Isle of Grain Pipe Jacking
HOBAS® CC-GRP Pipes for Great Britain

In addressing future demands for alternative supplies of gas, the UK has seen the construction of a number of new terminals for the importation of liquefied natural gas (LNG) one of which is sited at the Isle of Grain on the Thames estuary. For the most economic transportation of the gas it is cooled to achieve this liquid state and needs to go through a process of regasification for use in the UK gas grid. The latter process is no more than raising its temperature back to ambient. This requires heat and at the Isle of Grain this is being supplied by utilizing surplus heat from the existing Isle of Grain power station in the form of hot water. A twin pipeline system connects the station's two plants, part of which is installed inside tunnels using HOBAS CC-GRP jacking pipes.

For the first 2 drives the pipe lengths were two 3 m pipes behind the shield with the remaining pipes being 6 m long. Every third pipe was fitted with two bentonite injection points. The 144 m long drives were at relatively shallow depths and parallel to each other so that they could share the same jacking pits.

Shortly after starting the second drive an obstruction was encountered that stopped the machine, which was eventually found to be a large steel pipe crossing the top of the proposed alignment. This investigation involved a hand constructed adit cut through from the first drive in front of the second drive to determine the extent of the obstruction. The remedial action was to reverse the machine out by winching, to remove the first few pipes while at the same time backfilling in front of the shield and at the same rate using low density concrete to stabilize the void left. The drive was then restarted 1 m lower so as to go under the existing pipe.

The pipes in the third and fourth drive had to be installed at a depth of 23 m because they had to cross a gas main (2x DN 1400; main supply from London) a safe enough distance below it. To keep the construction costs for the 25 m deep jacking pit within reasonable limits, HOBAS demonstrated flexibility by supplying 3 m long pipes.

Year of Construction
2008 - 2009
Total length of pipe
522 m
Pressure Class
PN 1
Stiffness Class
SN 32000
Diameter
D_e 2160 mm, wall thickness 69 mm
Installation Method
Jacking

Application
Protection pipe
Client
Stockton Drilling Ltd.
Contractor
A E Yates Trenchless Solutions
Advantages
Installation with a small tunnelling machine, smooth outer pipe surface, flexible pipe length, quick installation

The shaft diameter was therefore minimized and expenditure substantially reduced. In order to reach the existing jacking pit for pipeline sections one and two, sections three and four had to be pushed an unbelievable 15 meters uphill over a length of 117 meters.

By selecting HOBAS CC-GRP Jacking Pipes, the building contractors were also able to use a smaller tunnel boring machine (a Herrenknecht AVN 1600 full face excavation machine) than would have been the case with concrete pipes of the same inside diameter. In the second case, an AVN 2000 would have been required.

Other benefits for HOBAS CC-GRP Jacking Pipes include smooth outer diameters for reduced jacking loads (here only 160 t) and the non-absorbent pipe surface lowering lubrication needs and the reduced excavation volume improving production rates and diminishing spoil disposal costs.

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