Larsen & Toubro Limited, Construction, Hydel Projects

Hydel projects

- 1200 MW Punatsangchu - I HEP, Bhutan
- 330 MW Srinage HEP, Uttarakhand
- 99 MW Singoli Bhatwari HEP, Uttarakhand
- 520 MW Tapovan Vishnugad HEP, Uttarakhand
- 520 MW Parbatí Stage III HEP, Himachal Pradesh
- 2000 MW Subansiri Lower HEP, Arunachal Pradesh
- 600 MW Access Road to Sawalkot HEP, Jammu & Kashmir
- 100 MW Kuti Panj Pinj d HEP, Kerāla
- 192 MW Allan-Dhungan HEP, Himachal Pradesh
- 900 MW Purula Pumped Storage Project, West Bengal
- 1020 MW Tala HEP, Bhutan
- 72 MW Koppul HEP, Maharashtra
- 234 MW Priyadarshini Jurala HEP, Andhra Pradesh
- 22.5 MW Vara HEP, Karnataka
- 22.1 MW Chāme HEP, Nepal
- 72 MW Tata Bhrikut HEP, Maharashtra
- 35.4 MW Trīkali-Dwāpati HEP, Nepal
- 3 MW Sunsari Morang Head Works, Nepal
- 150 MW Tata Bhira Pumped Storage Project, Maharashtra

Irrigation projects

- Pranahita Chevella Irrigation project - Package 13, Andhra Pradesh
- Indra Sagar (Polavaram) Right Main Canal project - Package VII, Andhra Pradesh
- Vedavoda Dam Project, Andhra Pradesh
- Underground LPG storage tanks, Andhra Pradesh
- Earth dam cum spillway across river Korket, Chattisgarh
- Sai Ganga Canal Project, Andhra Pradesh
- Kukatpally canal project, Andhra Pradesh
- Wear cum causeway, Gujarat
- Eluru Canal Project, Andhra Pradesh
- WJC Link Channel and appurtenant works, Haryana
- Underground Metro rail corridors for CMRL, Chennai
- Underground Metro rail Corridor for DMRC, Delhi
- Khamoshit TVS Tunnel, Maharashtra
- Railway Tunnels for Konkan Railways, Maharashtra

L&T Construction

Turn-key Hydel Solutions
Larsen & Toubro

L&T is India’s largest technology, engineering, construction and manufacturing company - reputed for its engagement in key growth sectors, its ability to respond positively to challenging requirement and its excellent value system.

L&T has an international presence, with a manufacturing footprint in eight countries, a wide network of offices and collaboration with global majors. Today, the company sets engineering benchmarks in terms of scale and complexity. For over seven decades, L&T has been creating landmark assets for many of its customers and has been adjudged ‘India’s Best Managed and Most Respected Company’. L&T is regarded as the pre-eminent infrastructure major – often referred to as the ‘Builder of Nations’.

L&T Construction

L&T Construction, the construction arm of Larsen & Toubro has been building landmark projects in India and abroad for over six decades and the hallmark of L&T Construction’s continuing success is its ability to execute complex projects of large magnitude within the stipulated time and cost, as per international standards of quality and safety.
**Capabilities**

Drawing from its rich experience of providing EPC services to various industrial sectors, L&T’s Hydel Business Unit is one of the key players in the country’s hydel industry. L&T secured its first hydel order for the modernization of 150 MW Bhira pumped storage project in the early ‘90s and entered the Public Private Partnership sector in the hydel business through the Singoli-Bhatwari hydel power project in Uttarakhand on a Build-Operate-Transfer (BOT) basis. Today, L&T is fully geared-up to enhance its complete turnkey ‘Water to Wire’ solutions when it comes to hydropower.

L&T is involved in construction of hydel power projects with a capacity of 8092 MW and has the experience of executing projects in all geographies under extreme weather conditions, be it sub-zero temperatures or scorching heat. L&T has EPC capabilities to execute water retaining and diversion structures, water conductor systems, power house and substations, right upto evacuation of power through multi-circuit transmission lines. Keeping in line with its corporate commitment to sustainability, L&T has constructed pumped storage projects and run-of-the-river projects which do not negatively impact the environment.

L&T offers a wide range of services for implementation of hydel power projects on EPC / BOT basis – including, but not limited to, construction of:

- Diversion weirs, barrages, concrete / earthen / rockfill dams including roller compacted concrete dams
- Underground tunnels of various geometry (both concrete lined and steel lined), pressure shafts, surge and de-silting chambers
- Large underground power houses and surface power houses
- Hydro-mechanical components such as gates, penstocks, etc., including erection of electro-mechanical equipment
- Preparation of pre-feasibility, feasibility and detailed project reports for hydroelectric power plants including geo-technical investigation reports
- Specialized underground structures such as storage cavern for LPG / crude oil
- Refurbishment of old hydropower plants

**Infrastructure**

The Infrastructure Independent Company (IC), one of four IC’s of L&T Construction, undertakes Engineering, Procurement, Construction (EPC) services for Heavy Civil and Transportation infrastructure projects, including hydel and nuclear power plants.

Infra IC is poised to enhance its contribution to the development of hydroelectric power plants in India and abroad, with its innovative solutions and state-of-the-art technologies.

**Hydel Business Unit**

Hydropower is a renewable energy resource that uses water to generate electricity. India ranks fifth in terms of exploitable hydro-potential on a global scenario, and is endowed with economically exploitable hydropower potential to the tune of 2,50,000 MW of installed capacity, as per the assessment done by Central Electricity Authority of India. Considering the potential available, a dedicated Business Unit has been formed in Infrastructure IC to formulate policies, perform marketing functions and ensure project execution to international benchmarks of quality and speed.

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Design

The hydel design requirement is met by a dedicated and specialized design unit that offers basic studies, detailed project reports, conceptual design, detail engineering and consultancy services for all projects. The design team has the capability to conduct hydrological, power potential and geological studies, detailed site survey and investigation, project layout and design, preparation of pre-feasibility report, determination of Bill of Quantities, construction methodologies, project cost and economic evaluation of the project, river flood analysis, EIA studies, rate analysis and detail engineering etc.

- Intake works in progress for 2000 MW Subansiri Lower HEP, Arunachal Pradesh
- Barrage for 192 MW Alain-Duhangan HEP, Himachal Pradesh
- Earthen dam cum spillway works across river Kunkri in Chhattisgarh
- Desilting basin, 330 MW Srinagar HEP, Uttarakhand
- Regulator cum head works for Sunsari Morang HEP, Nepal

The hydel project design team, based at L&T’s Faridabad office, together with the Construction Methods Planning Cell, support the project team in optimizing alternative construction methods and technologies for speedy execution of the project. In addition, L&T also partners with world-renowned design agencies for basic hydel designs.

L&T GeoStructure, a specialized arm of L&T Construction, executes a wide range of sophisticated geo-technical services right from soil investigation, design to foundation engineering and construction. L&T GeoStructure has to its credit some of the most critical and prestigious hydel projects in terms of foundation engineering.
Water retaining and diversion structures

L&T has experience in construction of all types of river diversion structures such as dams, weirs, barrages, etc., for various capacities of hydropower projects. Track record of structures include weir for Varahi Hydropower project - Karnataka, concrete dams at Veligonda - Andhra Pradesh, for 330 MW Srinagar HEP, Uttarakhand and for 1200 MW Punatsangchhu - I, Bhutan. Barrage for 192 MW Alain-Duhangan HEP in Himachal Pradesh. Rock fill dam for 520 MW Parbati Stage III HEP - Himachal Pradesh and Earthen dam cum spillway across river Kurket in Chhattisgarh.
Water conductor system

The water conductor system is vital to hydropower generation, as these structures ensure consistent and ample supply of water for power generation. The water conductor system including intake, head race tunnels, de-silting chambers and tail race tunnels, are generally underground and various technologies / methods are used for excavation during construction. In some projects, based on layout and technical requirement, high pressure penstock pipes are used instead of tunnels and L&T has the expertise in design and construction of such structures.

Tunneling

With its rich experience of tunnelling in challenging altitudes and terrain like the Himalayas, one of the world’s toughest fold mountain ranges, L&T has built expertise in all types, sizes and shapes of tunnelling. It has vast experience in construction of tunnels using various technologies such as conventional Drill and Blast Method (DBM), New Austrian Tunneling Method (NATM), Tunnel Boring Machines (TBM), Mechanical excavation or soft tunnelling using Road headers, etc.

L&T Construction is involved in over 100 km of tunnelling for hydel projects and has deployed tunnel boring machine for a tunnel length of about 9 km in a hydropower project in Uttarakhand. Soft tunnelling employing road headers is being carried out at 2000 MW Subansiri Lower HEP in Arunachal Pradesh for a length of about 14km, for the first time in India!

De-silting arrangement

L&T’s experience in underground tunnelling has led to the execution of complex underground structures in hydropower projects. L&T has been successfully involved in the construction of many underground and open de-silting arrangements. The de-silting basin in 520 MW Parbati stage III HEP, Himachal Pradesh and in 1200 MW Punatsangchhu - I, Bhutan are some of the large size underground de-silting basins. In 330 MW Srinagar HEP, Uttarakhand, L&T is currently executing a very large open de-silting basin.
Power house

Power house is the heart of a hydropower project in which hydro energy is converted into electric energy. L&T has expertise in the construction of thermal and nuclear power projects which house the turbine power generating units, and this expertise is replicated in hydel also. L&T has executed / involved in construction of many underground and surface power houses and associated transformer caverns. L&T is currently involved in the construction of surface power house of 2000 MW Subansiri Lower HEP for India’s largest hydropower project, 330 MW Srinagar HEP and 99 MW Singoli Bhatwari HEP in Uttarakhand. L&T has successfully completed the surface power house structures for 100 MW Kuttiyadi HEP in Kerala, 22.5 MW Varahi HEP in Karnataka, underground powerhouse structures for 900 MW Purulia pumped storage project in West Bengal, 20 MW Chilime Hydropower project in Nepal, etc.

Underground and Irrigation Structures

Apart from hydel structures, L&T is the country’s leading solution provider of sophisticated underground metro rail stations with all utilities. The expertise in metro tunnelling is complementary to hydel tunnelling experience and enables sharing of knowledge and resources. L&T’s experience also covers specialised underground caverns such as LPG / crude oil storage caverns. It has the distinction of successfully executing one of the world’s deepest underground caverns for LPG storage with a capacity of 125000 cu.m in Vizag. L&T is also involved in the construction of irrigation projects.
Plant & Machinery

Construction of hydropower projects requires special plant & machinery as it involves tunnelling, mass excavation, concreting, etc. Over the years, L&T has acquired hydel equipment worth over ₹ 40 billion. Some of the key machinery employed by L&T, to provide cutting-edge hydel construction solutions and to meet the stringent deadlines set by customers, include tunnel boring machine, road headers, drill jumbos, shotcrete machine, rock bolting machine, load haul dumpers, cable cranes, heavy-duty batching plants (dam version), tower cranes and other concrete placement systems.

Resources

Execution of hydel projects presents numerous challenges in terms of accessibility, logistics and resources. L&T’s strong supply chain management leverages its strength to optimise the cost, which is, in turn, helpful to customers to realise value for money. L&T’s superior project execution capabilities are aptly supported by various people-centric initiatives and a judicious mixture of lateral recruitment and intensive training for in-house staff.

At L&T, Environment, Health & Safety (EHS) is given prime importance. Utmost care is taken to ensure the safety of employee, workmen and assets. L&T’s corporate management has enunciated policies that emphasise on EHS through structured and well-defined procedures at every stage of construction. The various operations of the business units are certified by ISO 9001 quality standards.
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- 2000 MW Subansiri Lower HEP Assam and Arunachal Pradesh
- 600 MW Access Road to Sawai Kheer HEP Jammu & Kashmir
- 100 MW Kattipadi HEP Kerala
- 192 MW Allian-Duhangan HEP Himachal Pradesh
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- 21.2 MW Chitrak HEP, Nepal
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- WJC Link Channel and appurtenant works, Haryana
- Underground Metro rail corridors for CMRL, Chennai
- Underground Metro rail Corridor for DMRC, Delhi
- Khamarhat Twin Tunnels, Maharashtra
- Railway Tunnels for Konkan Railways, Maharashtra

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