

SAS thread bars *soil nails*



SOIL NAILS

A soil nail is a structural element which provides a load-transfer mechanism for the reinforcement of earth and rock masses. Similar in concept to earth reinforcing or MSE walls, soil nailing was developed as a form of in-situ reinforced earth.

The process is utilized in top down construction applications where a 5 to 6 foot high temporary vertical cut can be made into an existing soil or rock formation. A horizontal row of soil nails is drilled and grouted, then a thin skin of shotcrete is placed over the exposed earth. Each of the above steps is repeated until the excavation reaches the lowest level.

Soil nails have been constructed in a wide range of soil conditions to heights exceeding 100 feet.

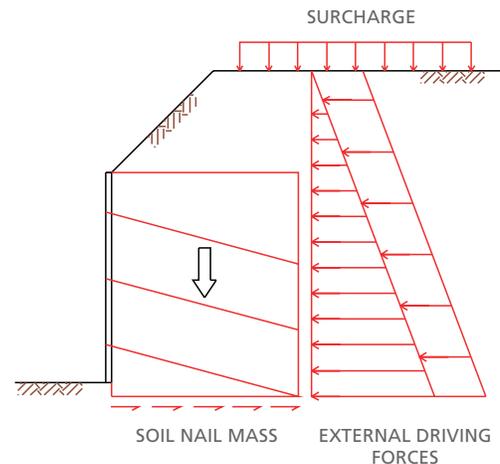
Applications include the following:

- ▶ Temporary Earth Support for Shoring*
- ▶ Permanent Retaining Walls
- ▶ Slide Stabilization

** temporary anchors are limited for a service life of <24 months*

The completed reinforced soil structure acts like a gravity block to resist sliding and overturning forces that are imposed from soils acting on the structure.

The primary components of the soil nail system are the soil nails, the earth, and the facing. SAS is the world leader in the production of thread bar systems for soil nail applications, and is dedicated to the continuous improved development of products for the industry. SAS supplies thread bar systems of the highest quality, and provides exceptional service through its worldwide network of partners. SAS supplies soil nails from Grade 75/80 steel in sizes from #5 up to #20 thread bars.



Grade 97

SAS's continuous development and innovation in the industry has produced another first – Grade 97 bars, available in sizes from #6 up to 3" in diameter. This grade for applications in soil nail walls allows the design engineer and contractor much greater flexibility in matching the design load requirements to the site condition.

In most cases, using Grade 97 reduces the bar size by 1/8" in diameter. This reduction translates in savings of weight, resulting in cost reduction for materials, freight, and installation labor.

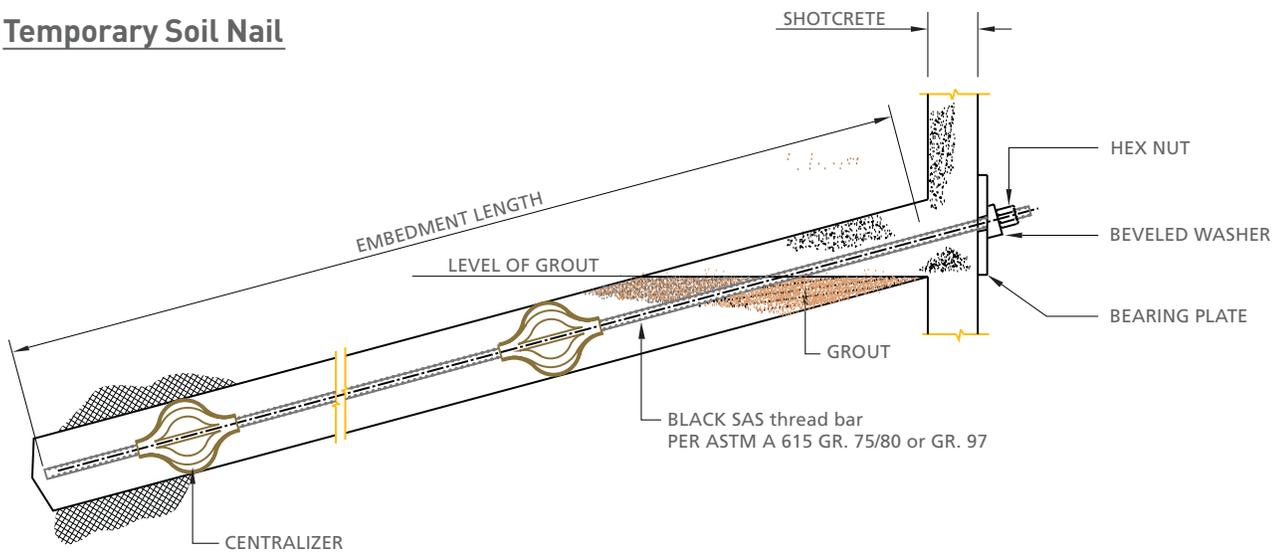
SAS thread bars

- ▶ Unlike some other “threaded bar” systems using machined threads, SAS bars have a continuous rolled-in, thread-like deformation along the entire length, allowing anchorages and couplers to be threaded onto the bar at any point. The deformation eliminates jamming of nuts, even when the bar is covered by mud or dirt at the construction site.
- ▶ Deformation pattern provides excellent bond between bar and cement grout
- ▶ Easy to splice and stress
- ▶ Easy to remove after de-tensioning, when temporary nails are installed under adjacent properties and must be removed after use
- ▶ Multiple corrosion protection options available depending on length of service and aggressiveness of the soil

Temporary Earth Support

Soil nails are frequently used to provide temporary earth support for shoring of excavations in soil materials that can be temporarily cut up to 5 feet. Since service life is <24 months, no corrosion protection for the nails is required.

Temporary Soil Nail

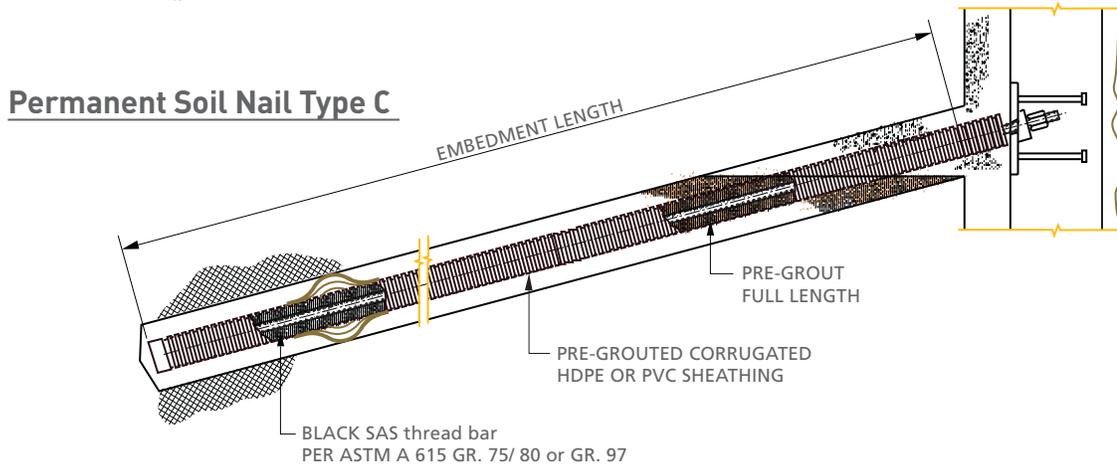
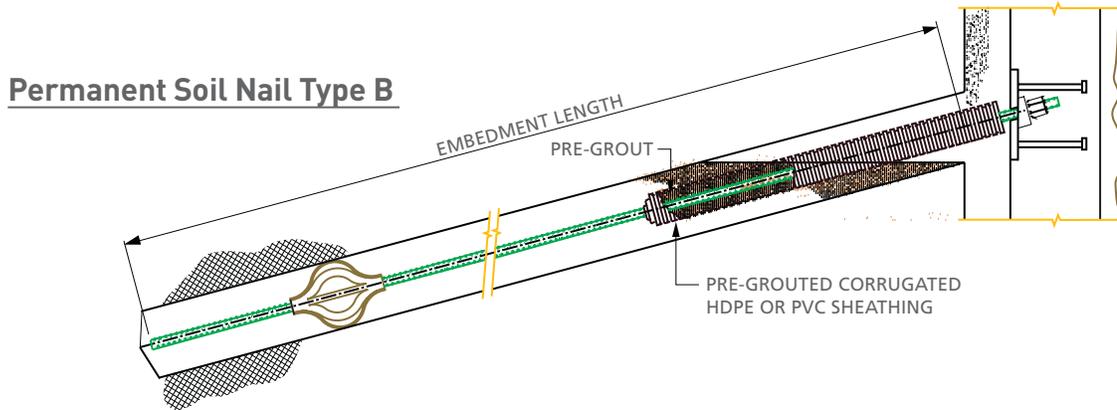
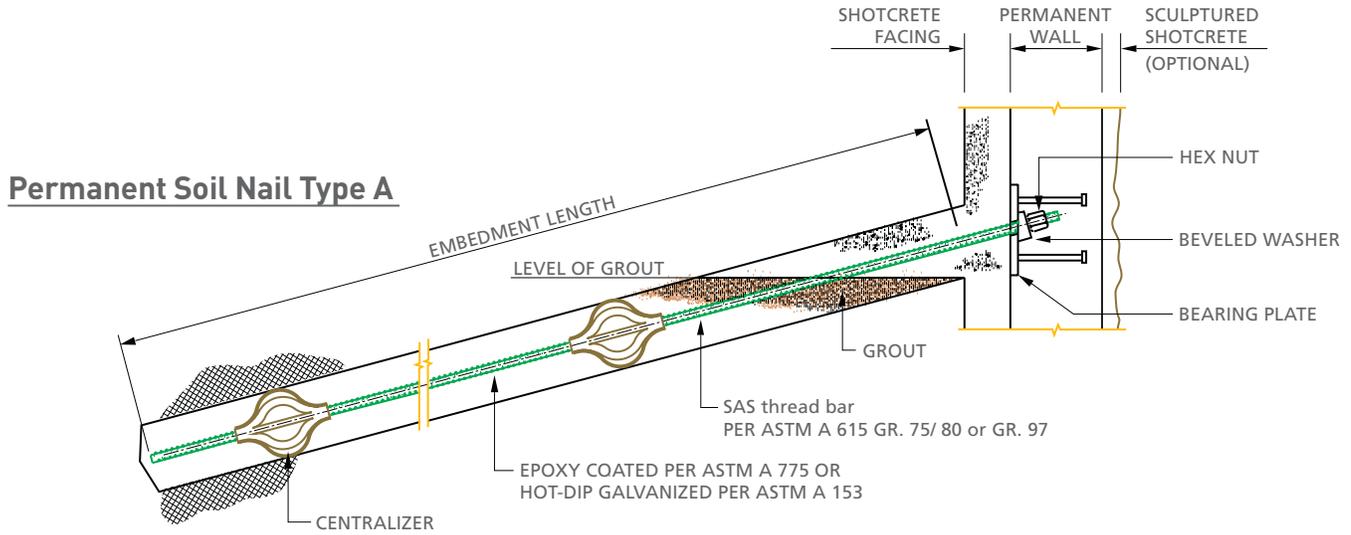


Permanent Soil Nails

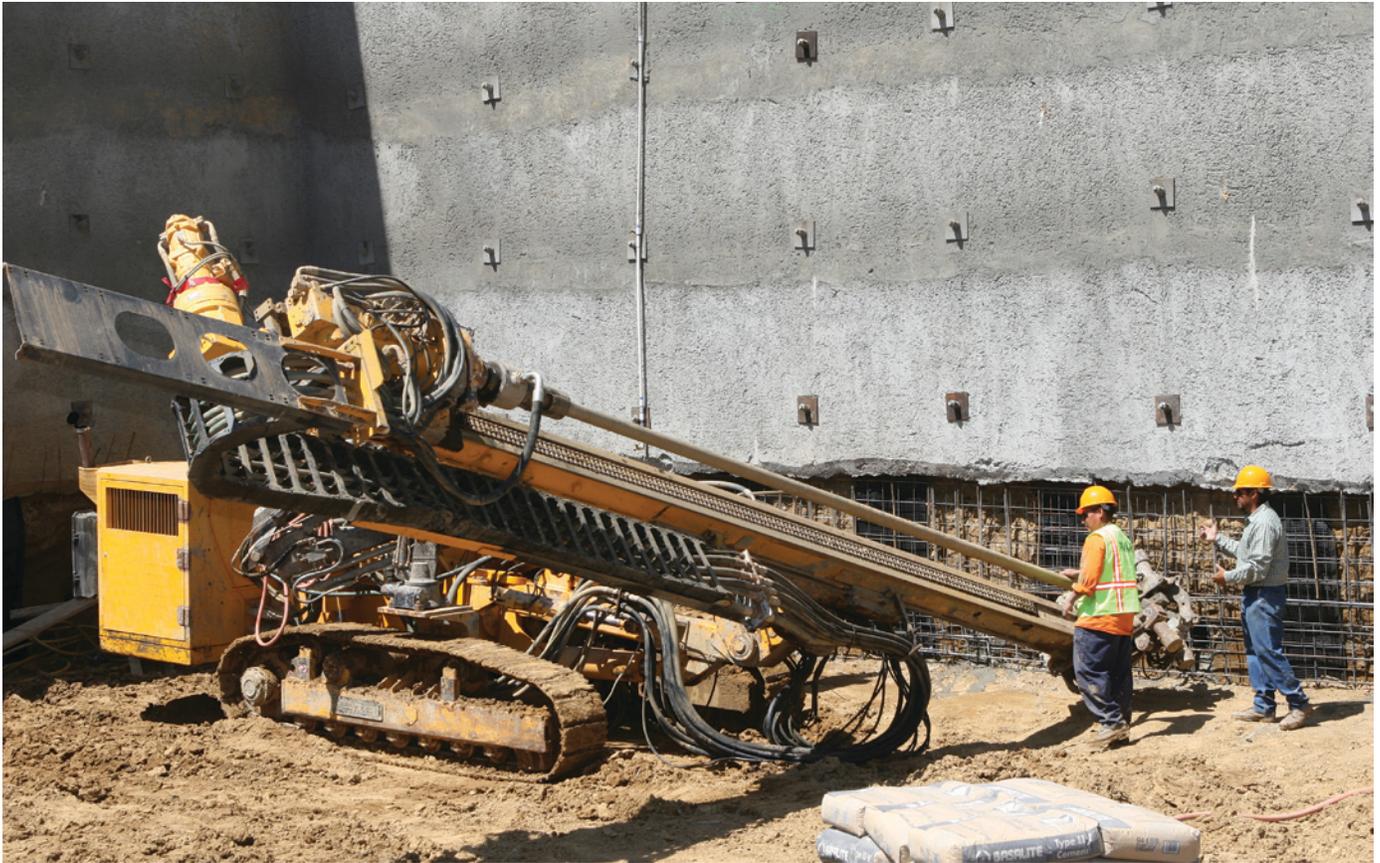
For permanent structures, such as retaining walls and slide stabilizations, the construction process is similar to a temporary wall, however, the soil nails must be fabricated with a protective coating or encapsulation to prevent corrosion of the soil nail for the life of the structure.

As shown below, three types of corrosion protection systems are available, depending on whether soil is aggressive or non-aggressive

CORROSION PROTECTION SYSTEM

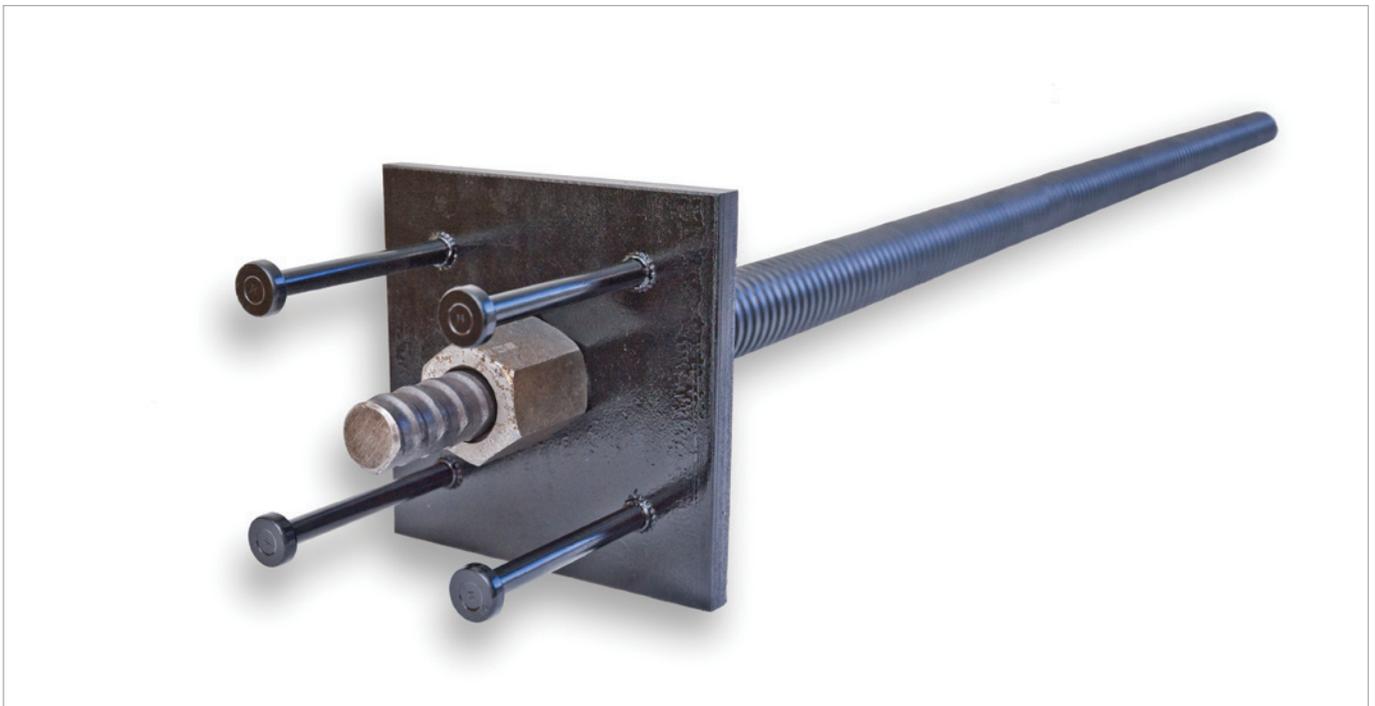


Temporary Earth Support for Vertical Excavation of 65 feet





Soil Nail Wall with Sculpted Shotcrete





thread bars

		Nominal Diameter - ϕ		Area	Minimum Yield Strength	Minimum Ultimate Strength	Weight	Maximum Bar Diameter	Part Number	
		#	in.	mm	sq. in.	kips	kips	lbs./ft.	in.	
SAS 550 (BSt 550 S) / Grade 75/80										
 B 550 / 620 N/mm² Reinforcing Systems				12	0.18	14	16	0.60	0.55	120GL
				14	0.24	19	21	0.81	0.63	140GL
	5	5/8	16	0.31	25	28	1.06	0.75	160GL	
	6	3/4	20	0.49	39	44	1.66	0.91	200GL	
 Geotechnical Systems	8	1	25	0.76	61	68	2.59	1.14	250GL	
	9	1-1/8	28	0.95	76	86	3.25	1.26	280GL	
	10	1-1/4	32	1.25	99	112	4.24	1.42	320GL	
	11	1-3/8	36	1.58	126	142	5.37	1.62	360GL	
			1-5/8	40	1.95	156	176	6.63	1.77	400GL
		14	1-3/4	43	2.25	180	202	7.65	1.89	430GL
		16	2	50	3.04	242	273	10.35	2.20	500GL
		18	2-1/4	57	4.00	319	360	13.60	2.52	570GL
		20	2-1/2	63.5	4.91	393	498	16.71	2.76	635GL
	Grade 97									
 S 670 / 800 N/mm² Geotechnical Systems	6	3/4	18	0.39	38	46	1.34	0.83	180AT	
	7	7/8	22	0.59	57	68	2.00	0.98	220AT	
	8	1	25	0.76	74	88	2.59	1.10	250AT	
	9	1-1/8	28	0.95	93	111	3.25	1.26	280AT	
	10	1-1/4	30	1.10	107	127	3.73	1.34	300AT	
 Tunneling / Mining	11	1-3/8	35	1.49	145	173	5.07	1.57	350AT	
	14	1-3/4	43	2.25	219	261	7.66	1.89	430AT	
	18	2-1/4	57.5	4.03	391	467	13.67	2.48	575AT	
	20	2-1/2	63.5	4.91	477	570	16.68	2.76	635AT	
	24	3	75	6.85	665	795	23.27	3.21	750AT	



Whatever your project – geotechnical, bridge, building or maritime construction – count on one of our companies to deliver reliable service and a product of highest quality

For additional information or sample specifications for soil nails contact the SAS office nearest you.