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FOR GEOTECHNICAL TERMS AND  
SYMBOLS REFER FORM E:GEOT 017/6-2010

REFERENCE No **H11070**

JOB No 232/10A/2 HEIGHT DATUM AHD BEARING            DATE COMPLETED 09/08/11 DRILLER Drillsure Pty Ltd

OLD\_DMR\_LIB\_01A.GLB Log A ENGINEERING BOREHOLE LOG WLITHOLOGY FG5799 - BRUCE HWY UPGRADE SECTION C.GPJ DWG46352.GDW D:\tbl\CP\Tool\INI\Add-In 12/12/2011 16:28

LOGGED BY  
JA/DC

# ENGINEERING BOREHOLE LOG

FOR GEOTECHNICAL TERMS AND  
SYMBOLS REFER FORM F:GEOT 017/6-2010

BOREHOLE No BH C06  
SHEET 2 of 3  
REFERENCE No H11070

PROJECT Bruce Highway Upgrade (Cooroy to Curra) Section C  
LOCATION Cut 3 COORDINATES 472966.5 E; 7089037.7 N  
PROJECT No FG5799 SURFACE R.L. 120.00m PLUNGE          DATE STARTED 08/08/11 GRID DATUM MGA94  
JOB No 232/10A/2 HEIGHT DATUM AHD BEARING          DATE COMPLETED 09/08/11 DRILLER Drillsure Pty Ltd

DEPTH (m)	R.L. (m)	AUGER CASING WASH BORING CORE DRILLING	RQD (%)	SAMPLE	MATERIAL DESCRIPTION	LITHOLOGY	USC WEATHERING	INTACT STRENGTH	DEFECT SPACING (mm)	GRAPHIC LOG	ADDITIONAL DATA AND TEST RESULTS	SAMPLES TESTS
10	110.00				<b>METASILTSTONE (MW):</b> (Cont'd)		MW					
10.58			(63)		<b>BASALTIC BRECCIA (MW):</b> Brown/grey, fine grained with coarse grained phenocrysts, massive, medium strength.		MW				J, 45°, O, R, FeSt	
11					Defects: -Joint at ~60° (2/m) -Joint at ~80° (1/m)		MW				J, 80°, Pl, O, R, FeSt	
12			(30)		Defect spacing is medium to wide. Defect surfaces are planar, open, smooth, clay infilled.		MW				J, 60°, Pl, T, FeSt J, 60°, Pl, T, FeSt J, Subvertical, I, C, FeSt J, 80°, O, SR, FeSt J, 40°, I, O, SR, FeSt	
107.50					<b>METASILTSTONE (MW):</b> Brown, fine grained, massive, medium to high strength.		MW				J, 50°, Pl, T, Clnf, FeSt J, 70°, Pl, T, S, FeSt J*2, 70°, Pl, T, SR, FeSt J, 80°, I, O, R, FeSt J, 40°, Pl, T, S, FeSt	
13			(90)		Defects: -Joint at ~30° (2/m) -Joint at ~50° (1/m) -Joint at ~80° (1/m)		MW				J, 20°, Pl, O, Clnf 10mm J, 40°, I, T, FeSt	
14					Defect spacing is medium to wide. Defect surfaces are planar, open or tight, slightly rough, clay infilled.		MW				Is(50) = 0.94MPa	x
15			(40)				MW				DD = 2.29t/m <sup>3</sup> ; MC = 6.6%; UCS=22.7MPa	UCS
16							MW				J, 40°, Pl, O, R, Clnf	
103.24			(58)				MW				J, 50°, Pl, T, R, FeSt	
17					<b>BASALTIC BRECCIA (MW):</b> Grey/brown, fine grained with coarse grained phenocrysts, high to very high strength.		MW				CLy BZ J, 30°, Pl, T, S, Clnf J, 10°, Pl, R, Clnf	
18			(36)		Defects as above.		MW				CLy BZ	
101.80							MW				Is(50) = 3.81MPa	x
19			(49)		<b>METASILTSTONE (MW):</b> Grey, fine grained, massive, high to very high strength.		MW				Metasiltstone inclusions	
100.32					Defects: -Joint at 10° (2/m) -Joint at 30° (1-2/m) -Joint at 50° (2/m) -Joint at subvertical (1/m)		MW				Metasiltstone inclusions Water loss from 18.0m	
20					Defect spacing is generally close to medium. Defect surfaces are planar, tight, clay infilled, iron stained, some quartz infill.		MW				Is(50) = 0.99MPa J, 45°, Pl, T, Thin Clnf, FeSt	x
							MW				Is(50) = 5.69MPa Is(50) = 9.63MPa	x o
							MW				XW Clay Seam HW contact zone	

REMARKS         

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QLD DMR LIB 01A GLB Log A ENGINEERING BOREHOLE LOG LITHOLOGY FG5799 - BRUCE HWY UPGRADE SECTION C.GPJ DWG48352.GDW D:\geot\in Add-in 12\12\2011 16:28





## CORE PHOTO LOG - BH C6

Project Name:	BRUCE HIGHWAY UPGRADE - SECTION C		
Project No.:	FG5799	Date:	06/09/2011
Details:	Cut 3	Start Depth (m):	2.30
Reference No.:	H11079	Finish Depth (m):	22.22



SCALE 1:5



## CORE PHOTO LOG - BH C6

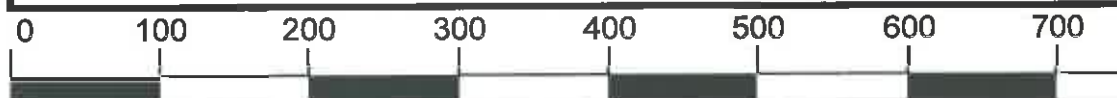
Project Name:	BRUCE HIGHWAY UPGRADE - SECTION C		
Project No.:	FG5799	Date:	06/09/2011
Details:	Cut 3	Start Depth (m):	2.30
Reference No.:	H11079	Finish Depth (m):	22.22



SCALE 1:5

## CORE PHOTO LOG - BH C6

Project Name:	BRUCE HIGHWAY UPGRADE - SECTION C		
Project No.:	FG5799	Date:	06/09/2011
Details:	Cut 3	Start Depth (m):	2.30
Reference No.:	H11079	Finish Depth (m):	22.22



SCALE 1:5

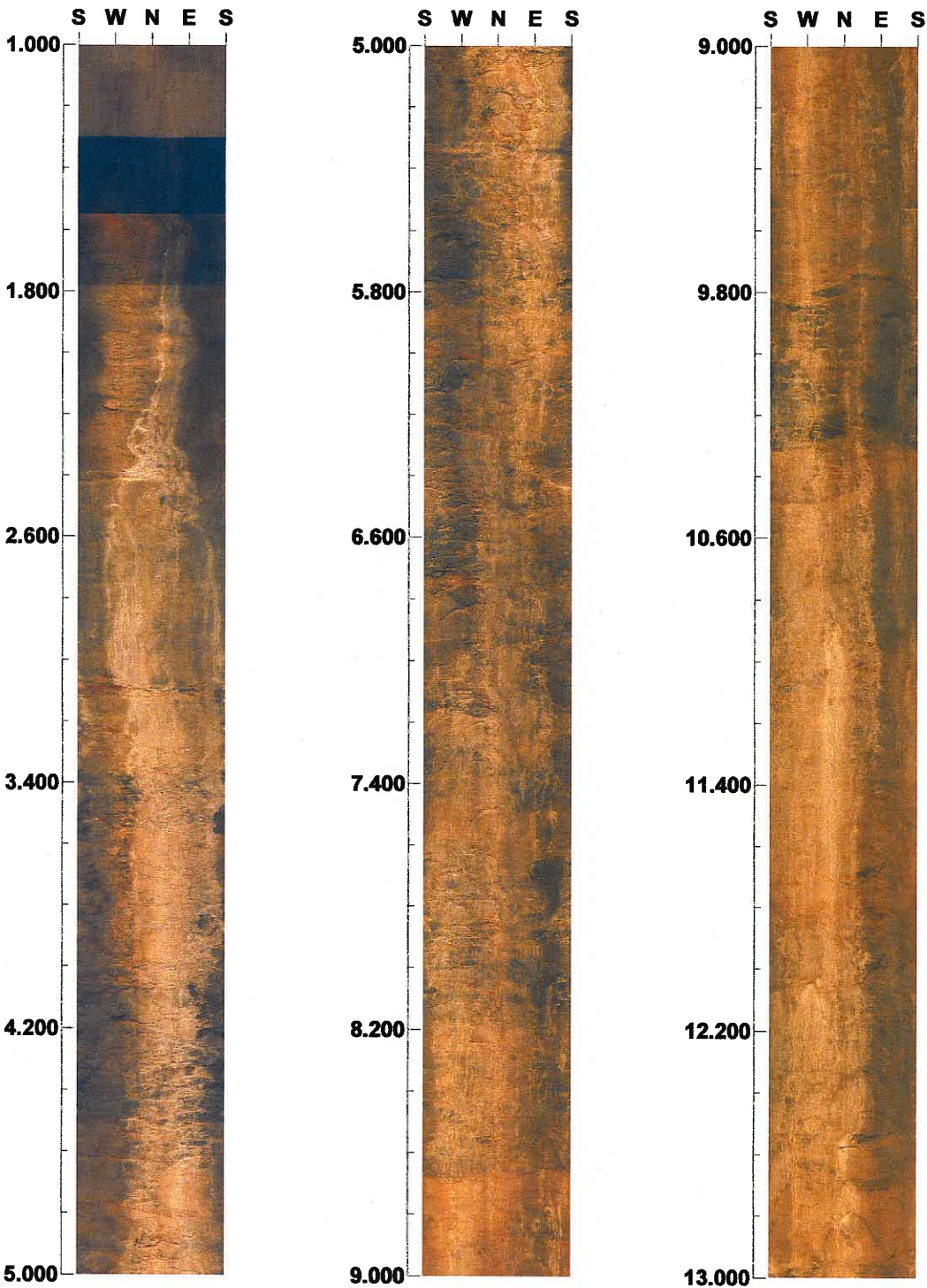
**Project name: BRUCE HIGHWAY UPGRADE SECTION C**

**Bore hole No.: C-6**

**Azimuth: 0**

**Inclination: -90**

**Depth range: 1.000 - 13.000 m**



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



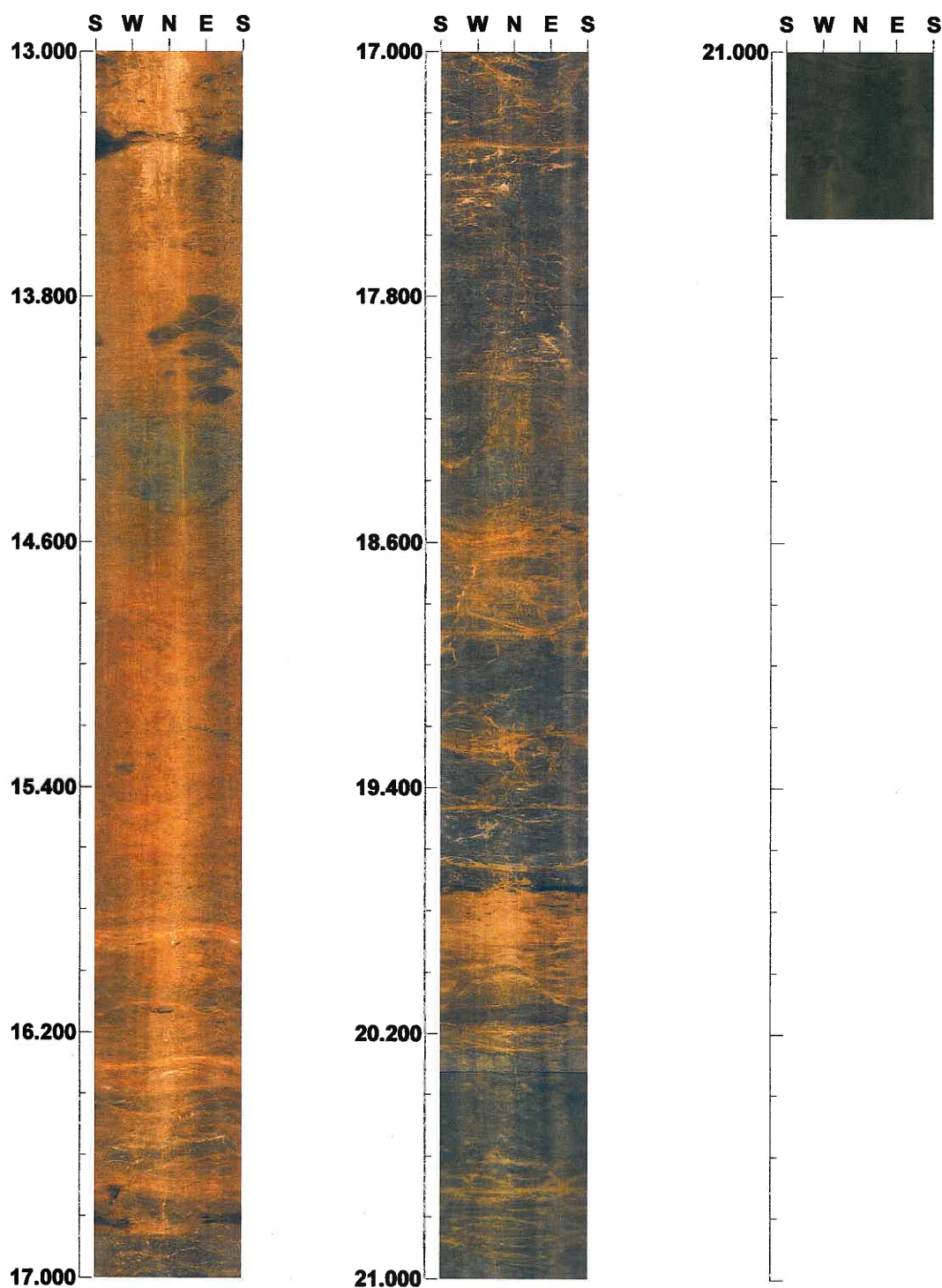
**Project name: BRUCE HIGHWAY UPGRADE SECTION C**

**Bore hole No.: C-6**

**Azimuth: 0**

**Inclination: -90**

**Depth range: 13.000 - 21.543 m**



**Scale: 1/20**

**Aspect ratio: 200 %**

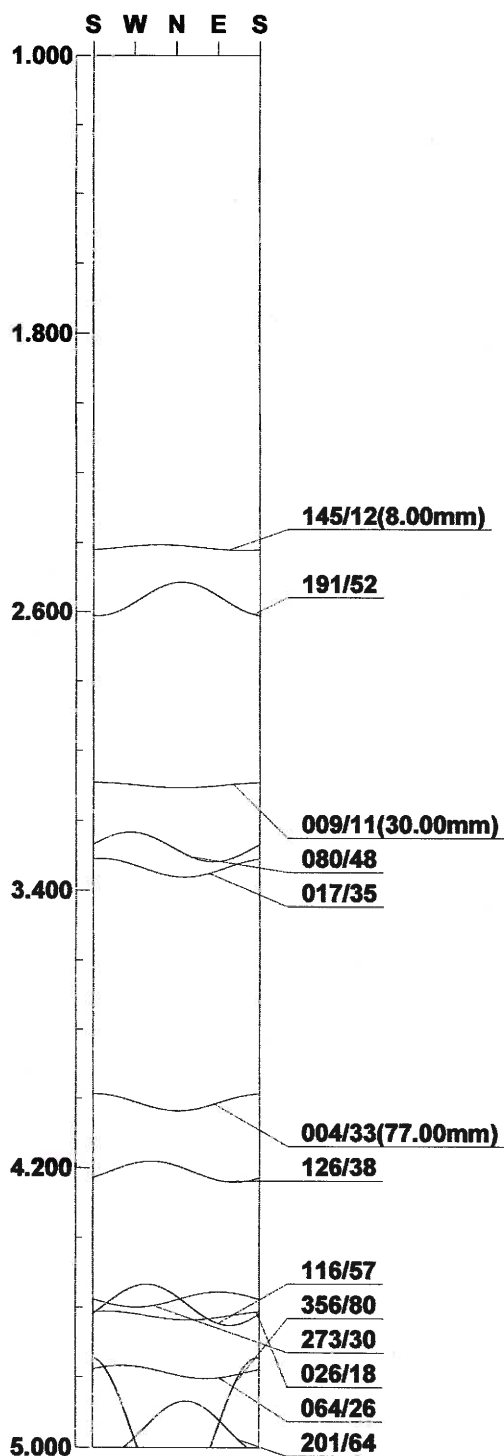
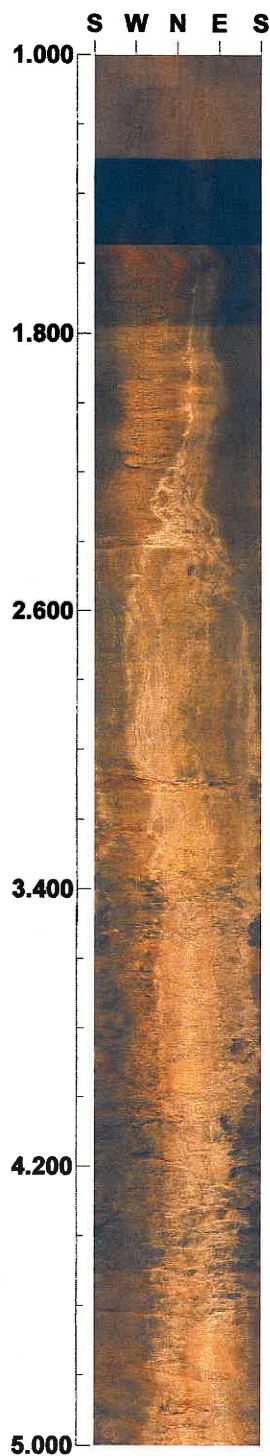
Project name: BRUCE HIGHWAY UPGRADE SECTION C

Bore hole No.: C-6

Azimuth: 0

Inclination: -90

Depth range: 1.000 - 5.000 m



Scale: 1/20

Aspect ratio: 200 %

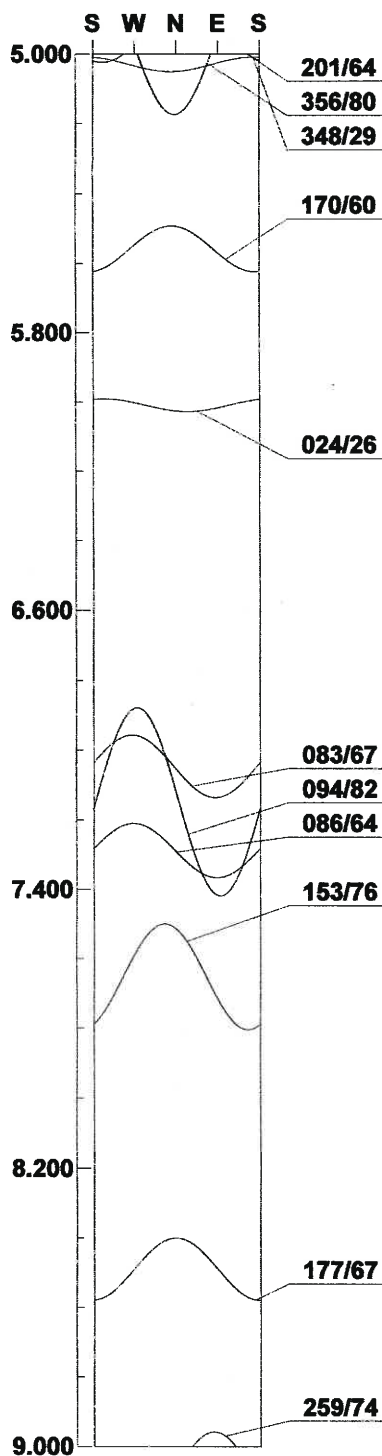
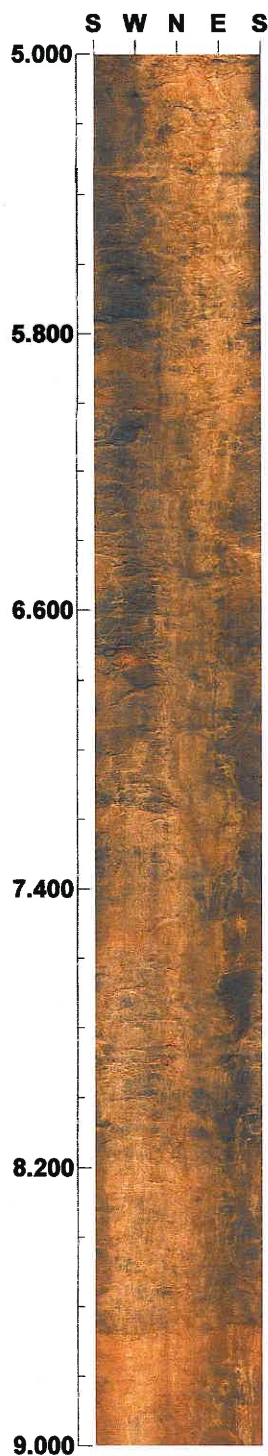
Project name: BRUCE HIGHWAY UPGRADE SECTION C

Bore hole No.: C-6

Azimuth: 0

Inclination: -90

Depth range: 5.000 - 9.000 m



Scale: 1/20

Aspect ratio: 200 %

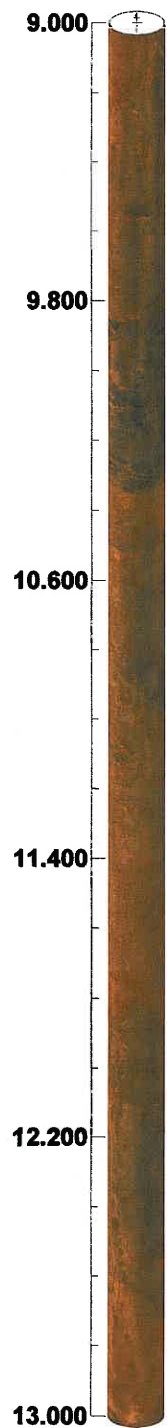
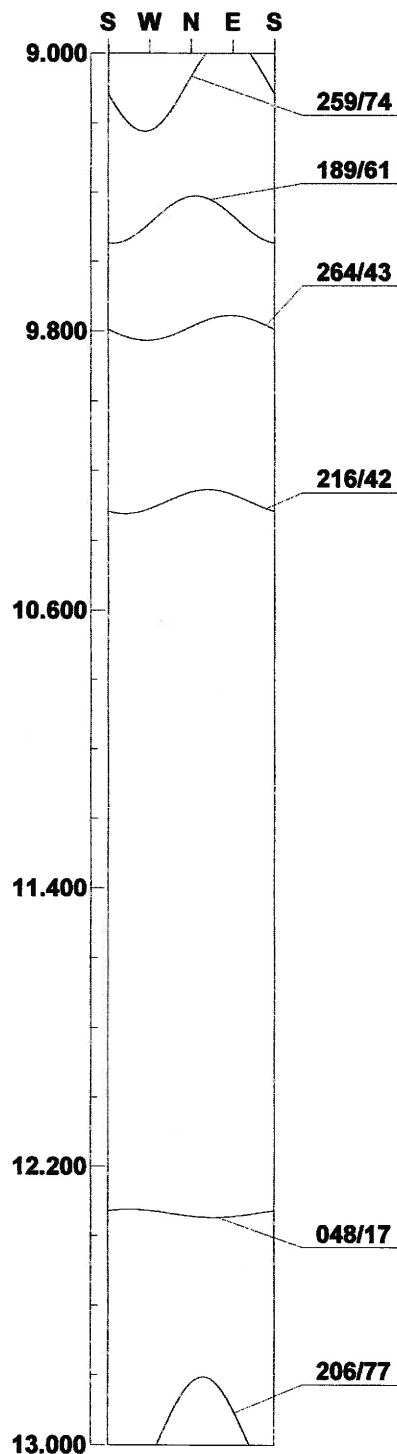
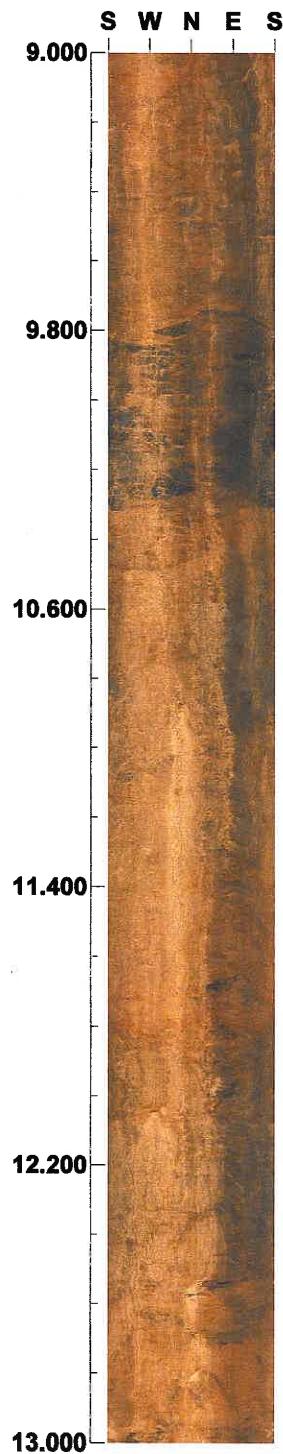
Project name: BRUCE HIGHWAY UPGRADE SECTION C

Bore hole No.: C-6

Azimuth: 0

Inclination: -90

Depth range: 9.000 - 13.000 m



Scale: 1/20

Aspect ratio: 200 %



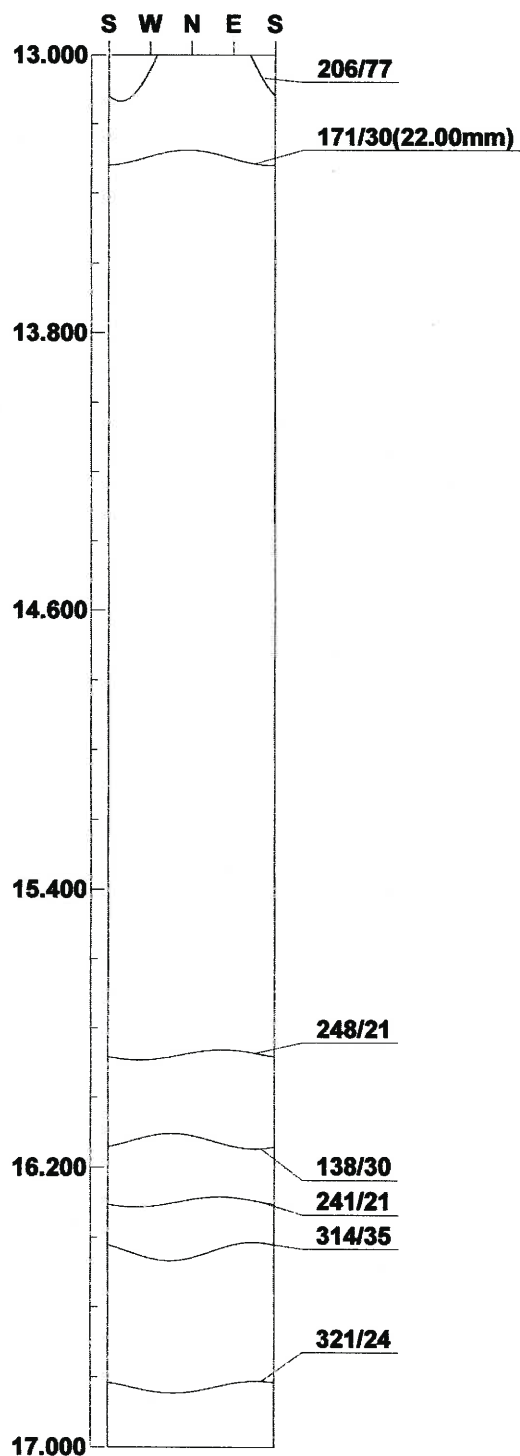
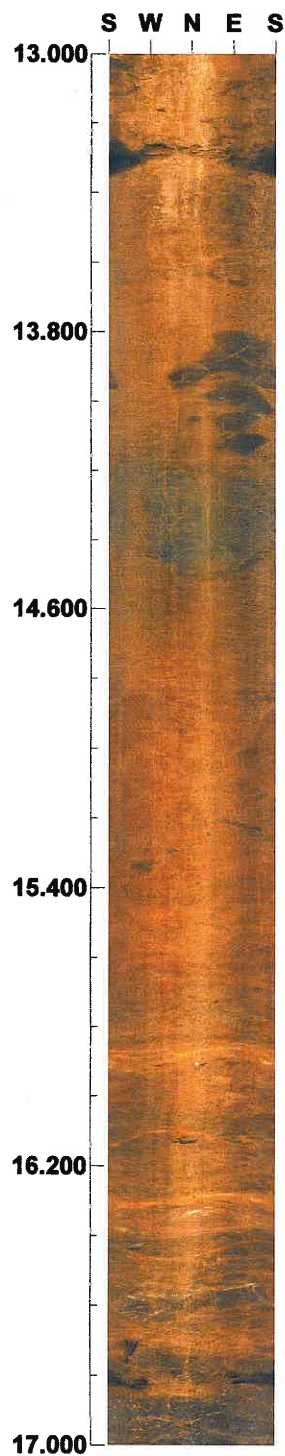
Project name: BRUCE HIGHWAY UPGRADE SECTION C

Bore hole No.: C-6

Azimuth: 0

Inclination: -90

Depth range: 13.000 - 17.000 m



Scale: 1/20

Aspect ratio: 200 %

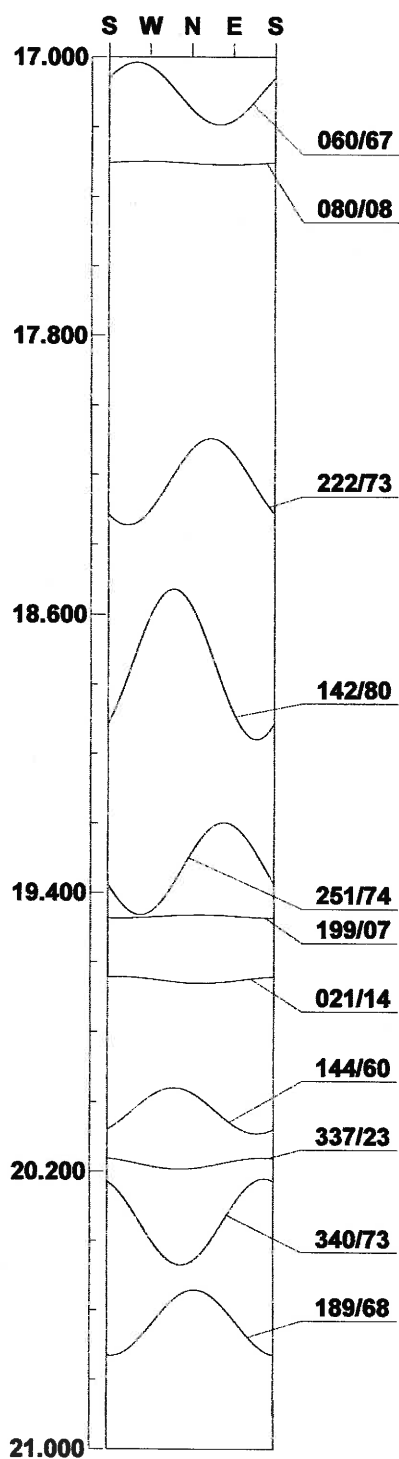
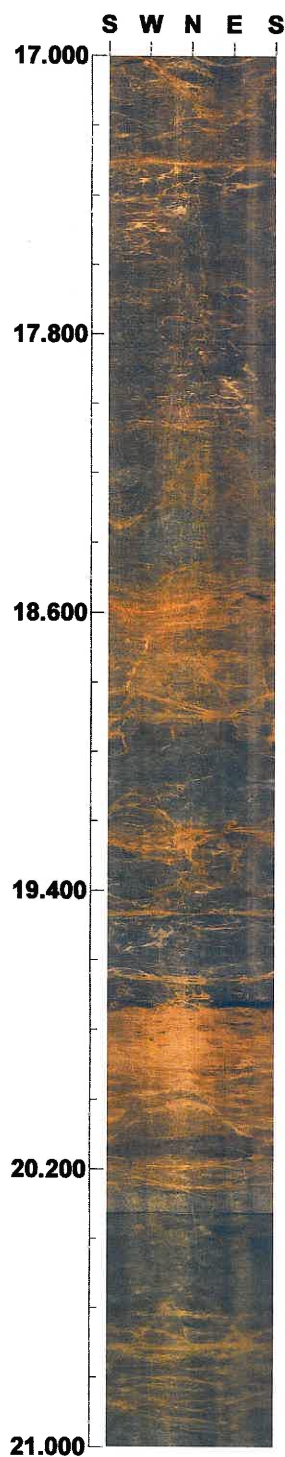
Project name: BRUCE HIGHWAY UPGRADE SECTION C

Bore hole No.: C-6

Azimuth: 0

Inclination: -90

Depth range: 17.000 - 21.000 m



Scale: 1/20

Aspect ratio: 200 %

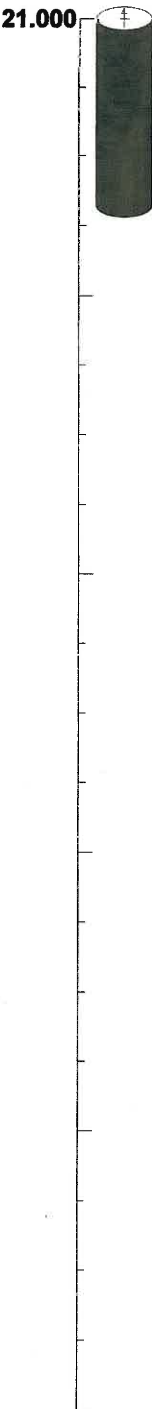
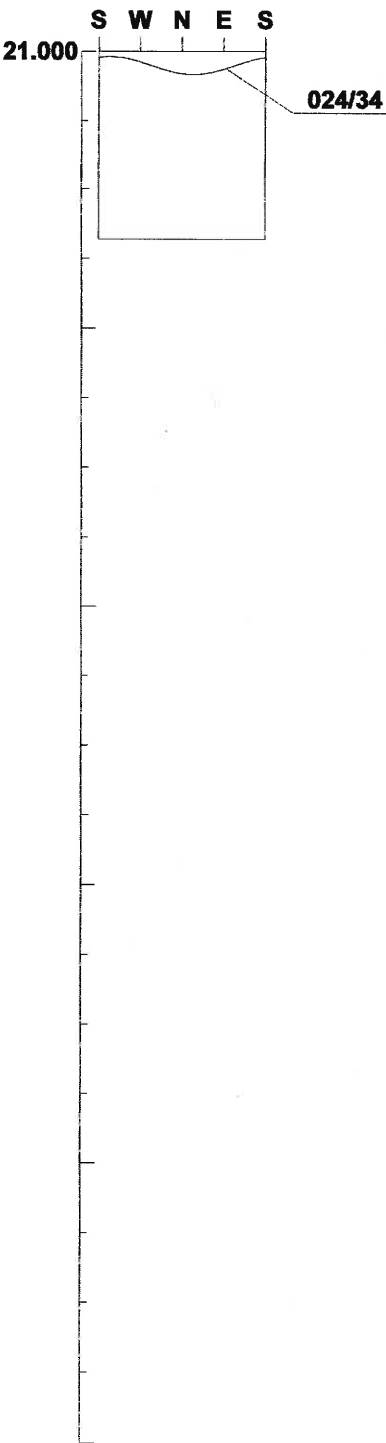
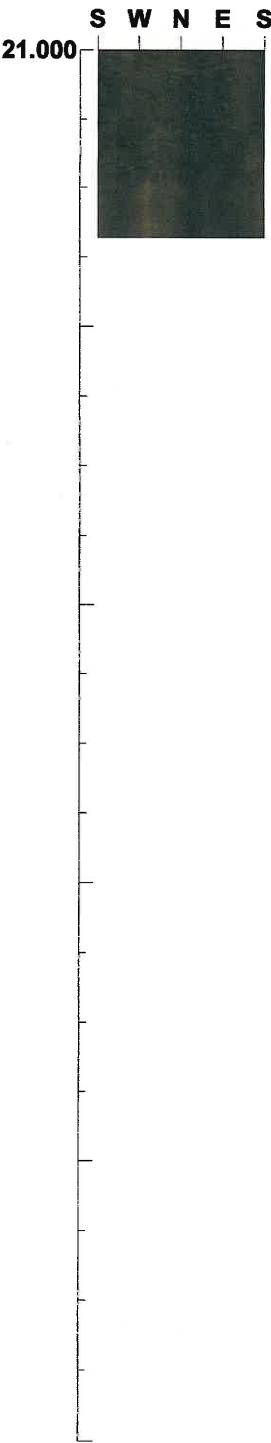
Project name: BRUCE HIGHWAY UPGRADE SECTION C

Bore hole No.: C-6

Azimuth: 0

Inclination: -90

Depth range: 21.000 - 21.543 m



Scale: 1/20

Aspect ratio: 200 %

Tab. Table of Discontinuity ( 1 / 1 )

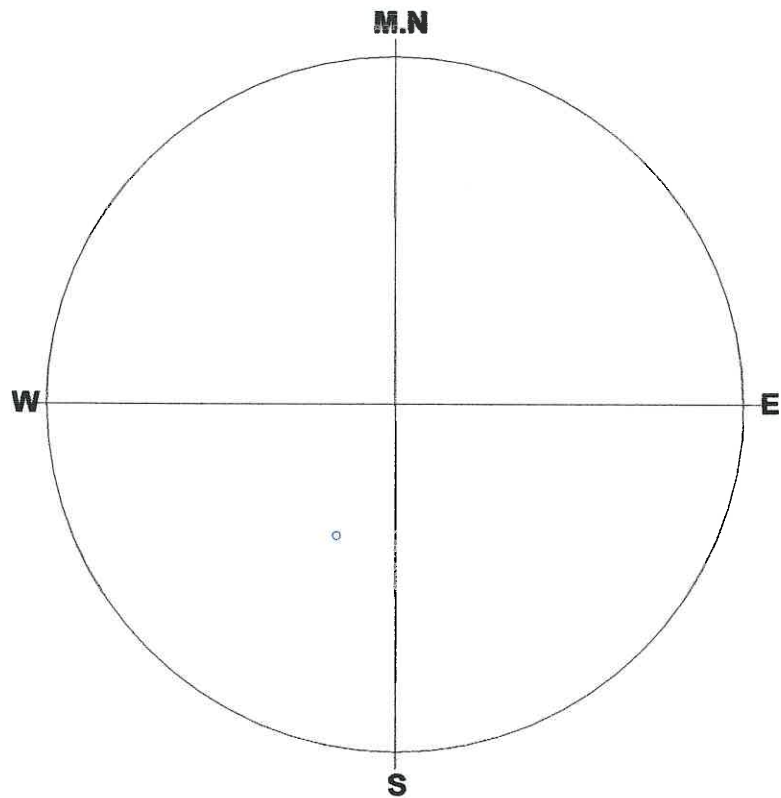
File name: C-6.STR  
[ ]

No.	Depth (m)	Dir/Dip	Sort	Aperture (mm)	Form	Condition	Remark
1	2.414	145/12	ShearZone	8.0	Planar	Weathered	Open/loose
2	2.563	191/52	Joint	0.5	Planar	Smooth	Tight/fil'd
3	3.098	009/11	ShearZone	30.0	Planar	Brec/crus'd	Open/loose
4	3.275	080/48	ShearZone	4.0	Planar	Brec/crus'd	Open
5	3.335	017/35	ShearZone	5.0	Planar	Brec/crus'd	Open
6	4.011	004/33	ShearZone	77.0	Planar	Brec/crus'd	Open
7	4.210	126/38	Joint	0.5	Planar	Smooth	Open
8	4.577	273/30	Joint	0.5	Planar	Rough	Open
9	4.592	116/57	Joint	0.3	Planar	Smooth	Tight
10	4.623	026/18	Joint	0.5	Planar	Rough	Open
11	4.785	064/26	ShearZone	10.0	Planar	Brec/crus'd	Open
12	4.946	201/64	Joint	0.3	Planar	Rough	Tight
13	4.959	356/80	Joint	1.0	Undulating	Rough	Open/loose
14	5.030	348/29	ShearZone	70.0	Planar	Brec/crus'd	Open/loose
15	5.559	170/60	Joint	0.3	Planar	Rough	Open
16	6.010	024/26	ShearZone	10.0	Planar	Brec/crus'd	Open
17	7.046	083/67	Joint	0.3	Planar	Rough	Tight
18	7.148	094/82	Joint	0.5	Undulating	Rough	Open
19	7.288	086/64	Joint	0.5	Planar	Smooth	Open
20	7.652	153/76	Joint	0.5	Planar	Smooth	Open
21	8.489	177/67	Joint	0.3	Planar	Smooth	Open
22	9.091	259/74	Joint	0.3	Undulating	Smooth	Open
23	9.480	189/61	Joint	0.3	Planar	Rough	Open
24	9.791	264/43	Joint	0.5	Planar	Rough	Open
25	10.289	216/42	Joint	0.3	Planar	Smooth	Tight
26	12.335	048/17	Joint	0.5	Planar	Rough	Open
27	12.970	206/77	Joint	0.5	Planar	Rough	Open
28	13.298	171/30	ShearZone	22.0	Planar	Brec/crus'd	Open/loose
29	15.877	248/21	ShearZone	24.0	Planar	Brec/crus'd	Open
30	16.125	138/30	Joint	1.0	Planar	Smooth	Open
31	16.298	241/21	ShearZone	7.0	Planar	Brec/crus'd	Open/loose
32	16.440	314/35	Joint	3.0	Planar	Smooth	Open
33	16.828	321/24	ShearZone	19.0	Planar	Brec/crus'd	Open
34	17.105	060/67	Joint	1.0	Planar	Rough	Tight/fil'd
35	17.304	080/08	Joint	2.0	Planar	Brec/crus'd	Open
36	18.221	222/73	Joint	0.3	Planar	Smooth	Tight
37	18.743	142/80	Joint	0.3	Undulating	Rough	Tight/fil'd
38	19.331	251/74	Joint	0.3	Undulating	Rough	Tight
39	19.469	199/07	ShearZone	5.0	Planar	Brec/crus'd	Open
40	19.652	021/14	ShearZone	9.0	Planar	Brec/crus'd	Open
41	20.025	144/60	Joint	0.3	Planar	Rough	Tight
42	20.177	337/23	Joint	1.0	Planar	Smooth	Tight/fil'd
43	20.345	340/73	Joint	0.3	Planar	Rough	Tight
44	20.636	189/68	Joint	0.3	Planar	Rough	Tight
45	21.041	024/34	Foliation	0.0	Planar	Smooth	Tight



## C-6.STR

<<FOLIATION>>



Number of Data : 1/45

### <Legend>

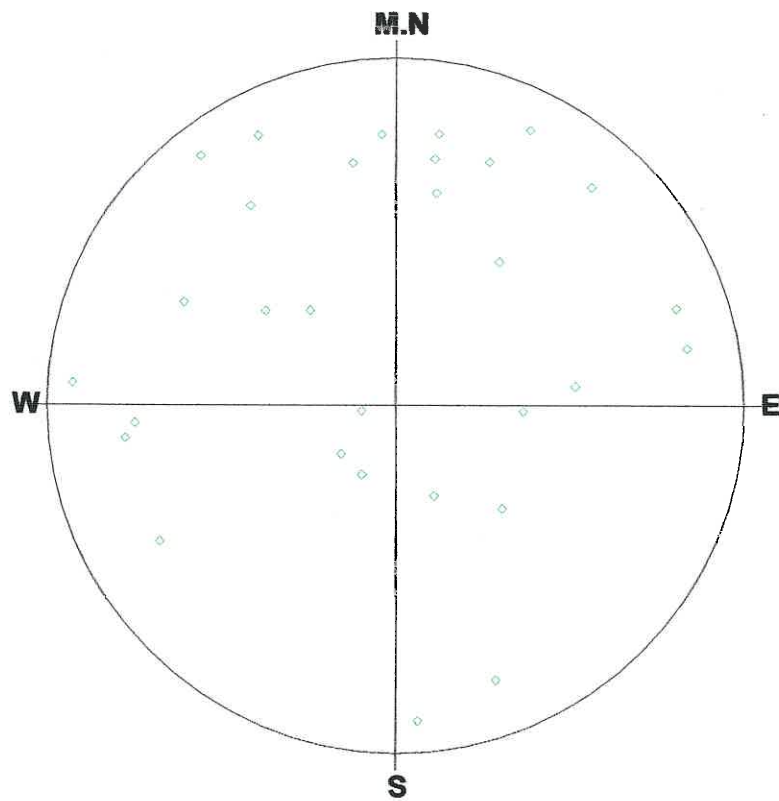
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◇:Joint	--	0		
□:Parting	--	0		
△:Fault	--	0		
▽:ShearZone	--	0		
×:Vein	--	0		

Schmidt (L.H)M

Depth : 2.414 - 21.041 m

Aperture : 0.0 - 77.0 mm

**C-6.STR**  
**<<JOINT>>**



**Number of Data : 30/45**

**<Legend>**

○:Foliation	--	0	+:Mineralban-	0
◇:Joint	--	30		
□:Parting	--	0		
△:Fault	--	0		
▽:ShearZone-		0		
×:Vein	--	0		

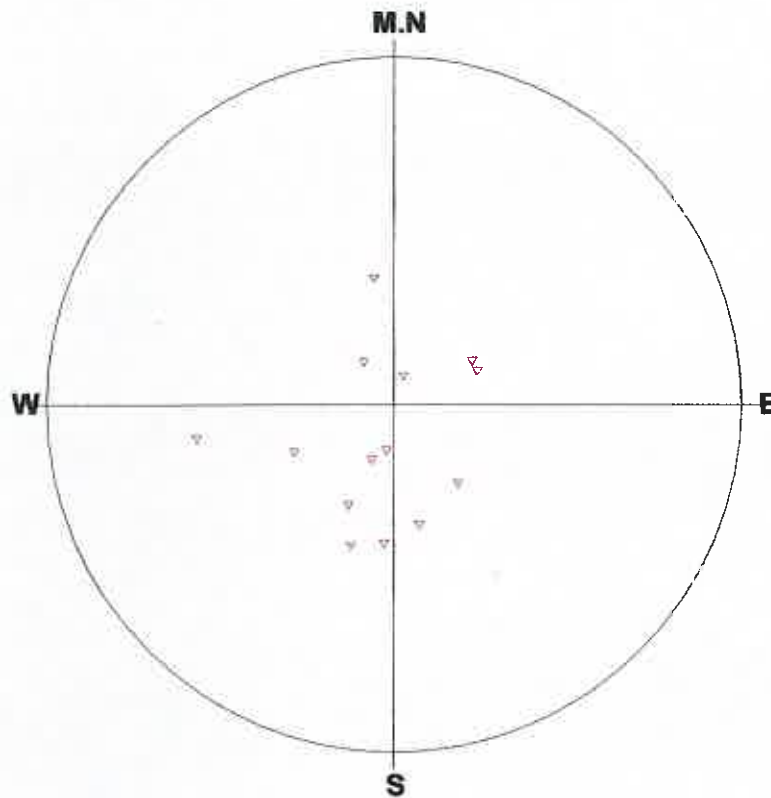
**Schmidt (L.H)mM**

**Depth : 2.414 - 21.041 m**

**Aperture : 0.0 - 77.0 mm**

C-6.STR

<<SHEAR ZONE>>



Number of Data : 14/45

<Legend>

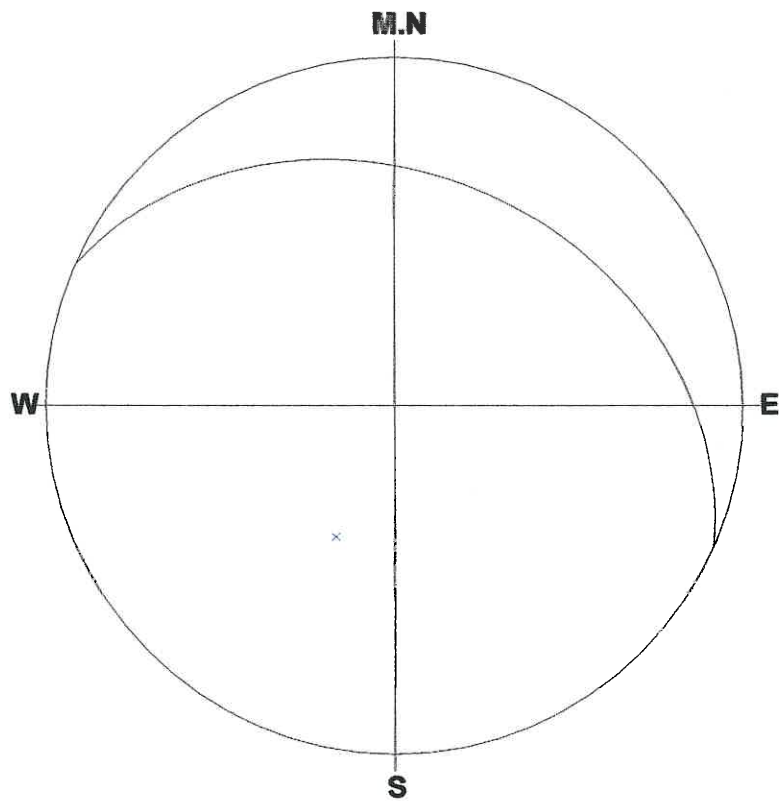
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◇:Joint	--	0		
□:Parting	--	0		
△:Fault	--	0		
▽:ShearZone	--	14		
×:Vein	--	0		

Schmidt (L.H)

Depth : 2.414 - 21.041 m

Aperture : 0.0 - 77.0 mm

**C-6.STR**  
**<<FOLIATION>>**



**Number of Data:1/45**

**1 : 024/34(45)**

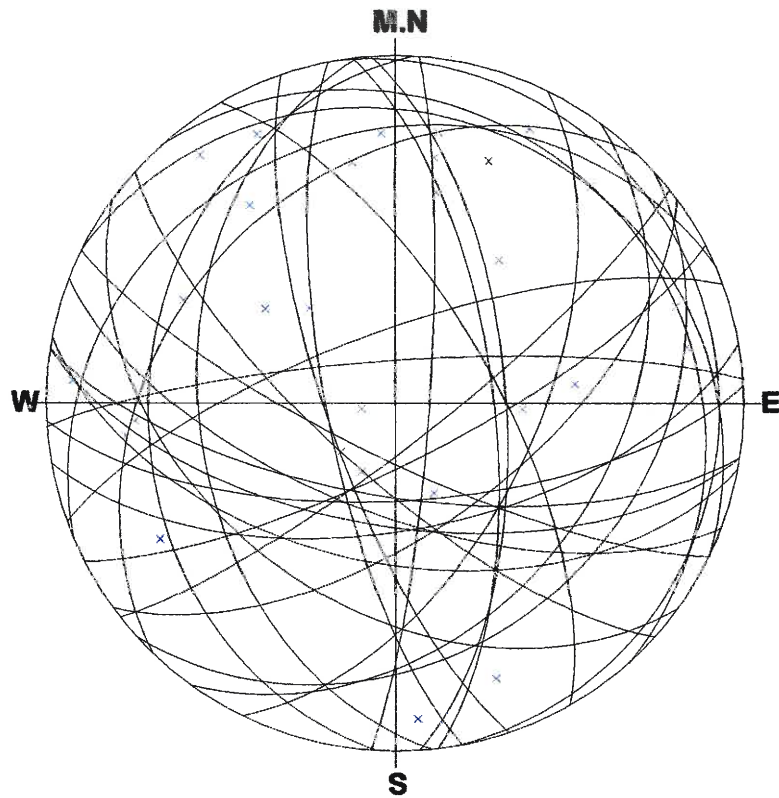
**Schmidt (L.H)**

**Depth : 2.414 - 21.041 m**

**Aperture : 0.0 - 77.0 mm**



**C-6.STR**  
**<<JOINT>>**



**Number of Data:30/45**

<b>1 : 191/52(2)</b>	<b>6 : 201/64(12)</b>
<b>2 : 126/38(7)</b>	<b>7 : 356/80(13)</b>
<b>3 : 273/30(8)</b>	<b>8 : 170/60(15)</b>
<b>4 : 116/57(9)</b>	<b>9 : 083/67(17)</b>
<b>5 : 026/18(10)</b>	<b>10 : 094/82(18)</b>

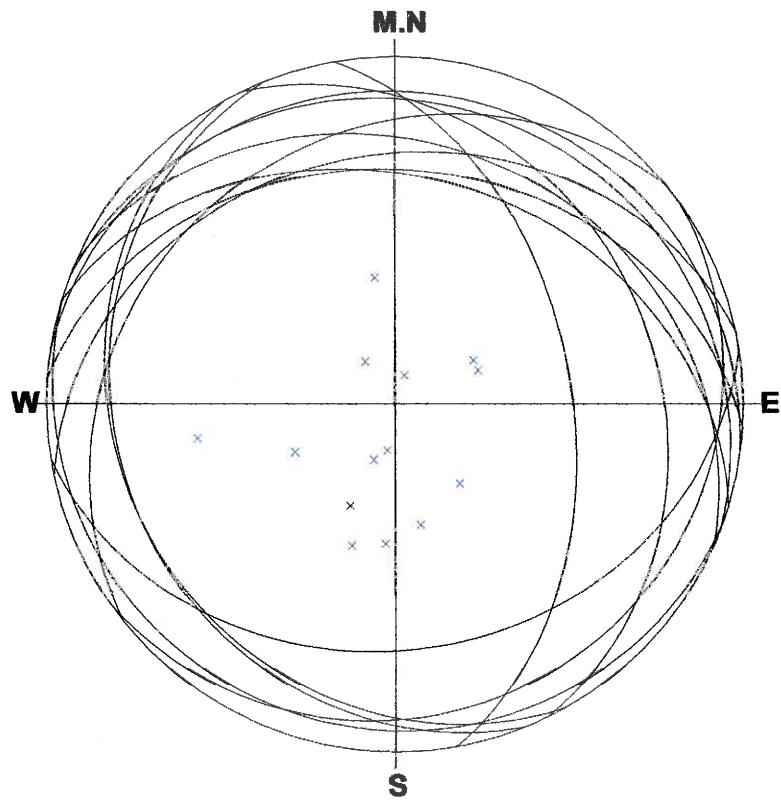
**Schmidt (L.H)M**

**Depth : 2.414 - 21.041 m**

**Aperture : 0.0 - 77.0 mm**

## C-6.STR

<<SHEAR ZONE>>



**Number of Data:14/45**

<b>1 : 145/12(1)</b>	<b>6 : 064/26(11)</b>
<b>2 : 009/11(3)</b>	<b>7 : 348/29(14)</b>
<b>3 : 080/48(4)</b>	<b>8 : 024/26(16)</b>
<b>4 : 017/35(5)</b>	<b>9 : 171/30(28)</b>
<b>5 : 004/33(6)</b>	<b>10 : 248/21(29)</b>

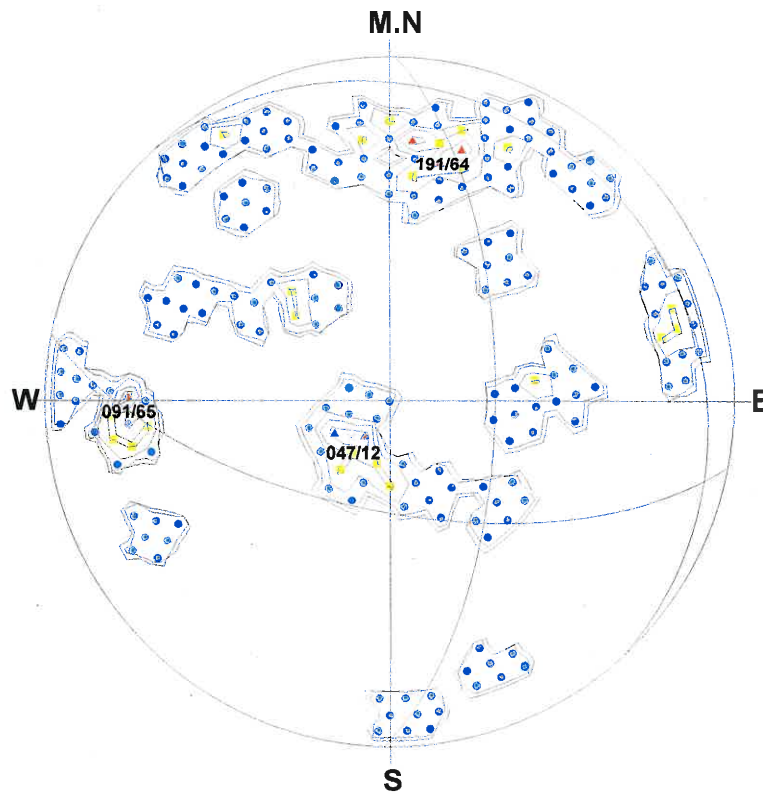
**Schmidt (L.H)**

**Depth : 2.414 - 21.041 m**

**Aperture : 0.0 - 77.0 mm**

**C-6.STR**  
**<<JOINT>>**

\*\*\*\*\* % Diagram \*\*\*\*\*



**Number of Data : 30**

**<Legend> Sym. (%)**

- ▲ : 10
- ▼ : 8 - 10
- : 6 - 8
- ◆ : 4 - 6
- : 2 - 4
- ⊕ : 0 - 2

**Contour Value (%)**

- Contour 1 : 0
- Contour 2 : 2
- Contour 3 : 4
- Contour 4 : 6
- Contour 5 : 8
- Contour 6 : 10



**Schmidt (L.H)**

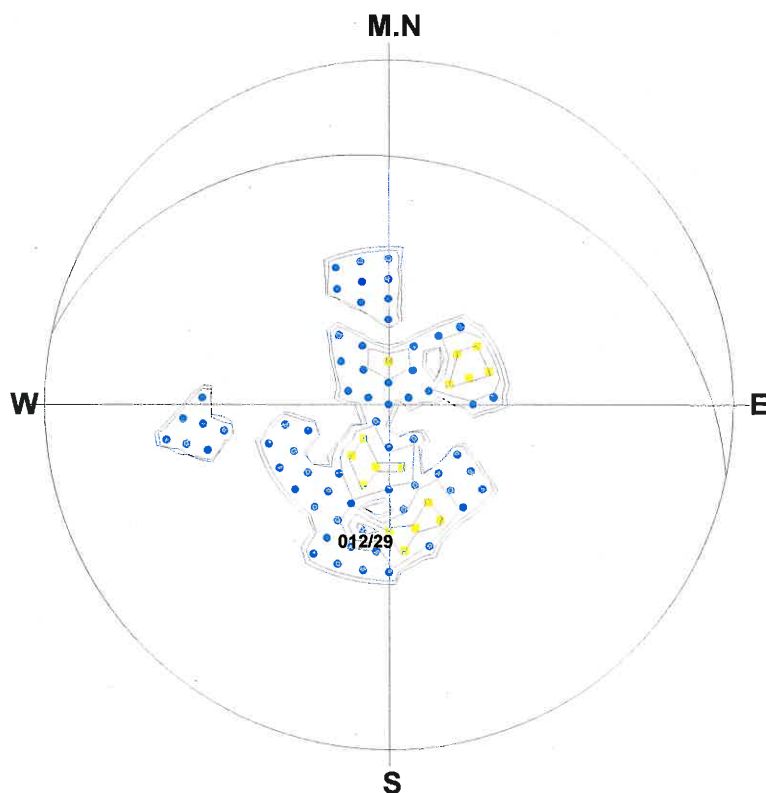
**Depth : 2.414 - 21.041 m**

**Aperture : 0.0 - 77.0 mm**

# C-6.STR

<<SHEAR ZONE>>

\*\*\*\*\* % Diagram \*\*\*\*\*



Number of Data : 14

<Legend> Sym. (%)

- ▲ : 21
- ▼ : 17 - 21
- : 12 - 17
- ◆ : 8 - 12
- : 4 - 8
- ⊕ : 0 - 4

Contour Value (%)

- Contour 1 : 0
- Contour 2 : 4
- Contour 3 : 8
- Contour 4 : 12
- Contour 5 : 17
- Contour 6 : 21

Schmidt (L.H)

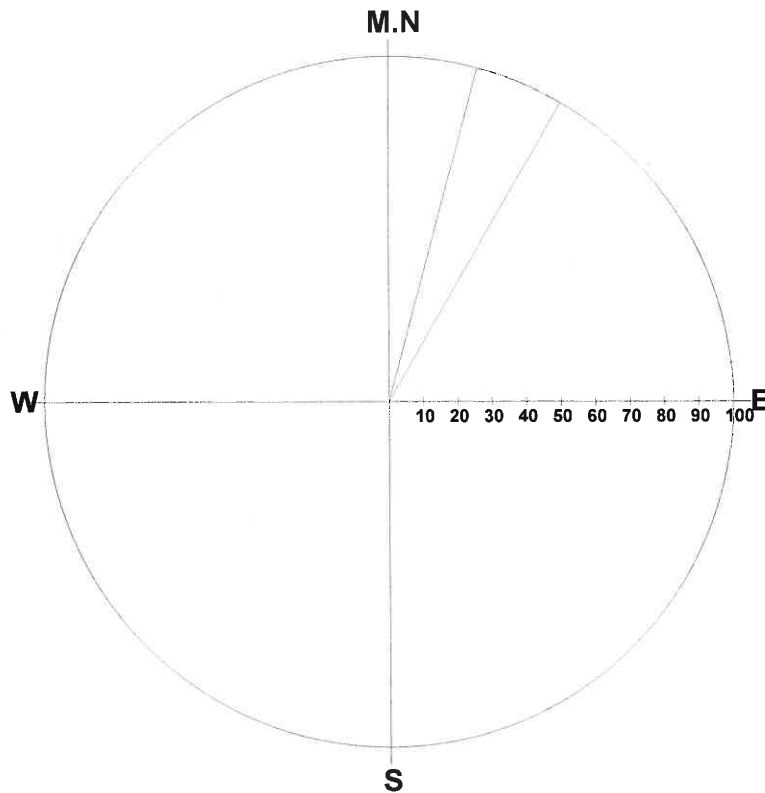
Depth : 2.414 - 21.041 m

Aperture : 0.0 - 77.0 mm



**C-6.STR**

**<<FOLIATION>>**



**Number of Data : 1/45**

**Max : 100.0%**

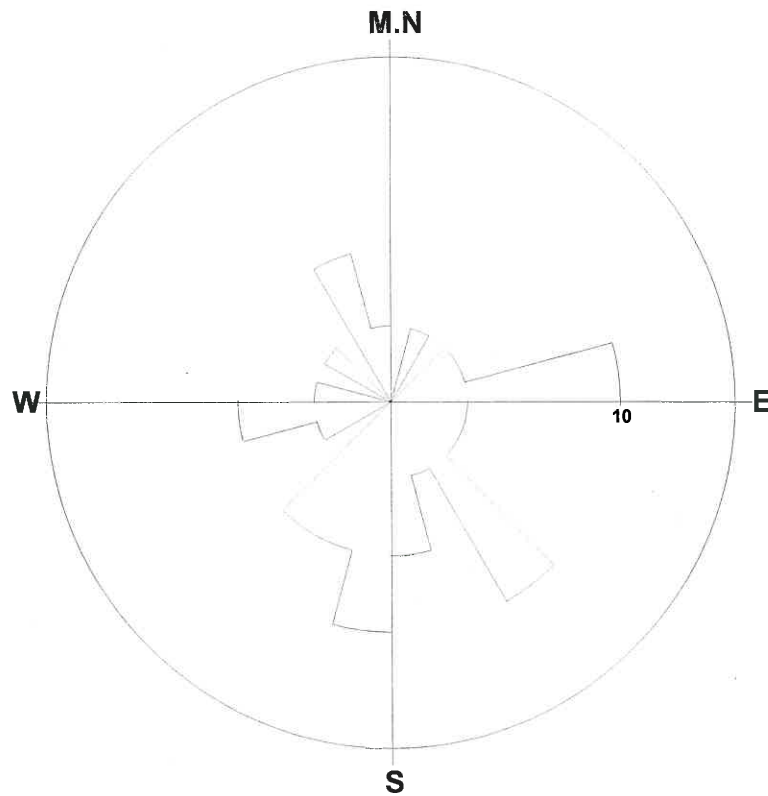
**Grouping Angle : 15 deg**

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

**Depth : 2.414 - 21.041 m**

**Aperture : 0.0 - 77.0 mm**

**C-6.STR**  
**<<JOINT>>**



**Number of Data : 30/45**

**Max : 10.0%**

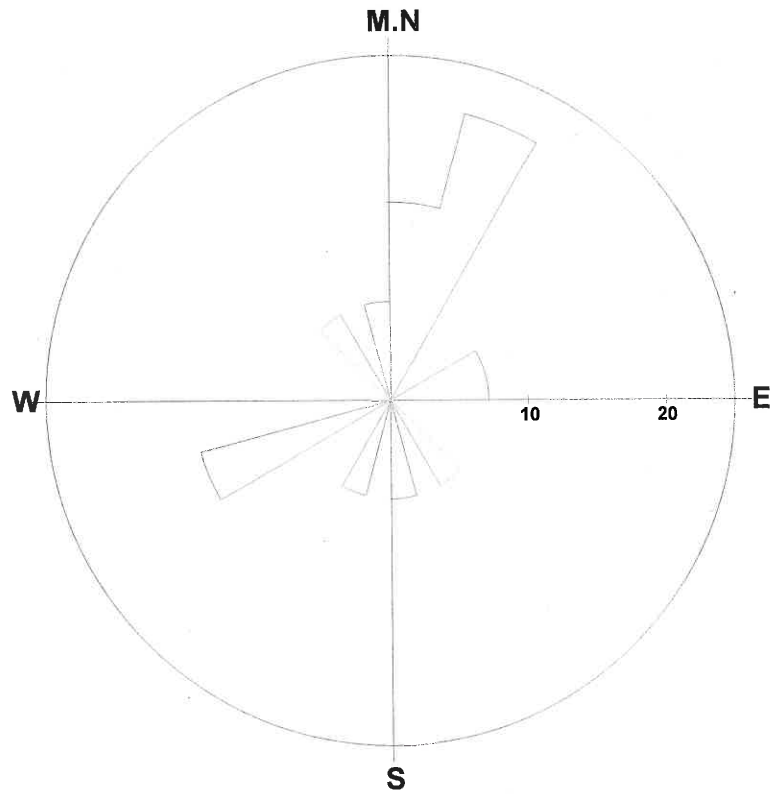
**Grouping Angle : 15 deg**

Dir	%	Dir	%	Dir	%
0-	0	135-	10	270-	3
15-	3	150-	3	285-	0
30-	0	165-	7	300-	3
45-	3	180-	10	315-	0
60-	3	195-	7	330-	7
75-	10	210-	7	345-	3
90-	3	225-	0		
105-	3	240-	3		
120-	3	255-	7		

**Depth : 2.414 - 21.041 m**

**Aperture : 0.0 - 77.0 mm**

**C-6.STR**  
**<<SHEAR ZONE>>**



**Number of Data : 14/45**

**Max : 21.4%**

**Grouping Angle : 15 deg**

Dir	%	Dir	%	Dir	%
0-	14	135-	7	270-	0
15-	21	150-	0	285-	0
30-	0	165-	7	300-	0
45-	0	180-	0	315-	7
60-	7	195-	7	330-	0
75-	7	210-	0	345-	7 M
90-	0	225-	0		
105-	0	240-	14		
120-	0	255-	0		

**Depth : 2.414 - 21.041 m**

**Aperture : 0.0 - 77.0 mm**

Title: C-6.STR  
 Comment: JOINT  
 Depth: 2.414 - 21.041 m  
 Aperture: 0.0 - 77.0 mm

Sort: 1/ 7  
 Form: 5/ 5  
 Condition: 11/11  
 Remark: 9/ 9

2011/ 8/ 30  
 Elevation: 0.000m  
 Water Level: 20.300m

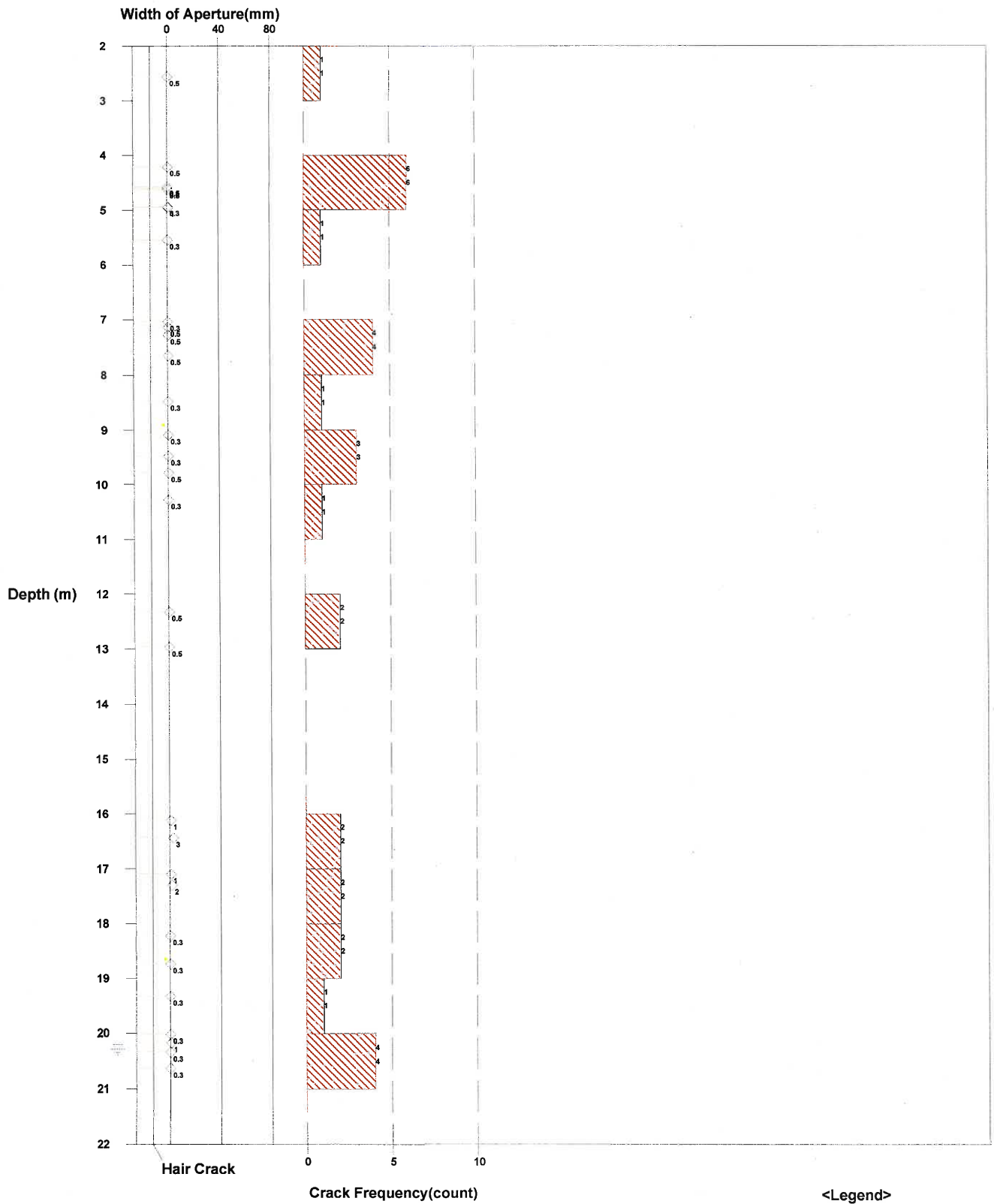


Fig. Rock Mass Condition Graph

All Crack Frequency  
 Open Crack Frequency  
 Water Level

Title: C-6.STR  
 Comment: SHEAR ZONE  
 Depth: 2.414 - 21.041 m  
 Aperture: 0.0 - 77.0 mm

Sort: 1/ 7  
 Form: 5/ 5  
 Condition: 11/11  
 Remark: 9/ 9

2011/ 8/ 30  
 Elevation: 0.000m  
 Water Level: 20.300m

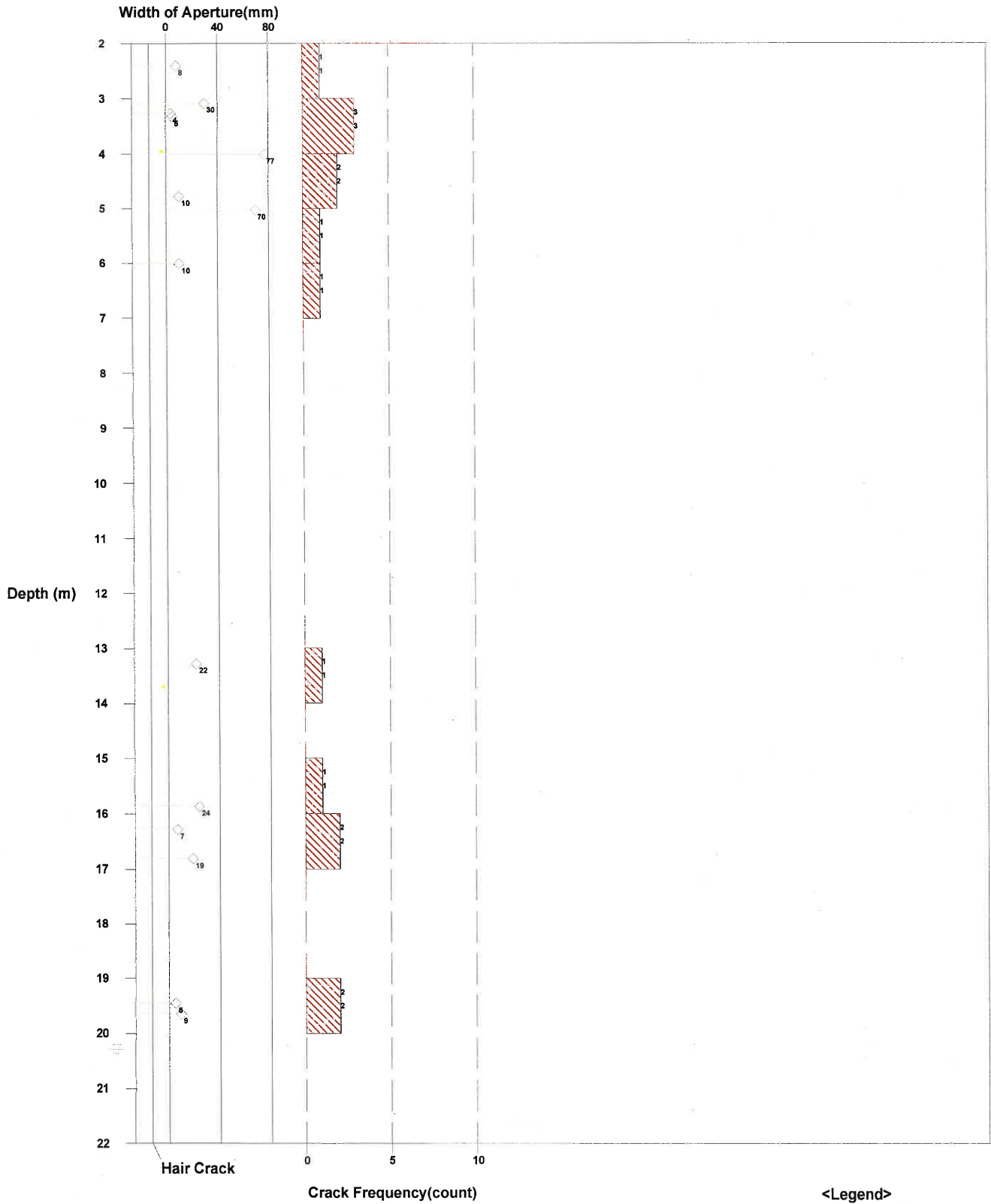


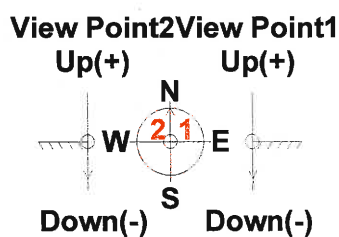
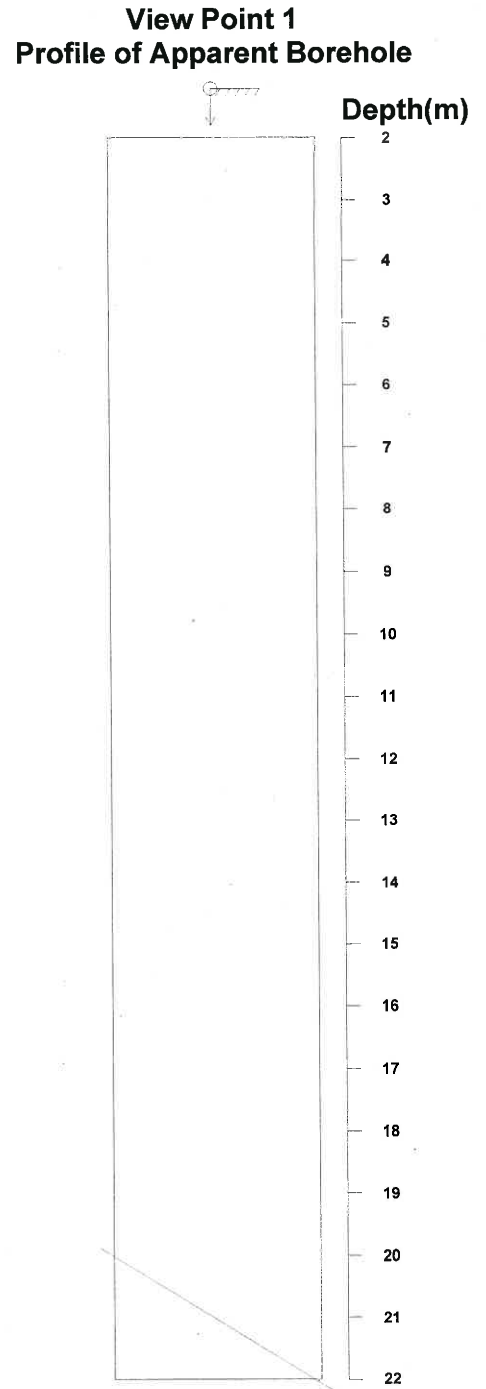
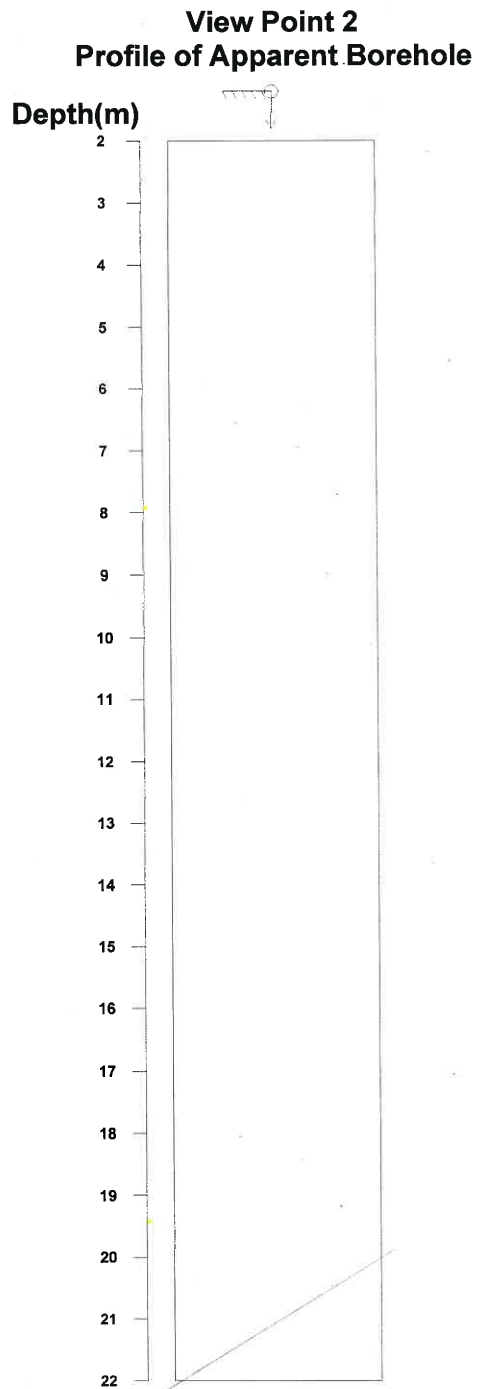
Fig. Rock Mass Condition Graph

All Crack Frequency  
 Open Crack Frequency  
 Water Level



Title: C-6.STR  
 Comment: FOLIATION  
 Depth: 2.414 - 21.041 m  
 Aperture: 0.0 - 77.0 mm

Sort: 1/ 7  
 Form: 5/ 5  
 Condition: 11/11  
 Remark: 9/ 9



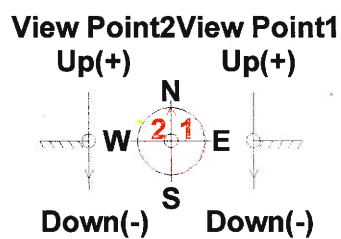
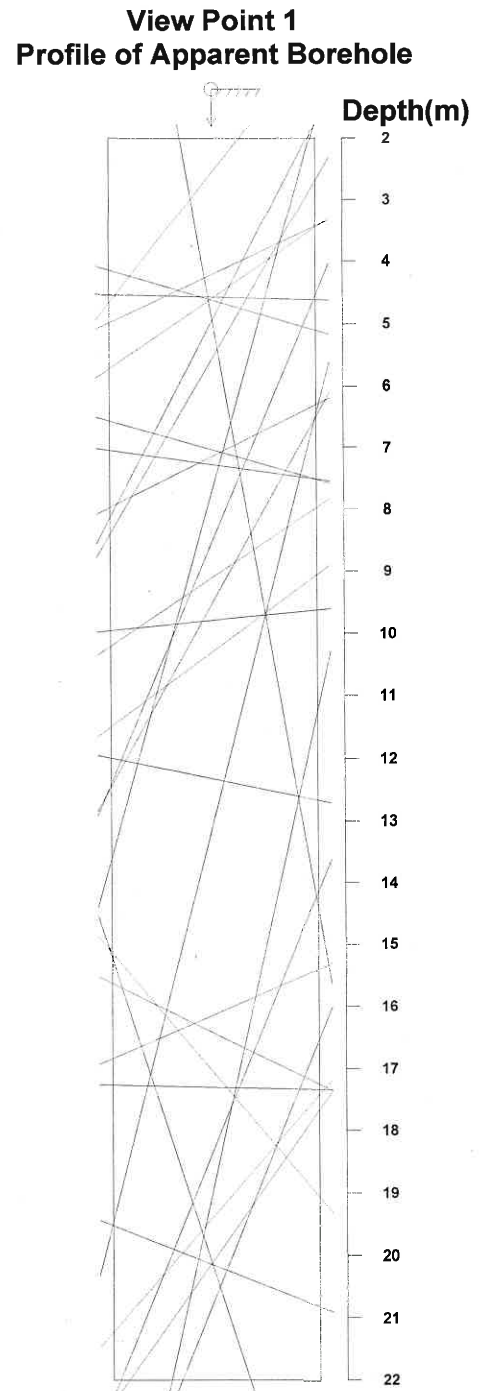
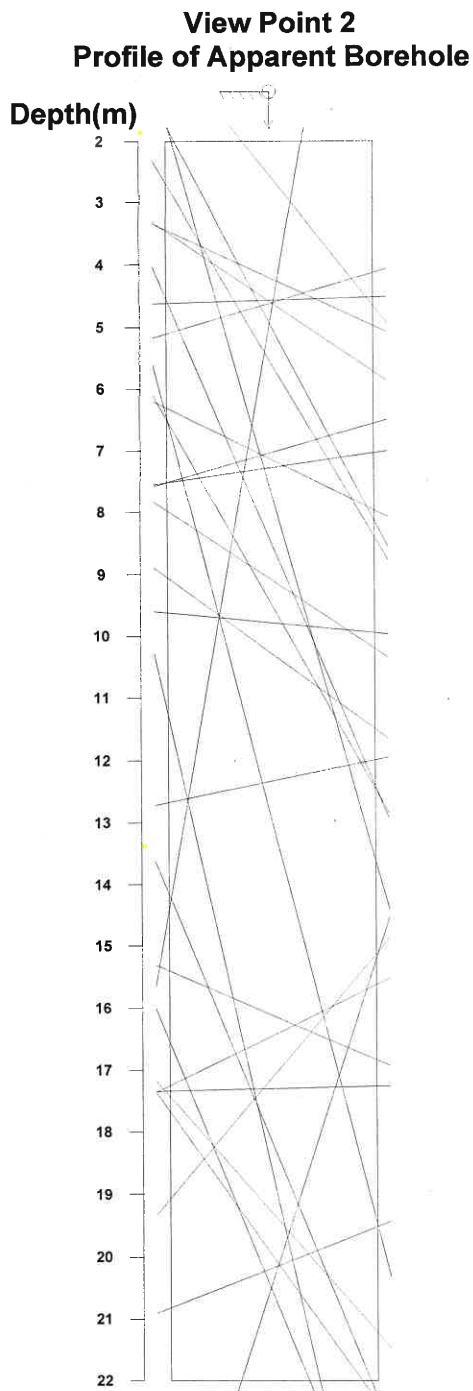
Direction: 0 deg  
 Inclination: Vertical(Down)

<Legend>  
 Entrance G.L.  
 Bottom

Fig. Apparent Dip

**Title:** C-6.STR  
**Comment:** JOINT  
**Depth:** 2.414 - 21.041 m  
**Aperture:** 0.0 - 77.0 mm

**Sort:** 1/ 7  
**Form:** 5/ 5  
**Condition:** 11/11  
**Remark:** 9/ 9



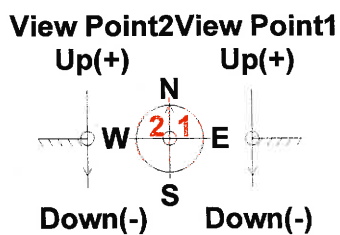
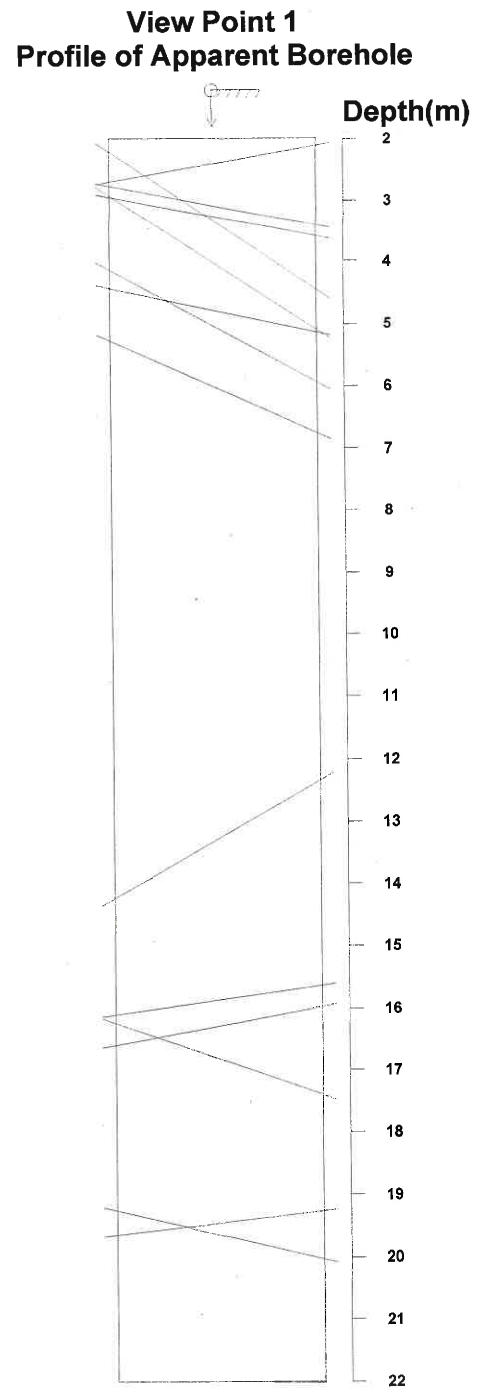
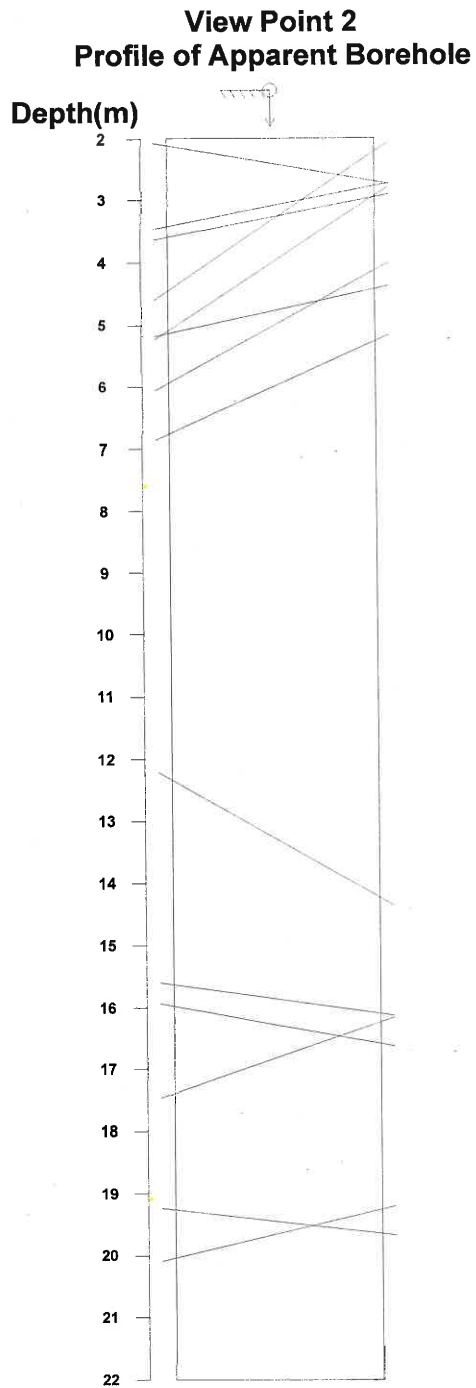
**Direction:** 0 deg  
**Inclination:** Vertical(Down)

**<Legend>**  
**Entrance** **G.L**  
**Bottom**

**Fig. Apparent Dip**

Title: C-6.STR  
 Comment: SHEAR ZONE  
 Depth: 2.414 - 21.041 m  
 Aperture: 0.0 - 77.0 mm

Sort: 1/ 7  
 Form: 5/ 5  
 Condition: 11/11  
 Remark: 9/ 9



Direction: 0 deg  
 Inclination: Vertical(Down)

<Legend>  
 Entrance G.L.  
 Bottom

Fig. Apparent Dip