



RBL Project No.: PN2400279373
ISSUE: 001
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Piling Method Risk Assessment
FOR
Sandycroft Projects Ltd
AT
Acacia Avenue Port Talbot



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1. Executive Summary

This document aims to explain the installation process and benefits of bottom driven steel cased mini piles and why this technique was selected as the most appropriate for the site in Accacia Avenue.

Bottom Driven Mini Piles serve as a strategic solution tailored for projects facing challenging ground conditions and spatial constraints. These piles are specifically designed to excel in scenarios where traditional deep foundations are unfeasible or impractical, typically due to restricted access or poor ground conditions.

One of the primary applications of Bottom Driven Mini Piles is within restricted areas, where space limitations pose significant challenges to conventional construction methods. The compact rig size and efficient installation process make them well-suited for deployment in confined spaces such as urban environments, in and around buildings and structures, or areas with limited manoeuvrability and headroom for heavy machinery.

Furthermore, Bottom Driven Mini Piles are particularly effective in addressing poor ground conditions, where unstable or weak soil compositions may be prone to over-flighting where traditional bored piles undermine the ground by taking out too much of the existing ground.

The versatility of Bottom Driven Mini Piles extends to various construction projects, including residential, commercial, and infrastructure developments. Whether used for building foundations, retaining walls, or other structural elements, these piles offer a dependable and cost-effective solution for enhancing the stability and longevity of construction projects.

			  		
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2. Installation Process

The installation process of closed-ended thin-walled steel tube piles involves a series of steps designed to ensure structural integrity and stability. This technique offers numerous advantages over traditional piling methods, making it a preferred choice for projects requiring reliable foundation support.

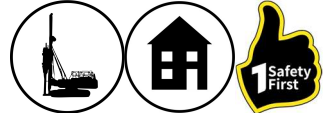
Initially, a closed-ended thin-walled steel tube is driven into the ground using an internal drop hammer. A dry concrete plug is placed at the bottom of the tube. This serves as a solid base for the internal drop weight to land on and helps prevent soil from entering the tube during installation. The lengths of these tubes typically range between 2 meters and 6 meters, depending on project specifications and soil conditions. As the tube is driven into the ground, it displaces the soil, creating a borehole.

Additional tubes are added using full but non-structural fillet welds as the installation progresses, ensuring a secure and seamless connection between sections, and preventing the ingress of water where present.

As the pile is driven deeper into the ground, additional sections of tube are added as needed until the pile reaches the predetermined set penetration or design length criteria. At this point, the tube is filled with high slump concrete or grout to provide the structural capability and stability.

Finally, a single reinforcement bar or cage is inserted into the filled tube to enhance its structural capacity. This additional reinforcement helps distribute loads throughout the pile, improving its overall performance and longevity.

Link to a video illustrating the technique

					
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<https://www.youtube.com/watch?v=6ua3sCSXrWA>



2. Advantages of the bottom driven piling technique for this project

This piling technique offers a multitude of benefits over other piling and ground improvement techniques, some benefits include;

- ☐ Small lightweight plant
- ☐ Deliveries on small rigid vehicles, no need for low loaders or articulated lorries
- ☐ Engine can be remote from the rig and sited away from neighbouring properties
- ☐ Pile is driven from its base internally reducing noise and vibration
- ☐ All piles filled at once therefore less deliveries are required
- ☐ Once established only one van movement per day
- ☐ No spoil to remove off site

			  		
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3. Specific Concerns

- Piling options. - A mini piling technique was selected due to the site constraints, in particular being located close to residential properties.
- Types of piling works – Alternatives such as precast piling and CFA would involve for more vehicle movements and greater noise levels which would potentially generate objections from the residents. The type of pile proposed is regularly used on domestic extensions so is proven to be sympathetic to the general public.
- Locations of the piling works being undertaken on site. Piling will be undertaken on the west side of the site, furthest away from the houses
- Targets noise levels. Anticipated noise levels will be <75dBA at source
- Proposed methods of noise and vibration mitigation. The rig is powered by a 3 cylinder Hatz silenced engine and produces similar noise levels to a 1T mini excavator so in construction terms is one of the quietest machines available. Vibration magnitudes will be minimal as using a bottom driven technique.
- Anticipated duration of the piling works. 1 week
- Hours of work during piling operations. 8.30am – 5.00pm

4. Conclusion

In conclusion based on the above RB consider bottom driven steel tubular piles will provide the best environmental and technical solution for the project.

D. H. Johnson

08.10.25

			  		
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