Project: Morpeth FAS

Balfour Beatty/ Environment Agency

Full mechanical & electrical contractor

5 x 3m² Penstocks 12mwc
1 x 1.5m² Penstock 12mwc

£800k (£27m total project)

"The ACE project team managed their supply chain very well, always meeting our requests and dealing with changes in an efficient, professional and friendly manner. They are good people to work with and achieved high safety standards, embracing all of our safety procedures and requirements." - Chief Engineer, Balfour Beatty

The approach of the Morpeth flood alleviation scheme was to divert and store water in a large reservoir which could then be used to control the flow of water being passed through the town. The new reservoir needed to be capable of holding 1.4 million cubic meters of water which would remove the need for excessively high flood walls being built in the historic town.

The main feature of the reservoir is the large dam which stems the flow of the River Wansbeck during times of flood. This huge structure utilises five 3m x 3m ACE penstocks, which had to be designed to withstand pressures of up to 12.5MwC. The frames of the penstocks had to be large enough to allow the doors to be lifted completely clear in time of normal or low flow,

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Aquatic Control Engineering are market leaders of innovative water flow control, maintenance and fish passage equipment. We are proud to supply our customers with high quality, innovative solutions and high standard installation services for over 20 years.

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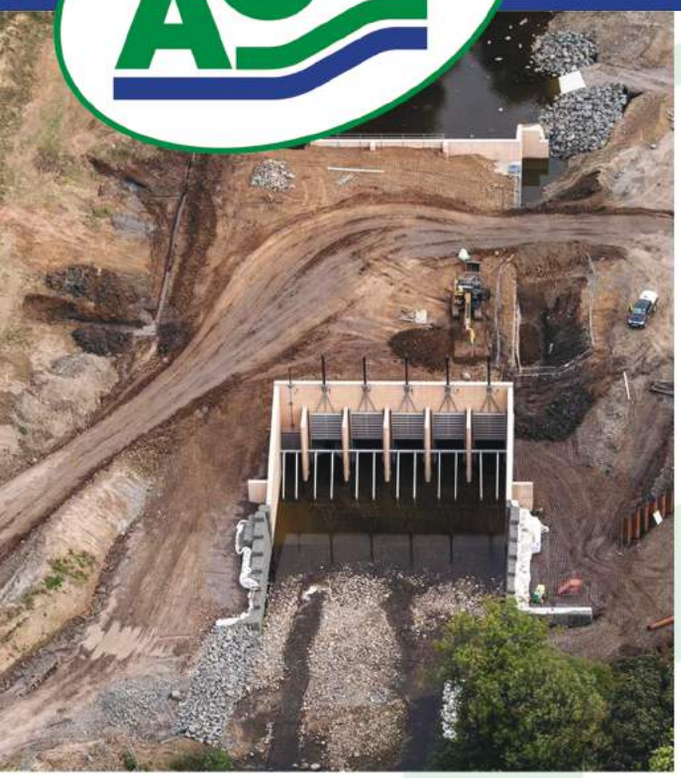
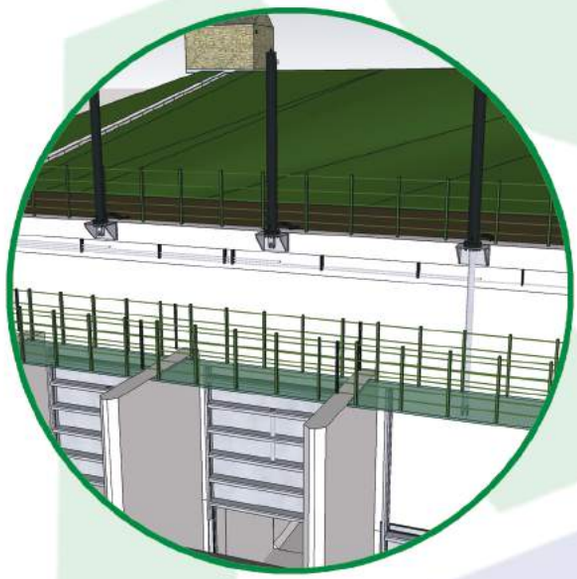


Whilst the dam's main aim was flood protection, this wasn't allowed to sacrifice fish migration. To this end the second penstock was mounted in a lower position than the other four doors, which would allow the migration of trout and salmon. The five large doors are accompanied by a smaller 1.8m x 1.8m penstock door to allow cray-fish and eel migration, which meant the critical migration path, would stay open.
The key to successful operation of penstocks are the large hydraulic actuators which allow the doors to be controlled with accuracy to regulate the downstream flow. This would allow the opera-tors to manage the discharge from the lake and keep flow at a level that would not overwhelm the existing and new flood defences in the town.



As Balfour Beatty knew that ACE had a reputa-tion for completing projects of this scale, being able to offer £5m of professional indemnity insur-ance, and also having a portfolio which included being a major contractor on the construction of the Uk's largest ever Pumping Station (St Ger-mans) they decided to entrust this major part of the project to ourselves. The project at St Ger-mans involved installing 4m flap valves, 4m pen-stocks and 4m wide stoplogs that could be stacked to 11m in height.
The project at Morpeth utilised a wide variety of specialist skills from the team at ACE which in-cluded the design of the door, able to withstand the pressure requirements, fabrication, testing and installation and the project management in multiple areas.

ACE would like to thank Balfour Beatty, the Envi-ronment Agency, and Northumberland County Council for the opportunity to work on this land-mark project.

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