

Civil Engineering

Design and Build

MARCHWOOD, SOUTHAMPTON, UK



Waste to Energy Plant, Foundations, Bunker Excavation and Reinforced Concrete Works

Introduction

As part of the Hampshire Waste Services waste management initiative a Waste to Energy Plant is being constructed at Marchwood, just outside Southampton in Southern England.

Bachy Soletanche was employed to develop, design and construct an economic solution to the overall foundations and below ground bunker structure. This had to be achieved within a very restricted programme.

The main bunker works comprise a 45.65m long x 14.3m wide and 13m deep shaft structure located in the centre of the future Incineration / Power Plant.

Ground Conditions

The site is located on the area of a previous power station. The ground consisted of made ground overlying very soft clayey, sandy silt alluvium with peat and below this, dense clayey silty sands. Groundwater was encountered between 2 and 3.5m below the existing ground surface.



CLIENT:	Hampshire Waste Services Limited
MAIN CONTRACTOR:	CNIM
CONSULTING ENGINEER:	Mott MacDonald
DURATION OF WORKS:	35 weeks

WORKS QUANTITIES

CFA Piles	872 N°. 300mm to 750mm diameter
Diaphragm wall	2605 m ² of 1m thick wall 20.5m depth
Excavation & propping	8682 m ³ excavation & 300 T props
Temporary Dewatering	4 N°. internal wells & 200mm drainage layer
Civil RC concrete works	1984 m ³ RC structures



Design

The design of the overall bunker package has been optimised by BSL to allow excavation to -13.3m with a single level of temporary propping at -6m. The final support for the bunker walls are given by the base slab and capping beam. The capping beam tie back system allows the top of the wall to be anchored back to a 750mm piled raft on one side and pairs of 750mm piles under the tipping ramp.

To enable the bunker to be excavated temporary dewatering wells were installed and kept running until completion of the base slab.

Of particular note is the use of a proprietary walling / propping system which has allowed savings in time and cost.



Bunker Structure - Diaphragm Wall construction, grab excavation progress

Summary

In conclusion the benefits offered by a single multi-disciplinary contractor have allowed a flexible and value engineered strategy to be provided.

This has allowed optimisation of the diaphragm wall design using the overall structure and associated civil works to achieve the most economical solution to the client.



Bunker Structure - Tipping ramp construction in progress / propping installed with bottom up dividing wall in progress