

Natural Power Design and Advisory Services - 250kW Hydro Scheme



Project:	250kW Hydro Scheme
Client:	Confidential
Project Description:	<p>A 250kW Archimedes Screw Turbine (AST) run-of-river scheme on the River Tay, Perthshire. The design elements included the intake, the headrace, the powerhouse, tailrace and the associated access tracks.</p>
Services Provided:	<p>Natural Power worked as the Owner's Engineer for the design and construction management of the project.</p> <p>During pre-construction the team carried out the tendering and contracting services required for the turbine supply, civil and electrical works. It also co-ordinated the input and interface with the Local Planning Authority, SEPA and other statutory authorities to discharge planning and CAR conditions. Furthermore, it co-ordinated the pre-construction phase activities such as the grid connection and civil works design.</p> <p>Natural Power developed designs at the tender and detailed design stages and obtained the appropriate local authority approvals. During the construction stage the team regularly inspected the site, including the monitoring of construction activities and the testing of formations. In addition, we provided ecological and environmental services for discharging planning conditions including undertaking the role of Ecological Clerk of Works.</p> <p>Natural Power performed the CDM Co-ordinator/Principal Designer role including preparing pre-construction information, reviewing contractor competencies, preparation of the health and safety file and advising the client of their duties under the CDM regulations.</p> <p>Natural Power's Geotechnical team completed a site investigation which informed the design and the construction tender process.</p>
Dates and duration of contract for project	<p>Our involvement: August 2014 to September 2016 Construction period September 2015 to August 2016</p>



Performance delivered, including strategic value to the client

- Natural Power reduced the material requirements of this project at the design stage by specifying stone excavated on site be reused to form features such as the tailrace area on site for structures e.g. the powerhouse and retaining wall. In addition larch trees felled on site were used to clad the turbine housing structure and parts of the powerhouse
- The visual impact and overall cost of the tailrace area was reduced at the design stage by specifying a landscaped access path instead of a concrete stair to access the tailrace
- During the course of the tender stage Natural Power optimised the headrace design by specifying a piped penstock instead of an open channel. This was primarily driven by the ability to reduce the visual, environmental and health and safety impacts of the open channel design, while also having better control of the system efficiencies. It also had the added benefit of easier construction, which ultimately drove costs down
- The change to the headrace design meant the requirement for two bridges was removed entirely from the scheme

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