

## Structural Repairs & Waterproofing

Upper Keele Service Reservoir, Welshpool



**FREYSSINET**  
SUSTAINABLE TECHNOLOGY

**Client**  
Severn Trent Water

**Main Contractor**  
Black & Veatch

**Contract value**  
£35,546

**Construction Period**  
4 weeks

**Works Completed**  
May 2009



Upper Keel service reservoir forms part of the STW drinking water distribution network in the Welshpool area of Powys. Freyssinet were contracted by Black and Veatch to undertake structural repairs and waterproofing works to the service reservoir as part of the Severn Trent Water AMP 4 contract. The reservoir is of in-situ concrete construction. The base and walls are buried and the domed roof is exposed.

STW commissioned their consulting engineers to undertake a structural survey of the reservoir to establish the extent of the structural repair works. From the structural report it was established that the domed roof had been cast independent to the tank walls. There were signs of some movement at the interface joint between the roof and walls, deemed to be as a consequence of the exposed roof experiencing considerable variations in seasonal temperature. There was evidence that repair work had been undertaken at this interface on several occasions and STW/Black and Veatch requested that Freyssinet provide a technical solution to overcome the risk of future cracking of this joint and the risk of ingress of leached water.

Freyssinet proposed the use of a Sika Combiflex jointing system that would be applied on the internal face of the structure and would span across the roof /wall joint. The combiflex system comprised of a Sikadur 31 structural epoxy adhesive and a Combiflex Hypalon strip. The Hypalon strip is a highly elastic, rot proof and chemically resistant sealing sheet designed to span roof/wall joint interface and will provide permanent elasticity to accommodate any differential movement.

The internal surfaces of the structure had previously been treated with a waterproof coating. This had degraded and in need of re-treatment. Freyssinet proposed a BASF Thoroseal FX100 waterproofing system for the re-treatment of these surfaces. This product is approved under section 31 of the Water Supply regulations for use in drinking water environments and is a cementitious, elastomeric waterproof membrane. This product was applied to the inner walls and floor and the external roof surface.

In order to undertake the preparation and waterproofing works within the tanks, confined spaces procedures in accordance with the Confined Spaces Regulations 1997 had to be adhered to. Due to the domed shape of the roof structure, a scaffold access platform had to be designed and erected to provide a level area on which to erect the confined spaces escape tripod. This scaffold access was inspected in accordance with the Work at Height Regulations 2005.

Works were undertaken in May 2009 and were completed ahead of Black and Veatch's target date, thus allowing the re-commissioning of the reservoir ahead of programme.

Freyssinet Ltd. Innovation House, Euston Way, Town Centre, Telford, Shropshire, TF3 4LT  
Phone +44 (0) 1952 201901 Fax +44 (0) 1952 201753 Email [info@freyssinet.co.uk](mailto:info@freyssinet.co.uk)