

Aeration Tank at Chelmsford STW

Contract No: C738

Client: Skanska Aker Solutions JV

Location: Chelmsford STW, Essex

Value: Approximately £275,000.00

Summary: Design, supply and installation of steel sheet piles to form a permanent aeration tank, including welding of clutches and installation of puddle flange water bar to give a 100% watertight structure.

Sheet Piling (UK) Ltd were employed by Skanska Aker Solutions on behalf of their client Anglian Water for the design and construction of a permanent sheet pile aeration tank cofferdam.

The 55.0m x 15.0m x 3.6m deep tank was originally designed as a conventional reinforced concrete structure requiring sheet piles as temporary earthworks support only. However, SP.UK provided an innovative and alternative permanent sheet pile wall scheme including welded interlocks to give an equivalent of a Grade 2 to 4 structure to BS8102:1990 ie. 100% watertight. This alternative sheet piled tank offered both cost and programme savings. Although this has always been a priority, additional focus on cost has recently been required following OFWAT's recent ruling that Water Company's charges are to be capped. Therefore, all future capital works are now being scrutinised and further savings demanded. SP.UK work closely with clients to ensure the most cost effective and innovative solutions are proposed. Anglian Water requested evidence of previous similar schemes and SP.UK provided details of two such schemes where sheet piles had previously been used as permanent water storage tanks.

The 236 no. NSP.3W x 11.00m long sheet piles were installed using a Bauer Telescopic Leader Rig mounted with a 100te High Frequency Vibrohammer, serviced by a 35te capacity crane. Although 'back-driving' with an impact hammer to gain the required penetration into the dense Gravels and stiff Clays was envisaged, the efficient and powerful vibrohammer proved to be more than capable by itself!

As previously noted, the tank was made watertight using a horizontal steel 'puddle flange' water bar and hydrophilic strip at the mid slab height in conjunction with plated and welded pile interlocks from the base soffit level to the pile head level within the RC capping beam. Due to the client's stringent welding criteria and testing requirements, SP.UK had to produce specific welding procedures which are Lloyd's accredited in order to carry out the works. Welder qualifications, acceptance criteria and testing regimes were also formulated.

The 60 year design life was achieved using sacrificial steel thickness to mitigate the calculated corrosion rates of 0.044mm/yr and 0.012mm/yr for the water and soil faces respectively.

Project Images

