Audley Square Redevelopment

London's Audley Square Redevelopment is a prestigious new residential development being constructed by Caudwell Properties, in Mayfair, one of the City's most desirable and exclusive neighbourhoods.

When complete, the project, designed by New York based Robert A.M. Stern Architects, will deliver a property that fits seamlessly into the personality and character that makes Mayfair renowned across the world. Built to exacting standards, the Audley Square Redevelopment will also make a positive contribution to the Mayfair conservation area and enhance the adjacent public realm.

The project is being undertaken by principle contractor Careys Civil Engineering, who awarded the piling and foundation works to Bauer Technologies, a subsidiary of the BAUER Group.

Specifically, Bauer was contracted to construct a secant wall around the perimeter of the development. This saw the company install 245 liner metres of guidewall and 432nr 780/880mm piles, with design depths up to 54m. In addition, some 18nr kingposts were installed in selected primary piles to facilitate propping of adjacent structures during the excavation of the basement.

The bearing piles, necessary to support a super structure, were constructed within the perimeter wall and comprised 95nr 1200mm, 1350mm and 1800mm, with depths up to 57m. To facilitate a top-down construction approach, 24nr plunge columns were installed in selected piles. Both the secant wall and bearing piles were constructed using the Rotary Bored Cast-in-Situ technique.

There were multiple plunge column section sizes and levels, which prevented standardisation of installation technique and equipment. Specifically, the plunge columns required the use of a hydraulic frame to install the columns in the larger diameter piles, and plunge column templates to install the columns in the smaller diameter piles. Multiple templates were also required to fit each column section size and 5nr different 'follower sections' were required to fit the various column section sizes and finish levels.

Prior to commencing piling works, some advanced works were also undertaken by Bauer. These included the installation of 2nr 1200mm preliminary test piles, using the bi-directional O-Cell method. Obstruction coring and old pile removal was also performed, as some pile locations were obstructed with in-ground features, including existing slabs, old piles, and concrete thrust blocks. A period of pre-coring was factored into the project schedule to clear these obstructions in readiness for new piles.

The nature and complexity of the project meant it was not without significant challenges. Site congestion was the biggest issue that had to be addressed. There were often 3 piling rigs, three handling cranes and piling attendant equipment, such as cranes and dumpers working within the relatively small site (approx. 2800m^2 area). In addition, there were other sub-contractors on site, with a full complement of equipment also working within the limited site area.

Bauer Technologies managed this challenge by using a 3D model of the site that clearly defined areas of working for both its plant and workforce, as well as those of other contractors. This modelling was supported with robust daily coordination meetings, between all parties, to facilitate planning of the scheduled work ahead.

Other challenges included a large number of unforeseen obstructions which were encountered during the construction phase. These included old piles not identified in drawings, existing contiguous piles, old steel props/plates that all required coring out using heavy duty rotary equipment. This impacted on programme and resulted in heavy wear/tear and damage of rotary tools too.

Time was another challenging factor to manage, with the S61 dispensation for the project restricting all site activities to between 08:00 to 18:00. The Mayfair, Central London location of the site also presented logistical challenges with the supply of concrete, reinforcement, equipment delivery and spoil transport to/from site when required. In fact, the site recorded up to 60 daily delivery movements, which required careful coordination to adhere to the time restrictions and avoid congestion within this affluent residential location.

Bauer commenced work early September 2020 and completed the project at the end of May 2021. Despite the many challenges, seen and unforeseen, works were completed successfully and to the complete satisfaction of the client.

Client:
Caudwell Properties

Principal Contractor:
Careys Civil Engineering

Piling Contractor:
BAUER Technologies Limited

Contract Period:
September 2020 to May 2021

Equipment Used:
- 3nr Piling Rigs (2nr BG45 & 1nr BG39)
- 3nr Crawler Cranes (1nr 90te Lattice, 1nr 80te Telescopic & 1nr 60te Telescopic)
- Casing & Digging Tools (Multiple number and diameters)
- MEWP (Z45)
- 2nr Water Bowsers
- 1nr 3000ltr Diesel Bowser
- 3nr 13te Excavators (supplied by others)
- 2nr 6te dumpers (supplied by others)
- Hydraulic Plunge Column Rig
- 3nr Plunge Column Templates
- 5nr PC Follower Sections (various sizes/ lengths)- Secant pile walls 10,000m^2
- 2.4m diameter 68m deep OSD piles 7nr
- Diaphragm walls 6,437m^2

Scope of Works:
For the Secant Wall
- 245 Lin. m of guidewall
- 432nr 780/880mm piles, with design depths up to 54m
- 18nr kingposts

For the Bearing Piles
- 95nr 1200mm, 1350mm & 1800mm bearing piles, with depths up to 57m
- 24nr plunge column installed in selected piles, to facilitate a top-down construction approach

Advance Works
- 2nr 1200mm preliminary test piles using the bi-directional O-Cell method

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