Northcombe New Service Reservoir

increases security of supply & maximises economical operation

by
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Northcombe Reservoir is situated in the heart of Devon and primarily provides treated water to the North Devon Area of the county. A new 20Ml service reservoir was identified in the South West Water's (SWW) asset management plan in order to increase the security of supply to customers and to maximise economical operation of the asset. With a total scheme cost estimated at £3.3m and project duration of 18 months, this was a green field site development positioned next to the existing water treatment works.

Northcombe New Service Reservoir:under construction & Northcombe WTW *courtesy Black & Veatch*

The standard reservoir design used by SWW had been successfully employed for over 20 years, however, the partnering team thought it appropriate to consider new materials and apply knowledge based experience. Design changes were agreed and implemented, the original design used a layout of full contraction joints at 4m centres constructed with a rearguard waterbar. The modified design reduced the amount of joints by 40% by opting for expansion joints at 25m centres, which also simplified the construction sequence by enabling concrete base pours of 150m^3

The final design also included a proprietary overbanding system applied to all joints to introduce another watertight layer. This system has been retrospectively fitted to many reservoirs throughout the UK to eliminate leaks. The introduction of this in the initial design should reduce the need for remedial repairs during the reservoirs life span.

The reinforcement detail for the wall was developed between *Black & Veatch (B & V),* who were appointed as Principal Contractor on the project and *Faber Maunsell (FM)* as Design Consultants under the K4 Framework - to enable prefabrication of reinforcement panels that could be fabricated at ground level, reducing the risk of working at height and accelerating the construction sequence.

The reservoir bulk excavation equated to the removal of 30,000m^3 of subsoil, which was used to form a screening bund around the reservoir site, preventing the need for disposal off site. The reinforced concrete structure consists of a 90m long by 60m wide tank with a maximum depth of 6m. The walls are 4m high with a reinforced concrete roof supported by 117no. 300mm square columns. The structure has a total quantity of 3,500m^3 of concrete and 400T of reinforcement steel.

The bulk of the construction work was carried out during the winter and as the site is located on the edge of Dartmoor, the weather was a major factor with only 6 dry working days in 4 months. Even with these conditions the sub-contractor *Steve Lee Structures Ltd* substantially completed the concrete structure in 17 weeks.

The reservoir is fed from the existing trunk main by 900mm dia. Ductile iron connecting pipework laid at depths of up to 6m. A shutdown of the strategic North Devon trunk main was required to facilitate the installation of 3 new 900mm gate valves. This operation was carried out at night and through extensive planning and liaison with the SWW distribution engineers there was no adverse affects to customers. This operation demonstrated the benefits of a partnering

agreement with all parties working together as a single unit to successfully complete a complex critical activity.

The local community were informed of the construction works via a letter drop to local houses and liaison with the Parish Council Chairman. The local Parish is very small and this was a scheme of high significance to the local community. With this in mind the Parish Council was invited for a site visit during the construction phase. A group of 15 local residents and Council Officials attended the site and were given a presentation on the scheme and a directed tour of the construction works. The feedback from the community was excellent and although we were constructing a major part of the infrastructure in their backyard they appreciated seeing how SWW investment in assets was benefiting the customers.

The scheme was used as a trial to conduct a material flow survey of a construction project, this involved recording all materials that came onto and left the site and where they were used. All the materials were then assessed to determine if they were primary, secondary, reused or recycled. This information is currently being collated to include in the overall environmental assessment of the project. Throughout the scheme a photographic diary was used to record daily progress from a single location. This was utilised as a progress management tool, enabling senior construction management and client representatives to monitor progress from remote locations.

The bulk of the construction work was completed by April 2007, with the reservoir being commissioned ready for operational use in June 2007. This operational use date is two months ahead of programme. Given that this area encounters significant population changes in the summer months, this new asset will assist SWW deliver its statutory obligations by making efficient use of its resources.■

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