



 **L&T Construction**
Heavy Civil Infrastructure



Tunnelling Excellence Academy

Shaping the Future of Tunnelling Excellence



Vision

L&T Tunnelling Excellence Academy will be a Global Centre of Excellence for academic research in the field of tunnelling and related underground construction technologies.

Mission

TEA will achieve this by developing and delivering capability-building programmes for creating a world-class talent pool of tunnelling specialists.

TEA will work towards making L&T engineers self-reliant and have a sustainable competitive advantage in the medium-term and be the final word on science of tunnelling in the long-term.



Note from the CMD

The growth of cities is directly proportional to their increasing demand for infrastructure, and with space always at a premium, there is a growing trend to build underground. The challenges of underground construction are different and sterner, requiring more specialized skills; hence, tunnelling is rapidly assuming relevance and importance in the scheme of building heavy civil infrastructure.

Over time, we at L&T have built expertise in overground construction, but now in the light of changing dynamics, it was imperative to hone our tunnelling skills, which is why we have invested time, talent, and resources to create the Tunnelling Excellence Academy. Most probably India's first, this is a unique, purpose-built centre of excellence to teach and train the next-generation construction professionals in the key skills required for underground construction.

Building on our curriculum, we continue to collaborate with global experts, professional bodies, partners, and academia to further enhance and refine our courses.

I am confident that this Academy will play a significant role in creating specialized talent for tunnelling for our construction industry that is constantly hamstrung due to a dearth of skilled manpower. With this Academy, we are building on our efforts at skilling through the various Construction Skills Training Institutes across the country.

I wish the Academy all success in the future!



S N Subrahmanyam
Chairman & Managing Director,
Larsen & Toubro

Tunnelling Excellence Academy

Developing and delivering capabilities

At TEA, we are leading a new era of training, learning, and development for the tunnel construction workforce.

Drawing on our company's history and the expertise of our people, we are well positioned to lead a new era of training, learning, and development for the tunnel construction workforce. Bold initiatives, such as our in-house tunnel construction training with expert educators from Visvesvaraya National Institute of Technology, Nagpur, are designed to create new career paths and enhance the capability of our workforce, as well as organizational capacity-building in tunnel construction.

We are passionate about our work, and our industry's sustainability and future success depends on making a career in tunnel construction more attainable, accessible, and attractive for future generations. This initiative, along with many others, is expanding our organizational capacity and capability to respond to the evolving underground infrastructure project pipeline.

Highlights

- Commenced operation in February 2019
- International and local faculty for global exposure
- State-of-the-art facility offering classroom and hands-on training
- Multiple cutterheads with diameter up to 6.7 metres
- Segment installation training simulator
- Foam generator training
- Cutter repair and replacement workshop
- Training for L&T engineers and front-line supervisors
- Tunnel orientation training for local engineering students
- Trains over 375 engineers annually





About Us

Larsen & Toubro (L&T) is India's foremost technology, engineering, and construction conglomerate, renowned as 'builders of nations'. Few companies globally can match the breadth, depth, and scale of L&T's operations. Tunnel construction is at the forefront of modern infrastructure development, playing a pivotal role in connecting communities, facilitating transportation, and enabling efficient utilization of subterranean spaces.

As urbanization continues to surge, India is experiencing high demand for tunnel construction due to various infrastructure projects. However, there is a global shortage of skilled tunnelling engineers to meet this demand. L&T's Tunnelling Excellence Academy (TEA) was set up to address this demand and bridge the skills gap for both engineers and workers by developing and delivering capability building programmes to create a world-class talent pool of tunnelling specialists.

We are focused on creating multiple training pathways to encourage newcomers, support upskilling and reskilling, and make a career in tunnel construction attractive to aspiring professionals. TEA programmes are designed to equip our engineers and workforce through a mix of classroom, workshop, practical lab sessions, and on-site training. The curriculum has been developed with the skills gap in mind and is continuously enhanced to meet changing needs.

We are focused on creating multiple training pathways to encourage newcomers, support upskilling and reskilling, and make a career in tunnel construction attractive to aspiring professionals.

Facilities

L&T's Tunnelling Excellence Academy is a state-of-the-art training facility located in L&T's Kanchipuram campus in Tamil Nadu, India. TEA is a unique training facility in scale and purpose. The custom-designed, purpose-built learning facility specializes in delivering training activities in tunnel safety and tunnelling disciplines. Facilities at TEA include spaces suitable for:

- Full-day technical training
- Seminars
- Safety induction seminars
- Meetings and conferences

TEA also provides facility tours to introduce university students to the field of tunnel construction.



Auditorium: A fully tiered theatre seating up to 100 guests, the auditorium features flip-top desks and state-of-the-art AV equipment, including a large screen, projector, and variable lighting.

Workshop: A full-size industrial workshop equipped with cutter workshop, foam generator compressor, electrical substation, 20 T gantry crane, etc. is available for hands-on training.



Training rooms: Suitable for training, meetings, seminars, and conferences. These versatile spaces can also be used as breakout rooms during group learnings.

Model Tunnel: The TEA contains a 36-metre-long tunnel, constructed to replicate tunnel boring machine techniques. This tunnel allows for simulated scenarios that mimic working in an underground environment.





TBM Cutter Head: At TEA we have two Cutter Heads of 6.7 m and 2.8 m diameter, a crucial component of Tunnel Boring Machines (TBMs), underscoring TEA's commitment to real-world application-based training.

TBM: A decommissioned TBM is available at the facility to give trainees a real-world hands-on experience.



Laboratory: A fully equipped laboratory is available to train engineers on various types of soil/rock testing, grout mix design, rheology testing, etc.

Simulator Tech: The TEA makes available a range of immersive learning demonstrations and experiences using simulator equipment, such as the segment installation simulator, for an experience as close to the real thing as possible. These experiences have been designed to cover all aspects of tunnelling operations. Partnered with the replica training facilities, the TEA also offers an immersive experience in underground tunnelling and operations.



AV Facilities: Ceiling-mounted data projectors, large-screen televisions, whiteboards, flip charts, and all necessary equipment for presentation and training purposes.

Structured Training Programmes

Our programmes are meticulously crafted to empower trainees with the knowledge, technical skills, and insights necessary to excel and bring the highest level of skills to running our current and future tunnel & underground construction projects.

At TEA, we create scenarios and environments that simulate real-world conditions when constructing and operating tunnels. However, scenarios are designed in a manner that removes the risk of injury to the trainee.

Training is staged from Level 1 to Level 4, with participants graduating from one level to the next based on assessments at TEA and on-site competency assessment.

Programme Map

Competency	Capabilities				
Basic	Safety in Tunnels	Tunnelling Basics	Equipment Knowledge	Tools Handling	
Level 1	Safety in Tunnels	Types of Tunnels	Shaft Construction	Soil & Rock Mechanics	NATM Introduction
Level 2	Tunnel Activities	Primary & Secondary Lining	Grout, Slurry, Foam Design	TBM & PLC Electrical	Segment Simulator
Level 3	TBM Operation	Geotechnical Interpretation	Blast-Design T-Survey	Geo-Risk Case Study	Design of Tunnels
Level 4	Selection of TBM & STP	Risk assessment Sustainability	T-Logistics Productivity	T-Planning, BIM, AI, ML	Alternative Design



Level 2 Certification in collaboration with VNIT Nagpur

Leaderspeak

S V DESAI

**Whole-Time Director & Senior Executive
Vice President (Civil Infrastructure)**

Worldwide, there is a quest for urban space driven by increasing urbanization. Underground space is one of the vital cornerstones for developing urbanscape globally. Presently, underground space is only being marginally utilized across the globe, primarily for rail, road, hydro, and smart tunnels. Strategically, we foresee enormous potential for extended and improved utilization of underground infrastructure.

The vision of our Heavy Civil Infrastructure business to establish the state-of-the-art Tunnelling Excellence Academy was to foster genuine collaboration and cooperation among stakeholders involved in the design, construction, operation, and management of tunnels. In the past, we have experienced numerous challenges in tunnel construction, and in the future, we may face new ones. I believe the Tunnelling Excellence Academy will provide a robust platform to our young engineers to test and prove smart ways and innovative methods in developing underground infrastructure.



K BHAVANI

**Executive Vice President & IC Head –
Heavy Civil Infrastructure**

Tunnelling projects are challenging to execute due to uncertain geological conditions, lack of operational skills, safety concerns, and emergency situations. TEA is a strategic initiative and gives a competitive advantage to L&T to build its capability in various technical areas to effectively manage projects within targeted bottom lines. Going forward, it is critical for our business to have a trained workforce for tunnelling operations, which will give us a competitive edge.

K SENTHILNATHAN

**Executive Vice President & Head – Technical
Services, Heavy Civil Infrastructure**

In India, Asia-Pacific, and the Middle East, many prospects for building underground infrastructure are emerging, especially for metro and road tunnels. Shifting our focus to enhance underground tunnelling capability is the need of the hour. To achieve this vision, the Tunnelling Excellence Academy at Kanchipuram was established in 2019. TEA is India's first dedicated training centre for tunnelling and underground construction. It offers a mix of classroom-based learning and hands-on training, covering all aspects of tunnelling, from design and construction to TBM operation.



Faculty



PUNY PRAYA BONI
Technical Director, TEA



RETHINA VELU SAMBASIVAM
Manager – Workshop, TEA



SRINIVASAN M
Asst Manager – Civil, TEA



DORASWAMY RAJU G
Sr. Chief Engineering Manager – Geotech, EDRC



MAHALAKSHMI M
Lead Engineering Manager – Geotech, EDRC



HEMAKUMAR JAYAKODI
Engineering Manager – Geotech, EDRC



SUDHARSAN R
DGM – EHS



PRASAD SELVAM S R
Lead - Technical Services
(New Initiatives)



ASHITHA E V R
Lead - Talent Development



SUNDAR V
Sr. Engineer – Systems



SRIKANTH P R
Sr. Executive,
Admin & Accts

Comments from Visitors

Arnold Dix, President, International Tunnel Association (ITA)

What a wonderful surprise! Excellence in tunnelling, bravo!

Kenji Matsumo, IHI Corporation

This is precious time for us to understand L&T's training capabilities, which can also provide valuable feedback for our business strategy.

Tomoko Odaira, Shimizu Corporation

Very impressed with visiting one of only 4 tunnelling academies globally.

Mangu Singh, MD, DMRC

I am highly impressed by the world-class facility for tunnelling training. My compliments to L&T for this exceptional initiative. I hope it will benefit not only L&T but also numerous professionals across the country, rendering a great service to the nation. My best wishes for the academy's expansion program.

R L Gupta, Dean, DMRC Academy, DMRC

An excellent tunnel training academy that comprehensively covers all aspects of tunnel boring, TBM operation, and maintenance. It's likely the only one of its kind in India. Spread over a vast area, the academy boasts outstanding and unique training aids, including high-tech simulators. The staff is knowledgeable and effectively explains complex concepts. I'm grateful for hosting our visit and shedding light on various aspects of tunnel boring and TBM operation.

Daljeet Singh, Director, DMRC

Excellent arrangements of physical and digital demonstrations of TBM operation. L&T has meticulously planned the correct content for short-term courses for the skilling of engineers and foremen. I wish all the success for the future generation of L&T.

R K Dhiman, President – Tunnelling Association of India, former ADG, BRO

Excellent Tunnelling Academy for imparting knowledge. BRO has already benefited from L&T's training for our officers. My best wishes to the L&T team.



Tunnelling Excellence Academy

L&T Construction, Neervallur Village, Enathur P.O., Kanchipuram District, Tamil Nadu, India – 631561

☎ 044 6172 2998 ✉ hcioffice@Lntecc.com