

## TECHNICAL VISIT TO GERI, SARDAR SAROVAR & KARJAN DAM



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## 1. GERI

GERI is one of the leading state research institute in the country. It has distinction of being adjudged as one of the best research stations in the country, by Central Board of Irrigation and Power (CBIP) in the year 1989.

The institute aims at providing research and development inputs to the activities of the institute are centered around investigation and testing, research and development, consultancy and training in various areas.

The institute extends its activities to both Government and Public/Private sector bodies. GERI is working under Narmada, Water Resources, Water Supply & Kalpsar Department of Government of Gujarat. The institute is headed by officer of the rank of state Chief Engineer.

Three Joint Directors manned by officers of the rank of state Superintending Engineer and one Superintending Engineer (SDR) assist Director.

The research work in various divisions/units are organized by Research Officers of the rank of Executive Engineers with the supporting engineering & scientific staff. The main institute is located on a 9 hector plot at Race Course in Vadodara city. The other campus is on a 60 hector plot at Gotri in Vadodara city. In addition to this the institute has three regional divisions at Surat, Gandhinagar and Rajkot. Under each regional division district laboratories are set up. Besides there are four regional divisions of Soil, Drainage and Reclamation at Vadodara, Surat, Ahmedabad and Rajkot.

We visited GERI on 12<sup>th</sup> august 2015, on Wednesday morning. We visited different models such as Santram Sarovar, Sardar Sarovar, Balloon barrage on Tapi river, Ukai dam at Tapi river etc.

Each model was explained in detail by khan sir a technical person and research scientist form GERI. This physical model explanation increased our knowledge and changed perspective towards hydraulic structures.

## 2. SARDAR SAROVAR

We have visited Sardar Sarovar dam constructed on Narmada river near Navagam, Gujarat in India on 13<sup>th</sup> August. It is a concrete gravity dam. It is the largest dam and part of the Narmada Valley Project, a large hydraulic engineering project involving the construction of a series of large irrigation and hydroelectric multi-purpose dams on the Narmada river. The project took form in 1979 as part of a development scheme to increase irrigation and produce hydroelectricity. The dam height is about 163 m, the construction is going on for radial gates.

Firstly we visited the model room of the Sardar Sarovar dam. There was a 3D model, which describes the locations of the whole project. The map of the Gujarat, Madhya Pradesh, Maharashtra and Rajasthan, which uses the water of Narmada for various purposes mainly for irrigation.

There are six number of turbines in the tunnel. The dam's main power plant houses six 200 MW Francis pump-turbines to generate electricity and include a pumped-storage capability. Additionally, a power plant on the intake for the main canal contains five 50 MW Kaplan turbine-generators. The total installed capacity of the power facilities is 1,450 MW. Its final configuration is the second largest concrete gravity dam. This tunnel is constructed in a hard core rock. The height is about 10 floors of a building. The walls are constructed with the help of Soil nailing. There is also some part of tunnel, which is having the whole part of turbines and penstocks.

Then we visited the view point of dam. The dam was overflowing at that time. There was an Ogee spillway for disposing surplus water. The dam has the capacity is 29 lac cusec. There are also Auxiliary spillways provided for high flood. There is an energy dissipation arrangement at the downstream side of the dam, which controls the velocity of the water.

Then we visited the Crane which is used for transporting the construction material from one side to another. The capacity of the crane is also very high.

We saw three ponds which are diverted from the upstream side of the reservoir. The three ponds are constructed because the velocity of the water is very high, 27 m/s, so to control the velocity of the water, the three ponds are constructed and then the Main canal is started. The design velocity of the canal is 1.5 m/s. The main canal is the lining canal. There is a head regulator at the main canal. (details) This main canal is 488 km long.

We also visited the Garudeshwar temple and the Shulpaneshwar temple.

### 3. KARJAN DAM

We visited Karjan dam on 14<sup>th</sup> august 2015, last day of our trip. It is a concrete masonry type of dam. It has ogee type of spillway crest. Total number of gates are nine.

The other features of dam are shown in following figure:

SALIENT FEATURES OF KARJAN PROJECT			
Gujarat		5) Spillway:	
Narmada		Length of spillway	: 171.60 m
Karjan		Crest level of spillway	: 101.23 m
		Shape of crest	: ogee
		No. of radial gates	: 9 Nos.
		Size of radial gates	: 15.55 m x 14.02 m
		Down stream protective works	: Stilling basin with horizontal apron
		Aeration gallery 2.5 x 3.75 m with air-inlet duct 1.20 m x 1.20 m and aeration groove 1.40 m x 1.40 m	
rainfall:		Low level sluices	: 4 Nos. X 2.13 m x 2.74m
: 2288.00 mm		6) Canal system :	
: 584.90 mm		: L.B.M.C.                      R.B.M.C.	
: 1209.50 mm		i) capacity	: 28.30 cumecs              9.06 cumecs
: 19,625 cumecs		: (1000 cusecs)              (320 cusecs)	
: (8,93,000 cusecs)		ii) Type	: Lined
: 17,275 cumecs		iii) Section	: 2.60 m x 2.65 m
: (6,10,000 cusecs)		iv) C.B.L.	: R.L. 75.00 m
AS PER project report 1984		v) F.S.L.	: R.L. 77.85 m
AS PER 2005 Sedi. Sry		vi) Grade	: 1 in 3000
: 630.00 Mm <sup>3</sup>		: upto 11.77 Km	
: 49.00 Mm <sup>3</sup>		: 1 in 5000	
: 581.00 Mm <sup>3</sup>		: From 11.77 Km	
: 32.70 Mm <sup>3</sup>		: onwards	
at		vii) Length	: 51.005 Km              12.6 Km.
vel		viii) Head - Regulator	
own level		Location	: Ch. 120 m              Ch. 510 m
: R.L. 115.25 m		Design Discharge	: 28.30 cumecs              9.06 cumecs
: R.L. 116.10 m		: (1000 cusecs)              (320 cusecs)	
own level		: 3 Nos.	
: R.L. 78.00 m		No. & Size of Opening	: 3 Nos.              2 Nos.
m		1.219m x 1.524 m	
: Masonry / Concrete		ix) Command Area Gross	
: 903.00 m		Command Area	
: R.L. 119.70 m		: 60350 Ha.              19435 Ha.	
above deepest		: (Total - 79785 Ha.)	
vel)		Culturable Command Area	
: 100.00 m		: 39588 Ha.              11412 Ha.	
dway			
: 7.77m			

## 4. APPENDIX









