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FG5799.

ENGINEERING **BOREHOLE LOG**

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

BOREHOLE No	BH_C62
SHEET	_ <u>1</u> _ of _ <u>2</u> _
REFERENCE No	<u>H11144</u>

PROJECT Bruce Highway Upgrade (Cooroy to Curra) Section C LOCATION <u>Cut 16</u> COORDINATES 470474.6 E; 7097762.8 N _____ PROJECT No FG5799 SURFACE R.L. 76.70m PLUNGE _____ DATE STARTED _16/08/11_ GRID DATUM MGA94 _232/10A/2 ____ HEIGHT DATUM __AHD ___ JOB No DRILLER ______ Drillsure Pty Ltd_____ DATE COMPLETED _16/08/11_ R.L RQD INTACT DEFECT AUGER CASING WASH BORING CORE DRILLING ()% (m) ADDITIONAL DATA STRENGTH SPACING Ê 8 MATERIAL (mm) LITHOLOGY Ē AND SAMPLE GRAPHIC SAMPLES DEP1 DESCRIPTION TESTS CORE TEST RESULTS 0 76.70 REC % JULI 1111 76.60 47 TOPSOIL: Pale grey, dry, silt. (MI SANDSTONE (XW): Generally exhibits engineering properties Based on driller's logs only of a brown/grey, fine grained, dense to very dense, sandy silty gravel. - 1 16,18,18 A SPT N=36 XW Tool gINt Add-In 12/12/2011 16:30 -2 30/80 B SPI N>50 73.70 SANDSTONE (HW): (9) - Clayey Seam Brown/grey, fine grained, massive, low to Datgel CPT T medium strength. J, 80°, I, O, Cinf, 2mm J, 30°, PI, T, S, Cinf J, 30°, I, O, Cinf, 2mm J, 60°, PI, T, S, Cinf Defects: DWG46352.GDW -Frequent clay seams throughout -Joint at 20° (2/m) -Joint at 40° (3-4/m) -Joint at 60°-70° (2/m) • 4 100 J, 80°, Pl, O, S, Cinf (8) - J, 60°, PI, C, FeSt SECTION C.GPJ Defect spacing is mainly close. Clayey Seam Defect surfaces are planar, tight, smooth, clay infilled, iron stained. - 5 - J, 40°, PI, T, S, Cinf Is(50) = 0.50MPa ýź 100 HWY UPGRADE ls(50) = 0.61MPa D HHH - CLY BZ (21)- Clayey Seam BRUCE J, 30°, PI, T, Cinf нw Is(50) = 0.33MPa Is(50) = 0.58MPa × DMR_LIB_01A.GLB_L00_A_ENGINEERING BOREHOLE LOG WLTTHOLOGY 100 (0) – J, 20°, PI, T, S, CInf - J, 10°, I, O, Cinf 100 (9) -J, 60°, Pt, T, S, Cinf Is(50) = 0.83MPa х Is(50) = 0.56MPa 0 - J, 30°, I, O, R, Cinf ÐE 100 1(REMARKS LOGGED BY JA/DC

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Bruce Highway Lir

arada (Caarou to Curro) Section C

ENGINEERING BOREHOLE LOG

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

BOREHOLE No	BH C62
SHEET	_2_ of _2_
REFERENCE No	<u>H11144</u>

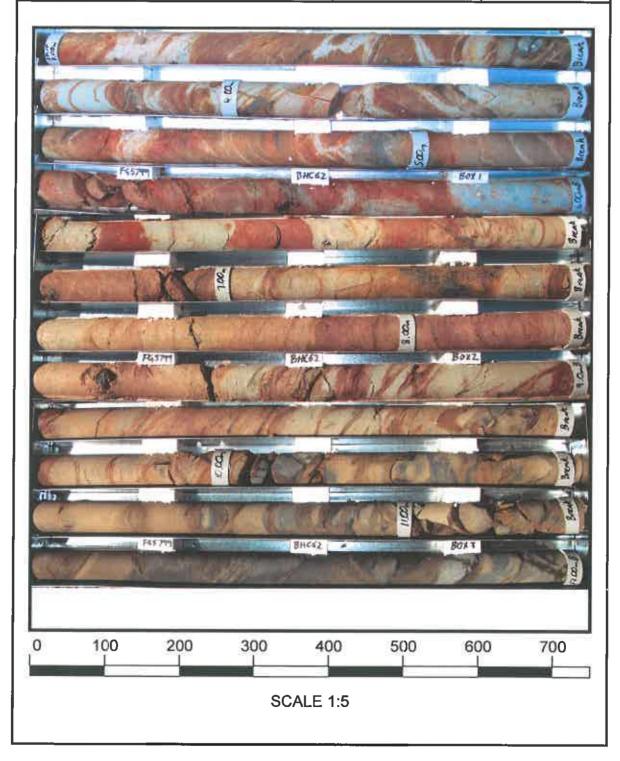
	<u>Cut 16</u>							00		e 470474	.6 E; 7097762.	8 N
			SURFACE R.L. <u>76.70m</u> PLUNGE			DATE S	 TARTED					<u> </u>
JOB No			HEIGHT DATUM <u>AHD</u> BEARING								Drillsure Pty L	_td
(E) HLd 30 10 66.70	AUGER CASING CASING CORE DRILLING JOS DEN JOS DEN CORE DRILLING	% BALE	MATERIAL DESCRIPTION	ПТНОСОСУ	USC	INTACT STRENGTH	DEFECT SPACING (mm)	GRAPHIC LOG	-	DDITIONAL AND TEST RESU		SAMPLES TESTS
- 12 - 13 - 13 - 14 - 14 - 62.70 - 14 - 15 - 16	10 10 (18 10 (18 10 (18 10 (3 ⁻ 10 (3 ⁻ 10 (10 (10 (10 (10 (10 (10 (10) (10 (10 (10 (10 (10) (10 (10 (10 (10) (1	() () () () () () () () () () () () () (SANDSTONE (MW): Grey/brown, fine grained, massive, medium to high strength, indurated and/or slightly metamorphosed. Defects: -Broken Zones up to 300mm. -Joint at 40° (2-3/m) Joint at 60° (2/m) Defect spacing is close to medium. Defect surfaces are planar, tight, smooth, thinly clay infilled, iron stained. Prominent siltstone interbeds. SANDSTONE (SW): Grey, medium to coarse grained, massive, high to very high strength, indurated and/or slightly metamorphosed. Defects: -Joint at 40° (2-3/m) -Joint at 60° (1-2/m) Defect spacing is mainly wide. Defect surfaces are planar, open, slightly rough to rough, iron stained. Particles up to 50mm throughout. 		SW				 BZ, DI? J, 50°, PI, J, 60°, PI, J, 60°, PI, J, 70°, PI, BZ J, 40°, PI, J*2, 40°, FI, J*2, 40°, FI, J*40°, PI, 	T, S, FeSt Is(T, CInf T, S, FeSt Is(Is(O, CInf, 2mm O, R, Cn Is(O, R, Cn Is(Is(O, R, FeSt	50) = 1.64MPa 50) = 1.53MPa 50) = 2.56MPa 50) = 0.61MPa 50) = 0.61MPa 50) = 1.13MPa 50) = 4.52MPa 50) = 2.14MPa 50) = 7.17MPa 50) = 7.17MPa	x - x - x - x - x - x - x - x - x - x -
- 17 - - - - - - - - - - - - - - - - - - -	10	0								DD = 2 62t/n	50) = 2.69MPa n³; MC = 0.6%; CS=21.49MPa	0 UCS
- 17 - 59.00 - 18 - 19 - 19 - 20 			Borehole terminated at 17.7m								LOGGED BY	-

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CORE PHOTO LOG = BH C62

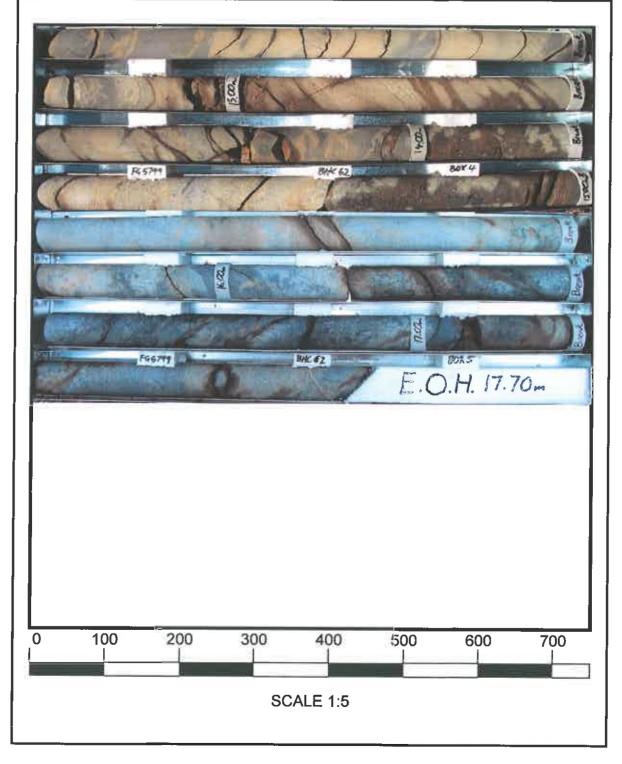
Project Name:	BRUCE HIGHWAY UPGRADE - SECTION C				
Project No.:	FG5799	Date:	08/09/2011		
Details:	Cut 16	Start Depth (m):	3.00		
Reference No.:	H11144	Finish Depth (m):	17.70		





CORE PHOTO LOG - BH C62

Project Name:	BRUCE HIGHWAY UPGRADE - SECTION C			
Project No.:	FG5799	Date:	08/09/2011	
Details:	Cut 16	Start Depth (m):	3.00	
Reference No.:	H11144	Finish Depth (m):	17.70	

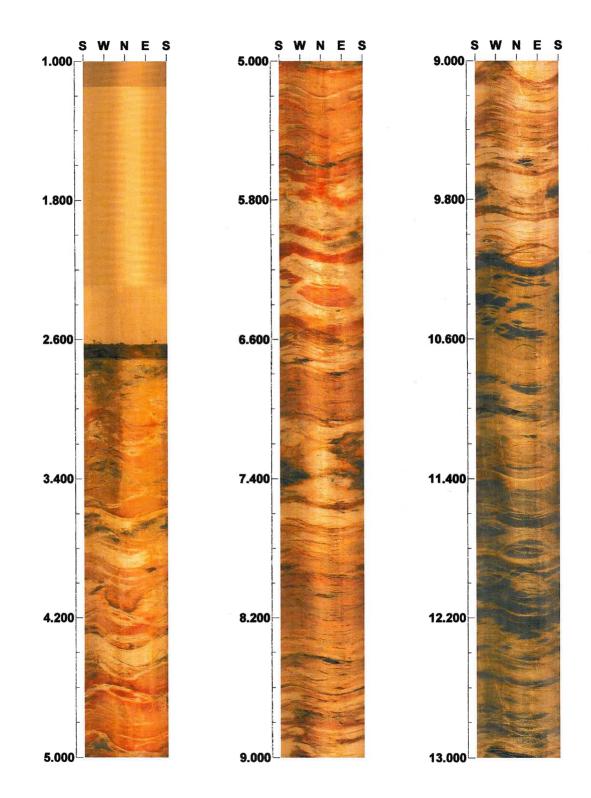


Project name: BRUCE HIGHWAY UPGRADE SECTION C Bore hole No.: C-62 Azimuth: 0

 \bigcirc

Inclination: -90

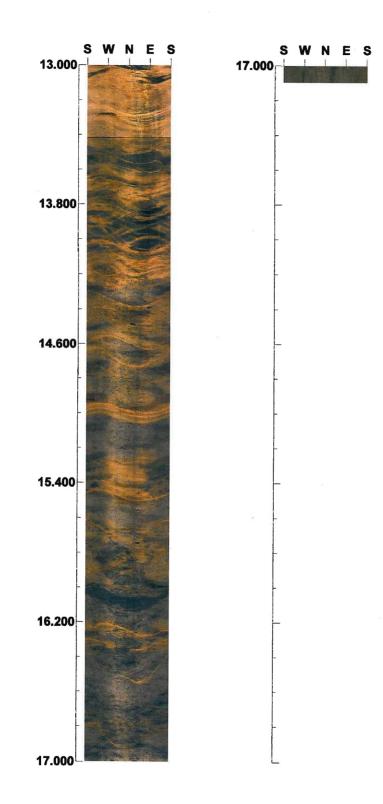
Depth range: 1.000 - 13.000 m



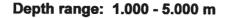
Project name: BRUCE HIGHWAY UPGRADE SECTION C Bore hole No.: C-62 Azimuth: 0

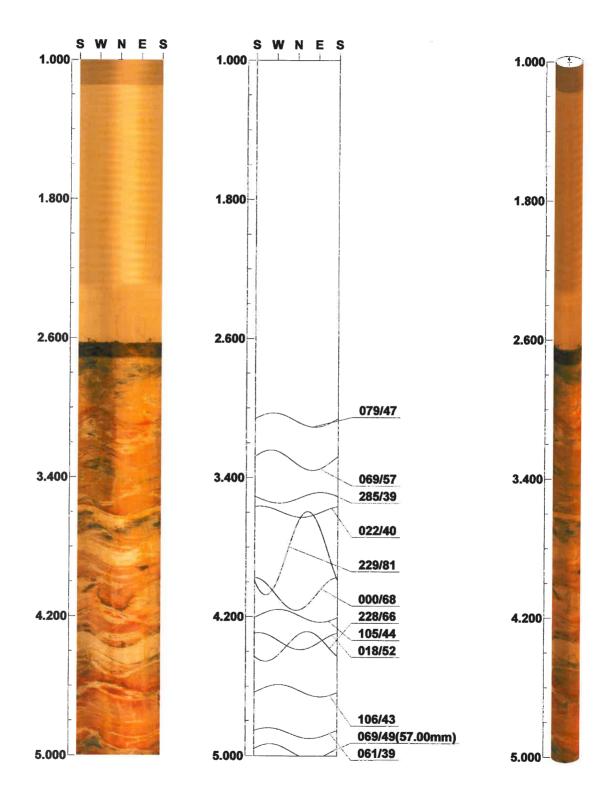
Inclination: -90

Depth range: 13.000 - 17.093 m



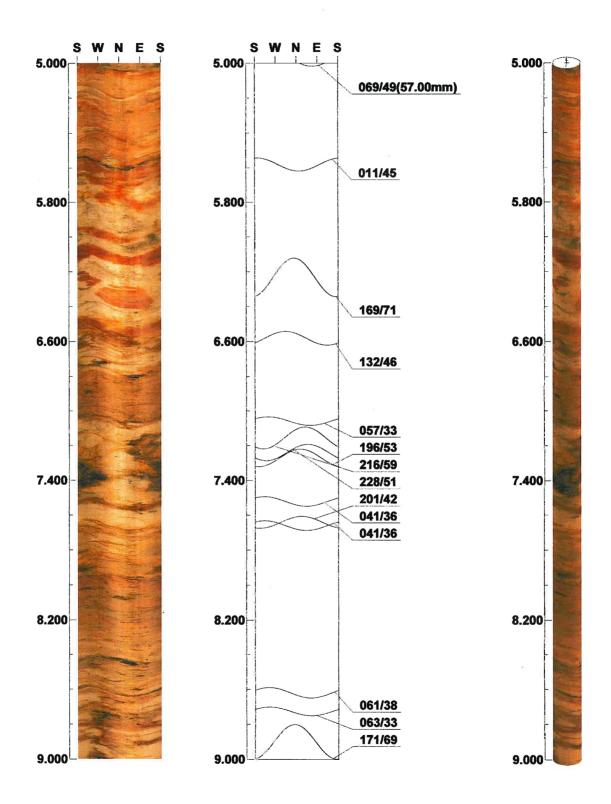
C





Inclination: -90

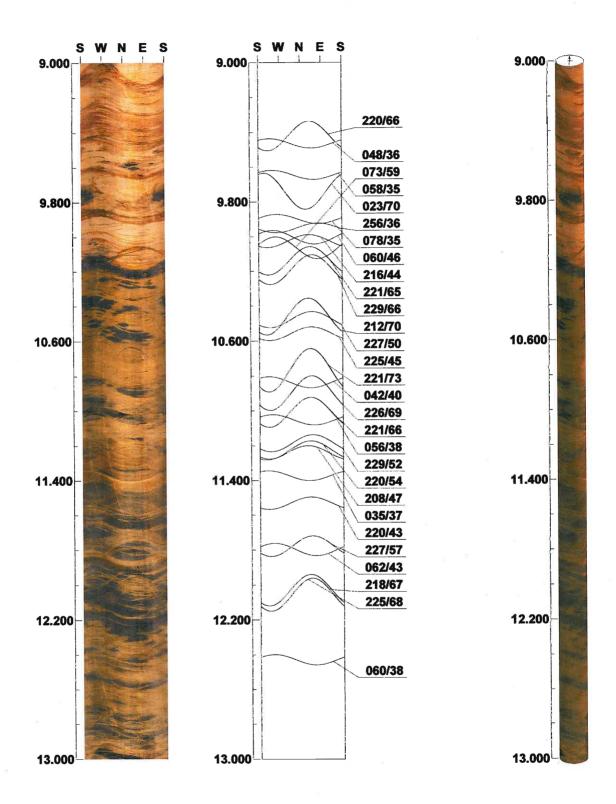
Depth range: 5.000 - 9.000 m



Project name: BRUCE HIGHWAY UPGRADE SECTION C Bore hole No.: C-62 Azimuth: 0

Inclination: -90

Depth range: 9.000 - 13.000 m



Scale: 1/20

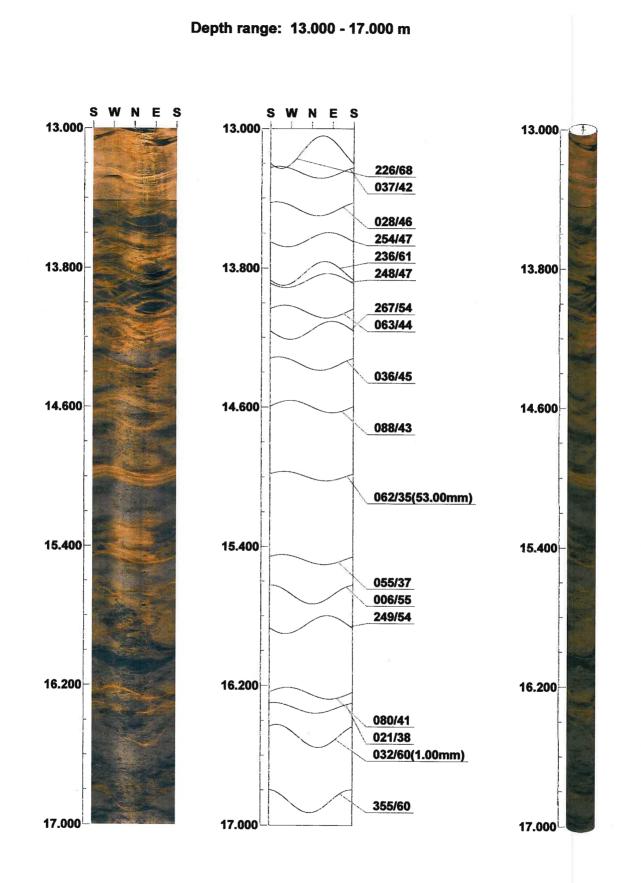
Aspect ratio: 200 %

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Project name: BRUCE HIGHWAY UPGRADE SECTION C Bore hole No.: C-62 **Azimuth: 0**

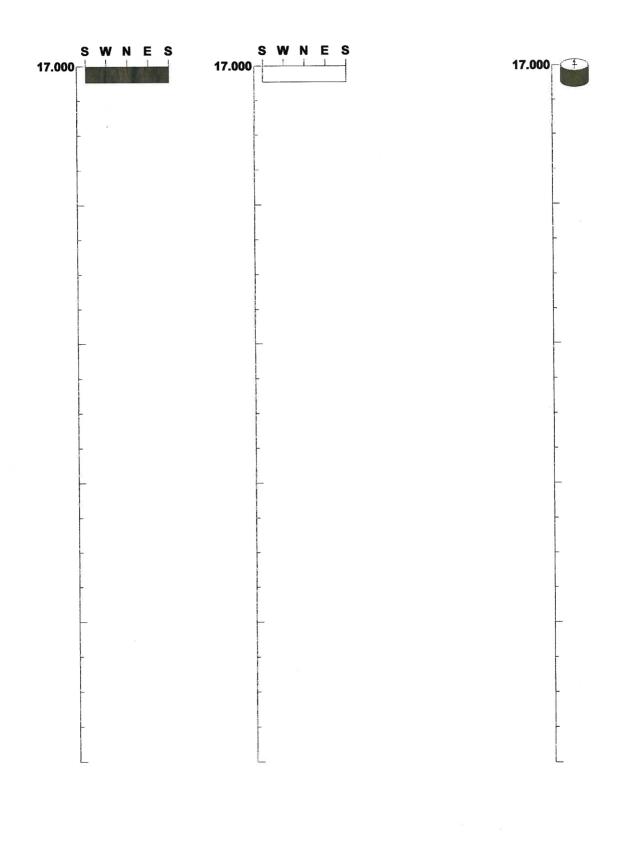
Inclination: -90





Project name: BRUCE HIGHWAY UPGRADE SECTION C Bore hole No.: C-62 Azimuth: 0

Depth range: 17.000 - 17.093 m



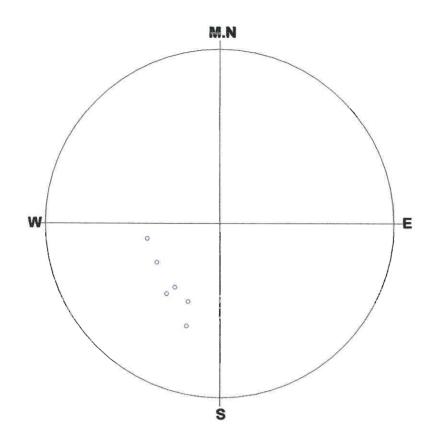
File	name:	C-62.9	STR
[]			

No.	Depth (m)	Dir/Dip	Sort	Aperture (mm)	Form	Condition	Remark
1	3.068	079/47	Parting	0.3	Planar	Smooth	Open
2	3.299	069/57	Parting	0.5	Planar	Smooth	Open
3	3.515	285/39	Joint	0.5	Planar	Rough	Open
4	3.595	022/40	Foliation	0.0	Planar	Smooth	Tight
5	3.834	229/81	Joint	0.5	Undulating	Rough	Open
6	4.068	000/68	Fault	0.5	Undulating	Rough	Open
7	4.194	105/44	ShearZone	13.0	Planar	Brec/crus'd	Open
8	4.340	018/52	Foliation	0.0	Planar	Smooth	Tight
9	4.370	228/66	Joint	0.3	Planar	Smooth	Tight
10	4.625	106/43	ShearZone	15.0	Planar	Brec/crus'd	Open
11	4.869	061/39	ShearZone	11.0	Planar	Brec/crus'd	Open
12	4.974	069/49	ShearZone	57.0	Planar	Brec/crus'd	Open
13	5.581	011/45	ShearZone	12.0	Planar	Brec/crus'd	Open
14	6.232	169/71	Joint	0.3	Planar	Rough	Tight
15	6.581	132/46	Joint	0.3	Undulating	Smooth	Open
16	7.058	057/33	ShearZone	17.0	Planar	Brec/crus'd	Open/loose
17	7.155	216/59	Joint	0.3	Planar	Smooth	Open
18	7.239	228/51	Joint	0.3	Planar	Smooth	Open
19	7.270	196/53	Joint	0.3	Planar	Smooth	Open
20	7.520	041/36	Parting	0.5	Planar	Smooth	Open
21	7.640	201/42	Joint	0.3	Planar	Smooth	Open
22	7.659	041/36	Parting	0.5	Planar	Smooth	
23	8.619	061/38	ShearZone	8.0	Planar	Brec/crus'd	Open
24	8.725	063/33	ShearZone	15.0	Planar	Brec/crus d Brec/crus/d	Open
25	8.899	171/69	Joint	0.3	Planar		Open
26	9.421	220/66	Joint	0.3	Planar	Rough	Tight
27	9.464	048/36	Parting	0.3	Planar	Rough	Tight
28	9.645	058/35	Foliation			Smooth	Open
29	9.739	023/70	Joint	0.0 0.3	Planar Undulation	Smooth	Tight
30	9.899	078/35	Foliation		Undulating	Rough	Open
31	9.950			0.0	Planar	Smooth	Tight
32	9.950	256/36	Joint Destination	0.3	Planar	Smooth	Tight
32 33		060/46	Parting	0.5	Planar	Smooth	Open
33 34	10.026	216/44	Joint	0.3	Planar	Smooth	Tight
34 35	10.065	073/59	Joint	0.3	Planar	Smooth	Open
	10.140	221/65	Joint	0.3	Planar	Smooth	Tight
36	10.191	229/66	Joint	0.3	Planar	Smooth	Tight
37	10.460	212/70	Joint	0.5	Planar	Smooth	Open
38	10.478	227/50	Joint	0.5	Pianar	Smooth	Open
39	10.558	225/45	Joint	0.3	Planar	Smooth	Tight
40	10.767	221/73	Joint	0.5	Undulating	Smooth	Open
41	10.836	042/40	ShearZone	17.0	Planar	Brec/crus'd	Open
42	10.898	226/69	Joint	0.3	Planar	Smooth	Tight
43	11.008	221/66	Joint	0.3	Planar	Smooth	Tight
44	11.051	056/38	Parting	0.5	Planar	Smooth	Open
45	11.185	229/52	Joint	0.3	Planar	Smooth	Open
46	11.224	220/54	Joint	0.3	Planar	Smooth	Open
47	11.240	208/47	Joint	0.3	Planar	Smooth	Open
48	11.372	035/37	Foliation	0.0	Planar	Smooth	Tight
49	11.531	220/43	Joint	0.3	Planar	Smooth	Tight
50	11.778	227/57	Joint	0.3	Planar	Smooth	Open

File	name:	C-62.STR
[]		

No.	Depth (m)	Dir/Dip	Sort	Aperture (mm)	Form	Condition	Remark
51	11.797	062/43	Joint	0.3	Planar	Smooth	Open
52	12.029	218/67	Joint	0.3	Planar	Smooth	Tight
53	12.055	225/68	Joint	0.3	Planar	Smooth	Tight
54	12.428	060/38	Parting	0.5	Planar	Smooth	Open
55	13.135	226/68	Joint	0.3	Planar	Smooth	Tight
56	13.251	037/42	Foliation	0.0	Planar	Smooth	Tight
57	13.462	028/46	Parting	0.3	Planar	Smooth	Tight
58	13.637	254/47	Joint	0.3	Planar	Smooth	Tight
59	13.830	236/61	Joint	0.3	Planar	Smooth	Tight
60	13.871	248/47	Joint	1.0	Planar	Smooth	Tight/fil'd
61	14.050	063/44	ShearZone	18.0	Planar	Brec/crus'd	Open
62	14.158	267/54	Joint	0.5	Planar	Smooth	Open
63	14.349	036/45	Parting	0.5	Planar	Smooth	Open
64	14.596	088/43	Parting	5.0	Planar	Smooth	Open
65	14.994	062/35	Parting	53.0	Planar	Brec/crus'd	Open
66	15.474	055/37	Parting	5.0	Planar	Smooth	Open
67	15.676	006/55	Joint	0.3	Planar	Rough	Open
68	15.849	249/54	Joint	1.0	Planar	Smooth	Tight/fil'd
69	16.242	080/41	Joint	4.0	Planar	Rough	Open
70	16.326	021/38	Joint	4.0	Planar	Smooth	Open
71	16.487	032/60	Joint	1.0	Planar	Rough	Open
72	16.862	355/60	Joint	1.0	Planar	Rough	Open

C-62.STR <<FOLIATION>>



Number of Data : 6/72

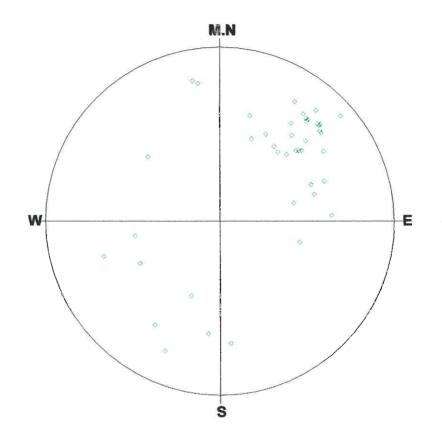
<Legend>

\bigcirc :Foliation	alle type	6
🔷 : Joint		0
:Parting		0
∆:Fault		0
\bigtriangledown :ShearZon	e -	0
imes:Vein		0

+:Mineralban- 0

Schmidt (L.H)

C-62.STR <<JOINT>>



Number of Data : 42/72

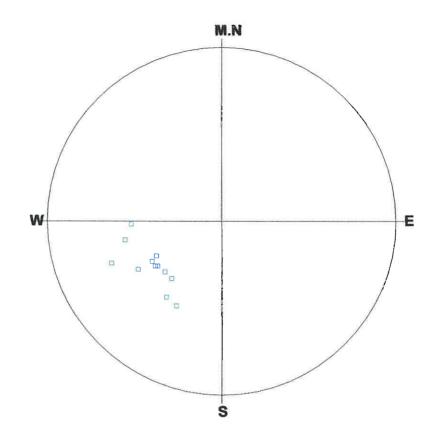
<Legend>

O:Foliation	-	0
♦ Solution	**	42
:Parting		0
∆:Fault	10 M	0
\bigtriangledown :ShearZon	e-	0
imes:Vein		0

+:Mineralban- 0

Schmidt (L.H)

C-62.STR <<PARTING>>



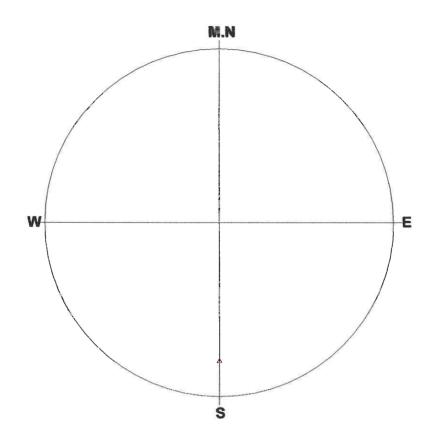
Number of Data : 13/72

<Legend>

		0	+:Mineralban-	0
🔷 :Joint		0		
:Parting		13		
∴:Fault		0		
igvee:ShearZone	8	0		
imes:Vein	**	0		

Schmidt (L.H)

C-62.STR <<FAULT>>



Number of Data : 1/72

<Legend>

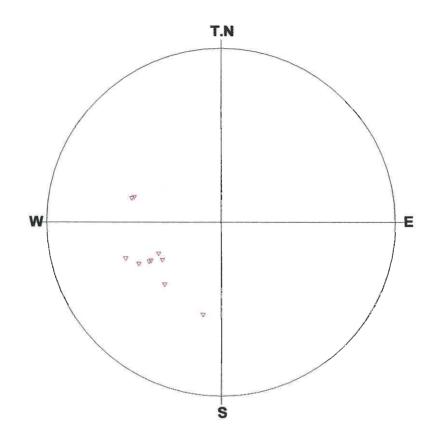
:Foliation		0
🔿 :Joint		0
:Parting		0
∆:Fault		1
\bigtriangledown :ShearZon	e-	0

 \times :Vein -- 0

+:Mineralban- 0

Schmidt (L.H)

C-62.STR <<SHEAR ZONE>>



Number of Data : 10/72

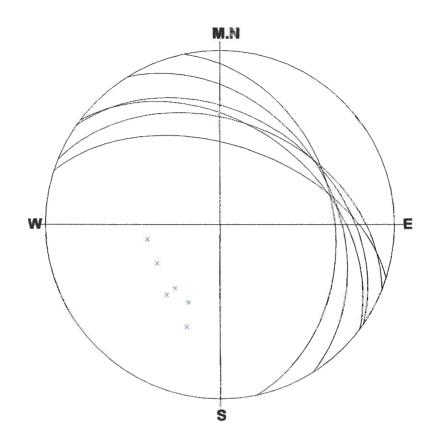
<Legend>

:Foliation	-	0
🔷 :Joint	-	0
:Parting		0
∆:Fault		0
\bigtriangledown :ShearZon	e-	10
imes:Vein	**	0

_	-:Mineralban-	0
	HARDER OWN OF STORAGE C	•

Schmidt (L.H)

C-62.STR <<FOLIATION>>

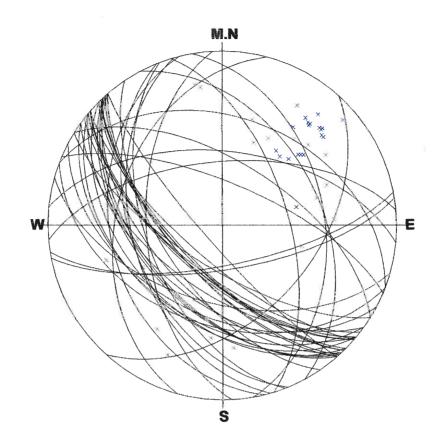


Number of Data:6/72

1 : 022/40(4)	6 : 037/42(56)
2 : 018/52(8)	
3 : 058/35(28)	
4 : 078/35(30)	
5 : 035/37(48)	

Schmidt (L.H)

C-62.STR <<JOINT>>

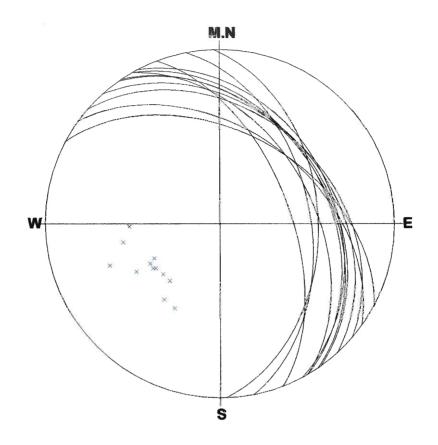


Number of Data:42/72

1 : 285/39(3)	6 : 216/59(17)
2 : 229/81(5)	7 : 228/51(18)
3 : 228/66(9)	8 : 196/53(19)
4 : 169/71(14)	9 : 201/42(21)
5 : 132/46(15)	10 : 171/69(25)

Schmidt (L.H)

C-62.STR <<PARTING>>

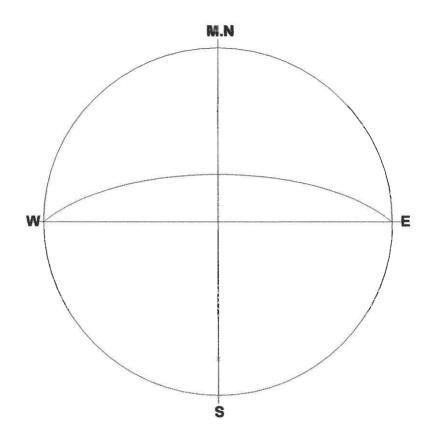


Number of Data:13/72

1 : 079/47(1)	6 : 060/46(32)
2 : 069/57(2)	7 : 056/38(44)
3 : 041/36(20)	8 : 060/38(54)
4 : 041/36(22)	9 : 028/46(57)
5 : 048/36(27)	10 : 036/45(63)

Schmidt (L.H)

C-62.STR <<FAULT>>

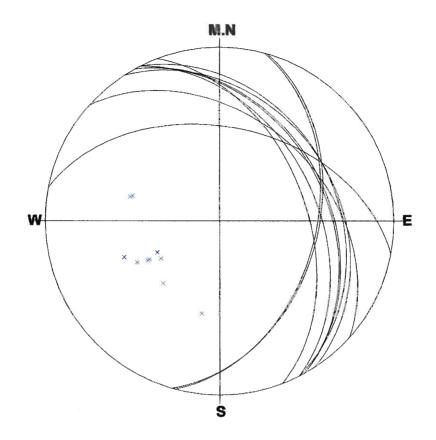


Number of Data:1/72

1:000/68(6)

Schmidt (L.H)

C-62.STR <<SHEAR ZONE>>

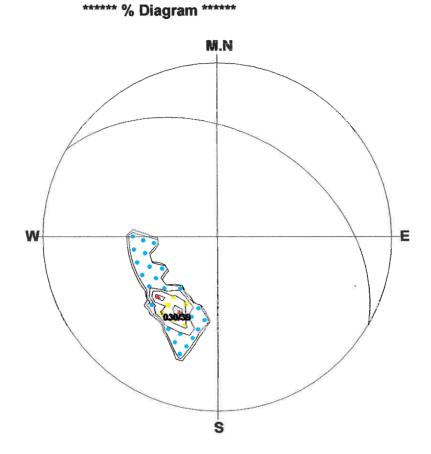


Number of Data:10/72

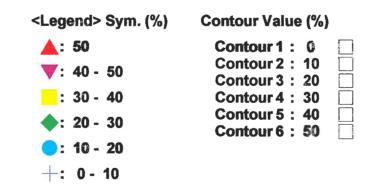
1 : 105/44(7)	6 : 057/33(1 6)
2 : 106/43(10)	7 : 061/38(23)
3 : 061/39(11)	8 : 063/33(24)
4 : 069/49(12)	9 : 042/40(41)
5 : 011/45(13)	10 : 063/44(61)

Schmidt (L.H)

C-62.STR <<FOLIATION>>

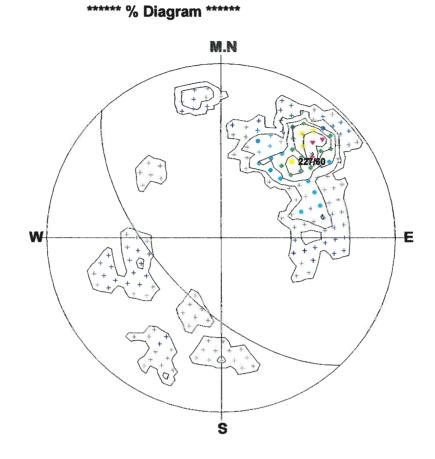


Number of Data : 6

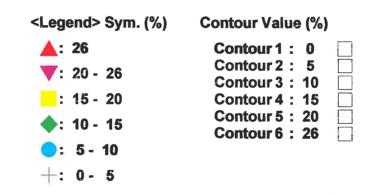


Schmidt (L.H)

C-62.STR <<JOINT>>

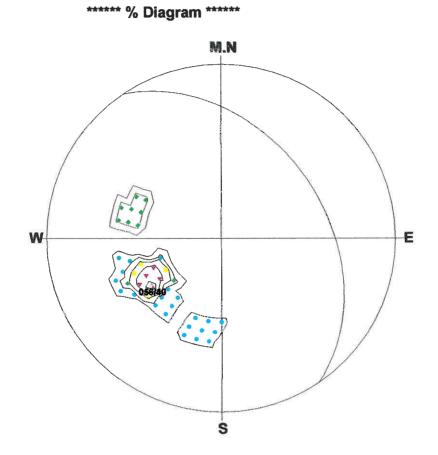


Number of Data : 42

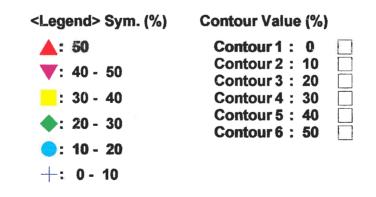


Schmidt (L.H)

C-62.STR <<SHEAR ZONE>>

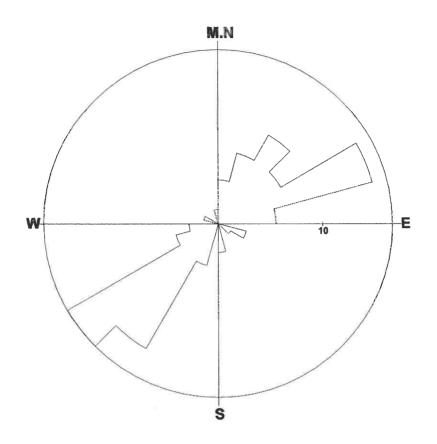


Number of Data : 10



Schmidt (L.H)

C-62.STR <<FOLIATION>>

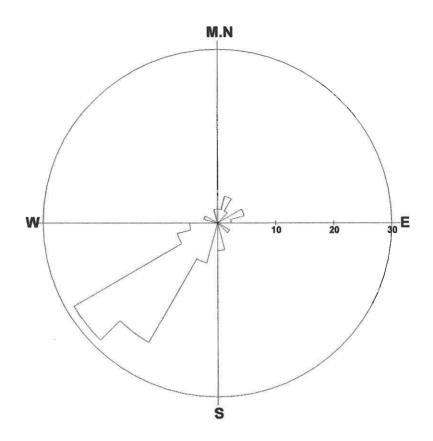


Number of Data : 72/72 Max : 16.7%

Dir	%	Dir	%	Dir	%
0-	4	135-	0	270-	0
15-	7	150-	0	285-	1
30-	10	165-	3	300-	0
45-	7	180-	0	315-	0
60-	15	195-	4	330-	0
75-	6	210-	14	345-	1
90-	0	225-	17		
105-	3	240-	4		
120-	1	255-	3		

Depth : 3.068 - 16.862 m Aperture : 0.0 - 57.0 mm

C-62.STR <<JOINT>>

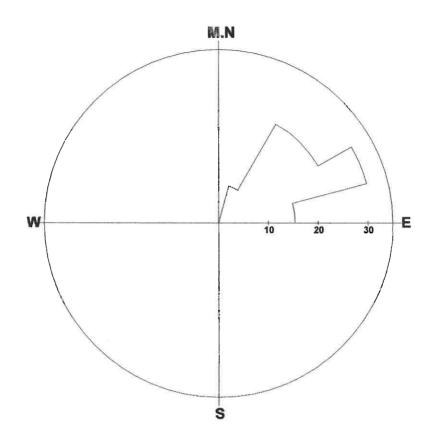


Number of Data : 42/72 Max : 28.6%

Dir	%	Dir	%	Dir	%
0-	2	135-	0	270-	0
15-	5	150-	0	285-	2
30-	2	165-	5	300-	0
45-	0	180-	0	315-	0
60-	5	195-	7	330-	0
75-	2	210-	24	345-	2
90-	0	225-	29		
105-	0	240-	7		
120-	2	255-	5		

Depth : 3.058 - 16.862 m Aperture : 0.0 - 57.0 mm

C-62.STR <<PARTING>>

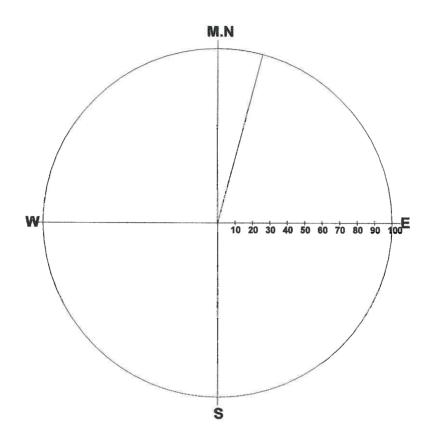


Number of Data : 13/72 Max : 30.8%

Dir	%	Dir	%	Dir	%
0-	0	135-	0	270-	0
15-	8	150-	0	285-	0
30-	23	165-	0	300-	0
45-	23	180-	0	315-	0
60 -	31	195-	0	330-	0
75-	15	210-	0	345-	0
90-	0	225-	0		
105-	0	240-	0		
120-	C	255-	0		

Depth : 3.068 - 16.862 m Aperture : 0.0 - 57.0 mm

C-62.STR <<FAULT>>

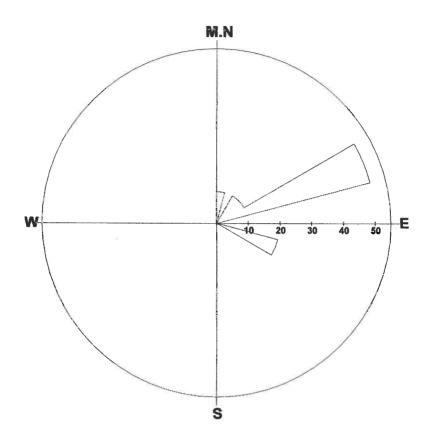


Number of Data : 1/72 Max : 100.0%

Dir	%	Dir	%	Dir	%
0-	100	135-	0	270-	0
15-	0	150-	0	285-	0
30-	0	165-	C	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 : 3.068 - 16.862 m Aperture : 0.0 - 57.0 mm

C-62.STR <<SHEAR ZONE>>



Number of Data : 10/72 Max : 50.0%

Dir	%	Dir	%	Dir	%
0-	10	135-	0	270-	0
15-	0	150-	0	285-	0
30-	10	165-	0	300-	0
45-	10	180-	0	315-	0
60-	50	195-	0	330-	0
75-	0	210-	0	345-	0
90-	0	225-	0	and a second provide the	
105-	20	240-	0	Announcements	
120-	0	255-	0		

Depth : 3.068 - 16.862 m Aperture : 0.0 - 57.0 mm

Title: C-82.STR Comment: JOINT Depth: 3.068 - 16.862 m Aperture: 0.0 - 57.0 mm

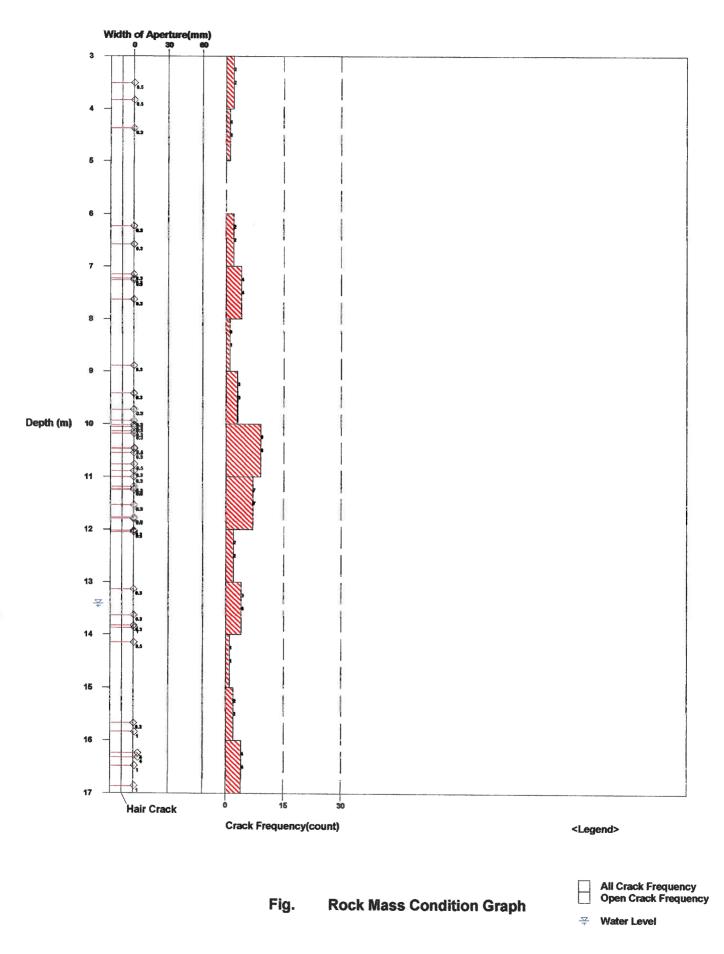
 Sort:
 1/7

 Form:
 5/5

 Condition:
 11/11

 Remark:
 9/9

2011/ 8/ 30



Title: C-82.STR Comment: PARTING Depth: 3.068 - 16.862 m Aperture: 0.0 - 57.0 mm

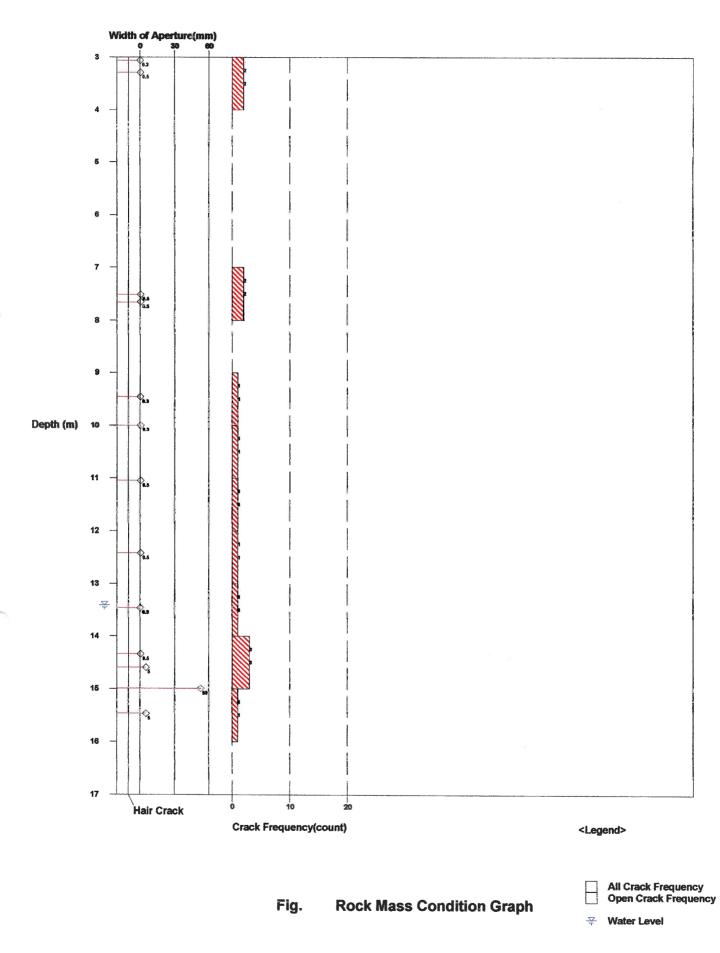
 Sort:
 1/7

 Form:
 5/5

 Condition:
 11/11

 Remark:
 9/9

2011/ 8/ 30



Title: C-62.STR Comment: FAULT Depth: 3.068 - 16.862 m Aperture: 0.0 - 57.0 mm

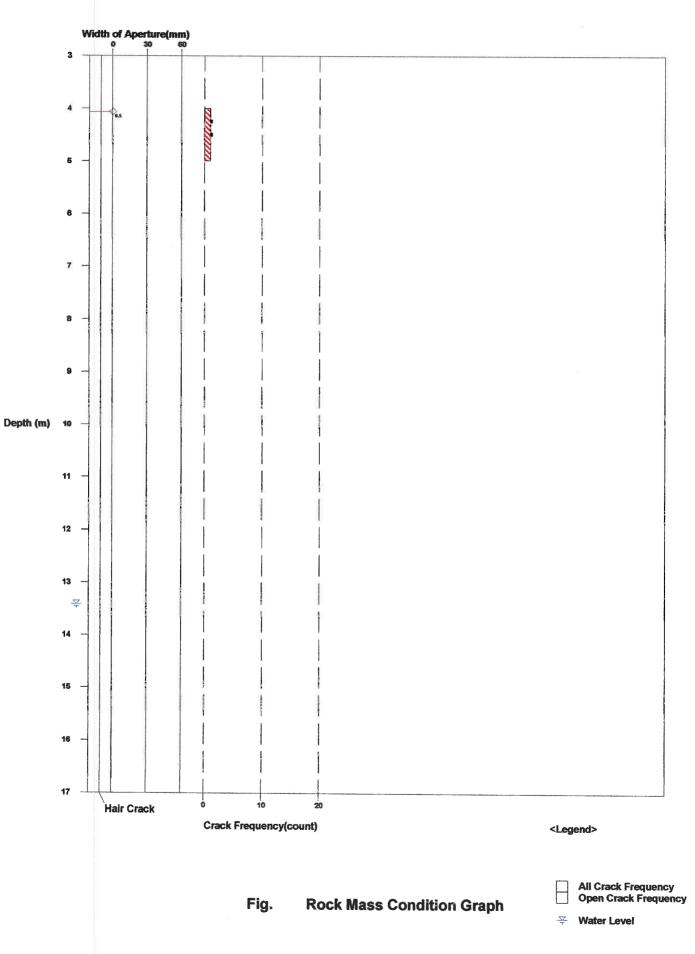
 Sort:
 1/7

 Form:
 5/5

 Condition:
 11/11

 Remark:
 9/9

2011/ 8/ 30



Title: C-62.STR Comment: SHEAR ZONE Depth: 3.068 - 16.862 m Aperture: 0.0 - 57.0 mm

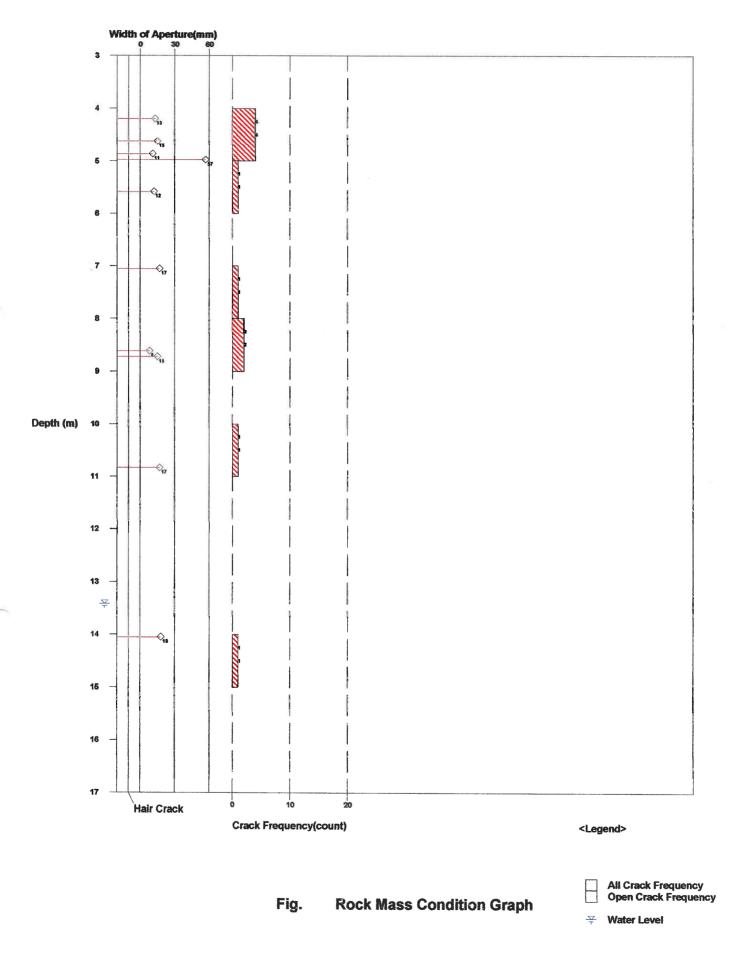
 Sort:
 1/7

 Form:
 5/5

 Condition:
 11/11

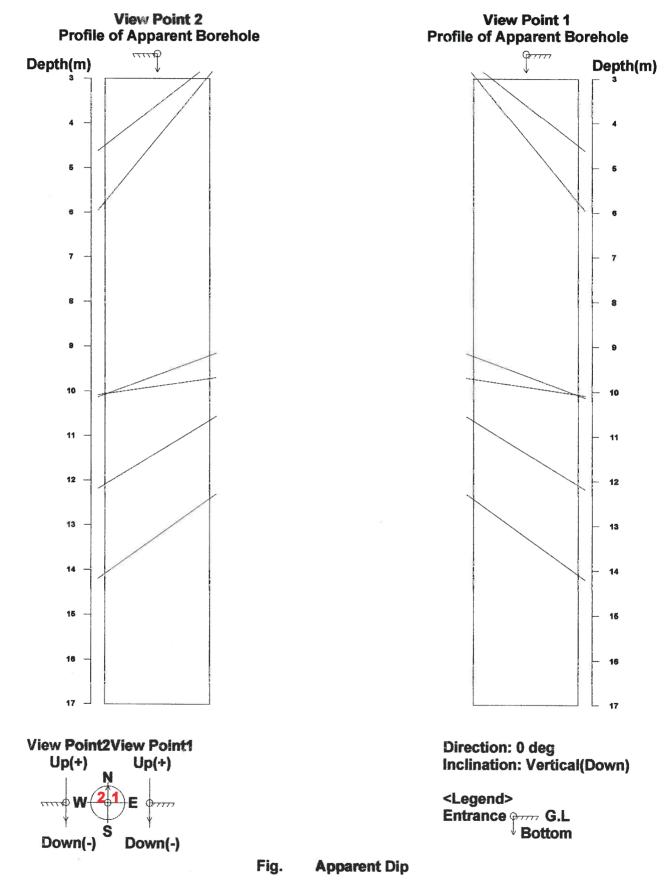
 Remark:
 9/9

2011/ 8/ 30



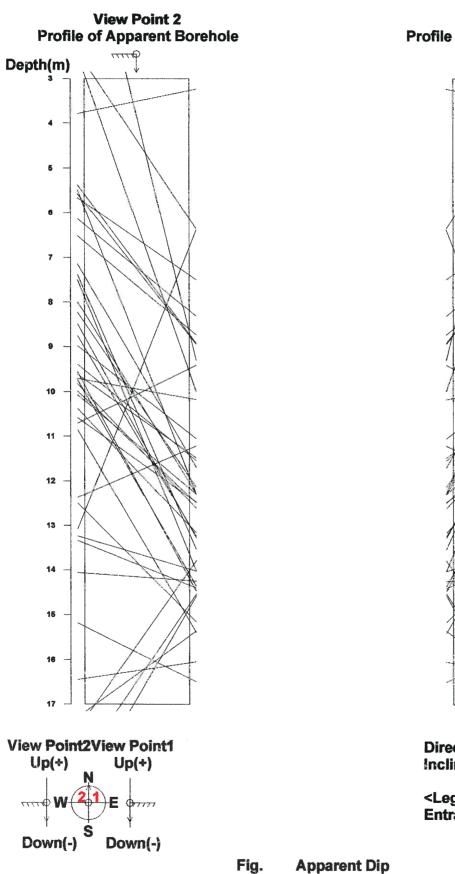
Title: C-62.STR Comment: FOLIATION Depth: 3.068 - 16.862 m Aperture: 0.0 - 57.0 mm

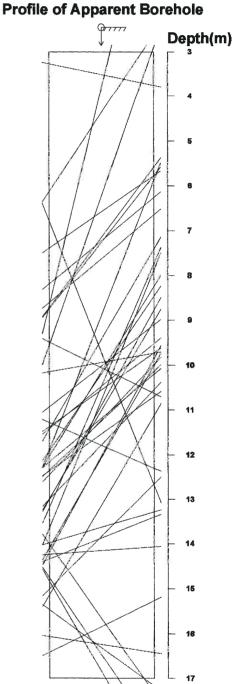
Sort:	1/ 7
Form:	5/5
Condition:	11/11
Remark:	9/ 9



Title: C-62.STR Comment: JOINT Depth: 3.068 - 16.862 m Aperture: 0.0 - 57.0 mm

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





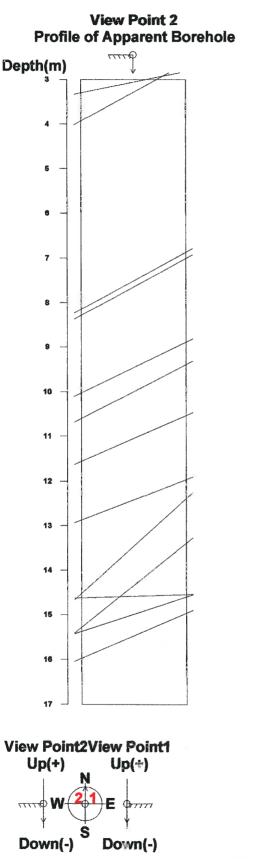
View Point 1

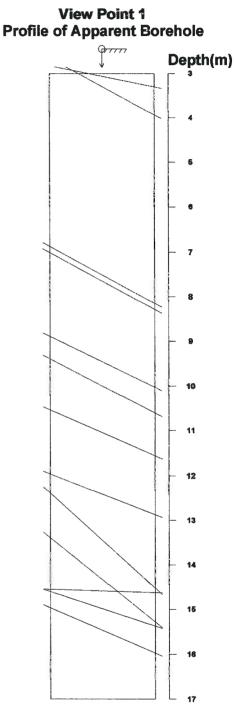
Direction: 0 deg Inclination: Vertical(Down)

<Legend> Entrance

Title: C-62.STR Comment: PARTING Depth: 3.068 - 16.862 m Aperture: 0.0 - 57.0 mm







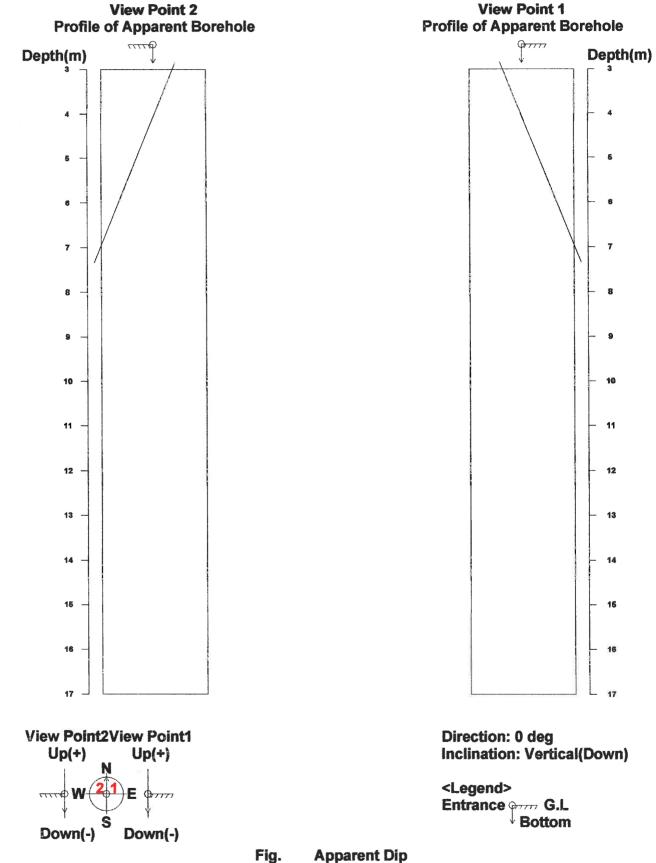
Direction: 0 deg Inclination: Vertical(Down)

<Legend> Entrance G.L Bottom

Fig.

Apparent Dip





Title: C-62.STR Comment: SHEAR ZONE Depth: 3.068 - 16.862 m Aperture: 0.0 - 57.0 mm

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

