



News & Views

Where there's a will, there's a way: The story of the 180-year-old Ganga Canal and Roorkee's journey from a cluster of mud huts to a modern hub of engineering education

Necessity is the mother of all engineering activities, and civil engineering, in particular, has always inspired creative outpourings that shape society. Large-scale construction projects improve lives and push engineers to innovate, validate theories, and develop new approaches for the future.

The planning of major river valley development projects / irrigation projects is done on a long-term basis, considering many aspects, and the construction of the 180-year-old Northern Ganga Canal is one such story - a tale of vision, resilience, and transformation. Indeed, this is an excellent example of a civil engineering marvel.

During the 18th and 19th centuries, North India was repeatedly struck by famines, often due to weak monsoons. In 1837, when the rains failed, the Ganga and Yamuna rivers dropped drastically, triggering a famine that claimed nearly eight million lives. Known as the Agra Famine, it devastated more than ten main districts of the state of Uttar Pradesh, including Agra, Kanpur, Etawah, Fatehpur, Mainpuri, Hamirpur, Banda, Mathura, and Aligarh. The occurrence of famines was one of the most devastating natural calamities during the Mughal / British-ruled periods. The famines that occurred during the 18th and 19th centuries in West Bengal and some parts of Northern India were probably the main reasons for the development of integrated irrigation canal systems in most parts of India.

The problem prevailing in one area can be a good "lesson" for another area facing similar problems. It was then that Colonel Proby Cautley (1802–1871), a British military engineer and paleontologist, rose to the challenge. He envisioned and supervised the construction of the Northern Ganga Canal, stretching over 500 km from Haridwar to Kanpur, irrigating famine-hit regions and bringing prosperity to countless villages.

There were many obstacles and objections to this dream project of Colonel Cautley, but he persevered wholeheartedly, and after six months of walking and riding through the challenging areas, taking measurements, Colonel Cautley managed to convince and persuade the concerned authorities to sponsor the project.

Cautley faced financial hurdles, opposition from priests at Haridwar, and the engineering challenge of crossing the Solani River. To appease the priests, he left a gap in the barrage at Bheemgoda (upstream of Har ki Paidy, Haridwar) for uninterrupted holy flow and began construction with Ganesh Puja (worshipping of the god of good beginnings). To solve the Solani challenge, he built India's first aqueduct, raising the canal 25 meters above the river—a marvel that still stands today.

Interestingly, India's first steam engine was used here in 1851- not for passengers, but to haul clay for bricks along an 8 km track near Roorkee, two years before the first passenger train ran in Bombay.

At the time of completion, it carried the highest discharge of any irrigation canal in the world. The canal was formally opened in 1854, stretching 560 km with branches and tributaries over 4,800 km, irrigating 3,100 sq. km, and touching nearly 5,000 villages. It transformed agriculture and led to the establishment of the Thomason College of Civil Engineering (1847), later the University of Roorkee (1949), and eventually the prestigious IIT Roorkee (2001).

On April 17, 1982, I arrived in this charming town for the first time (after completing my master's in rock mechanics from IIT Delhi), and I was captivated by its serenity and soon began my government job with the State Engineering Services at the Irrigation Research Institute, Roorkee.

Over the years, I was fortunate to serve in various organizations in different capacities (from an Assistant Engineer to Chief Engineer), including the Irrigation Design Organization (IDO); IRI Roorkee; Upper Ganga Canal Modernization Project; Basic Research Circle, IRI (as its Superintending Engineer); Hydraulic Research Station, Bahadradab (with an additional charge as its Head); IIT Roorkee (as a faculty member); Chief Engineer (Research & Design), Govt. of Uttarakhand; and Director, College of Engineering Roorkee. Considering the immense scope of R&D in rock mechanics and underground space technology at Roorkee, I pursued my Ph.D. degree under the supervision of a renowned professor of rock mechanics—Dr. Bhawani Singh, in the Department of Civil Engineering at IIT Roorkee, which I completed in 1991. My professional journey in Roorkee gave me not just technical knowledge but also a lifetime of cherished memories.

Roorkee is located on the south bank of the Solani River (one of the tributaries of the holy Ganga), flowing through the foothills of the Shivalik ranges of the Himalayas. This beautiful town is said to derive its name from Ruri, the wife of a Rajput chieftain. Roorkee was spelled as 'Rurki' in the 1887 edition of the Saharanpur Gazetteer. According to "Ain-e-Akbari" (16th century detailed documents on the administration of Mughal Emperor Akbar written by Abul Fazal, one of the nine jewels (Navratna) of Akbar's royal court), Rurki or Roorkee was the capital of a pargana (mahal) in the time of Mughal King Akbar. In the mid-eighteenth century, it was included in the estate of the Gujjars of Landhaura and remained in their possession until 1813.

To truly appreciate Roorkee's place in history, here is a timeline of its remarkable development:

1838 : Northern Ganga Canal project initiated by Sir Proby Cautley after the disastrous famine during the period of 1837–38 in the region.

1842 : Construction of the Ganga Canal started. Roorkee at that time was merely a collection of a few mud huts on the ridge overlooking the Solani River.

1845 :

- Lieutenant-Governor Sir James Thomason approved the proposal to establish a school at Saharanpur (approximately 60 km from Roorkee) to train surveyors and draughtsmen for canal works, which is considered the seed of the Engineering College later established at Roorkee.
- During the construction of the Solani Aqueduct in 1845 (one of the most challenging works on the Ganges Canal), Sir James Thomason, the then Lieutenant-Governor of the North-Western Provinces, took the initiative to establish the College of Civil Engineering at Roorkee. The proposal was supported by three prominent military engineers working in the field of irrigation in the Ganga–Yamuna Doab region at that time, namely Sir Proby Cautley, Er. Baird Smith, and Er. Baker.

1847 : The prospectus of Roorkee College was issued on 25th November.

1848 :

- On 1st January, the College of Civil Engineering at Roorkee started functioning in tents, with Lieut. R. Maclagan of the Bengal Engineers as its principal and four other teachers, designated as Head Master, Instructor of Drawing, Head Native Master, and Assistant Native Master, the last two being Indians.
- A temporary college building was constructed. Also, the design work of the main building was initiated by Lieut. George Price, an assistant engineer posted on the construction work of the Ganga Canal.
- The main market in Old Roorkee was constructed during 1848.

1851 :

- The first train in India ran between Roorkee and Kaliyar, covering approximately 8 km.
- A Tehsil School started functioning.

1852 :

- The first Indian to graduate from Roorkee College was Rai Bahadur Kanhaiya Lal.
- Irrigation Canal Workshop established.
- The first church was built.

1853 :

- The Bengal Sappers were stationed at Roorkee.
- The first Indian Nilmani Mitra, a graduate of Roorkee College, was appointed as an assistant engineer on the Ganga Canal project.

1854 :

- The Ganga Canal was formally inaugurated by Governor-General Lord Dalhousie at Haridwar on 8th April.
- The Civil Engineering College at Roorkee was renamed Thomason College of Civil Engineering after the demise of Sir James Thomason in 1954.

1855 : The development work of the old Tehsil area began.

1857 : Col. Baird Smith started editing the town's first newspaper, titled "The Roorkee Garrison Gazette".

1859 : A Cantonment Magistrate was appointed to Roorkee.

1866 : General Post Office opened.

1878 : Swami Dayanand Saraswati established Arya Samaj on 20th August.

1879 : Roorkee Municipality was established on 24th February.

1886 : Railway traffic opened between the Laksar–Haridwar and Saharanpur–Moradabad sections.

1890 :

- Thomason College of Civil Engineering was affiliated to Allahabad University.
- Town's first Hindi newspaper, Dharam Prakash, was published by Pt. Yamuna Dutt.

1893 : Telegraph Engineering course started.

1896 : Roorkee Tehsil (a unit of administrative division of Saharanpur District) was formed into a subdivision with a separate treasury under the charge of a Joint Magistrate.

1898 : Residential development of the Civil Lines area started.

1902 : Thomason College won the Hockey Shield six times in a row in the University Tournament.

1905: The affiliation of Thomason College with Allahabad University ended. The control of the college was transferred to the Industries Department.

1907 : The first provincial trunk road from Meerut-Roorkee-Dehradun was constructed.

1909 :

- Electrification of the college was completed.
- Courses in electrical and mechanical engineering started at par with civil engineering. Chemical, physical, mechanical, and mineralogical laboratories inaugurated.
- Photomechanical Department, power installations, and electric lighting were completed and inaugurated.

1910 : A course in textile engineering started.

1913 : The Association of Old Boys of Thomason College was formed, called the Thomason College Engineers Association.

1919 : Cricket on the campus revived.

1920 :

- Roorkee became the first town in Uttar Pradesh to produce hydroelectricity.
- Development of the Amber Talab area on the right bank of the Ganga Canal started.
- Courses in electrical & mechanical engineering were closed down in the college.

1928 : A research unit was established by the U.P. Irrigation Department at Lucknow, later expanded for hydraulic model studies in 1945, and shifted to Bahadradab (approx. 15 km from Roorkee), eventually developing into a full-fledged institute in 1949.

1931 : College magazine 'Lion' started.

1935 :

- The first batch of Indian commissioned officers from IMA joined the college for engineering education.
- The Indian students' mess started.

1943 : A School of Military Engineering started functioning on the campus.

1946 : Electrical and mechanical engineering courses restarted, and the college was renamed Thomason College.

1947 :

- The Military Engineering School was shifted to Pune.
- Development of Ramnagar Colony started in the old Roorkee area.

1948 : The Roorkee University Act was passed by the provincial legislature earlier this year.

1949 : On 25th November, Thomason College was upgraded to the University of Roorkee (UoR) — the first technical university of India.

1949 : Research Centre of U.P., Irrigation Department, was upgraded as U.P. I.R.I. for carrying out R&D work related to irrigation and hydroelectric projects. The institute was established on the right bank of the canal.

1951 :

➤ Foundation stone of the Central Building Research Institute (CBRI) was laid adjacent to the UoR campus.

➤ Short-term courses inaugurated in the UoR.

1953 :

➤ Postgraduate courses introduced in UoR.

➤ Shramdaan activities began.

➤ Kanhaiyalal Technical Institute (now K.L. Polytechnic) was established in the old Roorkee area.

1955 :

➤ Refresher courses started in UoR.

➤ Water Resources Development Training Centre (WRDTC) was inaugurated by the Prime Minister of India.

➤ Massive building activities started.

1956 :

➤ First girl student admitted.

➤ Student Aid and Loan Funds established.

1957 :

➤ B. Arch. And B.E. (Telecommunication) courses started.

➤ Roorkee University became co-educational.

1958 :

➤ Overseer and Draftsman classes reconstituted as Polytechnic. The overseer course was raised to three years.

➤ B.S.M. Postgraduate College was established for arts students.

➤ 1960 :

➤ K.L. D.A.V. Degree College was established for science students.

➤ B.E. course duration raised from three to four years at UoR.

➤ Four science departments (Mathematics, Physics, Chemistry, and Geology & Geophysics) were constituted.

➤ School of Research and Training in Earthquake Engineering (SRTEE, now the Department of Earthquake Engineering) was established.

1961 : Indian Science Congress was inaugurated by the President of India.

1963 :

➤ B.E. (Chemical Engineering) and B.E. (Metallurgy) courses started at UoR.

➤ St. Gabriel's Academy established in Cantonment area.

1964 : Central School and St. Ann's School established.

1965 : Structural Engineering Research Centre (SERC) was established within CBRI.

1967 : S.D. Degree College started for girls.

1970 : Residential development of Azad Nagar and Subhash Nagar started.

1971 : B.E. in Industrial Engineering started. In addition, the Quality Improvement Program (QIP) was also initiated.

1972 :

- Interdisciplinary courses in hydrology started.
- Irrigation Design Organization (IDO) Roorkee was established as one of the design directorates of the U.P. Irrigation Department on the right bank of the Ganga Canal.

1973 : Humanities Section given the status of a department.

1974:

- A special batch of 129 Tanzanian students admitted to B.E. courses.
- A Regional Centre of CSIR-CIMFR (formerly CMRS) established within the CBRI Campus near UoR.

1977 : SRTEE renamed as the Department of Earthquake Engineering.

1978 : Institute of Paper Technology, Saharanpur, amalgamated with the University. The University Science and Instrumentation Centre started, and the Hydrology Section was given departmental status.

1979 :

- Regional Computer Centre at UoR established.
- National Institute of Hydrology (NIH) established within the UoR campus.
- The Government of India and the U.P. government approached the World Bank to modernize the Upper Ganga Canal. Consequently, the project agreement was signed in 1984.

1980 :

- First of five special batches for Nepalese students admitted to B.E. courses.
- Centre for Biosciences started
- An iron cable bridge near IRI was constructed.

1981 : Welding Research Laboratory established.

1982 :

- Alternate Hydro Energy Centre (AHEC) established.
- M.Phil. courses in sciences started.

1983 : B.E. in Computer Science and Technology started.

1984 : Audio Video Research Centre (AVRC) was established in the UoR.

1985 : Development work of Solanipuram, Kashipuri, Pathanpura, and Adarsh Nagar started.

1986 : Centre of Biosciences was raised to the level of a department (now Biosciences and Biotechnology) in UoR.

1987 : Science and Technology Entrepreneur Park (STEP) was established by DST.

1989 : Nobel laureate Dr. S. Chandrasekhar was honoured with an honorary degree at a special convocation.

1990 : UGC recognized the Mechanical Engineering Department as a Center of Advanced Study.

1992 : Prof. Bhawani Singh (UoR) and Dr. V. M. Sharma (Director, CSMRS, New Delhi) initiated the publication of Asia's first journal dedicated to Rock Mechanics and Underground Space

Technology—JRMTT, the first issue of which was brought out in 1995 and is now listed in UGC-CARE.

1998 : Department of Management Studies was established, and MBA courses started.

1999 : Master of Computer Applications (MCA) program started.

2001 :

- UoR converted to the 7th IIT (IIT Roorkee).
- The construction of the parallel Ganga Canal between Haridwar and Roorkee was completed and commissioned.
- An attractive public park near the Solani Aqueduct was created.

2005 :

- Construction of multistoried flats (Hill View Apartments) completed in the IIT campus.
- Three Centres of Excellence, namely Nanotechnology, Disaster Mitigation, and Transportation Systems established.

2021 :

- Mehta Family School of Data Science and Artificial Intelligence was established to offer undergraduate, postgraduate, and Ph.D. programs.
- Seven new programs started, including M. Tech. (Artificial Intelligence), M.Tech.(Data Science) under the Centre for Artificial Intelligence and Data Science (CAIDS); M. Des. (Industrial Design); MIM (Master in Innovation Management); Online M. Tech. (Micro-electronics and VLSI) for working professionals under the Department of Electronics and Communication Engineering; MS (Economics, five-year integrated program) under the Department of Humanities and Social Sciences; and the M. Tech. (Dam Safety and Rehabilitation) program under the proposed International Centre for Dams.

The magnificent journey of Roorkee still continues, with many more developmental works inside and outside the IIT Roorkee campus. Thus, Roorkee can rightly be considered an epitome of engineering marvels, research, and innovation for years to come.

I wish Roorkee to continue to remain a living example of engineering commitment, contribution, and dedication for the welfare of not only society but of all humankind on this beautiful planet.

From the vision of Sir Proby Cautley to the modern glory of IIT Roorkee, and from the life-saving Northern Ganga Canal to its evolution into a hub of research and education, Roorkee is more than just a city—it is a living legacy of engineering marvel and education.

- **Dr. Subhash Mitra**
Chief Editor, JRMTT

Breakthrough on India's longest rail tunnel on the Rishikesh-Karnprayag rail line

On 21 April 2025 Larsen & Toubro broke through in India's longest railway tunnel. It is the 14.57 km tunnel number 8 between Devprayag and Janasu in Uttarakhand part of the 125-km Rishikesh-Karnprayag Broad Gauge Rail Link Project of Rail Vikas Nigam Limited (RVNL).

The breakthrough of the first tube was achieved using a Herrenknecht Single-Shield TBM named Shakti (9.11 m diameter, 140 m length, 1900 t weight) which is also the largest TBM to be deployed in the Himalayan region. Excavating at an average rate of 413 m per month, 10.4 km of the tunnel was completed with TBM. The New Austrian Tunnelling Method (NATM) was used to complete the remaining 4.11 km of the tunnel. The second machine, involved in the excavation of the second tube, is still progressing steadily toward its breakthrough.

L&T's role in the Char Dham Yatra, covers Packages 2 and 4. The 125 km Rishikesh-Karnprayag Railway Line project which connects Rishikesh, Devprayag, Srinagar, Rudraprayag, Gauchar, and Karnprayag across five Himalayan districts, will cut travel time from seven hours to two.

In Package 4, L&T is building India's longest railway tunnel (14.5 km upline, 13.1 km downline). Package 2 includes 26.6 km of tunnel excavation, 28 km of tunnel lining, two railway bridges, one road bridge, and embankments.

Source: <https://tunnelbuilder.com/News>, 27.4.2025

Jiribam-Imphal railway line in Manipur

Manipur is experiencing a significant transformation driven by accelerated infrastructure development, with Indian Railways at the forefront of efforts to boost the state's connectivity and unlock its economic potential. A centerpiece of this progress is the ongoing construction of the 111 km Jiribam-Imphal railway line, an engineering marvel designed to traverse Manipur's challenging and rugged landscape, promising to revolutionize transport and spur regional development.

This railway project is a major undertaking that involves the creation of numerous tunnels, bridges, and stations engineered to overcome the difficult topography and environmental conditions in the area. One of the standout achievements of this initiative is the near completion of the world's tallest railway pier bridge, which will not only be a structural landmark but also a vital component enabling seamless rail connectivity across difficult terrain.

Tunnel excavation forms a critical part of the railway line's construction. There are 52 tunnels planned, and to date, nearly 59 km of the total 61.32 km of tunnelling work has been successfully completed. This includes the development of a pioneering shaft- the first of its kind in the Northeast region and for the Northeast Frontier Railway- which will significantly accelerate excavation in the upcoming phase. Completion of the tunneling work is projected for 2027, highlighting strong momentum despite the project's inherent complexities.

Bridge construction is progressing steadily as well. Out of eleven major bridges planned, five have already been finalized, while 81 of the 138 minor bridges have been constructed. Station development has also made significant headway, with six out of eleven stations built. One station located in the Noney district is already operational, expanding travel options and improving access for local communities.

A standout element of this railway project is the Sangaihel Tunnel, which will become the Northeast's longest railway tunnel, stretching nearly ten kilometres. To ensure maximum safety and smooth operations, the design includes two parallel tunnels—one designated for everyday train movement, and the other reserved exclusively for emergency evacuations and rescue missions. This dual-tunnel configuration highlights the project's strong commitment to passenger security and operational readiness.

The anticipated benefits for the local population are considerable. Presently, journeys to Assam or Silchar can take up to ten hours due to the region's limited transport infrastructure, imposing significant constraints on both passengers and freight transporters. With the railway in operation, travel times are expected to be cut drastically to around four to five hours, making travel more efficient and less burdensome. Additionally, the railway will drastically reduce freight transport costs, providing a more affordable and dependable alternative to road transport, which is currently challenged by difficult terrain and lengthy travel times.

Beyond the immediate transport benefits, this railway project is fostering broader socio-economic growth. The construction phase has created jobs for local residents and workers from other states, injecting income into the local economy and catalyzing business activity. Enhanced connectivity is expected to attract investment, stimulate tourism, and boost commerce, which are vital for sustainable development in the region.

This infrastructural advancement is also playing a role in enhancing social cohesion. Historically, the region has faced challenges related to instability and underdevelopment. The improved connectivity and economic opportunities offered by the railway are contributing to a more stable and harmonious social environment by fostering integration and cooperation among diverse communities.

Strategically, the Jiribam-Imphal railway line represents a critical link in integrating Manipur more fully with the rest of India. Improved accessibility will open doors for increased trade, tourism, and cultural exchange, reducing regional isolation and narrowing economic disparities. Moreover, this project fits within a broader national framework aimed at upgrading infrastructure in the Northeast—a region long hampered by difficult terrain and limited connectivity. The successful execution of this railway project is likely to inspire similar initiatives, encouraging investment and confidence in the area's future potential.

The railway line also supports India's national objectives of fostering inclusive growth and strengthening ties between all parts of the country through enhanced infrastructure. By connecting remote and underdeveloped areas with major economic centers, the government seeks to promote balanced regional development and national unity.

In conclusion, the Jiribam-Imphal railway line represents far more than a mere transit corridor; it stands as a powerful emblem of development and new possibilities for Manipur and the wider Northeast region. Featuring tunnels that cut through rugged mountains, bridges that cross vast valleys, and stations that enhance accessibility, this ambitious project is poised to transform transportation, commerce, and economic progress throughout the state. As the construction continues to move forward steadily, the railway is expected to stimulate economic vitality, raise quality of life, and foster enduring social harmony—demonstrating the profound influence that strategic infrastructure development can have on regional advancement.

Source: <https://www.travelandtourtworld.com/news>, 25.5.2025

Switzerland glacier collapse: Swiss Alpine village buried under tons of ice

A massive section of the Birch Glacier broke off and crashed into the Lötschental Valley on 28th May 2025 afternoon, engulfing most of the Swiss village of Blatten in mud, rock, and ice. The disaster occurred around 3:30pm, nine days after officials had ordered all 300 residents to evacuate due to signs of glacier instability.

Swiss authorities confirmed that a 64-year-old man remains missing. He was reportedly in the area at the time of the collapse, but had not been among those previously evacuated.

Blatten's mayor, Matthias Bellwald, gave a sombre address after the collapse, saying, "The unimaginable has happened. We have lost our village, but not our hearts. Even though the village lies under a huge pile of rubble, we know where our homes and our church must be rebuilt."

Stéphane Ganzer, head of security in the Valais region, told local broadcaster Canal9: "About 90% of the village is covered or destroyed, so it's a major catastrophe that has happened here in Blatten."

Swiss President Karin Keller-Sutter shared a message of solidarity on social media: "It's terrible to lose your home. In these difficult times, my thoughts are with the residents of Blatten."

The collapse was long feared. In the days leading up to it, geologists observed the Birch Glacier was moving at a rate of 8 to 11 feet per day, covered under approximately 9 million tonne of debris. Regional authorities, monitoring the activity, had already removed livestock-around 52 cattle, sheep, and even domestic rabbits by helicopter.

The glacier finally gave way on Wednesday, sending debris down the mountain with a roar. Drone footage showed an enormous dust cloud swallowing the valley as homes were partially or fully submerged.

Raphaël Mayoraz, head of the canton's Natural Hazards Service, confirmed that "three million cubic metre of material had accumulated on the glacier, and then tumbled down into the valley. This is a very rare event. We don't know exactly what's still up there, but most of it has fallen."

The landslide was powerful enough to register as a 3.1 magnitude tremor. It buried the Lonza riverbed, forming a two-kilometre-long blockage and creating a small lake behind it.

Mayoraz warned, "A debris flow cannot be ruled out completely. That's a risk we have to monitor."

Emergency response teams acted swiftly. Three rescue specialists were airlifted to the site, and drones equipped with thermal cameras searched the wreckage. However, Valais police later confirmed: "Despite significant efforts, the man has still not been found."

The army has been deployed with pumps and heavy equipment to prevent potential flooding caused by blocked water flows. Defence and civil protection minister Martin Pfister called the collapse a disaster of "striking proportions," adding, "We assure you of our support, today and in the weeks and probably years to come."

Swiss Environment Minister Albert Rösti described it as "an extraordinary event" and pledged support to the displaced. "The government will do everything possible to give Blatten a future, although it will take a lot of effort and time," he said.

Glaciologists have long warned that warming temperatures are destabilising glaciers across the Alps. Switzerland, home to more glaciers than any other European country, lost 4% of its total glacier volume in 2023 and 6% in 2022.

In the words of Röstli, “Nature is stronger than humankind, as mountain dwellers know.”

The permafrost, often described as the glue that binds mountain terrain, is also thawing. This not only destabilises glaciers but weakens the rock faces they rest upon.

Events like this are not isolated. In 2023, the village of Brienz in eastern Switzerland was evacuated ahead of a similar rockslide. That same community was evacuated again last year due to renewed risk. In 2017, eight hikers died in Bondo, Switzerland, when the country’s largest landslide in over a century struck without warning.

The latest report from Swiss glaciologists has sounded an alarm: unless global temperature rise is held within 1.5°C, all of Switzerland’s glaciers could disappear within a century.

The road connecting Blatten to the nearby village of Goppenstein has been closed to all but residents. The full scale of damage is still being assessed. Officials have said recovery will take years and have not ruled out further evacuations in the region.

Bellwald, fighting back tears, vowed that his community would endure. “We will support each other and console each other. After a long night, it will be morning again.”

Source: The Economic Times, 29.5.2025

INDOROCK-2025

10th Indian Rock Conference, INDOROCK-2025, was organized by Indian Society for Rock Mechanics and Tunnelling Technology (ISRMTT) in association with Central Soil and Materials Research Station (CSMRS) and Norwegian Geotechnical Institute (NGI) at Hotel Radisson Blu, Dwarka, New Delhi from 05-07 November 2025.

The conference was presided over and inaugurated by Dr. R. Chitra, Director, CSMRS. Her Excellency, Ambassador, Embassy of Norway, New Delhi, Ms. May-Elin Stener graced the occasion as Guest of Honour and Mr. Arnstein Aarset, Head Rock Mechanics, NGI as Special Guest. Indorock-2025 proceedings was released during the inauguration ceremony on 5th Nov. 2025.

The conference included XI technical sessions covering various subjects areas like, rock and rock mass characterisation, tunnelling, NMT and NATM, geological and geophysical investigations, case studies of rail/road/hydropower projects, landslide hazards and mitigation, geothermal energy, underground storage for oil, gas and nuclear waste mining, blasting techniques, pumped storage schemes, TBM Tunnelling, numerical modelling, instrumentation, construction methodologies and other allied fields. The volume of the Indorock-2025 proceedings contains 1 conference paper, 10 keynote papers, and 64 technical papers contributed by authors from government and private organisations working in engineering geology and rock mechanics.

Conference lecture was delivered by Dr. Mahendra Singh, Prof. Emeritus, IIT Roorkee. Apart from the conference lecture, 12 keynote lectures, 46 technical papers and 7 corporate presentations were delivered by eminent personalities who shared their rich experiences and case studies.

An award ceremony was organised in the evening of 6th Nov. 2025 to present various ISRMTT awards for 2023 and 2024. ISRMTT life time achievement awards were conferred on Prof. Mahendra Singh (2023) and Mr. Imran Sayeed (2024) for their meritorious and unparalleled contributions to the Rock Mechanics, Rock Engineering and Tunnelling. ISRMTT Outstanding Contribution to Rock Mechanics Awards were presented to Dr. Altaf Usmani (2023), Sh. Vachaspati Pandey (2024) and Sh. Sumit Jain (2024); and ISRMTT Excellence Performance Awards to Mr. Rajeev Sethi (2023) and Mr. Vijai Saran (2024). ISRMTT also presented Best Paper Awards for the years 2023 & 2024 carrying cash prize of Rs. 2000/- per paper to selected papers published in Journal of Rock Mechanics and Tunnelling Technology (JRMTT) and conferences/seminars organised by ISRMTT based on the recommendations of the Awards Committee. ISRMTT also felicitated the distinguished personalities for their exceptional work in their respective fields.

The conference got the overwhelming response with participation of more than 260 delegates from different organizations including overseas delegates. An exhibition was also held in which 7 exhibitors including software companies showcased their strengths and innovative products.

The greatest attraction in the conference turned out to be the presence of Dr. Nick Barton, the originator of Q System who was especially invited to deliver a special lecture on ‘Strengths and Weaknesses with NMT & NATM and due care with Numerical Modelling’. Delegates particularly young practicing professionals benefited by way of long interactions with Dr. Nick Barton and other eminent personalities. A dedicated session on NMT and NATM focussing on knowledge sharing and the adoption of new tunnelling technologies in line with India’s ambitious plan to build over 4000 kilometres of tunnels in coming decade was also organised with keynote lectures by Dr. Pål Drevland Jakobsen, Senior Specialist, NGI, Mr. Arnstein Aarset, Section Head, NGI and Mr. Vebjørn Røvde, Project Engineer, NGI.

Indian Society for Rock Mechanics and Tunnelling Technology (ISRMTT) acknowledge the support by all the sponsors, to make the event a great success.



Release of Indorock-2025 proceedings during the inaugural function



View of participants



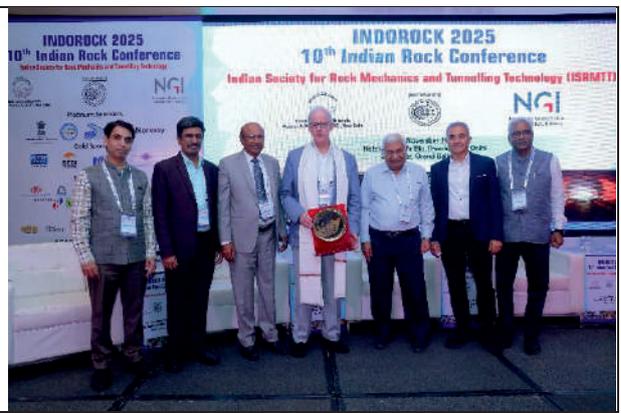
Life time achievement award (2023) to Prof. Mahendra Singh



Life time achievement award (2024) to Mr. Imran Sayeed



Dr. Nick Barton delivering the keynote lecture



Felicitation to Dr. Nick Barton



Concluding session on 7th Nov. 2025



List of sponsors

- Dr. D. V. Sarwade

Honorary Secretary, ISRMTT

Feedback from some participants on IndoRock-2025

- Dear Indian colleagues! I add my congratulations to the organizers for a very well-organized conference, not least the session chairs. I am sorry to have disappointed some re critique of

the GSI repetitions so undermining of H-B meaningfulness. It does not hurt to put in real joints but clients will have to pay more!

- **Nick Barton**

International Consultant, Norway

- ISRMTT KI JAI HO - **Prof. C.S. Gokhale**

- Very well organised conference. Congratulations to the organizers. - **Prof. L.B. Roy**

- What an enriching and nostalgic experience IndoRock 2025 turned out to be! The energy over the three days reminded me so much of the early days of our fraternity — bumping into several familiar faces from those times truly brought back memories. It was heartening to see how our community continues to grow while staying deeply connected to its roots.....

- **Dr. Manoj Verman**

Tunnelling & Rock Engineering Expert, India

- It was really a very successful and well-organized conference. Thanks a lot, and my best wishes to the team members.

- **Nripendra Kumar**

Former Joint Director,

Central Soil and Materials Research Station (CSMRS), New Delhi

- Thank you for inviting for this conference. I have enjoyed the technical sessions, key note, friendly talks. I am looking forward seeing you all again. Can also foreigners become member of ISRMTT?

- **Pål Drevland Jakobsen**

Norway

- IndoRock 2025 was an exceptionally well-organized conference, made possible through your continuous dedication and the sincere efforts of all the helping hands involved. My best wishes to you and all the team members for this remarkable achievement.

- **Dr Vinay Kumar Pandey**

Founder & Director

Geosp Engineer and Consultant LLP, Mumbai

- Just wanted to say a huge congratulations to the Indorock 2025 organizers for putting on an absolutely fantastic show- it was inspiring and seamless from start to finish! A special shoutout for your incredible hospitality and warmth, which truly sets this conference apart from the rest. Thanks for making us all feel so welcome!

- **Dr. Sanjay Rana**

MD, Parsan Overseas, India

- Thanks to the dedicated team of organizers and esteemed participants for the enlightening sessions.

Amit Gupta

SGM, WAPCOS

- We are very grateful to attend the wonderful conference conducted by CSMRS, ISRMTT and NGI. Great arrangements and gestures.

- **Chandramouli**

Dy.GM (Geology), SCCL

- INDOROCK 2025 has been a wonderfully organized and successful conference. Thanks to Organizing Team led by respected Sh. Rajbal Singh, Sh. Hari Dev, Dr. DV Sarwade, Dr. Altaf Usmani and other officers of their team.

- Vachaspati Pandey
GM(Geology),
NHPC Limited

- It was a very lovely 3 days interactive session and well organised too. Many thanks to the organising committee and participants for these lovely three days gathering.

- Parakh Mishra
Manager, Sarathy Geotech and Engineering Services - New Delhi

- Many congratulations to all award winners and organizers for conducting such a wonderful event.

- Sharique Khan
Atkinsrealis, India

- I'm pleased to share that A.G. Advance Chemicals Pvt. Ltd. participated as a bronze sponsor at Indo Rock 2025 - the 10th Indian Rock Conference, held from 5th to 7th November 2025. The event was exceptionally well organized, insightful, and interactive, offering an excellent platform for knowledge exchange and networking within the rock engineering & construction community.

We extend our gratitude to the organisers for organising such a great event & giving us opportunity to participate.

- Sandeep Sharma
Vice President, Business Development
Herrenknecht India Pvt. Ltd

- It was a wonderful experience in INDOROCK-2025 as organised by ISRMTT, New Delhi in association with "CSMRS, New Delhi" and "NGI, Norway". All the technical sessions including the hospitalities were amazing in the conference. Wising many more such stupendous successful celebrations of the said conferences in the coming years.

- Avik Kumar Mandal
Chief General Manager
LEA Associates South Asia Pvt. Ltd. (A LEA Group of Company, Toronto, CANADA)

- Thanks for all the wonderful feedback, and to all the delegates for their excellent technical deliberations. I am glad that in addition to all the Indian delegates we had participants from U.K., Norway, Iran and Turkey. We will try to make IndoRock a full international event next time. All the Best to those who participated and to those ISRMTT members who could not join.

-Dr. Rajinder Bhasin
NGI, Norway & President, ISRMTT