



Project: Morpeth FAS

Location: Morpeth, Northumberland

Penstock Installation

Client: Balfour Beatty & Environment Agency



Mitford Dam sits across the river Wansbeck in Northumberland and is the main feature of the £27million Morpeth Flood Alleviation Scheme (FAS). Morpeth had a historic problem with flooding as the river through the centre of town could not carry enough water during sustained periods of heavy rainfall. The dam provides a solution by penning water upstream in a temporary storage reservoir which can hold over a million cubic meters of water.



The key feature of the dam are the ACE stainless steel penstocks which close as the river levels rise to start penning and thus storing the water upstream. The penstocks are all rated to 12.5MwC pressure, five of them are 3m x 3m (large enough to drive a pick up through) with one smaller 1.8m x 1.8m gate to aid wildlife passage.

The dam funded by the Environment Agency and Northumbrian county council is the largest of its kind in the UK.



ACE not only supplied and installed the huge penstocks but provided a full turnkey mechanical and electrical (M&E) package, supplying and installing the hydraulics, HPU's and control systems. ACE's turnkey approach was attractive to the principle contractor Balfour Beatty enabling them to focus on earth works and civil construction knowing ACE was in full control of the full M&E scope.

The ACE gate supply in full stainless steel was also attractive to the end client, as it requires much less maintenance than the original mild steel wheeled gate design. ACE gates use water lubricated seals which slide over HDPE surfaces requiring virtually no maintenance and reduce the risk of seized wheels. The stainless-steel approach also ensures that possible corrosion issues typical with coated mild steel assets is removed. Although penstocks of this size can be electrically driven a hydraulic system was selected as during maximum water levels the drive system is submerged. The hydraulic cylinders can operate even when fully submerged.

ACE would like to thank Balfour Beatty, the Environment Agency and Northumbrian County Council for working with us on this award-winning scheme.

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