

Wainisavulevu Weir Raising Project

Project Brief

Wainisavulevu Weir is owned and operated by the Fiji Electricity Authority (FEA). The Weir is operated as a diversion structure supplying water for hydro-electric generation initially through Wainikasou Power Station and then through Wailoa Power Station after impoundment behind Monasavu Dam.

The Wainisavulevu Weir is a component of the overall Monasavu Hydro-Electric Scheme. The Weir was constructed in 1984 and intercepts flow in Wainisavulevu Creek for diversion through a tunnel to the Wainikasou Power Station and on to the Monasavu Reservoir.

The capture of additional water during rainfall events has long been recognised as a desirable development for Wainisavulevu Weir. This would be achieved through raising the current Weir wall and allowing additional generation from the existing power stations without the need for any new generation or distribution systems.

An investigation of the civil engineering, energy yields and financial circumstances associated with the Weir was conducted. Raising of the Weir was determined to be a viable project of advantage to FEA as a component of the national electricity grid.

In light of the above, the FEA has embarked upon a capital works project to raise the **Wainisavulevu Weir by eight meters (8m)**.

Features and issues of relevance to the adoption of the project as determined through the investigations were:

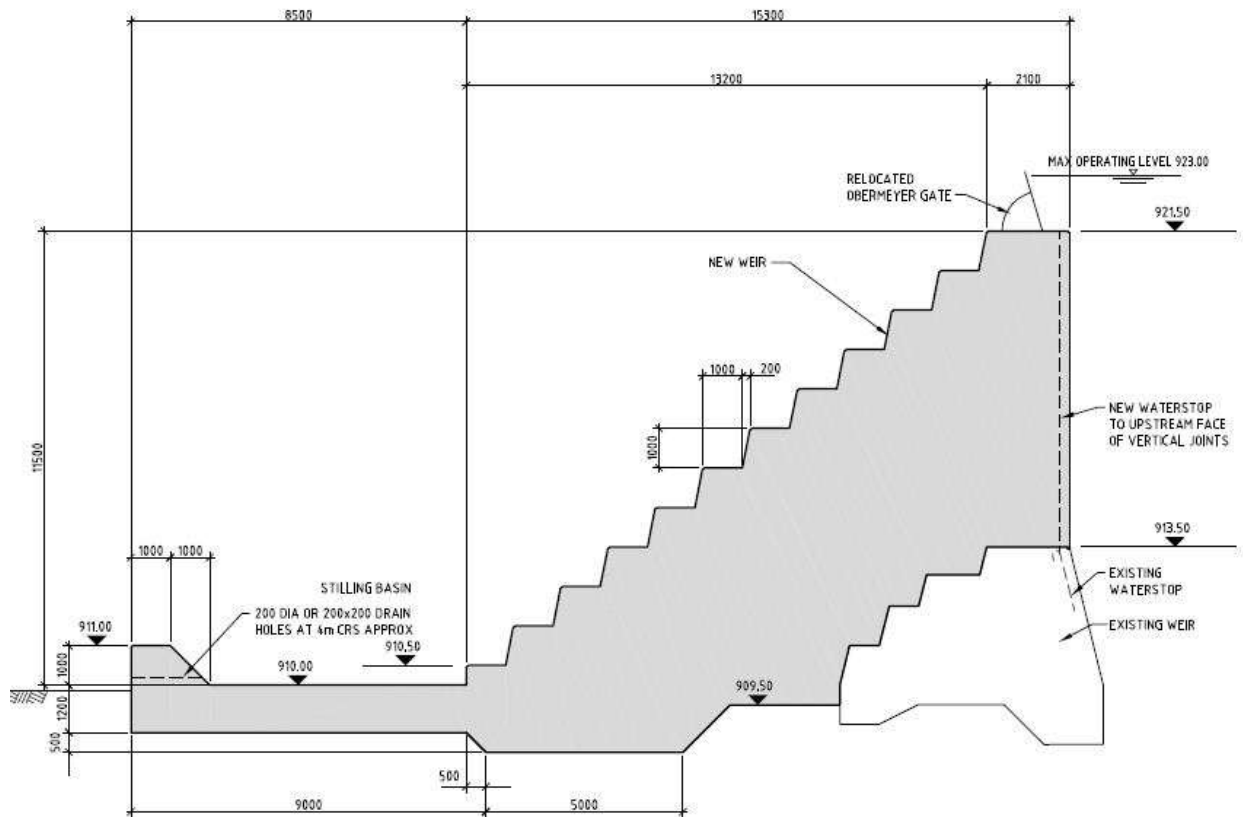
- Existing Diversion Scheme – The Weir has functioned for over twenty years as part of the water diversion scheme. The scheme has proved valuable and is suited for both continuation and augmentation in energy yield. Currently, the diversion contributes in average 30% of the Monasavu Dam's water storage
- Weir Engineering – The Weir is soundly constructed with conservative safety factors. The structure would be suitable for use as the foundation for construction of a new and enlarged Weir at the site.
- Geotechnical Conditions – The performance of the Weir over the long period since construction and all of the available geotechnical records indicate that the Weir site has good foundation material. The sandstone rock foundation stratum is capable of sustaining further loading that would result from a raised structure.
- Hydrology and Hydraulics – An examination of catchment characteristics demonstrates some more water could be diverted from Wainisavulevu Creek to the advantage of generation of electricity. The spillway characteristics as currently constructed are suitable for inclusion in a raised Weir structure.
- Fusegate – Options for raising of the top water level using both simple concrete walls and structures with the existing fusegate re-installed were examined. All cases demonstrate the financial advantages for the fusegate options.

Wainisavulevu Location



Locality Plan – Monasavu Scheme

Sketch of the Spillway to be Raised:



This would be achieved by removal of the existing fusegate, construction of new concrete elements with an additional height of 8 m and re-installation of the fusegate. Two earthen embankments would be needed on the southern abutment ridge. A new access road would be required across the northern ridge to replace the existing road which would be inundated by the higher water levels.

In raising the weir from a current level of RL915.08m to RL923.0m the storage is increased from 307,000m³ to 5,261,000m³, which is a seventeen fold increase.

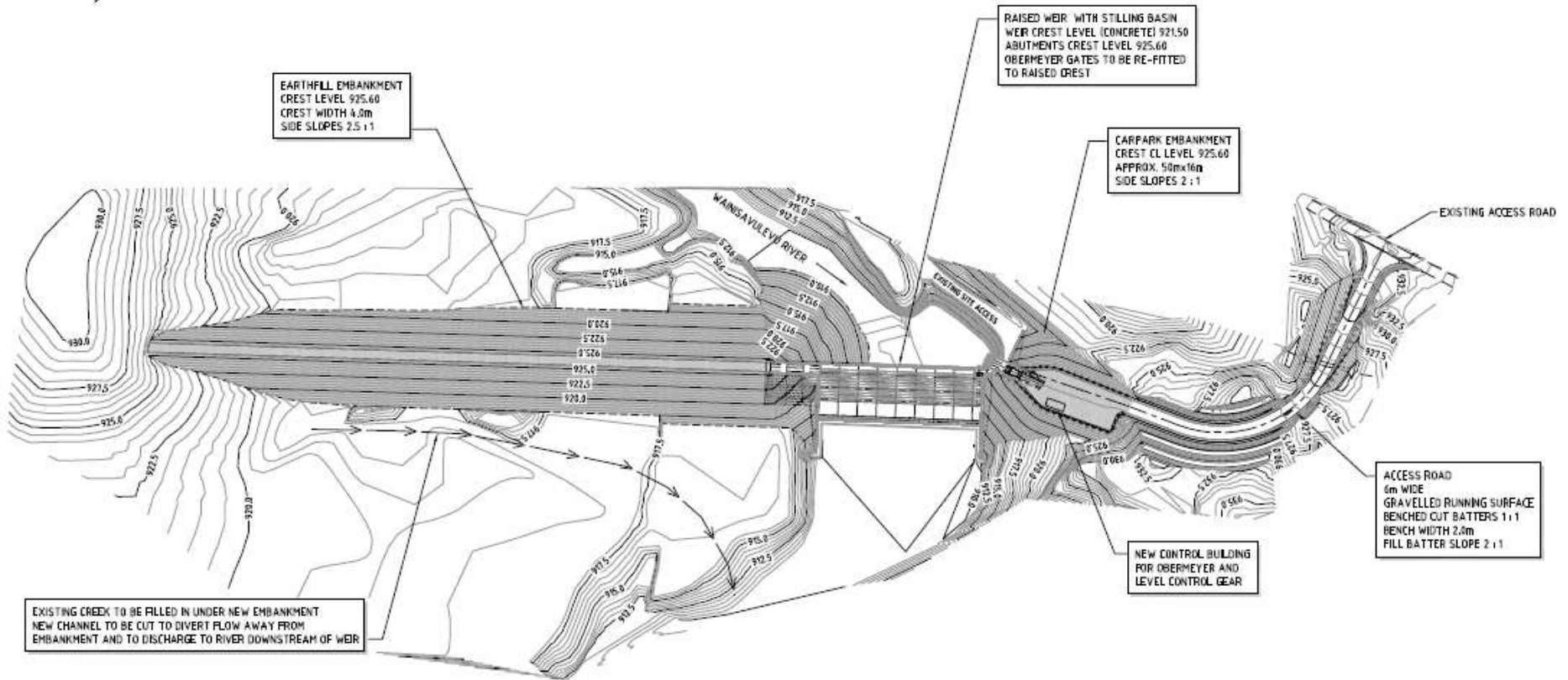
In addition, the energy yield at Wainikasau would be an additional 10 GWh over and above the current 21 GWh

Construction Tender

The tender for construction of the Wainsavulevu Weir Raising Project [WWRP] was first advertised in 2008. After a review of the design in 2010 and 2011, the tender was awarded to Sinohydro Corporation. The total cost of the project is FJD \$41.5 million and work started in late December 2011.

Supervision of the Contractors are being done by Engineering Consultants MWH of New Zealand and a team of FEA engineers.

The project should be completed by early 2015.



General Arrangement of the proposed project



Pictures of Existing Wainisavulevu Weir



During Construction Pictures:











