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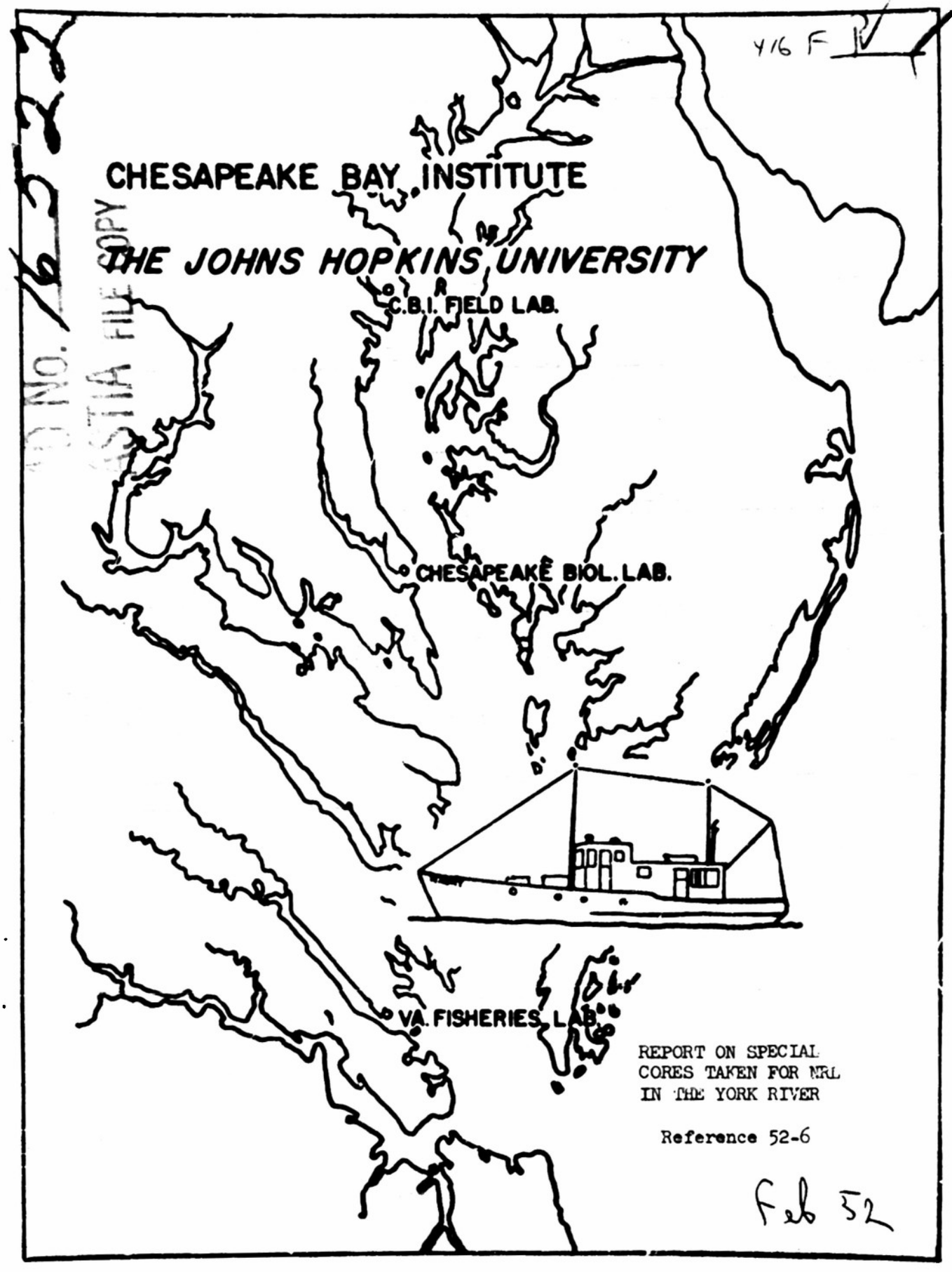

REPORT ON SPECIAL
CORES TAKEN FOR NRL
IN THE YORK RIVER

Reference 52-6

Feb 52

CHESAPEAKE BAY INSTITUTE

THE JOHNS HOPKINS UNIVERSITY

Reference No. 52-6

REPORT ON SPECIAL CORES TAKEN IN THE YORK RIVER FOR THE NAVAL RESEARCH LABORATORY

By

M. C. Powers

This report contains results of work carried out for the Office of Naval Research and the Hydrographic Office of the Navy Department under Contract No. Nonr-24807 with The Johns Hopkins University.

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Wayne V. Burt
Project Supervisor
February 29, 1952

PHYSICAL DATA FROM BOTTOM CORES OBTAINED OFF PIER 1 OF THE NAVAL MINE DEPOT, YORK RIVER

Six cores were taken at the request of NRL personnel working in conjunction with Operation MUD in the area adjacent to Pier 1 of the Naval Mine Depot at Yorktown, Virginia. The locations of the cores are shown in Figure 1. This report contains analyses of cores as requested by NRL. The results of certain other tests which were made in the field are listed.

The sediments in the area are predominantly sand which is derived chiefly from the erosion of nearby beaches. There can be little doubt but what ships occasionally stir the bottom sediments. This stirring puts sediments into suspension and probably results in occasional changes in the type material present.

Field Tests

As soon as the cores were extruded aboard ship the natural water content, wet density, rigidense and pH were determined. These tests have been described in Chesapeake Bay Institute, Inshore Survey Program, Interim Reports.

Natural water content and porosity are determined from the water contained in the sediment according to the following equations:

$$\text{Natural water} = \frac{\text{Wet weight} - \text{Dry Weight}}{\text{Dry Weight}} \times 100$$

$$\text{Porosity} = \frac{\text{Wet Weight} - \text{Dry Weight}}{\left(\frac{\text{Dry Weight}}{2.65}\right) + \text{Weight of water}} \times 100$$

In determining porosity it is assumed that the pore space in the sediments is saturated with water.

Wet density of the bulk material was measured with a Braun "MUDWATE" hydrometer.

Rigidense is the depth in centimeters to which a small penetrometer sinks in a section of the core in two minutes.

pH was determined with "pHydrion" pH paper placed directly on the core immediately after extrusion.

Laboratory Size Determinations

Size distribution determinations were run on samples taken at various depths in the cores. The samples were selected on the basis of lithologic changes in the cores.

The samples were dispersed in sodium carbonate after removing organic matter and calcium carbonate which tends to flocculate the clay and fine silt fractions. "U. S. Standard" sieves were used to separate fractions larger than 0.062 millimeters. A "BOUYOUCOS" hydrometer was used in the analysis of the lutites. These results were checked against pipette analyses. Only hydrometer results are given in this report.

Most of the central tendencies from the cumulative curves occur in the sand size fractions and are therefore reliable. However, the size analysis of particles less than about 0.03 mm is subject to error due to difference in the dis-aggregating ability of the dispersal agent used. Therefore the size analysis of the fractions in the fine silt and clay range does not give the size distributions that occur in the natural environment.

Central Tendencies and Parameters

Cumulative curves were plotted and the following parameters and central tendencies which are discussed by Krumbein and Pettijohn (Manual of Sedimentary Petrography, 1938, Chapter 9) were determined:

Md Median diameter in mm.

Q_1, Q_3 First and third quartiles.

P_{10}, P_{90} Ten and ninety percentiles.

$QD_a = \frac{Q_3 - Q_1}{2}$ Arithmetic quartile deviation.

This last term is a measure of sorting and though rarely used by sedimentologists it may prove useful in studying the attenuation of sound through sediments since it is affected by grain size. The smaller the numerical value the better the sorting. Values greater than 0.1 are considered poorly sorted.

$$Sk_a = \frac{Q_3 + Q_1}{2} - Md$$ Arithmetic quartile skewness.

This measure of skewness is affected by grain size. A zero value indicates a perfectly symmetrical frequency distribution. Distributions with negative values are skewed toward larger grain sizes and those with positive values are skewed toward smaller grain sizes.

$$Kq_a = \frac{Q_3 - Q_1}{2\,(P_{90} - P_{10})}$$ Arithmetic quartile kurtosis.

The lower the numerical value, the flatter the frequency curve. The values are independent of grain size.

$$QD_g = \sqrt{\frac{Q_3}{Q_1}}$$ Geometric quartile deviation.

According to Trask (Origin and Environment of Source Sediments of Petroleum, 1932), who introduced this as a "sorting coefficient", values less than 2.5 indicate well sorted sediments, values from 2.5 to 4.0 indicate moderate sorting while values greater than 4.0 indicate poor sorting.

$$Sk = \frac{Q_3\,Q_1}{Md^2}$$ Square of the geometric quartile skewness.

A perfectly symmetrical frequency curve would have an Sk value of 1.0. Curves with Sk greater than 1.0 are skewed toward smaller grain size and curves with Sk less than 1.0 are skewed toward larger grain sizes.

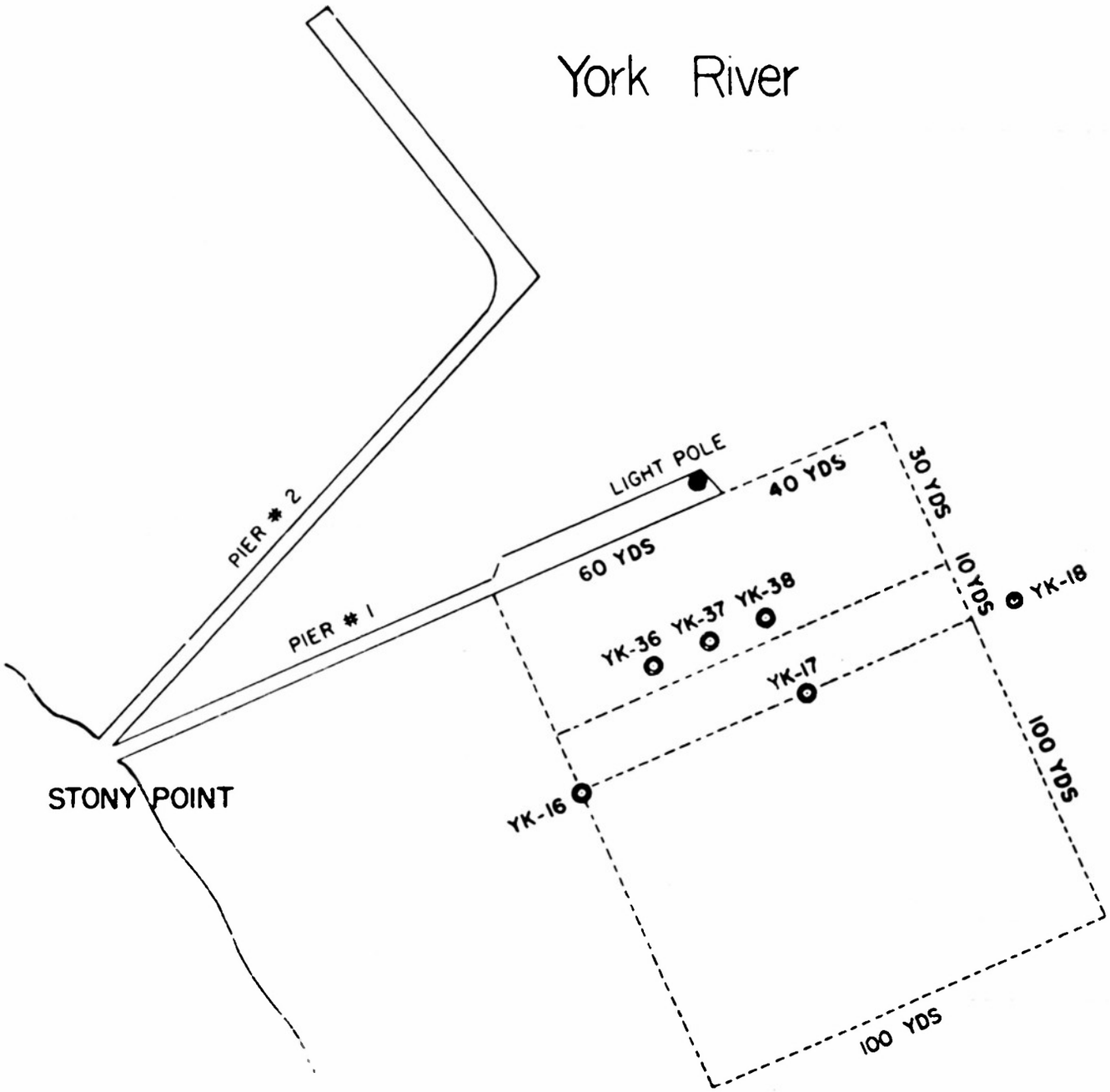


Figure 1. Chart showing location of cores.

Core YK-16

Depth from top in feet	% Nat. water	% Porosity	Wet Density	Rid. value	Odor	pH
0	190.42	81.5	1.12	5.7	None	8.0
2	197.97	82.9	1.26	3.6	None	8.0
4	58.68	60.8	1.64	3.3	None	8.0
6	28.80	43.2	1.98	1.7	None	8.0
6½	--	--	--	3.3	None	8.0
8	60.97	56.7	1.57	4.8	None	8.0
9½	51.33	57.6	1.43	--	None	8.0

Description

Depth from top in inches	Color	Roundness *	Megascopic sorting**	Grain size of sand fraction***
0-24	black	--	W.	V. F.
24-66	dark grey	--	P.	F. to V. F.
66-74	yellow	A. to S.A.	P.	C. to F.
74-Bottom	dark grey	A. to S.A.	P.	M. to V. F.

Depth from top in inches	Estimated % of Gravel	sand	silt	clay	Consistency or induration
0-24	--	30	40	30	Oozey to plastic
24-66	5	60	25	10	Plastic to almost soupy
66-74	--	90	5	5	Semi-plastic
74-Bottom	--	85	10	5	Semi-plastic

*Roundness
V. A. - Very Angular, A. - Angular, S. A. - Subangular, S. R. - Subrounded
R. - Rounded, W. R. - Well Rounded

**Megascopic Sorting
W. - Well sorted, S. - sorted, P. - Poorly sorted, V. P. - Very Poorly sorted

***Grain Size of Sand Fraction
V. F. - Very Fine, F. - Fine, M. F. - Medium Fine, Medium, C. - Coarse,
G. - Gravel

Core YK-17

Depth from top in feet	% Nat. water	% Porosity	Wet Density	Rid. value	Odor	pH
0	139.37	78.6	1.40	5.8	None	7.0
2	33.55	47.3	1.98	3.7	None	7.0
3½	24.33	39.1	1.96	2.0	None	7.0

Description

Depth from top in inches	Color	Roundness *	Megascopic sorting**	Grain size of sand fraction***
0-6	Medium grey	--	W.	F. to V. F.
6-40	Light grey	S.A. to A.	P.	C. to V. F.
40-42	Light grey	S.A. to A.	P.	Mostly C.

Depth from top in inches	Estimated % of Gravel	sand	silt	clay	Consistency or induration
0-6	--	70	15	15	Oozey
6-40	--	90	5	5	Soupy
40-42	5	90	2.5	2.5	Wet

Core YK-18

Depth from top in feet	% Nat. water	% Porosity	Wet Density	Rid. value	Odor	pH
0	142.29	78.9	1.63	2.0	H_2S	7.5
2	137.09	78.4	1.42	0.5	H_2S	7.5
4	32.71	46.0	--	2.2	H_2S	7.5
6	102.04	73.0	--	6+	None	7.5

Description

Depth from top in inches	Color	Roundness *	Megascopic sorting**	Grain size of sand fraction***
0-18	Medium grey	--	W.	V. F.
18-48	Brown	S.A. to A.	P.	C. to V. F.
48-72	Medium grey	--	S.	V. F.

Depth from top in inches	Estimated % of Gravel	sand	silt	clay	Consistency or induration
0-18	--	75	15	10	Hard-plastic
18-48	--	90	5	5	Hard-plastic
48-72	--	30	40	30	Soupy with hard-plastic clay balls

Core YK-36

Depth from top in feet	% Nat. water	% Porosity	Wet Density	Rid. value	Odor	pH
0	215.00	85.0	1.25	6+	None	7.2
2	175.00	82.4	1.28	4.7	None	7.2
4	38.00	50.0	1.73	4.4	None	7.0
6	36.00	49.1	1.88	4.3	None	7.0
8	37.00	49.3	1.89	3.8	None	7.0

Description

Depth from top in inches	Color	Roundness *	Megascopic sorting**	Grain size of sand fraction***
0-30	Dark grey	S.R. to W.R. Mostly W.R.	S.	F. to V.F. Mostly M.F.
30-54	Mustard salt & pepper	R. to W.R. Mostly W.R.	S.	M. to F. Mostly M.F.
54-96	Mustard salt & pepper	R. to W.R. Mostly W.R.	W.	M. to V.F. Mostly F.

Depth from top in inches	Estimated % of Gravel	sand	silt	clay	Consistency or induration
0-30	--	5	55	40	Sticky gelatinous
30-54	--	60	30	10	Soggy slick sand
54-96	--	100	--	--	Very wet squishy

Core YK-37

Depth from top in feet	% Nat. water	% Porosity	Wet Density	Rid. value	Odor	pH
0	42.00	52.5	1.83	6+	None	7.0
2½	35.00	48.4	1.90	4.7	None	7.0

Description

Depth from top in inches	Color	Roundness *	Megascopic sorting**	Grain size of sand fraction***
0-12	Medium grey salt & pepper	R. to W.R. Mostly W.R.	S.	M. to F. Mostly M.
12-30	Medium grey salt & pepper	R. to W.R. Mostly W.R.	WS	M. to F. Mostly M.

Depth from top in inches	Estimated % of Gravel	sand	silt	clay	Consistency or induration
0-12	--	90	8	2	Squishy sand
12-30	--	100	0	0	Firm sand where undiluted

Core YK-38

Depth from top in feet	% Nat. water	% Porosity	Wet Density	Rid. value	Odor	pH
0	78.00	67.5	1.57	6+	None	8.0
2	30.00	44.6	1.94	2.0	None	7.0
4	28.00	42.8	2	2.0	None	7.0
6	28.00	42.6	1.99	3.2	None	7.0
8	25.00	39.8	2	1.6	None	7.0

Description

Depth from top in inches	Color	Roundness *	Megascopic sorting**	Grain size of sand fraction***
0-12	Dark grey	S.A. to R. Mostly S.R.	S.	M. to F. Mostly M.
12-36	Medium grey salt & pepper	S.R. to W.R. Mostly W.R.	W.	M. to F. Mostly M.
36-84	Medium grey salt & pepper	S.R. to W.R. Mostly W.R.	V.P.	G. to F. Mostly M.

Depth from top in inches	Estimated % of Gravel	sand	silt	clay	Consistency or induration
0-12	--	50	35	15	About like toothpaste
12-36	--	100	0	0	Very wet but firm
36-84	5	95	0	0	Very wet but firm

Sample No. YK-16 (5'6")

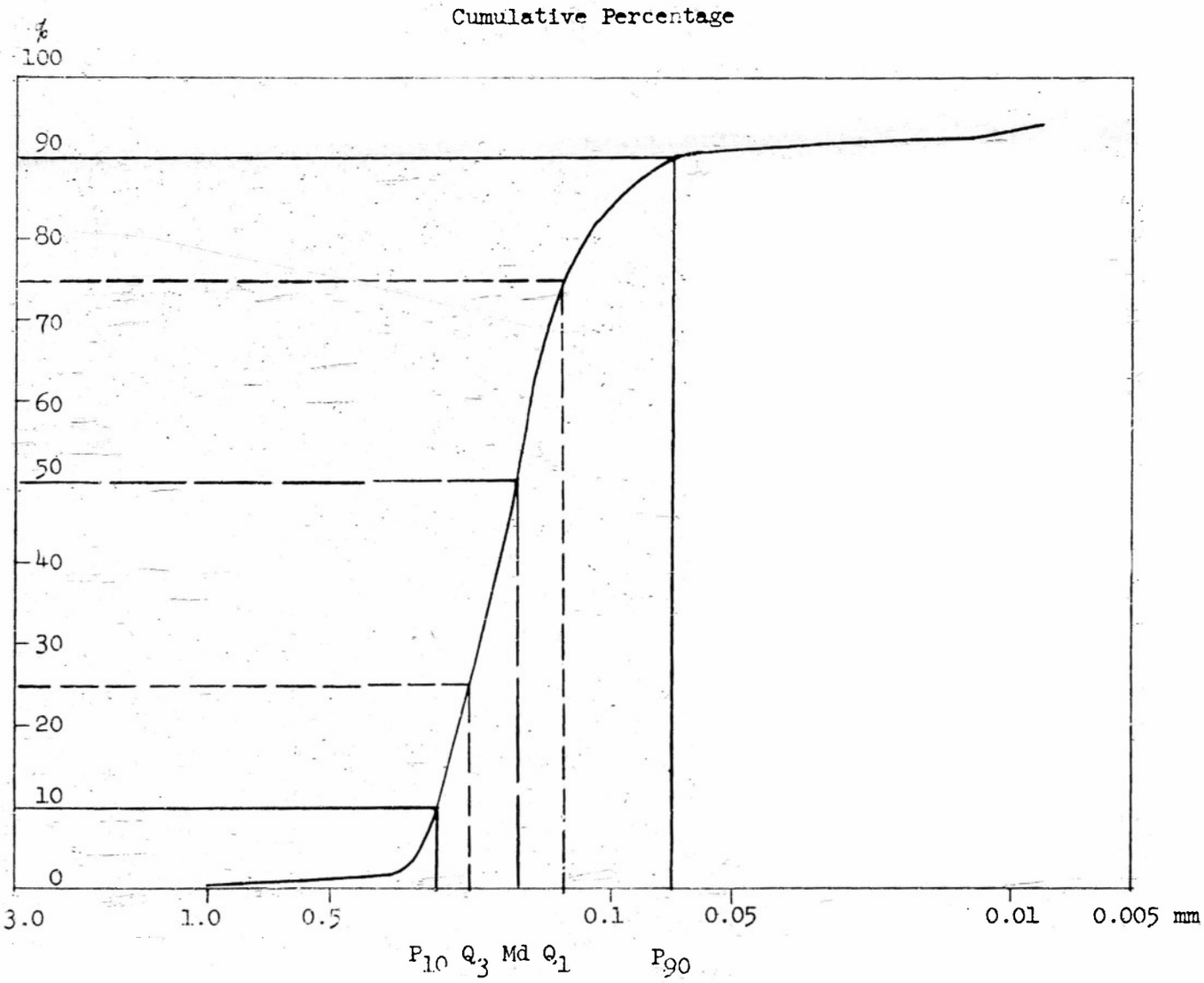
Grade Size mm.	Weight	% in Grade Size	Cumulative %
>1.00	0.08	0.16	0.16
1.00-7.10	0.09	0.18	0.34
.710-.500	0.15	0.30	0.64
.500-.350	0.46	0.92	1.56
.350-.250	6.78	13.60	15.16
.250-.177	16.67	33.20	48.36
.177-.125	13.88	28.70	77.06
.125-.088	5.43	10.80	87.86
.088-.062	1.18	2.40	90.26
.062-.055	0.10	0.20	90.46
.055-.031	0.70	1.40	91.86
.031-.015	0.10	0.20	92.06
.015-.009	1.00	2.00	94.06
<.009		6.30	100.36

Sample No. YK-16 (7')

>2.00	0.82	1.72	1.72
2.00-1.40	0.35	0.73	2.45
1.40-1.00	0.45	0.94	3.39
1.00-.710	0.52	1.09	4.48
.710-.500	0.73	1.53	6.01
.500-.350	1.02	2.14	8.15
.350-.250	3.34	7.00	15.15
.250-.177	5.47	11.50	26.65
.177-.125	2.70	5.66	32.31
.125-.088	1.64	3.44	35.75
.088-.062	1.40	2.94	38.69
.062-.055	1.00	2.10	40.79
.055-.031	11.00	23.00	63.79
.031-.015	4.00	8.40	72.19
.015-.009	3.80	7.90	80.09
<.009		18.00	98.09

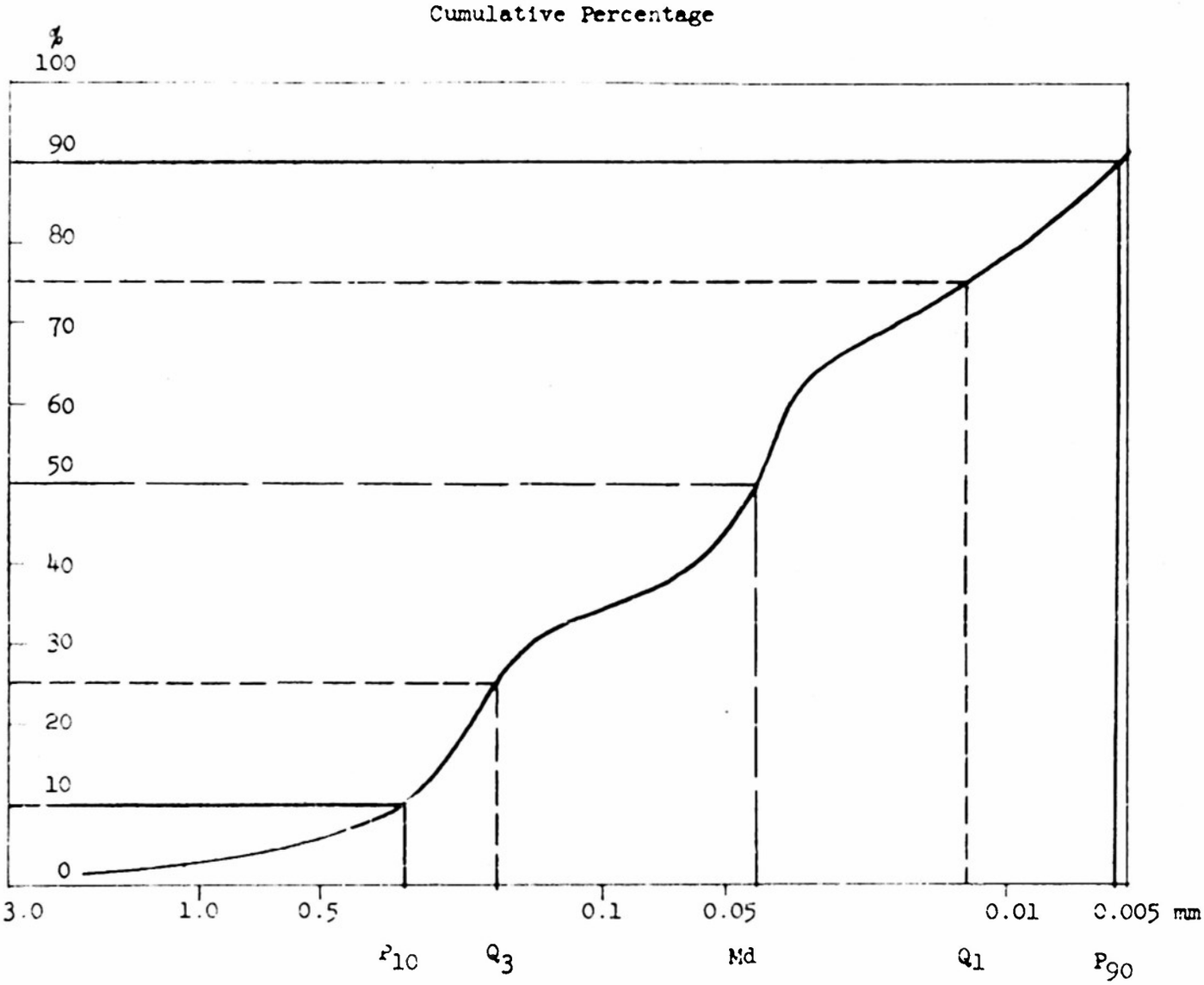
Core YK 16 Depth 5'6"

		Arithmetic Parameters	Geometric Parameters
Md	= 0.17	QD_a = 0.047	QD_g = 1.325
Q_1	= 0.13	SK_a = 0.007	Sk = 1.015
Q_3	= 0.225	Kq_a = -0.239	
P_{90}	= 0.07		
P_{10}	= 0.27		



Core YK 16 Depth 7'

		Arithmetic Parameters		Geometric Parameters	
Md	= 0.042	QD_a	= 0.086	QD_g	= 3.84
Q_1	= 0.0125	SK_a	= -0.027	Sk	= 1.34
Q_3	= 0.185	Kq_a	= -0.096		
P_{90}	= 0.0052				
P_{10}	= 0.32				



Sample No. YK-17 (0')

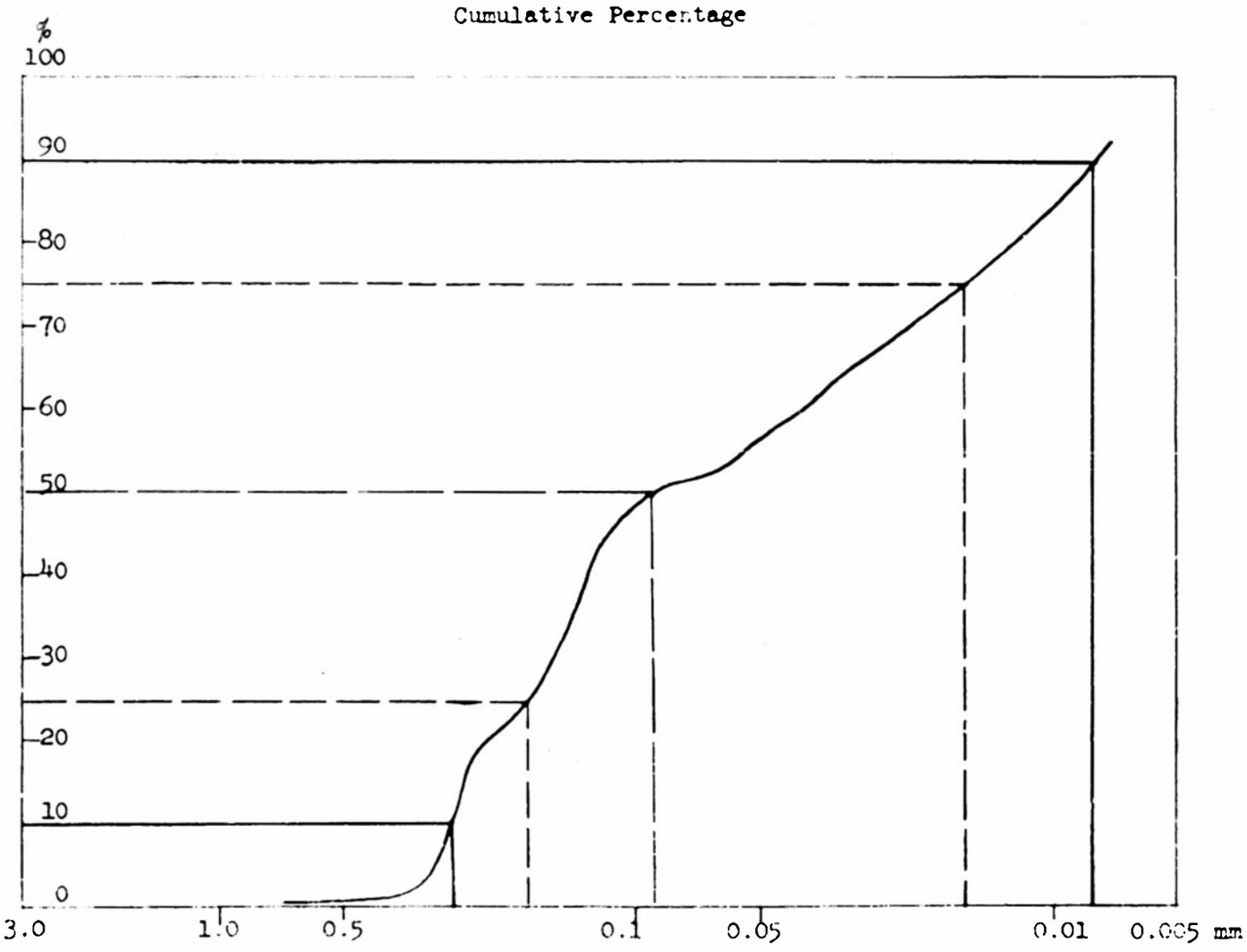
Grade Size mm.	Weight	% in Grade Size	Cumulative %
>1.00	0.00	0.00	0.00
1.00-.710	0.07	0.22	0.22
.710-.500	0.08	0.25	0.47
.500-.350	0.28	0.87	1.34
.350-.250	5.32	16.40	17.74
.250-.177	2.45	7.55	25.29
.177-.125	5.72	17.60	42.89
.125-.088	2.55	7.85	50.74
.088-.062	0.52	1.60	52.34
.062-.055	1.10	3.40	55.74
.055-.031	3.00	9.30	65.04
.031-.015	3.60	11.10	76.14
.015-.009	3.30	10.20	86.34
<.009		13.60	99.94

Sample No. YK-17 (2')

>1.00	0.02	0.04	.04
1.00-.710	0.05	0.10	.14
.710-.500	0.22	0.47	.61
.500-.350	0.71	1.50	2.11
.350-.250	4.10	8.65	10.76
.250-.177	10.50	22.10	32.86
.177-.125	19.40	41.00	73.86
.125-.088	8.10	17.10	90.96
.088-.062	1.44	3.02	93.98
.062-.055	0.50	1.00	94.98
.055-.031	0.50	1.00	95.98
<.031		1.00	96.98

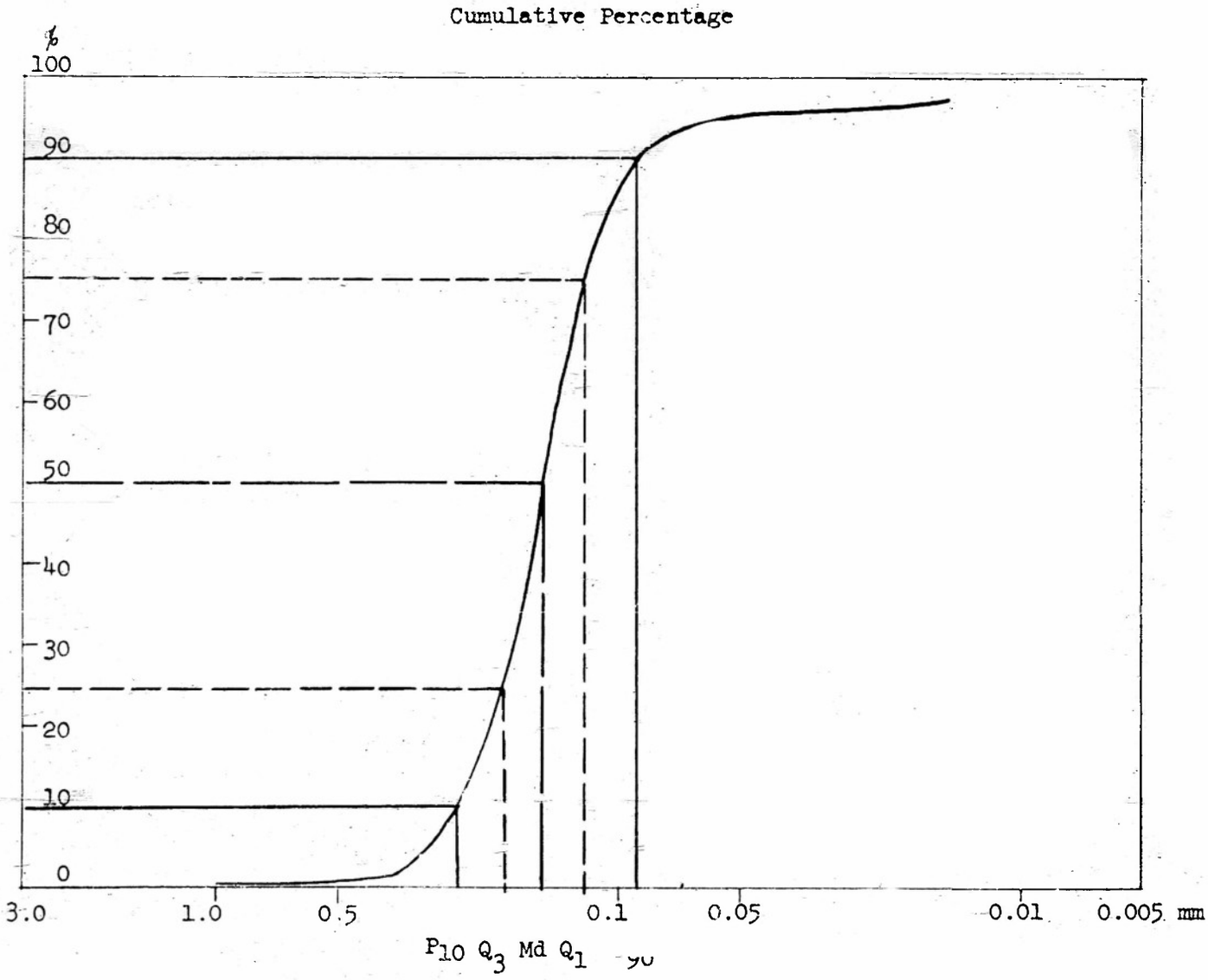
Core YK 17 Depth 0'

		Arithmetic Parameters		Geometric Parameters	
Md	= 0.091	QD_a	= 0.085	QD_g	= 3.34
Q_1	= 0.0164	SK_a	= 0.009	Sk	= 0.035
Q_3	= 0.18	Kq_a	= -0.318		
P_{90}	= 0.008				
P_{10}	= 0.275				



Core YK 17 Depth 2'

		Arithmetic Parameters	Geometric Parameters
Md	= 0.155	QD_a = 0.035	QD_g = 1.259
Q_1	= 0.12	SK_a = 0.0	Sk = 0.949
Q_3	= 0.19	Kq_a = -0.217	
P_{90}	= 0.089		
P_{10}	= 0.25		



Sample No. YK-18 (0')

Grade Size mm.	Weight	% in Grade Size	Cumulative %
>2.00	0.00	0.00	0.00
2.00-1.40	0.00	0.00	0.00
1.40-1.00	0.00	0.00	0.00
1.00-.710	0.06	0.20	0.20
.710-.500	0.06	0.20	0.40
.500-.350	0.10	0.32	0.72
.350-.250	0.31	1.00	1.72
.250-.177	0.62	2.00	3.72
.177 .125	1.05	3.36	7.08
.125-.088	3.26	10.40	17.48
.088-.062	6.55	20.90	38.38
.062-.055	5.40	17.30	55.68
.055-.031	6.00	19.20	74.88
.031-.015	2.30	7.35	82.23
.015-.009	4.30	13.75	95.98
<.009	1.30	4.15	100.13

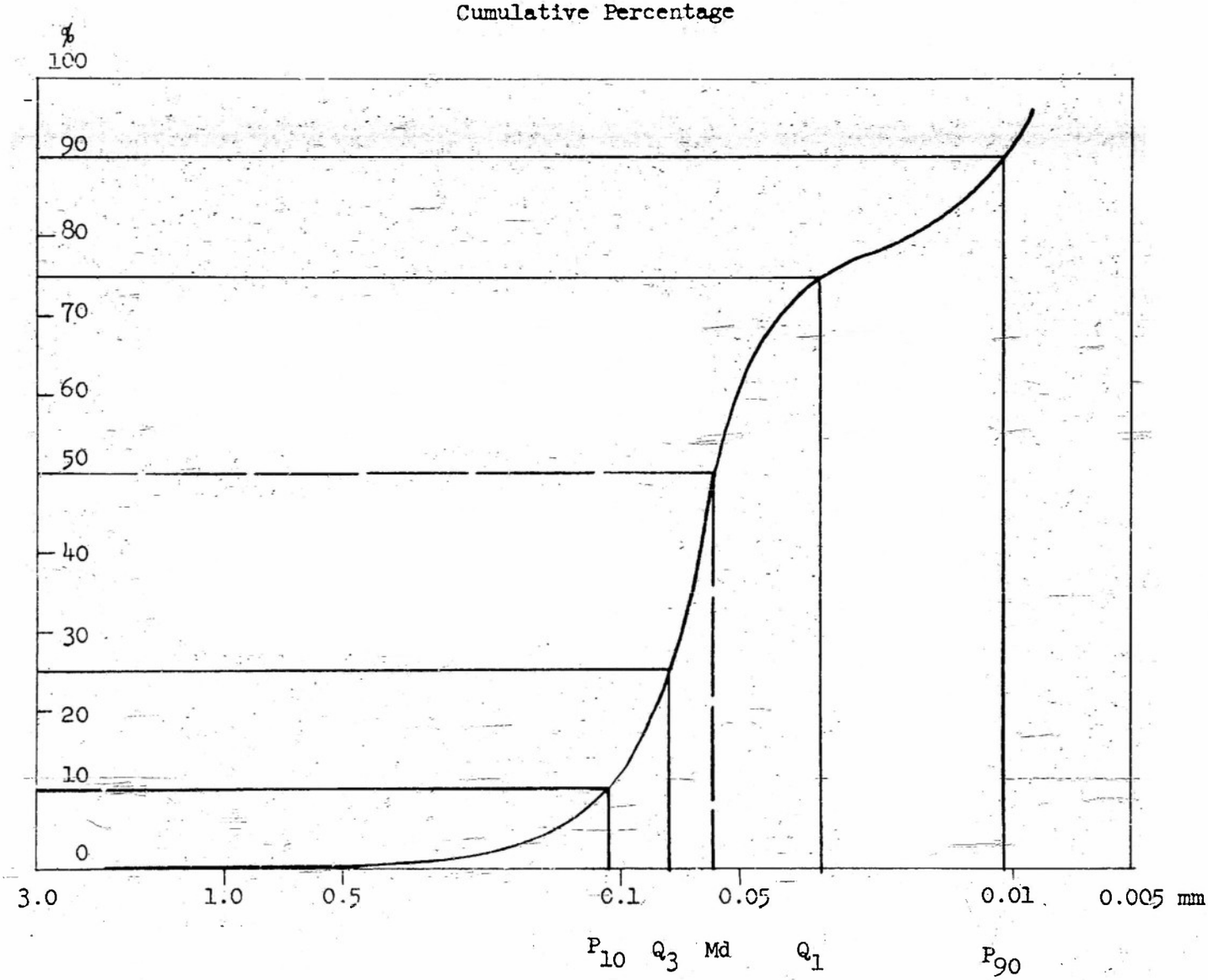
Sample No. YK-18 (4')

>2.00	0.20	0.43	0.43
2.00-1.40	0.20	0.43	0.43
1.40-1.00	0.26	0.56	1.25
1.00-.710	0.34	0.73	1.98
.710-.500	0.80	1.73	3.71
.500-.350	1.60	3.40	7.11
.350-.250	19.32	43.00	50.11
.250-.177	4.35	9.40	59.51
.177-.125	9.44	20.20	79.71
.125-.088	1.76	3.80	83.51
.088-.062	0.28	0.60	84.11
.062	0.13	0.27	84.38
.062-.055	0.75	1.50	85.88
.055-.031	0.75	1.50	87.38
.031-.015	1.40	2.80	90.18
.015-.009	0.50	1.00	91.18
<.009	0.50	8.70	99.88

Core YK 18 Depth 0'

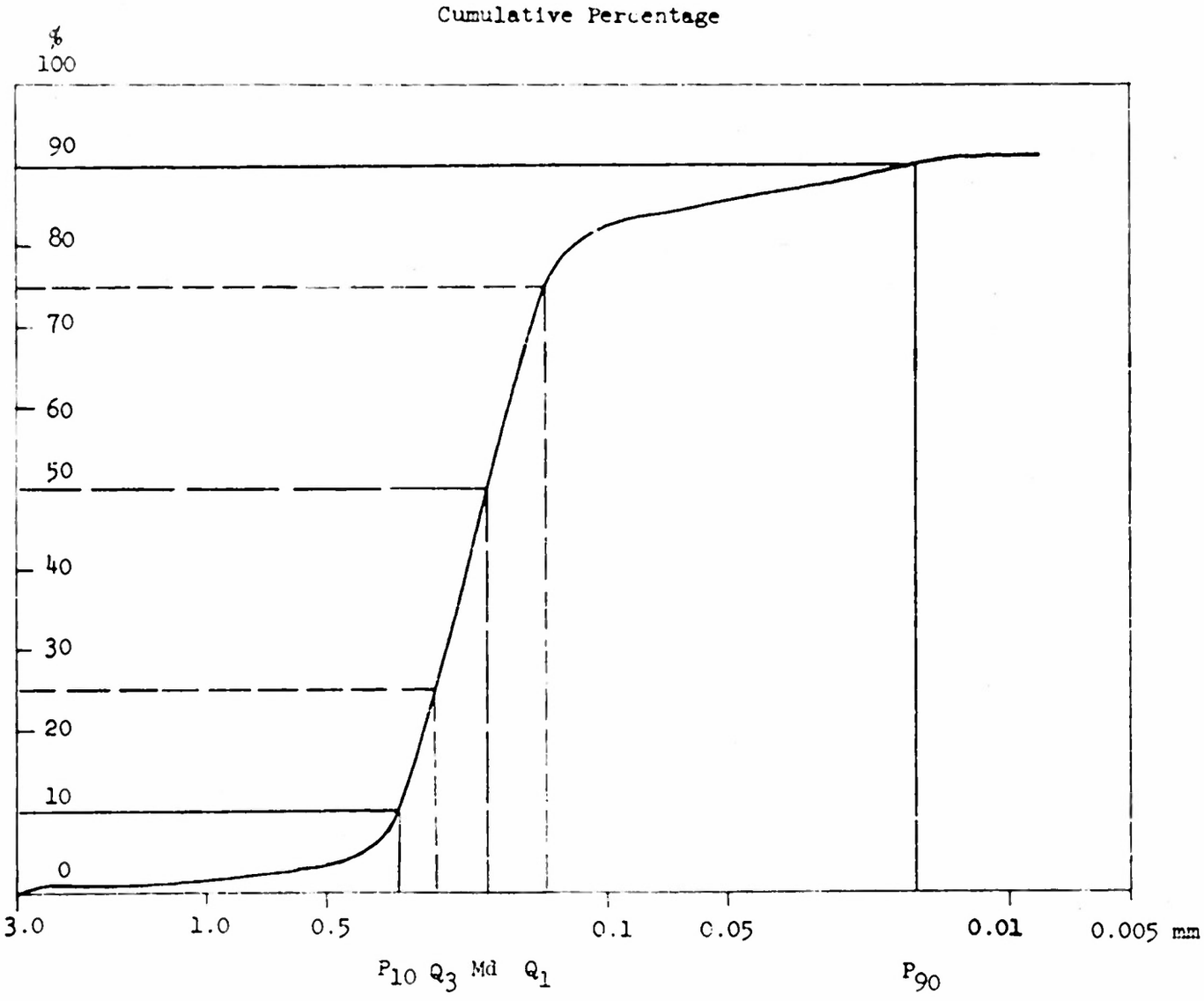
		Arithmetic Parameters	Geometric Parameters
Md	= 0.058	QD_a = 0.022	QD_g = 1.565
Q_1	= 0.031	SK_a = -0.005	Sk = 0.792
Q_3	= 0.076	Kq_a = -0.125	
P_{90}	= 0.0105		
P_{10}	= 0.19		

Cumulative Percentage



Core YK 18 Depth 4'

		Arithmetic Parameters		Geometric Parameters	
Md	= 0.20	QD_a	= 0.06	QD_g	= 1.36
Q_1	= 0.14	SK_a	= 0.0	Sk	= 0.909
Q_3	= 0.26	Kq_a	= -0.192		
P_{90}	= 0.017				
P_{10}	= 0.33				



Sample No. YK-18 (6')

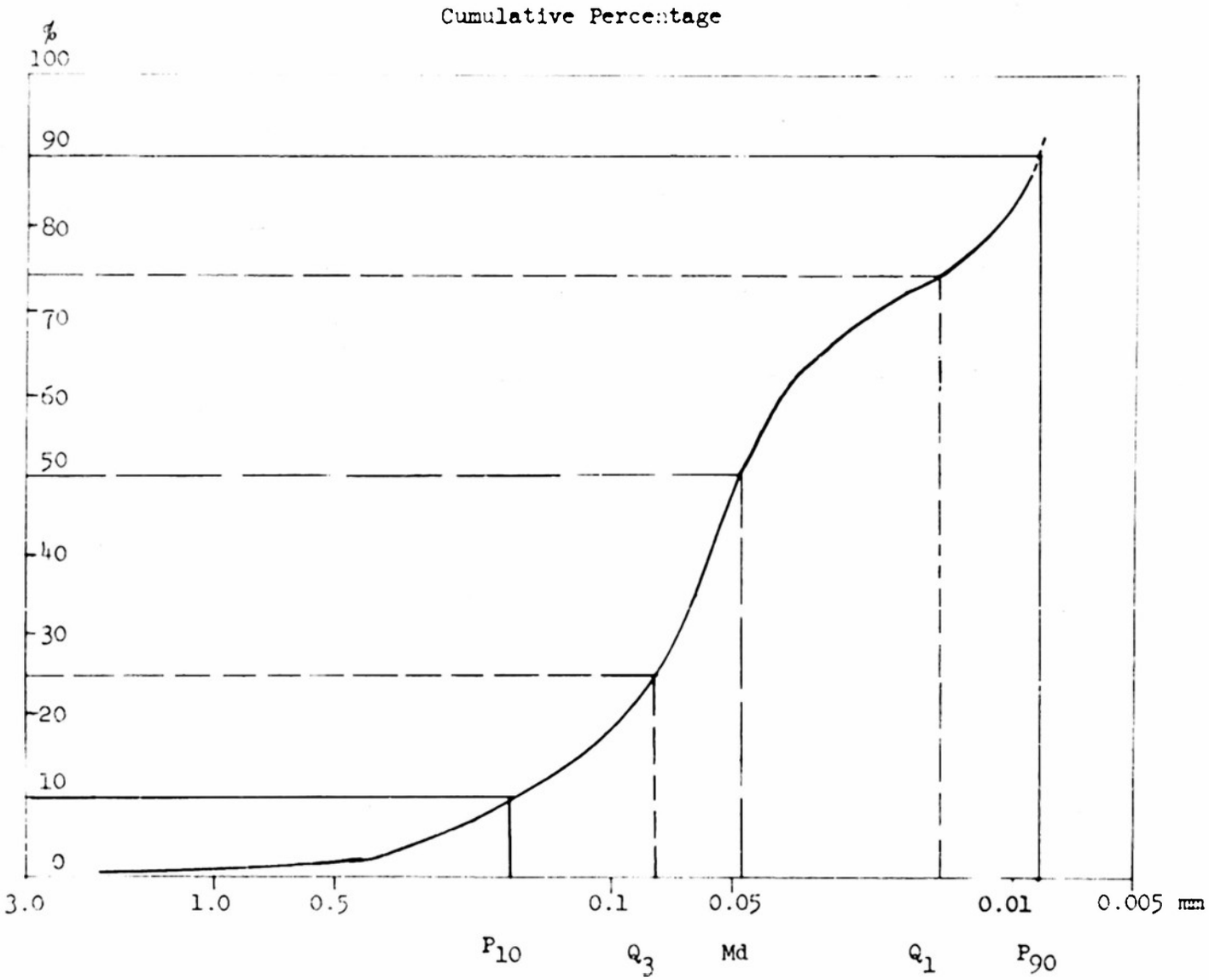
Grade Size mm.	Weight	% in Grade Size	Cumulative %
>2.00	0.08	0.20	0.20
2.00-1.40	0.07	0.17	0.37
1.40-1.00	0.14	0.34	0.71
1.00-.710	0.18	0.45	1.16
.710-.500	0.30	0.75	1.91
.500-.350	0.50	1.25	3.16
.350-.250	1.18	2.94	6.10
250-.177	1.85	4.61	10.71
.177-.125	1.43	3.56	14.27
.125-.088	2.83	7.05	21.32
.088-.062	5.42	13.50	34.82
.062-.055	3.60	9.00	43.82
.055-.031	8.10	21.00	64.82
.031-.015	4.20	10.50	75.32
.015-.009	4.80	12.00	87.32
<.009	5.40	13.00	100.32

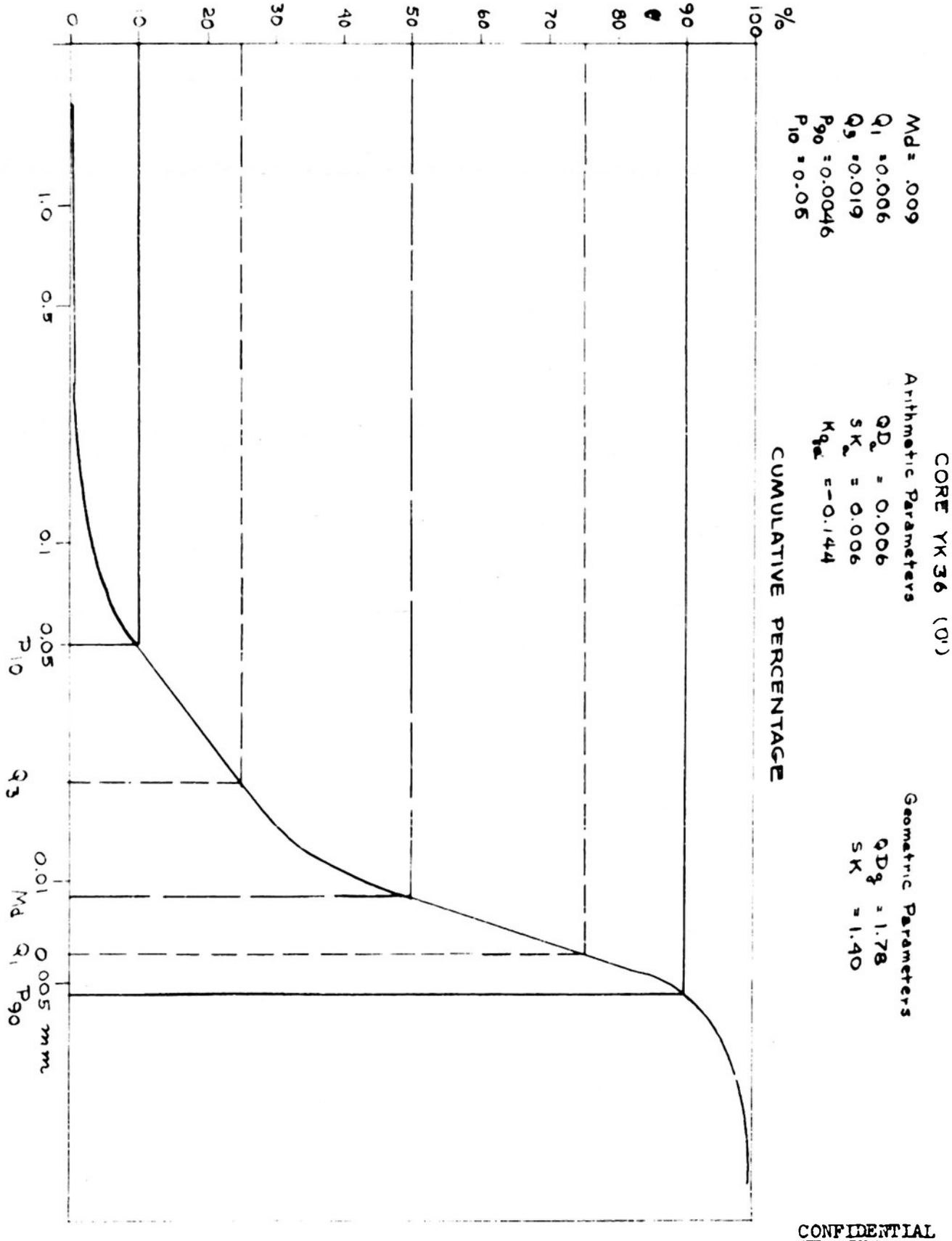
Sample No. YK-36 (0')

>2.00	0.07	0.22	0.22
2.00-1.40	0.00	0.00	0.22
1.40-1.00	0.04	0.13	0.35
1.00-.710	0.04	0.13	0.48
.710-.500	0.04	0.13	0.61
.500-.350	0.04	0.13	0.74
.350-.250	0.15	0.48	1.22
.250-.177	0.24	0.77	1.99
.177-.125	0.37	1.18	3.17
.125-.088	0.42	1.34	4.51
.088-.062	0.39	1.25	5.76
.062-.055	1.00	3.20	8.96
.055-.031	3.00	9.50	18.46
.031-.015	4.70	14.90	33.36
.015-.009	5.40	17.20	50.56
<.009		47.60	98.16

Core YC 18 Depth 6'

		Arithmetic Parameters		Geometric Parameters	
Md	= 0.048	QD_a	= 0.033	QD_g	= 2.28
Q_1	= 0.015	SK_a	= -0.01	Sk	= 0.518
Q_3	= 0.078	Kq_a	= -0.184		
P_{90}	= 0.0086				
P_{10}	= 0.18				




CORE YK 36 (0')
Arithmetic Parameters
QD = 0.006
SK = 0.006
Kq = -0.144
Geometric Parameters
QDg = 1.78
SK = 1.40
Md = .009
Q1 = 0.006
Q3 = 0.019
P90 = 0.0046
P10 = 0.06
CUMULATIVE PERCENTAGE
%
100
90
80
70
60
50
40
30
20
10
0
1.0
0.5
0.1
0.05
0.01
0.005 mm
P10
Q3
Md
Q1
P90

Sample No. YK-36 (5')

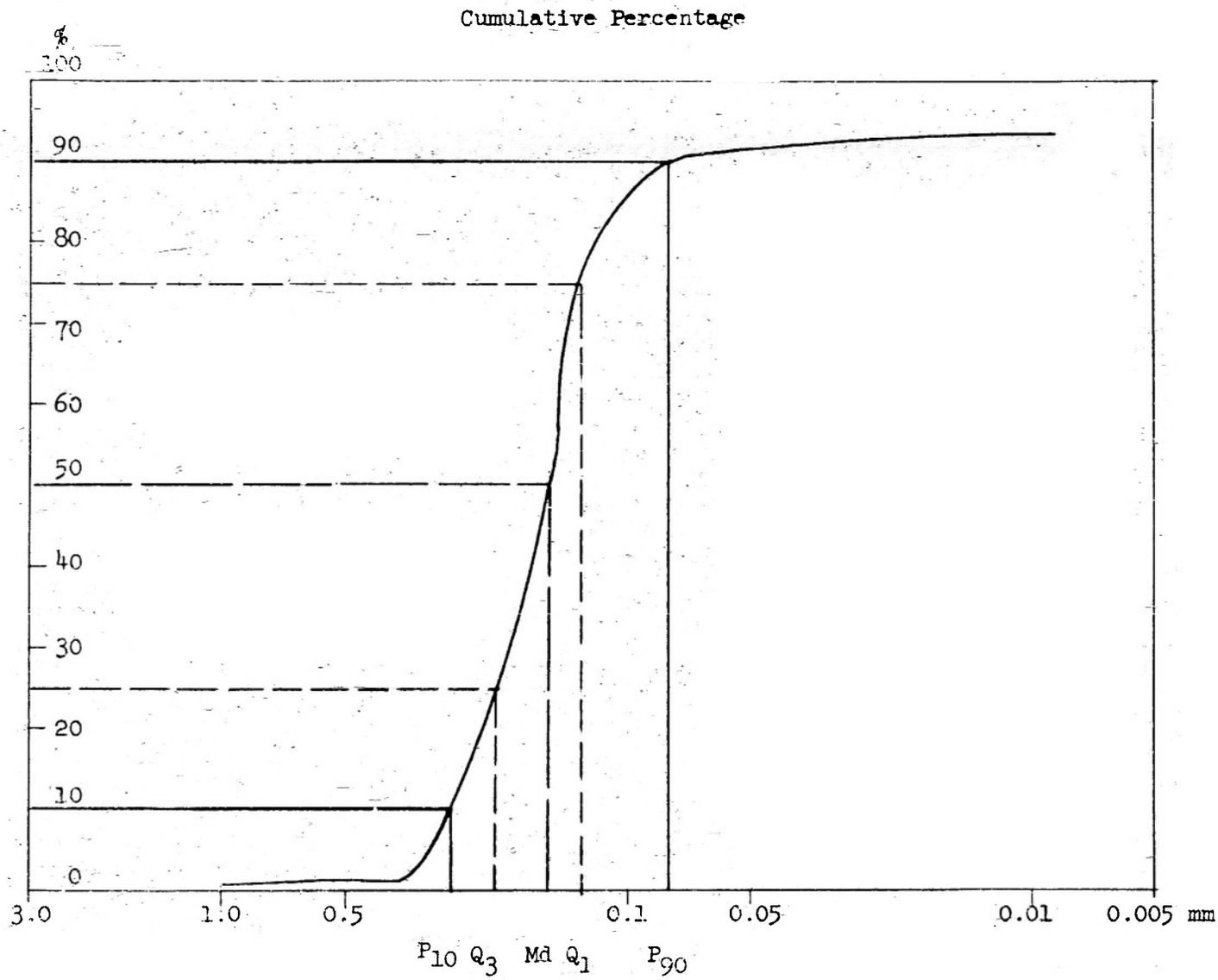
Grade Size mm.	Weight	% in Grade Size	Cumulative %
1.40-1.00	0.11	0.22	0.22
1.00-.710	0.15	0.31	0.53
.710-.500	0.19	0.39	0.92
.500-.350	0.41	0.84	1.76
.350-.250	7.00	14.30	16.06
.250-.177	15.45	31.50	47.56
.177-.125	15.14	30.90	78.46
.125-.088	5.24	10.70	89.16
.088-.062	1.11	2.26	91.42
.062-.055	0.10	0.20	91.62
.055-.031	0.30	0.60	92.22
.031-.015	0.30	0.60	92.82
.015-.009	0.50	1.00	93.82
<.009		5.80	99.62

Sample No. YK-37 (0')

>2.00	0.89	1.87	1.87
2.00-1.40	0.11	0.23	2.10
1.40-1.00	0.22	0.46	2.56
1.00-.710	0.17	0.36	2.92
.710-.500	0.30	0.63	3.55
.500-.350	0.58	1.22	4.77
.350-.250	7.50	15.80	20.57
.250-.177	17.03	35.80	56.37
.177-.125	9.74	20.40	76.77
.125-.088	4.52	9.50	86.27
.088-.062	1.09	2.30	88.57
.062-.055	1.00	2.10	90.67
.055-.031	0.10	0.21	90.88
.031-.015	0.00	0.00	90.88
.015-.009	0.90	1.90	92.78
<.099		6.50	99.28

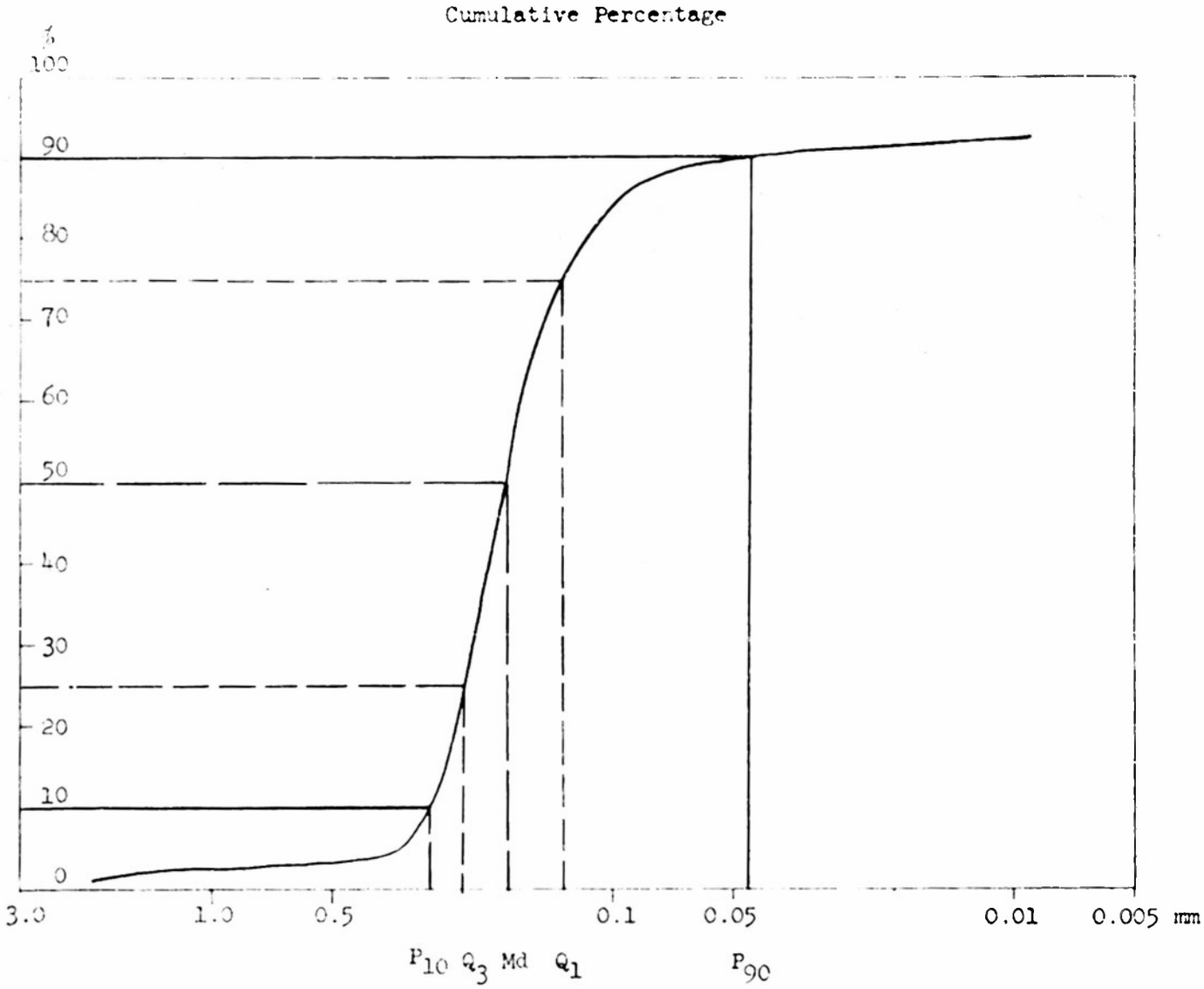
Core YK 36 Depth 5'

		Arithmetic Parameters		Geometric Parameters	
Md	= 0.155	QD_a	= 0.04	QD_g	= 1.259
Q_1	= 0.132	SK_a	= 0.018	SK	= 1.225
Q_3	= 0.215	Kq_a	= -0.205		
P_{90}	= 0.08				
P_{10}	= 0.275				



Core YK 37 Depth 0'

Md = 0.182	Arithmetic Parameters	Geometric Parameters
Q_1 = 0.135	QD_a = 0.05	QD_g = 1.318
Q_3 = 0.235	SK_a = 0.003	Sk = 0.96
P_{90} = 0.046	Kq_a = -0.397	
P_{10} = 0.29		



Sample No. YK-37 (2'6")

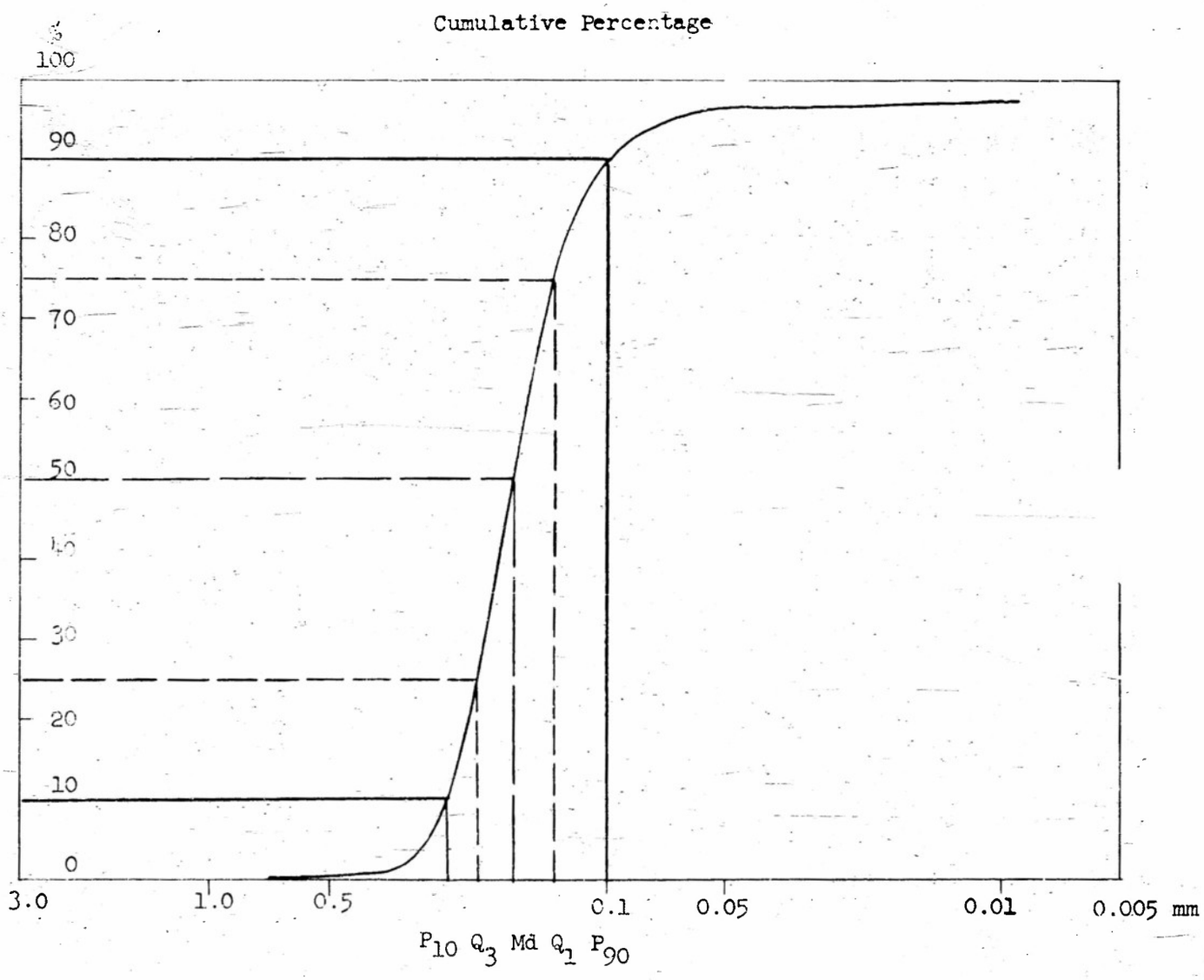
Grade Size mm.	Weight	% in Grade Size	Cumulative %
>1.00	0.00	0.00	
1.00-.710	0.02	0.05	.05
.710-.500	0.12	0.25	.30
.500-.350	0.37	0.82	1.12
.350-.250	4.68	10.50	11.62
.250-.177	15.51	35.00	46.62
.177-.125	15.63	35.00	81.62
.125-.088	5.04	11.30	92.92
.088-.062	1.34	3.00	95.92
.062-.055	0.20	0.45	96.37
.055-.031	0.20	0.45	96.82
.031-.015	0.20	0.45	97.27
.015-.009	0.20	0.45	97.72
<.009		0.90	98.62

Sample No. YK-38 (0')

>2.00	0.01	0.02	0.02
2.00-1.40	0.00	0.00	0.02
1.40-1.00	0.01	0.02	0.04
1.00-.710	0.05	0.12	0.16
.710-.500	0.11	0.25	0.41
.500-.350	0.43	1.00	1.41
.350-.250	3.24	7.50	8.91
.250-.177	10.48	24.30	33.21
.177-.125	10.20	23.70	56.91
.125-.088	5.76	13.40	70.31
.088-.062	3.26	7.55	77.86
.062-.055	1.70	3.90	81.76
.055-.031	1.50	3.50	85.26
.031-.015	1.30	3.00	88.26
.015-.009	1.00	2.30	90.56
<.009		4.80	95.36

Core YK 37 Depth 2'6"

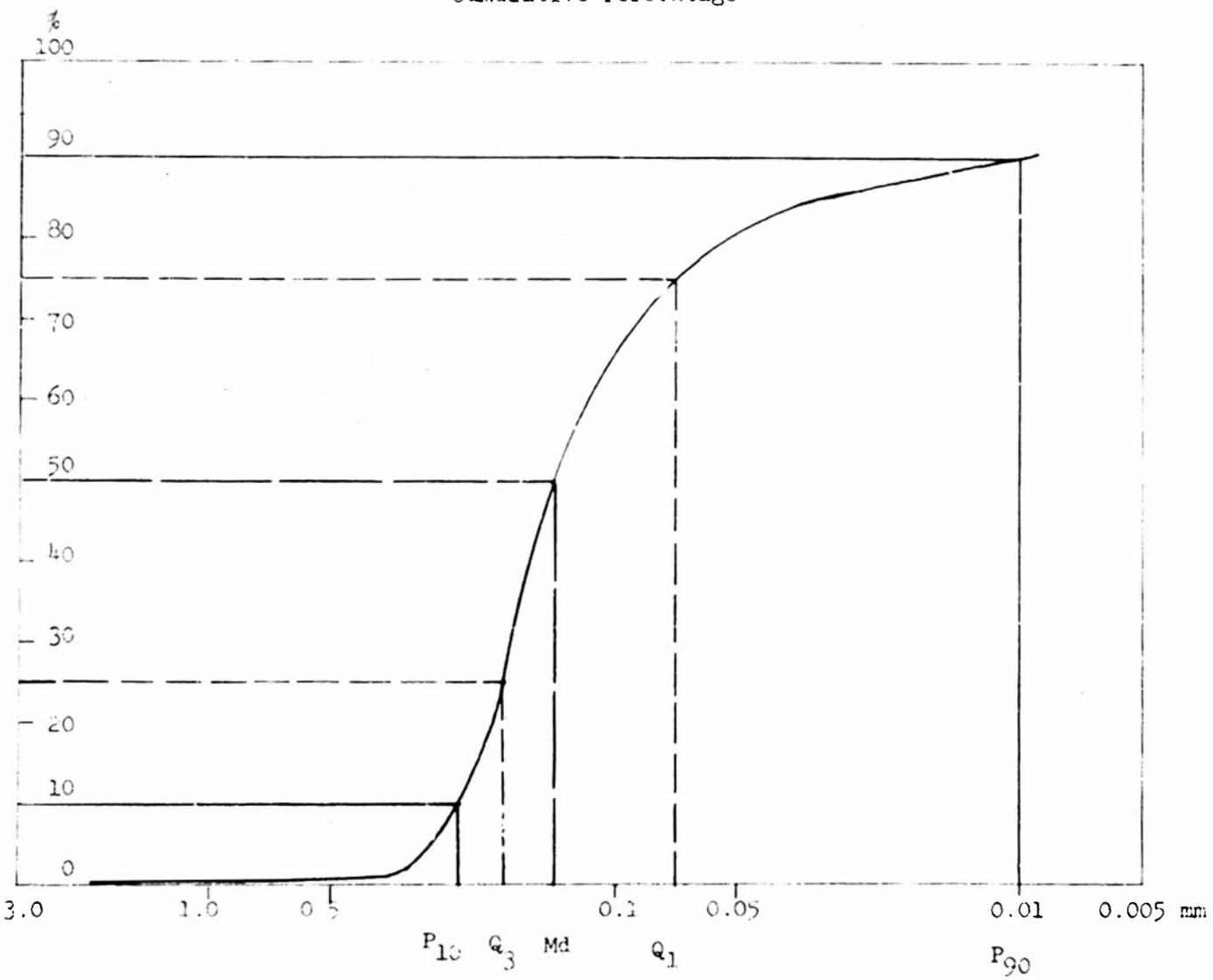
Md = 0.17	Arithmetic Parameters	Geometric Parameters
Q_1 = 0.135	QD_a = 0.037	QD_g = 1.245
Q_3 = 0.21	SK_a = 0.007	Sk = 0.98
P_{90} = 0.1	Kq_a = -0.25	
P_{10} = 0.25		



Core YK 38 Depth 0'

Md = 0.14	Arithmetic Parameters	Geometric Parameters
Q_1 = 0.072	QD_a = 0.06	QD_g = 1.645
Q_3 = 0.19	SK_a = 0.12	Sk = 0.694
P_{90} = 0.01	Kq_a = -0.261	
P_{10} = 0.24		

Cumulative Percentage



Sample No. YK-38 (1'6")

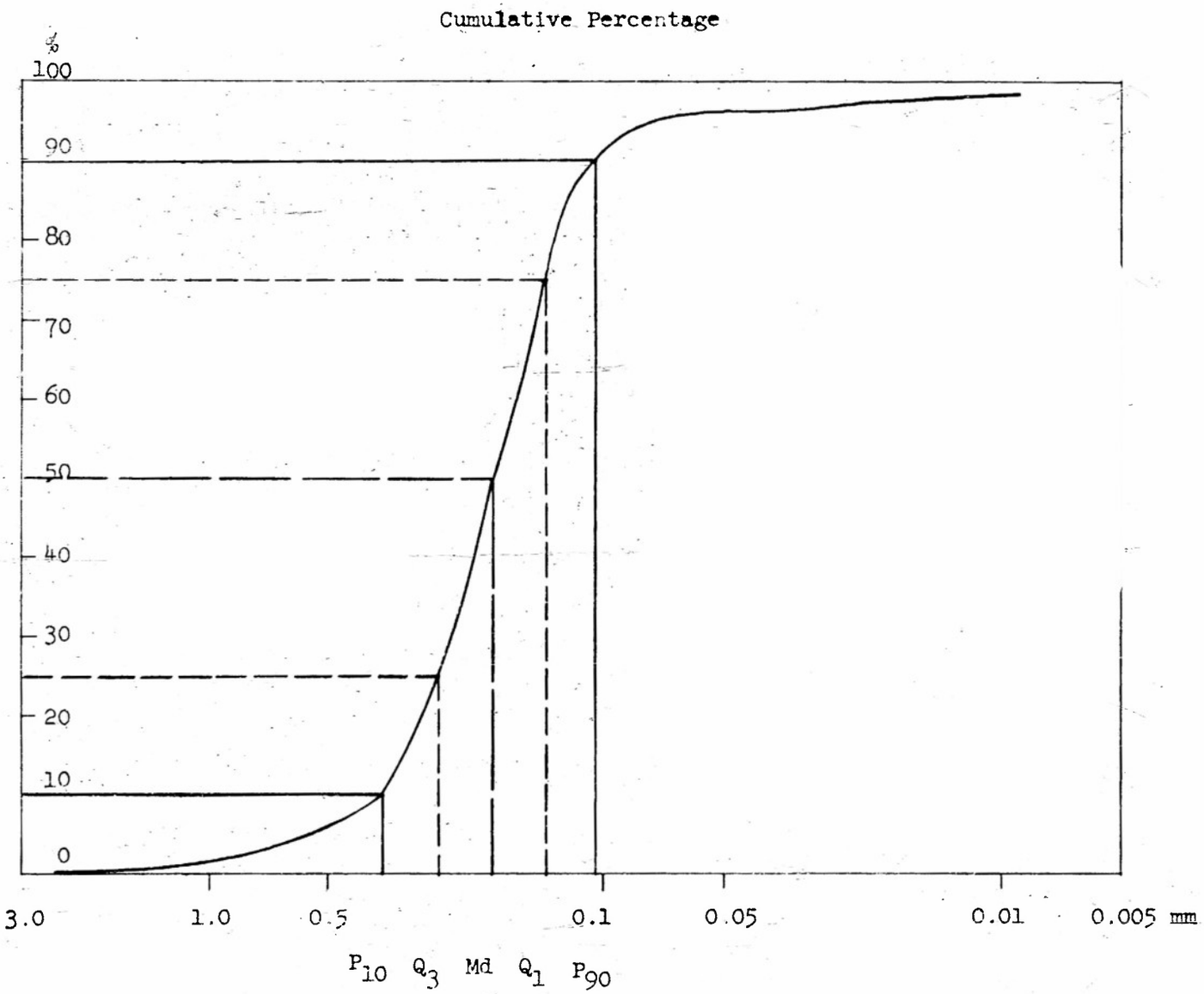
Grade Size mm.	Weight	% in Grade Size	Cumulative %
>2.00	0.31	0.62	0.62
2.00-1.40	0.25	0.50	1.12
1.40-1.00	0.47	0.94	2.06
1.00-.710	0.73	1.46	3.52
.710-.500	1.18	2.36	5.88
.500-.350	2.15	4.31	10.19
.350-.250	8.55	17.10	27.29
.250-.177	13.80	27.60	54.89
.177-.125	14.68	29.20	84.09
.125-.088	4.92	9.85	93.94
.088-.062	0.94	1.88	95.82
.062-.055	0.20	0.40	96.22
.055-.031	0.30	0.60	96.82
.031-.015	0.50	1.00	97.82
.015-.009	0.40	0.80	98.62
<.009		2.60	101.22

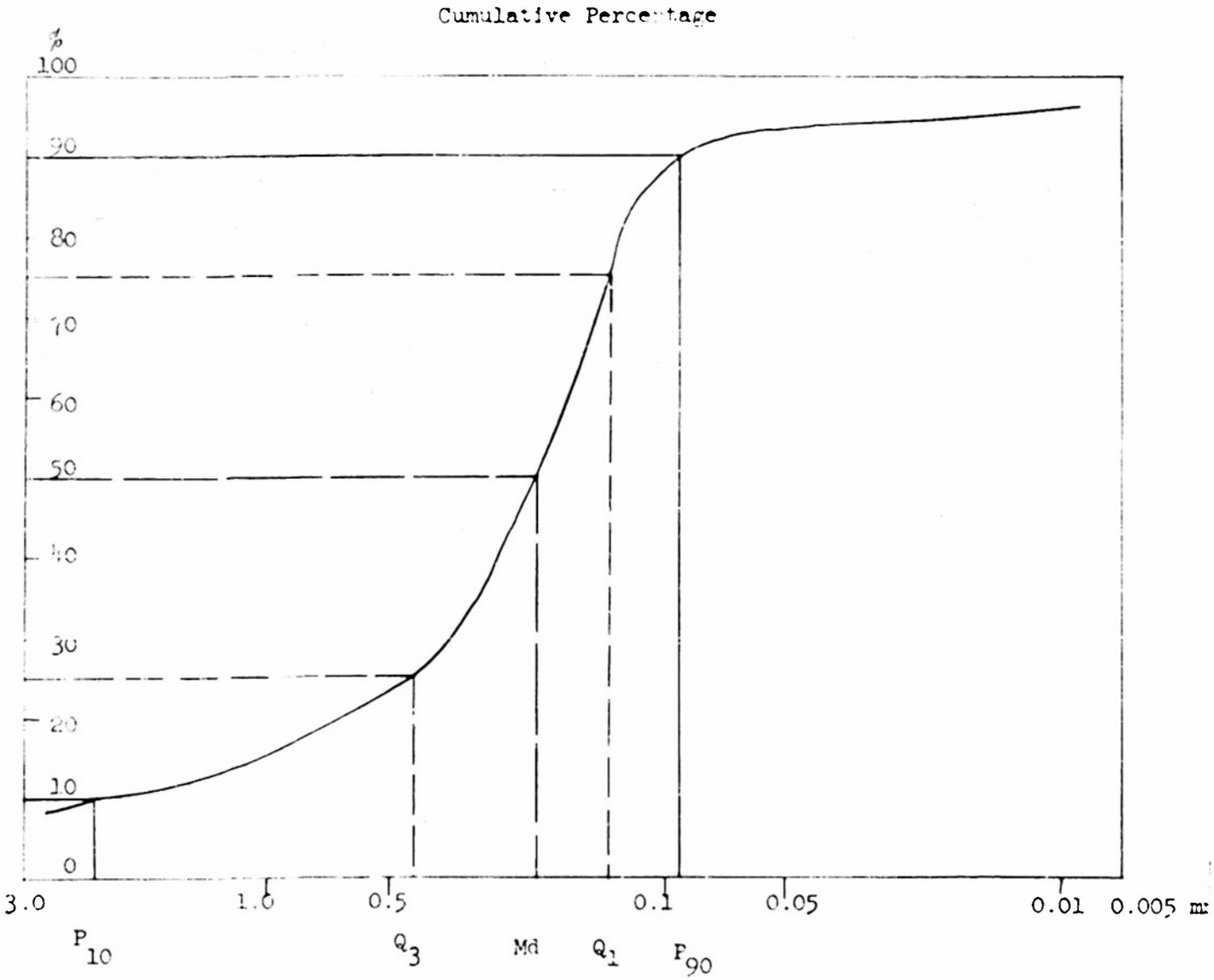
Sample No. YK-38 (5')

>2.00	5.48	11.18	11.10
2.00-1.40	1.07	2.18	13.28
1.40-1.00	1.20	2.34	15.62
1.00-.710	1.37	2.78	18.40
.710-.500	2.13	4.34	22.74
.500-.350	3.30	6.70	29.44
.350-.250	6.80	13.80	43.24
.250-.177	7.78	15.80	59.04
.177-.125	11.64	23.70	82.74
.125-.088	4.02	8.15	90.89
.088-.062	1.00	2.02	92.91
.062-.055	0.30	0.60	93.51
.055-.031	0.50	1.00	94.51
.031-.015	0.30	0.60	95.11
.015-.009	0.55	1.20	96.31
<.009		3.60	99.91

Core YK 38 Depth 1'6"

Md = 0.19	Arithmetic Parameters	Geometric Parameters
Q_1 = 0.14	QD_a = 0.06	QD_g = 1.36
Q_3 = 0.26	SK_a = 0.01	Sk = 1.01
P_{90} = 0.11	Kq_a = -0.231	
P_{10} = 0.37		



Core YK 38 Depth 5'

		Arithmetic Parameters		Geometric Parameters	
Md	= 0.21	QD_a	= 0.146	QD_g	= 1.77
Q_1	= 0.137	SK_a	= 0.073	Sk	= 1.33
Q_3	= 0.43	Kq_a	= -0.056		
P_{90}	= 0.092				
P_{10}	= 2.7