

# Vulcan Earth Anchors®

Air Dome and Pitch Cover  
Anchoring System



## VULCAN EARTH ANCHORS®

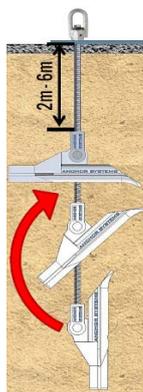
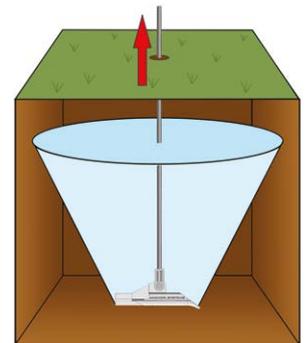
Anchor Systems (International) Ltd specialises in the design, manufacture and supply of earth anchoring systems and solutions worldwide. Our Vulcan range of Earth Anchors were designed in house and are the largest and most versatile globally, and have extensively been utilised for many universal applications.

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



## AIR DOME SOLUTION

We have developed an anchoring solution for the use with temporary air domes and pitch covers to offer a fast, reliable and cost-effective solution for your structures connection requirements.

This system eliminates the need for concrete and offers an immediate, active connection point which can be concealed at ground level when not in use. Installation is fast and simple via easily portable percussion driven equipment which is available to hire from Anchor Systems. Anchoring systems are also available for areas in which concrete sections are pre-existent.



## HOLDING CAPACITIES

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

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



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

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 <sup>2</sup>	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.

## PITCH COVER ACCESSORIES

Anchor Systems has created a range of specialist accessories designed to be used specifically with our Pitch Cover systems.

These can be supplied with a range of accessories to conceal the subterranean part of the system whilst the air dome is not being used.

We also offer anchoring solutions when part of the installation is to be positioned over concrete or other non-displaceable ground. These solutions are designed to be capped off and remain flush with ground level when the air dome is not in use.



Covair approached Anchor Systems (International) Ltd with a request of supplying an anchoring solution for a project they were working on with Cardiff International Sports Campus to install a new Double Skin air dome over a full size 3G pitch to allow for use in all weather conditions. The anchoring solution had to be capable of achieving a holding capacity of 64kN (inclusive of FOS) at 1.5m centres around the pitch to secure the Air Domes frame.

## SOLUTION

Anchor Systems have worked with Covair Structures for many years in providing anchoring solutions and concrete preplacement systems for an array of projects. For this project, an initial site test was conducted by ASIL operatives to determine the most suitable and cost-effective Vulcan Earth Anchor for the required load. After the initial site tests were conducted, the AS-90 Vulcan anchor was confirmed in achieving a 65kN SWL at a 3m driven depth within the available ground conditions. 240 fully galvanised systems were installed at pre-marked positions around the pitch at a 65° angle from horizontal. The anchor was then stressed to the required holding capacity (64kN); this work was carried out over a ten working day period. The alternative solution was to install a concrete ring beam over a four week installation and setting process. This system therefore offered a large cost and time saving benefit to the client as well as minimal mobilisation of vehicle and installation plant.

### CLIENT

Covair Structures Ltd

### CONTRACTOR

Hartmann Construction Ltd

### STRUCTURE

Double skin air dome  
Ground: Land fill site, Backfill

### QUANTITY

240 Anchors with load requirements of 64kN

### DESIGN LIFE

25 Years+

### ANCHOR SYSTEM USED

- AS-90 Vulcan® Anchor
- 20mm shackle
- 3m x 20mm tendon
- 20mm eye nut



# Double Skin Air Dome

## CARDIFF INTERNATIONAL SPORTS CAMPUS



# 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



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  
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(INTERNATIONAL) LTD

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