

Grand Hotel, Birmingham. Mini-Piling for Tower Crane Base.

Client: Hortons Estates/Greswold Construction

Designer: JNP Group

Value: £120k

Period: Oct — Nov 2014

The redevelopment of the Grand Hotel in Birmingham required the erection of a tower crane which was to be founded on a reinforced concrete base constructed in the hotel basement. The basement area chosen to establish the crane was restricted so a large gravity base could not be constructed thus requiring a piled solution to ensure the stability of the crane base.

The design required the installation of 20 no x 200mm diameter augered mini-piles up to 16.5m deep founded in the sandstone strata lying beneath the site. Pile loads were up to 1165KN.

We utilised a Klemm KR 701 mini rig to install the piles. The rig has a weight of approximately 2.5 tonnes, has an extendable mast up to 3m working height and has a separate towable diesel/hydraulic power pack which remained outside the building with 20m long umbilical hydraulic hoses supplying the rig. The rig had to be lowered into position from a ground level access point by mobile crane. Drilling was carried out using rock augers with the piles installed at 750mm centres.

In order to ensure there was sufficient reinforcement in each pile a circular hollow section tube was installed to full depth in lieu of a reinforcing cage. The CHS required was 168.7mm outer diameter, 10mm wall thickness and steel grade SJ355. Due to the confined space available the CHS was provided as butt jointed sections in 1m lengths with chamfered ends and sections were welded together with a full strength fillet weld.

The existing basement floor slab required oversize cored holes to be drilled in advance for the piles and the slab was constructed on a polystyrene mat to ensure that the base/pile system was unconnected to the existing building structure. The 3.5m x 3.5 m x 1.8m thick heavily reinforced concrete base slab was constructed following completion of piling, the CHS reinforcement from each pile extending 1.0m into the base slab.

