8th Annual Conference on

# TUNNEL CONSTRUCTION IN INDIA

## Emerging Requirements, New Technologies and Best Practices

May 22-23, 2017, The Leela, Mumbai

*Organisers:*

Indian Infrastructure

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# TUNNEL CONSTRUCTION IN INDIA

## Mission

- Tunnel development in India has accelerated in the past few years. This is driven by increased investments in the hydropower, railway, road and highway, metro rail, and water and sewerage sectors. Around 2,700 km of tunnel length is either under construction or is planned to be taken up in the future.
- Several landmark and challenging projects are under implementation, the size and complexity of which have increased over the years. These include the 9 km Chenani-Nashri tunnel on the Jammu-Srinagar national highway, the 8.8 km Rohtang tunnel on the Leh-Manali highway, and the 11.55 km rail tunnel on the Jiribam-Tupul-Imphal rail line.
- New designs, technologies and construction techniques for tunnelling are thus becoming a growing area of interest for the industry.
- Advanced mechanised techniques such as the use of tunnel boring machines (TBMs) and the New Austrian Tunnelling Method (NATM) are gaining prominence. A variety of new trenchless technologies such as micro-tunnelling and horizontal directional drilling are being deployed to undertake tunnelling in congested areas. The standards of tunnel design and engineering are continuously improving. New types of materials are also being used to improve the durability and strength of tunnels.
- Further, special techniques/methodologies such as DRESS (drainage, reinforcement, excavation, support and solution) are increasingly being considered as a viable solution for tunnelling in challenging rock and soil conditions. There is also an increased emphasis on pre-excavation investigation and survey.
- At the same time, the structure of the tunnelling industry is constantly evolving. Domestic players are entering into tie-ups and strategic alliances with global players to bring in the latest technology and equipment. Renting of equipment from bigger players has also emerged as a preferred option.
- Going forward, the outlook for the tunnel development market is promising and will be largely driven by the central government's focus on infrastructure development. One of the major growth drivers for tunnel construction will be the urban rail segment. About 2,050 km of metro rail network is expected to be added in the next six to eight years. Heavy investments are planned for the construction of all-weather roads and new tunnels in strategic and sensitive areas. The railway capex target for 2017-18 is at an all-time high of Rs 1.3 trillion. Hydropower capacity is expected to increase by 13 GW in the next five to six years.
- The tunnelling segment is thus expected to offer significant business opportunities for contractors, technology providers, and equipment and material suppliers.
- However, there are many factors that can slow down implementation and execution. These include geological complexities, inadequate investigations, deficiencies in contract documents, complexities of the Himalayan region and the Western Ghats, safety risks, etc.
- **The mission of this conference is to highlight the latest innovations and most promising and relevant techniques for tunnel construction, identify new and emerging requirements, and highlight opportunities in the hydropower, metro, roads and railways sectors. It will also showcase successful projects and best practices.**

## Target Audience

The conference is targeted at:

- MRTS project developers
- Equipment providers
- Hydropower generators
- Fire protection and safety system providers
- Water and sewerage system developers
- Communication and security equipment suppliers
- Indian Railways
- Consultancy and design service providers
- Road developers
- Urban local bodies and relevant government agencies
- Pollution control and ventilation equipment manufacturers
- Tunnel design and construction organisations
- Civil contractors
- Technology providers
- Other service providers, etc.

### *Previous Participants*

*The organisations that have participated in our previous conferences on* ***"Tunnel Construction in India"*** *include* ***Aarvee Associates, Adcos, Afcons, Aggreko, Aldesa, Amberg, Ambuja Cements, Atlas Copco, Bajaj Allianz, Bangalore Metro Rail Corporation, BASF, Bekaert, Border Roads Organisation, Caterpillar India, CBIP, CH2M Hill, Chicago Pneumatic Construction Equipment, CH2M Hill, Chennai Metro Rail, COWI, Dassault, DFCCIL, Delhi Jal Board, Dextra India, Draeger Safety India, DRDO, DSI Bridgecon, Duraflex, Eimco Elecon, Egis, Elcome Technologies, Elkem, Essar Power, Essel Infraprojects, Eurostar Engineering, Fibretex, FOGTEC Brandschutz GmbH, Frischmann Prabhu, Gammon, Geoconsult, Geo Constech, Geodata, GMR, GMW, GR Infraprojects, GVK Group, Halfen, HCC, Herrenknecht, Hitachi Zosen, HPPCL, Hochtief, HPRIDC, IL&FS Transportation Networks, Ircon International, Isolux Corsan, ITD Cementation, J&K SPDC, Jal India, Jindal power, Jindal Steel, JSW Infrastructure, Kalpan Hydro, Kameng Dam Hydro Power, KEC International, Khator Technical Textiles, KMC Electric, Kolkata Metro Rail Corporation, Kross Air Distribution Systems, Konkan Railway Corporation, Krishna Hydro Projects, KSK Dibbin Hydro Power, Kutch Railways, Larsen & Toubro, Lahmeyer, Lanco, Leighton, Lombardi, Louis Berger, Marti India, MBL Infrastructures, Manas Geo tech, Mayur Electronics, MC Bauchemie, Mekaster, Ministry of Railways, Mitsui, Monnet Projects, Mumbai Rail Vikas Corporation, Muncipal Corporation of Greater Mumbai, Nagarjuna Construction Company, NCB, Newkem, NHAI, NHPC, Nina Concrete, NIS Marketing, NHIDCL, Normet, North East Frontier Railway, Northern Railway Construction, NTPC, OBO Betterman, Outokompu, Patel Engineering, Precision Drawell, Promat India, Punj Lloyd, PWD, Rail Vikas Nigam, Railway Board, Ramboll, RDSO, Reinforced Earth India, Reliance Infrastructure, Renesco, Rex Poly Extrusion, RITES, Robbins, Sammon Infracorp, Sandvik, Savronik Sistem, SERING Ingegneria, Siemens, Sika India, Simplex Infrastructure, SJVN, SMC India, SMEC, SMS Infrastructure, Stanley Black & Decker India, Star Drilling, Sterling Wilson, Sunil Chemicals, Systemair India, Systra MVA Consulting, TAM Construction Chemicals, TCE, Terratec, THDC, Tangsibji Hydro Energy, Tata Power, Tata Projects, TNEB, Totem Infra, Transstroy India, TROX India, Tvastar Engineering, Uniquest Infra, Unity Infraprojects, Vayam Technologies, VE Commercial Vehicles, Wapcos, Welspun, YM Conchem,*** *etc.*

# AGENDA/STRUCTURE

## KEY TRENDS AND OUTLOOK
- What have been the key trends and developments in the tunnelling sector?
- What is the future outlook? What are the new opportunities?
- What are the key issues and challenges?

## CONTRACTORS' PERSPECTIVE
- What has been the experience of contractors?
- What have been the key challenges and lessons learnt?
- What are the future plans/priorities?

## FOCUS ON TUNNELLING METHODS AND TECHNIQUES
- What are the different tunnelling methods and techniques in use (drill and blast, NATM, cut and cover, etc.)?
- What are the key issues and challenges faced in tunnelling?
- What are the emerging technologies? What has been the experience so far?

## FOCUS ON TBM
- What is the current state of TBM deployment in India?
- What are the prevailing procurement options?
- What are the complexities in TBM designs?
- What are the global advances in TBMs? What are the key challenges?

## FOCUS ON TRENCHLESS BORING TECHNIQUES (MICRO-TUNNELLING, HORIZONTAL DIRECTIONAL DRILLING, ETC.)
- What is the current state of trenchless technologies in India?
- In which situations is it most appropriate to deploy trenchless techniques?
- What are the global advances?
- What are the key issues and challenges?

## TUNNEL DESIGN AND ENGINEERING
- What are the current design practices? What are the new Indian design requirements?
- What are the key design elements – geology, ground parameters, structure, soil and rock mechanics, etc.?
- What are the global best practices? Which designs are the most promising and relevant in the Indian scenario?

## USE OF TECHNOLOGY FOR SAFETY IN TUNNELLING
- What are the technological advancements in improving tunnel safety?
- What has been the experience so far?
- What are the global best practices?

## SPOTLIGHT ON EQUIPMENT
- What is the equipment needed for tunnel construction? What are the procurement options?
- What are the recent technology developments and innovations in India and globally?
- What are the key issues and challenges? What is the outlook?

## CHALLENGES AND STRATEGIES FOR TUNNELLING IN THE HIMALAYAN REGION AND THE WESTERN GHATS
- What has been the tunnelling experience in the Himalayan region and the Western Ghats?
- What are the various risks and complexities?
- How can modern tunnel construction technologies help in managing such complexities?

## GEOTECHNICAL INVESTIGATIONS
- What are the geotechnical investigation requirements for tunnel projects? How do they impact the choice of tunnelling techniques?
- What are the advancements in instruments and techniques for geotechnical investigations?
- What are the cost and technical characteristics?
- What are the key challenges? How can they be addressed?

## FOCUS ON CONSTRUCTION MATERIALS
- What are the key material requirements for tunnel construction (explosives, steel, cement, geomembrane, etc.)?
- What are the new materials and innovations?
- What are the key challenges?

## METRO RAIL TUNNELS: PROJECT AND TECHNOLOGY SHOWCASE
- What has been the experience with metro tunnel construction? What are the key trends?
- What are the most prevalent techniques and methods for tunnelling?
- What are some of the noteworthy projects? What can be learnt from them?
- What are the key issues and challenges?

## HYDRO TUNNELS: PROJECT AND TECHNOLOGY SHOWCASE
- What has been the experience with hydro tunnel construction? What are the key trends in this space?
- What are the most prevalent techniques and methods for tunnelling?
- What are some of the noteworthy projects? What can be learnt from them?
- What are the key challenges?

## RAIL TUNNELS: PROJECT AND TECHNOLOGY SHOWCASE
- What has been the experience with rail tunnel construction? What are the key trends?
- What are the most prevalent techniques and methods for tunnelling?
- What are some of the noteworthy projects? What can be learnt from them?
- What are the key challenges?

## ROAD TUNNELS: PROJECT AND TECHNOLOGY SHOWCASE
- What has been the experience with rail tunnel construction? What are the key trends?
- What are the most prevalent techniques and methods for tunnelling?
- What are some of the noteworthy projects? What can be learnt from them?
- What are the key challenges?

## WATER SUPPLY AND SEWAGE TUNNELS: PROJECT AND TECHNOLOGY SHOWCASE
- What has been the experience with water and sewage tunnel construction? What are the key trends?
- What are the most prevalent techniques and methods for tunnelling?
- What are some of the noteworthy tunnel projects? What can be learnt from them?
- What are the key challenges?

## FOCUS ON UNDERGROUND STORAGE CAVERNS
- What has been the experience with underground storage caverns?
- What are the methods and techniques deployed?
- What are the key issues and challenges? How can they be addressed?

## Organisers

*The conference is being organised by* ***India Infrastructure Publishing****, the leading provider of information on the infrastructure sectors through magazines, newsletters, reports and conferences. The company publishes* ***Power Line*** *magazine,* ***Power News*** *(a weekly newsletter), and a series of reports, including* ***Tunnelling in India, Hydro Power Generation, Urban Rail Transport in India, Road Development in India, Water and Wastewater in India, Water in India*** *and* ***Railways in India****.*

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## Registration Form

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| One delegate | 20,000 | 3,000 | 23,000 | 383 | 25,000 | 3,750 | 28,750 | 479 |
| Two delegates | 32,000 | 4,800 | 36,800 | 613 | 40,000 | 6,000 | 46,000 | 767 |
| Three delegates | 44,000 | 6,600 | 50,600 | 843 | 55,000 | 8,250 | 63,250 | 1,054 |
| Four delegates | 56,000 | 8,400 | 64,400 | 1,073 | 70,000 | 10,500 | 80,500 | 1,342 |

- **There is a 20 per cent "early bird" discount for those registering before April 28, 2017.**
- There is a special low fee of Rs 5,000 per participant for state-owned hydro power producers, PWDs, ULBs, Indian Railways, metro rail corporations, research organisations and academic institutions.
- To register online, please log on to http://indiainfrastructure.com/conf.html
- Registration will be confirmed on receipt of the payment.

**Payment Policy:**

- Full payment must be received prior to the conference. Payments for "early bird" registrations should come in before the last date of discount.
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- Conference fee includes lunch, tea/coffee and conference material.

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India Infrastructure Publishing Private Limited, B-17, Qutab Institutional Area, New Delhi 110016
Tel: +91-11-46113912, 41034615, +91-9971992998; Fax: +91-11-26531196, 46038149
Email: conferencecell@indiainfrastructure.com; Website: www.indiainfrastructure.com