

MONDI -VUSELELA

Richards Bay, South Africa



Project Facts

Product

Auger Piles, DCIS Piles, SDA Piles

Market

Industrial

Client

Mondi SA (Pty) Ltd

Engineers

Sivest SA (Pty) Ltd

Scope of Works

17 No. 750mm diameter cased auger piles, 470 No. DCIS piles (520-610mm diameter) installed to depths up to 18m, 125 no. micropiles to a maximum depth of 18m.

About the project

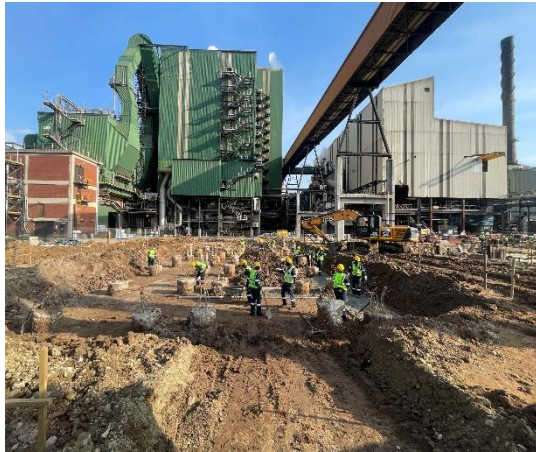
Franki Africa was commissioned by the Mondi Group to deliver foundation works for six new structures at their operational mill, including the Power Boiler, Boiler MCC, Biomass MCC, Biomass Storage, Bag Filter Area, Tank Farm, Conveyor Line to the Boiler, and the Main Pipe Bridge. The works were executed while the plant remained fully operational on a 24-hour schedule, requiring strict control over settlement, vibration levels, and headroom due to the presence of sensitive equipment.

The site geology consisted of saturated, unconsolidated clayey sands overlying very soft Cretaceous siltstone at depths of 22–26 m, with groundwater encountered as shallow as 2–3 m. These conditions made open-hole piling unfeasible and demanded a tailored foundation solution that balanced performance, safety, and constructability.

Challenges

The combination of weak geological layers, shallow groundwater, and strict operational constraints created a complex working environment. Sensitive equipment in both the new extension areas and the existing plant required extremely tight settlement and vibration limits that many conventional piling methods could not meet. Access and headroom restrictions imposed further limitations on equipment selection and construction sequencing.

The demanding operational environment of an active 24-hour mill also required rigorous safety, document control, and coordination with multiple



stakeholders. Ensuring compliance, managing vibration effects, achieving consistent pile performance, and maintaining programme continuity across multiple structures were central challenges throughout the project.

• **Solution**

Franki Africa designed a hybrid foundation system combining Large Diameter Temporary Cased Auger piles, Driven Cast In Situ (DCIS) piles, and Self-Drilling Anchor (SDA) piles, each selected to suit specific geotechnical conditions and structural requirements. Auger piles were socketed into the underlying siltstone to control settlement, DCIS piles provided reliable load transfer in medium-dense soils, and SDA piles offered efficient installation in constrained locations, with depths of up to 15 m.

Comprehensive settlement analyses and 3D finite element modelling were carried out to confirm load-bearing capacity and predict performance across all pile types. The observational method was used throughout construction, supported by rock logging, point load testing, and continuous on-site engineering oversight. Predrilling and vibration monitoring ensured compliance with vibration limits, while close monitoring of SDA drilling rates ensured the required grout body expansion.

Static pile load testing was performed on floating DCIS piles to verify performance relative to the socketed Auger piles, and dynamic load testing provided an economical means of confirming consistency across the system. Together, these verification methods ensured full compliance with settlement and vibration criteria.

Despite the operational complexities, the project was successfully executed under a 24-hour construction schedule, enabling simultaneous progress on multiple structures. Delivered through strong collaboration between the client, consulting engineers, and site teams, the foundation system provided Mondi with a robust, innovative, and fully compliant solution.