VAN ELLE
TOTAL FOUNDATION SOLUTIONS

CASE STUDY
RESTRICTED ACCESS PILING, HIGH MAST LIGHTING COLUMNS

Project: Piles and RC bases to provide foundations for the high masts as part of the Derby street lighting term contract
Location: Derby, City Centre Inner Ring Road
Client: Balfour Beatty Power Networks Ltd.

Project Overview

As part of the 5yr term contract to replace and upgrade the street lighting on some of Derby's main highways, we were approached to share our experience of working in such conditions using some of our smallest and most versatile piling rigs.

A column base being cast next to the A52 post-piling.

Originally there were no piles designed into this scheme and the plan was to use mass filled concrete pads throughout, however, owing to the location of the columns, their size, volume of concrete required, ground conditions and timescales involved, Balfour Beatty decided to look for an alternative and more economical solution.

Result

The restricted access conditions and working in such close proximity to fully operational main roads meant a piled solution was the only feasible option. Our engineers worked closely with the client's project team keeping them informed of progress and discussing possible time and cost saving options along the way.

A cast plinth ready for the lighting column to be attached.

Understanding the specific issues involved on a project of this type allowed us to utilise the correct design, rigs and solution for the job ensuring that both Balfour Beatty and the Council/Highways Authority were confident in their choice. Both the Kitten rig, used to pre-auger and the Mobi-drop rig, used to drive the piles were able to operate without infringing upon the existing ring road maintaining normal traffic flow under traffic management.

The locations and surfaces on which we were to site the rigs were varied and required us to look at each base location on an individual basis to come up with the best solution.

Due to the pre-works preparation, the communication with the client and our team approach to the project, we achieved better production rates than expected and our client and the local council highways division were extremely happy with the service we provided.

RK Civil Engineering Ltd were doing the enabling works and service preparation ensuring that the piling and casting of the bases and plinths were not held up throughout the project.

High masts on Derby's inner city ring road.

Technical Information

There were two types of lighting columns installed as part of this contract: 30m high masts, as can be seen in the picture opposite, and 18m road lights.

There were four piles under each of the bases and the high mast columns were anchored using 10No. 1m long bolts cast into the top plinths (as below). The bases themselves were 2.2m²x0.6m deep and the plinths for both types of mast were 1m³.

The road lighting masts were anchored using 4 bolts as can be seen in the diagram on page 1, their bases being 1.75m²x0.6m deep.


The plinth and anchor bolts for a high mast column.

To date, we have piled and cast the RC bases/plinths for 11 high masts and 4 road light columns in Derby. The piles ranged between 5 & 8m deep and were pre-augered to probe for obstructions and help keep them straight. The piles themselves are 220mm diameter steel-cased driven tube.

The access and difficulty of working in these locations varied greatly but all potential problems were overcome through careful planning and by working closely and communicating with both RK Civil Engineering and our client, Balfour Beatty Power Networks Ltd.


High mast piles, base and plinth installed on a slope.


High mast installed between two carriageways on the A52.


Column installed between the main carriageway and the slip road on the inner city ring road.