Welcome to the first webinar series
'how to make the ground work for you'

www.roger-bullivant.co.uk

Info@roger-bullivant.co.uk

0845 838 1801

@rogerbullivantlimited

An Introduction to Driven Piling

James Cowburn *BSc (Hons) CEng MICE FGS*
Area Manager – North West

Matt Walpole *MEng (Hons) MBA CEng MICE*
Area Manager – South East

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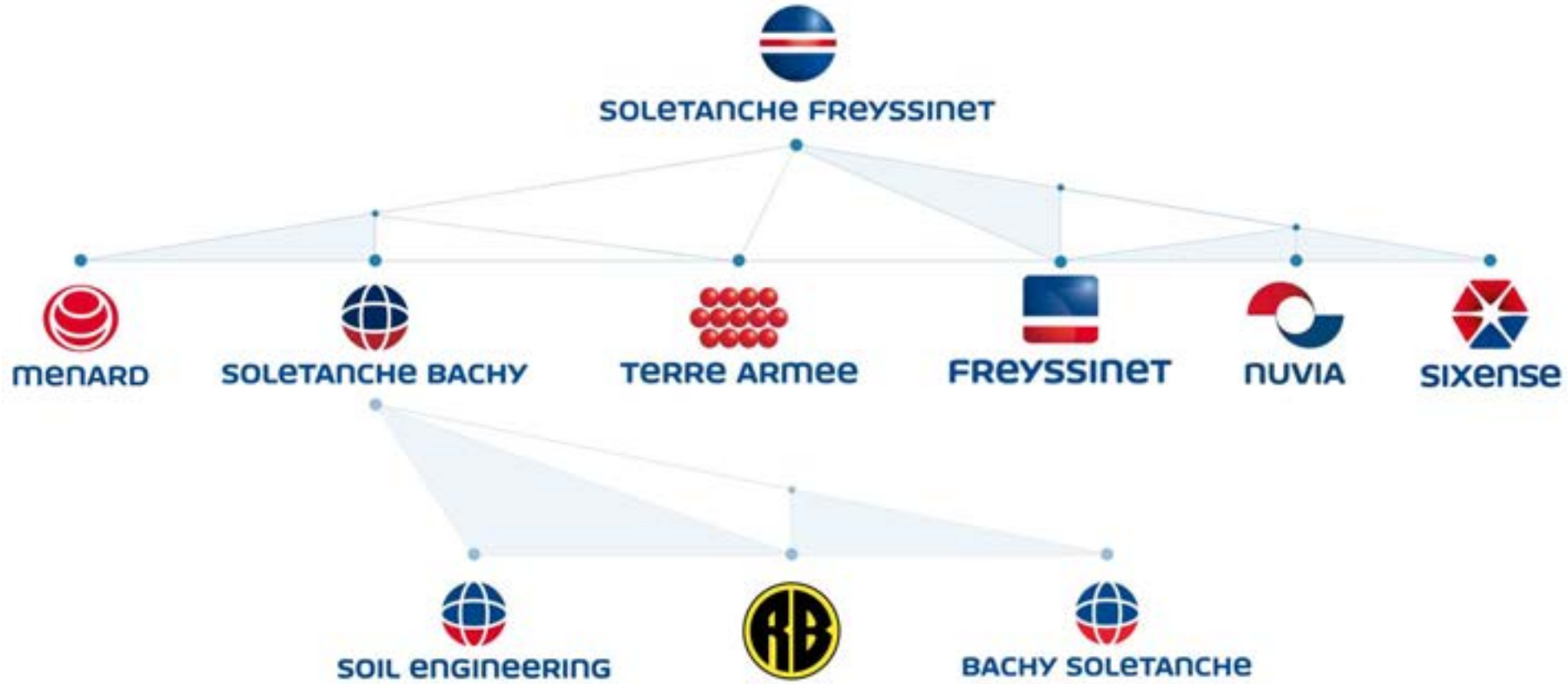
Our Business


SOLETANCHE FREYSSINET
MENARD
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TERRE ARMEE
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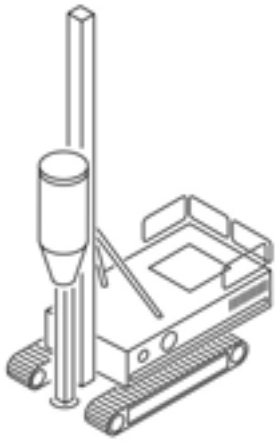
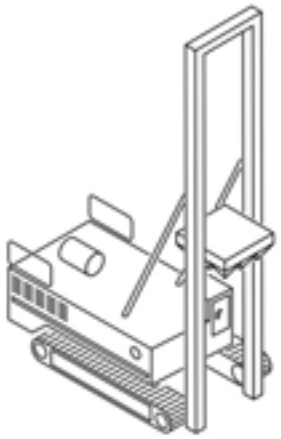
NUVIA
SIXENSE
SOIL ENGINEERING
BACHY SOLETANCHE

About

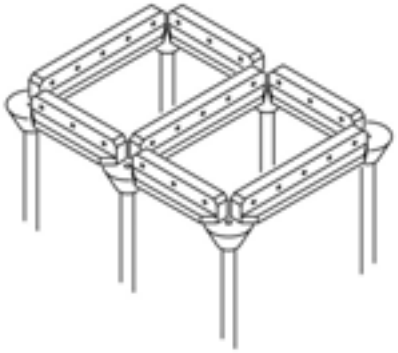
Wealth of experience...



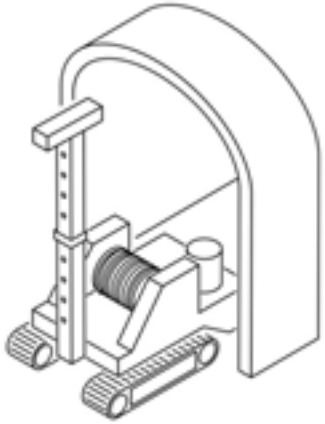
PILING



GROUND IMPROVEMENT



FOUNDATIONS



RESTRICTED ACCESS

An Introduction to Driven Piling

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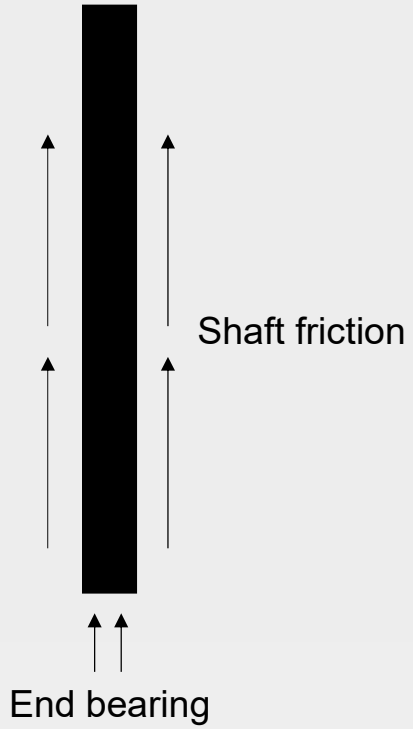
What are piles?

"…columnar elements in a foundation transferring load from the superstructure through weak compressible strata onto stiffer or more compact and less compressible soils or onto rock".

Tomlinson (1977)

Design

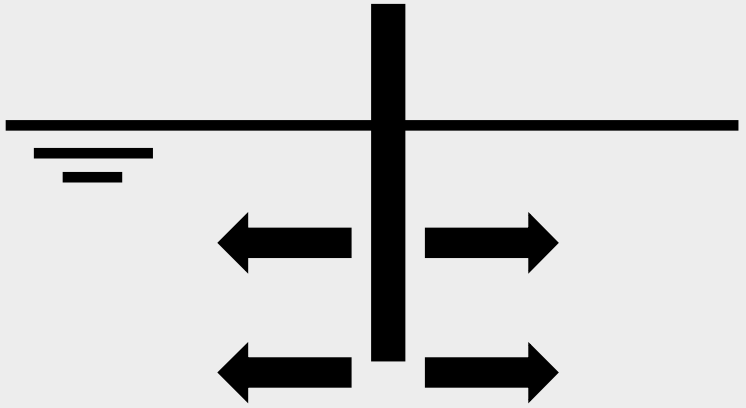
- Structural – pile material
- Geotechnical – soil & rock mechanics
- Friction, end bearing, or combination
- Static design and dynamic design
- Based on BS8004 & BS8110
- now EC7 and EC2



Classification

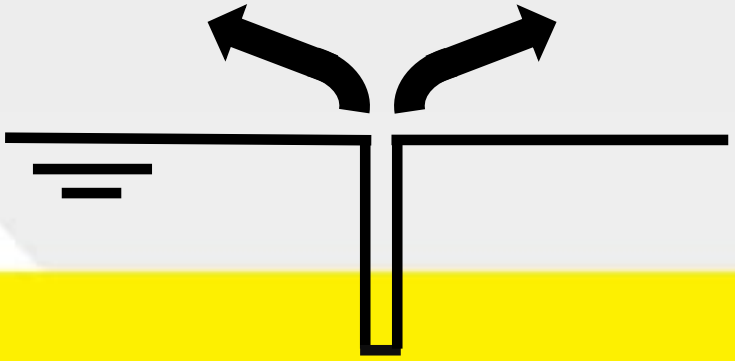
Displacement Piles

- **Preformed Steel or Concrete**
- **Insitu Concrete**
- **Vibro Stone Columns**



Replacement Piles

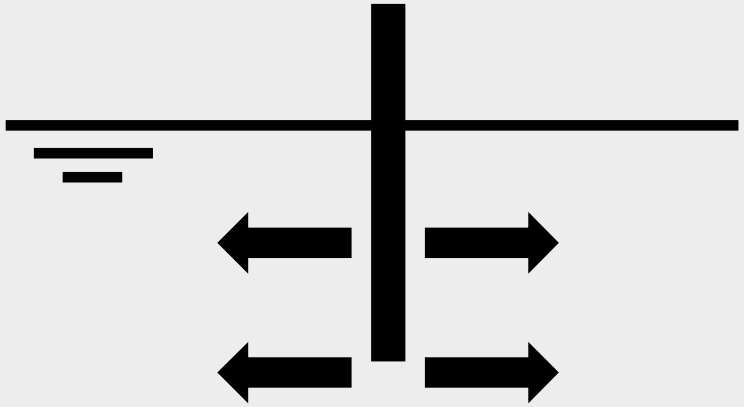
- **Insitu Concrete**



Driven Piling

- Displacement piles

- BS EN 12699 Execution of special geotechnical works – Displacement piles



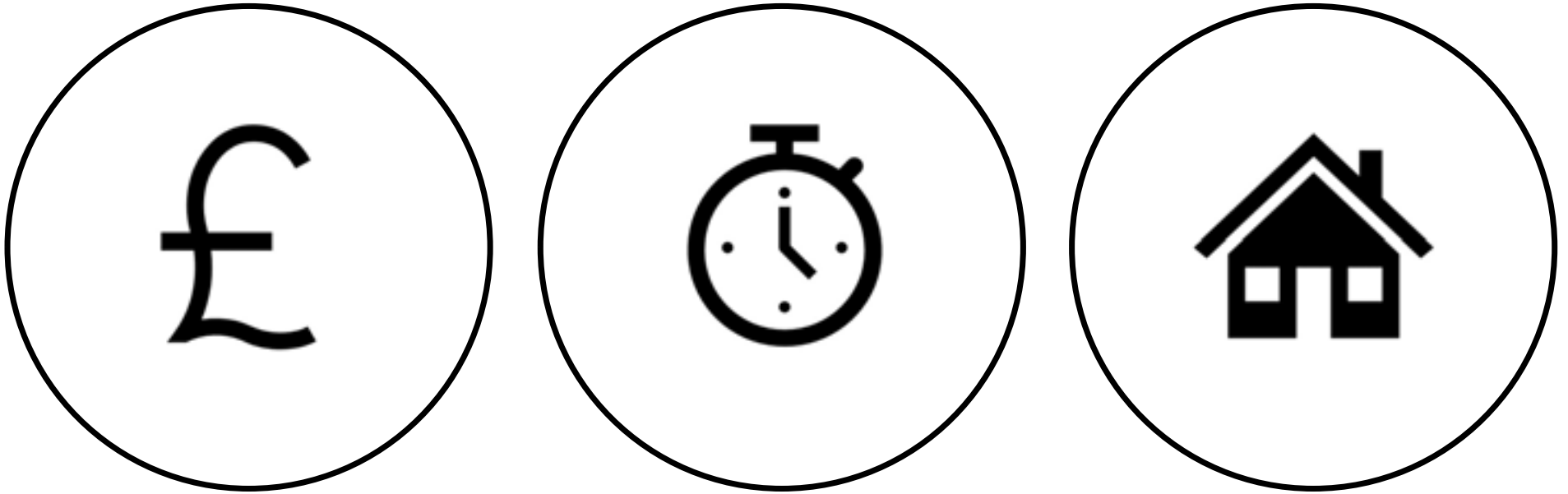
02

Driven Precast Concrete Piles

Driven Precast Concrete Piling

- BS EN 12794 Precast concrete products – Foundation piles
- UK market estimated to be 3,000,000m per annum
- Piles installed as single lengths or jointed segments

Driven Precast Concrete Piling



Segmental Piles

	Single Bar					Multi Bar		
	Section Size (mm)							
Length	175	200	225	250	300	200	250	300
2m	✔	✔						
3m		✔	✔	✔	✔			✔
4m		✔	✔	✔	✔		✔	✔
6m						✔	✔	✔

Reinforcement – Class 1 or 2
Joints – Class A to D

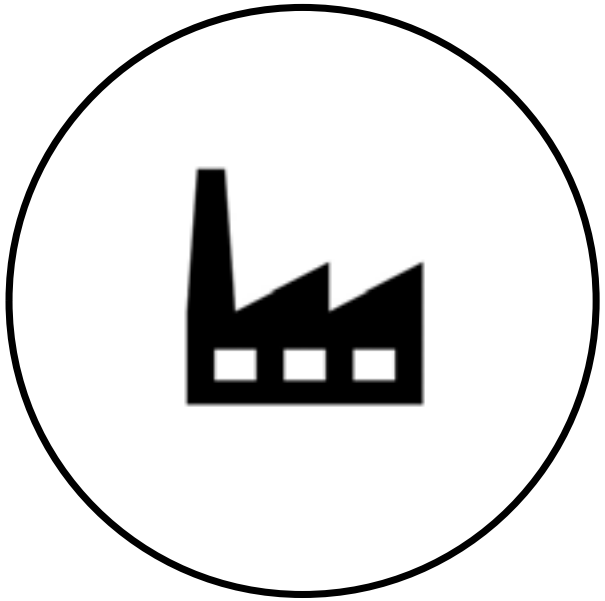
Typical Capacities

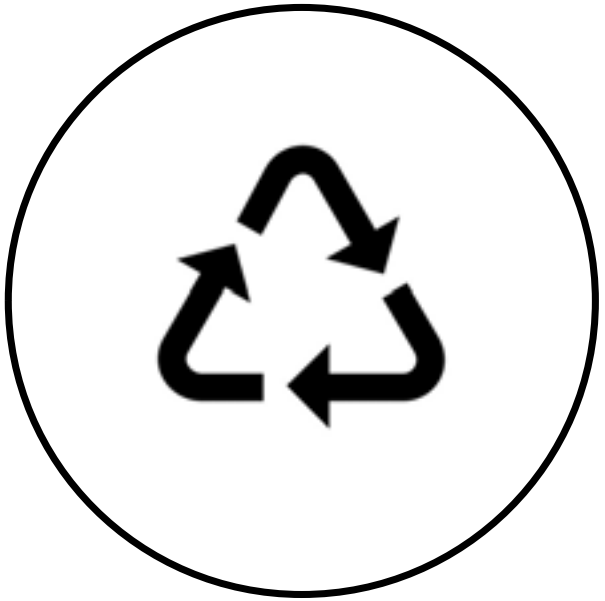
- 175mm – 250kN
- 200mm – 350kN
- 250mm – 550kN
- 300mm – 800kN

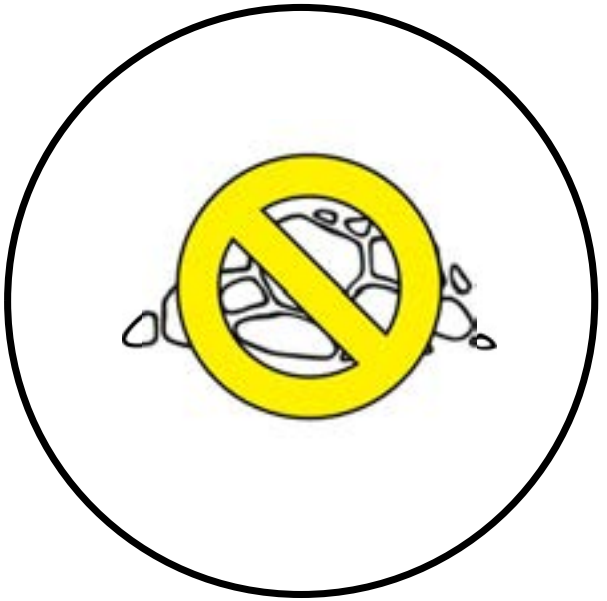
Plant

- Top driven rigs
- Hammer weights 1.5 to 6.0 tonnes
- Range of rig sizes
- RB Quiet Hammer

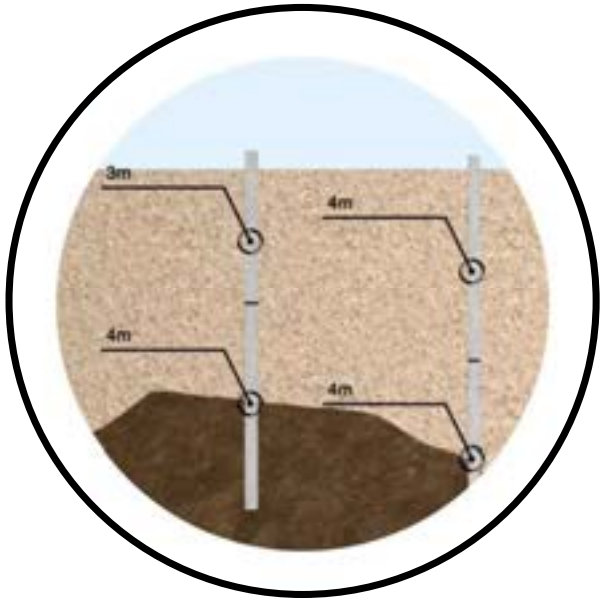
Driven Precast Concrete Piling

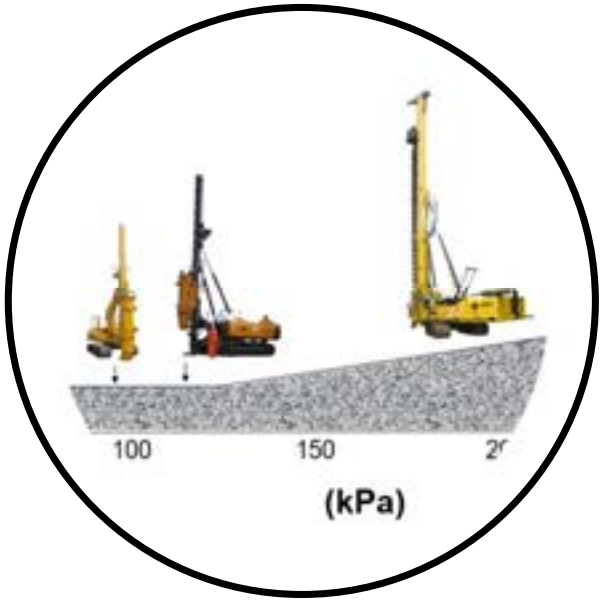






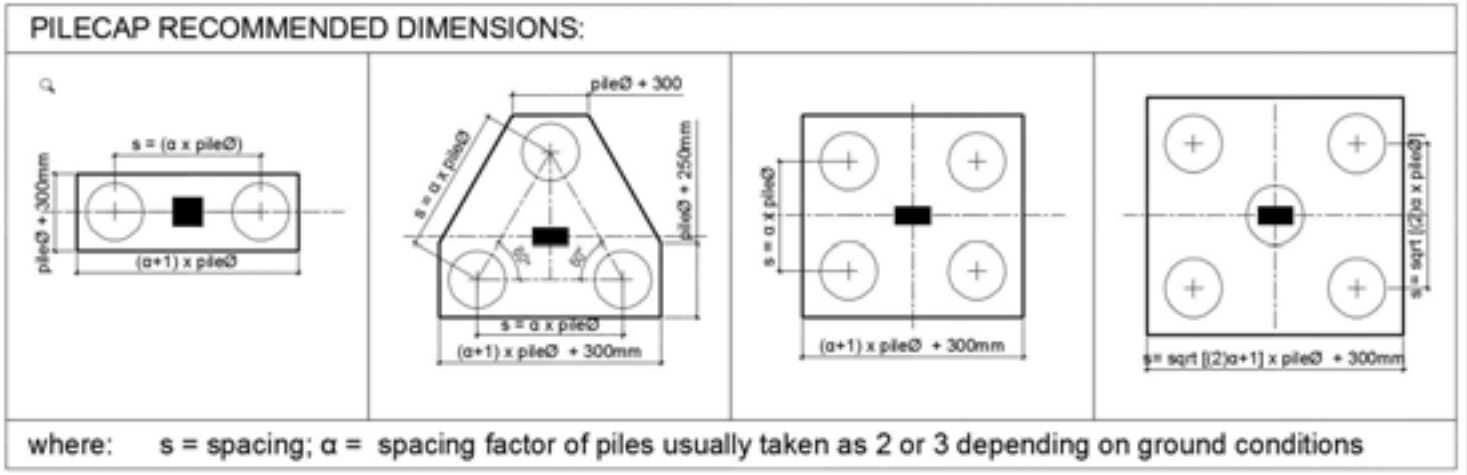
Driven Precast Concrete Piling





Application

- Individual piles – RC beams or caps
- Pile groups – caps typically 2 – 6 piles
- Grid – floor slab or load transfer platform



Application

- Residential
- Education
- Care homes
- Health
- Commercial
- Industrial
- Infrastructure

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ROGER BULLIVANT

Barking Riverside

Client:
Barking Riverside London

Main Contractor:
L&Q

Key issues/requirements
- Piles to support townhouse, podium and mansion blocks
- Made Ground, alluvium over river terrace gravels (12-14m) over London Clay (18-20m)
- <800kN
- 15-25kN shear

Project Solution
- 1246 no. 250mm and 300mm driven precast concrete piles
- 16m

Value
- £1.3m

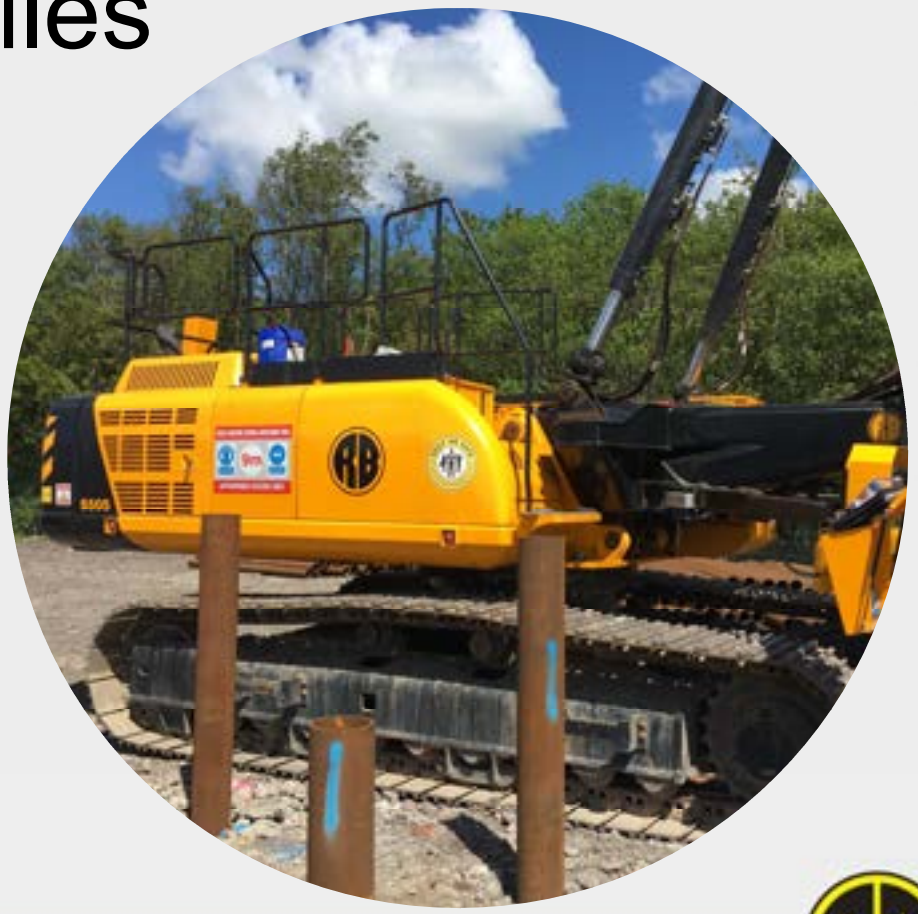
Barking Riverside

03

Driven Steel Tubular Piles

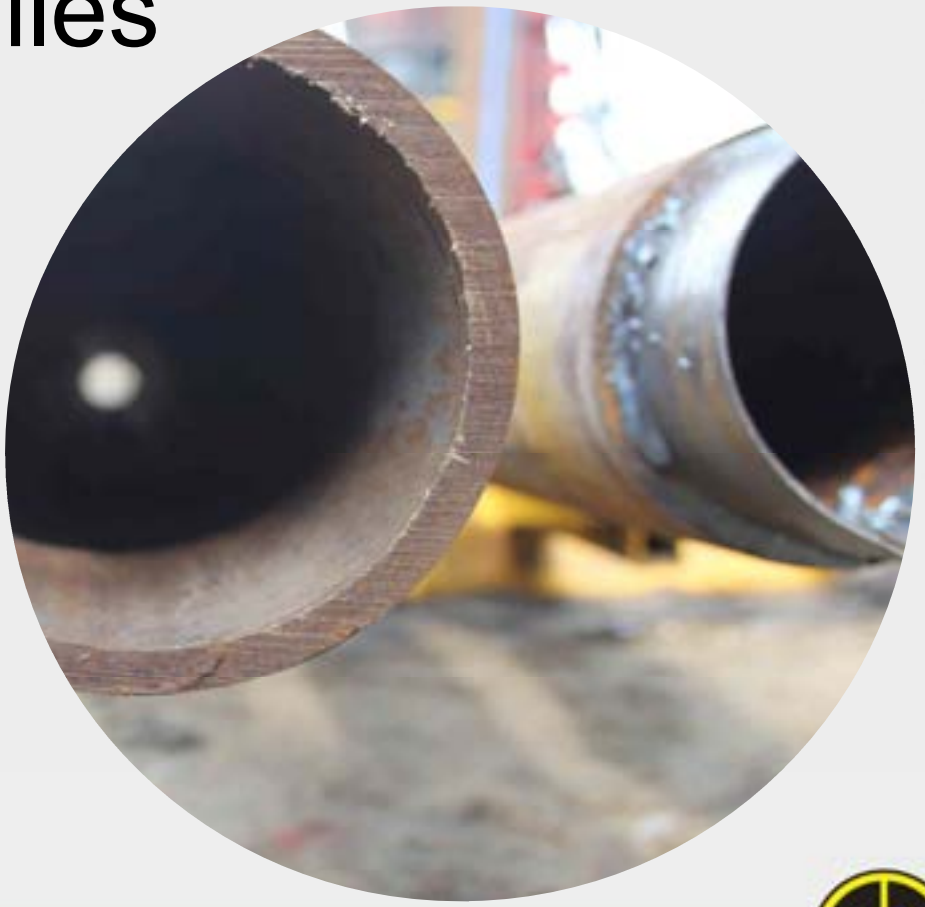
Driven Tubular Steel Piles

- Top driven rigs (same as precast concrete)
- Robust and lightweight
- Suitable for hard driving
- Small diameter – low displacement



Driven Tubular Steel Piles

- New or used oil industry casing
- Minimum API 5CT L80 grade
- Lengths up to 12m
- Cut to segment lengths as required
- Open or closed end



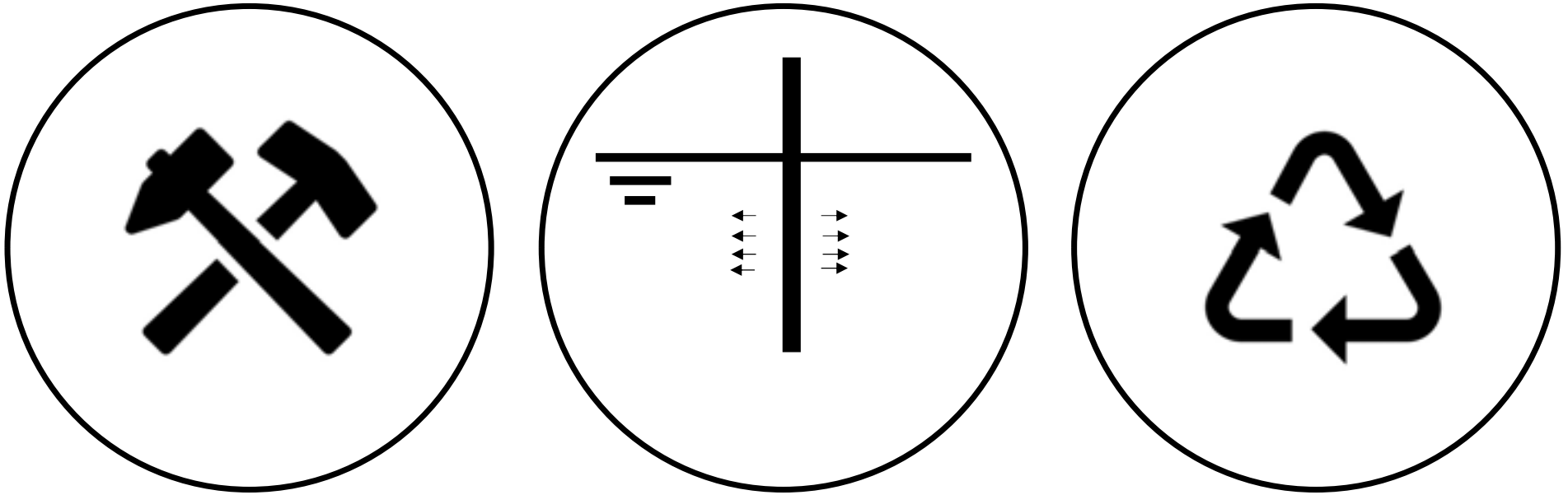
Driven Tubular Steel Piles

Diameter	Wall thickness	Typical Load	Typical Sector
137.7mm	8/9mm	<350kN	Residential
177.8mm	10/11.5mm	<550kN	Residential
244mm	13.8mm	<800kN	Commercial / Infrastructure
273mm	13.8mm		Commercial / Infrastructure
339mm	13mm		Commercial / Infrastructure

Advantages

- Robust
- Low displacement
- High strength
- Suitable for hard driving
- Recycled material
- Variety of segment lengths
- Steel tube is the structural element

Driven Tubular Steel Piles



Application

Waterfront Plaza, Edinburgh

Client:
- Port of Leith Housing Association

Main Contractor:
- CALA Homes

Key issues/requirements
- Made Ground overlying stiff CLAY
- Adjacent Shopping Centre
- Former Victoria Dock

Project Solution
- 178mm and 244mm tubular steel
- 300kN and 600kN SWL
- RB Quiet Hammer
- 2 rigs
- Static testing to reduced lengths

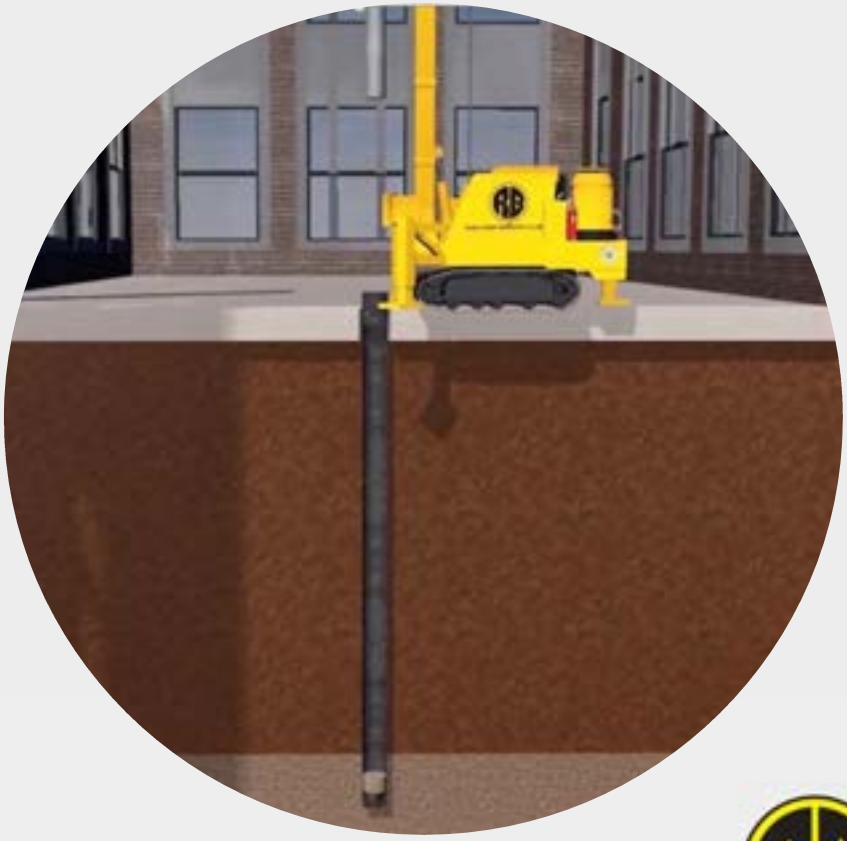
Value
- £830k

04

Bottom Driven Piles

Bottom Driven Steel Cased Piles

- Light gauge, thin wall steel casing
- Driven internally
- Small diameter tubes
- Welded sections
- Concrete and reinforcement form the pile



Bottom Driven Steel Cased Piles

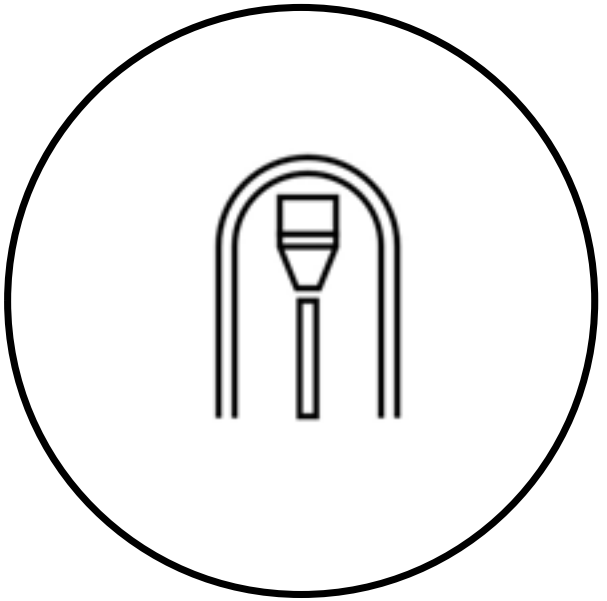
- Casings typically range from 152 – 324mm diameter
- Wall thickness ranges from 1.5 – 4mm

Diameter	Typical Load
152.4mm	100kN
168.3mm	150kN
219.1mm	250kN
323.9mm	400kN

Bottom Driven Steel Cased Piles

- Hammer weights range from 250kg to 1.5Te
- Lighter hammers give less vibration than top driven techniques
- Smaller rigs allow restricted access

Bottom Driven Steel Cased Piles



Applications

- Housing
- Commercial
- Restricted Access: refurbishment, mezzanines, machine bases
- Rail: signal bases, bridge abutments, lift shafts, platforms

Sutton Hoo, Suffolk

Client:
- National Trust

Main Contractor:
- Vinci Construction

Key issues/requirements
- Observation tower
- Anglo-Saxon burial mounds
- No spoil

Project Solution
- 273mm diameter steel-cased
- 500kN
- 8-10m
- Electric rig

Value
- £12.5k

05

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Info@roger-bullivant.co.uk

0845 838 1801

@rogerbullivantlimited