Queensland Government
Department of Main Roads

ENGINEERING BOREHOLE LOG

FOR GEOTECHNICAL TERMS AND SYMBOLS REFER FORM F:GEOT 017/5-2009

BOREHOLE No BH016
SHEET 1 of 2
REFERENCE No H10583

PROJECT BRUCE HIGHWAY (COOROY - CURRA) SECTION A GEOTECHNICAL INVESTIGATION
LOCATION Cut 10 COORDINATES 486845.1 E; 7080844.3 N
PROJECT No FG5825 SURFACE R.L. 133.98m PLUNGE DATE STARTED 22/7/09 GRID DATUM MGA94
JOB No 128/10A/901 HEIGHT DATUM AHD BEARING DATE COMPLETED 22/7/09 DRILLER Geodrill

DEPTH (m)	R.L. (m)	AUGER / CASING / CORE DRILLING	RQD ( )% CORE REC %	SAMPLE	MATERIAL DESCRIPTION	LITHOLOGY	USC	WEATHERING	INTACT STRENGTH (EH VH H M L VL EL)	DEFECT SPACING (mm) (20 60 200 600 2000)	GRAPHIC LOG	ADDITIONAL DATA AND TEST RESULTS	SAMPLES	TESTS
0	133.98				**Clayey SILT (RESIDUAL)** Red to brown, moist, firm.									
				A	Slight rock fabric in parts.		(MI)					2,2,3 N=5		SPT
1														
	132.48				**PHYLLITE (XW):** Pale grey to brown, moist, very stiff to hard, silty clay.									
				B	Rock fabric visible throughout; occasional fine quartz gravels.		XW					5,10,12 N=22		SPT
2														
				C								11,15,16 N=31		SPT
3	130.78				**PHYLLITE (HW):** Pale grey to green, fine grained, foliated.									
				D	Rock is highly fractured and clay altered; quartz veins throughout.		HW					29,30/145 N>50		SPT
4			(0)											
	129.81				**PHYLLITE (MW):** Pale grey to slightly green, fine grained, foliated.							Broken zone		
			47				MW							
			(0)											
			100											
5	128.98		(0)		Defects are generally very closely spaced.									
			100		Prominent defect set parallel to foliation with occasional steeply dipping sets.									
			(0)											
					Defect surfaces are typically thinly clay infilled.							Broken zone		
			67				HW							
6			(0)		**PHYLLITE (HW):** Pale grey to slightly green, fine grained, foliated.							Clay seam		
			67											
			(0)		Foliations dip at ~20-30°.									
	127.25													
			88		Rock is highly fractured and clay altered.									
7			(31)		**PHYLLITE (MW):** Dark grey, fine grained, foliated.							Is(50) = 0.12MPa Is(50) = 0.06MPa		x o
					Foliations are disturbed and dip at ~70°.							Is(50) = 0.08MPa Is(50) = 0.06MPa Is(50) = 0.11MPa Is(50) = 0.05MPa		x o x o
					Defects are generally closely spaced.									
			100											
8			(0)		Visible defect set at ~30°.									
			80		Defect surfaces are typically iron stained with slight clay infilling.		MW							
			(0)											
			90		Quartz veins throughout.							Is(50) = 0.37MPa Is(50) = 0.49MPa		x o
			(0)		**Detailed defect descriptions are shown on Form GEOT533/8 attached.**									
9			100		8.25 - 10.65m: Altered contact zone.							Altered contact zone.		
			(0)											
			100											
			(0)											
10			100											
			(0)											

REMARKS **Detailed defect descriptions are shown on Form GEOT533/8 attached.** RAAX images taken of borehole.

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Queensland Government
Department of Main Roads

ENGINEERING BOREHOLE LOG

FOR GEOTECHNICAL TERMS AND SYMBOLS REFER FORM F:GEOT 017/5-2009

BOREHOLE No BH016
SHEET 2 of 2
REFERENCE No H10583

PROJECT BRUCE HIGHWAY (COOROY - CURRA) SECTION A GEOTECHNICAL INVESTIGATION
LOCATION Cut 10 COORDINATES 486845.1 E; 7080844.3 N
PROJECT No FG5825 SURFACE R.L. 133.98m PLUNGE ____ DATE STARTED 22/7/09 GRID DATUM MGA94
JOB No 128/10A/901 HEIGHT DATUM AHD BEARING ____ DATE COMPLETED 22/7/09 DRILLER Geodrill

DEPTH (m)	R.L. (m)	AUGER / CASING / CORE DRILLING	RQD ( )% / CORE REC %	SAMPLE	MATERIAL DESCRIPTION	LITHOLOGY	USC	WEATHERING	INTACT STRENGTH (EH VH H M L VL EL)	DEFECT SPACING (mm) (20 60 200 600 2000)	GRAPHIC LOG	ADDITIONAL DATA AND TEST RESULTS	SAMPLES	TESTS
10	123.98				**PHYLLITE (MW):** (Cont'd)			MW				Altered contact zone. Is(50) = 3.52MPa Is(50) = 3.22MPa		x o
	123.32													
11			100 (0) 100 (0)		**ANDESITE (MW):** Dark grey, fine grained, hard, heavily altered. Heavily jointed, small vesicles throughout. Defects are generally closely spaced, irregular and iron stained.									
12			100 (0)		Corestone development throughout. **Detailed defect descriptions are shown on Form GEOT533/8 attached.**			MW				Is(50) = 0.69MPa Is(50) = 0.87MPa Is(50) = 1.32MPa Is(50) = 0.23MPa		x o x o
13	120.93		100		Borehole terminated at 13.05m									
14														
15														
16														
17														
18														
19														
20														

REMARKS **Detailed defect descriptions are shown on Form GEOT533/8 attached.** RAAX images taken of borehole.

LOGGED BY JA

QLD_DMR_LIB_01.GLB Log A_ENGINEERING BOREHOLE LOG W LITHOLOGY FG5825 BRUCE HWY COOROY-CURRA SECTION A BHS.GPJ DWG95012.GDW Datgel CPT Tool gINt Add-in 12/05/2010 10:29

Project: **Bruce Highway Upgrade (Cooroy – Curra) Section A**

Borehole No: **BH16**

Start Depth: 3.80m
Finish Depth: 13.05m
Project No: FG5825
H No: 10583

0 100 200 300 400 500 600mm

SCALE 1:5

F:GEOT043/1

GEOTECHNICAL BRANCH LABORATORY
Materials Services - Brisbane
35 Butterfield Street, HERSTON Q 4006
Phone: (07) 3115 3035 Fax: (07) 3115 3011

Queensland Government
Department of Main Roads

DEFECT DESCRIPTIONS OF ENGINEERING BORELOGS

[CHARACTERISATION OF DEFECTS ARE IN ACCORDANCE WITH ISRM SUGGESTED METHODS (1981)]

BOREHOLE NO.:	BH16
SHEET:	1 of 3
REFERENCE NO.:	H10583

PROJECT: Bruce Highway (Cooroy – Curra) Section A Geotechnical Investigation

LOCATION: Cut 10

PROJECT NO.: FG5825 **SURFACE R.L.:** 133.97 **DRILLER:** R & D Drilling

JOB NO.: 120/10A/901 **DATUM:** MGA94 **DATE DRILLED:** 22/07/09

DEPTH	DEFECT TYPE	DIP°	PLANARITY	ROUGHNESS	APERTURE	WALL ALTERATION	OTHER
4.31	J	20°	Pl	S	O	FeSt	
4.33	J	20°	Pl	S	O	FeSt	
4.35	J	20°	Pl	S	O	FeSt	
4.37	J	20°	Pl	S	O	FeSt	
4.39	J	20°	Pl	S	O	FeSt	
4.42	J	20°	Pl	S	O	FeSt	
4.86	J	30°	Pl	S	O	FeSt	
4.89	J	30°	Pl	S	O	FeSt	
4.91	J	30°	Pl	S	O	FeSt	
4.95	J	30°	Pl	S	O	FeSt	
5.41	J	30°	Pl	S	O	FeSt	
6.51	J	10°	Pl	R	O		Cl
6.56	J	10°	Ir	R	O	FeSt	
6.59	J	10°	Pl	S	O	Cn	
6.63	J	10°	Ir	R	O	Cn	
6.67	J	20°	Pl	S	O	FeSt	
6.86	J	20°	Pl	S	O	Cn	
6.98	J	50°	Pl	S	O	Cn	

Abbreviations *(as per F: GEOT 017/5 – 2009)*

ROUGHNESS		WALL ALTERATIONS		TYPE		OTHER	
R	Rough	FeSt	Iron Stained	J, Js	Joint, Joints	Cl	Clay Infill
Sr	Slightly Rough	W	Weathered	B	Bedding	CLy	Clayey
S	Smooth	Smn	Secondary Mineralisation	BP	Bedding Parting	Co	Coal Seam
SL	Slickensided	Cn	Clean	FP	Foliation Parting	Carb	Carbonaceous
PO	Polished	MnSt	Manganese Stained	LP	Lamination Parting	Sl	Sand Infill
PLANARITY		**APERTURE**		CLV	Cleavage	QZ	Quartz
Pl	Planar	C	Closed	Fr	Fracture	CA	Calcite
St	Stepped	O	Open	SZ	Sheared Zone	Chl	Chlorite
Un	Undulating	F	Filled	CZ	Crushed Zone	In	Incipient
Cu	Curved	T	Tight	BZ	Broken Zone	Int	Intersecting
Ir	Irregular			HFZ	Highly Fractured Zone	Lam (s)	Lamination (s)
				WS	Weathered Seam	Di	Drilling Induced
				Vn	Vein	H	Horizontal
						V	Vertical

NOTE: This sheet should be read in conjunction with appropriate Engineering Borelog. Defect angles were measured with respect to horizontal plane.

BOREHOLE NO.:	BH16
SHEET:	2 of 3
REFERENCE NO.:	H10583

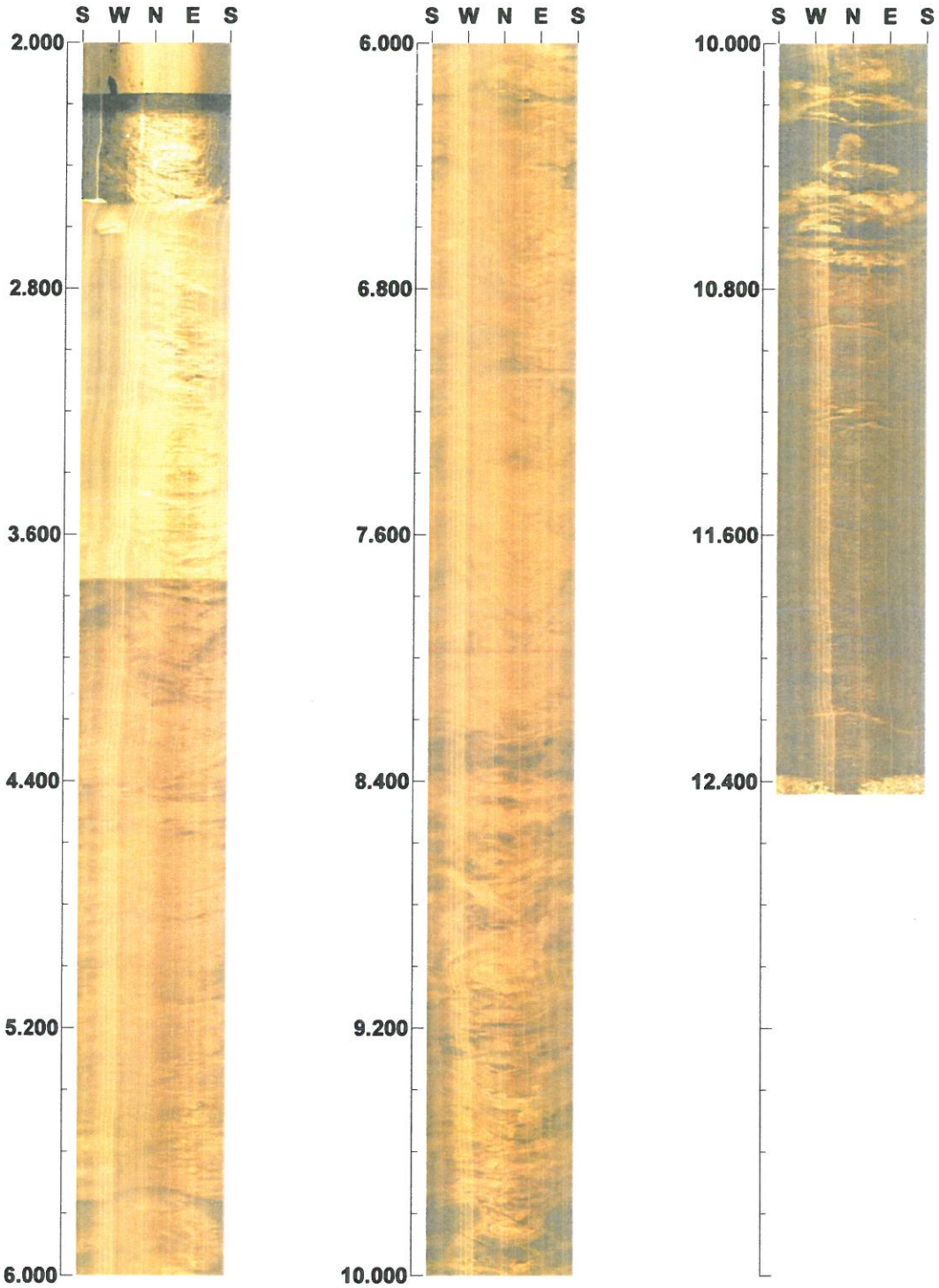
DEPTH	DEFECT TYPE	DIP°	PLANARITY	ROUGHNESS	APERTURE	WALL ALTERATION	OTHER
7.02	J	50°	Pl	S	O	FeSt	
7.11	J	20°	Pl	S	O	FeSt	
7.26	J	70°	Pl	S	O	FeSt	
7.31	J	50°	Pl	SR	O	FeSt	
7.4	J	20°	Ir	SR	O	Minor FeSt	
7.53	J	30°	Pl	S	O	Minor FeSt	
7.68	J	30°	Pl	S	O		Cn
7.73	J	70°	Pl		C		
7.87	J	50°	Pl	S	O		Cn
7.89	J	50°	Pl		C		
7.94	J	30°	Pl	S	O	FeSt	
8.15	J	10°	Pl	R	O		Cl
8.6	J	30°	Pl	SR	O	FeSt	
8.64	J	30°	Pl	SR	O	FeSt	
8.71							QZ
8.81	J	30°	Pl	SR	O	FeSt	
9.07	J	30°	Pl	SR	O	FeSt	
9.11	J	30°	Pl	SR	O	FeSt	
9.2	J	50°	Pl	SR	O	FeSt	
9.23	J	30°	Pl	SR	O	FeSt	
9.48	J	30°	Pl	R	O	FeSt	
9.62	J	70°	Pl	SR	O	FeSt	
9.66	J	30°	Pl	SR	O	FeSt	
9.7	J	10°	Cu	SR	O	FeSt	
9.72	J	SubVertical	Pl	SR	O	FeSt	
9.76	J	30°	Ir	SR	O	FeSt	
9.81	J	30°	Pl	SR	O	FeSt	
9.83	J	70°	Ir	SR	O	FeSt	
9.89							QZ
10							QZ
10.07							QZ
10.23							QZ
10.3							QZ
10.39	J	20°	Pl	SR	O		Cl
10.42	J	10°	Pl	SR	O		Cl
10.5	J	20°	Pl	SR	O		Cl
10.52							QZ
10.76	J	10°	Ir	SR	O	FeSt	
10.82	J	10°	Pl	SR	O	FeSt	
10.9	J	10°	Pl	SR	O	FeSt	
10.92	J	30°	Pl	SR	O	FeSt	
11.0	J	70°	Pl	SR	O	FeSt	
11.23	J	10°	Pl	SR	O	FeSt	
11.26	J	10°	Pl	SR	O	FeSt	
11.3	J	30°	Pl	SR	O	FeSt	
11.36	J	10°	Pl	SR	O	FeSt	
11.43	J	30°	Pl	SR	O	FeSt	
11.47	J	30°	Pl	SR	O	FeSt	
11.57	J	10°	Pl	SR	O	FeSt	
11.61	J	10°	Pl		C	FeSt	
11.68	J	30°	Pl	SR	O	FeSt	
11.76	J	10°	Pl	SR	O	FeSt	
11.81	J	20°	Pl	SR	O	FeSt	
11.97	J	70°	Pl		C	FeSt	
12.1	J	40°	Pl	SR	O	FeSt	
12.23	J	10°	Ir	SR	O	FeSt	
12.25	J	10°	Pl	SR	O	FeSt	

BOREHOLE NO.:	BH16
SHEET:	3 of 3
REFERENCE NO.:	H10583

DEPTH	DEFECT TYPE	DIP°	PLANARITY	ROUGHNESS	APERTURE	WALL ALTERATION	OTHER
12.3	J	20°	Pl	SR	O	FeSt	
12.35	J	30°	Pl	SR	O	FeSt	
12.43	J	20°	Pl	SR	O	FeSt	
12.51	J	10°	Pl	SR	O	FeSt	
12.53	J	10°	Pl	SR	O	FeSt	
12.57	J	10°	Pl	SR	O	FeSt	
12.63	J	30°	Pl	SR	O	FeSt	
12.69	J	10°	Pl	R	O	FeSt	
12.73	J	20°	Ir		O	FeSt	
12.83	J	20°	Pl	R	O	FeSt	
12.88	J	20°	Pl	SR	O	FeSt	
12.96	J	10°	Pl	SR	O	FeSt	
13.01	J	30°	Pl	SR	O	FeSt	

Project name: BRUCE HIGHWAY UPGRADE
Bore hole No.: BH16 **Azimuth: 0** **Inclination: -90**

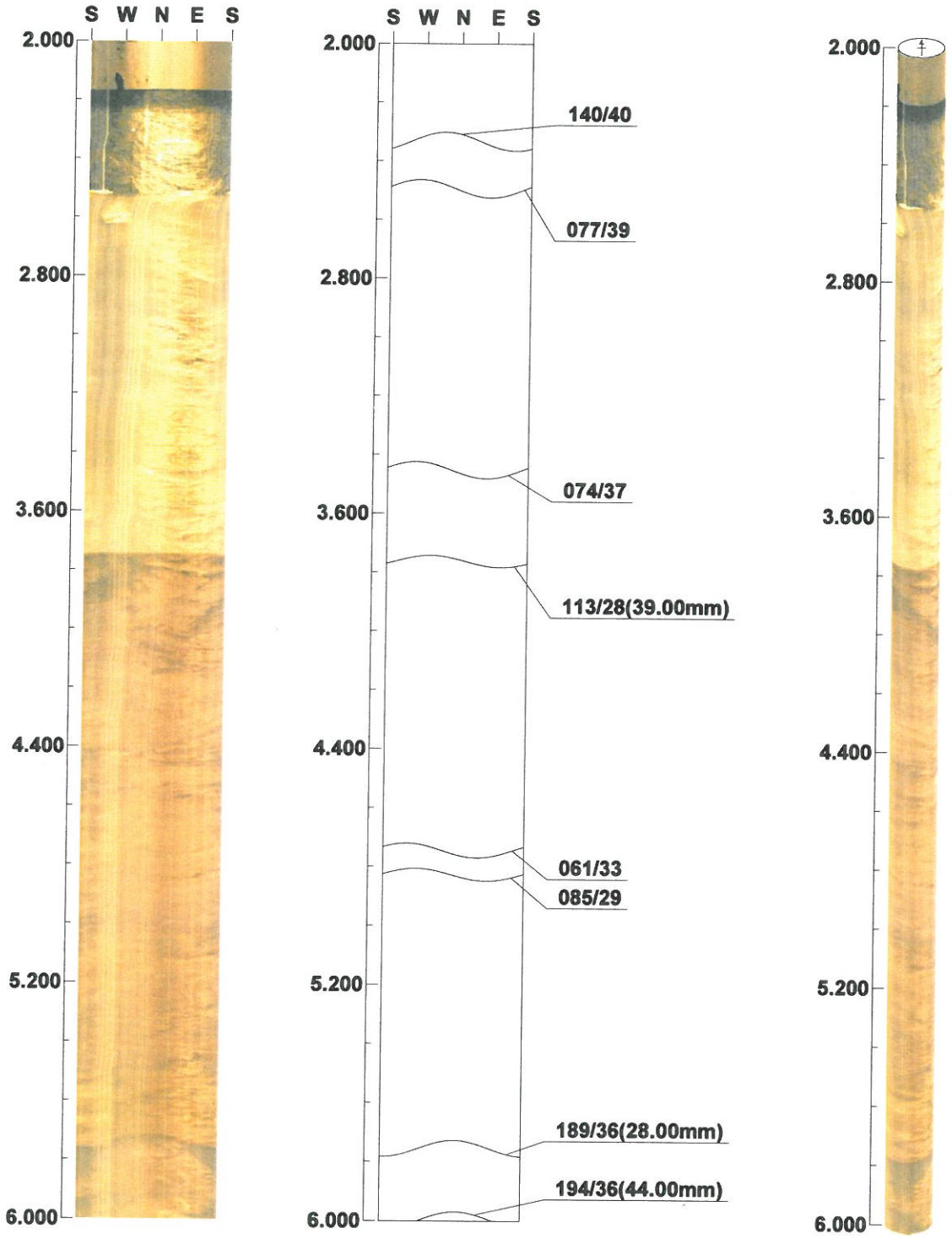
Depth range: 2.000 - 12.441 m



Scale: 1/20 **Aspect ratio: 200 %**

Project name: BRUCE HIGHWAY UPGRADE
Bore hole No.: BH16 **Azimuth: 0** **Inclination: -90**

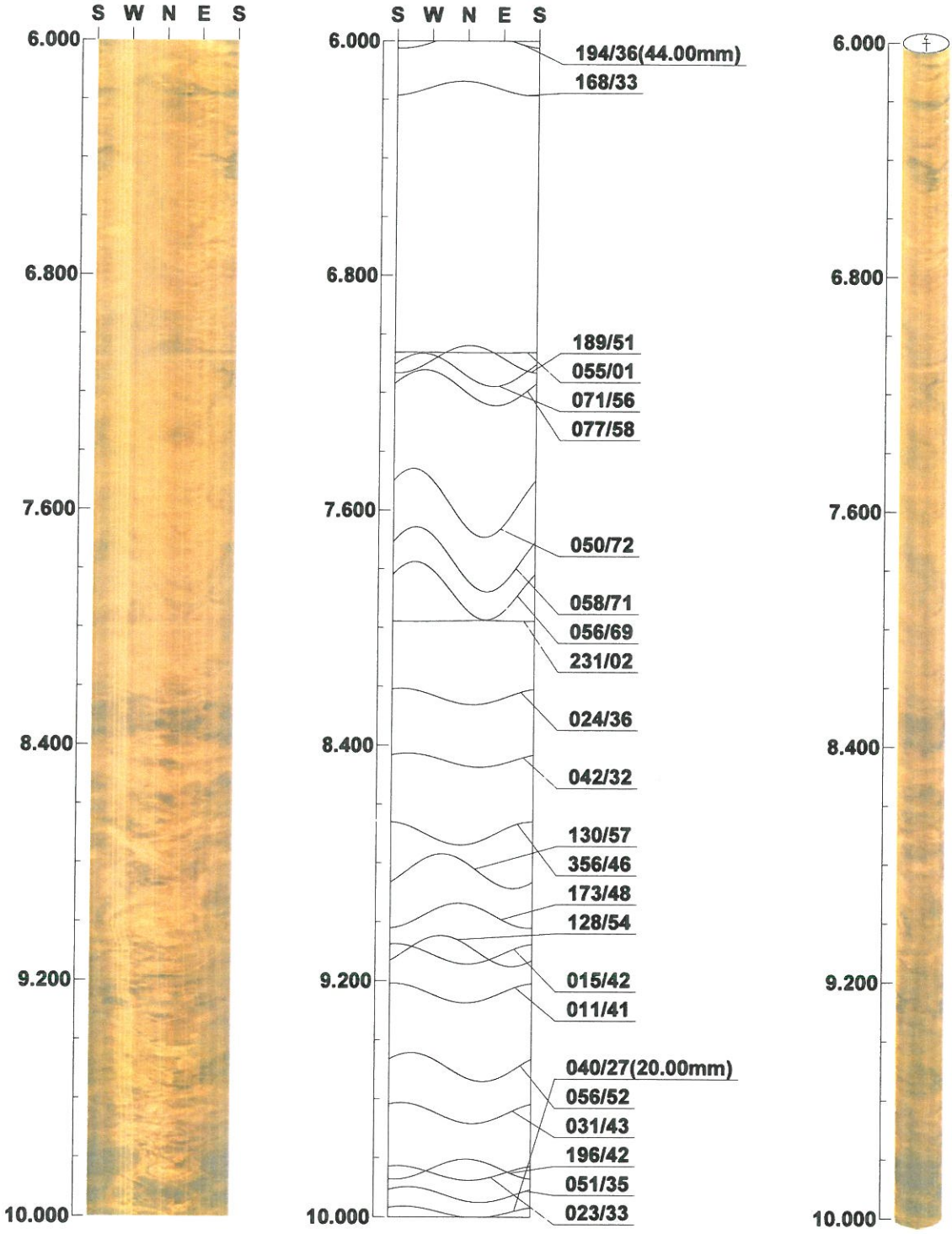
Depth range: 2.000 - 6.000 m



Scale: 1/20 **Aspect ratio: 200 %**

Project name: BRUCE HIGHWAY UPGRADE
Bore hole No.: BH16 **Azimuth: 0** **Inclination: -90**

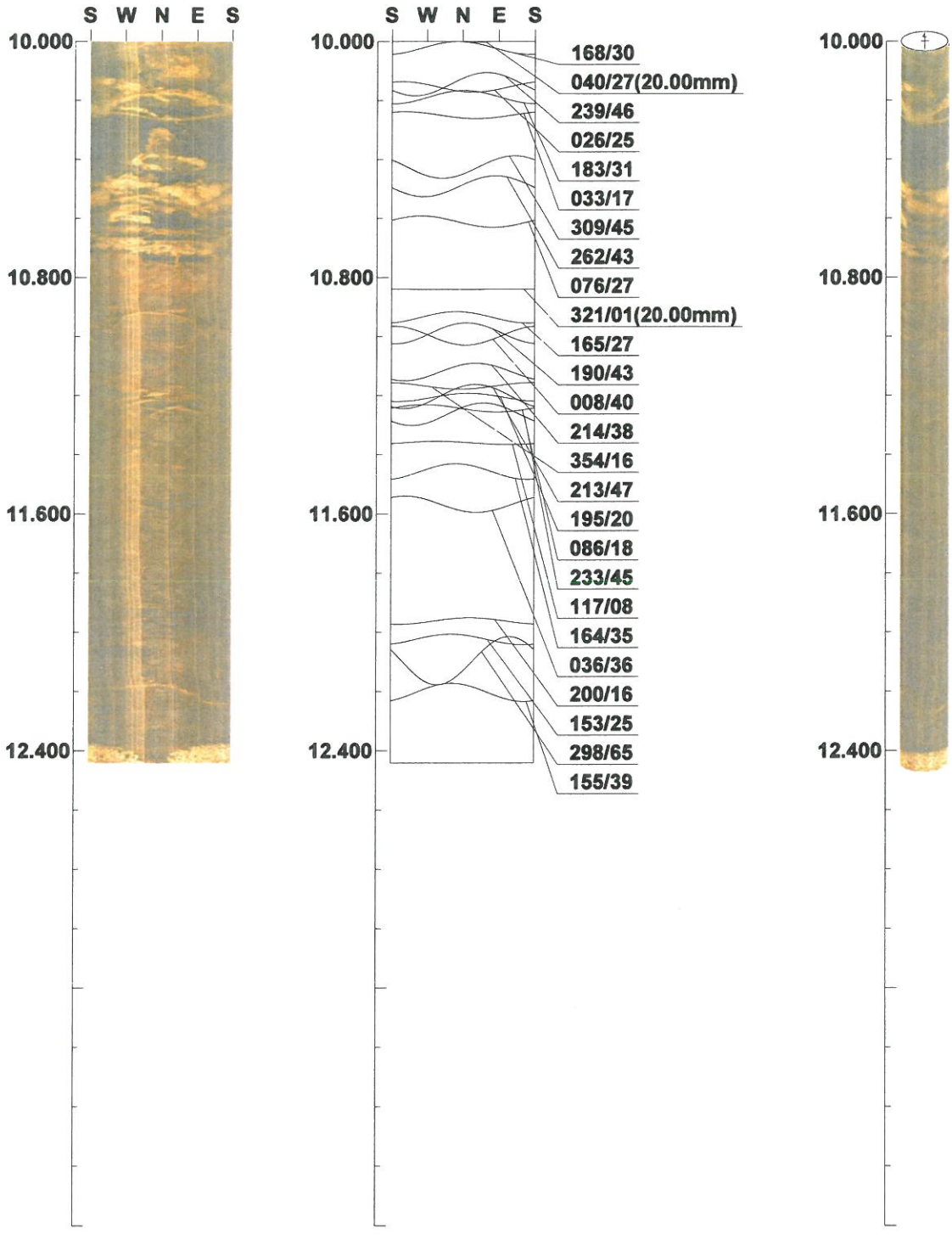
Depth range: 6.000 - 10.000 m



Scale: 1/20 **Aspect ratio: 200 %**

Project name: BRUCE HIGHWAY UPGRADE
Bore hole No.: BH16 **Azimuth: 0** **Inclination: -90**

Depth range: 10.000 - 12.441 m



Scale: 1/20 **Aspect ratio: 200 %**

Tab. Table of Discontinuity (1 / 2)

File name: BH16.STR
[ ]

No.	Depth (m)	Dir/Dip	Sort	Aperture (mm)	Form	Condition	Remark
1	2.332	140/40	Joint	0.3	Planar	Rough	Open
2	2.490	077/39	Bed/foliat	0.0	Planar	Rough	Tight
3	3.453	074/37	Parting	3.0	Planar	Weathered	Open/loose
4	3.763	113/28	ShearZn	39.0	Planar	Brec/crus'd	Open/loose
5	4.727	061/33	Parting	0.5	Planar	Smooth	Open
6	4.827	085/29	Parting	0.5	Planar	Rough	Open/loose
7	5.755	189/36	ShearZn	28.0	Planar	Brec/crus'd	Open/loose
8	5.999	194/36	ShearZn	44.0	Planar	Brec/crus'd	Open/loose
9	6.162	168/33	ShearZn	11.0	Planar	Brec/crus'd	Open/loose
10	7.063	055/01	Joint	0.5	Planar	Smooth	Open/loose
11	7.086	189/51	Joint	15.0	Planar	Brec/crus'd	Open
12	7.122	071/56	Joint	0.3	Planar	Rough	Open
13	7.183	077/58	Joint	0.3	Planar	Rough	Open
14	7.575	050/72	Joint	0.3	Planar	Rough	Open
15	7.767	058/71	Joint	0.3	Planar	Rough	Open
16	7.874	056/69	Joint	0.3	Planar	Rough	Open
17	7.977	231/02	Joint	0.5	Planar	Rough	Open
18	8.234	024/36	Parting	0.5	Planar	Rough	Open
19	8.450	042/32	ShearZn	112.0	Planar	Brec/crus'd	Open
20	8.699	356/46	ShearZn	57.0	Planar	Brec/crus'd	Open
21	8.827	130/57	Joint	0.5	Planar	Rough	Open/loose
22	8.978	173/48	Joint	0.5	Planar	Shea'd/flt	Open
23	9.098	128/54	Joint	0.5	Planar	Rough	Open
24	9.108	015/42	ShearZn	75.0	Planar	Brec/crus'd	Open
25	9.241	011/41	ShearZn	60.0	Planar	Brec/crus'd	Open/loose
26	9.492	056/52	ShearZn	168.0	Planar	Brec/crus'd	Open/loose
27	9.648	031/43	ShearZn	187.0	Planar	Brec/crus'd	Open/loose
28	9.838	196/42	Joint	0.5	Planar	Rough	Open
29	9.851	023/33	Parting	0.5	Planar	Rough	Open
30	9.924	051/35	Joint	0.5	Planar	Rough	Open
31	9.983	040/27	ShearZn	20.0	Planar	Rough	Open
32	10.022	168/30	Joint	0.5	Planar	Rough	Open
33	10.145	239/46	Joint	0.5	Planar	Rough	Open
34	10.154	026/25	ShearZn	30.0	Planar	Brec/crus'd	Open
35	10.189	183/31	ShearZn	9.0	Planar	Brec/crus'd	Open/loose
36	10.250	033/17	Parting	2.0	Planar	Rough	Open
37	10.426	309/45	Joint	0.3	Planar	Rough	Open
38	10.491	262/43	Joint	0.5	Planar	Rough	Open
39	10.611	076/27	ShearZn	231.0	Planar	Brec/crus'd	Open/loose
40	10.840	321/01	ShearZn	20.0	Planar	Brec/crus'd	Open
41	10.935	165/27	Joint	1.0	Planar	Rough	Open/loose
42	10.989	190/43	Joint	0.5	Planar	Rough	Open
43	10.997	008/40	Joint	0.5	Planar	Rough	Open
44	11.120	214/38	Joint	0.3	Planar	Rough	Open
45	11.167	354/16	Joint	0.5	Planar	Rough	Open
46	11.203	213/47	Joint	0.5	Planar	Rough	Open
47	11.206	195/20	Joint	0.5	Planar	Rough	Open
48	11.243	086/18	Joint	0.5	Planar	Rough	Open
49	11.263	233/45	Joint	0.3	Planar	Rough	Open
50	11.360	117/08	Joint	0.5	Planar	Rough	Open

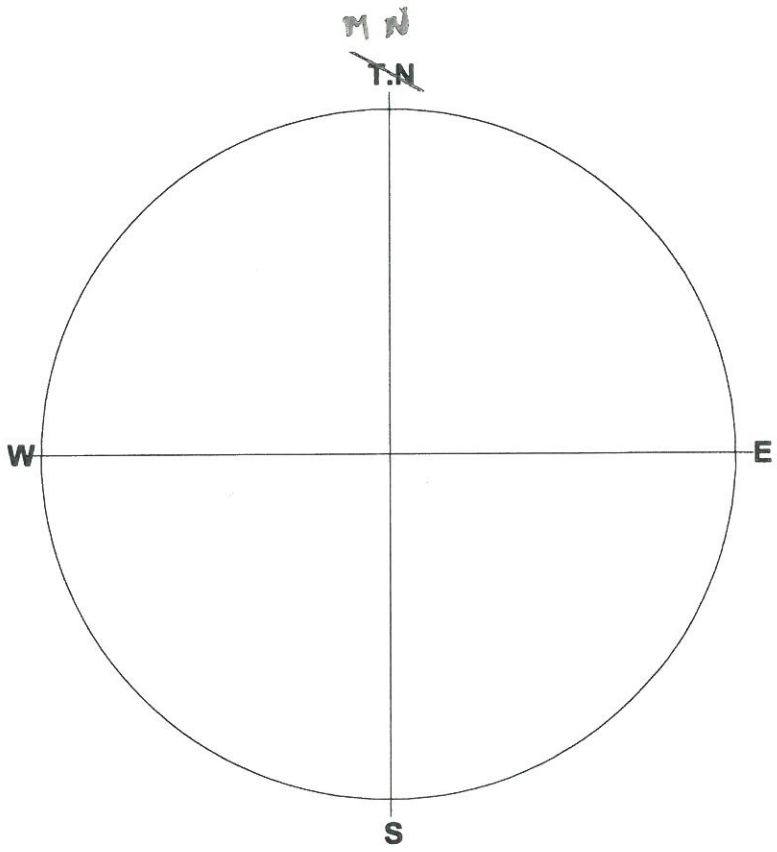
Tab. Table of Discontinuity (2 / 2)

File name: BH16.STR
[ ]

No.	Depth (m)	Dir/Dip	Sort	Aperture (mm)	Form	Condition	Remark
51	11.457	164/35	Joint	0.3	Planar	Rough	Open
52	11.567	036/36	Joint	0.5	Planar	Rough	Open
53	11.962	200/16	Joint	0.5	Planar	Smooth	Open
54	12.024	153/25	Joint	0.5	Planar	Rough	Open
55	12.096	298/65	Joint	0.5	Planar	Rough	Open
56	12.203	155/39	Joint	1.0	Planar	Smooth	Open/loose

BH16.STR

<<BEDDING/FOLIATION>>



Number of Data : 1/56

<Legend>

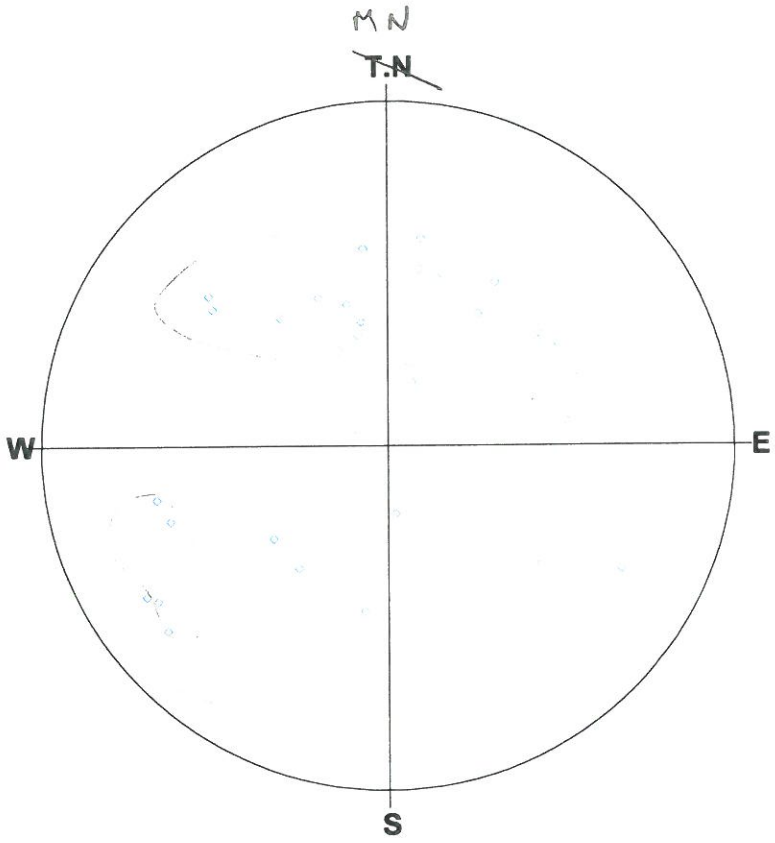
:Bed/foliat	--	1	:Boundary	--	0
:Joint	--	0			
:Parting	--	0			
:ShearZn	--	0			
:Fault	--	0			
:Vein	--	0			

Schmidt (L.H)

Depth : 2.332 - 12.203 m

BH16.STR

<<JOINT>>



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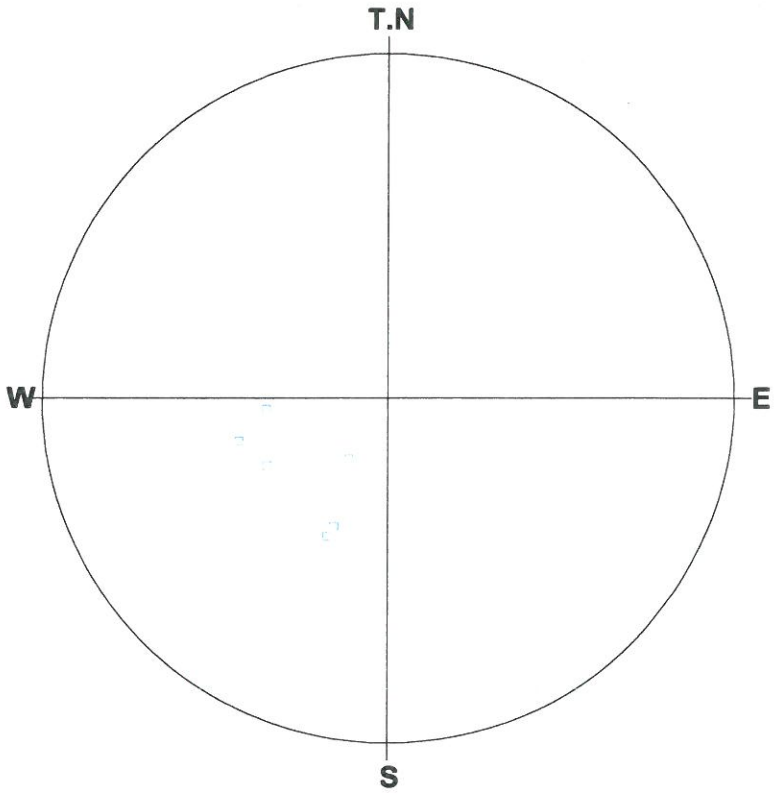
:Joint	-- 34		
:Parting	-- 0		
:ShearZn	-- 0		
:Fault	-- 0		
:Vein	-- 0		

Schmidt (L.H)

Depth : 2.332 - 12.203 m

BH16.STR

<<PARTING>>



Number of Data : 6/56

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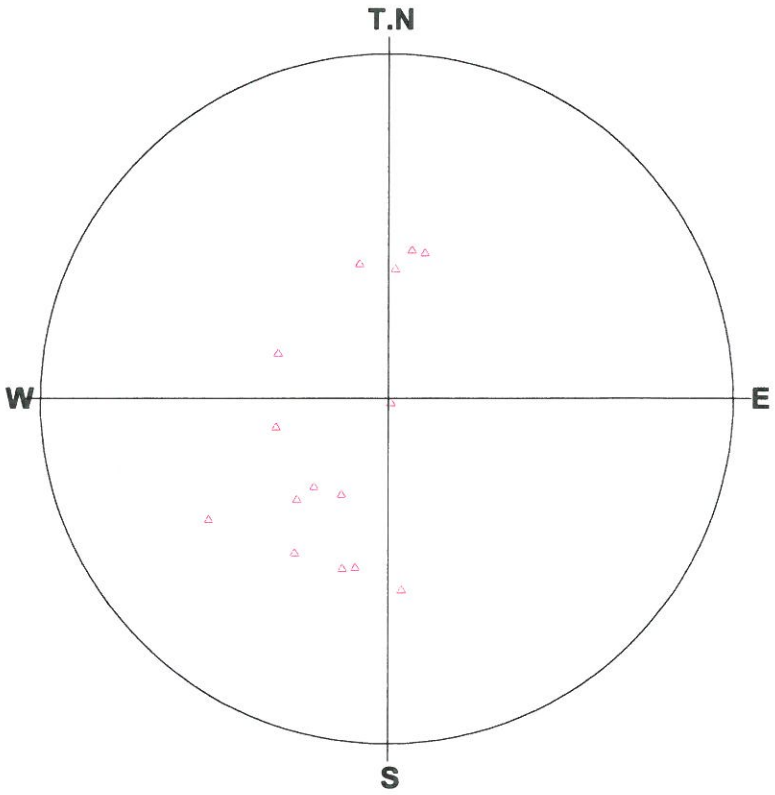
:Bed/foliat	--	0	:Boundary	--	0
:Joint	--	0			
:Parting	--	6			
:ShearZn	--	0			
:Fault	--	0			
:Vein	--	0			

Schmidt (L.H)

Depth : 2.332 - 12.203 m

BH16.STR

<<SHEAR ZONE>>



Number of Data : 15/56

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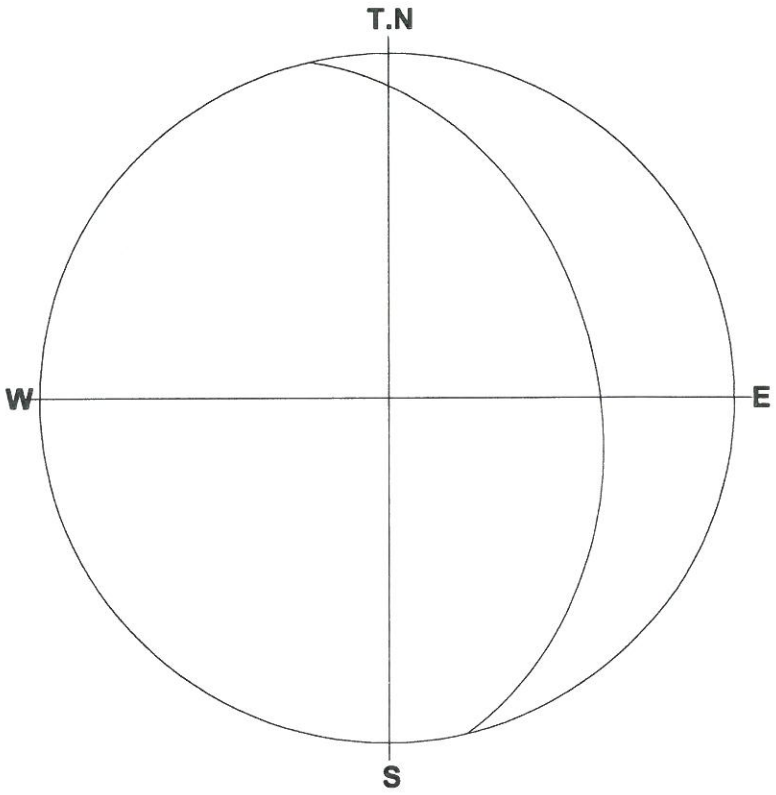
:Bed/foliat	-- 0	:Boundary	-- 0
:Joint	-- 0		
:Parting	-- 0		
:ShearZn	-- 15		
:Fault	-- 0		
:Vein	-- 0		

Schmidt (L.H)

Depth : 2.332 - 12.203 m

BH16.STR

<<BEDDING/FOLIATION>>



Number of Data:1/56

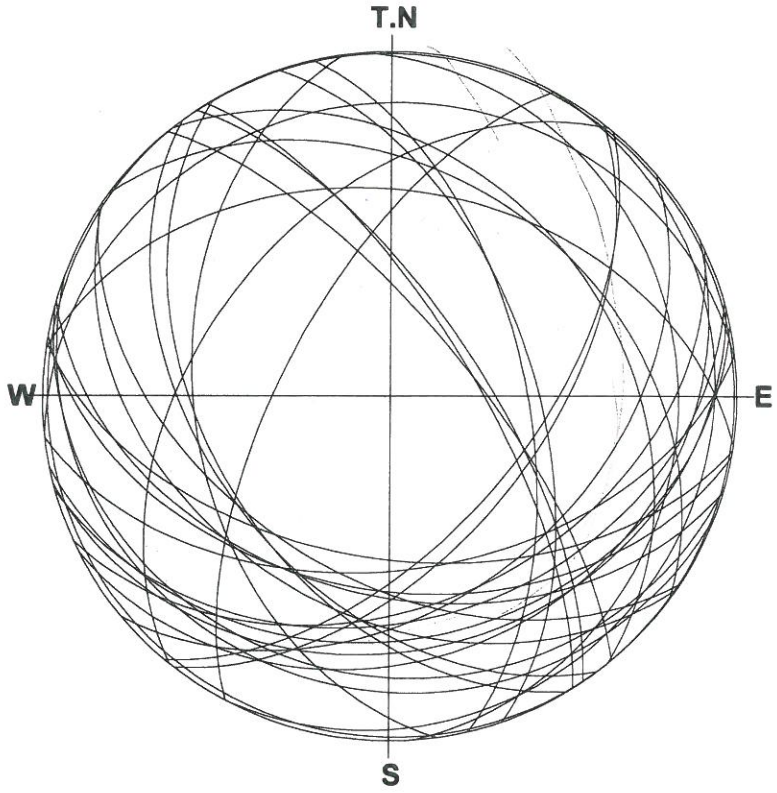
1 : 077/39(2)

Schmidt (L.H)

Depth : 2.332 - 12.203 m

BH16.STR

<<JOINT>>



Number of Data:34/56

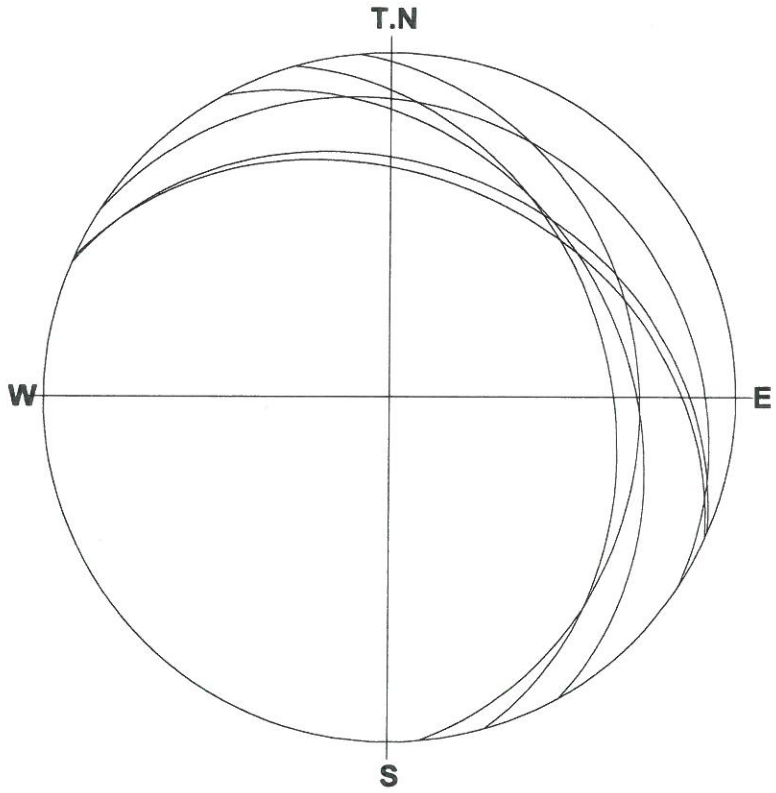
1 : 140/40(1)	**6 : 050/72(14)**
2 : 055/01(10)	**7 : 058/71(15)**
3 : 189/51(11)	**8 : 056/69(16)**
4 : 071/56(12)	**9 : 231/02(17)**
5 : 077/58(13)	**10 : 130/57(21)**

Schmidt (L.H)

Depth : 2.332 - 12.203 m

BH16.STR

<<PARTING>>



Number of Data:6/56

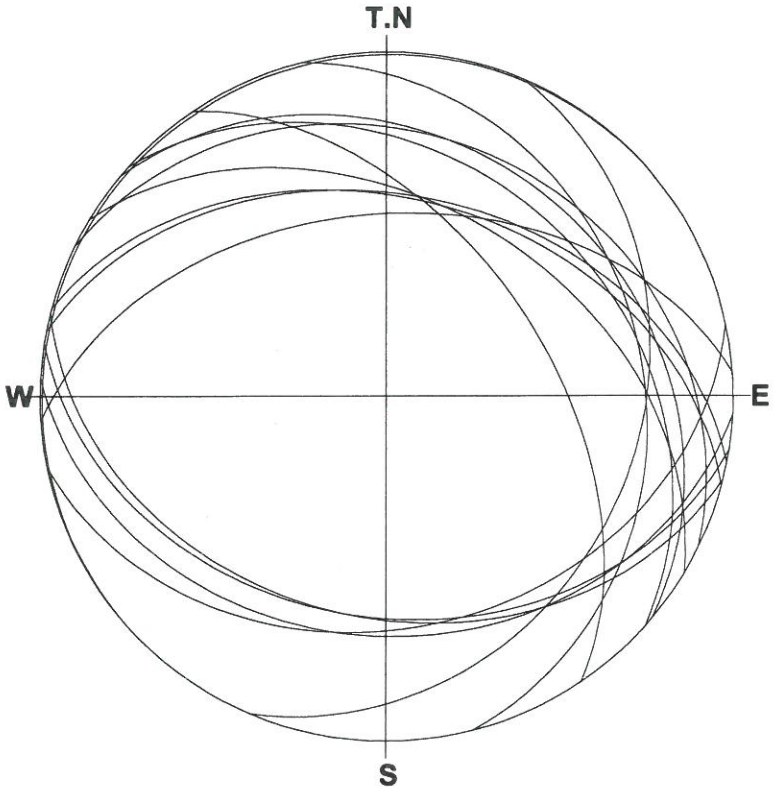
1 : 074/37(3)
2 : 061/33(5)
3 : 085/29(6)
4 : 024/36(18)
5 : 023/33(29)
6 : 033/17(36)

Schmidt (L.H)

Depth : 2.332 - 12.203 m

BH16.STR

<<SHEAR ZONE>>



Number of Data:15/56

1 : 113/28(4)	**6 : 356/46(20)**
2 : 189/36(7)	**7 : 015/42(24)**
3 : 194/36(8)	**8 : 011/41(25)**
4 : 168/33(9)	**9 : 056/52(26)**
5 : 042/32(19)	**10 : 031/43(27)**

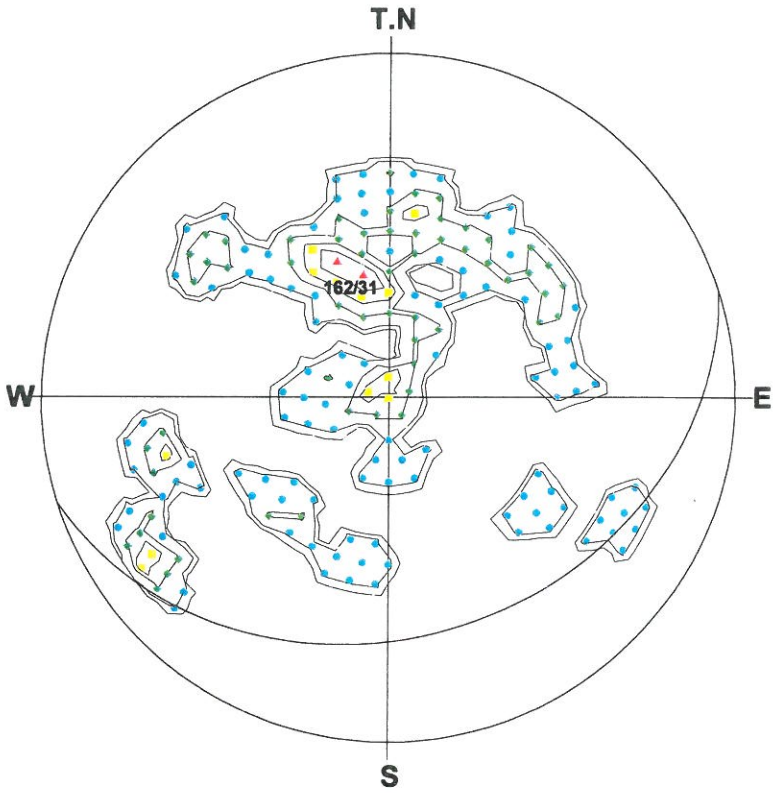
Schmidt (L.H)

Depth : 2.332 - 12.203 m

BH16.STR

<<JOINT>>

******** % Diagram ********



Number of Data : 34

<Legend> Sym. (%)		Contour Value (%)	
▲	: 11	Contour 1 : 0	☐
▼	: 9 - 11	Contour 2 : 2	☐
■	: 7 - 9	Contour 3 : 4	☐
◆	: 4 - 7	Contour 4 : 7	☐
●	: 2 - 4	Contour 5 : 9	☐
	: 0 - 2	Contour 6 : 11	☐

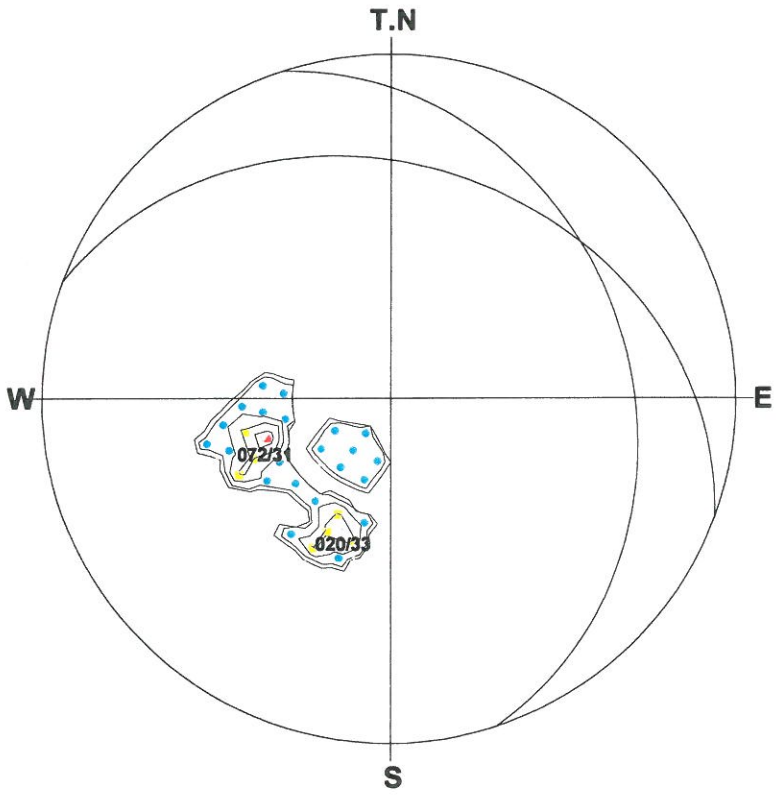
Schmidt (L.H)

Depth : 2.332 - 12.203 m

BH16.STR

<<PARTING>>

******** % Diagram ********



Number of Data : 6

<Legend> Sym. (%)	Contour Value (%)
▲ : 50	Contour 1 : 0 ☐
▼ : 40 - 50	Contour 2 : 10 ☐
■ : 30 - 40	Contour 3 : 20 ☐
◆ : 20 - 30	Contour 4 : 30 ☐
● : 10 - 20	Contour 5 : 40 ☐
: 0 - 10	Contour 6 : 50 ☐

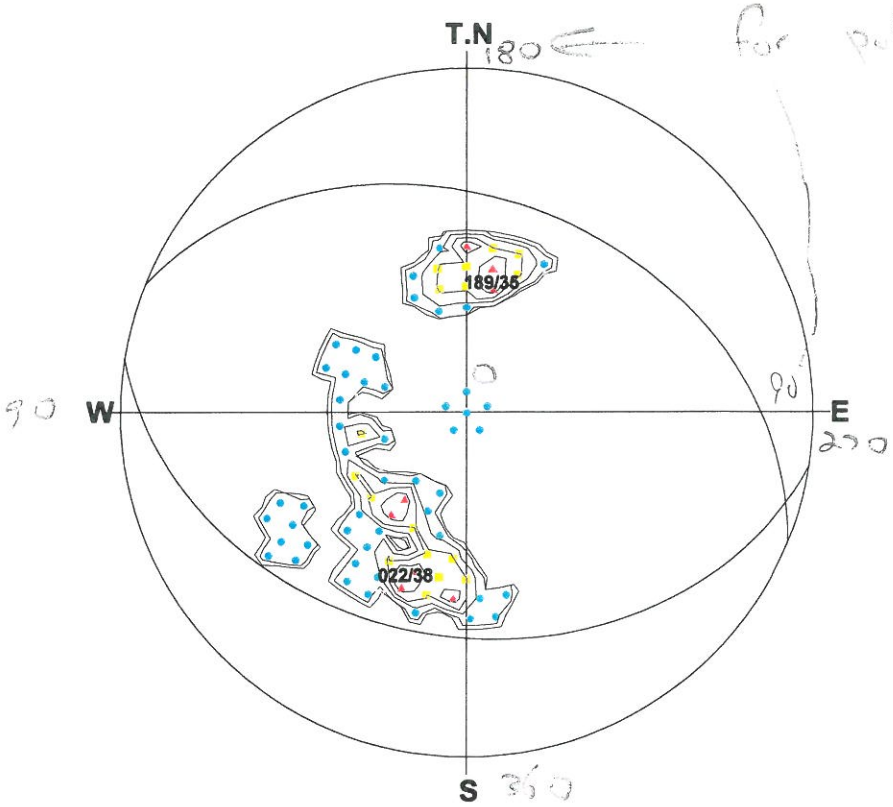
Schmidt (L.H)

Depth : 2.332 - 12.203 m

BH16.STR

<<SHEAR ZONE>>

******** % Diagram ********



Number of Data : 15

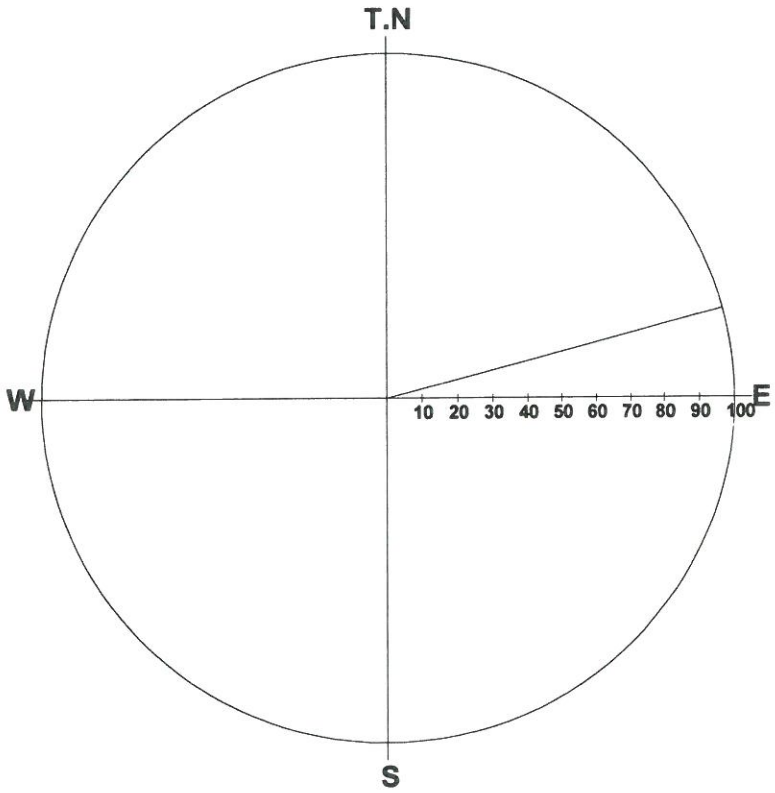
<Legend> Sym. (%)	Contour Value (%)
▲ : 20	Contour 1 : 0 ☐
▼ : 16 - 20	Contour 2 : 4 ☐
■ : 12 - 16	Contour 3 : 8 ☐
◆ : 8 - 12	Contour 4 : 12 ☐
● : 4 - 8	Contour 5 : 16 ☐
— : 0 - 4	Contour 6 : 20 ☐

Schmidt (L.H)

Depth : 2.332 - 12.203 m

BH16.STR

<<BEDDING/FOLIATION>>



Number of Data : 1/56

Max : 100.0%

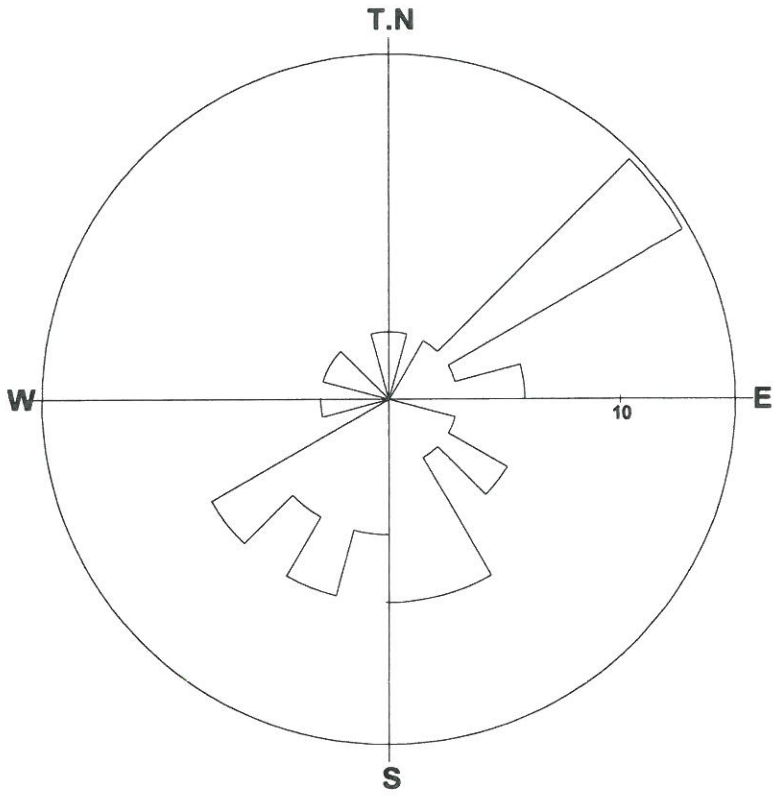
Grouping Angle : 15 deg

Dir	%	Dir	%	Dir	%
0-	0	135-	0	270-	0
15-	0	150-	0	285-	0
30-	0	165-	0	300-	0
45-	0	180-	0	315-	0
60-	0	195-	0	330-	0
75-	100	210-	0	345-	0
90-	0	225-	0		
105-	0	240-	0		
120-	0	255-	0		

Depth : 2.332 - 12.203 m

BH16.STR

<<JOINT>>



Number of Data : 34/56

Max : 14.7%

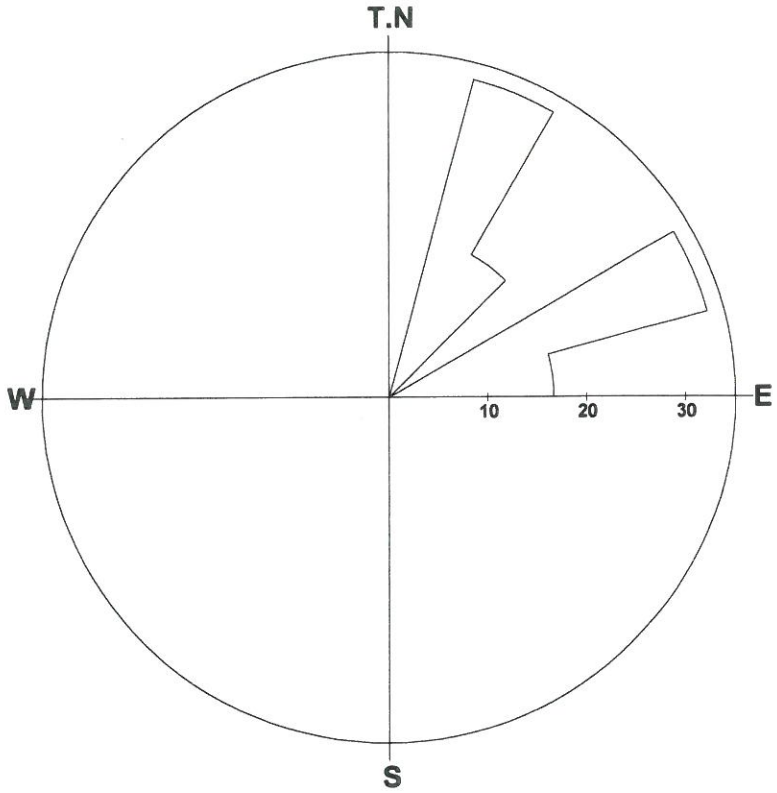
Grouping Angle : 15 deg

Dir	%	Dir	%	Dir	%
0-	3	135-	3	270-	0
15-	0	150-	9	285-	3
30-	3	165-	9	300-	3
45-	15	180-	6	315-	0
60-	3	195-	9	330-	0
75-	6	210-	6	345-	3
90-	0	225-	9		
105-	3	240-	0		
120-	6	255-	3		

Depth : 2.332 - 12.203 m

BH16.STR

<<PARTING>>



Number of Data : 6/56

Max : 33.3%

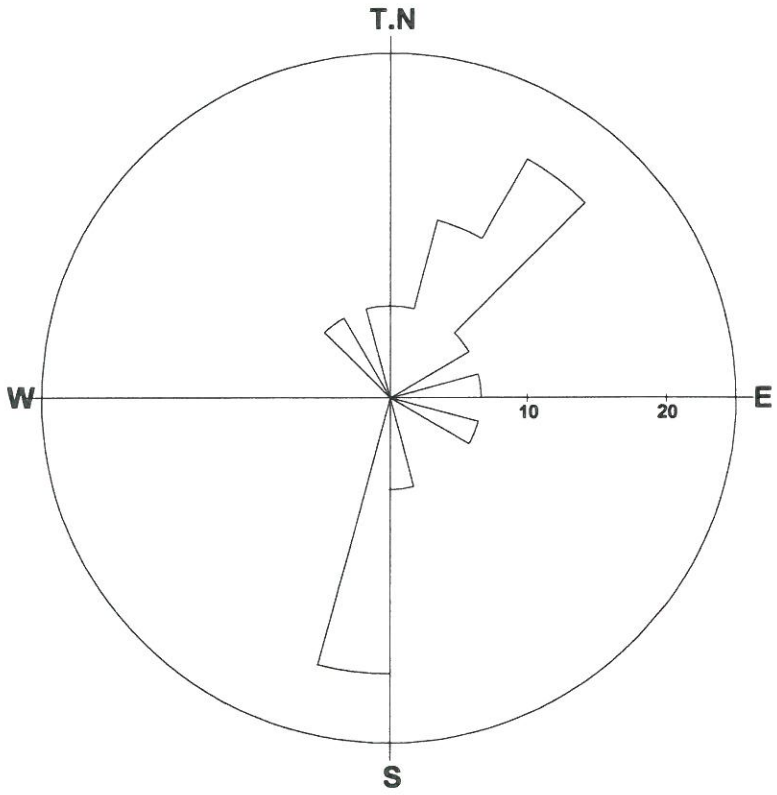
Grouping Angle : 15 deg

Dir	%	Dir	%	Dir	%
0-	0	135-	0	270-	0
15-	33	150-	0	285-	0
30-	17	165-	0	300-	0
45-	0	180-	0	315-	0
60-	33	195-	0	330-	0
75-	17	210-	0	345-	0
90-	0	225-	0		
105-	0	240-	0		
120-	0	255-	0		

Depth : 2.332 - 12.203 m

BH16.STR

<<SHEAR ZONE>>



Number of Data : 15/56

Max : 20.0% **Grouping Angle : 15 deg**

Dir	%	Dir	%	Dir	%
0-	7	135-	0	270-	0
15-	13	150-	0	285-	0
30-	20	165-	7	300-	0
45-	7	180-	20	315-	7
60-	0	195-	0	330-	0
75-	7	210-	0	345-	7
90-	0	225-	0		
105-	7	240-	0		
120-	0	255-	0		

Depth : 2.332 - 12.203 m

Title: BH16.STR
Comment: JOINT
Depth: 2.332 - 12.203 m
Aperture: 0.0 - 231.0 mm

Sort: 1/ 7
Form: 8/ 8
Condition: 11/11
Remark: 11/11

2009/ 9/ 1

Elevation: 0.000m
Water Level: 2.680m

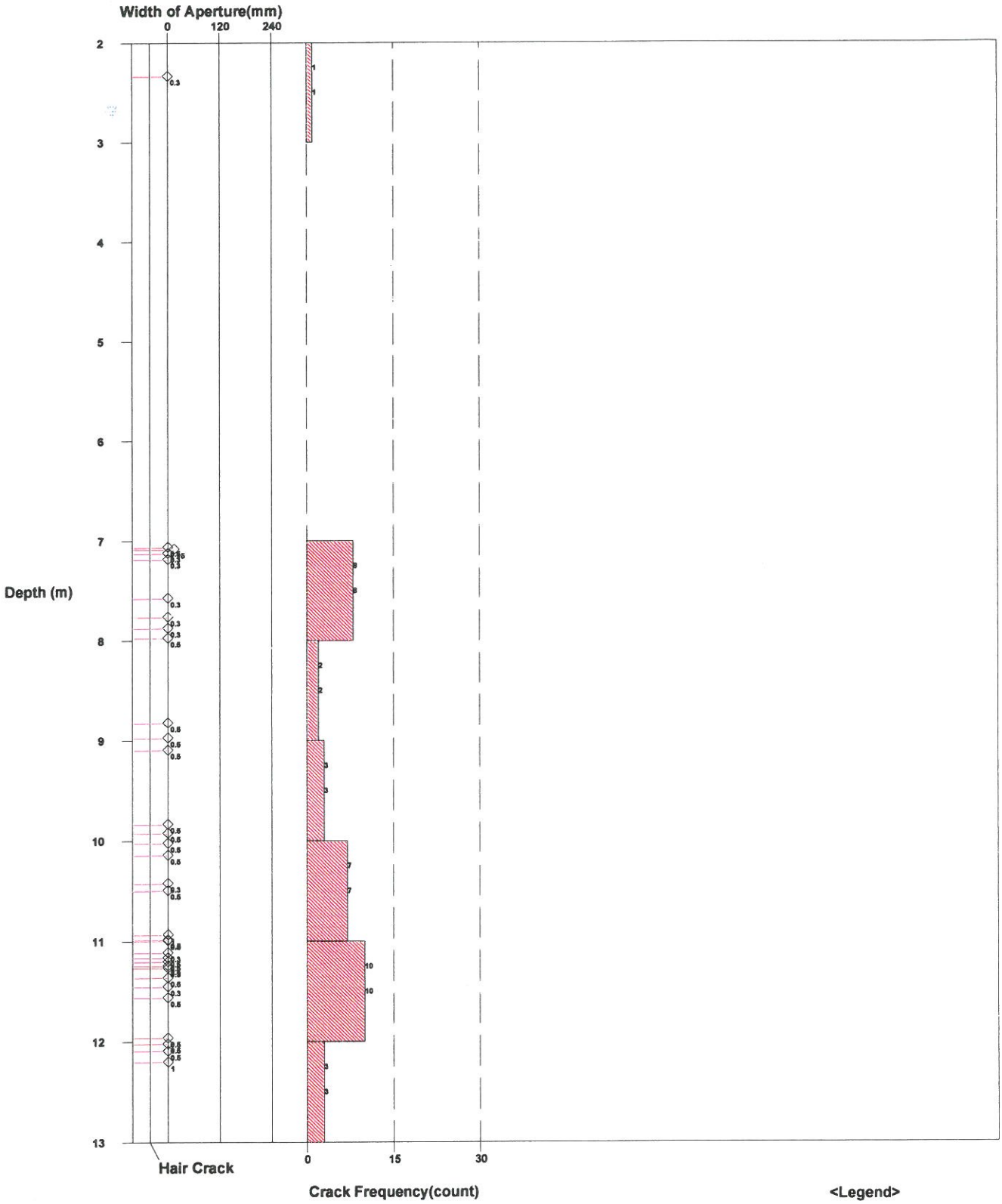


Fig. Rock Mass Condition Graph

Title: BH16.STR
Comment: PARTING
Depth: 2.332 - 12.203 m
Aperture: 0.0 - 231.0 mm

Sort: 1/ 7
Form: 8/ 8
Condition: 11/11
Remark: 11/11

2009/ 9/ 1

Elevation: 0.000m
Water Level: 2.680m

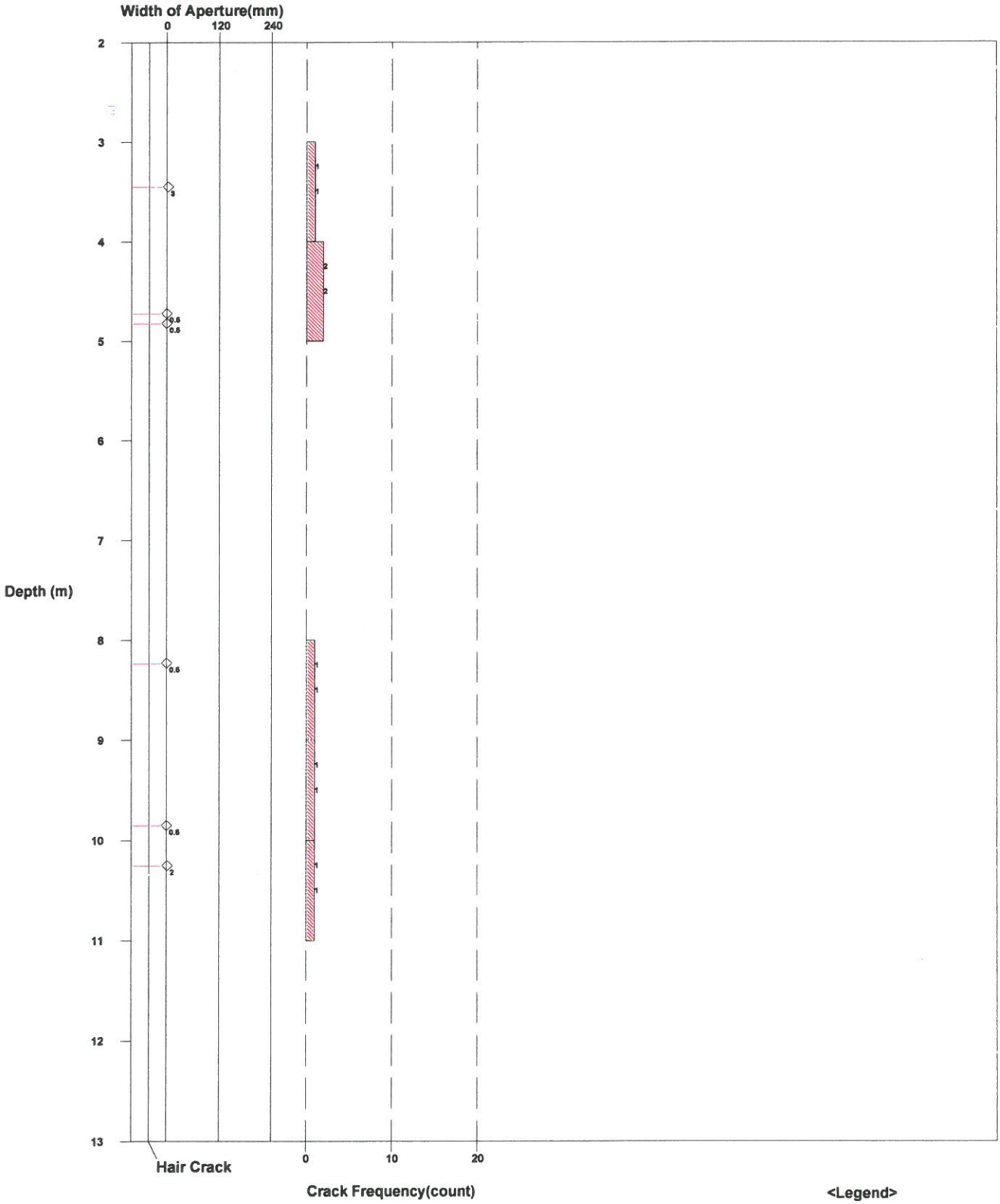


Fig. Rock Mass Condition Graph

Title: BH16.STR
Comment: SHEAR ZONE
Depth: 2.332 - 12.203 m
Aperture: 0.0 - 231.0 mm

Sort: 1/ 7
Form: 8/ 8
Condition: 11/11
Remark: 11/11

2009/ 9/ 1

Elevation: 0.000m
Water Level: 2.680m

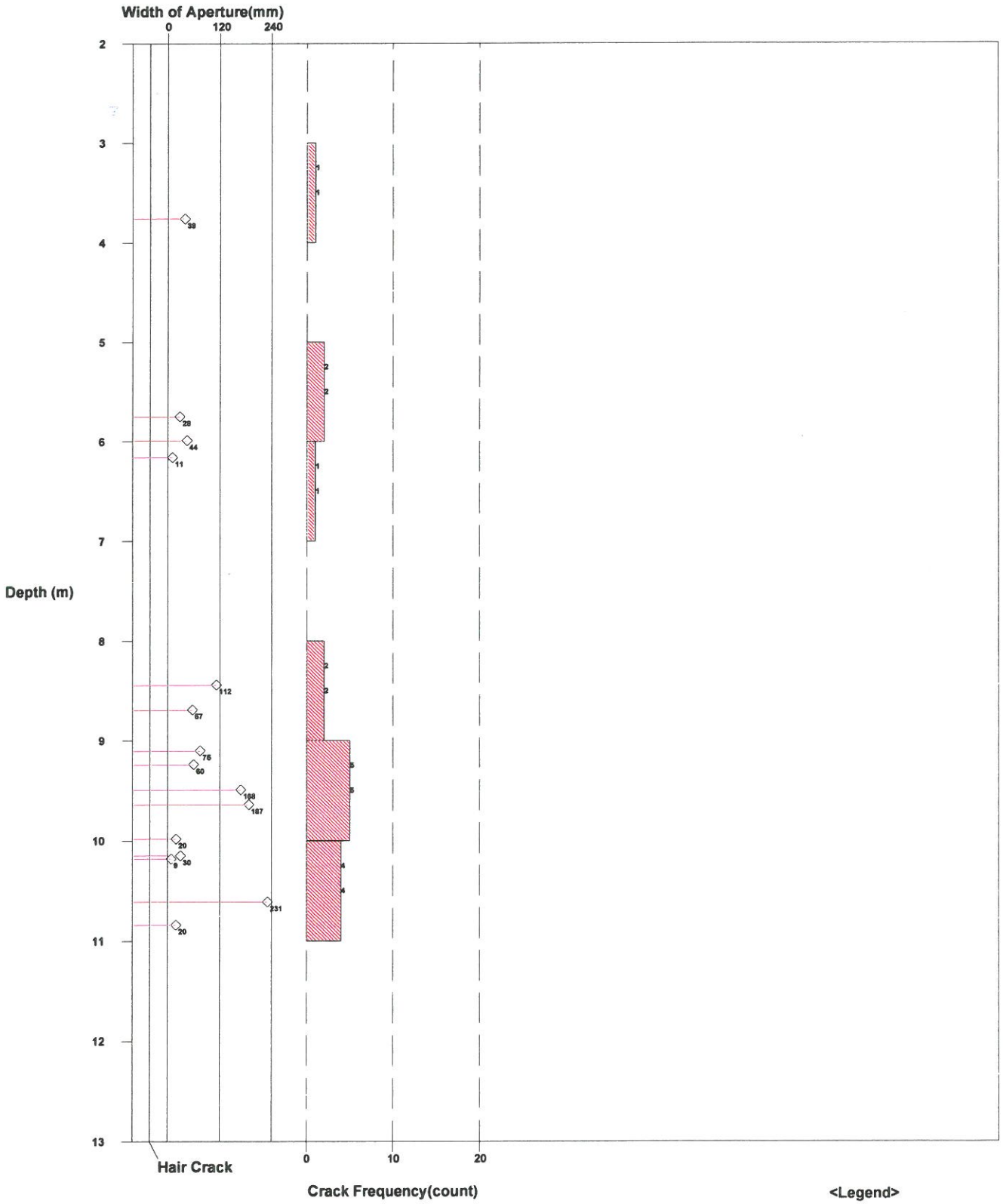
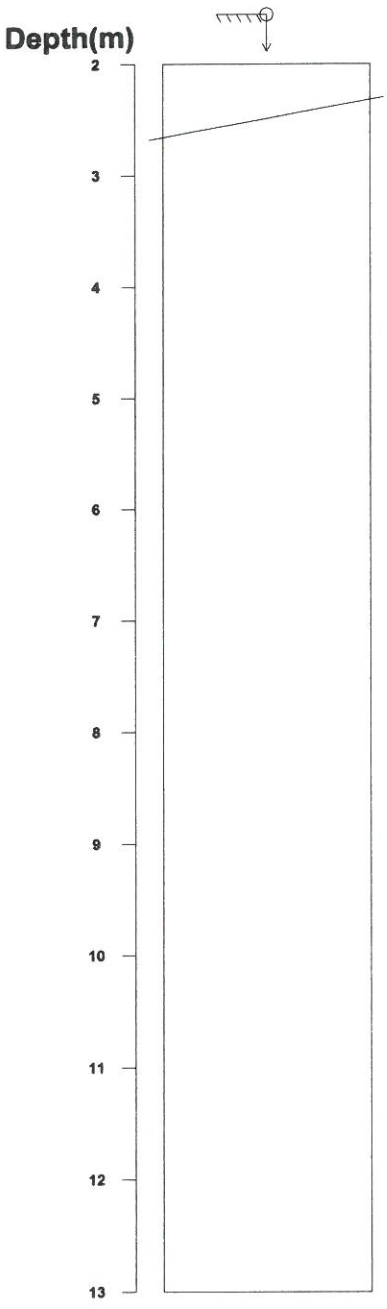


Fig. Rock Mass Condition Graph

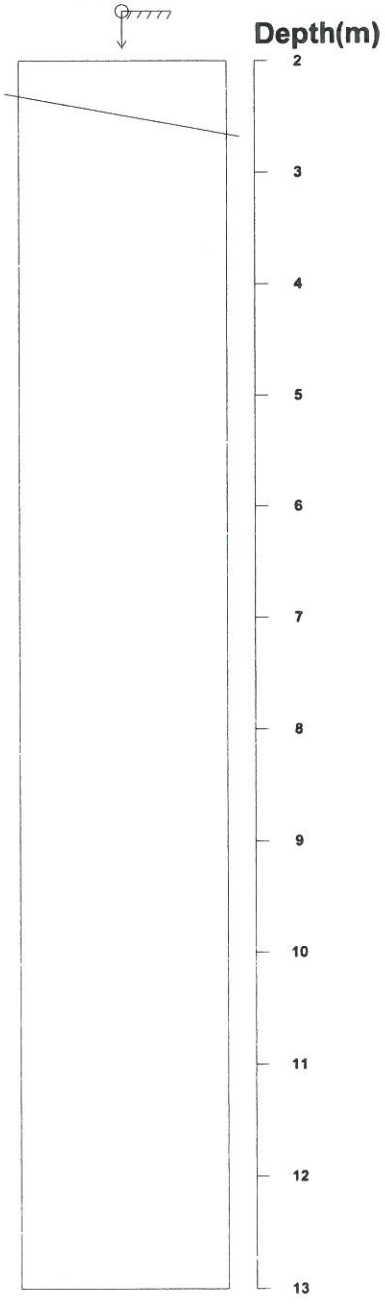
Title: BH16.STR
Comment: BEDDING/FOLIATION
Depth: 2.332 - 12.203 m
Aperture: 0.0 - 231.0 mm

Sort: 1/ 7
Form: 8/ 8
Condition: 11/11
Remark: 11/11

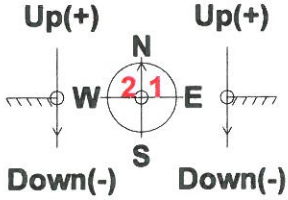
View Point 2
Profile of Apparent Borehole



View Point 1
Profile of Apparent Borehole



View Point2 View Point1
Up(+) Up(+)



Down(-) Down(-)

Direction: 0 deg
Inclination: Vertical(Down)

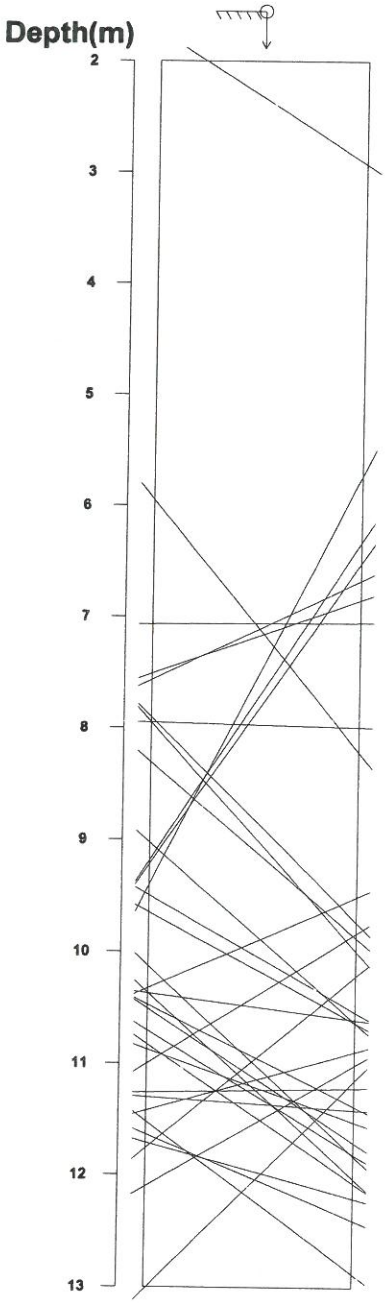
<Legend>
Entrance G.L
Bottom

Fig. Apparent Dip

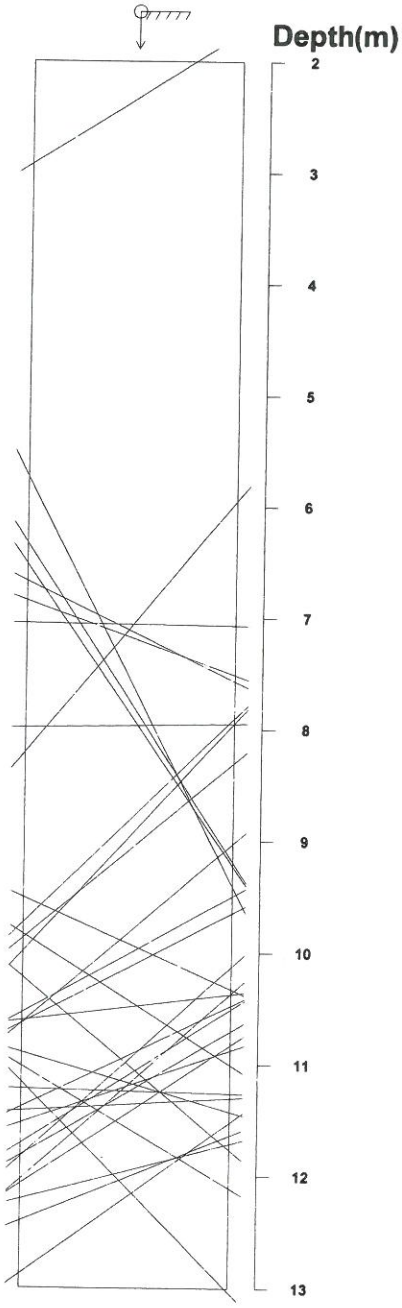
Title: BH16.STR
Comment: JOINT
Depth: 2.332 - 12.203 m
Aperture: 0.0 - 231.0 mm

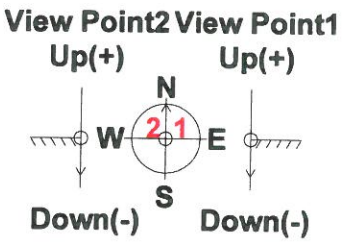
Sort: 1/ 7
Form: 8/ 8
Condition: 11/11
Remark: 11/11

View Point 2
Profile of Apparent Borehole



View Point 1
Profile of Apparent Borehole





Direction: 0 deg
Inclination: Vertical(Down)

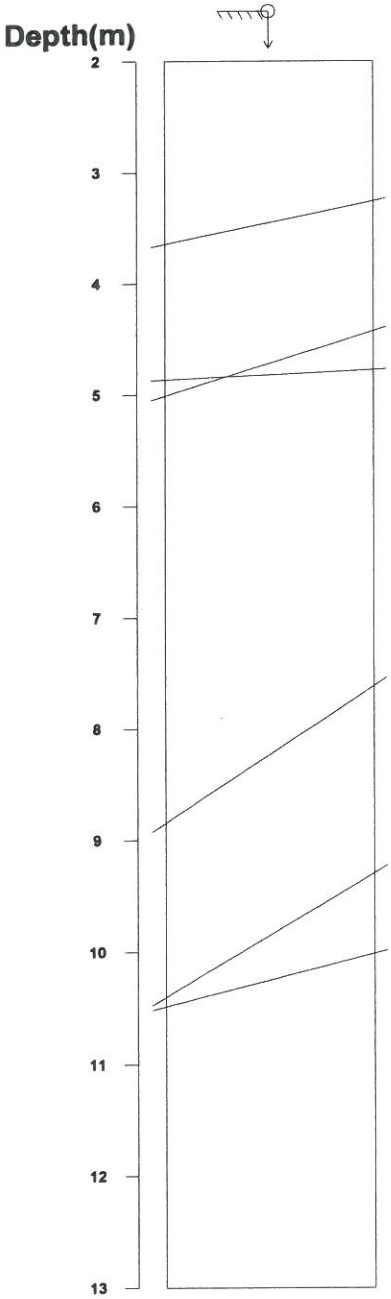
<Legend>
Entrance G.L
Bottom

Fig. Apparent Dip

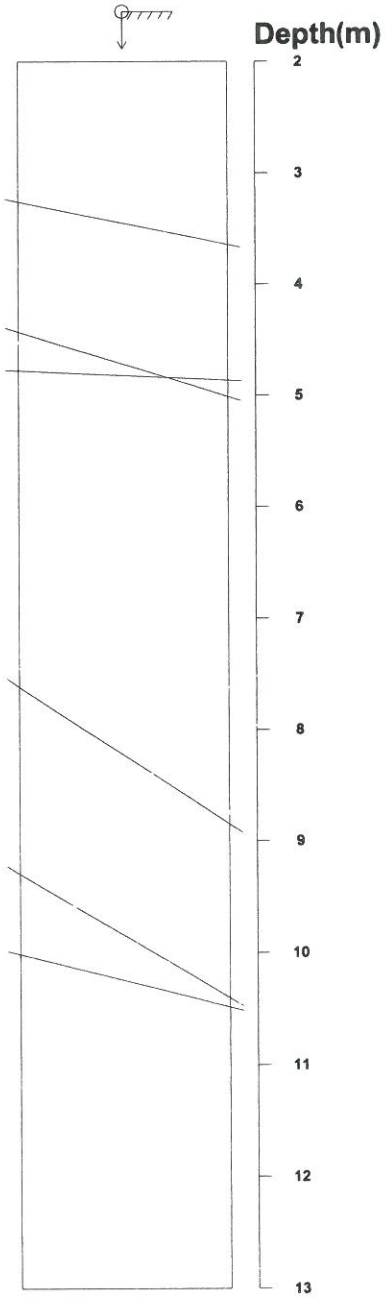
Title: BH16.STR
Comment: PARTING
Depth: 2.332 - 12.203 m
Aperture: 0.0 - 231.0 mm

Sort: 1/ 7
Form: 8/ 8
Condition: 11/11
Remark: 11/11

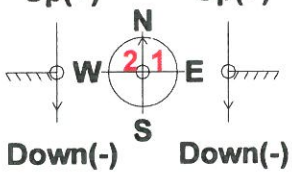
View Point 2
Profile of Apparent Borehole



View Point 1
Profile of Apparent Borehole



View Point2 View Point1
Up(+) Up(+)



Down(-) Down(-)

Direction: 0 deg
Inclination: Vertical(Down)

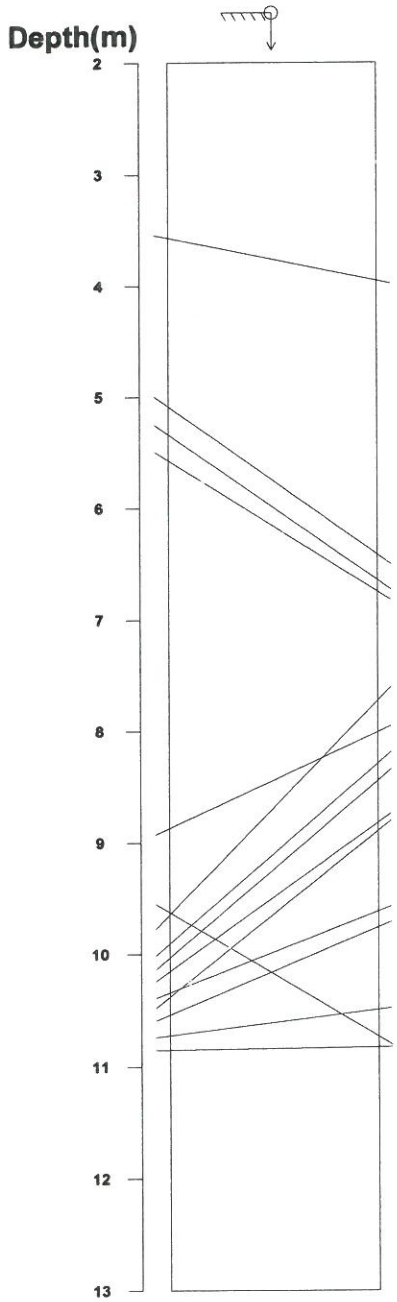
<Legend>
Entrance G.L
Bottom

Fig. Apparent Dip

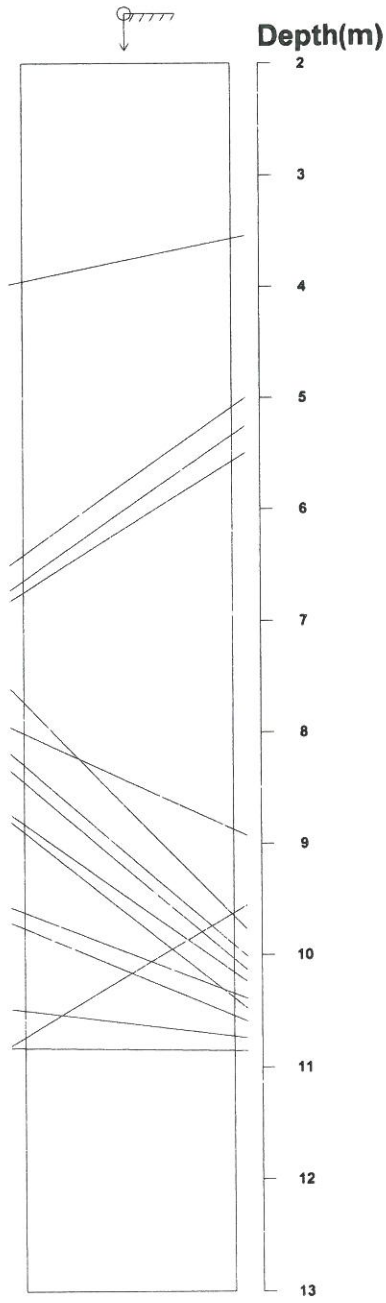
Title: BH16.STR
Comment: SHEAR ZONE
Depth: 2.332 - 12.203 m
Aperture: 0.0 - 231.0 mm

Sort: 1/ 7
Form: 8/ 8
Condition: 11/11
Remark: 11/11

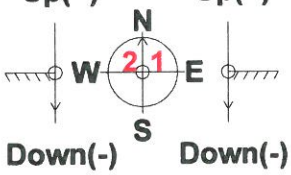
View Point 2
Profile of Apparent Borehole



View Point 1
Profile of Apparent Borehole



View Point2 View Point1
Up(+) Up(+)



Down(-) Down(-)

Direction: 0 deg
Inclination: Vertical(Down)

<Legend>
Entrance G.L
Bottom

Fig. Apparent Dip