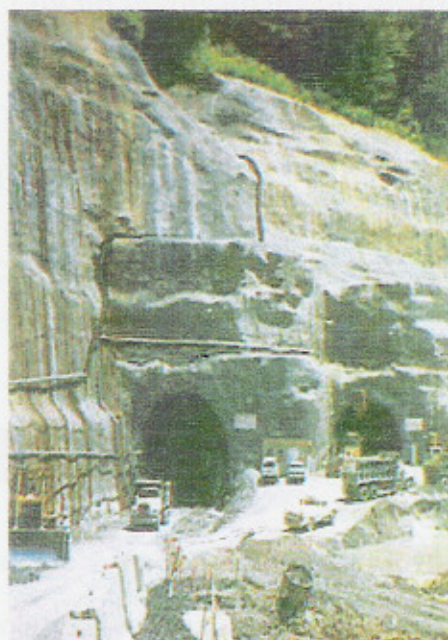
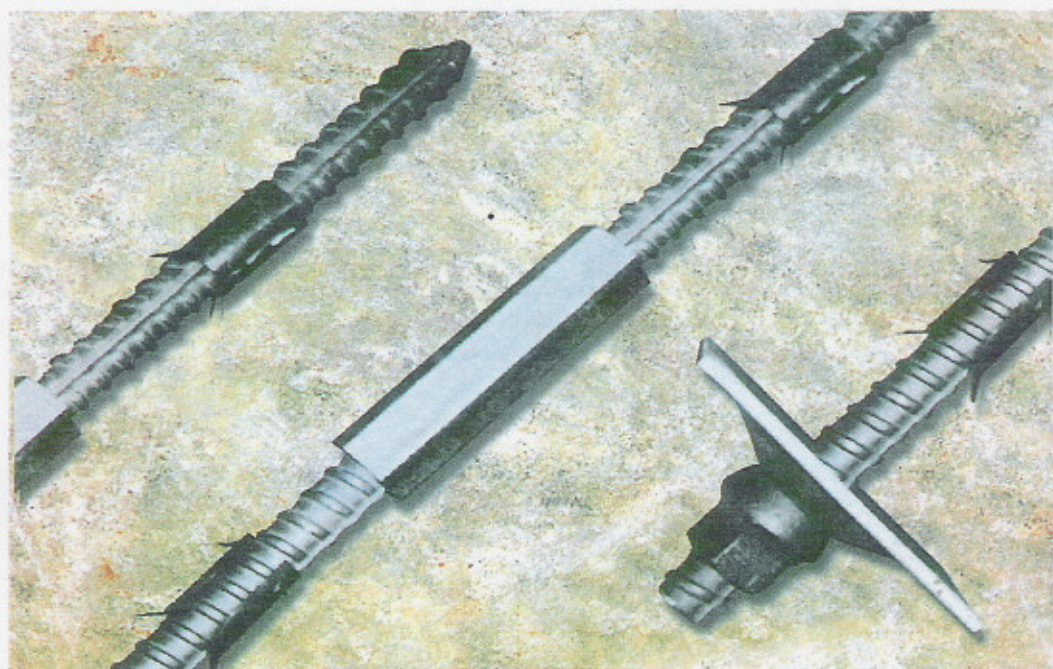


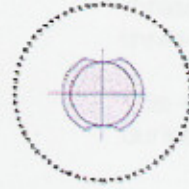
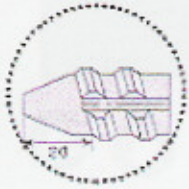
ROCK BOLT



ROCK-BOLT

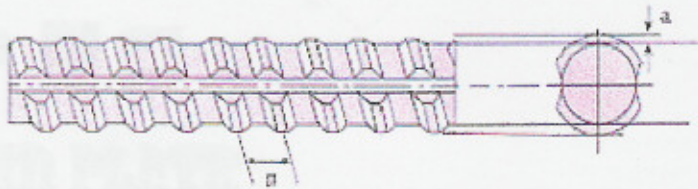


ALL SCREW TYPE



Diameter	Yield Strength	Ultimate Tensile Strength	Elongation	Specification
25 MM	35 ~ 45 kg/mm ²	Above 50 kg/mm ²	Above 18%	KS E 3132

DIMENSION AND UNIT WEIGHT



Nominal Size	Unit Weight (kg/m)	Standard Diameter (mm)	Standard Cross Section (cm ²)	Pitch p (mm)	Thread Thickness a (mm)
D25	3.98	25.4	5.067	12	2.0
D29	5.04	28.6	6.424	15	2.0

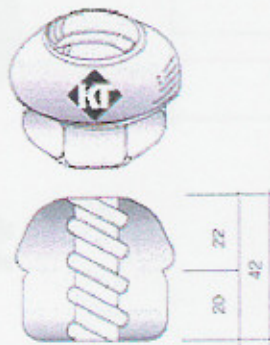
MERITS

1. Any location at the bolt can connect with nut.
2. Any length can connect using sleeve between the bolt
3. We applied face processing at the bolt end to connect between the nut and bolt.



ACCESSORIES

RING NUT

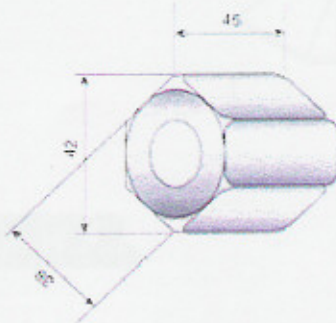
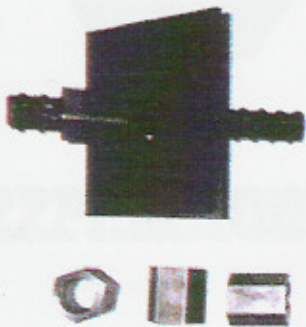


Quality	Characteristics
KS B 1012SS41	Casting Iron

Using casting iron, we make inner thread in the nut as same as bolt thread.

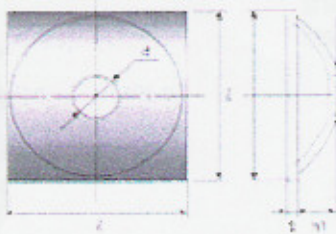
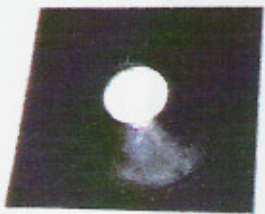
This can reduce cost and schedule during the working period.

HEX NUT



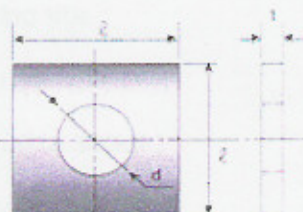
Quality	Characteristics
KS B 1012SS41	Casting Iron

DOMED PLATE



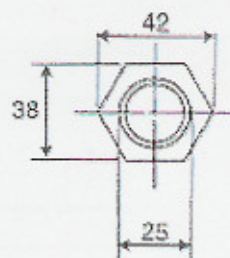
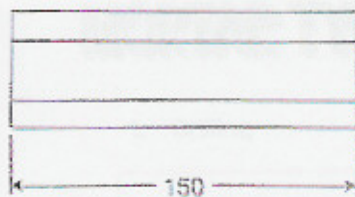
Diameter	d	h1	(Unit : mm)	
			l	T
25mm	40±3	40	150	6
		50	120	9
				12

FLAT PLATE



Diameter	d	l	T
25mm	30±2	150	6
		120	9
			12

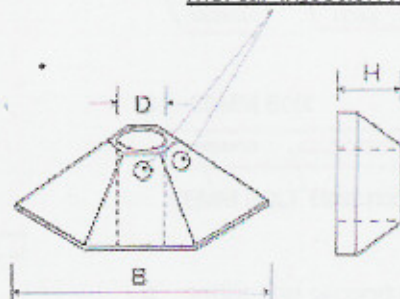
SLEEVE PROCEDURE



CASTING PLATE



mortar injection hole



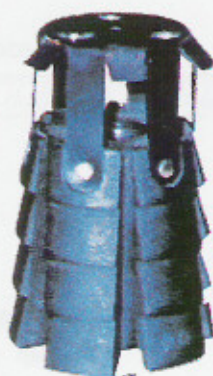
D: $\varnothing 32 \pm 3$

B: 168 ± 6

H: 40 ± 6

0

EXPANSION SHELL



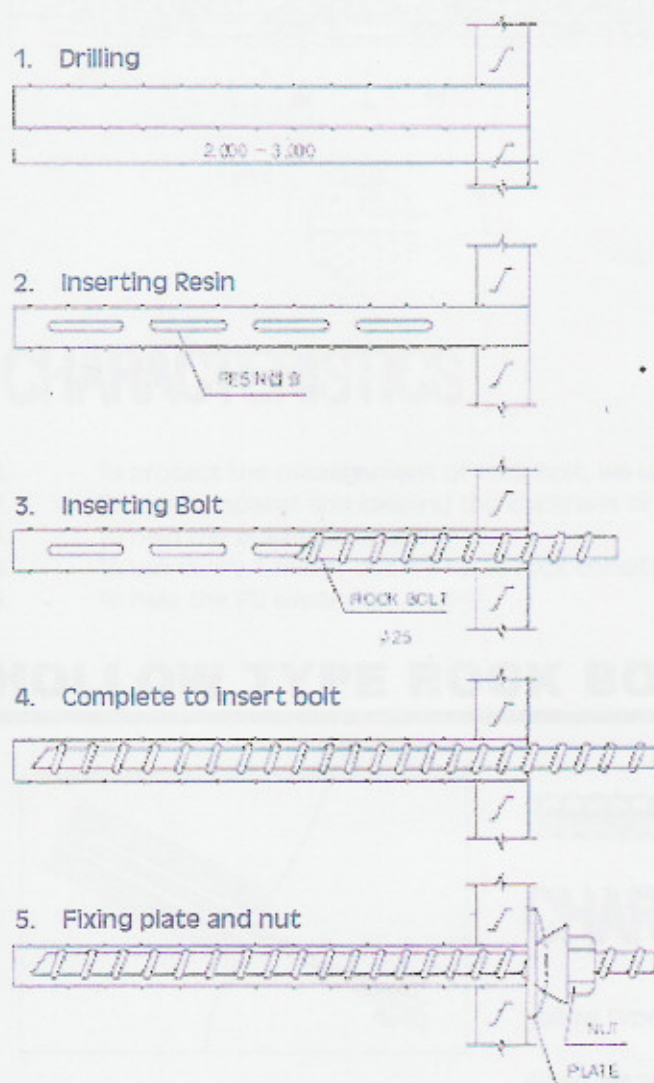
After fixing the rock bolt inside of rock area, rock bolt can fix solid and stronger using this item (Expansion Shell) because this expansion shell roles as same concept with anchoring inside of rock.

CHARACTERISTICS

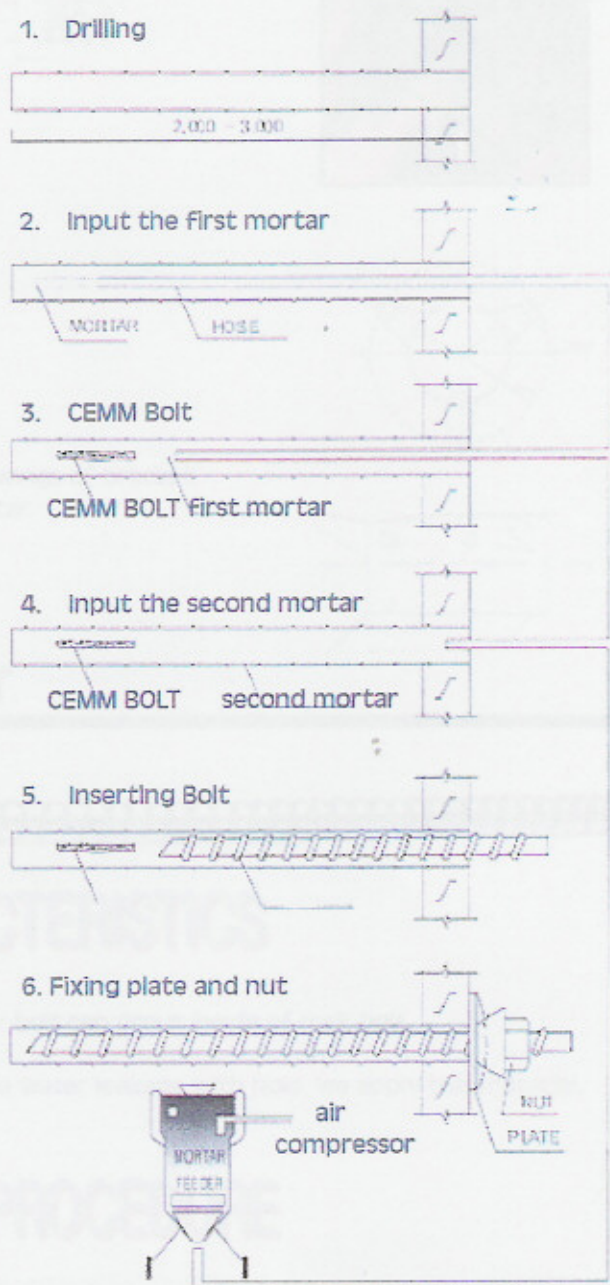
1. can use at the versatile working site.
2. is useful in the water leakage point.
3. can increase the pulling load up to 500kN
4. finish with mortar after fixing rock bolt

WORK PROCEDURE

RESIN TYPE



MORTAR TYPE

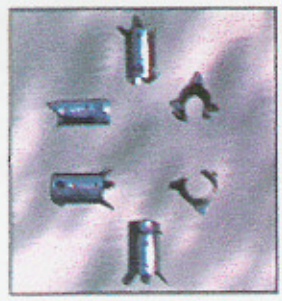
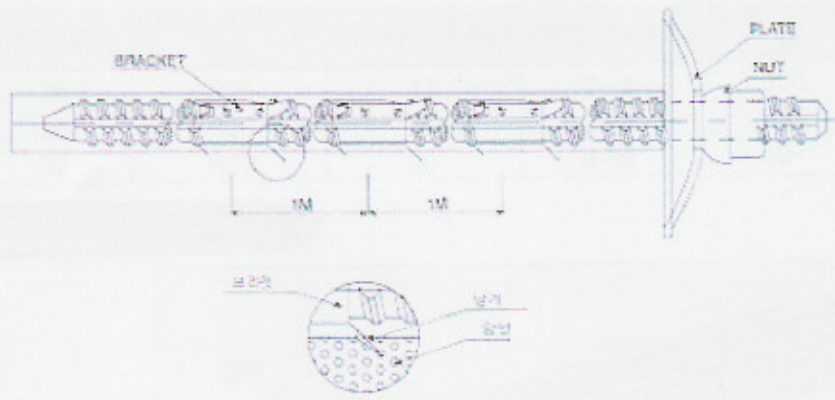


NOTE

1. Rock bolt with Resin can use in the water area but not too much but should match with size and specification.
2. When using the equipment like as auger drill, pick hammer or lift RPM should higher than 150.
3. When using the rock bolt with cement mortar, you can use mortar feeder to fill up.
4. Ratio of cement

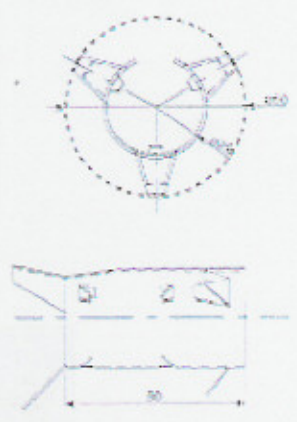
Cement type	Ratio		W/C
	Cement	sand	
OPC	1	1	40~50
Jet	1	1.5	40~50

BRACKET

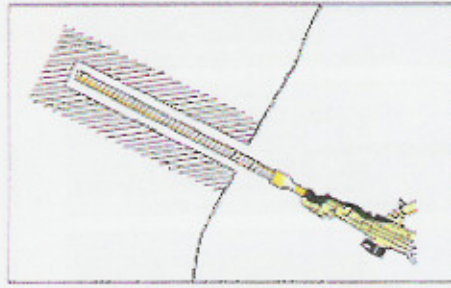


CHARACTERISTICS

1. To protect the misalignment of rock bolt, we use 3 wings of bracket.
2. To use for spacer and keeping the thickness of mortar.
3. To help the pulling strength.
4. To use every 1 meter but it's up to rock condition.
5. To help the PU expansion.

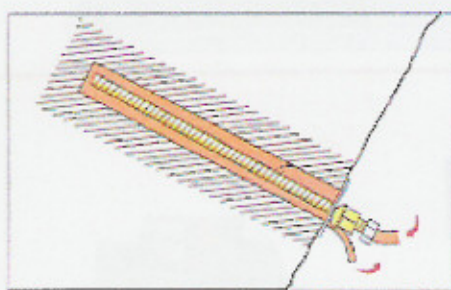


HOLLOW TYPE ROCK BOLT



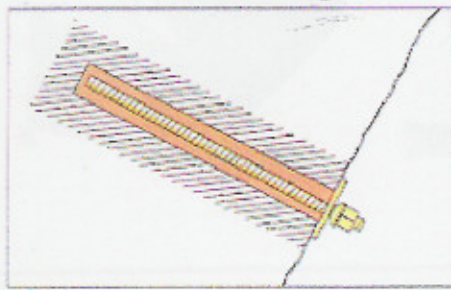
CHARACTERISTICS

Hollow type rock bolt can grout inside of rock bolt.
 When we see the water leakage with hole, we apply this material.



WORK PROCEDURE

1. After drilling, inserting rock bolt
2. Start grouting with mortar
(The ratio of water cement (W/C) can be determined with rock condition)
3. Fixing with plate and nut.
(Using bracket to fix more efficiently)



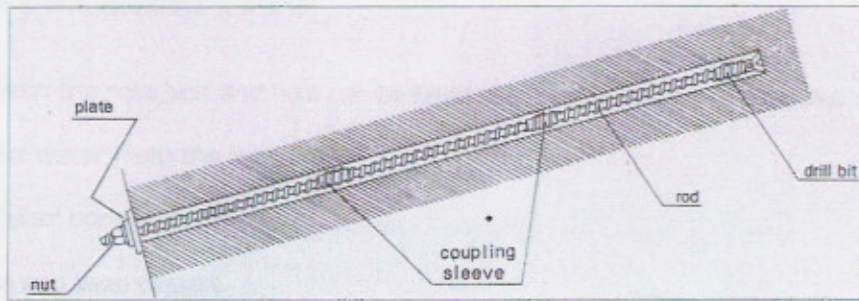
SELF DRILLING ROCK BOLT

Utility Model Patent NO 117559 (KOREA)

ROCK BOLT

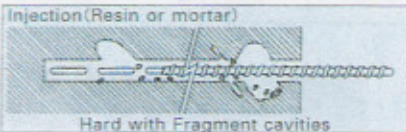
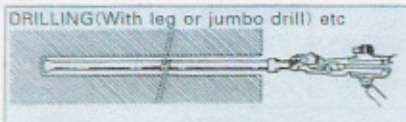
NAME	ROPE THREAD DIA	INNER DIA (mm)	LENGTH (M)	SURFACE AREA (mm ²)	TENSILE STRENGTH (kg/mm ²)	WEIGHT (kg/M)
25	R25	11	2~4	306	16,000	2.4±1
28	R28	14	3~5	345	19,000	2.8±1
32	R32	20	4~6	407	23,000	3.2±1

SELF DRILLING ROCK BOLT

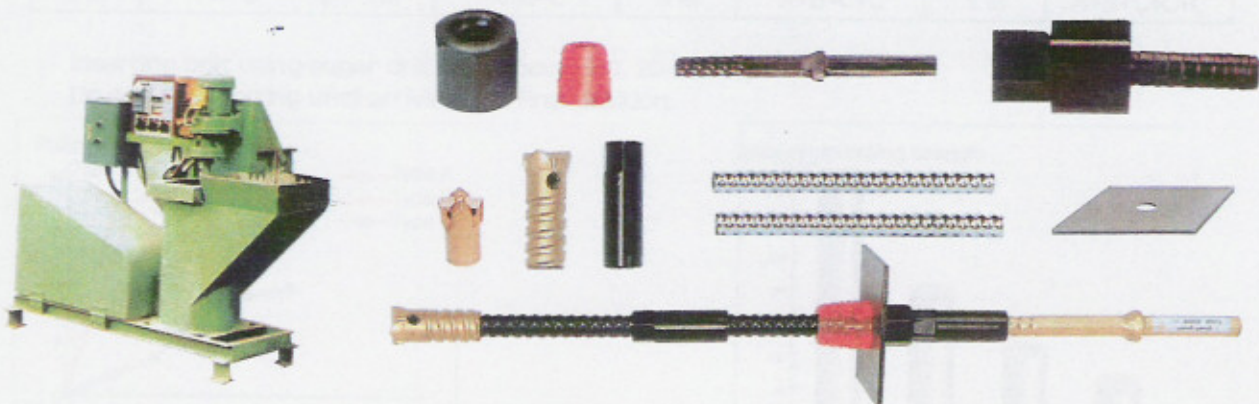
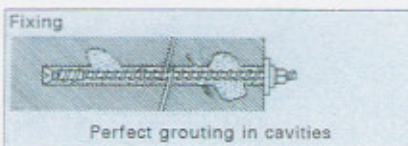
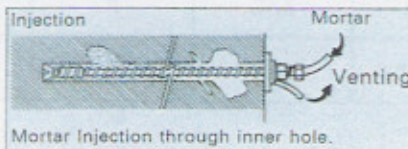
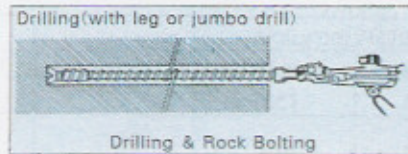


COMPARED OF WORK METHOD

Original Rock-Bolt



YPSD Rock-Bolt



RESIN (PU TYPE)

We can supply Poly Urethane type resin capsule to overcome problem in which happened in the NATM tunnel construction especially water leakage.



CHARACTERISTICS

1. Void between the rock bolt and hole can be filled with resin because of polyurethane effect.
2. can protect water from the hole.
3. can get higher boning strength.
4. can handle and keep of ease

DATA

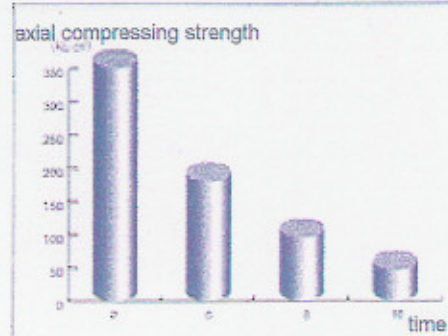
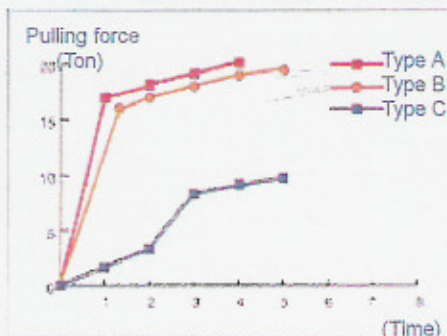
Type	Purpose	Size (mm)	Swelling (%)	Reaction time (Sec)	Hardening (Hour)	Volume(26mm)		Pulling force (Ton)
						Before (cc)	After (cc)	
A	Fast hardening	26x650 32x650	200	30	1	255	510	15~20
B	Forehead	26x650 32x650	200	60	1	255	510	13~18
C	filling	26x650 32x650	200	360	6	255	1020	5~10

WORK PROCEDURE

1. Making hole using drill machine (diameter 32mm ~38mm).
2. Flushing inside of hole
3. Inserting resin inside of hole.
4. Combination of Resin

Length	Combination	Length	Combination	Length	Combination	Length	Combination
2 M	A+C	3 M	A+B+C	4 M	A+B+C+C	5 M	A+B+C+C+C

5. Inserting bolt using auger drill (rpm above 700, 20-30 sec)
6. Do not stop bolting until arriving the final position.



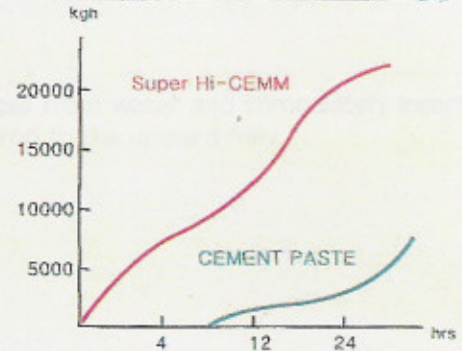
CEMM BOLT (CEMENT TYPE)

This item can apply to the SLAG Bolt System and Fore-poling Rock Bolt System. Without any other grouting facility Rock Bolt can apply especially water leakage point with high water pressure.



CHARACTERISTICS

1. Excellent fixing effect due to high bonding strength
2. High workability due to cartridge type.
3. Fast hardening time due to quick cement.
4. No corrosion due to cement type.
5. Non-shrinkage type
6. Good effect at the water leakage point



(Pulling Test Result)

PURPOSE

1. Subway, MRT and Wastewater Tunnel
2. Hydraulic Tunnel in Dam Project
3. Retaining Wall
4. Mining Project

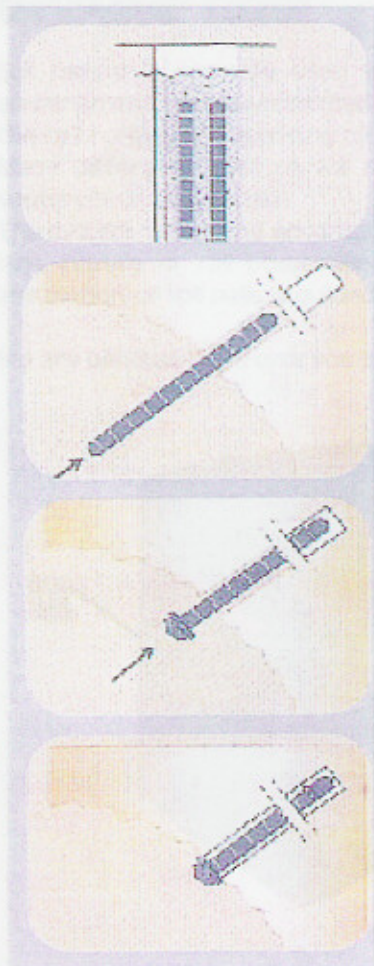
Physical Character of the CEMM Bolt

PH	Minimum Pulling Strength
12.5	Above 17 ton (170 KN)

DIMENSION & SPECIFICATION

Diameter (mm)	Length (mm)	Weight (Gram)	Drill Size (mm)	Usage (EA)	Avg. Pulling Str (Ton)	Rock Bolt (Dia mm)
28	500	500	D38	1M/1EA	17 - 21	D25
32	500	600	D42	1M/1EA	17 - 21	D29

WORK PROCEDURE



1. Before work starting, the cartridges dip into the clean water during the 20 to 30 second to absorb water fully.
2. Taking out the cartridges from water and immediately inserting the drill hole with tamping rod to the upward fully.
3. Using auger drill, driving the rock bolt up to the total line.
4. Installing the bearing plate and nut.

(SOIL NAIL)

(CONNECTION OF SOIL NAIL IF NECESSARY)

SOIL NAILING

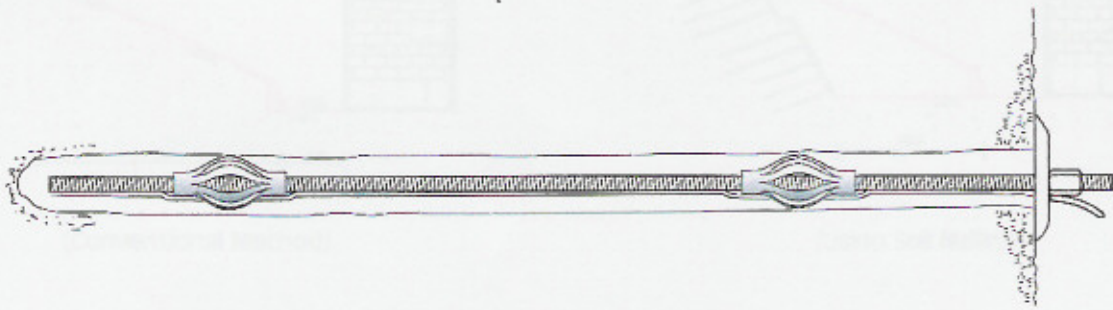
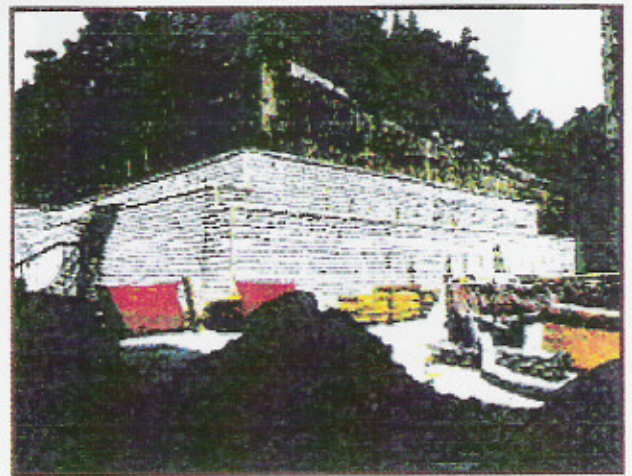
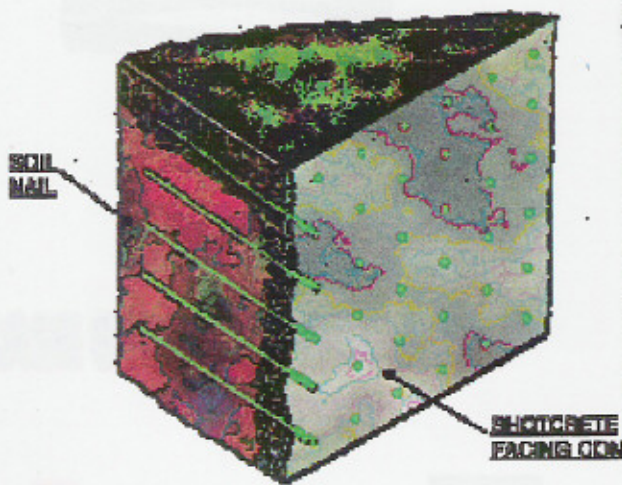
DESCRIPTION

Soil nailing is normally used when improving the stability of existing embankment. For example rail or rail embankment that have started to degrade due to changed loading or ground conditions. It is also used to assist in the re-profiling or extending of existing embankments or in close proximity to adjacent structures.

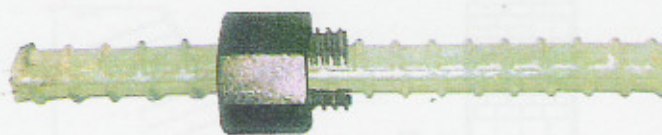
Many different types of soil nailing solutions exist where they are used in conjunction with mini-piled walls, shotcrete or geo-textiles.

The system offers the advantage that work may be progressed using small drill rigs and plant that do not require lane closure or rail possessions unlike larger equipment. The design of embankments construction with the installation of soil nails is guided by a number of international standards including BS8006.

We are pleased to inform you to supply the materials of soil nails including accessory with high quality standard.



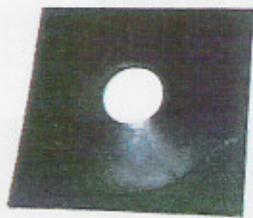
(SOIL NAIL)



LINER SCREW

(CONNECTION OF SOIL NAIL IF NECESSARY)

ACCESSORY OF SOIL NAIL



PLATE



R-WASHER



HEX NUT



CENTRALIZER

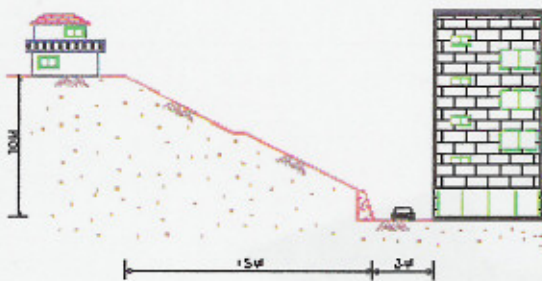


SPACER

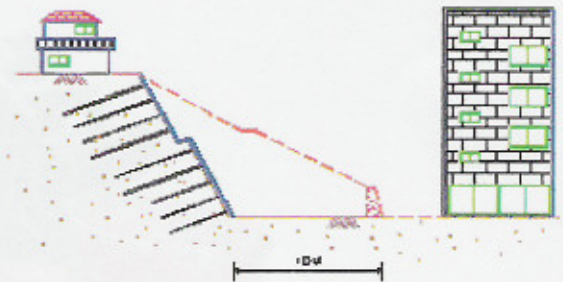


SPACER

CASE STUDY OF SOIL NAIL



(Conventional Method)



(Using Soil Nailing)



(Comparing between two method)