

Vulcan Earth Anchors®

Temporary and Permanent
Structure Anchoring



VULCAN EARTH ANCHORS®

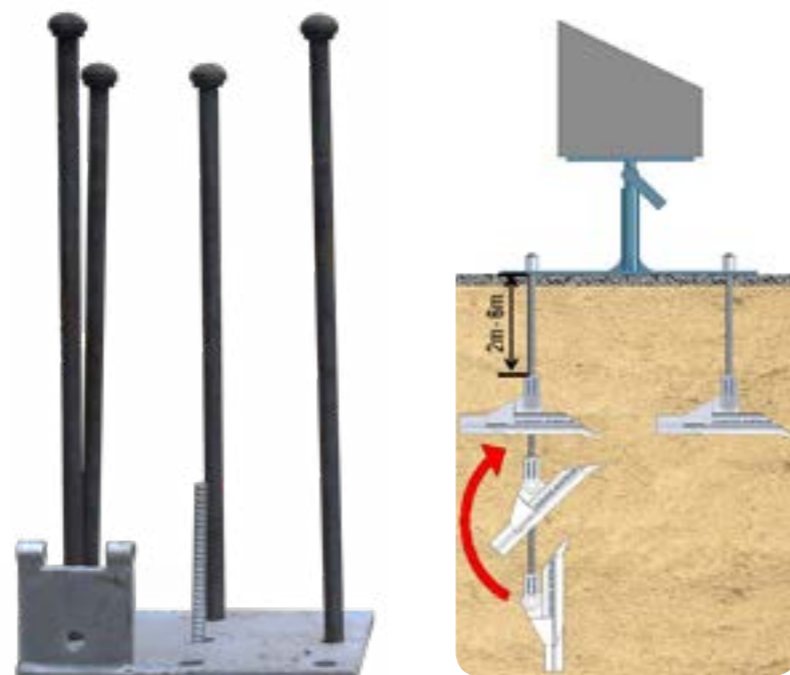
Anchor Systems (International) Ltd specialises in the design, manufacture and supply of earth anchoring systems and solutions worldwide. Our Vulcan range of Earth Anchors were designed in house and are the largest and most versatile globally, and have extensively been utilised for many universal applications.

Established in 1995, Anchor Systems have become the 'Go To' experts for mechanical earth anchoring solutions in the civil engineering and geotechnical world. Renowned for providing top quality products along with a first-class service – we have gained a reputation of always providing our clients with trusted solutions to fit their requirements as well as their budget.

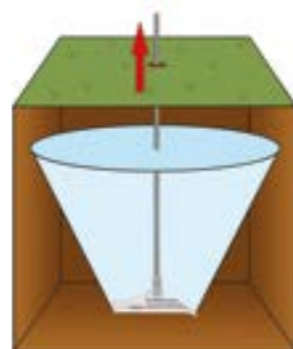
The Vulcan Earth Anchor range was designed by Anchor Systems (International) Ltd as a simple, reliable and cost-effective ground anchoring solution with the ability to provide immediate loading capacities from 1 - 450kN in displaceable ground conditions with extensive applications.

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



**Bespoke options available –
We create solutions tailored for you.**



HOLDING CAPACITIES

Typical Vulcan Earth Anchor range for Temporary/Permanent Structures AS10 to AS90.

ANCHOR	ANCHOR NAME
	AS10 4 - 27 kN
	AS20 10 - 63 kN
	AS30 14 - 87 kN
	AS50 19 - 119 kN
	AS90 33 - 169 kN



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

Common Soil Type Description

- Very Dense and/or Cemented Sands; Course Gravel & Cobbles
- Dense Fine Sand; Very Hard Silts & Clays
- Dense Clays, Sands & Gravel; Very Stiff to Hard Silts & Clays
- Medium Dense Sandy Gravel; Very Stiff to Hard Silts & Clays
- Medium Dense Course Sand & Sandy Gravel; Stiff to Very Stiff Silts & clays
- Loose to Medium Dense Fine to Course Sand; Firm to Stiff Clays & Silts

Anchor System	AS10	AS20	AS30	AS50	AS90	
Tendon type	6mm Stainless Steel Wire	16mm Galvansied Bar	16mm Galvansied Bar	16mm Galvansied Bar	20mm Galvansied Bar	
Independent destructive TEST of mechanical anchor head (kN)	20	112.6	112.6	112.6	195.3	
Ultimate strength of tendon (kN)	64	121	121	188	188	
Limiting structural strength	18.0	101.3	101.3	101.3	169.2	
Anchor head surface area mm ²	6,781	15,637	21,130	29,093	48,734	
Common Soil Type Description	Blow Count or "SPT"	Ultimate anchor resistance (kN)				
Very Dense and/or Cemented Sands; Course Gravel & Cobbles	60 +	18	64	87	101	169
Dense Fine Sand; Very Hard Silts & Clays	45 - 60	18	57	77	101	169
Dense Clays, Sands & Gravel; Very Stiff to Hard Silts & Clays	35 - 50	18	48	64	89	149
Medium Dense Sandy Gravel; Very Stiff to Hard Silts & Clays	25 - 40	16	38	52	72	120
Medium Dense Course Sand & Sandy Gravel; Stiff to Very Stiff Silts & clays	14 - 25	11	26	35	49	82
Loose to Medium Dense Fine to Course Sand; Firm to Stiff Clays & Silts	7 - 14	7	18	24	33	56

Details on the full range of anchors, AS01 to AS400, are available on request.

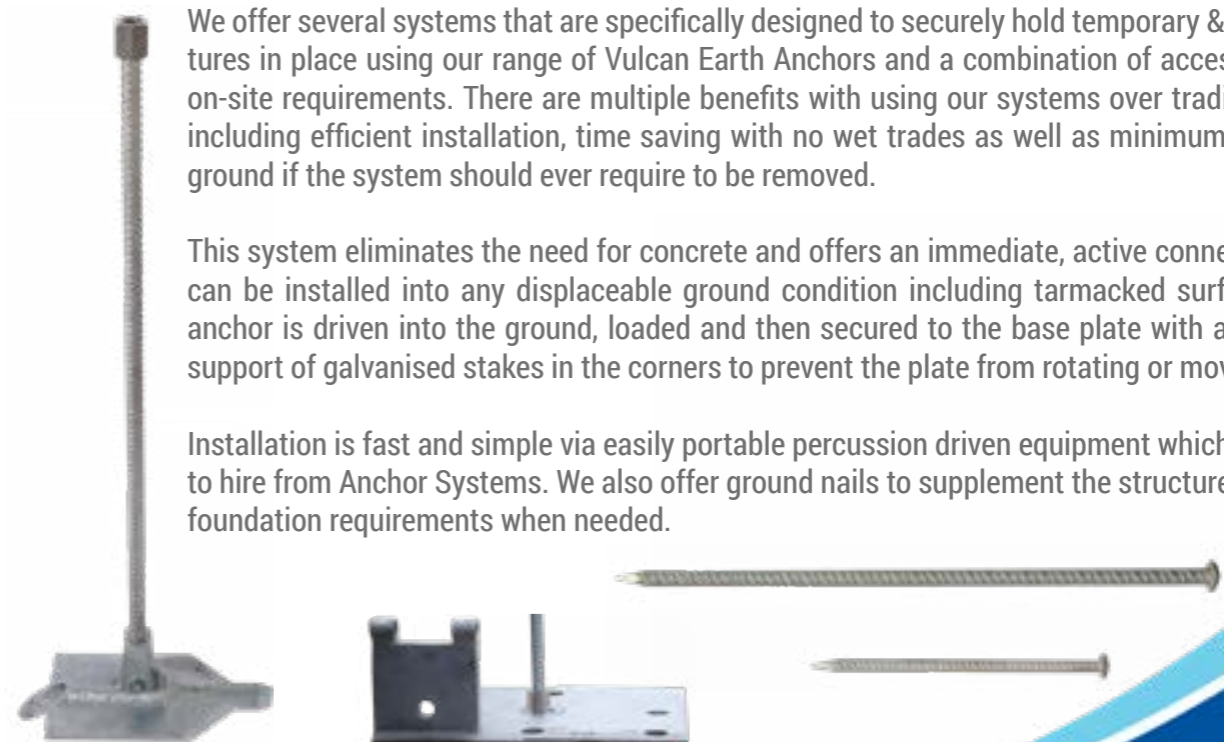
N.B. For guidance purposes only – True capacity must be tested with a load locker: Previous project tests have shown that if an earth anchor is grouted into poor ground, the results that can be achieved are favorable to increased tensile loading capacity. *Note:* All below ground work should be undertaken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

TEMPORARY STRUCTURE SOLUTION

We offer several systems that are specifically designed to securely hold temporary & permanent structures in place using our range of Vulcan Earth Anchors and a combination of accessories to suit the on-site requirements. There are multiple benefits with using our systems over traditional techniques including efficient installation, time saving with no wet trades as well as minimum disruption to the ground if the system should ever require to be removed.

This system eliminates the need for concrete and offers an immediate, active connection point which can be installed into any displaceable ground condition including tarmacked surfaces. The Vulcan anchor is driven into the ground, loaded and then secured to the base plate with a load nut and the support of galvanised stakes in the corners to prevent the plate from rotating or moving.

Installation is fast and simple via easily portable percussion driven equipment which is available to hire from Anchor Systems. We also offer ground nails to supplement the structures foundation requirements when needed.



Project Report

CHELSEA FLOWER SHOW

At the Chelsea Flower Show, two giant temporary structures were erected by De Boer Structures to house the main arenas for this famous annual event. Measuring 65m x 110m and 65m x 85m and covering 3.2 acres, the structures replaced the old canvas style 'Grand Marquee'.

De Boer's required a reliable, cost-effective method of securing the structures to prevent any wind uplift or movement. The anchors needed to be easily removed and re-usable as the structures were due to return for the next nine Chelsea Shows.

Following previous good experience at similar events, such as the Fleet Motor Show at Donnington, De Boer's consulting engineer recommended the structures were kept securely in position by using Anchor Systems well proven mechanical ground anchors.

SOLUTION

The vast Delta System structures were erected in just seven days on very poor quality ground, consisting of original silts overlaid with rubble and a reconstructed ground. They were then levelled before a total of 46 mechanical ground anchors were installed. The AS400 is the latest addition to, and the largest anchor, in the mechanical ground anchor range, capable of accepting immediate proof loads of up to 450kN.

Each of the 5m deep stainless steel anchors was driven into the ground and tensioned to a working load of 80kN. The anchor load plates were then bolted to the steel frames which sat on pre-formed concrete pads. After the event was over, and the structure removed, the corrosion resistant stainless steel mechanical ground anchors were capped off and concealed to enable them to be re-used for the next nine Chelsea Flower Shows.



CLIENT
De Boer Structures

STRUCTURE
Delta System structures
Ground: Silts overlaid with rubble

QUANTITY
46 Anchors with load requirements of 80kN



Project Report

KINGS DOCK TEMPORARY ARENA

A giant 4,200 seater temporary arena, built at Kings Dock in Liverpool for the city's annual summer pops by the Royal Liverpool Philharmonic, needed to be securely anchored to the ground to prevent the possibility of any movement or wind uplift and ensure total safety for audiences and performers.

During the four weeks the Arena was located at King's Dock it enabled a record 35,000 people to enjoy the orchestra's season of concerts and a further 10,000 to attend other live events.

SOLUTION

Designed and built by De Boer Structures, and constructed in just a few days, the pre-fabricated aluminium framework, solid PVC wall panels, PVC roofing, interlocking wood flooring and all seating was supported by a steel frame base.

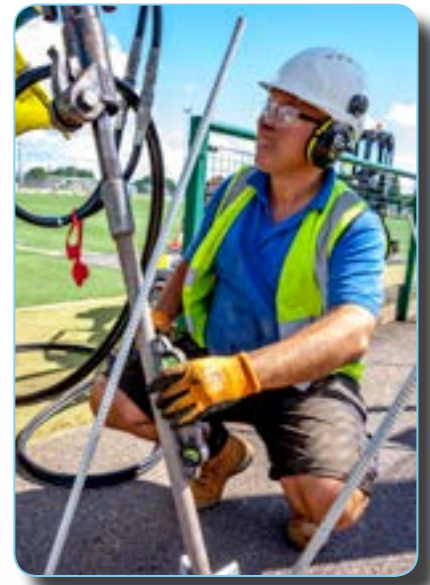
Once the arena had been levelled it was then secured using mechanical ground anchors. De Boer chose to help create a totally firm arena base using mechanical anchors because of their durability, cost-effectiveness and rapid easy installation.

Approximately 80 mechanical ground anchors were installed to a depth of 3m around the perimeter of the stadium to provide a 40kN working load. The anchors were terminated with small load plates and then bolted to main structural plates on the steel base of the 5,000 sq.m. arena floor to prevent any uplift.

CLIENT
De Boer Structures

STRUCTURE
Pre-fabricated aluminium framework

QUANTITY
80 Anchors with load requirements of 40kN



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

Plant & Tools

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.

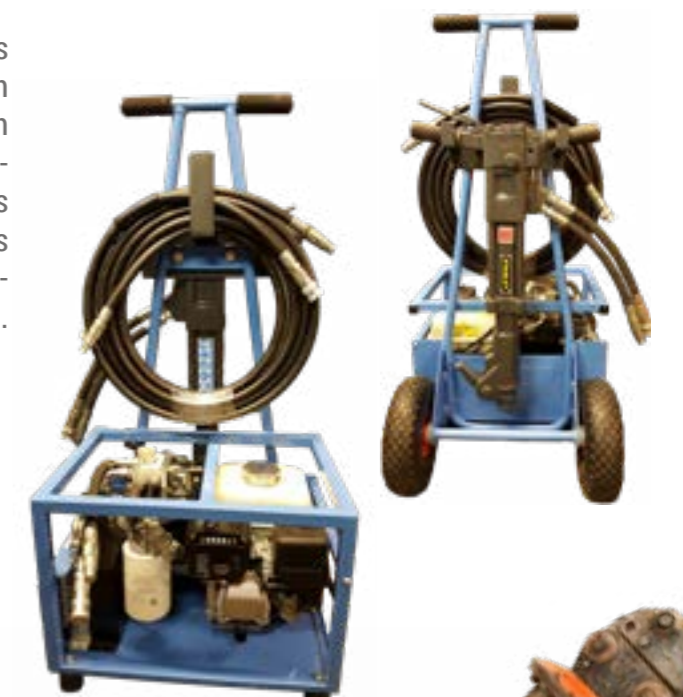
HANDHELD EQUIPMENT

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.



- All in one installation pack
- Easy start power pack
- Easy lift points for in and out of vans
- Powerful and light weight
- Compact for tight and restricted areas
- Unleaded fuel, no need to mix up 2 stroke fuel
- Reliable and robust
- Anti-vibration breaker
- Suitable for installing AS-05 to AS-90 anchors

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.





**ANCHOR
SYSTEMS**
(INTERNATIONAL) LTD

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