

# Global, yet local

Punj Lloyd has strongly held its ground by maximising its resources with efficient project management and strong execution contributing to its strong portfolio.



**A** global EPC player with an annual turnover of \$2.13-billion, Punj Lloyd provides services in Energy and Infrastructure along with engineering and manufacturing capabilities in the Defence sector. The Group comprises three brands - Punj Lloyd, PL Engineering (both head-

quartered in India), and Sembawang Engineers & Constructors, based in Singapore. The Punj Lloyd Group has a global presence and operates from 21 offices across Middle East, the Caspian, Asia-Pacific, Africa, South Asia, China and Europe.

Several factors have contributed to the Group's success, the most impor-

tant being its people. Punj Lloyd has a dynamic multicultural workforce of around 31,000, who have experience of working in different geographies and diverse terrain, with the advantage of being global yet local.

Varied project experience in global markets, rich knowledge of local conditions, high standards of health, safe-



ty, quality and environment, accolades and recognitions from industry bodies and clients, ability to manage operations in diverse industries and economies, long-term relationships with world renowned clients and ability to mobilise financial resources are some of the factors that have immensely helped the company in becoming one of the global leaders in EPC.

## The World of Construction

Ironically, the construction industry, which is known to be the second largest industry in the country, faces major challenges. Many Indian construction companies face high interest rates, cost over runs, problems in land acquisitions, environmental clearances, policy ambiguity and administrative delays by sector specific nodal agencies. However, several new mega-projects are clear indicators that the industry is poised for a bright future.

Punj Lloyd has strongly held its ground by maximising its resources with efficient project management and strong execution contributing to its strong portfolio. In financial year 2012-2013, the Group bagged a range of projects including EPC of Qatar's first polysilicon plant from Qatar Solar technologies, Qatar; Drilling Contract in Gabon, Libya; Electro-mechanical onshore erection work, Malaysia; Construction of integrated residential and retail complex - Capitol Heights, by Tata Reality and Infrastructure Limited, Maharashtra; and, Main Plant Air-Conditioning and Ventilation Package for Rajasthan Atomic Power

Project, Rajasthan.

Also, Punj Lloyd's overseas arm, Sembawang Engineers and Constructors Pte. Ltd., bagged a project from Housing and Development Board of Singapore to build McNair Towers - a cluster of four residential blocks and construction of new Prison Headquarters for Changi Prison Complex. Besides, Punj Lloyd is also currently involved in building metro stations for Bangalore Metro Rail Corporation.

## New Prospects

After the success of the Delhi Metro, where Punj Lloyd constructed an elevated viaduct with four stations on the Inderlok-Mundka corridor, and the stretch between Kirtinagar-Tilaknagar, the company is now building eight metro stations for Bangalore Metro Rail Corporation Limited (BMRC). It is a joint venture of the Government of India and Government of Karnataka, where BMRC has been entrusted with the responsibility of implementation of the Bangalore Metro Rail project.

The Bangalore Metro project, popularly called 'Namma Metro', will contribute immensely to realign the traffic situation and provide seamless travel in the metropolis. It adds beauty to Bangalore's skyline and significantly contributes in reducing carbon emission and also provides comfort while travelling. The metro is a complementary mode of transport, running in tandem with the public transport system.

Feeder bus services will be provided to all the metro stations, bus bays

and parking facilities for private vehicles will be available at all major stations. Moreover, the Bangalore Metro will be integrated with the railways and other modes of transport at Baiyappanahalli railway station in the East, Yeshwantpur railway station in the North, Bangalore city railway station and Kempegowda bus stand in city centre.

The first stretch of the Namma Metro, between Baiyappanahalli and M G Road, was launched in October 2011.

The metro line snakes its way through the bustling commercial and residential areas of Bangalore. The sleek Bangalore Metro promises the commuter rapid connectivity, convenience, affordability, frequency, reliability and safety. This is the first metro rail project in India commissioned with 750V DC Third Rail on Standard Gauge.

Phase I of Bangalore Metro, consisting of two corridors of double line electrified - The East-West corridor and the North-South corridor - will cover a total of 42.30 km. Implementation of the elevated parts of Phase I has been divided into four 'reaches' and two underground sections connecting Reach-1 and Reach-2 in the East-West Corridor and Reach-3 and Reach-4 in the North-South Corridor respectively.

The East-West corridor, or the Purple Line, is 18.10 km long, starting from Baiyappanahalli and terminating at Mysore Road terminal. The North-

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South corridor, or the Green Line, is 24.20 km long, and will start at Nagasandra and terminate at Puttenahalli.

### Reach-I Glides Smoothly

Reach-I, extending from MG Road to Trinity Circle, was the first to be completed by Punj Lloyd among all contractors and handed over to the client. It was inaugurated in October 2011 and the rest of the six stations are under construction.

One of the most challenging tasks for the project team was to connect MG Road Metro station to Plaza building via a foot over bridge. Due to its location in the heart of the city, it was not possible to close the road to traffic for more than 48 hours. The team expedited the construction of the bridge and erected it in a record 36 hours, 12 hours before the scheduled time.

A total of 3,000 MT of structural steel had to be fabricated and erected at the stations in the form of arch trusses, purlins, staircases, foot over

bridge, etc., where structural work amounted to 73,972m<sup>3</sup> of concrete.

A total of 978 piles had to be bored, varying in diameter from 600 mm to 1,600 mm. 1,377 precast girders were cast at a yard, located 20 km away from the city that served a multipurpose role. The girders were transported from the yard via trailers and erected at site; the highest erection being at a height of 25 m from the ground level. The longest girder measured 19 m and the heaviest, 50 MT.

One of the unique technologies installed by the team was casting of pre-tensioned and post-tensioned girders by pre-stressing technology. Out of the 1,377 girders, 997 were pre-stressed concrete (PSC) girders. One of the distinguishing features of the Bangalore Metro Project was the use of steam curing, wherein steam is continuously supplied and a temperature of 70° C maintained, resulting in concrete attaining 85 percent strength in a single day. With the use of this technology, the cycle time of girder production reduced to two-and-a-half days.

### Best Practices at construction site

Punj Lloyd adopted best practices of HSEQ - health, safety, environment and quality, throughout the project execution. To ensure safety on the road, various signboards were installed. As construction was happening in the midst of the city, it was important to differentiate the work site from the normal public.

Apart from this, Punj Lloyd has always displayed environment sensitivity, minimizing its impact on the environment or offsetting the impact of its construction activity with well planned environment initiatives.

### NAMMA RAIL PROJECT

Punj Lloyd was contracted to build eight metro stations across three reaches.

#### Reach I:

MG Road Station  
Trinity Circle Station

#### Reach II:

Magadi Road Station  
Deepanjali Nagar Station  
Mysore Road Terminal Station

#### Reach III:

Rajajinagar Station  
Malleswaram Station  
Kuvempu Station

