Canvey Island Student Housing

Driving of precast piles for new flats and shops.

AARSLEFF

Property developer Homestead Plc won planning to construct 46 flats and six shops along the seafront esplanade, Canvey Island. Canvey Island has a standard design for all buildings, based on what is called a Canvey raft, with the allowable bearing capacity for foundation design provided by Essex County Council.

However, Homestead's design, which featured shops on the ground floor and a block of flats above, would not allow the load to be spread adequately for a Canvey raft. Typically, there would be a lot of walls on the ground level, which would allow provision for spreading the load and the raft designed in between the walls, but in this instance the ground floor was designed with more columns than walls so a piled solution was called for.

Aarsleff had previously installed a number of very long precast concrete piles for the construction of a nearby school and using this 'local' experience suggested that the piles be much longer than those specified in a preliminary design and feasibility study. Homestead, together with its consulting engineer, Wickford-based John Sime & Associates, confirmed the need for longer piles and Aarsleff won the contract in opentender.

Specifically, borehole data from approximately 200m away from the development was used by Sime & Associates to produce a preliminary design of the foundations and pile loadings which indicated the piles needed to be about 18m in length and subsequently the engineer requested budget prices from four piling contractors to determine if the project was financially viable. With the experience gained piling the nearby Castle View School development, which required 750 piles, at up to 28m in length, Aarsleff suggested pile lengths of 26-28m as the ground, was exceptionally poor. In fact, the engineer confirmed that Aarsleff's suggested pile lengths were much longer than other tenders, but a later borehole sunk on the actual site confirmed the need for the proposed longer piles. A revised tender was issued and Aarsleff was awarded the contract.

On site, works included the installation of 154 precast concrete piles of 250mm square section, which were supplied and manufactured by Centrum, Aarsleff's wholly owned subsidiary, in Newark Nottinghamshire. All piles were between 26m and 28m long and mechanically jointed with a 14m under pile and pin jointed over pile, all in accordance with BS EN 12794 (class 1 A). Using its own Banut 700 rig, Aarsleff drove the piles through layers of alluvium, loose sand and peat, to toe into underlying dense sand and gravel to take the required maximum 475kN working load.

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Scope of Works
154 No. 250mm x 259mm, precast concrete reinforced piles; L 26-28m

Client
Homestead Plc

Equipment
Banut 700

Construction period
July 2011

Aarsleff Ground Engineering Ltd, is the UK trading arm of Danish contracting giant Per Aarsleff A/S, and is one of the UK's leading piling and geotechnical design and installation specialist contractors; actively promoting early consultation to ensure each scheme can be Value Engineered to give clients the best service, quality design, safety and value. Aarsleff's strategy and philosophy of investment into the future has resulted in its wholly owned subsidiary Centrum Pile Ltd having the most advanced precast pile production facilities in the UK, producing segmentally jointed precast concrete piles to BS En12794 to Class 1A.

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