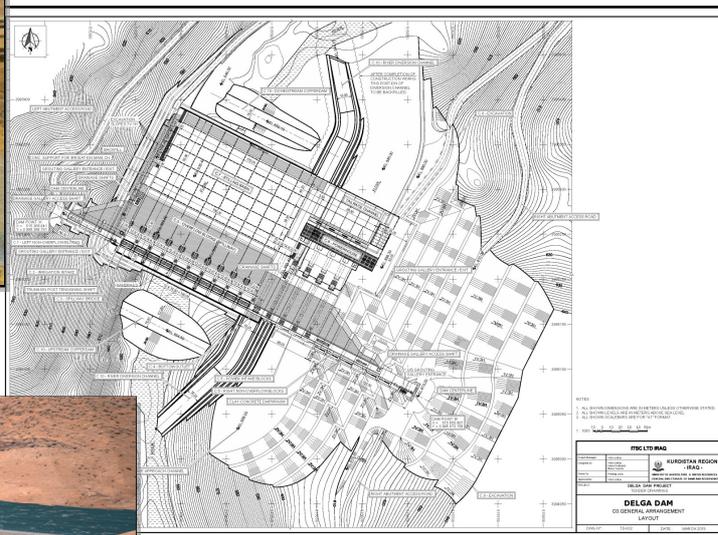


DELGA DAM PROJECT



Contract title: **DETAIL STUDY AND DESIGN & TENDER DOCUMENTS FOR DELGA DAM**

Location/River: Pishdar District / Sulaimaniya Governorate / Lesser Zab River IRAQ

Employer: Ministry of Agriculture & Water Resources, General Directorate of Dams & Reservoirs, Kurdistan Region - IRAQ

Commencement date: 2013.

Completion date: 2015.

Investment cost: 325,886,904. USD

Hydrology data

Catchment area	7313.6 km ²
Average discharge	6.92 m ³ /s
PMF flood	14000 m ³ /s

Dam

Type	Concrete gravity dam
Height	82.0 m
Crest length	436.0 m
Concrete vol.	1.01 x 10 ⁶ m ³

Reservoir total storage 100.16 x 10⁶ m³

Spillway

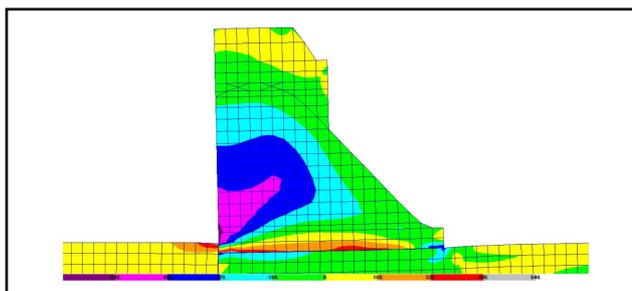
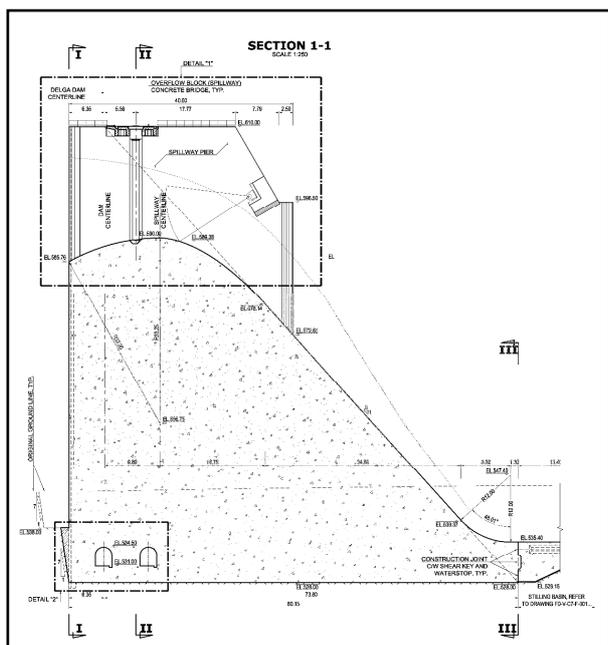
Type	Gated (radial gates) / 10 bays
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HPP

Installed capacity	70 MW (4 units)
Turbine type	Francis

Bottom outlets

Diameter	6.0 m
Total length	80.15 m



Description of the Project: Delga Dam is located at Lesser Zab River at app. 20 km upstream of existing Dokan reservoir and app. 26 km from Iranian border line measured along to Lesser Zab River. The Delga Dam will form a reservoir of sufficient storage for energy production and irrigation requirements. HPP of 70 MW (4 Francis units) is proposed to utilize water which will be normally released from the reservoir to the river downstream. Delga Dam is designed as concrete gravity dam with spillway, 4 power intake blocks, 2 irrigation intakes and left & right non-overflow blocks with clay concrete diaphragm. Appurtenant structures includes diversion channel, bottom outlet, irrigation intake with pipe, and HPP.

The Services Provided: Preparation of Final Design & Tender Documents have been the most essential goals of the Project, including the following specific Consulting Services:

- Determination of General Layout, Optimization and Engineering Design of the Dam, Appurtenant Structures & HPP at Final Design stage;
- Implementation of Earthquake Hazard Study at Planning Report stage;
- Designing (structural and stability analyses with mathematical modeling). Seismic Design including hydrodynamic response. Temperature influences on the civil structure;
- Implementation of Cost Estimate with Construction Time Schedule at Final Design stage.