VULCAN®
EARTH ANCHOR SYSTEMS

Vulcan Earth Anchors®

Distribution Partner

GREENMAX

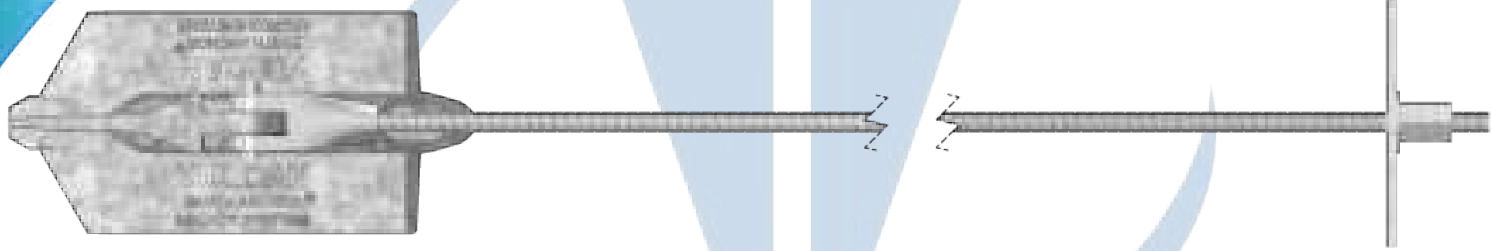
connecting green and infrastructure

ANCHOR SYSTEMS (INTERNATIONAL) LTD

WWW.ANCHORSYSTEMS.CO.UK

Have any questions?
01342 719 362

Home of the Vulcan



VULCAN EARTH ANCHORS®

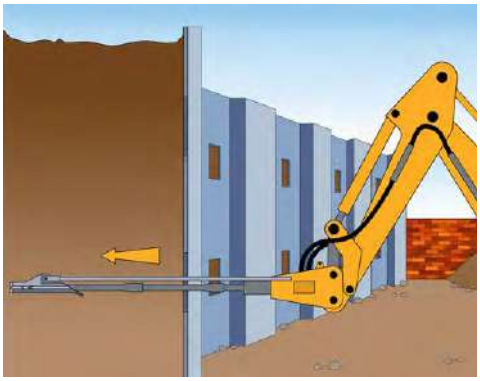
The Vulcan Earth Anchor range was designed by Anchor Systems (International) Ltd as a simple, reliable and cost-effective ground anchoring solution with the ability to provide immediate loading capacities from 1 - 450kN in displaceable ground conditions with extensive applications.
The concept involves a specially designed earth anchor with a larger surface area, attached to high yield tie bars or tendons to suit a variety of conditions, being driven into the ground where it is locked in position. The tensile load is applied, and the exposed end locked off and terminated.

With their ease of use and speed of installation, Vulcan Earth Anchors provide a time and cost saving alternative to more traditional means of anchoring, particularly where tight programme schedules are involved. This, combined with the wide range of sizes available, means that the Vulcan Earth Anchor has gained recognition across a vast array of applications internationally.

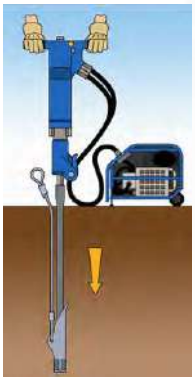
- Larger surface area allowing the Vulcan Earth Anchor to achieve the greatest holding capacity in all ground conditions
- Rapid installation
- Largest range of anchors in the World ranging from 1 - 450kN+
- We are the only company globally to manufacture and stock fully stainless-steel systems
- Bespoke design available
- Huge stock of plant and products with next day delivery available
- Made in Britain

INSTALLATION

MACHINE MOUNTED

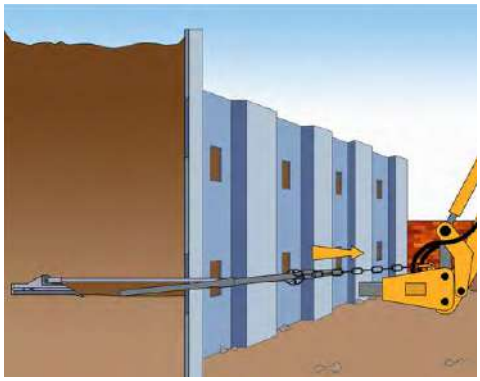


HAND HELD



Vulcan anchors are designed to be driven into the ground using hydraulic or percussion equipment, with little or no disruption to the structure or surrounding area.

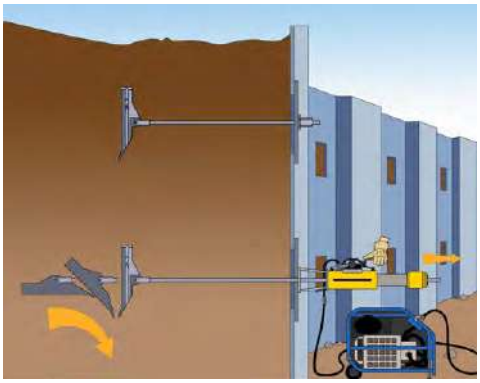
MACHINE MOUNTED



HAND HELD

Once the anchor has been driven to the required depth the drive rod is removed for reuse.

MACHINE MOUNTED



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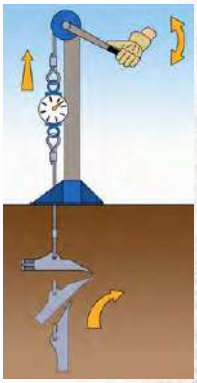


A tensile load is applied to the attached tie bar or tendon. This rotates the anchor into the locked position for maximum load holding capacity. The anchor is then proof tested to the designed loading requirements before the top termination is fitted, as specified by the civil or structural engineer.

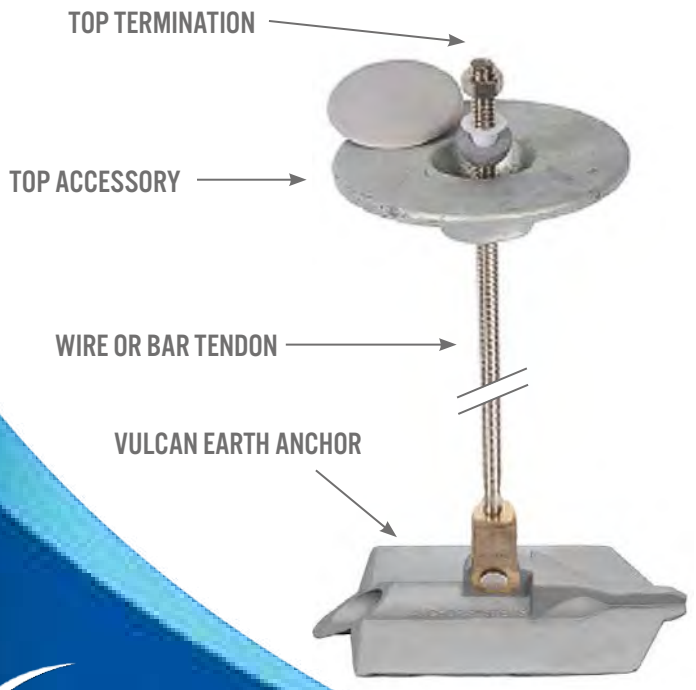
The Vulcan® Range

All kN loadings are based upon the optimal tendon choice for the mechanical Anchoring systems to achieve Ultimate Resistance test.

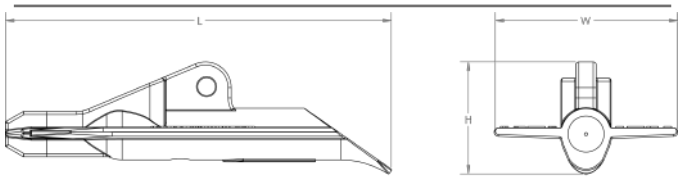
Anchor System	AS01	AS05	AS10	AS20	AS30	AS50	AS90	AS120	AS200	AS300	AS400
Tendon type	3mm	M-8	M-12	16mm HYB	16mm HYB	20mm HYB	20mm HYB	25mm HYB	28mm HYB	30mm HYB	30mm HYB
Independent destructive TEST of mechanical anchor head (kN)	5	30	55	70.74	112.6	195.3	195.3	222.2	356.7	450	500
Ultimate strength of tendon (kN)	6.98	15	64	121	121	188	188	295	370	566	566
Limiting structural strength	4.5	13.5	49.5	63.7	101.3	169.2	169.2	200.0	321.0	405.0	450.0
Anchor head surface area mm2	1,500	3,481	6,781	15,637	21,130	29,093	48,734	104,517	65,886	104,769	216,078

Common Soil Type Description	Blow Count or "SPT"	Ultimate anchor resistance (kN)									
Very Dense and/or Cemented Sands Coarse Gravel & Cobbles	60 +	4	13	27	63	87	119	169	199	271	405	450
Dense Fine Sand Very Hard Silts & Clays	45 - 60	4	12	24	57	77	106	169	199	242	384	450
Dense Clays, Sands & Gravel Very Stiff to Hard Silts & Clays	35 - 50	4	10	20	48	64	89	149	199	202	322	450
Medium Dense Sandy Gravel Very Stiff to Hard Silts & Clays	25 - 40	3	8	16	38	52	72	120	199	163	259	450
Medium Dense Coarse Sand & Sandy Gravel; Stiff to Very Stiff Silts & clays	14 - 25	2	5	11	26	35	49	82	177	112	178	367
Loose to Medium Dense Fine to Coarse Sand; Firm to Stiff Clays & Silts	7 - 14	1	4	7	18	24	33	56	121	76	121	251
Loose Fine Sand; Alluvium;Soft-Firm Clays; Varied Clays; Fill	4 - 8	1	3	6	14	18	26	43	93	58	93	193
Peat, Organic Silts; Inundates Silts Fly Ash	0 - 5	1	2	4	10	14	19	33	71	45	71	148

N.B. For guidance purposes only – True capacity must be tested with a load locker: Previous project tests have shown that if an earth anchor is grouted into poor ground, the results that can be achieved are favorable to increased tensile loading capacity. **Note:** All below ground work should be undertaken after properly reviewing survey documentation on services. It is imperative in all cases that anchors are fully load locked before being out into service.



SIZES AND WEIGHTS



Anchor	L - mm	W - mm	H - mm	Weight kg
AS01	75	28	30	0.09
AS05	127	41	35	0.22
AS10	168	70	72	0.96
AS20	240	76	95	2
AS30	293	88	107	3
AS50	375	98	110	4
AS90	375	178	109	5
AS120	500	300	178	10
AS200	500	172	150	10
AS300	500	300	176	15
AS400	650	450	176	29

Performance

Anchor Systems are the only company globally to offer such an extensive range of mechanical ground anchors with loading capacities from 1-450kN+.

Our Vulcan Earth Anchors are produced from a range of durable materials to accommodate for the varied environments that they are used in.

We produce our systems from a range of high quality materials to provide a system design life from 5 years to 120+ years. These are typically either fully galvanised, a mixture of galvanised, aluminium bronze and stainless steel or a complete 316 stainless steel system.

ANCHOR	ANCHOR TYPE
	AS 01
	AS 05
	AS 10
	AS 20
	AS 30
	AS 50
	AS 90
	AS 120
	AS 200
	AS 300
	AS 400

Load Distribution

INITIAL LOAD APPLICATION

During the first stage, a force is exerted to initiate the rotation of the anchor into its load-locked position. This process involves both loading and extension elements.

COMPACTION AND LOADING

In the second stage, the anchor system creates a conical shape of soil directly ahead of the anchor. During this phase, the load typically increases with minimal extension. The type of soil involved will influence the total extension experienced.

PEAK LOAD RANGE

During the third stage, the anchor reaches its maximum load capacity. As the load on the anchor nears the soil's bearing capacity, the rate of load increase diminishes until the soil experiences bearing capacity failure.

NEARING CAPACITY FAILURE

Attention: If the mechanical shear strength of the soil is surpassed, the remaining load will diminish as the anchor continues to extend and shear through the ground.

ULCAN® EARTH ANCHOR SYSTEMS

Preliminary Design Service

DESIGN

At Anchor Systems, we pride ourselves on providing full support and a first-class service, which we believe goes above and beyond that of our competitors. This starts from the enquiry stage, where we work with out clients to gain a full understanding of what they are trying to achieve and how they like to work.

We then offer full support and advice throughout the design and ordering process and even when our client has received their goods – we don't leave it there. We go on to offer support, training and on-site supervision and will always make sure our clients are completely happy throughout the whole process. We can also provide clients with bespoke designed products that can be unique to them and their project.

Anchor Systems work with several Consultant Engineers that support us in providing fully indemnified designs that consider site location and installation whilst delivering the most cost-effective solution.

STABILITY DESIGNS

We offer two types of stability design that are used for retaining walls, embankments, and slope stabilisation. The first is a Local Stability Design which is based on a principal engineer supplying loading requirements and associated drawings and soil investigation. This design will assess the specific soil conditions based on the information provided and in turn specify the correct anchor(s) to be used and in what specific layout.

The other stability design is a Global Stability Analysis Design, and it is based upon a principal engineer supplying associated drawings, a factor of safety, and soil investigation data. This design will specify the loads of each anchor to maintain the required level of stability.

Both designs are derived based upon data calculations using published methods appropriate to this form of ground anchorage e.g. Euro-codes, DMRB, CIRIA etc. The design will be delivered in a report format in PDF along with a signed design certificate if required.

When using either type of stability design that has a structure (retaining wall etc.) incorporated within the overall design, there is a requirement to use a Structural Engineer to ensure that the structure is adequate.

Plates Available

All plates are available in various sizes and materials to accommodate your requirements.

FLAT PATTRESS PLATE

Designed predominately for slope stabilisation where the anchor is driven perpendicular to the slope surface.

COMBI-TECH

An innovative design using the Vulcan mechanical earth anchor technology combined with the sock anchor technology that offers a completely concealed system. This systems allows the original drilled core to be placed back into its original position which entirely hides the anchor termination. Ideal for heritage and conservation works or installations where cosmetics are of paramount importance. This system can be installed at any angle.

FLAT PATTRESS PLATE (WITH WIRE

This Pattress Plate finish is designed and used in the same way as the Flat Pattress Plate above. Replacing the lock nut with a barrel and wedge grip allows the plate to be used with wire instead of bar.

FORMED PATTRESS PLATE

Designed for retaining walls and slope stabilisation where there is a requirement for a large degree of flexibility of the angle the anchor is to be driven. This plate is used with a Domed Load Nut to terminate the bar.

TAPERED WASHER PATTRESS PLATE

For use in applications similar to that of ones that may use a Formed Plate - where there is a requirement for a large degree of flexibility of the angle the anchor is to be driven but require a much higher load to be applied to the plate.

RECESSED PATTRESS PLATE

This Plate is ideal for heritage and conservation works or installations where aesthetics are of great importance. The plate is designed to achieve an attractive, flush finished appearance with the termination completely hidden. This type of plate pro-vides safety for areas of high public traffic where a protruding tendon could injure a pedestrian.

WEDGE BOSS PATTRESS PLATE

A wedge boss allows for installations where there is a requirement to drive the anchor to an angle of up to 45 degrees whilst also allowing for a good degree of flexibility and well as being able to transfer high loads.

ANCHOR DRAIN

The Anchor Drain is installed in the same way as a Vulcan Earth Anchor and is designed to alleviate water pressure in a slope or behind a wall. The system is finished of either by pointing mortar or a bespoke plate design that will allow the water to flow. Please ask one of our team for full details.

Plates in Use

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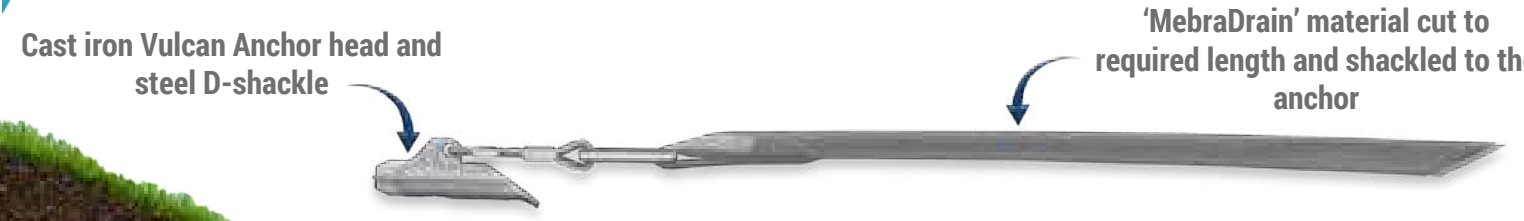
Vulcan Anchor Drain

The Anchor Drain system provides a relief to built up water pressure through a retro fit drainage membrane and is installed in the same way as a Vulcan Earth Anchor. A length of 'MebraDrain' wicking material is secured to the Vulcan anchor head. Once the anchor has been installed the drive rod is withdrawn and the Anchor Drain provides an instant drainage membrane. The system is finished off either by pointing mortar or a bespoke plate design that will allow the water to flow. Installing the Anchor Drain is an effective method of ensuring the future stability of a slope or structure.



- Ideal for road, railway embankments or retaining walls
- Prevents ground becoming saturated
- Retro-fit solution
- Rapidly and easily installed
- Simple, effective and economical
- Helps avoid embankment failure
- Relives puddle pressure
- Can be installed by machine or handheld equipment

MEBRADRAIN

Vulcan Specification Manual

Information Includes

- How they Work
- The Vulcan Range
- Capacities & Performance
- Component Specifications
- Site Testing
- Case Studies
- FAQs
- Health & Safety
- System Examples
- Other Applications

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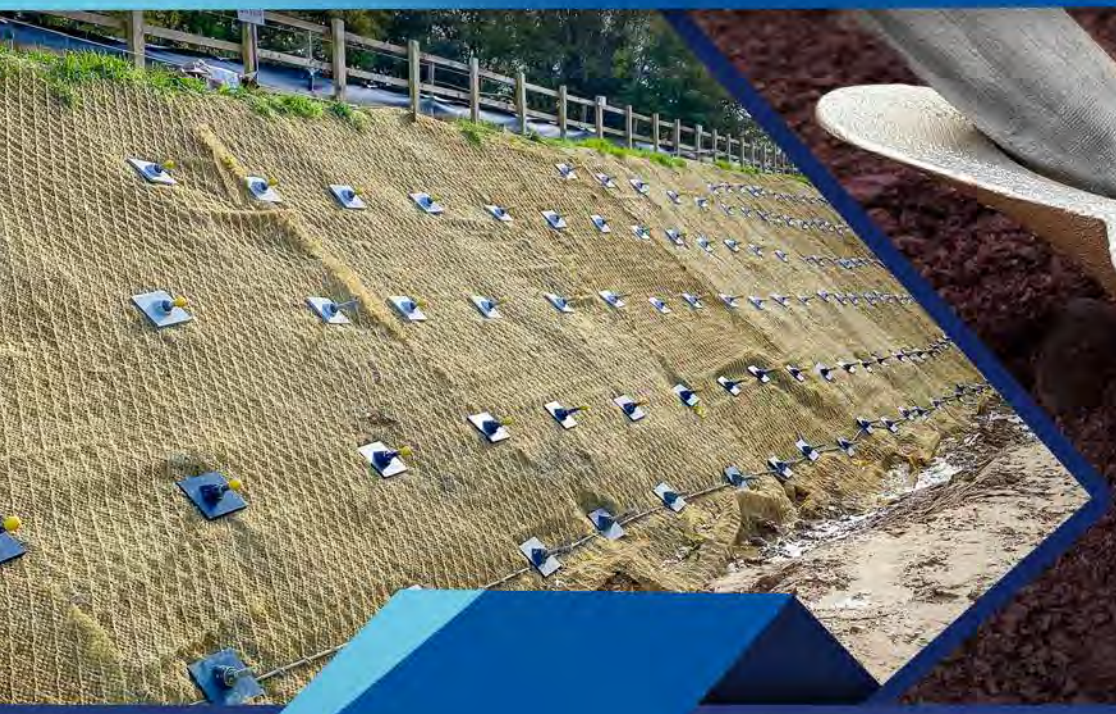
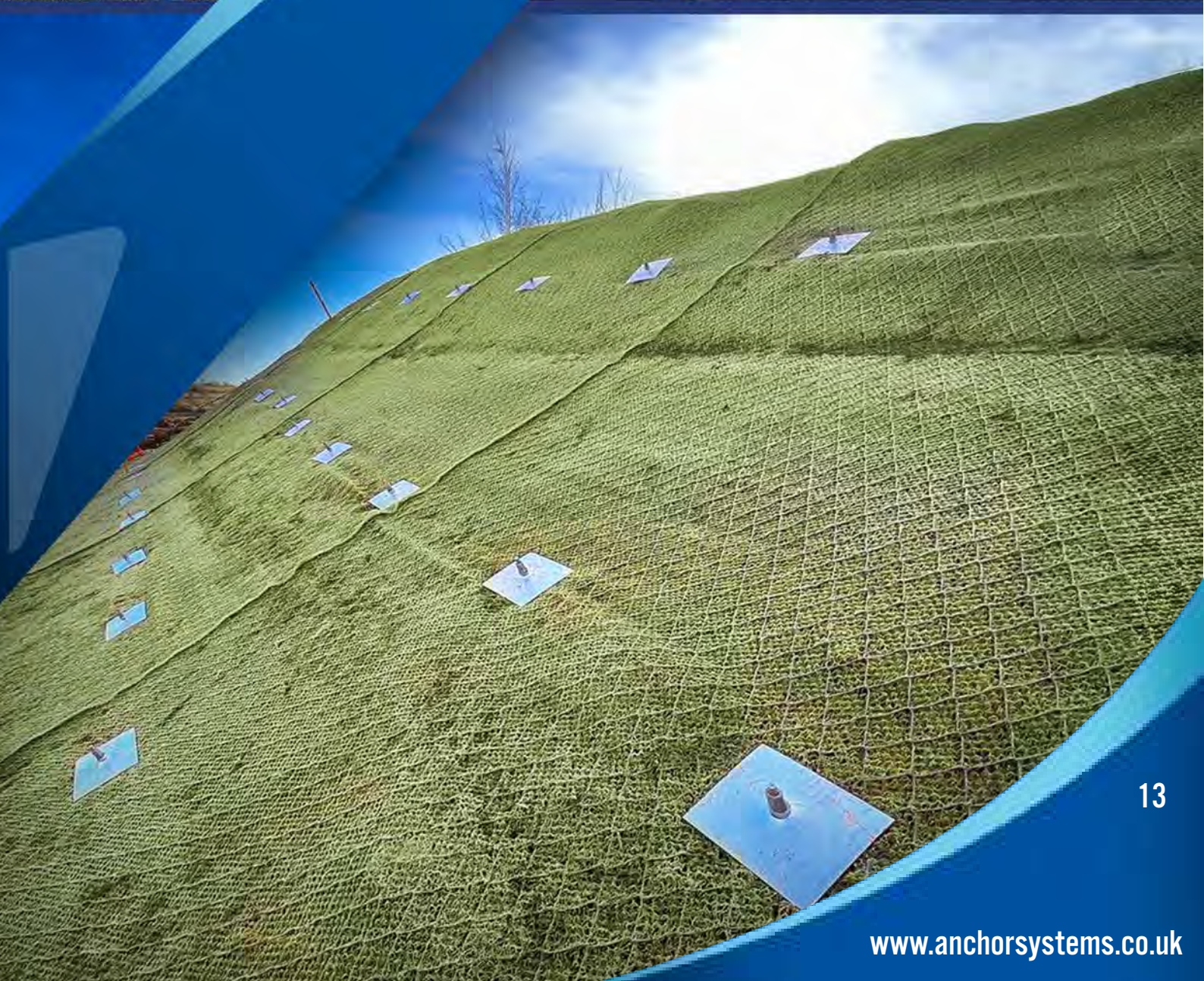
Embankment Stabilisation

Deep Seated Slope Stabilisation





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VULCAN® EARTH ANCHOR SYSTEMS

Retaining Walls

Backstay

Solar Panels

Airdomes

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Temporary Structures

Geo-textiles

Errosion Control

VULCAN® EARTH ANCHOR SYSTEMS

Installation Service & Equipment

When you purchase a product through Anchor Systems there's no need for you to shop around trying to find installation equipment or specialist installers. We can supply you with all the tools and training you need or if you require a complete supply and installation service, we have our very own list of approved and experienced contractors who have undertaken specialist training to install Vulcan Anchors.

SITE TESTING

The chosen anchor system should always be proof tested on site prior to starting work. Site tests are vital, especially when soil test reports are not available as they allow the confirmation of maximum loading achievable in the areas that the ground anchors are to be positioned and also allow for creep testing.

SITE PREPARATION

Before any anchors are installed it is always recommended to use a CAT scanner to the required depth to check for buried services.

PERSONAL PROTECTION EQUIPMENT

At Anchor Systems (International) Ltd we strongly recommend that before you install any type of below ground system that the proper safety equipment is worn. Please see below the recommended personal protection equipment.

- Hard Hat
- Safety Boots
- Goggles
- Overalls
- Ear Defenders
- Gloves

VULCAN® EARTH ANCHOR SYSTEMS

Plant

Anchor Systems (International) Ltd have created specialist installation tools that are fit for the purpose of efficiently installing and tensioning our Ground Anchors. All of our equipment is available to either hire out for the length of time you require it for or to purchase. If you would like to know more about our equipment specifications then we will happily provide you with this on request.

HANDHELD EQUIPMENT

We offer a range of handheld installation and loading equipment that is fit for the purpose of efficiently installing and tensioning our Vulcan Earth Anchors from the AS-05 (5kN) up to an AS-90 (90kN) capacity. We have also tried to keep the individual plant unit weights as low as possible to ensure that our anchoring systems can be installed as easily as possible.

TRUNDLE PACK

Our focus is to ensure that the plant that we provide is both robust and quick for hand held plant installation. With this in mind we have developed the Trundle Pack which contains the installation equipment you need altogether on one easy to manoeuvre trolley. The Trundle Pack has been designed for rough terrain and long-distance sites with poor access meaning there is no need to make multiple trips back and forth to your vehicle when unloading.

MACHINE MOUNTED

All installations over 90kN would be conducted using machine mounted equipment required for our heavy-duty range of anchors ranging from 120kN to 400kN capacity. We can supply an adaptor pot fit for breaker points up to 110mm, drive adaptor and drive extensions.

ULCAN®
EARTH ANCHOR SYSTEMS

FOR TECHNICAL ADVICE OR
FURTHER INFORMATION PLEASE CONTACT:

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