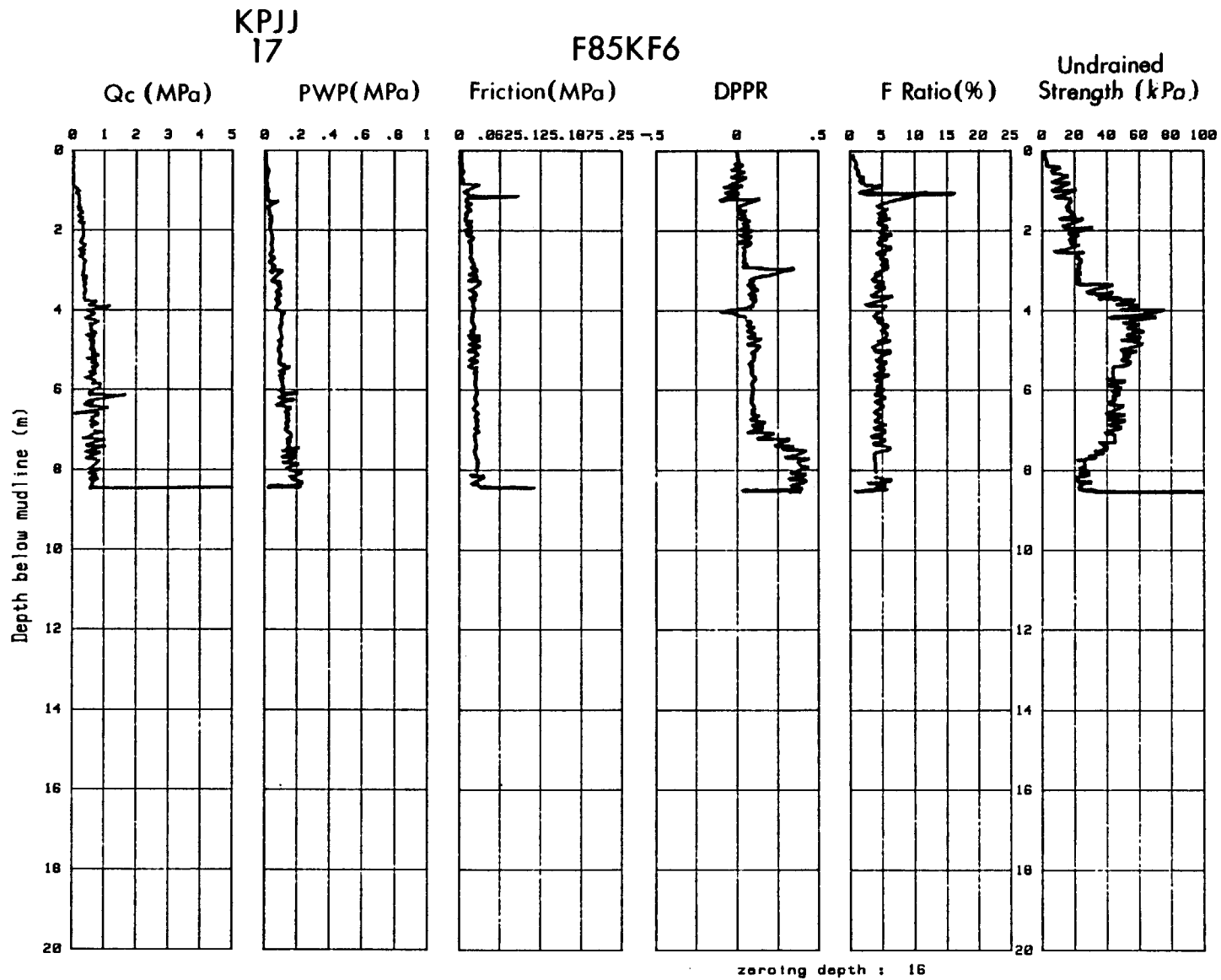
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/08/02

DRAWN BY: MG

DWG. No.: C-2



CPT Data for
Test hole F85KF6

M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

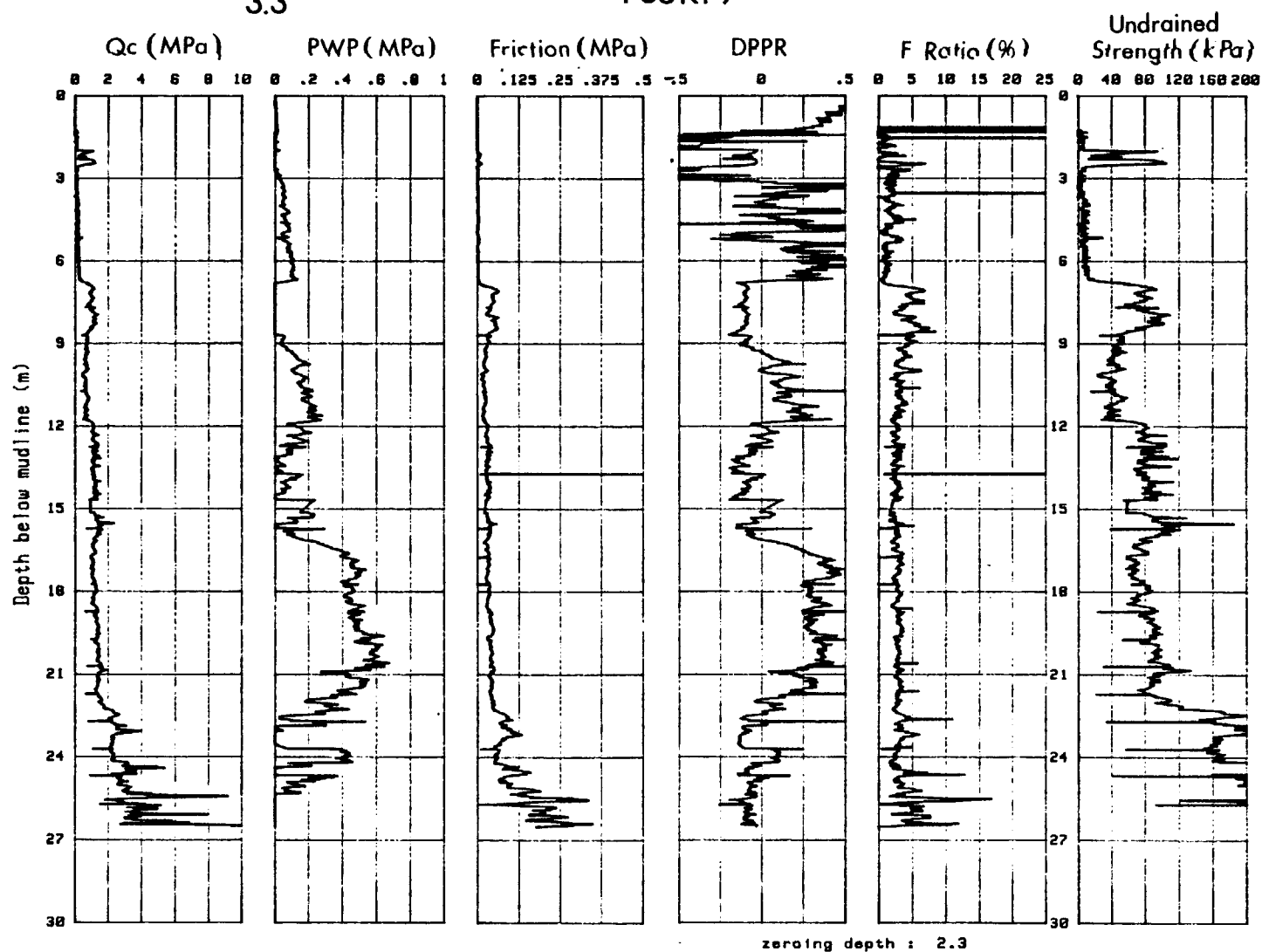
DATE: 85/08/02

DRAWN BY: MG

DWG. No.: C-3

King Point
3.3

F85KF9



CPT Data for
Test hole F85KF9

M. J. O'CONNOR & ASSOCIATES LTD.

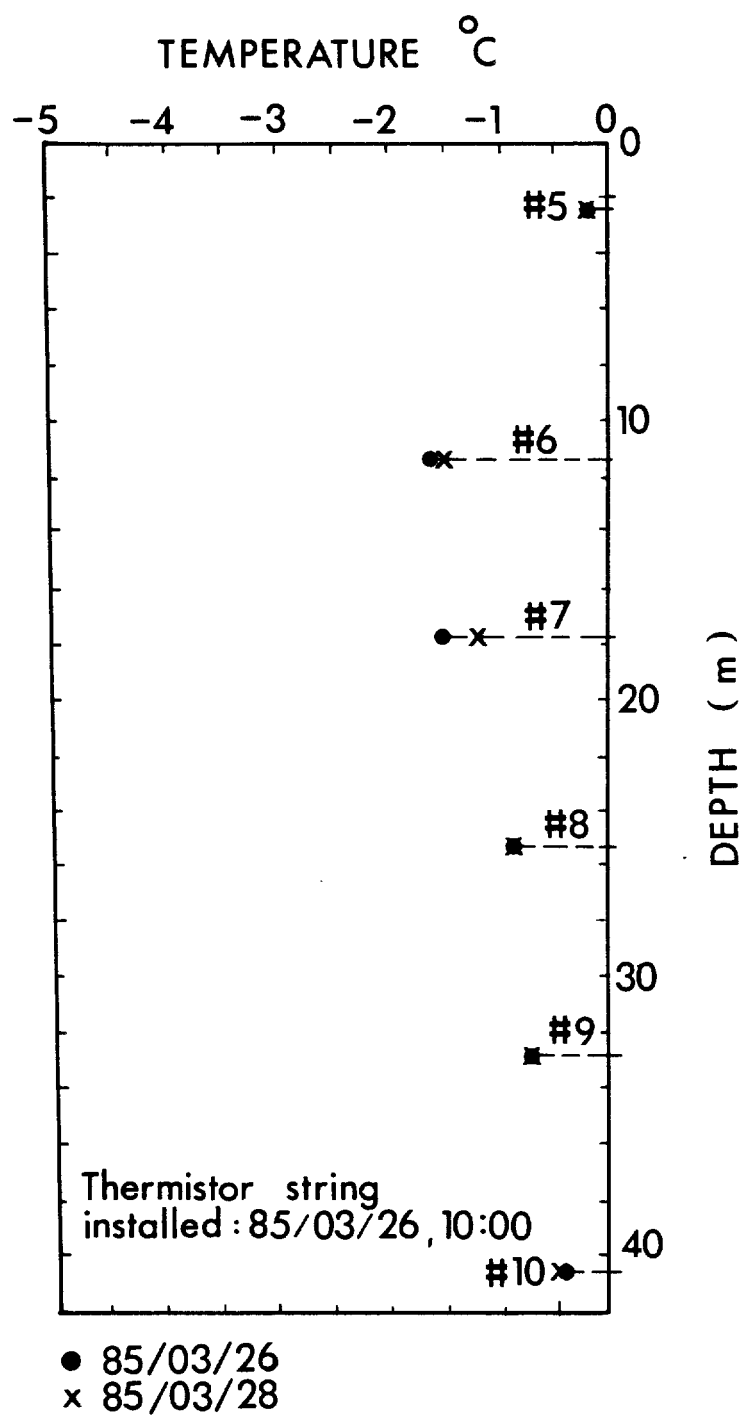
JOB No.: 10-300

DATE: 85/08/02

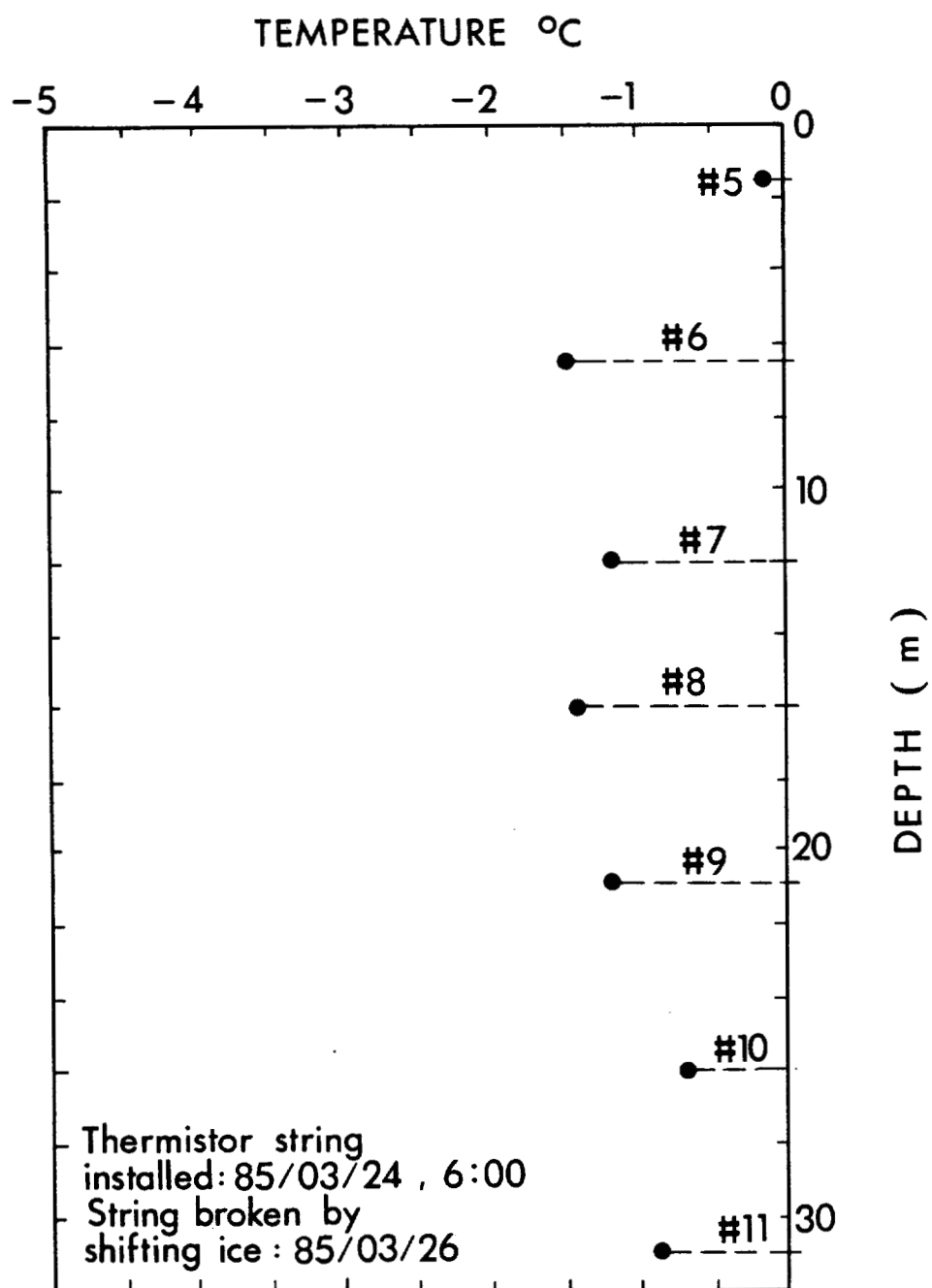
DRAWN BY: MG

DWG. No.: C-4

F85-KF8
Cable # 312

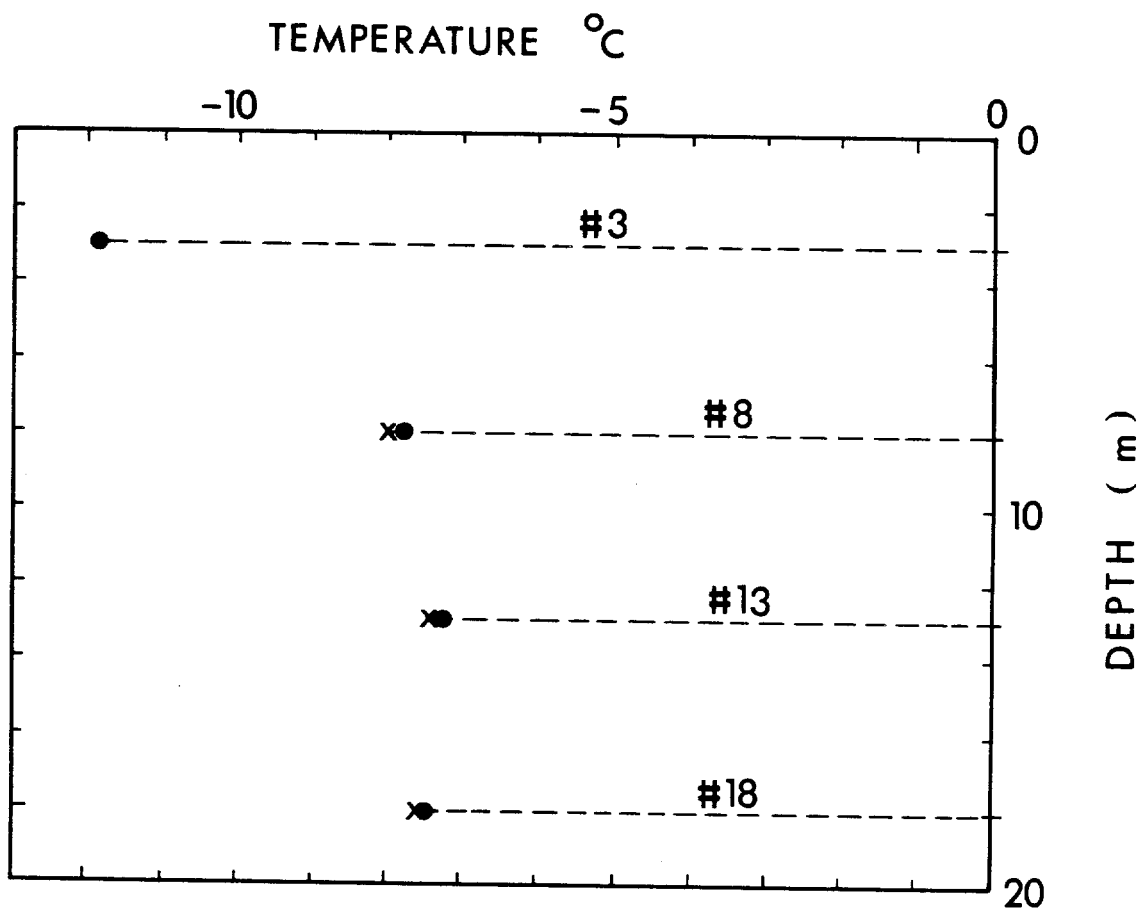


F85-KM2
Cable # 329



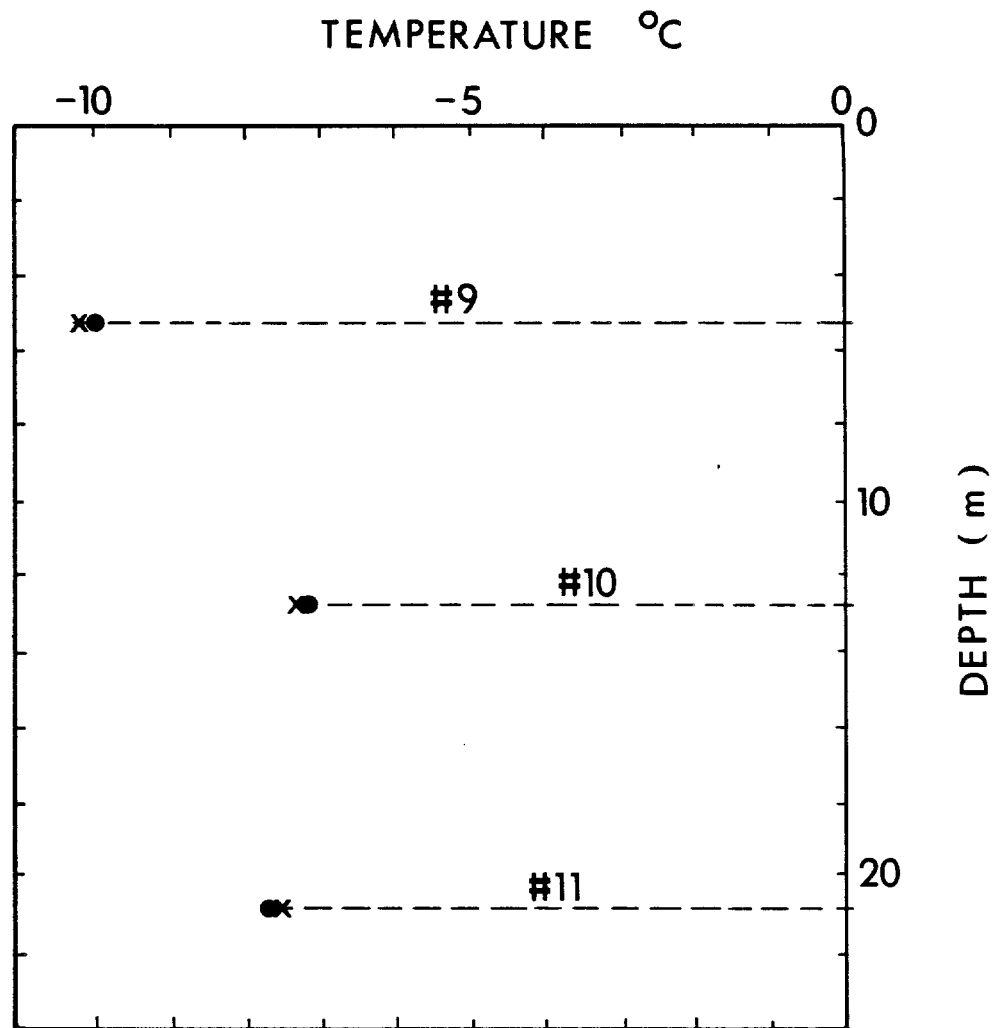
● 85/03/25 , 11:30

F85 - KM 13
Cable # 328
Installed : 85/03/22



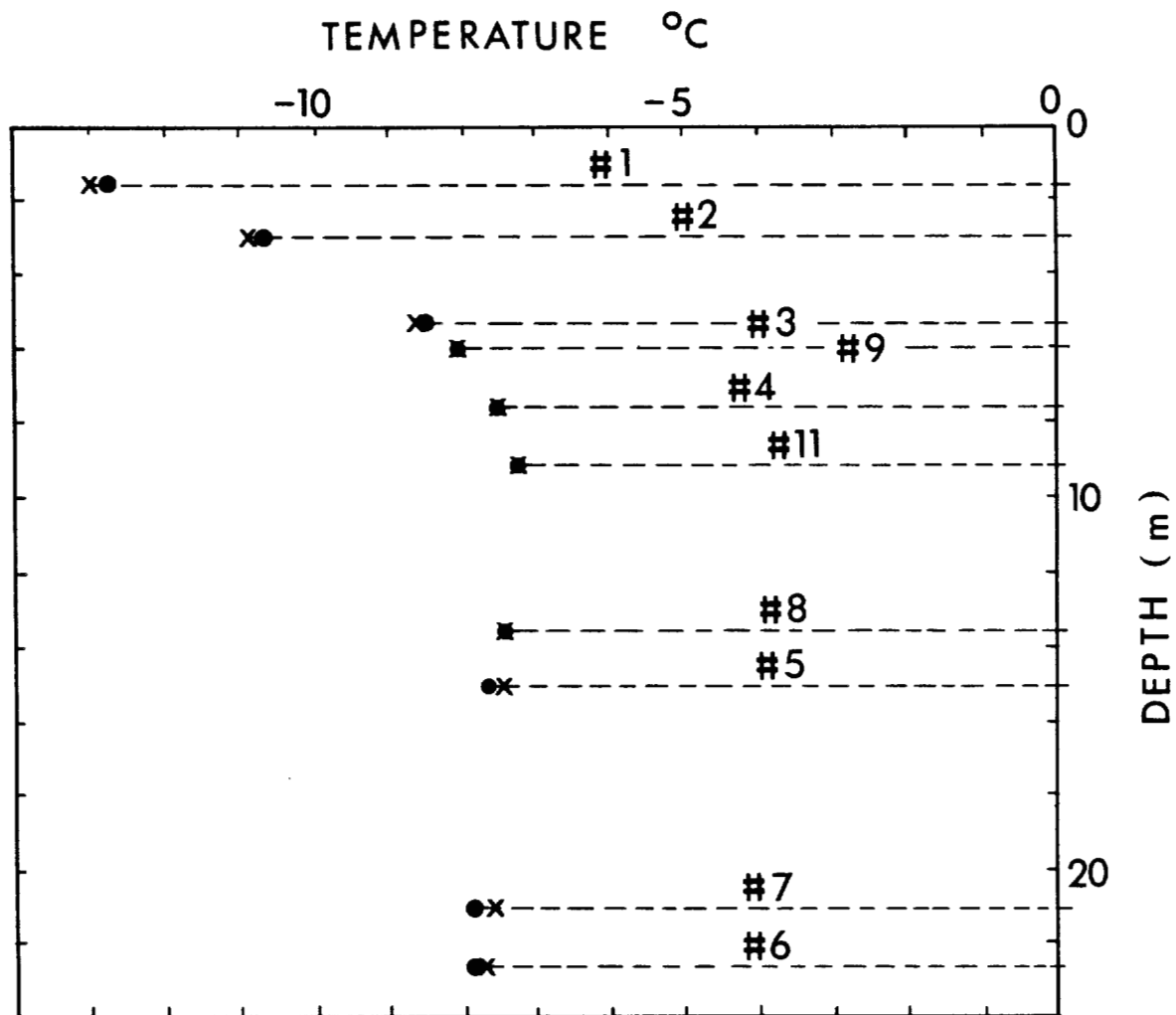
● 85/03/26
x 85/03/28

F85-KM18
Cable #317
Installed : 85/03/24



● 85/03/26
x 85/03/28

F85-KM23
Cable #311
Installed : 85/03/25



● 85/03/26
x 85/03/28

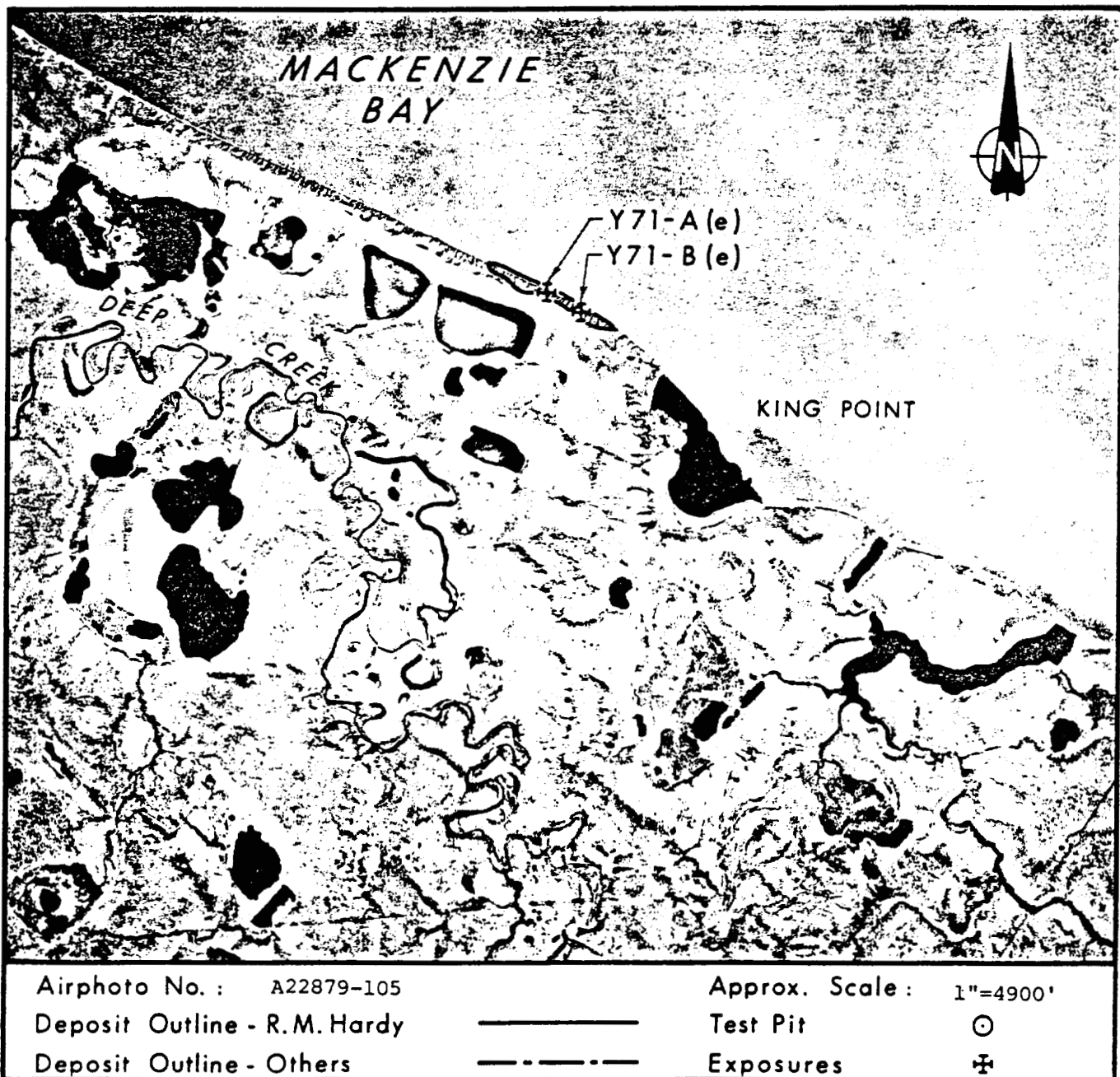
DEPOSIT Y71

Setting: Deformed preglacial gravels and sands along the coastal escarpment immediately northwest of King Point.

Material: Gravel and Sand; well graded, fine to coarse, some sand, silt interbeds.

Volume: 2,400,000 cubic yards total.

Assessment: Only part of the escarpment face exposes good quality granular material. Because of the stratified nature of the deposit, it would be difficult to cleanly excavate good quality material. Coastal retreat may be hastened by removal of material.



TEST HOLE LOG

TEST PIT NO.

Y71-A(e)

SHEET 1 OF 1

DEPTH (FT)	SOIL GROUP SYMBOL	SOIL GRAPHIC LOG	MATERIAL DESCRIPTION	ICE GRAPHIC LOG	NCR ICE TYPE VISUAL ICE %	DEPTH (FT)	OTHER INFORMATION
1	GW	[Pattern]	GRAVEL - well graded, little medium to coarse sand, occasional cobble, brown.		UF		
2							
3	SM	[Pattern] 2.5 3.2	SAND - and low plastic silty fines, dark grey, moist.				
4	GW	[Pattern]	GRAVEL - well graded, some fine to coarse sand, trace silty fines, occasional cobble, light brown, rusty spots.				
5							
6	ML	[Pattern] 6.0	SILT - low plastic, dark grey, wet.				Base of exposure is 20 feet above sea level.
7		7.0	Bottom of Pit				Sample from 3.2'-6.0'
8							

TEST HOLE LOG

TEST PIT NO.

Y71-B(e)

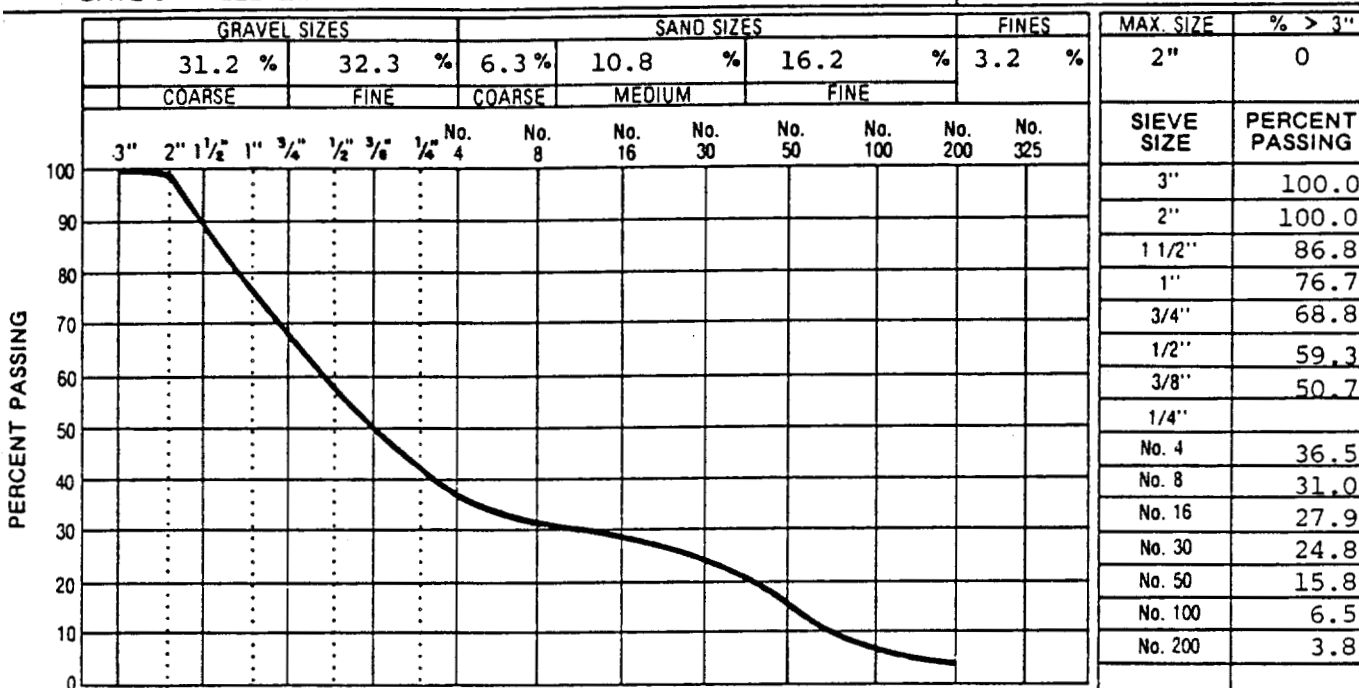
SHEET 1 OF 1

DEPTH (FT)	SOIL GROUP SYMBOL	SOIL GRAPHIC LOG	MATERIAL DESCRIPTION	ICE GRAPHIC LOG	NCR ICE TYPE VISUAL ICE %	DEPTH (FT)	OTHER INFORMATION
5	ML		SILT - trace gravel, trace sand.		UF		Organic Color: #4 Lightweight Pieces - Fine Aggregate: 0.23%
10							
15							
20							
22.0			oxidized layer				
25							
27.0							
30	GW		GRAVEL - well graded to 10" cobbles, and medium to coarse sand, sandstones.				
35							
35.0			sand becoming finer, trace silty fines.				
40							
45							
50							
51.0							
51.3	Pt		PEAT - organic layer				
55	ML		SILT				
200			sea level at approx. 200' depth.				
			Bottom of Pit				Sample from 27.0'-51.0'

GRAIN SIZE ANALYSIS

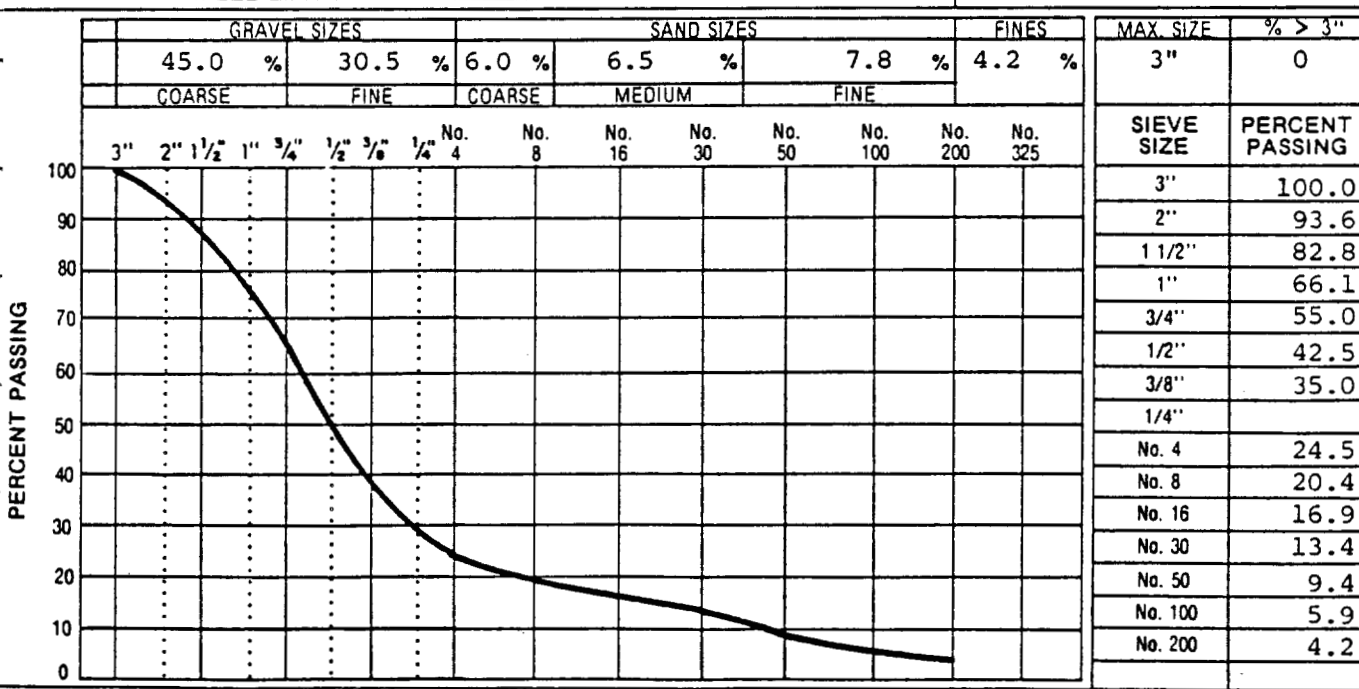
SAMPLE Y71-A(e) DEPTH 3.2'-6.0'
DATE SAMPLED Sept. 23, 1976 SAMPLED BY JDF

LAB TEST NUMBER
TP96



SAMPLE Y71-B(e) DEPTH 27.0'-51.0'
DATE SAMPLED Sept. 23, 1976 SAMPLED BY GCD

LAB TEST NUMBER
97HA



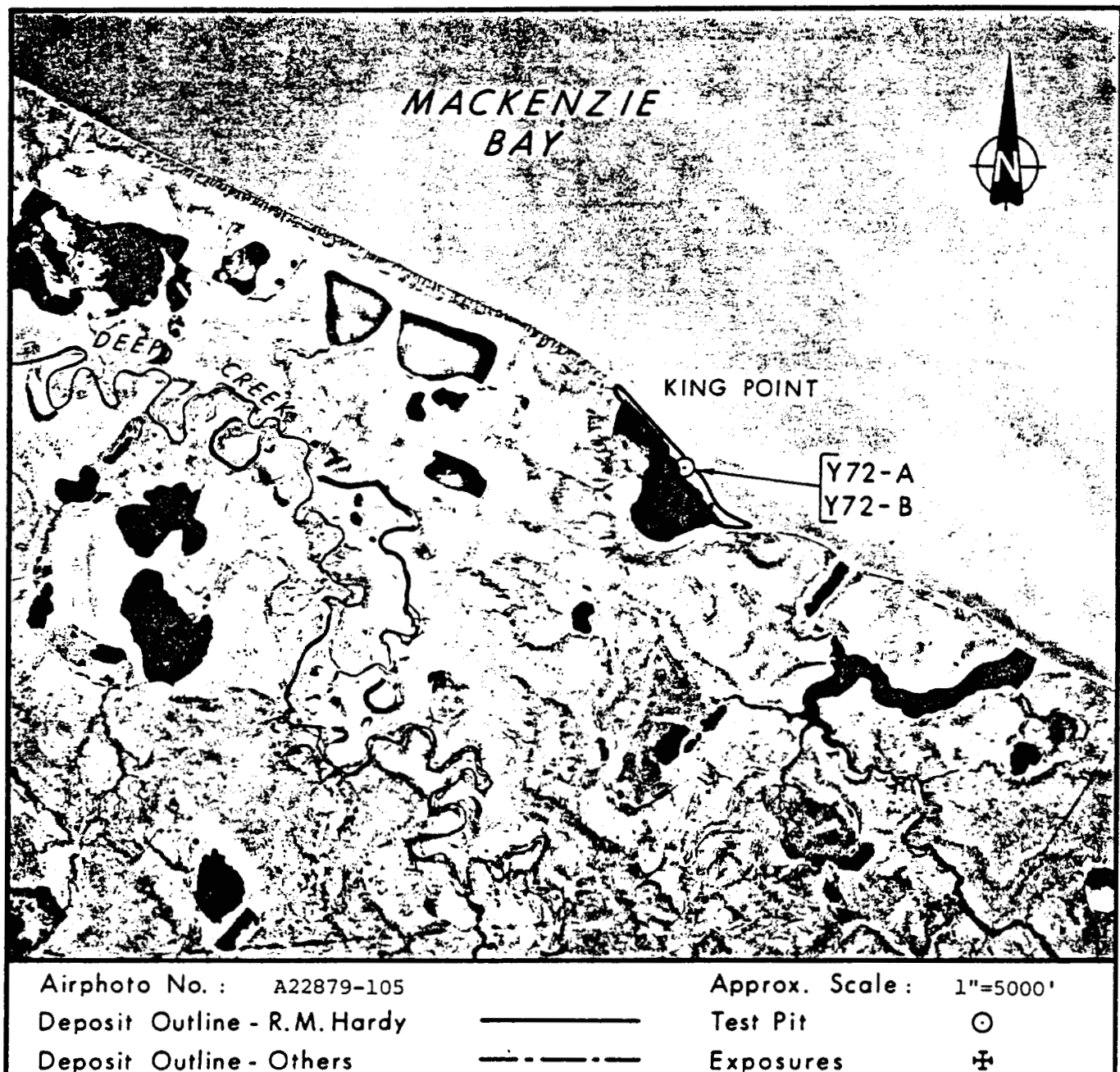
DEPOSIT Y72

Setting: Bay-mouth bar immediately southeast of King Point.

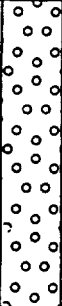
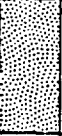
Material: Gravel and Sand; well to poorly graded, fine to coarse.

Volume: 1,000,000 cubic yards total.

Assessment: Contains fair to good quality granular material. Natural restoration of the bay-mouth bar would be rapid. Inland access is fair. Recoverable volume may be limited to 340,000 cubic yards.



TEST PIT NO.
Y72-A
SHEET 1 OF 1

DEPTH (FT)	SOIL GROUP SYMBOL	SOIL GRAPHIC LOG	MATERIAL DESCRIPTION	ICE GRAPHIC LOG	NCR ICE TYPE VISUAL ICE %	DEPTH (FT)	OTHER INFORMATION
1 2 3	GP		GRAVEL - poorly graded to 2", and medium to coarse sand, subrounded to rounded, stratified 4" layers, clean.		UF		
4	SP		SAND - medium to coarse, subrounded.				hole abandoned due to sloughing.
5			Bottom of Pit				Sample from 0'-4.6'

TEST HOLE LOG

TEST PIT NO.

Y72-B

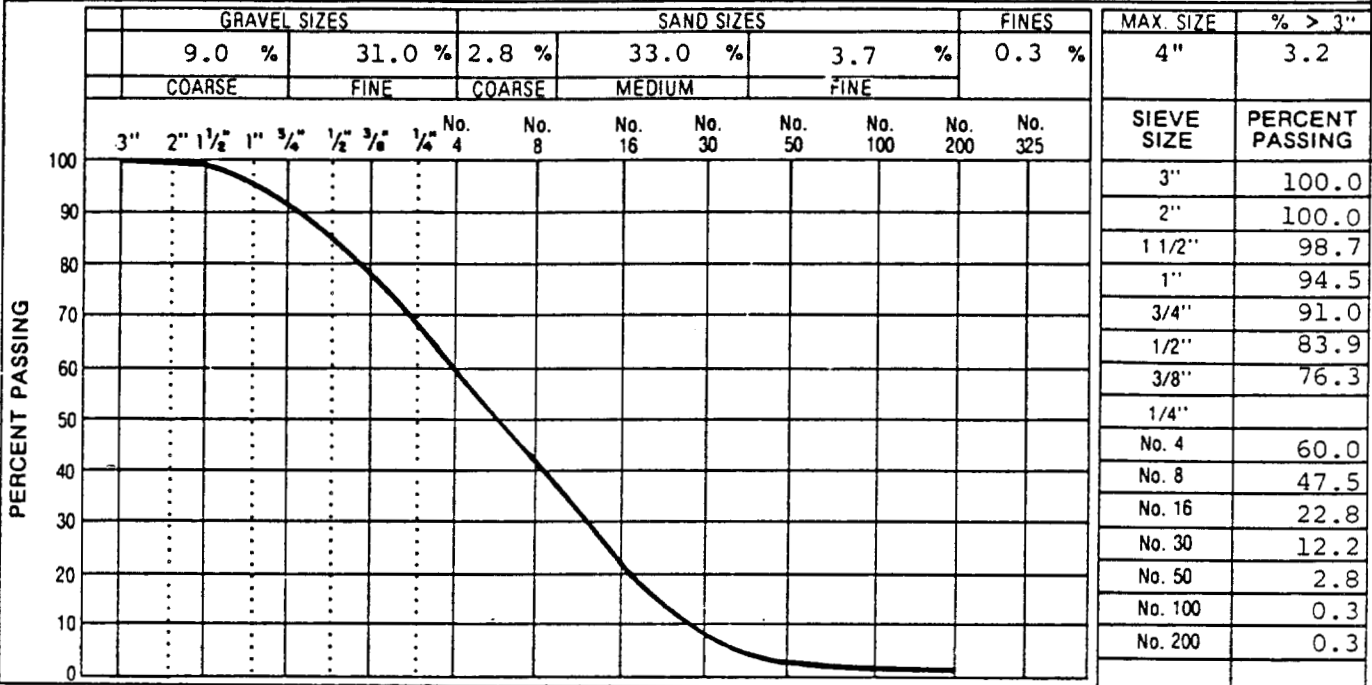
SHEET 1 OF 1

DEPTH (FT)	SOIL GROUP SYMBOL	SOIL GRAPHIC LOG	MATERIAL DESCRIPTION	ICE GRAPHIC LOG	NCR ICE TYPE VISUAL ICE %	DEPTH (FT)	OTHER INFORMATION
1 2 3	SP	[Patterned Box]	SAND - medium to coarse, and well graded gravel to 3" size, occasional cobbles, subangular, medium brown, wet, clean.		UF		Lightweight Pieces - Fine Aggregate: 0.05%
			3.5 ▽ free water at 3.5'.			3.5	
4			Bottom of Pit				Sample from 0'-3.5'

GRAIN SIZE ANALYSIS

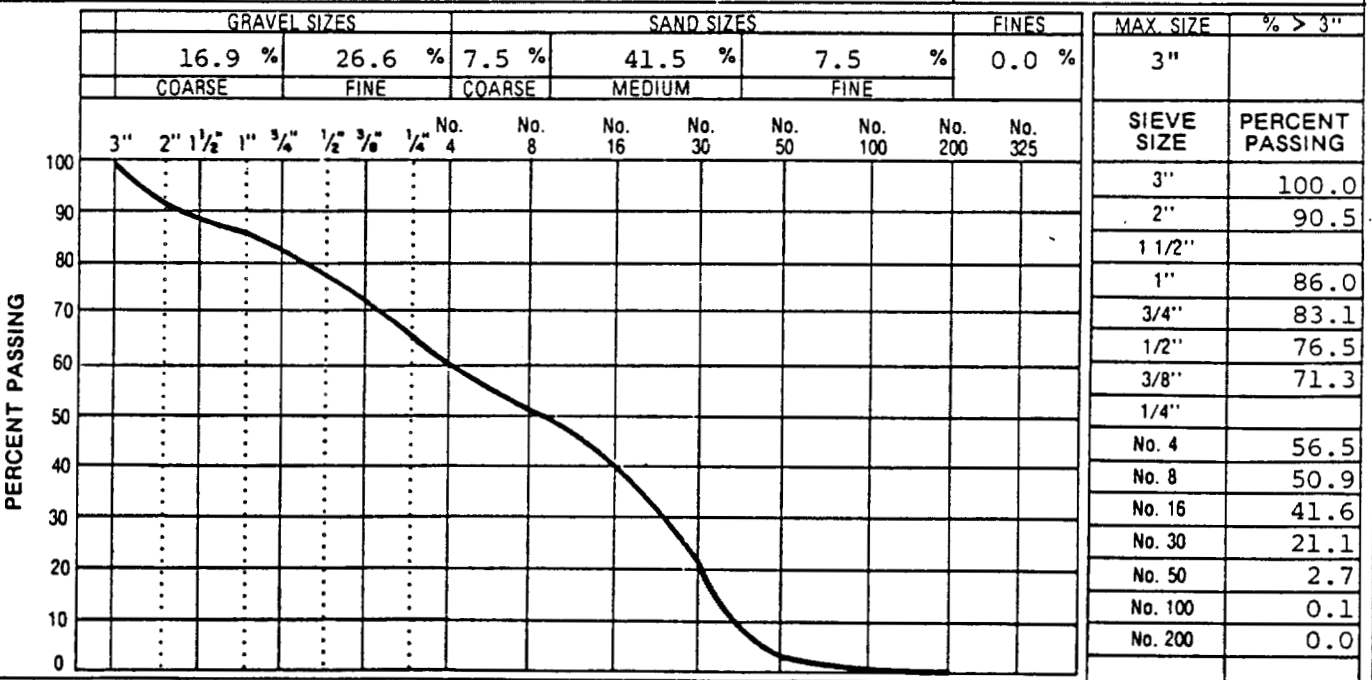
SAMPLE Y72-A DEPTH 0'-4.6'
DATE SAMPLED Sept. 23, 1976 SAMPLED BY GCD

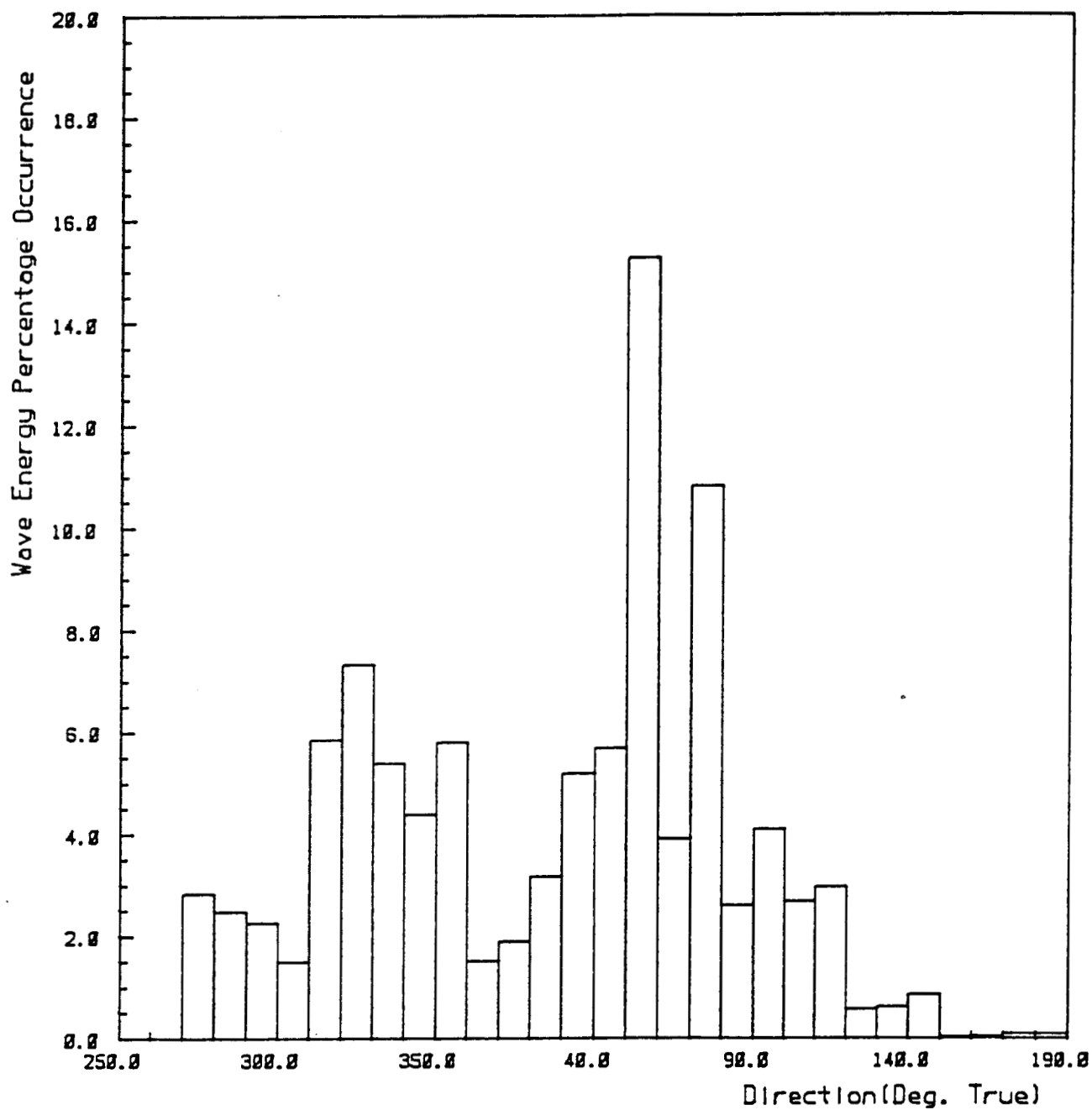
LAB TEST NUMBER
13HA-A



SAMPLE Y72-B DEPTH 0'-3.5'
DATE SAMPLED Sept. 23, 1976 SAMPLED BY JDF

LAB TEST NUMBER
TP 13 B





Direction Limits: 270.0 TO 190.0

Calms: 19.4 %

Dates: 2/7/78 to 7/9/83

Season: Summer, Fall

Total No. of Records: 34065

Waves Hindcast Using Wind Data from Tuktoyaktuk N.W.T.

BEAUFORT SEA COASTAL SEDIMENT STUDY

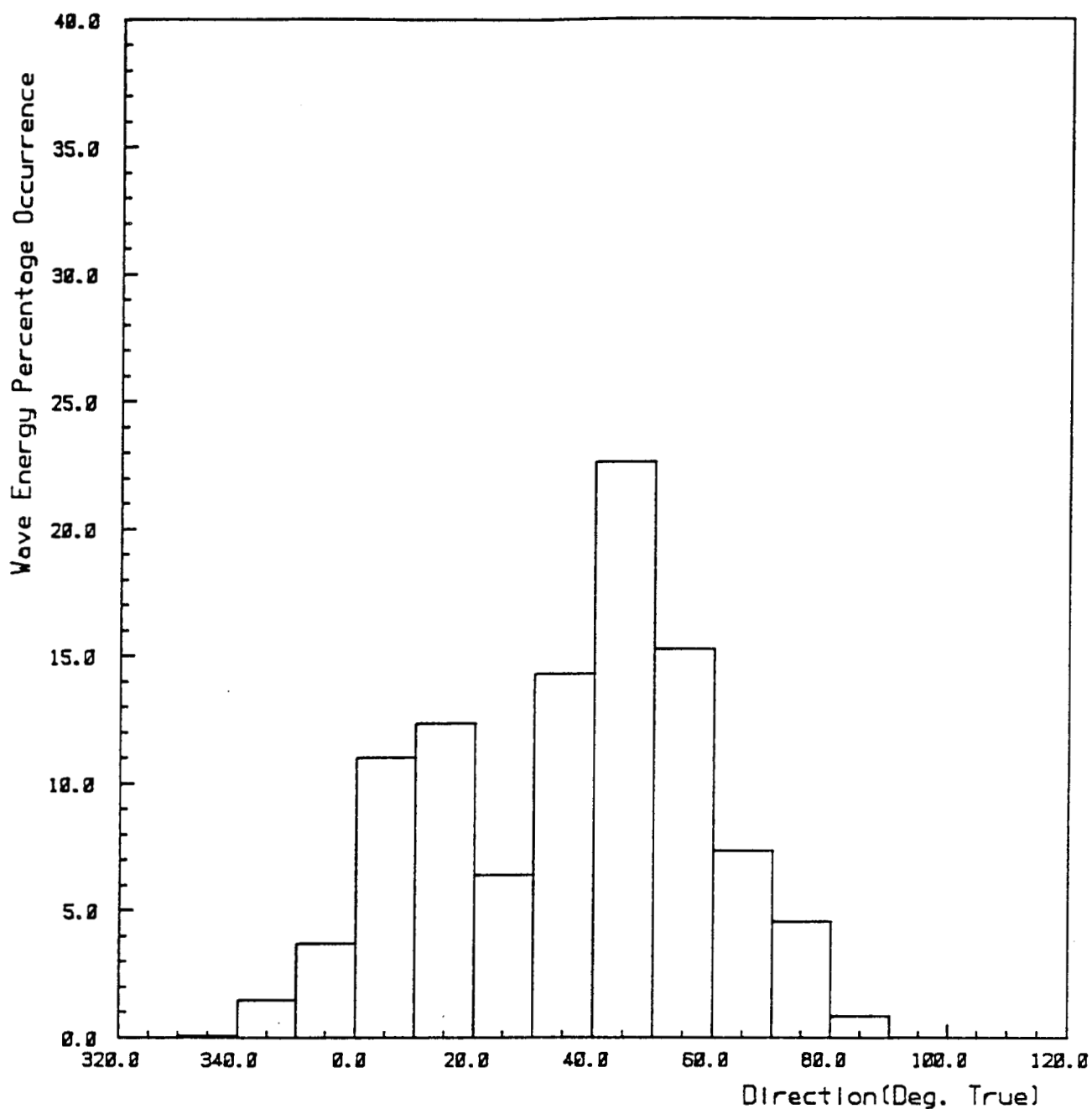
King Point: Deep Water Wave Energy Distribution
1970 - 1983

Date: 17 Feb 85

Scales as shown

Checked by:

Keith Philpott
Consulting Limited



Direction Limits: 330.0 TO 100.0

Calms: 30.4 %

Dates: 2/7/70 to 7/9/83

Season: Summer, Fall

Total No. of Records: 32736

Waves Hindcast Using Wind Data from Tuktoyaktuk N.W.T.

BEAUFORT SEA COASTAL SEDIMENT STUDY

King Point: Node 2 Inshore Wave Energy Distribution
1970 - 1983

Date: 14 Mar 85

Scales as shown

Checked by:

Keith Philpott

Consulting Limited

Application of the Beach Plan Model at King Point

Conditions Without a Structure

Operating Conditions for Final Run 1978-1983

Beach Plan Shape Model Results - Without a Structure - Run KP8P7

No. of beach sections = 11

Initial beach offsets

at each section(1 to 11): 812.2, 982.2, 982.2, 982.2, 878.2, 788.2, 722.2, 642.2, 532.2, 722.2, 878.2

Length of each section(1 to 11): 652.2, 422.2, 322.2, 322.2, 422.2, 422.2, 322.2, 422.2, 222.2, 522.2, 322.2

Angle of baseline normal to true north = 47.2

Refraction data specified at

drift calculation points: 2, 4, 8, 10, 11

Refraction data given at 4.2 m. contour

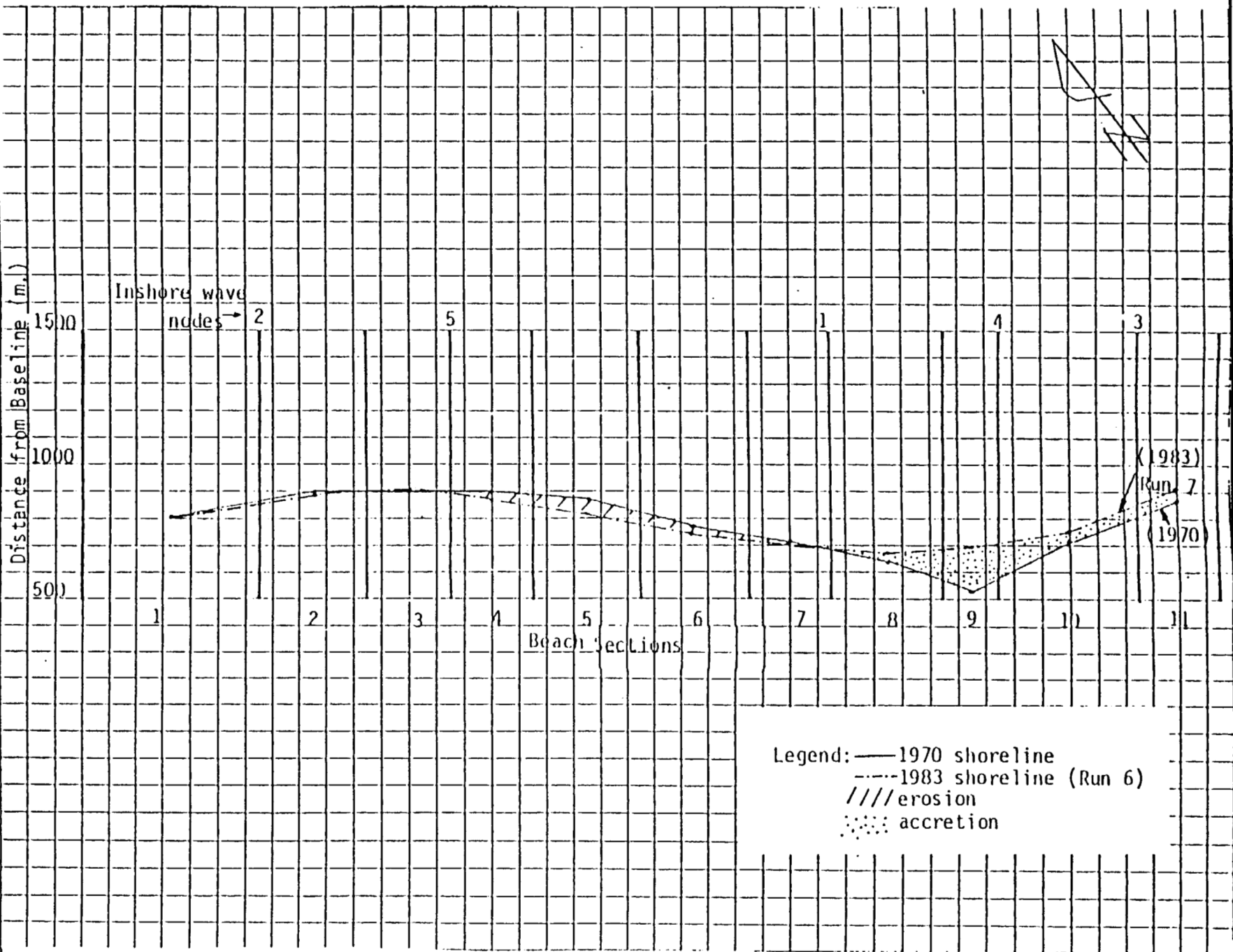
Calibration height

(for sections 1 to 11): 52.2, 52.2, 52.2, 52.2, 5.2, 5.2, 25.2, 25.2, 25.2, 25.2, 25.2

Drift calculation point 1 is an open boundary

Drift calculation point 12 is an open boundary

- Notes: 1. Distances and heights are in metres; angles are in degrees.
2. Calibration beach height equals (actual height) X (height factor).



Date: 8 Mar 85

Scale: 1:20,000

Checked by:

Kalith Philpott

Consulting Limited

END OF YEAR, 23-Sep- 70

BEACH SECTION	DIFT CALC. POINT	BEACH LINE POSITION (metres) TOTAL CHANGE THIS YEAR	OVERALL	POSITION NOW	LITTORAL DRIFT DURING YEAR (cu.m.) LEFT	RIGHT	NET DRIFT	TOTAL FEED THIS YEAR	BEACH VOLUME CHANGE (Incl. Feed) (cu.m.) THIS YEAR	OVERALL	DRIFT CALC. POINT	BEACH SECTION
1	1	-4.432E-01	-4.427E-01	809.56	-24984.8	17715.3	-7268.7	.0	-1.448E+04	-1.448E+04	1	1
2	2	-7.282E-01	-7.211E-01	899.28	-19251.4	26387.4	7136.0	.0	-1.448E+04	-1.448E+04	2	2
3	3	6.915E-01	6.896E-01	900.69	-17967.5	39509.3	21540.8	.0	1.037E+04	1.037E+04	3	3
4	4	-9.238E-01	-9.238E-01	899.88	-24034.1	35201.9	11167.7	.0	-1.386E+04	-1.386E+04	4	4
5	5	-7.496E+00	-7.495E+00	862.51	-16372.7	41397.0	25024.4	.0	-1.499E+04	-1.499E+04	5	5
6	6	1.340E+00	1.341E+00	781.34	-8638.8	48654.8	40016.0	.0	2.679E+03	2.679E+03	6	6
7	7	-1.233E+00	-1.232E+00	718.77	-7457.6	44794.4	37336.8	.0	-9.245E+03	-9.245E+03	7	7
8	8	-1.263E+00	-1.264E+00	638.74	-3781.8	50363.4	46581.6	.0	-1.263E+04	-1.263E+04	8	8
9	9	2.051E+01	2.051E+01	550.51	-3995.6	63204.1	59208.5	.0	1.025E+05	1.025E+05	9	9
10	10	-6.184E-01	-6.185E-01	719.38	-52291.6	8957.1	-43334.6	.0	-7.738E+03	-7.738E+03	10	10
11	11	-1.031E+00	-1.032E+00	868.97	-50150.0	14545.6	-35604.4	.0	-7.738E+03	-7.738E+03	11	11
	12				-49190.0	21315.7	-27874.3				12	

END OF YEAR, 14-Oct- 71

BEACH SECTION	DIFT CALC. POINT	BEACH LINE POSITION (metres) TOTAL CHANGE THIS YEAR	OVERALL	POSITION NOW	LITTORAL DRIFT DURING YEAR (cu.m.) LEFT	RIGHT	NET DRIFT	TOTAL FEED THIS YEAR	BEACH VOLUME CHANGE (Incl. Feed) (cu.m.) THIS YEAR	OVERALL	DRIFT CALC. POINT	BEACH SECTION
1	1	-1.397E+00	-1.842E+00	803.16	-27628.5	107748.1	80119.5	.0	-4.541E+04	-5.981E+04	1	1
2	2	-2.270E+00	-2.991E+00	897.01	-22884.4	149411.6	125527.1	.0	-4.541E+04	-5.981E+04	2	2
3	3	2.122E-01	9.839E-01	900.90	-19441.1	190376.0	170934.9	.0	3.183E+03	1.356E+04	3	3
4	4	-1.109E+00	-2.031E+00	897.97	-26362.6	194114.0	167752.3	.0	-1.664E+04	-3.050E+04	4	4
5	5	-3.046E+00	-1.854E+01	859.46	-16926.4	201319.2	184392.7	.0	-6.093E+03	-2.108E+04	5	5
6	6	3.920E+00	5.259E+00	785.26	-9695.7	200181.3	190485.6	.0	7.841E+03	1.052E+04	6	6
7	7	-3.231E-01	-1.556E+00	718.44	-7316.9	109961.9	102644.9	.0	-2.423E+03	-1.167E+04	7	7
8	8	-1.979E+00	-3.242E+00	636.76	-4441.0	109509.1	105068.1	.0	-1.979E+04	-3.241E+04	8	8
9	9	3.417E+01	5.468E+01	584.68	-8068.1	212914.0	204845.8	.0	1.709E+05	2.734E+05	9	9
10	10	-1.247E+00	-9.867E+00	718.13	-51253.4	85244.0	33990.6	.0	-1.559E+04	-2.332E+04	10	10
11	11	-2.079E+00	-3.111E+00	866.99	-55727.4	105318.1	49582.6	.0	-1.559E+04	-2.332E+04	11	11
	12				-60339.1	125513.9	65174.7				12	

END OF YEAR, 4-Nov- 72

BEACH SECTION		DRIFT CALC. POINT	BEACH LINE POSITION (metres)			LITTORAL DRIFT DURING YEAR			TOTAL FEED	BEACH VOLUME CHANGE (Incl. Feed)		DRIFT CALC. POINT	BEACH SECTION
			TOTAL CHANGE			(cu.m.)				(cu.m.)			
					POSITION NOW	LEFT	RIGHT	NET DRIFT	THIS YEAR	THIS YEAR	OVERALL		
			THIS YEAR	OVERALL	NOW	LEFT	RIGHT	DRIFT	YEAR	THIS YEAR	OVERALL		
		1				-34458.2	33535.8	-922.4				1	
1		2	-2.185E-01	-2.061E+00	807.94	-36651.1	42831.4	6180.3	.0	-7.183E+03	-6.692E+04	2	1
2		3	-3.551E-01	-3.344E+00	896.66	-39623.4	52986.4	13282.9	.0	-7.183E+03	-6.692E+04	3	2
3		4	9.389E-01	1.835E+00	981.83	-50866.6	49385.3	-681.3	.0	1.396E+04	2.752E+04	4	3
4		5	-1.866E+00	-3.897E+00	896.98	-33864.8	49176.1	15312.1	.0	-1.599E+04	-4.649E+04	5	4
5		6	-5.812E+00	-1.635E+01	853.65	-19913.4	46849.2	26935.8	.0	-1.162E+04	-3.271E+04	6	5
6		7	-2.269E+00	2.992E+00	782.99	-12633.8	44186.3	31473.3	.0	-4.538E+03	5.982E+03	7	6
7		8	-1.533E+00	-3.889E+00	716.91	-6744.5	49715.1	42970.7	.0	-1.152E+04	-2.317E+04	8	7
8		9	6.888E-01	-2.632E+00	637.37	-21695.8	58578.8	36883.8	.0	6.888E+03	-2.632E+04	9	8
9		10	1.470E+01	6.938E+01	599.38	-64368.5	27728.5	-36632.8	.0	7.352E+04	3.469E+05	10	9
10		11	1.289E-01	-1.745E+00	718.26	-69815.8	38871.8	-39143.2	.0	1.511E+03	-2.181E+04	11	10
11		12	2.815E-01	-2.989E+00	867.89	-73711.8	34856.8	-39654.3	.0	1.511E+03	-2.181E+04	12	11

END OF YEAR, 7-Oct- 73

BEACH SECTION	DRIFT CALC. POINT	BEACH LINE POSITION (metres)			LITTORAL DRIFT DURING YEAR			TOTAL FEED	BEACH VOLUME CHANGE		DRIFT CALC. POINT	BEACH SECTION
		TOTAL CHANGE			(cu.m.)				(Incl. Feed)			
		POSITION			NET				(cu.m.)			
		THIS YEAR	OVERALL	NOW	LEFT	RIGHT	DRIFT		THIS YEAR	OVERALL		
	1				-14141.7	16174.9	2033.3				1	
1	2	-1.799E-01	-2.248E+00	807.76	-13278.4	21159.4	7891.8	.0	-5.848E+03	-7.276E+04	2	1
2	3	-2.924E-01	-3.638E+00	896.36	-13283.3	26932.8	13728.7	.0	-5.848E+03	-7.276E+04	3	2
3	4	3.479E-01	2.182E+00	982.18	-16435.8	24944.9	8509.9	.0	5.219E+03	3.274E+04	4	3
4	5	-4.669E-01	-3.566E+00	896.43	-18685.8	26119.3	15513.5	.0	-7.884E+03	-5.349E+04	5	4
5	6	-1.822E+00	-1.818E+01	851.92	-7894.2	26252.1	19157.8	.0	-3.644E+03	-3.635E+04	6	5
6	7	-7.373E-01	2.255E+00	782.25	-5183.8	25736.3	20632.5	.0	-1.475E+03	4.508E+03	7	6
7	8	-7.440E-01	-3.833E+00	716.17	-3584.8	29716.8	26212.8	.0	-5.580E+03	-2.875E+04	8	7
8	9	1.623E-01	-2.478E+00	637.53	-8285.8	32875.5	24589.7	.0	1.623E+03	-2.478E+04	9	8
9	10	7.932E+00	7.732E+01	687.32	-24878.5	9888.8	-15869.6	.0	3.966E+04	3.866E+05	10	9
10	11	2.951E-01	-1.449E+00	718.55	-28415.1	9656.3	-18758.8	.0	3.689E+03	-1.812E+04	11	10
11	12	4.919E-01	-2.415E+00	867.58	-32245.5	9797.6	-22447.9	.0	3.689E+03	-1.812E+04	12	11

END OF YEAR, 30-Sep- 74

BEACH SECTION	DRIFT : CALC. : POINT :	BEACH LINE POSITION (metres) TOTAL CHANGE POSITION	LITTORAL DRIFT DURING YEAR (cu.m.) NET LEFT RIGHT DRIFT	TOTAL : FEED : THIS	BEACH VOLUME CHANGE (Incl. Feed) (cu.m.) THIS YEAR OVERALL	DRIFT : CALC. : POINT :	BEACH SECTION
		THIS YEAR OVERALL NOW	LEFT RIGHT DRIFT	YEAR	THIS YEAR OVERALL		
1	1	-8.933E-02 -2.328E+00 887.67	-26161.5 297.7 -25863.8	.0	-2.983E+03 -7.567E+04	1	1
2	2	-1.452E-01 -3.782E+00 896.22	-24821.4 1860.7 -22960.7	.0	-2.983E+03 -7.567E+04	2	2
3	3	3.279E-01 2.589E+00 902.51	-24549.2 4491.6 -20057.6	.0	4.918E+03 3.766E+04	3	3
4	4	-1.858E+00 -4.617E+00 895.38	-38802.8 5027.3 -24975.5	.0	-1.575E+04 -6.925E+04	4	4
5	5	-4.534E+00 -2.271E+01 847.29	-17176.4 7953.1 -9223.2	.0	-9.869E+03 -4.542E+04	5	5
6	6	-2.876E+00 -6.220E-01 779.38	-9463.3 9309.8 -154.3	.0	-5.752E+03 -1.244E+03	6	6
7	7	-8.651E-01 -4.697E+00 715.38	-4341.7 9939.4 5597.7	.0	-6.488E+03 -3.523E+04	7	7
8	8	1.819E+00 -6.514E-01 639.35	-1815.7 13981.6 12865.9	.0	1.819E+04 -6.516E+03	8	8
9	9	7.827E+00 8.514E+01 615.14	-14758.4 8658.7 -6099.7	.0	3.913E+04 4.257E+05	9	9
10	10	6.320E-01 -8.185E-01 719.18	-45640.2 485.9 -45234.3	.0	7.988E+03 -1.822E+04	10	10
11	11	1.853E+00 -1.363E+00 866.64	-53274.5 139.8 -53134.7	.0	7.988E+03 -1.822E+04	11	11
	12		-61153.1 118.8 -61035.1			12	

END OF YEAR, 25-Sep- 75

BEACH SECTION	DRIFT : CALC. : POINT :	BEACH LINE POSITION (metres) TOTAL CHANGE POSITION	LITTORAL DRIFT DURING YEAR (cu.m.) NET LEFT RIGHT DRIFT	TOTAL : FEED : THIS	BEACH VOLUME CHANGE (Incl. Feed) (cu.m.) THIS YEAR OVERALL	DRIFT : CALC. : POINT :	BEACH SECTION
		THIS YEAR OVERALL NOW	LEFT RIGHT DRIFT	YEAR	THIS YEAR OVERALL		
1	1	-2.152E-01 -2.545E+00 887.45	-14627.3 4139.8 -10487.5	.0	-6.994E+03 -8.266E+04	1	1
2	2	-3.497E-01 -4.134E+00 895.87	-10429.2 6936.8 -3493.2	.0	-6.994E+03 -8.266E+04	2	2
3	3	7.127E-02 2.582E+00 902.58	-8185.6 11686.6 3501.0	.0	1.269E+03 3.873E+04	3	3
4	4	-6.842E-01 -5.381E+00 894.78	-9526.5 11958.6 2432.0	.0	-1.826E+04 -7.951E+04	4	4
5	5	-1.742E+00 -2.445E+01 845.55	-4244.1 16939.6 12695.5	.0	-3.485E+03 -4.891E+04	5	5
6	6	-9.924E-01 -1.615E+00 778.39	-2533.2 18713.5 16180.3	.0	-1.985E+03 -3.229E+03	6	6
7	7	-6.886E-01 -5.380E+00 714.78	-1652.7 19817.8 18165.1	.0	-4.585E+03 -3.974E+04	7	7
8	8	8.497E-01 1.983E-01 648.28	-943.6 23613.3 22669.7	.0	8.497E+03 1.988E+03	8	8
9	9	6.341E+00 9.148E+01 621.48	-4426.3 18599.2 14172.9	.0	3.171E+04 4.574E+05	9	9
10	10	7.893E-01 -1.874E-01 719.89	-22727.3 5194.4 -17532.9	.0	8.867E+03 -1.355E+03	10	10
11	11	1.182E+00 -1.818E-01 869.82	-38174.4 3774.9 -26399.5	.0	8.867E+03 -1.355E+03	11	11
	12		-37987.4 2721.4 -35266.0			12	

END OF YEAR, 14-Oct- 76

BEACH	DRIFT	BEACH LINE POSITION (metres)	LITTORAL DRIFT DURING YEAR	TOTAL	BEACH VOLUME CHANGE	DRIFT	
SECTION	CALC.			FEED	(Incl. Feed)	CALC.	BEACH
POINT	TOTAL CHANGE		(cu.m.)		(cu.m.)	POINT	SECTION
		POSITION		THIS			
	THIS YEAR	OVERALL	NOW	YEAR	THIS YEAR	OVERALL	
1	1					1	1
1	2	-2.748E-01 -2.820E+00	807.18	-27642.8	6854.7	-20788.1	2
2	3	-4.466E-01 -4.580E+00	895.42	-25293.8	13437.1	-11855.9	3
3	4	2.676E-01 2.850E+00	902.85	-26176.8	23253.1	-2923.7	4
4	5	-1.402E+00 -6.702E+00	893.38	-31556.4	24618.8	-6937.6	5
5	6	-4.871E+00 -2.852E+01	841.48	-23119.8	37215.8	14096.8	6
6	7	-3.107E+00 -4.723E+00	775.29	-17913.4	40152.6	22239.2	7
7	8	-1.094E+00 -6.392E+00	713.61	-13409.6	41863.1	28453.5	8
8	9	2.445E+00 2.644E+00	642.64	-9727.6	46382.8	36655.2	9
9	10	9.839E+00 1.013E+02	631.32	-22253.2	34459.4	12286.2	10
10	11	1.582E+00 1.475E+00	721.48	-45531.7	8544.9	-36986.9	11
11	12	2.637E+00 2.456E+00	872.46	-61515.8	4751.6	-56763.4	12
				-78889.1	2269.3	-76539.8	

END OF YEAR, 20-Oct- 77

BEACH	DRIFT	BEACH LINE POSITION (metres)	LITTORAL DRIFT DURING YEAR	TOTAL	BEACH VOLUME CHANGE	DRIFT	
SECTION	CALC.			FEED	(Incl. Feed)	CALC.	BEACH
POINT	TOTAL CHANGE		(cu.m.)		(cu.m.)	POINT	SECTION
		POSITION		THIS			
	THIS YEAR	OVERALL	NOW	YEAR	THIS YEAR	OVERALL	
1	1					1	1
1	2	-6.846E-01 -3.504E+00	886.50	-68894.9	8958.2	-59936.7	2
2	3	-1.113E+00 -5.692E+00	894.31	-53729.6	16043.2	-37686.4	3
3	4	3.867E-02 2.889E+00	902.89	-43779.6	28343.6	-15436.1	4
4	5	-3.459E+00 -1.016E+01	889.84	-48268.6	32244.5	-16016.2	5
5	6	-7.163E+00 -3.569E+01	834.31	-27726.4	63591.4	35864.9	6
6	7	-6.800E+00 -1.072E+01	769.28	-20182.9	70373.6	50190.9	7
7	8	-1.881E+00 -8.273E+00	711.73	-14181.3	76372.1	62190.8	8
8	9	6.686E+00 9.331E+00	649.33	-9685.5	85987.5	76302.0	9
9	10	1.899E+01 1.203E+02	650.31	-32787.9	42227.9	9439.9	10
10	11	4.978E+00 6.452E+00	726.45	-98898.4	13382.0	-85508.4	11
11	12	8.297E+00 1.075E+01	890.75	-156522.3	8789.5	-147732.9	12
				-216717.5	6768.1	-209957.2	

END OF YEAR, 4-Oct- 78

END OF YEAR, 4-DEC-78		DRIFT		BEACH LINE POSITION (metres)		LITTORAL DRIFT DURING YEAR			TOTAL BEACH VOLUME CHANGE			DRIFT			
BEACH	SECTION	CALC.	POINT	TOTAL CHANGE	POSITION	(cu.m.)	NET	THIS	FEED	(Incl. Feed)	(cu.m.)	CALC.	POINT	BEACH	SECTION
				THIS YEAR	OVERALL	NOW	LEFT	RIGHT	DRIFT	YEAR	THIS YEAR	OVERALL			
			1				-34232.3	6487.3	-27825.8					1	
1			2	-5.276E-02	-3.557E+00	886.44				.8	-1.715E+03	-1.156E+05			1
			3				-35756.3	9646.8	-26118.4					2	
2			4	-8.573E-02	-5.777E+00	894.22				.8	-1.715E+03	-1.156E+05			2
			5				-39582.9	15187.1	-24395.8					3	
3			6	3.492E-01	3.237E+00	983.24				.8	5.238E+03	4.856E+04			3
			7				-46637.9	17803.9	-29634.8					4	
4			8	-1.476E+00	-1.164E+01	888.36				.8	-2.214E+04	-1.746E+05			4
			9				-31687.9	24196.6	-7491.3					5	
5			10	-3.885E+00	-3.949E+01	838.51				.8	-7.618E+03	-7.898E+04			5
			11				-24488.2	24686.9	118.7					6	
6			12	-3.332E+00	-1.485E+01	765.95				.8	-6.664E+03	-2.811E+04			6
			13				-18144.8	24927.8	6783.8					7	
7			14	-1.881E+00	-9.356E+00	712.64				.8	-8.118E+03	-7.816E+04			7
			15				-13488.9	28382.4	14893.5					8	
8			16	3.242E+00	1.257E+01	652.57				.8	3.242E+04	1.257E+05			8
			17				-37128.9	19683.8	-17525.9					9	
9			18	6.983E+00	1.272E+02	657.21				.8	3.451E+04	6.361E+05			9
			19				-59973.5	7934.8	-52838.7					10	
10			20	1.418E+00	7.861E+00	727.86				.8	1.763E+04	9.828E+04			10
			21				-74973.8	5383.4	-69669.6					11	
11			22	2.351E+00	1.318E+01	883.18				.8	1.763E+04	9.828E+04			11
			23				-91887.8	3787.4	-87388.5					12	

END OF YEAR, 17-Oct- 79

		DRIFT	BEACH LINE POSITION (metres)		LITTORAL DRIFT DURING YEAR			TOTAL	BEACH VOLUME CHANGE		DRIFT	
BEACH	CALC.							FEED	(Incl. Feed)		CALC.	BEACH
SECTION	POINT	TOTAL CHANGE			(cu.m.)				(cu.m.)		POINT	SECTION
				POSITION		NET		THIS				
		THIS YEAR	OVERALL	NOW	LEFT	RIGHT	DRIFT	YEAR	THIS YEAR	OVERALL		
	1				-72391.6	5748.4	-66643.8				1	
1		-1.166E+01	-3.671E+00	886.33				.8	-3.788E+03	-1.193E+05		1
	2				-71697.3	8842.6	-62854.6				2	
2		-1.894E+01	-5.966E+00	894.83				.8	-3.788E+03	-1.193E+05		2
	3				-72558.8	13492.6	-59066.1				3	
3		3.294E+01	3.567E+00	983.57				.8	4.941E+03	5.358E+04		3
	4				-79358.5	15343.5	-64087.8				4	
4		-3.885E+00	-1.472E+01	885.28				.8	-4.627E+04	-2.288E+05		4
	5				-48885.6	38271.3	-17734.4				5	
5		-6.155E+00	-4.565E+01	824.35				.8	-1.231E+04	-9.129E+04		5
	6				-37259.4	31834.3	-5425.8				6	
6		-5.597E+00	-1.965E+01	768.35				.8	-1.119E+04	-3.938E+04		6
	7				-27582.6	33352.8	5769.5				7	
7		-1.591E+00	-1.894E+01	789.86				.8	-1.193E+04	-8.289E+04		7
	8				-28773.1	38473.6	17700.5				8	
8		6.815E+00	1.939E+01	659.39				.8	6.815E+04	1.939E+05		8
	9				-67576.5	17129.5	-50447.8				9	
9		1.182E+01	1.398E+02	669.84				.8	5.912E+04	6.952E+05		9
	10				-115751.4	6185.2	-109566.2				10	
10		3.576E+00	1.144E+01	731.44				.8	4.478E+04	1.438E+05		10
	11				-157136.4	2872.3	-154264.2				11	
11		5.968E+00	1.986E+01	889.86				.8	4.478E+04	1.438E+05		11
	12				-288252.1	1298.1	-198962.8				12	

END OF YEAR, 18-Sep- 88

BEACH SECTION	DRIFT	BEACH LINE POSITION (metres)			LITTORAL DRIFT DURING YEAR			TOTAL	BEACH VOLUME CHANGE		DRIFT	BEACH SECTION
	CALC.							FEED	(Incl. Feed)		CALC.	
	POINT	TOTAL CHANGE			(cu.m.)				(cu.m.)		POINT	
				POSITION		NET	THIS					
		THIS YEAR	OVERALL	NOW	LEFT	RIGHT	DRIFT	YEAR	THIS YEAR	OVERALL		
	1				-54533.3	14899.9	-48433.4				1	
1		-5.721E+01	-4.245E+00	885.76				.8	-1.859E+04	-1.379E+05		1
	2				-44386.9	22465.4	-21841.4				2	
2		-9.296E+01	-6.896E+00	893.18				.8	-1.859E+04	-1.379E+05		2
	3				-37436.8	34187.3	-3249.5				3	
3		-5.585E+01	3.817E+00	983.82				.8	-8.258E+03	4.524E+04		3
	4				-36628.1	41628.3	5888.2				4	
4		-2.648E+00	-1.737E+01	882.63				.8	-3.972E+04	-2.686E+05		4
	5				-19825.3	63754.4	44729.8				5	
5		-2.063E+00	-4.771E+01	822.29				.8	-4.127E+03	-9.542E+04		5
	6				-14494.5	63358.6	48856.8				6	
6		-1.713E+00	-2.136E+01	758.64				.8	-3.426E+03	-4.273E+04		6
	7				-18487.1	62689.4	52282.3				7	
7		-6.212E+01	-1.157E+01	788.43				.8	-4.659E+03	-8.675E+04		7
	8				-7642.6	64584.2	56941.6				8	
8		5.583E+00	2.489E+01	664.89				.8	5.583E+04	2.489E+05		8
	9				-34877.6	35989.5	1911.8				9	
9		9.639E+00	1.487E+02	678.68				.8	4.819E+04	7.434E+05		9
	10				-68721.8	22448.8	-46281.8				10	
10		5.792E+00	1.723E+01	737.23				.8	7.248E+04	2.154E+05		10
	11				-129684.3	11881.2	-119683.8				11	
11		9.654E+00	2.872E+01	898.72				.8	7.248E+04	2.154E+05		11
	12				-197875.8	6789.6	-191885.4				12	

END OF YEAR, 7-Oct- 81

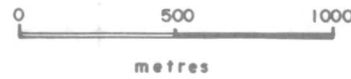
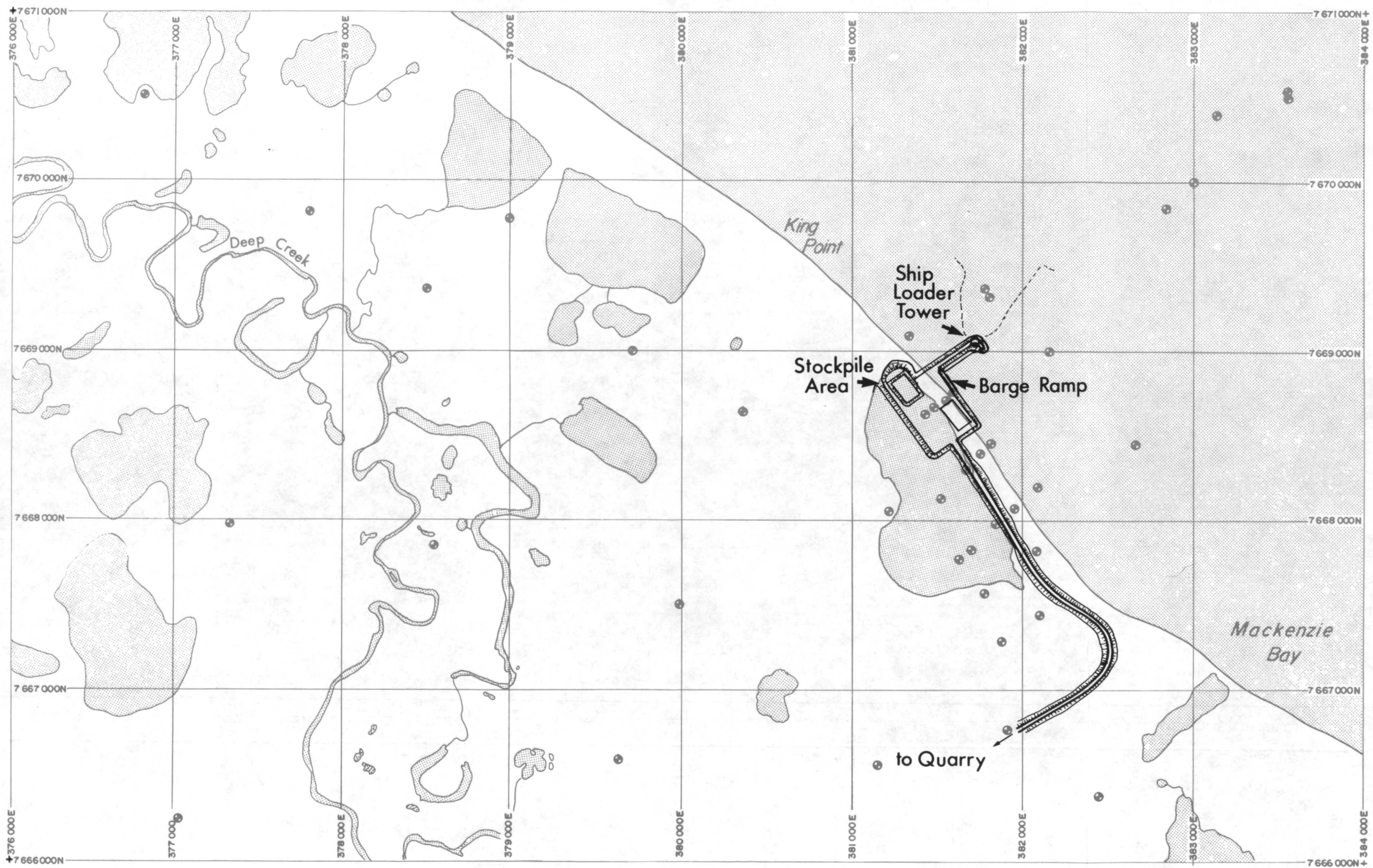
		BEACH LINE POSITION (metres)			LITTORAL DRIFT DURING YEAR			TOTAL BEACH VOLUME CHANGE			DRIFT	
BEACH	CALC.							FEED	(Incl. Feed)		CALC.	BEACH
SECTION	POINT	TOTAL CHANGE			(cu.m.)				(cu.m.)		POINT	SECTION
		POSITION						THIS				
		THIS YEAR	OVERALL	NOW	LEFT	RIGHT	NET	YEAR	THIS YEAR	OVERALL		
	1				-37691.8	28331.7	-9359.3				1	
1		-5.111E+01	-4.756E+00	885.24				.8	-1.661E+04	-1.545E+05		1
	2				-34648.4	41891.4	7251.8				2	
2		-8.385E+01	-7.727E+00	892.27				.8	-1.661E+04	-1.545E+05		2
	3				-35427.9	59289.2	23861.4				3	
3		-4.838E+01	2.612E+00	982.61				.8	-6.857E+03	3.918E+04		3
	4				-37819.8	66936.9	29917.9				4	
4		-1.773E+00	-1.914E+01	888.86				.8	-2.668E+04	-2.872E+05		4
	5				-22747.7	79265.2	56517.5				5	
5		-8.899E+01	-4.868E+01	821.48				.8	-1.788E+03	-9.728E+04		5
	6				-18387.2	76684.4	58297.2				6	
6		-4.579E+01	-2.182E+01	758.18				.8	-9.159E+02	-4.364E+04		6
	7				-14586.8	73799.8	59213.1				7	
7		-2.793E+01	-1.185E+01	788.15				.8	-2.894E+03	-8.885E+04		7
	8				-12598.4	73897.8	61387.5				8	
8		3.784E+00	2.859E+01	668.59				.8	3.784E+04	2.859E+05		8
	9				-35289.4	59554.4	24265.8				9	
9		7.877E+00	1.558E+02	685.76				.8	3.539E+04	7.788E+05		9
	10				-52598.1	41469.8	-11128.3				10	
10		5.858E+00	2.228E+01	742.28				.8	6.312E+04	2.785E+05		10
	11				-94732.2	28488.9	-74243.3				11	
11		8.416E+00	3.713E+01	987.13				.8	6.312E+04	2.785E+05		11
	12				-147366.8	9999.6	-137366.4				12	

END OF YEAR, 6-Oct- 82

BEACH		DRIFT	BEACH LINE POSITION (metres)		LITTORAL DRIFT DURING YEAR			TOTAL	BEACH VOLUME CHANGE		DRIFT	BEACH	
SECTION	POINT	CALC.	TOTAL CHANGE		POSITION	(cu.m.)		FEED	(Incl. Feed)		CALC.	POINT	SECTION
			THIS YEAR	OVERALL	NOW	LEFT	RIGHT	NET	THIS				
								DRIFT	YEAR	THIS YEAR	OVERALL		
1	1		-1.825E+01	-4.859E+00	885.14	-56085.6	8255.8	-47749.9	.8	-3.332E+03	-1.579E+05	1	1
2	2		-1.666E+01	-7.895E+00	892.10	-56367.8	11958.1	-44417.7	.8	-3.332E+03	-1.579E+05	2	2
3	3		-4.885E+02	2.578E+00	982.57	-57285.8	16119.2	-41885.7	.8	-6.128E+02	3.857E+04	3	3
4	4		-2.197E+00	-2.134E+01	878.66	-58628.9	18155.9	-40473.8	.8	-3.295E+04	-3.281E+05	4	4
5	5		-4.841E+00	-5.264E+01	817.36	-37534.2	38018.6	-7523.6	.8	-8.882E+03	-1.053E+05	5	5
6	6		-3.353E+00	-2.518E+01	754.82	-29686.1	38244.2	558.2	.8	-6.787E+03	-5.835E+04	6	6
7	7		-4.184E+01	-1.226E+01	787.74	-22891.2	38156.3	7265.1	.8	-3.138E+03	-9.198E+04	7	7
8	8		5.112E+00	3.371E+01	673.71	-28533.1	38936.3	10403.2	.8	5.112E+04	3.371E+05	8	8
9	9		6.826E+00	1.626E+02	692.58	-57641.8	16921.1	-40720.6	.8	3.413E+04	8.129E+05	9	9
10	10		3.734E+00	2.682E+01	746.82	-83928.3	9871.5	-74848.8	.8	4.668E+04	3.252E+05	10	10
11	11		6.224E+00	4.336E+01	913.36	-125741.2	4211.9	-121529.3	.8	4.668E+04	3.252E+05	11	11
12	12					-171394.1	3184.6	-168289.5				12	

END OF YEAR, 4-Sep- 83

DRIFT	BEACH LINE POSITION (metres)	LITTORAL DRIFT DURING YEAR	TOTAL	BEACH VOLUME CHANGE	DRIFT					
CALC.			FEED	(Incl. Feed)	CALC.					
POINT	TOTAL CHANGE	(cu.m.)		(cu.m.)	POINT					
	POSITION		THIS		SECTION					
	THIS YEAR	OVERALL	NOW	LEFT	RIGHT	NET	THIS	THIS YEAR	OVERALL	
						DRIFT	YEAR			
1	-1.689E+01	-5.829E+00	884.97	-29781.6	13464.4	-15317.2				1
2	-2.744E+01	-8.168E+00	891.83	-29141.2	19312.4	-9828.7	.8	-5.488E+03	-1.634E+05	1
3	-1.199E+01	2.451E+00	982.45	-38688.7	26268.4	-4342.3	.8	-5.488E+03	-1.634E+05	2
4	-1.882E+00	-2.242E+01	877.58	-38552.2	28089.8	-2542.3	.8	-1.798E+03	3.677E+04	3
5	-1.833E+00	-5.367E+01	816.33	-18818.1	32582.6	13692.5	.8	-1.623E+04	-3.363E+05	4
6	-6.771E+01	-2.585E+01	754.15	-15199.2	38957.3	15758.1	.8	-2.866E+03	-1.873E+05	5
7	-1.281E+01	-1.239E+01	787.61	-12122.8	29235.2	17112.3	.8	-1.354E+03	-5.171E+04	6
8	2.369E+00	3.687E+01	676.87	-11442.2	29515.8	18072.8	.8	-9.684E+02	-9.295E+04	7
9	3.789E+00	1.663E+02	696.29	-31769.7	26156.1	-5613.6	.8	2.369E+04	3.687E+05	8
10	2.448E+00	2.846E+01	748.46	-43847.9	19689.9	-24158.8	.8	1.854E+04	8.314E+05	9
11	4.888E+00	4.744E+01	917.44	-65881.9	18242.1	-54759.8	.8	3.868E+04	3.558E+05	10
12				-98886.5	5444.9	-85361.7	.8	3.868E+04	3.558E+05	11

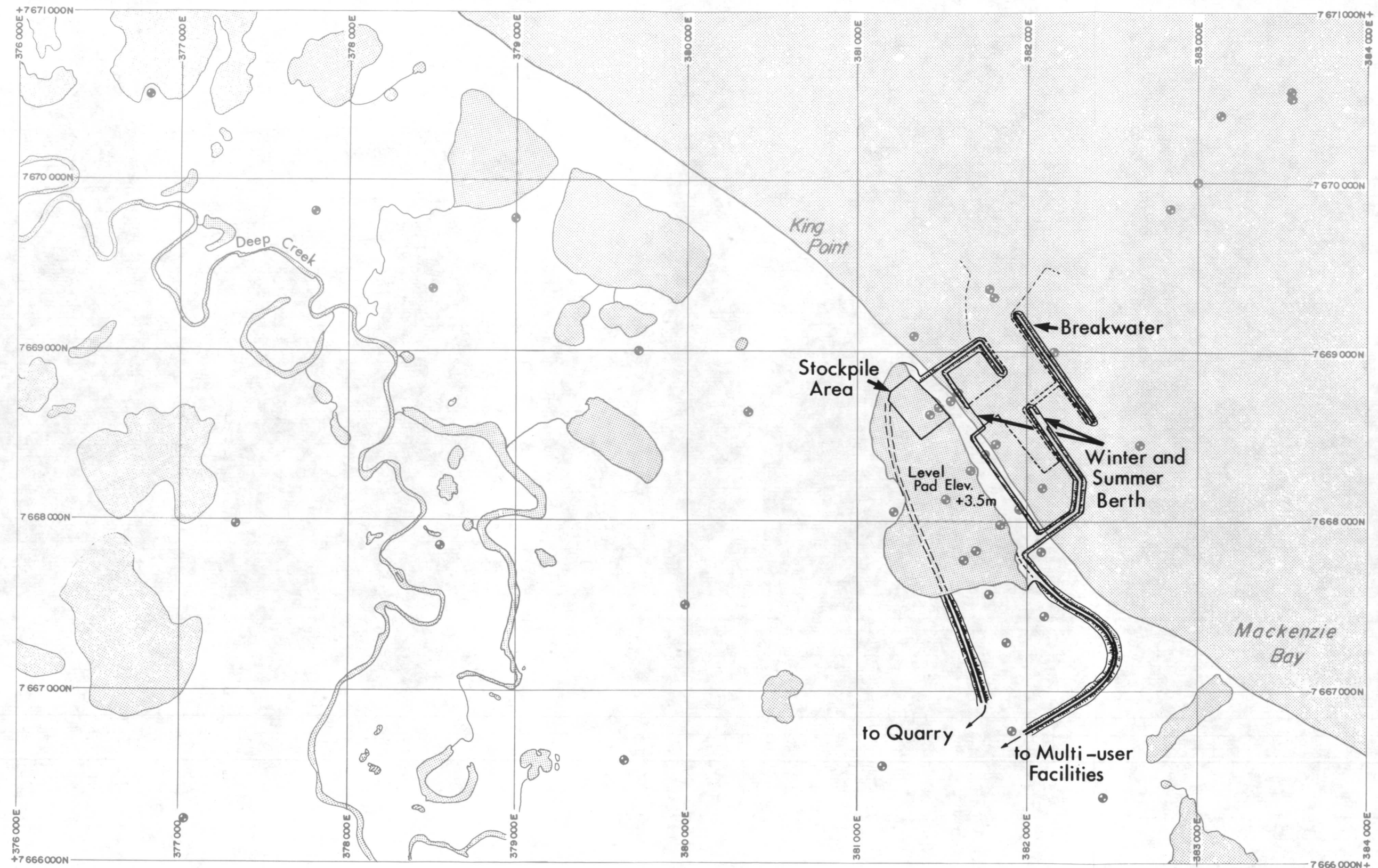


Phase I - conceptual

PETER KIEWIT SONS CO. LTD.
PHASE I DEVELOPMENT

M.J. O'CONNOR & ASSOCIATES LTD.

JOB No. : 10-300	DATE : 85/08/02
DRAWN BY : M.G.	DWG. No. : G-1



Phase II - conceptual

PETER KIEWIT SONS CO. LTD.
PHASE II DEVELOPMENT

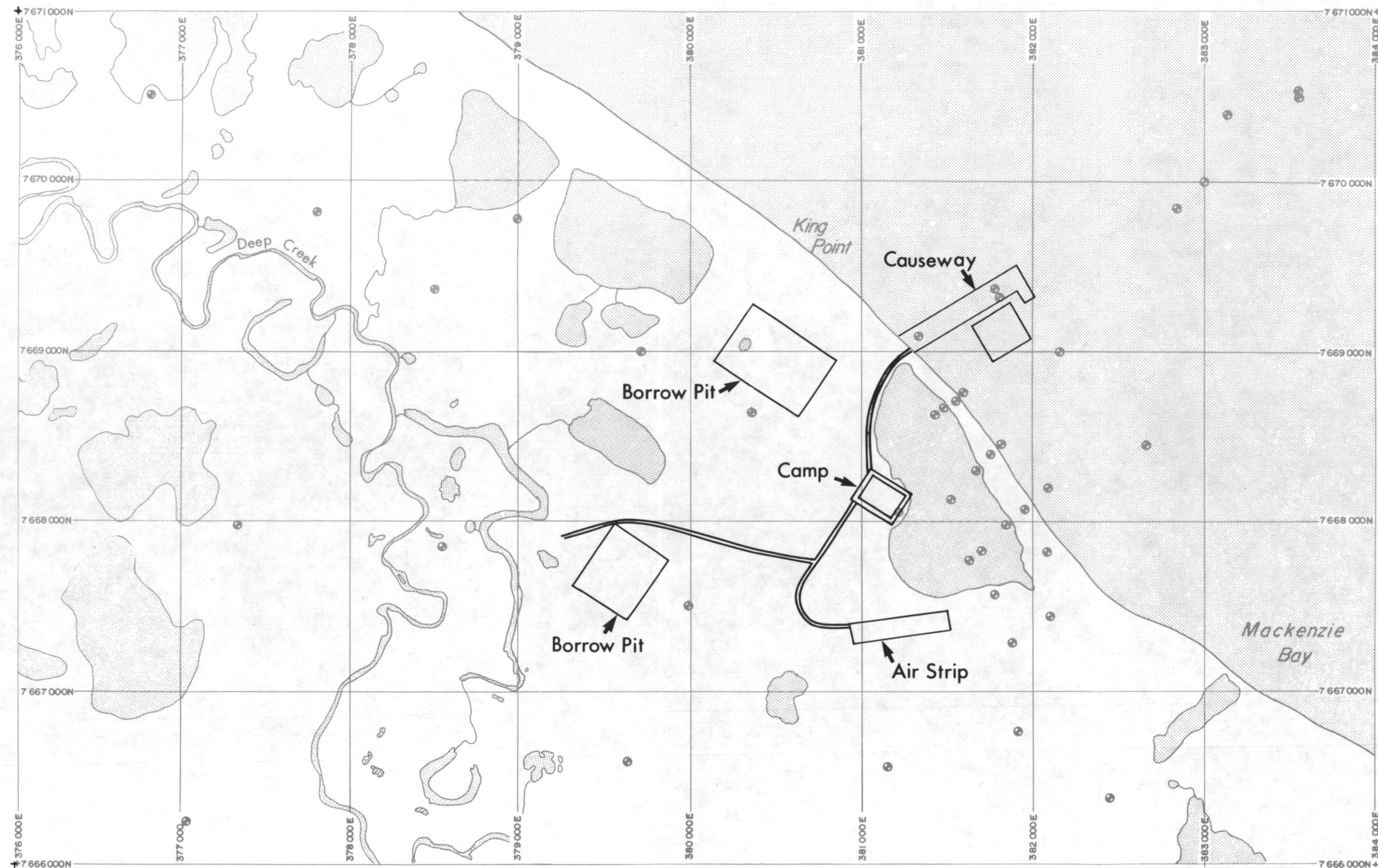
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/08/02

DRAWN BY: M.G.

DWG. No.: G-2



0 500 1000
metres

Phase I - conceptual

DOME SHORT-TERM
DEVELOPMENT

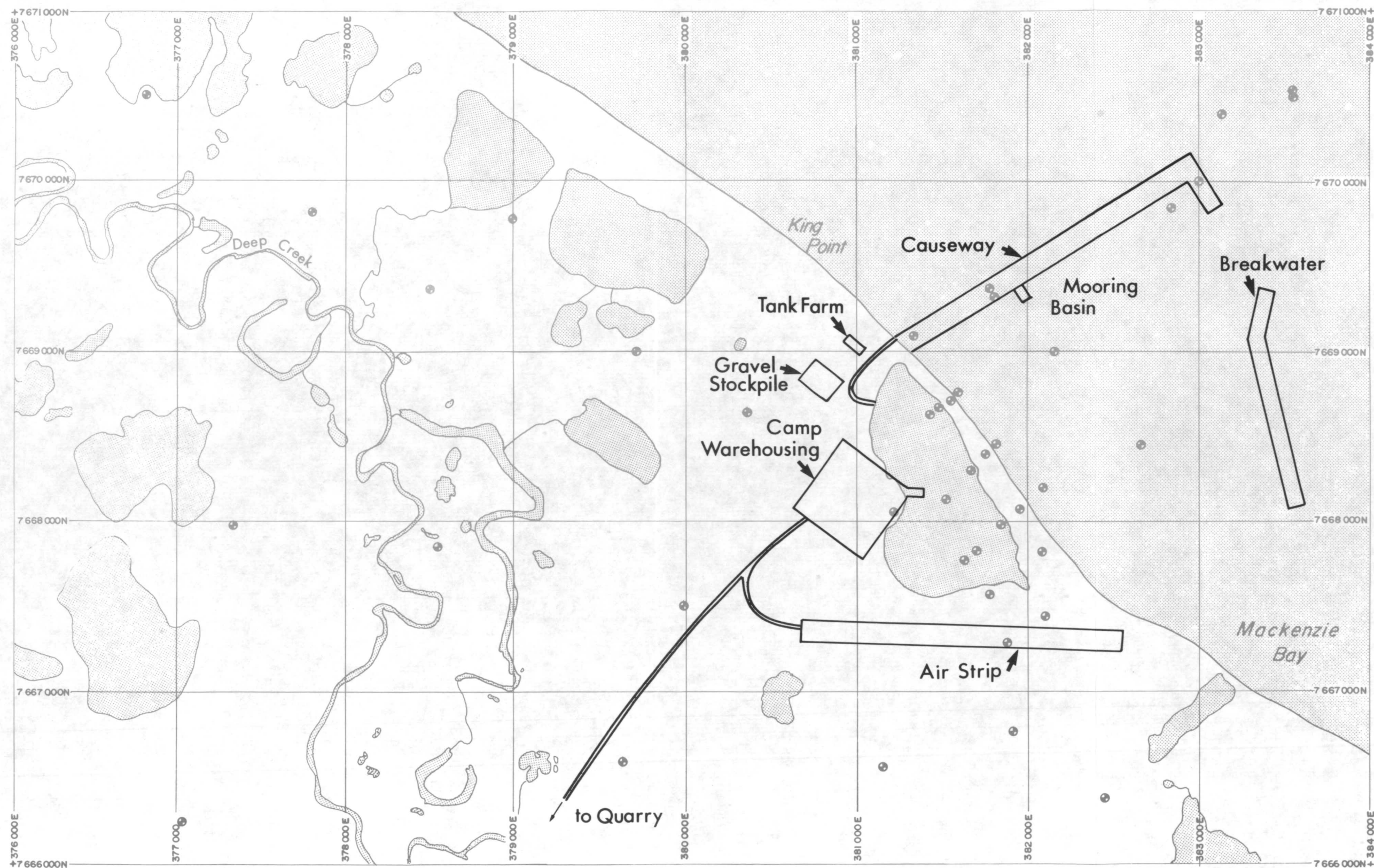
M.J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/08/02

DRAWN BY: M.G.

DWG. No.: G-3



0 500 1000
metres

Phase II-conceptual

DOME LONG-TERM
DEVELOPMENT

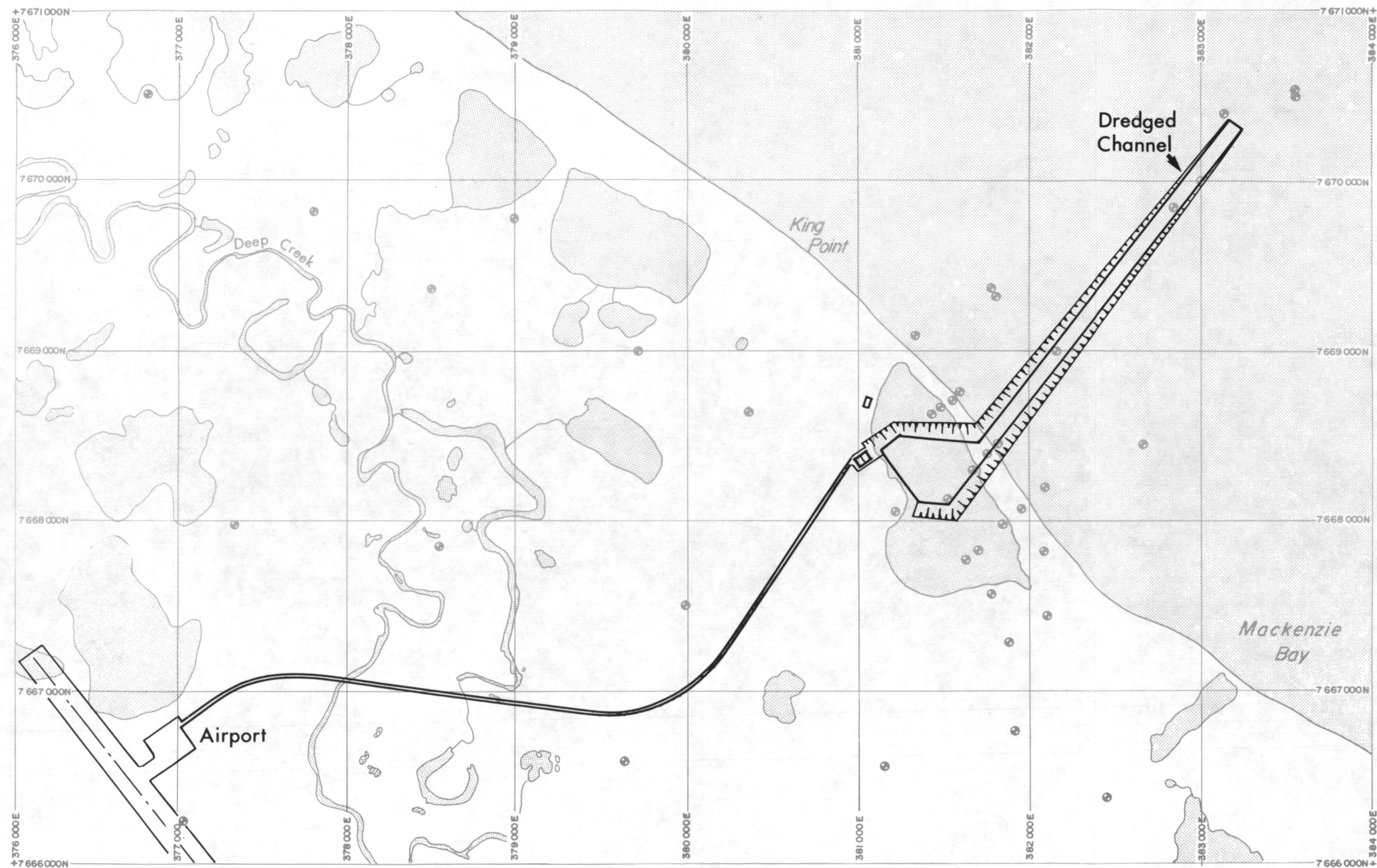
M.J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/08/02

DRAWN BY: M.G.

DWG. No.: G-4



Phase I-conceptual

MONENCO PHASE I
DEVELOPMENT

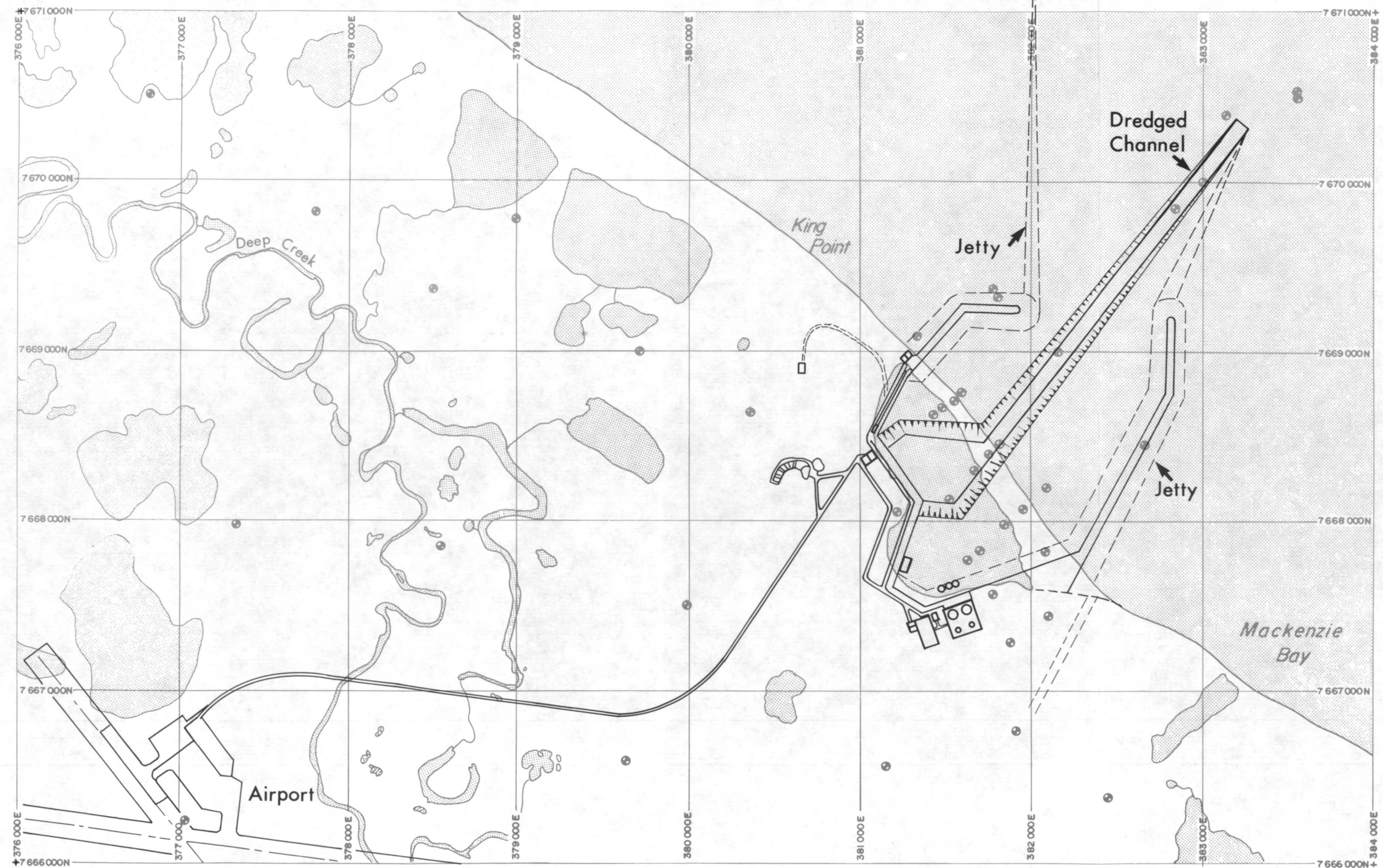
M. J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/08/02

DRAWN BY: M.G.

DWG. No.: G-5



0 500 1000
metres

Phase II - conceptual

MONENCO PHASE II
DEVELOPMENT

M.J. O'CONNOR & ASSOCIATES LTD.

JOB No.: 10-300

DATE: 85/08/02

DRAWN BY: M.G.

DWG. No.: G-6

TABLE H-1

DEFINITIONS OF TERRAIN UNITS

ALLUVIAL DEPOSITS (A):

Deposits formed by the processes of post-glacial streams and rivers. Alluvial deposits of differing genetic origin and character in the King Point area include:

1. Active flood plain (A_p): the land adjacent to an existing river which is subjected to annual flooding.
2. Fan (A_p): low, flat to gently sloping deposit, 2-7 m thick, shaped like a segment of a cone, deposited subaerially where a steeply sloping stream debouches onto a gently sloping area.
3. Thin fan (A_B): fan deposit less than 3 m thick.
4. Apron (A_A): formed by the coalescence of several fans.

COLLUVIAL DEPOSITS:

Materials derived by mass wasting processes (frost heave, soil creep, slope wash, solifluction, etc.) from underlying or upslope deposits. Several classes of colluvium are defined below:

1. Blanket (C_B): 0.5 - 3.0 m thick.
2. Veneer (C_V): less than 1.0 m thick.
3. Complex (C_X): deposit of irregular shape and thickness formed at the base of a scarp.
4. Landslides (C): mainly retrogressive-thaw flow-slides described by Rampton and Mackay (1971).

Table H-1 cont'd: Definitions of Terrain Units

GLACIOFLUVIAL DEPOSITS (G):

Deposits produced by meltwater streams flowing from wasting glaciers:

1. Hummocky (G_H): circular to oval knolls with steep ($10^\circ - 30^\circ$) slopes and 5 - 10 m local relief.
2. Ridged (G_R): sinuous to straight ridges with steep ($10^\circ - 30^\circ$) slopes and 5 - 10 m local relief.
3. Rolling (G_M): gentle ($0^\circ - 10^\circ$) slopes and low (0 - 5 m) local relief.
4. Apron (G_A): deposit shaped like a cone segment formed by glaciofluvial outwash sediments.
5. Terrace (G_T): flat to gently rolling valley fill incised by late glaciofluvial or alluvial activity.

LACUSTRINE DEPOSITS:

Deposits formed in a lake including the following types:

1. Plain (L_P): flat lying, 1 - 10 m thick deposits.
2. Blanket (L_B): flat to gently rolling deposits, typically 0.5 - 3 m thick.

MORAINAL DEPOSITS (M):

Deposits formed by direct deposition from glacial ice:

1. Rolling (M_R): Characterized by rolling topography with gentle slopes ($0^\circ - 10^\circ$) and low (0 - 10 m) local relief.

Table H-1 cont'd: Definitions of Terrain Units

MARINE DEPOSITS (W):

Deposits formed by marine processes or deposited in a marine environment:

1. Beach Ridge (W_R): coastal beach deposits of marine origin characterized by ridges with gentle slopes.

ORGANIC DEPOSITS (O):

Deposits formed by the accumulation of organic material resulting from the growth and decay of plants or by deposition of detrital organic material. Commonly contains some inorganic constituents.

1. Blanket (O_B): 0.5 - 3.0 m thick.
2. Veneer (O_V): less than 1.0 m thick.

PERIMARINE DEPOSITS (P):

Defined by Hageman (1972) and applied to the Beaufort Sea area by Vincent (1984), these deposits are mixtures of gravel, sand, silt, clay and organic deposits formed in estuarine and backswamp environments. Previous work has shown these deposits to have formed partly in marine and partly in fresh water environments.

BEDROCK (R):

Consolidated and lithified deposits; Upper Cretaceous to low Tertiary age.

Table H-2: Description of Map Units

Map Unit	Geomorphology and Drainage	Stratigraphy and Materials	Permafrost and Ground Ice	Natural Processes	Comments on Engineering Properties (and Reference Drill Holes)
A _a Active alluvial floodplain	Point bars and low benches forming floodplain; subject to periodic flooding during the year; at other times floodplains are moderately well drained.	3 to 10 m of silt and silty sand, commonly very organic; a few layers and lenses of sand and gravel may be present; alluvium generally underlain by till or periglacial deposits.	Shallow taliks may be expected under Deep Creek, deeper taliks under the Sabbage River moderate to high ice content expected in upper parts of frozen alluvium.	Unit subject to periodic erosion and alluvial deposition due to adjacent stream.	Natural hazards include flooding, erosion and alluvial deposition. Thermal disturbance may result in moderate subsidence. Negligible amounts of granular material available.
A _v Alluvial terrace	Abandoned alluvial terraces standing 1-10 m above active floodplain. Flat surface with low scarps separating different terrace levels. Poorly drained, commonly with standing water on surface; better drained near scarps.	3 to 10 m silt, organic silt and peat, commonly inter bedded with silty sand and silt gravel particularly at depth, some thin clay layers. Poorly stratified. Less than 0.3 m of surface peat. Alluvium generally underlain by till or periglacial deposits.	Moderate to high ice contents common in alluvium; low ice contents common at depth in underlying materials, although zones of moderate ice contents may be present.	Lowest terraces subject to periodic flooding and alluvial deposition. Erosion where adjacent to stream.	Natural hazards include periodic flooding and alluvial deposition and erosion in places. High ice content near surface may cause moderate subsidence after thermal disturbance. Negligible amounts of granular material available. (F85-KM24; F85-KM29; F85-KM33)
A _s Alluvial fan	Fans form within and at the mouths of gullies; smooth gently (2-4°) sloping surface, commonly incised by stream. Commonly 0.01 km ² in area. Moderately well drained. Located near the base of moderately steep to steeply sloping terrain.	Up to 7 m silt and clay with some peat, sand and gravel layers. Alluvium generally overlies till, periglacial or lacustrine deposits.	Variable but generally moderate to high ice contents in alluvium. Underlying materials generally characterized by low ice contents.	Deposition of alluvial material; stream channel may change location periodically.	High ice contents near surface would cause subsidence and possibly retrogressive thaw flow slides if thermally disturbed. No potential as a source of aggregate. (F85-KM13; F85-KM25)
A _s Thin alluvial fan	Blanket of alluvial material, on slope. Moderately well drained. Gently sloping (2-4°) surface traversed by many small gullies and rills.	Less than 3 m silt and clay. Rare gravel and sand lenses. Alluvium generally overlies till and periglacial deposits.	Moderate to high ice contents expected in alluvium. Underlying till may contain ice; periglacial deposits low in ice contents.	Slopewash along gullies and rills common.	High ice contents would cause surface subsidence if thermally disturbed. Other characteristic dependent on underlying material.
A _a Alluvial apron	Formed by coalescing alluvial fans, deposits are similar to fans but commonly 0.1-0.2 km ² in area. Moderately well drained. Generally located at the base of steeply sloping terrain.	Up to 7 m silt and clay with some peat, sand and gravel layers. Alluvium generally overlies till, periglacial, or lacustrine deposits.	Moderate to very high ice contents expected in alluvium. Underlying materials generally characterized by low ice contents.	Slopewash along gullies and rills common.	High ice contents will cause subsidence if thermally disturbed. No potential as aggregate source (see A _s).
C _a Colluvial complex	Steeply sloping (10-25°) well drained colluvial deposits at the base of, and on scarps. Well drained.	Generally 1 to 3 m of diamicton composed of material derived from the scarp. Locally up to 10 m of colluvium may be present. Colluvium underlain by till, glacioluvial, lacustrine or periglacial deposits.	Moderate to very high ice contents expected in colluvium; ice contents in underlying deposits will be characteristic of that deposit.	Soilification and soil creep common; Parts of unit may be subject to deposition from scarp. Retrogressive-thaw flow-slides common in some areas.	Generally prone to mass wastage or retrogressive-thaw flow-slides if disturbed; retrogressive-thaw flow-slides will be especially common where underlying deposit is characterized by high ice contents or massive ice. (F85-KM18; see also C _a). Steep slopes west of King Point relatively stable due to general absence of ice.
C _l Landslides	Very hummocky to ridged, sloping terrain with 1 to 5 m local relief. Variable drainage, may have small ponds between ridges.	Unit is underlain by materials composing upslope unit, commonly morainal or glacioluvial deposits capped by colluvium.	Ice contents will be typical of unit of which landslide is composed; massive ice can be expected at depth.	Due to steep slopes unit is subject to mass wasting and slopewash. Landsliding process may still be active in parts of the unit.	Reactivation of landsliding is main hazard. Unit may be unstable and overlie massive ice.
C _v Colluvial veneer	Veneer of material derived from the underlying or upslope deposits by mass wastage (frost heaving, soil creep, slopewash, etc.). Although present on most deposits, usage of this terrain unit was restricted to where it overlies bedrock. Well drained.	Generally underlain by less than one metre of coarse angular sandstone blocks; up to 5% interstitial sand and silt; Grades downwards to sandstone.	Colluvium largely within active layer, but underlying units characterized by thick permafrost.	Mass wastage (frost heaving, frost shattering, soilification, creep) may occur on slopes.	Potential source of rock. Stable ground conditions below active layer. (N75-117A-81-1)

Table H-2 cont'd: Description of Map Units

Map Unit	Geomorphology and Drainage	Stratigraphy and Materials	Permafrost and Ground Ice	Natural Processes	Comments on Engineering Properties (and Reference Drill Holes)
C_a Colluvial blanket	Colluvial blanket was only mapped where it overlies broad expanses of perimarine deposits, glaciofluvial deposits or bedrock, although it is present on most upland terrain units. Its surface form is governed to a large extent by that of the underlying terrain unit. Moderate to poorly drained on gently sloping and flat areas; well drained on slopes and near scarps.	Where the colluvium overlies perimarine or glaciofluvial deposits it is characterized by about 0.5 m peat capping 3 m silt, organic silt and clay. Where the colluvium overlies bedrock it is characterized by up to 3 m of silt and shale fragments.	High ice contents characterize colluvium; massive ice is common at base of underlying glaciofluvial deposits; low ice contents expected in underlying perimarine deposits and bedrock.	Some solifluction and creep can be expected on steeper slopes.	Thermal disturbance will lead to subsidence where high ice contents are present; subsidence will be extreme if massive ice is thermally disturbed (F85-KM 18; F85-KM 27; F85-KM 28; F85-KM 31; F85-KM 32).
G_H Hummocky glaciofluvial deposits G_R Ridged glaciofluvial deposits G_M Rolling glaciofluvial deposits	Ridged (G _a) hummocky (G _w) or rolling (G _m) topography with 2-10 m local relief. Ridges and hummocks probably produced by erosion or thermokarst rather than glaciofluvial processes. Well drained.	Generally 3 to 10 m of gravel, sand, silty gravel and silty sand. Poorly stratified. Generally overlies till or perimarine deposits.	Low ice contents expected in upper part of unit, increasing with depth. Unit may be underlain by massive ice.	Unit is generally stable, although some creep may occur on slopes.	Potential for use as borrow source. Thermokarst activity and subsidence to be expected if underlying massive ice is thermally disturbed.
G_a Glaciofluvial apron	Flat, gently sloping apron deposited as thick deposit of glaciofluvial materials at ice front. Well drained except where covered by fines (see C _a).	Generally 2 to 10 m of interbedded sand and gravel; few silt beds. Well rounded particles, generally poorly sorted (SM, GM). Massive ice is common at base. Where ice is not present, sand and gravel is underlain by till or perimarine deposits.	Low ice contents in upper part of unit, ice content increases with depth. Unit generally underlain by massive ice. Taliks may occur beneath lakes.	Unit is generally stable.	Potential for use as borrow source. Extreme thermokarst activity including development of retrogressive-thaw flow-slides if underlying massive ice is thermally disturbed. (F85-KM27; F85-KM28; F85-KM31; F85-KM32.)
G_r Glaciofluvial terrace	Flat topped terrace, up to 10 m above adjacent alluvial terraces. Poorly drained on flat broad terrace remnants, well drained near edges, particularly above scarps.	Up to 10 m of interbedded sand and gravel, few silt beds. Generally overlies till or perimarine deposits.	Low ice contents in upper part of unit, increasing with depth. Massive ice may underlie some parts of unit.	Unit is generally stable.	Potential borrow source, although sand within unit may be characteristically fine-grained, poorly graded and silty. If disturbed thermokarst subsidence will be significant where massive ice underlies unit. (N75-1170-813-A)
L_a Lacustrine plain L_b Lacustrine blanket	Flat to gently undulating low lying areas. One to five m of local relief or terracing results mainly from thermokarst activity. Poorly drained with standing water in small pools except near scarps where they are well drained.	4 to 10 m of interbedded silt, organic silt, clay and peat with traces of sand. Base of lacustrine deposits may be a diamicton (re-worked till). Lacustrine deposits generally overlie till and/or colluviated till.	Moderate to very high ice contents are common to lacustrine deposits; ice wedges form significant part of upper 4 m of terrain; ice contents in underlying materials are commonly low. Where lacustrine deposits cap hills and ridges, massive ice is common at depth.	Unit is generally stable. Patterned ground outlined by standing water in trenches and low centres of polygons.	Thermokarst subsidence will occur if upper part of unit is thermally disturbed. Subsidence will be limited once lacustrine deposits are thawed. Poorly drained with standing water common on surface. (F85-KM 19; F85-KM 20; F85-KM 21; F85-KM 22)
M_a Rolling moraine deposits	Gently undulating to rolling surface with local relief less than 10 m. Forms a continuous ridge between King Point and Shingle Point up to 25 m above sea level. South of this ridge the unit forms low hills. Variable drainage depending on local topography; commonly inset by poorly drained thermokarst depressions.	Dark grey to black, massive, blocky silt and clay with traces of sub-rounded pebbles and sand. Very stiff to hard when thawed. In places only 2 m thick but generally 4 to 12 m thick. The upper 5 m is commonly reworked by colluvial activity, and may contain interbedded colluvial lacustrine, alluvium and organic deposits. Overlies bedrock or perimarine deposits.	Moderate to high ice contents generally characterize upper colluviated part of unit, but lower part is characterized by low ice contents. Massive ice is common under till where unit forms hills and ridges.	Prono to retrogressive-thaw flow-sliding and related landslides along slopes, especially those adjacent to sea cliffs, streams or lake shores.	Extreme subsidence possible if underlying massive ice thermally disturbed. Retrogressive thaw flow-slides will develop along slopes if disturbed. (F85-KM 18; F85-KM 23; F85-KM 24; F85-KM 30; B1022A; B1023; B1024; B1025; see also other units with moraine deposits at depth)

Table H-2 cont'd: Description of Map Units

Map Unit	Geomorphology and Drainage	Stratigraphy and Materials	Permafrost and Ground Ice	Natural Processes	Comments on Engineering Properties (and Reference Drill Holes)
W ₆ Marine beaches and ridges	Beach ridge, bars and spits formed along the coast, generally standing less than 2 m above sea level. Well drained.	Underlain by up to 6 m of interbedded gravel and sand. Commonly overlies silt, peat, organic silt, and clay.	Thickness of active layer is unknown. Low ice contents generally reported in sand and gravel units from drill holes.	Longshore drift results in deposition by wave action. Position and shape of pits and bars changing due to wave action. Some ice shoving occurs.	Potential source of aggregate, but will alter pattern of erosion and deposition along coast if utilized. Gravel and sand commonly contains wood. Vulnerable to flooding, wave activity, and ice shoving. (F85-KM 6; F85-KM 7; F85-KM 12; F85-KM 15)
O ₆ Organic blanket	Thick organic deposits are generally only present in depressions, generally on till, or on lacustrine units. Unit is generally poorly drained and characterized by small ponds of standing water.	Underlain by 0.5 - 3.0 m of peat and organic silt. This in turn overlies lacustrine, paludal, colluvial and alluvial deposits.	High ice contents in organic deposits and underlying lacustrine deposits. Ice wedge forms significant part of upper 4 m of terrain. Ice contents in deposits underlying lacustrine deposits are generally low.	Unit is generally stable. Patterned ground outlined by standing water in trenches and low centre polygons.	Prone to thermokarst subsidence if thermally disturbed, both from thawing of underlying ice rich materials as well as ice wedges. Poor drainage. (F85-KM 22)
O ₄ Organic veneer	Thin organic deposits are present in some depressions, in till or on lacustrine units. Unit is characterized by moderate to poor drainage.	Less than 0.5 m of peat and organic silt overlies till on lacustrine deposits.	High ice contents common to bottom part of organic unit and upper part of underlying lacustrine deposits. Ice wedges present. Ice content in deposits underlying lacustrine deposits are generally low.	Unit is generally stable. Patterned ground outlined by standing water in trenches and low centre polygons.	Prone to thermokarst subsidence if thermally disturbed. Ice wedges in underlying material. Poor drainage. (see O ₆).
Perimarine deposits P ₆ rolling P ₆ ridged	Forms main ridge up to 60 m high adjacent to shore northwest of King Point. Surface gently rolling to ridged (P ₆). Sharp ridges are underlain by steeply dipping gravels (P ₆).	Interbedded silts, sands and gravels, gently to steeply dipping, highly contorted. Materials are coarse in bluffs at King Point, becoming finer grained to the northwest. Drill holes intersect mainly silts. Coarse materials are poorly sorted sand and gravel silt and clay commonly contain organic pebbles, shells, peat beds or inclusions, and wood. Upper part of unit (up to 4 m) may be in part till and colluvium.	Generally marked by very low ice contents although moderate ice contents may occur in gravels, sands, and rarely in silt. Thin layers of massive ice (less than 0.5 m thick) were encountered in some drill holes. Where present, colluvium or till at crest of unit may have medium to high ice contents.	Landslides (retrogressive-thaw flow-slides) are present where icy till or colluvium caps unit or where icy beds in unit have been exposed by coastal erosion. Surface generally stable, except for minor solifluction and creep on slopes.	Moderately stable unit. Small sources of poor aggregate available in some gravel ridges. (F85-KM 13; F85-KM 18; F85-KM 19; F85-KM 20; F85-KM 21; F85-KM 22; F85-KM 25; F85-KM 26; F85-KM 27; F85-KM 29; F85-KM 30)
R Bedrock	Underlies ridges, exposed at surface in southern part of the area. Light tone on airphotos interpreted as sandstone, or conglomerate, dark tone as mudstone. Generally overlain by C ₆ or C ₅ .	<u>Lower Tertiary or Upper Cretaceous:</u> Reindeer Fm (785±150 ft) interbedded sandstone and mudstone. <u>Upper Cretaceous:</u> Moose Channel Fm (2250 ft) interbedded mudstone, sandstone, minor conglomerate. Tent Island Fm (610 ft) mudstone.	Low ice contents expected in bedrock under colluvium.	Frost shattering of bedrock will occur on exposed bedrock surfaces.	Stable unit. Possible source of quarry rock or crushed rock (sandstone and conglomerate only). (Young 1975).