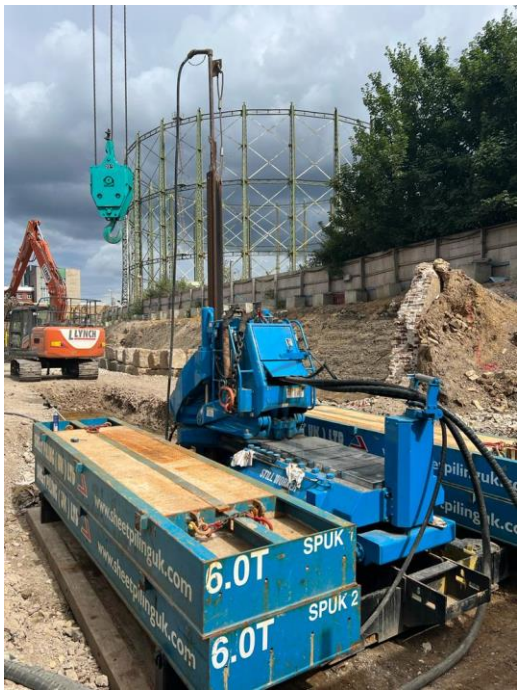
Permanent Sheet Pile Basement

Oval Village Development

In summer 2022, Sheet Piling (UK) Ltd started work on a major urban development project at the iconic former gasholder site, adjacent to the Kia Oval cricket, in the London borough of Lambeth.



The new Oval Village development will ultimately create 1309 homes, plus leisure, community and retail facilities. All will be contained within a village-like destination but the major challenge, in order to realise the vision, is to remove the famous gasholders, or repurpose them for other uses.

Sheet Piling UK was appointed to assist with this mission, by Keltbray Remediation. This contractor is charged with removing the majority of the gasholders on the brownfield site on behalf of the client, Berkeley Homes.

This is a sensitive process, bearing in mind the nostalgia attached to the gasholders, which have overlooked every game played at The Oval since 1853. Most of the world's greatest cricketers have played in their shadow and many fans are attached to the urban landscape to which they have contributed, since Victorian times.

In addition, whilst the site has been redundant since decommissioning in 2014, not all of the gasholders can be removed, to enable the redevelopment to take place. The most iconic – No 1 Gasholder – which was the world's largest, at one point in time, is a Grade II-listed piece of Victorian architecture. Consequently, flats are being built inside it, which is where Sheet Piling UK's involvement is so crucial.

A permanent sheet pile basement was constructed around this feature, which was capable of storing more than six million cubic feet of gas and had a diameter of 218 feet. The gasholder's height was doubled in 1891-2, when a 'flying lift' was also added to the previous 1877-9 design, by engineer, Frank Livesey.

Sheet pile construction

To construct the sheet pile basement, Sheet Piling UK used 630 Emirates Steel EZ19-700 and EZ26-700 sections. To maximise the perimeter, the sheet pile specialist had to install the sheet pile line through the thick gasholder foundations. These, as is typical in gasholder construction, have a puddle clay dumpling that prevents water ingress.

The Sheet Piling UK team worked to a sheet pile design produced by Wentworth House Partnership, whilst the existing foundation of the gasholder intersecting the proposed pile line was pre-augured by Kelbray Piling. The resulting void was backfilled with cohesive material.

This enabled Sheet Piling UK to use a pressing-in method of sheet pile installation, delivering the silent and vibrationless piling so welcomed in sensitive environments. Two Kowan ZU100 silent and vibrationless pile presses carried out the Z-pile installation, supported by a Kobeko 90Te crawler crane.

Geological assessments and influences

Sheet Piling UK was involved very early in the project's planning phase, offering advice on the optimal sheet pile installation methods for use in the prevailing geology. The soils at the brownfield site are River Terrace Gravels, laying on top of London Clay.

Sheet Piling UK had to ensure that axial loading did not impact the sheet piles detrimentally, by carefully calculating the axial load that would result from soil structure interactions. The UK's leading sheet pile installation specialist proposed a schedule of non-destructive CAPWAP testing, on isolated, individual off-line sheet piles, to verify empirical calculations of the available loading capacity, with specific reference to London Clay.

The works for the construction of the permanent sheet pile basement at the Oval Village Development started in June 2022 and were completed over a 10-week period by:

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