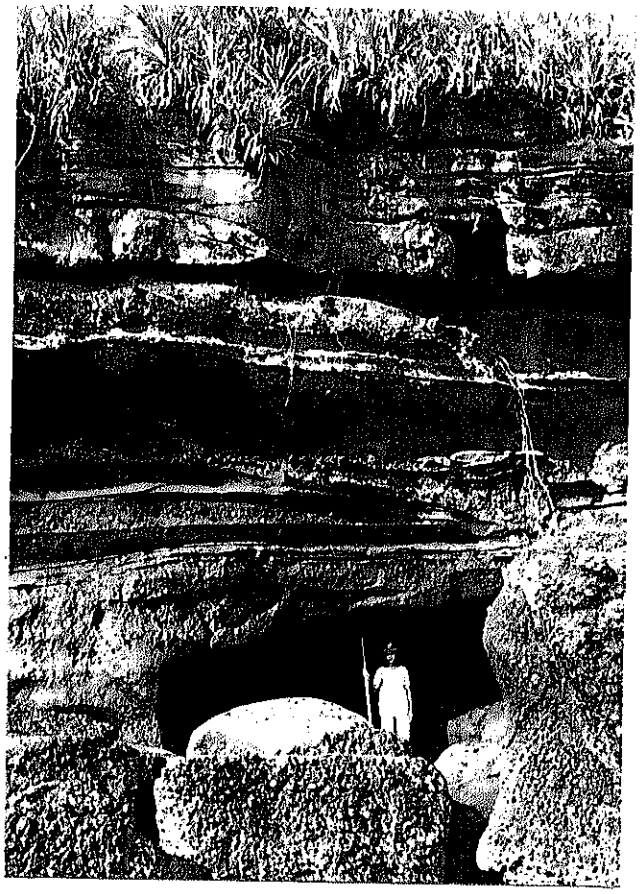
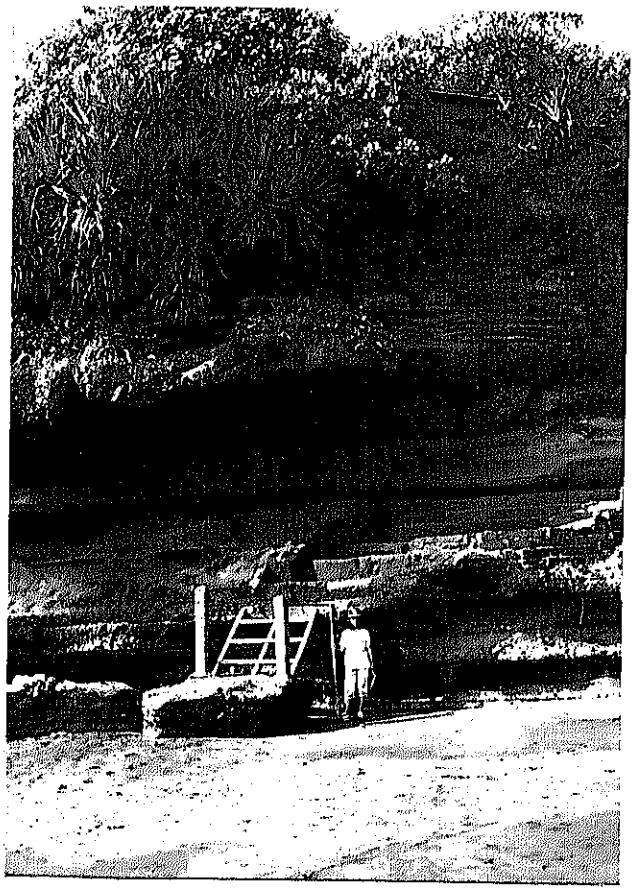
Photographs of the sea cliffs in Tanah Lot (1)

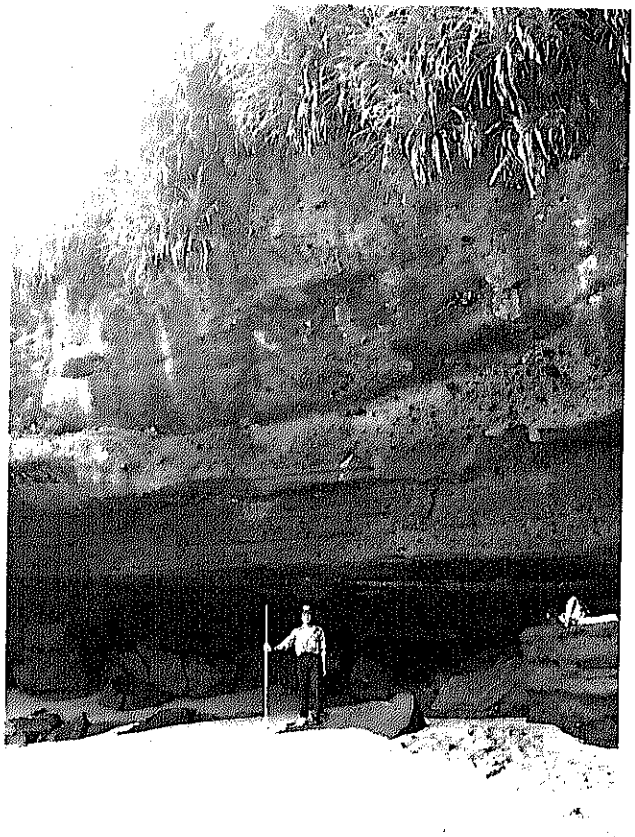


The sea cliff at geological section line A-A′, Tanah Lot Beach.

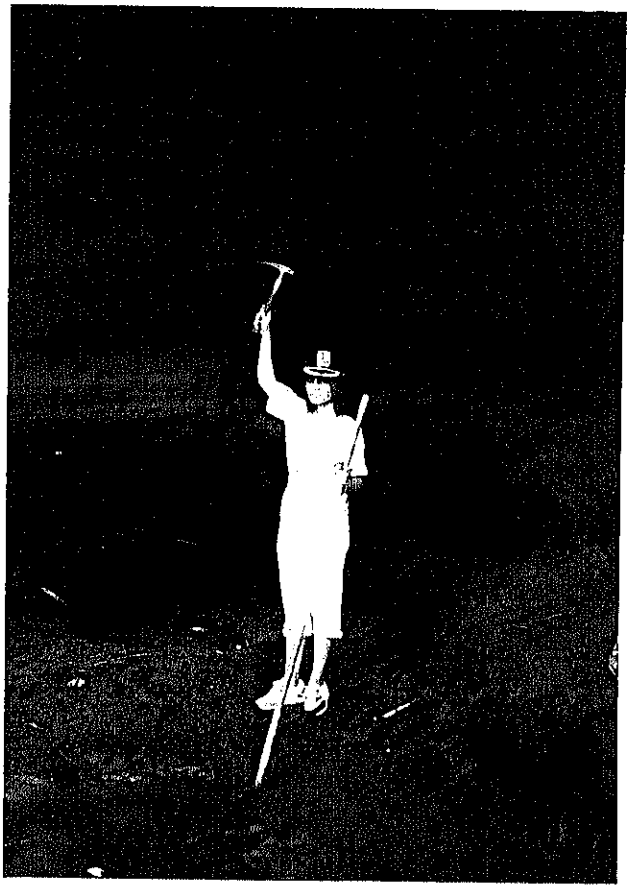


The sea cliff at geological section line B-B′, Tanah Lot Beach.

Photographs of the sea cliffs in Tanah Lot (2)

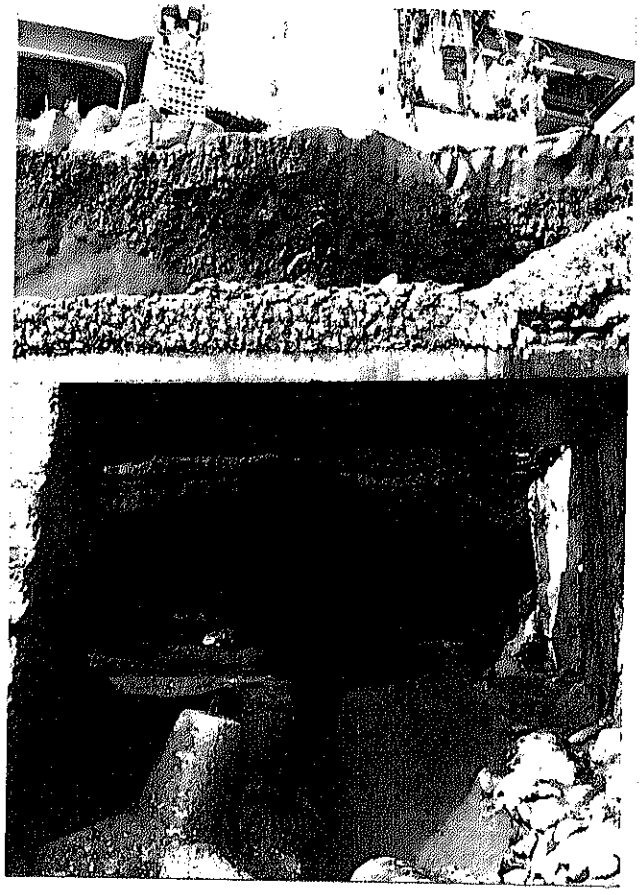


The sea cliff at geological section line C-C′, Tanah Lot Beach.



The sea cliff at geological section line D-D′, Tanah Lot Beach.

Photographs of the sea cliffs in Tanah Lot (3)

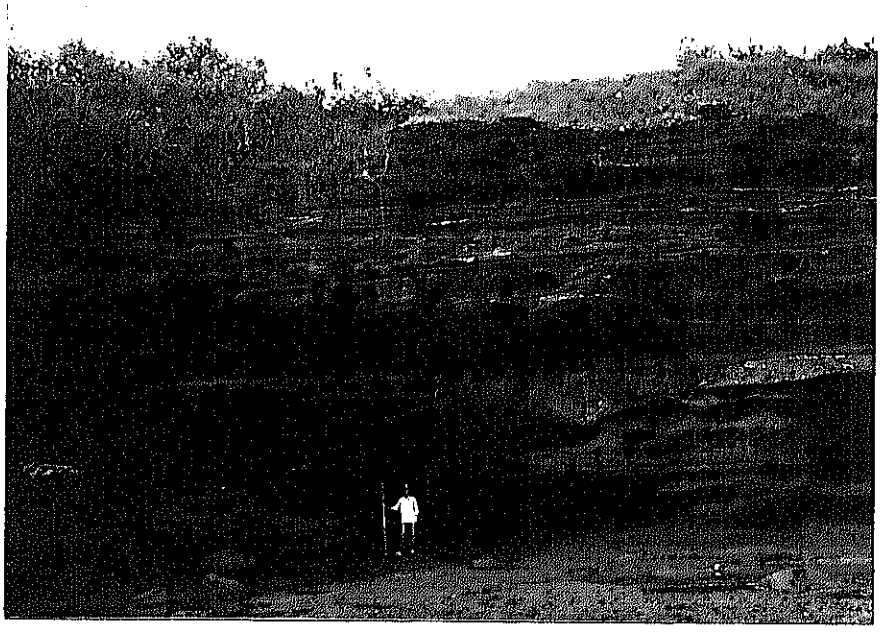


The sea cliff at geological section line E-E′, Tanah Lot Island.

The sea cliff of the southern side, Tanah Lot Island.

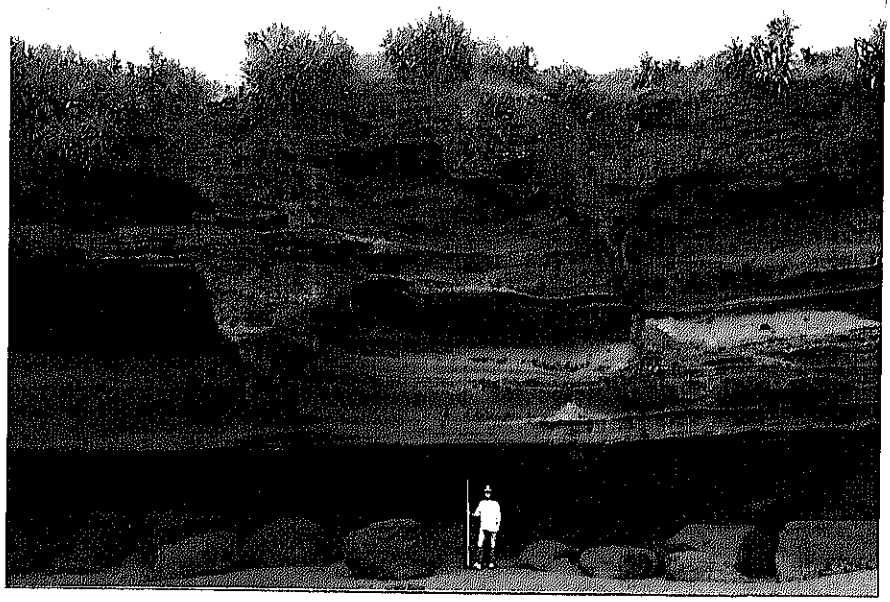
Photographs of the sea cliffs in Tanah Lot (4)

The sea cliff at geological section line F-F′, Tanah Lot Beach.

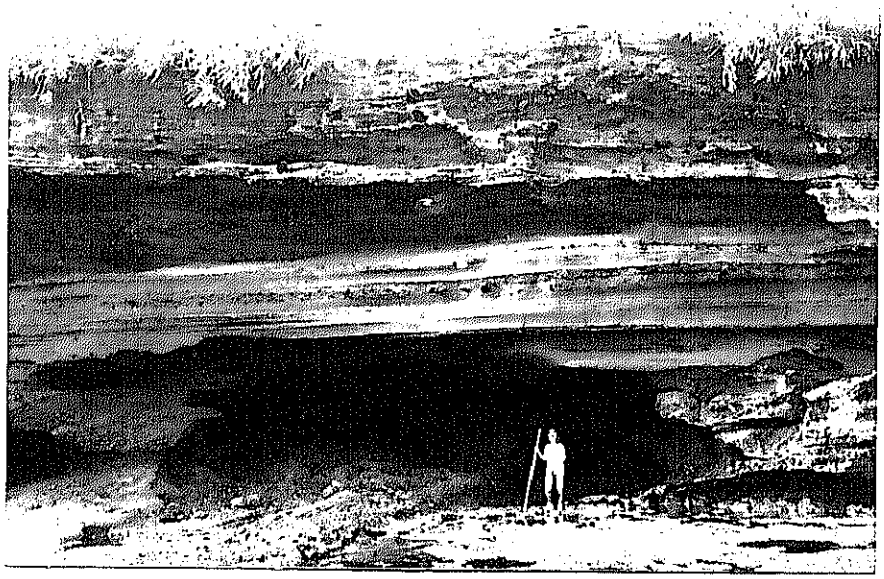


The sea cliff at geological section line G-G′, Tanah Lot Beach.

Photographs of the sea cliffs in Tanah Lot (5)



The sea cliff at geological section line H-H′, Tanah Lot Beach.



The sea cliff at geological section line I-I′, Tanah Lot Beach.

Results of Unconfined Compression Test

Sample No.	Locality	Rock Name	Test Condition	Test Piece		Water Content (%)	Unit Weight (g/cm^3)	Compressive Strength (kg/cm^2)	Rebound Number of Rock
				Diameter (cm)	Length (cm)				
181	10 m SE from section H-H'	Volcanic breccia in the lower part	Natural	5.68	11.63	16.7	1.8	19.2	25
182 A	4 m SE from section G-G'	Ditto	Ditto	5.52	11.07	23.3	1.5	32.9	32
182 B			Ditto	5.58	9.07	29.3	1.5	19.3	
183 A	5 m SE from section D-D'	Ditto	Ditto	5.61	10.72	46.6	1.2	17.4	29
183 B			Ditto	5.55	9.32	5.8	1.4	16.0	
184	6 m NW from section E-E'	Ditto	Ditto	5.61	9.31	10.6	1.9	49.8	33
185 A	11 m SE from section E-E'	Ditto	Ditto	5.61	11.80	2.5	2.0	79.1	32
185 B			Ditto	5.61	11.63	14.9	1.9	60.0	
Average						18.7	1.7	36.7	

Note: Two tests, A and B were done about one sample.

Unconfined Compression Test

Sample No. 181 Date 27 Juni 1988

Name of sample Breccia Signature

Locality Tanahlot Bali Test machine No.

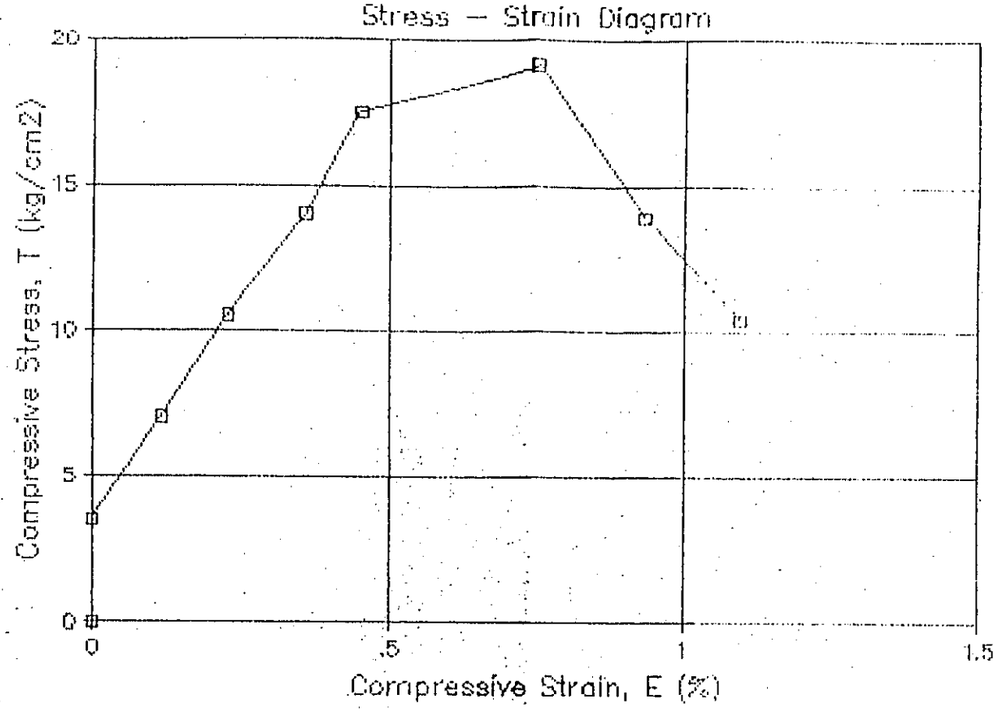
Measuring capacity of test machine 15.000 kgf Speed of compression %/min

Test piece No. Scale coefficient K 0.454 kgf/a division of scale

$k = \frac{K}{Ao}$ 0.0141 kgf/cm^2/a division of scale

Test piece in natural condition	Average diameter cm	5.68 x 5.68	Section Ao cm^2	32.26	Water contents	Weight of sample in natural condition mn g	675.50
	Height Lo cm	11.63	Volume V cm^3	375.81		Weight of sample in dry condition md g	579.00
	Weight m g	675.50	Density g/cm^2	1.80		Water contents $\frac{mn-md}{md} \times 100$ %	16.67

Reduce length by compression ΔL mm	Compressive strain ε %	Reading of test machine R	p = R:k kgf/cm^2	Compensate as for section $1-\frac{\varepsilon}{100}$	Compressive stress $\sigma=p(1-\frac{\varepsilon}{100})$ kgf/cm^2	Unconfined compressive strength kgf/cm^2
0	0	0	0	1	0	0
0	0	250	3.525	1	3.525	3.58
0.133	0.1144	500	7.05	0.9988	7.042	7.16
0.262	0.2253	750	10.58	0.9977	10.556	10.74
0.415	0.3568	1000	14.10	0.9964	14.050	14.32
0.522	0.4488	1250	17.63	0.9955	17.551	17.85
0.870	0.7481	1370	19.32	0.9925	19.175	19.26
1.082	0.9303	1000	14.10	0.9907	13.968	14.32
1.270	1.0920	750	10.58	0.98908	10.464	10.74



Sketch of test piece

Befor test

After test

Relation between compression axis and bedding plane

Paralel at Natural Condition

Unconfined Compression Test

Sample No. 182 A

Name of sample Volcaoc Breccia

Locality Tanahlot Bali

Measuring capacity of test machine 15.000 kgf

Date 27 Juni 1988

Signature

Test machine No.

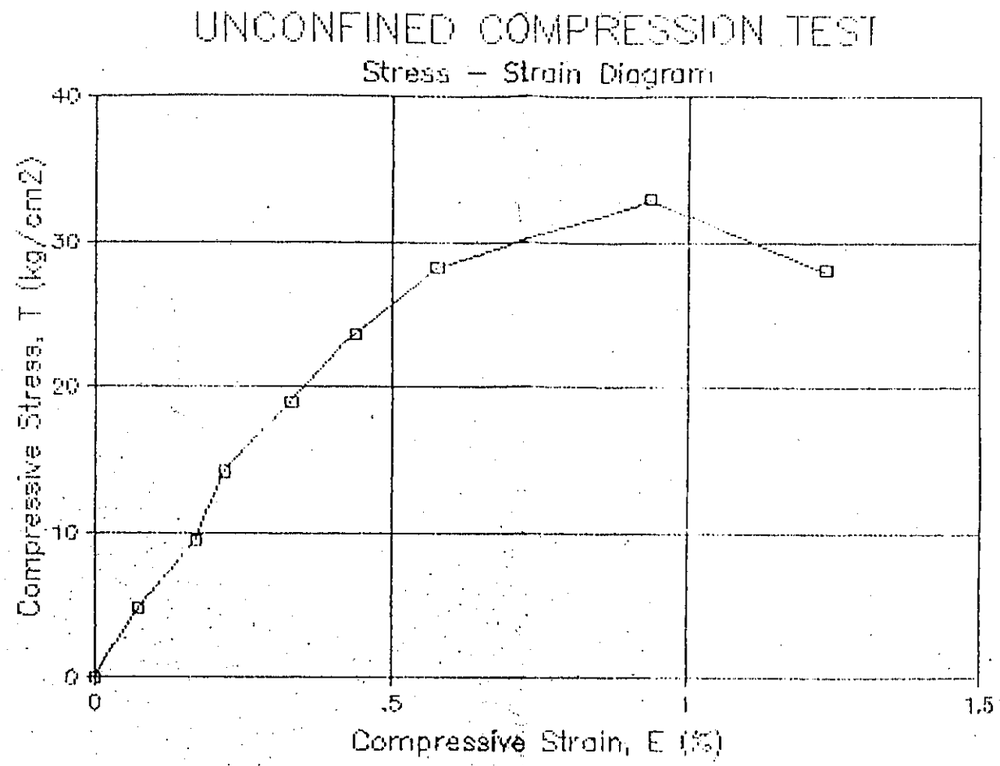
Speed of compression %/min

Test piece No. Scale coefficient K 0.454 kgf/a division of scale

$k = \frac{K}{Ao}$ 0.0190 kgf/cm^2/a division of scale

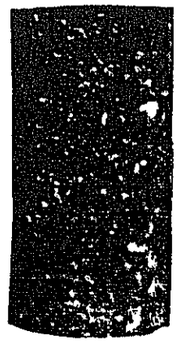
Test piece in natural condition					Water contents		
	Average diameter cm	5.52	Section Ao cm^2	23.92		Weight of sample in natural condition mn g	393.80
	Height Lo cm	11.07	Volume V cm^3	264.79		Weight of sample in dry condition md g	319.50
	Weight m g	393.80	Density g/cm^2	1.49		Water contents $\frac{mn-md}{md} \times 100$ %	23.26

Reduce length by compression ΔL mm	Compressive strain ε %	Reading of test machine R	$p = R \cdot k$ kgf/cm^2	Compensate as for section $1-\frac{\varepsilon}{100}$	Compressive stress $\sigma = p(1-\frac{\varepsilon}{100})$ kgf/cm^2	Unconfined compressive strength kgf/cm^2
0	0	0	0	1	0	0
0.080	0.07227	250	4.75	0.9993	4.747	4.79
0.188	0.1698	500	9.50	0.9983	9.484	9.57
0.242	0.2186	750	14.25	0.9978	14.218	14.36
0.365	0.32792	1000	19.00	0.9967	18.937	19.14
0.486	0.43902	1250	23.75	0.9956	23.646	23.93
0.635	0.57362	1500	28.50	0.9943	28.337	28.71
1.037	0.9360	1750	33.25	0.9906	32.937	33.50
1.368	1.23577	1500	28.50	0.9876	28.148	28.71



Sketch of test piece

Befor test



After test

Relation between compression axis and bedding plane

Paralel at Natural Condition

Unconfined Compression Test

Sample No. 182-B
Name of sample Volcanic Breccia
Locality Tanahlot - Bali
Measuring capacity of test machine 15,000 kgf

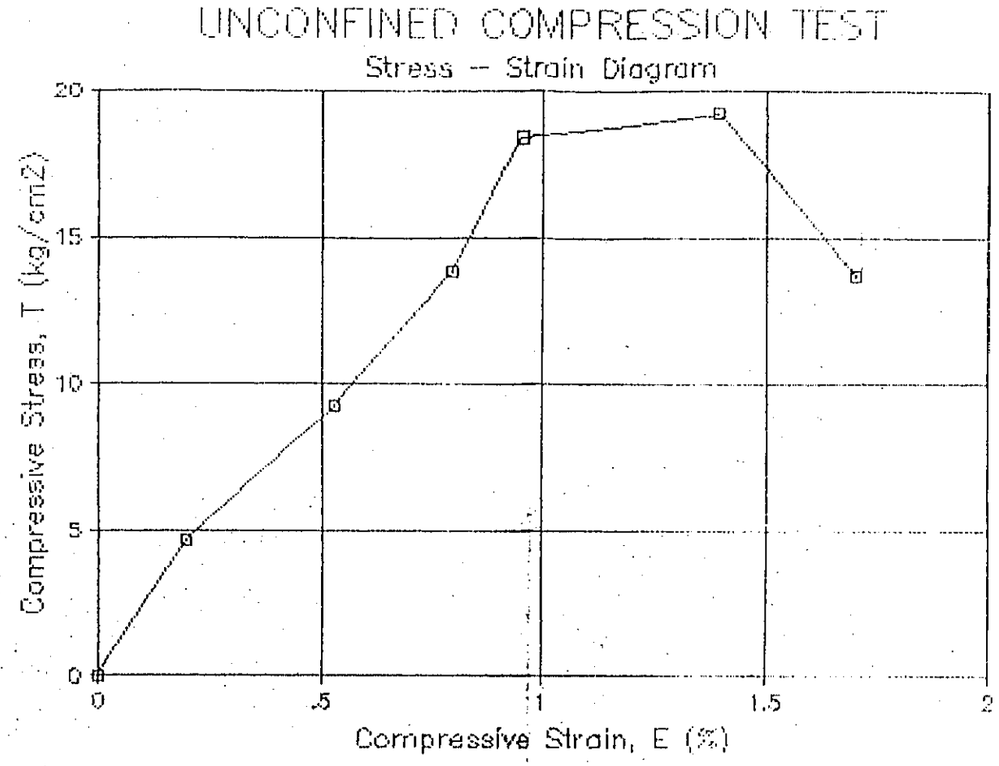
Date June 27, 1988
Signature
Test machine No.
Speed of compression %/min

Test piece No. Scale coefficient K 0,454 kgf/a division of scale

$k = \frac{K}{Ao}$ 0,0186 kgf/cm^2/a division of scale

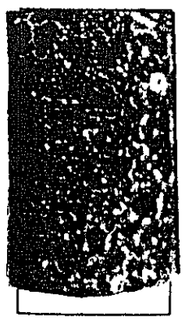
Test piece in natural condition	Average diameter cm	5.58	Section Ao cm^2	24.44	Water contents	Weight of sample in natural condition mn g	331
	Height Lo cm	9.07	Volume V cm^3	221.67		Weight of sample in dry condition md g	256
	Weight m g	331.00	Density g/cm^2	1.49		Water contents $\frac{mn-md}{md} \times 100$ %	29.30

Reduce length by compression ΔL mm	Compressive strain ε %	Reading of test machine R	$p = R \cdot k$ kgf/cm^2	Compensate as for section $1-\frac{\varepsilon}{100}$	Compressive stress $\sigma = p(1-\frac{\varepsilon}{100})$ kgf/cm^2	Unconfined compressive strength kgf/cm^2
0	0	0	0	1	0	0
0.175	0.193	250	4.65	0.9981	4.641	4.51
0.480	0.529	500	9.30	0.9947	9.251	9.02
0.715	0.788	750	13.95	0.99212	13.840	13.53
0.862	0.950	1000	18.60	0.9905	18.420	18.04
1.262	1.391	1050	19.53	0.9861	19.259	18.94
1.545	1.703	750	13.95	0.98297	13.712	13.53



Sketch of test piece

Befor test



After test

Relation between compression axis and bedding plane

Paralel
At Natural Condition

Unconfined Compression Test

Sample No. 183-A

Name of sample Volcanic Breccia

Locality Tanahlot - Bali

Measuring capacity of test machine 15,000 kgf

Date June 27, 1988.

Signature

Test machine No.

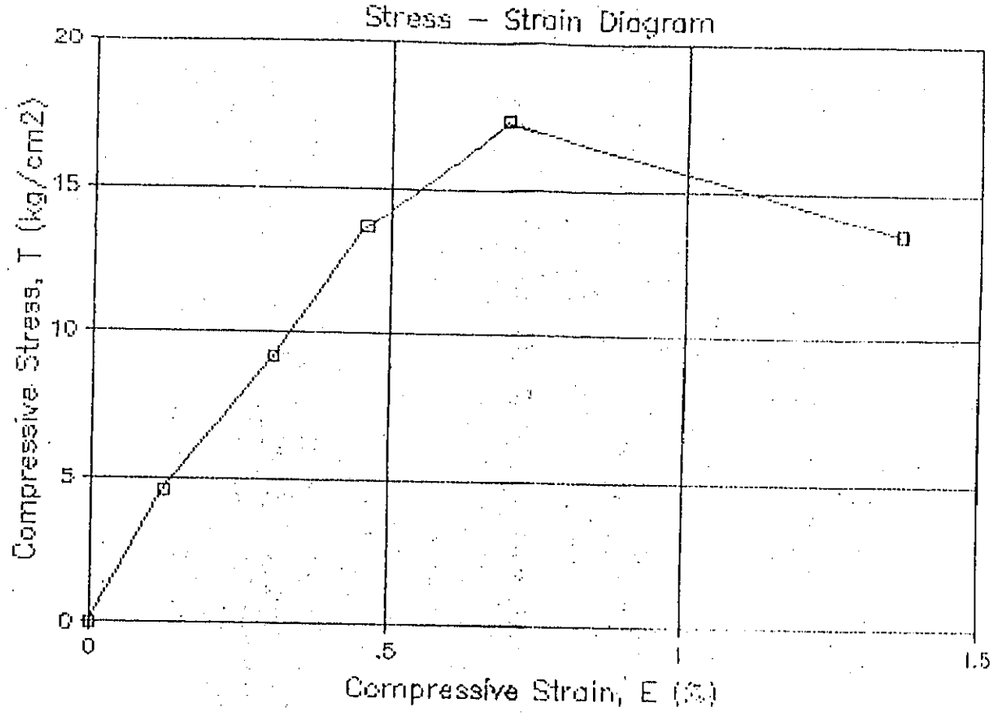
Speed of compression %/min

Test piece No. Scale coefficient K 0.454 kgf/a division of scale

$k = \frac{K}{Ao}$ 0.0184 kgf/cm²/a division of scale

Test piece in natural condition					Water contents		
	Average diameter cm	5.61	Section Ao cm²	24.71		Weight of sample in natural condition mn g	376.50
	Height Lo cm	10.72	Volume V cm³	264.89		Weight of sample in dry condition md g	256.90
	Weight m g	376.50	Density g/cm²	1.24		Water contents $\frac{mn-md}{mm}$ x100 %	46.56

Reduce length by compression ΔL mm	Compressive strain ε %	Reading of test machine R	p = R·k kgf/cm²	Compensate as for section $1-\frac{\varepsilon}{100}$	Compressive stress $\sigma=p(1-\frac{\varepsilon}{100})$ kgf/cm²	Unconfined compressive strength kgf/cm²
0	0	0	0	1	0	0
0.128	0.1194	250	4.60	0.9988	4.59	4.58
0.325	0.3031	500	9.20	0.9970	9.17	9.15
0.492	0.4402	750	13.80	0.9956	13.74	13.73
0.746	0.6959	950	17.48	0.9930	17.36	17.39
1.466	1.3675	750	13.80	0.9863	13.61	1373



Sketch of test piece

Befor test

After test

Relation between compression axis and bedding plane

Paralel

At Natural Condition

Unconfined Compression Test

Sample No. 183-B

Name of sample Volcanic Breccia

Locality Tanahlot - Bali

Measuring capacity of test machine 15,000 kgf

Date June 27, 1988

Signature

Test machine No.

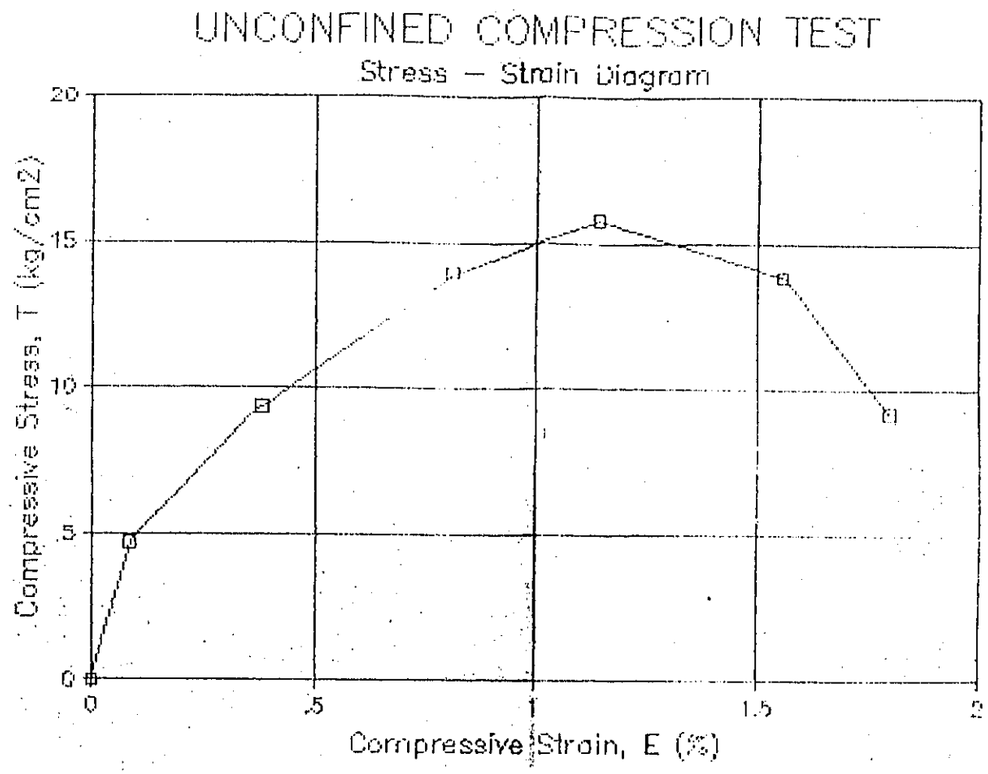
Speed of compression %/min

Test piece No. Scale coefficient K 0.454 kgf/a division of scale

$k = \frac{K}{Ao}$ 0.019 kgf/cm^2/a division of scale

Test piece in natural condition	Average diameter cm	5.55	Section Ao cm^2	24.18	Water contents	Weight of sample in natural condition mn g	317.20
	Height Lo cm	9.32	Volume V cm^3	225.36		Weight of sample in dry condition md g	229.80
	Weight m g	317.20	Density g/cm^2	1.41		Water contents $\frac{mn-md}{mm} \times 100$ %	5.80

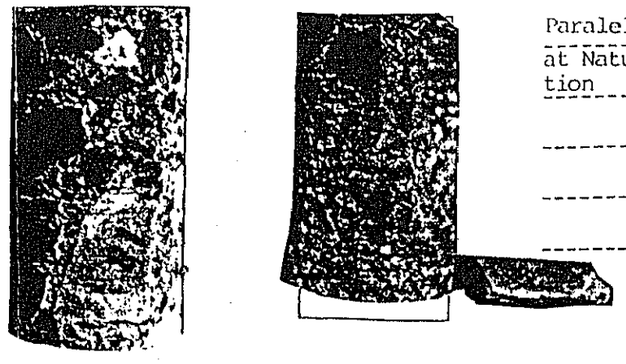
Reduce length by compression ΔL mm	Compressive strain ε %	Reading of test machine R	$p = R \cdot k$ kgf/cm^2	Compensate as for section $1-\frac{\varepsilon}{100}$	Compressive stress $\sigma = p\left(1-\frac{\varepsilon}{100}\right)$ kgf/cm^2	Unconfined compressive strength kgf/cm^2
0	0	0	0	1	0	0
0.078	0.08369	250	4.75	0.99916	4.75	4.59
0.352	0.3777	500	9.50	0.9962	9.46	9.17
0.750	0.8047	750	14.25	0.9919	14.13	13.76
1.063	1.1406	850	16.15	0.9886	15.97	15.60
1.450	1.5557	750	14.25	0.9844	14.03	13.76
1.674	1.7961	500	9.50	0.9820	9.33	9.17



Sketch of test piece

Befor test

After test



Relation between compression axis and bedding plane

Paralel at Natural Condition

Unconfined Compression Test

Sample No. 184 — Date June 27, 1988

Name of sample Volcanic Breccia — Signature

Locality Tanahlot - Bali — Test machine No.

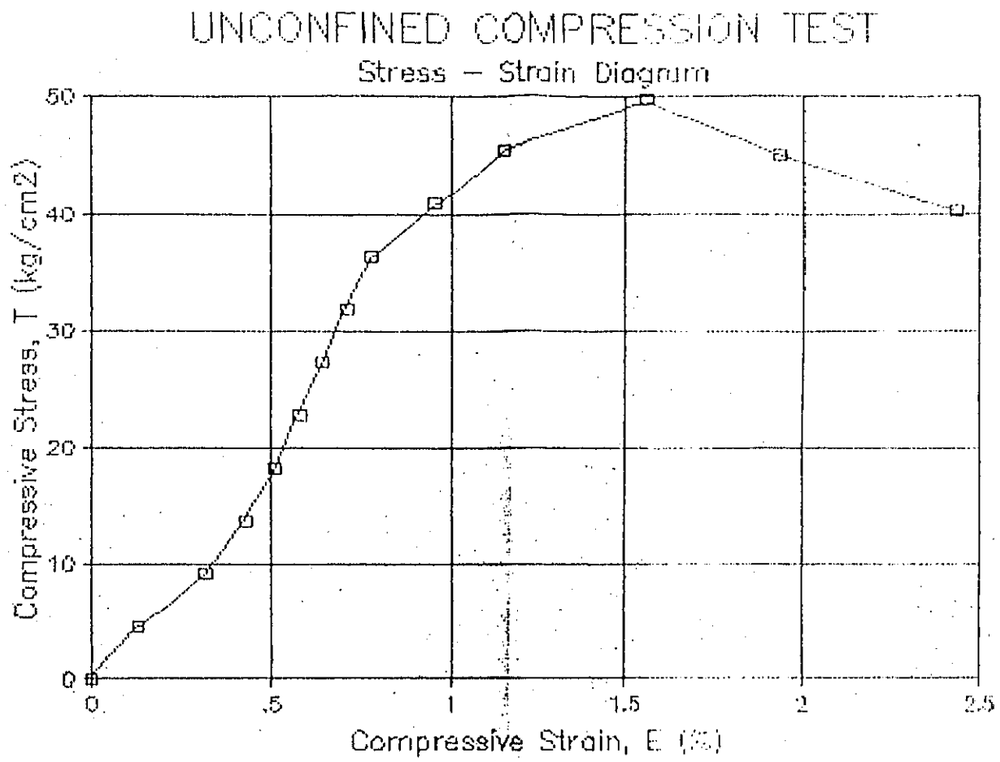
Measuring capacity of test machine 15,000 kgf — Speed of compression %/min

Test piece No. — Scale coefficient K 0.454 kgf/a division of scale

$k = \frac{K}{Ao}$ 0.0184 kgf/cm^2/a division of scale

Test piece in natural condition	Average diameter cm	5.61	Section Ao cm^2	24.72	Water contents	Weight of sample in natural condition mn g	433.70
	Height Lo cm	9.31	Volume V cm^3	230.14		Weight of sample in dry condition md g	392
	Weight m g	433.70	Density g/cm^2	1.88		Water contents $\frac{mn-md}{md} \times 100$ %	10.64

Reduce length by compression ΔL mm	Compressive strain ε %	Reading of test machine R	p = R·k kgf/cm^2	Compensate as for section $1-\frac{\varepsilon}{100}$	Compressive stress $\sigma=p(1-\frac{\varepsilon}{100})$ kgf/cm^2	Unconfined compressive strength kgf/cm^2
0	0	0	0	1	0	0
0.120	0.129	250	4.60	0.9987	4.59	4.67
0.296	0.318	500	9.20	0.9968	9.17	9.34
0.399	0.429	750	13.80	0.9957	13.74	14.01
0.473	0.508	1000	18.40	0.9949	18.31	18.69
0.538	0.528	1250	23.00	0.9942	22.87	23.30
0.600	0.644	1500	27.60	0.9936	27.42	27.91
0.664	0.713	1750	32.20	0.9929	31.97	32.51
0.724	0.778	2000	36.80	0.9922	36.51	37.13
0.890	0.956	2250	41.40	0.9904	41.00	41.63
1.074	1.368	2500	46.00	0.9863	45.37	46.14
1.450	1.557	2750	50.60	0.9844	49.81	50.64
1.800	1.719	2500	46.00	0.9828	45.21	46.15
2.262	2.215	2250	41.40	0.9779	40.48	41.63



Sketch of test piece

Befor test

After test

Relation between compression axis and bedding plane

Paralel

At Natural Condition

Unconfined Compression Test

Sample No. 185-A

Name of sample Volcanic Breccia

Locality Tanahlot - Bali

Measuring capacity of test machine 15,000 kgf

Date June 27, 1988

Signature

Test machine No.

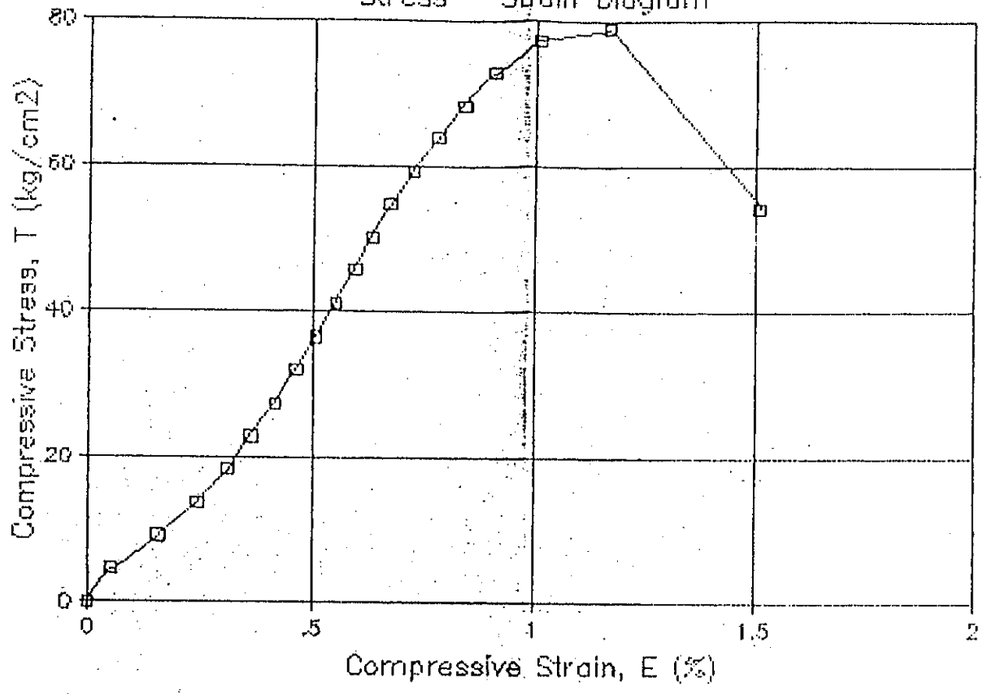
Speed of compression %/min

Test piece No. Scale coefficient K 0.454 kgf/a division of scale

$k = \frac{K}{Ao}$ 0.0184 kgf/cm^2/a division of scale

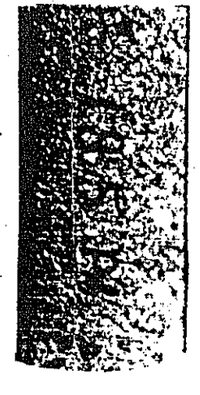
Test piece in natural condition					Water contents		
	Average diameter cm	5.61	Section Ao cm^2	24.27		Weight of sample in natural condition mn g	572.60
	Height Lo cm	11.80	Volume V cm^3	291.70		Weight of sample in dry condition md g	507
	Weight m g	572.60	Density g/cm^2	1.96		Water contents $\frac{mn-md}{md} \times 100$ %	2.49

Reduce length by compression ΔL mm	Compressive strain ε %	Reading of test machine R	$P = R \cdot k$ kgf/cm^2	Compensate as for section $1-\frac{\varepsilon}{100}$	Compressive stress $\sigma = p(1-\frac{\varepsilon}{100})$ kgf/cm^2	Unconfined compressive strength kgf/cm^2
0	0	0	0	1	0	0
0.062	0.0525	250	4.60	0.99475	4.58	4.67
0.186	0.1576	500	9.20	0.99842	9.18	9.34
0.286	0.2424	750	13.80	0.9976	13.77	14.01
0.366	0.3102	1000	18.40	0.9969	18.34	18.67
0.426	0.3610	1250	23.00	0.9964	22.92	23.34
0.490	0.4152	1500	27.60	0.9958	27.48	28.01
0.546	0.4627	1750	32.20	0.9954	32.05	32.68
0.598	0.5067	2000	36.80	0.9949	36.61	37.35
0.650	0.5508	2250	41.40	0.9945	41.17	42.02
0.700	0.5932	2500	46.00	0.9941	45.73	46.69
0.746	0.6322	2750	50.60	0.9937	50.28	51.35
0.795	0.6737	3000	55.20	0.9932	54.80	56.02
0.850	0.7203	3250	59.80	0.9928	59.37	60.69
0.915	0.7754	3500	64.40	0.9922	63.90	65.36
0.981	0.8314	3750	69.00	0.9917	68.43	70.03
1.062	0.9000	4000	73.60	0.9910	72.94	74.74
1.188	1.0070	4250	78.20	0.9899	77.41	79.37
1.372	1.1627	4350	80.04	0.9884	79.11	81.23
1.780	1.5084	3000	55.20	0.9849	54.37	56.02

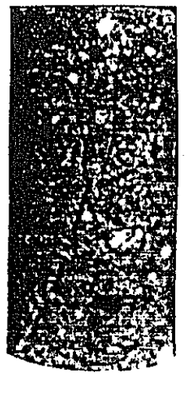


Sketch of test piece

Befor test



After test



Relation between compression axis and bedding plane

Paralel

At Natural Condition

Unconfined Compression Test

Sample No. 185-B
Name of sample Volcanic Breccia
Locality Tanahlot - Bali
Measuring capacity of test machine 15,000 kgf

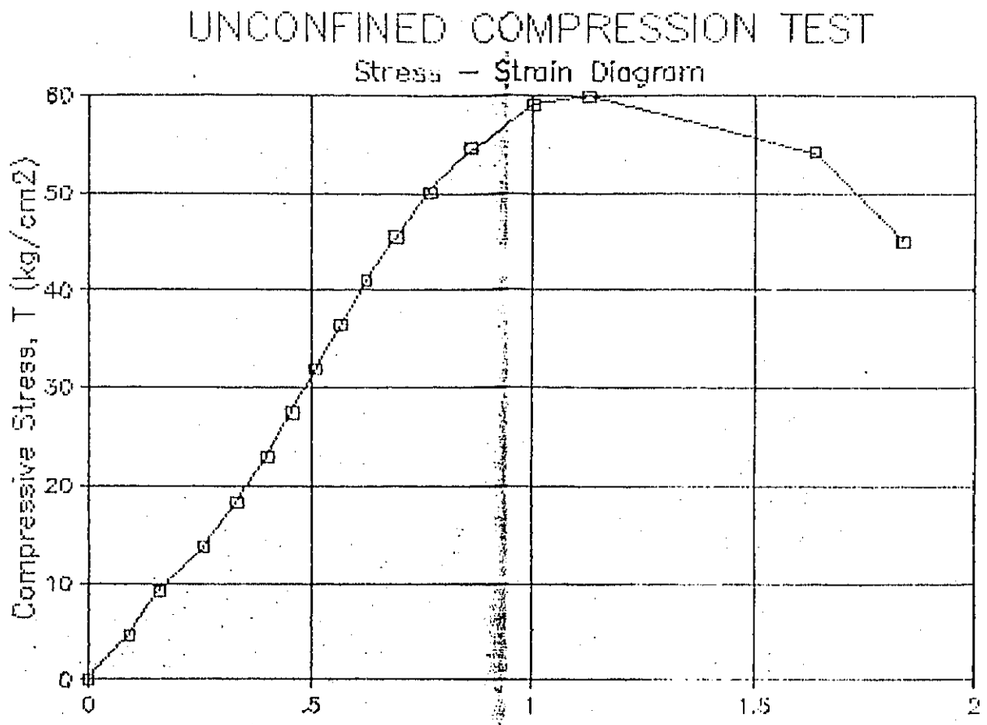
Date June 27, 1988
Signature
Test machine No.
Speed of compression %/min

Test piece No. Scale coefficient K 0.454 kgf/a division of scale

$k = \frac{K}{Ao}$ 0.0184 kgf/cm^2/a division of scale

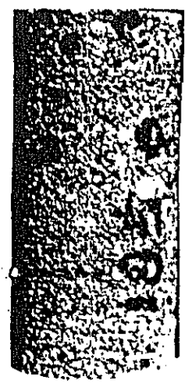
Test piece in natural condition					Water contents		
	Average diameter cm	5.61	Section Ao cm^2	24.72		Weight of sample in natural condition mn g	553.80
	Height Lo cm	11.63	Volume V cm^3	287.49		Weight of sample in dry condition md g	482
	Weight m g	553.80	Density g/cm^2	1.92		Water contents $\frac{mn-md}{mm} \times 100$ %	14.89

Reduce length by compression $\frac{\Delta L}{\frac{1}{100}}$ mm	Compressive strain ε %	Reading of test machine R	$p = R \cdot k$ kgf/cm^2	Compensate as for section $1-\frac{\varepsilon}{100}$	Compressive stress $\sigma = p(1-\frac{\varepsilon}{100})$ kgf/cm^2	Unconfined compressive strength kgf/cm^2
0	0	0	0	1	0	0
0.1050	0.0928	250	4.6	0.9991	4.596	4.67
0.185	0.1591	500	9.2	0.9984	9.19	9.34
0.297	0.2554	750	13.8	0.9975	13.76	14.01
0.386	0.332	1000	18.4	0.9968	18.34	18.69
0.465	0.399	1250	23.0	0.9960	22.91	23.30
0.532	0.457	1500	27.6	0.9954	27.47	27.91
0.593	0.509	1750	32.2	0.9949	32.03	32.51
0.658	0.566	2000	36.8	0.9943	36.59	37.13
0.728	0.630	2250	41.4	0.9937	41.14	41.36
0.803	0.690	2500	46.0	0.9931	45.68	46.14
0.888	0.764	2750	50.6	0.9924	50.21	50.64
0.995	0.856	3000	55.2	0.9914	54.73	55.14
1.165	1.002	3250	59.8	0.9900	59.20	59.79
1.312	1.128	3300	60.72	0.9887	60.04	60.55
1.090	1.453	3000	55.70	0.9855	54.40	55.14
2.135	1.836	2500	46	0.9816	45.16	46.14



Sketch of test piece

Befor test

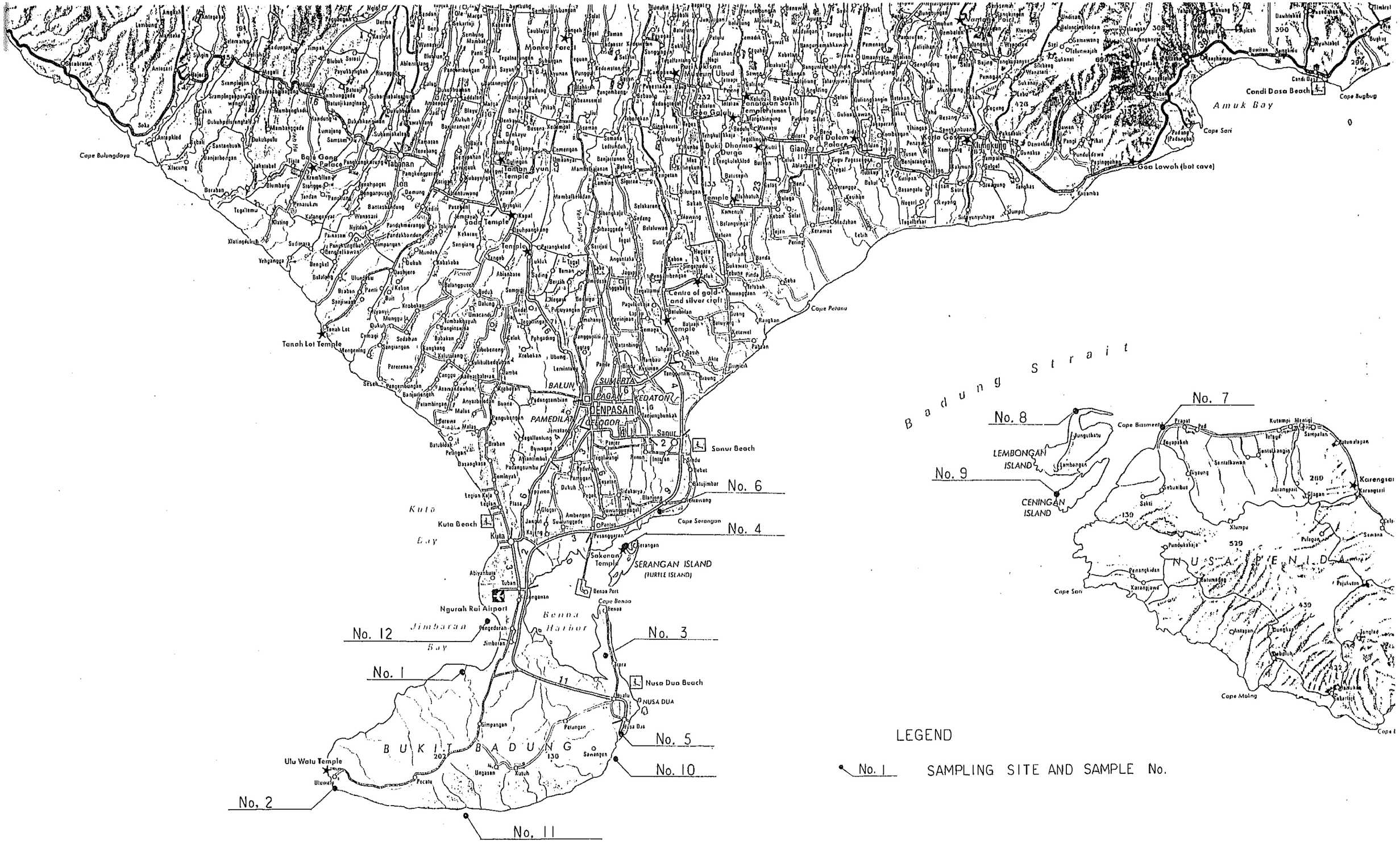


After test

Relation between compression axis and bedding plane

Paralel
At Natural Condition

III. Construction Material Test



LEGEND

No. 1 SAMPLING SITE AND SAMPLE No.

LOCATION MAP OF SAMPLING SITES ON CONSTRUCTION MATERIAL TEST

Specific Gravity

Name of sample Beach and Dune Sand

Locality _____

Date _____

Signature _____

Sample No.	Weight of sample Ws (g)	Weight of measuring flask Wf (g)	Weight totaled measuring flask and pure water, at T'°C Wa' (g)	T' °C	Weight totaled measuring flask, pure water and sample, at T°C Wb (g)	T °C	Weight totaled measuring flask and pure water, at T°C (by calculation) Wa (g)	Specific gravity (T°C/T°C)	Specific gravity (T°C/15°C)	Specific gravity (T°C/4°C)
1	400	156.50	651.90	26	915.70	24	652.1549521	2.931	2.926	2.923
2	400	166.15	661.00	26	912.20	24	661.2546691	2.684	2.679	2.677
3	400	169.70	665.35	26.5	919.50	24	665.6722513	2.736	2.731	2.729
4	400	151.65	648.90	26	905.60	24	649.1559042	2.786	2.781	2.779
5	400	165.30	661.10	27	914.55	24	661.4895574	2.722	2.717	2.715
6	400	154.35	650.00	26.5	904.95	24	650.3222513	2.752	2.747	2.745

Grain Size Analysis

Sample No. 1 Date

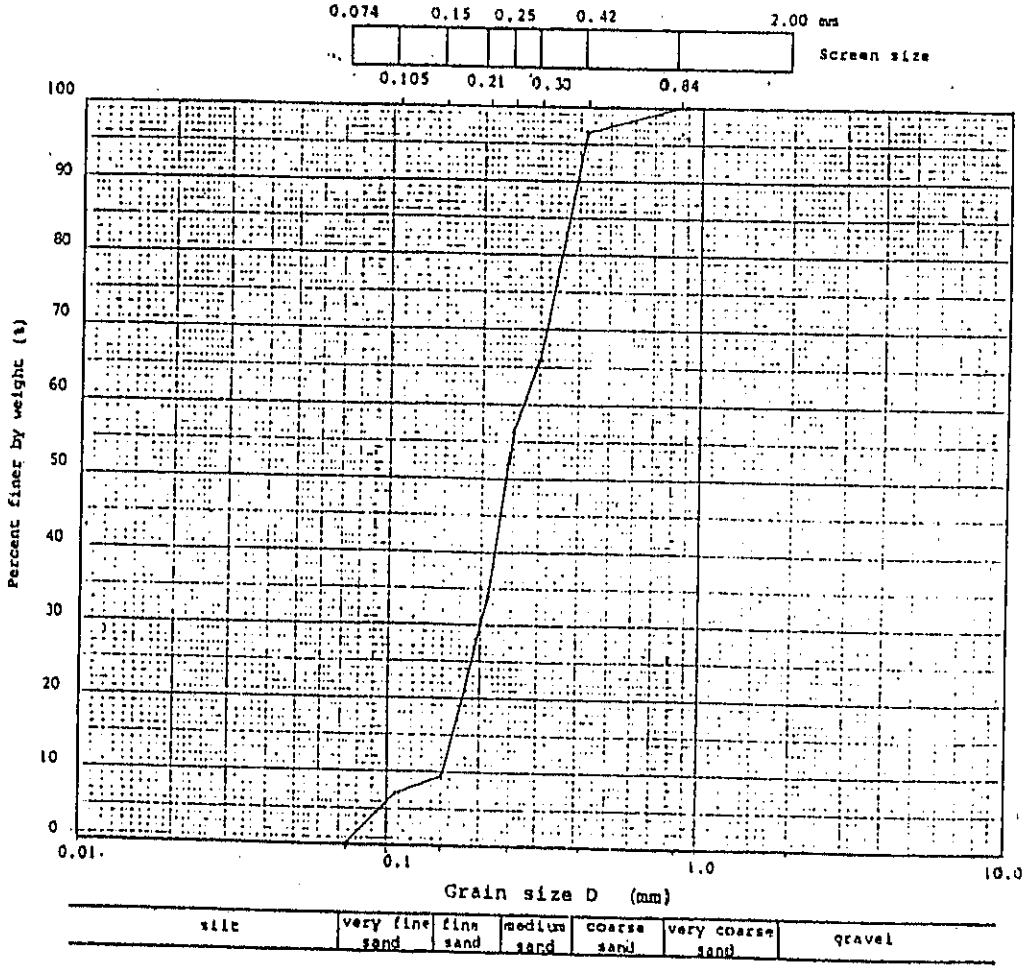
Name of sample Beach Sand (for construction material) Signature

Locality from Tegalsa 1 km to West, Bukit Badung

Grain size (mm)	Weight (g)	Weight percent (%)
2.00	0	100
0.84	0	100
0.42	6.7	96.65
0.30	61.60	65.85
0.25	18.75	56.475
0.21	44.85	34.05
0.15	49.20	9.45
0.105	4.6	7.15
0.074	14.1	0.1
	0.2	-

Very coarse sand (2.00-0.84mm) %	0
Coarse sand (0.84-0.42mm) %	3.35
Medium sand (0.42-0.25mm) %	40.175
Fine sand (0.25-0.15mm) %	47.025
Very fine sand (0.15-0.074mm) %	9.35
Silt or clay (under 0.074mm) %	0.1
Maximum grain size mm	0.42
60% grain size mm	0.27
30% grain size mm	0.20
10% grain size mm	0.151
Coefficient of uniformity Uc	1.788
Coefficient of curvature Uc'	0.981

Grain size accumulation curve



Grain Size Analysis

Sample No. 2

Name of sample Beach Sand (for construction material)

Locality Uluwatu, Bukit Badung

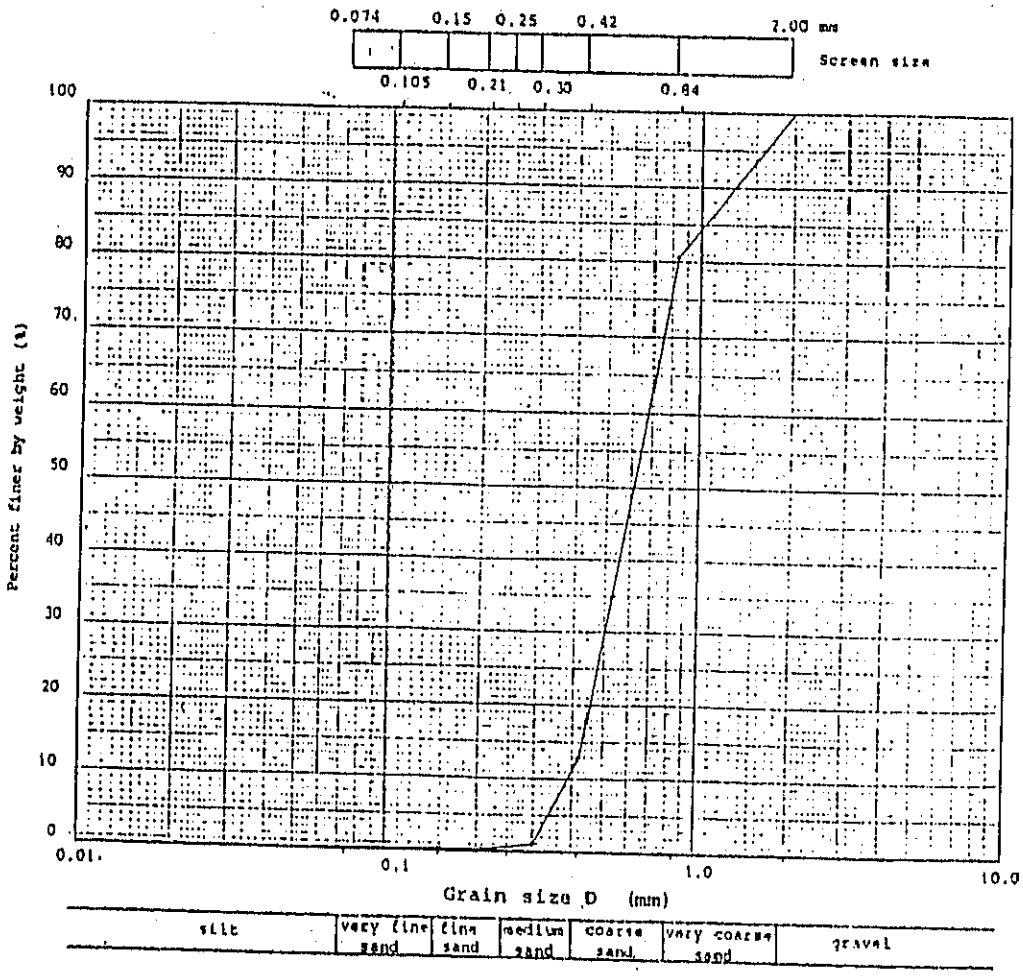
Date

Signature

Grain size (mm)	Weight (g)	Weight percent (%)
2.00		100
0.84	38.85	80.575
0.42	135.35	12.9
0.30	23.75	1.025
0.25	0.60	0.725
0.21	0.80	0.325
0.15	0.45	0.10
0.105	0.10	0.05
0.074	0.05	0.025
	0.05	-

Very coarse sand (2.00-0.84mm) %	19.425
Coarse sand (0.84-0.42mm) %	67.675
Medium sand (0.42-0.25mm) %	12.175
Fine sand (0.25-0.15mm) %	0.625
Very fine sand (0.15-0.074mm) %	0.075
Silt or clay (under 0.074mm) %	0.025
Maximum grain size mm	0.84
60% grain size mm	0.67
30% grain size mm	0.50
10% grain size mm	0.385
Coefficient of uniformity Uc	1.740
Coefficient of curvature Uc'	0.969

Grain size accumulation curve



Grain Size Analysis

Sample No. 3 Date

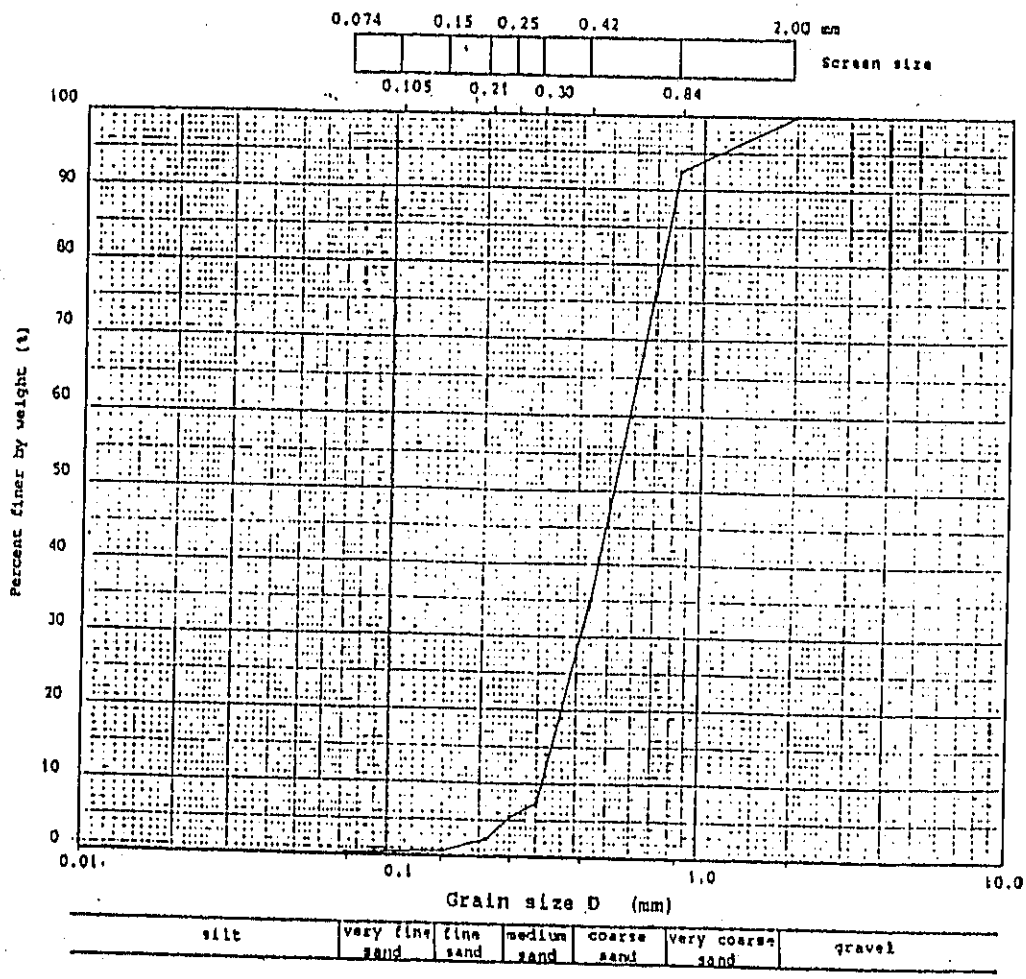
Name of sample Dune Sand (for construction material) Signature

Locality Tenora, Sand Quarry, Nusa Dua

Grain size (mm)	Weight (g)	Weight percent (%)
2.00		100
0.84	14.95	92.525
0.42	121.90	31.575
0.30	48.55	7.3
0.25	3.45	5.575
0.21	6.0	2.575
0.15	3.55	0.8
0.105	0.70	0.45
0.074	0.40	0.25
	0.50	-

Very coarse sand (2.00-0.84mm) %	7.475
Coarse sand (0.84-0.42mm) %	60.95
Medium sand (0.42-0.25mm) %	26.0
Fine sand (0.25-0.15mm) %	4.775
Very fine sand (0.15-0.074mm) %	0.55
Silt or clay (under 0.074mm) %	0.25
Maximum grain size mm	0.84
60% grain size mm	0.57
30% grain size mm	0.41
10% grain size mm	0.31
Coefficient of uniformity Uc	1.839
Coefficient of curvature Uc'	0.951

Grain size accumulation curve



Grain Size Analysis

Sample No. 4 Date

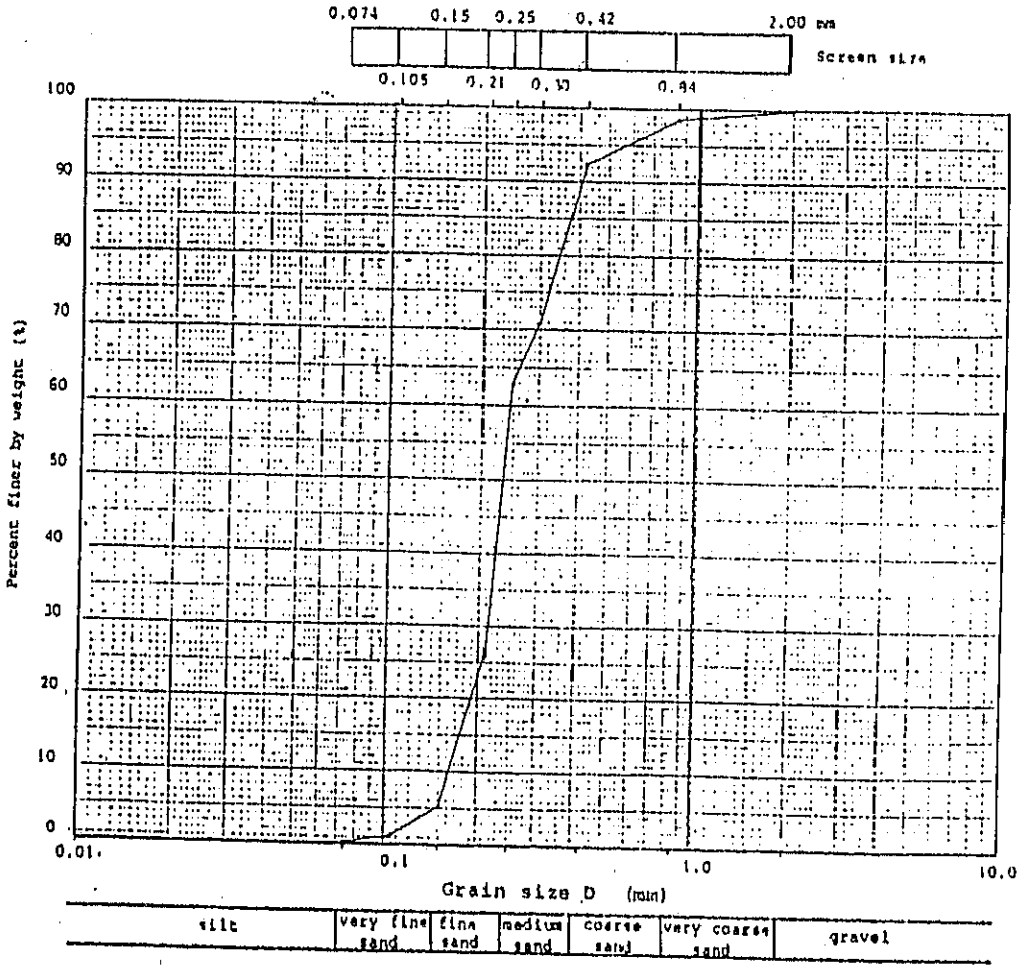
Name of sample Beach Sand (for construction material) Signature

Locality Dukuh Serangan, Island

Grain size (mm)	Weight (g)	Weight percent (%)
2.00		100
0.84	2.75	98.625
0.42	12.40	92.425
0.30	43.20	70.825
0.25	15.45	63.10
0.21	74.55	25.825
0.15	41.50	5.075
0.105	7.6	1.275
0.074	2.3	0.125
	0.25	-

Very coarse sand (2.00~0.84mm) %	1.375
Coarse sand (0.84~0.42mm) %	6.20
Medium sand (0.42~0.25mm) %	29.325
Fine sand (0.25~0.15mm) %	58.025
Very fine sand (0.15~0.074mm) %	4.95
Silt or clay (under 0.074mm) %	0.125
Maximum grain size mm	0.84
60% grain size mm	0.245
30% grain size mm	0.212
10% grain size mm	0.161
Coefficient of uniformity Uc	1.522
Coefficient of curvature Uc'	1.139

Grain size accumulation curve



Grain Size Analysis

Sample No. 5 Date

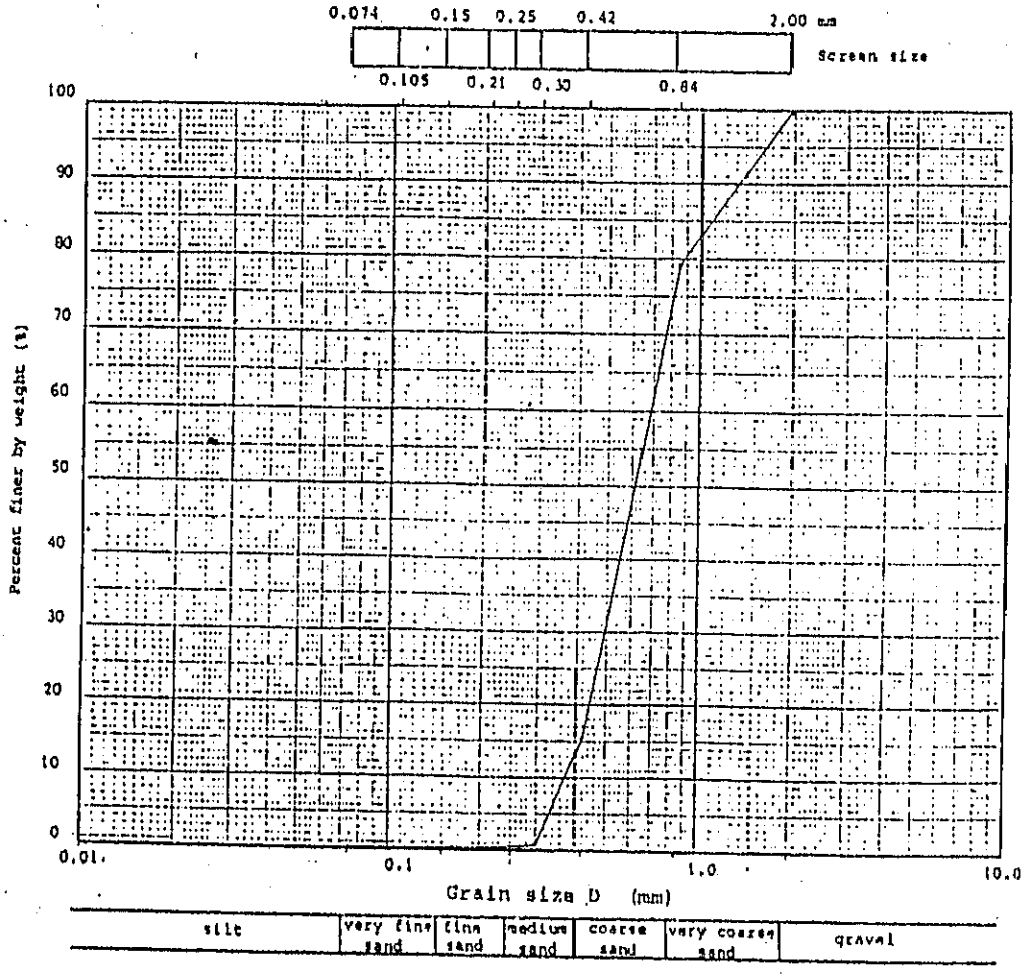
Name of sample Dune Sand (for construction material) Signature

Locality Hotel Bualu 200 meter to South, Sand quarry, Nusa Dua

Grain size (mm)	Weight (g)	Weight percent (%)
2.00		100
0.84	31.35	84.325
0.42	137.35	15.65
0.30	29.30	1.00
0.25	0.70	0.65
0.21	0.80	0.25
0.15	0.25	0.125
0.105	0.10	0.075
0.074	0.05	0.05
	0.10	-

Very coarse sand (2.00-0.84mm) %	15.675
Coarse sand (0.84-0.42mm) %	68.675
Medium sand (0.42-0.25mm) %	15.00
Fine sand (0.25-0.15mm) %	0.525
Very fine sand (0.15-0.074mm) %	0.075
Silt or clay (under 0.074mm) %	0.05
Maximum grain size mm	0.84
60% grain size mm	0.68
30% grain size mm	0.49
10% grain size mm	0.37
Coefficient of uniformity Uc	1.838
Coefficient of curvature Uc'	0.954

Grain size accumulation curve



Grain Size Analysis

Sample No. 6 Date

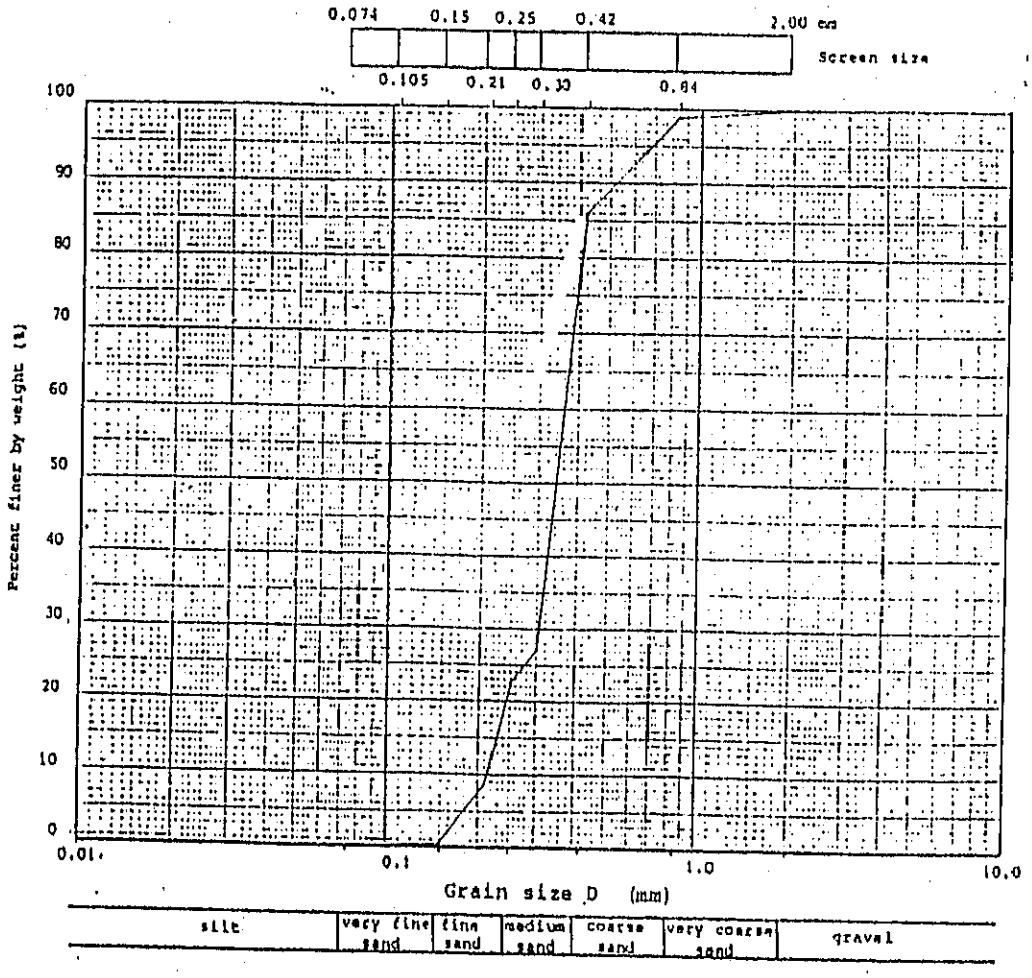
Name of sample Dune Sand (for construction material) Signature

Locality West of Surya Beach Hotel, Sand quarry, Sanur

Grain size (mm)	Weight (g)	Weight percent (%)
2.00		100
0.84	2.10	98.95
0.42	26.10	85.90
0.30	117.0	27.40
0.25	10.0	22.40
0.21	27.70	8.55
0.15	16.0	0.55
0.105	1.0	0.05
0.074	0.1	0
	0	-

Very coarse sand (2.00-0.84mm) %	1.05
Coarse sand (0.84-0.42mm) %	13.05
Medium sand (0.42-0.25mm) %	63.50
Fine sand (0.25-0.15mm) %	21.85
Very fine sand (0.15-0.074mm) %	0.55
Silt or clay (under 0.074mm) %	0
Maximum grain size mm	0.84
60% grain size mm	0.36
30% grain size mm	0.305
10% grain size mm	0.215
Coefficient of uniformity Uc	1.674
Coefficient of curvature Uc'	1.202

Grain size accumulation curve



Grain Size Analysis

Sample No. 7 Date

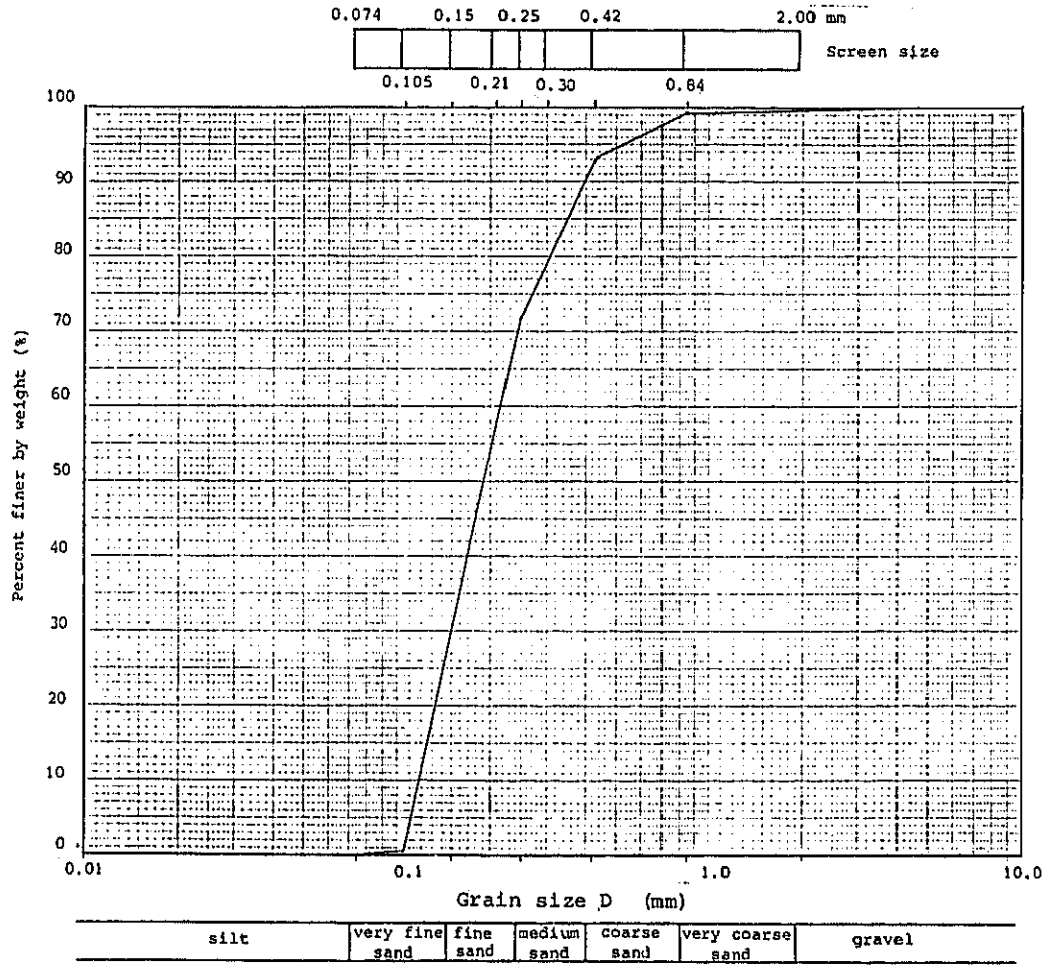
Name of sample Construction material (beach sand) Signature

Locality Northern beach in Nusa Penida

Grain size (mm)	Weight (g)	Weight percent (%)
4.76	0	100
2.00	0.03	99.98
0.84	1.40	99.17
0.42	10.50	93.13
0.30		
0.25	37.00	71.84
0.21		
0.15		
0.105	124.70	0.11
0.074	0.14	0.03
	0.05	-
Total	173.82	

Very coarse sand	~~(2.00~~ 4.76 ~0.84mm) %	0.83
Coarse sand	(0.84~0.42mm) %	6.04
Medium sand	(0.42~0.25mm) %	21.29
Fine sand	(0.25~0.15mm) %	-
Very fine sand	(0.15~0.074mm) %	71.82
Silt or clay	(under 0.074mm) %	0.03
Maximum grain size mm		4.76
60% grain size mm		0.215
30% grain size mm		0.150
10% grain size mm		0.125
Coefficient of uniformity Uc		1.72
Coefficient of curvature Uc'		0.837

Grain size accumulation curve



Grain Size Analysis

Sample No. 8 Date

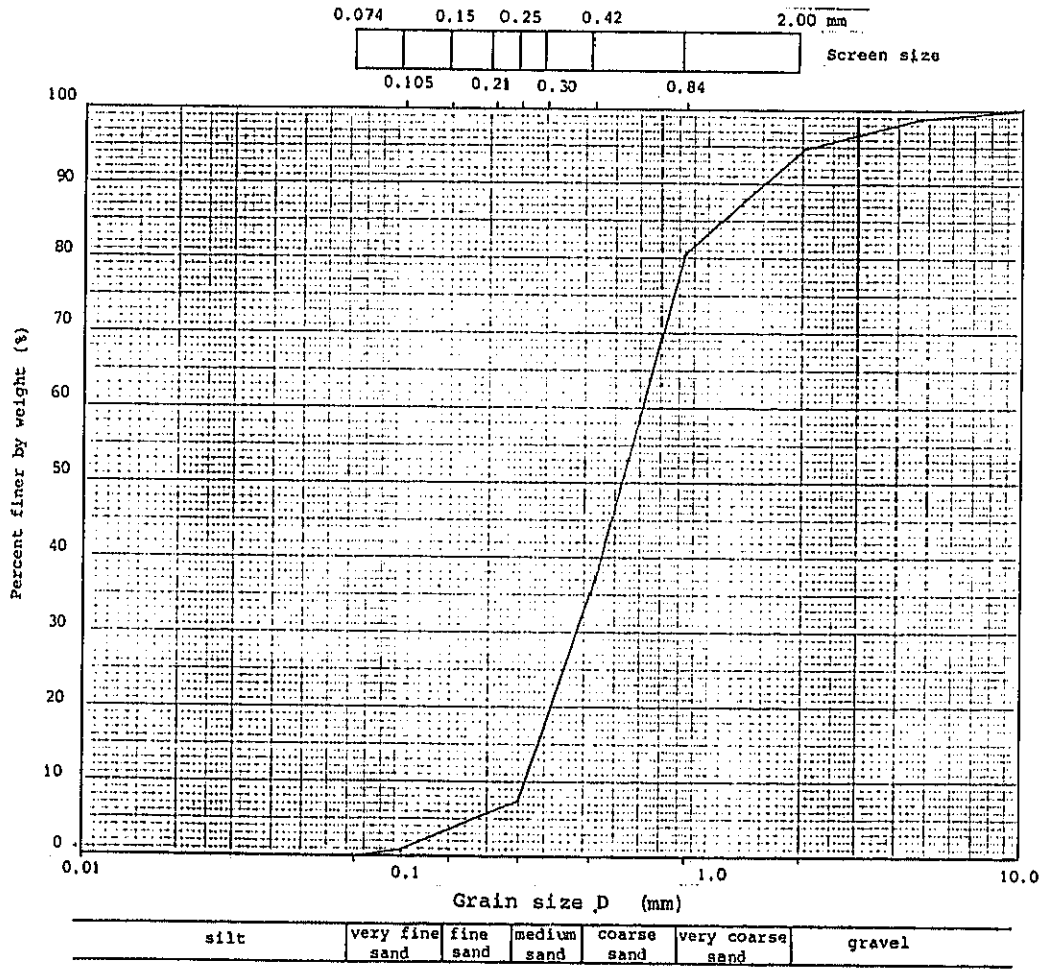
Name of sample Construction material (beach sand) Signature

Locality Nusa Lembongan

Grain size (mm)	Weight (g)	Weight percent (%)
9.52	0	100
4.76	4.60	97.57
2.00	6.20	94.30
0.84	26.00	80.57
0.42	86.20	35.07
0.30		
0.25	52.00	7.61
0.21		
0.15		
0.105	13.90	0.27
0.074	0.30	0.11
	0.20	-
Total	189.40	

Very coarse sand	(~~2.00~~ 9.52 - 0.84mm) %	19.43
Coarse sand	(0.84 - 0.42mm) %	45.51
Medium sand	(0.42 - 0.25mm) %	27.46
Fine sand	(0.25 - 0.15mm) %	-
Very fine sand	(0.15 - 0.074mm) %	7.50
Silt or clay	(under 0.074mm) %	0.11
Maximum grain size	mm	9.52
60% grain size	mm	0.625
30% grain size	mm	0.39
10% grain size	mm	0.27
Coefficient of uniformity	Uc	2.31
Coefficient of curvature	Uc'	0.909

Grain size accumulation curve



Grain Size Analysis

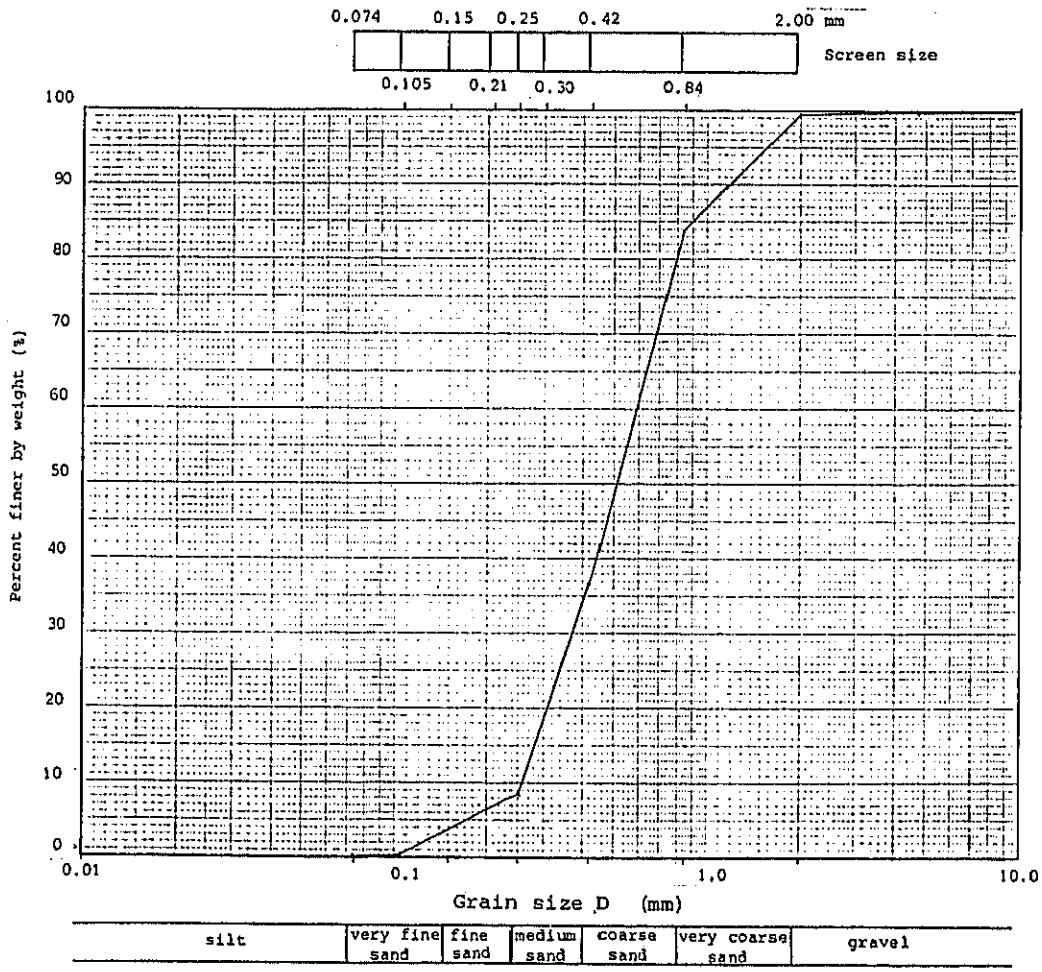
Sample No. 9
Name of sample Construction material (beach sand)
Locality Nusa Cemingan

Date
Signature

Grain size (mm)	Weight (g)	Weight percent (%)
9.52	0	100.
4.76	0.10	99.95
2.00	0.70	99.63
0.84	34.50	83.90
0.42	104.20	36.39
0.30		
0.25	61.20	8.48
0.21		
0.15		
0.105	18.50	0.04
0.074	0.02	0.03
	0.06	-
Total	219.28	

Very coarse sand	(2.00~0.84mm) %	16.10
Coarse sand	(0.84~0.42mm) %	47.52
Medium sand	(0.42~0.25mm) %	27.91
Fine sand	(0.25~0.15mm) %	-
Very fine sand	(0.15~0.074mm) %	8.44
Silt or clay	(under 0.074mm) %	0.03
Maximum grain size	mm	9.52
60% grain size	mm	0.60
30% grain size	mm	0.375
10% grain size	mm	0.26
Coefficient of uniformity	Uc	2.31
Coefficient of curvature	Uc'	0.901

Grain size accumulation curve



Grain Size Analysis

Sample No. 10 Date

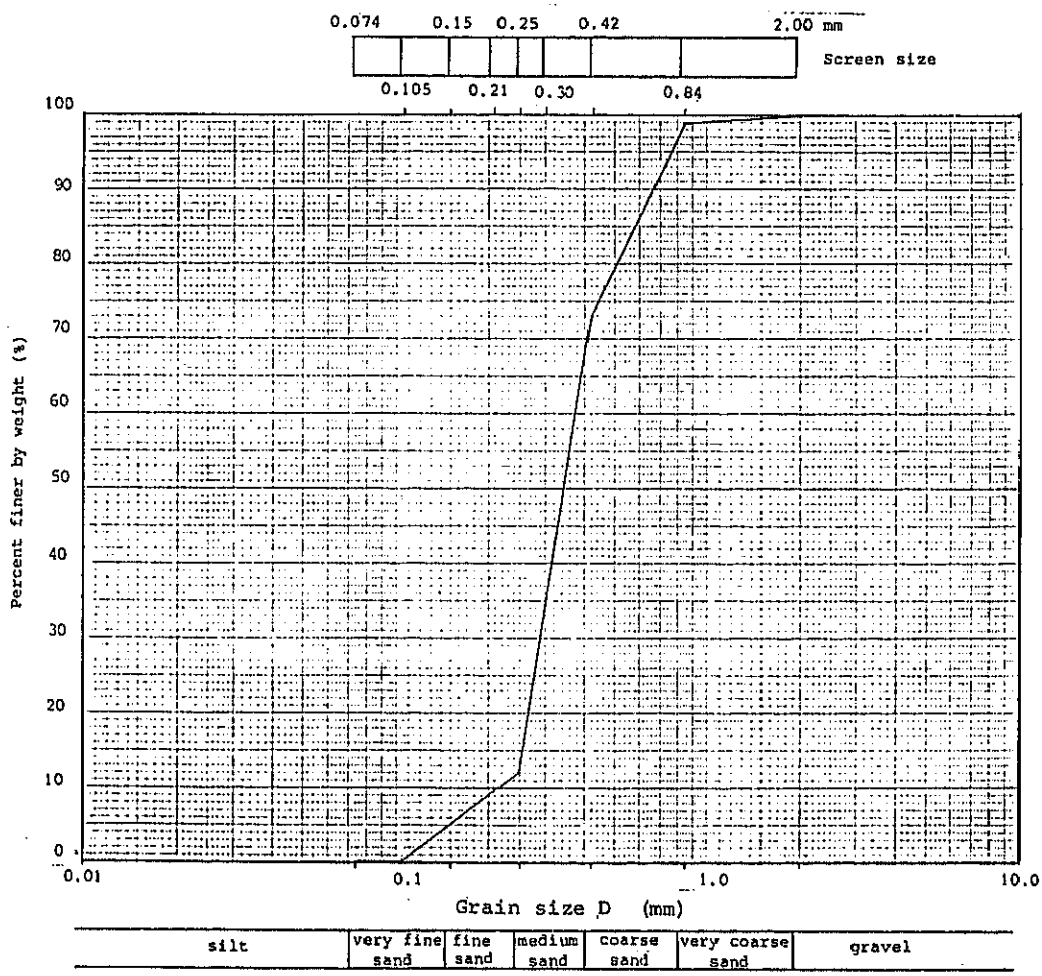
Name of sample Construction material (sea sand) Signature

Locality Off-shore of Sawangan

Grain size (mm)	Weight (g)	Weight percent (%)
2.00	0	100
0.84	1.24	98.84
0.42	27.71	72.76
0.30		
0.25	64.50	12.06
0.21		
0.15		
0.105	12.76	0.05
0.074	0.05	0.00
		-
Total	106,26	

Very coarse sand (2.00~0.84mm) %	1.17
Coarse sand (0.84~0.42mm) %	26.08
Medium sand (0.42~0.25mm) %	60.70
Fine sand (0.25~0.15mm) %	-
Very fine sand (0.15~0.074mm) %	12.06
Silt or clay (under 0.074mm) %	-
Maximum grain size mm	2.00
60% grain size mm	0.37
30% grain size mm	0.28
10% grain size mm	0.22
Coefficient of uniformity Uc	1.682
Coefficient of curvature Uc'	0.963

Grain size accumulation curve



Grain Size Analysis

Sample No. 11 Date

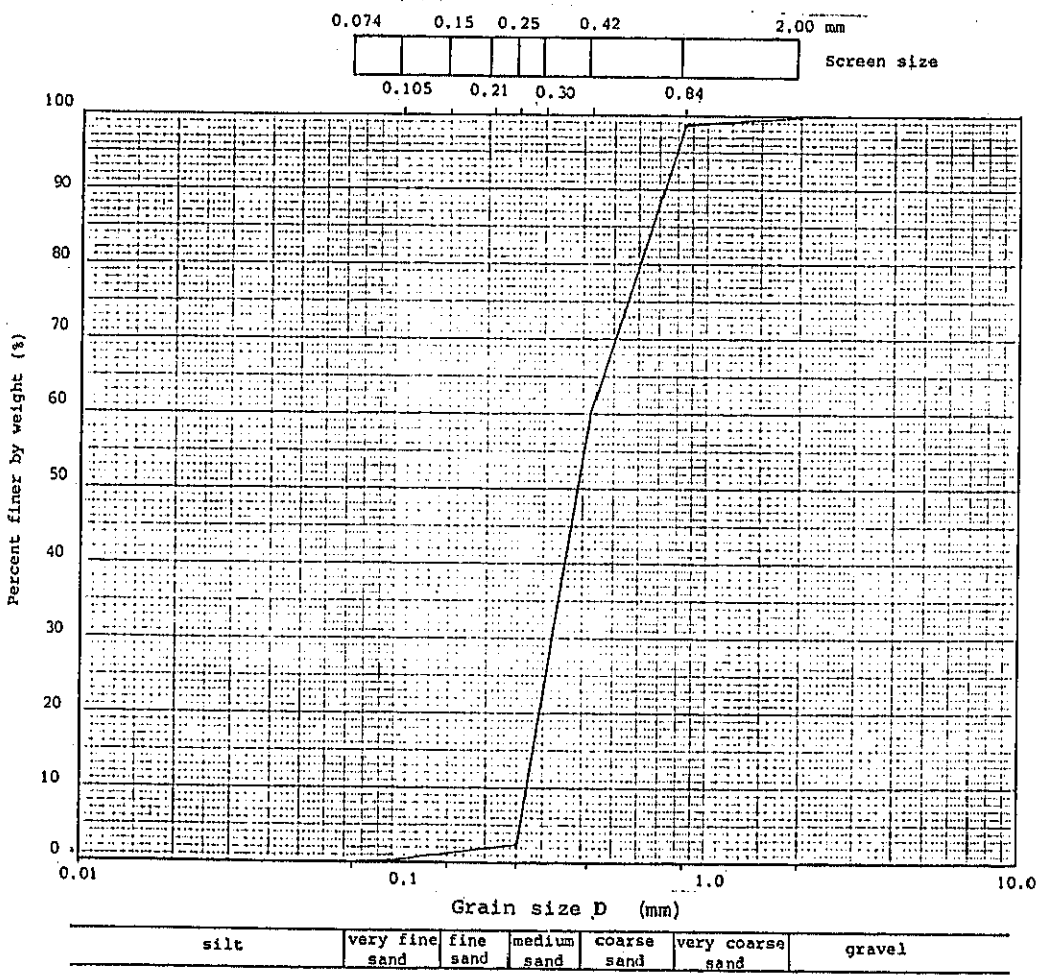
Name of sample Construction material (sea sand) Signature

Locality Off-shore of Ungasan

Grain size (mm)	Weight (g)	Weight percent (%)
2.00	0	100
0.84	1.68	98.80
0.42	54.94	59.70
0.30		
0.25	80.90	2.13
0.21		
0.15		
0.105	2.88	0.08
0.074	0.12	0
		-
Total	140.52	

Very coarse sand (2.00~0.84mm) %	1.20
Coarse sand (0.84~0.42mm) %	39.10
Medium sand (0.42~0.25mm) %	57.57
Fine sand (0.25~0.15mm) %	-
Very fine sand (0.15~0.074mm) %	2.13
Silt or clay (under 0.074mm) %	-
Maximum grain size mm	2.00
60% grain size mm	0.43
30% grain size mm	0.32
10% grain size mm	0.27
Coefficient of uniformity Uc	1.593
Coefficient of curvature Uc'	0.882

Grain size accumulation curve



Grain Size Analysis

Sample No. 12 Date

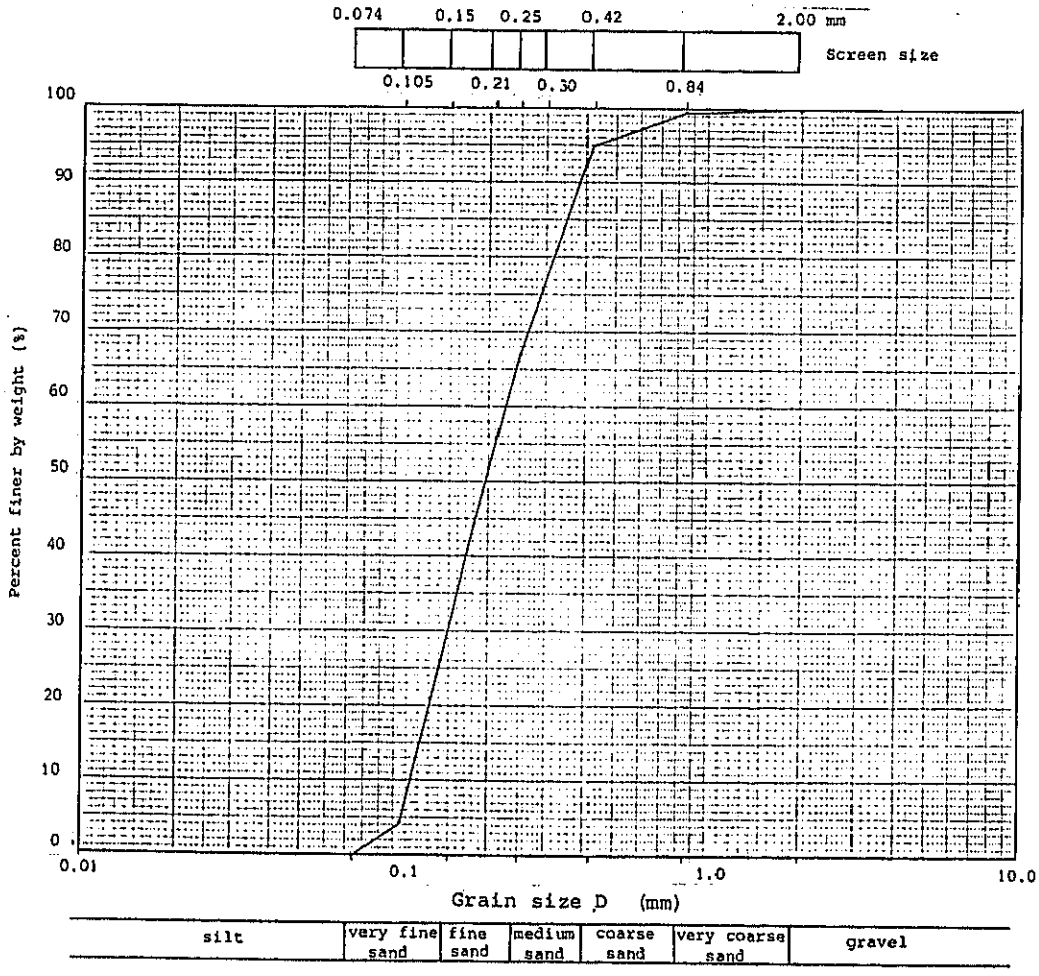
Name of sample Construction material (sea sand) Signature

Locality Off-shore of Pengederan

Grain size (mm)	Weight (g)	Weight percent (%)
2.00	0	100
0.84	0.15	99.32
0.42	0.98	94.85
0.30		
0.25	6.12	66.94
0.21		
0.15		
0.105	13.80	4.01
0.074	0.88	0
		-
Total	21.93	

Very coarse sand (2.00~0.84mm) %	0.68
Coarse sand (0.84~0.42mm) %	4.47
Medium sand (0.42~0.25mm) %	27.91
Fine sand (0.25~0.15mm) %	-
Very fine sand (0.15~0.074mm) %	66.94
Silt or clay (under 0.074mm) %	-
Maximum grain size mm	2.00
60% grain size mm	0.23
30% grain size mm	0.16
10% grain size mm	0.12
Coefficient of uniformity Uc	1.917
Coefficient of curvature Uc'	0.928

Grain size accumulation curve



JICA