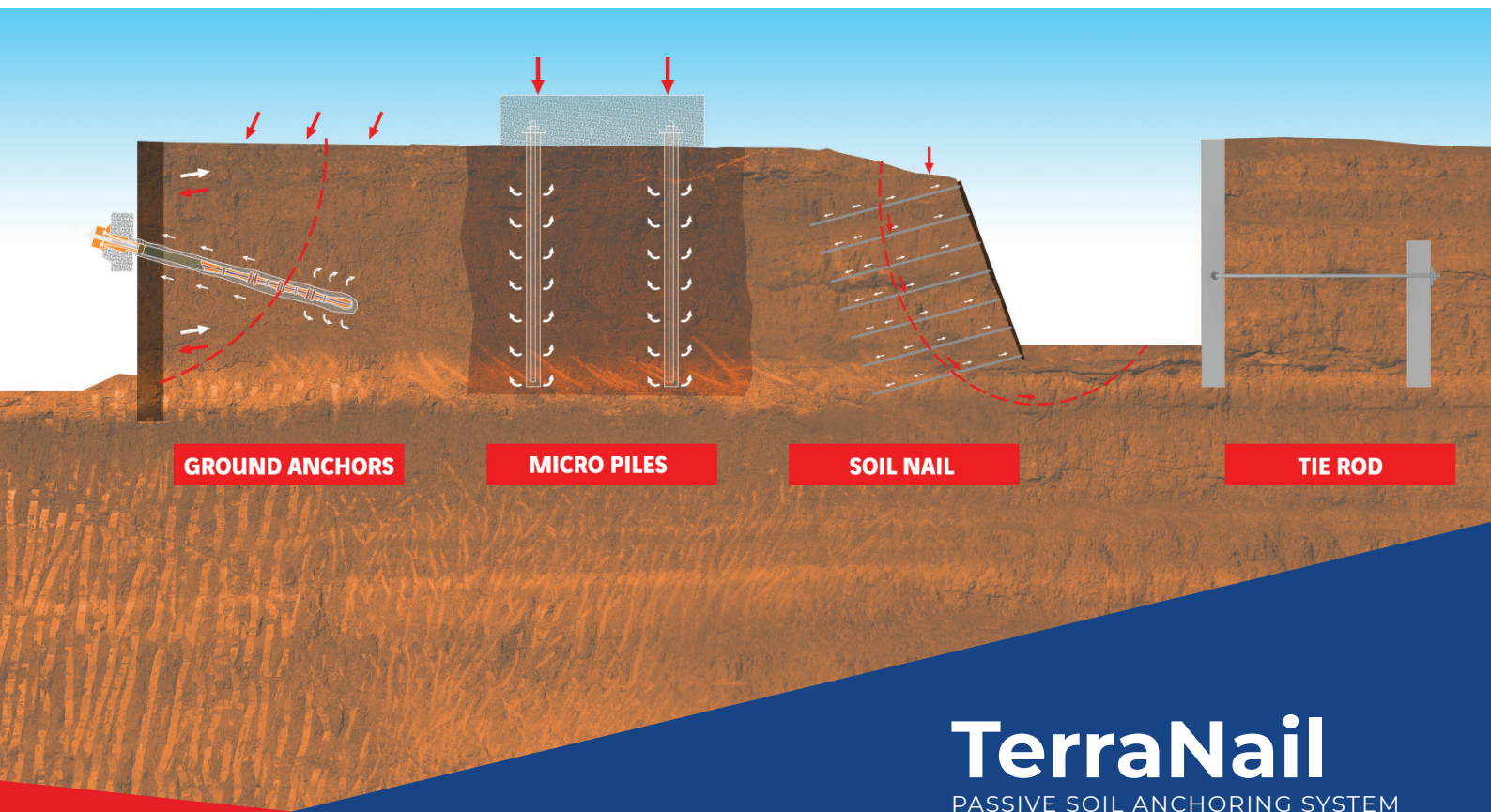


**GEOQUEST**



TerraNail is a passive geotechnical anchoring system consisting of a range of bars and adapted accessories, allowing its use in several civil engineering applications. The bars are either fully threaded (Hot threaded) solid bars or rope threaded hollow bars. On demand, the bars and the accessories can be coated with a corrosion protection system (hot-dip galvanization or epoxy or double corrosion protection with hot-dip galvanization and epoxy). The fundamental concept of TerraNail consists of reinforcing the soil or rock mass by passive inclusions, closely spaced, to create an in-situ coherent gravity structure. Hence, it increases the overall shear strength and stability of the in-situ soil or rock strata and restrains its displacements. Installation of TerraNail for any permanent solution involves basic steps - drilling, placing of the bars, grouting and securing the nail end.

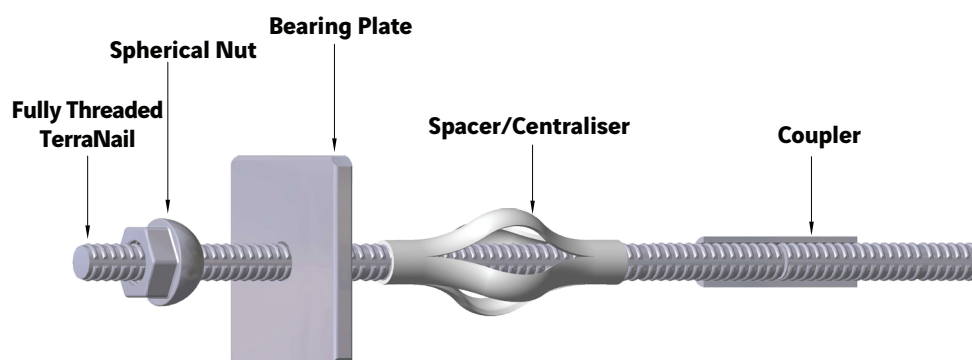
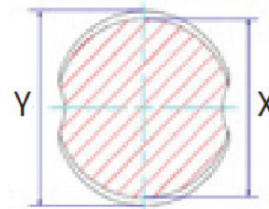
## Applications

- **Strengthening:** TerraNail is used for strengthening of existing slopes, embankments, tunnel portals, tunnel caverns, retaining structures and bridge abutments.
- **Repair and Rehabilitation Structures:** TerraNail can be effectively used to repair and to restore failed retaining structures and bridge abutments.
- **Slope Stabilisation, Landslide Repair:** TerraNail alone or in combination with other slope stabilisation techniques can be used for rehabilitation of failed slopes and landslides.

## Fully Threaded TerraNail Grade 670/800

Nominal Diameter (mm)	Grade (MPa/MPa)	Weight (kg/m)	Cross Section (mm <sup>2</sup> )	Nominal X (mm)	Nominal Y (mm)	Yield Load (kN)	Ultimate Load (kN)	Elongation Min. (%)
18	Grade 670/800	1.96	250	17.3	20.0	168	200	5
22		2.94	375	21.5	23.8	251	300	5
25		3.85	491	24.2	27.3	329	393	5
28		4.83	616	27.0	30.6	413	493	5
30		5.55	707	29.2	33.0	474	566	5
32		6.4	804	31.5	35.5	620	750	5
35		7.55	962	34.2	38.3	645	770	5
43		11.4	1452	42.3	46.8	973	1162	5
57.5		20.38	2597	55.9	61.5	1740	2078	5
63.5		24.86	3167	62.1	67.8	2122	2534	5

- **Widening of Mountain Roads:** TerraNail in combination with other Terre Armée techniques is used for widening of hill roads.
- **Widening of Flyover/ Bridge Approaches:** Flyover or bridge approaches supported by retaining structures in highways and/or railways can be widened using TerraNail in combination with other Terre Armée techniques.
- **Temporary or Permanent Stabilisation of Excavation:** TerraNail can be used during construction of any buried structure (such as road | rail under bridges, underpasses and building basements.) for temporary or permanent stabilisation of the excavated ground profile.
- **Slope Retention:** TerraNail in combination with Terre Armée's High tensile steel mesh system can be used for slope retention and thus prevention of failure of slopes or rock displacement.
- **Rockfall Barrier:** TerraNail is used to secure the posts of the hinged or fixed rockfall barrier system.



## Couplers

### Technical Parameters for Grade 670/800

	Nominal diameter (mm)									
	18	22	25	28	30	32	35	43	57.5	63.5
L (mm)	100	110	120	140	150	160	170	200	250	300
D (mm)	36	40	45	50	55	60	65	80	102	114
Weight (kg)	0.56	0.71	0.94	1.36	1.84	2.6	2.95	5.42	10.31	14.48

## Spherical Nuts

### Technical Parameters for Grade 670/800

	Nominal diameter (mm)									
	18	22	25	28	30	32	35	43	57.5	63.5
H (mm)	35	45	50	55	60	60	70	85	115	125
SW (mm)	32	36	41	46	50	80	60	70	90	100
Weight (kg)	0.18	0.32	0.43	0.62	0.66	1.4	1.29	2.21	5.32	7.26

## Fully Threaded TerraNail

### Grade 525/575, 835/1035 and 935/1085

Nominal Diameter	Cross Section Area	Weight	Grade 525/575		Grade 835/1035		Grade 935/1085	
			Yield load (kN)	Ultimate load (kN)	Yield load (kN)	Ultimate load (kN)	Yield load (kN)	Ultimate load (kN)
mm	(mm <sup>2</sup> )	(kg/m)						
25	491	4.10	270	375	405	500	450	520
32	804	6.65	440	620	660	820	740	860
36	1018	8.41	560	780	840	1040	940	1090
40	1257	10.34	690	960	1040	1290	1160	1350
50	1964	16.28	1080	1500	1600	2010	1820	2110

## Spherical Nuts

	Nominal diameter (mm)						
	18	25	28	32	36	40	50
SW (mm)	36	50	60	60	65	70	85
SL (mm)	42	58	69	69	75	81	98
D1 (mm)	50	72	80	80	90	100	120
D2 (mm)	30	38	45	45	50	55	64
L1 (mm)	55	75	90	90	100	115	145
L2 (mm)	15	22	28	28	30	32	36

## Couplers

	Nominal diameter (mm)						
	18	22	25	32	36	40	50
D (mm)	15	20	25	32	36	40	50
D (mm)	38	38	50	60	70	75	90
L (mm)	110	110	132	168	200	220	290
Weight (kg)	0.8	0.7	1.35	2.4	3.6	5.2	9.64

## Bearing Plates

### Technical Parameters for all Grades

	Nominal diameter (mm)												
	18	22	25	28	30	32	35	36	40	43	50	57.5	63.5
LxL (mm)	120	150	150	200	200	200	200	200	225	250	275	300	300
Thickness (mm)	8	8	8	10	20	20	20	20	25	30	32	40	50
Ø (mm)	24	41 or 34	46 or 34	52 or 34	58 or 41	60 or 42	70 or 46	70 or 50	80 or 60	87 or 58	90 or 65	87 or 70	120 or 87
Weight (kg)	0.85	1.3	1.3	3.0	6.0	6.0	6.2	6.0	11.0	13.8	18.5	25.8	32.0

## Self Drilling TerraNail

The self-drilling TerraNail anchoring system is comprised of a threaded hollow bar with an attached drill bit that can perform drilling, anchoring and grouting in a single operation. The hollow bar allows air and water to freely pass through the bar during drilling to remove debris and then allow grout to be injected simultaneously while drilling the hole. Grout fills the hollow bar and around the hole in the entire drilled hole.

Couplers can be used to join hollow bars and extend the bar length while nuts and plates are used to provide the required tension.

Self-drilling TerraNail anchors are offered in variants of R25, R32, R38, R51 and T76 and their accessories including the nuts, plates, coupler, drill bits depending on the engineering design and geological condition of the project site.

## Technical Parameters

	Nominal diameter (mm)									
	Unit	R 25N	R 32L	R 32N	R 32S	R38 N	R51 L	R51 N	T 76N	T 76S
Outer Diameter	mm	25.0	32.0	32.0	32.0	38.0	51.0	51.0	76.0	76.0
Inner Diameter	mm	14.0	22.0	20.0	18.5	22.0	36.0	33.0	51.0	47.0
Ultimate Load	kN	200	260	280	360	500	550	800	1600	1900
Yield Load	kN	150	200	230	280	400	450	630	1200	1500

## Spherical Nuts

	Nominal diameter (mm)									
	Unit	R 25N	R 32L	R 32N	R 32S	R38 N	R51 L	R51 N	T 76N	T 76S
Key Size	mm	41	46	46	46	50	75	75	100	100
Length	mm	35	45	45	65	60	70	70	80	80

## Bearing Plates

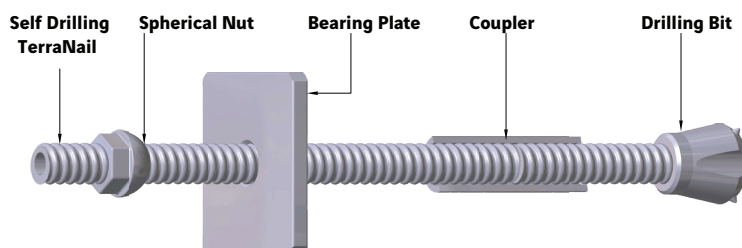
	Nominal diameter (mm)									
	Unit	R 25N	R 32L	R 32N	R 32S	R38 N	R51 L	R51 N	T 76N	T 76S
Dimension	mm	150x150	200x200	200x200	200x200	200x200	200x200	200x200	250x250	250x250
Thickness	mm	8	10	10	12	12	30	40	40	40
Hole Diameter	mm	30	35	35	35	41	60	60	80	80

## Couplers

	Nominal diameter (mm)									
	Unit	R 25N	R 32L	R 32N	R 32S	R38 N	R51 L	R51 N	T 76N	T 76S
Outer Dimension	mm	36	42	42	42	52	63	63	95	95
Length	mm	150	145	160	190	220	140	200	200	220

## Drill Bits

Description	Available drilling diameter per bar thread (mm)				
	R25	R32	R38	R51	T76
<b>Steel cross bit</b> Made of heat treated steel.	Ø 42 Ø 51	Ø 51 Ø 76	Ø 76 Ø 90 Ø 115	Ø 76 Ø 90 Ø 100 Ø 115 Ø 130 Ø 150	Ø 115 Ø 130 Ø 200
<b>Carbide cross bit</b> Made of heat treated steel, with carbide inserts.	Ø 42 Ø 51	Ø 51 Ø 76	Ø 76 Ø 90 Ø 115	Ø 90 Ø 110 Ø 115	Ø 115 Ø 130 Ø 200
<b>Steel button bit</b> Made of heat treated steel.	Ø 42 Ø 51	Ø 51 Ø 76	Ø 76 Ø 90 Ø 115	Ø 76 Ø 100 Ø 115	Ø 120 Ø 130
<b>Carbide button bit</b> Made of heat treated steel, with carbide inserts.	Ø 42 Ø 51	Ø 51 Ø 76	Ø 76 Ø 90 Ø 115	Ø 76 Ø 100 Ø 115	Ø 120 Ø 130



### NOTES

- A. These properties may change at the time of handling, storage and shipping.
- B. The values can be customized.
- C. The above values are subject to change as per discretion of the company.
- D. Various grades of couplers, nuts, plates and drill bits available

[info@geoquest-asia.com](mailto:info@geoquest-asia.com) | [www.geoquest-asia.com](http://www.geoquest-asia.com)

Local Contact: .....

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