



RBL WEBINAR

Overburden Drilling System

The RBL Approach



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RBL'S PRESENTERS



Jon Ball

Chief Geotechnical Engineer



David Johnson

Regional Technical Sales Manager



Megan Goodchild

Marketing Executive

WHAT ARE WE COVERING?

01 Our Business

02 What is ODS?

03 What are the types of system involved?

04 Ground conditions and design

05 Applications and advantages

06 Q&A



ROGER BULLIVANT LIMITED

AT A GLANCE

Total employees.

500+

Linear metres of precast beam
manufactured annually.

>250,000 LM

Providing piling and foundation
solutions in the residential sector.

Residential

RBL has the capacity to
manufacture over 1 million metres
of precast pile every year.

1M

100% of precast products manufactured
with low carbon concrete.

100%

Fleet of piling rigs.

50+

Providing piling and foundation
solutions for various commercial projects.

Commercial

OUR PRODUCTS

WHAT WE DO

PILING



- Driven Precast Concrete Piles
- Driven Steel Tubular Piles
- RB Combipile
- Continuous Helical Displacement Piles (CHD)
- Continuous Displacement Auger Piles (CDA)
- Continuous Helical Auger Displacement Piles (CHAD)
- Continuous Flight Auger Piles (CFA)
- Contiguous Piled Retaining Walls

GROUND IMPROVEMENT



- Vibro Stone Columns
- Controlled Modulus Rigid Inclusions (CMRIs)

FOUNDATION SYSTEMS



- RBeam Precast Concrete Ground Beams
- Precast Caps

RESTRICTED ACCESS



- Sectional Flight Auger (SFA)
- Bottom Driven Minipiles
- Overburden Drilling System
- Jack Piles & Jack Pile Raft
- Grundomat Piles
- Drill Bar Piles
- Underpinning

LOCAL KNOWLEDGE NATIONAL SUPPORT



What are ODS Piles?



OVERBURDEN DRILLING SYSTEM (ODS) PILES

“ODS is a family of rotary percussive drilling systems, with an integral casing ”



ODS PILES

PERCUSSIVE ROCK DRILLING

Conventional driven and bored piles work well in soft overburden

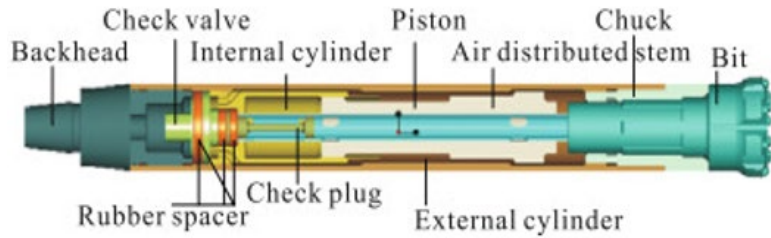
Where the ground is obstructed with highly competent material, but not useful in reinforced concrete.

Size ranges from 52mm to 813mm but more commonly 140-280mm, larger diameters are possible using cluster drilling techniques.



ODS PILES

DTH HAMMERS



Percussion - High pressure air drives the piston which strikes the drill bit

Rotation – Provided by the rig via a string of drill rod

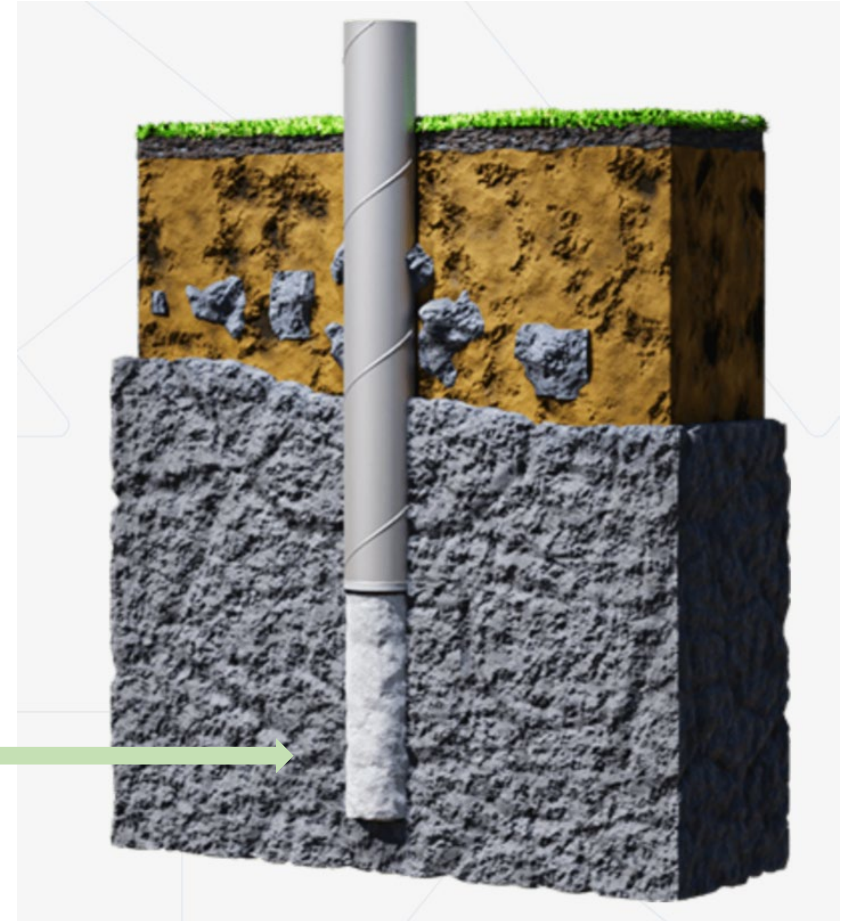
Flush – After driving the piston the compressed air goes through the bit clearing the drill face and flushing the cuttings back to the surface



WHY DO YOU NEED CASING ADVANCEMENT SYSTEMS?

In soft or layered soils the pile bore will be unstable and collapse.

Rock Socket

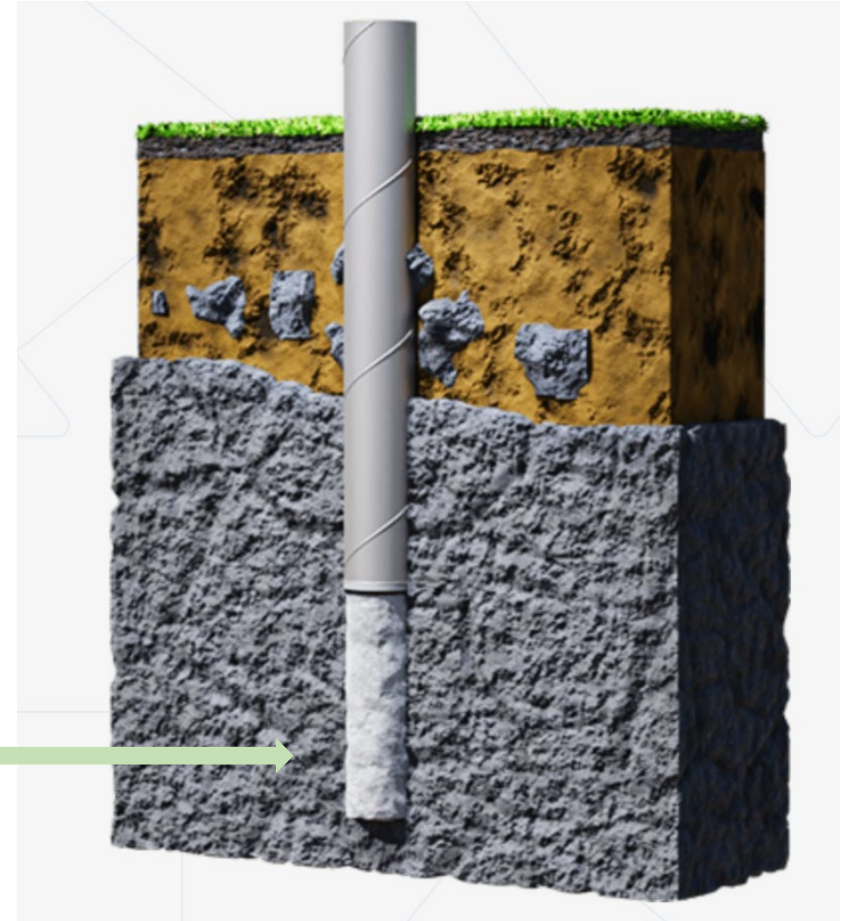


WHY DO YOU NEED CASING ADVANCEMENT SYSTEMS?

In soft or layered soils the pile bore will be unstable and collapse.

A casing advancement system is a drill bit which takes with it a steel liner providing an open stable pile bore.

Rock Socket



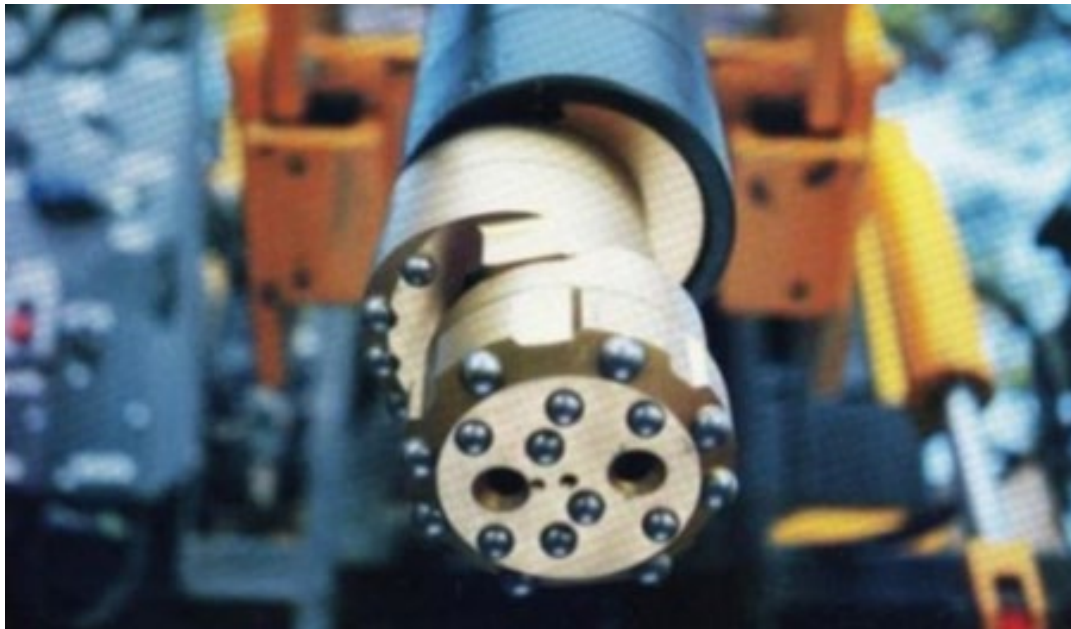
ODS System Types



SYSTEM TYPES

REAMER TYPE SYSTEM

(ODEX, Super jaws, Tubex...)



SYSTEM TYPES

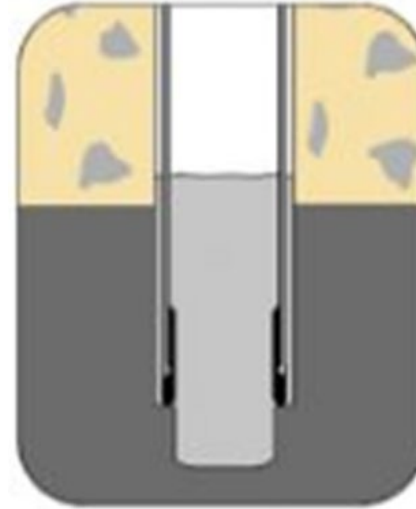
REAMER SYSTEM INSTALLATION PROCESS



Progress drilling over reaming the outer casing with the drill system engaged into the drill shoe



Once the casing has passed through the over burden counter rotate the drill system



Withdraw the drill system, hammer and rods



Drill through the drill shoe with standard DTH button bit to form a rock socket

SYSTEM TYPES

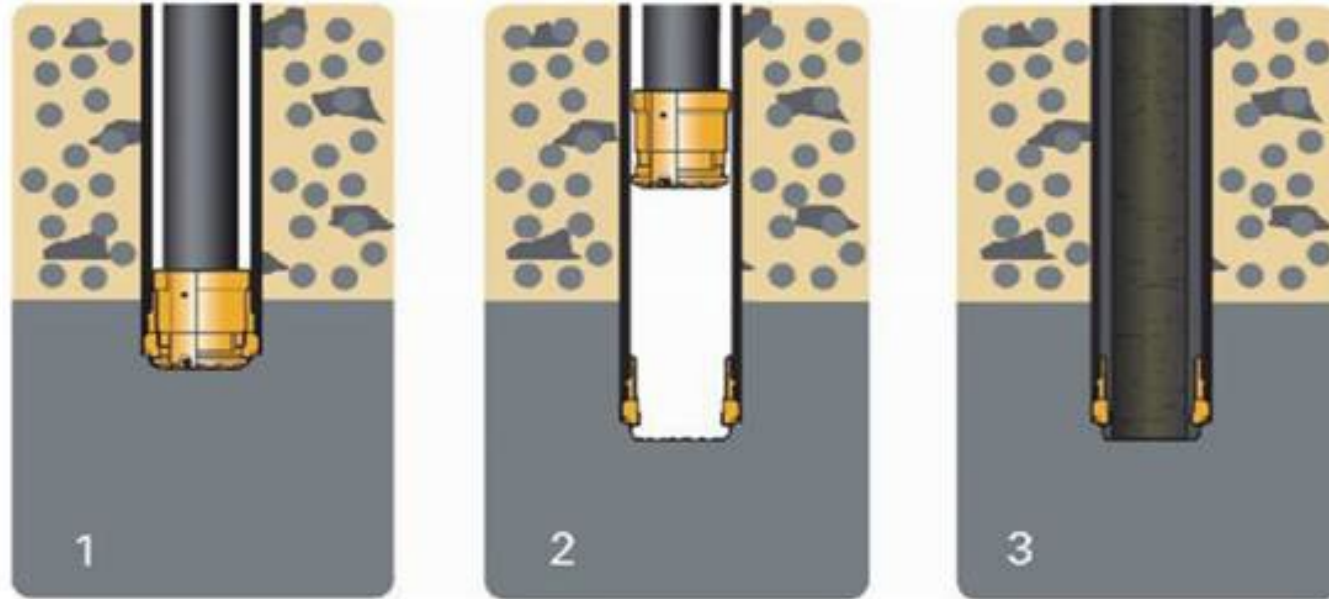
RING BIT TYPE SYSTEM

(Symmetrix, Elemex, Numa...)



SYSTEM TYPES

RING BIT SYSTEM INSTALLATION PROCESS



Drill system engages with the ring bit and both parts rotate as the hammer drives the pile into the ground. Once rock head is reached, the system is withdrawn leaving the ring bit behind.

SYSTEM TYPES

DRILL THROUGH TYPE SYSTEM,

(Mincon, Bulroc, Atlas Copco...)



Where would ODS be used?



ODS PILES

GROUND CONDITIONS AND DESIGN



Generally suitable for rock foundations or obstructions of competent/ very competent strata.



Limited accommodation of very stiff clays caused by difficulties in removing drilled debris.



Geotechnical calculation dictates design length.



The design is controlled by standard geotechnical pile design adapted to the method of installation.



Duration and bullet wear are the major limitation on depth, up to 25m has been achieved.

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APPLICATIONS

BACKFILLED QUARRIES

Several residual conditions result in difficulties for more conventional piling methods including:



Quarry high walls & sumps

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Unworked boulders (or larger)

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Irregular basal levels

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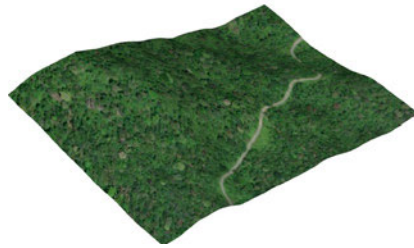
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Irregular basal levels



Presence of adits and residual overhangs

APPLICATIONS

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Presence of adits and residual overhangs



Irregular mass backfill

APPLICATIONS

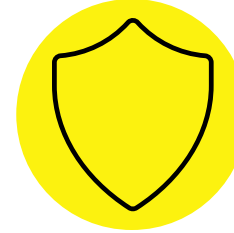
VOIDED ROCK



Subsidence and sinkholes



Variable ground conditions



Structural integrity

APPLICATIONS

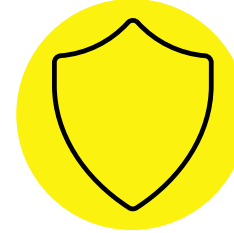
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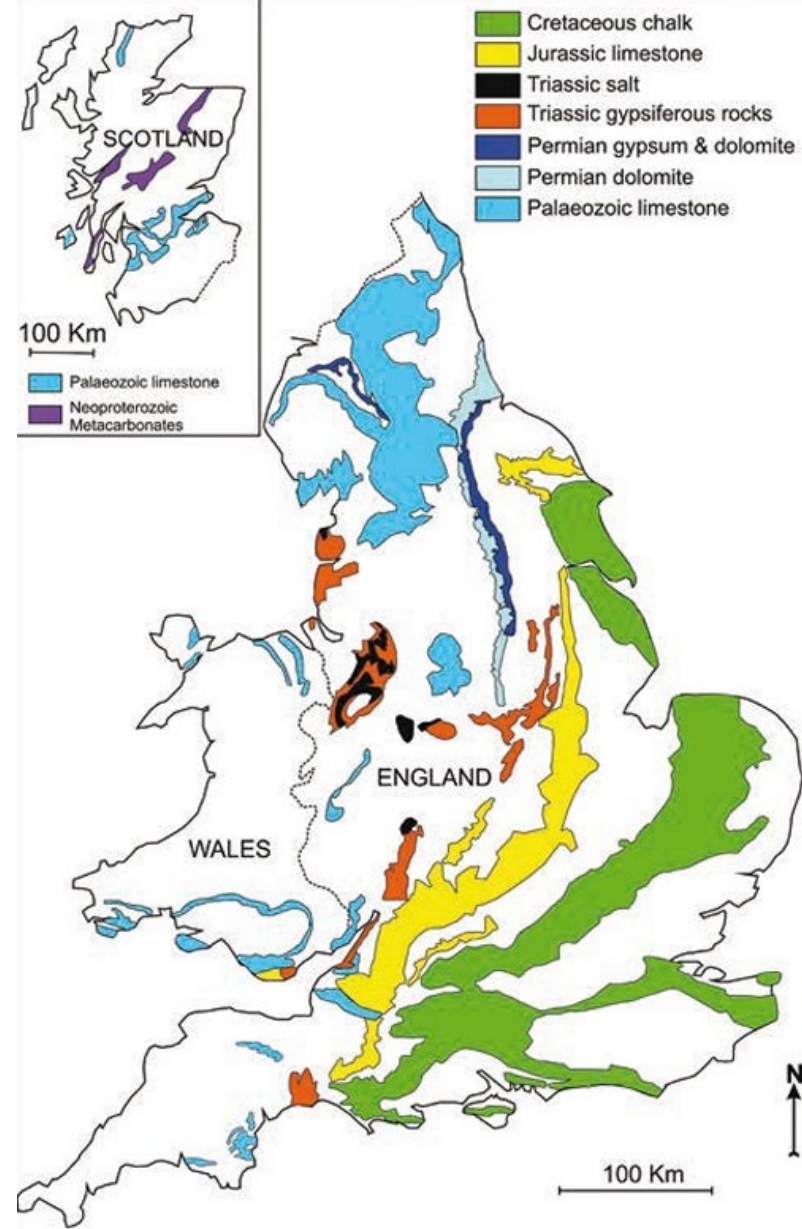
Structural integrity

Solution

- ✔ Deep piles beyond the problematic voided layers
- ✔ Redundancy
- ✔ ODS drilling ideal for strong rock where auger techniques are unable to penetrate

ODS PILES

APPLICATIONS



BGS Geohazard map of soluble rocks in the UK

- Chalk
- Limestone
- Gypsum
- Dolomite
- Salt

APPLICATIONS

MINING

- ODS piles allow penetration of the hard rock to depths beyond broken ground and seams (worked or unworked).
- The use of integral casing can control grout consumption and help to maintain the continuity of construction and integrity of the pile.
- Some systems that use air/mist or fluid flushing have advanced control mechanisms intended to minimise external fluid migration away from the pile, addressing concerns of uncontrolled ground gas and drill fluid migration.

What are the advantages?



ODS PILES

ADVANTAGES



Reliable installation in very adverse ground conditions.



Relatively quick in very competent strata.



Presence of casing guarantees integrity of pile.



Relatively small rigs are ideally suited for restricted access situations, where existing foundations may need to be supplemented.

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Q&A

