



**CIVIL ENGINEERING
DEPARTMENT**

A REPORT ON ACADEMIC VISIT TO KAKRAPAR DAM

(Date: 22nd Sept., 2023)

CONCERNED FACULTY: Dr. Bankim Joshi
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STUDENTS: B.E. CIVIL 4th Year

SUBJECT: IRRIGATION ENGINEERING

**SITARAMBHAI NARANJI PATEL INSTITUTE OF TECHNOLOGY & RESERCH
CENTRE, UMRKHAH
CIVIL ENGINEERING DEPARTMENT**

ACKNOWLEDGEMENTS

We take this opportunity to acknowledge that who has been great sense of support inspiration thought, the academic visit successful. We are grateful to our college for giving us the opportunity to have an academic visit to Kakrapar dam.

On the behalf of Civil Engineering Department and the Principal of S. N. Patel Institute of Technology & Research Centre, Umrakh, we thank the authorities of the Kakrapar dam to give us permission to visit the corresponding place and giving us sufficient knowledge about the technical details of Kakrapar dam and infiltration galleries. We once again extend our sincere thanks to all those who knowingly or unknowingly helped us with the visit.



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INDUSTRY DETAIL:

- **NAME OF INDUSTRY:** Visit at Kakrapar Weir Site, Mandvi.
- **ADDRESS:** Kakrapar, Mandvi
- **DATE OF VISIT:** 22/09/2023
- **YEAR / SEMESTER:** 4th Year / 7th Semester
- **NO. OF STUDENTS:** 46
- **NO. OF FACULTIES:**3

Introduction about Kakrapar dam Project:

The river Tapi is the second largest west –flowing river of India. The Tapi river has its origin at Mulati in Betul District of Madhya Pradesh (Lat 21° 43' N, 78° 16'). The river has a Total length of 720 km out of which 208 km lies in the Madhya Pradesh, 323 km in the Maharashtra and 189 km in Gujarat. It ultimately meets the Arabian Sea approximately

19.2 km west of surat in Gujarat. The Gujarat Government has developed the lower Tapi in two stages. The Karapar weir and its Canal system having estimated cost of Rs. 18 crores form the first stage. This Project was commissioned in the year 1954 and the canal system provides seasonal irrigation facilities to 2,27,530 ha from the run off the river.

The functions of the Project are:

1. Irrigation
2. Power Generation
3. Flood Protection
4. Fisheries development

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KAKRAPAR DAM

Kakrapar Dam is the most precious gift to this area by the government. Before independence, various protests were made to construct a dam in this area as the water of River Tapi caused a huge disturbance and calamity in the nearby areas of Mandvi Tehsil of Surat. Water of the river was not managed and the mutilated hinterland of the Tapi River was facing severe flood incidents regularly. To put a check on the flood, area was surveyed and village Kakrapar was earmarked for construction of dam. Construction work was started in 1950 and completion done in 1954. This dam was intended for providing irrigation support to the nearby areas as well as prevention from routine flood.

This dam has a height of 15.48mtr and length of the dam is restricted upto 7315 mtrs. Height of the dam is including the foundation. Much height is not given to the dam as hydro electricity generation was not needed and only water management was intended. Though, the wall of the dam is 11.55' thick so that the same can bear the huge water load in the reservoir. Catchment area of this dam is 59904 SQKM as average rainfall point of this area is 786mm. Basalt bed Rocks are the main bed of the dam. Naturally the reservoir is built on tough shell of granite and this supports the water pumping towards upper direction in case of excess rainfall in the area. Water reservoir of this dam is spread in 442 SQKM with a storage capacity of 51.51mm³. In the dam area, 26 villages come under the submergence zone. Maximum discharge capacity of this dam is 38228 m³/s. No gates are provisioned in this dam to release and control the water. Both sides of the dam channels have been provisioned from where canals are initiated. Left portion canal and right portion canals are 64 kilometers long.





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SALIENT FEATURES

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1. RIVER	TAPI (PERENIAL)	
2. LENGTH	2038.40 FT.	
3. CREST LEVEL OF WEIR	160.00 FT-RL	
4. MAXIMUM DESIGNED FLOOD LEVEL	185.00 FT-RL	
5. MAXIMUM DESIGNED FLOOD LEVEL	13,57,000.00 CUSECS	
6. DETAIL OF HEAD REGULATOR GATES		
A - LEFT BANK H.R.	3 GATES EACH OF 20'10 FT SIZE	
B - RIGHT BANK H.R.	3 GATES EACH OF 20'8 FT SIZE	
7. DETAIL OF HEAD UNDER SLUICE GATES		
A - LEFT BANK U.S.	6 GATES EACH OF 10'8 FT SIZE	
B - RIGHT BANK U.S.	1 GATE OF 50'18 FT SIZE	
8. SILL LEVELS OF GATES		
A - LEFT BANK-H.R.	143.50 FT-RL	
B - RIGHT BANK-H.R.	145.00 FT-RL	
C - LEFT BANK-U.S.	125.00 FT-RL	
D - RIGHT BANK-U.S.	142.00 FT-RL	
9. MAXIMUM HEIGHT OF WEIR FOUNDATION	44.83 FT	
10. MAXIMUM WIDTH OF WEIR FOUNDATION		
A - AT BOTTOM	80.50 FT	
B - AT TOP	5.00 FT	
11. CATCHMENT AREA OF WEIR	23.400 SQ MILE	
12. DATE OF STARTING OF PROJECT	19-01-1951	
13. DATE OF COMPLETION OF PROJECT	30-08-1954	
14. MAXIMUM FLOOD LEVEL		
A. YEAR 1959	30-08-1954	179.85 FT
B. YEAR 1968		81.00 FT
C. YEAR 2006		182.70 FT (9-8-2016)
		182.70 FT (9-8-2016)
15. DETAILS OF GROSS COMMAND AREA		
A - LEFT BANK MAIN CANAL		12,47,000.00 HACT
B - RIGHT BANK MAIN CANAL		1,00,200.00 HACT
16. DETAIL OF CULTIVABLE COMMAND AREA		
A - LEFT BANK MAIN CANAL		1,45,335.00 HACT
B - RIGHT BANK MAIN CANAL		1,20,054.00 HACT
17. DETAIL OF AFFLUX BUND		
A - LENGTH		LEFT BANK AFFLUX BUND
B - TOP WIDTH		RIGHT BANK AFFLUX BUND
C - TOP R.L.		9,222.00 FT
		10.00 FT
		10.00 FT
		193.00 FT
		LEFT BANK MAIN CANAL
		RIGHT BANK MAIN CANAL
		66.32 KM
		108.96 KM
		25.54 KM
		50.24 KM
		50.24 KM
18. DETAILS OF FEEDER CANAL		
A - LENGTH OF MAIN CANAL		
B - LENGTH OF BRANCH CANAL		
19. DETAILS OF FEEDER CANAL		
A - FROM 0 FT TO 4300 FT(1.31 K.M)		BRICK LINING
1 - BED WIDTH		55.00 FT
2 - DEPTH		10.00 FT
3 - VELOCITY		4.62 SECONDS
B - FROM 4300 FT TO 21000 FT (5.08 K.M)		UNLINED CANAL
1 - BED WIDTH		9.00 FT
2 - DEPTH		10.00 FT
3 - VELOCITY		3.00 SECONDS
4 - CANAL BED LEVEL		142.30 TO 140.58 FT
5 - FULL SUPPLY LEVEL		152.30 TO 150.48 FT
6 - DISCHARGE CAPACITY		3006.00 CUSECS

Attraction about this dam site is itself an attraction point. Various water sport facilities including boating and water scooting have been provided by state government in the water reservoir of the dam. Approach road is well connected to the nearby highway. A park has been established alongside the dam is a beautiful place where people can spend their weekends. At 77 kilometers from this dam, Kakrapar Atomic Power station is located. National highway No 6, state highway No 171/187 and 05 are connecting the place from this dam.



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Location	Vill.:Kakrapar, Tal.:Mandvi, Dist.:Surat
Purpose	Irrigation
River	Tapi
Area of catchment	59904 km ²
Mean annual runoff in the catchment	
Mean annual rainfall	786 mm
Year of commencement of construction work	1950
Year of completion	1954

