

**ANNEXE E**

**RÉSULTATS DES ESSAIS DE LABORATOIRE**

**TABLE 1**

**SUMMARY OF WATER CONTENT DETERMINATIONS**

PROJECT NUMBER	011-7112			
PROJECT NAME	Intersan / Etude Geot. & Hydrogeo. / Ste-Sophie			
DATE TESTED	December, 2001			
Sample No.	Depth (ft)	Depth (m)	Water Content (%)	Atterberg Limits LL, PL, PI
S-6	20.0-22.0	6.10-6.71	48.4%	
S-7	22.0-24.0	6.71-7.32	50.6%	LL=42.0, PL=18.0, PI=24.0
S-8-9			67.4%	
S-8-10			8.1%	
S-9-7			59.5%	
S-12	18.0-20.0	5.49-6.10	39.3%	LL=33.2, PL=12.0, PI=21.2
S-12	30.0-32.0	9.14-9.75	61.0%	LL=75.8, PL=24.1, PI=51.7
S-16	18.0-20.0	5.49-6.10	41.0%	LL=71.6, PL=24.5, PI=47.1
S-16	24.0-26.0	7.32-7.92	73.7%	LL=70.9, PL=23.4, PI=47.5
S-18	16.0-18.0	4.88-5.49	66.1%	LL=69.8, PL=25.7, PI=44.1
S-18	24.0-26.0	7.32-7.92	56.5%	LL=42.9, PL=22.3, PI=20.6
S-19-7	12.0-14.0	3.66-4.27	82.2%	
S-19-12	22.0-24.0	6.71-7.32	9.8%	
S-20-4	14.0-16.0	4.27-4.88	79.8%	
S-21-4	14.0-16.0	4.27-4.88	66.4%	
S-21	26.0-28.0	7.92-8.53	53.1%	LL=63.5, PL=21.9, PI=41.6
S-22	22.0-24.0	6.71-7.32	79.6%	LL=74.1, PL=24.4, PI=49.7
S-22	32.0-34.0	9.75-10.36	72.1%	LL=75.1, PL=24.1, PI=51.0
S-23	25.0-27.0	7.62-8.23	69.6%	LL=71.6, PL=24.5, PI=47.1
S-24	20.0-22.0	6.10-6.71	37.7%	LL=50.1, PL=20.5, PI=29.6
S-24	28.0-30.0	8.53-9.14	38.0%	
S-28-3	10.0-12.0	3.05-3.66	76.2%	
S-29	20.0-21.0	6.10-6.40	29.3%	
S-29-2	21.0-23.0	6.40-7.01	9.4%	

## SPECIFIC GRAVITY TEST RESULTS

### ASTM D 854-98 TEST METHOD A

PROJECT NUMBER	011-7112	
PROJECT NAME	Intersan / Etude Geot. & Hydrogeo. / Ste-Sophie	
DATE TESTED	December, 2001	
Sample Number	Specific Gravity	Sample Depth (ft)
S-7 TS-1	2,79	22.0-24.0
S-7 CF-1	2,73	10.0-12.0
S-8 CF-9	2,67	
S-8 CF-10	2,76	
S-9 CF-7	2,71	
S-12 TS-1	2,74	18.0-20.0
S-12 CF-1	2,75	2.0-4.0
S-14 CF-4	2,74	12.0-14.0
S-14 CF-6	2,75	46.0-48.0
S-16 TS-1	2,75	18.0-20.0
S-18 TS-2	2,74	24.0-26.0
S-19 CF-2	2,75	2.0-4.0
S-19 CF-12	2,78	22.0-24.0
S-20 CF-4	2,76	14.0-16.0
S-21 TS-1	2,74	26.0-28.0

## SPECIFIC GRAVITY TEST RESULTS

### ASTM D 854-98 TEST METHOD A

PROJECT NUMBER	011-7112
PROJECT NAME	Intersan / Etude Geot. & Hydrogeo. / Ste-Sophie
DATE TESTED	December, 2001

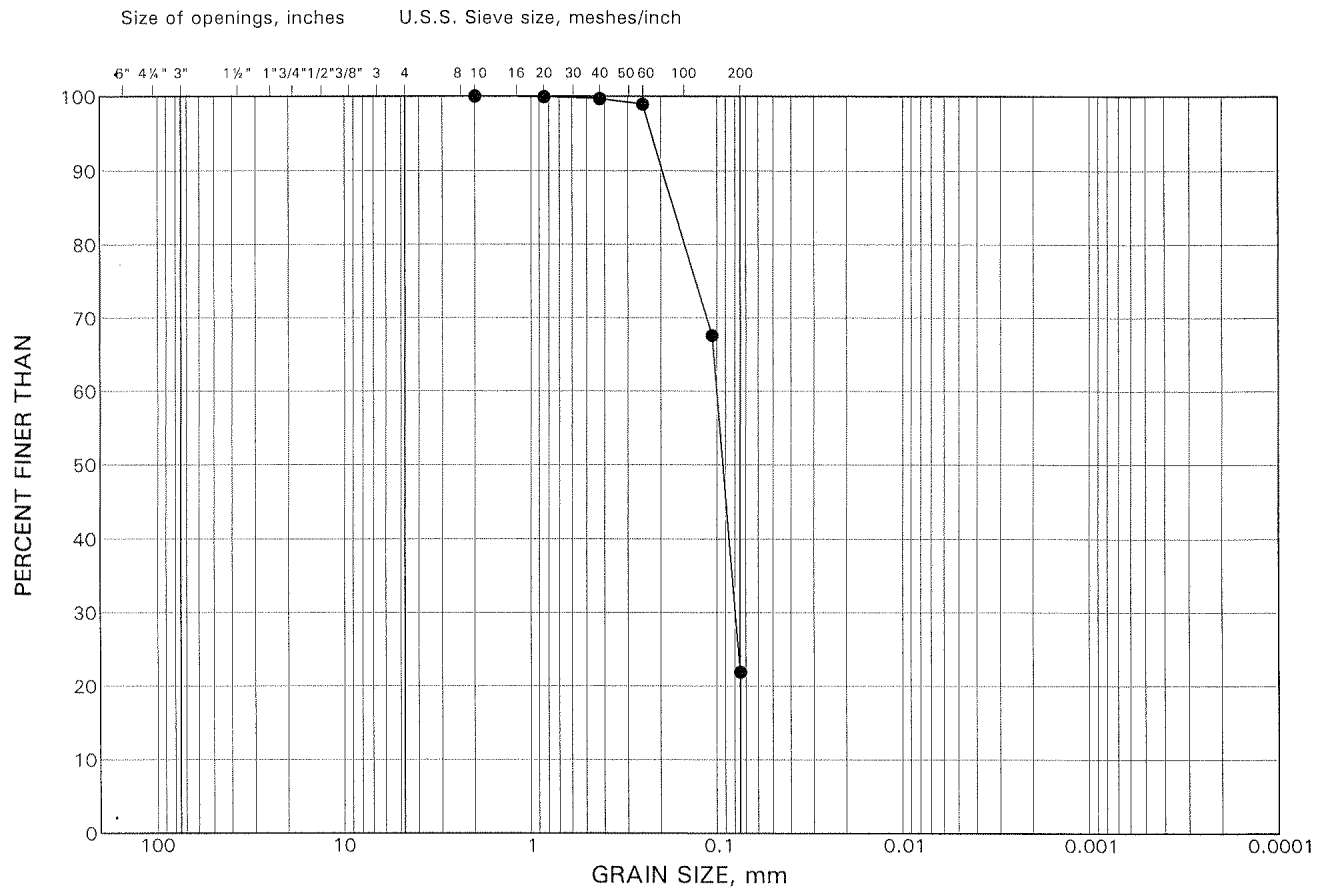
  

Sample Number	Specific Gravity	Sample Depth (ft)
S-21 CF-1	2,74	2.0-4.0
S-22 TS-3	2,77	32.0-34.0
S-23 TS-1	2,74	25.0-27.0
S-28 CF-2	2,74	6.0-8.0
S-28 CF-3	2,75	10.0-12.0
S-24 TS-1	2,75	20.0-22.0
S-24 CF-2	2,69	6.0-8.0
S-29 TS-1	2,71	20.0-21.0
S-29 CF-2	2,76	21.0-23.0

Note: Test carried out on soil particles <4.75mm using distilled water .

# GRAIN SIZE DISTRIBUTION

FIGURE



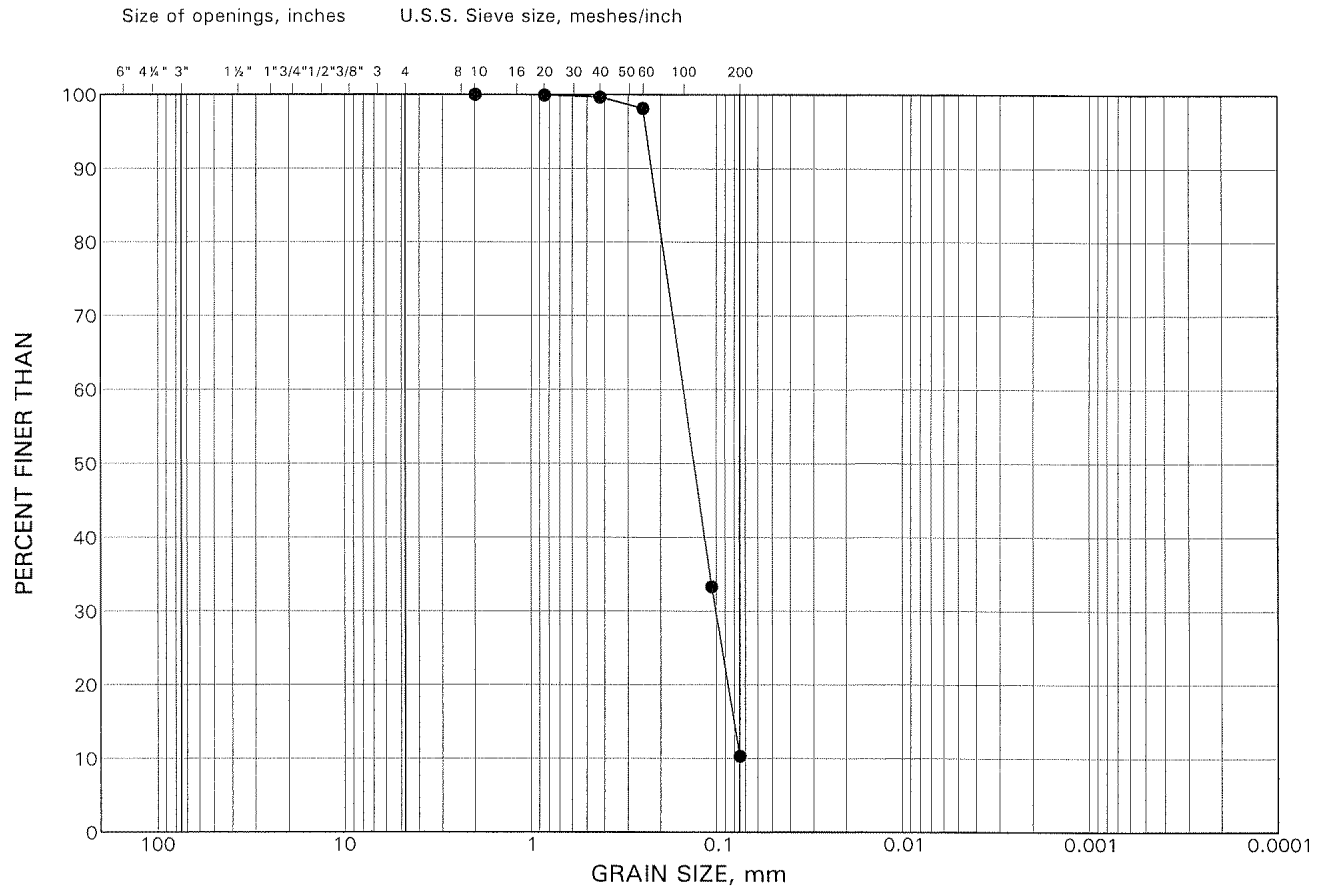
COBBLE SIZE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND CLAY SIZES
	GRAVEL SIZE		SAND SIZE			

## LEGEND

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)
●	-	S-11-4	-

# GRAIN SIZE DISTRIBUTION

FIGURE



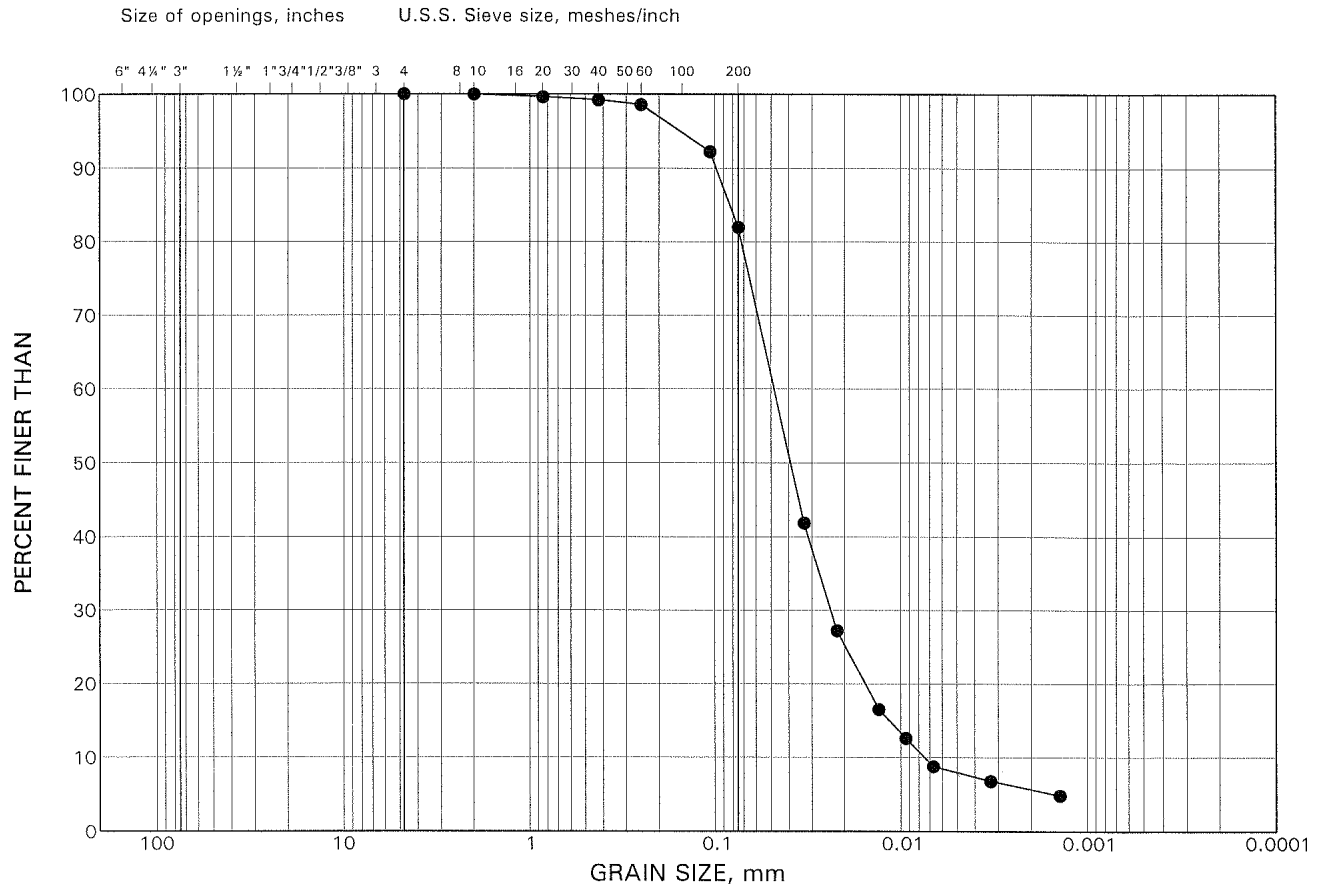
COBBLE SIZE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND CLAY SIZES FINE GRAINED
	GRAVEL SIZE		SAND SIZE			

## LEGEND

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)
●	-	S-12-1	1.2

# GRAIN SIZE DISTRIBUTION

FIGURE



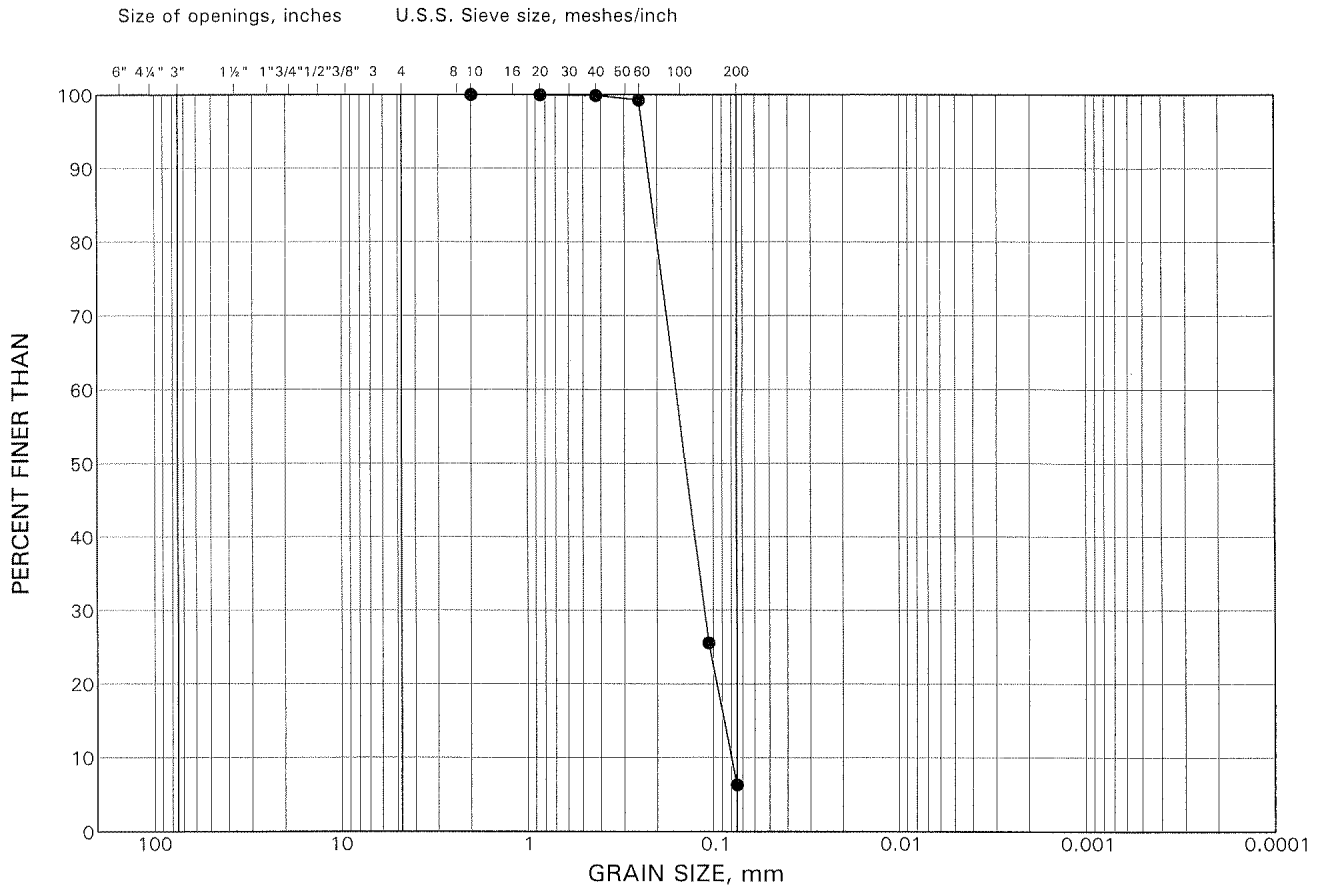
COBBLE SIZE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND CLAY SIZES FINE GRAINED
	GRAVEL SIZE		SAND SIZE			

## LEGEND

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)
●	-	S-12-7	11.0

# GRAIN SIZE DISTRIBUTION

FIGURE



COBBLE SIZE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND CLAY SIZES
	GRAVEL SIZE		SAND SIZE			

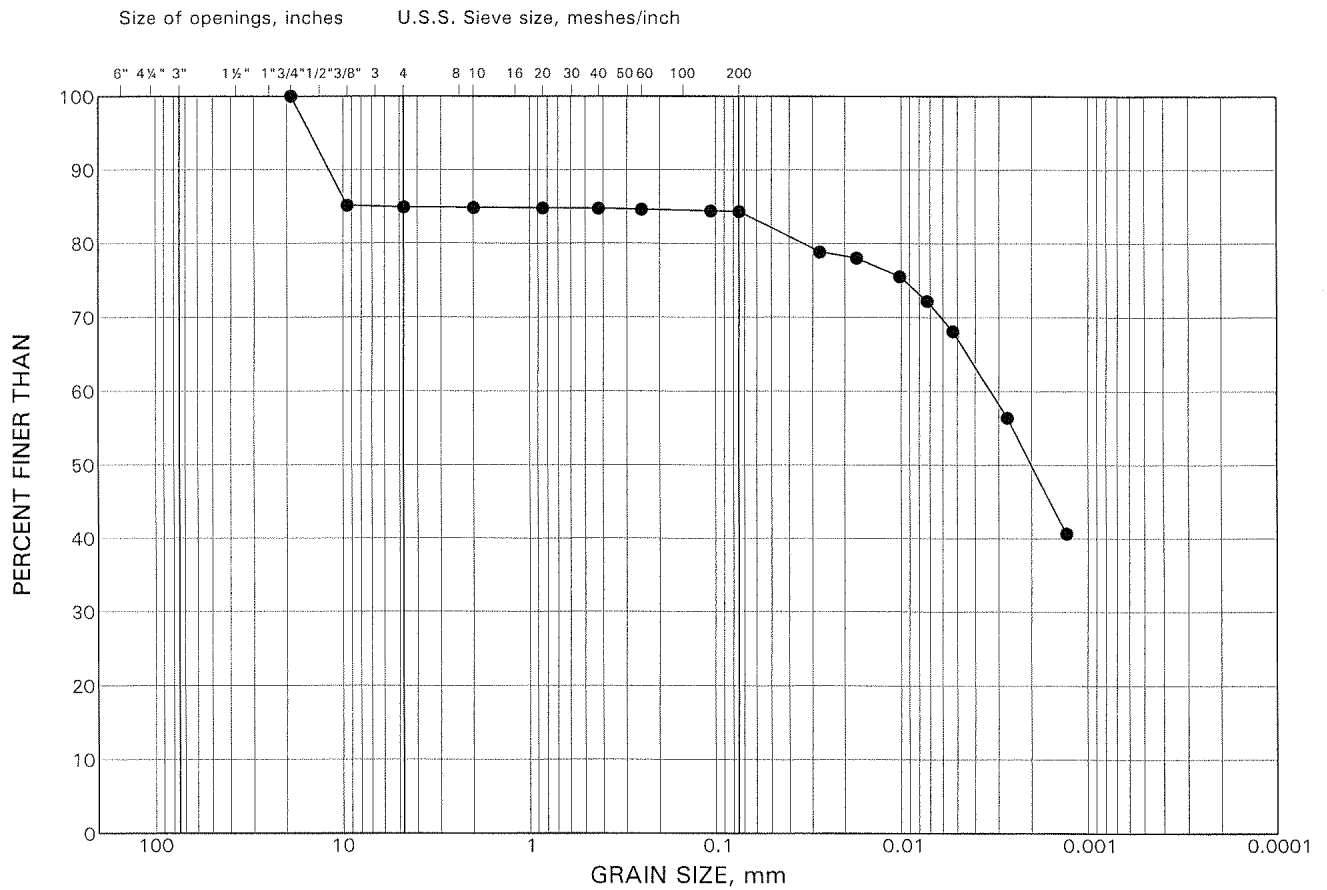
## LEGEND

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)
●	-	S-14-2	2.4



# GRAIN SIZE DISTRIBUTION

FIGURE



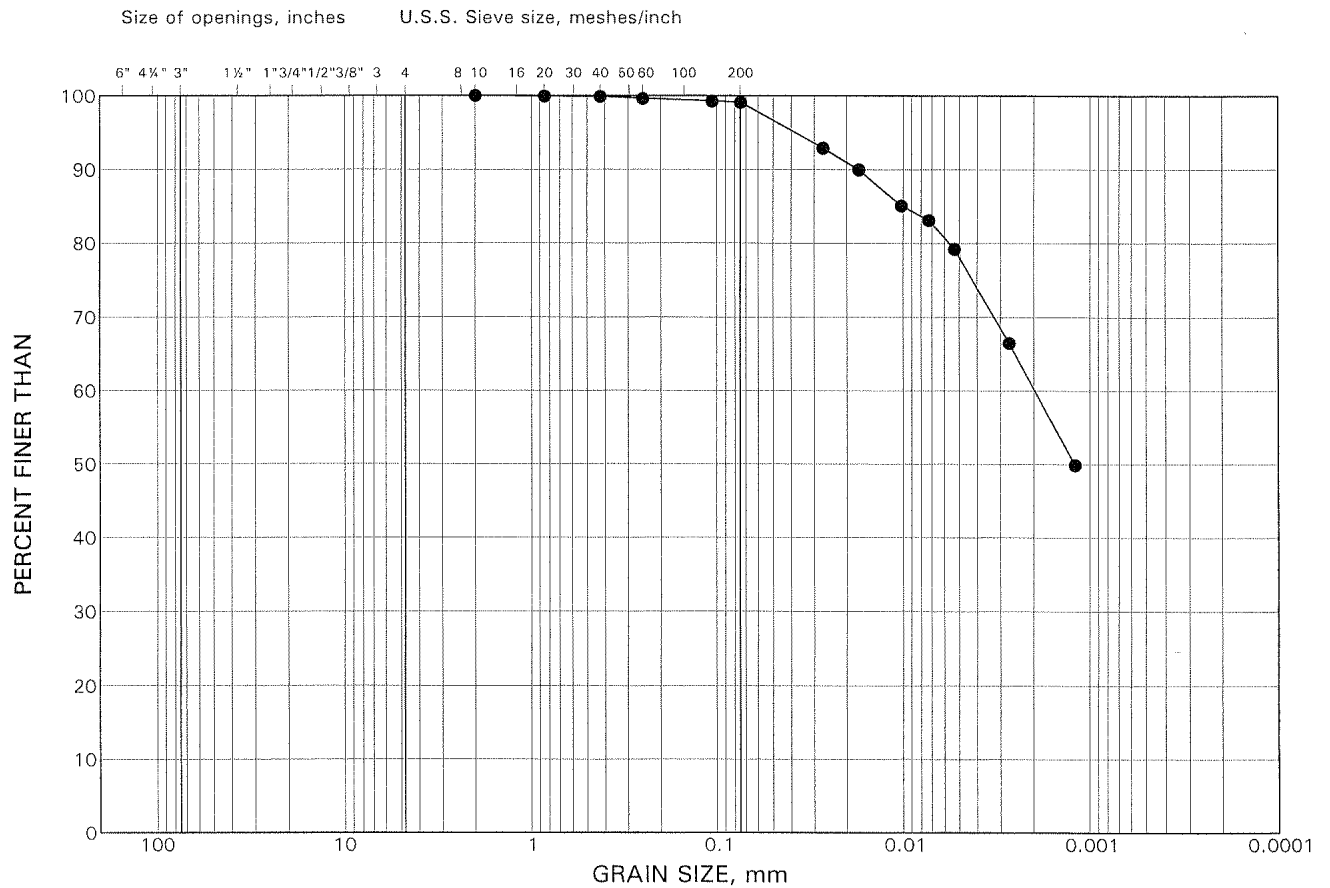
COBBLE SIZE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND CLAY SIZES
	GRAVEL SIZE		SAND SIZE			

## LEGEND

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)
●	-	S-14-6	14.6

# GRAIN SIZE DISTRIBUTION

FIGURE



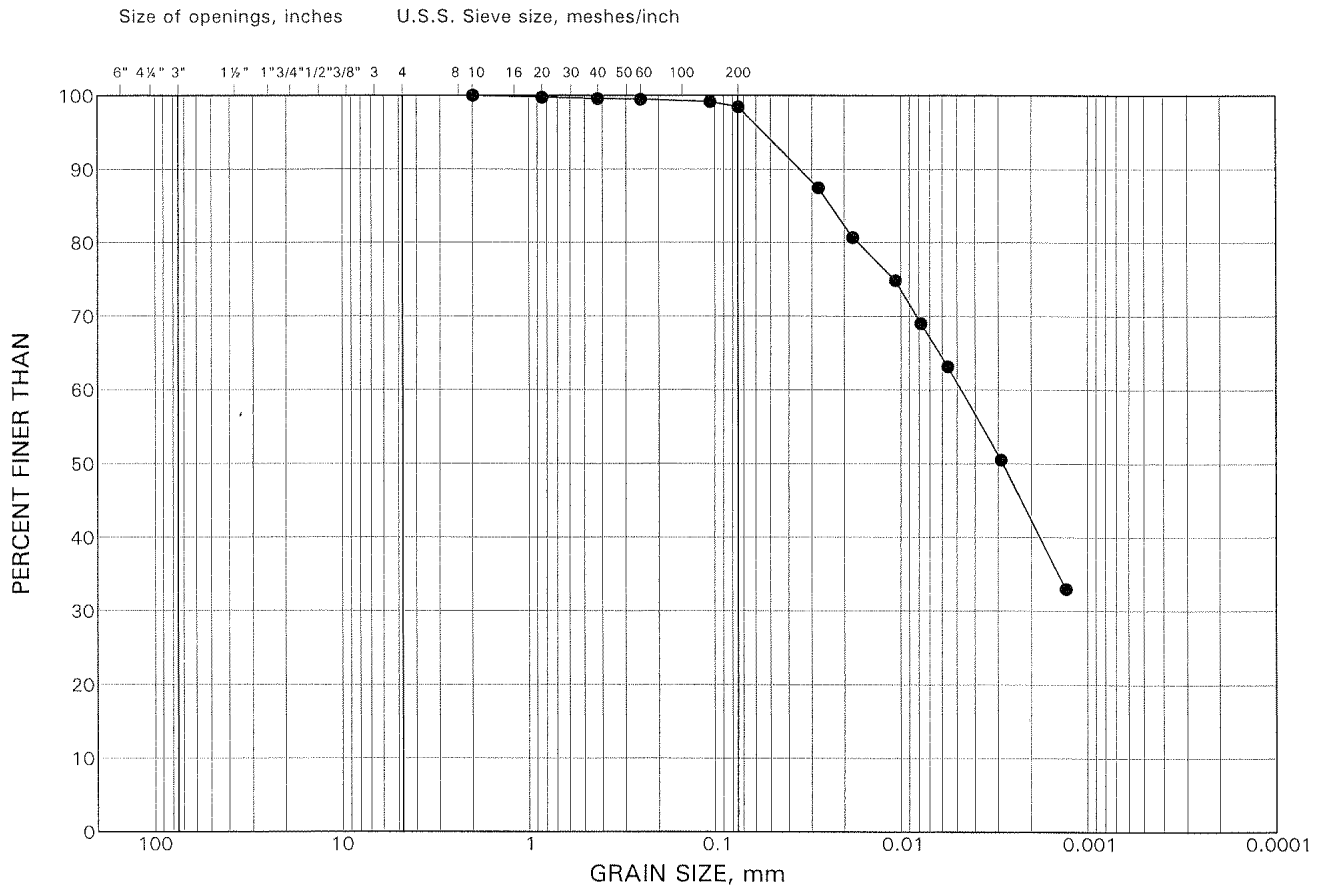
<b>COBBLE</b>	COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND CLAY SIZES
<b>SIZE</b>	GRAVEL SIZE		SAND SIZE			FINE GRAINED

## LEGEND

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)
●	-	S-16	6.1

# GRAIN SIZE DISTRIBUTION

FIGURE



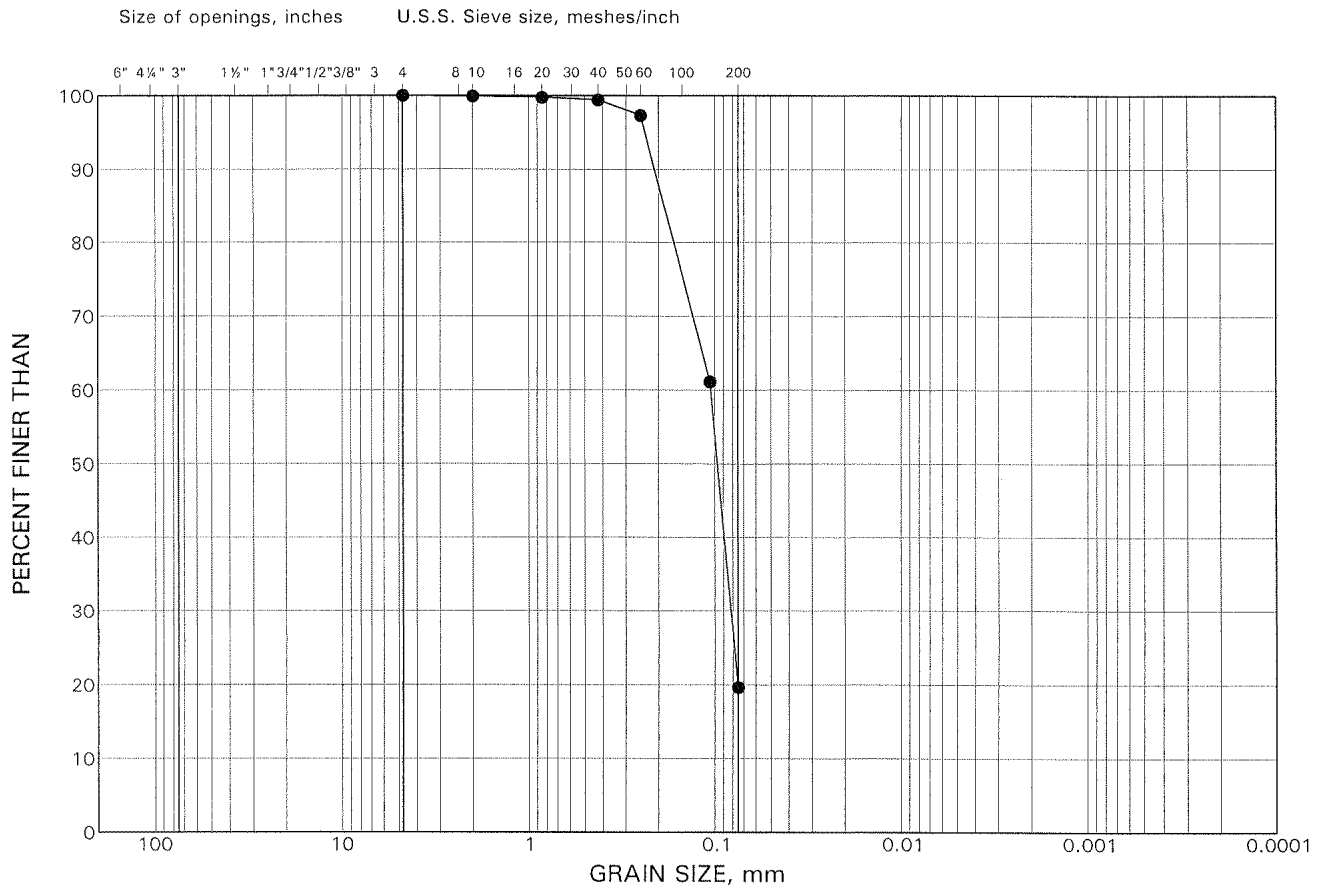
COBBLE SIZE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND CLAY SIZES
	GRAVEL SIZE		SAND SIZE			

## LEGEND

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)
●	-	S-18	7.9

# GRAIN SIZE DISTRIBUTION

FIGURE



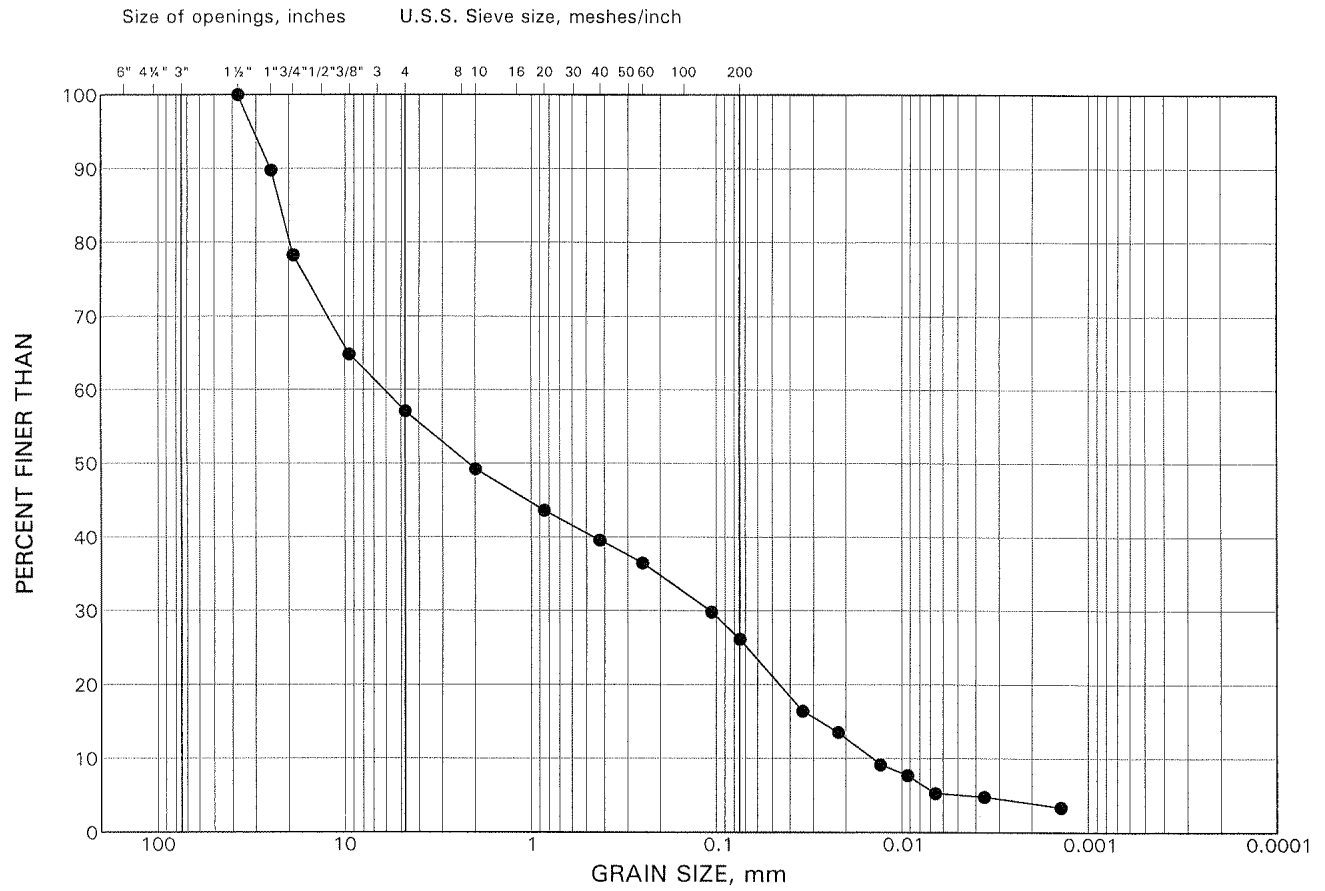
COBBLE SIZE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND CLAY SIZES
	GRAVEL SIZE		SAND SIZE			

## LEGEND

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)
●	-	S-19-2	1.2

# GRAIN SIZE DISTRIBUTION

FIGURE



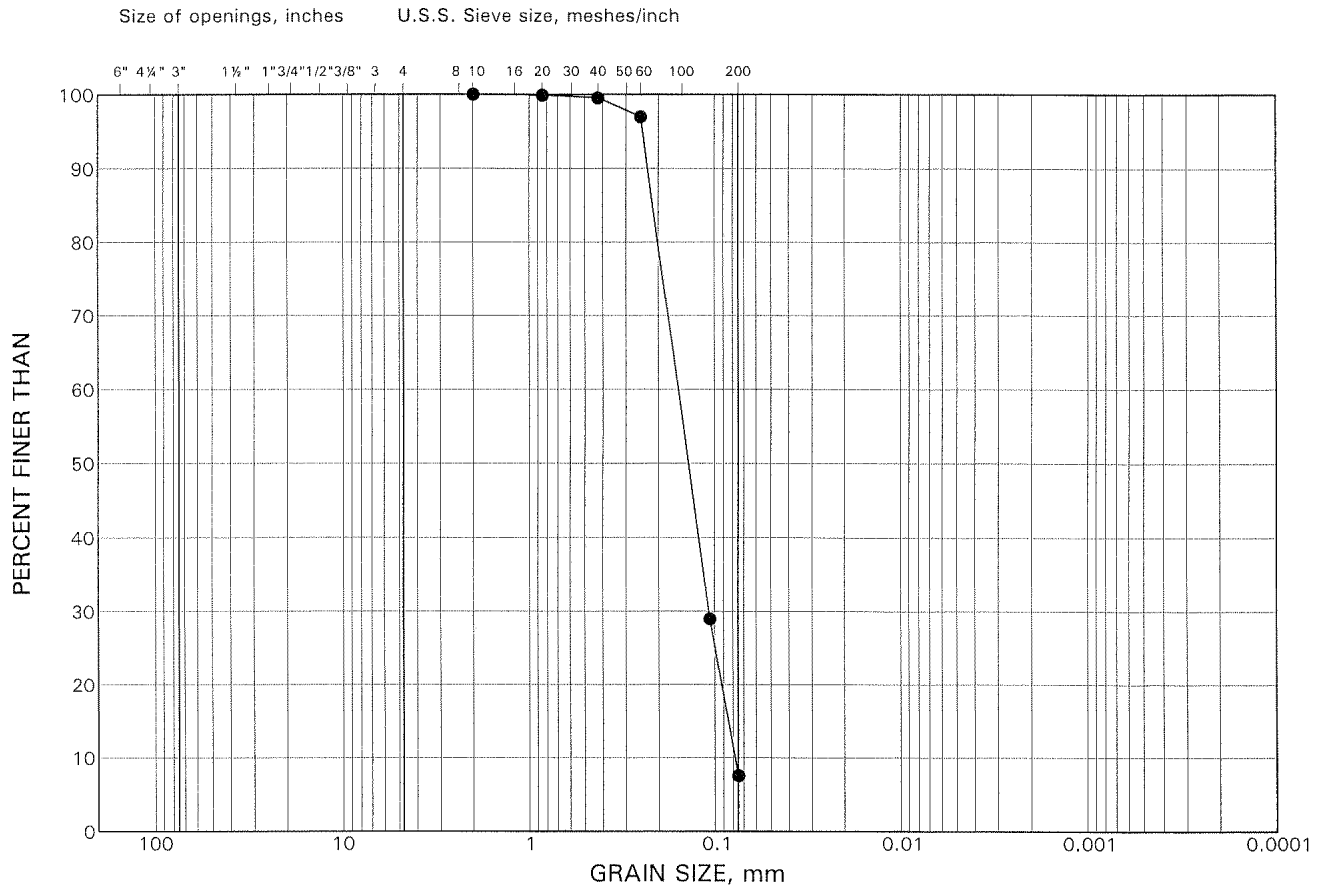
COBBLE SIZE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND CLAY SIZES
	GRAVEL SIZE		SAND SIZE			

## LEGEND

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)
•	-	S-19-12	7.3

# GRAIN SIZE DISTRIBUTION

FIGURE



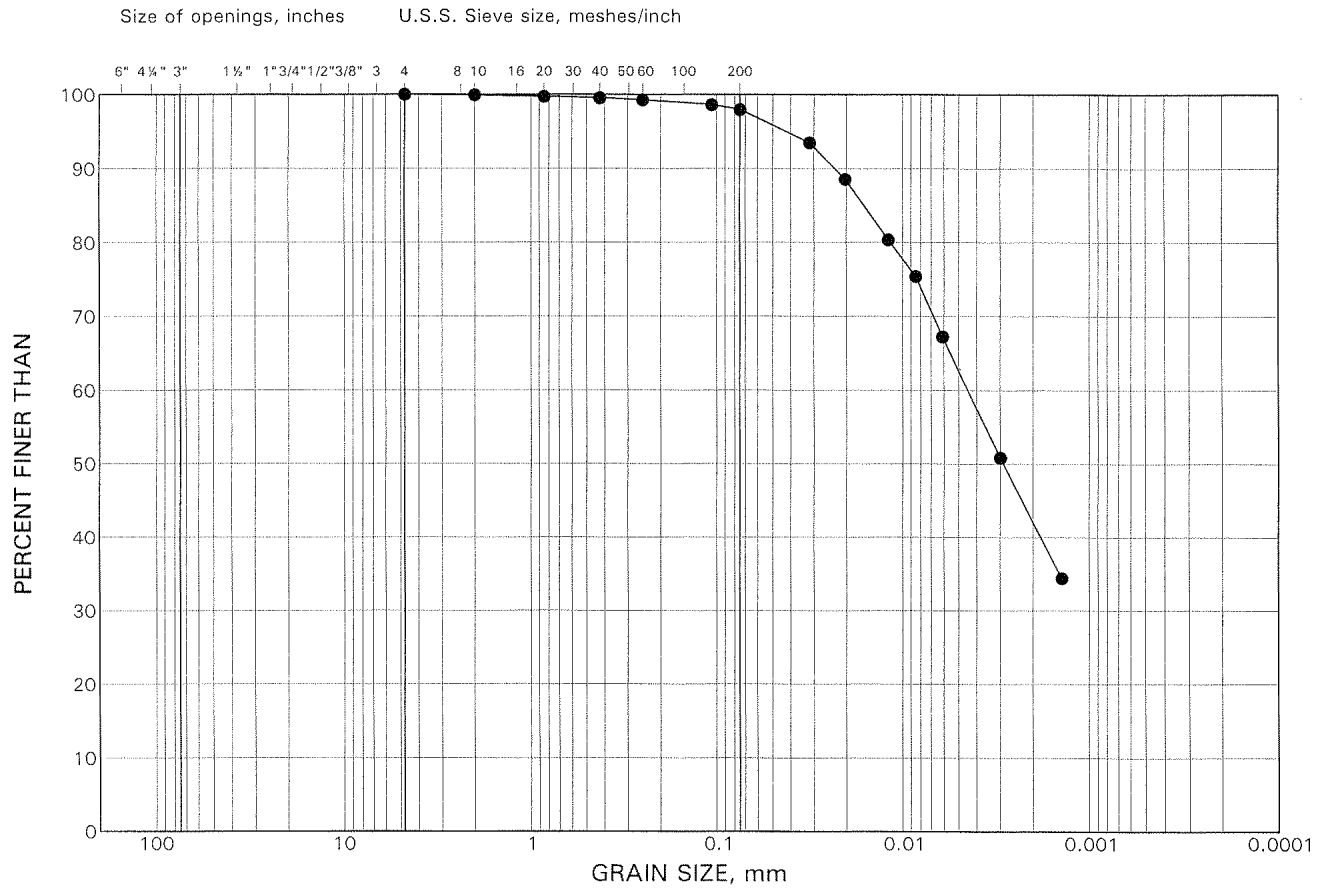
COBBLE SIZE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND CLAY SIZES
	GRAVEL SIZE		SAND SIZE			

## LEGEND

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)
●	-	S-21-1	1.2

# GRAIN SIZE DISTRIBUTION

FIGURE



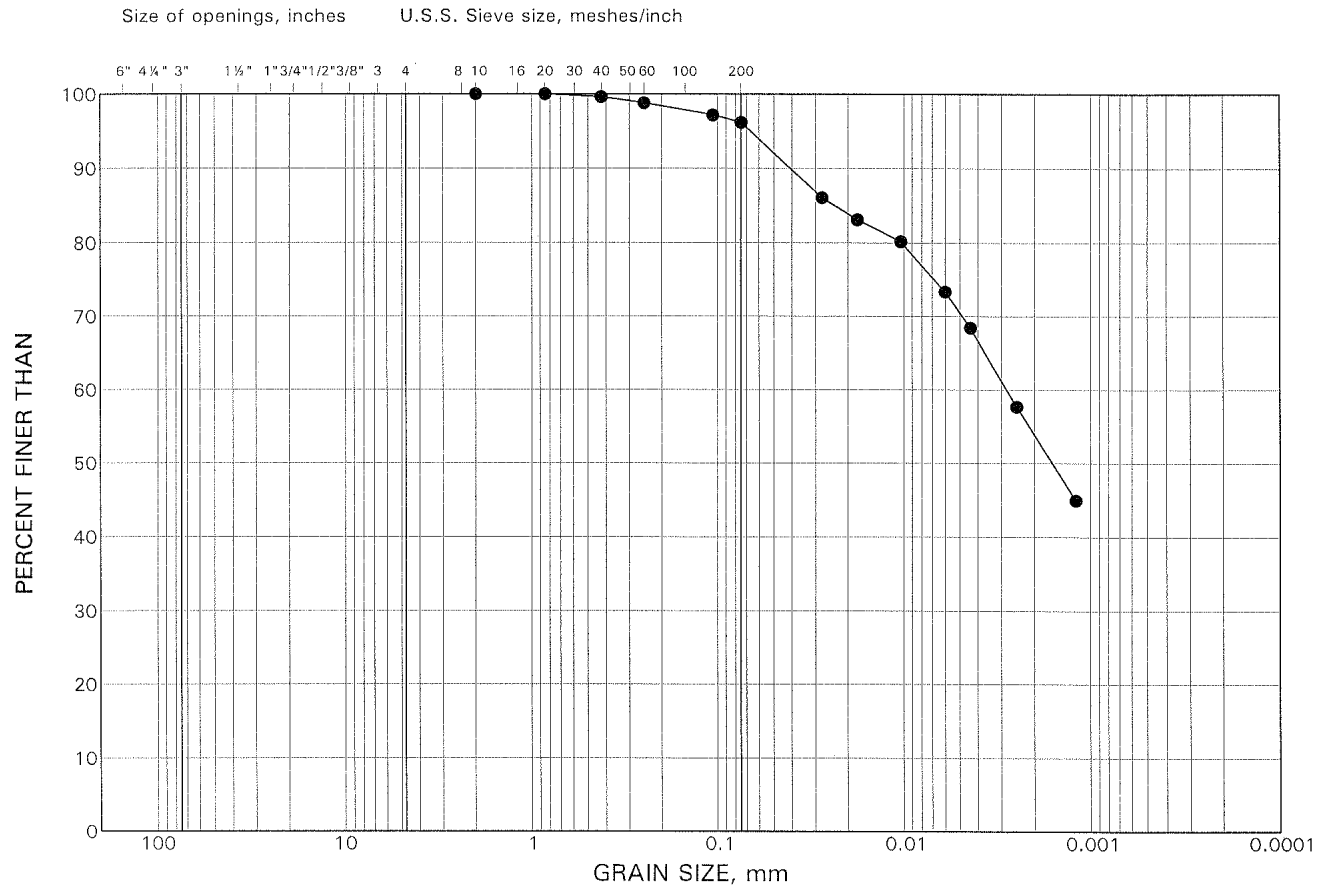
COBBLE SIZE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND CLAY SIZES
	GRAVEL SIZE		SAND SIZE			

## LEGEND

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)
●	-	S-21	8.5

# GRAIN SIZE DISTRIBUTION

FIGURE



COBBLE SIZE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND CLAY SIZES
	GRAVEL SIZE		SAND SIZE			

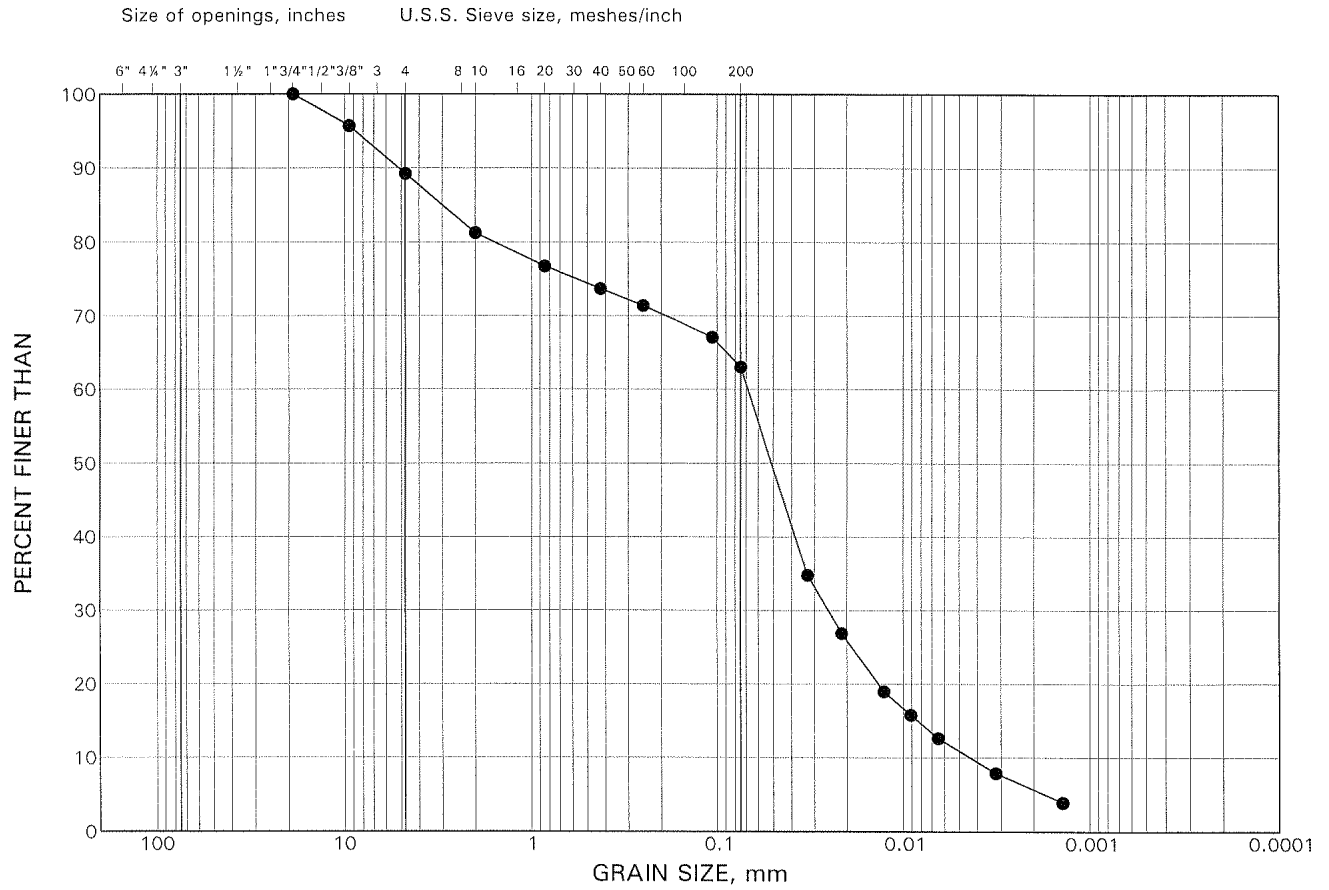
## LEGEND

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)
●	-	S-24	6.7



# GRAIN SIZE DISTRIBUTION

FIGURE



COBBLE SIZE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND CLAY SIZES FINE GRAINED
	GRAVEL SIZE		SAND SIZE			

## LEGEND

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)
●	-	S-29-2	7.0

**SOIL DESCRIPTION OF SHELBY TUBE SAMPLES**

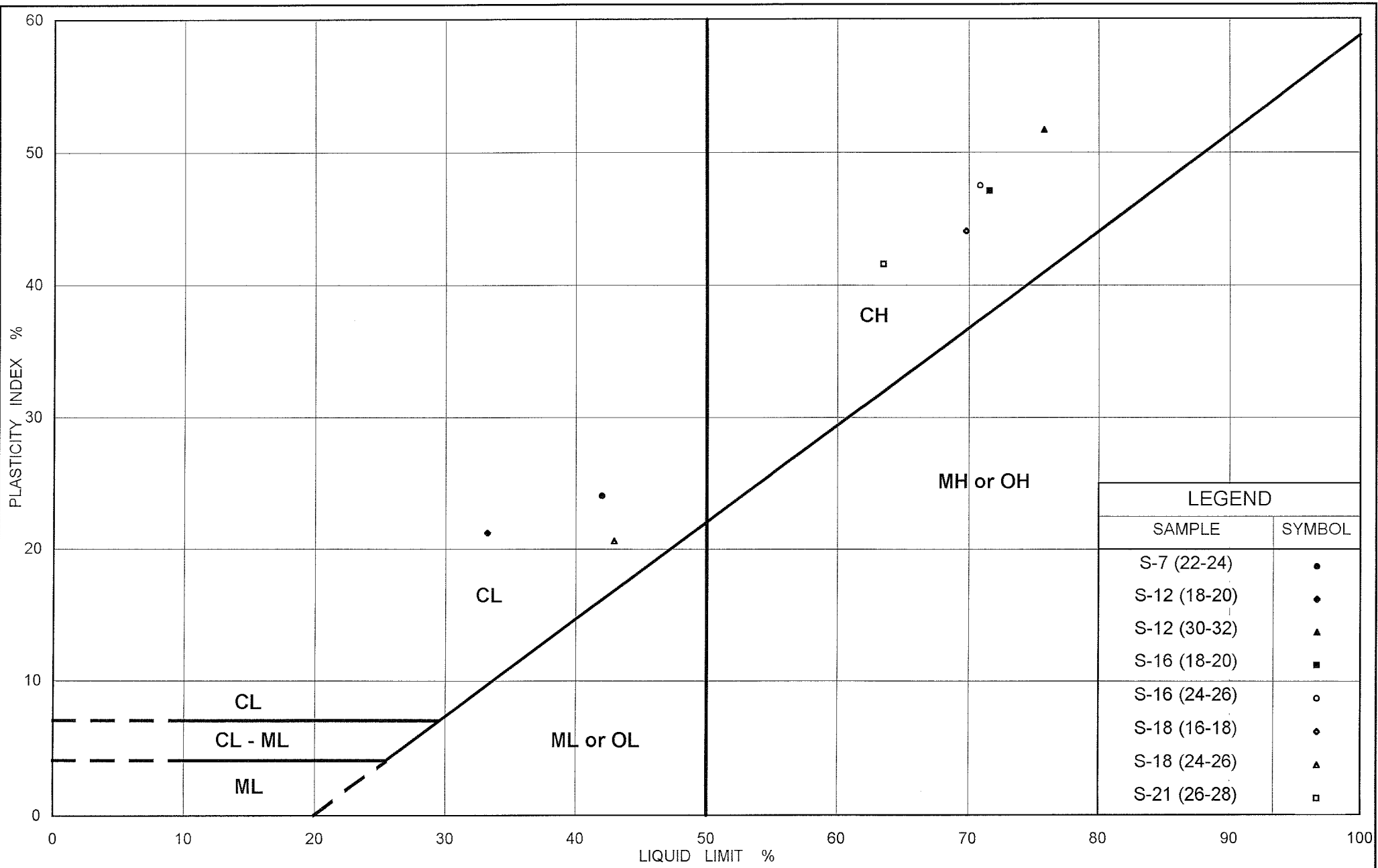
Project Number 011-7112

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE DESCRIPTION
S-6	20.0-22.0	Medium firm uniform grey clay, some silt.
S-7	22.0-24.0	Firm to soft towards top of tube, uniform grey clay, trace silt.
S-12	18.0-20.0	Firm grey clay, little to some silt.
S-12	30.0-32.0	Firm grey clay, little to some silt.
S-16	18.0-20.0	Medium firm grey clay, some silt, traces of shell pieces, softer towards the top.
S-16	24.0-26.0	Firm grey clay, little silt.
S-18	16.0-18.0	Firm grey clay, little silt.
S-18	24.0-26.0	Medium firm dark grey clay, little silt, traces of nonfibres organics.
S-21	26.0-28.0	Firm grey clay, some silt, traces of shell pieces.
S-22	22.0-24.0	Firm to medium firm towards the top, grey clay, little silt.

## SOIL DESCRIPTION OF SHELBY TUBE SAMPLES

Project Number 011-7112

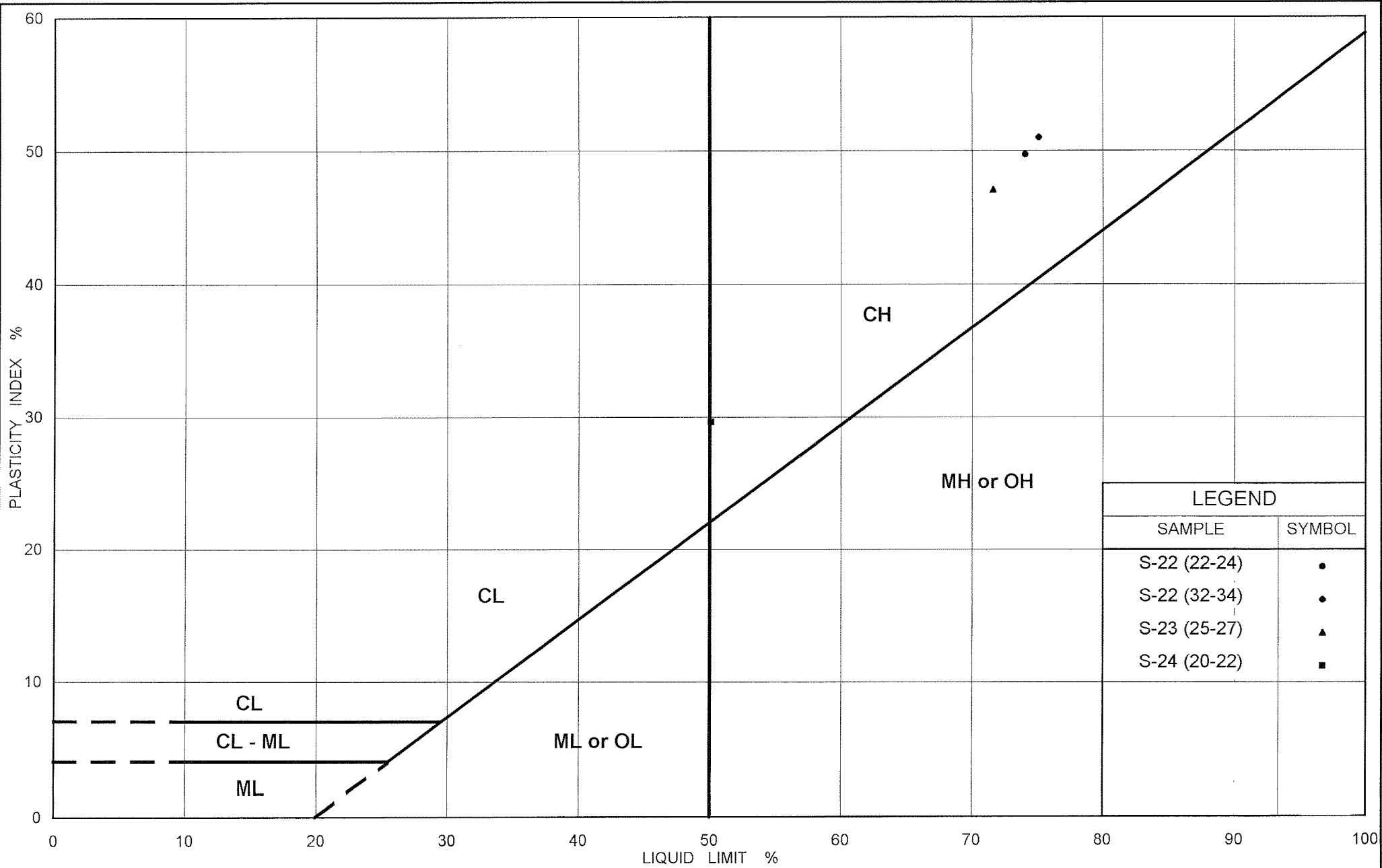
S-22	32.0-34.0	Medium firm to soft grey clay, some silt, slightly disturbed towards the top and on the side of the shelby tube.
S-23	25.0-27.0	Firm grey clay, some silt, sample disturbed during the extrusion.
S-23	36.0-38.0	Missing tube.
S-24	20.0-22.0	Medium firm grey clay, some silt, trace of shells.
S-24	28.0-30.0	Firm to medium firm grey clay, little silt.
S-29	20.0-21.0	Disturbed firm grey clay with silt and sand layer on the top of tube.



# PLASTICITY CHART

FIG No.

Project No. 011-7112



PLASTICITY CHART



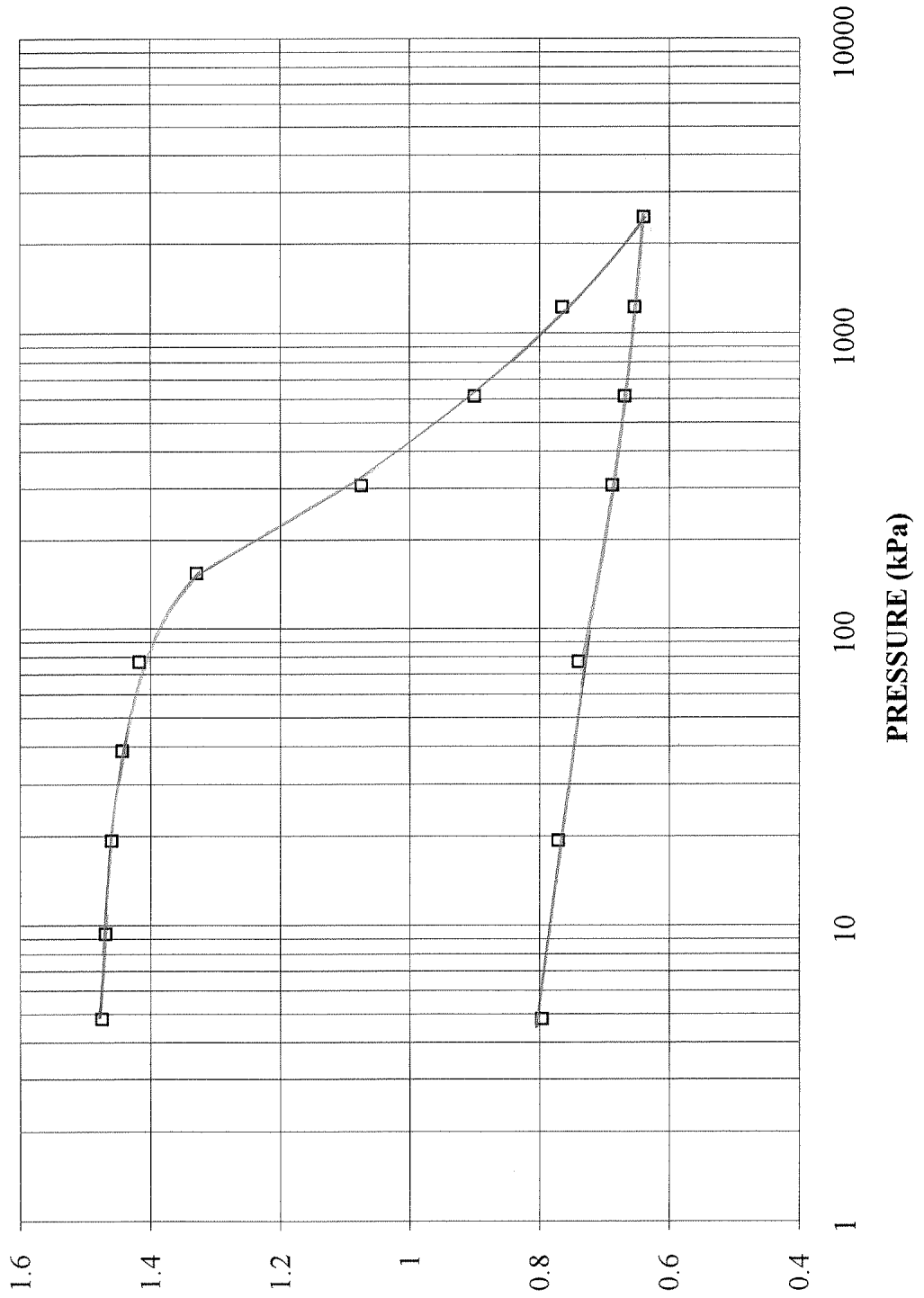
FIG No.

Project No. 011-7112

CONSOLIDATION TEST  
VOID RATIO VS. LOG PRESSURE

FIGURE

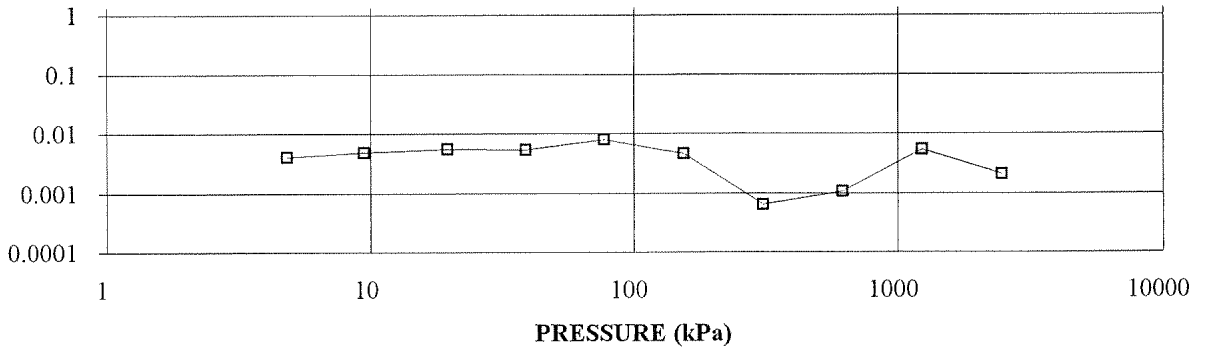
CONSOLIDATION TEST  
VOID RATIO vs PRESSURE  
SA-12



# OEDOMETER CONSOLIDATION SUMMARY

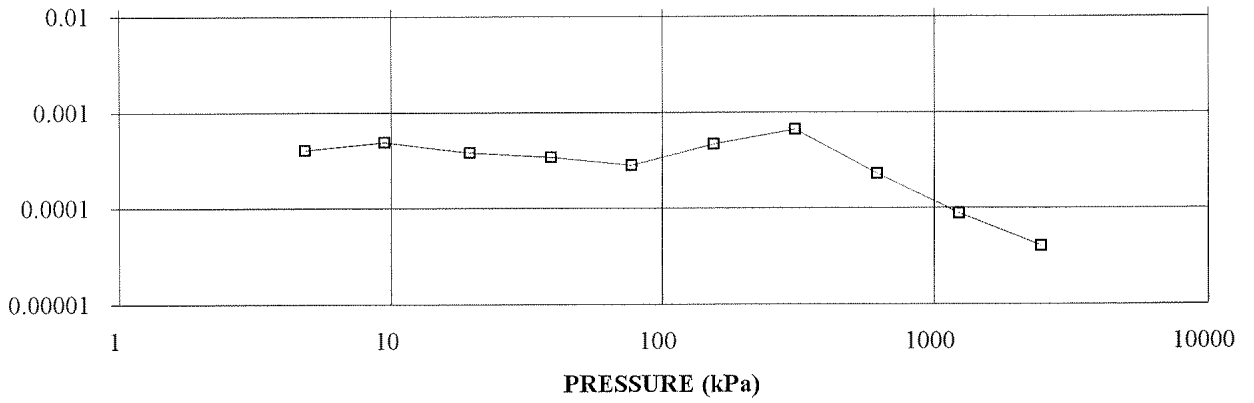
COEFFICIENT OF CONSOLIDATION,  $\text{cm}^2/\text{s}$

**CONSOLIDATION TEST**  
 $c_v$   $\text{cm}^2/\text{s}$  vs PRESSURE (kPa)  
 SA-12



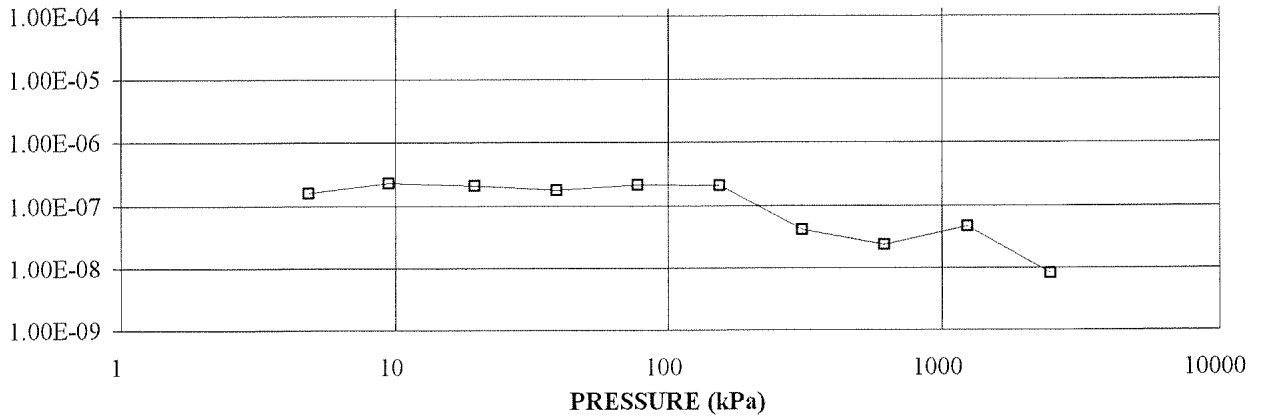
VOLUME  
 COMPRESSIBILITY,  
 $\text{m}^2/\text{kN}$

**CONSOLIDATION TEST**  
 $m_v$ ,  $\text{m}^2/\text{kN}$  vs PRESSURE (kPa)  
 SA-12



HYDRAULIC  
 CONDUCTIVITY,  $\text{cm}/\text{s}$

**CONSOLIDATION TEST**  
 HYDRAULIC CONDUCTIVITY vs PRESSURE  
 SA-12



Project No. 011-7112

## OEDOMETER CONSOLIDATION SUMMARY

### SAMPLE IDENTIFICATION

Project Number	011-7112	Sample Number	S-12
Borehole Number	-	Sample Depth, m	5.5-6.1

### TEST CONDITIONS

Test Type	Standard	Load Duration, hr	24
Oedometer Number	7		
Date Started	01-11-28		
Date Completed	01-12-10		

### SAMPLE DIMENSIONS AND PROPERTIES - INITIAL

Sample Height, cm	1.91	Unit Weight, kN/m <sup>3</sup>	16.64
Sample Diameter, cm	6.35	Dry Unit Weight, kN/m <sup>3</sup>	10.84
Area, cm <sup>2</sup>	31.67	Specific Gravity, measured	2.74
Volume, cm <sup>3</sup>	60.49	Solids Height, cm	0.770
Water Content, %	53.59	Volume of Solids, cm <sup>3</sup>	24.39
Wet Mass, g	102.66	Volume of Voids, cm <sup>3</sup>	36.09
Dry Mass, g	66.84	Degree of Saturation, %	99.2

### TEST COMPUTATIONS

Pressure kPa	Corr. Height cm	Void Ratio	Average Height cm	t <sub>90</sub> sec	cv. cm <sup>2</sup> /s	mv m <sup>2</sup> /kN	k cm/s
0.00	1.910	1.480	1.910				
4.82	1.906	1.475	1.908	190	4.06E-03	4.02E-04	1.60E-07
9.45	1.902	1.469	1.904	160	4.80E-03	4.86E-04	2.29E-07
19.49	1.895	1.460	1.898	137	5.58E-03	3.81E-04	2.08E-07
38.88	1.882	1.444	1.888	140	5.40E-03	3.38E-04	1.79E-07
77.52	1.862	1.417	1.872	94	7.90E-03	2.81E-04	2.17E-07
154.78	1.793	1.327	1.827	155	4.57E-03	4.66E-04	2.09E-07
309.13	1.598	1.074	1.695	948	6.43E-04	6.62E-04	4.17E-08
618.29	1.463	0.899	1.530	464	1.07E-03	2.28E-04	2.39E-08
1235.96	1.358	0.764	1.411	79	5.34E-03	8.85E-05	4.63E-08
2473.05	1.263	0.640	1.311	175	2.08E-03	4.04E-05	8.24E-09
1235.96	1.273	0.653	1.268				
618.29	1.285	0.668	1.279				
309.13	1.300	0.687	1.292				
77.52	1.339	0.739	1.320				
19.49	1.364	0.770	1.351				
4.82	1.383	0.795	1.373				

Notes:

k calculated using cv based on t<sub>90</sub> values.

### SAMPLE DIMENSIONS AND PROPERTIES - FINAL

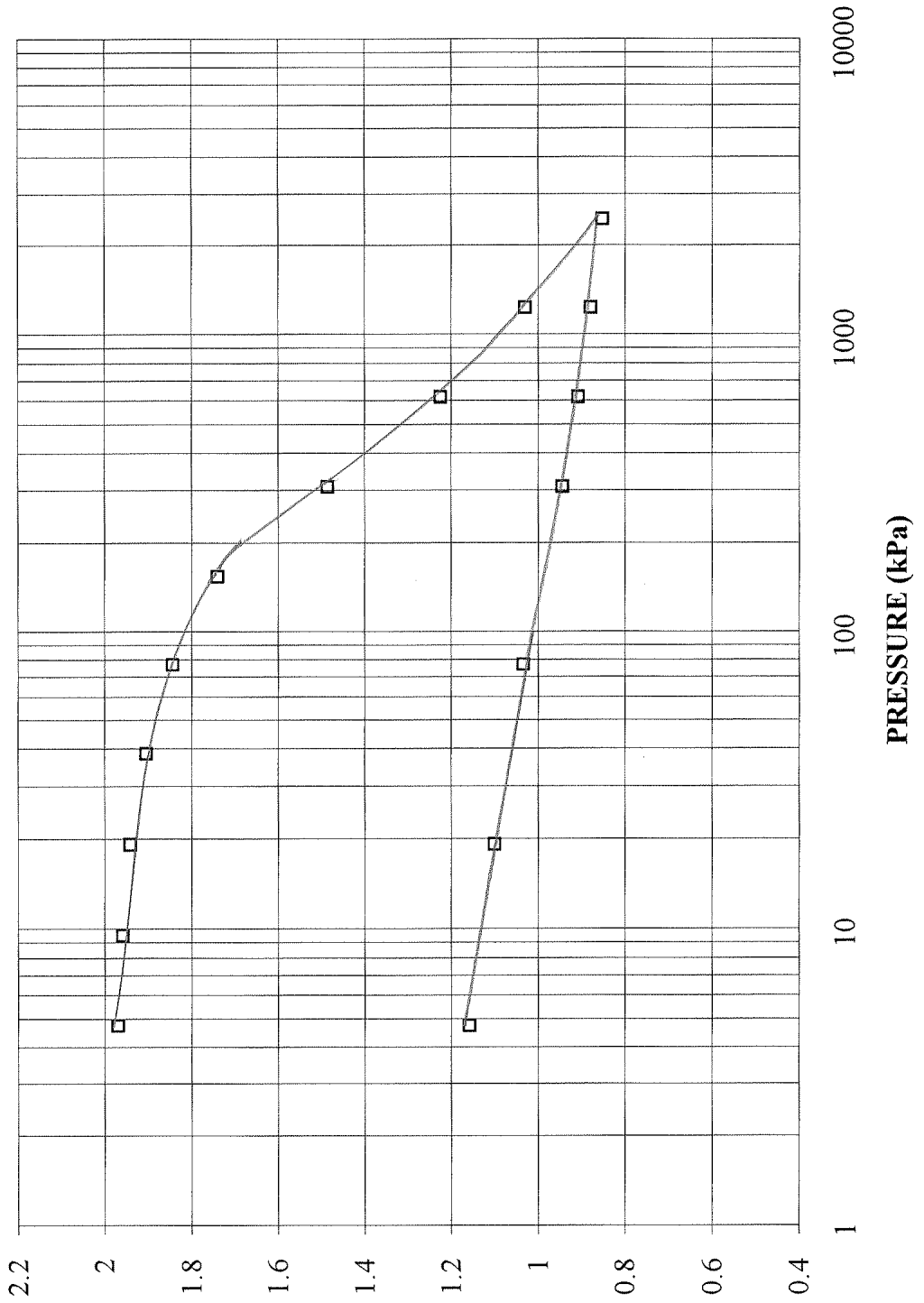
Sample Height, cm	1.38	Unit Weight, kN/m <sup>3</sup>	19.47
Sample Diameter, cm	6.35	Dry Unit Weight, kN/m <sup>3</sup>	14.97
Area, cm <sup>2</sup>	31.67	Specific Gravity, measured	2.74
Volume, cm <sup>3</sup>	43.80	Solids Height, cm	0.770
Water Content, %	30.07	Volume of Solids, cm <sup>3</sup>	24.39
Wet Mass, g	86.94	Volume of Voids, cm <sup>3</sup>	19.40
Dry Mass, g	66.84		



CONSOLIDATION TEST  
VOID RATIO VS. LOG PRESSURE

FIGURE

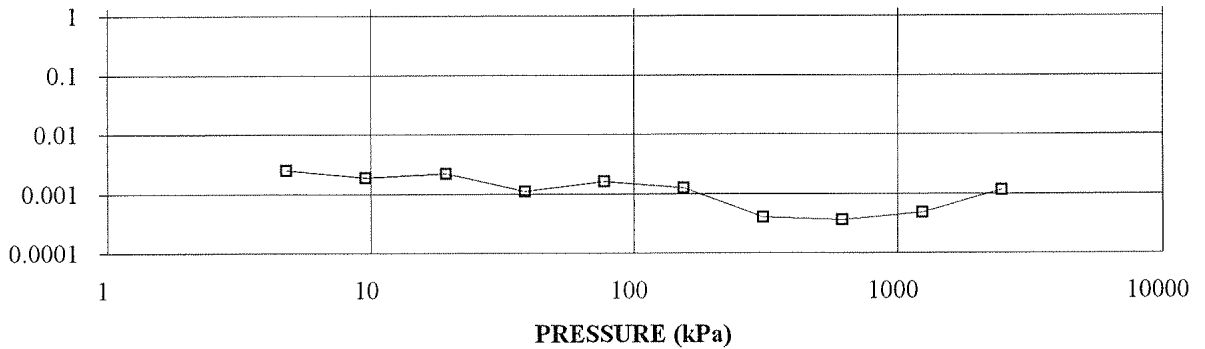
CONSOLIDATION TEST  
VOID RATIO vs PRESSURE  
SA-22



# OEDOMETER CONSOLIDATION SUMMARY

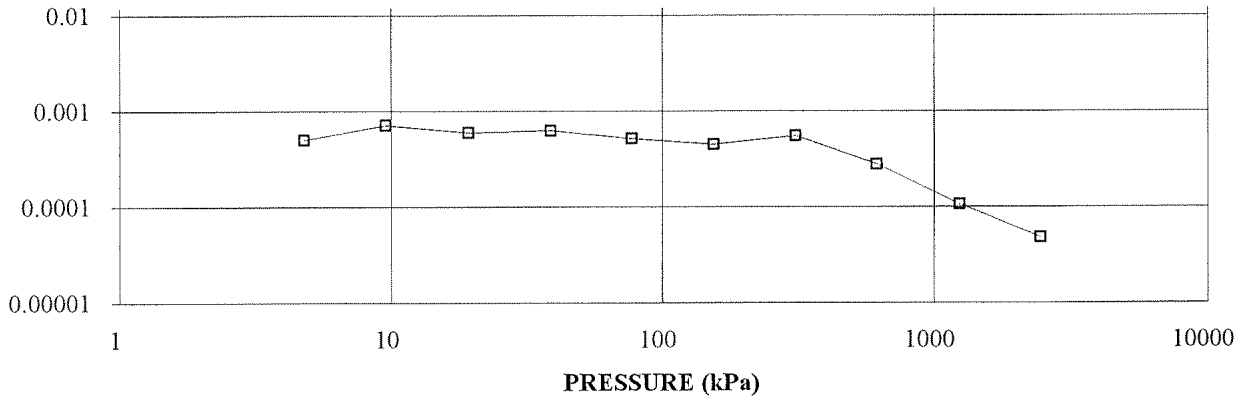
COEFFICIENT OF CONSOLIDATION,  $\text{cm}^2/\text{s}$

**CONSOLIDATION TEST**  
 $\text{cv cm}^2/\text{s}$  vs PRESSURE (kPa)  
 SA-22



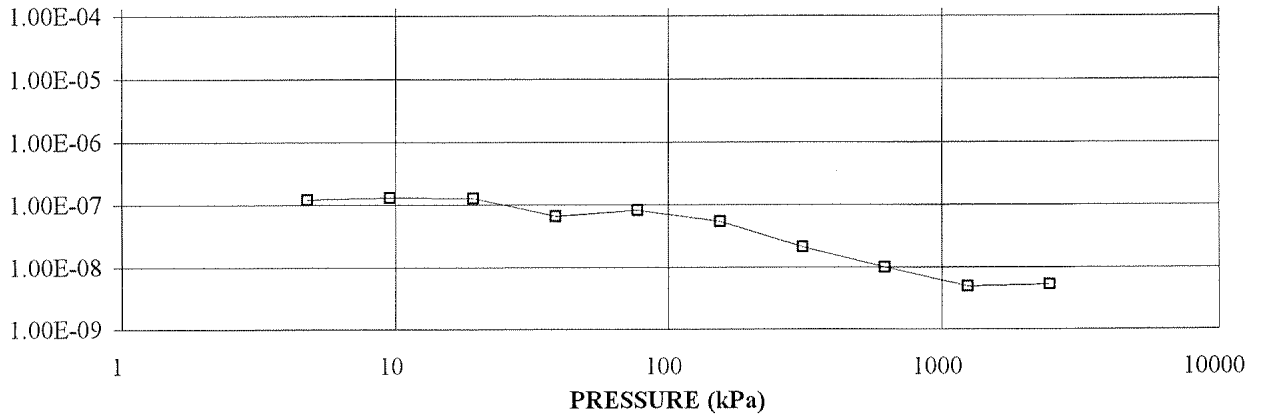
VOLUME  
 COMPRESSIBILITY,  
 $\text{m}^2/\text{kN}$

**CONSOLIDATION TEST**  
 $\text{mv, m}^2/\text{kN}$  vs PRESSURE (kPa)  
 SA-22



HYDRAULIC  
 CONDUCTIVITY,  $\text{cm}/\text{s}$

**CONSOLIDATION TEST**  
 HYDRAULIC CONDUCTIVITY vs PRESSURE  
 SA-22



Project No. 011-7112

## SUMMARY OF LABORATORY VANE TESTING

Project Number		011-7112		Date of Testing			December, 2001		
Borehole Number	Sample Number	Sample Depth m	Vane Angular Deflection	Peak	Residual	Vane Blade	Peak	Residual	Water
			Peak / Residual Degrees	Torque Nm	Torque Nm	Constant m <sup>3</sup>	Shear Strength kPa	Shear Strength kPa	Content %
-	S-12	5.48-6.10	47/4	0.09	0.01	4.24E-06	20.87	1.78	39.3%
-	S-12	9.14-9.75	104/8	0.47	0.04	4.24E-06	109.76	8.88	61.0%
-	S-16	5.48-6.10	50/2	0.09	0	4.24E-06	22.21	0.89	41.0%
-	S-16	7.32-7.92	53/10	0.1	0.02	4.24E-06	23.54	4.44	73.7%
-	S-18	4.88-5.48	43/5	0.08	0.01	4.24E-06	19.10	2.22	66.1%
-	S-18	7.32-7.92	55/9	0.1	0.02	4.24E-06	24.43	4.00	56.5%
-	S-21	7.92-8.53	56.5/20	0.26	0.09	4.27E-06	60.60	20.89	53.1%
-	S-22	6.71-7.32	74/9	0.14	0.02	4.24E-06	32.87	4.00	79.6%
-	S-22	9.75-10.36	56/6	0.11	0.01	4.24E-06	24.87	2.66	72.1%
-	S-24	6.10-6.71	28/12	0.13	0.06	4.27E-06	29.64	13.23	37.7%
-	S-24	8.53-9.14	61/12	0.28	0.06	4.27E-06	64.85	13.23	38.0%

## OEDOMETER CONSOLIDATION SUMMARY

### SAMPLE IDENTIFICATION

Project Number	011-7112	Sample Number	S-22
Borehole Number	-	Sample Depth, m	9.8-10.4

### TEST CONDITIONS

Test Type	Standard	Load Duration, hr	24
Oedometer Number	6		
Date Started	01-11-28		
Date Completed	01-12-10		

### SAMPLE DIMENSIONS AND PROPERTIES - INITIAL

Sample Height, cm	1.91	Unit Weight, kN/m <sup>3</sup>	15.56
Sample Diameter, cm	6.34	Dry Unit Weight, kN/m <sup>3</sup>	9.10
Area, cm <sup>2</sup>	31.61	Specific Gravity, measured	2.76
Volume, cm <sup>3</sup>	60.37	Solids Height, cm	0.642
Water Content, %	71.05	Volume of Solids, cm <sup>3</sup>	20.29
Wet Mass, g	95.79	Volume of Voids, cm <sup>3</sup>	40.08
Dry Mass, g	56.00	Degree of Saturation, %	99.3

### TEST COMPUTATIONS

Pressure kPa	Corr. Height cm	Void Ratio	Average Height cm	t <sub>90</sub> sec	cv, cm <sup>2</sup> /s	mv m <sup>2</sup> /kN	k cm/s
0.00	1.910	1.976	1.910				
4.76	1.905	1.968	1.908	313	2.46E-03	5.06E-04	1.22E-07
9.56	1.899	1.958	1.902	406	1.89E-03	7.20E-04	1.33E-07
19.29	1.888	1.941	1.893	350	2.17E-03	6.03E-04	1.28E-07
38.75	1.864	1.904	1.876	690	1.08E-03	6.35E-04	6.73E-08
77.53	1.825	1.843	1.845	448	1.61E-03	5.25E-04	8.29E-08
154.98	1.759	1.740	1.792	540	1.26E-03	4.50E-04	5.56E-08
310.31	1.595	1.484	1.677	1500	3.97E-04	5.52E-04	2.15E-08
620.27	1.428	1.224	1.511	1343	3.60E-04	2.82E-04	9.96E-09
1240.19	1.302	1.028	1.365	825	4.79E-04	1.06E-04	4.98E-09
2479.57	1.189	0.852	1.245	289	1.14E-03	4.78E-05	5.33E-09
1240.19	1.205	0.877	1.197				
620.27	1.224	0.907	1.215				
310.31	1.247	0.943	1.236				
77.53	1.305	1.033	1.276				
19.29	1.347	1.099	1.326				
4.76	1.385	1.158	1.366				

Notes:

k calculated using cv based on t<sub>90</sub> values.

### SAMPLE DIMENSIONS AND PROPERTIES - FINAL

Sample Height, cm	1.39	Unit Weight, kN/m <sup>3</sup>	17.90
Sample Diameter, cm	6.34	Dry Unit Weight, kN/m <sup>3</sup>	12.54
Area, cm <sup>2</sup>	31.61	Specific Gravity, measured	2.76
Volume, cm <sup>3</sup>	43.78	Solids Height, cm	0.642
Water Content, %	42.73	Volume of Solids, cm <sup>3</sup>	20.29
Wet Mass, g	79.93	Volume of Voids, cm <sup>3</sup>	23.49
Dry Mass, g	56.00		

**ANNEXE F**

**RÉSULTATS DES ESSAIS DE LABORATOIRE  
DES ÉTUDES ANTÉRIEURES**

**ANNEXE F-1**

**LEROUX, LEROUX, NANTEL, PÉPIN ET ASSOCIÉS**

**1975**

# ANALYSE GRANULOMETRIQUE

Puits No: LEROUX, LEROUX

Profondeur: 5'

Date: 14 NOVEMBRE 1973

Silt

Sable

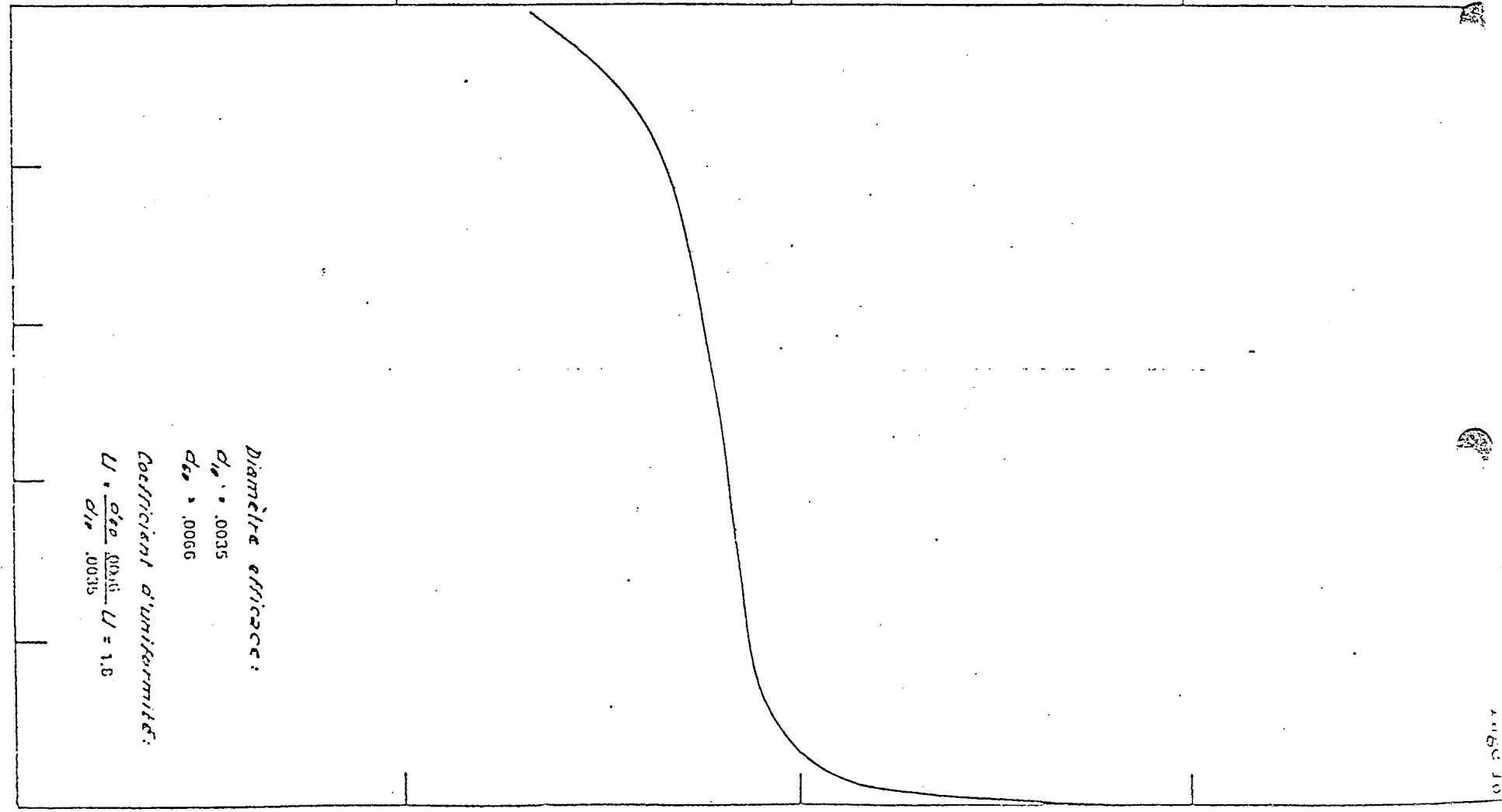
Gravier

1/10" - 3

Diamètres (pouce)

1/16" - 1

1/10" - 1



10 2507

# ANALYSE GRANULOMETRIQUE

Puits No: LEROUX, LEROUX

Profondeur: 5'

Date: 14 NOVEMBRE 1975

Silt

Sable

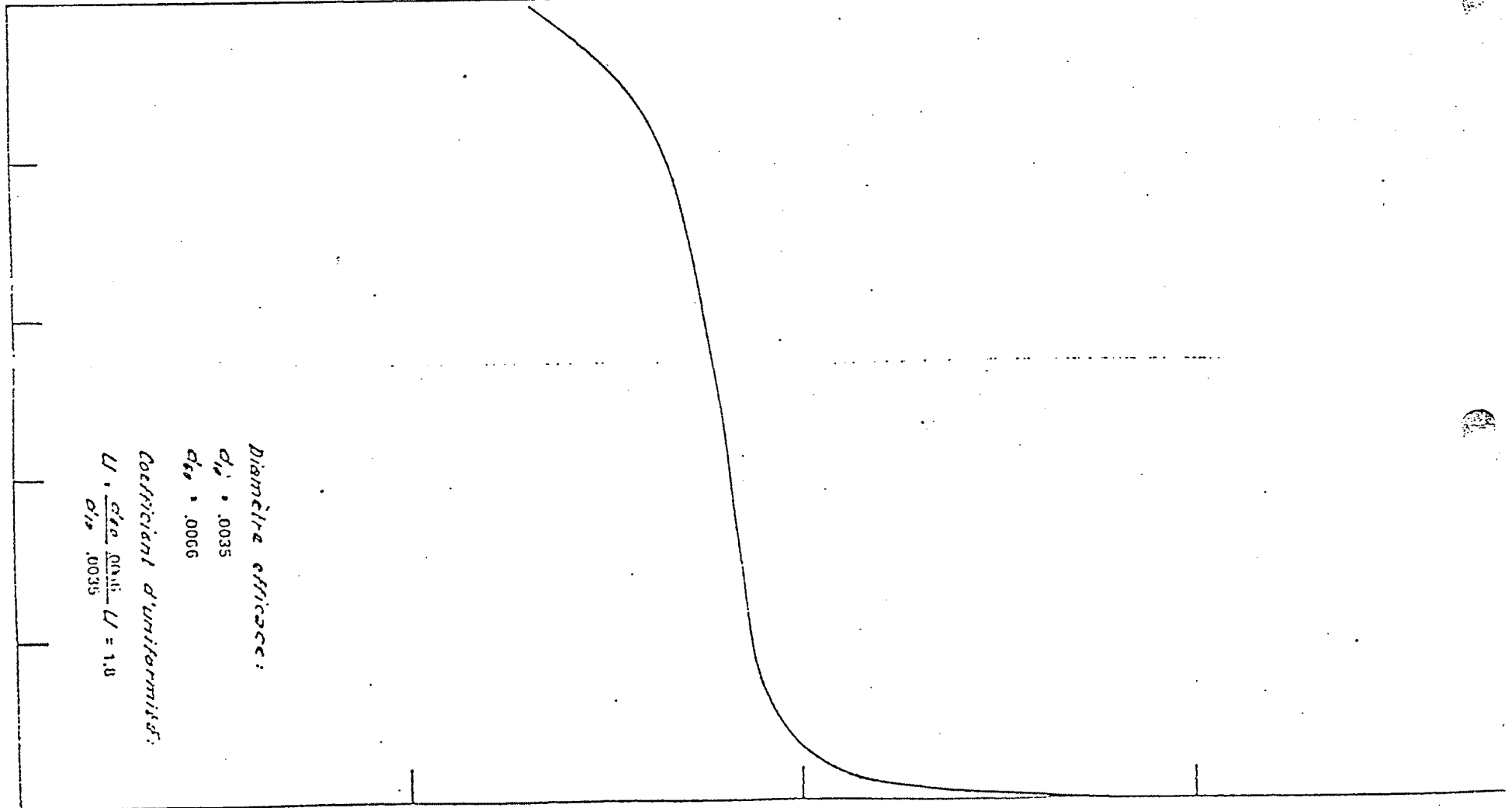
Gravier

$1 \times 10^{-3}$

Diamètres (pouce)

$1 \times 10^{-1}$

$1 \times 10^{-1}$





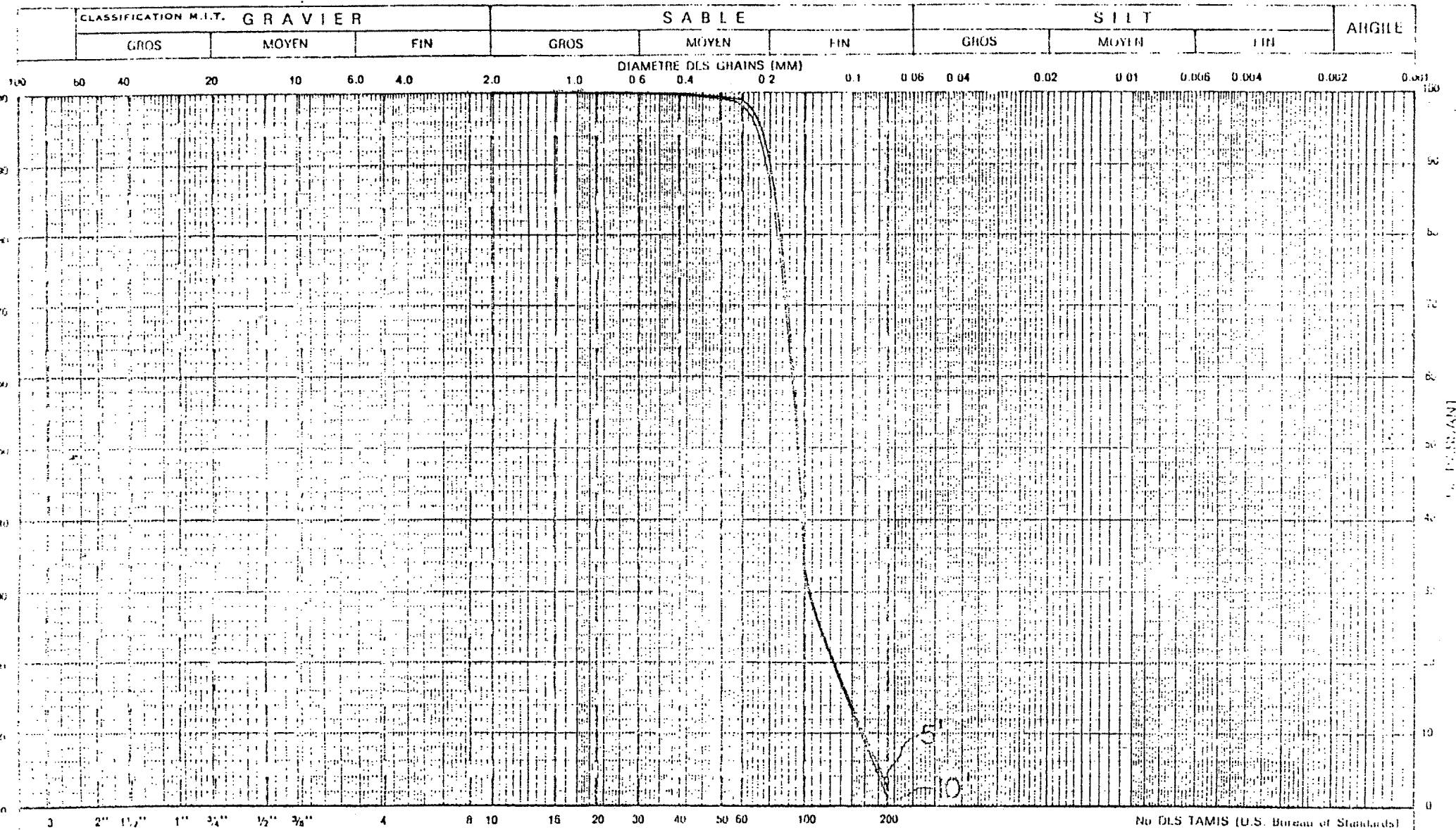
**ANNEXE F-2**

**HYDROGÉO CANADA INC.**

**1981**

# COMPAGNIE NATIONALE DE FORAGE ET SONDAGE INC.

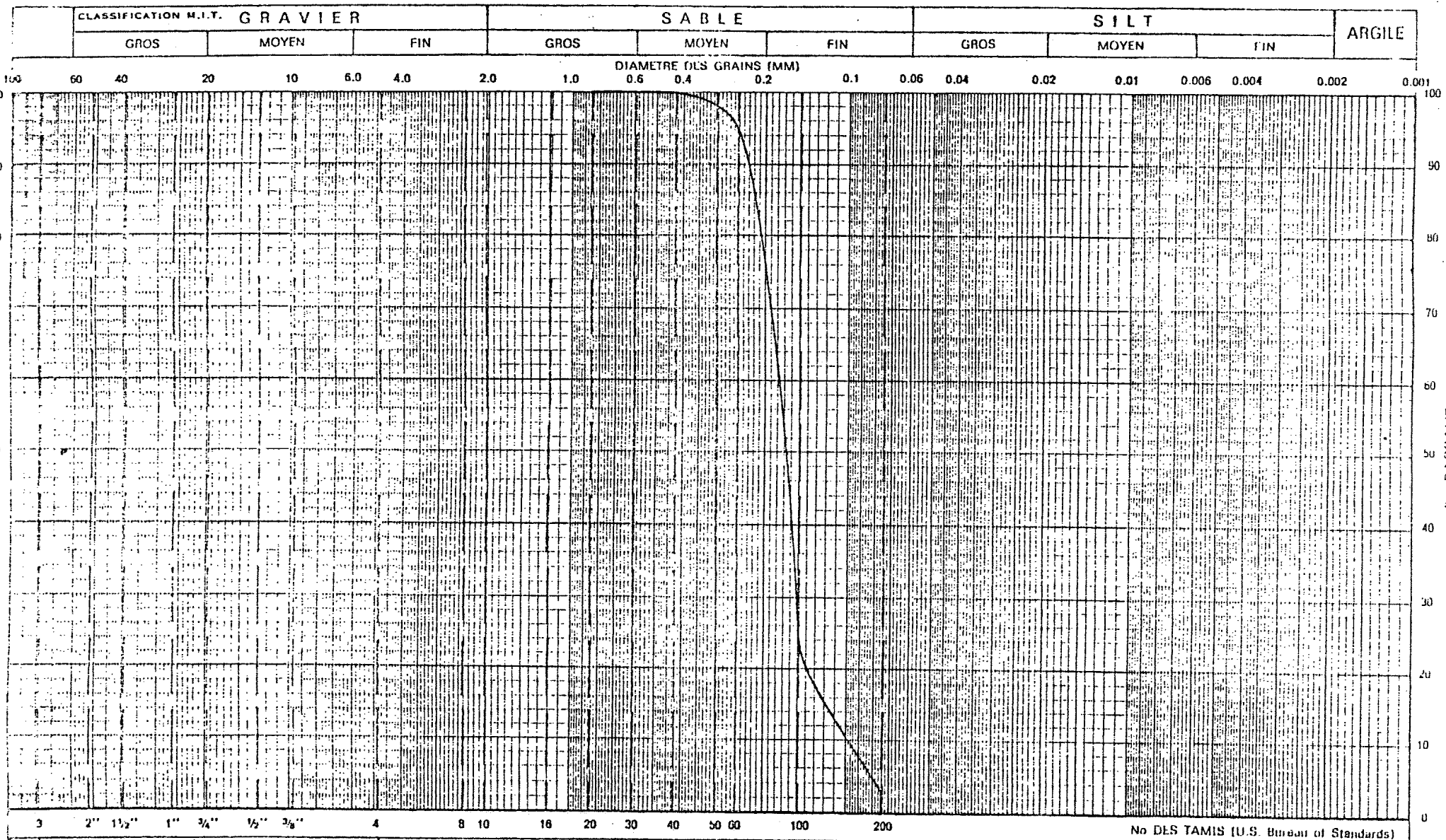
## ANALYSE GRANULOMÉTRIQUE



CLASSIFICATION UNIFIÉE DES SOLS			GRAVIER			SABLE			PARTICULES FINES		
GROS		FIN	GROS	MOYEN	FIN	SILT ET ARGILE					
FORAGE NO	PROFONDEUR		ECHANTILLON NO		PROVENANCE						
1	5' - 10'				ROBERT RICHER LTEE						
REMARQUES					PROJET			DATE	CONTRAT NO		
					ETUDE HYDROGEOLOGIQUE			JUN '81	4973		

# COMPAGNIE NATIONALE DE FORAGE ET SONDAGE INC.

## ANALYSE GRANULOMÉTRIQUE

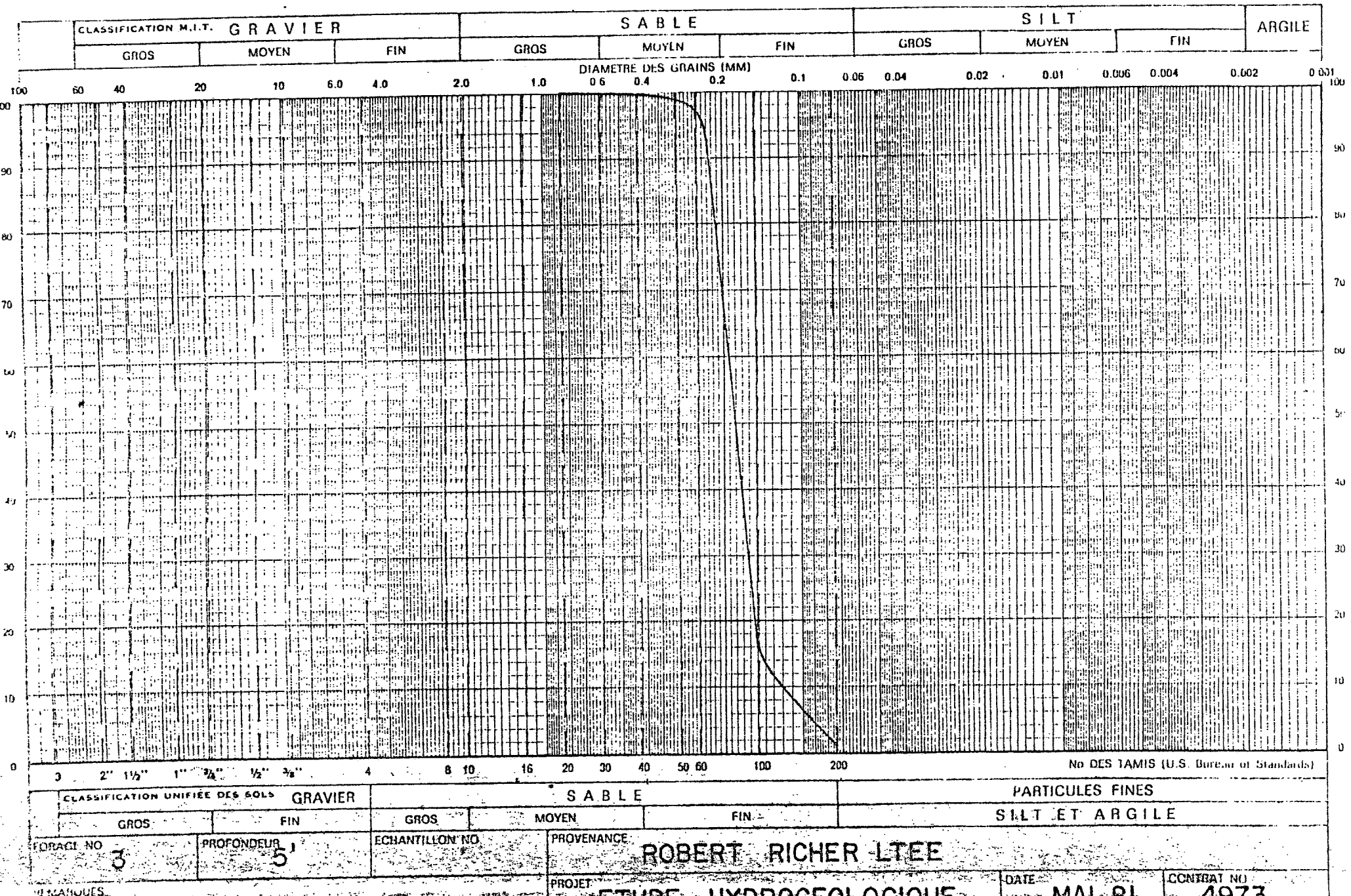


CLASSIFICATION UNIFIÉE DES SOLS		GRAVIER		SABLE		PARTICULES FINES					
GROS		FIN		GROS		MOYEN		FIN		SILT ET ARGILE	
FORAGE NO	PROFONDEUR	ECHANTILLON NO		PROVENANCE							
2	10'			ROBERT RICHER LTEE							
PROJET				DATE				CONTRAT NO			
ETUDE HYDROGEOLOGIQUE				MAI 81				4973			

# COMPAGNIE NATIONALE DE FORAGE ET SONDRAGE INC.

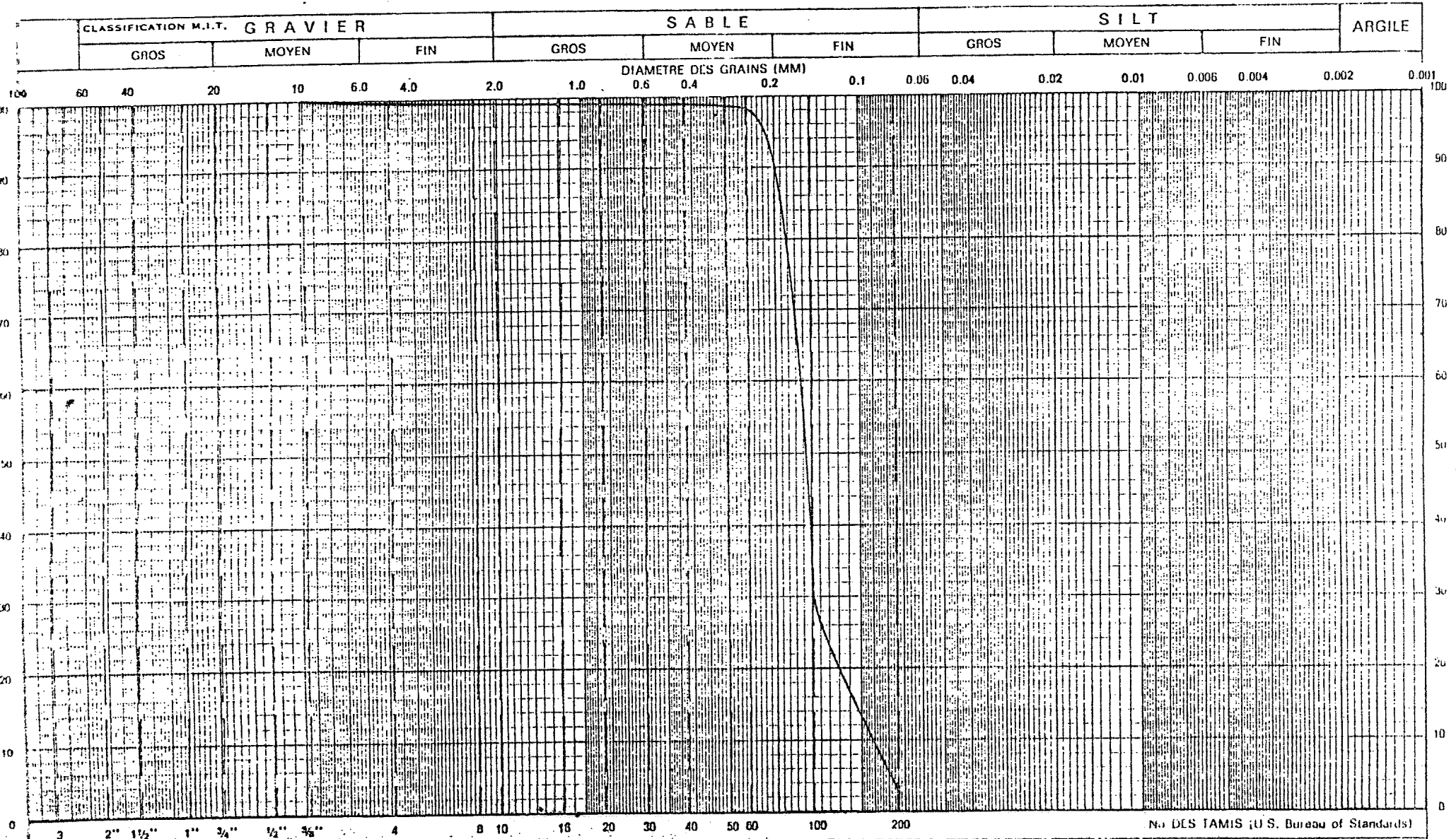
## ANALYSE GRANULOMETRIQUE

U. A.



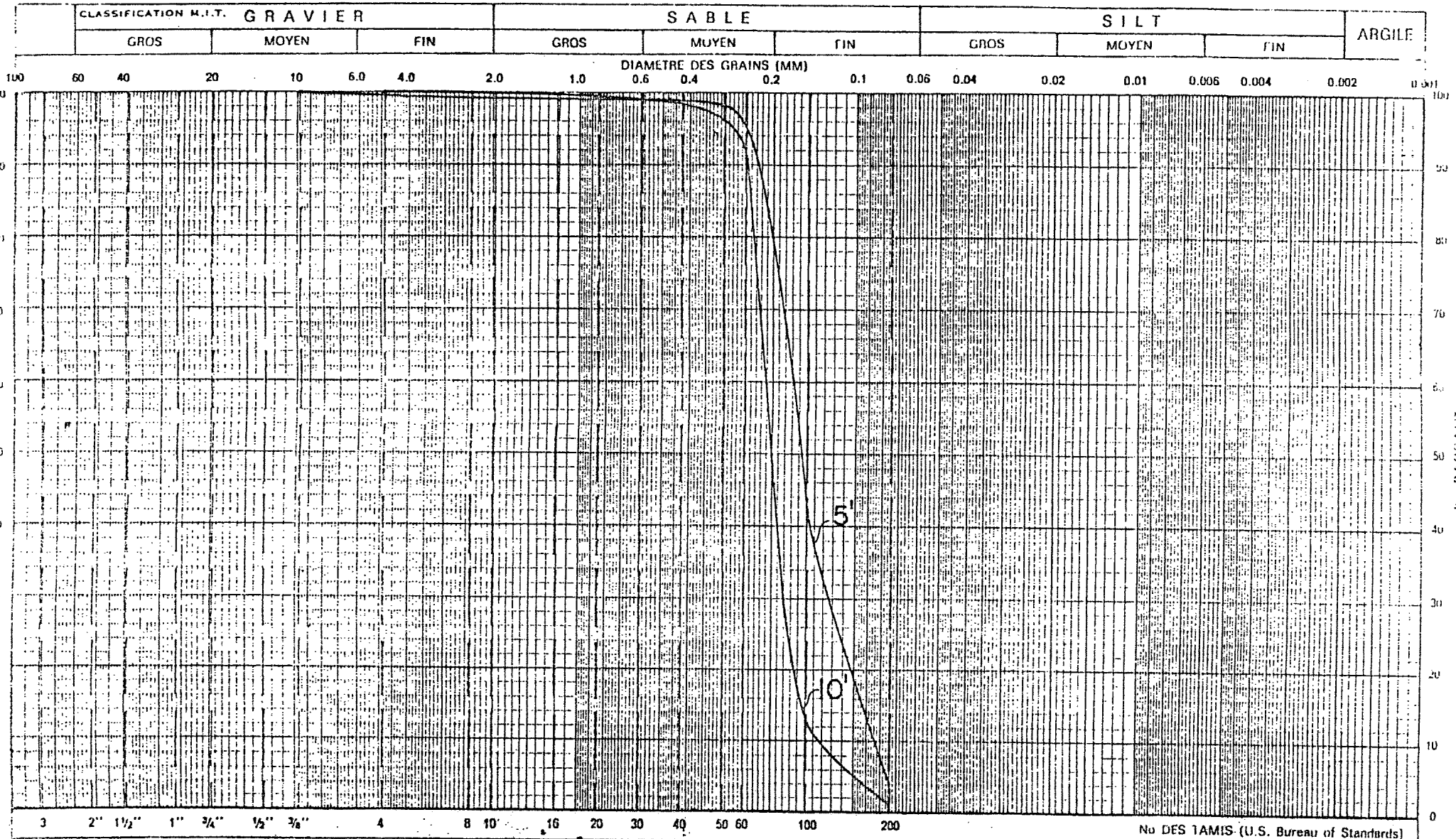
# COMPAGNIE NATIONALE DE FORAGE ET SONDRAGE INC.

## ANALYSE GRANULOMETRIQUE



CLASSIFICATION UNIFIEE DES SOLS		SABLE			PARTICULES FINES	
GROS	FIN	GROS	MOYEN	FIN	SILT ET ARGILE	
4	5					
FORAGE NO	PROFONDEUR	ECHANTILLON NO	PROVENANCE			
4	5		ROBERT RICHER LTEE			

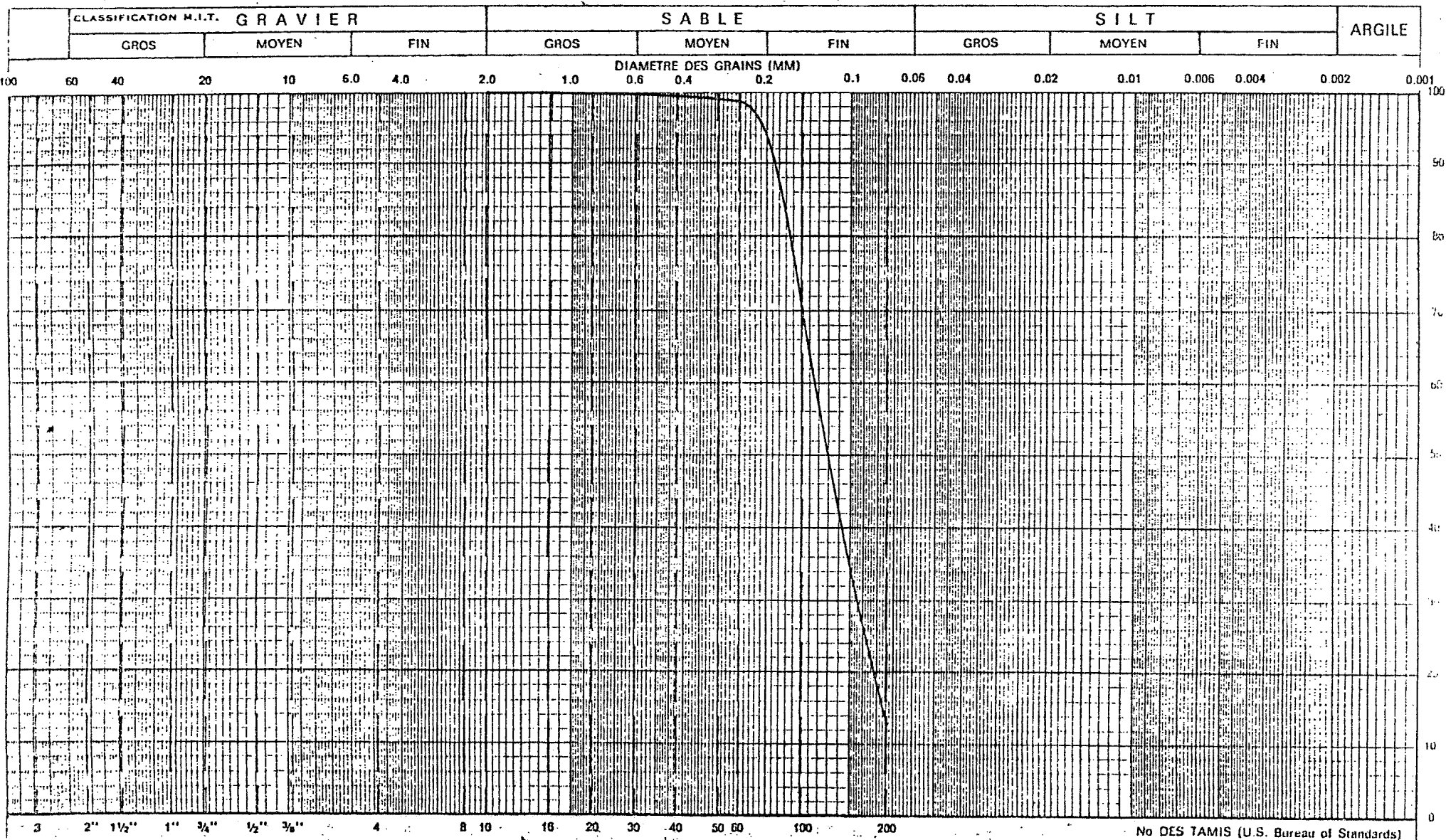
**COMPAGNIE NATIONALE DE FORAGE ET SONDRAGE INC.**  
**ANALYSE GRANULOMETRIQUE**



CLASSIFICATION UNIFIÉE DES SOLS		GRAVIER		SABLE			PARTICULES FINES	
GROS		FIN		GROS	MOYEN	FIN	SILT ET ARGILE	
FORAGE NO	PROFONDEUR	ECHANTILLON NO	PROVENANCE					DATE
5	5 - 10'		ROBERT RICHER LTEE					
REMARQUES			PROJET	ETUDE HYDROGÉOLOGIQUE			CONTRAT NO.	

# COMPAGNIE NATIONALE DE FORAGE ET SONDRAGE INC.

## ANALYSE GRANULOMÉTRIQUE



CLASSIFICATION UNIFIÉE DES SOLS		GRAVIER		SABLE		PARTICULES FINES	
GROS		FIN		GROS		SILT ET ARGILE	
FORAGE NO	PROFONDEUR	ECHANTILLON NO	PROVENANCE				
6	5'		ROBERT RICHER LTEE				
DI MARCOUS	PROJET		DATE		CONTRAT NO		
	ETUDE HYDROGÉOLOGIQUE		11-01-01		1077		

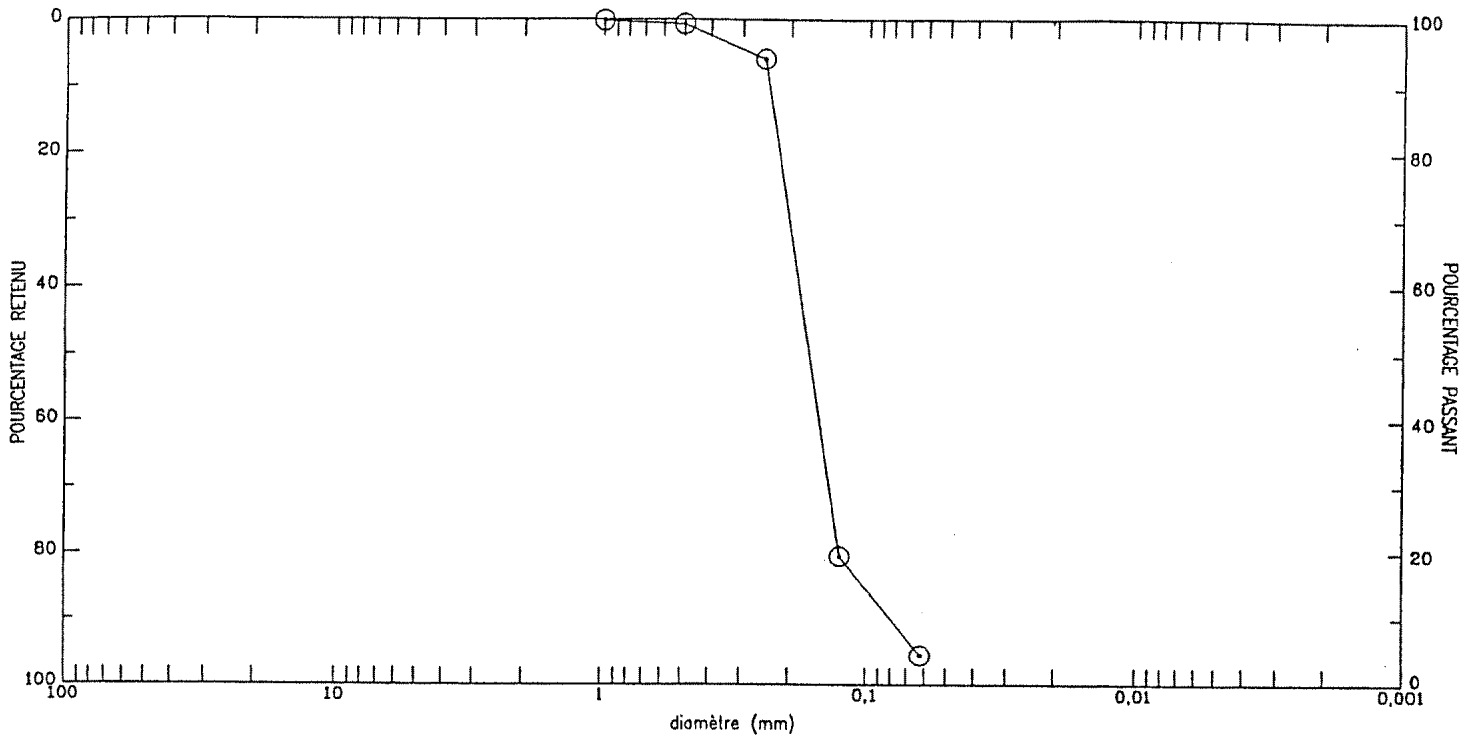
**ANNEXE F-3**

**FORATEK INC.**

**1989**



# COURBE GRANULOMETRIQUE



CAILLOUX	GRAVIER					SABLE					SILT				ARGILE
	TRES GROS	GROS	MOYEN	FIN	TRES FIN	TRES GROS	GROS	MOYEN	FIN	TRES FIN	GROS	MOYEN	FIN	TRES FIN	

DATE: 4/10/89  
 LOCALISATION: Sainte - Sophie  
 FORAGE: PZ 2  
 PROFONDEUR: 8'-8'

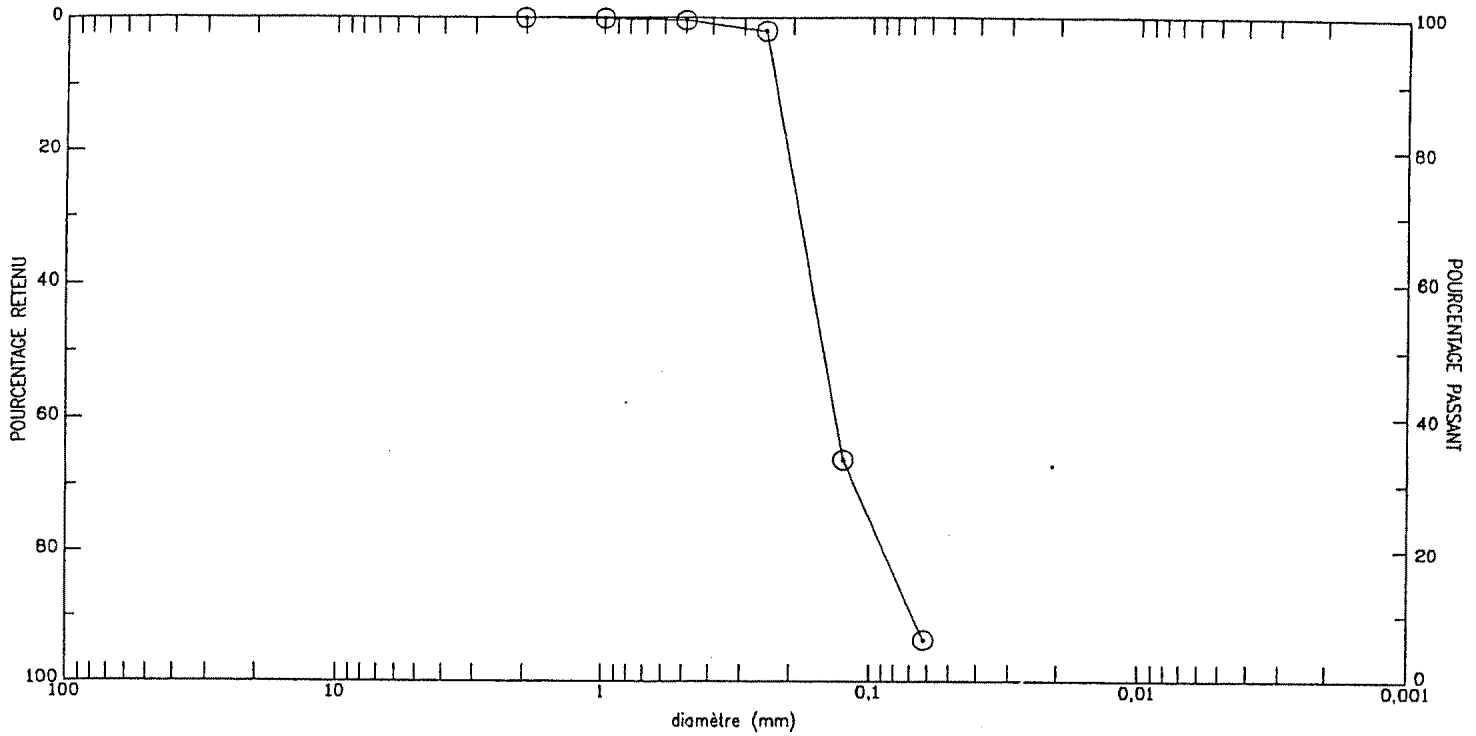


**FORATEK Inc.**

2251 Ch. St. Francois  
 Dorval, Quebec  
 H9P 1K3  
 Tel.: (514) 683-2860

NO. DE MAILLE	(mm)	RETENU	POIDS CUMULE EN % PASSE	%	POIDS CUMULE EN % RETENU
18	1.000	1.100	99.813	0.187	0.187
35	0.500	2.800	99.336	0.477	0.664
60	0.250	30.300	94.179	5.157	5.821
120	0.125	437.900	19.643	74.536	80.357
230	0.062	89.200	4.460	15.183	95.540
0	0.000	26.200	0.000	4.460	100.000

# COURBE GRANULOMETRIQUE



CAILLOUX	GRAVIER					SABLE					SILT				ARGILE
	TRES GROS	GROS	MOYEN	FIN	TRES FIN	TRES GROS	GROS	MOYEN	FIN	TRES FIN	GROS	MOYEN	FIN	TRES FIN	

DATE: 04/10/89  
 LOCALISATION: Sainte SOPHIE  
 FORAGE: PZ 3  
 PROFONDEUR: 5'-8'6"

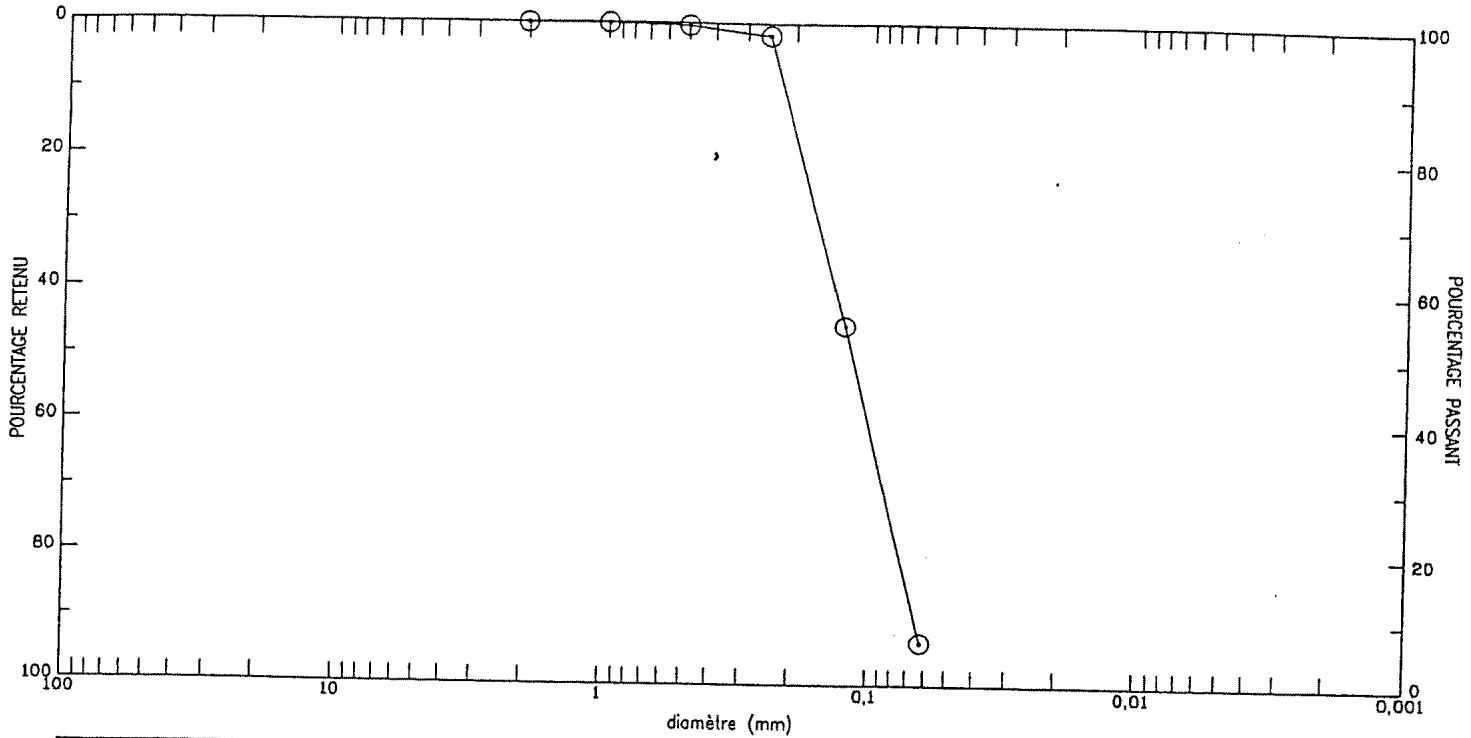


**FORATEK Inc.**

2251 Ch. St. Francois  
 Dorval, Quebec  
 H9P 1K3  
 Tel.: (514) 683-2860

NO. DE MAILLE	(mm)	RETENU	POIDS CUMULE EN % PASSE	%	POIDS CUMULE EN % RETENU
10	2.000	0.300	99.927	0.073	0.073
18	1.000	0.350	99.843	0.085	0.157
35	0.500	1.150	99.564	0.279	0.436
60	0.250	6.400	98.014	1.550	1.986
120	0.125	264.980	33.827	64.186	66.173
230	0.062	113.800	6.262	27.566	93.738
0	0.000	25.850	0.000	6.262	100.000

# COURBE GRANULOMETRIQUE



CAILLOUX	GRAVIER					SABLE					SILT				ARGILE
	TRES GROS	GROS	MOYEN	FIN	TRES FIN	TRES GROS	GROS	MOYEN	FIN	TRES FIN	GROS	MOYEN	FIN	TRES FIN	

DATE: 26/10/89  
 LOCALISATION: Sainte - Sophie  
 FORAGE: PZ 4  
 PROFONDEUR: 5'-6'66"

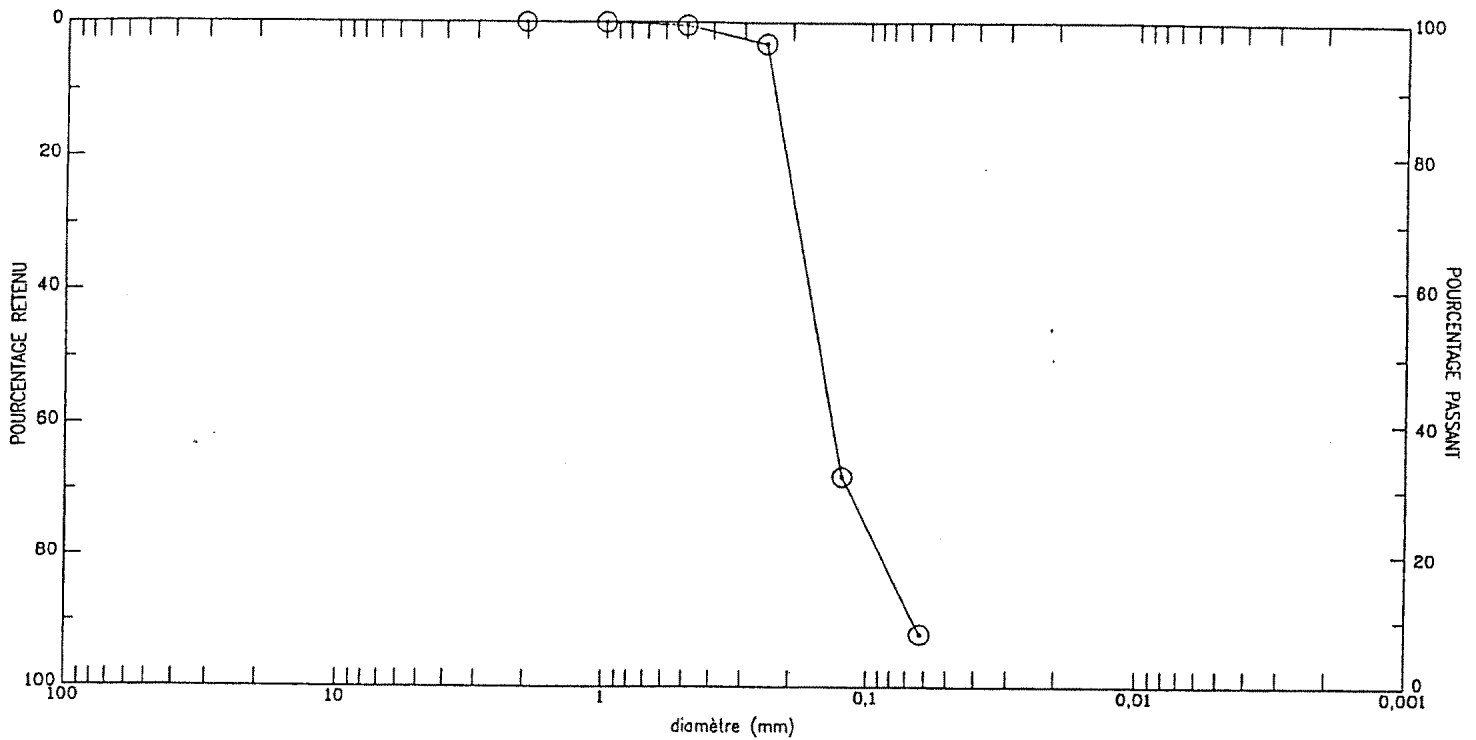


**FORATEK Inc.**

2251 Ch. St. Francois  
 Dorval, Quebec  
 H9P 1K3  
 Tel.: (514) 683-2860

NO. DE MAILLE	(mm)	RETENU	POIDS CUMULE EN % PASSE	%	POIDS CUMULE EN % RETENU
10	2.000	0.340	99.931	0.069	0.069
18	1.000	0.300	99.870	0.061	0.130
35	0.500	1.100	99.645	0.224	0.355
60	0.250	7.150	98.188	1.457	1.812
120	0.125	212.100	54.954	43.234	45.046
230	0.062	236.800	6.686	48.268	93.314
0	0.000	32.800	-0.000	6.686	100.000

# COURBE GRANULOMETRIQUE



CAILLoux	GRAVIER					SABLE					SILT				ARGILE
	TRES GROS	GROS	MOYEN	FIN	TRES FIN	TRES GROS	GROS	MOYEN	FIN	TRES FIN	GROS	MOYEN	FIN	TRES FIN	

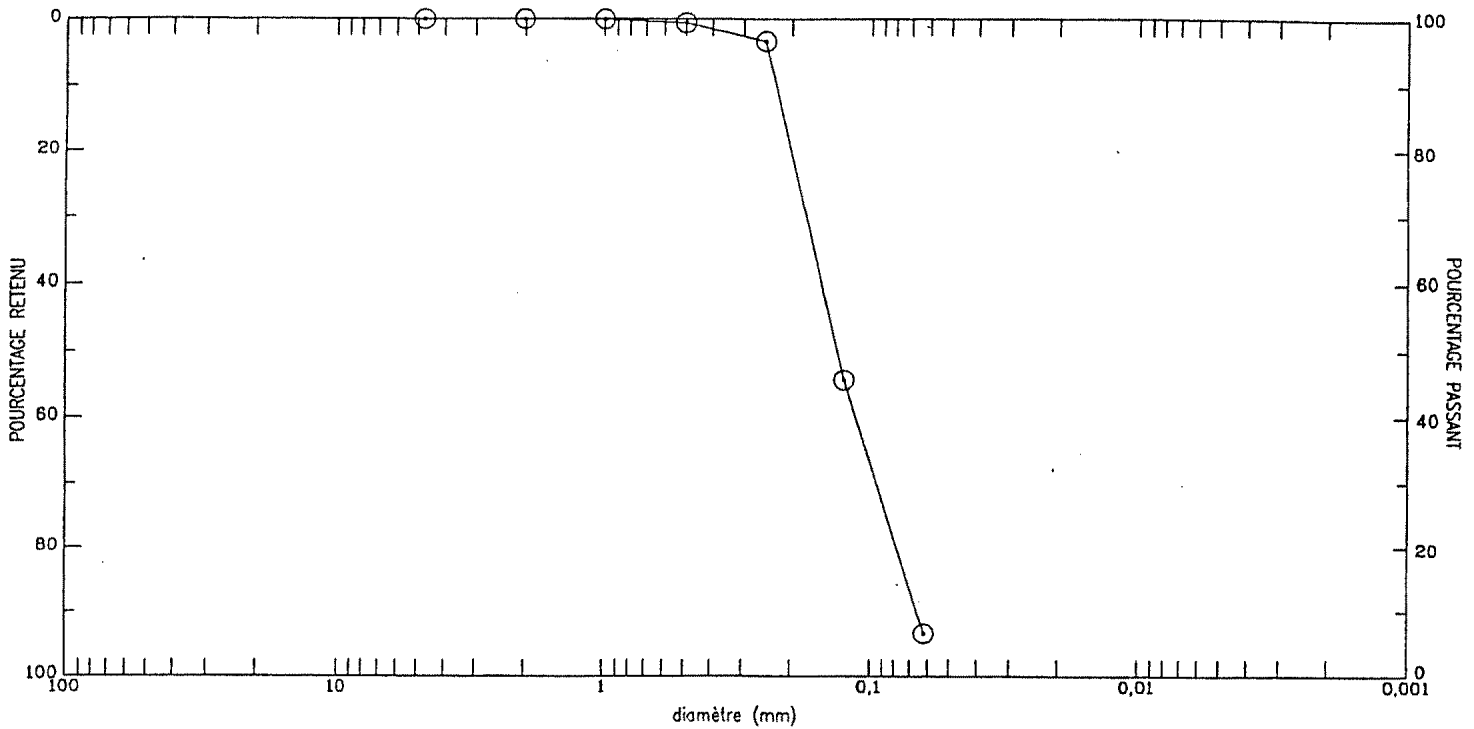
DATE: 26/10/89  
 LOCALISATION: Sainte - Sophie  
 FORAGE: PZ 5  
 PROFONDEUR: 10' - 11'6"



**FORATEK Inc.**  
 2251 Ch. St. Francois  
 Dorval, Quebec  
 H9P 1K3  
 Tel.: (514) 683-2860

NO. DE MAILLE	(mm)	RETENU	POIDS CUMULE EN % PASSE	%	POIDS CUMULE EN % RETENU
10	2.000	0.200	99.963	0.037	0.037
18	1.000	0.320	99.905	0.059	0.095
35	0.500	2.000	99.538	0.367	0.462
60	0.250	14.430	96.891	2.647	3.109
120	0.125	353.200	32.101	64.790	67.899
230	0.062	131.100	8.053	24.048	91.947
0	0.000	43.900	0.000	8.053	100.000

# COURBE GRANULOMETRIQUE



CAILLOUX	GRAVIER					SABLE					SILT				ARGILE
	TRES GROS	GROS	MOYEN	FIN	TRES FIN	TRES GROS	GROS	MOYEN	FIN	TRES FIN	GROS	MOYEN	FIN	TRES FIN	

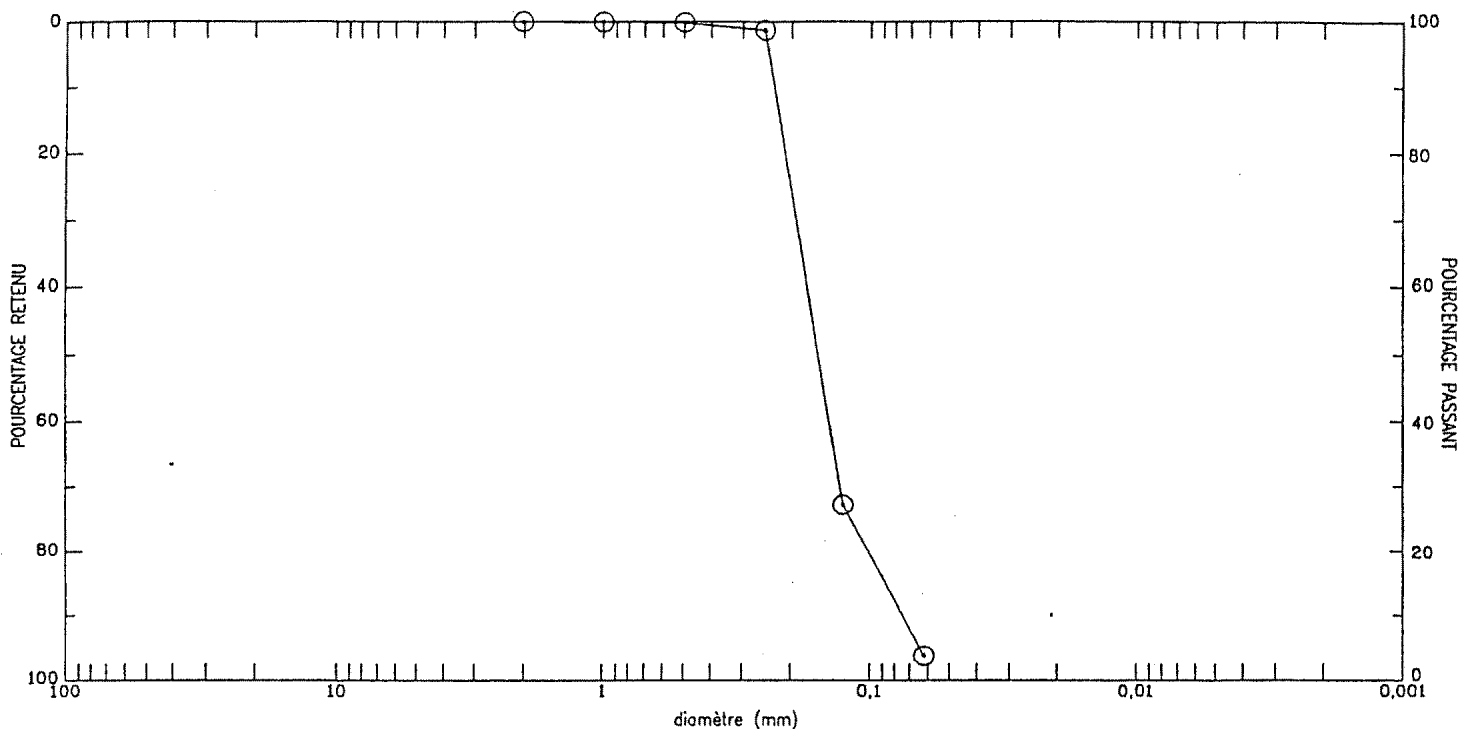
DATE: 26/10/89  
 LOCALISATION: Sainte - Sophie  
 FORAGE: PZ 6  
 PROFONDEUR: 5'-7.5'



**FORATEK Inc.**  
 2251 Ch. St. Francois  
 Dorval, Quebec  
 H9P 1K3  
 Tel.: (514) 683-2860

NO. DE MAILLE	(mm)	RETENU	POIDS CUMULE EN % PASSE	%	POIDS CUMULE EN % RETENU
4	4.750	0.000	100.000	0.000	0.000
10	2.000	0.100	99.970	0.030	0.030
18	1.000	0.200	99.911	0.060	0.089
35	0.500	1.600	99.434	0.477	0.566
60	0.250	9.300	96.661	2.773	3.339
120	0.125	170.600	45.796	50.865	54.204
230	0.062	131.500	6.589	39.207	93.411
0	0.000	22.100	-0.000	6.589	100.000

# COURBE GRANULOMETRIQUE



CAILLOUX	GRAVIER					SABLE					SILT				ARGILE
	TRES GROS	GROS	MOYEN	FIN	TRES FIN	TRES GROS	GROS	MOYEN	FIN	TRES FIN	GROS	MOYEN	FIN	TRES FIN	

DATE: 03/10/89  
 LOCALISATION: Sainte Sophie  
 FORAGE: PZ 7  
 PROFONDEUR: 10'-15'

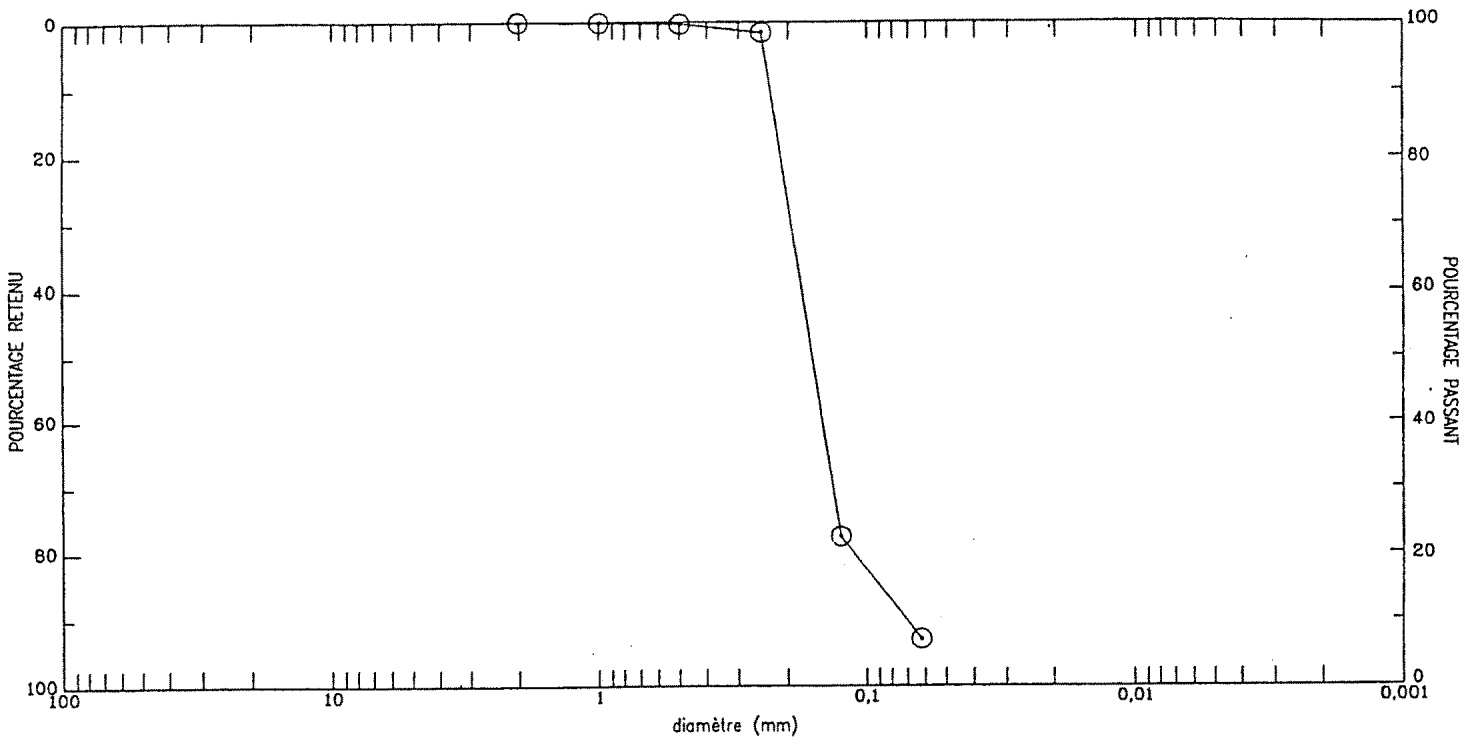


**FORATEK Inc.**

2251 Ch. St. Francois  
 Dorval, Quebec  
 H9P 1K3  
 Tel.: (514) 683-2860

NO. DE MAILLE	(mm)	RETENU	POIDS CUMULE EN % PASSE	%	POIDS CUMULE EN % RETENU
10	2.000	0.150	99.976	0.024	0.024
18	1.000	0.250	99.937	0.039	0.063
35	0.500	0.500	99.859	0.079	0.141
60	0.250	7.200	98.728	1.131	1.272
120	0.125	455.250	27.243	71.485	72.757
230	0.062	149.800	3.721	23.522	96.279
0	0.000	23.700	-0.000	3.721	100.000

# COURBE GRANULOMETRIQUE



CAILLOUX	GRAVIER					SABLE					SILT				ARGILE
	TRES GROS	GROS	MOYEN	FIN	TRES FIN	TRES GROS	GROS	MOYEN	FIN	TRES FIN	GROS	MOYEN	FIN	TRES FIN	

DATE: 26/10/89  
 LOCALISATION: Sainte - Sophie  
 FORAGE: PZ 8  
 PROFONDEUR: 5'-9'6"

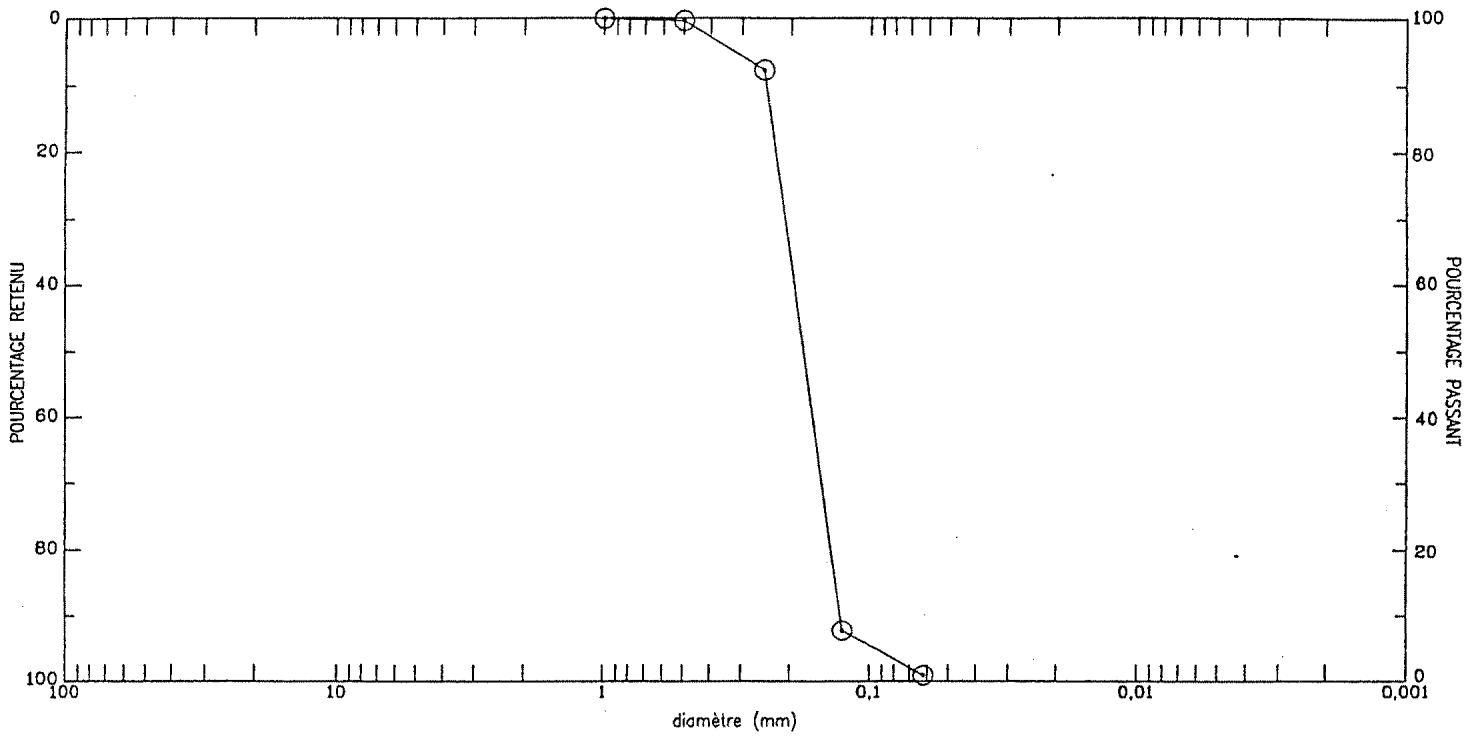


**FORATEK Inc.**

2251 Ch. St. Francois  
 Dorval, Quebec  
 H9P 1K3  
 Tel.: (514) 683-2860

NO. DE MAILLE	(mm)	RETENU	POIDS CUMULE EN % PASSE	%	POIDS CUMULE EN % RETENU
10	2.000	0.100	99.981	0.019	0.019
18	1.000	0.300	99.925	0.056	0.075
35	0.500	1.200	99.701	0.224	0.299
60	0.250	6.700	98.451	1.250	1.549
120	0.125	406.400	22.602	75.849	77.398
230	0.062	83.200	7.074	15.528	92.926
0	0.000	37.900	0.000	7.074	100.000

# COURBE GRANULOMETRIQUE



CAILLOUX	GRAVIER					SABLE					SILT				ARGILE
	TRES GROS	GROS	MOYEN	FIN	TRES FIN	TRES GROS	GROS	MOYEN	FIN	TRES FIN	GROS	MOYEN	FIN	TRES FIN	

DATE: 26/10/89  
 LOCALISATION: Sainte - Sophie  
 FORAGE: PZ 10  
 PROFONDEUR: 5'-10'

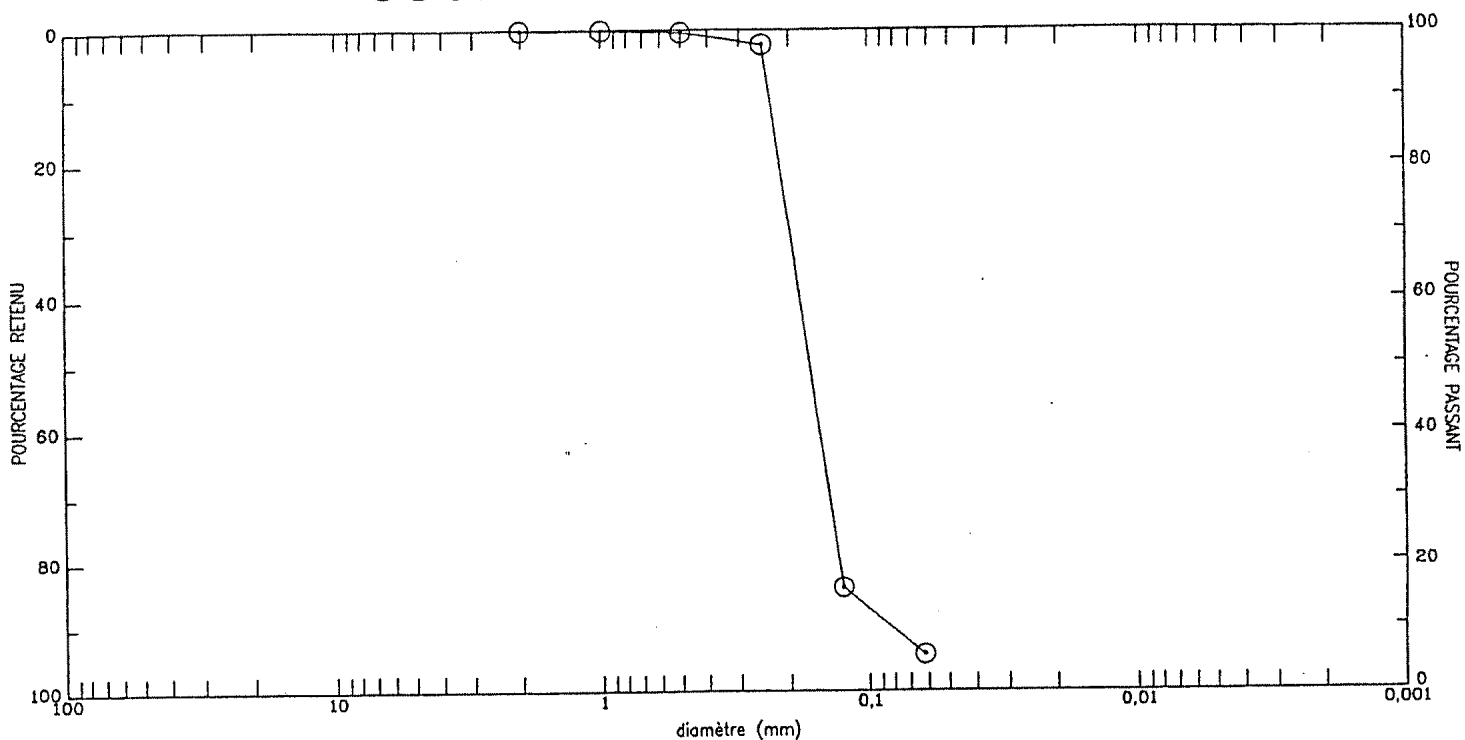


**FORATEK Inc.**  
 2251 Ch. St. Francois  
 Dorval, Quebec  
 H9P 1K3  
 Tel.: (514) 683-2860

NO. DE MAILLE	(mm)	RETENU	POIDS CUMULE EN % PASSE	%	POIDS CUMULE EN % RETENU
18	1.000	0.200	99.933	0.067	0.067
35	0.500	1.070	99.575	0.358	0.425
60	0.250	21.900	92.250	7.325	7.750
120	0.125	252.600	7.760	84.490	92.240
230	0.062	20.500	0.903	6.857	99.097
0	0.000	2.700	0.000	0.903	100.000



# COURBE GRANULOMETRIQUE



CAILLOUX	GRAVIER				SABLE					SILT				ARGILE
	TRES GROS	GROS	MOYEN	FIN	TRES FIN	TRES GROS	GROS	MOYEN	FIN	TRES FIN	GROS	MOYEN	FIN	

DATE: 04/10/89  
 LOCALISATION: Sainte SOPHIE  
 FORAGE: PZ 10  
 PROFONDEUR: 5'-10'



**FORATEK Inc.**

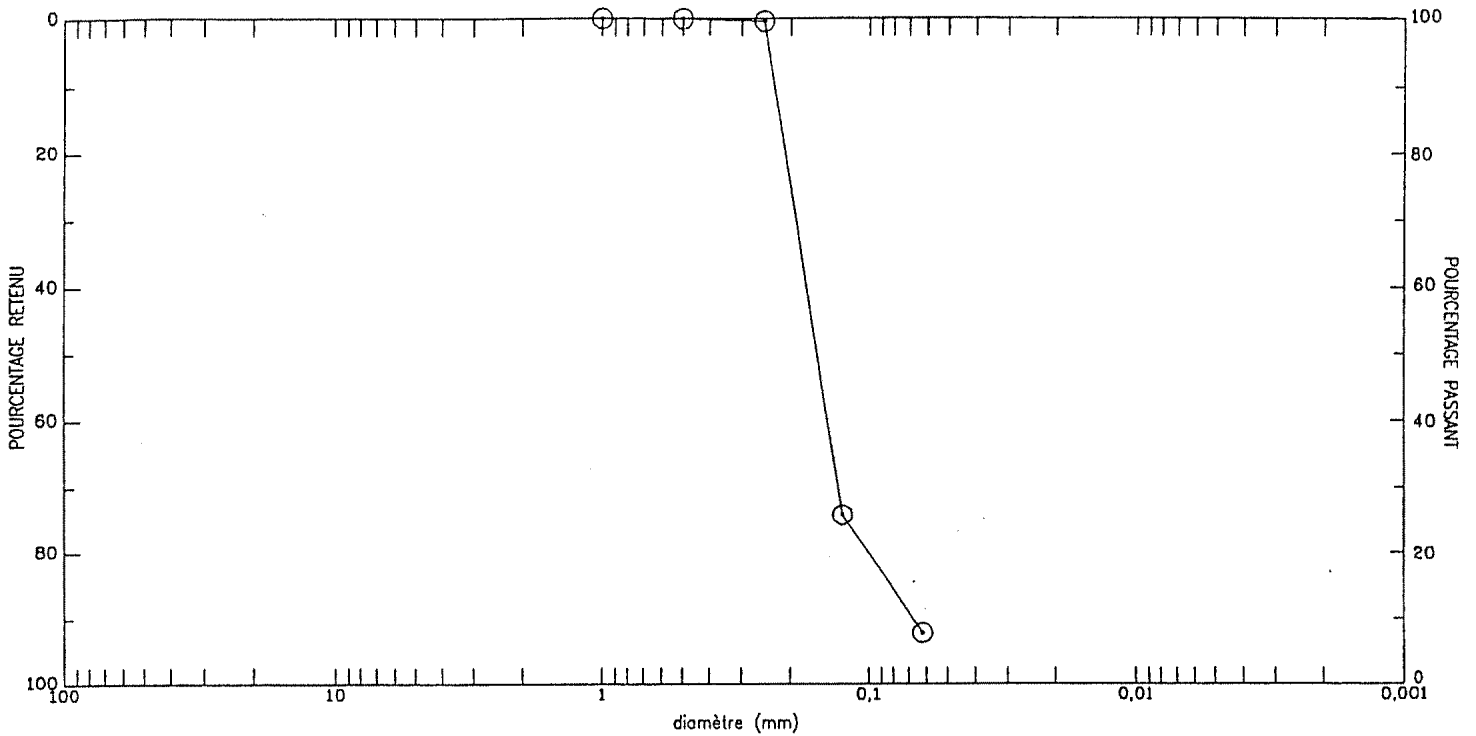
2251 Ch. St. Francois  
 Darval, Quebec  
 H9P 1K3  
 Tel.: (514) 683-2860

NO. DE MAILLE	(mm)	RETENU	POIDS CUMULE EN % PASSE	%	POIDS CUMULE EN % RETENU
10	2.000	0.300	99.949	0.051	0.051
18	1.000	0.450	99.873	0.076	0.127
35	0.500	1.700	99.585	0.288	0.415
60	0.250	10.300	97.838	1.747	2.162
120	0.125	482.400	16.041	81.797	83.959
230	0.062	61.450	5.621	10.420	94.379
0	0.000	33.150	0.000	5.621	100.000

SOL HUMIDE + TARE:	g.	POIDS DE L'EAU:	g.	*D <sub>60</sub> =:	0.181
SOL SEC + TARE:	g.	POIDS SOL SEC:	g.	D <sub>10</sub> =:	0.083
TARE:	g.	TENEUR EN EAU:	%	Cu :	2.181

\*Pourcentage passant

# COURBE GRANULOMETRIQUE



CAILLOUX	GRAVIER				SABLE					SILT				ARGILE
	TRES GROS	GROS	MOYEN	FIN	TRES FIN	TRES GROS	GROS	MOYEN	FIN	TRES FIN	GROS	MOYEN	FIN	TRES FIN

DATE: 04/10/89  
 LOCALISATION: Sainte SOPHIE  
 FORAGE: PZ 10  
 PROFONDEUR: 10'-13'



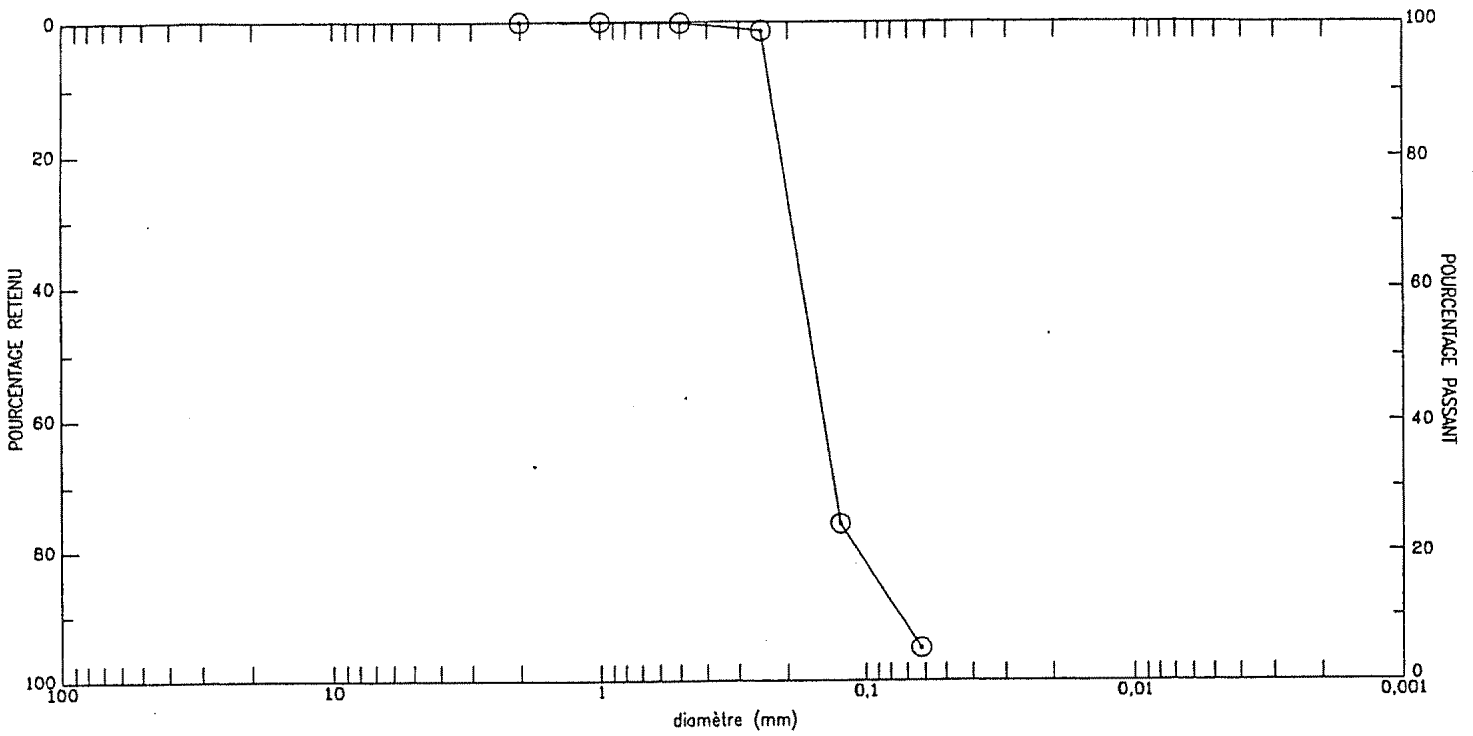
**FORATEK Inc.**  
 2251 Ch. St. Francois  
 Dorval, Quebec  
 H9P 1K3  
 Tel.: (514) 683-2860

NO. DE MAILLE	(mm)	RETENU	POIDS CUMULE EN % PASSE	%	POIDS CUMULE EN % RETENU
18	1.000	0.060	99.990	0.010	0.010
35	0.500	0.300	99.939	0.051	0.061
60	0.250	1.900	99.618	0.321	0.382
120	0.125	436.200	25.918	73.700	74.082
230	0.062	106.700	7.890	18.028	92.110
0	0.000	46.700	0.000	7.890	100.000

SOL HUMIDE + TARE:	g.	POIDS DE L'EAU:	g.	*D <sub>60</sub> =:	0.172
SOL SEC + TARE:	g.	POIDS SOL SEC:	g.	D <sub>10</sub> =:	0.067
TARE:	g.	TENEUR EN EAU:	%	Cu :	2.567

\*Pourcentage passant

# COURBE GRANULOMETRIQUE



CAILLOUX	GRAVIER				SABLE					SILT				ARGILE	
	TRES GROS	GROS	MOYEN	FIN	TRES FIN	TRES GROS	GROS	MOYEN	FIN	TRES FIN	GROS	MOYEN	FIN		TRES FIN

DATE: 26/10/89  
 LOCALISATION: Sainte - Sophie  
 FORAGE: PZ 11  
 PROFONDEUR: 10'-13'

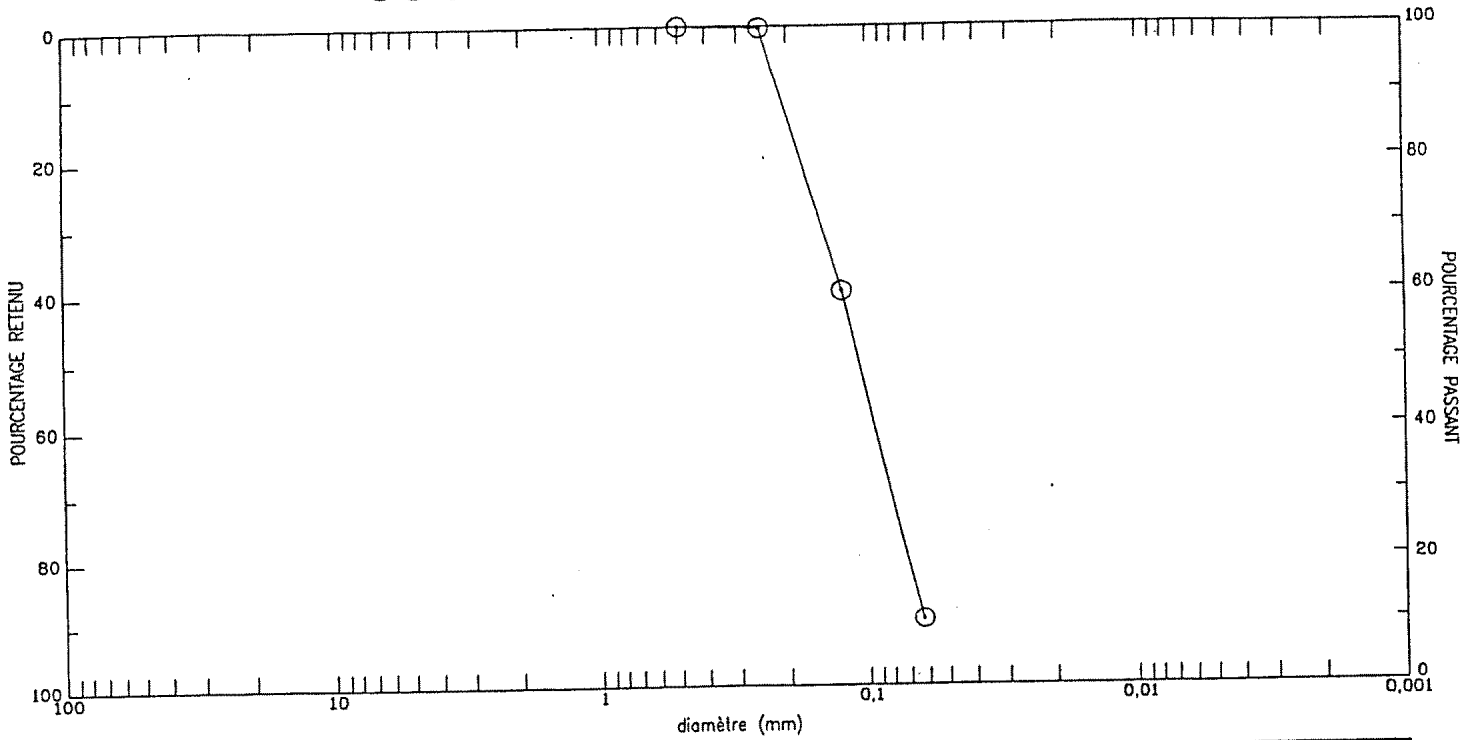


**FORATEK Inc.**

2251 Ch. St. Francois  
 Dorval, Quebec  
 H9P 1K3  
 Tel.: (514) 683-2860

NO. DE MAILLE	(mm)	RETENU	POIDS CUMULE EN % PASSE	%	POIDS CUMULE EN % RETENU
10	2.000	0.080	99.987	0.013	0.013
18	1.000	0.200	99.956	0.032	0.044
35	0.500	1.100	99.782	0.174	0.218
60	0.250	7.000	98.674	1.108	1.326
120	0.125	469.300	24.391	74.282	75.609
230	0.062	122.700	4.970	19.421	95.030
0	0.000	31.400	0.000	4.970	100.000

# COURBE GRANULOMETRIQUE



CAILLOUX	GRAVIER				SABLE					SILT				ARGILE	
	TRES GROS	GROS	MOYEN	FIN	TRES FIN	TRES GROS	GROS	MOYEN	FIN	TRES FIN	GROS	MOYEN	FIN	TRES FIN	

DATE: 03/10/89  
 LOCALISATION: Sainte Sophie  
 FORAGE: pz 12  
 PROFONDEUR: 5-9

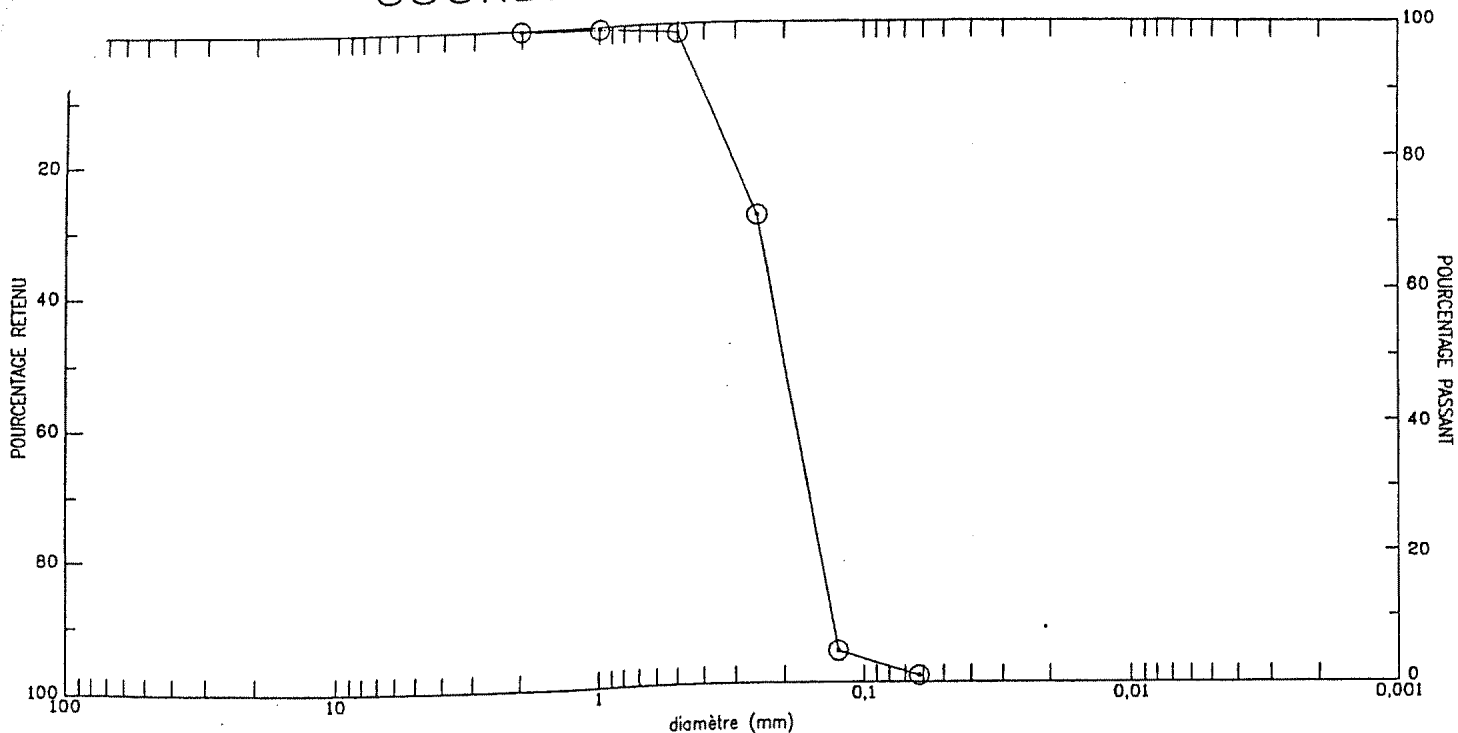


**FORATEK Inc.**

2251 Ch. St. Francois  
 Dorval, Quebec  
 H9P 1K3  
 Tel.: (514) 683-2860

NO. DE MAILLE	(mm)	RETENU	POIDS CUMULE EN % PASSE	%	POIDS CUMULE EN % RETENU
35	0.500	0.050	99.988	0.012	0.012
60	0.250	1.150	99.716	0.272	0.284
120	0.125	167.100	60.185	39.532	39.815
230	0.063	210.650	10.350	49.834	89.650
0	0.000	43.750	0.000	10.350	

# COURBE GRANULOMETRIQUE



CAILLOUX	GRAVIER					SABLE					SILT				ARGILE
	TRES GROS	GROS	MOYEN	FIN	TRES FIN	TRES GROS	GROS	MOYEN	FIN	TRES FIN	GROS	MOYEN	FIN	TRES FIN	

DATE: 4/10/89  
 LOCALISATION: Sainte - Sophie  
 FORAGE: PZ 13  
 PROFONDEUR: 10' - 11.5'

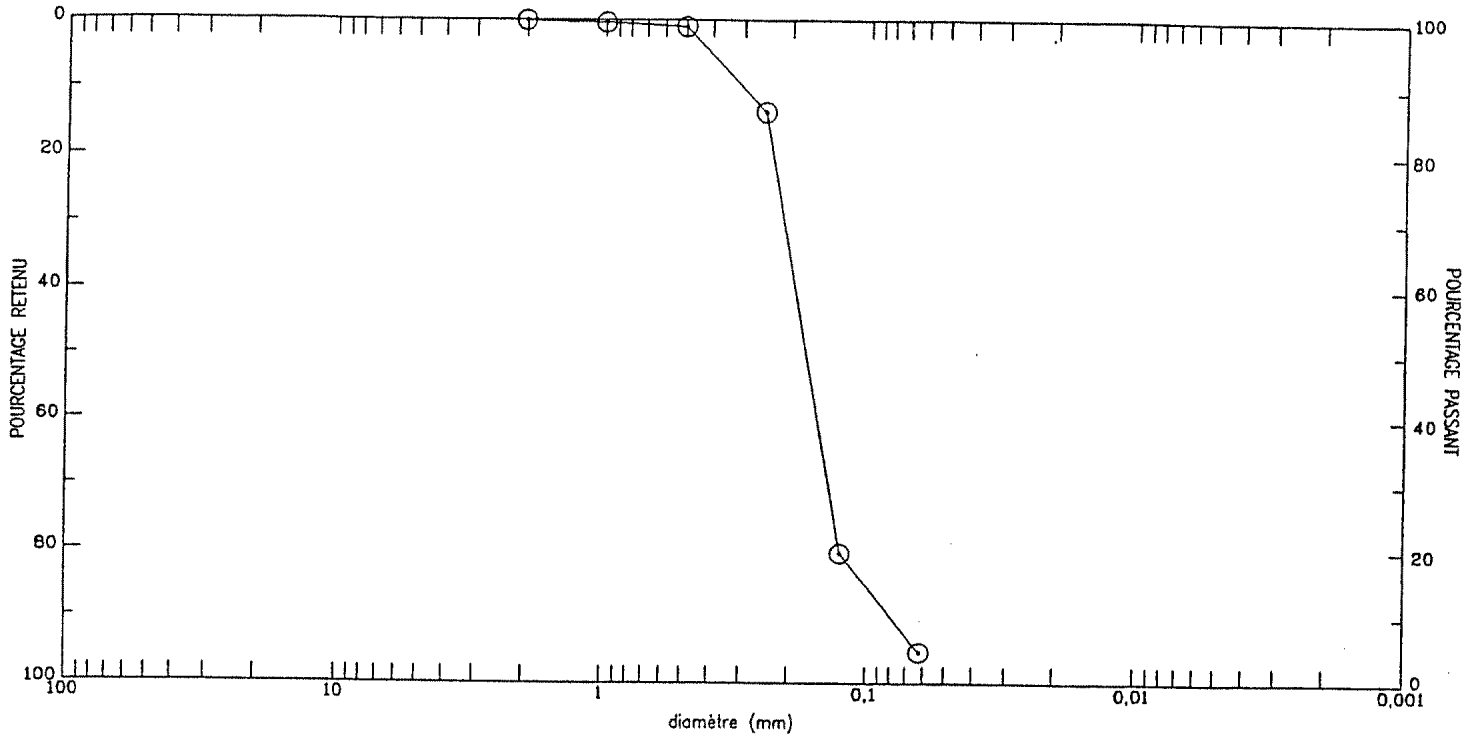


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 Dorval, Quebec  
 H9P 1K3  
 Tel.: (514) 683-2860

NO. DE MAILLE	(mm)	RETENU	POIDS CUMULE EN % PASSE	%	POIDS CUMULE EN % RETENU
10	2.000	0.400	99.886	0.114	0.114
18	1.000	1.100	99.572	0.314	0.428
35	0.500	3.200	98.660	0.912	1.340
60	0.250	96.400	71.180	27.480	28.820
120	0.125	233.200	4.704	66.477	95.296
230	0.062	13.100	0.969	3.734	99.031
0	0.000	3.400	0.000	0.969	100.000

# COURBE GRANULOMETRIQUE



CAILLOUX	GRAVIER					SABLE					SILT				ARGILE
	TRES GROS	GROS	MOYEN	FIN	TRES FIN	TRES GROS	GROS	MOYEN	FIN	TRES FIN	GROS	MOYEN	FIN	TRES FIN	

DATE: 4/10/89  
 LOCALISATION: Sainte - Sophie  
 FORAGE: PZ 14  
 PROFONDEUR: 10'-12'

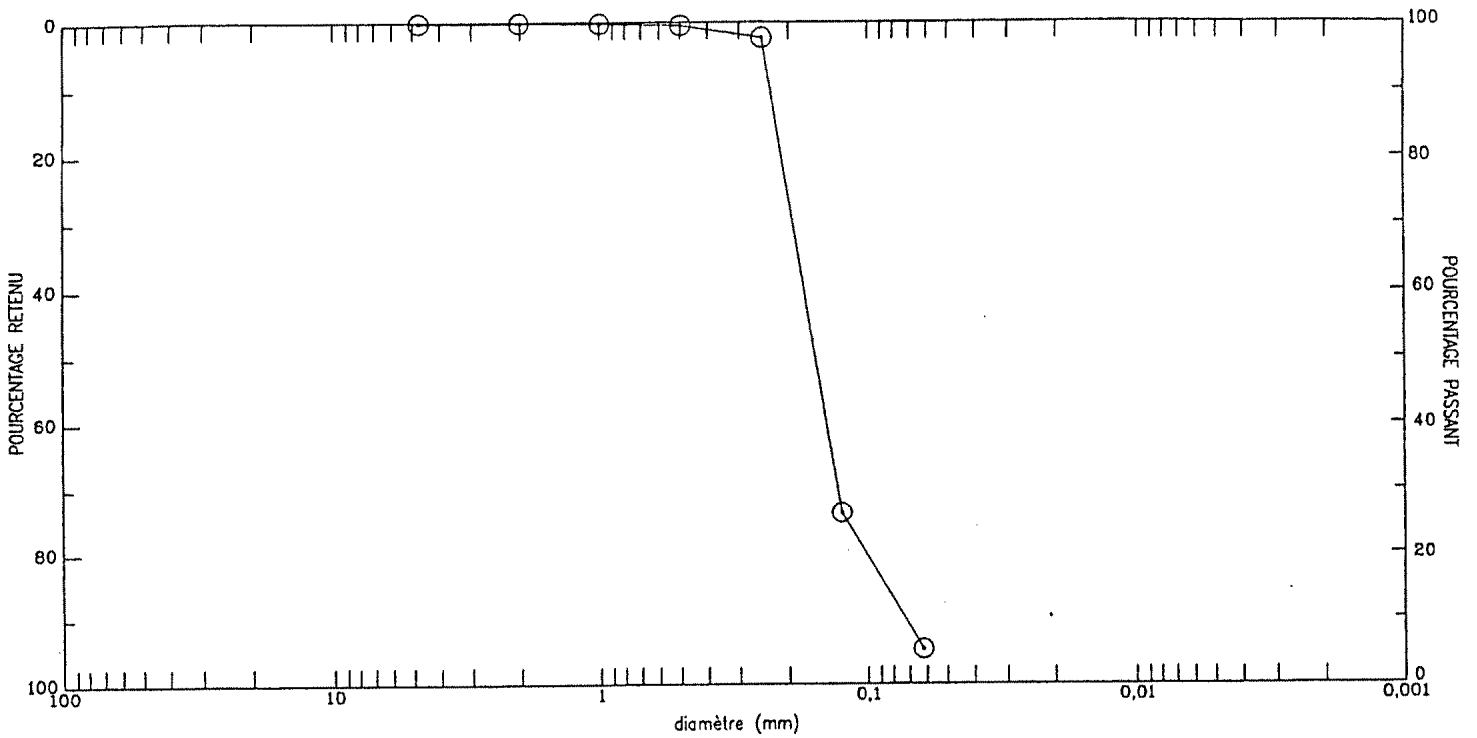


**FORATEK Inc.**

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 Dorval, Quebec  
 H9P 1K3  
 Tel.: (514) 683-2860

NO. DE MAILLE	(mm)	RETENU	POIDS CUMULE EN % PASSE	%	POIDS CUMULE EN % RETENU
10	2.000	0.200	99.950	0.050	0.050
18	1.000	1.400	99.600	0.350	0.400
35	0.500	2.300	99.025	0.575	0.975
60	0.250	50.300	86.455	12.570	13.545
120	0.125	267.100	19.705	66.750	80.295
230	0.062	59.950	4.723	14.982	95.277
0	0.000	18.900	0.000	4.723	100.000

# COURBE GRANULOMETRIQUE



CAILLOUX	GRAVIER					SABLE					SILT				ARGILE
	TRES GROS	GROS	MOYEN	FIN	TRES FIN	TRES GROS	GROS	MOYEN	FIN	TRES FIN	GROS	MOYEN	FIN	TRES FIN	

DATE: 26/10/89  
 LOCALISATION: Sainte - Sophie  
 FORAGE: PZ 15  
 PROFONDEUR: 5'-9'

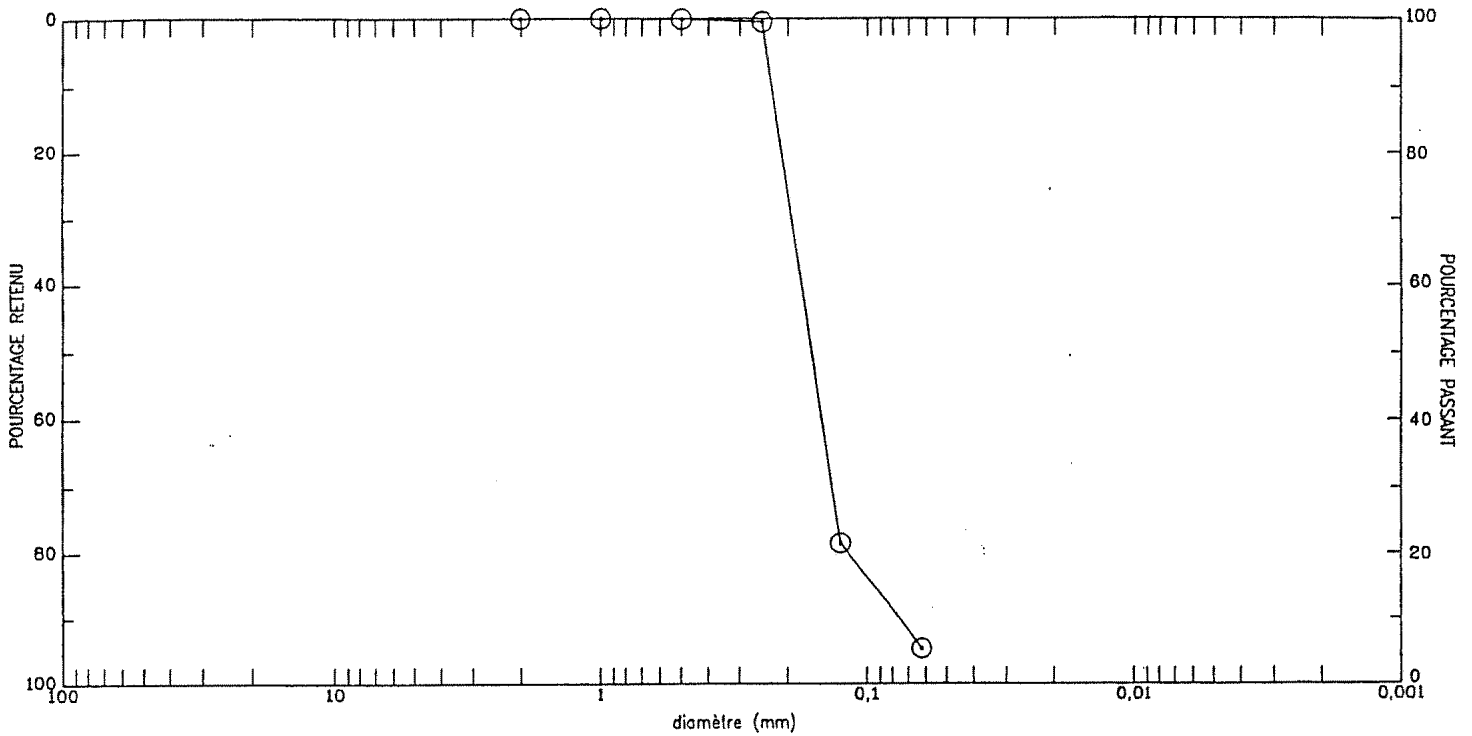


**FORATEK Inc.**

2251 Ch. St. Francois  
 Dorval, Quebec  
 H9P 1K3  
 Tel.: (514) 683-2860

NO. DE MAILLE	(mm)	RETENU	POIDS CUMULE EN % PASSE	%	POIDS CUMULE EN % RETENU
4	4.750	0.500	99.891	0.109	0.109
10	2.000	0.100	99.869	0.022	0.131
18	1.000	0.400	99.782	0.087	0.218
35	0.500	1.100	99.543	0.239	0.457
60	0.250	8.600	97.672	1.871	2.328
120	0.125	327.790	26.366	71.307	73.634
230	0.062	97.100	5.243	21.123	94.757
0	0.000	24.100	0.000	5.243	100.000

# COURBE GRANULOMETRIQUE



CAILLOUX	GRAVIER					SABLE					SILT				ARGILE
	TRES GROS	GROS	MOYEN	FIN	TRES FIN	TRES GROS	GROS	MOYEN	FIN	TRES FIN	GROS	MOYEN	FIN	TRES FIN	

DATE: 04/10/89  
 LOCALISATION: Sainte SOPHIE  
 FORAGE: PZ 16  
 PROFONDEUR: 5'-10'



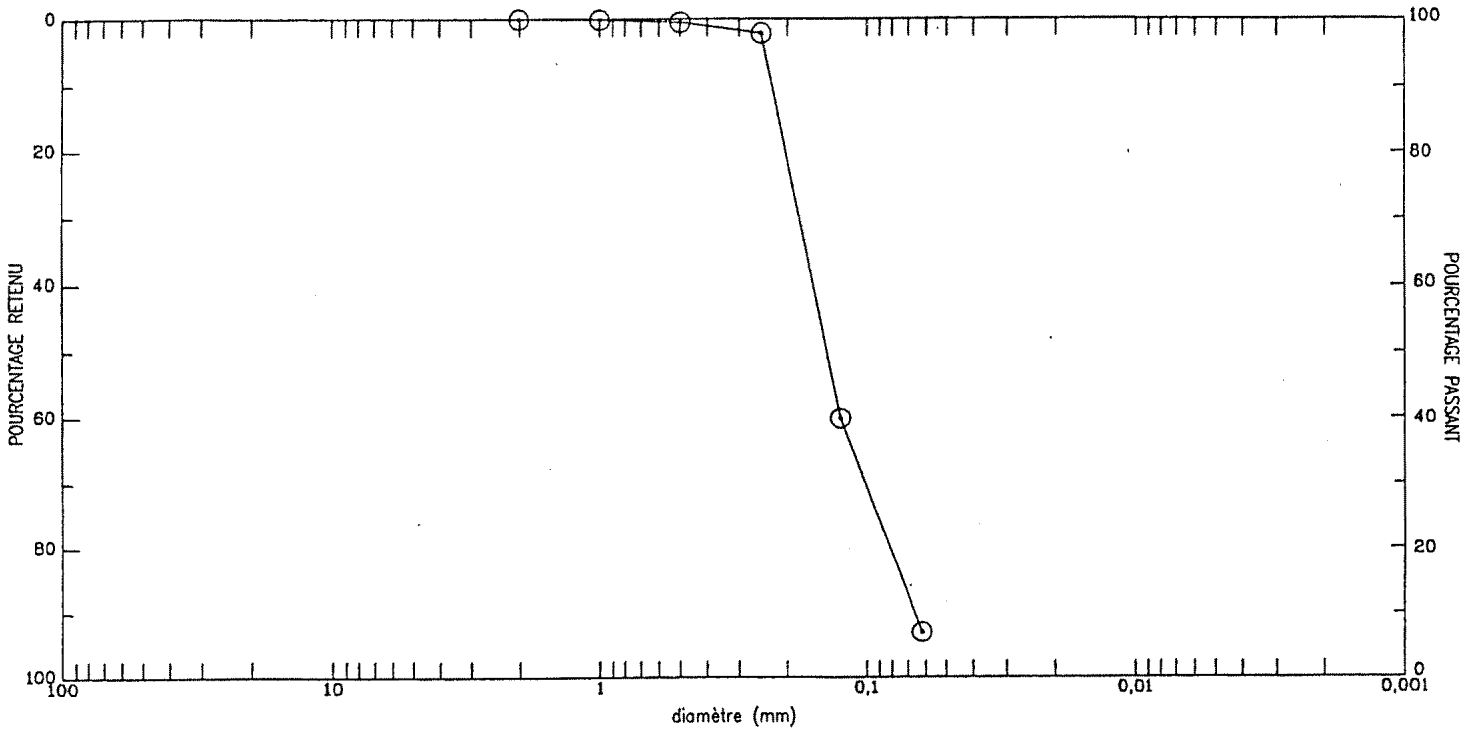
**FORATEK Inc.**

2251 Ch. St. Francois  
 Dorval, Quebec  
 H9P 1K3  
 Tel.: (514) 683-2860

NO. DE MAILLE	(mm)	RETENU	POIDS CUMULE EN % PASSE	%	POIDS CUMULE EN % RETENU
10	2.000	0.100	99.986	0.014	0.014
18	1.000	0.050	99.979	0.007	0.021
35	0.500	0.550	99.900	0.078	0.100
60	0.250	2.950	99.481	0.419	0.519
120	0.125	547.500	21.650	77.831	78.350
230	0.062	114.600	5.359	16.291	94.641
0	0.000	37.700	0.000	5.359	100.000



# COURBE GRANULOMETRIQUE



CAILLOUX	GRAVIER					SABLE					SILT				ARGILE
	TRES GROS	GROS	MOYEN	FIN	TRES FIN	TRES GROS	GROS	MOYEN	FIN	TRES FIN	GROS	MOYEN	FIN	TRES FIN	

DATE: 4/10/89  
 LOCALISATION: Sainte - Sophie  
 FORAGE: PZ 17  
 PROFONDEUR: 10' - 12'

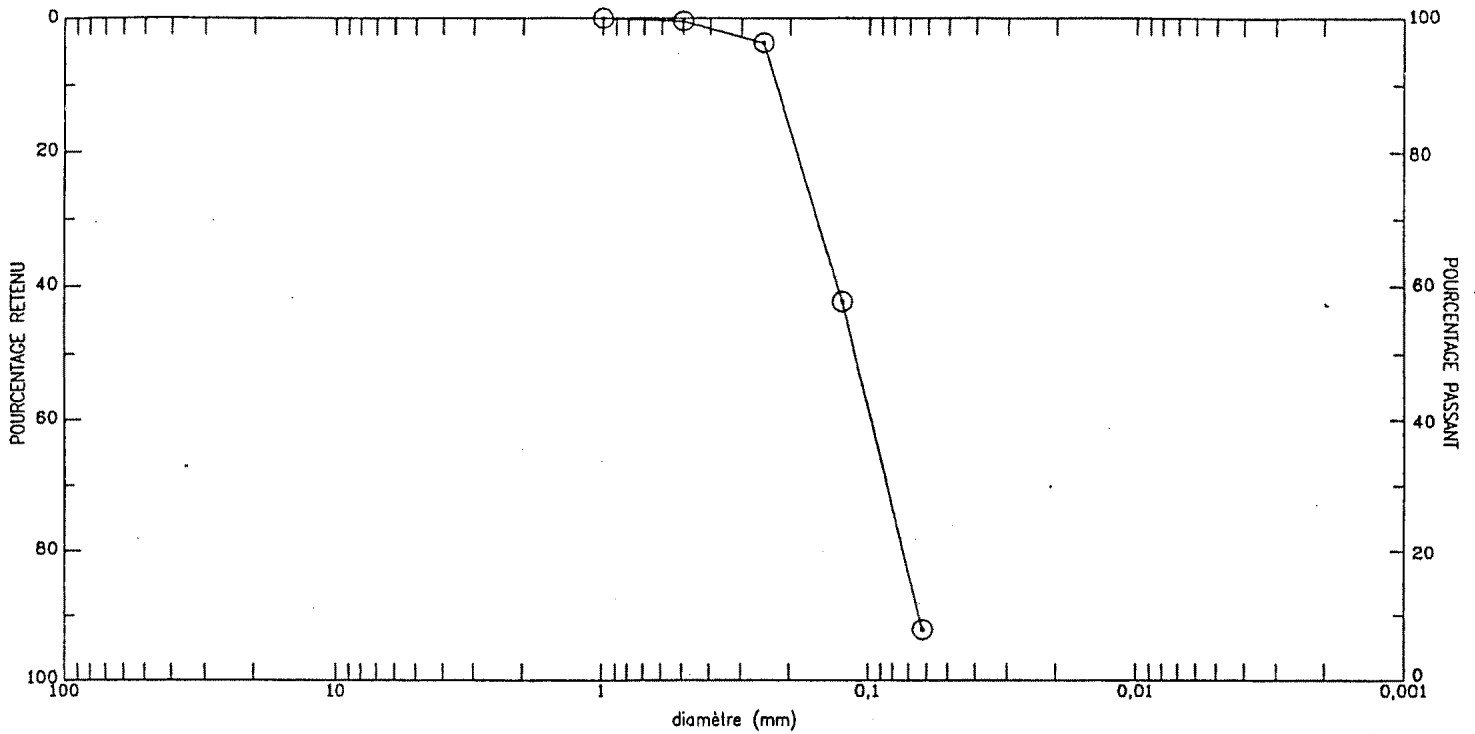


**FORATEK Inc.**

2251 Ch. St. Francois  
 Dorval, Quebec  
 H9P 1K3  
 Tel.: (514) 683-2860

NO. DE MAILLE	(mm)	RETENU	POIDS CUMULE EN % PASSE	%	POIDS CUMULE EN % RETENU
10	2.000	0.100	99.978	0.022	0.022
18	1.000	0.500	99.867	0.110	0.133
35	0.500	1.500	99.536	0.331	0.464
60	0.250	7.500	97.878	1.657	2.122
120	0.125	262.100	39.956	57.923	60.044
230	0.062	149.200	6.983	32.972	93.017
0	0.000	31.600	0.000	6.983	100.000

# COURBE GRANULOMETRIQUE



CAILLoux	GRAVIER					SABLE					SILT				ARGILE
	TRES GROS	GROS	MOYEN	FIN	TRES FIN	TRES GROS	GROS	MOYEN	FIN	TRES FIN	GROS	MOYEN	FIN	TRES FIN	

DATE: 26/10/89  
 LOCALISATION: Sainte - Sophie  
 FORAGE: PZ 18  
 PROFONDEUR: 5'-8'



**FORATEK Inc.**

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 Dorval, Quebec  
 H9P 1K3  
 Tel.: (514) 683-2860

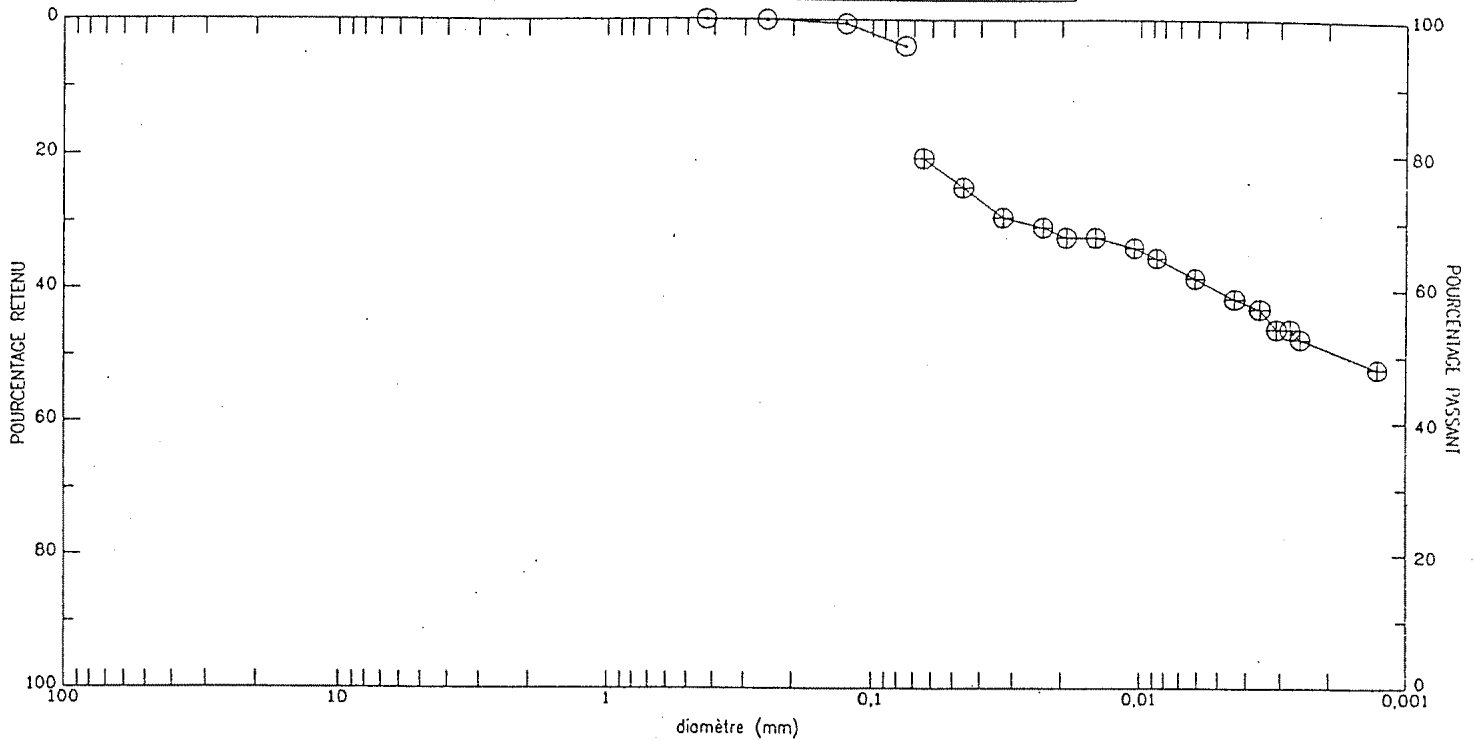
NO. DE MAILLE	(mm)	RETENU	POIDS CUMULE EN % PASSE	%	POIDS CUMULE EN % RETENU
18	1.000	0.100	99.974	0.026	0.026
35	0.500	1.600	99.553	0.421	0.447
60	0.250	12.200	96.341	3.211	3.659
120	0.125	146.000	57.910	38.431	42.090
230	0.062	190.300	7.818	50.092	92.182
0	0.000	29.700	0.000	7.818	100.000

**ANNEXE F-4**

**FORATEK INC.**

**1991**

# GRANULOMÉTRIE ET SÉDIMENTOMÉTRIE



CAILLOUX	GRAVIER					SABLE					SILT				ARGILE
	TRES GROS	GROS	MOYEN	FIN	TRES FIN	TRES GROS	GROS	MOYEN	FIN	TRES FIN	GROS	MOYEN	FIN	TRES FIN	

DATE: 06-02-91  
 LOCALISATION: Ste-Sophie  
 PROJET #: 90042  
 FORAGE: Ce-4  
 PROFONDEUR: -

Légende  
 R: Densité de la suspension  
 $\Delta R$ : Densité du défloculant  
 L: Distance au centre de volume  
 K: Constante  
 G: Gravité spécifique: 2,70 (approx.)  
 ⊙ Analyse Granulométrique  
 ⊕ Analyse Sedimentometrique



**FORATEK Inc.**

2251 Ch. St. Francois  
 Dorval, Quebec  
 H9P 1K3  
 Tel.: (514) 683-2860

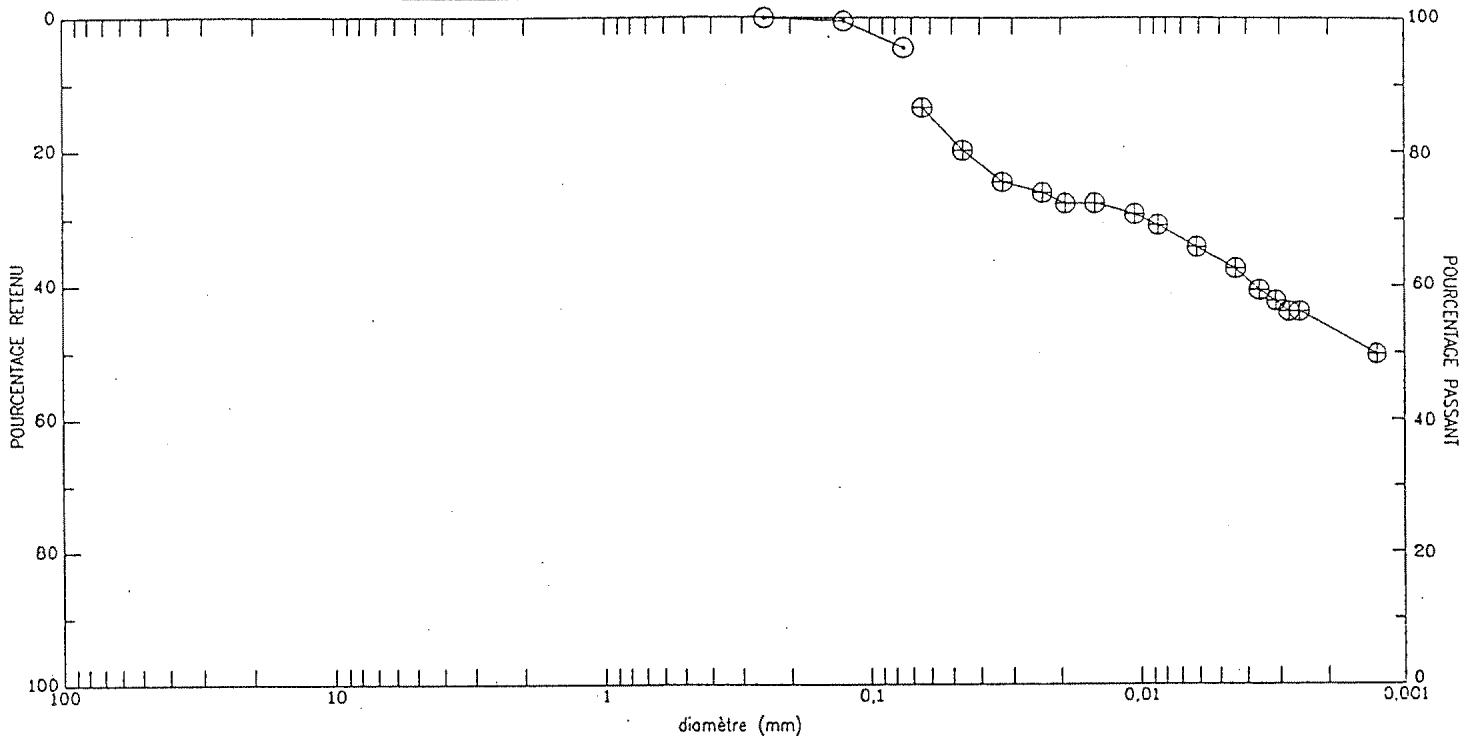
**POIDS UTILISÉS**

Poids sol humide: 89.20      Poids sec tamisé: 2.05  
 Poids sol sec(WL): 53.10      Poids sec passant  
 Poids de l'eau: 36.10          tamis 200 (Ws): 51.05  
 Teneur en eau: 40.47

Numéro de toms	Poids retenu (g)	% retenu cumulatif	% retenu	Diamètre (mm)	% passant cumulatif
40	0.025	0.047	0.047	0.425	99.95
60	0.025	0.094	0.047	0.250	99.91
120	0.250	0.565	0.471	0.125	99.44
200	1.750	3.861	3.296	0.075	96.14

Température (C)	T Temps (min)	R	$\Delta R$	(R- $\Delta R$ )	L (cm)	$\sqrt{L/T}$	K	Diamètre (mm)	% passant cumulatif
18	0.5	30.0	3.40	26.6	10.93	4.6752	0.01378	0.06442	79.55
18	1.0	28.5	3.40	25.1	11.16	3.3411	0.01378	0.04604	75.06
18	2.0	27.0	3.40	23.6	11.40	2.3872	0.01378	0.03290	70.58
18	4.0	26.5	3.40	23.1	11.48	1.6938	0.01378	0.02334	69.08
18	6.0	26.0	3.40	22.6	11.55	1.3876	0.01378	0.01912	67.59
18	10.0	26.0	3.40	22.6	11.55	1.0749	0.01378	0.01481	67.59
18	20.0	25.5	3.40	22.1	11.63	0.7626	0.01378	0.01051	66.09
18	30.0	25.0	3.40	21.6	11.71	0.6248	0.01378	0.00861	64.60
18	60.0	24.0	3.40	20.6	11.87	0.4447	0.01378	0.00613	61.61
18	120.0	23.0	3.40	19.6	12.02	0.3165	0.01378	0.00436	58.62
18	180.0	22.5	3.40	19.1	12.10	0.2593	0.01378	0.00357	57.12
18	240.0	21.5	3.40	18.1	12.26	0.2260	0.01378	0.00311	54.13
18	300.0	21.5	3.40	18.1	12.26	0.2021	0.01378	0.00279	54.13
18	360.0	21.0	3.40	17.6	12.33	0.1851	0.01378	0.00255	52.63
18	1440.0	19.5	3.40	16.1	12.57	0.0934	0.01378	0.00129	48.15

# GRANULOMÉTRIE ET SÉDIMENTOMÉTRIE



CAILLOUX	GRAVIER					SABLE					SILT				ARGILE
	TRES GROS	GROS	MOYEN	FIN	TRES FIN	TRES GROS	GROS	MOYEN	FIN	TRES FIN	GROS	MOYEN	FIN	TRES FIN	

DATE: 06-02-91 LOCALISATION: Ste-Sophie PROJET #: 90042 FORAGE: Ce-6 PROFONDEUR: -	Légende R: Densité de la suspension ΔR: Densité du défloculant L: Distance au centre de volume K: Constante ⊙: Gravité spécifique: 2,70 (approx.) ⊖: Analyse Granulométrique ⊕: Analyse Sedimentométrique
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**FORATEK Inc.**

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 Dorval, Quebec  
 H9P 1K3  
 Tel.: (514) 683-2860

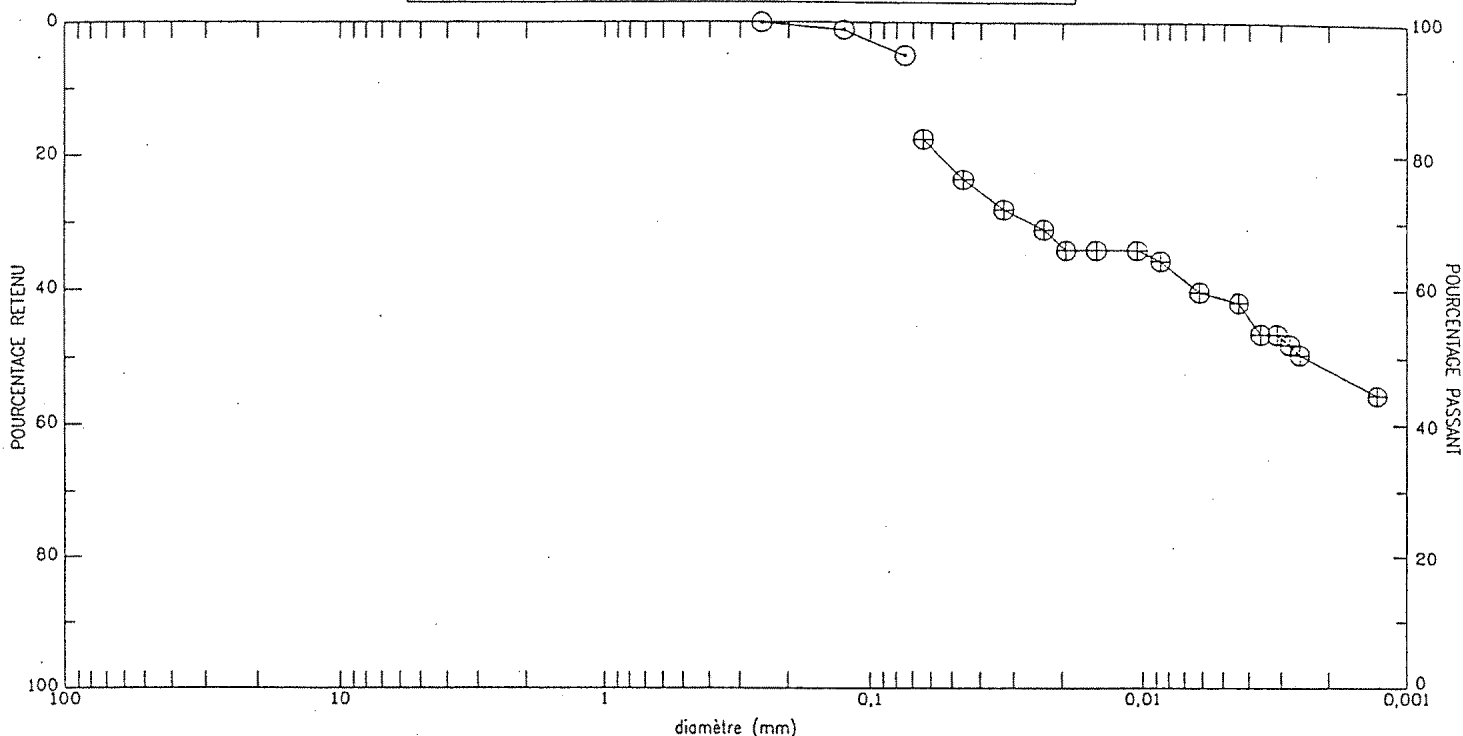
Numéro de tamis	Poids retenu (g)	% retenu cumulatif	% retenu	Diamètre (mm)	% passant cumulatif
60	0.050	0.100	0.100	0.250	99.90
120	0.200	0.502	0.402	0.125	99.50
200	2.000	4.518	4.016	0.075	95.48

**POIDS UTILISÉS**

Poids sol humide:	84.10	Poids sec tamisé:	2.25
Poids sol sec(Wt):	49.80	Poids sec passant	
Poids de l'eau:	34.30	tamis 200 (Ws):	47.55
Teneur en eau:	40.78		

Température (C)	T Temps (min)	R	ΔR	(R-ΔR)	L (cm)	√L/T	K	Diamètre (mm)	% passant cumulatif
18	0.5	30.5	3.40	27.1	10.85	4.6585	0.01378	0.06419	86.42
18	1.0	28.5	3.40	25.1	11.16	3.3411	0.01378	0.04604	80.04
18	2.0	27.0	3.40	23.6	11.40	2.3872	0.01378	0.03290	75.25
18	4.0	26.5	3.40	23.1	11.48	1.6938	0.01378	0.02334	73.66
18	6.0	26.0	3.40	22.6	11.55	1.3876	0.01378	0.01912	72.07
18	10.0	26.0	3.40	22.6	11.55	1.0749	0.01378	0.01481	72.07
18	20.0	25.5	3.40	22.1	11.63	0.7626	0.01378	0.01051	70.47
18	30.0	25.0	3.40	21.6	11.71	0.6248	0.01378	0.00861	68.88
18	60.0	24.0	3.40	20.6	11.87	0.4447	0.01378	0.00613	65.69
18	120.0	23.0	3.40	19.6	12.02	0.3165	0.01378	0.00436	62.50
18	180.0	22.0	3.40	18.6	12.18	0.2601	0.01378	0.00358	59.31
18	240.0	21.5	3.40	18.1	12.26	0.2260	0.01378	0.00311	57.72
18	300.0	21.0	3.40	17.6	12.33	0.2028	0.01378	0.00279	56.12
18	360.0	21.0	3.40	17.6	12.33	0.1851	0.01378	0.00255	56.12
18	1440.0	19.0	3.40	15.6	12.65	0.0937	0.01378	0.00129	49.74

# GRANULOMÉTRIE ET SÉDIMENTOMÉTRIE



CAILLOUX	GRAVIER					SABLE					SILT				ARGILE
	TRES GROS	GROS	MOYEN	FIN	TRES FIN	TRES GROS	GROS	MOYEN	FIN	TRES FIN	GROS	MOYEN	FIN	TRES FIN	

DATE: 06-02-91  
 LOCALISATION: Ste-Sophie  
 PROJET #: 90042  
 FORAGE: Ce-5  
 PROFONDEUR: -

Légende  
 R: Densité de la suspension  
 ΔR: Densité du défloculant  
 L: Distance au centre de volume  
 K: Constante  
 G: Gravité spécifique. 2,70 (approx.)  
 ⊙ Analyse Granulométrique  
 ⊕ Analyse Sédimentométrique



**FORATEK Inc.**

2251 Ch. St. Francois  
 Dorval, Quebec  
 H9P 1K3  
 Tel.: (514) 683-2860

Numéro de tamis	Poids retenu (g)	% retenu cumulé	% retenu	Diamètre (mm)	% passant cumulé
60	0.050	0.096	0.096	0.250	99.90
120	0.550	1.149	1.054	0.125	98.85
200	2.000	4.981	3.831	0.075	95.02

**POIDS UTILISÉS**

Poids sol humide: 87.10      Poids sec tamisé: 2.60  
 Poids sol sec(Wt): 52.20      Poids sec passant  
 Poids de l'eau: 34.90      tamis 200 (Ws): 49.60  
 Teneur en eau: 40.07

Température (C)	T Temps (min)	R	ΔR	(R-ΔR)	L (cm)	$\sqrt{L/T}$	K	Diamètre (mm)	% passant cumulé
18	0.5	30.5	3.40	27.1	10.85	4.6585	0.01378	0.06419	82.44
18	1.0	28.5	3.40	25.1	11.16	3.3411	0.01378	0.04604	76.36
18	2.0	27.0	3.40	23.6	11.40	2.3872	0.01378	0.03290	71.79
18	4.0	26.0	3.40	22.6	11.55	1.6995	0.01378	0.02342	68.75
18	6.0	25.0	3.40	21.6	11.71	1.3970	0.01378	0.01925	65.71
18	10.0	25.0	3.40	21.6	11.71	1.0821	0.01378	0.01491	65.71
18	20.0	25.0	3.40	21.6	11.71	0.7652	0.01378	0.01054	65.71
18	30.0	24.5	3.40	21.1	11.79	0.6268	0.01378	0.00864	64.19
18	60.0	23.0	3.40	19.6	12.02	0.4476	0.01378	0.00617	59.63
18	120.0	22.5	3.40	19.1	12.10	0.3175	0.01378	0.00438	58.11
18	180.0	21.0	3.40	17.6	12.33	0.2618	0.01378	0.00361	53.54
18	240.0	21.0	3.40	17.6	12.33	0.2267	0.01378	0.00312	53.54
18	300.0	20.5	3.40	17.1	12.41	0.2034	0.01378	0.00280	52.02
18	360.0	20.0	3.40	16.6	12.49	0.1863	0.01378	0.00257	50.50
18	1440.0	18.0	3.40	14.6	12.80	0.0943	0.01378	0.00130	44.42

ESSAI DE PERMÉABILITÉ

Pz-3-A

# ESSAI DE PERMEABILITE



FORATEK INTERNATIONAL INC.

PROJET : \_\_\_\_\_

OUVRAGE : P2-A3

ESSAI : \_\_\_\_\_

Localisation ; Services Sanitaires L.R.

Date : 9-10/08/90 Durée : 18 heures

Terminé dans le : argile Profondeur 4.53m

Volume \_\_\_\_\_

Tube ; longueur : 4.63m diamètre : 5.08cm

Niveau statique : 1.19 m

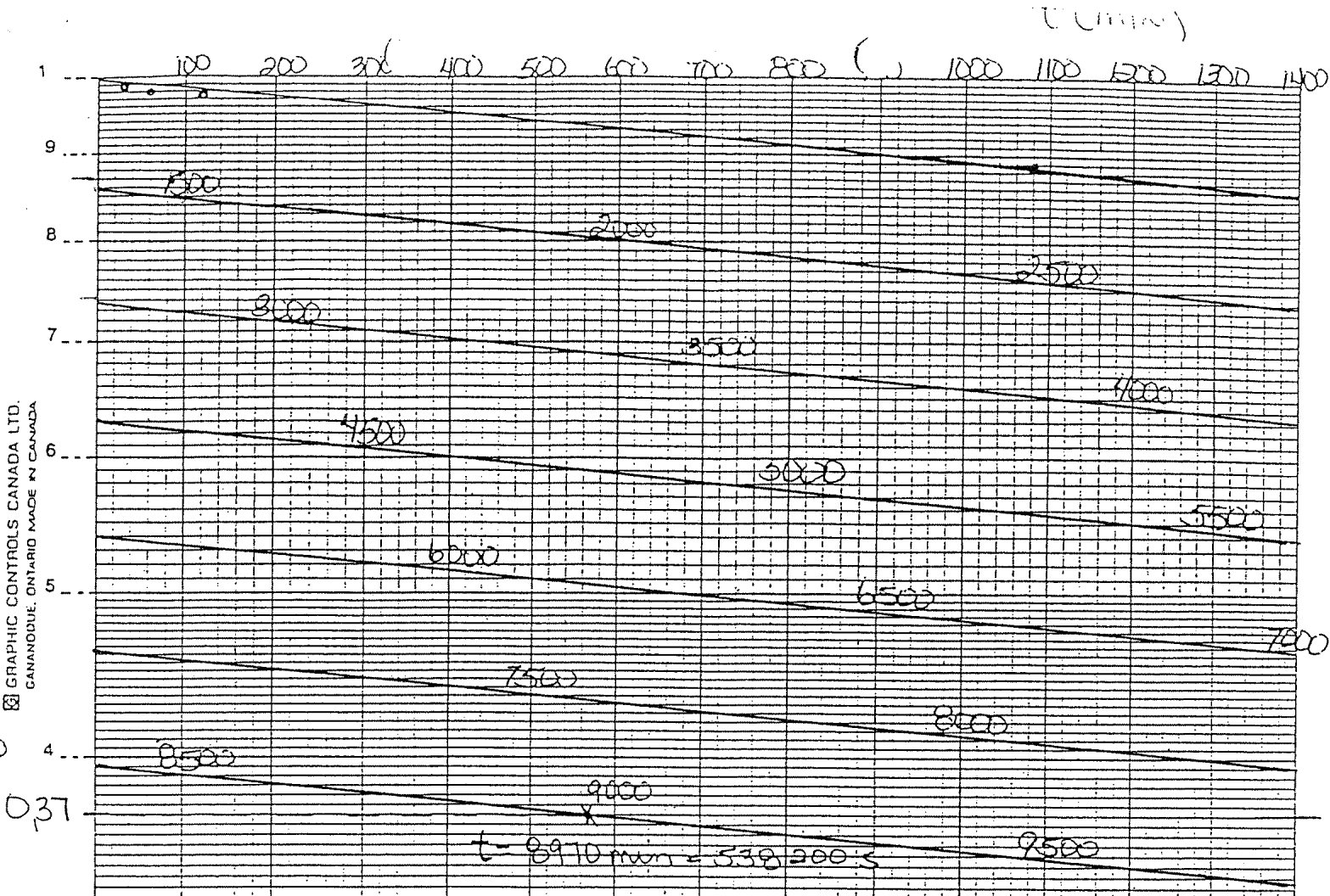
Crépine ; longueur : 0.6m diamètre : 5.08cm no. : \_\_\_\_\_

Instrument utilisé : SOUDE

OBSERVE PAR : \_\_\_\_\_ ECHANTILLON D'EAU : \_\_\_\_\_ T : \_\_\_\_\_ °C

TEMPS		MINUTES	PROFONDEUR	CHARGE	H/H <sub>0</sub>	REMARQUES
date	heure	après le début	du niveau d'eau	RESIDUELLE		
j   m	h   m   s	de l'essai	en m (sous la margelle)	H en m		
	14:50	0.	4.47	3.28	1.	partie crépinée du pyromètre de 3.93 m à 4.53 m.
		1.	4.455	3.265	0.995	
		2.	4.45	3.26	0.993	
		3.	4.45	3.26	0.993	
		4.	4.45	3.26	0.993	
		5.	4.45	3.26	0.993	
		6.	4.445	3.255	0.992	
		7.	4.445	3.255	0.992	
		8.	4.445	3.255	0.992	
		9.	4.44	3.25	0.991	
		10.	4.44	3.25	0.991	enveloppe de 3.63 m à 4.53 m.
		12.	4.44	3.25	0.991	
		15.	4.435	3.245	0.989	
		23.	4.43	3.24	0.988	
		30.	4.425	3.235	0.986	
		60.	4.41	3.22	0.98	
		120.	4.395	3.205	0.977	
		1080.	4.10	2.91	0.887	
		.	.	.	.	
		.	.	.	.	





$$K = \frac{d^2 \ln\left(\frac{2 \cdot \text{m.l.}}{D}\right)}{8LT}$$

$$m = 1$$

$$t = 538200 \text{ sec}$$

$$d = 5.08 \text{ cm}$$

$$D = 15.24 \text{ cm}$$

$$L = 90 \text{ cm}$$

$$= 1.6 \times 10^{-7} \text{ cm/s}$$

methode Housler (1951)

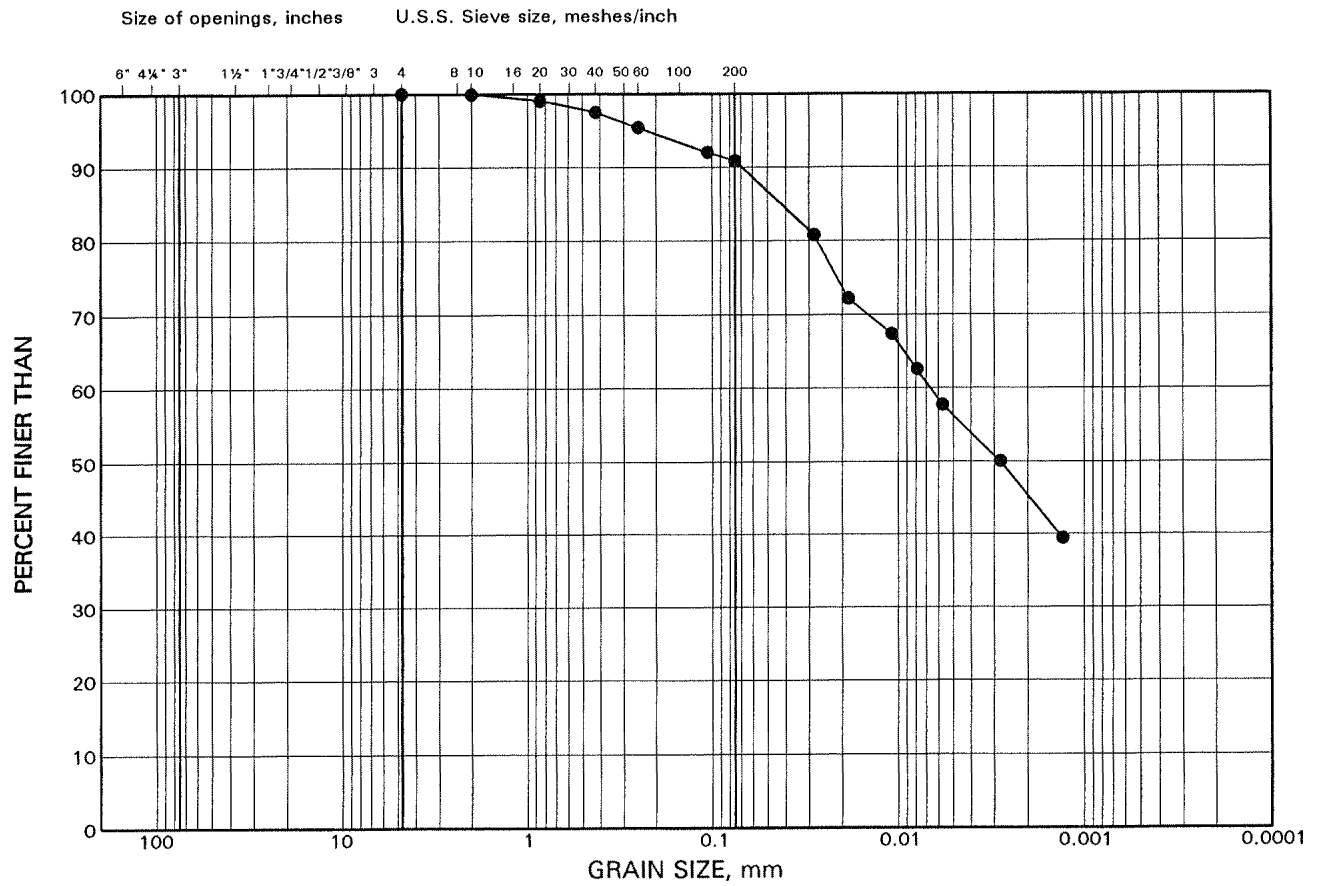
**ANNEXE F-5**

**GOLDER ASSOCIÉS LTÉE**

**2000**

# GRAIN SIZE DISTRIBUTION

FIGURE



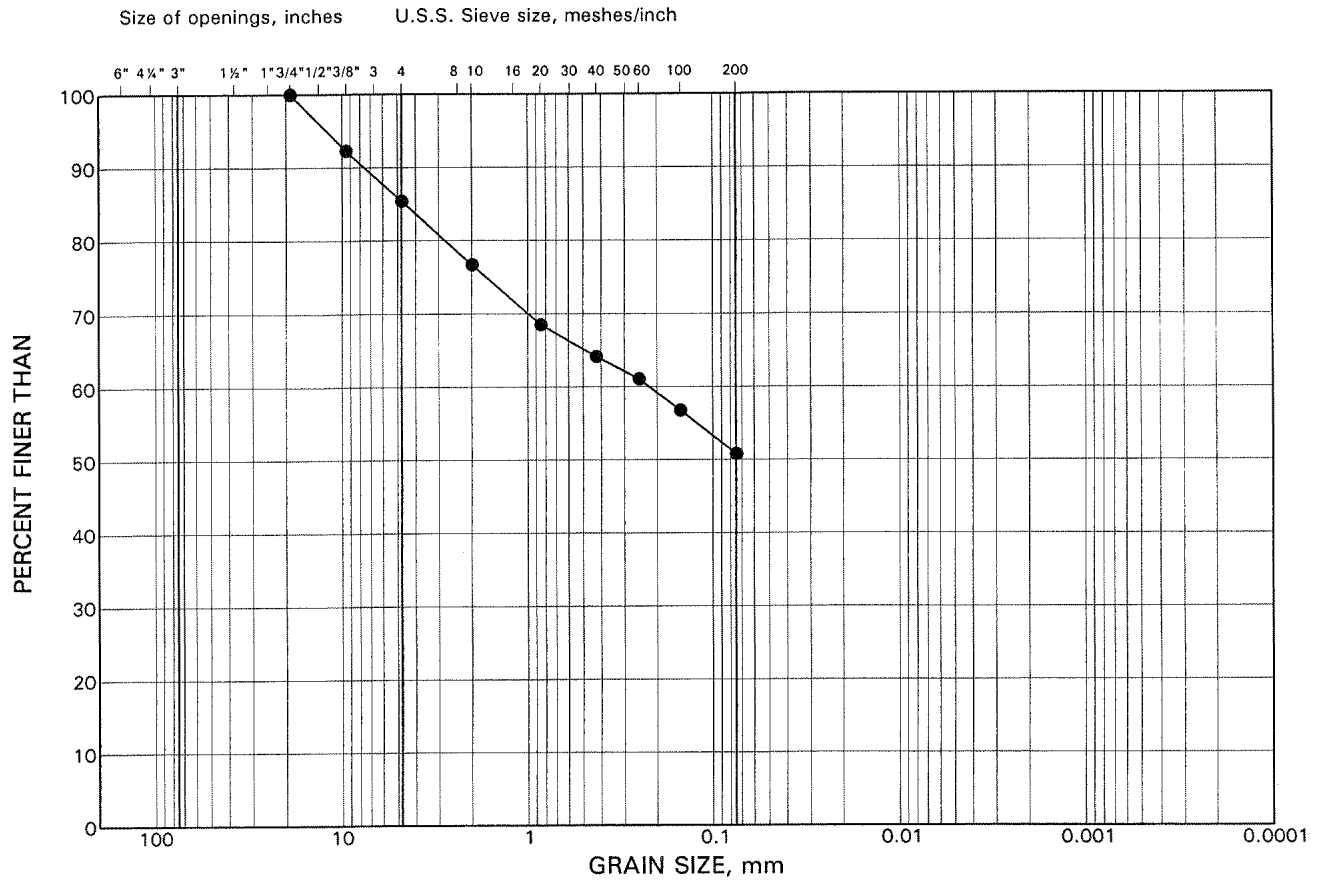
COBBLE SIZE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND CLAY SIZES
	GRAVEL SIZE		SAND SIZE			

## LEGEND

SYMBOL	BOREHOLE	SAMPLE	DEPTH(m)
●	-	P0-00-1	6.7

# GRAIN SIZE DISTRIBUTION

FIGURE



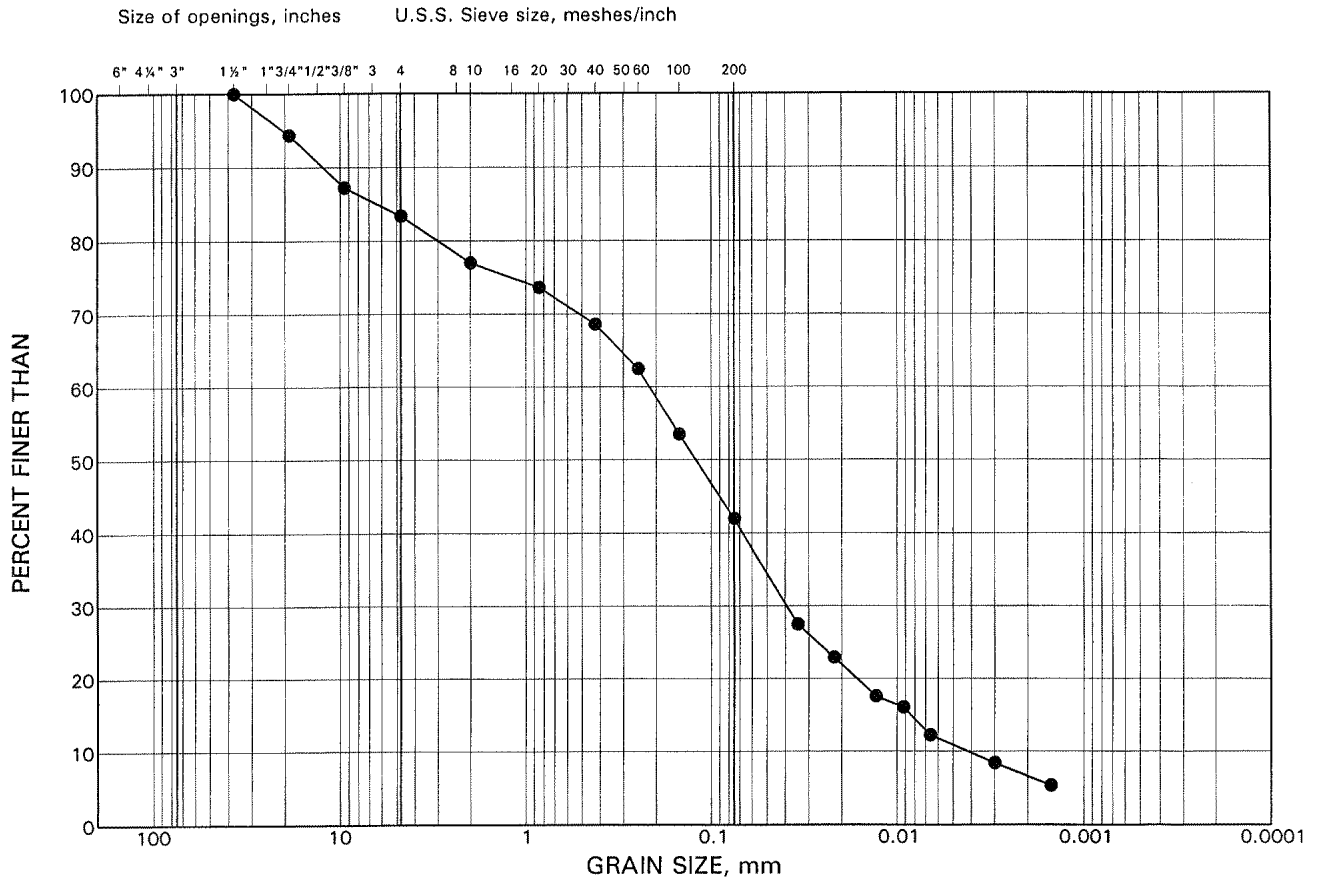
COBBLE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND CLAY SIZES
SIZE	GRAVEL SIZE		SAND SIZE			FINE GRAINED

## LEGEND

SYMBOL	BOREHOLE	SAMPLE	DEPTH(m)
●	-	P0-00-1	11.9

# GRAIN SIZE DISTRIBUTION

FIGURE



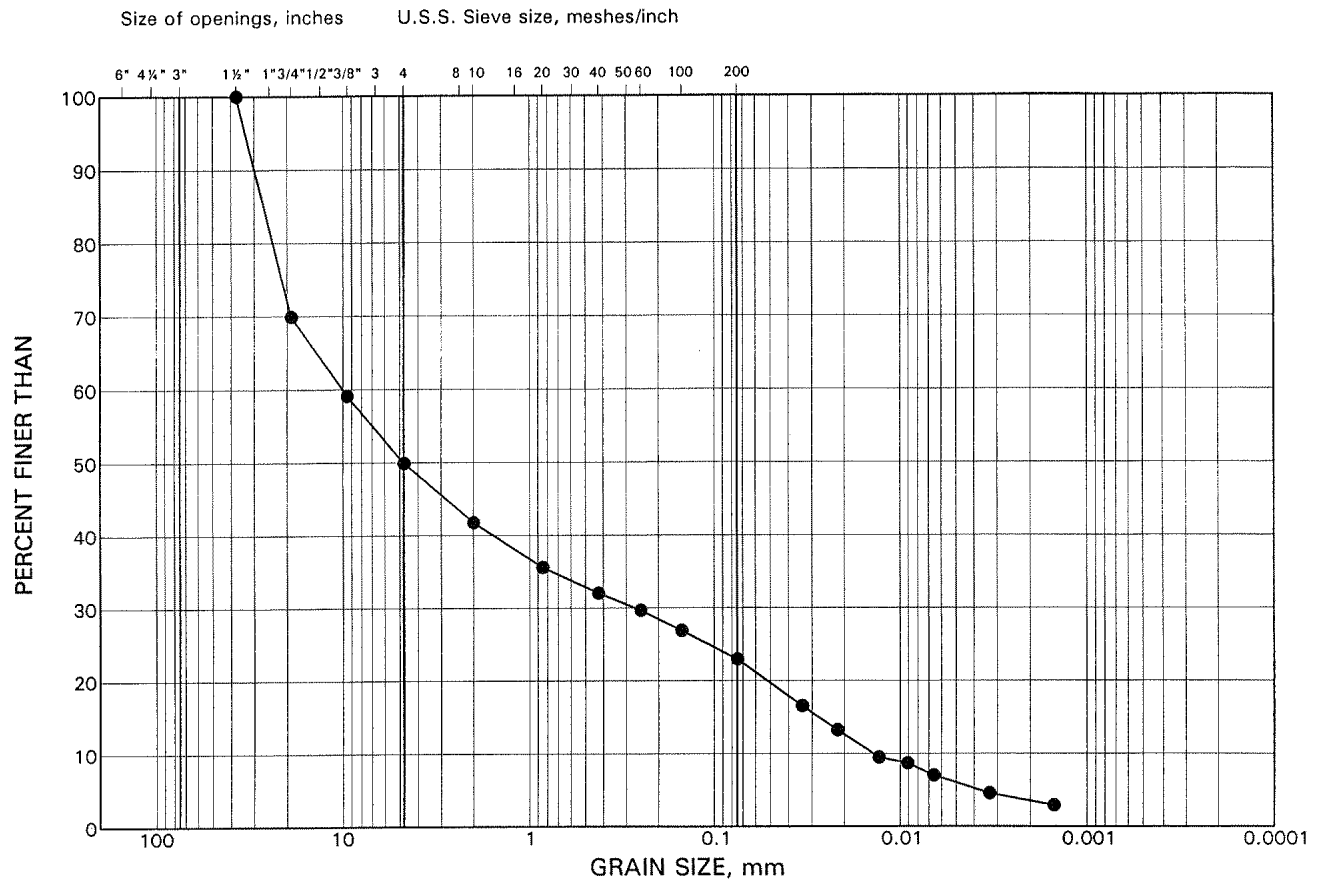
COBBLE SIZE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND CLAY SIZES FINE GRAINED
	GRAVEL SIZE		SAND SIZE			

## LEGEND

SYMBOL	BOREHOLE	SAMPLE	DEPTH(m)
●	-	P0-00-02	6.1

# GRAIN SIZE DISTRIBUTION

FIGURE



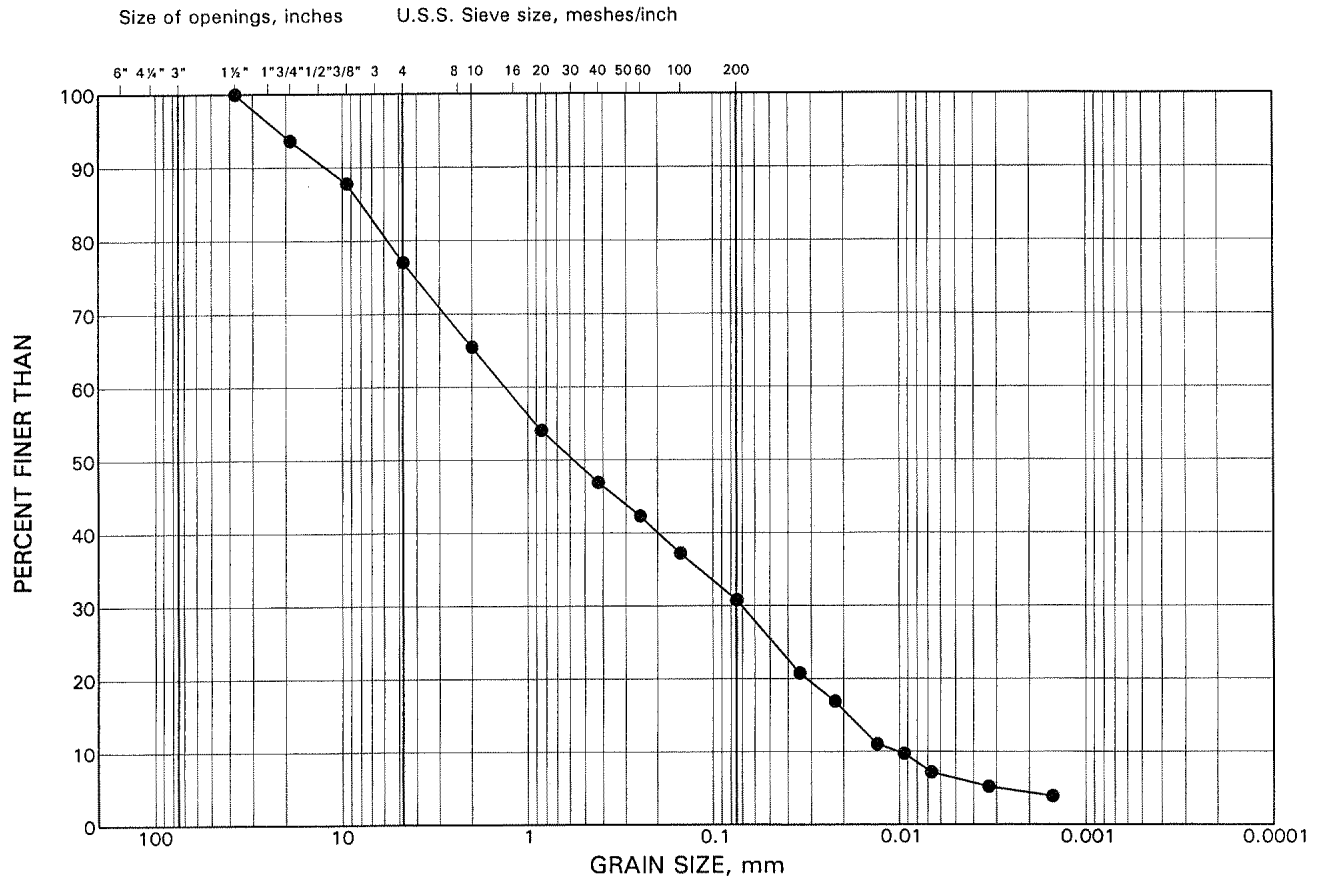
COBBLE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND CLAY SIZES
SIZE	GRAVEL SIZE		SAND SIZE			FINE GRAINED

## LEGEND

SYMBOL	BOREHOLE	SAMPLE	DEPTH(m)
•	-	P0-00-02	6.7

# GRAIN SIZE DISTRIBUTION

FIGURE



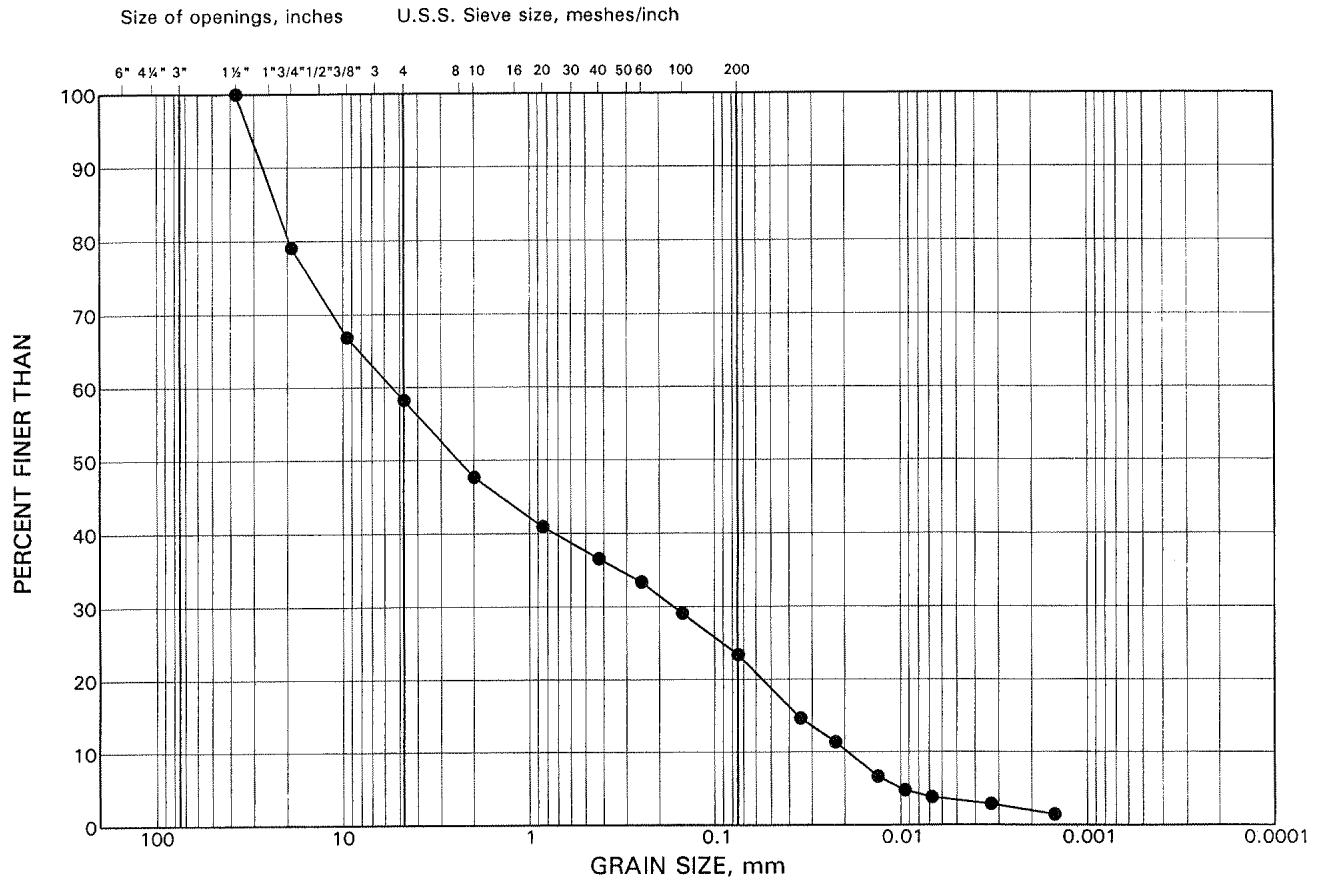
COBBLE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND CLAY SIZES
SIZE	GRAVEL SIZE		SAND SIZE			FINE GRAINED

## LEGEND

SYMBOL	BOREHOLE	SAMPLE	DEPTH(m)
•	-	PO-00-02	7.3

# GRAIN SIZE DISTRIBUTION

FIGURE



COBBLE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND CLAY SIZES
SIZE	GRAVEL SIZE		SAND SIZE			FINE GRAINED

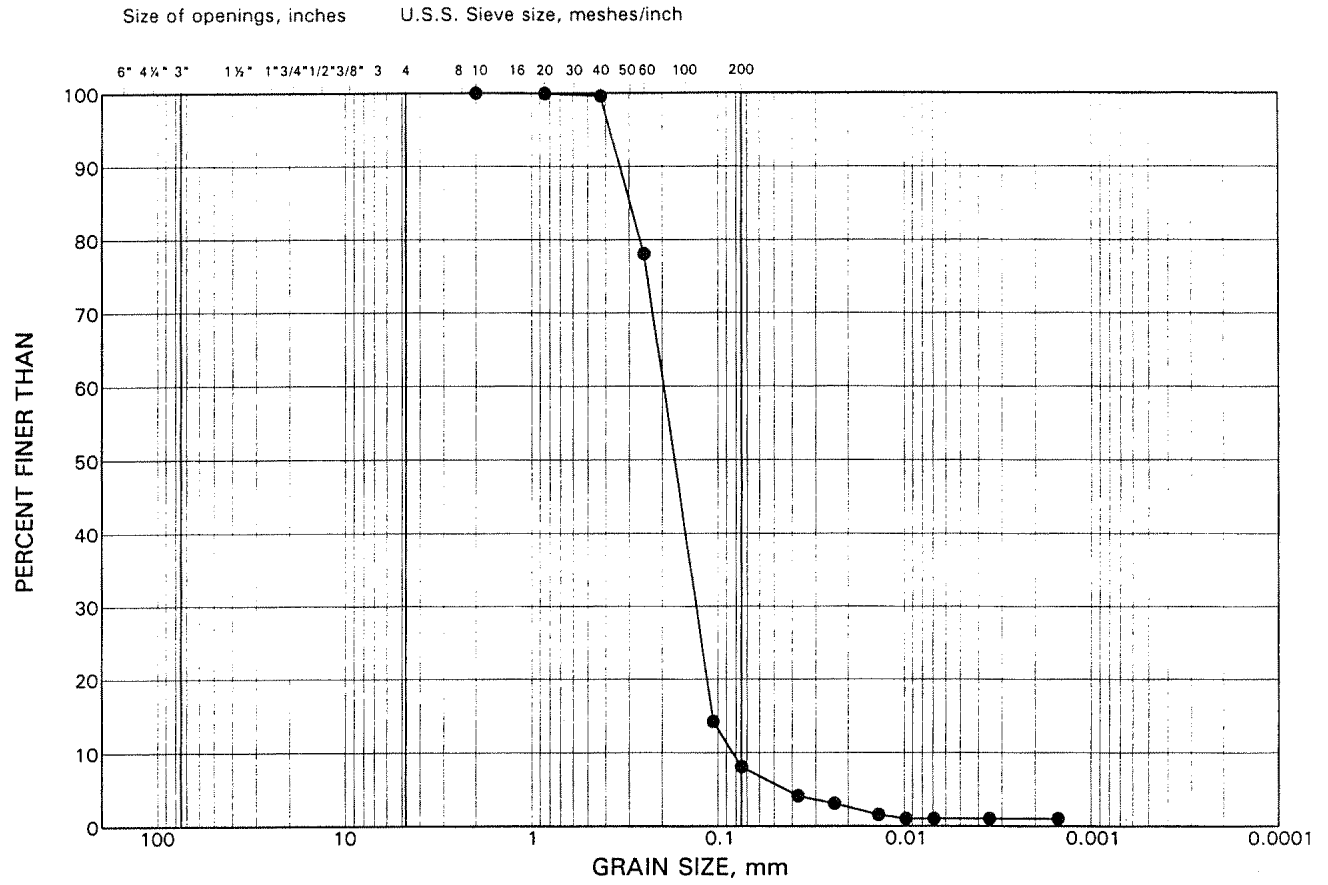
## LEGEND

SYMBOL	BOREHOLE	SAMPLE	DEPTH(m)
•	-	P0-00-02	7.9



# GRAIN SIZE DISTRIBUTION

FIGURE



COBBLE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND CLAY SIZES
SIZE	GRAVEL SIZE		SAND SIZE			FINE GRAINED

## LEGEND

SYMBOL	BOREHOLE	SAMPLE	DEPTH(m)
●	-	P0-00-4	-

●

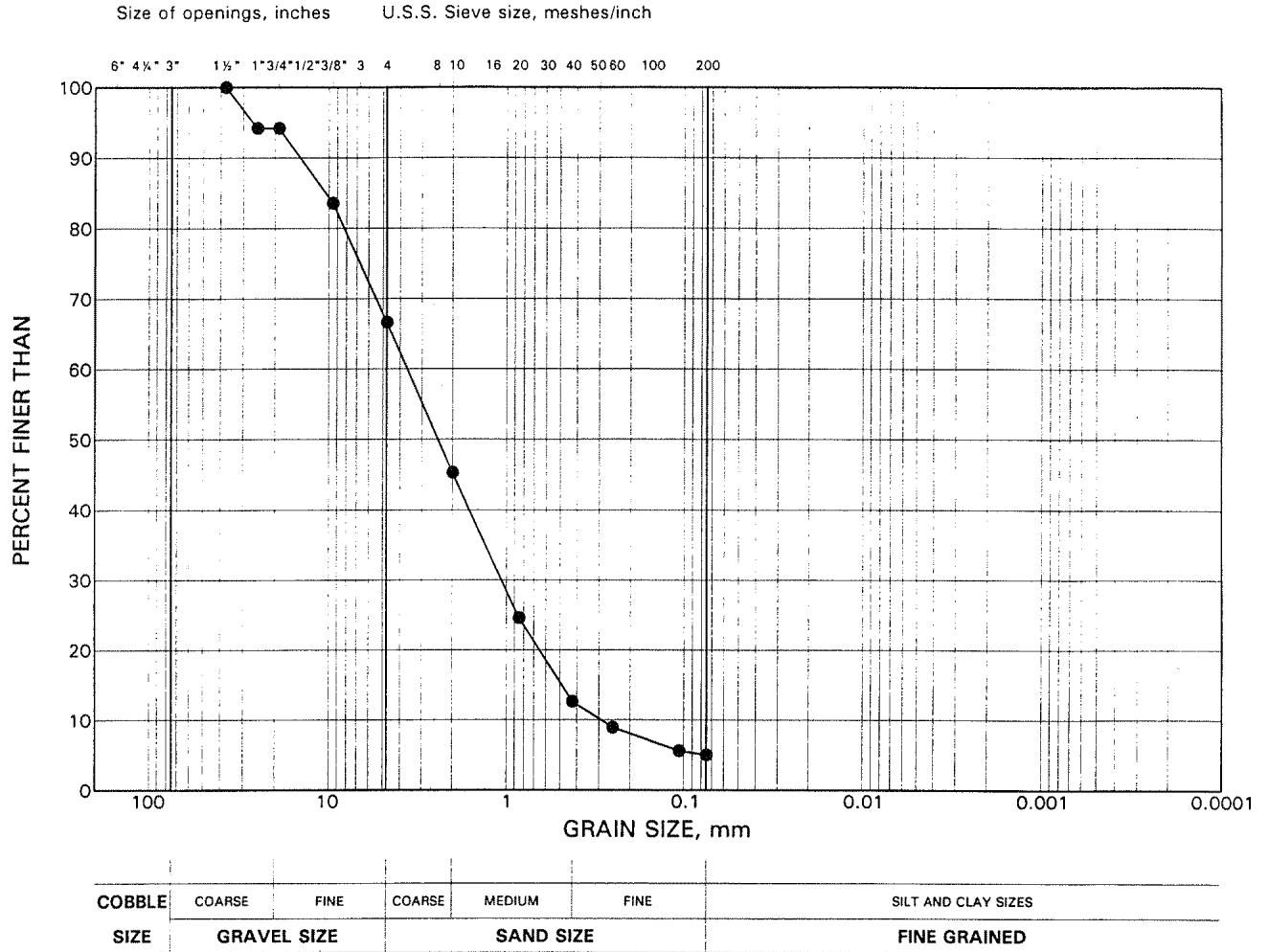
-

P0-00-4

-

# GRAIN SIZE DISTRIBUTION

FIGURE



## LEGEND

SYMBOL      BOREHOLE      SAMPLE      DEPTH(m)

•                      -                      S-00-2                      -

## OEDOMETER CONSOLIDATION SUMMARY

### SAMPLE IDENTIFICATION

Project Number	001-7077	Sample Depth, m	6.4-7.0
Sample Number	P0-00-1		

### TEST CONDITIONS

Test Type	Standard	Load Duration, hr	(2-24)
Oedometer Number	8		
Date Started	00-06-23		
Date Completed	00-07-04		

### SAMPLE DIMENSIONS AND PROPERTIES - INITIAL

Sample Height, cm	1.91	Unit Weight, kN/m <sup>3</sup>	16.62
Sample Diameter, cm	6.35	Dry Unit Weight, kN/m <sup>3</sup>	10.90
Area, cm <sup>2</sup>	31.65	Specific Gravity, measured	2.75
Volume, cm <sup>3</sup>	60.45	Solids Height, cm	0.772
Water Content, %	52.42	Volume of Solids, cm <sup>3</sup>	24.44
Wet Mass, g	102.46	Volume of Voids, cm <sup>3</sup>	36.01
Dry Mass, g	67.22	Degree of Saturation, %	97.9

### TEST COMPUTATIONS

Pressure kPa	Corr. Height cm	Void Ratio	Average Height cm	t <sub>90</sub> sec	cv. cm <sup>2</sup> /s	mv m <sup>2</sup> /kN	k cm/s
0.00	1.910	1.473	1.910				
4.84	1.905	1.466	0.952	190	1.01E-03	5.52E-04	5.47E-08
9.49	1.900	1.460	1.905	128	6.01E-03	5.51E-04	3.25E-07
19.26	1.893	1.451	1.896	97	7.86E-03	3.97E-04	3.05E-07
38.70	1.876	1.428	1.884	97	7.76E-03	4.61E-04	3.50E-07
75.00	1.840	1.382	1.858	104	7.03E-03	5.16E-04	3.56E-07
100.00	1.803	1.334	1.821	3253	2.16E-04	7.79E-04	1.65E-08
50.03	1.807	1.339	1.805				
80.03	1.804	1.336	1.822	33	2.13E-02	5.24E-05	1.09E-07
110.02	1.778	1.303	1.791	71415	9.52E-06	4.45E-04	4.15E-10
125.00	1.747	1.262	1.763	81894	8.04E-06	1.08E-03	8.54E-10
150.03	1.699	1.199	1.723	35284	1.78E-05	1.02E-03	1.78E-09
200.00	1.616	1.092	1.657	7968	7.31E-05	8.71E-04	6.23E-09
400.00	1.464	0.896	1.540	371	1.36E-03	3.96E-04	5.26E-08
799.99	1.349	0.747	1.407	289	1.45E-03	1.51E-04	2.14E-08
1599.98	1.251	0.620	1.300	217	1.65E-03	6.43E-05	1.04E-08
200.00	1.274	0.649	1.262				
80.03	1.289	0.669	1.281				

Notes:

k calculated using cv based on t<sub>90</sub> values.

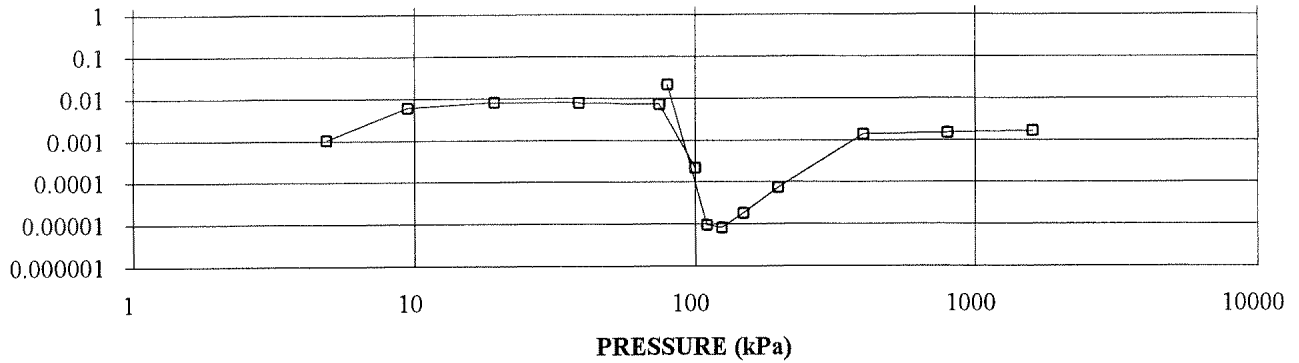
### SAMPLE DIMENSIONS AND PROPERTIES - FINAL

Sample Height, cm	1.29	Unit Weight, kN/m <sup>3</sup>	20.35
Sample Diameter, cm	6.35	Dry Unit Weight, kN/m <sup>3</sup>	16.16
Area, cm <sup>2</sup>	31.65	Specific Gravity, measured	2.75
Volume, cm <sup>3</sup>	40.79	Solids Height, cm	0.772
Water Content, %	25.94	Volume of Solids, cm <sup>3</sup>	24.44
Wet Mass, g	84.66	Volume of Voids, cm <sup>3</sup>	16.35
Dry Mass, g	67.22		

# OEDOMETER CONSOLIDATION SUMMARY

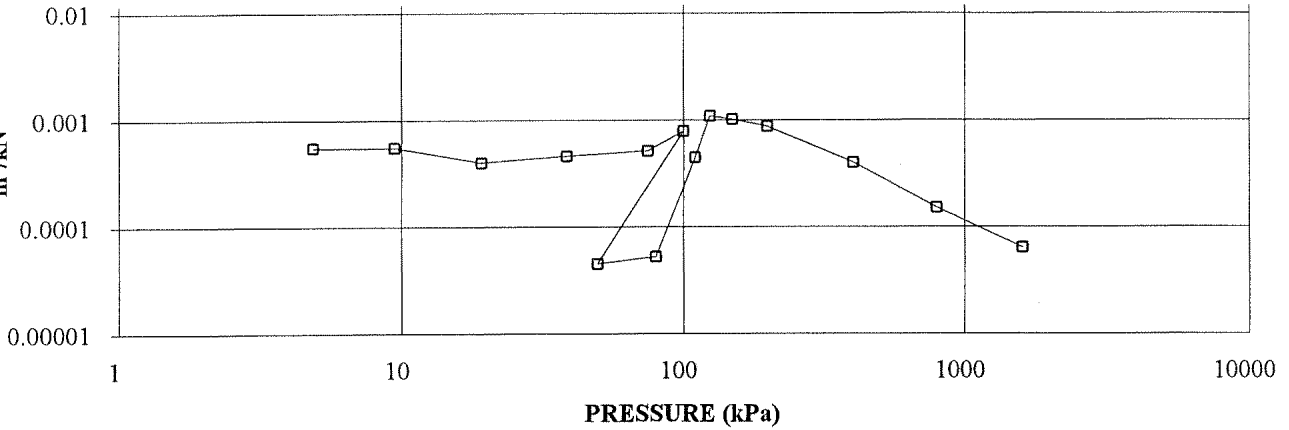
COEFFICIENT OF CONSOLIDATION,  $\text{cm}^2/\text{s}$

**CONSOLIDATION TEST**  
 $c_v$   $\text{cm}^2/\text{s}$  vs PRESSURE (kPa)  
 SA P0-00-1

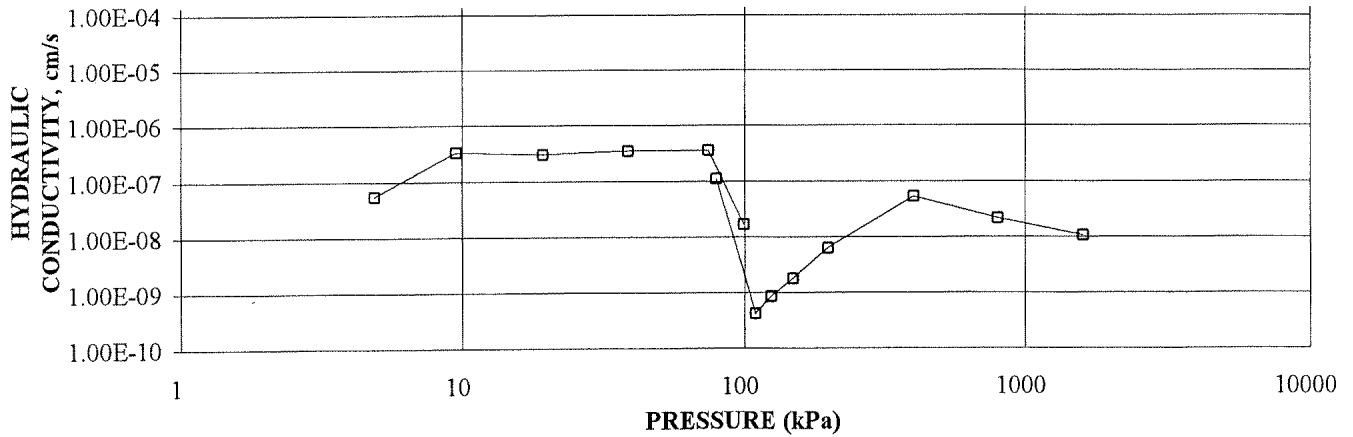


VOLUME  
 COMPRESSIBILITY,  
 $\text{m}^2/\text{kN}$

**CONSOLIDATION TEST**  
 $m_v$ ,  $\text{m}^2/\text{kN}$  vs PRESSURE (kPa)  
 SA P0-00-1



**CONSOLIDATION TEST**  
 HYDRAULIC CONDUCTIVITY vs PRESSURE  
 SA P0-00-1

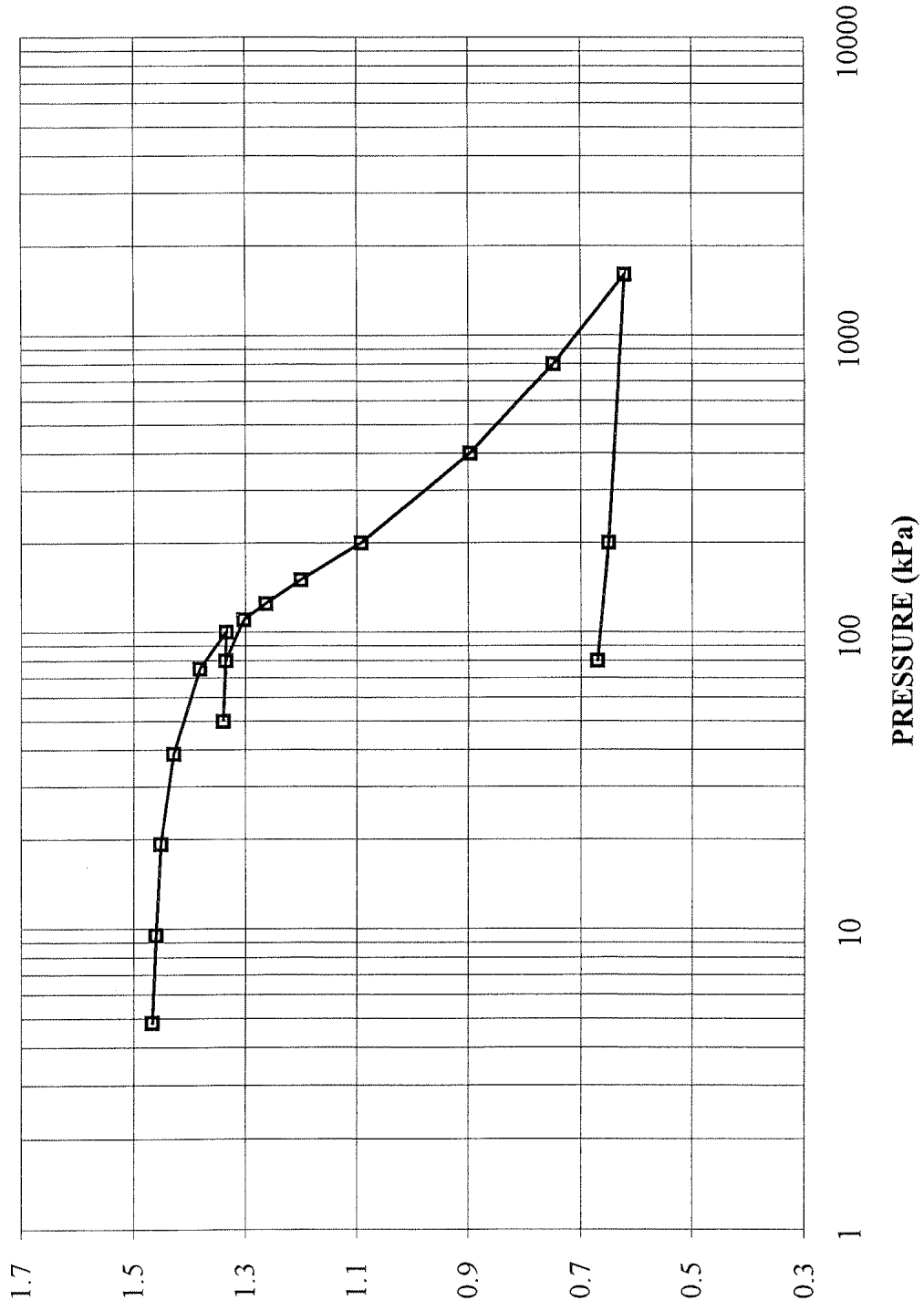


Project No. 001-7077

CONSOLIDATION TEST  
VOID RATIO VS. LOG PRESSURE

FIGURE

CONSOLIDATION TEST  
VOID RATIO vs PRESSURE  
SA P0-00-1



Project No. 001-7077

VOID RATIO

## SPECIFIC GRAVITY TEST RESULTS

### ASTM D 854-98 TEST METHOD A

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PROJECT NUMBER	001-7077
PROJECT NAME	Intersan / Expertise / Ste-Sophie
DATE TESTED	July, 2000

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Borehole No.	Sample No.	Specific Gravity
	P0-00-1	2.75

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Note: Test carried out on soil particles <4.75mm using distilled water .