



# Technical visit: BDS conference 2012 – tour of Winscar, Langsett and Underbank reservoirs

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One of the four technical visits on 14 September 2012, as part of the British Dam Society Conference in Leeds, visited Yorkshire Water's Winscar, located at the head of the River Don, and Langsett and Underbank impounding reservoirs, located in the Little Don valley.

On a blustery but fortunately mainly dry day about 47 delegates visited the reservoirs. Dr Andy Hughes of Atkins gave a general introduction to each of the reservoirs, with detailed information provided by Lindsay Deuchar of Yorkshire Water. Gabriella Vaschetti of Carpi Tech provided additional information on the membrane seen at Winscar.

Winscar was built between 1972 and 1975. It consists of a 53 m high, 520 m long rockfill embankment with upstream membrane of asphaltic concrete (Figure 1) with a storage capacity of 8300 Ml. It experienced leakage problems on first filling. Successful filling was achieved in 1982 after rectification of the leakage problems. In 2001 leakage was again problematic and a flexible polyvinyl chloride (PVC) geocomposite supplied and fitted by Carpi Tech SA was installed to cover the upstream face.

The overflow works are located at the left abutment. They consist of a weir and tumble bay arrangement connecting to a steep gradient concrete channel joining the natural valley by



Figure 2. Delegates viewing the lowered spillway channel at Langsett reservoir



Figure 1. Geomembrane on upstream face of Winscar dam



Figure 3. Widened upper section of spillway channel at Underbank reservoir

way of a stilling basin beyond the embankment toe. The drawoff works are located on the left flank of the valley upstream of the overflow. They consist of a multi-level valve controlled pipe intake within a concrete access culvert built on the ground surface.

After a pleasant lunch in a local hostelry, the coach took the group to Langsett reservoir. Langsett was completed in 1904 as a typical Pennine zoned earth embankment with a central puddle clay core and concrete cut-off wall (Figure 2). The reservoir is 32 m high, 352 m long with a storage capacity of 6401 MI.

About 10 years ago the upper part of the spillway channel and

tumblebay, located on the left mitre, was modified by increasing its depth by approximately 2 m to remove a hydraulic restriction while retaining the original masonry bridge and side walls in situ.

The party then travelled to Underbank reservoir further down the valley. Underbank is of similar construction to Langsett, is 18 m high with a 440 m long crest, and has a storage capacity of 2955 MI. In 1996 overflow works were completed which increased the spillway capacity in the upper part of the spillway channel by increasing its width (Figure 3).

Many thanks are given to Yorkshire Water for organising the visits.

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