

Foundation Engineering





#### 2018 Owen McVerry / Andrew Wandless

# Piling & Foundation Engineering

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- 01 About Roger Bullivant Limited
- **02** Selecting Foundation Types for Your Project
- 03 Piling Techniques
- 04 RB Precast Modular Foundation
- **05** Ground Improvement & Working Platforms
- 06 Case Studies & Summary

07 Questions



# Local Knowledge - International Expertise









# **Foundation Solutions**

- Cast In-situ Piling
- Restricted Access
- Driven Piling
- Ground Improvement
- Precast Beam Packages





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# **Piling Techniques**

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# Piling

#### **Displacement Piles**

- Preformed Steel or Concrete
- In-situ Concrete
- Vibro Stone Columns

### **Replacement Piles**

In-situ Concrete











### **Driven Precast Concrete Piling**







CAST INSITU CHD PILES

DRIVEN PRECAST CONCRETE PILES

DRIVEN STEEL TUBULAR PILES RBCAST INSITUCOMBIPILECFA PILES









# **Driven Tubular Steel Piling / Combi Pile**









**DRIVEN PRECAST CONCRETE PILES** 

**DRIVEN STEEL TUBULAR PILES** 

RB **CAST INSITU** COMBIPILE

**CFA PILES** 











# **CFA** Piling



RB

COMBIPILE







DRIVEN PRECAST DRIVI CONCRETE PILES TUBU

DRIVEN STEEL TUBULAR PILES CAST INSITU CFA PILES CAST INSITU CHD PILES











# **CHD** Piling



RB





**DRIVEN STEEL TUBULAR PILES** 

**CAST INSITU** COMBIPILE **CFA PILES** 

**CAST INSITU CHD PILES** 











# **Restricted Access Piling**









MINI-PILING SFA MINI-PILING DRIVEN UNDERPINNING









# **Pile Testing**

Static Maintained Load

SETTLEMENT

- Kentledge
- Reaction

#### **Dynamic Load**

Integrity





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# **Foundations**















# **Precast Modular Foundation**

- Compliments piling system
- Stock beam lengths
- Short lead time
- Off site factory quality
- Full setting out and as-built checks included

• Dedicated design teams





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# **Ground Improvement** & Working Platforms

















### **Vibro Stone Columns**







DYNAMIC COMPACTION













## **Dynamic Compaction**







VIBRO STONE COLUMNS DYNAMIC COMPACTION





# **Working Platforms – The Problem**

# 'One third of accidents in the piling industry result from defects in the working platform'

PILING AND FOUNDATION SPECIALISTS FEDERATION (PFSF)





Productivity

### **Working Platforms – Design Procedure**

BRE 470 – 'Working Platforms For Tracked Plant'

- Ground Conditions
- Rig Loadings
- Platform Strength

	Rig Waterfacturer :	ROSER BULLIVANT	Rin Type :	5063 to 5021		
		Operation mode	C Driven Filing			
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# **Working Platforms – Installation & Maintenance**

Working Platform Design & Specification

Often the responsibility of the Principal Contractor

- Ground Preparation
- Check for Soft Spots or Voids
- Selection and Placement of Platform Material
- Post Installation Testing
- Monitor, Maintain and Repair

Piling Contractor will require a permit – FPS Certificate











# **Research & Development**

- Remote data collection
- Size and Weight
- Efficiency
- Compliance
- Reliability







### **Case Studies**











# Residential

- Former Strathclyde Hospital, Motherwell
- Bellway Homes
- 62 No. Units
- 1260 No. Driven Precast Piles
- 5300 Lm Precast Ground Beams

















- Hawkhead Road, Paisley
- Redevelopment of the 64 acre former BASF facility site
- 7,999 No. Vibro Stone Columns
- 43,740 Lm VSC
- 370 No. Driven Precast
   Concrete Piles
- 5,500 Lm PCC
- 236 No. Units



















# Residential

- Waterfront Plaza, Leith
- Apartments and housing

- 1220 No. Driven Tubular Steel Piles
- 600kN / 300kN Compression
- Piles pre-bored through historic relic using rotary percussive drilling system
- Heavy restrictions due to neighbouring Ocean Terminal Centre

















- Partickhill Road, Glasgow
- Westpoint Homes Limited
- 400kN / 700kN Compression
- 356 No 300/600mm CHD piles
- Design depth 6.0m 9.0m























- Queen St Station Redevelopment, Glasgow
- Balfour Beatty Civil Engineering Limited
- Accommodation Block / Internal Works / Rail Possessions
- 323 / 240mm dia Drill and Cased mini-piles
- Eurocode 7 Design
- Station to remain fully live

and operational throughout

works



# **Balfour Beatty**













- Premier Inn, Howard Street, Glasgow
- Ogilvie Construction Scotland
- 223 No. CHD piles plus 20 No. Ischebeck micro-piles
- Piles in close proximity to SPT subway tunnels
- Stringent noise, movement, dust and vibration limits
- Preliminary test piles for SPT approval























- Golden Jubilee Hospital Ophthalmology Unit
- 177 No. 300/600mm dia CHD piles for max SWL = 600kN
- Extensive experience working in the area / Clyde-side
- Piling technique adopted to ensure minimal disturbance
- Specialised hot water concrete mix for cold weather working









### **Further Examples Available on our Website**





### A Concrete Production...

