CASE STUDY GUILDHALL, YORK





PILING

CLIENT

City of York Council

MAIN CONTRACTOR

VINCI Construction UK

SCOPE OF WORKS

SFA Mini Piling SFA Piling

ACHIEVEMENTS

Completed on time Completed on budget

Project Brief

Roger Bullivant Limited was employed to carry out the piling works for the £16.5m renovation at York's Guildhall site, one of the city's most historically significant buildings. Guildhall will see its first major restoration and redevelopment in over 60 years. The building will undergo vital restoration and redevelopment.

The Guildhall originally dates back from the 15th century and was extensively rebuilt after being destroyed in the World War in 1942. It has since been used as council chambers.

The vital restoration and redevelopment will secure the long-term future for the site, offering high-quality office space, spaces for community use , a café, a new riverside restaurant, and better access for residents.



PILING



Key Issues/Requirements

Guildhall is situated on the River Ouse, the complex contains a collection of Grade I, II* and II listed buildings built around the 15th century hall and riverside meeting room, with parts dating from 1445.

Naturally, this project faced many challenges from challenging ground conditions, piling engineering for the restoration of part of the building through to the continuous challenges regarding restricted access.

- The only access to the site at the first stage was via the front entrance through a fairly small brickwork corridor from a restricted access road. Guildhall is located within St Helen's Square, an urban courtyard surrounded by fashion, lifestyle, and eateries. A crane was therefore required to lift materials from a barge supplied from a loading area on the other side of the River Ouse.
- Design and installation of mini piled underpinning system to underpin the North Range Annexe to the existing Guildhall as well as the design and installation of piles for the South Range and North Annexe new build sections.

Solution

- Roger Bullivant North East piling team liaised closely with VINCI Construction UK and their engineers from an early stage to assist in developing a value-engineered solution using domestic type mini piling and SFA piles.
- RB carried out the design and installation works for the crane base mini piling, underpinning piling, and SFA mini piling to the proposed South Range and North Annexe buildings.
- RB installed 220mm bottom driven mini piles to depths of 14m onto sandstone rock head to a swl of 165Kn compression, -47.5Kn tension, and 5Kn shear for the proposed crane base.
- RB installed 12 Nr. 300mm dia SFA piles to the South Range new build section.
- Due to historic movement RB was then required to underpin the existing North Annexe Tower to allow the new North Annexe to be constructed. RB originally proposed a vibration-free jack pile system integral with RC ground beams externally and internally connected with needle beams.

- During the excavation works for the ground beams carried out by VINCI Construction UK, an old brick arch was discovered within the makeup of the main wall. A major redesign was carried out and involved stepping underpinning down in the area of the arch and then returning to its original level beyond the arch.
- Upon curing of the underpinning system, vibration-free jack piles were installed using the dead weight of the structure as a reaction to install the piles. This was the preferred method of VINCI Construction UK, Arup, and York City Council due to the vibration-free operation.





- A section of the jack piles installed, refused 6m into the ground on unknown obstructions. A redesign based upon an odex system (drill and case) to enable the piles to reach their design depth was undertaken. This proved successful externally but not internally due to the ingress of silts under pressure into the pile upon removal of the drill bit and hammer. RB recommended this method to be abandoned due to the risk of undermining the Tower which was accepted by all parties.
- RB then trailed pre auguring to rock head then immediately driving a 168mm dia bottom driven pile to rock head which was successful.

- RB installed 56 Nr. 450mm dia SFA piles to the North Annexe section.
- All piling works were delivered within the program schedule allowing follow on works to proceed as planned.

VINCI Construction UK, Project Manager said:

"The piling has been completed successfully and professionally by the Roger Bullivant team within what is a very constrained site, the team consistently provided solutions to overcome the challenges that we faced".

City of York Council, Assistant Director of Regeneration and Assest Management said:

"This unique project requires firms who are willing to work on a complex, historic site, with precision and within a tight city centre location. We're pleased to see the piling completed, forming the foundations of the new buildings."

