

DHANIKHARI DAM SPILLWAY, ANDAMAN AND NICOBAR.



SALIENT FEATURES

Location	: Port Blair
Union Territory	: Andaman & Nicobar
River	: Dhanikhari Nallah
Design Discharge	: 225 m ³ /s
Type of dam	: Concrete Gravity Dam with increased height (37.25 m)
Spillway	: 3 Spans of 3.6 m x 3.6 m (Orifice with Breast Wall)
Energy dissipator	: Stilling basin with end sill

MAJOR STUDIES

Comprehensive model scale 1: 25

- ☺ Discharging capacity of spillway with partial as well as full gate openings
- ☺ Water surface profiles over the spillway
- ☺ Piezometric pressures along the spillway profile
- ☺ Performance of stilling basin
- ☺ Flow conditions in the river downstream of stilling basin.



RESULTS

- ❖ The modified design of spillway proposed for augmentation of water supply by heightening of existing gravity dam by 5m is found suitable.
- ❖ The design discharge of 225 m³/s could be passed through 3 spans fully open with reservoir water level at El. 63.6 m as against the MWL El. 66 m. Also with one gate closed and with reservoir water level at MWL, the discharge of 225 m³/s could be passed.
- ❖ The piezometric pressure distribution on the spillway profile is acceptable. The spillway profile having equation $x^2=20y$ is acceptable.
- ❖ The performance of stilling basin is satisfactory for entire range of discharges.
- ❖ Height of the training walls is to be raised suitably to avoid overtopping.
- ❖ Necessary bank protection measures downstream of stilling basin may be taken to safeguard the left bank along 90 degree bend and further downstream so as to withstand the velocities of the order of 3 to 5 m/s.



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Service Through Research

CENTRAL WATER AND POWER RESEARCH STATION,
PUNE - 411 024, INDIA.

AREAS OF ACTIVITIES AT THE CWPRS

- * HYDROLOGY AND WATER RESOURCES ANALYSIS
- * RIVER ENGINEERING
- * RESERVOIR AND APPURTENANT STRUCTURES
- * COASTAL AND OFFSHORE ENGINEERING
- * SHIP HYDRODYNAMICS
- * HYDRAULIC MACHINERY
- * APPLIED EARTH SCIENCES
- * MATHEMATICAL MODELLING
- * INSTRUMENTATION AND CONTROL ENGINEERING
- * FOUNDATION AND STRUCTURES
- * INFORMATION SYSTEM (WATER AND POWER)

RESERVOIR AND APPURTENANT STRUCTURES

FACILITIES

Large size covered and open model trays, Glass sided and Tilting flumes for hydraulic model studies. Precision Equipment for measurement of hydraulic parameters with data acquisition system. Workshop facilities for fabrication models Equipment for Field data Collection, Computer Center Numerical models for aeration devices and water hammer analysis.

AREAS OF SPECIALIZATION AND MAJOR STUDIES

STORAGE AND DIVERSION STRUCTURES

The study of storage and diversion structures include spillways, energy dissipators and appurtenant structures such as training walls, divide walls, downstream protection works.

❖ Spillway and Energy Dissipators : Bhakra, Salal, Sardar Sarovar, Chamera, Srilsailam, Nathpa Jahakri, Dhauliganga, Tala (Bhutan), Kurichu (Bhutan), Chukha (Bhutan), Bekhme (Iraq), Bakurman (Iraq), Khaliikan (Iraq), Sedwagyi (Myanmar), Ukai, Kadana, Dharoi, Baira-Siul, Mahi Bajaj Sagar, Matrikundai, Ranjitsagar, Icha, Rajghat, Khandong, Thoubal, Doyang.

❖ Appurtenant Structures : Assessment of hydrodynamic pressures/forces and bending moments on divide walls, chute, baffle blocks, breast walls, stilling basin apron and plunge pool lining for Sardar Sarovar, Salal, Bekhme (Iraq), Icha, Ranjitsagar, Ranganadi and Koyna Projects.

CONTROL STRUCTURES

The study of structures controlling and guiding high velocity flows include gate, tunnels and outlets. The major studies include assessment of hydrodynamic uplift and downpull and estimating air demand of gated outlets. CWPRS is the only laboratory in India using the state-of-art equipments for studies with the help of hydraulic models.

❖ Gates : Sardar Sarovar, Tala, Chamera, Supa, Beas, Mahanadi, Malaprabha, Cheruthoni, Kadana, Ukai, Idukki, Bhira.

CONVEYANCE STRUCTURES

The studies include intakes, penstocks, surge shafts, tunnels.

❖ Projects : Sardar Sarovar, Bhira Surge Tank, Indira Sarovar, Kakkad, Indravati, Doyang, Baira-Siul, Beas P3R, T1, T2 Tunnels, Pandoh Baggi, Koyna and Salal Tail Race Systems, Koyna Lake Tape, Srisailam Intake, Kalinadi Surge Shaft.

❖ Mathematical Modelling for water hammer analysis for Ghatghar and Kal Projects.

CENTRAL WATER AND POWER RESEARCH STATION, KHADAKWASLA, PUNE - 411024

Tel : (020) 4391801-14

Fax : (020) 4392004

Website : www.mah.nic.in/cwprs

E-Mail : wapis@mah.nic.in