

Trouble shooting

| 02-3433-7715 | bspark@ssyenc.co.kr

1.

가

(2000)

가

(Ductile deformation)
(Ductile shear Zone)
가
(Brittle

deformation)

가 m km

2.1

(Fault)

[2.1]

(Fracture zone), [2.2]

zone) cm km

가

(Fault plane) :

1

2.

(Deformation)

(Stress)

(Slickenside) :

(Fault clay) :

가

(Fault breccia) :

(Hanging wall)

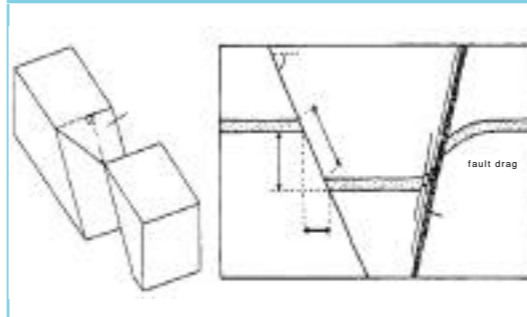
(Foot wall) :

가

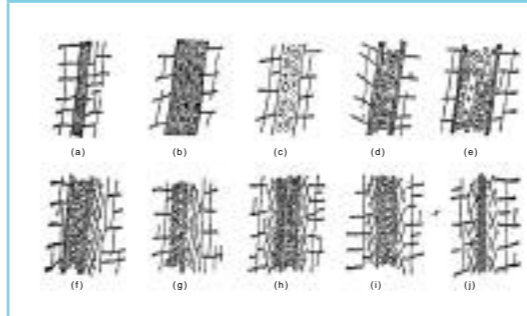
(Drag) :

(Fault scarp) :

[2.1]



[2.2]



2.2

(Normal fault)

(Reverse fault) :

(Strike-slip fault) :

가

(Dextral fault,

(Sinistral fault,

(Thrust) :

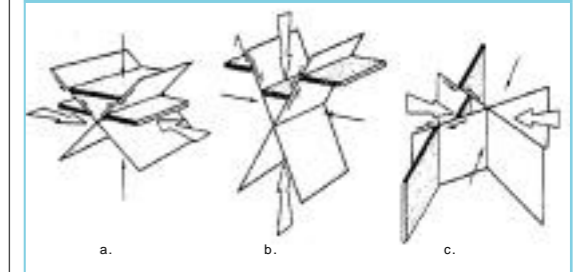
45

가

45

[2.3]

[2.3]



2.3

(Striation)

2

가 가

가

(, , ,)

가

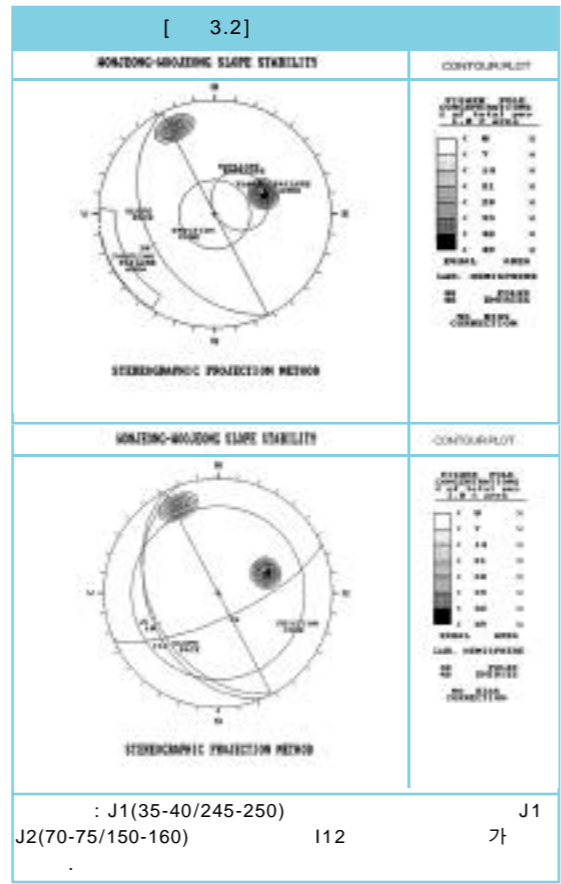
(, ,)

Trouble shooting

가
 [3.2] < 3.1 >
 SMR SMR 6.5
 V , Very bad ,
 (Completely
 unstable) ,
 (Big planar failure) (Soil-like
 failure) . SMR

Reexcavation
 . < 3.2 ~
 3.3 >
 가
 (: $j=25.0$,
 C = 0.0t/m) , J1 J2 (238/34)
 0.74, 0.51
 (1.5, 1.2)
 . [3.3]

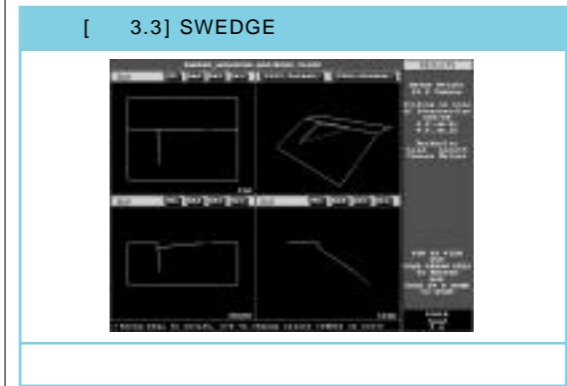
< 3.4 >
 .



[3.1]					
J1	J1	J2	(I12)	-	

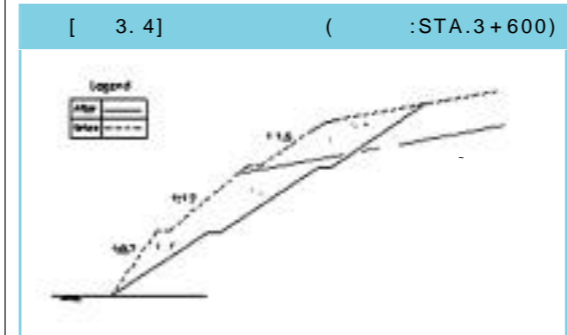
[3.2] RMR										
(kg/cm ³)	RQD (%)	(cm)	(m)		Damp	10	29	IV	(Poor)	
			(mm)							
100-400	3	<25	<6	>20	0	5	10	29	IV	(Poor)
				1-5	1					
				<5mm, Soft clay	2					
				Slickensided	0					
25-50	5	6-20	H.W-M.W		2					

[3.3] SMR [SMR = RMR + (F1 · F2 · F3) + F4]									
RMR	F1	F2	F3	F4	SMR				
29	0.9	0.5	-50	0	6.5	V	Very bad	Big Planar or Soil-like	

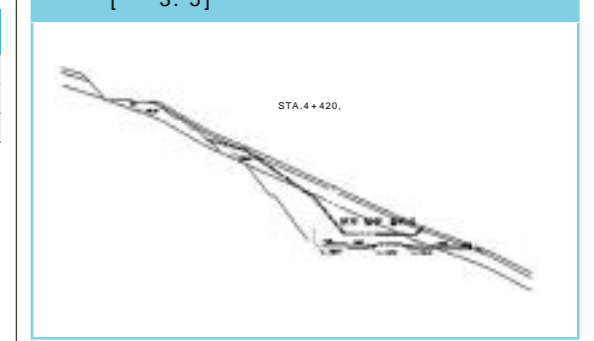


< 3.4 > SWEDGE			
(J1+J2)	1.5	0.74	
	1.2	0.51	

가
 (, ,)
 ()
 가
 Plunge
 (Plunge)34°
 (1 : 0.7 1 : 1.5, 1 :
 1.2~1.5 1 : 1.5)
 . [3.4]



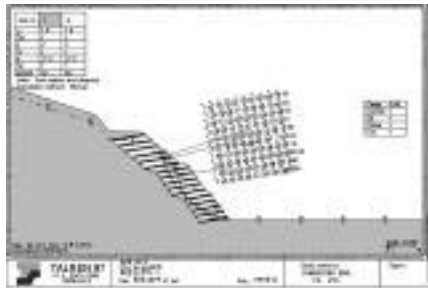
3.2
 가)
 STA. 4 + 360 ~ 4 + 500
 [3.5]
 ()가
 , 가 ,
 .



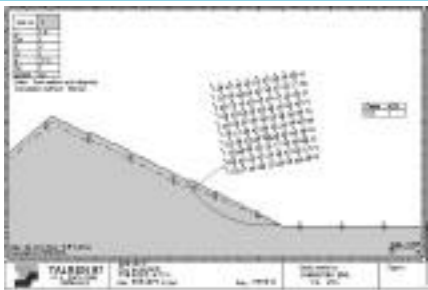
가
 . :
 ()
 . :
 (N17W) 30° N13E
 가
 (H.W) ~ (C.W)
 (M.W)

Trouble shooting

[3.6]



1 : (1:0.7,)



2 : (1:1.8,)

)
,
(C.W) (H.W)
Talren97
가
가 (: $j=27.5$, $C=2.0t/m^2$)
1:0.7
FRP (1) 가
(1 : 1.8) (2)
.[3.6]
FRP (

FRP Nailing 가

< >
1 : 1:0.7 C.T.C 1.5m x 2.0m FRP
2 : 가 (1 : 1.8)

1 2
1.76, 1.23 (1.5, 1.2)

3.3 가)
" 00
가
) 가 가
27m APT (B1 ~ 16F) (APT MAT 1.5 ~ 2.0m)
Nailing
(C.T.C 1.5m, L=7.0m, 1~4 , Nail SD30 D29)

< 3.5>

APT	50.5m	8m	(Nailing)
-----	-------	----	-----------

)
:
(Biotite Gneiss)
(Rock Test Hammer, Sanyo) 가 1,500kg/cm² (Very Strong)
(S.W) ~ (M.W ~ S.W)
: 4 Sets (J1: N20W/80NE, J2: N50E/55NW, J3: N15W/80SW, J4: N40E/15SE)
6~20cm, 0.2~0.6m
Shattered ~ Blocky
<6cm Sheared Persistent , (S.R), (Tight) (Dry)

(Shear Zone) (Wet) .
: 가 가
(N20W/80NE, W 30cm Fault clay) Minor Fault가
4Q
8Q APT
(Biotite Gneiss)
(Rock Test Hammer, Sanyo) 가
APT
(J2)
5~10mm MAT
가 cm
.[3.7]
APT
가

[3.7]

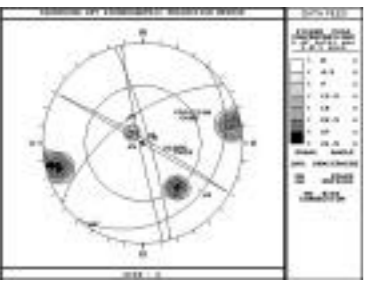
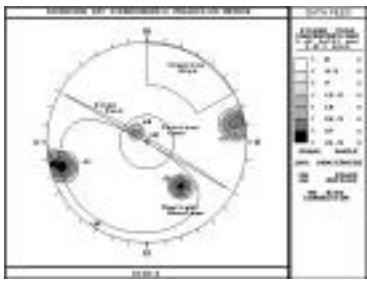


Trouble shooting

)
 Barton
 (1973) $j =$
 $35.0, C = 1.0 \text{ t/m}^2$
 가
 [3.8] < 3.6
 > 가 [3.9]
]
 $0.68(1.5)$, $0.65(1.2)$

70.21 tonf/m < 3.7 >

[3.8]

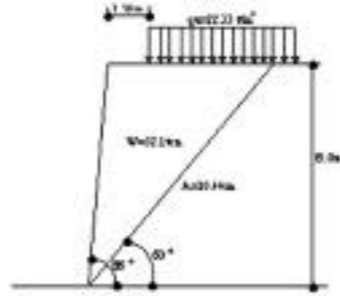


J1 J2 (I12) J1 J3 (I13)
가

< 3.6 >

	J1 J2 (I12)	
	J1 J3 (I13)	

[3.9] 가



I12(50/352)

< 3.7 >

	0.68	1.5	N. G	70.21 tonf/m
	0.65	1.2	N. G	52.50 tonf/m

)
)
 (Nailing
 (Re-bar)
 가

Nailing
< 3.8 > [3 .

10 ~ 3.11]

< 3.8 > Nail

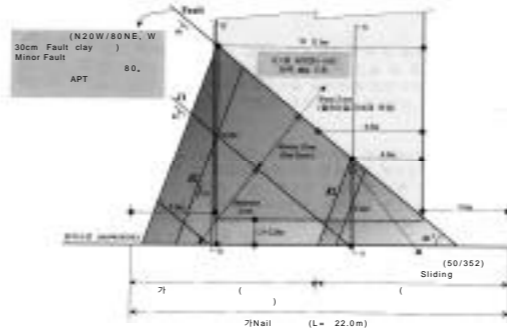
APT L=22.0m	C.T.C 0.75m ()	L = 14.0m* (가)	SD30, D29
----------------	--------------------	---------------------	--------------

* : Nail

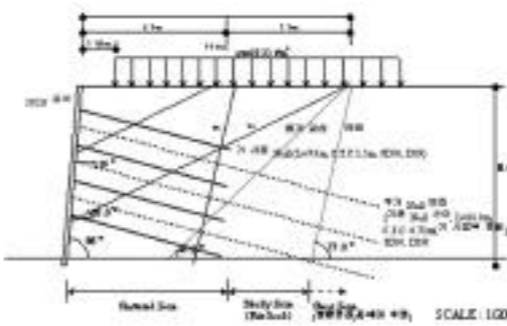
3.4
가)

0 " "00 6

[3.10]



[3.11] (B-B)



(Massive)

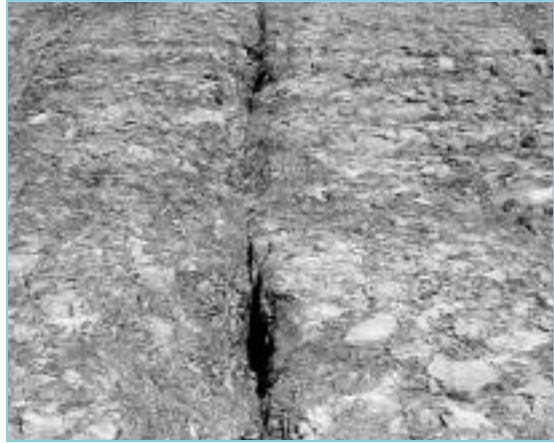
Slaking

,
 Slaking
 S.W ~ Fresh
 H.W ~ M.W
 : (0 ~ 10)
 3 Sets
 Massive
 Massive ~ Blocky
 6 ~ 20cm
 Shattered , (<6cm) Sheared
 :
 Warping
 (Fault Zone)
 (Normal Fault)
 (Step Fault)
 0.5 ~ 2.0m
 0.1m ~ 0.3m 1.0m
 ~ 90° [3.12]
 가
 70°

Trouble shooting

가
 , ,
 , ,

[3.12]



)

Barton

(1973)

$j = 35.0 \quad C = 0.9t/m^2$ ()

,

)

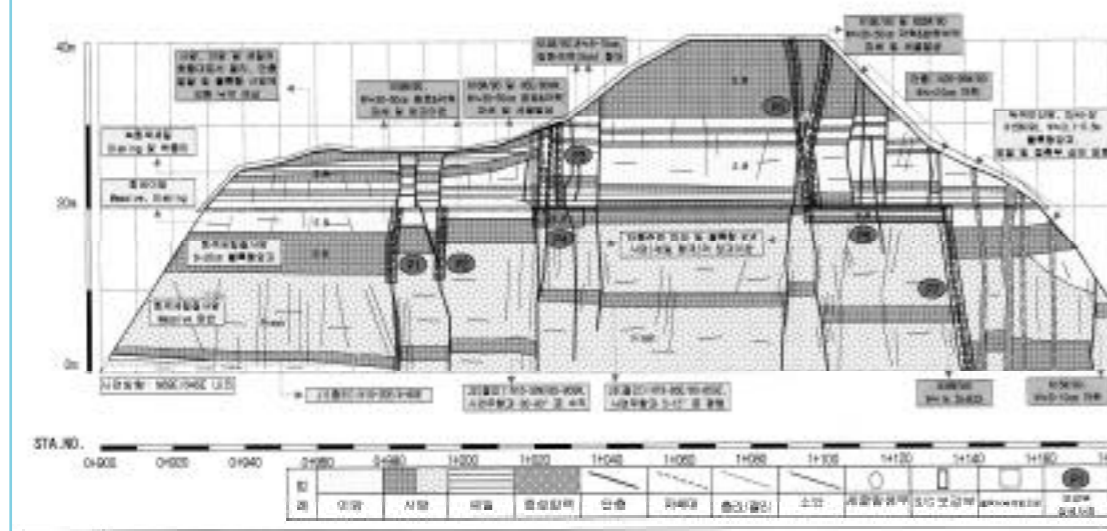
(, ,)

,

,

,

[3.13] B Face Mapping (STA.NO.0+900 ~ 1+180)



	(Massive)	
가	(, /)	가 Slaking
	Slaking, (Fissility)	
가	/ S/C	가

(가
)

,

,

,

가

. [3.13]

:

가

가

,

가

,

:

,

,

,

,

가

,

,

,

,

, pp.35 ~ 53, 2000.

,

, pp.163 ~ 180, 2001.

, pp.102 ~ 107, 1989.

, pp.184 ~ 190, 1983.

, p.123, 2001.

13 , p.103, 1997.

, pp.299 ~ 326, 1992.

, pp.79 ~ 112, 2000.

, pp.5 ~ 79, 1998.

] , pp.111 ~ 160, 1997.

] , pp.507 ~ 602, 1997.