

Guangzhao Hydropower Project

The Guangzhao hydropower project is situated in the middle reach of Beipan River in Guizhou Province, 162km away from Guiyang, the capital of the province.

The project is the up-most station of the power stations cascade on the main stream of Beipan River, with its main function of generating electricity. It has also other comprehensive benefits, such as navigation. The normal water level in the reservoir is EL. 745.00m, and the corresponding reservoir capacity is 3,135million m³. The reservoir is of semi-multi-annual regulation type. The installed capacity of the power plant is 1,040 MW (4×260MW) with its firm output of 180.2MW. The mean annual energy output is 2.754×10⁹ KW·h and it will be mainly used as an electric source for peak regulation, frequency modulation, stand-by for accident and load in the system.

The project scale is classified in Class I, therefore both the dam and the discharge structure are of Grade 1.

The Guangzhao hydropower project is a large scale project in Guizhou province and will serve for the second “electricity transmission from west to

east” plan. The project construction commenced in May, 2003, and the river closure was conducted in October, 2004. The total construction duration will be 66 months and the first generating units will be put into operation in June, 2008.

The dam is a full-section roller compacted concrete gravity dam. The crest elevation is at EL.750.50m with the maximum dam height of 200.5m. The dam slopes at upstream and downstream are 1:0.25 and 1:0.75 respectively. The crest of the non-overflow dam is 12.0m wide. The maximum bottom of the dam body is 159.05m wide. The whole crest length is 410m and the dam is divided into 20 dam monoliths. The total concrete quantity of the dam body amounts to about 2.80 million m³, which includes 2.42 million m³ of RCC, accounting for 86% of the total, and 0.38 million m³ of conventional concrete(CVC).

The discharge structure is made up of 3 surface spillways (for releasing flood) and 1 bottom orifice(for emptying reservoir). A radial working gate in size of 16m wide and 20m high is set for each orifice. The energy dissipater is designed in a narrow-slot ski-jump type with a deflecting bucket.

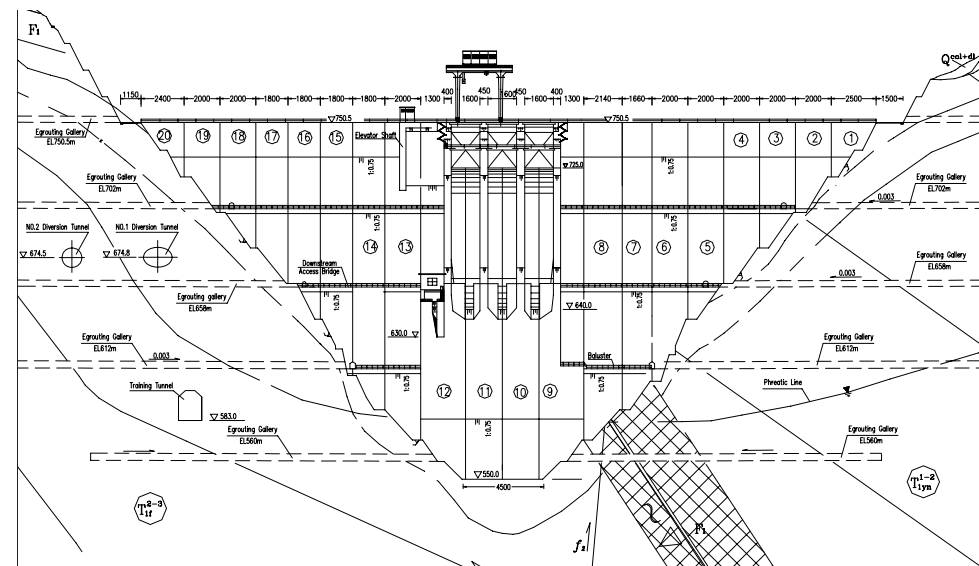


Fig.1 Guangzhao RCC dam (View from downstream)

Table.1 Main Features of Guangzhao RCC Project

Owner: Guizhou Beipan River Hydropower Development Co. Ltd.		Designer: Guiyang Institute of Hydropower reconnaissance and Design, China Hydropower Consultant Group				
Location: Beipan River, Guizhou Province		authorizing date: 2006-12				
Main function of the project: power generation, navigation						
Hydrology	drainage area	13,548 km ²	reservoir	regulation	semi-multi-annual	
	mean annual discharge	257m ³ /s		gross capacity of reservoir	3.245 billion m ³	
	normal runoff	8.11billion m ³		regulation storage	2.037 billion m ³	
	mean annual suspended load	170,000 t		check water level	747.07m	
	mean annual sediment concentration	2.085 kg/ m ³		normal water level	745.00m	
main structures	dam	type	RCC gravity dam	power generation benefit	installation capacity	1040MW
		max. height	200.5m		guaranteed output	180.2MW
		top elevation	750.5m a.s.l.		mean annual energy output	2,745 GW·h
		crest length	410m		mean annual generation hours	2,648 h
	surface spillway	number	3	investment	conventional concrete	0.40 million m ³
		clear width	16.00m		RCC	2.42 million m ³
		top elevation	725m a.s.l.		population relocated	18100
		radial gate size (width × height)	16m×20m		gross investment	6.148 billion RMB
		max. discharge	9,857m ³ /s		project period	completion time
	bottom orifice	number	1	total project duration		66 months
		elevation of bottom outlet	640m	main generat or hall	type	ground surface
		inlet size (width × height)	4m×6.5m		Size (length × width× height)	142.00m×28.10m×66.857m
		outlet size (width × height)	4m×6m		turbine installation elevation	577.00m a.s.l.
	max. discharge	799m ³ /s	Status of the project			
	surge tank	diameter		20 m		
length		69.50m				

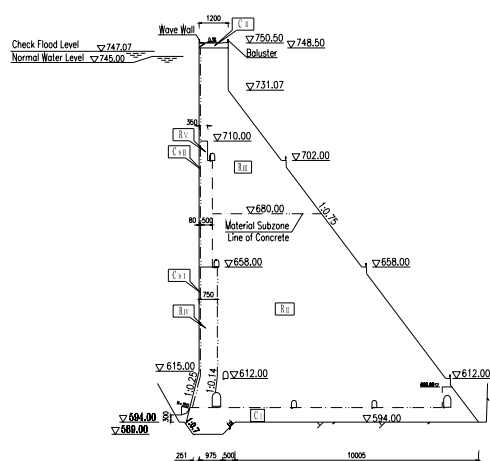


Fig.2 Cross section of Guangzhao RCC dam