



*Cable-stayed bridge across Durgam Cheruvu Lake, Telangana*

# INFRASTRUCTURE BUSINESS

## Sector Performance in FY 2020-21

The Infrastructure sector is a key driver of the Indian economy and contributes to India's overall development. The sector, accordingly, receives focused attention and resource allocation from both Central and State Governments.

FY 2020-21 started with the nationwide lockdown due to the Covid-19 pandemic which had stalled all economic activities during the first quarter of the year. The lockdown took a heavy toll on the economy, with up to two-thirds of activity either shut or working at reduced capacity. Post the lockdown, businesses took various steps to bring back labour and materials to site. Gradually, the operations at sites picked up, and by the second quarter of the year, there was improved labour presence at sites and work progress. Adequate precautions were taken to curtail the spread of

the virus by following the social distancing norms, proper sanitisation and by restricting physical movement.

Despite the Covid-19 pandemic, in FY 2020-21, both contract awards and construction activities were robust. Tenders of ~₹ 7.8 lakh crore were floated in FY 2020-21, higher by ~50% Y-o-Y. The FY 2020-21 saw cumulative awards of ~₹ 3.5 lakh crore. Several large-ticket projects were tendered, some of which were also awarded, viz. expressways, metro and defence.

The slew of other relief measures undertaken by the Central Government – including relaxation on EMD (Earnest Money Deposit) and performance security, relaxation of bidding eligibility criterion and increased frequency of payments for on-going contracts, relief for contractors/developers under the Atmanirbhar Bharat Scheme – has aided the growth of construction players.

MoRTH constructed a record total length of 13,394 km of national highway, translating into 37kms/day of highway construction, whereas in FY 2019-20 it had constructed a total length of 10,236 km. The NHAI awarded/opened bids for projects worth ~₹ 1.4 lakh crore and spanning ~4,800 km during FY 2020-21.

The Government has extended its ₹ 111 lakh crore National Infrastructure Pipeline (NIP) to cover more projects by 2025, in an effort to kick-start the economy. The NIP, which was launched with 6,835 projects, has now expanded to 7,400 projects.



*The 1.6-km Medigadda Barrage, Telangana*

The National Bank for Financing Infrastructure and Development Bill has already been passed by both Houses of the Parliament, paving the way for the creation of a development finance institution (DFI). The proposed DFI is expected to raise low-cost funds for long-term infrastructure financing to the tune of ₹ 5 lakh crore over the next three years, leveraging with an initial equity capital of ₹ 20,000 crore.

The Union Budget 2021 has an unprecedented increase in capital expenditure allocation for FY 2021-22 by 34.5% to ₹ 5.5 lakh crore to push growth through infrastructure investment. Key growth areas like Railways, Highways, Metros, Transmission & Distribution and Water (Jal Jeevan Mission) have witnessed a significant rise in allocations.

The public transportation system has received a lot of focus in the budget, with increased allocation to major ongoing metro projects and proposed plans of deploying two new technologies, i.e. 'MetroLite' and 'MetroNeo' in Tier-2 cities and the peripheral areas of Tier-1 cities.

The Union Budget 2021 allocated ₹ 3.05 lakh crore for a revamped reform scheme for cash-starved power Discoms, to be released over five years. The increase in allocation for infrastructure will boost the power sector overall. It will help in upgrading the country's Transmission & Distribution network and build on grid connectivity to ensure efficient evacuation of solar energy, particularly the ambitious Green Energy Corridor scheme.

For the renewables power sector, the budgetary measures support the ambitious energy transition announced by the

Prime Minister, including the renewable energy target of 450 GW by 2030.

Furthermore, the asset monetisation programme was one of the other highlights of the Budget. A National Monetisation Pipeline is proposed to be set up for brownfield infrastructure investment and monetising public infrastructure investments. Several measures have been rolled out in the direction of monetisation. It has been proposed that NHA and PGCIL sponsor InvIT to attract foreign and domestic investors. There are proposed plans of monetisation of the Dedicated Freight Corridor and other infrastructure assets of the Railways. The privatisation of airports, oil and gas pipelines, warehousing assets under CPSE shall further contribute to the monetisation plan. SPVs shall be set up to monetise the land assets of various PSUs and CPSEs.

### **International**

The construction industry in the MENA region struggled in 2020, leading to a contraction of about 4.5%, with the challenges presented by the outbreak of Covid-19, low oil prices and the impact of sovereign credit rating downgrades. The construction sector is expected to witness a slow recovery in 2021, but the pace of recovery will be uneven across the countries in the region. However, large-scale projects in the oil, gas, power and water sectors have gained traction against the downturn in market conditions this year, and this is likely to continue. A lot of contract awards are expected as the region pushes its renewable energy programme, particularly solar photovoltaic and



Hero Factory, Chittoor, Andhra Pradesh

wind power. Overall, the construction sector is expected to recover with growth of 1.9% in 2021 and 4.1% in 2022 in the MENA region as the region ramps up vaccination programmes.

The African construction market is expected to register a CAGR of 6.4% (2019-2024), aided by the availability of huge natural resources, cheap labour, significant investment opportunities in energy and infrastructure, and a fast-growing consumer market. Improvement in the business environment, including favourable economic development policies, rising commodity prices and stable governments, should support the growth of the construction sector. The transport sector, followed by power and energy projects, constitute half of the total ongoing projects. However, the constant rise of project costs due to rise in the prices of steel, cement and oil further accentuated by the weakening of local currencies against the dollar, may act as headwinds to the overall construction sector.

The construction sector suffered a contraction in the ASEAN region as well, due to lockdown measures implemented to stem the spread of the pandemic. Public spending is expected to be increased to accelerate recovery in 2021. Increasing population, rapid urbanisation and increasing investments in infrastructure development shall remain the key factors to stimulate market growth in the region.

With execution efficiencies largely back from the initial Covid-19 wave and a large active Order Book awaiting

execution, the infrastructure business is set for good growth ahead. However, the second wave of Covid-19 infections, if not disrupted, could delay the scale-up. Nevertheless, the disruption, owing to the efforts underway, is unlikely to be of the magnitude of the last time.

### Change in Segment Reporting

Effective April 1, 2020, the Smart World and Communication business, which was reported under the Infrastructure Segment, has been reclassified to the 'Others' Segment.

## BUILDINGS AND FACTORIES

### Overview:

L&T's Buildings & Factories business is an industry leader in Design & Engineering, Procurement and Construction (EPC) of projects ranging from airports, hospitals, stadiums, retail spaces, educational institutions, IT parks, office buildings, data centres to high-rise structures, mass housing complexes, cement plants, industrial warehouses, test tracks and other factory structures. The business offers total solutions, including in-house design expertise using advanced systems like BIM 4D, 5D and BIM 360 field, an efficient supply chain management and extraordinary project management expertise.

Artist's Impression



India International Convention Centre, New Delhi

The business has a track record of building tall, large and complex structures across India and overseas. The business is a forerunner in offering modular, mechanised processes for fast-track construction.

The business comprises six Business Units (BUs) – Airports, Health, Public Spaces, IT & Office Space (ITOS) and Datacentres, Residential Buildings and Factories.

**Airports:** The BU offers design-and-build solutions for passenger terminal buildings and allied service buildings, and cargo terminal buildings, with integrated airport system solutions such as baggage-handling systems, passenger-flow monitoring system, passenger boarding bridges, visual docking guidance systems and other facilities.

**Health:** The BU handles the design and execution of hospitals, medical and nursing colleges. Healthcare infrastructure is delivered with end-to-end healthcare facilities, including medical equipment, right from concept to commissioning.

**Factories:** The BU is a one-stop solution for the EPC requirements of factories such as cement plants, automobile plants, glass & paint manufacturing, warehouses, automobile test tracks and food processing plants.

**Public Spaces:** The BU provides design and execution of special structures such as tall statues, metro stations,

convention centres, secretariat buildings, hotels, malls, integrated development, and educational institutions.

**ITOS and Datacentres:** The BU focuses on providing turnkey office space solutions for IT and office spaces. Leveraging the strong mechanical, electrical and plumbing (MEP) competencies of the business, it also offers concept-to-commissioning services for setting up data centres.

**Residential Buildings:** The BU is a prime EPC solutions provider of elite, affordable and mass housing projects.

A new vertical, **B&F Fast**, is identified to explore and create value from advanced construction technologies such as Prefabricated Prefinished Volumetric Construction, Offsite Manufacturing, Structural Steel Construction, and 3D printing that will fast track project delivery.

Dedicated engineering design centres, competency cells, advanced formwork systems, mechanised project execution, a wide network of consultants and vendors, digitised project control and a talented pool of employees help the business sustain leadership position. The construction excellence, technology and expertise gained over several decades gives the business a competitive advantage in the construction industry.



Artist's Impression

Patna Medical College and Hospital

## Business Environment

In a move to give a boost to the infrastructure segment, the Government has kick-started the National Highspeed Rail Project. There is significant allocation for building premier educational institutions across the country. However, private investments in buildings such as hotels and malls were insignificant.

The Government's Atmanirbhar Bharat scheme, the PLI scheme and the logistics policy have helped in the growth of the manufacturing and warehousing segments. The Factories business has bagged orders from various private sector manufacturing and logistics companies.

With tourism and travel coming to a grinding halt, prospects in the Airports segment have been deferred.

With the Government's focus on improving healthcare facilities within the country, this sector has seen increased tendering activity.

The challenge in the IT and Office Spaces business continues as there were no major investments from IT majors for capacity expansion. With the Work from Home concept catching on in the IT industry, the need for new facilities is being reviewed.

The need for data centres and the private investment in these buildings have increased multi-fold in recent years. The market looks quite positive for this business.

The huge inventory level of unsold houses has reduced investment in the elite housing sector. The 'housing for all' concept for affordable mass housing is yet to pick up significantly.

In the international arena, though there were no major prospects seen in any segment, a breakthrough order was bagged by the Factories BU in Saudi Arabia during the year for warehouse construction.

## Major Achievements

### Major Orders secured

- Warehouse project at KSA
- Government Hospital and Medical College in Haryana and Odisha respectively
- High Speed Rail projects – building-related works in C4 & C6 packages
- Factories for various private clients in cement manufacturing, warehouses and painting industry

### Key projects completed

- Narendra Modi Stadium, Motera, Gujarat
- Al Rayyan Stadium, Qatar
- IKEA Showroom, Navi Mumbai



CIDCO Housing Project, Navi Mumbai, Maharashtra

- Government Medical College, Madhepura
- Medical Colleges in Coochbehar, West Bengal and Patna
- Prestige Leela Residences, Bengaluru
- RAMCO Cement plant, Odisha

### Other Key Achievements

In first-of-its-kind accomplishments, the business achieved the following in the execution of major landmark projects:

- 3-dimensional in-situ folded roof slab with huge span varying from 42-56 m was cast in the IIT Hyderabad project
- Erection of roof truss modules weighing 1000 MT using the new innovative hybrid methodology was executed in 5 stages – 4 modules each weighing 200 MT in IICC, Dwarka project
- First to build a parabolic asphalt high-speed test track with a unique 44-degree curvature, at Mahindra test track project, Tamil Nadu

The business erected a 425 MT roof truss at the Hyderabad International Airport Limited project. The erection, which was part of a total of 1075 MT of roof erection (650 MT erection was done earlier this year) using a strand jack was equipped with digital control with an automatic lifting system. The whole erection was carried out without the use of any heavy cranes.

### Awards

During the year, the business won the following awards:

- ICI Award for Innovative Concrete Structure and Outstanding Concrete - Ford GTBC, Chennai and Narendra Modi Stadium respectively
- The Best MEP Contractor Award in Oman from Dossier Construction's Infrastructure Awards & Summit 2020

### Significant Initiatives

Under **B&F Fast**, a business initiative was undertaken that aims to cut down the time taken for construction, using the latest technologies such as DfMA (Design for manufacturing and assembly) and PPVC (Prefabricated, Prefinished Volumetric Construction). This business promotes factory-based, off-site construction that reduces the overall timeline of the project and ensures high quality of the end product. As a trial, a modular set-up for setting up quick hospital buildings has already been established.

In the quest of using advanced technologies in construction, the business also tried 3D printing in FY 2020-21 and built a single-storey building as a pilot project. Further research on the same subject enabled the business to complete India's first 3D printing of a G+1 building with reinforcement.

Both the modular facility for hospitals and the 3D printed structure were done at L&T's Kancheepuram facility.



DLF Cyber Park, New Delhi

The business has developed “L&T Buildings Occupational Standards” (LTBOS) in line with National Occupation Standards (N.O.S) by NSDC. These standards will help to screen workmen for their designated trade and skill before deployment.

### Environment, Health and Safety

The business has been continuously improving safety standards by introducing various training programmes, digital / VR training and awareness sessions. To better manage the EHS training of workmen and supervisors, an integrated training module has been rolled out as part of the WISA (Workforce Induction and Skills Application) digital app. This online training module enables the project teams to identify the training needs for specific trades of workmen, effect better scheduling of the training, build the worker profile, track individual worker competence levels and maintain training records, etc.

The business was conferred several prestigious awards during the year:

- L&T is the only construction Company in India to bag Eight British Sword of Honour awards for eight project sites. The business also received five-star certification from the British Safety Council
- Fifteen Projects won Gold Awards conferred by The Royal Society for Prevention of Accidents (RoSPA).

### Human Resources

To nurture the psychological well-being of staff during the Covid-19 crisis, an Online Behavioural Intervention, encompassing anxiety and fear management, the importance of positive thinking and managing change during turbulence, was designed. Employees were also encouraged to attend VILT (virtual instructor led training) sessions to maintain the pace of learning. Around 430 virtual training sessions were conducted during the year. Through these initiatives, 4 training man-days per staffer were achieved, with coverage of 79% of staff.

Diagnostically Evolved Site Intervention (DESI) was implemented through Training Need Analysis at the Project Site Level and a tailor-made training session was designed in 18 Project Sites pan- India.

The learning edge platform (LEDGE) was made to improve the engagement of the engineering trainees that are inducted every year by providing them with a structured learning plan and hands-on experience of the various functions involved in a project.

Buildings and Factories digital skill inventory comprises employee’s knowledge, experience and skills. A database of profiles of 6000 staff was built through a digital solution which structures, categorises and stores up-to-date skill information under 40 major skills and 540 sub-skills with proficiency levels from Basic to Role Model.



*Ahmed Bin Ali Stadium, Doha, Qatar, built for the FIFA World Cup 2022*

## Risks and Concerns

The recent surge in the prices of commodities triggered by a pent-up demand may impact input costs, most of which are managed contractually through price variation clauses.

With the second wave of Covid-19 infections, there is a concern about workmen returning to their native places due to the surge in cases. As most projects are labour-intensive, any such situation may impact execution/progress.

Private investments may recede further if the pandemic continues for a longer period. In the case of prospects from Central / State Governments, although they show promise for the business in terms of opportunities, there is the risk of delay / deferment in tendering of new projects.

The ongoing pandemic may adversely impact the supply-chain. In order to mitigate this, the business is creating awareness among its supply chain partners regarding the transport / import restrictions and they are advised to avoid sourcing from locations that may be impacted due to the lockdown.

## Outlook

The Health sector has garnered significant attention from the Government after the pandemic. The Government has allocated about ₹ 65,000 crore for healthcare infrastructure over the next 6 years. Ayushman Bharat aimed at affordable healthcare, the Medical Tourism Hub in the North East and

the establishment of Critical Care Hospitals in 602 districts and 12 Central Institutions are the visible opportunities.

With more manufacturing leaders trying to set up their hubs in India, it is expected that the factories sector will have a significant boost. Cement manufacturing units are expanding their production capacities. The new National Logistics Policy and increased FDI Inflow for the warehouse sector have been introduced with an expected 20% CAGR. New manufacturing units are planned to cater to domestic and export demand with expected CAGR of 25%. Automotive Mission Plan 2026, NEMMP 2020 and promotion of E-vehicles manufacturing have been introduced with expected CAGR of 5%. Warehousing and logistics are picking up pace and many retail businesses are coming up with warehouse projects across India. The uptrend will lead to the increase in new manufacturing and warehousing establishments across the country.

The State and the Central Governments and a few public sector units are coming up with development projects of public buildings such as the state secretariat, public offices, directorate complex, museums, educational institutions, and mixed-use development. The high-speed rail projects for depots and stations are showing good momentum. Upcoming campuses and the expansion of existing campus for IITs/IIMs are also expected. Budget allocation for sports stadia through NITI Aayog will also lead to further opportunities.



A section of the 13-km Phase 1 of the Mauritius Metro project

The data centre market is quite promising, with India's data localisation policies and investors seeing it as a lucrative investment option.

Travel and tourism will take more time to rebound to the pre-Covid levels. This may impact the airport business and related transit facilities. AAI is looking at investing in new markets and opportunities for tie-ups. Prospects are also being explored in foreign markets such as SAARC, South East Asia and Africa. However, with 100% FDI allowance for greenfield airports, it is anticipated that India is set to become the 3rd largest aviation market by 2025.

The inventory levels of residential houses are still very high despite the revival that is being attempted and hence launch of new projects is very limited in the metros, especially in Mumbai. However, affordable housing is set to get a boost from the extension of the tax holiday till March 31, 2022.

The business will also pursue select prospects like design & build – EPC hospitals, stadiums, and airports in geographies like Bangladesh, Africa and Sri Lanka.

The prospects in Saudi Arabia under Vision 2030 – including Amaala, NEOM, the Red Sea Project, and Qiddiya projects – are yet to pick up and may show movement in the upcoming year. In Oman with divergence of focus from the oil sector, thrust is expected on tourism and hospitality development.

Overall, with increased focus of government spending on infrastructure projects, the outlook for the upcoming year looks quite promising.

## ■ TRANSPORTATION INFRASTRUCTURE

### Overview:

L&T's Transportation Infrastructure business is one of the oldest and largest reputed contractors in India for Engineering, Procurement & Construction of infrastructure projects in the Road, Railway & Airport sectors. The business is broadly divided into two Strategic Business Groups (SBG), namely, Railways Business Group (RBG) and Roads Runways & Elevated Corridors (RREC).

The Railways Business Group is further subdivided into Mainline Business Unit (MLBU) and the Metro Business Units (MTBU). MLBU is in the domain of civil & trackwork, electrification, system integration for all mainline railway projects, Western & Eastern Dedicated Freight Corridors, and Rail Links for Port, Mining and Power Plant facilities, etc. MTBU business involves ballastless trackwork, electrification (rigid and flexible OHE) and system integration for all Mass Rapid Transit System (MRTS) projects and Regional Rapid Transit System (RRTS), both in India and abroad. This BU also



Dhaka Metro MRT Line 6

addresses end-to-end Integrated Transit Systems, complete with civil and systems works.

The Road, Runways & Elevated Corridor Business Group is divided into Roads & Runways (R&R) and Elevated Corridor and Dedicated Freight Corridor (EC&DFCC). R&R provides EPC Design & Build Construction services for all types of roads (asphalt and concrete) including all associated structures, cross-drainage, toll booths, wayside amenities, etc. to NHAI, MoRTH, State Government and certain private clients. In the airport sector, the R&R BU is involved in the construction of complete airside infrastructure, viz. runways, taxiways, aprons, airfield ground lighting, fuel hydrant systems, etc. complete for international airports, both greenfield & brownfield. The R&R BU is also a pioneer in providing complete civil infrastructure for greenfield city infrastructure projects such as smart cities. The EC&DFCC Segment provides design & build construction services for all types of urban flyover projects and civil works (earthwork, blanket, earth-retaining structures, drain) in dedicated freight corridor projects.

The business leverages its vast experience in Project Management, Engineering, Design & Construction Management to achieve international standards of safety, quality and operational efficiency. It has Engineering Design Centres located at Mumbai, Faridabad and Chennai. It also has a competency development centre at Kancheepuram for RBG and a workmen training centre at Ahmedabad for RREC.

## Business Environment

### a) Railway Business Unit

The Railway sector has been on a high growth trajectory since the past few years. The Indian Railway (IR) has set a target of 100% electrification by the year 2023. This will make IR the first major railway in the world to have a fully electrified broad-gauge railway network of such a size. To achieve this target, IR has planned to electrify an average of 9500 route km annually in the next 3 years. The Central Organization for Railway Electrification (CORE) / Zonal Railways have also been actively floating and finalising large-scale tenders for electrification works.

This year, the business saw significant progress in the construction works for ongoing Eastern and Western Freight Corridors, the commissioning of which are expected by June 2022.

Another major development this year has been the kick-start of award of the High-Speed Rail Project.

### b) Roads, Runways & Elevated Corridor SBG

Over the last 5 years, the budgetary support for Road and Highways sector has seen a steady increase of more than 5.5 times. The Government announced the National Infrastructure Pipeline with total outlay of ₹ 111 lakh crore for FY20-FY25, out of which 18% of capital expenditure is earmarked for roads which is expected to give a further boost to the sector.



*Mumbai-Nagpur Expressway*

Over the last 7 years, the length of National Highways has gone up by 50% - from 91,287 km (as of April 2014) to 1,37,625 km (as on 20 March 2021). Construction of highways has increased to 37 km/day in 2020-21 with respect to 27 km/day in 2019-20, with an increased focus on delivery of projects.

Also, in view of the exponential increase in traffic over the years in urban areas, the Government has shifted its focus on developing many new Elevated Corridor/ Flyover projects across major cities, with the primary aim of decongesting urban roads and highways.

Airports as well as the smart/industrial city sector has not seen any major development in FY 2020-21. However, few opportunities, such as Jewar and Dholera in Airports and Krishnapatnam and Tumakuru in City Infrastructure, are in advanced stages, and would be awarded in the next financial year. Although the Covid-19 pandemic has severely affected construction activities due to lockdown restrictions and the reverse migration of workmen that followed, the business remained active in terms of new tenders and project awards, which helped maintain a healthy order book.

Further to Covid-19, there has been a significant change in client attitude, owing to which project milestones have become more realistic and closely intertwined with site progress, which has eased working capital pressure.

### Major Orders

- Mumbai – Ahmedabad High Speed Rail Project, Package C6 from NHSRC
- Delhi – Vadodara Expressway, Packages 11 and 22 from NHAI
- EPC overhead electrification projects, EPC-6 and EPC-15A (1630 Tkm), from CORE
- Delhi – Meerut RRTS Track Package (80 Tkm) from NCRTC
- Ballastless track package for Kanpur and Agra Metro (125 Tkm) from UPMRCL
- Overseas – Order received for 3.5 km extension in Mauritius LRT

### Projects Completed

The business has completed the following projects:

- Civil, Trackwork in WDFC CTP 1 & 2 sections of Rewari to Madar (306 rkm) and electrification in the same section (EMP 4 Project). The section is among the first in the world that allows plying of heavy haul rakes, 1.5-km-long, to transport double- stacked freight containers from the major ports to the hinterland.
- First EPC electrification project from Delhi Sarai Rohilla – Jaipur – Ajmer



Mumbai-Vadodara Expressway

- 4-Lane Rewa – Katni – Jabalapur – Lakhnadon Road Project, Packages 1, 2 & JL
- 4-Lane Yadgiri – Warangal Road Project
- 4-Lane Chandigarh – Kharar Elevated Corridor

### Significant Initiatives

Further to full range railway system integration projects such as the Dhaka and Mauritius LRTs, the Railway business is gearing up to assimilate newer technology skills to address some of recent projects, such as the RRTS Slab Track and Mumbai Metro LVT Track.

### Digitalisation

The Covid-19 pandemic has reinforced the importance of digitalisation. One such initiative, Workmen Induction and Skills Application (WISA), has helped the business immensely in identifying and approaching workmen with specific skill-sets during the remobilisation planning. Connected Assets & Geospatial are another crucial initiative that helped the business capture and monitor site data remotely. This tracking and monitoring of P&M assets via digital chipset and LiDAR and drone-based project surveys is becoming the 'new normal'.

### Environment, Health and Safety

Transportation Infrastructure projects are typically spread across hundreds of kilometres, with a multitude of discrete safety risks that are both location and task-specific, and

oversight of adherence to safety norms at each and every work-front simultaneously itself poses a major challenge. To overcome this, various initiatives were undertaken to enforce and monitor EHS protocols across all work-fronts.

- Periodic virtual training by means of SPARSH (Standard Precautions using Augmented Reality for Safety and Health) and Virtual Reality devices at various work locations for workmen have been introduced in addition to the basic induction training. In FY 2020-21, 27,587 trainings, corresponding to 0.27 million man-hours, were conducted across all sites.
- Inspection and verification are done online through a Digital App – RtR (Reverse the Risk) and Dome 360 Degree that allows safety officers to remotely inspect and monitor safety measures and ground conditions before giving the go-ahead for execution.
- The Green Card System is implemented across the business for fitness verification of P&M equipment before deployment through the IB4U digital app.

The Environment Management System (EMS) has been implemented in the business and various control measures to reduce environmental impact are being followed across project sites. Good practices are being followed, such as use of fog cannons, water sprinklers for dust suppression, proper disposal of C&G and hazardous wastes and use of renewable energy (solar power).



*Roha-Verna Konkan Railway Electrification Project*

During FY 2020-21, the business was conferred 17 international awards, 7 of which were from RoSPA (Royal Society for the Prevention of Accidents) and 10 from the BSC (British Safety Council). The business has also won 3 prestigious safety awards from NSC (National Safety Council), India.

### Human Resources

During the pandemic and the resultant nationwide lockdown that followed, the HR team proactively started various initiatives to keep the staff motivated and engaged at their homes by conducting various awareness programmes, training programmes, webinars and personal connect to check on their well-being and offer any help required. To keep the staff motivated, the business introduced Hi5 – an online portal for recognising staff members who have done extraordinary work amidst the lockdown.

The business has taken a significant step to enhance the safety culture by instituting the LIFE (Loss and Injury Free Environment) Awards to recognise and reward project teams that demonstrated excellence in safety practices.

Also, to ensure Learning & Development of the staff, two comprehensive Competency Developmental Programmes were designed and initiated this year – ‘NPL – Nurturing Potential Leaders’ for senior potential leaders and ‘PEDP – Planning Engineers’ Development Programme’ for Planning staff in junior cadres.

### Risks and Concerns

Land acquisition remains one of the critical concerns for the business, as most of the projects are predominantly ‘linear’ in nature. Indefinite delays in handing over of an encumbrance-free work-front not only impacts the progress but also costs dearly in terms of under-utilisation of resources and increase in overheads and prolonged project duration. Moreover, delays in environmental clearance, mining approvals, and variation approvals further lead to a drop in the execution momentum.

Besides the above, extreme environmental events such as unprecedented rainfall, cyclones, and air pollution leading to National Green Tribunal Act bans on construction activities also pose an adverse risk to project timelines.

Following Covid-19, global supply chain disruption and reverse migration of workmen also pose a major risk. Sourcing from China, EU and UK continue to affect the supply of critical items, especially for the Railway business. Reverse migration of workmen continues to be a concern due to the second wave.

To address and mitigate these risks, risk management teams have been formed, and primarily tasked with the identification of the risks and the development of a risk map categorising these risks on the basis of probability and severity. This acts as an early warning system to assess, mitigate or minimise the impact of risks on the key parameters of schedule, cost, quality and safety.



*The 1-km bridge over River Teesta, Ghoshpukur-Salsalabari Road Project*

## Outlook

### a) RREC Business

The Government has planned to expand the National Highway network by ~ 60,000 km by 2025 in major economic corridors, strategic areas, and Elevated Corridor & Flyovers network in major cities such as Delhi, Chennai, Kolkata, Mumbai and Bengaluru, with an investment outlay of ₹ 20.33 lakh crore under the National Infrastructure Pipeline (NIP). While a daily average of constructing 37 km of road per day has been achieved in March 2021, the Government aims to step up to its ambitious target of building 45 km of road per day in FY 2021-22.

In the airport sector, the Government has envisaged an investment of more than ₹ 1.43 lakh crore under NIP, over a period of 5 years. The Ministry of Civil Aviation (MoCA) envisages 100 new airports to be built in the country over the next 10 to 15 years. The MoCA is also working on the cargo policy, which will provide a boost to the nation's logistics capacity.

### b) Railway Business

The Union Budget 2021 has allocated a 'record' budgetary allocation of ₹ 1.10 lakh crore for the Railways, with total capital expenditure outlay of ₹ 1.07 lakh crore. In specific, the thrust will be on the development of New DFC, RRTS, HSR Corridors and upcoming metro sections in Tier 1 and Tier 2 cities.

In the Mainline Segment, a significant amount of capacity augmentation is planned in the next 3 years, and to achieve 100% electrification by 2023, the electrification projects are being floated on an EPC basis. Also, the upgradation of Signalling System projects worth ~ ₹ 16,000 crore is expected to pick up from FY 2021-22.

The Intercity Segment is a new emerging area of opportunities and the business is shifting focus towards RRTS. NCRTC is implementing its first RRTS in three elevated corridors on priority, of which Delhi – Meerut corridor has already been awarded in FY 2020-21 and tenders for the Delhi – Alwar and Delhi – Panipat RRTS corridors are expected in the next 1 to 2 years.

On the High-Speed Rail (HSR) front, Indian Railways has announced plans to develop 7 more HSR corridors, feasibility studies and environmental assessment for which have already been initiated. Apart from the HSR, Railways is also pursuing select semi-HSR corridor projects like Thiruvananthapuram – Kasaragod, Ahmedabad – Rajkot and Pune – Nashik sections in which tracks and systems projects worth ₹ 19,000 crore are expected to be finalised in next 2-3 years.

Rapid commissioning in the Western and Eastern Dedicated Freight Corridors will catalyse development of three new freight corridors, i.e., East Coast, East-West and North-South. The feasibility reports for these corridors have been

Artist's Impression



The Mumbai Coastal Road Project. L&T is executing Packages 1 and 4.

completed and projects worth ₹ 58,500 crore are expected to be finalised over the next 5 years.

On the international front, the focus will be on neighbouring countries like Bangladesh, Sri Lanka and also on ASEAN, North and East Africa where the projects are funded through secured sources like GoI lines of credit or through bilateral / multilateral agencies such as JICA, EBRD, ADB, etc.

## HEAVY CIVIL INFRASTRUCTURE

### Overview:

L&T's Heavy Civil Infrastructure business is a market leader in Engineering, Procurement, and Construction (EPC) projects in core civil infrastructure segments that are crucial to the economy viz. metros, nuclear, special bridges, hydel and tunnels, ports and harbours and defence.

As an industry leader in augmenting capabilities for urban mass rail transit systems, the business is involved in the construction of metro rail systems and has projects in almost all the major Indian cities. It provides extensive end-to-end engineering and construction services for both elevated and underground metro systems.

In the Nuclear segment, the business provides EPC solutions in civil, mechanical, electrical and

instrumentation, including seismic qualification and modular construction technology. Its expertise extends to both Pressurised Heavy Water Reactor (PHWR) and Light Water Reactor (LWR) technologies.

The Special Bridges segment has extensive experience in executing a wide range of bridges – such as cable-stayed, precast, pre-stressed concrete, steel and concrete composite construction – using ingenious cutting-edge construction techniques, viz. incremental launching, segmental construction, balance cantilever construction and span-by-span construction.

The Hydel and Tunnel segment offers EPC solutions for complete hydroelectric power projects, large-diameter transport / water tunnels and complex irrigation projects. The business also provides expertise for road and railway tunnelling projects which cater to nation-building.

The Ports & Harbours vertical has extensive experience in greenfield ports, shipyard structures and seawater intake systems in all the coastal states of India. It provides EPC solutions for breakwaters, berths, jetties and wharfs, dry docks and shore protection structures. It has unique expertise in providing design and construction solutions for state-of-the-art ship-lift structures.

Backed by the expertise and experience gained from managing mega projects, the business has established a position of pre-eminence in shoring up the country's

Artist's Impression



When completed, the 19.28-km Dhubri-Phulbari bridge over River Brahmaputra will be India's longest road bridge

defences. The business offers single-point EPC solutions in the form of infrastructure facilities for defence bases, underground facilities and surveillance.

The business has a strong presence in India, the Middle East, Bhutan and Bangladesh. The ability to provide tailor-made design-&-build and EPC solutions to suit the specific requirements of customers for complex infrastructure projects has made the business market leader in India. Dedicated design and technical centres, competency cells, specialised training centres, digital project management, and a talented pool of employees help the business sustain a leading role, attract key clients, penetrate new geographies and secure major orders.

L&T GeoStructure is a unique entity which focuses on foundation and ground improvement related projects. It has a strong and professional foundation specialist team with the knowledge of design, equipment and methods to execute and supervise sophisticated foundation works. It has expertise in deep piling and diaphragm walls, multi-cellular intake wells for river-linking, marine terminals with berths and jetties and deep cut-off walls.

## Business Environment

Rapid urbanisation in India is driving demand for better urban mobility in Tier 1 and Tier 2 cities. Also, the existing metro cities are expanding their metro network to

accommodate the growing urban commute requirements and connectivity to the neighbouring cities.

India's National High-Speed Rail Corporation Limited (NHSRCL) has initiated work on 2,365 km of new high-speed rail lines with bids being invited for conducting survey work for preparation of Detailed Project Reports (DPRs) for high-speed rail corridors connecting Mumbai – Hyderabad (711 km), Delhi – Amritsar (459 km), Chennai – Mysore (435 km) and Varanasi – Howrah (760 km). The Kerala State Government has cleared the Thiruvananthapuram – Kasaragod semi high-speed rail corridor involving an investment of ₹ 63,941 crore. The Maharashtra State Government approved the ₹ 16,039 crore Pune – Nashik semi-high-speed rail corridor project.

In the Hydel & Tunnels segment, NHPC signed an MoU with JKSPDCL for the execution of hydro projects in J&K. To shore up road infrastructure along the border with China, the Union Transport Minister has announced the construction of six new tunnels in Jammu and Kashmir and Ladakh that would help in ensuring quicker movement of troops and machines to the area during any border crisis. The DPRs of the tunnel projects are in progress.

The Bridges segment experienced a challenging first half of the year, and not many projects were awarded. India has committed to fund the Greater Male Connectivity Project at Maldives through an Indian line of credit and grant. The package consists of a 6.7 km bridge connecting Male with



Artist's Impression

*The High Speed Rail -- India's first Bullet Train project and the largest EPC order awarded in India till date*

Gulhifalhu Port and Thilafushi industrial zone to revitalise and transform the Maldivian economy.

The Ministry of Ports, Shipping, and Waterways (MoPSW) has created a compendium of 400 investable projects with an investment potential of ₹ 2.24 lakh crore. Increased investments from the private sector is expected by the Ministry. More than 574 projects at a cost ₹ 6 lakh crore have been identified under the Sagarmala project for investment. The Bangladesh Government has approved the enhancement of the Mongla Port Capacity. India has extended a line of credit for the expansion of the Mongla Port capacity.

The Defence capital outlay in the recent Union Budget 2021 has increased compared to last year to ₹ 1.4 lakh crore, leading to the creation of various defence infrastructure including maintenance, upgrade and repair. There is a definitive thrust to accelerate the naval infrastructure at Naval Base Seabird in Karwar and Project Varsha in Vizag.

## Major Achievements

### Orders Won

- Mega contract from the National High-Speed Rail Corporation Limited (NHSRCL) to construct the 237 km C4 section of the Mumbai – Ahmedabad High Speed Rail (MAHSR) project from Zaroli Village – Maharashtra – Gujarat Border to Vadodara

- Construction of tunnels and construction shafts and ancillary works between Rishikesh and Karanprayag in Uttarakhand by Rail Vikas Nigam Limited (RVNL)
- Construction of Sitamma Sagar Multipurpose Bund from the Government of Telangana
- Construction of reactor, auxiliary, turbine and diesel generator building and other safety related structures for Kudankulam Nuclear Power Plant (KKNPP) 5&6 awarded by Nuclear Power Corporation of India Limited (NPCIL)
- Contract to construct India's longest road bridge of 19 km across river Brahmaputra connecting Dhubri in Assam to Phulbari in Meghalaya from National Highway & Infrastructure Development Corporation Limited
- Delhi – Meerut Regional Rapid Transit System (RRTS) elevated Package-7
- 2nd Vikramshila Bridge across the Ganges, Bihar

### Projects completed

- Kakrapar Atomic Power plant (MPCW), Gujarat – criticality achieved on 22nd July 2020
- Durgam Cheruvu project, Hyderabad the world's longest extradosed cable-stayed concrete bridge was inaugurated on 25th September 2020



L&T is constructing 13 km of the 21-km Mumbai Trans Harbour Link – which will be India's longest sea bridge

## Other Key Achievements

- India's largest barge (110m x 64m x 6m), which is equal to one football ground, started functioning at Mumbai Trans Harbour Link Package 1
- India's largest TBM of 12.19 m dia. assembled and launched by in-house expertise at Mumbai Coastal Road Package 4
- Ahmedabad Metro tunneling activity completed
- WDFC CTP-14 project successfully achieved first-of-its-kind tunnel with the largest cross-section and electrified double tracks

## Significant Initiatives

Digitalisation has become a way of life and integrated into project delivery process. The business digitally monitors, in real-time, productivity of the 3M – Men, Material and Machinery – factors critical to project success. For effective project delivery, the business leverages contemporary digital technologies and drone-based project monitoring, 5D BIM and innovative digital platforms such as WISA (Workmen Induction and Skills Application) for workmen mobilisation and induction and Virtual Reality (VR) based training of workforce in EHS (Environment Health and Safety) aspects.

## Environment, Health and Safety

Committed to the mission of 'Zero Harm' the business clocked 343 million safe man-hours in the year, and 16 thousand man-hours were invested in EHS awareness and

training. The EHS app was launched to ensure compliance with corporate SOPs on restarting projects. The supervisor EHS checklist was developed to ensure activity risk control by the Supervisor. The Artificial Intelligence platform was implemented which improves construction safety through hazard- spotting at construction stages and suggests the applicable requirements for the hazards identified.

British Safety Council (BSC)-accredited 1-day BBS (Behaviour Based Safety) awareness certification courses were organised for projects. A total of 8 training programmes were conducted during the year.

The business provides control measures for emission control, wastewater treatment and waste management at construction sites in line with regulatory requirements and ISO 14001 EMS requirement. Wastewater from the labour colonies and site offices is being treated by STP. Bio-toilets are also being used for sewage treatment at project sites.

Various projects across the business have received EHS awards:

- Gold Award from RoSPA (The Royal Society for the Prevention of Accidents) – UK, has been conferred upon KKNPP 3 & 4 MPCW projects
- The Prestigious Golden Peacock Environment Management Award for 2020
- In October 2020, Kakrapar Atomic Power Project won the 'Sarvashreshtha Suraksha Puraskar Award' (Gold Trophy) from National Safety Council of India (NSCI)



Bangalore Metro – an underground section



Rishikesh-Karnaprayag Rail Link Package 2

- Kakrapar Atomic Power Project 3 & 4 bagged the 'Best Safe Contractor Award (Winner) – 2020-21' from NPCIL (Nuclear Power Corporation of India Limited)

### Human Resources

The business has always been focusing on employees and innovative initiatives towards employee development. Leadership interventions such as Global Leadership Development Programme (GLDP), Frontline Leadership Programme (FLP), and Project Leaders Assessment and development (PLDP) are held regularly.

The initiative of Trainee Engagement and Development Center (TEDC) for Graduate Engineer Trainees (GETs) is well institutionalised.

A 360-degree feedback has been introduced for Project Directors, followed by rigorous coaching based on the 'GROW' (Goal, Current Reality, Options & Way Forward) model.

During the lockdown and thereafter, various employee engagement and well-being programmes such as awareness on Covid-19, mental health, on-line cultural programmes Rock Off and Rave On, talent shows and various competitions were organised, with continuous employee reach-out initiatives.

The HR Talent Acquisition function has been accredited with ISO 30405 : 2016, endorsing its transparent recruitment process.

Further, the business has been conferred prestigious awards such as the Golden Peacock HR Excellence Award and ATD Best Award for Talent Development from the internationally acclaimed Association of Talent Development body of USA.

### Risks and Concerns

The major risk faced by the business during this financial year was the outcome of the Covid-19 pandemic, viz. stoppage of work at project sites due to the lockdown and reverse migration of labour. This further accentuated the other challenges faced in the business, viz. delay in obtaining right of way, statutory clearance delays, claim management and payment delays.

To address the risks emanating from the changed business environment, the business assessed the impact of Covid-19 and a collective representation by the industry was made to the Government at various forums. The additional cost impact emanating from the lockdown is under discussion with the clients.

Further, the business has a strong risk management system and process in place. Various measures to mitigate the risk include enhanced contracts administration and risk management at sites, deployment of Contracts Administration & Claim Management (CACM), war rooms on priority jobs to realise variation and claims and close follow-up with the client for pending payments.



400 kV Kamudhi-Ottapidaram Transmission Line, Tamil Nadu

## Outlook

Continued thrust on infrastructure investment by the Government will provide a thrust and the infrastructure business is expected to return to its growth path in FY 2021-22. The Government has also expanded the National Infrastructure Pipeline (NIP) during the Budget to 7,400 projects from 6,835 projects and announced plans for the National Monetisation Pipeline and Development Finance Institution (DFI) to improve the financing of infrastructure projects.

With the Union Budget 2021 promoting metro rail as public transport for sustainability reasons, cost-efficient technologies such as Metro-Lite and Light Rail Transit systems are expected to gain traction, especially in Tier 2 cities.

With hydel power evolving as a source of flexibility and grid stability, multiple large hydro power projects are being planned in J&K and the North East states. The Union Government is also focusing on developing road infrastructure in border areas and has announced multiple major tunnel projects to ensure border connectivity.

India's installed nuclear capacity is expected to reach 15 GW by 2027 from the present 6780 MW and contribute to 56.5% non-fossil sources such as nuclear, hydro and renewables. Along with continued thrust on 10 pressurised heavy water reactor (PHWR) projects, civil nuclear business is expected to continue its growth.

As India aims to emerge as a leading Blue Economy of the world, the Ministry of Ports, Shipping, and Waterways (MoPSW) has created a compendium of 400 investable projects with an investment potential of ₹ 2.24 lakh crore.

The Government is focusing on building new capacities and upgrading the existing defence infrastructure with increase in Defence capital outlay in budget from last year to ₹ 1.4 lakh crore.

Bridge construction in India is expected to grow with new funding mechanisms by NHAI, such as ToT (Toll Operate Transfer) and InvIT (Infrastructure Investment Trust) and interest from international funding agencies such as JICA, the World Bank, ADB.

The above initiatives by the GoI continue to provide a positive outlook for the business in the coming years.

## POWER TRANSMISSION & DISTRIBUTION

### Overview:

L&T's Power Transmission and Distribution business vertical is a leading EPC player in the field of power transmission & distribution and renewable energy. It offers integrated solutions and end-to-end services, ranging from design, manufacture, supply, installation and commissioning of transmission lines, substations,



400 kV GIS Substation, Chennai, Tamil Nadu



400/220 kV Mysandra GIS, Bengaluru, Karnataka

underground cable networks, distribution networks, power quality improvement projects, infrastructure electrification, fibre optic backbone infrastructure, solar PV plants including floating solar, battery energy storage systems, mini / micro grid projects and related digital solutions. Besides being a dominant player in the Indian subcontinent, the business enjoys a significant share and a strong reputation in the Middle East, Africa and ASEAN markets.

The business comprises several business units:

**Substation** business unit provides turnkey solutions for Extra High Voltage (EHV) air insulated / gas insulated substations, Flexible AC Transmission Systems (FACTS) and digital substation related solutions, EHV cable systems and complete electrical and instrumentation solutions for various utilities, plants and infrastructure projects, such as metros, airports, etc.

**Power Distribution** business unit provides a range of EPC services related to urban / rural electrification including last-mile connectivity, augmenting, reforming and strengthening of high voltage and low voltage distribution networks, power quality improvement works and advanced distribution management solutions.

**Transmission Line** business unit offers turnkey EPC solutions for overhead lines for power evacuation and transmission up to 800 kV. The digitally-driven, green tower manufacturing units at Puducherry, Pithampur and

Kancheepuram have a combined capacity to produce more than 1.5 lakh tonnes of tower components per annum. The Tower Testing and Research station at Kancheepuram is amongst the most renowned testing centres in the world. The clientele for this testing facility includes utilities from 30 different countries.

**The Optic Fibre Cabling (OFC) projects** segment provides turnkey solutions for deploying gigabit scale optical fibre backbone for both Government agencies and private telecoms by establishing a state-of-the-art network infrastructure typically involving a vast geographic spread. The business also provides operation & maintenance support to ensure healthiness of the Optic Fibre Cable by maintaining Mean Time Between Failure (MTBF) and Mean Time To Repair (MTTR) figures as per agreed Service Level Agreements (SLAs).

These business units cater to the Indian market including the neighbouring countries of Bangladesh and Nepal.

**Renewables** business unit provides single-point EPC turnkey solutions for Solar Photo Voltaic (PV) related projects including energy storage solutions and microgrids, in India and abroad. With more than a decade of experience in solar, the business has a strong track record of ground-mounted and floating solar projects with different module technologies, module mounting structures and storage types. It has accumulated vast engineering and construction know-how to execute Gigawatt (GW) scale solar projects, be it



400/220/132/11 kV Mawana Substation, Botswana

hybrid, floating or linear, with best suited technologies for terrain type and tracking. The in-house Battery Energy Storage System containerisation facility augments the capabilities to offer large-scale renewable integration solutions as grid stability and power conditioning requirements gain significance.

**The international units** of the business in the Middle East, Africa and the ASEAN region offer complete solutions in the field of power transmission and distribution up to 500 kV level. These include substations, power transmission lines, EHV cabling, distribution networks, solar plants and Electrical, Instrumentation and Controls (EI&C) works for infrastructure projects such as airports, oil & gas industries, etc.

The Middle East business unit that caters to the countries of the UAE, Saudi Arabia, Qatar, Oman, Kuwait and Bahrain has garnered a coveted place in the GCC region. With about three decades of presence in the region, it enjoys an enviable track record having achieved many milestones.

Having commissioned several landmark projects, the Africa business unit has established itself in 12 countries across the continent. The four regional offices located in Egypt, Kenya, South Africa and Ghana cater to the different regions of the vast continent. With a sizeable market share in the addressable segment and projects from all the business lines within the spectrum, the

business is now poised to make further inroads in southern and western parts of Africa.

In the ASEAN region, buoyed by the proven track record of successful project execution in Malaysia and Thailand, the business is consolidating its gains in Myanmar and Philippines as well, besides achieving deeper penetration in existing regions.

Larsen & Toubro Saudi Arabia LLC (LTSA), a wholly owned subsidiary, provides engineering, construction and contracting services in the sphere of transmission & distribution in the Kingdom of Saudi Arabia.

### Business Environment

In the domestic transmission & distribution space, projects from the centrally sponsored schemes were scarce, as the priority of Government spend shifted to healthcare in the pandemic year. The majority of the multi-lateral funding projects have been deferred to the next financial year. After a lull, the order finalisation in Green Energy Corridor related Tariff Based Competitive Bidding (TBCB) packages commenced.

Certain state distribution companies finalised underground cabling and High Voltage Distribution System (HVDS) packages that are aimed at grid modernisation and improving reliability and availability of power supply. The pace of finalisation of tunnel electrification packages for a project of national importance was noteworthy.



500 kV HVDC Transmission Line, Kenya

On the domestic Renewables front, solar capacity addition remained below 3 GW in the face of the pandemic and the uncertainty in module prices. However, the traditional power generation companies are seen adding renewable capacities in their portfolio, which lead to finalisation of solar Engineering, Procurement and Construction (EPC) packages especially in Gujarat.

Being a fast-growing economy in the region, Bangladesh has embarked on the alleviation of infrastructure deficiencies and upgradation of its power system to sustain growth. To cater to the power demand in emerging load centres and the Greater Dhaka region, several projects are planned to include construction of the country's first nuclear power plant. This provided a slew of Transmission Line opportunities in Bangladesh. Nepal also augmented its power transmission network with gas and air insulated substations.

Already constrained by lower oil prices, the Middle East economies had limited avenues for growth in the face of the pandemic. Travel restrictions, quarantine requirements, supply chain disruptions, etc. affected the initial months of the financial year. However, Saudi Arabia's ambitious National Renewable Energy Programme provided impetus for international solar orders. In Qatar, due to the expansion of the 400 kV electricity network, grid elements such as series reactors were necessitated to improve grid stability.

Vital substation and transmission line packages were finalised in other countries as well.

Several countries in Africa opted for the Debt Service Suspension Initiative of G20 countries facilitated by the World Bank Group. The finalisation of bilateral / multilateral funded projects remained muted. In view of the renewable generation capacity being added, Morocco has launched a slew of projects to expand its power transmission network. The business is well poised to achieve a breakthrough in West Africa and quickly expand its presence in the region. In the ASEAN region, Thailand remained comparatively unaffected especially with regard to execution progress.

FY 2020-21 was a challenging year for Supply Chain Management. The Covid-19 pandemic brought in a global disruption of supplies and logistics, to begin with, and moved on to a high volatility and scarcity of raw material, restriction of imports and delayed award of contracts by clients. At the same time, the business quickly adapted to the 'new normal' through various mitigative actions to re-stabilise the chain and achieve significant savings through re-negotiation of existing contracts.

Several orders materialised in the last quarter of an otherwise difficult financial year that witnessed Covid-19 related lockdowns, adverse commodity price movements and customer-end delays in order finalisation.



500 kV Bang Saphan 2 to Surat Thani 2 Transmission Line, Thailand

## Major Achievements

### Key Orders Won

- 4 major transmission line packages in Bangladesh
- Substation order in Nepal
- 1.5 GW solar PV project in Saudi Arabia – the largest overseas order for the business
- 380 kV Transmission lines in Saudi Arabia
- Unique series reactor package in Qatar
- 132 kV Substations in Dubai
- 400 kV Transmission line in Oman
- 500 kV Transmission line in Peninsular Malaysia
- 400 kV SS & TL for Telangana TRANSCO
- Tunnel electrification packages for Udampur Sri Nagar Baramulla Railway Link
- High voltage distribution system and cabling packages in West Bengal
- 400+MW Solar EPC orders in Gujarat

### Projects completed and commissioned

- 400 kV Gas insulated substations at Lahal, Guindy, Mylasandra and Papankalan

- 230 kV Substations at Ranchi, Chennai and Ratangarh
- 132 kV Receiving substation & 132 kV cabling for Dhaka Metro
- Power distribution packages in Uttar Pradesh, West Bengal and New Delhi
- Packages associated with 800 kV Raigarh – Pugalur HVDC transmission line
- 765 kV Ghatampur Agra – Greater Noida transmission line
- 765 kV Ranchi – Medinipur transmission line
- 23 substations and 72 km of overhead / underground transmission corridor in the Middle East
- One of the biggest 400 kV substations and one of the longest 400 kV transmission lines in Botswana
- Substations and transmission lines in Egypt, Ethiopia and Morocco
- 500 kV Surat Thani – Bang Saphan transmission line in Thailand

### Awards and Recognitions

The business won laurels for its technological and execution prowess. The power transmission & distribution projects in KSA and UAE bagged four Middle East Economic Digest



India's first large-scale solar PV project of 2 x 10 MW with 16 MW / 8 MWh battery energy storage system in the Andamans

(MEED) awards in different categories. The 400/132 kV Al Qabel project earned L&T the Dossier Award for the Best Contractor for Infrastructure Projects.

The transmission line tower manufacturing facility at Kancheepuram won the DL Shah Quality Award, the Quality System Excellence Award from FICCI and the EHS Excellence Award from CII Southern Region. The transmission line tower factory at Pithampur won the Golden Peacock Award for Occupational Health & Safety performance.

Also, 11 projects emerged as winners, each for National Safety Council of India Awards 2020 and British Safety Council International Awards 2021. Several overseas projects won awards from American Society of Safety Professionals (ASSP) and Royal Society for the Prevention of Accidents (RoSPA) under various categories.

### Significant Initiatives

As the electricity system gets increasingly decentralised, decarbonised and digitalised, a specialised team of top-notch experts has been created to develop and deliver smart digital solutions worldwide, leveraging the engineering know-how and integration abilities.

The first international battery energy storage system order secured in Thailand has achieved substantial progress. The 52 MWh system is meant to provide grid stability in a region with a large, inherently intermittent renewable generation.

A special thrust was given on Stakeholder Connect, a drive through which the supply chain team reached out to different levels of vendors to deliberate on challenges and mitigation measures.

### Digitalisation

A digitally integrated project management ecosystem has been created to enable timely completion of projects. It encompasses, integrates and enables sophisticated analytics of all the processes in the project lifecycle, right from prospecting to post-completion obligations. The predictive abilities of the platform equip the team with the requisite tools and analytics to create optimised plans initially and during the course of the project.

Significant process changes and digital initiatives were adopted in the supply chain front to reduce process time and to improve price discovery.

The experience gained in applying Building Information Modelling (BIM) for substation projects to advanced refinement Levels of Development (LOD) has provided an edge to the engineering capabilities. Aerial LiDAR survey techniques, usage of drones, user-friendly incident-reporting systems and deployment of smart glasses, mobility devices, etc. have yielded tangible benefits. Virtual collaboration tools came in handy during remote design review, inspection, installation supervision and testing processes and have now become the norm.



110 MWp NLC Project, Tamil Nadu

## Environment, Health and Safety

The implementation of 'Vision Zero Harm' related initiatives and enforcing of appropriate SOPs were pursued with vigour and enthusiastic participation. Helmets with in-built Bluetooth devices were deployed to improve communication amongst workmen engaged in height work. The analytics generated through the improvised SHEILD application were helpful in identifying root causes and associated behaviours, thereby enabling implementation of suitable interventions. Various digital and technical initiatives such as One Time Password-based approval for shutdown works, deployment of safety kiosks and biometric access for forklift operation in factories were implemented. More than 2.75 lakh manhours of training were provided to staff and workmen to enable them to imbibe the safety culture. These helped the business earn many awards, as described in a preceding section, and appreciation certificates from customers.

## Human Resources

HR played a key part in keeping employees engaged to overcome the emotional challenges during the pandemic. It included creating awareness among employees for preventive health care. The constant interaction and the leadership communication forums ensured that there was absolute clarity and connect across the organisation. The well laid-down set of safety and health protocols ensured the well-being of employees and their families and earned the employees' trust in adapting to the dynamic work conditions.

A major step in this direction of engagement was a range of virtual learning activities and digitally collaborated tools. Several learning opportunities and knowledge-sharing sessions were provided for upgradation of skills.

While the business continued to explore new geographies and new businesses for growth, the workforce was shaped to fit the new roles that were emerging through robust processes of performance management, succession planning and internal career movement efforts. As part of employee development and talent build-up, the business continues to create a talent pipeline across the levels through bespoke development programmes and coaching.

A framework named 'REACH' has been rolled out, with year-long activities that are designed to elevate the employee engagement experience.

## Risks and Concerns

Mature stage gate and escalation mechanisms were helpful in treading through the challenging times. Advocacy efforts were made to obtain contractual relief from customers for pandemic-induced delays in terms of time and cost, reduction of bank guarantee exposure to ease liquidity, etc. Being countries with considerable business prospects, the volatile political environment in Myanmar and parts of Ethiopia are under watch.

A number of physical and virtual workshops were conducted across the business to promote a strong risk awareness-led entrepreneurial culture.



*Al Daayen 2 GIS, Qatar*



*Haliba, Containerised Substation*

## Outlook

After a year that witnessed shrinkage of substation prospects as projects got deferred, the next fiscal year looks promising, with grid strengthening by key states, specific GEC-II related substations, metro receiving stations and multilateral-funded gas insulated substations in neighbouring countries.

Transmission line construction is expected to see continued levels of substantial activity with finalisation of orders pertaining to already-approved schemes, grid expansion by states and neighbouring countries.

As the priority of central funding shifted to other sectors, the distribution sector has not been so upbeat in the recent months with DISCOMs relying on multilateral funding for the projects. The reforms-based result-linked distribution scheme announced in the Budget should give the much-needed impetus, and election-bound states may augment infrastructure with UG cabling, feeder segregation, HVDS, etc., in addition to metering. The fallout of proposed privatisation of DISCOMs and the preference for OPEX models are the factors to watch for. The focus will shift from electricity access and connectivity to power quality and reliability.

With the renewed thrust on broadband access to villages and digital communications, FY 2021-22 may see finalisation of delayed Bharatnet tenders and increased fiberisation.

Despite the longer durations taken for bid evaluation, several substation and transmission line opportunities are expected to fructify in Malaysia, Thailand and Philippines. With the strengthening of the local team, Indonesian breakthrough is expected to help significant scaling up of activities in the ASEAN region.

Though the pandemic has reduced the borrowing capacities of low-income African countries, a substantial amount of funding has been already committed in the region, and several projects are under various stages of bidding. Despite heavy competition, the business has been able to garner a significant share in the countries in which it is present and has opened up in a few more countries. In the post-pandemic scenario, the multilateral funding is expected to surge, which bodes well with the growth ambition.

As vaccination levels increase and further prospects of oil prices going lower diminish, the situation in the Middle East is expected to ease. Massive developmental projects in KSA, residential projects in Kuwait, transmission network expansion in Oman, the end of the blockade in Qatar, etc. may harbour positive developments while budget deficits and preference for locals may pose some challenges.

8-15 GW of solar capacity may get added in the next year in India with a perceivable shift towards hybrid projects. The evacuation infrastructure seems to be commensurate with capacity-addition plans, which is a positive factor. The volatility in module prices, insistence on domestically manufactured content and the imposition of BCD (Basic Customs Duty) etc., may pose challenges.



*Bansujara Irrigation Scheme, Madhya Pradesh*

The renewable capacity addition plans in the Middle East, led by KSA, will receive a further boost with growing interests in green hydrogen. African countries, such as Egypt, Morocco and Ethiopia, have plans for large utility-scale solar plants. Coupled with visible prospects in SAARC countries and the ASEAN region, the overseas Renewables business is set to gain significant momentum in the budget year.

The nebulous nature of localised lockdowns due to the recurring Covid-19 waves has now become the ‘new normal’.

With the business outlook remaining largely favourable, the business expects an accelerated recovery to pre-pandemic levels of growth aspirations. The business continues to enable the highest standards of reliability, availability and efficiency of power transmission and distribution networks and provides a green technology path to clean energy transition in India and abroad.

## ■ WATER & EFFLUENT TREATMENT

### Overview:

L&T's Water & Effluent Treatment business is engaged in building comprehensive water management infrastructure with capabilities covering engineering and design, procurement, construction, operation & maintenance, and caters to the entire business

value chain. The business has a proven track record of executing a multitude of projects in the areas of water supply, water transmission and distribution, water treatment, desalination, municipal and industrial wastewater network, wastewater treatment, integrated urban utilities, irrigation, canal rehabilitation, riverfront development, etc.

Recently, the Water & Effluent Treatment business re-organised its business lines to reflect the changing trends and be more agile towards future opportunities. The business has been verticalised into three units – (i) Water & Wastewater; (ii) Industrial, Irrigation & Infrastructure; (iii) Water International.

The Water & Wastewater vertical comprises Rural Water Supply, Urban Water Supply, Water Management and Wastewater Treatment. Thus, it deals with the complete value chain of water & wastewater solutions for domestic consumers.

The Irrigation, Industrial & Infrastructure vertical constitutes Mega & Micro Irrigation, Industrial Water Systems & Effluent Treatment, Desalination and Smart Water Infrastructure, helping to focus and increase its business footprint in the domestic market.

The Water International vertical focuses on the international markets and will continue to tap business opportunities in the regions of Middle East, East Africa, ASEAN and SAARC.



*Mukkambu Upper Anaicut Project, Tamil Nadu*

## Business Environment

The water infrastructure market in India is on an upward trajectory with a sustained focus on bridging the demand-supply mismatch in rural and urban areas. Urban agglomerations necessitate the establishment of smart and future-ready water and wastewater infrastructure to boost the overall quality of life. Rapid population growth and erratic and unpredictable monsoons have necessitated manifold irrigation schemes to expand the total area under cultivation in the country. There is also a considerable thrust on industrial treatment and desalination projects, which bodes well for the business.

The UN Sustainable Development Goal to provide clean water and sanitation is driving investments in Africa and ASEAN Markets. The water demand in the Middle East is expected to grow significantly and the business foresees significant spending in the areas of wastewater treatment and desalination.

The Water sector is seeing increasing thrust from the government and new competitors are emerging to capture this market. The business sees a wide variety of competition from global technology giants, India-based EPC players and local state-specific contractors as well. The business, through its cost leadership, excellent track record and financial capabilities has been able to thrive against this stiff competition. Further, the business remains a market leader in India, with a presence across all the major states and enjoys a market share of more than 30%. The business

also has a strong presence in the international market, with projects in Qatar, Oman, UAE, Tanzania and Sri Lanka.

The Covid-19 pandemic has impacted the Government finances, with diversion of spending towards Covid-19 related relief work as well as social support. This had a serious impact on capex spending for new projects and led to delays in order finalisation. On the execution front, though some disruptions were experienced in initial phase, the activities picked up at sites as normalcy returned. The business ensured uninterrupted operations of projects under O&M even during lockdown by continuously supplying potable water, treating wastewater, and irrigating farmlands, thereby benefitting 30 million people.

## Major Achievements

### Major Orders Secured

- Multi-village water supply schemes to various districts in Madhya Pradesh
- Piped water supply schemes to various districts in Uttar Pradesh
- Upgradation of sewerage treatment plant for Chandigarh Smart City
- 24 x 7 Drinking water supply project at Patiala, Punjab
- Slurry pipeline project, Chhattisgarh



Water carrier system, Kanpur, Uttar Pradesh

- Sauni Yojana Irrigation Scheme, Gujarat
- Bargarh Canal Project, Odisha
- Integrated project for development of Maharajbada, Gwalior, Madhya Pradesh
- Industrial area effluent treatment plant, Qatar

### Projects Commissioned

In the year FY 2020-21, 30+ projects were completed. Some of the key projects commissioned are:

- Lift canal system of Upper Indravati Irrigation Project, Odisha
- Erode water supply scheme, Tamil Nadu
- Kadana and Kakrapar Irrigation Schemes, Gujarat
- 40 MLD STP at Rourkerla, Odisha
- Tabora Water Supply Scheme, Tanzania

### Awards

During the year, the business bagged a slew of prestigious awards from industrial forums across the world. Key awards and accolades received include:

- The coveted AEC Excellence Award from Autodesk for an advanced water treatment plant at Chandrawal, Delhi

- 15 Awards from Construction Industry Development Council under the categories of Corona Warriors and EHS Implementation
- 12 Awards from British Safety Council and 11 CII Awards for Safety, Health and Environment
- 10 Water Digest Awards including Best Water Company and Best Complete Domestic Water Solutions provider

### Patents

In a constant endeavour towards achieving self-sufficiency in treatment processes and transforming into a 'Technology Driven EPC', the business has developed, incubated and patented a new technology for domestic wastewater treatment with a competitive edge over other existing technologies.

### Significant Initiatives

#### Digitalisation & Productivity Improvement

The business has been a forerunner in digitalisation and digital interventions have been implemented across the entire business value chain. Some of the key solutions are:

- ViewEHS, a patented app for centralised reporting, documentation, and performance measurement system for EHS Management System
- Quality Incident Reporting (QIR), a mobile application to raise observations for quality defects and to escalate the observation, when required



*Moga Water Supply Scheme Project, Punjab*

- Smart glass to visually monitor real-time progress of projects
- Advanced data analytics for labour productivity benchmarking and improvement

In addition, the business is also working on developing new digital solutions based on the latest technologies, such as artificial intelligence and machine learning for cognitive search, image analytics, robotics, etc.

### Environment, Health and Safety

Some of the key EHS highlights for the business are:

- Achieved 117 million safe man-hours for the year
- 600+ Virtual EHS audits conducted to monitor EHS implementation across project sites
- Proactive risk mitigation through patented ViewEHS app for centralised reporting, documentation and EHS performance measurement
- 0.56 million man-hours spent on training staff and workmen at project sites. Training modules are tailor-made project-wise for identified hazards that could lead to major incidents
- Development of ATL (Any Time Learning) Modules on ISO 45001:2018 and ISO 14001:2015 Standards for designing and implementing safe, healthy and environmentally friendly workplaces across offices and sites

- EHS Climate Survey to evaluate the maturity level of the EHS culture in the organisation

### Sustainability Initiatives

- The business works with local communities, NGOs, schools and colleges to increase green cover and spread awareness about the environment. Over 7 Lakh saplings were planted across the country during the year
- Go Green campaign conducted across project sites to encourage reuse and recycle of waste materials. 12,000 MT of waste was recycled so far
- 'Ulta Chatha' initiative was curated to facilitate ground water recharge by rainwater harvesting in all project sites
- Solar panels were installed across project sites to reduce dependence on non-renewable energy sources

### Human Resources

Catering to employee needs, aspirations and their well-being is a philosophy deeply enshrined in the business. Learning & Development, employee engagement, excellence through innovation and continuous improvement have been the major areas of focus. The key initiatives undertaken during the financial year are:



*Dedicated Water Supply Project for Erode Corporation, Tamil Nadu*

- Thrust on leadership development, competency development and succession planning with focused competency development programmes, coaching programmes and capability building courses
- Employee Recognition Programmes, such as PRAISE and RAVE, to spark the innovative spirit of our employees and ensure continued excellence at work
- Development Week 2020: A unique learning initiative to create awareness about the training and development offerings available for all the employees to upskill themselves
- Learner's Corner: An internal website which serves as an easy-to-access and user-friendly platform to host Learning & Development offerings
- 'WET IC Radio': A new medium of internal communication with employees using podcasts
- The constrained finances led to delays in payment for ongoing projects. To mitigate this, client-wise project exposure is monitored periodically, and project activities are carried out based on the client's fund availability to avoid increasing the working capital.
- As water projects are labour-intensive, the availability of workmen plays a major role in the progress of the projects. The Covid-19 crisis saw a large-scale workmen exodus leading to a shortage of manpower and an increase in labour costs. New ways of working with social distancing norms also impacted labour productivity. The business is focusing on attracting and retaining high-skilled workmen. Initiatives like automation and mechanisation are being implemented to enhance productivity and reduce dependency on labour.
- Projects of the business are linear in nature and they involve extensive approval for ROW/ROU as well as land acquisition. The business engages a strong IR/Admin team to ensure all approvals are taken well in advance. Any delays on account of external factors are also properly documented and appropriate EOTs/cost claims are filed with the clients.
- Raw materials like pipes, valves, fittings, etc. form a major portion of the project costs and volatility in commodity prices has an impact on the margins. To hedge this risk, the business also enters into strategic tie-ups with vendors.

## Risks and Concerns

The business has a robust risk management process where upcoming tenders and ongoing projects are analysed periodically by the Risk Management Committee to ascertain the various risks and appropriate mitigation measures.

- The business is focused on increasing the share of projects from multi-lateral funding agencies.



Blast furnace, JSW, Dolvi, Maharashtra

## Outlook

The water sector possesses tremendous potential on the back of a large unserved population, rapid urbanisation, industrialisation, and climate change. There is a growing shortage of freshwater resources, and recycle and reuse, water management, desalination, efficient irrigation technologies are gaining traction as means of addressing this shortage.

The Government of India, under the Jal Jeevan Mission, has set a target to provide piped water supply to every rural household by 2024. The Government has allocated ₹ 50,000 crore in the union budget of FY 2021-22 with an expected outlay of ₹ 3,60,000 crore till 2024. Under the Jal Jeevan Mission (Urban), the government plans to treat 100% sewage in 500 cities and meet 20% of the total water demand and 40% of industrial non-potable demand through recycle and reuse of wastewater. The National Infrastructure Pipeline (NIP) expects to create an additional irrigation potential of 170 Lakh hectares. The Government is also focussing on desalination as an alternative source of water supply for domestic and industrial use. The Government's focus on building India as an alternative manufacturing hub leads to opportunities in the areas of industrial effluent treatment and smart water infrastructure businesses. In addition, the Government is also focusing on the creation of new smart cities, industrial parks, defence corridors, bulk drug parks, textile parks etc., which augurs well for the business.

## METALLURGICAL AND MATERIAL HANDLING

### Overview:

L&T's Metallurgical and Material Handling business offers complete EPC solutions for the Mining, Minerals & Metals sectors across the globe. The business undertakes end-to-end engineering, procurement, manufacture, supply, construction, erection and commissioning of the projects covering the complete spectrum – from mineral processing to finished metals.

The business also has a Product Business Unit offering comprehensive product solutions, including customised mineral crushing equipment for the cement and coal sectors, surface miners for blast-free eco- friendly open cast mining, advanced sand manufacturing plants which can replace usage of river sand, material handling equipment (stackers, reclaimers, ship unloaders, multipurpose cranes and other mining equipment), steel plant machinery and other custom-made equipment and critical fabricated structures (such as bridges, reformer modules & complex assemblies involving heavy fabrication, precision machining and critical assembly & testing) catering to core industrial sectors, including cement plants, the mining sector, power plants, the construction industry, steel plants, fertilisers and chemical plants, etc.



Coke dry quenching plant at JSW, Dolvi, Maharashtra

The complete range of product solutions is backed by 5 decades of experience and knowledge, in-house design resources, state-of-the-art manufacturing capabilities and providing cost-effective and value-added after-sales product support. The manufacturing centres of the Product BU are in Kansbahal, Odisha and Kancheepuram, Tamil Nadu.

## Business Environment

### Domestic Projects – M&M BU

As the pandemic-related restrictions were gradually withdrawn from Q2 FY2020-21 onwards, both metal demand and production picked up in the domestic market. Buoyed by global demand (more specifically from China) metal prices started improving from Q2 FY2020-21 onwards and continued in Q4 FY2020-21. Post the consolidation in the steel industry, capacity addition of 34 million tonnes is expected in the next 4 years. With the committed investments by the Govt in infrastructure development coupled with the rally in the prices of steel, major steel manufacturers have announced expansion plans. Backed by more than 2 decades of experience in providing large EPC packages in steel plants, the business is poised to capture the market opportunities.

The non-ferrous industries are in expansion mode with the sustainable rally in base metal prices due to increased consumption by the downstream industries, and have planned additions of 0.4 MTPA in copper, 3 MTPA in

alumina refinery, 1.5 MTPA in aluminium and 0.3 MTPA in zinc and lead manufacturing in India.

### International Projects – MENA BU

The Mining and Metallurgical sector is emerging as a frontrunner in the economic diversification of the GCC from oil dependency. All GCC countries are boosting their mining sectors with strategic long-term plans to exploit the untapped mineral deposits.

The Kingdom of Saudi Arabia (KSA), in particular, has been aggressively pursuing reforms and changes in legislature to facilitate foreign and private investments in the mining sector. The mining sector has been earmarked to become the third pillar of the Saudi Arabian industry after oil and petrochemicals, with the establishment of a Mining Fund to provide sustainable finance for the sector.

The aluminium, copper and gold industries are likely to present new investment opportunities, especially in the KSA and UAE.

The GCC member countries' vision to be net exporter of value-added products by 2030 is expected to provide opportunities in the development of the downstream metal industry.

### Product BU

The core products (such as crushers, surface miners, sand plants and bulk material handling equipment) growth are primarily driven by the following industrial sectors:



Stacker-Reclaimer

**Cement Sector:** Cement production witnessed a negative growth and had a steep fall during first 2 quarters of FY 2020-21, mainly due to the Covid-19 pandemic. In the first 3 quarters of FY 2020-21, cement production reported 209 MTPA, and recovered on a positive note in the last quarter and expected to reach 353 MTPA.

Major cement producers embarked on their expansion plans. Being fast-track expansions, some of the finalisations for crushing plants were completed favourably in March 2021 itself and more are expected to follow. L&T's 'Limestone, Coal and Additive/Corrective Crushing Solutions' supplied by the Metallurgical and Material Handling Product BU continue to be the preferred choice for the Indian cement industry and has a market share of more than 90%.

**Mining Sector:** The continued augmentation of capacities in coal and iron ore has increased business potential for mineral beneficiation and processing industries, coupled with mechanised evacuation systems from mine to rail to plant, offers business opportunities for the business to provide EPC solutions and has also increased requirements for its equipment range covering surface miners and skid-mounted coal-crushers, stacker-reclaimers, wagon tipplers, plough feeders, etc.

**Construction:** The sand plant business largely depends upon the real estate and infrastructure market, which is showing revival from Q3 FY2020-21 onwards. Further,

traction is also seen in Tier III cities, especially for advanced sand manufacturing plants.

The Government has announced various road projects across India in Q4 FY2020-21 to boost the infrastructure economy. A surge in demand for sand air classifiers is expected in FY 2021-22.

### Major Achievements

With increased demand and growth in domestic industrial sectors, the business has received some prestigious orders:

- 5 MTPA blast furnace and steel melt shop projects for JSW Steel, Bellary
- 3 MTPA Alumina Refinery project for Vedanta at Lanjigarh
- In-house design, development and manufacturing of launching girder for high-speed railway project

Marquee projects commissioned / at an advanced stage of completion in FY 2020-21 are:

- Slab caster, Bokaro Steel Plant – first slab casted
- Coke oven project, JSW Steel, Dolvi – Completion of first coke push of Battery D
- Blast furnace, JSW Steel, Dolvi – Commencement of stove heating up



*Coal-handling plant at Khargone, Madhya Pradesh*

- SK Mines PH III – Commissioning of Phase III graphite package
- 12 Surface miners commissioned across India for various clients

### Significant Initiatives

The business has formed strategic alliances with leading global technologists to offer comprehensive EPC solutions across various sectors of mineral beneficiation, steel processing units and various by-product plants of mega size. Technical collaboration has been strengthened with Kemco, Japan for the addition of new products for the construction industry.

The business has embarked on significant modularised and mechanised construction approaches to improve efficiency and the speed of delivery.

### Digitalisation

The systemic implementation of the EPC 4.0 initiative for digitising and integrating all processes across the spectrum was undertaken. Increased 3D engineering capability, coupled with Building Information Modelling (BIM) implementation, Smart EDMS for effective project, communication and document management, construction automation / mechanisation are being implemented across major projects. In addition, ongoing digital solutions are stabilised, such as IoT, WISA, AR/VR for EHS, Image Analytics, Rigging App, etc.

The business has implemented Design Automation and the AI-enabled engineering approach with continuous improvement on various processes in its domain area.

### Environment, Health and Safety

There is continued commitment from leadership and management at all locations and levels for improvement in the EHS processes and their implementation. EHS roadmaps were launched based on organisation-wide policies. To combat the Covid-19 pandemic at sites and offices, proactive initiatives were taken, such as strict implementation of SOPs, adequate quarantine / isolation rooms, recording attendance through facial recognition, and webinars/training programmes for resumption of work post-lockdown.

Increased implementation of digital technologies helps to regulate safe working conditions. Various digital tools include Virtual Reality (VR) based training modules for 'Safe Material Handling' and the IB4U app for tracking the inspection of various equipment and PPE, EHS Training integrated through the WISA app and Chatbot for health monitoring.

3700+ EHS Training Programmes were conducted during the year, covering 0.43 million training man-hours. Various projects and factories received 7 RoSPA Health & Safety awards during the year.



Raw Water Storage Tank for MENA, Maaden Gold Project, Kingdom of Saudi Arabia

Environmental initiatives undertaken are as under:

- Recycled plastic plywood extensively deployed along with plastic formwork to reduce the dependence on natural hardwood or treated plywood
- Dust-suppression through bio-based solution implemented at a project site
- Occupancy sensors at office buildings (EWL facility) to optimise power consumption
- Usage of spillage tray implemented at several project sites

## Human Resources

Focus was laid on creating a robust talent pipeline by identifying future and potential leaders. The impetus was on all-round development of business leaders by providing challenging opportunities, job rotation, active handholding, and mentoring / grooming by senior leaders. Across the cadres, key high-potential talent is identified right from 'Talent in Cradle' for staff in S&E Band to 'Leaders on the Go' for senior Tier 3 staff. Leaders for senior key positions are identified as part of succession planning. A host of specific competency-based programmes are organised to shape and fine-tune their leadership skills.

During the lockdown period, the business continued with talent acquisition activities through virtual mode, right from interviewing until onboarding. For the first time, onboarding

and orientation of GET/PGETs was successfully executed using the digital platform. Learning & Development went totally virtual during the lockdown, in view of all SOPs / Covid protocols.

A wide range of technical and behavioural programmes were conducted, ranging from Data Analytics, Construction 4.0, Smart EDMS system, Primavera, Aveva, Building Agile Teams, Creativity & Innovation, Analytical Thinking and Situational Leadership. ATL Next has also played an important role in meeting the training needs of staff members, being an effective virtual mode of imparting training.

During the lockdown, initiatives focused around 'Wellness' of the staff as well as their availability for business through 'Work from Home'. Flexi-time was introduced to make it easy for staff to attend office. Dedicated medical support, doctor on call, counselling sessions through TISS and Covid-19 SPOC across the locations were key interventions to maintain staff health and morale. At sites, as per the SOP, arrangements were made for stay, food and site commute to ensure staff availability and wellness.

A series of Town Hall Leadership Speak sessions for the business, Call to Staff and Joy @ WFH established effective communication channels for clarity amongst staff on the way forward during such challenging times.



*KSM-304C Surface Miner*

### **Risks and Concerns**

With the resurgence of Covid-19, uncertainty of availability of the work force and disruptions in the supply chain may have adverse effects on the projects under execution. However, strategies to overcome these difficulties are being put in place to minimise the impact, and customers are taken into confidence.

### **Outlook**

Market sentiments remaining positive with strong demand, commodity price forecasts remaining bullish in the near

term and metal producers recording unprecedented margins are solid impetus towards the new capex cycle.

The GCC economy is returning to pre-Covid levels, with massive vaccination drives by local Governments, enabling quicker recovery.

With the resumption of normalcy post the Covid-19 outbreak and with expected growth pick-up in the infrastructure, coal and cement sectors, all core products are expected to grow in the next year.