CASE STUDY

FORMER CATTLE MARKET SITE, RUGBY

PILING

CLIENT

Cassidy Group

MAIN CONTRACTOR

Metnor Construction

SCOPE OF WORKS

CFA Piles
Ground Improvement

ACHIEVEMENTS

Completed on time
Completed on budget

Project Brief

Roger Bullivant Ltd were invited by Metnor Construction to provide a solution for the foundations below 4 no. residential blocks at the former Market Quarter development, Rugby. This residential scheme was to complete the regeneration of the former Cattle Market site which has been derelict since it was closed in 2008. The residential scheme included 2 no. apartment blocks with up to 6 storeys and 2 no. apartment blocks with up to 3 storeys. Due to the loading requirements for the taller Blocks C and D a piled solution was proposed to meet the specification, however the 2 no. lower rise blocks were able to benefit from our ground improvement techniques which provided a more cost-effective option than piling the entire development. Roger Bullivant was able to provide both techniques from our Midlands Regional Office. 215 no. 400mm diameter CFA piles were proposed for Blocks C and D, and 1175 no. vibro stone columns were proposed for Blocks A and B.

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PILING

Key Issues/Requirements

- Piles were installed below cast in situ pile caps and beams (Blocks C and D) and vibro stone columns were installed below in-situ concrete pads and beams, and a ground bearing slab (Blocks A and B).
- 450mm piles were specified on the original drawings provided, however Roger Bullivant carried out pile design to reduce these to a more economic 400mm diameter pile size.
- 400mm CFA piles were designed to Eurocodes for design actions up to 859kN DA1C2 compression and 75kN DA1C1 horizontal.
- Vibro stone columns were designed to support bearing pressures of 150kN/m2 below foundations and 30kN/m2 below ground bearing floor slabs.
- The ground conditions comprised approximately 2m of made ground overlying sand and gravel extending to 5m depth, below which weathered Lias Mudstone was encountered.
- Roger Bullivant worked with the Contractors requirement for 2 no. separate mobilisations for each for each technique to site, to suit the timing of the diversion of the existing sewer located below Block D.

Solution

- 400mm CFA piles were designed for the loadings on Blocks C and D. CFA piles were installed to a predetermined length in the Lias Mudstone to resist the design actions, and reinforcement cages installed to cater for the horizontal loadings.
- CFA piles were installed up to 13m length and vibro stone columns were installed up to 4.3m length to suit the design requirements and ground conditions for each Block.
- The CFA piles were validated by an agreed testing regime, including integrity tests on all piles and 2 no. working static tests. 12 no. plate load tests and 4 no. dummy footing tests were carried out to validate the ground improvement works.
- The use of CFA piles (a low vibration method) allowed the piles to Block C to be installed as a first operation to permit Metnor to commence construction on this block, whilst the Sewer was yet to be diverted from below adjacent Block D. The CFA rig then returned to site at a later date to complete the piles to Block D after diversion of the sewer.
- CFA piles were installed using a GEAX EK100 CFA rig, and vibro stone columns were installed using RBL's in house developed 4000 series Vibro rigs.
- We are proud to have been involved in this final phase of the regeneration of the former Cattle Market site, and to have been able to offer a combination of our foundation techniques to suit the technical requirements of the scheme, whilst offering cost savings when compared to installing piles for all 4 blocks.

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