Chamberlayne Road Flood Alleviation

Work has now been completed on the AMP5 Thames Water scheme to reduce the risk of internal and external sewer flooding to 36 properties in the Chamberlayne Road area of Brent, London. Optimise JV Partner Barhale, carried out the works as principle contractor supplying their specialist tunnelling experience and knowledge. The scheme will prevent the properties flooding during storm events by diverting the combined sewer flows to a new 28 metre deep storage tank in Tiverton Green through a series of shallow gradient tunnels. Once the flood event passes and the sewer flows reduce, pumps are activated in the storage tank to pump the flows back into the main sewer.

As well as the large 15metre diameter, storage tank capable of holding 1700m3 of storm water, the project involves four drive/reception shafts, 550metres of DN 1200mm and 70 metres of DN 600mm pipe jacked tunnel, also acting as online storage. FP McCann has supplied both the smoothbore precast concrete shaft segments and the jacking pipes to the contract.

The shaft was constructed using the underpin method in two phases; the first phase involved excavating the shaft to a depth of 17metres and forming a temporary concrete base to launch the two jacked tunnel drives. Once the tunnel drives were completed the second phase involved breaking out the temporary base and excavating the shaft to the final formation depth. Due to the depth of the shaft, two different types of segmental rings were used for the construction. The top 23 rings were fibre reinforced and the bottom 5 rings required a rebar cage instead to withstand the earth pressures. The fibre reinforced segments had limited flexural strength, and when this was exceeded, segments with a rebar cage had to be introduced to accommodate the increased stresses arising from the increased shaft depth.

Both types of smoothbore shaft segments have been manufactured at FP McCann's Cadeby facility in Warwickshire. The segments are all factory fitted with EPDM rubber gaskets which provide an immediate water-tight seal upon construction. Cross segment connections are made by passing a spear bolt through a pocket in one segment and screwing it into a threaded plastic socket in the adjacent segment. Circle joint connections are made using a 'T' bolt passing through a hole in one segment into a 'T' box in the adjacent segment. Bolts are designed to fully compress the gasket.

Jacking pipes were supplied from the company's Alnwick plant in Northumberland. The pipes with a minimum structural strength of 50N/mm2 are manufactured using a wet cast process which gives a smoother external finish to aid the tunnel drive process. Each pipe was lowered into the entry drive shaft and into position before being pushed through the bore hole formed by the leading tunnel boring machine (TBM), by powerful hydraulic rams. The larger of the two tunnels formed using the DN1200 pipes offers an additional 800m3 of online storm water storage.

"FP McCann was chosen as the preferred supplier for the shaft and tunnel precast products. They have provided an outstanding service to deliver the job on time and have also assisted with some of the complex structural designs within the shafts." Mark McGeady – Project Manager Barhale (Optimise JV)

Site:	Chamberlayne Rd Flood Alleviation, Brent, London
Contractor:	Barhale/Optimise J.V.
Client:	Thames Water
Products Supplied:	Smoothbore Shaft Segments and Jacking Pipes

For sales enquiries, contact **Stuart Carson** (National Sales Manager) on **01455 290780** or email **scarson@fpmccann.co.uk**