

## CASE STUDY

# Taylormade Timber, Durham



## COMMERCIAL

### CLIENT

David Hardie Engineering

### SCOPE OF WORKS

**Multi piling techniques:  
CFA Piles  
Driven Precast Concrete  
Piles**

### Project Brief

RBL North East was engaged by David Hardie Engineering to design and deliver a bespoke piled foundation solution for the new sawmill unit, retaining wall, and office facilities at the Taylormade Timber processing site in Durham.

The foundation system was developed to accommodate the structural requirements of the project. The RBL team submitted designs for both Driven Precast Concrete Piles and Continuous Flight Auger (CFA) Piles, tailored to support the different structures.

The piling layout featured a large floor slab area with varying loading conditions, and pile caps tied together by ground beams to provide support for the steel frame of the sawmill. In addition, larger piled bases were designed for the retaining wall and adjacent office buildings to ensure stability and durability. This comprehensive solution aimed to meet the structural demands of the facility whilst optimising efficiency and cost-effectiveness for the client.



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## Key Issues & Requirements

- ▶ **Phased Construction and Multiple Rig Mobilisations:** Due to the complexity and scale of the project, the work was divided into multiple phases, requiring the careful coordination of several rig mobilisations. The RBL 5500 series rigs can be delivered, offloaded and rigged in less than an hour making multiple rig mobilisation a preferred option. This phased approach was essential to ensure that piling operations did not disrupt other trades or the overall construction timeline. Each mobilisation had to align with the broader project schedule, ensuring efficient transitions between phases and maintaining momentum on site.
- ▶ **Complex Ground Conditions:** The site presented ground conditions, consisting of made ground overlaying drift deposits generally consisting of firm to stiff clays, with significant areas of cut and fill required across the site. This geotechnical profile required careful consideration in designing the piled foundation system to ensure structural stability.

## Solutions

- ▶ **Deployment of Advanced Piling Rigs:** RBL deployed two of its 5500 series driven rigs to install Driven Precast Concrete Piles, ensuring they reached depths ranging from 10.5m to 17.5m. In addition, a Geax EK110 CFA rig was mobilised to install 450mm dia CFA piles, achieving depths of 7m to 11m. These rigs allowed RBL to efficiently change pile types across the site, adapting to varying ground conditions and structural demands.
- ▶ **Collaborative Design and Value Engineering:** Given the broad range of pile loads beneath the proposed slabs and column bases, the team worked closely with the principal designers to refine and optimise the foundation scheme. This collaboration involved careful value engineering to align the pile design loads with the project's loading criteria, resulting in optimised pile spacing.
- ▶ **Compliance with Eurocode Standards:** All piles were designed and executed in accordance with Eurocode standards. For the precast piles supporting the portal frame columns, the design accommodated maximum design actions of over 850kN DA1C2 compression, over 115kN DA1C1 horizontal load, and 10kN DA1C1 tension.
- ▶ **Comprehensive Testing and Validation:** To ensure the reliability of the design, working static tests were conducted on the working piles, and uplift pull-out testing was performed on a selection of piles. All test results successfully demonstrated compliance with the project's design and specifications, validating the effectiveness and quality of the foundation solution.
- ▶ **Tailored Solutions for Varied Structural Requirements:** RBL's ability to offer a combination of piling solutions proved essential for accommodating the diverse structural elements of the project. The mixture of steel-framed structures, retaining walls, and office facilities required distinct foundation approaches, and RBL's expertise enabled a seamless integration of precast and CFA piling techniques tailored to the specific load demands of each element.



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## Solutions

- ▶ **Showcasing Multidisciplinary Ground Engineering Expertise:** This project demonstrated the advantages of working with a multidisciplinary ground engineering specialist like RBL. By leveraging a wide range of expertise and equipment, RBL was able to deliver a tailored foundation solution, overcoming site challenges while optimising efficiency, sustainability, and cost.



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