

Welcome to...

CHD vs CFA

How To Decide The Winner...

roger-bullivant.co.uk

✉ info@roger-bullivant.co.uk

☎ 01332 977300

in [@rogerbullivantlimited](https://www.linkedin.com/company/rogerbullivantlimited)



ROGER BULLIVANT

RBL'S PRESENTERS



James Cowburn

Regional Technical Manager



Andrew Preece

National Business Development Manager



Megan Goodchild

Marketing Executive

WHAT ARE WE COVERING?

01 Our Business

02 What is CHD?

03 The History

04 Case Study Examples

05 Let's Recap!

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

Fleet of piling rigs.

50+

100% of precast products manufactured
with low carbon concrete.

100%

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
- ODEX Piles
- Jack Piles & Jack Pile Raft
- Grundomat Piles
- Drill Bar Piles
- Underpinning

LOCAL KNOWLEDGE NATIONAL SUPPORT



What is CHD?



CONTINUOUS HELICAL DISPLACEMENT (CHD) PILES

“CHD is a cast insitu concrete, augered displacement system, formed with a central core and a continuous outer helix.”

CHD PILES

INSTALLATION PROCESS

STEP 1

Drilling the pile bore – the CHD ‘bullet’ tool, with a helical flight, is rotated into the ground using a high-torque rotary head.

STEP 2

Pumping concrete under pressure – concrete is pumped down the hollow shaft as the tool is removed forming a continuous helix around a central core.

STEP 3

Clearing surface heave and waste – remove any excess material from pile formation to complete installation.

STEP 4

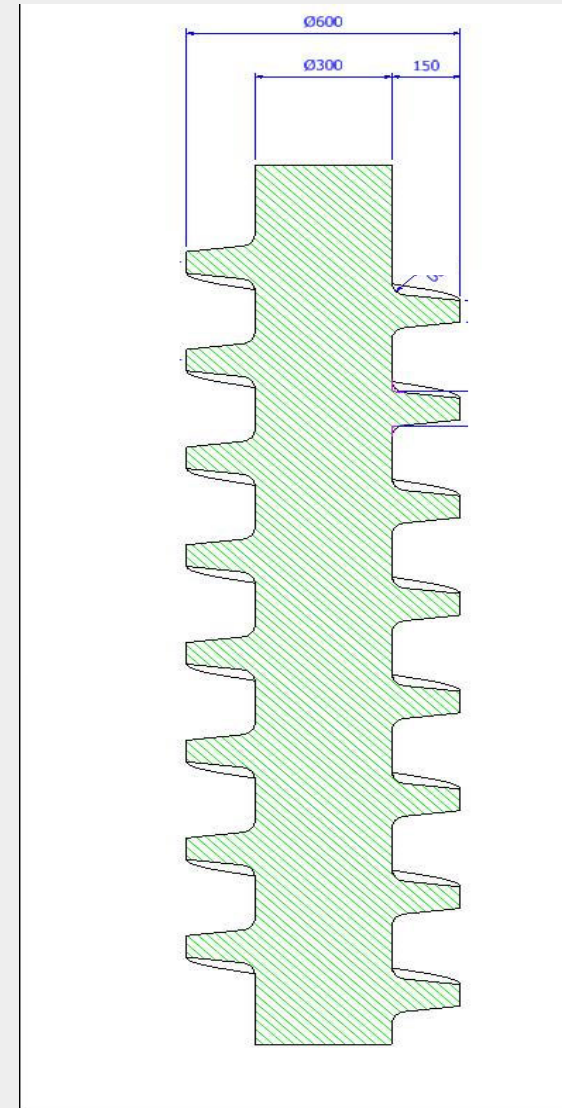
Inserting reinforcement – a reinforcement cage is inserted into the bore to cater for the design loading.



CHD PILES

THE DESIGN

- 300/600mm
- 400/700mm
- Geotechnical design
- Structural design - core



CHD PILES

THE DESIGN

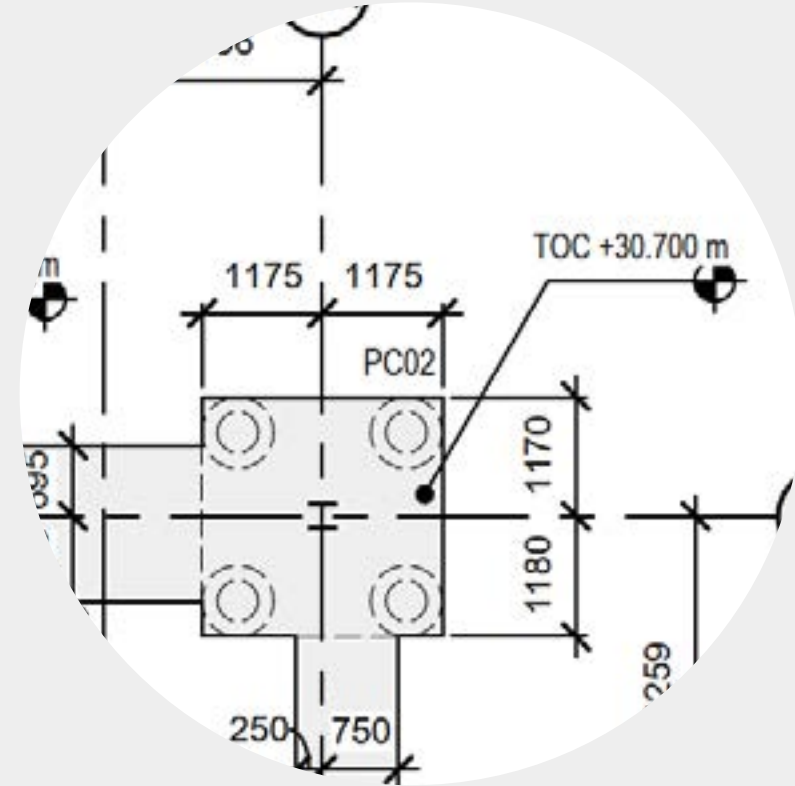
- 300/600mm up to 1200kN (SLS)
- 400/700mm up to 2400kN (SLS)
- Depths up to 26m



CHD PILES

THE DESIGN

- Layout standard 3d
- Based on nominal diameter
- 300/600mm spacing = 1350mm
- 400/700mm spacing = 1550mm
- 300/600mm equivalent to 450mm CFA
- 400/700mm equivalent to 600mm CFA

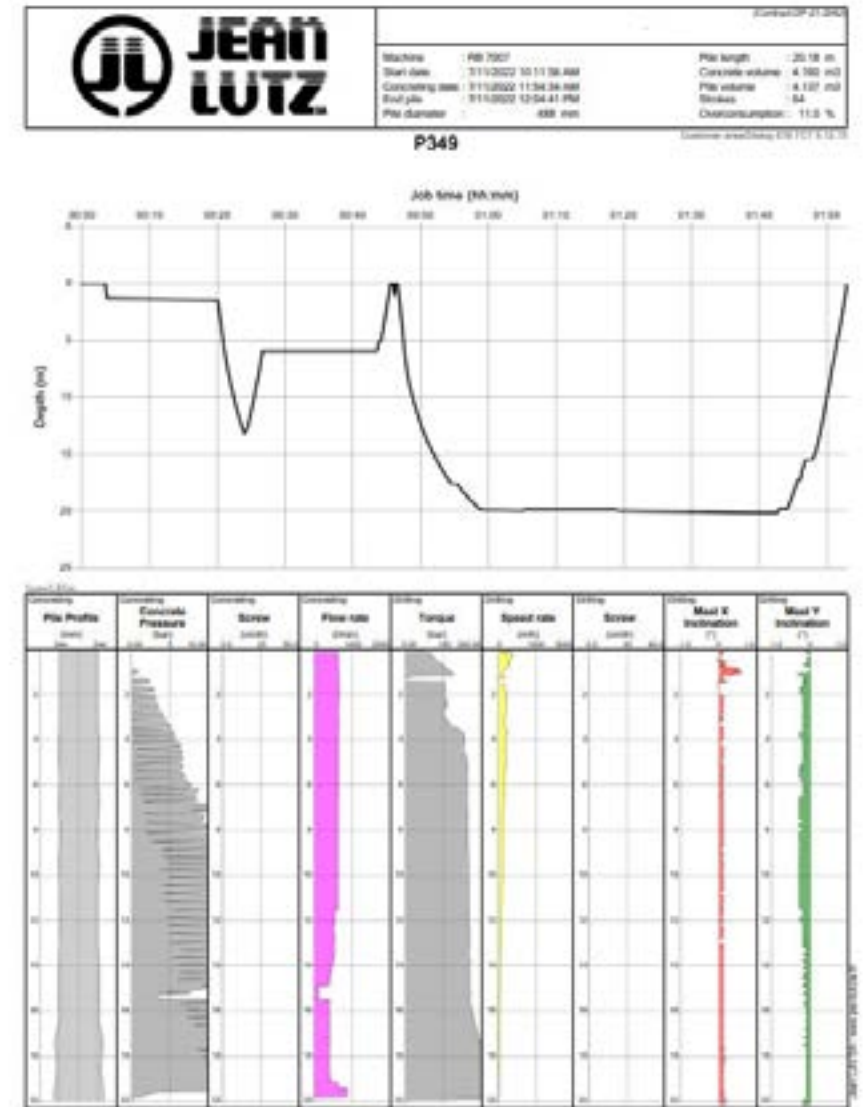
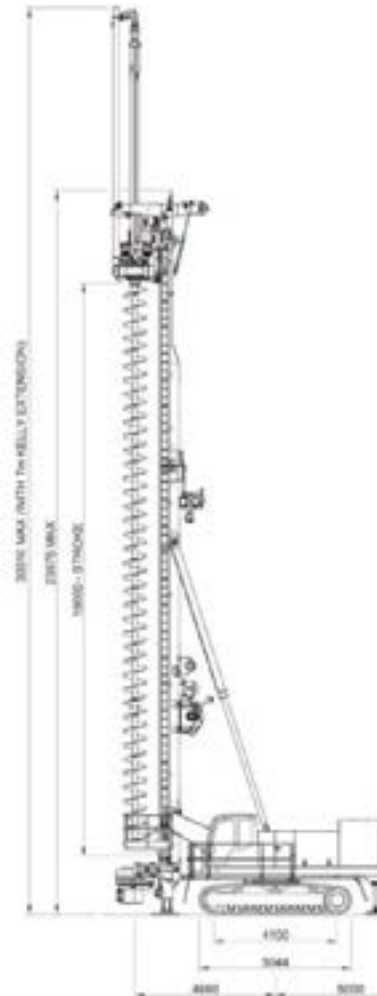


CHD – Ground Conditions



CHD PILES THE RIGS

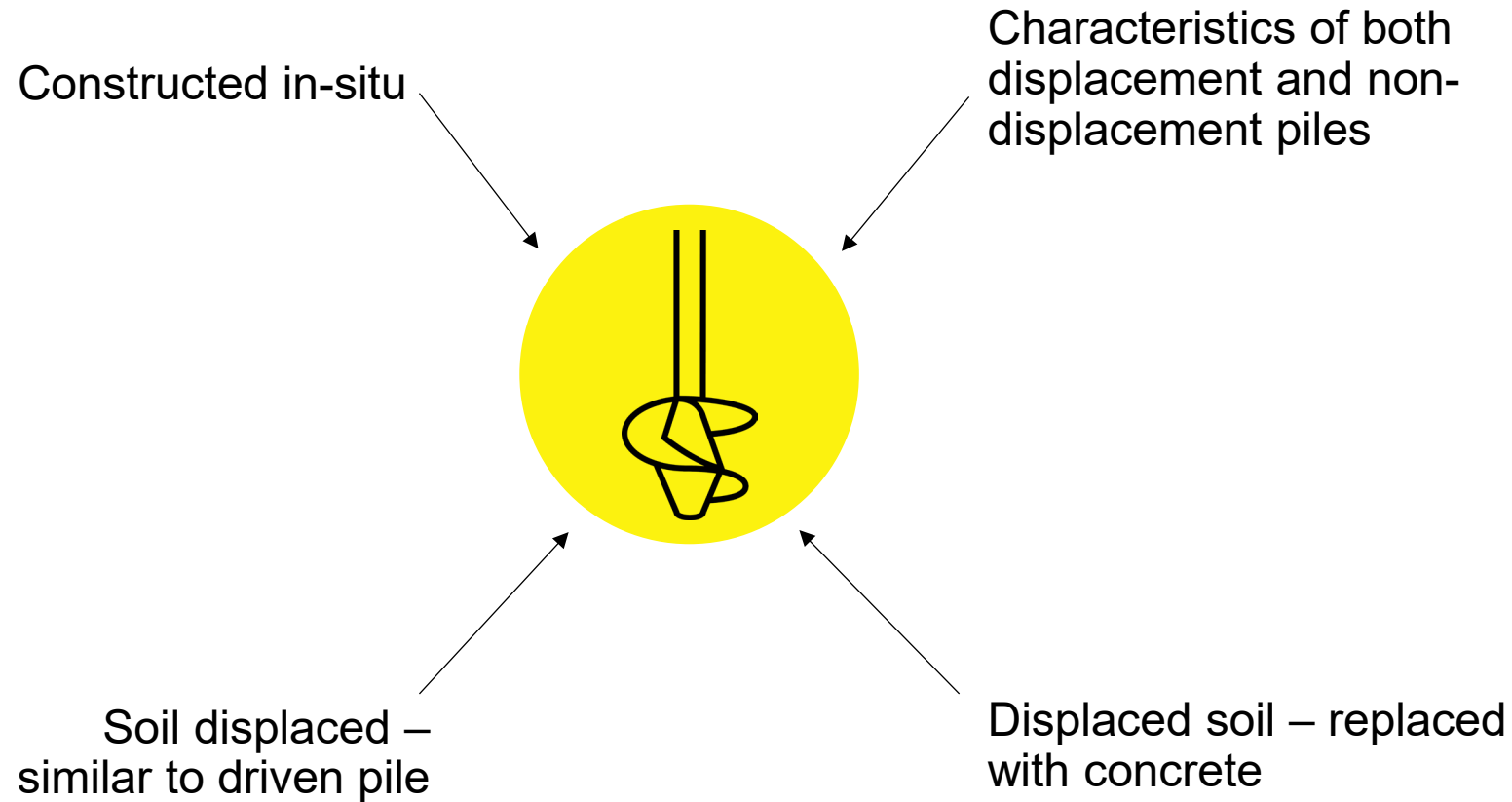
- In house designed
- Fully computerised installation
- Capable of CHD and CFA



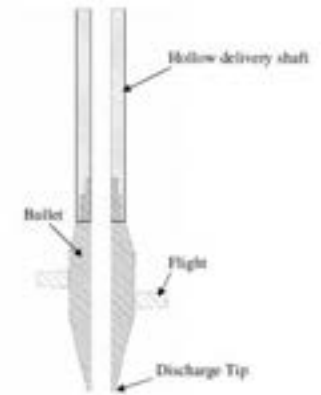
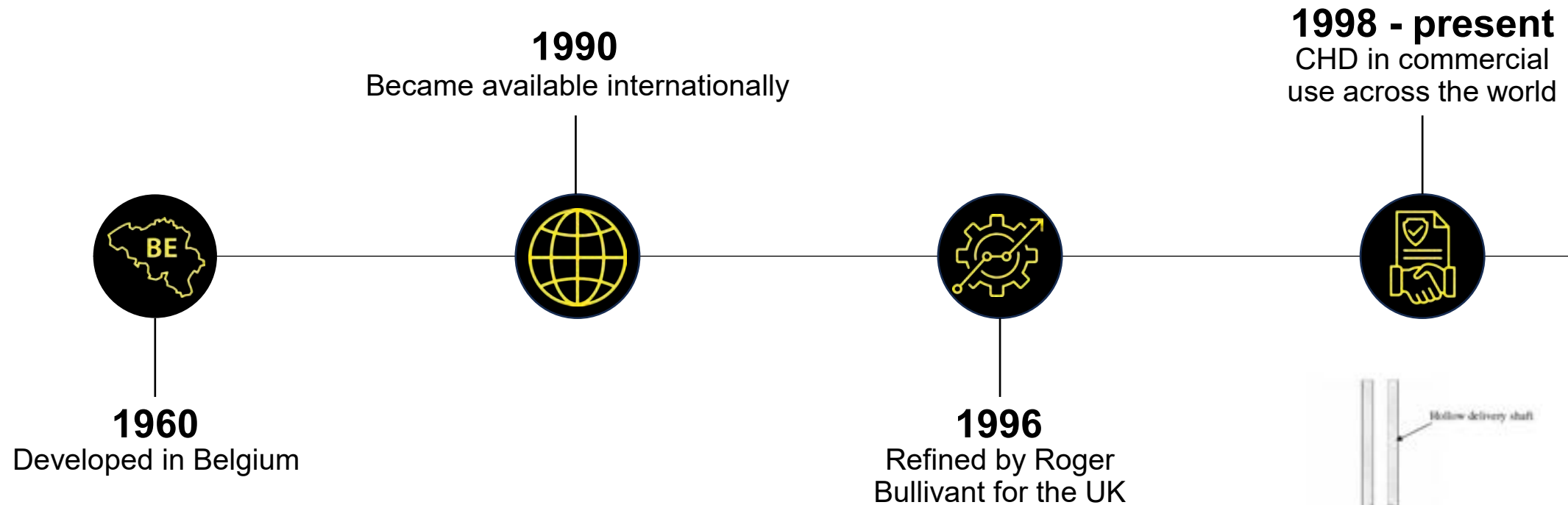
The History



AUGERED DISPLACEMENT PILES



AUGERED DISPLACEMENT PILES



CHD PILES

THE FACTS



CHD is exceedingly efficient in load carrying.



It has been in commercial use for over 25 years.



Numerous, award-winning scientific papers explore the design and installation of the method over that time.



Settlements are no more than other methods of piling.



Significant time savings can be made due to shorter piles.



Carbon emissions per tonne are half those CFA piles.



Minimal arisings benefit the environment and reduce further transport emissions.

Case Studies



CASE STUDY

UNION PARK, HAYES, UK



CASE STUDY

UNION PARK, HAYES, UK



Project Overview

- Ark Data Centre
- £600m investment
- Sustainable
- Renewable Energy
- Perfect Fit
- Reduced Concrete
- Saving eCO₂

CASE STUDY

UNION PARK, HAYES, UK



Project Overview

- Ark Data Centre
- £600m investment
- Sustainable
- Renewable Energy
- Perfect Fit
- Reduced Concrete
- Saving eCO₂



Ground Conditions & Design

- London Clay
- 2,900 nr piles
- 300/600 & 400/700
- <2400kN
- 75kN shear
- <23m

CASE STUDY

UNION PARK, HAYES, UK



Project Overview

- Ark Data Centre
- £600m investment
- Sustainable
- Renewable Energy
- Perfect Fit
- Reduced Concrete
- Saving eCO₂



Ground Conditions & Design

- London Clay
- 2,900 nr CHD piles
- 300/600 & 400/700
- <2400kN
- 75kN shear
- <23m
- 458 nr Secant piles
- <8.0m & 13.5m



Environmental Impact

Concrete:

- CFA 10m³ per pile
- CHD 4.4m³ per pile
- Saving 16,800m³
- Saving 3,600t CO₂
- Saving 33,000t waste (spoil)

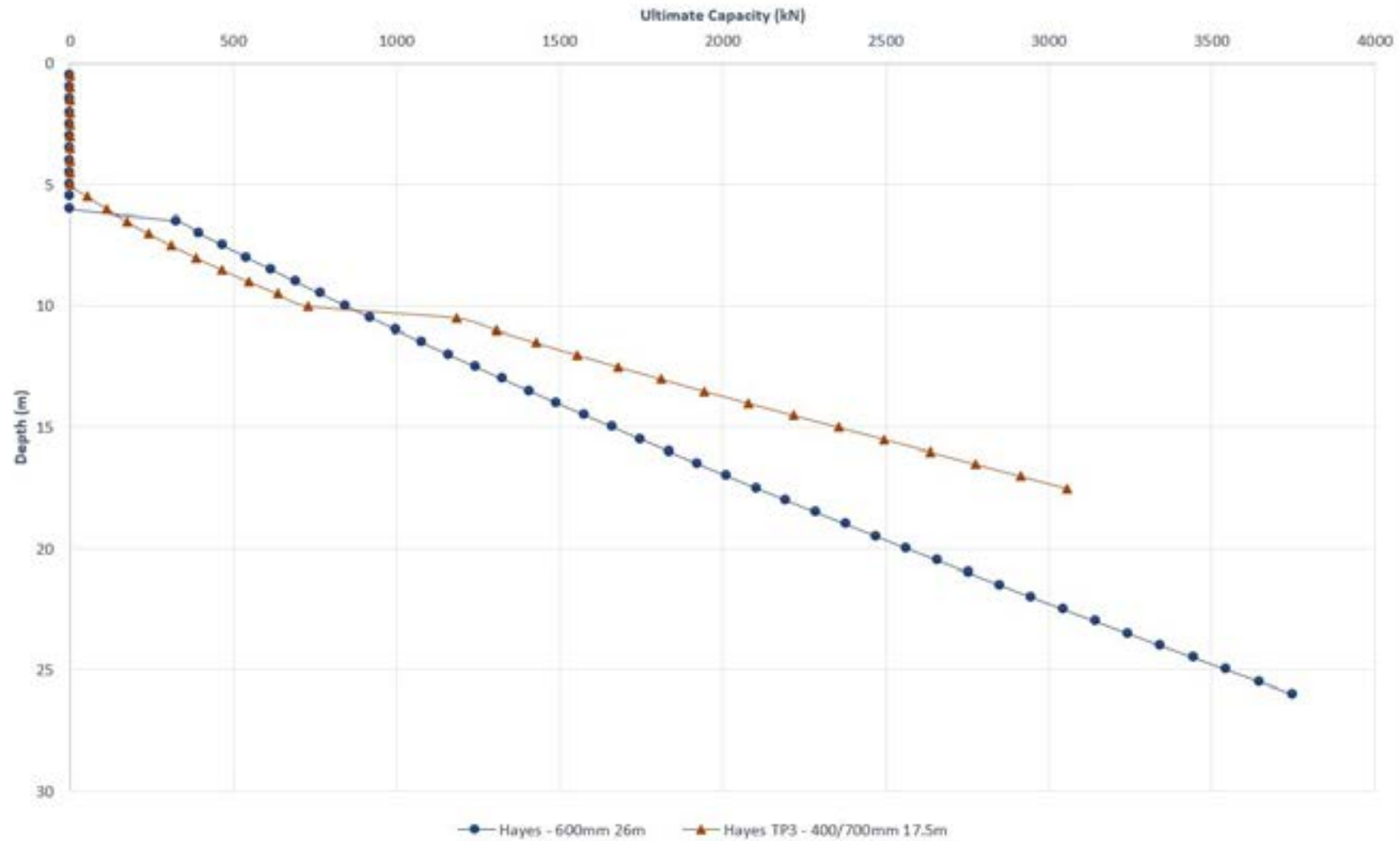
CASE STUDY

UNION PARK, HAYES, UK

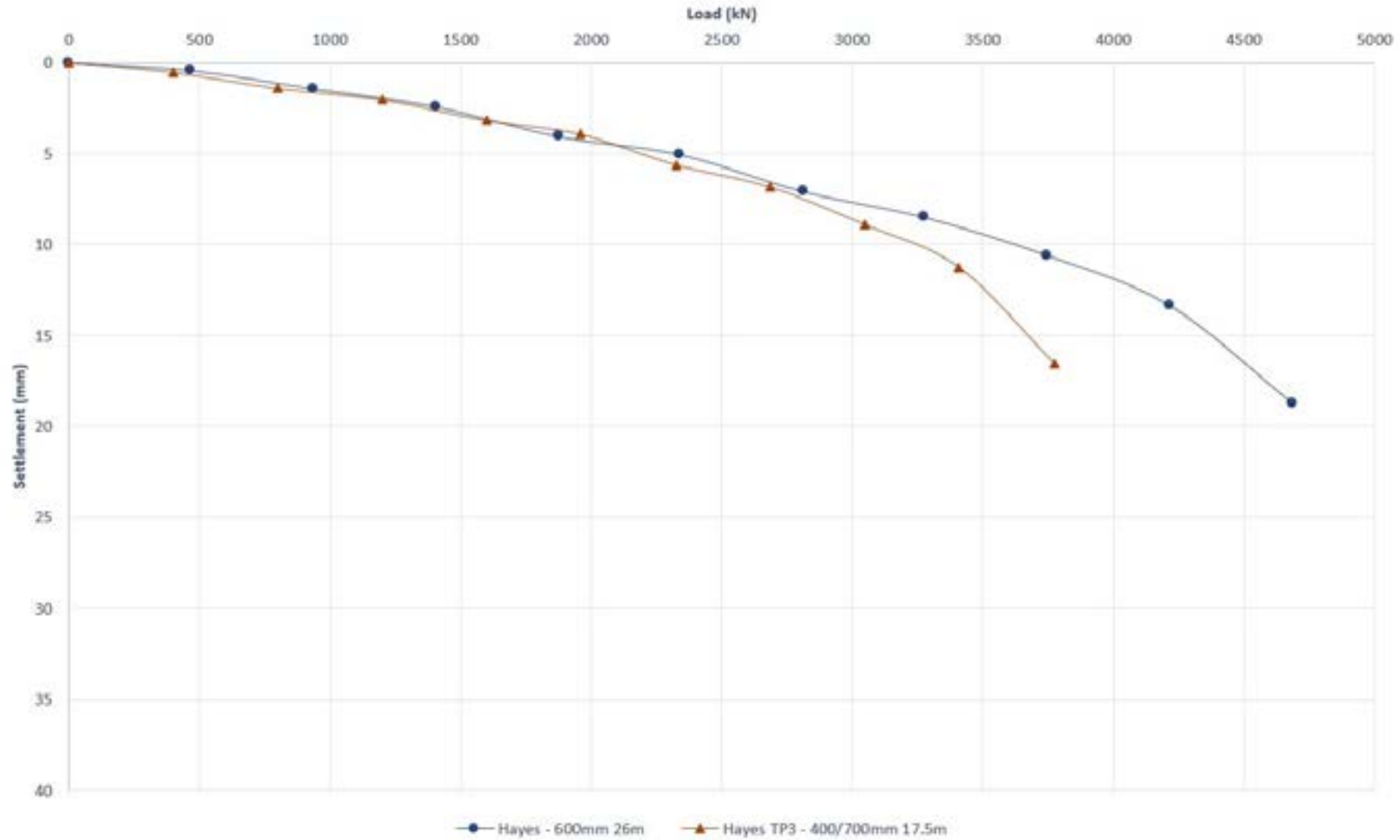
- Over consolidated London Clay
- 400/700mm CHD
- 600mm CFA
- Two piles – similar capacity
- CHD 17.5m
- CFA 26m
- Thames Water Asset
- Same Rig

IGE		Sonic Borehole Log		Borehole No. BH06	
Suite 4, 14-22 Hewitt St, Manchester, M15 4GB email: contact@igeconsulting.co.uk web: www.igeconsulting.co.uk tel: 0161 237 9310		ver: 1.0		Sheet 1 of 2	
Project Name: Hayes		Co-ords:	510483E - 179189N	Project No. 3249	
Location: London		Level (m AOD):	29.90	Logged By AJ	
Client: Paragon Building Consultancy Ltd		Date:	22/01/2020	Checked By AL	
Weather:		Cold and dry			
Mud / Starts	Water / Stops	Sample and In Situ Testing			Stratum Description
		Depth (m)	Type	Results	
		0.00			0.00 29.90
		0.30			0.30 29.60
					1.80 28.10
		3.00	SPT	N=1 (1.00, 1.0, 0)	3.00 26.90
		4.80		HVP=93	4.75 25.15
		5.00		HVP=108	
		5.20		HVP=108	
		5.40		HVP=102	
		5.60		HVP=102	
		6.00 - 6.45	UT		
		6.00		HVP=92	
		6.20		HVP=78	
		6.40		HVP=84	
		6.60		HVP=88	
		6.80		HVP=92	
		7.00		HVP=99	
		7.30		HVP=101	
		7.50		HVP=103	
		7.60			

Static Pile Design



Maintained Load Test



CASE STUDY

ORBISTON COMMUNITY HUB

Client: Morgan Sindall

Client requirements: Tender design 600mm dia CFA piles to 16m

Expertise: RBL proposed 300/600mm and 400/700mm CHD piles to 8m

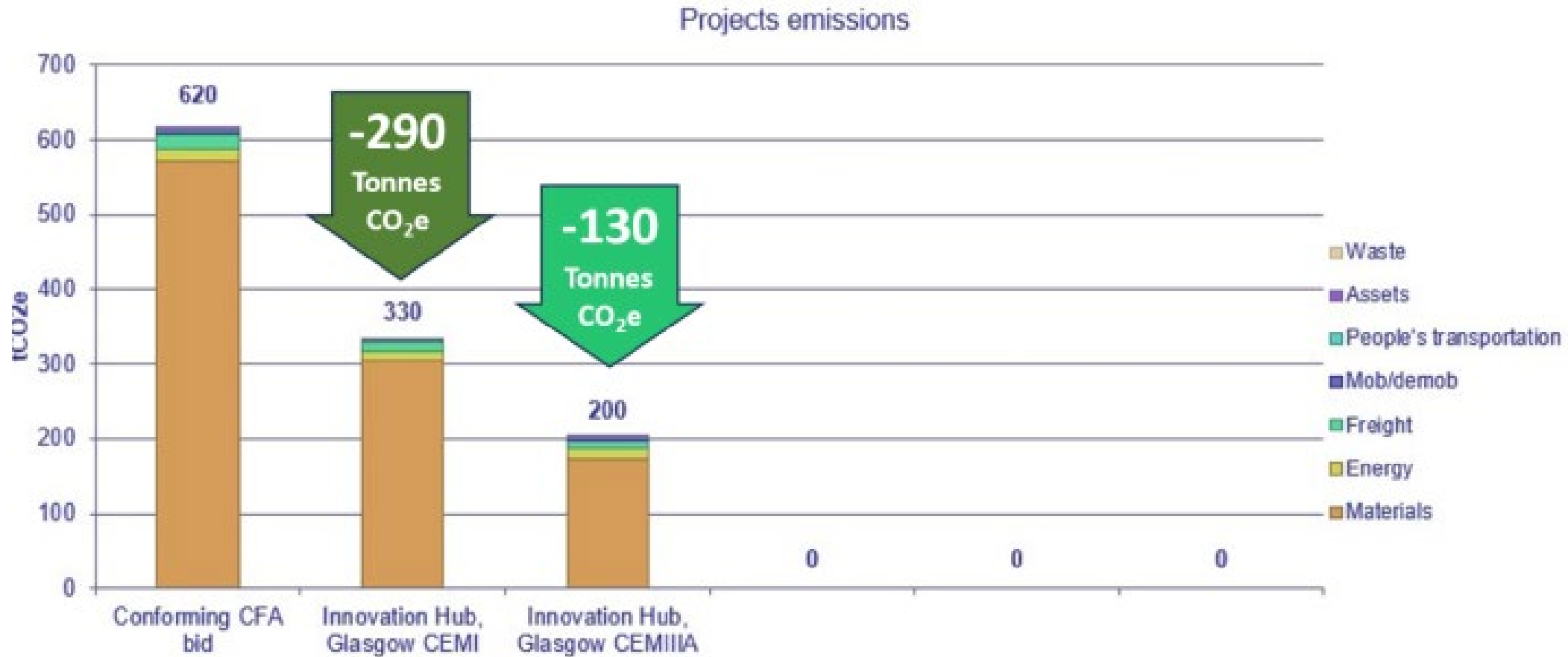
Sustainability benefits: Replaced up to 70% of Portland Cement (CEMI) in the original concrete mix with Ground Granulated Blast Furnace Slag (GGBS)

Benefit to client: Reduction of 420 tCO₂e, no spoil to remove from site & cost savings.



ORBISTON COMMUNITY HUB

VALUE ENGINEERING



CASE STUDY

ARUNDEL, WEST SUSSEX

Client: Oakland Homes

Client requirements: Tender design 450mm dia CFA piles to 25m
Former gas works with contamination.

Expertise: RBL proposed 300/600mm and 400/700mm CHD piles to 17m

Sustainability benefits: Replaced up to 70% of Portland Cement (CEMI) in the original concrete mix with Ground Granulated Blast Furnace Slag (GGBS)

Benefit to client: Reduction of 130 tCO₂e, no spoil to remove from site & cost savings.



ARUNDEL, WEST SUSSEX

VALUE ENGINEERING

Projects emissions

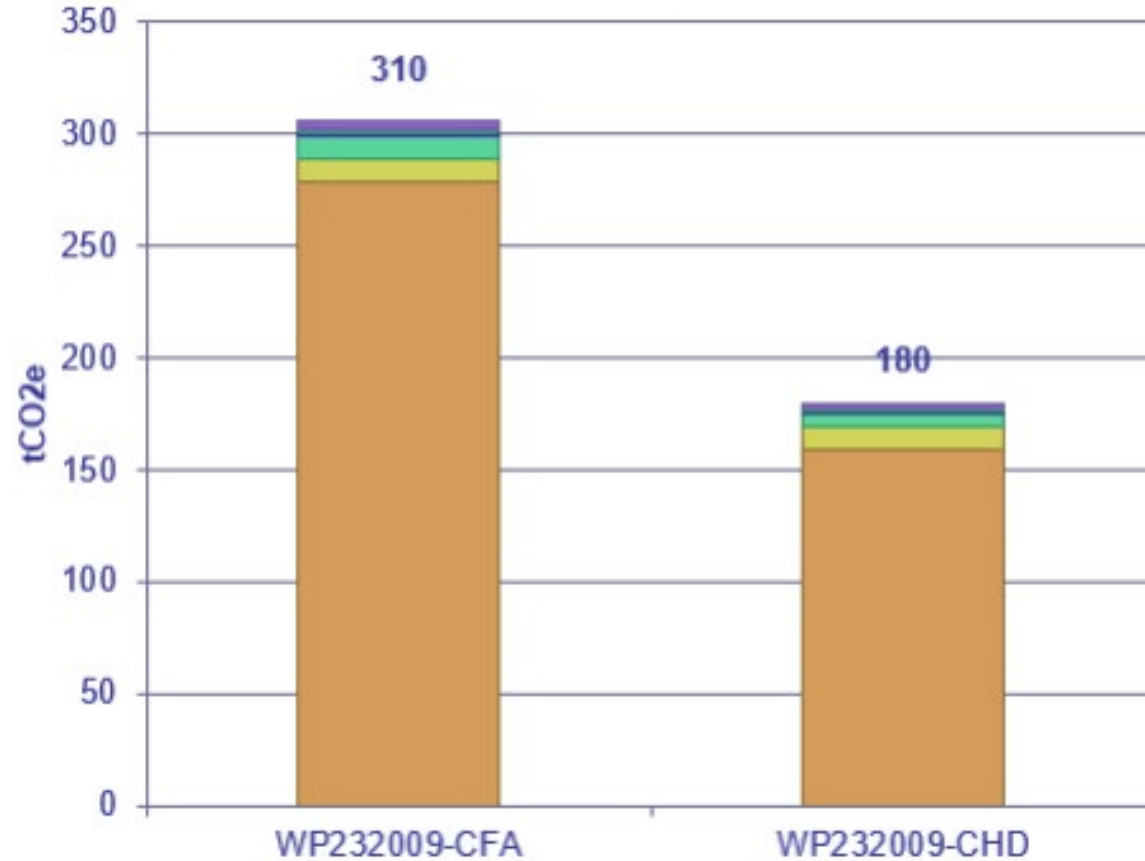


Table 1. CHD vs CFA Comparison

	CHD (300/600mm)	CFA (450mm)
Pile Depth (max)	17.0m	25.0m
Project Duration	12 days	17 days
Spoil Disposal	Minimum to none	737 m3
CO ₂ Footprint	180 tCO ₂ e	310 tCO ₂ e

Let's Recap!



FAQS

ABOUT CHD

? *Is CHD suitable for contaminated sites?*

FAQS

ABOUT CHD

 *Is CHD suitable for contaminated sites?*

Yes – less materials are bought to the surface making it ideal for brownfield and environmentally sensitive sites.



FAQS

ABOUT CHD



Can CHD piling support high loads?

FAQS

ABOUT CHD



Can CHD piling support high loads?

Yes, CHD piles can support up to 2,400kN.



FAQS

ABOUT CHD

? *Does CHD work in all ground conditions?*

FAQS

ABOUT CHD

 *Does CHD work in all ground conditions?*

No, CHD piles are ideally used in soft, firm and stiff clays and loose and medium dense silt and sands.

However, we do offer pre-boring for more challenging ground conditions.



FAQS

ABOUT CHD



Does CHD piling cause vibration and/or noise?

FAQS

ABOUT CHD

? *Does CHD piling cause vibration and/or noise?*

Virtually vibration free and low noise making it suitable for urban environments and sensitive sites.



CHD PILES

THE BENEFITS



Sustainable alternative to CFA



CHD PILES

THE BENEFITS



Sustainable alternative to CFA



Cost-effective solution



CHD PILES

THE BENEFITS



Sustainable alternative to CFA



Cost-effective solution



Minimal spoil



CHD PILES

THE BENEFITS



Sustainable alternative to CFA



Cost-effective solution



Minimal spoil



Ideal for contaminated ground



CHD PILES

THE BENEFITS



Sustainable alternative to CFA



Cost-effective solution



Minimal spoil



Ideal for contaminated ground



Improved soil strength



CHD PILES

THE BENEFITS



Sustainable alternative to CFA



Cost-effective solution



Minimal spoil



Ideal for contaminated ground



Improved soil strength



Minimal vibration



ROGER BULLIVANT

CHD PILES

THE BENEFITS



Sustainable alternative to CFA



Cost-effective solution



Minimal spoil



Ideal for contaminated ground



Improved soil strength



Minimal vibration



Low carbon concrete



CHD PILES

THE BENEFITS



Sustainable alternative to CFA



Cost-effective solution



Minimal spoil



Ideal for contaminated ground



Improved soil strength



Minimal vibration



Low carbon concrete



Can be used for cohesive & non-cohesive soils



Q&A

