

CASE STUDY

TIBER - USA



KEY STATISTICS

Head: 52m

Flow: 18.1 m³/s

Turbine type: 1600mm G270 Vertical Francis

Speed: 300 rpm

Output power: 7.5MW

A new design-build 7.5MW private hydroelectric generation facility was constructed in remote Montana. 8 foot diameter pipes delivered 700cfs of water to the turbine powerhouse.

The project is located on the outlet works of the existing Tiber Dam, approximately 15 miles south of the City of Chester, in Liberty County, Montana. Gilkes began working on the hydro electric project in 2001 providing proposals for the preparation of the submission to the US Bureau of Reclamation for the approval of the scheme.

Approval was granted by the Bureau of Reclamation to proceed with construction in July 2003. The Tiber hydroelectric power station began generating power in June 2004.

Gilkes scope of supply included the main inlet valve, a 1600mm diameter vertical shaft Francis turbine directly coupled to a 7.5MW alternator and a hydraulic unit to control the turbine guide vanes. the turbine spiral case and draft tube are cast in concrete.

CONTACT

Email: hydro@gilkes.com Tel: 01539 720028 Fax: 01539 732110

www.gilkes.com

Gilbert Gilkes & Gordon Ltd, Canal Head North, Kendal, Cumbria LA9 7BZ. Registration No.173768 London

GILKES

CASE STUDY

TIBER - USA

Detailed design started in July 2003. The construction programme required the spiral case and the draft were delivered to the site in November. The spiral case inlet diameter is 2.4m with the maximum dimension is 6.5m and the draft tube is 9.6m long, 4m high and 5.25m wide. In view of the size of these fabrications it was decided that they should be procured in the US.

Gilkes looked at a number of potential fabricators and placed the order with a company in Montana. The fabricator subcontracted the the precision machining required on the spiral case to a company, with capacity to handle fabrication size, in Salt Lake City. to ensure that the fabrications were manufactured to the required standard an inspector was employed in the US. Gilkes retained a Kendal based engineering consultant to design the reinforcement of the concrete around the spiral case and advise on the pouring sequence for the concrete.

The turbine runner, cartridge and shaft were manufactured in the UK. the project timescale presented a challenge in completing teh detailed design and procuring the material and components. All dimensions were required to be in US units. To meet the programme it was necessary to machine the shaft connecting teh turbine runner to the alternator rotor from a forged bar.

Though the cartridge, runner and shaft could be assembled in the UK the site assembly was critical to the success of the project as the first opportunity to bring all of the components together was when the UK manufactured components were delivered to site. The turbine was assembled by lowering all of the components through the core to the alternator.

In addition to procuring the large fabrications isn the US the main inlet valve and hydraulic control unit were also procured there. To meet the project programme it was necessary to purchase a previously used inlet valve and have it refurbished to "as new" and modified to the required specification.



CONTACT

Email: hydro@gilkes.com

Tel: 01539 720028

Fax: 01539 732110

www.gilkes.com

Gilbert Gilkes & Gordon Ltd, Canal Head North, Kendal, Cumbria LA9 7BZ. Registration No.173768 London

GILKES