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Bringing Biodiversity to Hydro Plant in Pershore

Article courtesy of Chris Elliott, Senior Hydropower Engineer at Renewables First Ltd

The hydro plant at Pershore on the River Avon in the UK was originally conceived as a project which would pay attention to environmental outcomes and deliver a win-win development for both wildlife and renewable energy.

Using two Archimedes screws passing 16m3/s of water, the system generates a peak of 230kW, and has averaged 1000MWh per annum since installation in 2014, using flow redirected from an existing 2m high weir.

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In addition to the turbines themselves, water is used to operate a new fish pass which allows fish migration past the historic weir structure for the first time. These aspects have become increasingly common as it is a cost effective way to meet the objectives of the Water Framework Directive in terms of connectivity within the river basin.

In high energy areas adjacent to the outfall and at exposed points, stone rip rap was necessary, but for the majority of the watercourse a soft engineered solution was possible. This was based on a wide and shallow inlet channel, using the naturally occurring substrate clay, protected with a new type of turf reinforcement mat, VMax C350 which provided scour protection from day one, but which then provided a matrix within which planting could take hold. Other erosion products used were the Bionet C125BN.

Using this measured approach the environmental benefits have been maximized at reasonable cost, and as can be seen in the photo opposite, the outcome has fulfilled the design intention becoming an area of high biodiversity.

In addition to this, the plant incorporates a relatively long inlet channel – this allowed the trees and habitat directly adjacent to the weir to be retained, and allowed the plant to be built entirely within land which was farmland. This could have pushed up costs if a conventional construction style of reinforced concrete channel or sheet pile retaining walls had been used. To overcome this we consulted Salix River and Wetlands Ltd who helped us achieve more environmental objectives, the construction style was sensitively adapted in a variety of ways based on the functional requirements of the relevant parts of the system.

In limited places it was necessary to use sheet piling for ground retention, scour protection and for hydraulic cut-offs around the main turbine structure.

The award winning Pershore Hydro plant was designed by Renewables First.

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