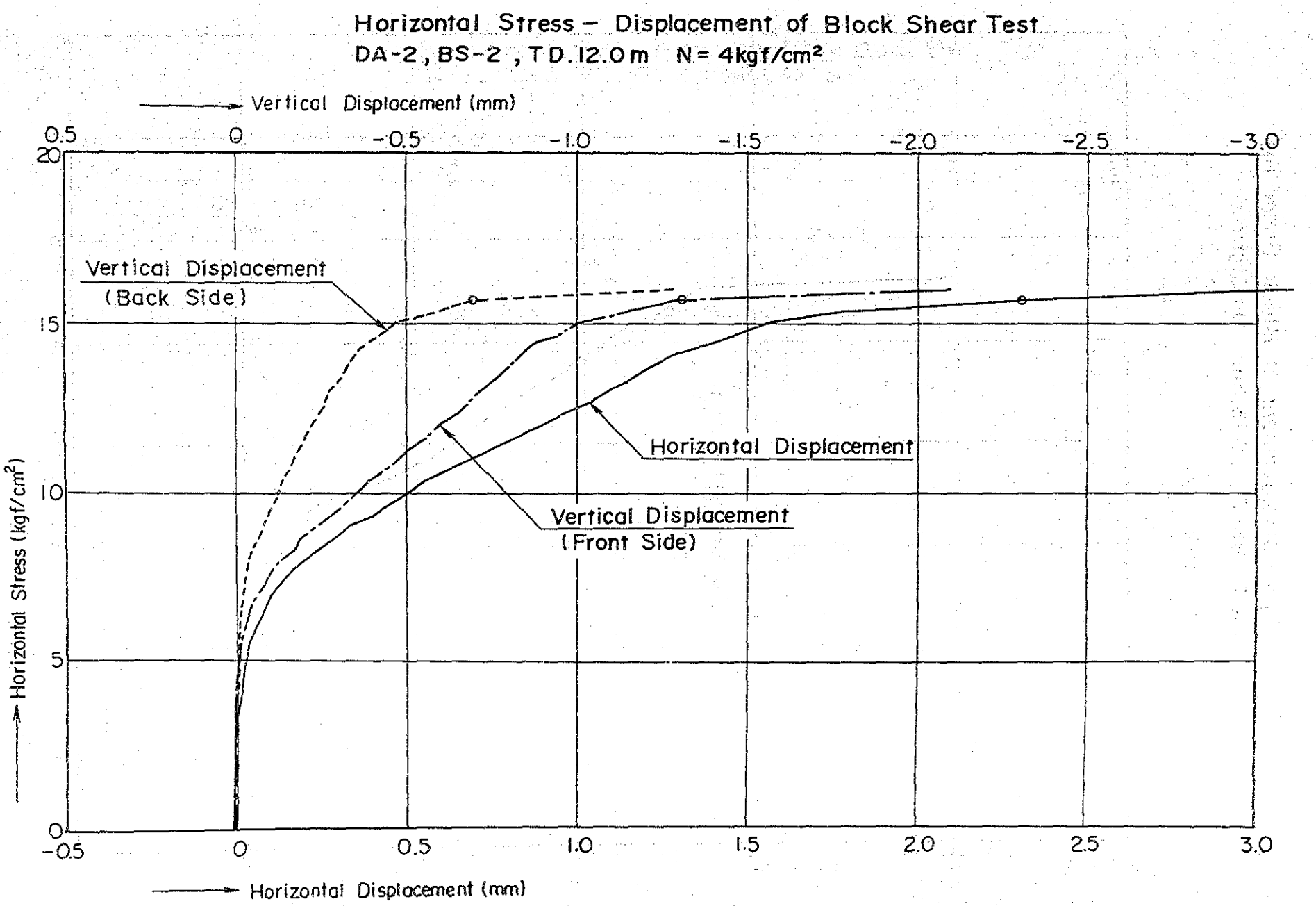
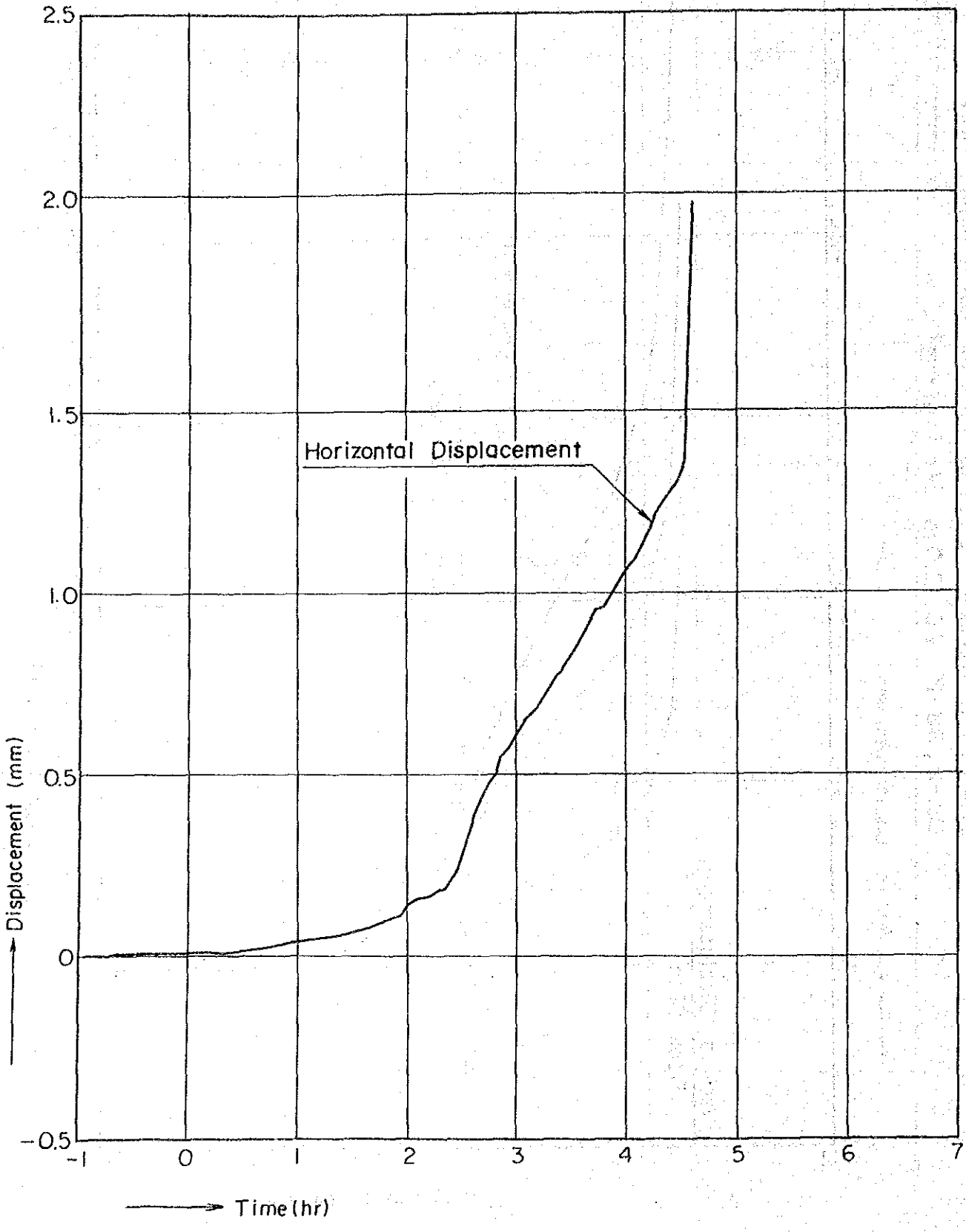
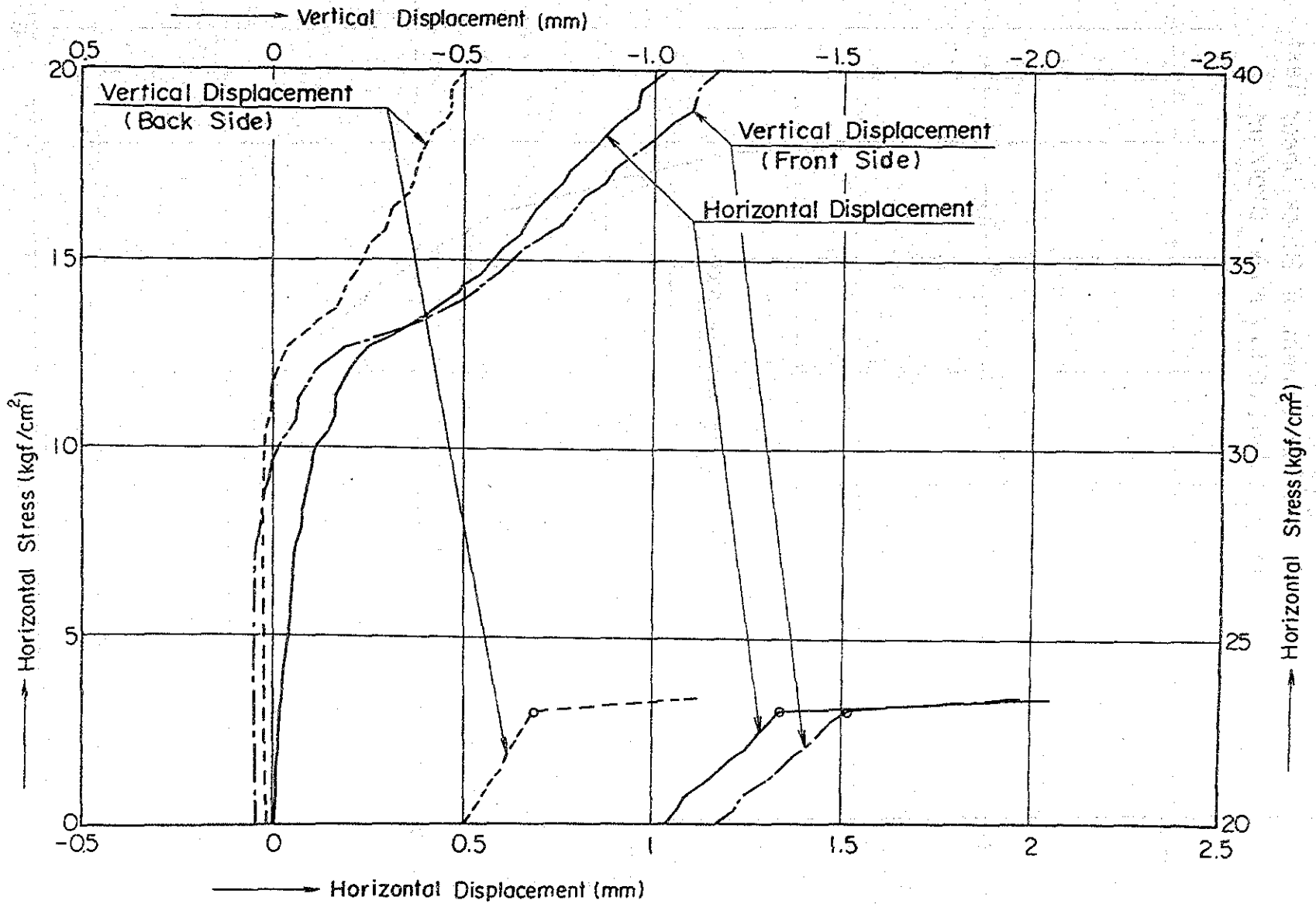
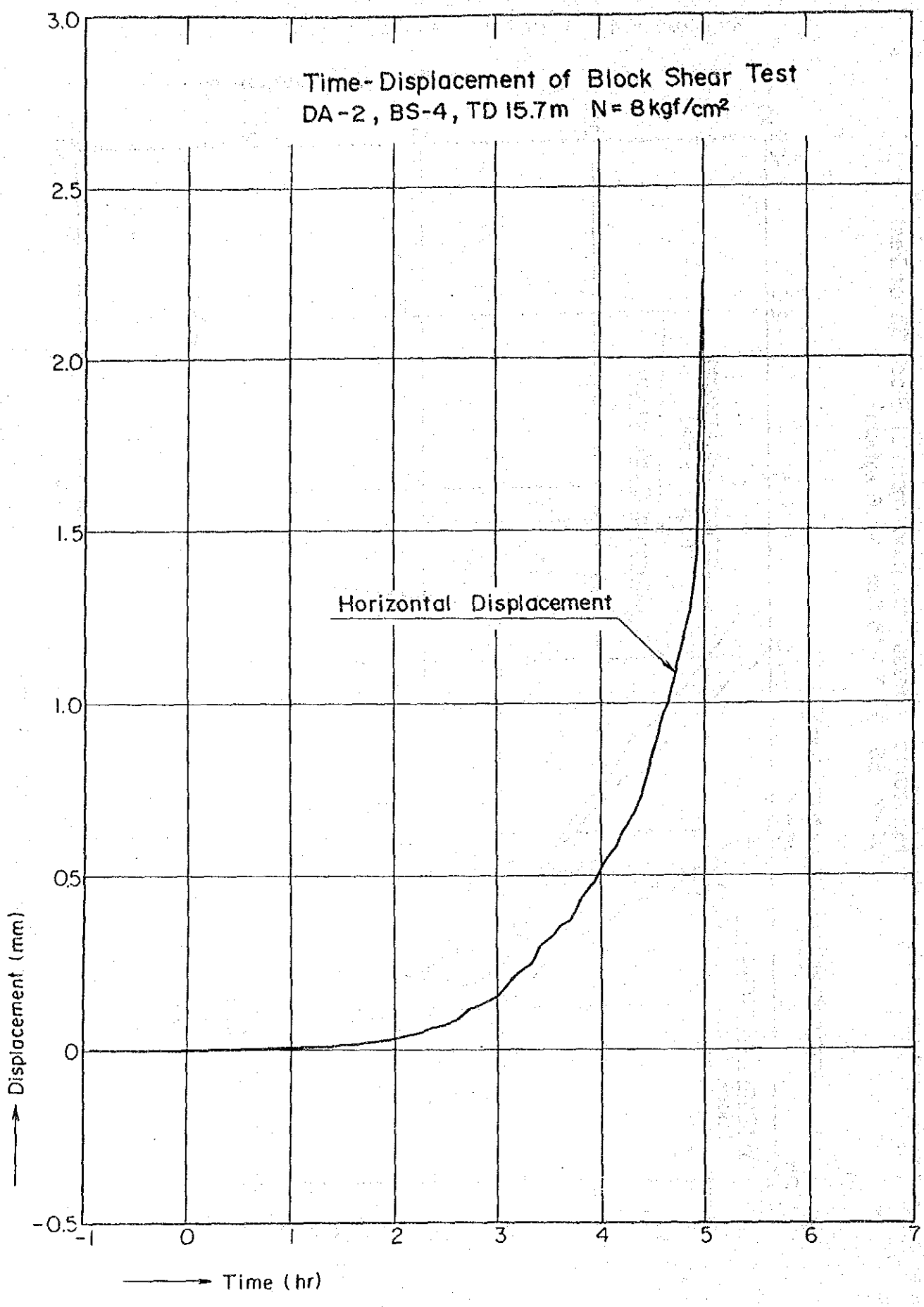

Horizontal Stress – Displacement of Block Shear Test
DA-2, BS-2, T.D. 12.0 m N = 4kgf/cm²
Vertical Displacement (mm)
0.5
0
-0.5
-1.0
-1.5
-2.0
-2.5
-3.0
20
15
10
5
0
Vertical Displacement
(Back Side)
Horizontal Displacement
Vertical Displacement
(Front Side)
Horizontal Stress (kgf/cm²)
-0.5
0
0.5
1.0
1.5
2.0
2.5
3.0
Horizontal Displacement (mm)

Time-Displacement of Block Shear Test
DA-2, BS-3, TD 13.5m N = 6kgf/cm²

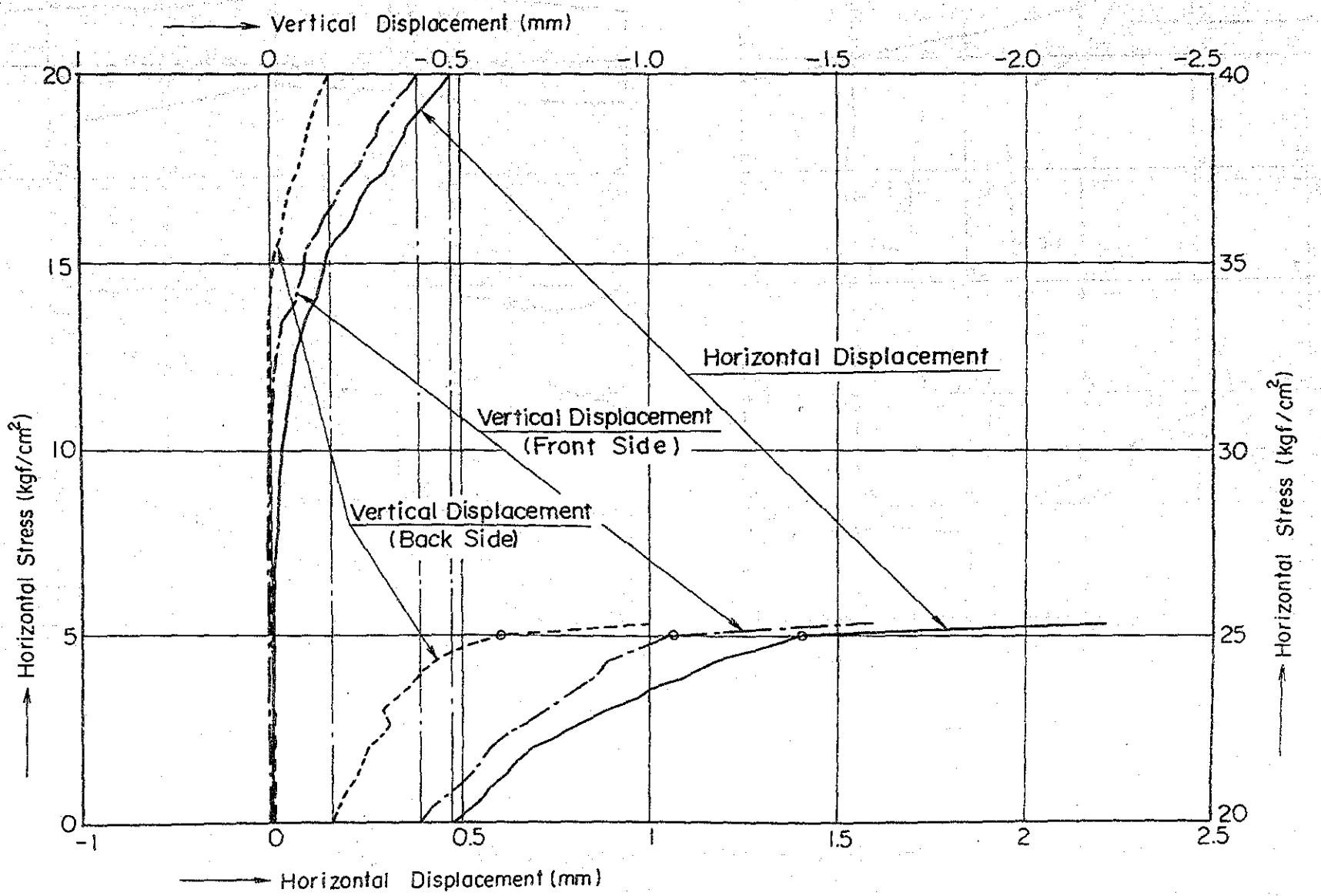


Horizontal Stress – Displacement of Block Shear Test
DA-2, BS-3, TD.13.5m N= 6 kgf/cm²




Time-Displacement of Block Shear Test
DA-2, BS-4, TD 15.7m N = 8 kgf/cm²
Horizontal Displacement
3.0
2.5
2.0
1.5
1.0
0.5
0
-0.5
-1
0
1
2
3
4
5
6
7
Displacement (mm)
Time (hr)

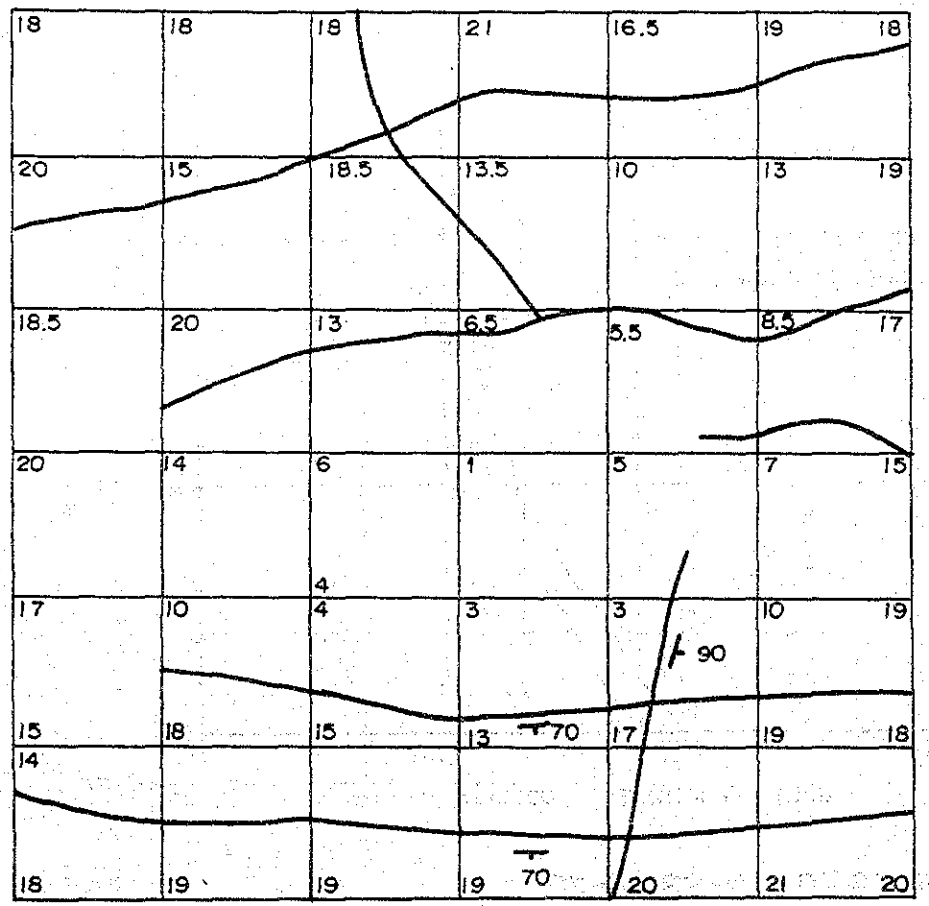
Horizontal Stress – Displacement of Block Shear Test
DA-2, BS-4, TD. 15.7m N = 8 kgf/cm²



3-11-4 SKETCHES OF ORIGINAL ROCK SURFACE

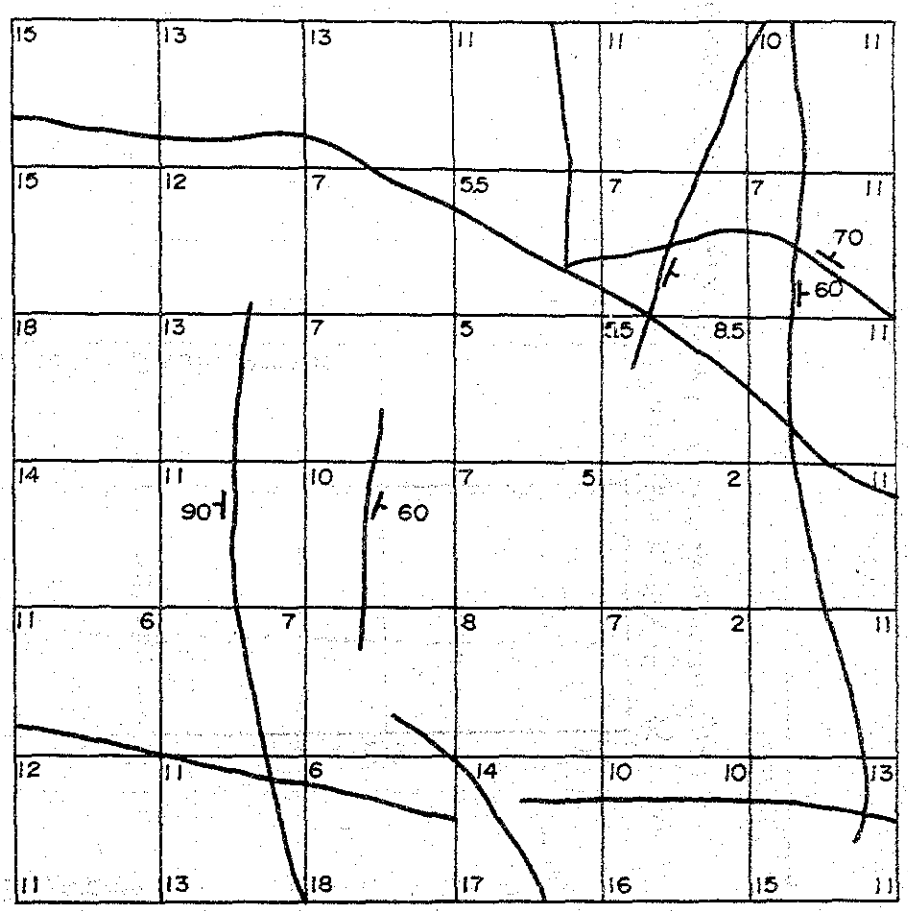
TEST LOCATION : DA-1 TEST NO. : BS-1

MEASURING POINT : TD-15.2m



TEST LOCATION : DA-1 TEST NO. : BS-2

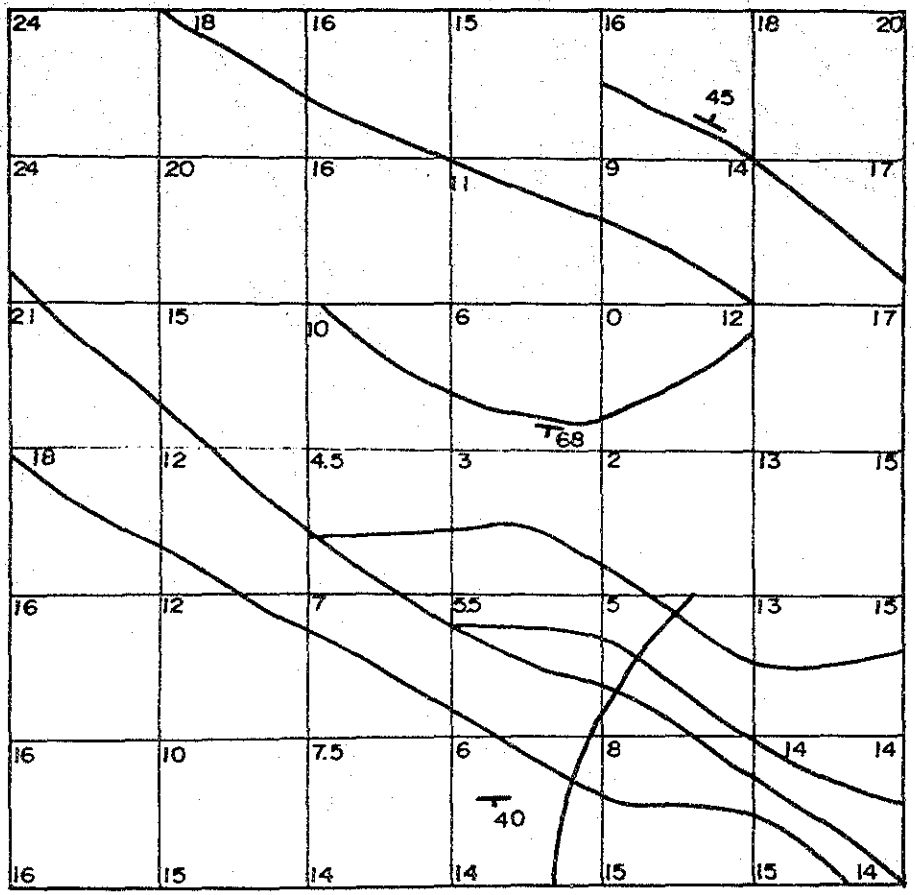
MEASURING POINT : TD-17.4m



SKETCHES OF ORIGINAL ROCK SURFACE

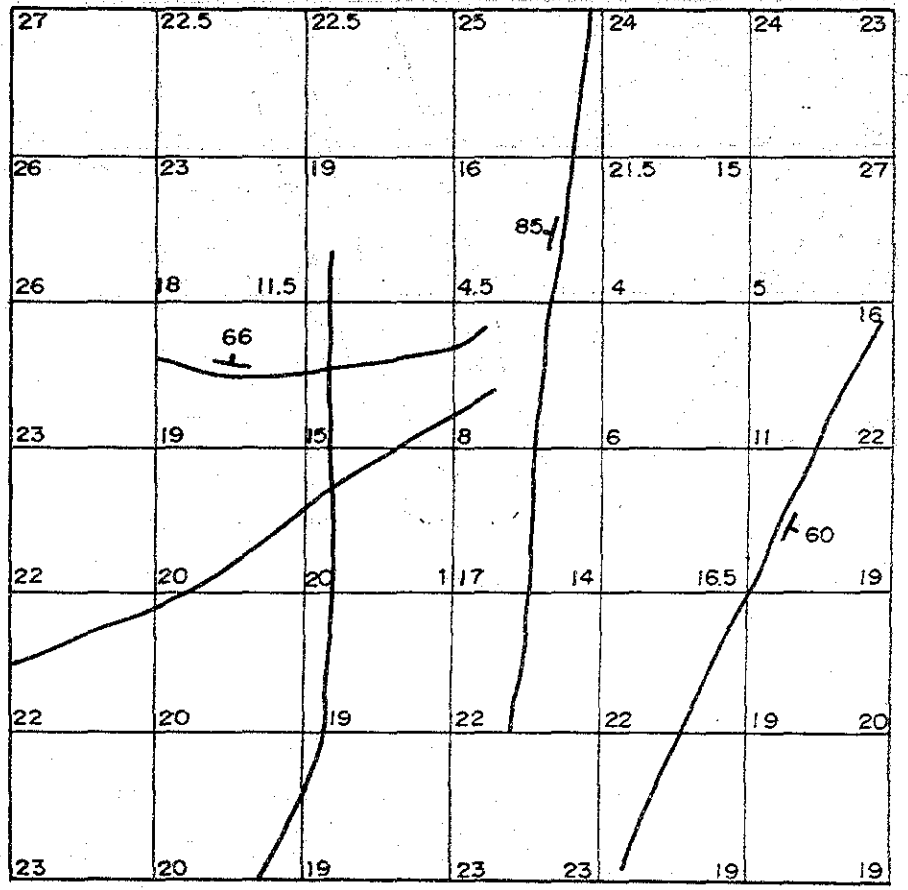
TEST LOCATION : DA-1 TEST NO. : BS-3

MEASURING POINT : TD-18.6 m



TEST LOCATION : DA-1 TEST NO. : BS-4

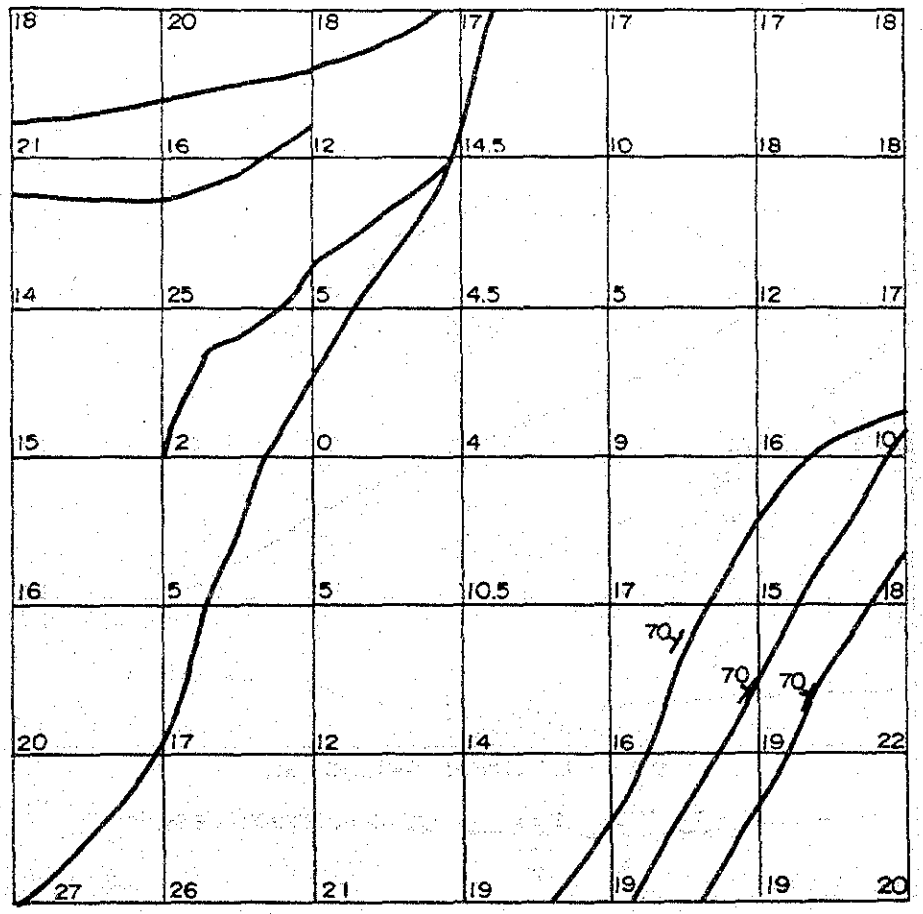
MEASURING POINT : TD-20.0 m



SKETCHES OF ORIGINAL ROCK SURFACE

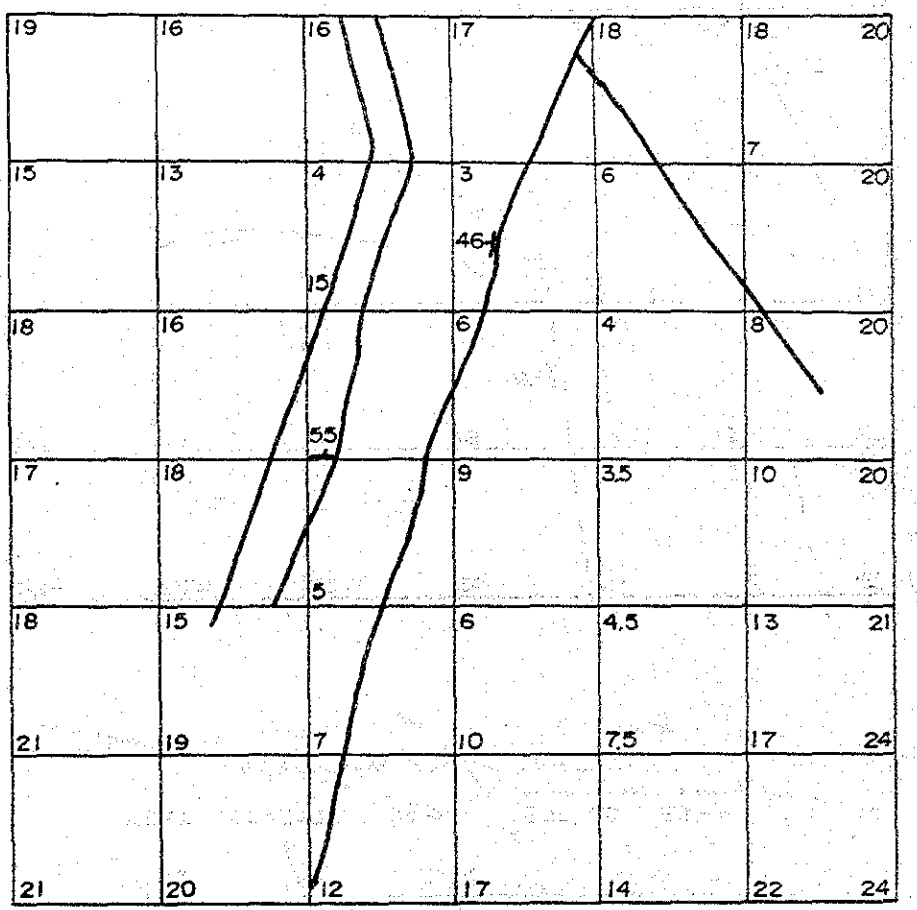
TEST LOCATION : DA-2 TEST NO. : BS-1

MEASURING POINT : TD-10.8 m



TEST LOCATION : DA-2 TEST NO. : BS-2

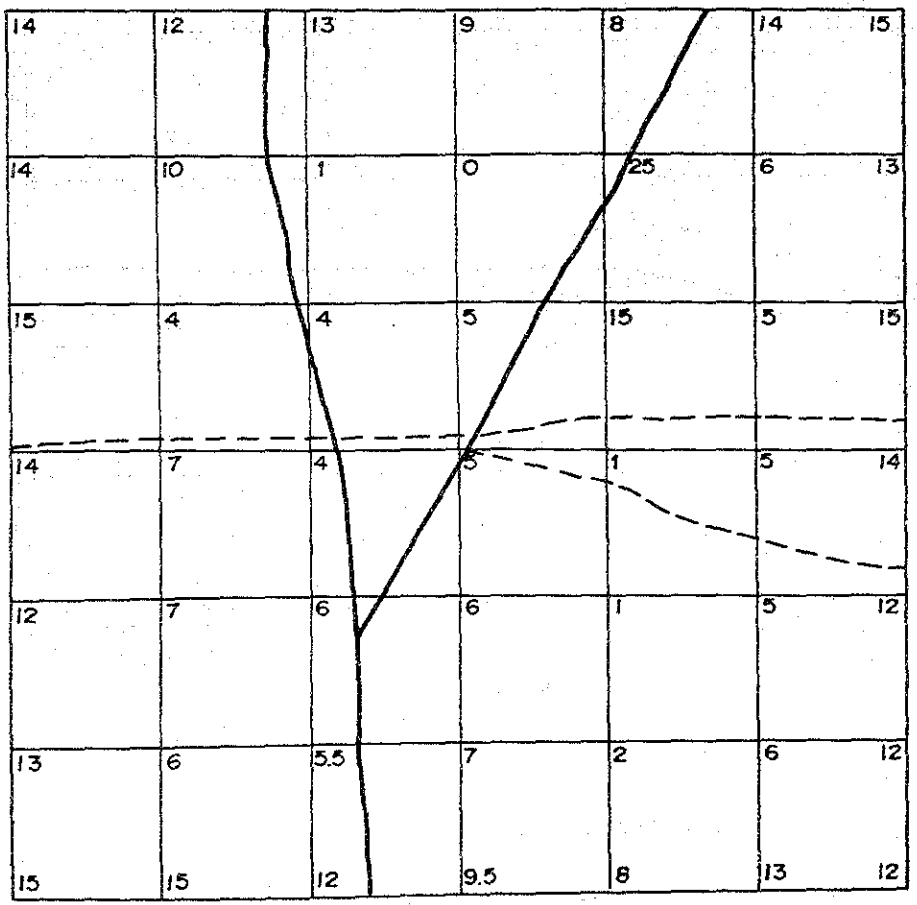
MEASURING POINT : TD-15.7 m



SKETCHES OF ORIGINAL ROCK SURFACE

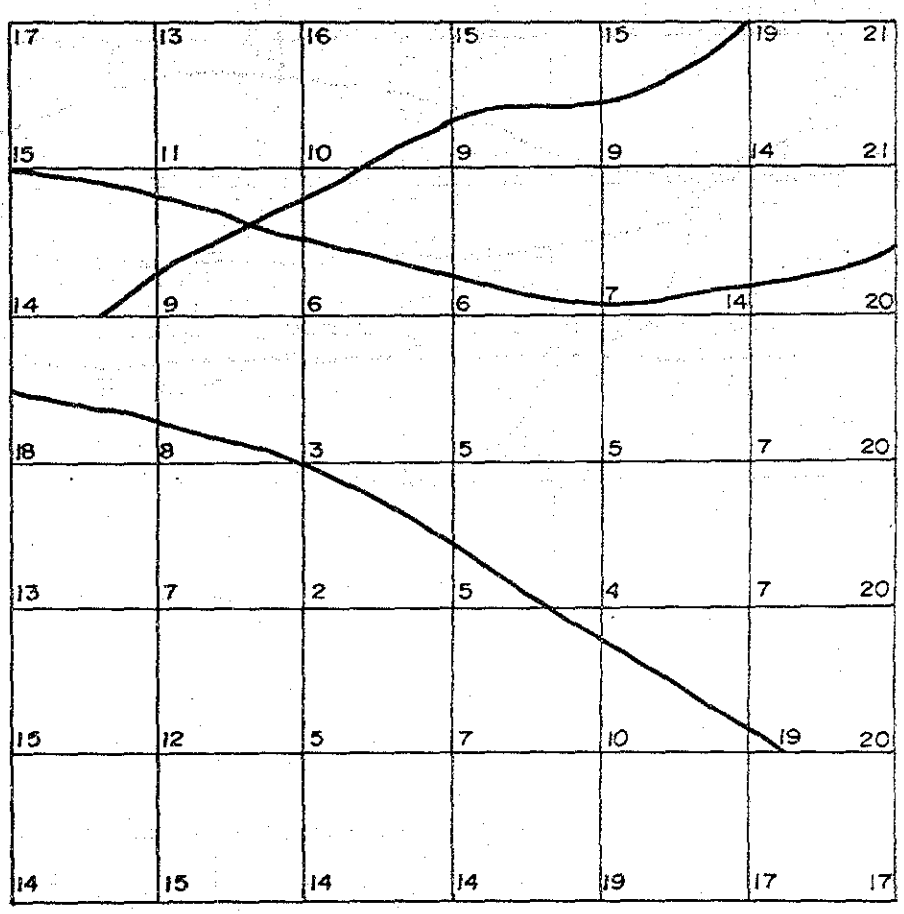
TEST LOCATION : DA-2 TEST NO. : BS-3

MEASURING POINT : TD-13.5 m



TEST LOCATION : DA-2 TEST NO. : BS-4

MEASURING POINT : TD-15.7 m

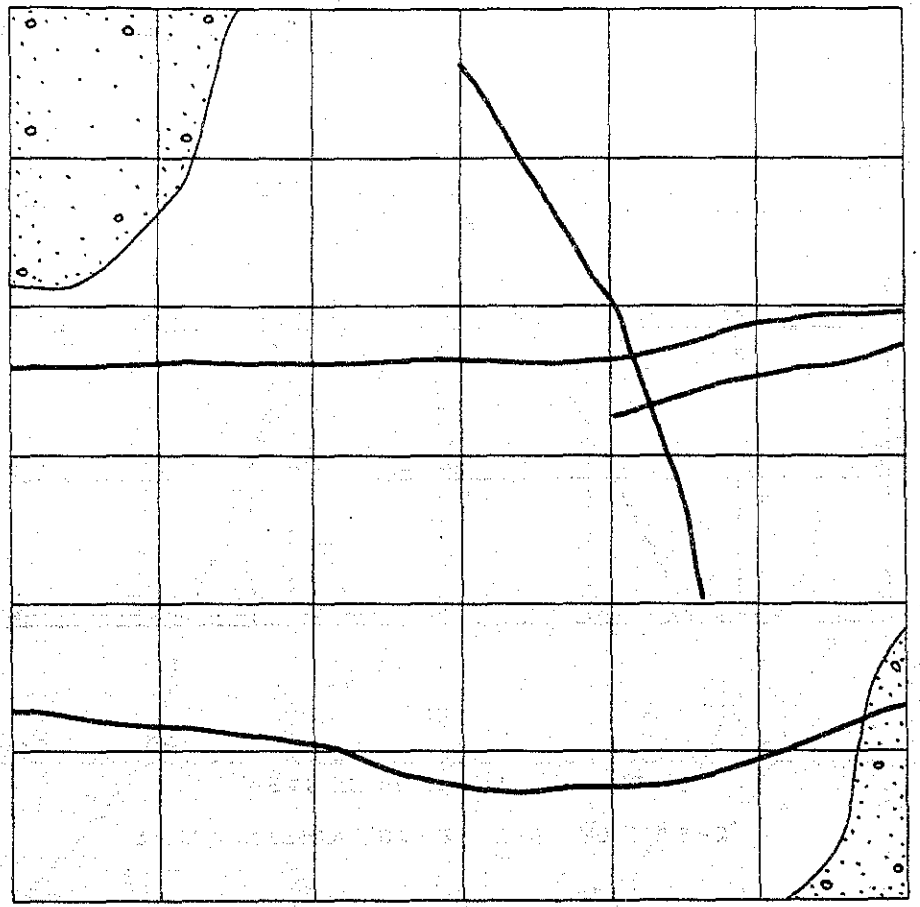


3-11-5 SKETCHES OF FRACTURED SURFACES

TEST LOCATION : DA-1 TEST NO: BS-1 MEASURING POINT: TD-15.2 m

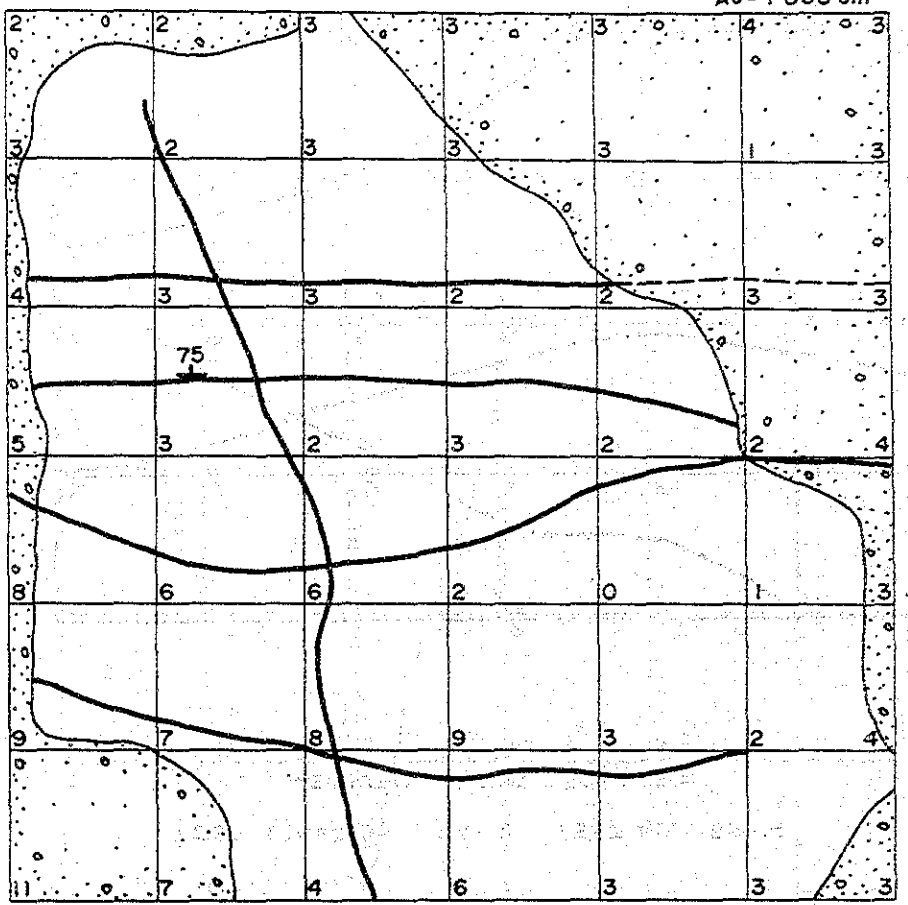
ROCK SURFACE

$A_R = 3\,360\ cm^2$
$A_C = 240\ cm^2$



BLOCK BOTTOM SURFACE

$A_R = 2\,570\ cm^2$
$A_C = 1\,030\ cm^2$

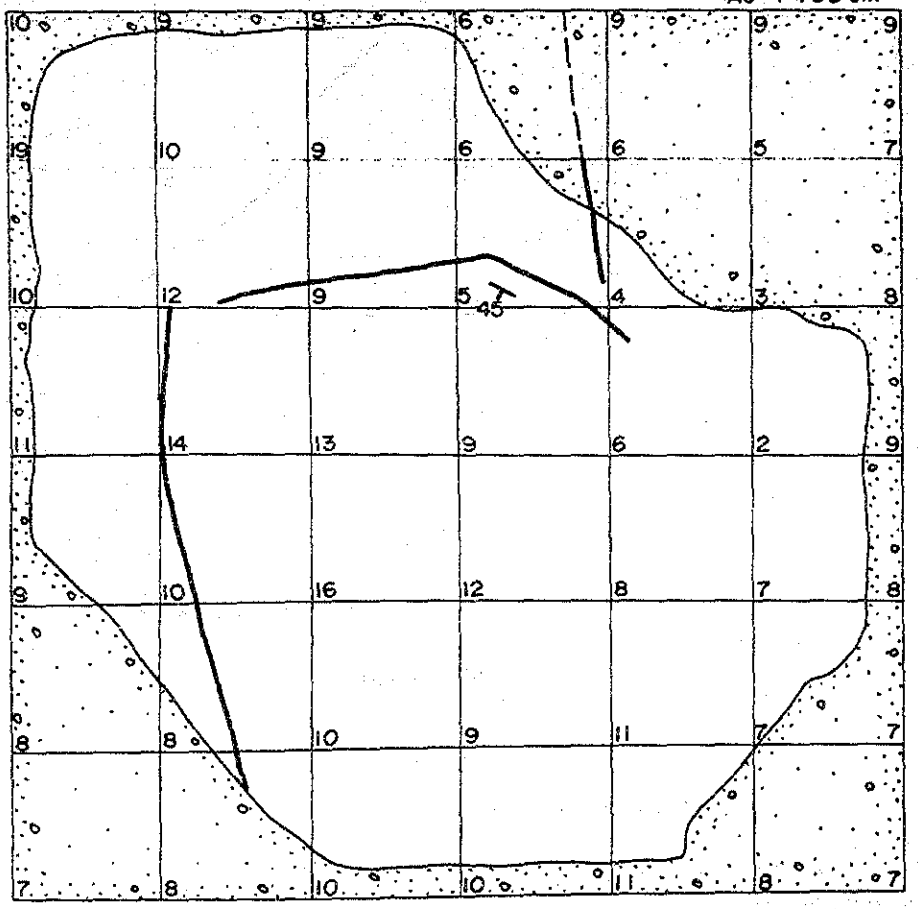


SKETCHES OF FRACTURED SURFACES

TEST LOCATION : DA-1　　TEST NO : BS-2　　MEASURING POINT : TD-17.4m

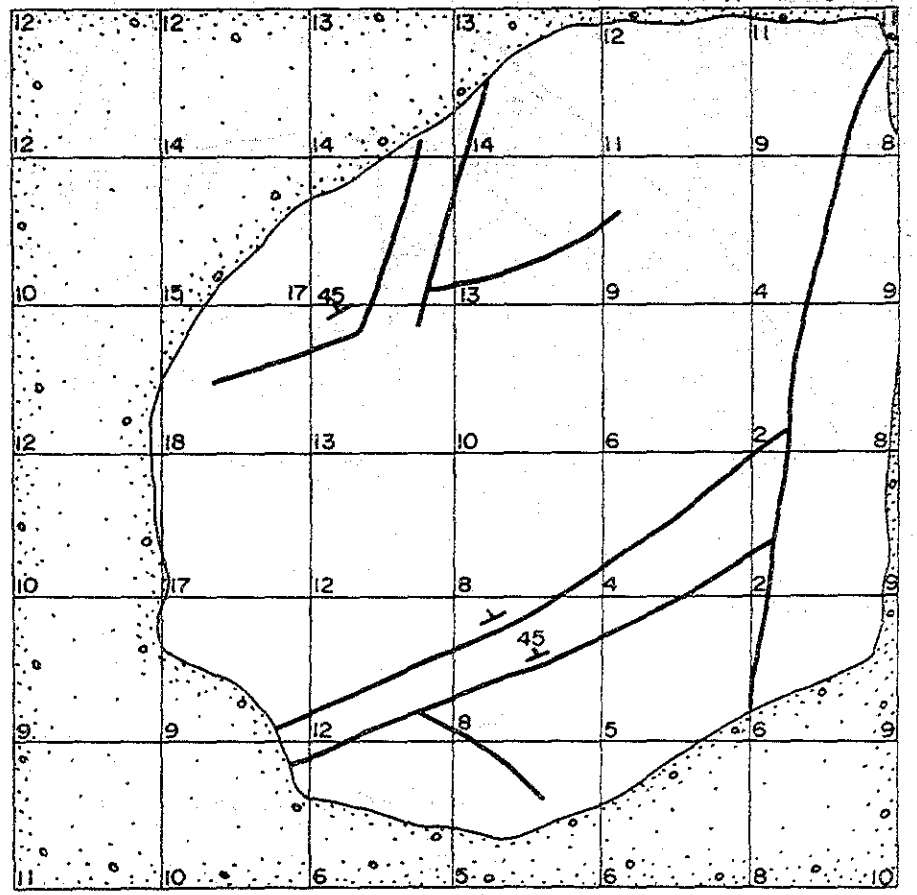
ROCK SURFACE

AR = 2 420 cm²
Ac = 1 180 cm²



BLOCK BOTTOM SURFACE

AR = 2 190 cm²
Ac = 1 410 cm²

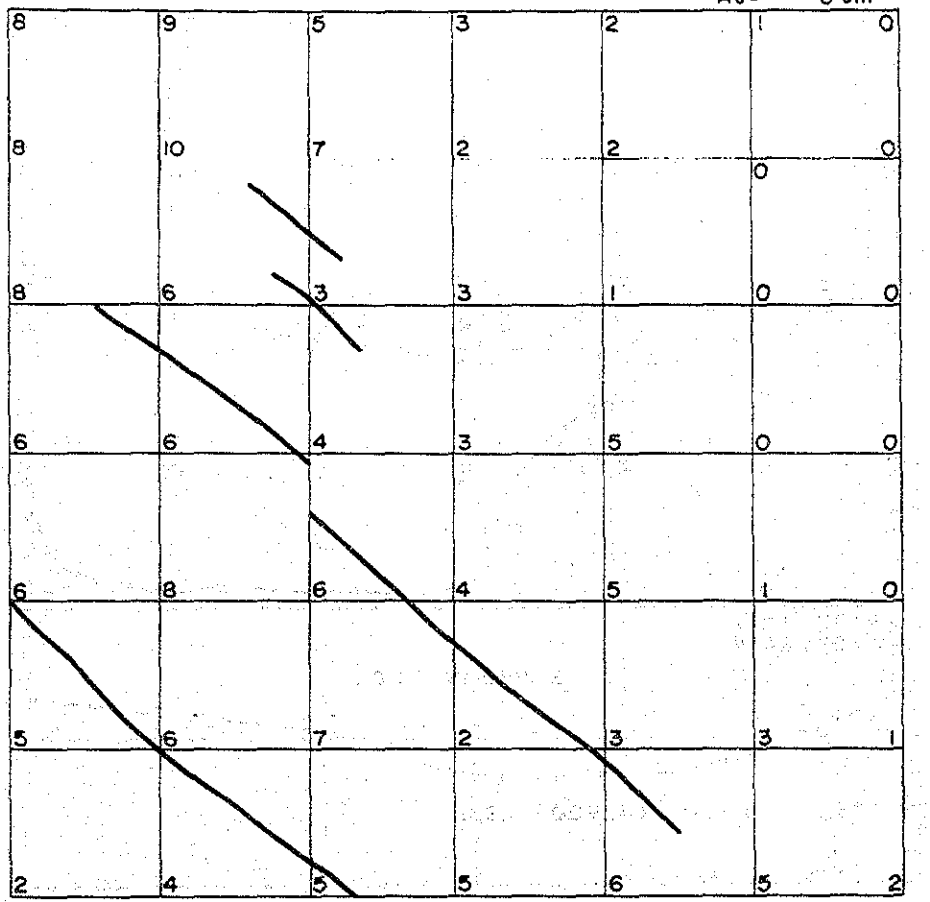


SKETCHES OF FRACTURED SURFACES

TEST LOCATION: DA-1　　TEST NO: BS-3　　MEASURING POINT: TD-18.6m

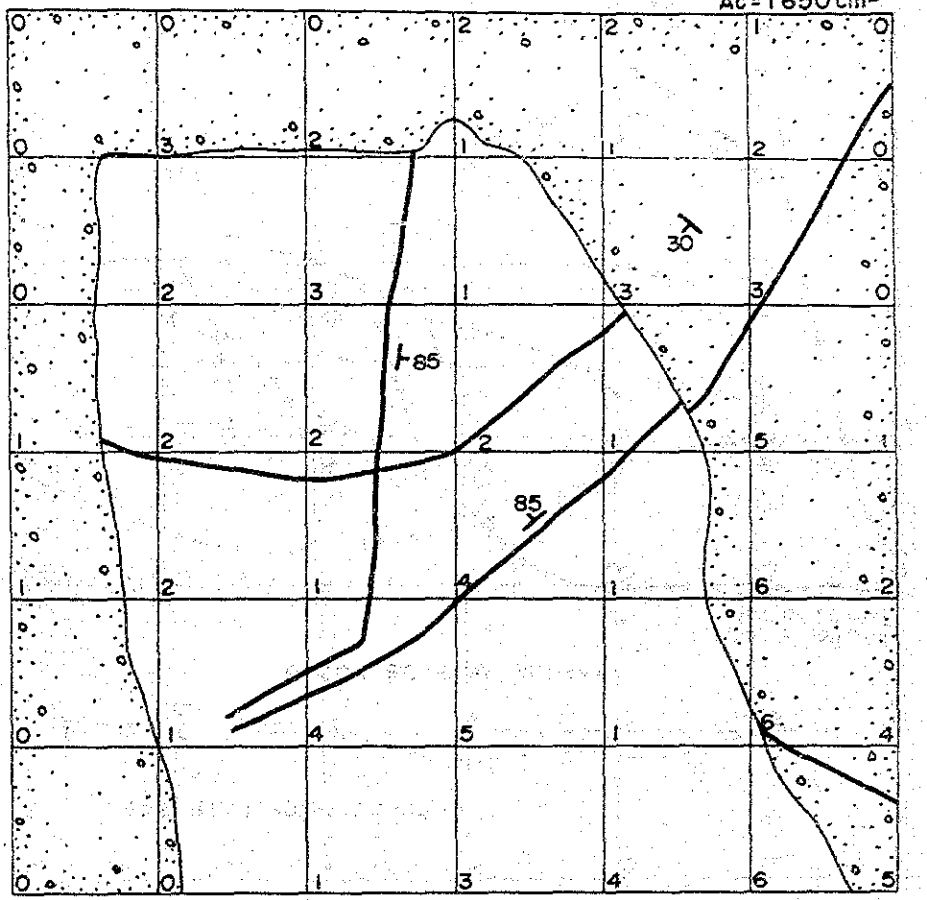
ROCK SURFACE

AR = 3 600 cm²
Ac = 0 cm²



BLOCK BOTTOM SURFACE

AR = 1 950 cm²
Ac = 1 650 cm²

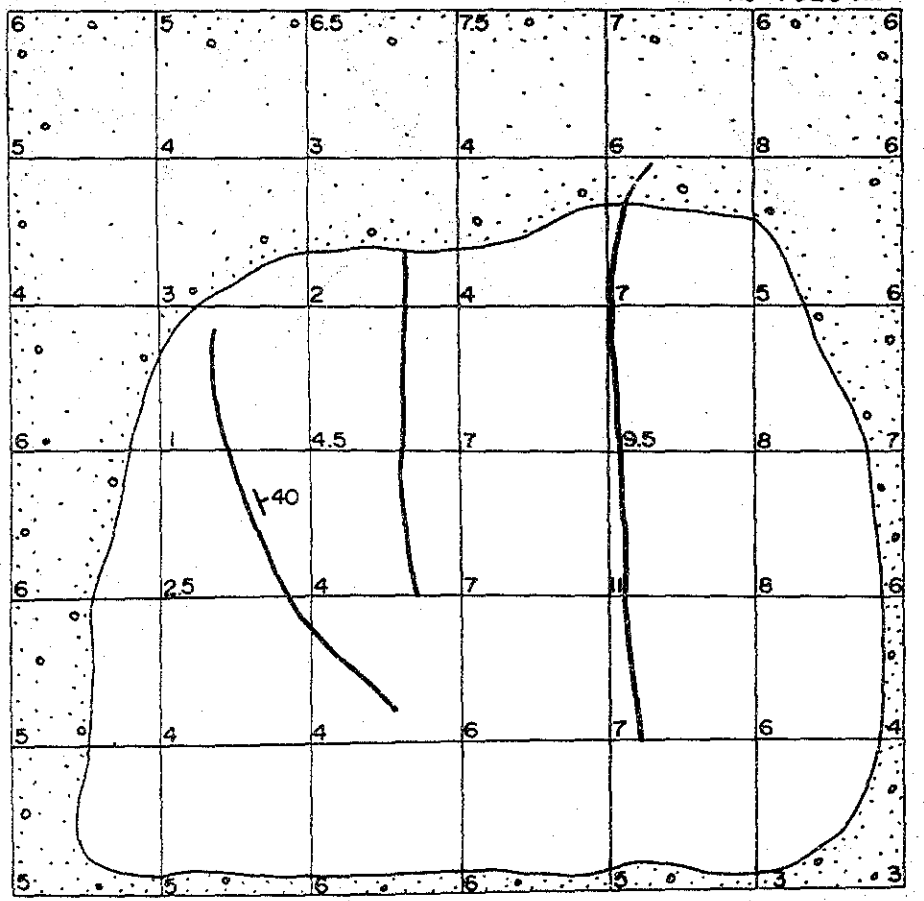


SKETCHES OF FRACTURED SURFACES

TEST LOCATION : DA-1　　TEST NO : BS-4　　MEASURING POINT : TD -20.0m

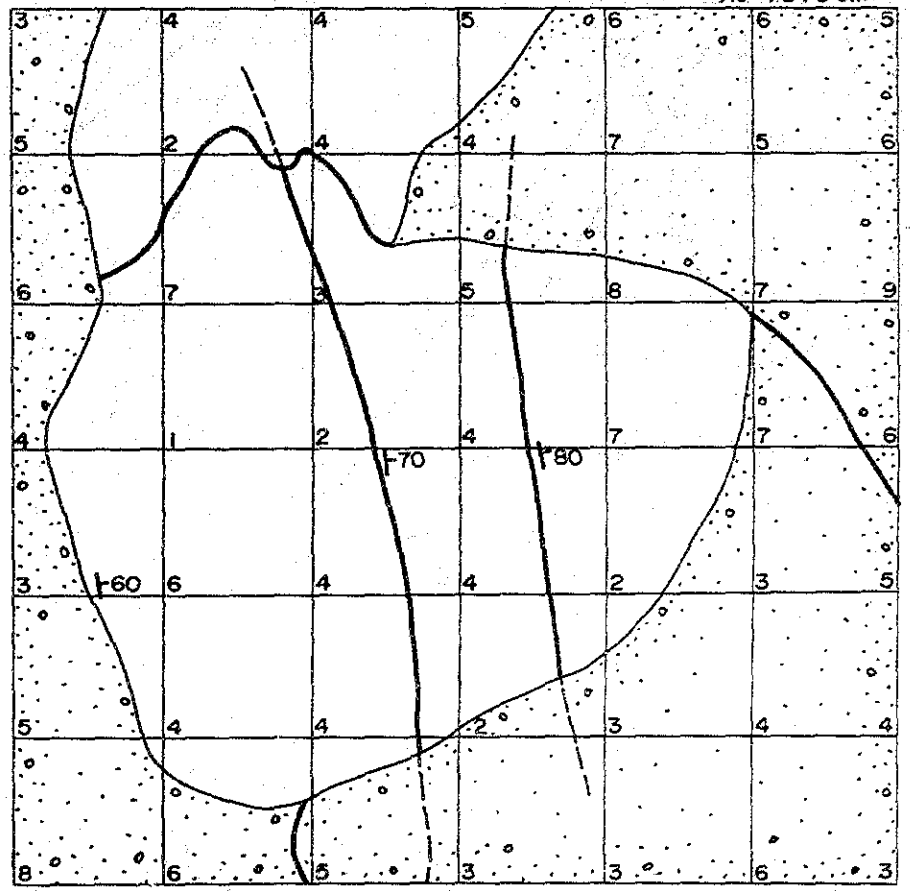
ROCK SURFACE

$A_R = 2080\ cm^2$
$A_C = 1520\ cm^2$



BLOCK BOTTOM SURFACE

$A_R = 1790\ cm^2$
$A_C = 1810\ cm^2$

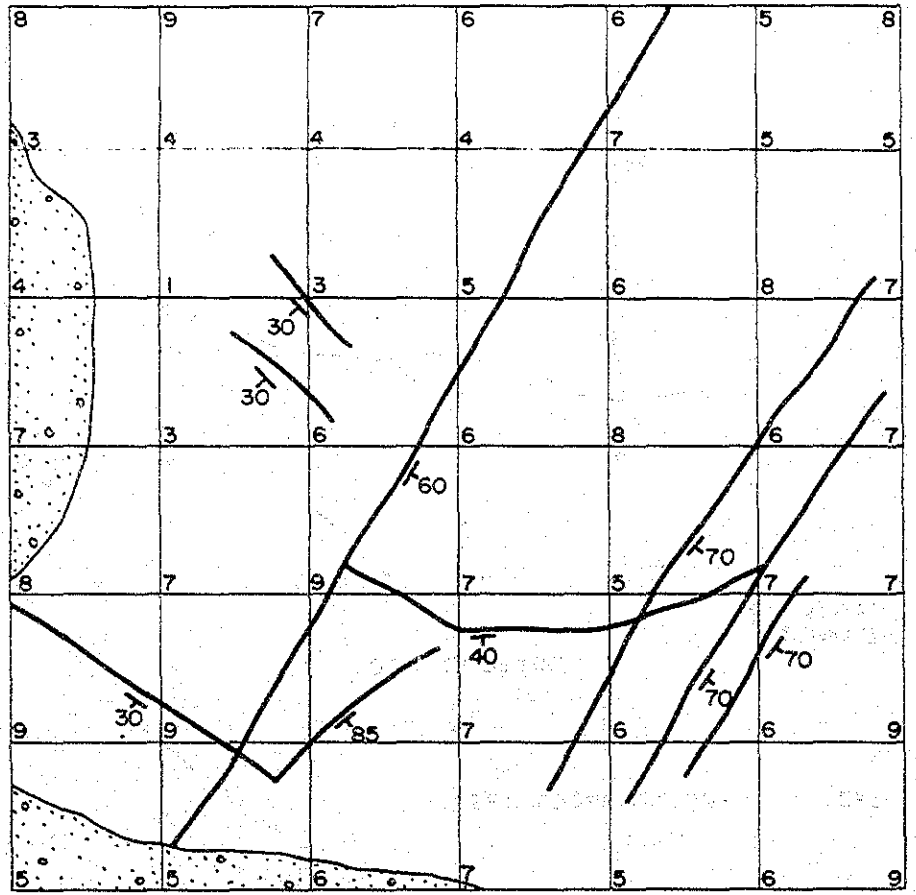


SKETCHES OF FRACTURED SURFACES

TEST LOCATION : DA-2　　TEST NO : BS-1　　MEASURING POINT : TD-10.1m

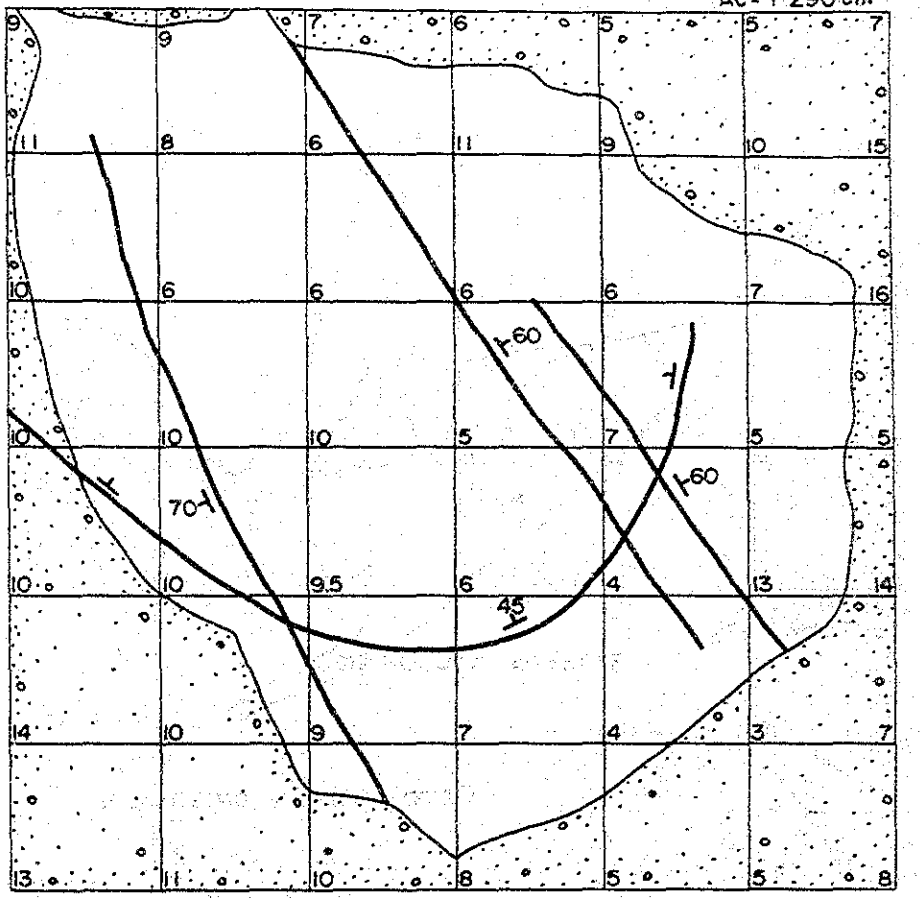
ROCK SURFACE

$A_R = 3390\,cm^2$
$A_C = 210\,cm^2$



BLOCK BOTTOM SURFACE

$A_R = 2310\,cm^2$
$A_C = 1290\,cm^2$

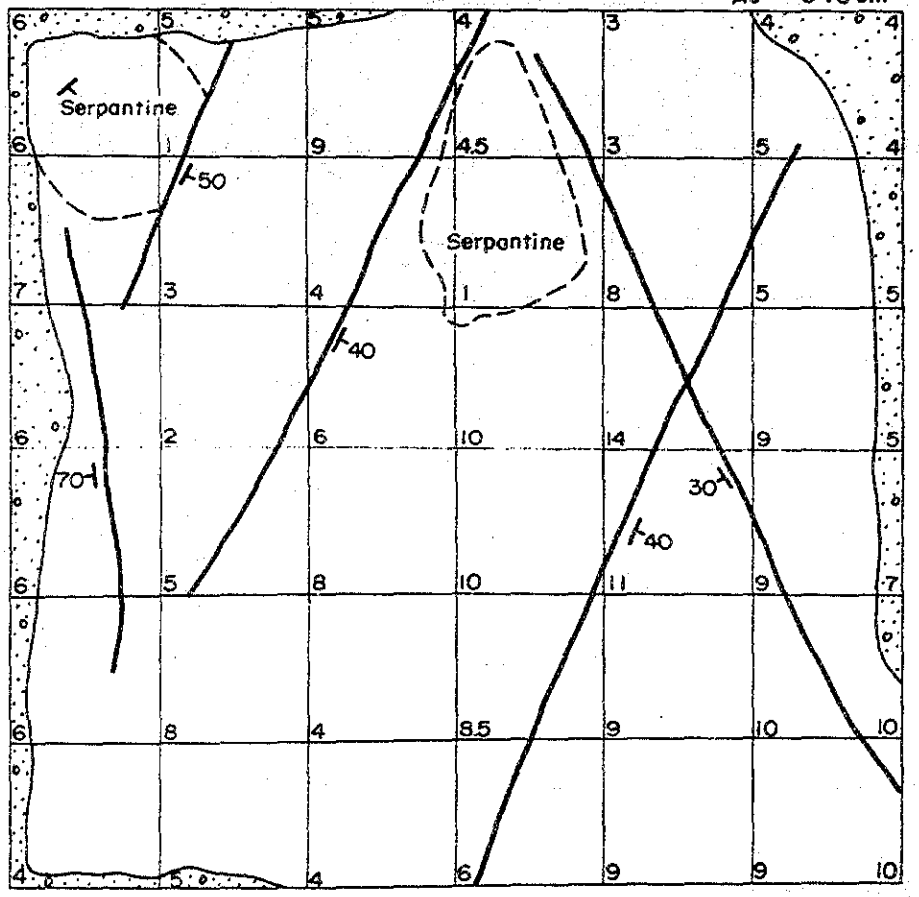


SKETCHES OF FRACTURED SURFACES

TEST LOCATION : DA-2　　TEST NO : BS-2　　MEASURING POINT : TD-12.0m

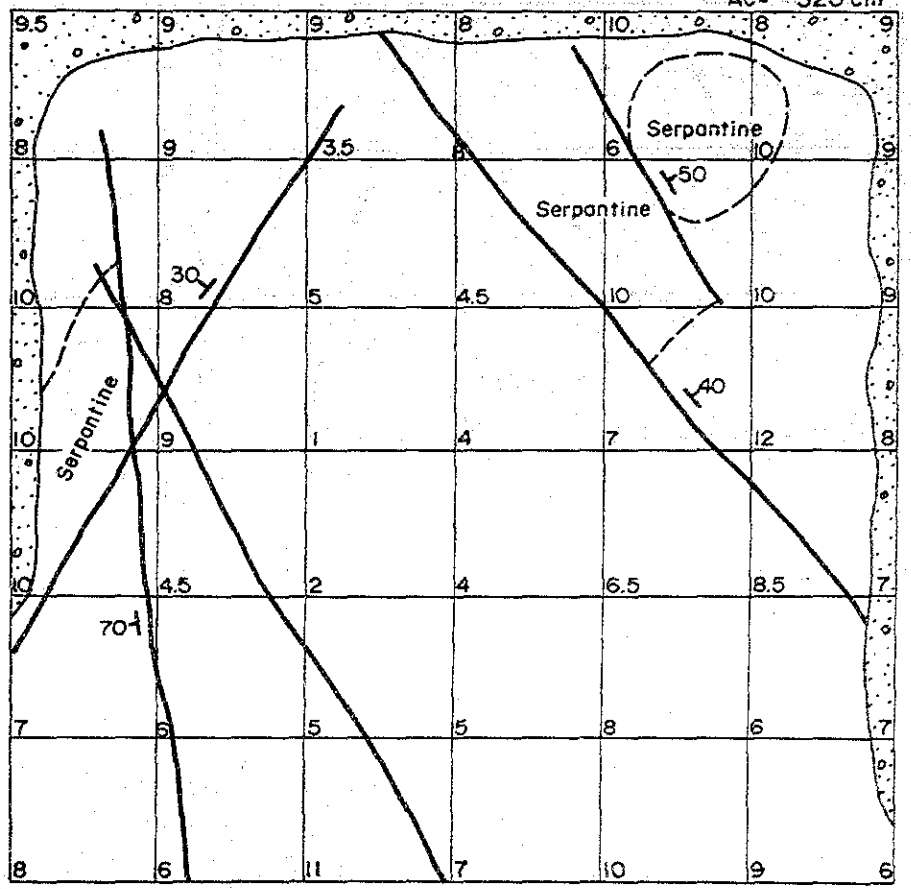
ROCK SURFACE

AR = 3260 cm²
Ac = 340 cm²



BLOCK BOTTOM SURFACE

AR = 3280 cm²
Ac = 320 cm²

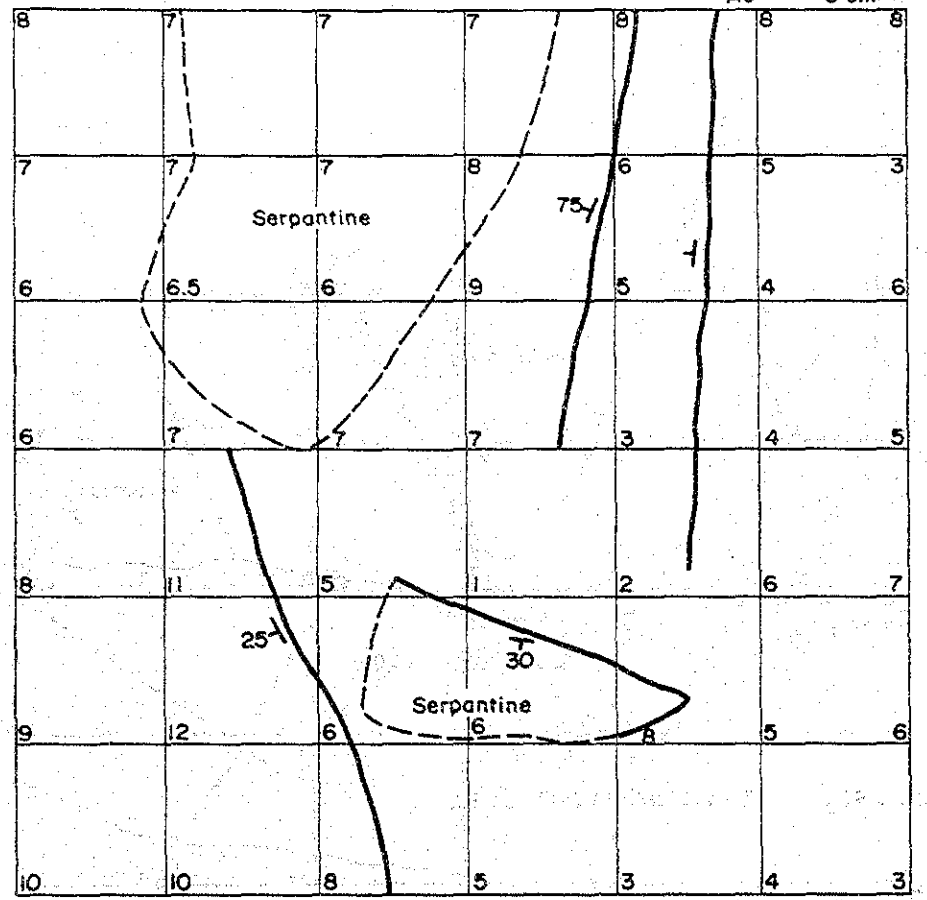


SKETCHES OF FRACTURED SURFACES

TEST LOCATION : DA-2　　TEST NO : BS-3　　MEASURING POINT : TD-13.5m

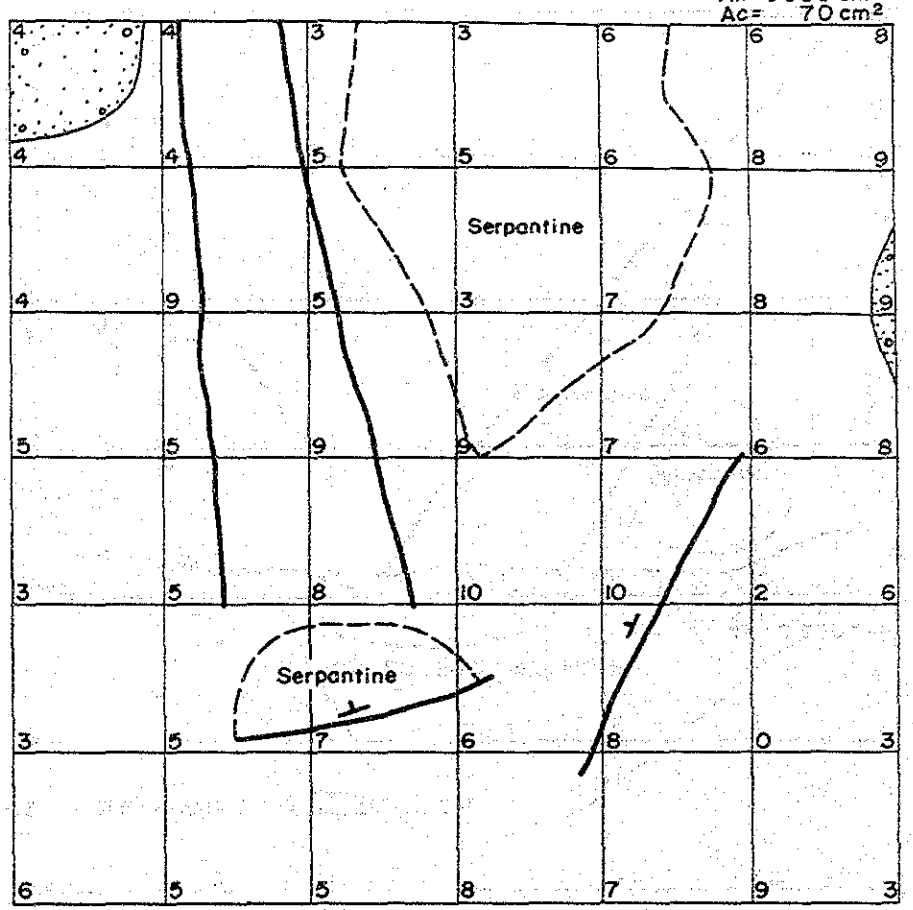
ROCK SURFACE

AR = 3 600 cm²
Ac = 0 cm²



BLOCK BOTTOM SURFACE

AR = 3530 cm²
Ac = 70 cm²

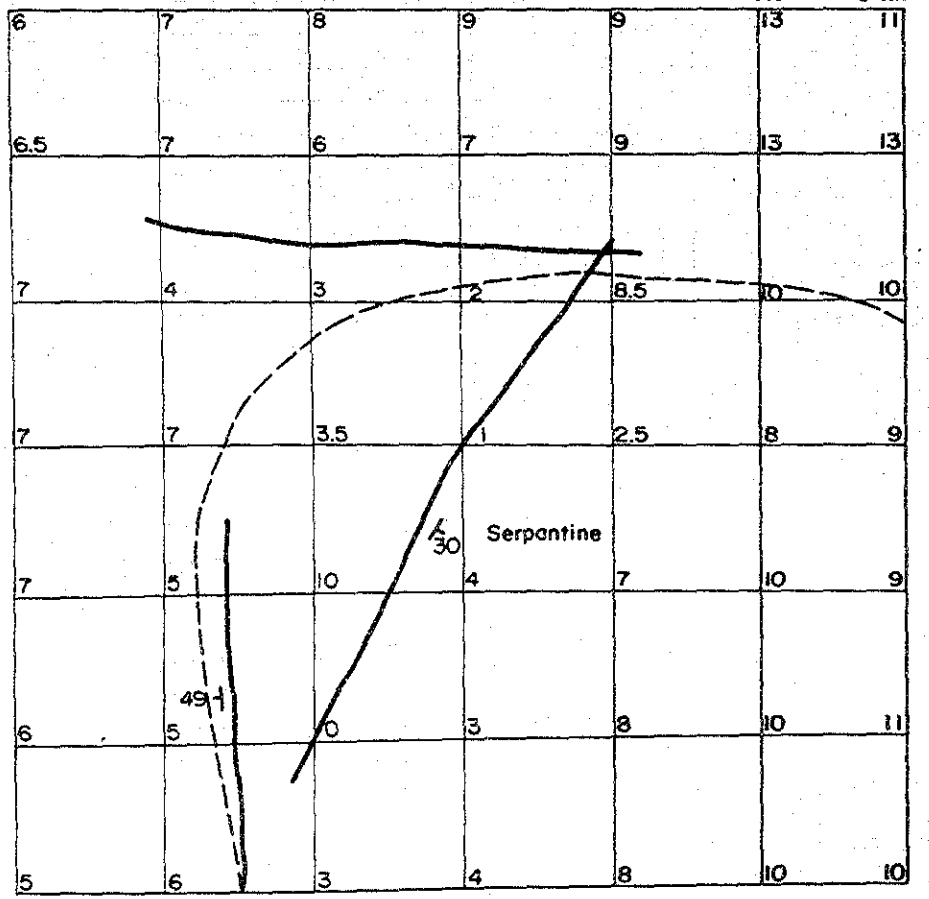


SKETCHES OF FRACTURED SURFACES

TEST LOCATION : DA-2　　TEST NO : BS-4　　MEASURING POINT : TD-12.0m

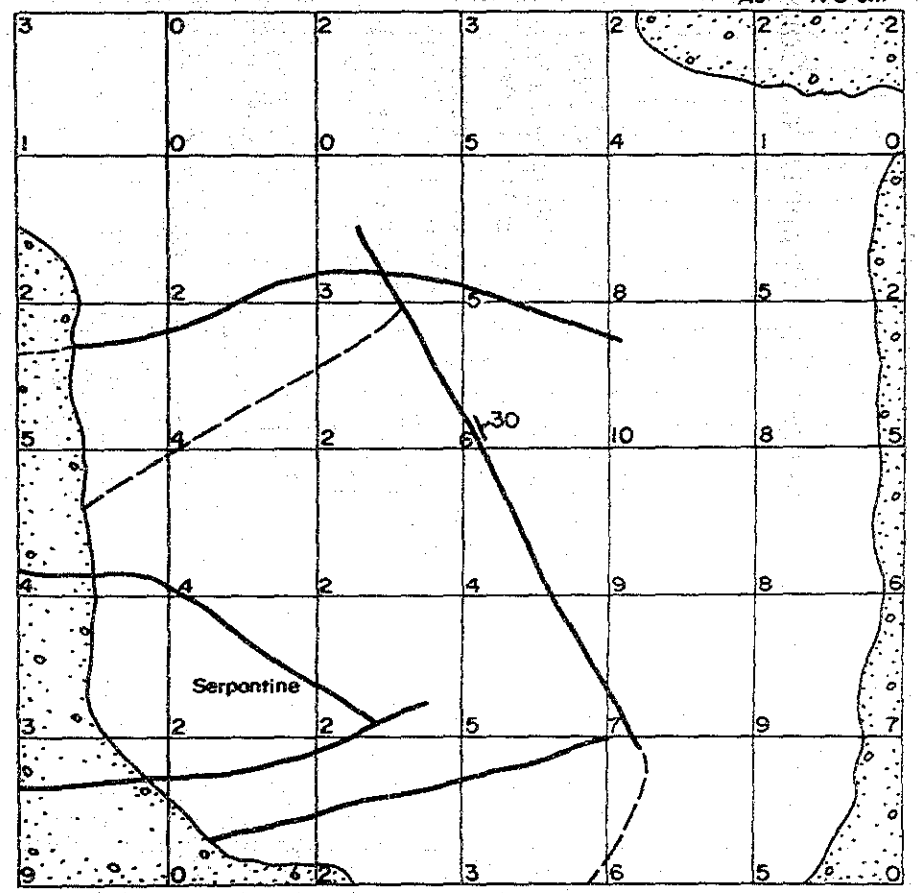
ROCK SURFACE

AR = 3 600 cm²
Ac = 0 cm²

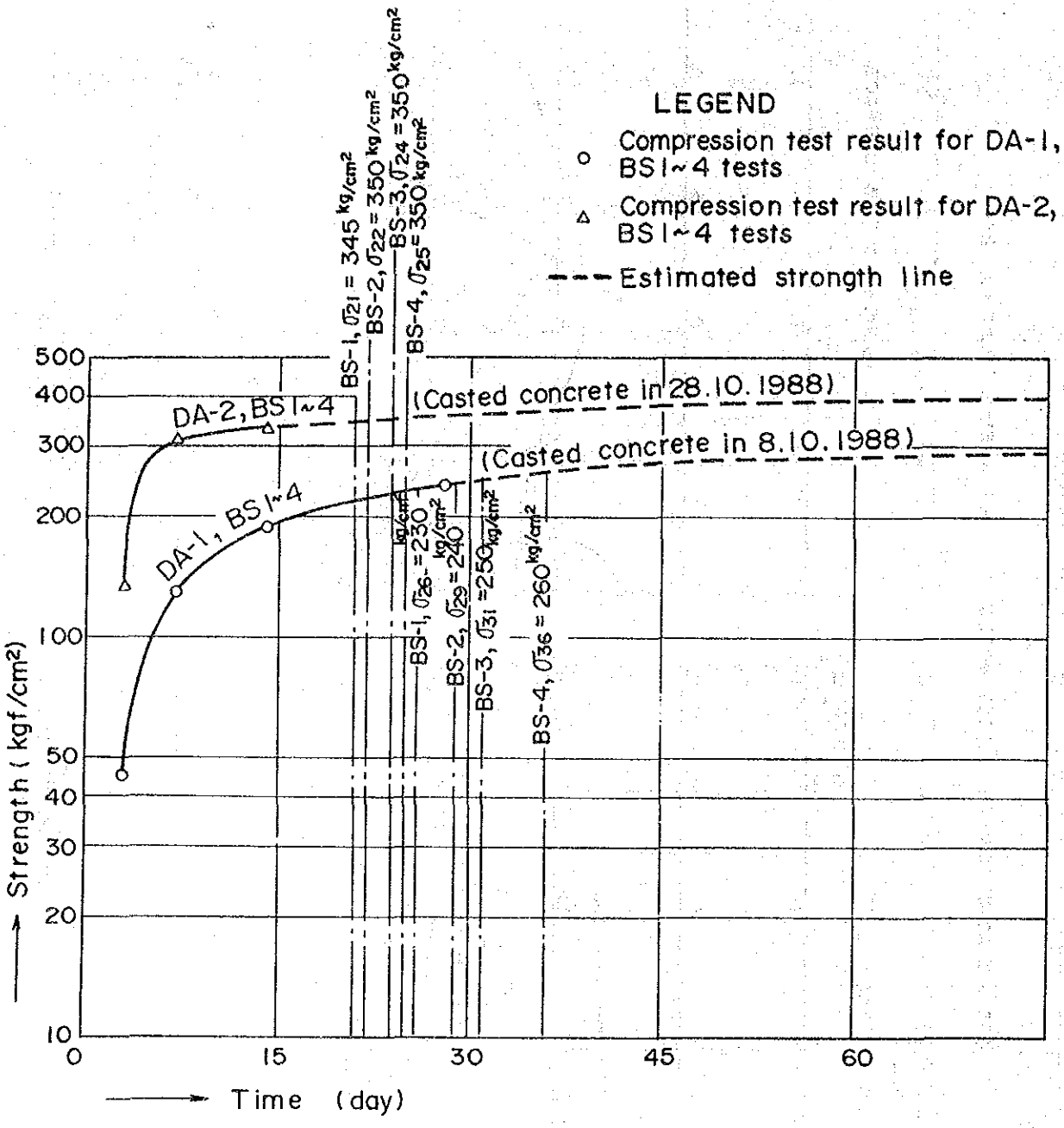


BLOCK BOTTOM SURFACE

AR = 3 130 cm²
Ac = 470 cm²



3-11-6 Time - Compression Strength of Concrete



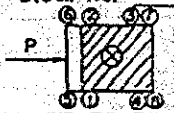
3-11-7 ROCK SHEAR TEST DATA SHEET (1)

Test Location DA-1, BS-1 Measuring Point TD-15.20m Date Measured 3.11.1988 Block No. N = 2 kgf/cm²

Geological Classification Ophiolite Rock Grade Measured by

Vertical Jack Capacity 200 ton x 1 units, Max. Oil Pressure 396.3 kg/cm² Ram Diameter ϕ25.35cm A = 3600 cm²

Diagonal Jack Capacity 200 ton x 2 units, Max. Oil Pressure 701.7 kg/cm² Ram Diameter ϕ19.05cm θ = 16.7°



Time	Time Elapsed	Vertical Jack: Vertical Stress (kg/cm²)	Vertical Jack: Jack Pressure (kg/cm²)	Diagonal Jack: Horizontal Stress (kg/cm²)	Diagonal Jack: Jack Pressure (kg/cm²)	Vertical Displacement (x10⁻³ mm): ①	②	(①+②)/2	③	④	(③+④)/2	Horizontal Displacement (x10⁻³ mm): ⑤	⑥	⑦	⑧	(⑤−⑧)/4	Remarks
	0	0	0			0	0	0/0	0	0	0/0	0	0	0	0	0/0	
	0	1	7			0	8	4/4	0	0	0/0	0	2	0	0	0/0	
	4	2	14			4	28	16/20	0	0	0/0	0	0	0	0	0/0	
	8	2	14			1	2	1.5/21.5	0	0	0/0	0	1	0	0	0.25/0.3	
	16	0	0			−2	−5	−3.5/18	1	−4	−1.5/−1.5	0	0	0	0	0/0.3	
	20	0	0			−1	−9	−5/13	0	0	0/−1.5	15	2	0	0	4.25/4.5	
	28	2	14			0	2	1/14	0	−1	−0.5/−2	7	1	0	0	2/6.5	
	32	2	14			0	8	4/18	0	0	0/−2	3	0	0	0	0.75/7.3	
	34	2	14			0	1	0.5/18.5	0	0	0/−2	2	0	0	0	0.5/7.8	
	37	2	14			0	1	0.5/19.0	0	0	0/−2	3	0	0	0	0.75/8.5	
	42	2	14														

ROCK SHEAR TEST DATA SHEET (2) Measuring Point TD 15.2 Block No. DA-1 BS-1 N = 2 kg/cm²

Time	Time Elapsed	Vertical Jack: Vertical Stress (kg/cm²)	Vertical Jack: Jack Pressure (kg/cm²)	Diagonal Jack: Horizontal Stress (kg/cm²)	Diagonal Jack: Jack Pressure (kg/cm²)	Vertical Displacement (x 10⁻³mm): ①	②	(①+②)/2	③	④	(③+④)/2	Horizontal Displacement (x 10⁻³mm): ⑤	⑥	⑦	⑧	(⑤−⑧)/4	Remarks
	0	2	14	0.34	2.25	0	19	9.5 / 28.5	−1	8	3.5 / 1.5	2	0	0	34	9 / 175	
	4	〃	〃	0.68	4.5	0	1	0.5 / 29	0	0	0 / 1.5	1	0	0	0	0.3 / 27.8	
	8	〃	〃	0.99	6.5	0	1	0.5 / 29.5	0	0	0 / 1.5	2	1	0	0	0.8 / 186	
	12	〃	〃	1.33	8.75	0	0	0 / 29.5	0	0	0 / 1.5	2	0	0	0	0.5 / 191	
	16	〃	〃	1.67	11.0	0	−8	−4 / 25.5	0	0	0 / 1.5	1	1	0	0	0.5 / 196	
	20	〃	〃	2.01	13.25	0	−16	−8 / 17.5	0	1	0.5 / 2.0	1	0	0	0	0.3 / 199	
	24	〃	〃	2.35	15.5	0	−20	−10 / 7.5	0	4	2 / 4.0	0	2	0	1	0.8 / 207	
	28	〃	〃	2.65	17.5	−54	−82	−68 / −60.5	−21	0	−10.5 / −6.5	30	0	54	55	34.8 / 58.5	
	32	〃	〃	3.00	19.75	−63	−95	−79 / −139.5	−40	−4	−22 / −28.5	−60	2	34	62	9.5 / 65	
	36	〃	〃	3.34	22.0	−121	−138	−129.5 / −269	−30	−21	−25.5 / −54	175	8	52	100	83.8 / 442.8	
	40	〃	〃	3.68	24.25	−134	−177	−155.5 / −424.5	−97	−20	−58.5 / −112.5	125	82	103	116	106.5 / 255.3	
	44	〃	〃	4.02	26.5	24	−183	−79.5 / −504	−59	−32	−45.5 / −158	125	112	113	144	123.5 / 378.8	
	48	〃	〃	4.32	28.5	−119	−141	−130 / −634	−59	−31	−45 / −203	69	95	124	81	92.5 / 471.3	
	52	〃	〃	4.66	30.75	−169	−6	−87.5 / −721.5	−80	−20	−50 / −253	149	92	120	141	125.5 / 536.5	
	56	〃	〃	5.00	33.0	−75	−94	−84.5 / −806	−32	−19	−25.5 / −278.5	87	87	86	71	82.5 / 679.6	
	1:00	〃	〃	5.35	35.25	−31	−48	−39.5 / −845.5	−53	−1	−27 / −305.5	55	8	12	30	26.3 / 705.9	
	4	〃	〃	5.69	37.5	−40	−50	−45 / −890.5	−17	−2	−9.5 / −315	55	27	17	57	39 / 744.9	
	8	〃	〃	5.99	39.5	−25	−63	−44 / −934.5	−25	−2	−13.5 / −328.5	82	105	38	40	53.8 / 798.9	
	12	〃	〃	6.33	41.75	−26	−31	−28.5 / −963	−18	−3	−10.5 / −339	31	21	43	28	30.8 / 829.5	
	16	〃	〃	6.67	44.0	−19	−28	−23.5 / −986.5	−8	−9	−8.5 / −347.5	32	0	0	50	20.5 / 850.0	
	20	〃	〃	7.01	46.25	−3	−30	−16.5 / −1003	−14	0	−7 / −354.5	55	16	14	20	38.6 / 888.8	
	24	〃	〃	7.36	48.5	−25	−32	−28.5 / −1031.5	−27	−3	−15 / −369.5	28	21	34	26	27.3 / 916.1	
	28	〃	〃	7.66	50.5	−30	−18	−24 / −1055.5	−10	−4	−7 / −376.5	7	13	2	28	12.5 / 928.6	
	32	〃	〃	8.00	52.75	−6	−2	−4 / −1059.5	−20	−2	−11 / −387.5	35	60	67	28	47.5 / 976.1	
	36	〃	〃	8.34	55.0	−28	−53	−40.5 / −1100	−9	−6	−7.5 / −395	29	18	0	38	21.3 / 997.4	
	40	〃	〃	8.68	57.25	−11	−17	−14 / −1114	−17	−6	−11.5 / −406.5	23	23	65	27	34.5 / 1031.9	
	44	〃	〃	9.02	59.50	−22	−24	−23 / −1137	−2	−3	−2.5 / −409	19	19	0	34	18 / 1049.9	
	48	〃	〃	9.33	61.5	−17	−17	−17 / −1154	−12	−10	−11 / −420	83	10	65	44	50.3 / 1100.4	
	52	〃	〃	9.67	63.75	−22	−19	−20.5 / −1174.5	−3	−9	−6 / −426	28	49	3	41	30.3 / 1130.7	
	56	〃	〃	10.01	66.0	−24	−19	−21.5 / −1196	−24	−8	−16 / −442	35	4	39	37	28.8 / 1159.5	
	2:00	〃	〃	10.35	68.25	−28	−33	−30.5 / −1226.5	−39	−8	−23.5 / −465.5	33	39	3	29	26 / 1185.5	
	04	〃	〃	10.69	70.5	−3	−4	−3.5 / −1229.9	0	−3	−1.5 / −467	18	2	0	29	12.3 / 1197.8	

ROCK SHEAR TEST DATA SHEET (3) Measuring Point TD 15.2 m Block No. DA-1 BS-1 N = 2 kg/cm²

Time	Time Elapsed	Vertical Jack: Vertical Stress (kg/cm²)	Vertical Jack: Jack Pressure (kg/cm²)	Diagonal Jack: Horizontal Stress (kg/cm²)	Diagonal Jack: Jack Pressure (kg/cm²)	Vertical Displacement (x 10⁻³ mm): ①	②	(①+②)/2	③	④	(③+④)/2	Horizontal Displacement (x 10⁻³ mm): ⑤	⑥	⑦	⑧	(⑤−⑧)/4	Remarks
	08	2	14	11.00	72.5	−27	−15	−21 / 1248	−7	−7	−7 / 1474	31	12	0	23	19 / 1248	
	12	〃	〃	11.84	74.75	−19	−4	−11.5 / 1259	−9	−9	−9 / 1483	57	48	0	36	35.5 / 1252	
	16	〃	〃	11.68	77.0	−20	−23	−26.5 / 1286	−8	−7	−7.5 / 1490.5	15	10	58	30	28.8 / 1280	
	20	〃	〃	12.02	79.25	−14	−15	−14.5 / 1300	0	−2	−1 / 1491.5	23	8	0	22	18.3 / 1287	
	24	〃	〃	12.86	81.5	−8	−15	−11.5 / 1312	−6	−9	−7.5 / 1499	36	11	0	28	18.8 / 1312	
	28	〃	〃	12.66	83.5	−39	−25	−32 / 1344	−2	−15	−8.5 / 1507.5	65	80	58	51	51 / 1363	
	32	〃	〃	13.01	85.75	−3	−5	−4 / 1348	−28	−7	−17.5 / 1525	24	8	0	21	12.8 / 1376	
	36	〃	〃	13.35	88.0	−26	−20	−23 / 1371	−20	−7	−13.5 / 1538.5	25	35	64	32	29 / 1405	
	40	〃	〃	13.69	90.25	−52	−17	−34.5 / 1406	−2	−14	−8 / 1546	29	19	0	41	22.3 / 1438	
	44	〃	〃	14.03	92.5	−12	−20	−16 / 1421	−10	−4	−7 / 1553	18	9	40	35	25.3 / 1463	
	48	〃	〃	14.33	94.5	−18	−13	−15.5 / 1437	−10	−10	−10 / 1563	41	12	0	35	22 / 1485	
	52	〃	〃	14.67	96.75	−23	−20	−21.5 / 1458	−2	−13	−7.5 / 1571	34	22	0	40	24 / 1509	
	56	〃	〃	15.01	99.0	−23	−5	−14 / 1472	−23	−17	−20 / 1591	176	30	95	45	38.5 / 1548	
	3:00	〃	〃	15.36	101.25	−14	−18	−16 / 1488	0	0	0 / 1591	8	5	0	12	6.3 / 1602	
	04	〃	〃	15.70	103.5	−19	−31	−25 / 1513	0	−11	−5.5 / 1596.5	10	36	0	43	22.3 / 1624	
	08	〃	〃	16.0	105.5	−14	0	−7 / 1520	−15	−6	−10.5 / 1607	18	15	37	33	25.8 / 1650	
	12	〃	〃	16.34	107.75	−29	−9	−19 / 1538	0	−2	−1 / 1608	9	11	6	15	10.3 / 1660	
	16	〃	〃	16.68	110.0	−2	−22	−12 / 1548	0	−6	−3 / 1611	59	13	0	41	28.3 / 1689	
	20	〃	〃	17.02	112.25	−9	−20	−14.5 / 1563	−20	−7	−13.5 / 1624.5	0	24	72	20	29 / 1718	
	24	〃	〃	17.37	114.5	−33	−20	−26.5 / 1589	−30	−5	−17.5 / 1642	41	19	5	66	32.8 / 1750	
	28	〃	〃	17.67	116.5	0	−16	−8 / 1597	0	0	0 / 1642	7	38	3	15	15.8 / 1767	
	32	〃	〃	17.97	118.5	−38	−19	−28.5 / 1626	−29	−19	−24 / 1666	34	37	0	40	22.5 / 1784	
	36	〃	〃	18.35	121.0	−22	−43	−32.5 / 1658	0	−6	−3 / 1669	23	57	36	36	26.5 / 1801	
	40	〃	〃	18.65	123.0	−17	−2	−9.5 / 1668	−5	−2	−3.5 / 1672.5	21	23	−1	4	11.8 / 1842	
	44	〃	〃	18.96	125.0	−11	−8	−9.5 / 1677	0	−16	−8 / 1680.5	36	4	4	45	23.8 / 1865	
	48	〃	〃	19.34	127.5	−10	−7	−8.5 / 1686	−7	−1	−4 / 1684.5	12	1	0	0	3.3 / 1868	
	52	〃	〃	19.68	129.75	−18	−17	−17.5 / 1703	0	−6	−3 / 1687.5	19	26	26	18	22.3 / 1870	
	56	〃	〃	20.02	132.0	0	−13	−6.5 / 1710	−20	−4	−12 / 1699.5	4	−4	2	23	6.3 / 1877	
	4:00	〃	〃	20.36	134.25	−4	−8	−6 / 1716	0	−3	−1.5 / 1701	37	15	55	30	34.3 / 1891	
	04	〃	〃	20.70	136.5	0	−22	−11 / 1727	0	−4	−2 / 1703	8	9	0	41	14.5 / 1945	
	08	〃	〃	21.01	138.5	1	−7	−3 / 1730	−13	−2	−7.5 / 1710.5	15	15	29	23	20.5 / 1966	
	12	〃	〃	21.38	141.0	0	−25	−12.5 / 1742	−7	−8	−7.5 / 1718	18	18	28	20	21 / 1987	

ROCK SHEAR TEST DATA SHEET (4) Measuring Point ID 15.2 Block No. DA-1, BS-1. N = 2 kg/cm²

Time	Time Elapsed	Vertical Jack: Vertical Stress (kg/cm²)	Vertical Jack: Jack Pressure (kg/cm²)	Diagonal Jack: Horizontal Stress (kg/cm²)	Diagonal Jack: Jack Pressure (kg/cm²)	Vertical Displacement (x 10⁻³ mm): ①	②	(①+②)/2	③	④	(③+④)/2	Horizontal Displacement (x 10⁻³ mm): ⑤	⑥	⑦	⑧	(⑤−⑧)/4	Remarks
	16	2	14	21.69	143.0	0	1	0.5	0	0	0	25	32	0	3		
	20	〃	〃	22.03	145.25	−94	−33	−63.5	−17	−14	−15.5	34	27	3	37		
	24	〃	〃	22.37	147.5	0	−3	−1.5	0	−1	−0.5	10	11	0	20		
	28	〃	〃	22.67	149.5	−8	−20	−14	−20	−4	−12	38	11	83	33		
	32	〃	〃	23.05	152.0	−15	−17	−16	0	−6	−3	19	13	0	30		
	36	〃	〃	23.36	154.0	−11	−11	−11	−6	−3	−4.5	7	15	37	14		
	40	〃	〃	23.66	156.0	0	−20	−10	−20	−2	−11	24	26	1	20		
	44	〃	〃	23.96	158.0	−18	−28	−23	0	−16	−8	50	29	0	28		
	48	〃	〃	24.84	160.5	−32	−15	−23.5	−15	−3	−9	20	7	116	13		
	52	〃	〃	24.65	162.5	−13	−10	−11.5	0	−5	−2.5	14	14	0	41		
	56	〃	〃	25.02	165.0	−3	−17	−10	0	−5	−2.5	18	17	0	30		
	5:00	〃	〃	25.83	167.0	−27	−29	−28	−20	−13	−16.5	64	33	60	33		
	04	〃	〃	25.63	169.0	−29	−13	−21	−12	−6	−9	64	44	28	18		
	08	〃	〃	25.93	171.0	−19	−18	−18.5	−3	−11	−7	30	12	0	51		
	12	〃	〃	26.81	173.5	−17	−25	−21	−17	−2	−9.5	31	10	82	31		
	16	〃	〃	26.69	176.0	−26	−28	−27	−46	−23	−34.5	40	53	3	56		
	20	〃	〃	27.00	178.0	−15	−19	−17	−6	−4	−5	30	26	0	17		
	24	〃	〃	27.30	180.0	−26	−15	−20.5	−14	−12	−13	64	7	10	30		
	28	〃	〃	27.60	182.0	−19	−33	−26	−17	−9	−13	31	40	45	37		
	32	〃	〃	27.98	184.5	−20	−38	−29	−10	−10	−10	44	12	37	45		
	36	〃	〃	28.06	187.0	−28	−14	−21	−15	−13	−14	27	51	41	50		
	40	〃	〃	28.66	189.0	−27	−27	−27	−18	−8	−13	35	43	47	28		
	44	〃	〃	28.97	191.0	−22	−33	−27.5	−17	−15	−16	71	37	39	35		
	48	〃	〃	29.27	193.0	−3	−22	−12.5	−17	−4	−10.5	12	51	41	40		
	52	〃	〃	29.65	195.5	−17	−27	−22	−18	−6	−12	28	19	35	38		
	56	〃	〃	30.03	198.0	−20	−31	−25.5	−15	−24	−19.5	37	30	25	31		
	6:00	〃	〃	30.33	200.0	−33	−46	−39.5	−28	−28	−28	56	81	185	91		
	04	〃	〃	30.64	202.0	−43	−45	−44	−37	−7	−22	59	85	6	55		
	08	〃	〃	30.94	204.0	−71	−83	−77	−75	−43	−59	145	35	14	70		
	12	〃	〃	31.32	206.5	0	0	0	0	0	0	−3	0	50	55		
	16	〃	〃	31.70	209.0	−36	−45	−40.5	−23	−22	−22.5	53	45	90	45		
	20	〃	〃	32.00	211.0	−20	−31	−25.5	−22	−15	−18.5	54	12	85	70		

ROCK SHEAR TEST DATA SHEET (5) Measuring Point TD15,2 Block No. DA-1, BS-1 N = 2 kg/cm²

Time	Time Elapsed	Vertical Jack: Vertical Stress (kg/cm²)	Vertical Jack: Jack Pressure (kg/cm²)	Diagonal Jack: Horizontal Stress (kg/cm²)	Diagonal Jack: Jack Pressure (kg/cm²)	Vertical Displacement (x 10⁻³ mm) ①	②	(①+②)/2	③	④	(③+④)/2	Horizontal Displacement (x 10⁻³ mm) ⑤	⑥	⑦	⑧	(⑤−⑧)/4	Remarks
	24	2	14	3220	213.0°	−19	−58	−38.5 / −2584.9	−42	−16	−29 / −1168	77	119	19	115	82.5 / 9208.3	
	28	〃	〃	3261	215.0°	−30	−10	−20 / −2554.9	−18	−8	−13 / −1161	60	44	36	23	40.8 / 9244.1	
	32	〃	〃	3291	217.0°	−26	−20	−23 / −2579.9	−20	−16	−18 / −1199	79	48	55	77	64.8 / 9288.9	
	36	〃	〃	3337	220.0°	−8	−20	−14 / −2579.9	−10	−10	−10 / −1209	25	21	17	43	26.5 / 9335.4	
	40	〃	〃	3367	222.0°	−11	−26	−18.5 / −2604.9	−15	−10	−12.5 / −1221.5	43	131	25	42	35.3 / 9370.7	
	44	〃	〃	3397	224.0°	−43	−34	−38.5 / −2688.9	−37	−26	−31.5 / −1253	87	72	48	94	75.5 / 9446.4	
	48	〃	〃	3428	226.0°	−43	−62	−52.5 / −3301.4	−58	−39	−48.5 / −1301.5	125	49	59	118	87.8 / 9534	
	52	〃	〃	3466	228.5	−32	−58	−45 / −2746.4	−15	−61	−38 / −1339.5	186	138	57	172	130.8 / 9668.8	
	56	〃	〃	3503	231.0°	−131	−80	−105.5 / −2851.9	−130	−110	−120 / −1459.5	276	136	254	243	227.5 / 9872.1	
	7:00	〃	〃	3534	233.0°	−72	−90	−81 / −2932.9	−85	−105	−95 / −1554.5	382	218	65	112	194.3 / 10067.4	
	04	〃	〃	3564	235.0°	−50	−1130	−590 / −3522.9	−640	−829	−734.5 / −2289	1100	1872	1010	211	1293 / 11360.7	

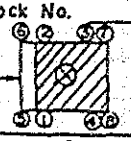
ROCK SHEAR TEST DATA SHEET (1)

Test Location DA-1 BS-2 Measuring Point TD 174 m Date Measured 6.11.1988 Block No. N = 4 kg/cm²

Geological Classification Ophiolite Rock Grade Measured by

Vertical Jack Capacity 200 ton x 1 units, Max. Oil Pressure 396.3 kg/cm² Ram Diameter φ25.35 cm

Diagonal Jack Capacity 200 ton x 2 units, Max. Oil Pressure 701.7 kg/cm² Ram Diameter φ19.05 cm



A = 3600 cm²

θ = 16.7 °

Time	Time Elapsed	Vertical Jack: Vertical Stress (kg/cm²)	Vertical Jack: Jack Pressure (kg/cm²)	Diagonal Jack: Horizontal Stress (kg/cm²)	Diagonal Jack: Jack Pressure (kg/cm²)	Vertical Displacement (x10⁻³ mm): ①	②	①+② / 2	③	④	③+④ / 2	Horizontal Displacement (x10⁻³ mm): ⑤	⑥	⑦	⑧	⑤−⑧ / 4	Remarks
	0	0	0			0	0	0 / 0	0	0	0 / 0	0	0	0	0	0 / 0	
	0	1	7			0	1	0.5 / 0.5	0	1	0.5 / 0.5	0	0	0	0	0 / 0	
	4	2	14			1	0	0.5 / 1	0	0	0 / 0.5	0	0	13	0	3.3 / 3.3	
	8	2	14			0	0	0 / 1	0	0	0 / 0.5	1	0	0	0	0.3 / 3.6	
	16	0	0			5	0	2.5 / 3.5	0	0	0 / 0.5	−4	0	0	0	−1 / 2.6	
	20	0	0			0	0	0 / 3.5	0	0	0 / 0.5	−1	0	0	0	−0.3 / 2.3	
	28	2	14			0	0	0 / 3.5	0	2	1 / 1.5	0	0	3	0	0.8 / 3.1	
	32	3	21			5	0	2.5 / 6	0	0	0 / 1.5	0	0	0	0	0 / 3.1	
	36	4	29			3	0	1.5 / 2.5	0	1	0.5 / 2	0	0	0	0	0 / 3.1	
	40	4	29			4	0	2 / 9.5	0	4	2 / 4	0	0	0	1	0.3 / 3.4	
	42	4	29			0	0	0 / 9.5	0	0	0 / 4	0	0	0	1	0.3 / 3.7	

ROCK SHEAR TEST DATA SHEET (2) Measuring Point TD 17.4 Block No. DA-1, BS-2 N = 4 kg/cm²

Time	Time Elapsed	Vertical Jack: Vertical Stress (kg/cm²)	Vertical Jack: Jack Pressure (kg/cm²)	Diagonal Jack: Horizontal Stress (kg/cm²)	Diagonal Jack: Jack Pressure (kg/cm²)	Vertical Displacement (x 10⁻³ mm): ①	②	(①+②)/2	③	④	(③+④)/2	Horizontal Displacement (x 10⁻³ mm): ⑤	⑥	⑦	⑧	(⑤−⑧)/4	Remarks
	0	4	29	0.34	2.25	0	0	0/9.5	0	0	0/4	0	0	0	0	0/3.7	
	4	〃	〃	0.68	4.5	0	0	0/9.5	0	0	0/4	0	0	0	0	0/3.7	
	8	〃	〃	0.99	6.5	0	0	0/9.5	0	0	0/4	0	0	0	0	0/3.7	
	12	〃	〃	1.33	8.75	0	0	0/9.5	0	0	0/4	0	0	0	0	0/3.7	
	16	〃	〃	1.67	11.0	−1	0	−0.5/9	0	0	0/4	0	0	2	0	0.5/4.2	
	20	〃	〃	2.01	13.25	−1	0	−0.5/8.5	0	0	0/4	0	4	6	0	2.5/6.7	
	24	〃	〃	2.35	15.50	−2	0	−1/7.5	0	0	0/4	0	2	0	1	0.8/7.5	
	28	〃	〃	2.65	17.5	−2	8	3/10.5	0	0	0/4	0	12	4	1	4.3/11.8	
	32	〃	〃	3.00	19.75	−3	10	3.5/14	−1	0	−0.5/3.5	0	11	8	5	6/17.8	
	36	〃	〃	3.34	22.0	−4	4	0/14	0	0	0/3.5	0	22	10	4	9/26.8	
	40	〃	〃	3.68	24.25	−6	6	0/14	0	0	0/3.5	3	2	12	16	8.3/35.1	
	44	〃	〃	4.02	26.5	−8	0	−4/10	0	0	0/3.5	1	23	15	5	11/46.1	
	48	〃	〃	4.32	28.5	−7	0	−3.5/6.5	0	0	0/3.5	11	9	6	5	7.8/33.9	
	52	〃	〃	4.66	30.75	−4	0	−2/4.5	0	0	0/3.5	5	11	2	8	6.5/28.4	
	56	〃	〃	5.00	32.0	−6	0	−3/1.5	0	0	0/3.5	3	0	15	13	7.8/38.2	
	1:00	〃	〃	5.35	35.25	−6	−2	−4/−2.5	0	0	0/3.5	11	11	13	9	10.8/39	
	4	〃	〃	5.69	37.5	−4	0	−2/−4.5	0	0	0/3.5	3	1	8	11	5.8/34.2	
	8	〃	〃	5.99	39.5	−8	−2	−5/−9.5	0	0	0/3.5	8	10	12	6	9/33.8	
	12	〃	〃	6.33	41.75	−12	−5	−8.5/−18	0	0	0/3.5	10	12	17	19	14.5/108.3	
	16	〃	〃	6.67	44.0	−7	−6	−6.5/−24.5	0	0	0/3.5	6	10	6	2	6/114.3	
	20	〃	〃	7.01	46.25	−3	−5	−4/−28.5	0	0	0/3.5	7	6	12	12	9.3/123.6	
	24	〃	〃	7.36	48.5	−8	−5	−6.5/−35	0	0	0/3.5	9	3	12	8	8/131.6	
	28	〃	〃	7.66	50.5	−10	−3	−6.5/−41.5	0	0	0/3.5	12	16	20	18	16.5/148.1	
	32	〃	〃	8.00	52.75	−17	−7	−12/−53.5	0	0	0/3.5	6	14	18	10	12/160.1	
	36	〃	〃	8.34	55.0	−13	−7	−10/−63.5	0	0	0/3.5	33	7	17	13	17.5/177.6	
	40	〃	〃	8.68	57.25	−22	−8	−15/−78.5	0	0	0/3.5	29	23	20	17	22.3/199.9	
	44	〃	〃	9.02	59.5	−17	−10	−13.5/−92	0	0	0/3.5	0	21	28	20	17.3/217.2	
	48	〃	〃	9.33	61.5	−8	−10	−9/−101	0	0	0/3.5	8	1	12	7	5/222.7	
	52	〃	〃	9.67	63.75	−15	−14	−14.5/−115.5	0	0	0/3.5	16	12	24	14	16.5/238.7	
	56	〃	〃	10.01	66.0	−15	−11	−13/−128.5	0	0	0/3.5	9	23	16	17	16.3/255.9	
	2:00	〃	〃	10.35	68.25	−10	0	−5/−133.5	0	0	0/3.5	12	13	17	14	14/269	
	04	〃	〃	10.69	70.5	−13	−30	−21.5/−155	0	0	0/3.5	12	10	10	10	10.5/279.5	✓

ROCK SHEAR TEST DATA SHEET (3) Measuring Point TD 17.4 Block No. DA-1, BS-2 N = 4 kg/cm²

Time	Time Elapsed	Vertical Jack: Vertical Stress (kg/cm²)	Vertical Jack: Jack Pressure (kg/cm²)	Diagonal Jack: Horizontal Stress (kg/cm²)	Diagonal Jack: Jack Pressure (kg/cm²)	Vertical Displacement (x 10⁻³ mm): ①	②	(①+②)/2	③	④	(③+④)/2	Horizontal Displacement (x 10⁻³ mm): ⑤	⑥	⑦	⑧	(⑤−⑧)/4	Remarks
	8	4	29	11.00	22.5	−6	−10	−8 / −163	0	0	0 / 0.5	10	8	14	18	12.5 / 292	
	12	〃	〃	11.34	24.75	−17	−10	−8.5 / −174.5	0	−1	−0.5 / 3	8	9	16	10	10.8 / 302.8	
	16	〃	〃	11.68	27.0	−15	−23	−19 / −190.5	0	−1	−0.5 / 2.5	8	16	18	15	14.3 / 317.1	
	20	〃	〃	12.02	29.25	−9	−7	−8 / −198.5	0	0	0 / 2.5	14	13	12	10	12.3 / 329.4	
	24	〃	〃	12.36	31.5	−13	−10	−11.5 / −210	0	−3	−1.5 / 1	9	13	18	10	12.3 / 341.7	
	28	〃	〃	12.66	33.5	−9	−20	−14.5 / −224.5	0	−3	−1.5 / −0.5	10	14	15	18	14.3 / 356	
	32	〃	〃	13.01	35.25	−20	−11	−15.5 / −240	0	−2	−1 / −1.5	11	15	20	19	16.3 / 372.3	
	36	〃	〃	13.35	38.0	−13	−21	−17 / −257	0	−1	−0.5 / −2	12	8	10	4	8.5 / 380.8	
	40	〃	〃	13.69	40.25	−10	−7	−8.5 / −265.5	−18	−3	−10.5 / −12.5	12	25	20	9	16.5 / 397.3	
	44	〃	〃	14.03	42.5	−12	−6	−9 / −274.5	−8	0	−4 / −16.5	10	11	21	23	16.3 / 413.6	
	48	〃	〃	14.33	44.5	−13	−15	−14 / −288.5	−7	−1	−4 / −20.5	10	18	18	9	13.8 / 427.4	
	52	〃	〃	14.67	46.75	−7	−16	−11.5 / −300.0	−1	−2	−1.5 / −22	10	21	16	13	15 / 442.4	
	56	〃	〃	15.01	49.0	−8	−14	−11 / −311	−1	−1	−1 / −23	20	20	25	17	20.5 / 462.9	
	3:00	〃	〃	15.36	101.25	−15	−11	−13 / −324	−3	−4	−3.5 / −26.5	34	11	11	13	17.3 / 480.2	
	4	〃	〃	15.70	103.5	−15	−15	−15 / −339	−5	−5	−5 / −31.5	14	9	8	19	12.5 / 492.7	
	8	〃	〃	16.00	105.5	−8	−14	−11 / −350	−1	−2	−1.5 / −33	18	18	10	19	16.3 / 509	
	12	〃	〃	16.34	107.75	−18	−10	−14 / −364	0	−2	−1 / −34	11	9	9	11	10 / 519	
	16	〃	〃	16.68	110.0	−13	−12	−11.5 / −375.5	−1	−1	−1 / −35	10	6	12	10	9.5 / 528.5	
	20	〃	〃	17.02	112.25	−6	−8	−7 / −382.5	−2	−1	−1.5 / −36.5	9	11	20	10	12.5 / 541	
	24	〃	〃	17.37	114.5	−9	−10	−9.5 / −392	0	0	0 / −36.5	8	32	15	15	17.5 / 558.5	
	28	〃	〃	17.67	116.5	−8	−10	−9 / −401	−4	−2	−3 / −39.5	9	9	14	8	10 / 568.5	
	32	〃	〃	17.97	118.5	−17	−18	−17.5 / −418.5	−1	−1	−1 / −40.5	8	19	9	13	12.3 / 580.8	
	36	〃	〃	18.35	121.0	−11	−12	−11.5 / −430	−2	−1	−1.5 / −42	11	19	20	22	18 / 598.8	
	40	〃	〃	18.65	123.0	−14	−14	−14 / −444	−1	−3	−2 / −44	17	13	19	12	15.3 / 614.1	
	44	〃	〃	18.96	125.0	−16	−16	−16 / −460	−1	−2	−1.5 / −45.5	15	11	19	12	14.3 / 628.4	
	48	〃	〃	19.34	127.5	−5	−6	−5.5 / −465.5	−2	−2	−2 / −47.5	14	6	17	14	12.8 / 641.2	
	52	〃	〃	19.68	129.75	−13	−10	−11.5 / −477	−1	−1	−1 / −48.5	9	12	15	14	12.5 / 653.7	
	56	〃	〃	20.02	132.0	−12	−10	−11 / −488	−1	−3	−2 / −50.5	12	19	16	20	16.3 / 670.0	
	4:00	〃	〃	20.36	134.25	−10	−11	−10.5 / −498.5	−3	−2	−2.5 / −53	15	11	18	20	16 / 686.0	
	04	〃	〃	20.70	136.5	−17	−13	−15 / −513.5	−1	−2	−1.5 / −54.5	13	16	17	16	15.5 / 702	
	08	〃	〃	21.01	138.5	−9	−12	−10.5 / −524	−2	−3	−2.5 / −57	9	6	29	17	15 / 717	
	12	〃	〃	21.38	141.0	−19	−18	−18.5 / −542.5	−4	−2	−3 / −60	17	25	25	12	19.8 / 736.8	

ROCK SHEAR TEST DATA SHEET (4)

Measuring Point TD 17.4m Block No. DA-1, BS-2 N = 4 kg/cm²

Time	Time Elapsed	Vertical Jack: Vertical Stress (kg/cm²)	Vertical Jack: Jack Pressure (kg/cm²)	Diagonal Jack: Horizontal Stress (kg/cm²)	Diagonal Jack: Jack Pressure (kg/cm²)	Vertical Displacement (x 10⁻³ mm): ①	②	(①+②)/2	③	④	(③+④)/2	Horizontal Displacement (x 10⁻³ mm): ⑤	⑥	⑦	⑧	(⑤−⑧)/4	Remarks
	16	4	29	2.69	148°	−10	−5	−7.5 / 550	−1	−3	−2 / −62	9	9	5	17	10 / 3468	
	20	〃	〃	22.03	145.5	−12	−5	−8.5 / 558.5	−5	−1	−3 / −65	17	14	26	8	16 / 7628	
	24	〃	〃	22.87	147.5	−19	−20	−19.5 / 578	−1	−1	−1 / −66	16	18	16	12	15.5 / 7783	
	28	〃	〃	22.67	149.5	−12	−12	−12 / 590	−5	−3	−4 / −70	17	11	27	18	18.3 / 7966	
	32	〃	〃	23.05	152°	−8	−8	−8 / 598	−4	−2	−3 / −73	5	15	12	12	11 / 8076	
	36	〃	〃	23.36	154°	−18	−22	−20 / 618	−1	−2	−1.5 / −76.5	17	9	19	19	16 / 8236	
	40	〃	〃	23.66	156°	−11	−10	−11.5 / 629.5	−5	−3	−4 / −78.5	8	9	13	6	9 / 8326	
	44	〃	〃	23.96	158°	−18	−23	−20.5 / 650	−6	−1	−3.5 / −82	18	22	35	17	23 / 8556	
	48	〃	〃	24.34	160.5	−20	−15	−17.5 / 667.5	−3	−4	−3.5 / −85.5	29	27	35	36	31.8 / 8874	
	52	〃	〃	24.65	162.5	−17	−25	−21 / 688.5	−2	−6	−4 / −89.5	27	24	23	8	20.5 / 9079	
	56	〃	〃	25.02	165.0	−14	−20	−17 / 705.5	−1	−6	−3.5 / −93	12	14	17	18	15.3 / 9232	
	5:00	〃	〃	25.33	167°	−12	−10	−11 / 716.5	−2	−1	−1.5 / −94.5	7	11	25	8	12.8 / 9336	
	4	〃	〃	25.63	169.0	−10	−5	−7.5 / 724	−1	−2	−1.5 / −96	11	7	16	16	12.5 / 9485	
	8	〃	〃	25.93	171.0	−20	−12	−16 / 740	−5	−5	−5 / −101	23	9	19	17	16.8 / 9653	
	12	〃	〃	26.31	173.5	−9	−28	−18.5 / 758.5	−1	−5	−3 / −104	16	25	36	29	26.5 / 9918	
	16	〃	〃	26.69	176.0	−35	−22	−28.5 / 787	−12	−8	−10 / −114	16	33	40	16	26.3 / 10181	
	20	〃	〃	27.00	178.0	−18	−20	−19 / 806	−15	−3	−9 / −123	14	19	25	16	18.5 / 10366	
	24	〃	〃	27.30	180.0	−19	−40	−29.5 / 835.5	−16	−5	−10.5 / −133.5	15	28	60	17	30 / 10664	
	28	〃	〃	27.60	182.0	−24	−28	−26 / 861.5	−17	−7	−12 / −145.5	31	31	25	25	28 / 10946	
	32	〃	〃	27.78	184.5	−30	−40	−35 / 896.5	−12	−7	−9.6 / −155	17	33	37	28	28.8 / 11234	
	36	〃	〃	28.36	187.0	−31	−55	−43 / 939.5	−2	−8	−5 / −160	24	52	53	47	44 / 11674	
	40	〃	〃	28.66	189.0	−84	−115	−99.5 / 1039	−9	−25	−17 / −177	81	120	110	60	92.8 / 12602	
	44	〃	〃	28.97	191.0	−115	−160	−137.5 / 1176.5	−8	−50	−29 / −206	70	184	180	103	134.3 / 13945	
	48	〃	〃	29.27	193.0	−100	−100	−100 / 1276.5	−11	−50	−30.5 / −236.5	69	114	85	67	83.8 / 14783	
	52	〃	〃	29.65	195.5	−75	−76	−75.5 / 1352	−28	−35	−31.5 / −268	62	123	135	65	96.3 / 15746	
	56	〃	〃	30.03	198°	−65	−56	−60.5 / 1412.5	−21	−27	−24 / −292	61	84	63	62	67.5 / 16421	
	6:00	〃	〃	30.33	200°	−45	−53	−49 / 1461.5	−11	−18	−14.5 / −306.5	39	94	82	56	62.8 / 17099	
	4	〃	〃	30.64	202°	−25	−47	−36 / 1497.5	−12	−15	−13.5 / −320	37	17	76	34	40.8 / 17501	
	8	〃	〃	30.98	204.0	−40	−38	−39 / 1536.5	−11	−20	−15.5 / −335.5	50	28	55	53	46.5 / 17972	
	12	〃	〃	31.32	206.5	−45	−45	−45 / 1581.5	−19	−18	−18.5 / −354	53	83	45	65	61.5 / 18558	
	16	〃	〃	31.70	209.0	−30	−30	−30 / 1611.5	−17	−12	−14.5 / −368.5	29	54	60	42	46.3 / 19005	
	20	〃	〃	32.00	211.0	−18	−13	−15.5 / 1627	−9	−45	−27 / −395	27	16	44	30	29.3 / 19343	

ROCK SHEAR TEST DATA SHEET (S) Measuring Point TD 17.4 m Block No. DA-1, BS-2 N = 4 kg/cm²

Time	Time Elapsed	Vertical Jack: Vertical Stress (kg/cm²)	Vertical Jack: Jack Pressure (kg/cm²)	Diagonal Jack: Horizontal Stress (kg/cm²)	Diagonal Jack: Jack Pressure (kg/cm²)	Vertical Displacement (x 10⁻³ mm): ①	②	(①+②)/2	③	④	(③+④)/2	Horizontal Displacement (x 10⁻³ mm): ⑤	⑥	⑦	⑧	(⑤−⑧)/4	Remarks
	24	4	29	32.30	213°	-22	-22	-22 / -1649	-32	-46	-39 / -432	56	22	36	23	34.3 / 968.4	
	28	〃	〃	32.61	215°	-15	-20	-17.5 / -1666.5	-29	-8	-18.5 / -445.5	1	27	47	3	19.5 / 988.1	
	32	〃	〃	32.91	217°	-5	-15	-10 / -1676.5	-33	-5	-19 / -464.5	8	23	33	17	20.3 / 1008.4	
	36	〃	〃	33.37	220°	-40	-54	-47 / -1723.5	-39	-10	-24.5 / -489	37	32	25	20	26.5 / 1034.9	
	40	〃	〃	33.67	222°	-30	-36	-33 / -1756.5	-49	-15	-32 / -521	35	46	85	50	54 / 1088.9	
	44	〃	〃	33.97	224°	-30	-55	-42.5 / -1799	-38	-10	-24 / -545	60	52	95	80	71.5 / 1160.4	
	48	〃	〃	34.28	226°	-24	-28	-26 / -1825	-31	-12	-21.5 / -566.5	67	56	95	45	65.5 / 1225.9	
	52	〃	〃	34.66	228.5°	-36	-92	-64 / -1889	-31	-18	-24.5 / -591	48	125	155	98	106.5 / 1332.4	
	56	〃	〃	35.03	231°	-60	-80	-70 / -1959	-38	-30	-34 / -625	124	106	145	122	124.3 / 1456.7	
	7:00	〃	〃	35.34	233.0°	-53	-150	-101.5 / -2060.5	-33	-175	-104 / -729	123	239	125	117	151 / 1607.7	
	04	〃	〃	35.64	235°	-170	-535	-352.5 / -2413	-309	-375	-342 / -1071	789	1197	1120	533	909.8 / 3517.5	

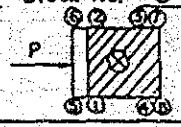
ROCK SHEAR TEST DATA SHEET (1)

Test Location DA-1, BS-3 Measuring Point TD 18.6m Date Measured 8-11-1988 Block No. 3 N = 6 kgf/cm²

Geological Classification Ophiolite Rock Grade _____ Measured by _____

Vertical Jack Capacity 200 ton x 1 units, Max. Oil Pressure 396.3 kg/cm² Ram Diameter φ25.35 cm

Diagonal Jack Capacity 200 ton x 2 units, Max. Oil Pressure 701.7 kg/cm² Ram Diameter φ19.95 cm



A = 3600 cm²

θ = 16.7 °

Time	Time Elapsed	Vertical Jack: Vertical Stress (kg/cm²)	Vertical Jack: Jack Pressure (kg/cm²)	Diagonal Jack: Horizontal Stress (kg/cm²)	Diagonal Jack: Jack Pressure (kg/cm²)	Vertical Displacement (×10⁻³ mm): ①	②	①+②/2	③	④	③+④/2	Horizontal Displacement (×10⁻³ mm): ⑤	⑥	⑦	⑧	⑤~⑧/4	Remarks
	0	0	0			0	0	0/0	0	0	0/0	0	0	0	0	0/0	
	0	1	7			0	2	1/1	0	0	0/0	0	0	0	0	0/0	
	4	2	14			1	2	1.5/2.5	1	2	1.5/1.5	0	0	0	0	0/0	
	8	2	14			0	0	0/2.5	0	0	0/1.5	0	0	0	0	0/0	
	16	0	0			-1	-3	-2/0.5	0	-1	-0.5/1.0	0	0	0	0	0/0	
	20	0	0			0	0	0/0.5	0	0	0/1.0	0	0	0	0	0/0	
	28	2	14			1	4	2.5/3	0	2	1/2	0	0	0	0	0/0	
	32	3	21			0	0	0/0	0	1	0.5/2.5	0	0	0	1	0.5/0.5	
	36	4	29			1	2	1.5/3.5	0	1	0.5/3	0	0	0	0	0/0.5	
	40	5	36			0	2	1/4.5	1	2	1.5/4.5	0	0	0	0	0/0.5	
	44	6	43			3	2	2.5/7	0	4	2/6.5	0	0	0	0	0/0.5	
	48	6	43			6	0	3/10	0	2	1/7.5	0	0	0	0	0/0.5	
	50	6	43			0	0	0/10	0	0	0/7.5	0	0	0	0	0/0.5	

ROCK SHEAR TEST DATA SHEET (2) Measuring Point TD 18.6m Block No. DA-1, BS-3 N = 6 kg/cm²

Time	Time Elapsed	Vertical Jack: Vertical Stress (kg/cm²)	Vertical Jack: Jack Pressure (kg/cm²)	Diagonal Jack: Horizontal Stress (kg/cm²)	Diagonal Jack: Jack Pressure (kg/cm²)	Vertical Displacement (x 10⁻³ mm): ①	②	(①+②)/2	③	④	(③+④)/2	Horizontal Displacement (x 10⁻³ mm): ⑤	⑥	⑦	⑧	(⑤−⑧)/4	Remarks
	0	6	43	0.34	2.25	0	0	0/10	0	0	0/7.5	0	0	0	1	0.3/0.8	
	4	〃	〃	0.68	4.5	0	1	0.5/10.5	0	1	0.5/8	0	0	0	0	0/0.8	
	8	〃	〃	0.99	6.5	1	2	1.5/12	0	0	0/8	0	0	0	0	0/0.8	
	12	〃	〃	1.33	8.75	0	0	0/12	0	0	0/8	0	0	0	0	0/0.8	
	16	〃	〃	1.67	11.0	0	0	0/12	0	0	0/8	0	0	0	0	0/0.8	
	20	〃	〃	2.01	13.25	0	0	0/12	0	0	0/8	0	0	2	1	0.8/1.6	
	24	〃	〃	2.35	15.50	1	0	0.5/12.5	0	0	0/8	0	0	0	1	0.3/1.9	
	28	〃	〃	2.65	17.5	0	0	0/12.5	0	1	0.5/8.5	0	0	2	3	1.3/3.2	
	32	〃	〃	3.00	19.75	0	0	0/12.5	0	0	0/8.5	0	7	0	0	1.8/5	
	36	〃	〃	3.34	22.0	1	−1	0/12.5	0	1	0.5/9	0	0	1	2	0.8/5.8	
	40	〃	〃	3.68	24.25	0	0	0/12.5	0	0	0/9	0	3	0	1	1/6.8	
	44	〃	〃	4.02	26.5	0	0	0/12.5	0	1	0.5/9.5	0	0	3	3	1.5/8.3	
	48	〃	〃	4.32	28.5	1	−1	−0.5/12	0	0	0/9.5	0	2	0	0	0.5/8.8	
	52	〃	〃	4.66	30.75	0	0	0/12	0	3	1.5/11	0	1	1	1	0.8/9.6	
	56	〃	〃	5.00	33.0	2	−3	−0.5/11.5	0	0	0/11	0	1	1	0	0.5/10.1	
	1:00	〃	〃	5.35	35.25	0	0	0/11.5	1	2	1.5/12.5	0	2	3	2	1.8/11.9	
	4	〃	〃	5.69	37.5	1	−1	0/11.5	0	0	0/12.5	0	2	0	2	1/12.9	
	8	〃	〃	5.99	39.5	0	−1	−0.5/11	0	3	1.5/14	0	3	1	1	1.3/14.2	
	12	〃	〃	6.33	41.75	0	0	0/11	0	0	0/14	6	2	4	4	4/18.2	
	16	〃	〃	6.67	44.0	−1	−1	−1/10	0	0	0/14	2	2	1	3	2/20.2	
	20	〃	〃	7.01	46.25	0	0	0/10	0	2	1/15	0	2	2	0	1/21.2	
	24	〃	〃	7.36	48.5	0	−1	−0.5/9.5	0	0	0/15	1	2	1	2	1.5/22.7	
	28	〃	〃	7.66	50.5	0	0	0/9.5	1	0	0.5/15.5	1	3	1	3	2/24.7	
	32	〃	〃	8.00	52.75	−1	−2	−1.5/8	0	0	0/15.5	1	1	0	1	0.8/25.5	
	36	〃	〃	8.34	55.0	−1	−1	−1/7	0	0	0/15.5	0	1	2	0	0.8/26.3	
	40	〃	〃	8.68	57.25	0	0	0/7	0	0	0/15.5	2	1	0	3	1.5/27.8	
	44	〃	〃	9.02	59.5	−1	−2	−1.5/5.5	0	0	0/15.5	1	2	1	0	1/28.8	
	48	〃	〃	9.33	61.5	−1	−2	−1.5/4	0	0	0/15.5	0	1	1	1	0.8/29.6	
	52	〃	〃	9.67	63.75	−1	−1	−1/3	0	0	0/15.5	0	3	2	2	1.8/31.4	
	56	〃	〃	10.01	66.0	−2	−1	−1.5/1.5	0	0	0/15.5	0	5	2	1	2/33.4	
	2:00	〃	〃	10.35	68.25	0	−2	−1/0.5	0	0	0/15.5	0	4	3	3	2.5/35.9	
	4	〃	〃	10.69	70.5	−2	−2	−2/−1.5	0	0	0/15.5	2	4	4	2	3/38.9	

ROCK SHEAR TEST DATA SHEET (3) Measuring Point TD 18.6 m Block No. DA-1, BS-3 N= 6 kg/cm²

Time	Time Elapsed	Vertical Jack: Vertical Stress (kg/cm²)	Vertical Jack: Jack Pressure (kg/cm²)	Diagonal Jack: Horizontal Stress (kg/cm²)	Diagonal Jack: Jack Pressure (kg/cm²)	Vertical Displacement (x 10⁻³ mm): ①	②	(①+②)/2	③	④	(③+④)/2	Horizontal Displacement (x 10⁻³ mm): ⑤	⑥	⑦	⑧	(⑤−⑧)/4	Remarks
	8	6	43	11.00	72.5	−2	−2	−2 / −35	0	0	0 / 15.5	1	5	0	0	1.5 / 40.4	
	12	〃	〃	11.34	76.25	0	−3	−1.5 / −5	0	0	0 / 15.5	1	3	2	3	5.3 / 46.7	
	16	〃	〃	11.68	77.0	−5	−5	−5 / −10	0	0	0 / 15.5	4	4	0	3	2.8 / 48.5	
	20	〃	〃	12.02	79.25	−5	−1	−3 / −13	0	0	0 / 15.5	3	3	1	0	1.8 / 50.3	
	24	〃	〃	12.36	81.5	−4	−1	−2.5 / −15.5	0	0	0 / 15.5	4	4	0	7	3.8 / 54.1	
	28	〃	〃	12.66	83.5	−2	−3	−2.5 / −18	0	0	0 / 15.5	7	2	1	4	3.5 / 57.6	
	32	〃	〃	13.01	85.75	−3	−5	−4 / −22	0	0	0 / 15.5	7	5	0	1	3.3 / 60.9	
	36	〃	〃	13.35	88.0	−3	−2	−2.5 / −24.5	0	0	0 / 15.5	5	5	0	2	3 / 63.9	
	40	〃	〃	13.69	90.25	−7	−3	−5 / −29.5	0	0	0 / 15.5	8	2	13	10	8.3 / 72.2	
	44	〃	〃	14.03	92.5	−3	−8	−5.5 / −35	0	0	0 / 15.5	8	3	5	5	5.3 / 77.5	
	48	〃	〃	14.33	94.5	−4	−7	−5.5 / −40.5	0	0	0 / 15.5	9	3	2	8	5.5 / 83	
	52	〃	〃	14.67	96.75	−5	−5	−5 / −45.5	0	0	0 / 15.5	4	14	13	5	9 / 92	
	56	〃	〃	15.01	99.0	−12	−5	−8.5 / −54	0	0	0 / 15.5	4	5	0	9	4.5 / 96.5	
	3:00	〃	〃	15.36	101.25	−6	−10	−8 / −62	0	0	0 / 15.5	8	6	20	6	10 / 106.5	
	4	〃	〃	15.70	103.5	−7	−2	−4.5 / −66.5	0	0	0 / 15.5	6	9	5	12	8 / 114.5	
	8	〃	〃	16.00	105.5	−14	−18	−16 / −82.5	0	0	0 / 15.5	8	19	20	18	16.3 / 130.8	
	12	〃	〃	16.34	107.75	−6	−5	−5.5 / −88	0	0	0 / 15.5	7	14	5	8	8.5 / 139.3	
	16	〃	〃	16.68	110.0	−14	−12	−13 / −101	0	0	0 / 15.5	9	15	15	6	11.3 / 150.6	
	20	〃	〃	17.02	112.25	−9	−18	−13.5 / −114.5	0	0	0 / 15.5	12	10	20	16	14.5 / 165.1	
	24	〃	〃	17.37	114.5	−11	−5	−8 / −122.5	0	0	0 / 15.5	3	9	4	7	5.8 / 170.9	
	28	〃	〃	17.67	116.5	−9	−15	−12 / −134.5	0	0	0 / 15.5	8	7	21	10	11.5 / 182.4	
	32	〃	〃	17.97	118.5	−7	−8	−7.5 / −142	0	0	0 / 15.5	14	14	9	9	11.5 / 193.9	
	36	〃	〃	18.35	121.0	−25	−17	−21 / −163	0	0	0 / 15.5	52	9	21	19	25.3 / 219.2	
	40	〃	〃	18.65	123.0	−13	−5	−9 / −172	0	0	0 / 15.5	11	7	5	12	8.8 / 228	
	44	〃	〃	18.96	125.0	−5	−15	−10 / −182	0	0	0 / 15.5	4	13	16	3	9 / 237	
	48	〃	〃	19.34	127.5	−17	−11	−14 / −196	0	0	0 / 15.5	4	9	14	15	10.5 / 247.5	
	52	〃	〃	19.68	129.75	−15	−10	−12.5 / −208.5	0	0	0 / 15.5	9	19	15	12	13.8 / 261.3	
	56	〃	〃	20.02	132.0	−15	−19	−17 / −225.5	−2	0	−1 / 14.5	29	51	18	15	28.3 / 289.6	
	4:00	〃	〃	20.36	134.25	−24	−13	−18.5 / −244	0	0	0 / 14.5	25	15	12	20	18 / 307.6	
	4	〃	〃	20.70	136.5	−16	−14	−15 / −259	−2	0	−1 / 13.5	12	15	20	20	16.8 / 324.4	
	8	〃	〃	21.01	138.5	−20	−13	−16.5 / −275.5	0	0	0 / 13.5	28	13	7	25	18.3 / 342.7	
	12	〃	〃	21.38	141.0	−25	−20	−22.5 / −298	−16	−2	−9 / 4.5	23	16	16	20	18.8 / 361.5	

ROCK SHEAR TEST DATA SHEET (4) Measuring Point TD. 186m Block No. DA-1. BS-3 N= 6 kg/cm²

Time	Time Elapsed	Vertical Jack: Vertical Stress (kg/cm²)	Vertical Jack: Jack Pressure (kg/cm²)	Diagonal Jack: Horizontal Stress (kg/cm²)	Diagonal Jack: Jack Pressure (kg/cm²)	Vertical Displacement (x 10⁻³ mm): ①	②	(①+②)/2	③	④	(③+④)/2	Horizontal Displacement (x 10⁻³ mm): ⑤	⑥	⑦	⑧	(⑤−⑧)/4	Remarks
	16	6	43	21.69	143.0	-18	-18	-18 / -316	0	-1	-0.5 / -4	31	21	24	25	25.3 / 386	
	20	〃	〃	22.03	145.25	-25	-15	-20 / -336	0	-2	-1 / -3	17	14	18	22	17.8 / 404.8	
	24	〃	〃	22.37	147.5	-27	-18	-22.5 / -358.5	0	-4	-2 / -1	27	15	12	26	20 / 424.8	
	28	〃	〃	22.67	149.5	-33	-18	-22.5 / -381	-17	-10	-13.5 / -12.5	25	12	23	37	24.3 / 448.9	
	32	〃	〃	23.05	152.0	-30	-23	-26.5 / -407.5	0	-12	-6 / -18.5	43	15	24	40	30.5 / 479.4	
	36	〃	〃	23.36	154.0	-27	-22	-24.5 / -432	0	-3	-1.5 / -20	33	15	16	19	20.8 / 500.2	
	40	〃	〃	23.66	156.0	-23	-18	-20.5 / -452.5	-17	-3	-10 / -30	16	25	20	26	21.8 / 522	
	44	〃	〃	23.96	158.0	-20	-20	-20 / -472.5	0	-5	-2.5 / -32.5	33	22	19	38	24.8 / 546.8	
	48	〃	〃	24.34	160.5	-24	-20	-22 / -494.5	0	-10	-5 / -37.5	24	17	21	18	20 / 566.8	
	52	〃	〃	24.65	162.5	-24	-24	-24 / -518.5	-5	-5	-5 / -42.5	16	14	10	34	18.5 / 585.3	
	56	〃	〃	25.02	165.0	-22	-19	-20.5 / -539	-3	-5	-4 / -46.5	27	15	24	20	21.5 / 606.8	
	5:00	〃	〃	25.33	167.0	-25	-17	-21 / -560	-10	-8	-9 / -55.5	21	11	15	18	16.3 / 623.1	
	4	〃	〃	25.63	169.0	-18	-20	-19 / -579	-3	-2	-2.5 / -58	25	23	16	28	23 / 646.1	
	8	〃	〃	25.93	171.0	-17	-21	-19 / -598	-2	-3	-2.5 / -60.5	32	11	19	25	21.8 / 667.9	
	12	〃	〃	26.31	173.5	-17	-19	-18 / -616	-2	-4	-3 / -63.5	20	15	13	20	17 / 684.9	
	16	〃	〃	26.69	176.0	-20	-16	-18 / -634	0	-3	-1.5 / -65	10	27	23	25	21.3 / 706.2	
	20	〃	〃	27.00	178.0	-20	-14	-17 / -651	-14	-8	-11 / -76	20	11	4	10	11.3 / 717.5	
	24	〃	〃	27.30	180.0	-33	-27	-30 / -681	-9	-12	-10.5 / -86.5	37	10	31	50	32 / 749.5	
	28	〃	〃	27.60	182.0	-23	-17	-20 / -701	-1	-10	-5.5 / -92	31	29	22	20	25.5 / 775	
	32	〃	〃	27.98	184.5	-17	-21	-19 / -720	0	-7	-3.5 / -95.5	10	20	13	20	15.8 / 790.8	
	36	〃	〃	28.36	187.0	-23	-21	-17 / -737	0	-5	-2.5 / -98	27	10	10	33	20 / 810.8	
	40	〃	〃	28.66	189.0	-17	-20	-18.5 / -755.5	0	0	0 / -98	32	30	20	20	25.5 / 836.3	
	44	〃	〃	28.97	191.0	-10	-14	-12.5 / -768	-6	-8	-7 / -105	29	1	3	22	13.8 / 850.1	
	48	〃	〃	29.27	193.0	-34	-18	-26 / -794	-4	-9	-6.5 / -111.5	20	40	23	38	30.3 / 880.4	
	52	〃	〃	29.65	195.5	-28	-19	-23.5 / -817.5	-42	-9	-25.5 / -137	37	10	46	29	30.5 / 910.9	
	56	〃	〃	30.03	198.0	-28	-28	-28 / -845.5	-5	-9	-7 / -144	31	7	8	30	19 / 929.9	
	6:00	〃	〃	30.32	200.0	-25	-13	-19 / -864.5	0	-3	-1.5 / -145.5	32	2	10	30	18.5 / 948.4	
	4	〃	〃	30.64	202.0	-25	-15	-20 / -884.5	-5	-15	-10 / -155.5	19	17	14	31	20.3 / 968.7	
	8	〃	〃	30.94	204.0	-20	-13	-16.5 / -901	-5	-7	-6 / -161.5	31	8	16	24	19.8 / 988.5	
	12	〃	〃	31.32	206.5	-20	-7	-13.5 / -914.5	-5	-3	-4 / -165.5	14	15	4	18	12.8 / 1001.3	
	16	〃	〃	31.70	209.0	-22	-15	-18.5 / -933	-10	-10	-10 / -175.5	21	21	18	40	25 / 1026.3	
	20	〃	〃	32.00	211.0	-23	-18	-20.5 / -953.5	-8	-2	-5 / -180.5	44	14	19	22	24.8 / 1051.1	

ROCK SHEAR TEST DATA SHEET (5)

Measuring Point TD. 18.6m Block No. DA-1 . BS-3 N = 6 kg/cm²

Time	Time Elapsed	Vertical Jack: Vertical Stress (kg/cm²)	Vertical Jack: Jack Pressure (kg/cm²)	Diagonal Jack: Horizontal Stress (kg/cm²)	Diagonal Jack: Jack Pressure (kg/cm²)	Vertical Displacement (x 10⁻³ mm): ①	②	(①+②)/2	③	④	(③+④)/2	Horizontal Displacement (x 10⁻³ mm): ⑤	⑥	⑦	⑧	(⑤−⑧)/4	Remarks
	24	6	43	32.30	213.0	-32	-21	-26.5 / -530	-9	-13	-11.5 / -192	32	21	22	33	270 / 1078	
	28	"	"	32.61	215.0	-12	-8	-10 / -990	-9	-5	-7 / -179	26	12	4	20	15.5 / 1093	
	32	"	"	32.91	217.0	-15	-11	-13 / -1003	-6	-5	-5.5 / -204	19	18	22	25	21.5 / 1114	
	36	"	"	33.37	220.0	-45	-11	-28 / -1021	-11	-10	-10.5 / -215	48	17	11	40	29 / 1143	
	40	"	"	33.67	222.0	-13	-11	-12 / -1043	-12	-10	-11 / -226	12	4	10	0	6.5 / 1150	
	44	"	"	33.97	224.0	-22	-12	-17 / -1060	-12	-10	-11 / -237	34	16	7	56	28 / 1178	
	48	"	"	34.28	226.0	-19	-9	-14 / -1074	-15	-7	-11 / -248	21	15	13	22	17.5 / 1195	
	52	"	"	34.66	228.5	-28	-10	-19 / -1093	-10	-16	-13 / -261	39	17	16	38	27.5 / 1223	
	56	"	"	35.03	231.0	-27	-14	-20.5 / -1113.5	-9	-11	-10 / -271	26	7	9	30	18 / 1241	
	7:00	"	"	35.38	233.0	-18	-15	-16.5 / -1130	-9	-11	-10 / -281	41	3	4	48	24 / 1265	
	4	"	"	35.64	235.0	-23	-10	-16.5 / -1146.5	-17	-13	-15 / -296	34	6	11	32	20.5 / 1285	
	8	"	"	35.94	237.0	-20	-11	-15.5 / -1162	-5	-9	-7 / -303	31	7	13	37	22 / 1307	
	12	"	"	36.32	239.5	-20	-25	-22.5 / -1184.5	-7	-10	-8.5 / -3115	29	5	13	19	16.5 / 1325.5	
	16	"	"	36.55	241.0	-24	-12	-18 / -1202.5	-9	-13	-11 / -322.5	31	7	13	37	22 / 1347.5	
	20	"	"	37.01	244.0	-31	-14	-22.5 / -1225	-19	-21	-20 / -342.5	66	32	11	62	42.5 / 1390	
	24	"	"	37.21	246.0	-47	-20	-33.5 / -1258.5	-25	-61	-43 / -385.5	90	7	19	108	56.5 / 1446.5	
	28	"	"	37.61	248.0	-53	-18	-35.5 / -1294	-20	-63	-41.5 / -427	136	6	12	110	66 / 1512.5	
	32	"	"	37.99	250.5	-75	-25	-50 / -1344	-16	-120	-68 / -495	133	6	20	145	76 / 1588.5	
	36	"	"	38.37	253.0	-62	-20	-41 / -1385	-9	-38	-23.5 / -518.5	107	13	8	100	57 / 1645.5	
	40	"	"	38.67	255.0	-81	-29	-55 / -1440	-5	-72	-38.5 / -557	163	37	135	180	128.5 / 1774	
	44	"	"	38.98	257.0	-87	-21	-54 / -1494	-1	-106	-53.5 / -610.5	183	32	143	155	123.5 / 1897.5	
	48	"	"	39.38	259.0	-60	-25	-42.5 / -1536.5	-14	-44	-29 / -639.5	130	33	22	120	76.5 / 1974	
	52	"	"	39.66	261.5	-70	-15	-42.5 / -1579	-17	-30	-23.5 / -663	101	27	37	120	76.5 / 2050.5	
	56	"	"	40.04	264.0	-28	-22	-25 / -1604	-5	-43	-24 / -687	139	22	33	120	78.5 / 2129	
	8:00	"	"	40.34	266.0	-42	-23	-32.5 / -1636.5	-9	-32	-20.5 / -707.5	109	32	34	120	73.5 / 2202.5	
	4	"	"	40.65	268.0	-30	-17	-23.5 / -1660	-7	-21	-14 / -721.5	84	25	26	78	53.5 / 2256	
	8	"	"	40.95	270.0	-30	-14	-22 / -1682	-13	-31	-22 / -743.5	82	31	43	85	60.5 / 2316.5	
	12	"	"	41.33	272.5	-43	-26	-34.5 / -1716.5	-1	-53	-27 / -770.5	97	21	25	103	61.5 / 2378	
	16	"	"	41.71	275.0	-37	-18	-27.5 / -1744	-2	-25	-13.5 / -784	109	22	32	80	60.5 / 2438.5	
	20	"	"	42.01	277.0	-35	-20	-27.5 / -1771.5	-10	-57	-33.5 / -817.5	77	28	35	115	63.5 / 2502	
	24	"	"	42.31	279.0	-20	-15	-17.5 / -1789	-1	-18	-9.5 / -827	56	23	18	45	35.5 / 2537.5	
	28	"	"	42.66	281.25	-37	-22	-29.5 / -1818.5	-17	-40	-28.5 / -855.5	92	34	42	98	66.5 / 2604	

ROCK SHEAR TEST DATA SHEET (6) Measuring Point TD. 18.6m Block No. DA-1, BS-3 N= 6 kg/cm²

Time	Time Elapsed	Vertical Jack: Vertical Stress (kg/cm²)	Vertical Jack: Jack Pressure (kg/cm²)	Diagonal Jack: Horizontal Stress (kg/cm²)	Diagonal Jack: Jack Pressure (kg/cm²)	Vertical Displacement (x 10⁻³ mm): ①	②	(①+②)/2	③	④	(③+④)/2	Horizontal Displacement (x 10⁻³ mm): ⑤	⑥	⑦	⑧	(⑤−⑧)/4	Remarks
	32	6	43	43.00	283.5	-46	-25	-35.5 / -8879	-3	-70	-36.5 / -8888	139	25	148	147	114.5 / 27126	
	36	〃	〃	43.30	285.5	-35	-15	-25 / -7904	-15	-28	-21.5 / -9095	102	20	121	60	78.5 / 27709	
	40	〃	〃	43.68	288.0	-27	-18	-22.5 / -7926.5	-35	-39	-37 / -9445	64	20	33	80	49.3 / 28405	
	44	〃	〃	43.98	290.0	-32	-22	-27 / -7953.5	-30	-33	-31.5 / -9778	64	21	39	100	53 / 28962	
	48	〃	〃	44.32	292.25	-43	-30	-36.5 / -7990	-42	-54	-48 / -10265	54	36	54	141	71.3 / 29675	
	52	〃	〃	44.67	294.5	-35	-33	-34 / -8024	-33	-35	-34 / -10600	158	20	45	94	79.3 / 30468	
	56	〃	〃	44.97	296.5	-60	-36	-48 / -8071	-32	-21	-26.5 / -10865	-3	70	100	80	61.3 / 31086	
	9:00	〃	〃	45.35	299.0	-30	-20	-25 / -8096	-10	-31	-20.5 / -11071	72	28	43	47	42.5 / 31561	
	4	〃	〃	45.65	301.0	-22	-6	-14 / -8110.5	0	0	0 / -11071	71	55	29	58	53.3 / 32094	
	8	〃	〃	45.99	303.25	-19	-30	-24.5 / -8135	-6	-9	-7.5 / -11145	45	38	50	51	46 / 32554	
	12	〃	〃	46.33	305.5	-21	-7	-14 / -8149	-12	-8	-10 / -11245	57	33	39	57	48.5 / 33019	
	16	〃	〃	46.64	307.5	-18	-23	-20.5 / -8169.5	-11	-8	-9.5 / -11340	56	23	29	43	37.8 / 33397	
	20	〃	〃	47.02	310.0	-15	-21	-18 / -8187.5	-8	-8	-8 / -11420	55	28	31	56	42.5 / 33822	
	24	〃	〃	47.32	312.0	-32	-26	-29 / -8216.5	-12	-10	-11 / -11531	53	32	32	46	40.8 / 34230	
	28	〃	〃	47.66	314.25	-27	-27	-27 / -8243.5	-3	-5	-4 / -11570	61	41	39	48	47.3 / 34703	
	32	〃	〃	48.00	316.5	-15	-13	-14 / -8257.5	-2	-4	-3 / -11600	43	29	30	35	34.3 / 35046	
	36	〃	〃	48.31	318.5	-31	-32	-31.5 / -8289	-12	-17	-14.5 / -11745	81	40	37	58	54.3 / 35587	
	40	〃	〃	48.68	321.0	-25	-17	-21 / -8310	-15	-11	-13 / -11875	75	33	35	57	50 / 36089	
	44	〃	〃	48.99	323.0	-35	-25	-30 / -8340	-17	-17	-17 / -12045	113	55	61	97	81.5 / 36870	
	48	〃	〃	49.33	325.25	-54	-49	-51.5 / -8391.5	-42	-35	-38.5 / -12430	79	69	65	45	64.5 / 37534	
	52	〃	〃	49.67	327.5	-38	-42	-40 / -8431.5	-21	-18	-19.5 / -12625	127	62	27	72	72 / 38267	
	56	〃	〃	49.97	329.5	-31	-41	-36 / -8467.5	-18	-21	-19.5 / -12822	126	55	57	104	86 / 39123	
	10:00	〃	〃	50.35	332.0	-28	-35	-31.5 / -8499	-16	-22	-19 / -13011	116	44	61	80	77.3 / 39900	
	4	〃	〃	50.66	334.0	-51	-43	-47 / -8546	-21	-17	-19 / -13210	135	96	77	64	93 / 40837	
	8	〃	〃	51.00	336.25	-66	-56	-61 / -8607	-31	-33	-32 / -13532	191	78	74	125	117 / 42007	
	12	〃	〃	51.34	338.5	-88	-83	-85.5 / -8692.5	-44	-43	-43.5 / -13975	193	98	110	207	153 / 43527	
	16	〃	〃	51.64	340.5	-92	-4	-48 / -8740.5	-52	-42	-47 / -14425	132	163	153	117	141.3 / 44974	
	20	〃	〃	51.98	342.75	-91	-82	-86.5 / -8827	-48	-46	-47 / -14895	123	196	191	101	152.8 / 46508	
	24	〃	〃	52.32	345.0	-88	-81	-84.5 / -8911.5	-46	-18	-32 / -15245	196	162	235	165	201.8 / 48484	
	28	〃	〃	52.67	347.25	-133	-121	-127 / -9038.5	-104	-147	-125.5 / -15470	341	281	238	211	267.8 / 51164	
	32	〃	〃	53.01	349.50	-125	-114	-119.5 / -9158	-85	-98	-91.5 / -15385	314	263	235	217	257.5 / 53237	
	36	〃	〃	53.31	351.5	-352	-167	-259.5 / -9417.5	-181	-128	-154.5 / -16925	617	528	915	961	2553 / 61291	

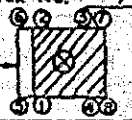
ROCK SHEAR TEST DATA SHEET (1)

Test Location DA-1, BS-4 Measuring Point TD 20.0m Date Measured 13-11-1988 Block No. 4 N = 8 kg/cm²

Geological Classification Ophiolite Rock Grade _____ Measured by _____

Vertical Jack Capacity 200 ton x 1 units, Max. Oil Pressure 396.3 kg/cm² Ram Diameter ϕ25.35 cm

Diagonal Jack Capacity 200 ton x 2 units, Max. Oil Pressure 701.7 kg/cm² Ram Diameter ϕ19.05 cm



A = 3600 cm²

θ = 16.7 °

Time	Time Elapsed	Vertical Jack: Vertical Stress (kg/cm²)	Vertical Jack: Jack Pressure (kg/cm²)	Diagonal Jack: Horizontal Stress (kg/cm²)	Diagonal Jack: Jack Pressure (kg/cm²)	Vertical Displacement (×10⁻³ mm): ①	②	(①+②)/2	③	④	(③+④)/2	Horizontal Displacement (×10⁻³ mm): ⑤	⑥	⑦	⑧	(⑤−⑧)/4	Remarks
	0	0	0			0	0	0/0	0	0	0/0	0	0	0	0	0/0	
	0	1	7			0	0	0/0	0	0	0/0	0	0	0	0	0/0	
	4	2	14			1	1	1/1	0	0	0/0	0	0	0	0	0/0	
	8	2	14			0	0	0/1	0	0	0/0	0	0	0	0	0/0	
	16	0	0			0	0	0/1	0	0	0/0	0	0	0	0	0/0	
	20	0	0			0	0	0/1	0	0	0/0	0	0	0	0	0/0	
	28	2	14			0	0	0/1	0	0	0/0	0	0	0	0	0/0	
	32	3	21			2	2	2/3	3	0	1.5/1.5	0	0	0	0	0/0	
	36	4	29			1	2	1.5/4.5	3	0	1.5/3	0	0	0	0	0/0	
	40	5	36			2	2	2/6.5	2	1	1.5/4.5	0	0	0	0	0/0	
	44	6	43			2	1	1.5/8	1	0	0.5/5	0	0	0	0	0/0	
	48	7	50			2	2	2/10	1	0	0.5/4.5	0	0	0	0	0/0	
	52	8	57			3	1	2/12	0	0	0/4.5	0	1	2	0	0.8/0.8	
	56	〃	〃			1	0	0.5/12.5	0	0	0/4.5	0	0	1	0	0.2/1.1	
	1:00	〃	〃			0	0	0/12.5	0	0	0/4.5	0	0	0	0	0/1.1	

ROCK SHEAR TEST DATA SHEET (2) Measuring Point TD 20.0 Block No. DA-1, BS-4 N = 8 kg/cm²

Time	Time Elapsed	Vertical Jack: Vertical Stress (kg/cm²)	Vertical Jack: Jack Pressure (kg/cm²)	Diagonal Jack: Horizontal Stress (kg/cm²)	Diagonal Jack: Jack Pressure (kg/cm²)	Vertical Displacement (x 10⁻³ mm): ①	②	(①+②)/2	③	④	(③+④)/2	Horizontal Displacement (x 10⁻³ mm): ⑤	⑥	⑦	⑧	(⑤−⑧)/4	Remarks
	0	8	57	0.34	2.25	0	0	0/12.5	0	0	0/4.5	0	0	0	0	0/1.1	
	4	〃	〃	0.68	4.5	0	0	0/12.5	0	0	0/4.5	0	0	0	0	0/1.1	
	8	〃	〃	0.99	6.5	0	0	0/12.5	0	0	0/4.5	0	0	0	0	0/1.1	
	12	〃	〃	1.33	8.75	0	0	0/12.5	0	0	0/4.5	0	0	0	0	0/1.1	
	16	〃	〃	1.67	11.0	0	0	0/12.5	0	0	0/4.5	0	0	0	0	0/1.1	
	20	〃	〃	2.01	13.25	6	0	3/15.5	0	0	0/4.5	0	0	0	0	0/1.1	
	24	〃	〃	2.35	15.50	2	2	2/17.5	0	0	0/4.5	0	0	0	0	0/1.1	
	28	〃	〃	2.65	17.5	0	1	0.5/18	6	0	3/7.5	0	0	0	0	0/1.1	
	32	〃	〃	3.00	19.75	0	2	1/19	2	−1	0.5/8.0	0	0	0	0	0/1.1	
	36	〃	〃	3.34	22.0	1	0	0.5/19.5	1	−1	0/8	0	0	0	0	0/1.1	
	40	〃	〃	3.68	24.25	0	3	1.5/21	1	−1	0/8	0	0	0	0	0/1.1	
	44	〃	〃	4.02	26.5	0	1	0.5/21.5	1	−1	0/8	0	0	0	0	0/1.1	
	48	〃	〃	4.32	28.5	0	1	0.5/22	1	−1	0/8	0	0	0	0	0/1.1	
	52	〃	〃	4.66	30.75	0	0	0/22	2	−1	0.5/8.5	0	0	0	0	0/1.1	
	56	〃	〃	5.00	33.0	0	1	0.5/22.5	1	−1	0/8.5	0	0	0	0	0/1.1	
	1:00	〃	〃	5.35	35.25	0	1	0.5/23	1	−2	−0.5/8	0	2	0	0	0.5/1.6	
	4	〃	〃	5.69	37.5	0	1	0.5/23.5	2	−2	0/8	0	11	0	0	2.8/4.4	
	8	〃	〃	5.99	39.5	0	0	0/23.5	2	−1	0.5/8.5	0	10	2	0	3/7.4	
	12	〃	〃	6.33	41.75	0	0	0/23.5	1	−1	0/8.5	0	3	2	0	1.3/8.7	
	16	〃	〃	6.67	44.0	0	1	0.5/24	1	−2	−0.5/8	0	3	3	0	1.5/10.2	
	20	〃	〃	7.01	46.25	0	0	0/24	1	−2	−0.5/7.5	0	3	2	0	1.3/11.5	
	24	〃	〃	7.36	48.5	0	0	0/24	7	−4	1.5/9.0	0	3	2	0	1.3/12.8	
	28	〃	〃	7.66	50.5	−1	1	0/24	2	−2	0/9.0	0	5	2	0	1.8/14.6	
	32	〃	〃	8.00	52.75	0	0	0/24	3	0	1.5/10.5	0	4	4	0	2/16.6	
	36	〃	〃	8.34	55.0	0	0	0/24	1	0	0.5/11	0	4	4	0	2/18.6	
	40	〃	〃	8.68	57.25	−1	0	−0.5/23.5	0	0	0/11	0	5	3	0	2/20.6	
	44	〃	〃	9.02	59.5	−1	0	−0.5/23	0	0	0/11	0	5	4	0	2.3/22.9	
	48	〃	〃	9.33	61.5	0	0	0/23	0	0	0/11	0	1	4	0	1.3/24.2	
	52	〃	〃	9.67	63.75	−2	0	−1/22	0	0	0/11	0	5	2	0	1.8/26	
	56	〃	〃	10.01	66.0	−1	0	−0.5/21.5	0	0	0/11	0	4	4	0	2/28	
	2:00	〃	〃	10.35	68.25	−1	0	−0.5/21	0	0	0/11	0	1	1	0	0.5/28.5	
	4	〃	〃	10.69	70.5	−1	0	−0.5/20.5	0	0	0/11	0	0	1	0	0.3/29	

ROCK SHEAR TEST DATA SHEET (3) Measuring Point TD-20.0 Block No. DA-1, BS-4 N= 8 kg/cm²

Time	Time Elapsed	Vertical Jack: Vertical Stress (kg/cm²)	Vertical Jack: Jack Pressure (kg/cm²)	Diagonal Jack: Horizontal Stress (kg/cm²)	Diagonal Jack: Jack Pressure (kg/cm²)	Vertical Displacement (x 10⁻³ mm): ①	②	①+②/2	③	④	③+④/2	Horizontal Displacement (x 10⁻³ mm): ⑤	⑥	⑦	⑧	⑤−⑧/4	Remarks
	8	8	57	11.00	72.5	0	0	0/20.5	0	0	0/11	0	3	6	0	0.8/29.8	
	12	"	"	11.34	74.75	0	0	0/20.5	0	0	0/11	0	2	1	0	0.8/36.4	
	16	"	"	11.68	77.0	0	0	0/20.5	0	0	0/11	0	3	2	0	1.3/31.9	
	20	"	"	12.02	79.25	0	0	0/20.5	0	0	0/11	0	3	2	0	1.3/33.2	
	24	"	"	12.36	81.5	0	0	0/20.5	0	0	0/11	0	3	3	0	1.5/34.7	
	28	"	"	12.66	83.5	−2	0	−1/19.5	0	0	0/11	0	2	2	0	1/35.7	
	32	"	"	13.01	85.75	−1	0	−0.5/19	0	0	0/11	0	6	3	0	2.3/38	
	36	"	"	13.35	88.0	−2	0	−1/18	0	0	0/11	0	5	3	2	2.5/40.4	
	40	"	"	13.69	90.25	−2	0	−1/17	0	0	0/11	2	6	4	1	3.3/43.8	
	44	"	"	14.03	92.5	−3	0	−1.5/15.5	−2	0	−1/10	4	4	2	1	2.8/46.6	
	48	"	"	14.33	94.5	−4	0	−2/13.5	−1	0	−0.5/9.5	6	7	4	1	4.5/51.1	
	52	"	"	14.67	96.75	−3	0	−1.5/12	−2	−3	−2.5/7	5	7	6	2	5/56.1	
	56	"	"	15.01	99.0	−2	0	−1/11	−1	3	−2/5	6	5	2	3	4/60.1	
	3:00	"	"	15.36	101.25	−2	0	−1/10	−1	−6	−3.5/1.5	3	4	3	2	3/63.1	
	4	"	"	15.70	103.5	−2	0	−1/9	−1	−1	−1/0.5	3	5	3	5	4/67.1	
	8	"	"	16.00	105.5	−1	0	−0.5/8.5	−1	−1	−1/−0.5	2	3	5	3	3.3/70.4	
	12	"	"	16.34	107.75	−2	0	−1/7.5	−1	0	−0.5/−1	4	5	3	2	3.5/73.9	
	16	"	"	16.68	110.0	−3	0	−1.5/7	−1	0	−0.5/−1.5	2	4	4	0	2.5/76.4	
	20	"	"	17.02	112.25	−2	0	−1/6	0	0	0/−1.5	3	4	4	0	2.8/79.2	
	24	"	"	17.37	114.5	−3	0	−1.5/4.5	0	0	0/−1.5	2	3	5	2	3/82.2	
	28	"	"	17.67	116.5	−2	0	−1/3.5	1	−1	0/−1.5	2	4	5	0	2.8/85	
	32	"	"	17.97	118.5	−1	0	−0.5/3	1	−1	0/−1.5	3	2	3	1	2.2/87.3	
	36	"	"	18.35	121.0	−2	−3	−2.5/0.5	1	0	0.5/−1	4	1	2	2	2.3/89.6	
	40	"	"	18.65	123.0	−1	−2	−1.5/−1	1	−1	0/−1	2	3	3	3	2.8/92.4	
	44	"	"	18.96	125.0	−1	−1	−1/−2	1	0	0.5/−0.5	8	3	2	12	6.3/98.7	
	48	"	"	19.34	127.5	−2	−1	−1.5/−3.5	0	0	0/−0.5	11	3	2	13	7.3/106	
	52	"	"	19.68	129.75	−1	−1	−1/−4.5	1	−1	0/−0.5	3	4	3	8	4.5/110.5	
	56	"	"	20.02	132.0	−2	−2	−2/−6.5	1	−1	0/−0.5	6	5	3	7	5.3/115.8	
	4:00	"	"	20.36	134.25	−3	−1	−2/−8.5	1	0	0.5/0	11	4	2	4	5.3/121.1	
	4	"	"	20.70	136.5	−2	−2	−2/−10.5	0	0	0/0	7	10	5	6	7/128.1	
	8	"	"	21.01	138.5	−2	−2	−2/−12.5	1	0	0.5/0.5	3	4	5	5	4.3/132.4	
	12	"	"	21.38	141.0	−2	−2	−2/−14.5	1	0	0.5/0.5	5	11	7	6	7.3/139.7	

ROCK SHEAR TEST DATA SHEET (4) Measuring Point TD 20.0m Block No. DA-1, BS-4 N= 8 kg/cm²

Time	Time Elapsed	Vertical Jack: Vertical Stress (kg/cm²)	Vertical Jack: Jack Pressure (kg/cm²)	Diagonal Jack: Horizontal Stress (kg/cm²)	Diagonal Jack: Jack Pressure (kg/cm²)	Vertical Displacement (x 10⁻³ mm): ①	②	①+②/2	③	④	③+④/2	Horizontal Displacement (x 10⁻² mm): ⑤	⑥	⑦	⑧	⑤−⑧/4	Remarks
	4:16	8	57	21.69	143°	−4	−3	-3.5 / -18	1	0	0.5 / 1.0	3	7	7	1	4.5 / 144.2	
	20	〃	〃	22.03	145.5	−4	−2	-3 / -21	1	0	0.5 / 1.5	5	14	11	6	9 / 158.2	
	24	〃	〃	22.37	147.5	−8	−1	-4.5 / -25.5	0	0	0 / 1.5	12	9	10	7	9.5 / 162.7	
	28	〃	〃	22.67	149.5	−12	−3	-7.5 / -33	1	0	0.5 / 2	10	19	10	15	13.5 / 176.2	
	32	〃	〃	23.05	152°	−9	−2	-5.5 / -38.5	0	0	0 / 2	7	12	7	3	7.3 / 183.5	
	36	〃	〃	23.36	154°	−7	−2	-4.5 / -43	0	0	0 / 2	20	11	10	4	11.3 / 194.8	
	40	〃	〃	23.66	156°	−4	−7	-5.5 / -48.5	0	0	0 / 2	5	16	10	4	8.8 / 203.6	
	44	〃	〃	23.96	158°	−1	−3	-2 / -50.5	0	0	0 / 2	11	5	12	5	8.3 / 211.9	
	48	〃	〃	24.24	160.5	−2	−7	-4.5 / -55	0	0	0 / 2	5	5	5	4	4.8 / 216.7	
	52	〃	〃	24.65	162.5	−2	−1	-1.5 / -56.5	0	0	0 / 2	4	4	6	5	4.8 / 221.5	
	56	〃	〃	25.02	165°	−1	−3	-2 / -58.5	0	0	0 / 2	9	8	10	5	8 / 229.5	
	5:00	〃	〃	25.33	167°	−2	−3	-2.5 / -61	0	0	0 / 2	11	9	10	6	9 / 238.5	
	4	〃	〃	25.63	169°	−3	−6	-4.5 / -65.5	0	0	0 / 2	12	11	9	4	9 / 247.5	
	8	〃	〃	25.93	171°	−4	−6	-5 / -70.5	0	0	0 / 2	12	11	9	12	11 / 258.5	
	12	〃	〃	26.31	173.5	−4	−4	-4 / -74.5	0	0	0 / 2	4	12	8	5	7.3 / 265.8	
	16	〃	〃	26.69	176°	−4	−4	-4 / -78.5	0	0	0 / 2	7	9	8	3	6.8 / 272.6	
	20	〃	〃	27.00	178°	−3	−5	-4 / -82.5	0	0	0 / 2	15	12	15	5	11.8 / 284.4	
	24	〃	〃	27.30	180°	−4	−5	-4.5 / -87	0	0	0 / 2	6	12	12	6	9 / 293.4	
	28	〃	〃	27.60	182°	−7	−2	-4.5 / -91.5	0	0	0 / 2	13	11	5	7	9 / 302.4	
	32	〃	〃	27.98	184.5	−10	−3	-6.5 / -98	0	0	0 / 2	2	11	4	7	6 / 308.4	
	36	〃	〃	28.36	187°	−11	−5	-8 / -106	0	0	0 / 2	7	19	11	7	11 / 319.4	
	40	〃	〃	28.66	189°	−9	−10	-9.5 / -115.5	0	0	0 / 2	13	9	16	15	13.3 / 332.7	
	44	〃	〃	28.97	191°	−9	−6	-7.5 / -123	0	0	0 / 2	3	12	14	2	7.8 / 340.5	
	48	〃	〃	29.27	193°	−7	−7	-7 / -130	0	0	0 / 2	5	7	9	4	6.3 / 346.8	
	52	〃	〃	29.65	195.5	−3	−6	-4.5 / -134.5	0	0	0 / 2	7	9	8	7	7.8 / 354.6	
	56	〃	〃	30.03	198°	−4	−7	-5.5 / -140	0	0	0 / 2	2	11	16	5	8.5 / 363.1	
	6:00	〃	〃	30.33	200°	−5	−8	-6.5 / -146.5	0	0	0 / 2	3	4	12	7	6.6 / 369.6	
	4	〃	〃	30.64	202°	−6	−4	-5 / -151.5	0	0	0 / 2	6	8	8	10	8 / 377.6	
	8	〃	〃	30.94	204°	−4	−1	-2.5 / -154	0	0	0 / 2	4	13	14	3	8.5 / 386.1	
	12	〃	〃	31.32	206.5	−5	−10	-7.5 / -161.5	0	0	0 / 2	7	16	6	7	9 / 395.1	
	16	〃	〃	31.70	209°	−11	−14	-12.5 / -174	0	0	0 / 2	14	6	6	3	7.3 / 402.4	
	20	〃	〃	32.00	211°	−9	0	-4.5 / -178.5	0	0	0 / 2	9	26	16	9	15 / 417.4	

ROCK SHEAR TEST DATA SHEET (5)

Measuring Point TD 20.0m Block No. DA-1, BS-4 N = 8 kg/cm²

Time	Time Elapsed	Vertical Jack: Vertical Stress (kg/cm²)	Vertical Jack: Jack Pressure (kg/cm²)	Diagonal Jack: Horizontal Stress (kg/cm²)	Diagonal Jack: Jack Pressure (kg/cm²)	Vertical Displacement (x 10⁻³ mm): ①	②	(①+②)/2	③	④	(③+④)/2	Horizontal Displacement (x 10⁻³ mm): ⑤	⑥	⑦	⑧	(⑤−⑧)/4	Remarks
	24	8	57	32.30	213°	−7	−6	−6.5 / −185	0	0	0 / 2	0	12	17	8	9.3 / 426.7	
	28	〃	〃	32.61	215°	−13	−6	−9.5 / −194.5	0	0	0 / 2	8	9	18	8	10.8 / 437.5	
	32	〃	〃	32.91	217°	−21	−13	−17 / −211.5	0	0	0 / 2	7	9	8	7	7.8 / 445.3	
	36	〃	〃	33.27	220°	−2	0	−1 / −212.5	0	0	0 / 2	26	12	14	20	18 / 463.3	
	40	〃	〃	33.67	222°	−4	−5	−4.5 / −217	−6	0	−3 / −1	31	18	17	10	19 / 482.3	
	44	〃	〃	33.97	224°	−8	−5	−6.5 / −223.5	−1	0	−0.5 / −1.5	7	9	11	11	9.5 / 491.8	
	48	〃	〃	34.28	226°	−11	−10	−10.5 / −234	−1	−2	−1.5 / −3	7	19	9	2	9.3 / 501.1	
	52	〃	〃	34.66	228.5	−9	−5	−7 / −241	0	−1	−0.5 / −3.5	−5	13	17	5	7.5 / 508.6	
	56	〃	〃	35.03	231°	−6	−5	−5.5 / −246.5	−1	0	−0.5 / −4	1	9	10	7	6.8 / 515.4	
	7:00	〃	〃	35.34	233°	−2	−4	−3 / −249.5	0	−1	−0.5 / −4.5	1	12	15	7	8.8 / 524.2	
	4	〃	〃	35.64	235°	−11	−16	−13.5 / −263	0	0	0 / −4.5	6	18	19	13	14 / 538.2	
	8	〃	〃	35.94	237°	−5	−3	−4 / −267	0	0	0 / −4.5	1	9	10	2	5.5 / 543.7	
	12	〃	〃	36.32	239.5	−4	−2	−3 / −270	0	0	0 / −4.5	2	22	13	4	10.3 / 554	
	16	〃	〃	36.55	241°	−8	−13	−10.5 / −280.5	0	0	0 / −4.5	0	9	17	8	6 / 560	
	20	〃	〃	37.01	244°	−2	−2	−2 / −282.5	0	0	0 / −4.5	4	19	6	8	9.3 / 569.3	
	24	〃	〃	37.31	246°	−12	−5	−8.5 / −291	0	0	0 / −4.5	15	11	17	3	9 / 578.3	
	28	〃	〃	37.61	248°	−10	−15	−12.5 / −303.5	0	0	0 / −4.5	12	19	16	8	13.8 / 592.1	
	32	〃	〃	37.99	250.5	−5	−2	−3.5 / −307	0	0	0 / −4.5	11	8	8	10	9.3 / 601.4	
	36	〃	〃	38.37	253°	−4	−6	−5 / −312	0	0	0 / −4.5	5	6	16	10	9.3 / 610.7	
	40	〃	〃	38.67	255°	−8	−13	−10.5 / −322.5	0	0	0 / −4.5	5	16	16	5	10.5 / 621.2	
	44	〃	〃	38.98	257°	−5	−4	−4.5 / −327	0	0	0 / −4.5	4	14	11	5	8.5 / 629.7	
	48	〃	〃	39.28	259°	−4	−5	−4.5 / −331.5	0	0	0 / −4.5	7	11	11	5	8.5 / 638.2	
	52	〃	〃	39.66	261.5	−4	−15	−9.5 / −341	0	0	0 / −4.5	7	29	19	7	15.5 / 653.7	
	56	〃	〃	40.04	264°	−10	−8	−9 / −350	0	0	0 / −4.5	1	16	17	6	10 / 663.7	
	8:00	〃	〃	40.34	266°	−6	−1	−3.5 / −353.5	0	0	0 / −4.5	6	21	27	7	15.3 / 679	
	4	〃	〃	40.65	268°	−9	−14	−11.5 / −365	0	0	0 / −4.5	15	9	16	2	10.5 / 689.5	
	8	〃	〃	40.95	270°	−10	−10	−10 / −375	0	0	0 / −4.5	1	22	22	13	14.5 / 704	
	12	〃	〃	41.33	272.5	−25	−25	−25 / −400	0	0	0 / −4.5	10	32	40	5	21.8 / 725.8	
	16	〃	〃	41.71	275°	−11	−7	−9 / −409	−15	0	−7.5 / −12	4	24	38	4	17.5 / 743.3	
	20	〃	〃	42.01	277°	−5	−17	−11 / −420	−18	0	−9 / −21	4	31	40	11	21.5 / 764.8	
	24	〃	〃	42.31	279°	−14	−28	−21 / −441	−18	0	−9 / −30	12	41	60	5	29.5 / 794.3	
	28	〃	〃	42.66	281.25	−20	−13	−16.5 / −457.5	−10	0	−5 / −35	6	39	42	10	24.3 / 818.6	

ROCK SHEAR TEST DATA SHEET (6) Measuring Point TD 20.0m Block No. DA-1, BS-4 N = 8 kg/cm²

Time	Time Elapsed	Vertical Jack: Vertical Stress (kg/cm²)	Vertical Jack: Jack Pressure (kg/cm²)	Diagonal Jack: Horizontal Stress (kg/cm²)	Diagonal Jack: Jack Pressure (kg/cm²)	Vertical Displacement (×10⁻³ mm): ①	②	(①+②)/2	③	④	(③+④)/2	Horizontal Displacement (×10⁻³ mm): ⑤	⑥	⑦	⑧	(⑤~⑧)/4	Remarks
	32	8	57	40.00	283.5	-2	-15	-8.5 / -466	-10	-3	-6.5 / -415	3	32	40	5	19.8 / 888	
	36	〃	〃	43.30	285.5	-16	-21	-18.5 / -484.5	-14	-1	-7.5 / -49	4	34	54	10	25.5 / 963.9	
	40	〃	〃	43.68	288.0	-7	-21	-14 / -498.5	-9	-2	-5.5 / -54.5	8	37	40	10	23.8 / 987.7	
	44	〃	〃	43.98	290.0	-30	-20	-25 / -523.5	-15	-4	-9.5 / -64	14	34	43	14	26.3 / 974	
	48	〃	〃	44.32	292.25	-10	-31	-20.5 / -544	-21	-3	-12 / -76	12	56	61	4	33.3 / 947.3	
	52	〃	〃	44.67	294.5	-19	-25	-22 / -566	-19	-1	-10 / -86	9	39	53	6	26.8 / 974.1	
	56	〃	〃	44.97	296.5	-16	-9	-12.5 / -578.5	-5	-3	-4 / -90	9	49	24	9	35.3 / 1009.4	
	9:00	〃	〃	45.35	299.0	-5	-31	-18 / -596.5	-21	-5	-13 / -103	14	38	25	10	21.8 / 1031.2	
	4	〃	〃	45.65	301.0	-37	-23	-30 / -626.5	-14	-3	-8.5 / -111.5	5	48	49	2	26 / 1057.2	
	8	〃	〃	45.99	303.25	-17	-36	-26.5 / -653	-32	-5	-18.5 / -130	18	59	47	22	36.5 / 1093.7	
	12	〃	〃	46.33	305.5	-9	-11	-10 / -663	-17	-10	-13.5 / -143.5	6	33	20	8	16.8 / 1110.5	
	16	〃	〃	46.64	307.5	-33	-30	-31.5 / -694.5	-14	-10	-12 / -155.5	7	52	60	10	34.8 / 1145.3	
	20	〃	〃	47.02	310.0	-18	-29	-23.5 / -718	-23	-3	-13 / -168.5	11	35	57	10	28.3 / 1173.6	
	24	〃	〃	47.32	312.0	-11	-14	-12.5 / -730.5	-10	-7	-8.5 / -177	9	39	54	5	26.8 / 1200.4	
	28	〃	〃	47.66	314.25	-15	-17	-16 / -746.5	-9	-2	-5.5 / -182.5	12	58	36	7	28.3 / 1228.7	
	32	〃	〃	48.00	316.5	-30	-16	-23 / -769.5	-8	-16	-12 / -194.5	15	39	44	20	29.5 / 1258.2	
	36	〃	〃	48.31	318.5	-20	-18	-19 / -788.5	-8	-4	-6 / -200.5	6	35	52	11	26 / 1284.2	
	40	〃	〃	48.68	321.0	-10	-6	-8 / -796.5	-4	-3	-3.5 / -204	5	34	26	7	18 / 1302.2	
	44	〃	〃	48.99	323.0	-15	-19	-17 / -813.5	-20	-5	-12.5 / -216.5	10	51	21	8	22.5 / 1324.7	
	48	〃	〃	49.33	325.25	-4	-12	-8 / -821.5	-3	-6	-4.5 / -221	8	48	16	7	19.8 / 1344.5	
	52	〃	〃	49.67	327.5	-21	-28	-24.5 / -846	-35	-13	-24 / -245	12	59	13	18	25.5 / 1370	
	56	〃	〃	49.97	329.5	-25	-28	-26.5 / -872.5	-17	-24	-20.5 / -265.5	6	64	45	17	33 / 1403	
	10:00	〃	〃	50.35	332.0	-5	-32	-18.5 / -891	-20	-180	-100 / -365.5	42	74	136	15	66.8 / 1469.8	
	4	〃	〃	50.66	334.0	-98	-41	-69.5 / -960.5	-25	-75	-50 / -415.5	27	134	159	35	88.8 / 1558.6	
	8	〃	〃	51.00	336.25	-97	-69	-78 / -1038.5	-35	-29	-47 / -462.5	59	221	45	62	96.8 / 1655.4	
	12	〃	〃	51.34	338.5	-288	35	-126.5 / -1165	-55	-39	-47 / -509.5	202	2208	143	240	698.3 / 2353.7	
	16	〃	〃	51.64	340.5	-1627	-1388	-1507.5 / -2672.5	-74	-1613	-769.5 / -1279	1573	-4649	3110	1883	2553.8 / 4907.5	
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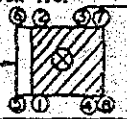
ROCK SHEAR TEST DATA SHEET (1)

Test Location DA-2, BS-1 Measuring Point TD 10.8m Date Measured 18-11-1988 Block No. 1 N = 2 kgf/cm²

Geological Classification Ophiolite Rock Grade _____ Measured by _____

Vertical Jack Capacity 200 ton x 1 units, Max. Oil Pressure 396.3 kg/cm² Ram Diameter ϕ25.35 cm

Diagonal Jack Capacity 200 ton x 2 units, Max. Oil Pressure 201.7 kg/cm² Ram Diameter ϕ18.05 cm



A = 3600 cm²

θ = 16.7 °

Time	Time Elapsed	Vertical Jack: Vertical Stress (kg/cm²)	Vertical Jack: Jack Pressure (kg/cm²)	Diagonal Jack: Horizontal Stress (kg/cm²)	Diagonal Jack: Jack Pressure (kg/cm²)	Vertical Displacement (x10⁻³ mm): ①	②	(①+②)/2	③	④	(③+④)/2	Horizontal Displacement (x10⁻³ mm): ⑤	⑥	⑦	⑧	(⑤−⑧)/4	Remarks
	0	1	7			0	0	0/0	0	0	0/0	0	0	0	0	0/0	
	4	2	14			29	−1	14/14	0	0	0/0	4	0	0	0	1/1	
	8	2	14			6	0	3/17	0	0	0/0	0	0	0	0	0/1	
	16	0	0			1	−2	0.5/17.5	0	3	1.5/1.5	0	0	0	0	0/1	
	20	0	0			1	−1	0/17.5	0	1	0.5/2	0	0	0	0	0/1	
	28	2	14			16	0	8/25.5	0	5	2.5/4.5	0	0	0	0	0/1	
	32	2	14			1	0	0.5/26	0	0	0/4.5	0	0	0	0	0/1	
	34	2	14			0	0	0/26	0	0	0/4.5	0	0	0	0	0/1	

ROCK SHEAR TEST DATA SHEET (2) Measuring Point TD 10.8m Block No. DA-2, BS-1 N = 2 kg/cm²

Time	Time Elapsed	Vertical Jack		Diagonal Jack		Vertical Displacement (x 10⁻³ mm)						Horizontal Displacement (x 10⁻³ mm)					Remarks
		Vertical Stress (kg/cm²)	Jack Pressure (kg/cm²)	Horizontal Stress (kg/cm²)	Jack Pressure (kg/cm²)	①	②	①+② / 2	③	④	③+④ / 2	⑤	⑥	⑦	⑧	⑤~⑧ / 4	
	0	2	14	0.34	2.25	1	0	0.5 / 26.5	0	0	0 / 4.5	0	0	0	0	0 / 1	
	4	〃	〃	0.68	4.5	3	−1	−1 / 27.5	−5	2	−1.5 / 3	0	0	0	0	0 / 1	
	8	〃	〃	0.99	6.5	3	−1	1 / 28.5	−3	2	−0.5 / 2.5	1	0	0	3	1 / 2	
	12	〃	〃	1.33	8.75	4	−1	1.5 / 30	−3	2	−0.5 / 2	1	0	0	3	1 / 3	
	16	〃	〃	1.67	11.0	2	−3	−0.5 / 30.5	−2	2	0 / 2	4	0	0	3	1.8 / 4.8	
	20	〃	〃	2.01	13.25	2	−2	0 / 30.5	−1	1	0 / 2	3	0	0	4	1.8 / 6.6	
	24	〃	〃	2.35	15.50	2	−2	0 / 30.5	−1	1	0 / 2	2	0	0	2	1 / 7.6	
	28	〃	〃	2.65	17.50	1	−1	0 / 30.5	−3	2	−0.5 / 1.5	1	0	0	1	0.5 / 8.1	
	32	〃	〃	3.00	19.75	0	−1	−0.5 / 30	−1	0	−0.5 / 1	4	0	0	1	1.3 / 9.4	
	36	〃	〃	3.34	22.0	1	−1	0 / 30	−1	0	−0.5 / 0.5	5	0	0	1	1.5 / 10.9	
	40	〃	〃	3.68	24.25	0	0	0 / 30	−2	1	−0.5 / 0	3	0	0	4	1.8 / 12.7	
	44	〃	〃	4.02	26.5	0	−2	−1 / 29	−1	0	−0.5 / −0.5	2	0	0	4	1.5 / 14.2	
	48	〃	〃	4.32	28.5	0	−1	−0.5 / 28.5	−2	2	0 / −0.5	5	0	0	4	2.3 / 16.5	
	52	〃	〃	4.66	30.75	0	−2	−1 / 27.5	−2	2	0 / −0.5	5	0	0	6	2.8 / 19.3	
	56	〃	〃	5.00	33.0	0	−1	−0.5 / 27	−3	2	−0.5 / −1	3	0	0	1	1 / 20.3	
	1:00	〃	〃	5.35	35.25	0	−2	−1 / 26	−2	2	0 / −1	3	0	0	2	1.3 / 21.6	
	4	〃	〃	5.69	37.5	0	−3	−1.5 / 24.5	−3	2	−0.5 / −1.5	3	0	0	8	2.8 / 24.4	
	8	〃	〃	5.99	39.5	0	−2	−1 / 23.5	−5	2	−1.5 / −3	2	0	0	8	2.5 / 26.9	
	12	〃	〃	6.33	41.75	0	−1	−0.5 / 23	−4	0	−2 / −5	4	2	3	2	2.8 / 29.7	
	16	〃	〃	6.67	44.0	0	−2	−1 / 22	−5	1	−2 / −7	5	3	2	2	3 / 32.7	
	20	〃	〃	7.01	46.25	0	−1	−0.5 / 21.5	−7	1	−3 / −10	2	2	3	1	2 / 34.7	
	24	〃	〃	7.36	48.5	0	−2	−1 / 20.5	−2	1	−0.5 / −10.5	3	3	3	2	2.8 / 37.5	
	28	〃	〃	7.66	50.5	0	−1	−0.5 / 20	−3	2	−0.5 / −11	5	5	5	4	4.8 / 42.3	
	32	〃	〃	8.00	52.75	0	−2	−1 / 19	−4	1	−1.5 / −12.5	5	7	6	5	5.8 / 48.1	
	36	〃	〃	8.34	55.0	0	−2	−1 / 18	−2	2	0 / −12.5	5	6	6	2	4.8 / 52.9	
	40	〃	〃	8.68	57.25	0	−2	−1 / 17	−1	1	0 / −12.5	3	5	6	3	4.3 / 57.2	
	44	〃	〃	9.02	59.5	0	−2	−1 / 16	−2	1	−0.5 / −13	7	6	6	3	5.5 / 62.7	
	48	〃	〃	9.33	61.5	−2	−10	−6 / 10	−2	1	−0.5 / −13.5	4	6	5	4	4.8 / 67.5	
	52	〃	〃	9.67	63.75	−3	−4	−3.5 / 6.5	−3	1	−1 / −14.5	6	10	6	8	7.5 / 75.	
	56	〃	〃	10.01	66.0	−2	−3	−2.5 / 4	−2	0	−1 / −15.5	8	5	4	8	6.3 / 81.3	
	2:00	〃	〃	10.35	68.25	−2	−6	−4 / 0	−3	0	−1.5 / −17	9	3	2	10	6 / 87.3	
	4	〃	〃	10.69	70.5	−3	−7	−5 / −5	−3	2	−0.5 / −17.5	8	2	2	10	5.5 / 92.8	

ROCK SHEAR TEST DATA SHEET (3)

Measuring Point TD 10.8m Block No. DA-2, BS-1 N = 2 kg/cm²

Time	Time Elapsed	Vertical Jack: Vertical Stress (kg/cm²)	Vertical Jack: Jack Pressure (kg/cm²)	Diagonal Jack: Horizontal Stress (kg/cm²)	Diagonal Jack: Jack Pressure (kg/cm²)	Vertical Displacement (x 10⁻³ mm): ①	②	(①+②)/2	③	④	(③+④)/2	Horizontal Displacement (x 10⁻³ mm): ⑤	⑥	⑦	⑧	(⑤−⑧)/4	Remarks
	8	2	14	11.0	72.5	-4	-8	-6 / -41	-2	0	-1 / -185	5	7	5	3	5 / 518	
	12	"	"	11.34	74.75	-5	-9	-7 / -48	-2	0	-1 / -195	6	8	7	4	6.3 / 1041	
	16	"	"	11.68	77.0	-7	-10	-8.5 / -265	-5	0	-2.5 / -22	12	16	18	13	14.8 / 1189	
	20	"	"	12.02	79.25	-5	-18	-11.5 / -38	-7	0	-3.5 / -255	12	26	55	26	29.8 / 1487	
	24	"	"	12.36	81.5	-6	-27	-16.5 / -545	-9	0	-4.5 / -30	20	13	10	20	15.8 / 1645	
	28	"	"	12.66	83.5	-7	-23	-15 / -695	-6	-2	-4 / -34	15	25	30	30	25 / 1895	
	32	"	"	13.01	85.75	-9	-28	-18.5 / -88	-20	-1	-10.5 / -445	24	28	24	17	23.3 / 2128	
	36	"	"	13.35	88.0	-27	-30	-28.5 / -1165	-21	-2	-11.5 / -56	17	22	38	24	25.3 / 2381	
	40	"	"	13.69	90.25	-18	-42	-30 / -1465	-21	-2	-11.5 / -67.5	38	52	23	34	36.8 / 2749	
	44	"	"	14.03	92.5	-35	-37	-36 / -1825	-59	-2	-30.5 / -98	40	38	22	16	29 / 3039	
	48	"	"	14.33	94.5	-19	-38	-28.5 / -211	-31	-2	-16.5 / -1145	21	45	52	48	41.3 / 3452	
	52	"	"	14.67	96.75	-26	-25	-25.5 / -2365	-22	-5	-13.5 / -128	50	25	24	20	29.8 / 3754	
	56	"	"	15.01	99.0	-15	-35	-25 / -2615	-18	-13	-15.5 / -143.5	5	36	28	41	26.3 / 4013	
	3:00	"	"	15.36	101.25	-36	-40	-38 / -2995	-29	-20	-24.5 / -168	25	49	36	53	40.8 / 4421	
	4	"	"	15.70	103.5	-43	-50	-46.5 / -346	-31	-10	-20.5 / -188.5	50	45	75	46	54 / 4961	
	8	"	"	16.00	105.5	-18	-45	-31.5 / -3775	-59	-15	-37 / -225.5	30	47	44	52	40.3 / 5319	
	12	"	"	16.34	107.75	-36	-37	-36.5 / -444	-31	-5	-18 / -243.5	50	63	34	31	44.5 / 5839	
	16	"	"	16.68	110.0	-44	-48	-46 / -460	-23	-32	-27.5 / -271	50	18	32	25	31.3 / 6152	
	20	"	"	17.02	112.25	-24	-35	-29.5 / -489.5	-25	-24	-24.5 / -295.5	16	62	21	44	35.8 / 651	
	24	"	"	17.37	114.5	-49	-50	-49.5 / -539	-31	-31	-31 / -326.5	54	50	41	60	51.3 / 7023	
	28	"	"	17.67	116.5	-36	-65	-50.5 / -589.5	-44	-49	-46.5 / -373	80	60	53	84	69.3 / 7716	
	32	"	"	17.97	118.5	-65	-115	-90 / -679.5	-39	-43	-41 / -414	64	110	77	87	84.5 / 8561	
	36	"	"	18.35	121.0	-50	-175	-112.5 / -792	-83	-50	-41.5 / -455.5	74	20	110	93	74.3 / 9304	
	40	"	"	18.65	123.0	-48	-105	-76.5 / -868.5	-39	-31	-35 / -490.5	63	80	57	56	64 / 9944	
	44	"	"	18.96	125.0	-51	-100	-75.5 / -944	-53	-44	-48.5 / -539	79	110	72	86	86.8 / 10812	
	48	"	"	19.34	127.5	-77	-149	-113 / -1057	-65	-50	-57.5 / -596.5	101	121	117	86	106.3 / 11875	
	52	"	"	19.65	129.75	-28	-94	-61 / -1118	-31	-24	-27.5 / -624	69	85	57	67	69 / 12554	
	56	"	"	20.02	132.0	-40	-77	-60.5 / -1178.5	-41	-33	-37 / -661	50	64	69	53	59 / 13145	
	4:00	"	"	20.36	134.25	-86	-120	-82.5 / -1266	-56	-47	-51.5 / -712.5	100	90	64	83	84.3 / 13988	
	4	"	"	20.70	136.5	-103	-185	-144.5 / -1409.5	-87	-84	-85.5 / -798	140	70	163	155	132 / 15306	
	8	"	"	21.01	138.5	-163	-405	-284 / -1693.5	-269	-374	-321.5 / -1119.5	330	430	447	140	336.8 / 16626	
	12	"	"	21.38	141.0	-338	-720	-529 / -2222.5	-1073	-261	-667 / -1786.5	820	850	633	820	780.8 / 26984	

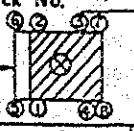
ROCK SHEAR TEST DATA SHEET (1)

Test Location DA-2, BS-2 Measuring Point TD. 12.0m Date Measured 19.11.1988 Block No. N = 4 kgf/cm²

Geological Classification Ophiolite Rock Grade Measured by

Vertical Jack Capacity 200 ton x 1 units, Max. Oil Pressure 396.3 kg/cm² Ram Diameter ø25.35cm A = 3600 cm²

Diagonal Jack Capacity 200 ton x 2 units, Max. Oil Pressure 701.7 kg/cm² Ram Diameter ø19.95cm θ = 16.7 °



Time	Time Elapsed	Vertical Jack: Vertical Stress (kg/cm²)	Vertical Jack: Jack Pressure (kg/cm²)	Diagonal Jack: Horizontal Stress (kg/cm²)	Diagonal Jack: Jack Pressure (kg/cm²)	Vertical Displacement (×10⁻³ mm): ①	②	①+② / 2	③	④	③+④ / 2	Horizontal Displacement (×10⁻³ mm): ⑤	⑥	⑦	⑧	⑤−⑧ / 4	Remarks
	0	1	7			0	0	0 / 0	0	0	0 / 0	0	0	0	0	0 / 0	
	4	2	14			2	2	2 / 2	1	0	0.5 / 0.5	0	0	0	0	0 / 0	
	8	2	14			0	0	0 / 2	1	0	0.5 / 1	0	0	0	0	0 / 0	
	16	0	0			−1	−1	−1 / −1	−1	0	−0.5 / −0.5	0	0	0	0	0 / 0	
	20	0	0			0	−1	−0.5 / 0.5	0	0	0 / 0.5	0	0	0	0	0 / 0	
	28	2	14			1	2	1.5 / 2	1	−1	0 / 0.5	0	0	0	0	0 / 0	
	32	3	21			0	2	1 / 3	0	0	0 / 0.5	0	0	−5	0	−2.5 / −2.5	
	36	4	29			0	2	1 / 4	0	0	0 / 0.5	0	−5	−4	0	−4.5 / −7	
	40	4	29			0	2	1 / 5	0	0	0 / 0.5	0	−4	−2	0	−3 / −10	
	42	4	29			0	2	1 / 6	0	0	0 / 0.5	0	0	0	0	0 / −10	
	45	4	29			0	0	0 / 6	0	0	0 / 0.5	0	0	0	0	0 / −10	

ROCK SHEAR TEST DATA SHEET (2)

Measuring Point TD12.0 Block No. DA-2, BS-2 N = 4 kg/cm²

Time	Time Elapsed	Vertical Jack: Vertical Stress (kg/cm²)	Vertical Jack: Jack Pressure (kg/cm²)	Diagonal Jack: Horizontal Stress (kg/cm²)	Diagonal Jack: Jack Pressure (kg/cm²)	Vertical Displacement (x 10⁻³ mm) ①	②	(①+②)/2	③	④	(③+④)/2	Horizontal Displacement (x 10⁻³ mm) ⑤	⑥	⑦	⑧	(⑤−⑧)/4	Remarks
	0	4	29	0.34	2.25	0	0	0/6	0	0	0/0.5	0	0	0	0	0/-10	
	4	〃	〃	0.68	4.5	0	0	0/6	0	0	0/0.5	0	0	0	0	0/-10	
	8	〃	〃	0.99	6.5	0	0	0/6	0	0	0/0.5	0	0	0	0	0/-10	
	12	〃	〃	1.33	8.75	0	0	0/6	0	0	0/0.5	0	0	0	0	0/-10	
	16	〃	〃	1.67	11.0	0	0	0/6	0	0	0/0.5	0	2	0	0	0.5/-8.5	
	20	〃	〃	2.01	13.25	0	0	0/6	0	0	0/0.5	0	2	0	0	0.5/-9	
	24	〃	〃	2.35	15.50	0	0	0/6	0	0	0/0.5	0	3	2	0	1.3/-7.7	
	28	〃	〃	2.65	17.5	0	0	0/6	0	0	0/0.5	0	2	1	0	0.8/-6.9	
	32	〃	〃	3.00	19.75	0	0	0/6	0	0	0/0.5	0	9	6	0	3.8/-3.1	
	36	〃	〃	3.34	22.0	0	0	0/6	0	0	0/0.5	0	7	7	0	3.5/-0.4	
	40	〃	〃	3.68	24.25	−1	−1	−1/5	0	0	0/0.5	3	8	7	0	4.5/-0.9	
	44	〃	〃	4.02	26.5	−1	−2	−1.5/3.5	0	0	0/0.5	5	6	8	0	4.8/-0.7	
	48	〃	〃	4.32	28.5	−2	0	−1/2.5	−2	−1	−1.5/−1	1	8	2	3	2.5/-13.2	
	52	〃	〃	4.66	30.75	−2	−2	−2/0.5	−2	−2	−2/−3	1	8	6	0	3.8/-17	
	56	〃	〃	5.00	33.0	−7	−1	−4/−3.5	−1	−1	−1/−4	5	7	12	4	7/-24	
	1:00	〃	〃	5.35	35.25	−9	−2	−5.5/−8.5	−1	−1	−1/−6	5	7	13	3	7/-31	
	4	〃	〃	5.69	37.5	−11	−6	−8.5/−17	−2	−2	−2/−7	12	20	16	10	14.5/-45.5	
	8	〃	〃	5.99	39.5	−11	−6	−8.5/25.5	0	−1	−0.5/−7.4	13	15	18	4	12.5/-58	
	12	〃	〃	6.33	41.75	−10	−7	−8.5/−34	−2	−2	−2/−9.5	7	20	20	6	13.3/-71.3	
	16	〃	〃	6.67	44.0	−10	−9	−9.5/−43.5	−6	−3	−4.5/−14	8	20	22	5	13.8/-85.1	
	20	〃	〃	7.01	46.25	−18	−15	−16.5/−60	−5	−4	−4.5/−18.5	5	25	30	5	16.3/-101.4	
	24	〃	〃	7.36	48.5	−20	−24	−22/−82	−7	−4	−5.5/−24	7	65	36	9	29.3/-130.7	
	28	〃	〃	7.66	50.5	−28	−25	−26.5/−108.5	−4	−4	−4/−28	13	40	38	11	25.5/-156.2	
	32	〃	〃	8.00	52.75	−27	−12	−19.5/−128	−8	−7	−7.5/−35.5	23	40	71	28	40.5/-196.7	
	36	〃	〃	8.34	55.0	−43	−31	−37/−165	−10	−12	−11/−46.5	12	80	59	25	44/-240.7	
	40	〃	〃	8.68	57.25	−24	−22	−23/−188	−21	−18	−19.5/−66	10	55	53	50	42/-282.7	
	44	〃	〃	9.02	69.5	−49	−41	−45/−233	−9	−12	−10.5/−76.5	−2	65	82	28	43.3/-326	
	48	〃	〃	9.33	61.5	−52	−33	−42.5/−275.5	−12	−15	−13.5/−90	56	90	87	67	75/-401	
	52	〃	〃	9.67	63.75	−49	−26	−37.5/−313	−15	−23	−19/−109	46	55	61	22	48.5/-449.5	
	56	〃	〃	10.01	66.0	−36	−40	−38/−351	−13	−14	−13.5/−122.5	28	65	77	30	50/-499.5	
	2:00	〃	〃	10.35	68.25	−45	−20	−32.5/−383.5	−9	−13	−11/−133.5	52	60	62	34	52/-547.5	
	4	〃	〃	10.69	70.5	−65	−46	−50.5/−434	−16	−35	−25.5/−159	64	90	88	41	70.8/-622.3	

ROCK SHEAR TEST DATA SHEET (3) Measuring Point TD 12.0m Block No. DA-2. BS-2 N = 4 kg/cm²

Time	Time Elapsed	Vertical Jack: Vertical Stress (kg/cm²)	Vertical Jack: Jack Pressure (kg/cm²)	Diagonal Jack: Horizontal Stress (kg/cm²)	Diagonal Jack: Jack Pressure (kg/cm²)	Vertical Displacement (x 10⁻³ mm): ①	②	①+②/2	③	④	③+④/2	Horizontal Displacement (x 10⁻³ mm): ⑤	⑥	⑦	⑧	⑤−⑧/4	Remarks
	08	4	29	11.00	72.5	−44	−34	−39 / −478	−8	−13	−10.5 / −169.5	54	75	72	42	60.8 / 688.1	
	12	〃	〃	11.84	74.75	−43	−31	−37 / −570	−17	−17	−17 / −186.5	62	75	78	57	68 / 751.1	
	16	〃	〃	11.68	77.0	−47	−49	−48 / −556	−12	−16	−14 / −200.5	50	90	82	49	67.8 / 918.9	
	20	〃	〃	12.02	79.25	−43	−27	−35 / −583	−18	−24	−21 / −241.5	59	80	81	87	76.8 / 885.7	
	24	〃	〃	12.36	81.5	−54	−50	−52 / −685	−19	−24	−21.5 / −243	51	95	94	20	65 / 960.7	
	28	〃	〃	12.66	83.5	−36	−33	−34.5 / −679.5	−14	−23	−18.5 / −261.5	69	35	101	90	73.8 / 1074.5	
	32	〃	〃	13.01	85.75	−43	−20	−31.5 / −721	−7	−11	−9 / −270.5	36	120	62	10	57 / 1071.5	
	36	〃	〃	13.35	88.0	−50	−40	−45 / −766	−26	−37	−31.5 / −302	46	70	70	61	61.5 / 1163.3	
	40	〃	〃	13.69	90.25	−40	−35	−37.5 / −828.3	−15	−23	−19 / −321	49	60	55	56	55 / 1208.3	
	44	〃	〃	14.03	92.5	−32	−35	−33.5 / −867	−24	−24	−24 / −345	49	80	75	81	71.3 / 1279.6	
	48	〃	〃	14.33	94.5	−53	−52	−52.5 / −919.5	−25	−33	−29 / −374	71	103	100	50	81 / 1360.6	
	52	〃	〃	14.67	96.75	−77	−48	−62.5 / −982	−32	−65	−48.5 / −422.5	90	122	118	104	108.5 / 1469.1	
	56	〃	〃	15.01	99.0	−50	−60	−55 / −997	−43	−45	−44 / −466.5	75	97	105	78	88.8 / 1558.9	
	3:00	〃	〃	15.36	101.25	−150	−130	−140 / −1137	−50	−140	−120 / −586.5	200	388	82	214	221 / 1779.7	
	04	〃	〃	15.70	103.5	−190	−145	−167.5 / −1304.5	−115	−95	−105 / −691.5	380	540	605	558	528.3 / 2307.4	
	08	〃	〃	16.00	105.5	−805	−773	−789 / −2093.5	−475	−658	−576.5 / −1268	1905	980	1540	797	1279 / 3586.4	

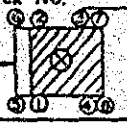
ROCK SHEAR TEST DATA SHEET (1)

Test Location DA-2. BS-3 Measuring Point TD 13.5m Date Measured 21.11.1988 Block No. N = 6 kgf/cm²

Geological Classification Ophiolite Rock Grade Measured by

Vertical Jack Capacity 200 ton x 1 units, Max. Oil Pressure 396.3 kg/cm² Ram Diameter ø25.35cm A = 3600 cm²

Diagonal Jack Capacity 200 ton x 2 units, Max. Oil Pressure 701.7 kg/cm² Ram Diameter ø19.05cm θ = 16.7 °



Time	Time Elapsed	Vertical Jack: Vertical Stress (kg/cm²)	Vertical Jack: Jack Pressure (kg/cm²)	Diagonal Jack: Horizontal Stress (kg/cm²)	Diagonal Jack: Jack Pressure (kg/cm²)	Vertical Displacement (×10⁻³ mm): ①	②	(①+②)/2	③	④	(③+④)/2	Horizontal Displacement (×10⁻³ mm): ⑤	⑥	⑦	⑧	(⑤~⑧)/4	Remarks
	0	1	7			0	0	0/0	0	0	0/0	0	0	0	0	0/0	
	4	2	14			3	16	9.5/6.5	7	-3	2/2	0	0	0	0	0/0	
	8	2	14			0	6	3/12.5	2	0	1/3	0	0	0	0	0/0	
	16	0	0			-2	0	-1/11.5	4	-1	1.5/4.5	0	2	0	0	0.5/0.5	
	20	0	0			0	0	0/0	2	-2	0/4.5	0	0	0	0	0/0.5	
	28	2	14			2	7	4.5/16	1	0	0.5/5	0	0	0	0	0/0.5	
	32	3	21			1	14	7.5/23.5	6	0	3/8	0	0	0	0	0/0.5	
	36	4	29			0	20	10/33.5	10	0	5/13	5	13	0	0	4.5/5	
	40	5	36			1	12	6.5/40	11	0	5.5/18.5	5	0	0	1	1.5/6.5	
	44	6	43			0	6	3/43	1	0	0.5/19	0	5	0	0	1.3/7.8	
	48	6	43			0	4	2/45	1	0	0.5/19.5	0	0	0	0	0/7.8	
	50	6	43			0	3	1.5/46.5	1	0	0.5/20	0	0	0	0	0/7.8	
	53	6	43			0	2	1/47.5	2	0	1/21	0	0	0	0	0/7.8	
	58	6	43			0	0	0/47.5	0	0	0/21	0	0	0	0	0/7.8	

ROCK SHEAR TEST DATA SHEET (2) Measuring Point TD 13.5m Block No. DA-2, BS-3 N = 6 kg/cm²

Time	Time Elapsed	Vertical Jack: Vertical Stress (kg/cm²)	Vertical Jack: Jack Pressure (kg/cm²)	Diagonal Jack: Horizontal Stress (kg/cm²)	Diagonal Jack: Jack Pressure (kg/cm²)	Vertical Displacement (x 10⁻³ mm): ①	②	①+② / 2	③	④	③+④ / 2	Horizontal Displacement (x 10⁻³ mm): ⑤	⑥	⑦	⑧	(⑤−⑧) / 4	Remarks
	0	6	43	0.34	2.25	0	0	0/4.75	0	0	0/2.1	0	0	0	0	0/7.8	
	4	〃	〃	0.68	4.5	0	0	0/4.75	2	0	1/2.2	0	0	0	0	0/7.8	
	8	〃	〃	0.99	6.5	0	2	1/6.85	2	0	1/2.3	0	1	0	0	0.3/8.1	
	12	〃	〃	1.33	8.75	0	1	0.5/4.9	1	0	0.5/2.35	0	1	0	1	0.5/8.6	
	16	〃	〃	1.67	11.0	0	1	0.5/4.95	1	0	0.5/2.4	3	0	0	1	1/9.6	
	20	〃	〃	2.01	13.25	0	0	0/4.95	1	0	0.5/2.45	2	1	0	2	1.3/10.9	
	24	〃	〃	2.35	15.50	0	1	0.5/5.0	1	0	0.5/2.5	2	3	0	2	1.8/12.7	
	28	〃	〃	2.65	17.5	0	0	0/5.0	1	0	0.5/2.55	3	3	3	3	3/15.7	
	32	〃	〃	3.00	19.75	0	0	0/5.0	1	0	0.5/2.6	4	2	1	3	2.5/18.2	
	36	〃	〃	3.34	22.0	0	1	0.5/5.05	2	0	1/2.7	3	1	0	3	1.8/20	
	40	〃	〃	3.68	24.25	0	0	0/5.05	1	0	0.5/2.75	2	4	4	2	3/23	
	44	〃	〃	4.02	26.5	0	0	0/5.05	1	0	0.5/2.8	2	4	4	3	3.3/26.3	
	48	〃	〃	4.32	28.5	0	0	0/5.05	0	0	0/2.8	4	3	4	4	3.8/30.1	
	52	〃	〃	4.66	30.75	−1	0	−0.5/5.0	0	0	0/2.8	5	2	2	4	3.3/36.4	
	56	〃	〃	5.00	33.0	0	0	0/5.0	1	0	0.5/2.85	4	2	3	4	3.3/36.7	
	1:00	〃	〃	5.35	35.25	0	0	0/5.0	0	0	0/2.85	3	3	2	5	3.3/40	
	4	〃	〃	5.69	37.5	0	0	0/5.0	1	−1	0/2.85	2	4	3	3	3/43	
	8	〃	〃	5.99	39.5	−1	0	−0.5/4.95	0	0	0/2.85	1	4	4	3	3/46	
	12	〃	〃	6.33	41.75	0	0	0/4.95	0	0	0/2.85	5	2	1	7	3.8/49.8	
	16	〃	〃	6.67	44.0	−1	0	−0.5/4.9	1	0	0.5/2.9	5	1	1	5	3/52.8	
	20	〃	〃	7.01	46.25	−3	−1	−2/4.7	0	0	0/2.9	2	4	5	3	3.5/56.3	
	24	〃	〃	7.36	48.5	−4	−2	−3/4.4	0	0	0/2.9	2	4	3	3	3/59.3	
	28	〃	〃	7.66	50.5	−6	−3	−4.5/3.95	0	0	0/2.9	11	3	3	5	5.5/64.8	
	32	〃	〃	8.00	52.75	−7	−3	−5/3.45	0	0	0/2.9	10	4	5	6	6.3/71.1	
	36	〃	〃	8.34	55.0	−5	−2	−3.5/3.1	0	0	0/2.9	10	2	1	3	4/75.1	
	40	〃	〃	8.68	57.25	−6	−2	−4/2.7	0	0	0/2.9	15	2	1	3	5.3/80.4	
	44	〃	〃	9.02	59.5	−5	−10	−7.5/1.95	0	0	0/2.9	7	6	5	22	10/90.4	
	48	〃	〃	9.33	61.5	−5	−10	−7.5/1.2	−1	0	−0.5/2.85	8	6	6	8	7/97.4	
	52	〃	〃	9.67	63.75	−9	−13	−11/1	−3	0	−1.5/2.8	8	8	0	11	6.8/104.2	
	56	〃	〃	10.01	66.0	−8	−16	−12/−11	−4	−3	−3.5/2.45	7	6	4	13	7.5/111.7	
	2:00	〃	〃	10.35	68.25	−16	−36	−26/−37	−6	−3	−4.5/2.0	25	30	30	20	26.3/138	
	4	〃	〃	10.69	70.5	−12	−28	−20/−57	−7	−2	−4.5/1.55	23	14	17	13	16.8/154.8	

ROCK SHEAR TEST DATA SHEET (3) Measuring Point TD 13.5m Block No. DA-2, BS-3 N = 6 kg/cm²

Time	Time Elapsed	Vertical Jack: Vertical Stress (kg/cm²)	Vertical Jack: Jack Pressure (kg/cm²)	Diagonal Jack: Horizontal Stress (kg/cm²)	Diagonal Jack: Jack Pressure (kg/cm²)	Vertical Displacement (x 10⁻³ mm): ①	②	(①+②)/2	③	④	(③+④)/2	Horizontal Displacement (x 10⁻³ mm): ⑤	⑥	⑦	⑧	(⑤−⑧)/4	Remarks
	8	6	43	11.00	72.5	−4	−4	−4 / −61	−2	−3	−2.5 / 12	4	4	4	9	5.3 / 160.1	
	12	〃	〃	11.34	74.75	−5	−3	−4 / −65	−2	−3	−2.5 / 8.5	5	4	4	9	5.5 / 165.6	
	16	〃	〃	11.68	77.0	−19	−20	−19.5 / −845	−5	−11	−8 / 1.5	15	11	8	27	15.3 / 180.9	
	20	〃	〃	12.02	79.25	−19	−20	−19.5 / −104	−6	−12	−9 / −7.5	21	7	7	28	15.8 / 198.4	
	24	〃	〃	12.36	81.5	−48	−42	−45 / −149	−20	−4	−12 / −19.5	39	13	2	30	21 / 217.4	
	28	〃	〃	12.66	83.5	−40	−38	−39 / −188	−22	−7	−14.5 / −34	40	25	18	27	27.5 / 244.9	
	32	〃	〃	13.01	85.75	−100	−110	−105 / −293	−33	−41	−37 / −71	70	65	60	59	63.5 / 308.4	
	36	〃	〃	13.35	88.0	−72	−105	−88.5 / −381.5	−40	−40	−40 / −111	80	58	57	77	68 / 376.4	
	40	〃	〃	13.69	90.25	−74	−60	−67 / −448	−22	−77	−49.5 / −160.5	60	22	40	78	50 / 426.4	
	44	〃	〃	14.03	92.5	−53	−65	−59 / −507.5	−21	−3	−12 / −172.5	45	50	38	30	40.8 / 467.2	
	48	〃	〃	14.33	94.5	−40	−39	−39.5 / −547	−14	−25	−19.5 / −192	35	20	25	42	30.5 / 497.7	
	52	〃	〃	14.67	96.75	−42	−46	−44 / −591	−18	−4	−22 / −214	37	40	89	29	48.8 / 546.5	
	56	〃	〃	15.01	99.0	−35	−29	−32 / −623	−5	−28	−16.5 / −230.5	23	5	46	19	23.3 / 569.8	
	3:00	〃	〃	15.36	101.25	−40	−41	−40.5 / −663.5	−24	−10	−17 / −247.5	25	23	37	50	33.8 / 603.6	
	4	〃	〃	15.70	103.5	−58	−65	−61.5 / −725	−43	−38	−41 / −288.5	75	42	19	37	43.3 / 646.9	
	8	〃	〃	16.00	105.5	−38	−36	−37 / −762	−13	−10	−11.5 / −300	20	12	18	25	18.8 / 665.7	
	12	〃	〃	16.34	107.75	−29	−21	−25 / −787	−14	−5	−9.5 / −309.5	28	16	19	18	24.3 / 690	
	16	〃	〃	16.68	110.0	−43	−14	−28.5 / −815.5	−18	−50	−34 / −343.5	34	13	42	55	36 / 726	
	20	〃	〃	17.02	112.25	−41	−69	−55 / −870.5	−25	−10	−17.5 / −361	33	54	20	26	33.3 / 759.3	
	24	〃	〃	17.37	114.5	−19	−35	−27 / −897.5	−8	−10	−9 / −370	32	10	40	14	24 / 783.3	
	28	〃	〃	17.67	116.5	−35	−30	−32.5 / −930	−15	−10	−12.5 / −382.5	33	15	37	47	33 / 816.3	
	32	〃	〃	17.97	118.5	−40	−45	−42.5 / −972.5	−13	−21	−17 / −399.5	30	45	26	41	35.5 / 851.8	
	36	〃	〃	18.35	121.0	−37	−43	−40 / −1012.5	−19	−19	−19 / −418.5	38	15	45	24	30.5 / 882.3	
	40	〃	〃	18.65	123.0	−43	−44	−43.5 / −1056	−40	−28	−34 / −452.5	42	22	32	48	36 / 918.3	
	44	〃	〃	18.96	125.0	−33	−63	−48 / −1104	−25	−1	−13 / −465.5	35	43	59	33	42.5 / 960.8	
	48	〃	〃	19.34	127.5	−10	−10	−10 / −1114	−1	0	−0.5 / −466	5	5	9	6	6.3 / 967.1	
	52	〃	〃	19.68	129.75	−12	−22	−17 / −1131	−9	−11	−10 / −476	34	26	43	23	31.5 / 998.6	
	56	〃	〃	20.02	132.0	−32	−42	−37 / −1168	−28	−17	−22.5 / −498.5	41	24	58	33	39 / 1037.6	
	4:00	〃	〃	20.36	134.25	−33	−68	−50.5 / −1218.5	−29	−20	−24.5 / −523	25	60	9	35	32.3 / 1069.9	
	4	〃	〃	20.70	136.5	−15	−18	−16.5 / −1235	−19	−28	−23.5 / −546.5	20	22	24	18	21 / 1090.9	
	8	〃	〃	21.01	138.5	−38	−45	−41.5 / −1276.5	−21	−12	−16.5 / −563	35	18	63	32	37 / 1127.9	
	12	〃	〃	21.38	141.0	−37	−65	−51 / −1327.5	−48	−11	−29.5 / −592.5	45	55	32	40	43 / 1169.9	