



SIKA AT WORK

PITFODELS DISTRIBUTION SERVICE RESERVOIR

PRODUCTS USED:

Sika® CarboDur® S626

Sikadur®-30

Sika® CarboDur® Grid C comprising:

Sika® CarboDur®-300 Grid

Sika® MonoTop®-3200 Grid

SikaTop®-588 Seal

BUILDING TRUST

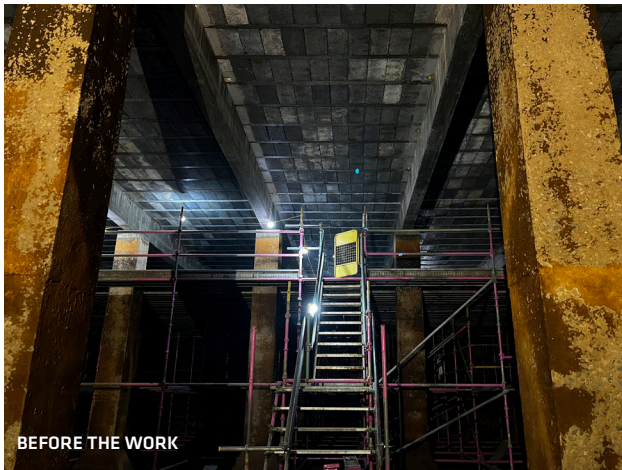


PITFODELS DISTRIBUTION SERVICE RESERVOIR (DSR)



AT A GLANCE

THE COST-EFFECTIVE REPAIR AND REFURBISHMENT OF A MOTHBALLED RESERVOIR TO BRING IT BACK INTO SERVICE PROVES A SUSTAINABLE, ECONOMIC ALTERNATIVE TO A COSTLY NEW BUILD REPLACEMENT



Scottish Water's Pitfodels DSR is an important source of clean drinking water for the local community. When a routine clean and inspection identified an ingress of water that, if left unchecked, could compromise the purity of the water supply, Scottish Water appointed Morrison Construction as Principal Contractor to manage urgent remedial works. Further inspection revealed severe deterioration of the roof structure, necessitating significant reinforcement measures. Knowing of Fraser Bruce's specialist expertise in waterproofing and structural repair, Morrison selected the family-run business to undertake the complex project. Fraser Bruce approached Sika® to explore potential solutions to present to Morrison Construction and Scottish Water. The entire project was an optioneering exercise between, Morrison Construction, FBG, Sika and Allen Gordon LLP.

The Challenge

This project presented many challenges including limited site information with no as-built records.

Another factor was its size: measuring around 3,000sqm and 8 metres deep, the tank is equivalent in size to two football pitches!

Thirdly, the wet environment meant the tank would have to be dehumidified before the Sika® products could be applied as they are designed to work with dry substrate.

Last but not least, due to the increased risks posed by the reservoir environment, employees and contractors needed to undergo advanced City and Guilds' Confined Space and First Aid at Work Training as part of Fraser Bruce's duty of care. This did not end when the classroom training was over: when contractors arrived on-site before they could get down to work, they carried out further exercises including carrying out an extraction using a dummy on a stretcher.



The Solution

Fraser Bruce's relationship with Sika® goes back a long way; the two companies worked closely together to plan the refurbishment of the 1930s-built tank. A cursory initial inspection suggested this would take around four weeks. During this time the roof would be stripped, a new membrane applied and power washed, repairs undertaken using Sika's® CarboDur® system and the joints sealed.

However, once the tank was drained for a thorough inspection to accurately assess the extent of the deterioration and scope of works required, the damage was revealed to be more extensive than first thought. The scale of the repairs added 20 weeks to the project timescale and meant a structural engineer was needed to ensure a safe workable solution. The resulting programme of works drawn up by Morrison Construction involved a multidisciplinary team including engineers, scaffolding contractors and Sika specialists.

"Repairing the roof was around a quarter of the £3 million cost of replacing it and far more sustainable"

The tank structure consists of primary beams held up by columns with secondary supporting columns every 500mm and precast blocks dropped on top. The inspection the secondary beams and blocks – needed repairing, strengthening and coating.

The initial proposal was to use SikaWrap fabrics and epoxy resins to strengthen the roof, however the surface was too uneven and damp to allow for economic strengthening. As a result, the Sika Carbodur Grid C system was specified. Instead of epoxy resins, the system employs a cementitious mortar to bond and encapsulate an expanded CFRP mesh to the dampened substrate. There was still a requirement for strengthening on the secondary beams which required a dry substrate, but this was much easier to manage prior to application of Sika Carbodur S626 plates.

PITFODELS DSR



The tank was originally intended to capture excess rainwater to prevent flooding but, on recognising the planned works would be of a high enough specification to meet the rigorous standards demanded for drinking water, the client decided the reservoir would have greater value as storage for drinking water instead.

As Fraser Bruce had not worked with this specific system before, Sika® arranged one day of thorough, hands-on training for the team. A Sika® specialist travelled from Switzerland to take the Fraser Bruce team through all the Sika® products and equipment they would be using during the project, including the spray machine, ensuring they could confidently deploy their new skills.

Sika® went to great lengths to ensure the project's success, with selected staff members undergoing Confined Space Training so they could support Fraser Bruce's personnel on-site in the event of any queries. CarboDur® S626 was used for the secondary beams with Sikadur®-30 and the CarboDur® Grid C system, comprising MonoTop®-3200 Grid repair mortar and CarboDur® 300 Grid, installed over the soffit between the primary beams. Once the structural strengthening work was completed, a protective layer of DWI-approved SikaTop®-588 Seal was laid on top to comply with strict Drinking Water Inspectorate hygiene rules for clean drinking water.

The Pitfodels DSR tank consists of eight bays and work was broken down into segments for more effective programming with contractors given a specific daily target to strive towards.

As a sizeable programme involving recurring daily tasks over a sustained period, Fraser Bruce rotated its workforce to complete the job while reducing the risk of repetitive strain injuries. A welcome consequence of this precautionary approach is that, in Bobby Moran's words, "the whole squad has been skilled up".

Results

The project now successfully concluded, Scottish Water's vital drinking water supply has not only been restored but also futureproofed for decades to come. The combination of Morrison Construction's expert project management and Fraser-Bruce's high quality application Sika's® ingenuity have enabled an existing asset to be refurbished for around one-quarter of the replacement price, a saving of around £3m.

Furthermore, as the Sika® products have a 30-year design life, refurbishment is a far more sustainable solution. Morrison Construction, and its client Scottish Water, is delighted with the outcome.



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