

The Lizard Lifeboat Station Marine Piling

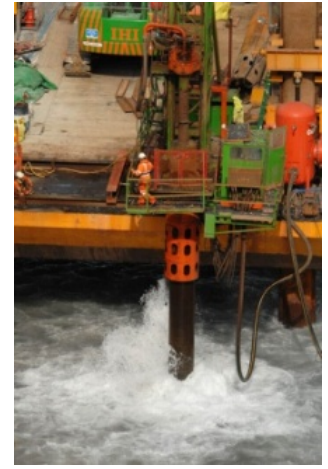
Client :
RNLI

Designer :
Royal Haskoning

Main Contractor :
Nuttall John Martin

Location :
Cornwall

Date :
2010



BAM Ritchies works comprised the installation and grouting of 27 762mm diameter steel piles. The pile socket depths varied from 5m to 10m from sea bed level. The drilling was carried out using BAM Ritchies RH600 piling rig mobilised on a jack-up platform.

A 980mm diameter conductor casing was used to locate and align each pile position. The starter length conductor casing was made up to a 14m length and was lowered through the rig's drilling table to the sea bed using craneage mounted on the jack-up.

The conductor casing was then attached to the drill head via a casing plug and reamed through the overburden to rock head. When the conductor casing was sealed off in the rock the casing plug was removed. If the depth of overburden was significant, additional 1.5m lengths of casing were added. The inclination and location of the conductor casing was then checked to ensure that it had not deviated during seating in the rock.

The rock socket was drilled using Down the Hole hammer techniques with air flush, supplied via a compressor farm consisting of seven 900cfm compressors (one spare). Six compressors were connected via 2" air hoses to a manifold and a 4" steel Alvenius pipe connected to the outlet on the manifold, a series of 4" steel and flexible pipes were constructed and connected to a 300 psi air receiver tank positioned on the jack-up platform. 4" flexible hose then connected the air receiver to the drill head to supply the air

flush. The drill string consisted of a Numa 240 DTH hammer with 864mm button bit, follower and shock absorber with a Beco to hex sub. The drill string was made up to 13.5m and fully shrouded. The drill string was then lowered into the conductor casing and the rock socket was drilled to its required depth. The hole was then flushed clean and the drill string removed with the service crane.

The 762mm diameter steel pile was then lowered down the conductor casing with the service crane and into the rock socket. The level and lateral location of the pile was checked and adjusted if required. The outer annulus of the pile was then two-thirds filled with 32mm crushed rock to provide temporary support to the pile within the rock socket. Grout was then mixed in a Col 4/10 grout plant, situated on the jack-up platform. The pile was filled with water to resist the additional buoyancy force when the pile was grouted. The grout was pumped through flexible lines connected to steel pipes inside the pile, 125% of the theoretical volume was pumped into each pile.

On completion of grouting the conductor casing was removed with the service crane and the drill rig moved on to its next pile position. Additional works carried out on site included drilling, installing and grouting eight 8m deep 200mm diameter tower crane foundation piles and 16 63.5mm diameter DCP shear dowels installed in 127mm diameter boreholes.

