Mersey Gateway Sections
- Bridge Abutments

Driving of vertical and raked precast piles for junction bridge and viaduct.

The Mersey Gateway Project comprises a new six-lane toll bridge passing over the River Mersey, running between the towns of Runcorn and Widnes and will relieve congestion from the Silver Jubilee Bridge. On a wider level, the project includes plans to develop and integrate public transport, cycle and pedestrian links across the Borough of Halton encouraging new and inward investment in the region.

Due to the size, scale and complexity of the project, works were split into sections, with each section having its own construction and consequently foundation demands.

Aarsleff was awarded the contract for piling works on two sections – Ditton Junction Bridge and Widnes Victoria Loops Viaduct. Works on these two sections commenced June 2015, although Aarsleff had been involved with the Mersey Gateway project for over 9 months prior, undertaking a programme of test piling, which was completed December 2014 – January 2015. The Company also assisted in the design of a specific technical solution.

The solution, unique to the UK and the UK driven piling market, involved using a Centrum cage former, as well as the use of ‘raked’ piles for the bridge abutment structures – the latter technique also uncommon to the UK civils sector, though employed widely on the continent. Aarsleff, a European company, was able to call upon the vast experience and technical expertise of the use of these techniques on projects throughout Europe to successfully meet the challenging specification demands set by the designer. The common operating system within its Centrum precast piling factories also facilitates this unique solution to be adopted across the business.

Specifically, the type of cages fabricated for use within the 350mm square sections were completely unique and innovative and required the Company’s ‘A Class’ mechanical locking joint to ensure a robust quality product was supplied for installation. Additionally, each pile cage had a complex internal cage structure which includes a tightly pitched helical and additional 40mm Rebar to withstand the forces being applied to the piles from the overlying structure. All of the pile fabrication solutions were trialled within Aarsleff’s own Centrum manufacturing plant, to ensure compliance with the specification from both a safety and quality perspective.

Foundations for the bridge at Ditton required Aarsleff to install 174-no. 20m long, 350 piles and at Victoria, forming the foundations for the approach viaduct to the new Mersey Bridge some 244-no. 21m long, 350 piles, were installed with work carried out using the Company’s own Junttan PM20s, complete with a high performance 7-tonne and a 5-tonne hammer.

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A challenging project, delivery required accurate and robust planning as well as logistics and thorough communications and planning between all parties involved throughout the project duration.

Speaking about the scheme, Kevin Hague, General Manager for Aarsleff said: "This was an exciting infrastructure project for Aarsleff, as it is an area the Company is looking to develop going forward. It also positions the business to take advantage of future large-scale infrastructure projects such as HS2.

The use of raked precast engineered piles overcame some of the many variable challenges associated with the project, ranging from space restrictions through to contaminated ground. The challenging complexity of the scheme demanded a solutions-based approach, working closely with the client and client’s designer. This approach ultimately outlined Aarsleff’s commitment to producing a number of innovative elements to accommodate the very technical design specification – "Specification for Highway Works."

The project construction works were delivered by a construction joint venture between FCC Construction S.A., Samsung C&T ECUK Limited and Kier Infrastructure and Overseas Limited.

**Scope of Works**
- At Ditton - 174 No. 350mm x 350mm L=20m
- At Victoria - 244 No. 350mm x 350mm L=20m

**Client**
- FCC Construction S.A., Samsung C&T ECUK Limited and Kier Infrastructure and Overseas Limited

**Equipment**
- PM20s with a high performance 7-tonne and a 5-tonne hammer

**Construction period**
- June 2015

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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