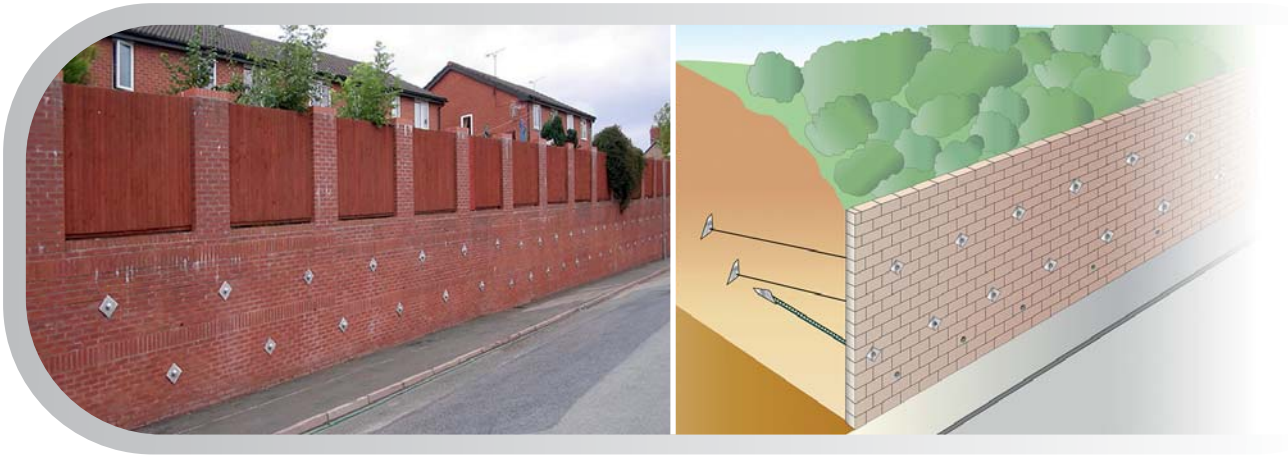
CIVIL ENGINEERING & CONSTRUCTION



CIRTEX

PLATIPUS
EARTH ANCHORING SYSTEMS

INTRODUCTION

Platipus® Anchors Limited are market leaders in the design, manufacture and supply of mechanical earth anchoring products in the UK. Founded in 1983, we are renowned for providing some of the most innovative and cost effective anchoring solutions for the Civil Engineering and Construction industries.

The percussion driven mechanical anchor is a unique, modern and versatile device that can be rapidly deployed in most displaceable ground conditions. It offers a lightweight corrosion resistant anchor that can be driven from ground level using conventional portable equipment. It creates minimal disturbance of the soil during installation, can be stressed to an exact holding capacity and made fully operational immediately. As a completely dry system it also has minimal environmental impact.

Applications

- Retaining Walls
- Slope Stabilisation
- Bridges
- Sheet Piling
- Erosion Control
- Gabion Support
- Rock Retention
- Buoyancy Control/ Pipelines
- Drainage
- Guyed Structures
- Scaffolding
- Foundations
- Landfill Capping
- Portable Buildings/ Structures
- General Security
- Marine Applications
- Tunnel Linings
- Temporary Works

FEATURES & BENEFITS

KEY BENEFITS OF THE PLATIPUS® EARTH ANCHORING SYSTEM

- Simple and effective concept
- Lightweight corrosion resistant products to suit a range of design life requirements
- Fast and easy installation
- Immediate quantifiable loads
- Holding capacity up to 200kN
- Ideal for temporary and permanent situations
- Cost effective alternative to traditional anchoring techniques

ENVIRONMENTAL BENEFITS

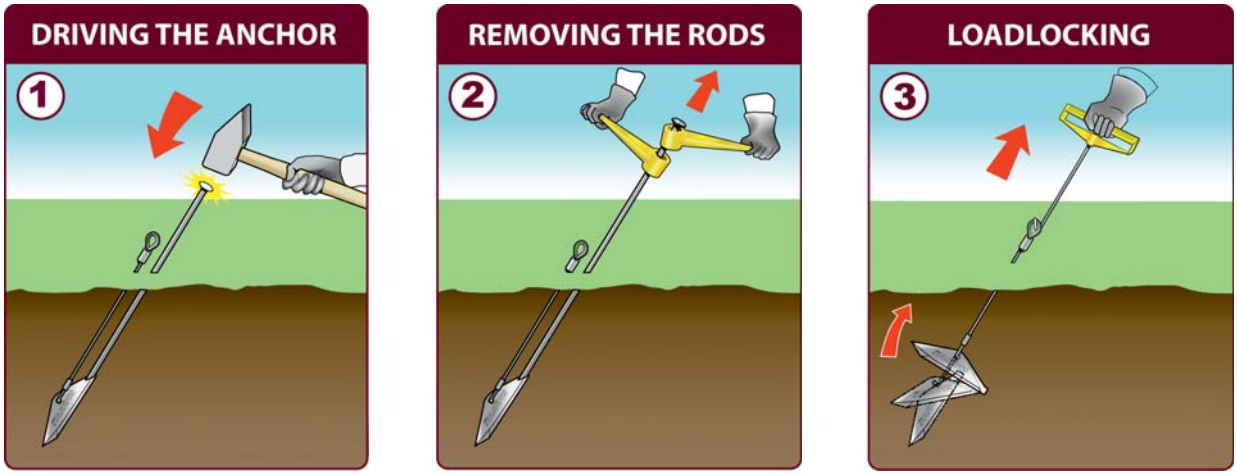
- No grout
  - No curing time
  - No mess
  - No contamination
- Low environmental impact
- Can be suitable for Special Areas of Conservation (SAC's)

ADDITIONAL SERVICES & PRODUCTS

- Design assistance including full indemnification
- Technical presentations
- Site surveys and anchor testing
- On-site training and demonstration
- Supply and installation service through a network of Approved Installers
- Large choice of hire equipment to install and proof test the system
- Latest information accessible to download from our website ***www.platipus-anchors.com***
- Anchor specification software and additional information is available online
- Plati-Drain® - a unique solution to reduce pore water pressure within clay slopes and from behind retaining walls
- Platipus® Anchored Reinforced Grid Solutions (ARGS) - a low impact solution for surface erosion and shallow seated slip failures

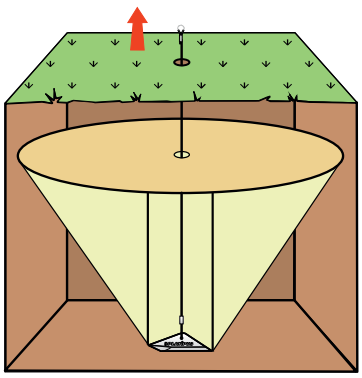
HOW A MECHANICAL ANCHOR WORKS

There are three steps to the installation of an anchor system:

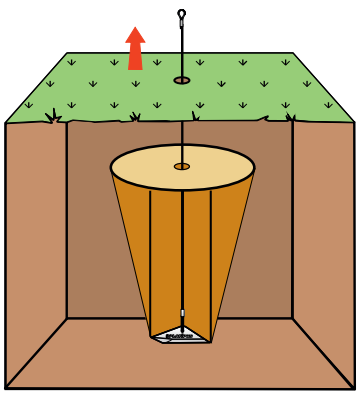


The same three basic steps apply to the installation of all anchor systems, from the smallest S2 to the largest B10 .

STRESS DISTRIBUTION & BEARING CAPACITY



Granular Soil
(Based on Terzaghi's calculation)



Soft Cohesive Soil
(Based on Skempton's calculation)

The stress distribution in front of a loaded anchor can be modelled using foundation theory. The ultimate performance of an anchor within the soil is defined by the load at which the stress concentration immediately in front of the anchor exceeds the bearing capacity of the soil.

Factors that will affect the ultimate performance of the anchor include:-

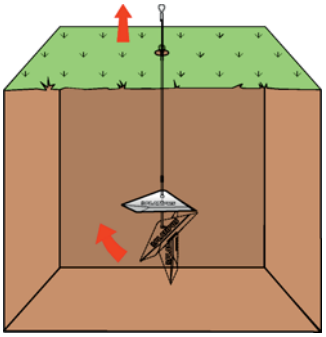
- Shear angle of the soil
- Size of the anchor
- Depth of installation

Platipus® anchors perform exceptionally well in a granular soil, displaying short loadlock and extension characteristics, a broad frustum of soil immediately in front of the anchor and extremely high loads.

Stiff cohesive soils, such as boulder clays, can also give outstanding results. However, weaker cohesive soils, like soft alluvial clays, can result in long loadlock and extension distances and a small frustum of soil in front of the anchor. Consequently these conditions require a larger size of anchor and if possible a deeper driven depth to achieve design loads.

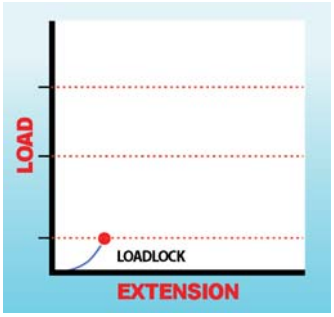
For further information please see the Anchor Load Calculator section on our website.

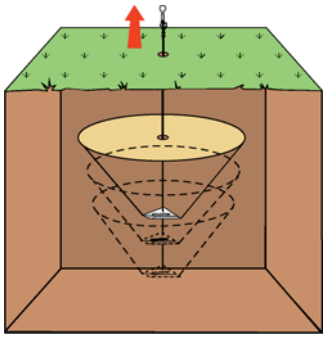
TYPICAL ANCHOR BEHAVIOUR



LOADLOCK

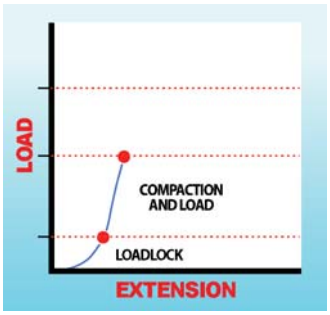
The first stage is where a load is applied to rotate the anchor into its loadlocked position. Elements of both load and extension are present.

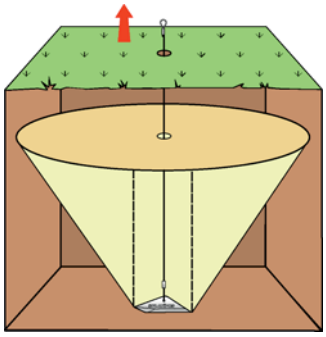




COMPACTION AND LOAD

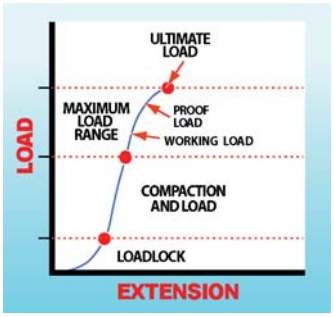
The second stage is where the anchor system is generating a frustum of soil immediately in front of the anchor. At this point load normally increases with minimum extension. The soil type will affect the overall extension.

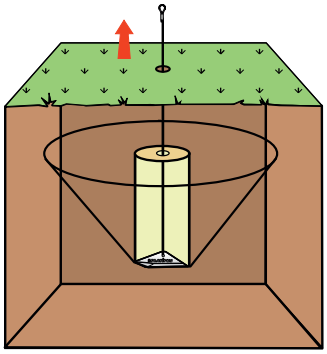




MAXIMUM LOAD RANGE

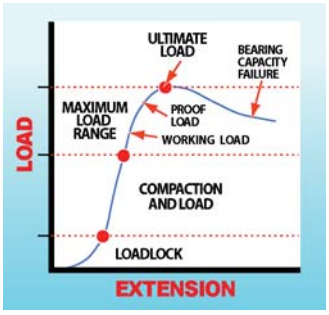
The third stage is where the anchor produces its ultimate load. As the anchor load approaches the bearing capacity of the soil, the rate of increase in load will reduce until bearing capacity failure of the soil takes place.





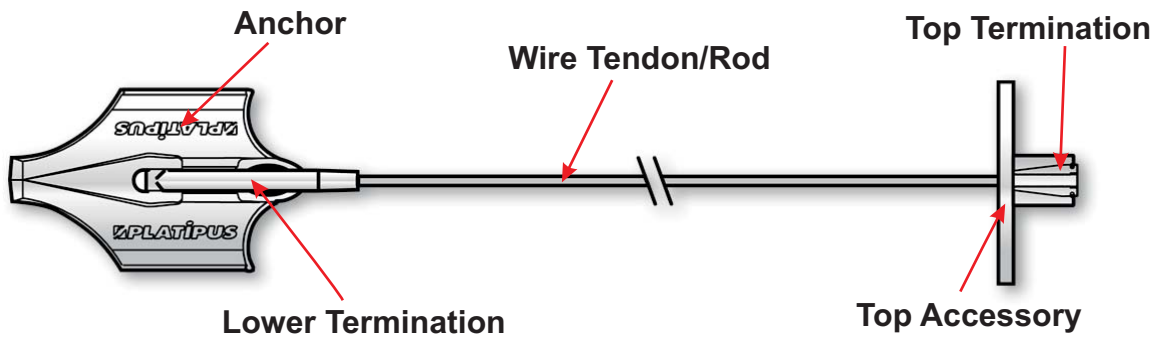
BEARING CAPACITY FAILURE

Caution: If the mechanical shear strength of the soil is exceeded, the residual load will decrease with continued extension as the anchor shears through the ground.



ANCHOR COMPONENTS

There are five components that make up an anchor system:



STEALTH ANCHOR

The ‘Stealth’ anchor is designed to cover a wide range of lightweight anchoring. Its narrow profile means that it requires a single core hole to drive through a stone or masonry wall.

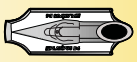
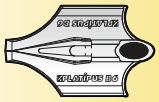
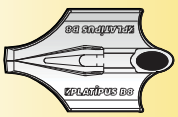
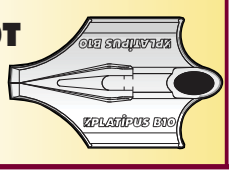
Its chisel drive point and streamline shape makes installation easy, in most cases, using simple hand or power tools. This also makes it an ideal choice when working in areas with restricted access.

Product Code	E=EYE VERSION	Dimensions L x W x H (mm)	Materials	Typical Load Range*	Minimum Driven Depth
S02E		80 x 28 x 25	Aluminium Alloy; Hard Anodised Aluminium Alloy	0 - 2.5 kN	0.4 - 0.6m
S04E		121 x 41 x 34	Aluminium Alloy; Hard Anodised Aluminium Alloy	1 - 10 kN	0.6 - 0.75m
S06E		171 x 58 x 50	Aluminium Alloy; Hard Anodised Aluminium Alloy; Aluminium Bronze	5 - 25 kN	0.8 - 1.2m
S08E		263 x 90 x 76	Aluminium Alloy; Hard Anodised Aluminium Alloy; Galvanised Spheroidal Graphite Iron; Aluminium Bronze	10 - 40 kN	1.1 - 1.5m

BAT ANCHOR

The ‘Bat’ anchor is designed to achieve higher loads and also enhance anchoring in soft cohesive soils. Its ability to accept the T-Loc lower termination allows flexibility with regard to on-site anchor system assembly. It also means it can accept a wide range of wire tendons and solid rods.

Installation requires more powerful hand held hydraulic breakers or, in some cases, a wheeled or tracked excavator with a percussive breaker attachment.

Product Code	T=T-LOC VERSION	Dimensions L x W x H (mm)	Materials	Typical Load Range*	Minimum Driven Depth
B04T		310 x 110 x 93	Galvanised Spheroidal Graphite Iron; Aluminium Bronze	20 - 60 kN	1.5 - 2.5m
B06T		336 x 206 x 91	Galvanised Spheroidal Graphite Iron; Aluminium Bronze	30 - 100+ kN	2 - 3m
B08T		423 x 259 x 105	Galvanised Spheroidal Graphite Iron; Aluminium Bronze	50 - 150+ kN	3 - 4m
B10T		541 x 335 x 110	Galvanised Spheroidal Graphite Iron; Aluminium Bronze	75 - 200 kN	4 - 5m

*The typical load range of an anchor is dependant on the engineering properties of the soil.

WIRE TENDONS & SOLID RODS

To suit most specifications and load requirements we can offer a wide selection of wire tendons and solid rods. Whether it is round strand wire tendon for applications requiring lower loads, the flexibility of wire tendons make it possible to work in areas where access and space is restricted.

We can also supply high yield solid rods which have a number of advantages over wire tendon. They can provide a higher ultimate load, sacrificial corrosion resistance and allow the depth of installation to be varied on-site.

Both wire tendons and rods are available in a range of sizes and materials to suit temporary (up to 5 year) through to permanent (120 year) design life.

TOP FITTINGS

We can provide a wide range of top fittings to suit most applications and budgets.

A load bearing plate and wedge grip is a perfect low cost solution for installations that are perpendicular to an application. Tilt washers are also available for angled installations. If the finished appearance is of aesthetic importance we offer a near flush fitting load plate that accepts a recessed wedge grip and cap or an inverted pattress plate which includes a hemispherical washer to allow the angle of anchor installation to vary between 0°-30°.

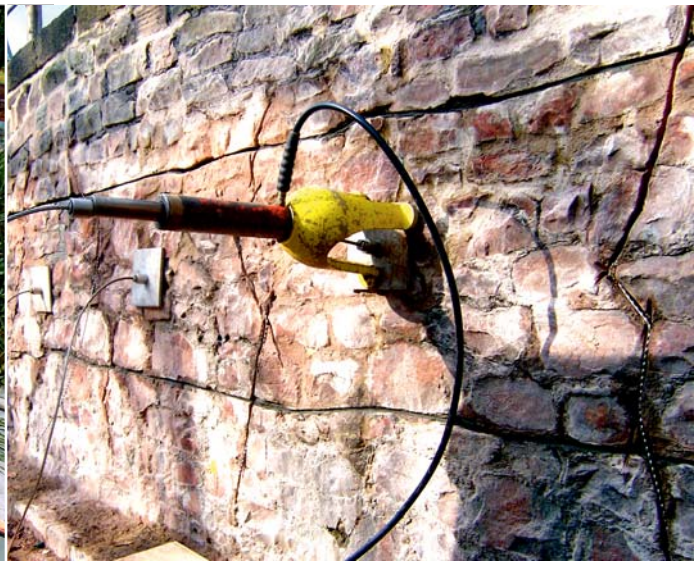
Top fittings specifically designed for revetment blocks and reinforced geomesh are available. We can also provide a variety of soft and hard eye terminations to secure guyed structures and scaffolding.

Over the last 30 years we have developed a large choice of top fittings. If you have a specific requirement that is not covered by our standard range we can supply a custom made solution.

Some applications, such as historical structures, require all evidence of anchoring to be concealed. This can be achieved by recessing the anchor system top fittings within the structure. Once complete the facing brick or stonework can be replaced to provide an invisible repair.

STRUCTURAL REINFORCEMENT

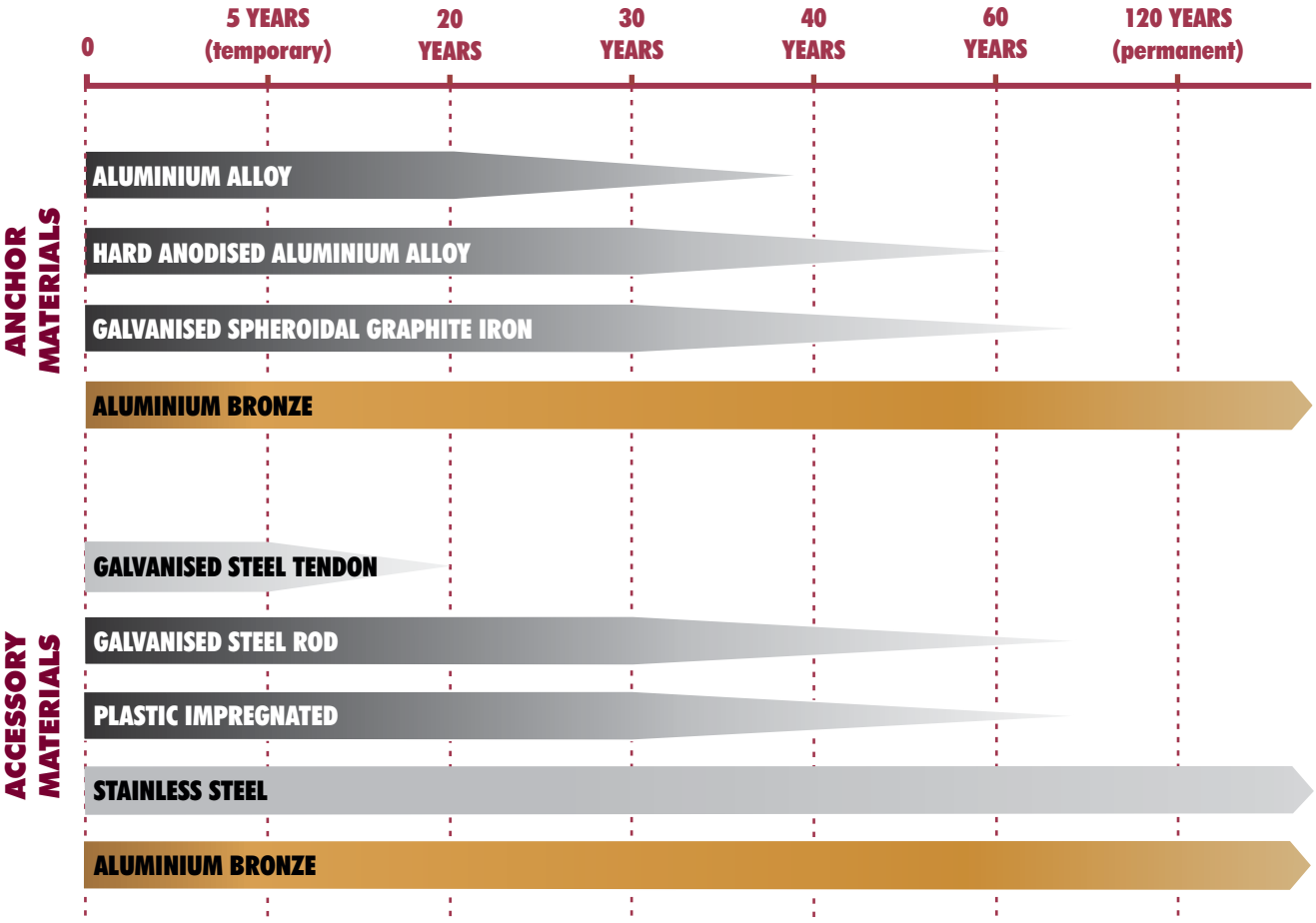
The Platipus® anchor system can also be used in conjunction with other structural reinforcement products to provide an extremely effective solution on masonry walls with limited structural integrity.



DESIGN LIFE

All anchor system components are available in a range of materials to suit the design life.

The selection of the project materials should be carefully chosen taking our advice for each individual project. The life expectancy of the anchor / tendon is dependant upon the corrosivity of the soil in which it is placed.



OTHER PRODUCTS

Water saturation, due to heavy rainfall and insufficient drainage, leads to the softening of clay soils within slopes and increases hydraulic forces behind earth retaining structures.

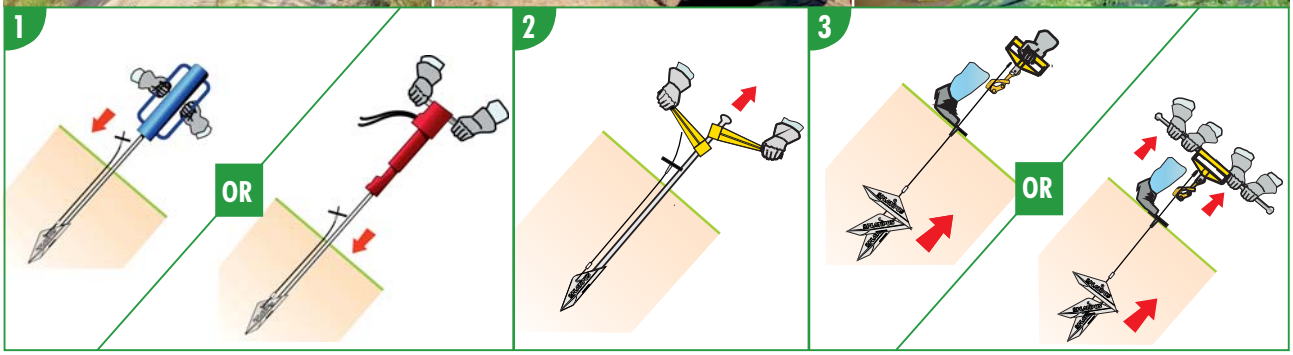
Plati-Drain® is a unique solution that reduces pore water pressure within clay slopes and behind retaining walls. Unlike conventional weep holes Plati-Drain® provides deep penetration, this can be in excess of 10 metres. It can also help prevent shallow or deep seated slope failures.

Available as a 'Passive' or 'Active' solution. The 'Passive' system uses a sacrificial anchor head to drive the Plati-Drain® into its optimum position providing an immediate channel for water to drain. The 'Active' system has an additional wire tendon attached to the anchor which allows it to be loadlocked, providing simultaneous draining and restraining capability.

The Platipus® Anchored Reinforced Grid Solution(ARGS) is a perfect low impact anchoring solution for surface erosion problems and shallow seated slide failures. These lightweight systems can be used with most geosynthetic products including erosion control matting, membranes, geogrids, reinforced mesh, high density polyethylene coverings and cellular confinement systems.

Our S2, S4 and S6 Percussive Driven Earth Anchors (PDEAs) are particularly effective in situations where access is difficult, where scour protection is required for example flood prone areas, riverbanks and storm water channels. Benefits of the system include its speed and simplicity, in most cases requiring only hand held equipment for installation. The system provides immediate load bearing capability and when combined with geosynthetic products and an appropriate range of plant types it can retain the slopes surface integrity. Our solutions can incorporate products from all major manufacturers to provide the best complete solution.

Please refer to our Platipus Anchored Reinforced Grid Solutions Brochure for more information or alternatively download this brochure from our website at www.platipus-anchors.com



SITE ANALYSIS & LOAD REPORT

With the correct soil information we are able to predict holding capacities of our earth anchors. In circumstances where soil information is not readily available we recommend that a site analysis and load test report is completed.

The information recorded on this report will create an accurate picture of the site's condition and the exact capabilities of the anchor system. It will also identify other important considerations such as accessibility and installation times.

DESIGN ASSISTANCE

As part of our commitment to offer a complete package for clients, a full Indemnified Design service is available through our Geotechnical Consultant. These comprehensive designs are covered by Professional Indemnity Insurance.

A typical Indemnified Design will provide a calculation of earth pressures, prevailing and proposed factors of safety and specific earth anchoring system proposals.

APPROVED INSTALLERS

We have an excellent relationship with a network of Platipus® trained 'Approved Installers' throughout the UK. We work with these companies to provide our clients with a complete design, supply and installation service.

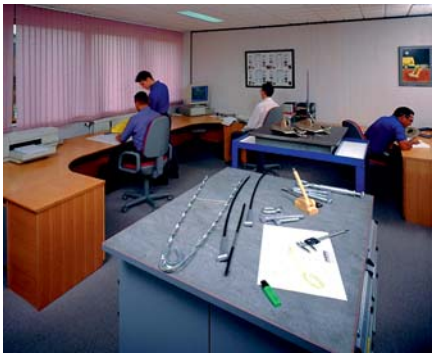
We can introduce you to the most suitable 'Approved Installer' who will be pleased to provide you with a competitive quotation for installation.

ON-SITE INSTRUCTION & SUPERVISION

We place great emphasis on customer training and product support. To achieve this, we offer a range of comprehensive training programmes for clients and distributors.

To satisfy individual requirements and for your convenience, we can also offer tailor made training and full product demonstrations on-site.

RESEARCH & DEVELOPMENT



Platipus® works at the leading edge of ground anchoring and to remain market leaders involves continuous development in product innovation and design.

New and unique applications for our products are constantly being identified. Working closely with customers, distributors and our Regional Managers new system designs are continually being launched into the market.

TECHNICAL PRESENTATIONS

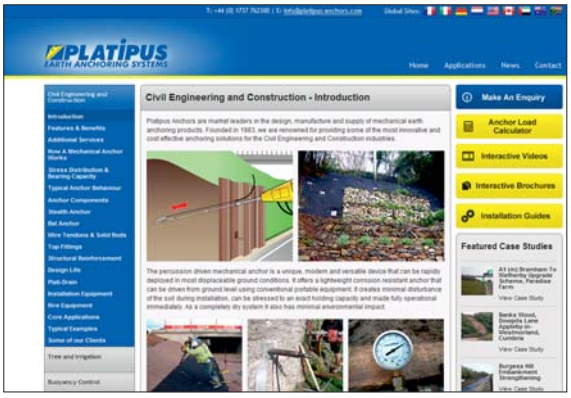
We understand the importance of Continued Professional Development. Our philosophy is to offer busy professionals the opportunity to discover the advantages of the Platipus® earth anchoring system through comprehensive technical presentations, at a time and location convenient to you. This may take the form of a focused 1 to 1 introduction to our products or more formal presentation to a larger group.

If you would like a technical presentation please contact us to arrange a suitable date and time.

PLATIPUS ONLINE

The Platipus® website is a quick and easy way to access the latest information. It contains over one hundred pages of product information, brochures, case studies, installation instructions and other technical documents. All are available to print or download.

Visit: ***www.platipus-anchors.com***



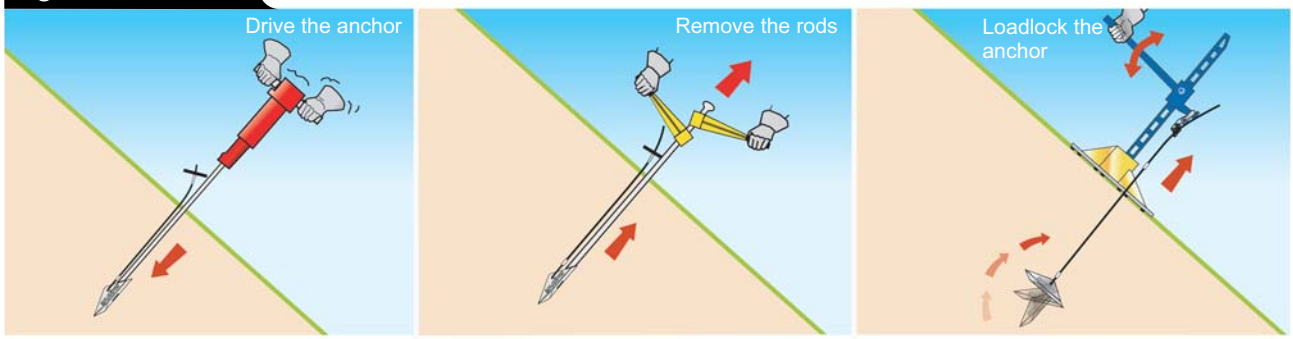
ANCHOR LOAD CALCULATOR

We are committed to providing our customers with effective products and solutions, together with unrivalled service and support. As part of this commitment, we can offer anchor specification software and additional technical assistance online.

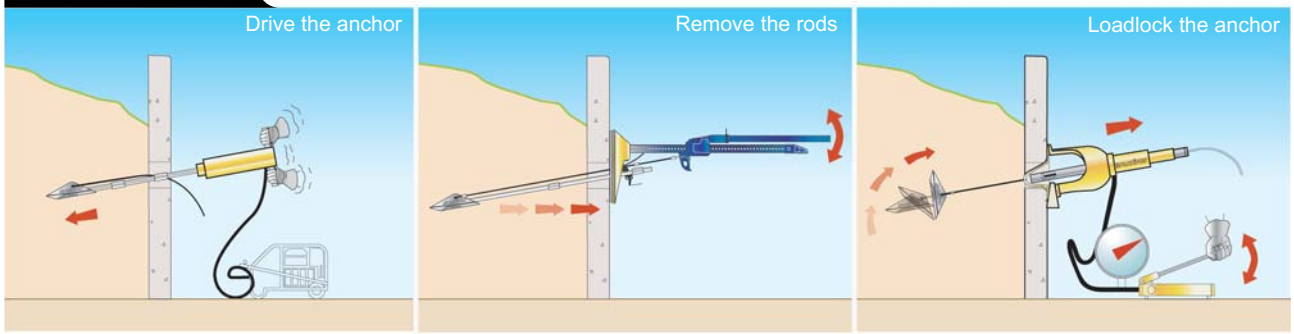
Located on the Platipus® website this area has been specifically developed for Civil and Geotechnical Engineers with experience in foundation design. If you are working on a project that requires ground anchors and would like access to this area of our website please register online.

INSTALLATION EQUIPMENT

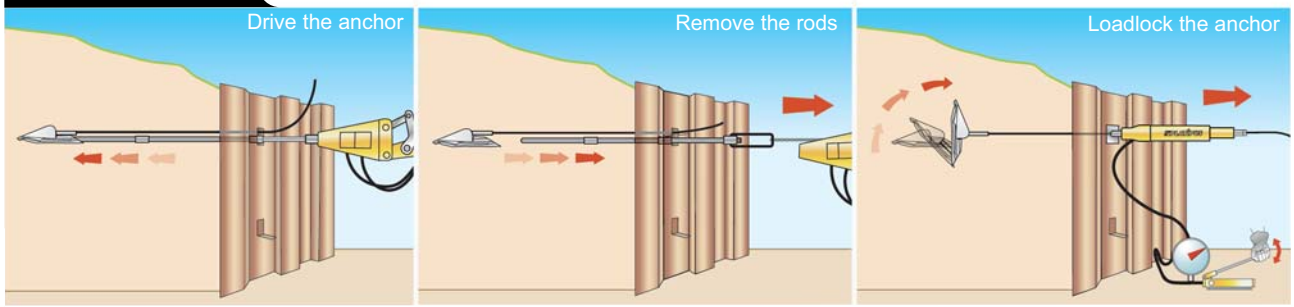
Light Installation



Medium Installation



Heavy Installation



HIRE EQUIPMENT

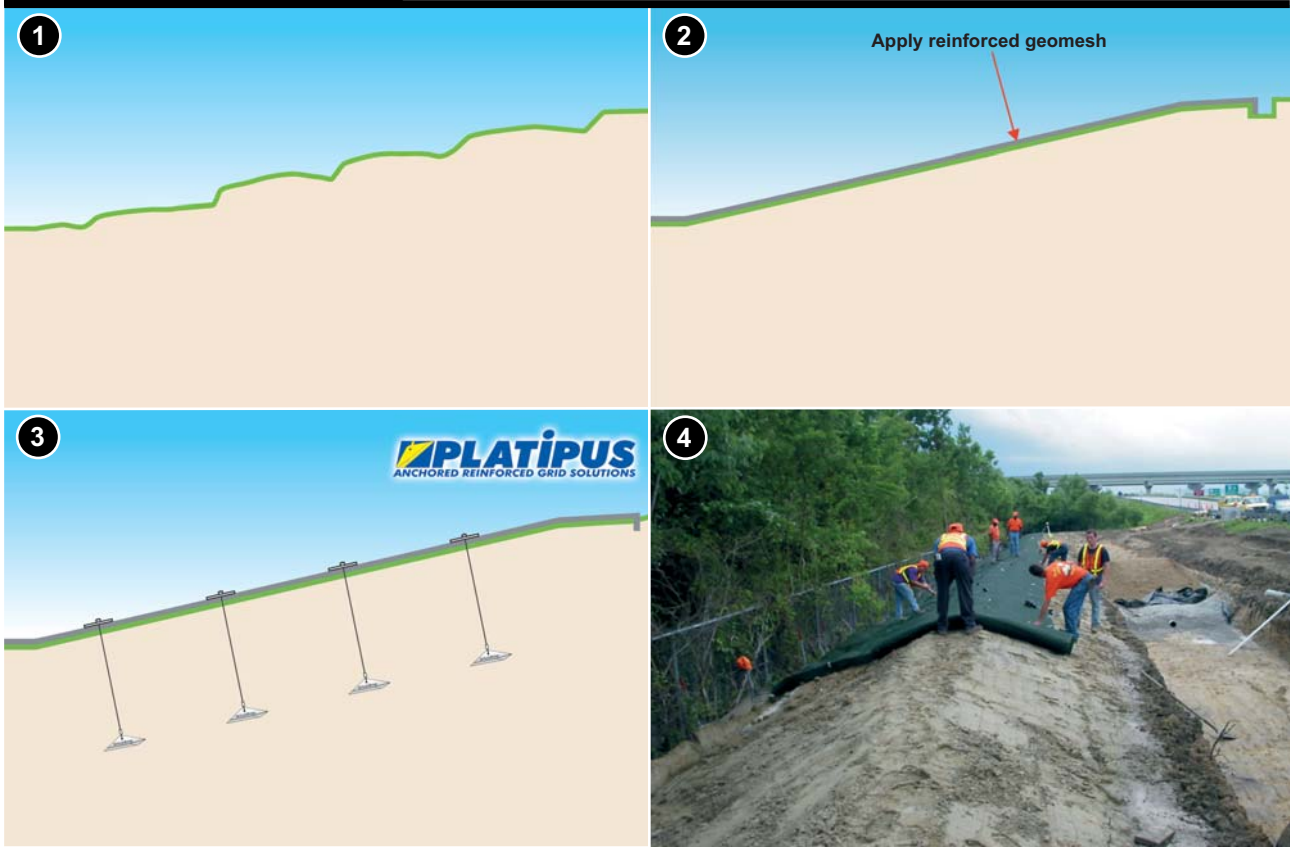
Although all installation equipment and tools are available to purchase, we understand that some customers may only require equipment for one-off installations. As a result, we can provide a large choice of hire equipment to install and proof test the complete range of earth anchors.

We purchase all of our equipment and tools from the market's leading manufacturers. Our hand-held hydraulic breakers and power packs deliver the lowest vibration and noise levels available.

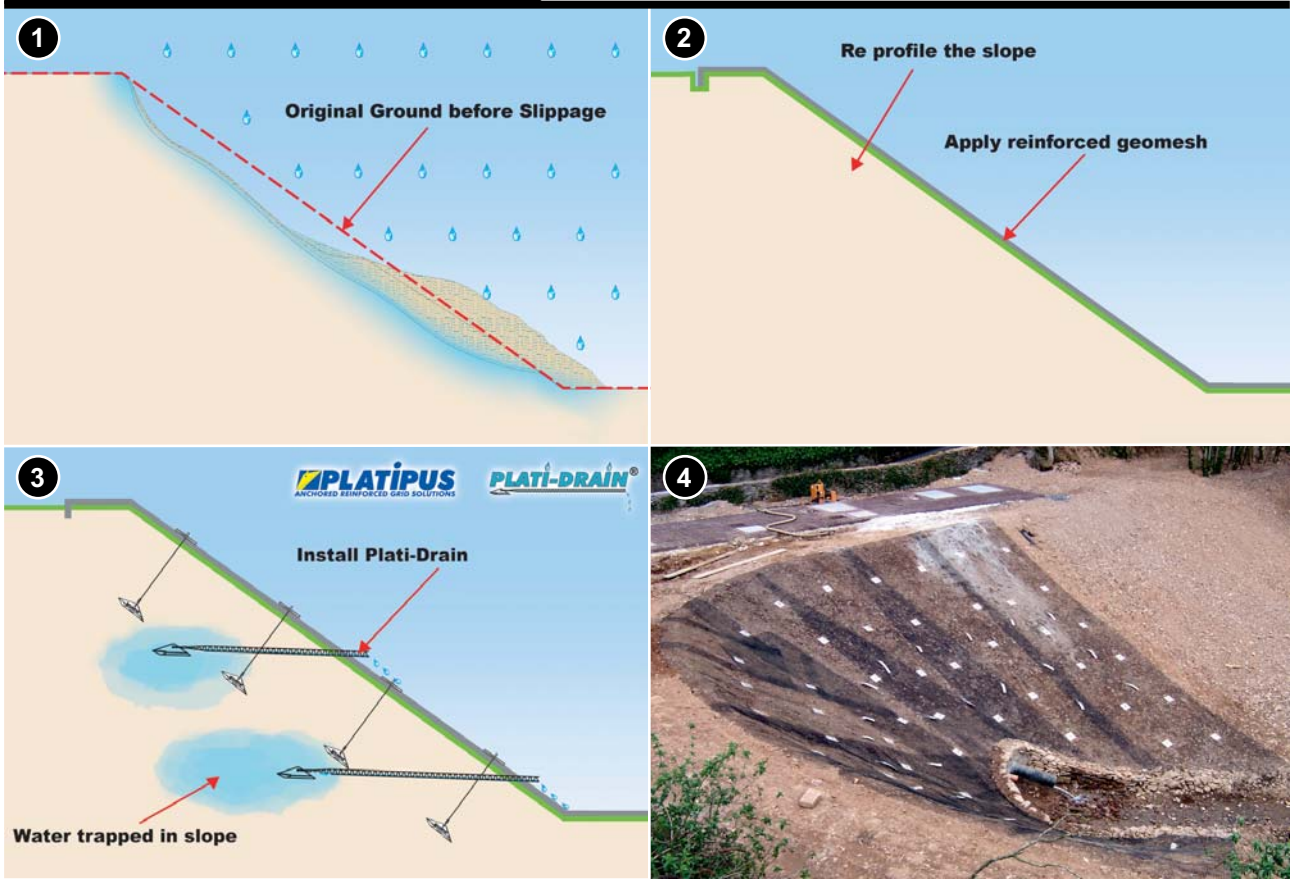
CORE APPLICATIONS

The Platipus® anchor system can be used in many situations. Below are some illustrations of the most common circumstances.

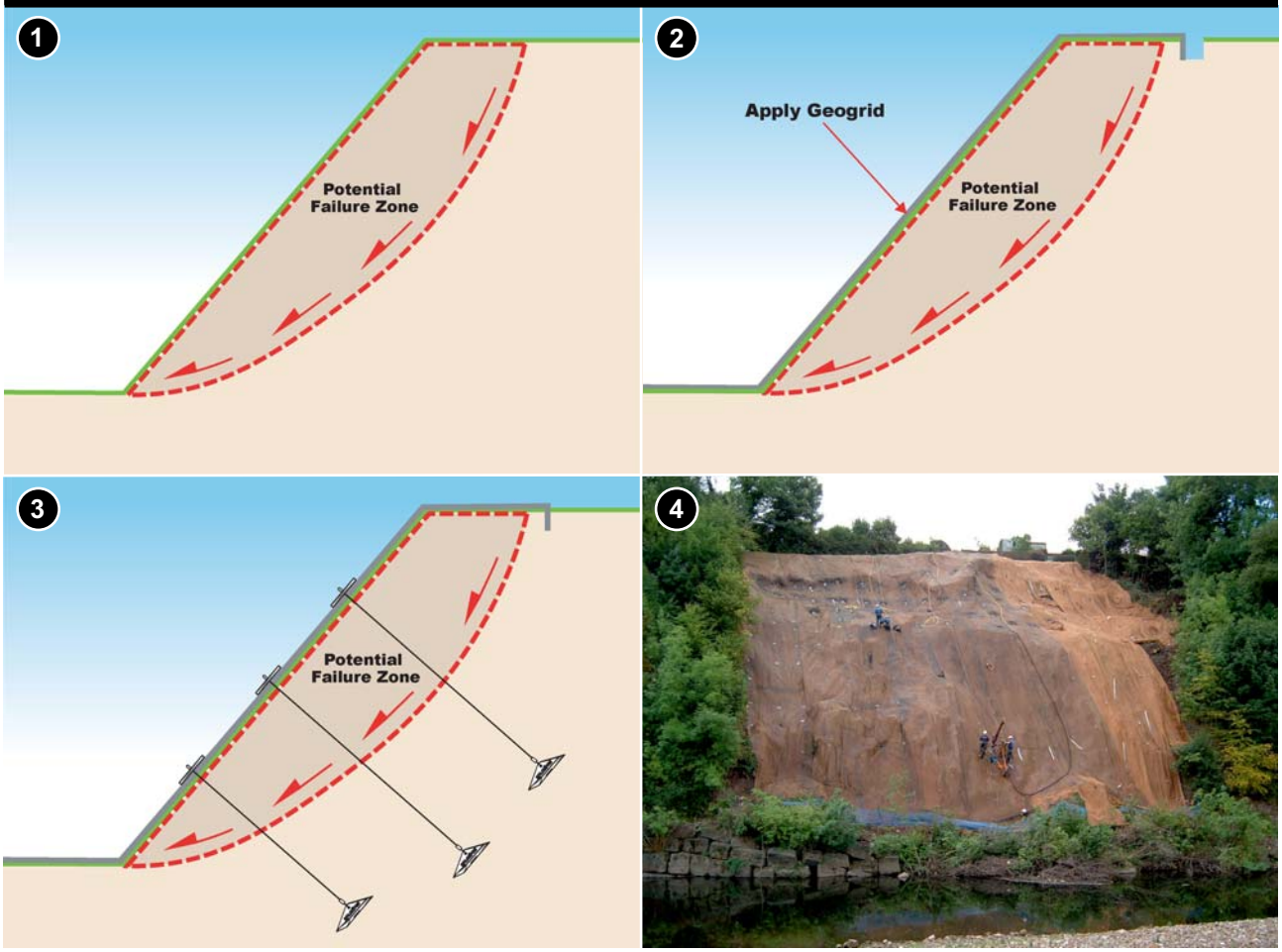
EROSION CONTROL



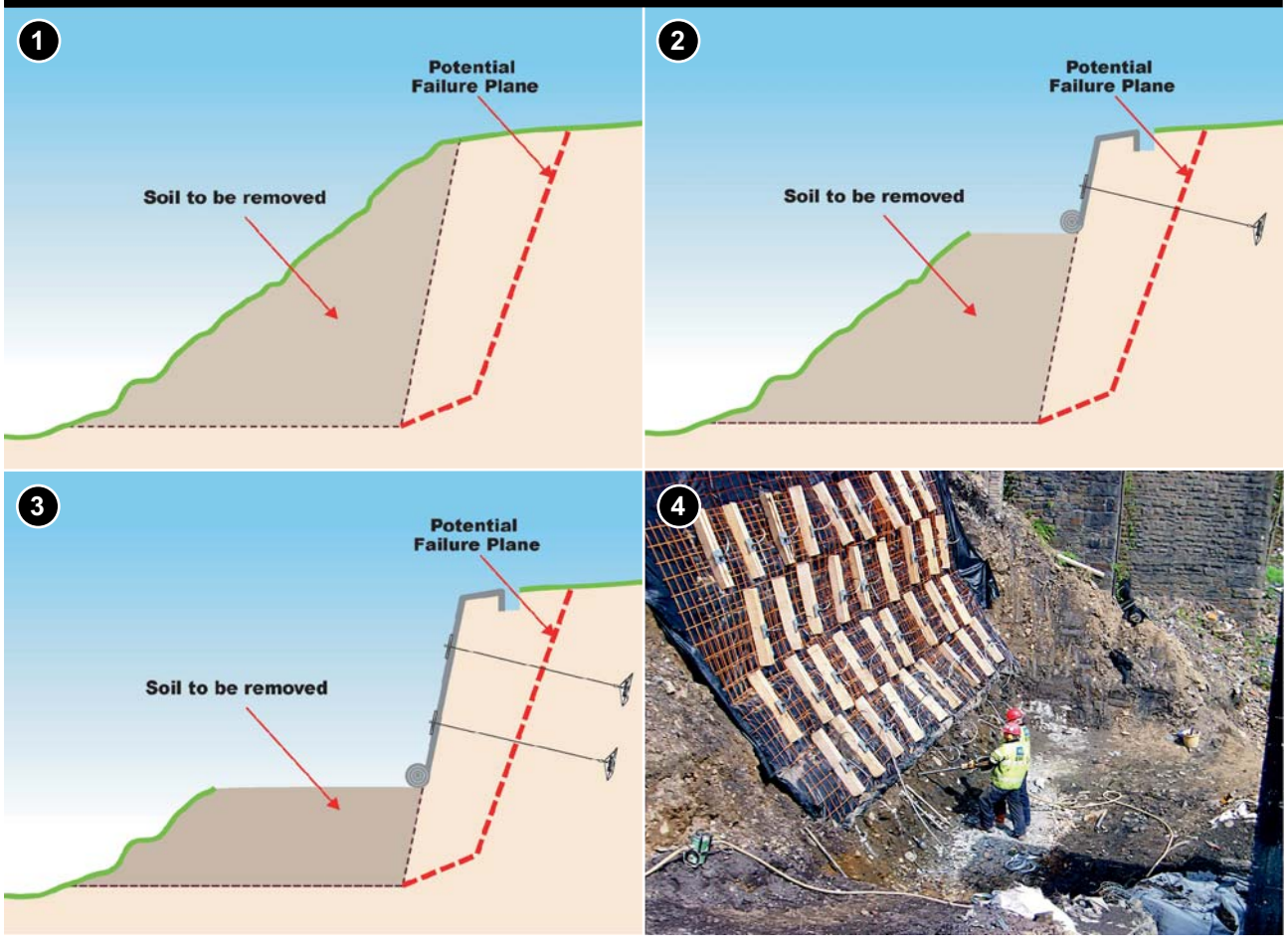
SHALLOW SLIP FAILURES



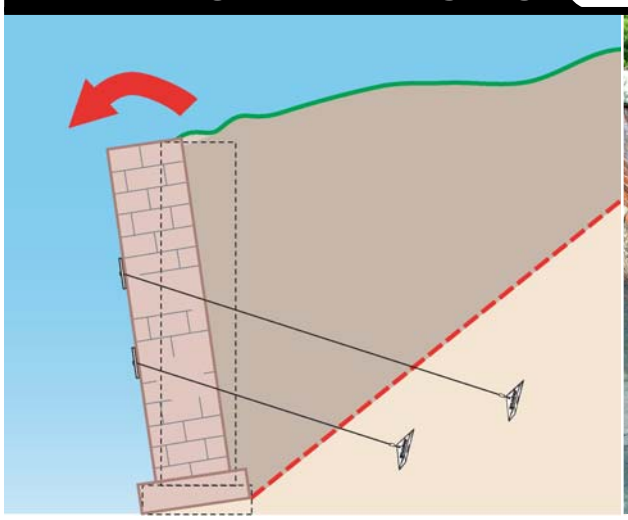
DEEP SEATED FAILURES



CUT FACE SLOPES



RETAINING WALL FAILURES



TYPICAL EXAMPLES

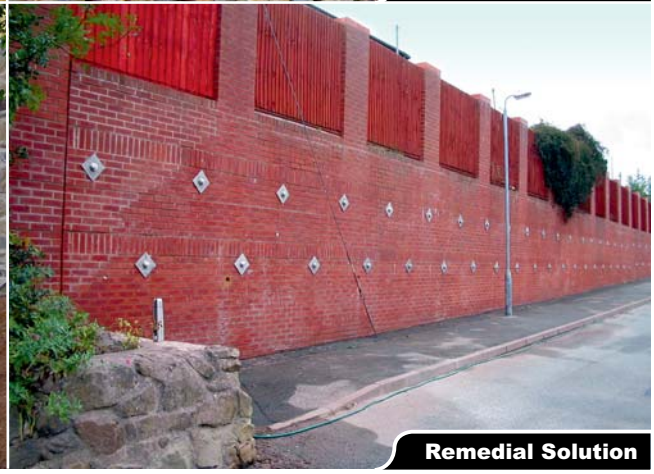
The Platipus® anchor system delivers excellent performance for an increasing range of applications. The following pages show a portfolio of projects we have completed over the last few years and have been divided into specific areas.

RETAINING WALLS

Timber

Cast in-situ Wall

New Reinforced Walls



Remedial Solution

SLOPE STABILISATION

Temporary Support

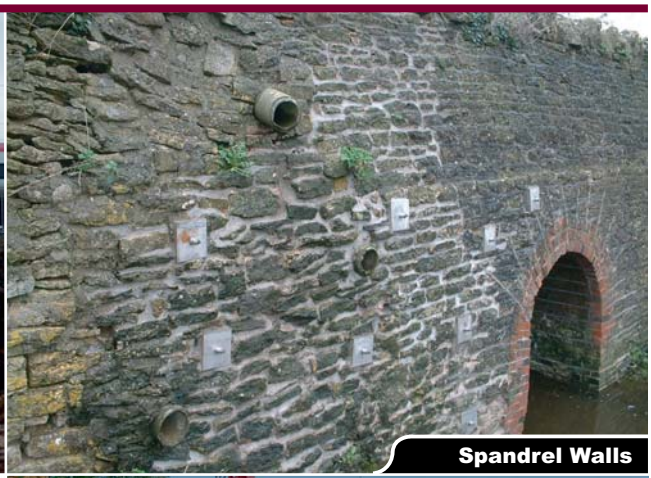
Permanent Rail

Difficult Access

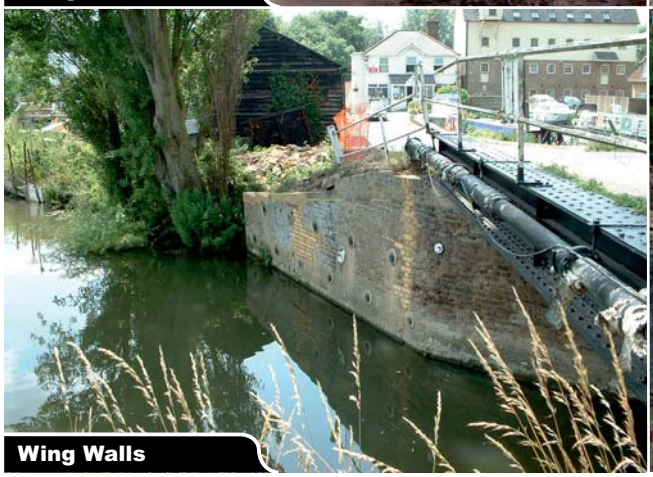
Deep Excavation

BRIDGE REPAIR

Bridge Abutments



Spandrel Walls



Wing Walls

Deck Replacement

SHEET PILING

Temporary Support

Excavation

Permanent Support

Canal Bank Stabilisation

EROSION CONTROL

Coastal Erosion

Surface Erosion

Scour Protection

Flood Protection

GABIONS

Additional Support

Rotating

Emergency Support

New Build

ROCK RETENTION

Railway

Difficult Access

Coastal

Highways

BUOYANCY CONTROL

Pipelines

Storm Water Tanks

Water Cascades

Buoyancy

DRAINAGE SOLUTIONS

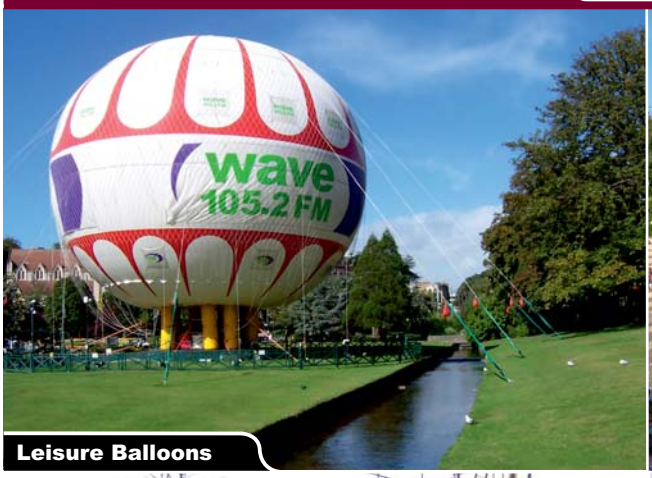
Increase Soil Strength

Increase Slip Plane Friction

Dual Draining & Restraining

Deep Penetration

GUYED STRUCTURES



Leisure Balloons

Permanent Structures

Signal Gantries

Temporary Structures

SCAFFOLDING SECURITY

Temporary Support

Power Line Crossing

Rail

Historical Repair

FOUNDATIONS

Mooring Pontoons

Fence Posts

Handrail

Footbridge

LANDFILL CAPPING

Steep Gradients

Rapid Installation

Aesthetically Pleasing

Environmentally Friendly

GENERAL SECURITY

Aircraft

Pitch Cover

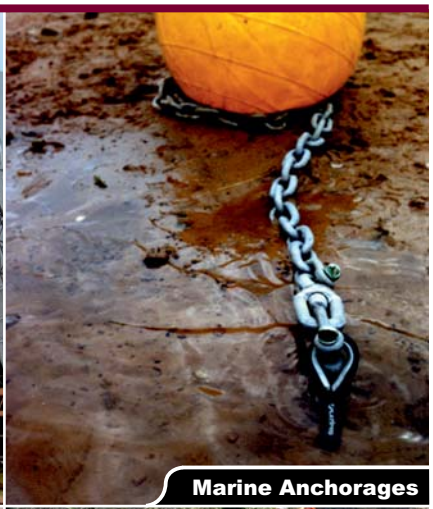
Safety Boom

Boat

PLUS MANY MORE

Utility Anchoring

Stages



Marine Anchorages

Rope Courses

Tree Anchoring

Winch Points

SOME OF OUR CLIENTS

Contractors

- Alfred McAlpine
- Alun Griffiths Contractors Ltd
- Amco
- Amec
- APB Group
- Ascon Ltd
- Balfour Beatty
- Barr Environmental Ltd
- Birse
- BSR Metro
- Byzak
- CainWhite Piling & Foundations Ltd
- Carillion
- Cementation Foundations-Skanska
- Clancy Docwra
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- Phi Group Ltd
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- W A Developments

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- Atkins
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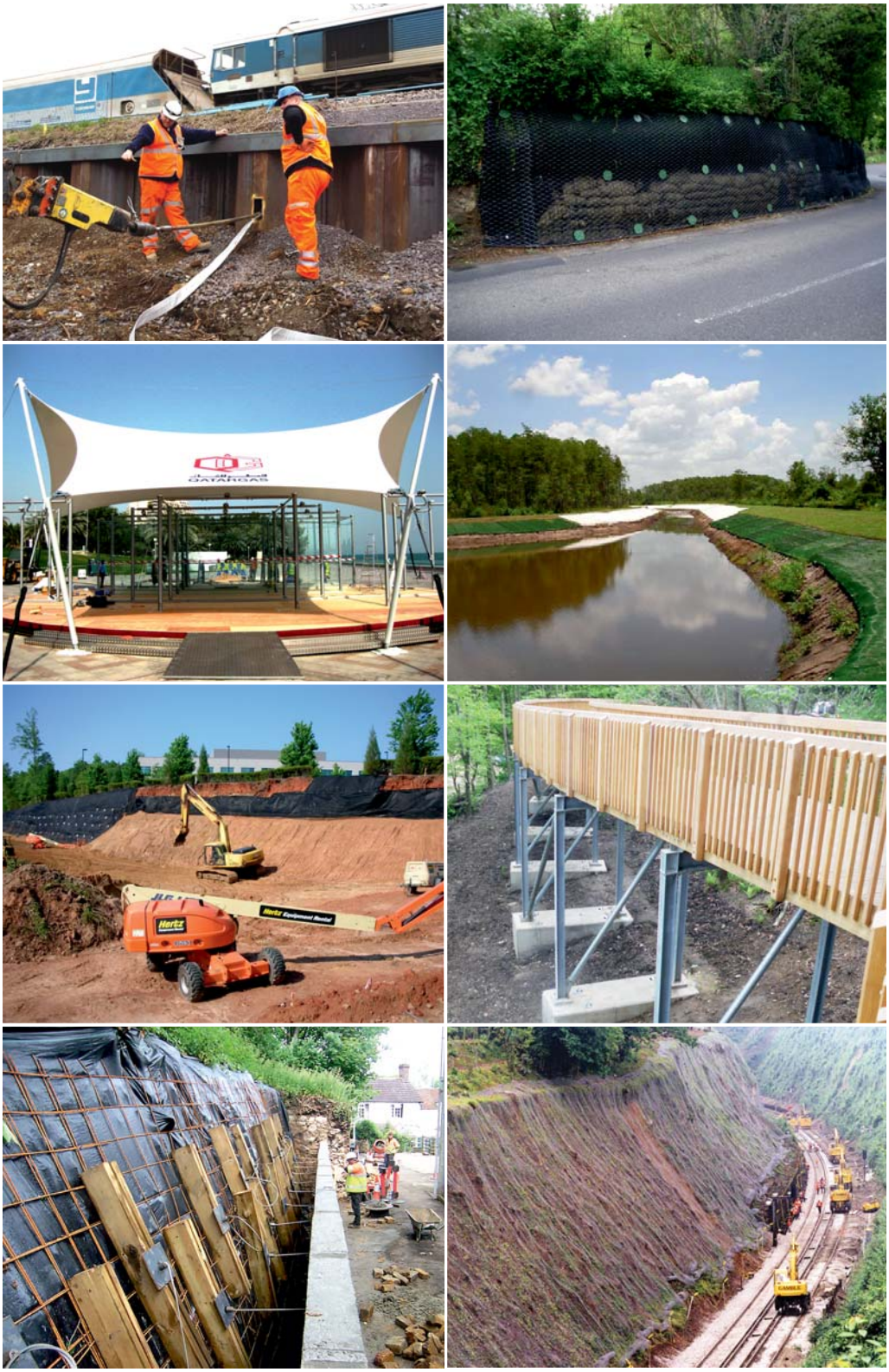
- Mott MacDonald
- Mouchel Group
- MWH
- Owen Williams Rail
- Paul Carpenter Associates
- Pell Frischman
- Ringway Parkman
- W A Fairhurst
- White Young Green Plc

Please Note: This is not an exhaustive list and we apologise to anybody we may have left off.



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