



उत्तराखण्ड शासन

IRRIGATION RESEARCH INSTITUTE ROORKEE - 247667 (UTTARAKHAND)



**IRRIGATION DEPARTMENT
GOVT. OF UTTARAKHAND**



अपार शक्तेः स्त्रोतः गंगेयम्

Activity Profile



(An ISO 9001 Certified Organisation)

Website : www.iriroorkee.res.in, Email : info@iriroorkee.res.in



THE INSTITUTE

- Initially, established at Lucknow in 1928 for R&D works related to Hydraulic Engineering.
- Mr. Garald Lacey was the first Research Officer of this station.
- In 1946, station was shifted from Lucknow to Bahadurabad to conduct model studies on large scale.
- In 1954, the institute was established for testing of civil engineering materials and other R&D works in addition to hydraulic model studies.
- The institute is serving as advisory member of several technical committees of BIS, CBI&P, GFCC, IRC, WRD, etc.
- The institute is maintaining a close liaison with CBI&P New Delhi, CBRI Roorkee, IIT Roorkee, NIH Roorkee, SEA Roorkee, WALMI, Govt. Workshop Roorkee, IDO, Roorkee etc.
- In 2012, institute got ISO 9001:2008 Certificate.



CONSULTANCY AREAS

Major Consultancy Areas

- (i) Water Resources R&D Works
- (ii) Testing of Materials

Water Resources R&D Works

❖ Physical Model Studies –

Different hydraulic structures related to

- River valley projects,
 - Highways (bridges, etc.),
 - Irrigation & drinking water projects,
 - River training, flood protection & anti erosion measures, etc.
- #### ❖ Mathematical Modeling
- Surface and sub-surface flow,
 - Hydraulic structures,
 - Dam Break Modeling
- #### ❖ Reservoir Sedimentation Studies
- Hydrographic Survey of Reservoirs
 - Reservoir Sedimentation and sediment transport at intakes, reservoirs, etc.



Model of Tehri Dam (UK)



Model of Ratle HEP (J & K)



View of EMDA Laboratory

❖ Ground Water Development : Studies for

- Uplift pressure, exit gradient, depth of cut-off, etc.
- Conjunctive use of subsurface and surface water
- Water logging
- Regeneration/Seepage of water from perennial river
- Suitability of canal linings, seepage from canals, tube wells reservoirs, etc.

CONSULTANCY AREAS

Ground Water Development : Preparation of DPR for Artificial Recharge to Groundwater

❖ **Basic Research & Development Studies**

- Studies of River migration and sinuosity index using Remote sensing and GIS Technique.
- Discharge measurement of different rivers.

✚ **Testing of Materials**

❖ **Concrete and its Ingredients**

(Cement, Aggregate, Water, etc.)

- Physical & Chemical Tests of Concrete, Cement & Mineral admixtures, Aggregates, Water for concrete.
- Physical Tests of Admixtures



- ❖ **Concrete Mix Design (with or without admixture), RCC, SCC, HPC, etc.**
- ❖ **Steel - Physical properties**

❖ **Pressure Release Valve Test Lab.**

Testing of Pressure Release Valves (PRV)

- ❖ Sensitivity Test,
- ❖ Back-Leakage Test



❖ **Soil** Determination of engineering properties of soils **Field Tests:**

- Bearing capacity at foundation of structures.
- In-situ Shear Parameters
- Modulus of Subgrade Reaction
- In-situ Permeability and Sub-Soil Strata to study the seepage behaviour etc.



❖ **Rock** - Determination of Engineering Properties of Rock

- Modulus of Elasticity & Poisson's Ratio.
- Unconfined Compressive Strength on Rock core specimen.
- Shear Parameters – 'c' and ' ϕ '.
- Point Load Strength Index.
- Water Absorption, Specific Gravity.
- Weathering/Durability/Porosity/Soundness/ Permeability Test of Natural Building Stone.



❖ **Field Tests**

- Bearing Capacity by Plate Load Test.
- Block Shear Test for ('c' and ' ϕ ').
- Pull out Test (Anchor Bar & Rock Bolts).
- Uniaxial Jacking Test (Modulus of Deformation).
- Load Test for Bridges and Aqueduct.



❖ **Testing of GI, MS, PVC, uPVC Pipes upto 400 mm dia. & Cement & Hume Pipe**

- Physical Parameters
- Hydrostatic Pressure Test

❖ Highway Construction Materials

- Thickness Design & Testing of Rigid & Flexible Pavements
- Job mix for bituminous pavement
- Testing of all ingredients of Rigid & Flexible Pavements
- Core Cutting and Testing of Bituminous & Concrete Pavements



Highway Lab



Timber Testing Lab



Chemical Lab

- ❖ Chemical analysis of Water for construction purpose, Cement & Mineral Admixtures (Fly Ash, silica Fume, etc.)
- ❖ Proportional ratio of its ingredients of Cement mortar & Cement concrete
- ❖ Alkali aggregate reactivity (AAR) test of aggregate samples.
- ❖ Determination of suspended sediment concentration in PPM.
- ❖ Grain size distribution of silt samples by using Puri's Siltometer

❖ Timber Testing Lab

Testing of Timber & Plywood

❖ Physical Properties

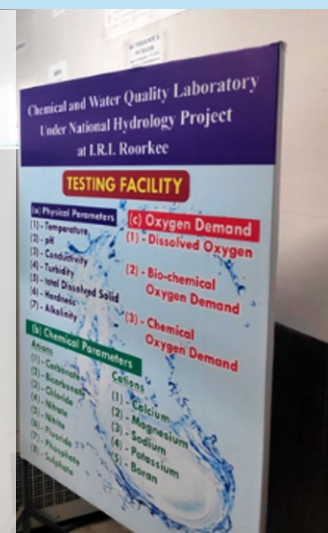


Hydrographic Survey

- ❖ Capacity Survey
- ❖ Estimation of Life of Reservoirs/Lakes
- ❖ Sedimentation Studies etc.

❖ Testing of Drinking/ River/ Lake/ Sewage water

- Physical & Chemical Parameter
- E-Coli & Total Coliform Heavy Metals & Pesticide residue



INFRASTRUCTURE FACILITIES

Water Resources R&D Works

❖ **Physical Model Studies-** Hydraulic Research Station, Bahadrabad is located at 18 km. Milestone from Roorkee on Delhi-Haridwar Highways and is facilitated with

- More than 18 hectares area,
- 6-8 cumecs water and
- 4-10 m head drop for carrying out physical model studies

❖ **Reservoir Sedimentation Studies**

- Lasted fully automatic echo-sounder with GPS.

❖ **Ground Water Development**

- Well equipped Aquifer Modelling Laboratory
- Well equipped EHDA Laboratory

❖ **Basic Research & Development Studies**

- Computer Centre having more than 15 PC with different software, Large size scanner, plotter and several types of printers.

Testing of Materials

❖ **Testing of Concrete & its Ingredients, Steel and Concrete Mix Design**

- Well equipped Concrete Laboratory with NDT facility

❖ **Testing of Soil**

- Well equipped Soil Laboratory with field test facility.

❖ **Testing of Rock**

- Well equipped Rock mechanics Laboratory with field test facility.

OUTSTANDING CONTRIBUTIONS

- Design of "Sharda Type Fall"
- Design of different types of desilting chambers
- Design of Surge Systems
- Drainage arrangement for diversion tunnel
- Well equipped Remote sensing Laboratory
- Criterion for Design of energy dissipaters of different structures.
- Design criteria for river training works
- Estimation of down pull of gates
- Energy dissipaters for shaft spillway
- Hydraulic design of Intermediate level outlets for high dams.
- About 1400 Hydraulic model studies of indigenous and abroad projects
- Preparation of DPR for Artificial Recharge to Groundwater
- Mix Design of High Performance Concrete, Roller Compacted Concrete,
- Shotcrete, etc.

OTHER ACTIVITIES

❖ **Observation of Meteorological Data** – Well equipped meteorological lab. is established at HRS, Bahadrabad.

❖ **Training programme** – The institute has been organised more than 100 computer and other training programme for inservice engineers, research personal and students.

❖ **Publications-** Annual Report is issued by the institute. More than 100 technical papers based on findings of the different studies have been published in various international and national seminar, symposia, conferences and workshops.

❖ **Library** – One no. well equipped library at Roorkee with more than 20,000 technical books/ manuals/ standard/ guidelines, etc. Other at Bahadrabad with more than 3,000 technical books/manuals/standard/ guidelines, etc.



ACHIEVEMENTS

Opinions of distinguished visitors

❖ “It was very great pleasure for me to visit and study the very interesting and high scientific level researches carried out in the laboratory”

**Prof. Emil Mosonyi,
Budapest Tech University.**

❖ “Today has been my first opportunity to observe both the model research and the actual construction of large Indian Projects.”

**Peter Rogers,
Harvard University**

❖ “It was a privilege and pleasure to see this important station.”

**J W Hilf, Chief (Designs),
USBR, Colorado**

❖ “A very impressive water management project and one that surely has stood the test of time. It must rank among the greatest Irrigation undertakings in the world.”

**J F Kennedy,
Chairman, IAHR**

❖ “Very interesting and useful experiments are in progress. The Director and staff deserves congratulations for their energetic and original approach in solving practical problems.”

**Dr K L Rao,
Union Irrigation Minister**

❖ “This station needs to be developed as a centre of excellence in hydraulic model studies, particularly in view of the large hydropower potential of the Himalayan region.”

**A D Mohile,
Chairman, Central Water Commission**

❖ “I am very pleased to see further development of the station since my last visit about three years back, very important researches are being carried out, which would lead to efficient and economical hydraulic structures, I wish the staff all success.”

**D.V. Joglekar,
Director, CWPRS, Pune**

❖ पूरे देश के लिये यह संस्थान उपयोगी है।

**नितीश कुमार
रेल मंत्री**

❖ “The Institute has excellent facilities and an asset to the Nation.”

**- Prof. Bharat Singh,
Former Vice Chancellor, University of Roorkee**

Glory of Roorkee Town

❖ Location- 170 km. milestone on Delhi-Haridwar Highway

Latitude 29052'00" N

Longitude 77053'52" E

R.L. 268.00 m El.

❖ Recognized as Educational and R&D Hub.

- IRI, Roorkee
- Bengal Engineers Group
- IIT, Roorkee
- CBRI, Roorkee
- NIH, Roorkee
- Govt. Workshop, Roorkee



In India, first train was run on 22nd Dec.

1851 between Roorkee and Piran Kaliyar



Awards

- ❖ In 1986, first “CBI&P Trophy” for Outstanding R&D Works.
- ❖ In 1987, “CBI&P - IRPO-HI-TECH-87”
- ❖ In 2018, CBI&P Award for the Best R&D Institute in Water Sector



Research Personnel's Award

- CBIP-Pt. Jawahar Lal Birth Centenary Research Award
- CBIP- Young Engineers Award
- CBIP-Cash Your Idea Award
- HYDROSEM Award of the Institution of Engineers(India), U. P. State Centre
- Gold Medals, Cash Awards
- Certificate of Merits for Best Research Papers, etc.



Contact us

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