

Press Release

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OLIPHENTA BRIDGE AN ENGINEERING MARVEL BY L&T METRO RAIL (HYDERABAD) LIMITED

“It is a matter of great pride for us to set the benchmarking and pioneering new ideas and construction techniques while implementing mega projects like Hyderabad Metro Rail. LTMRHL team has proved again its mettle and capability in pulling up structures like Oliphenta Bridge.”

M. P. Naidu, Project Director, LTMRHL

“Execution of this work is quite formidable as it involves erection of heavy members at heights, moving the huge girder assembly over heavy road traffic and across railway tracks under traffic block. It calls for discipline, devotion and dedication of very high order from each and every team member to accomplish such an onerous task. The crack team consisting of people from various parts of India and diverse back grounds, worked together and shown what we can achieve, together.”

K. M. Rao, General Manager, RoB, LTMRHL

Oliphenta RoB is the most vital link in the Metro Rail project which connects one side of Secunderabad (East) to the other side of Mettuguda station. The bridge is constructed over 14 railway tracks, including 5 tracks to be used in the future. The span of the bridge is 83 meters with steel girder. This is the first time in the history of Indian Railways that a bridge is being constructed over 14 railway tracks at a very busy Secunderabad railway junction which approximately caters to 200 trains per day. This bridge has been constructed by 20 bridge engineers and 200 bridge staff who have extensive experience in Indian railways, directly and indirectly. Some of the engineers have worked in the Assam-Himalayan range and the Konkan range. Oliphenta bridge is an outstanding example of relentless effort by engineers and staff, working round the clock, with huge support from the top management.

M. Y. Kondalu, Joint General Manager, RoB, LTMRHL

Salient features and challenges in the process of construction of Oliphenta Bridge by L&T Metro Rail (Hyderabad) Limited (LTMRHL) are listed below.

SALIENT FEATURES OF OLIPHENTA RoB

1. Welded Open web steel girder with over all dimensions of length 82.6 m, width 17.3 m and height 10.55 m spanning across 8 existing and 5 future tracks.
2. Width of girder is more as the alignment of Metro is on a steep curve of radius 128 m at this location.
3. Cast-in-situ deck slab on steel girder to provide ballast-less track to control noise.
4. Steel Truss is supported on Hammer head pier having a cantilever of about 10.57m from centre of pier.
5. Steel girder will be 12.768 m above existing Rail Level and 3.8 m above Railway OHE.
6. Weight of steel girder about 1100 MT, made of E 350 grade steel. Bottom & top chords and end rakers are box sections. Cross Girders, stringers, verticals and diagonals are plate girders.
7. **Modern Fasteners for Splicing:** High Strength Friction Grip (HSFG) bolts about 56,000 Nos, grade 10.9 Size M 24 with Direct Tension Indicator (DTI) washers are used for splicing the joints. Proof Load of each Bolt 293 kN.
8. **Modern Bearings for supports:** Spherical Bearings are used for supporting the girder and to accommodate a maximum movement of 90mm on account of temperature variation.
9. **About Launching:** Girder is assembled on top of trestles in assembly area. Front Nosing girder of length 44m and rear nosing girder of 34 m are fixed to the main girder for stability.
10. By means of special pulling arrangement provided on top of pier cap at RP2, the entire assembly of main girder and front & rear launching girders is pulled.
11. The girder is supported on HILLMAN rollers at each trestle location and guided by special guiding rollers to control its direction of movement during launching.
12. The girder is pushed from the rear by means of SPREADER BEAM and high strength steel strands, pulled by special jacks installed at RP2.
13. Launching of girder from RP2 to RP3 will be carried out under Railway Traffic block of 6.5 hours.
14. The total length of launching is about 200 m.
15. Use of high capacity Hydraulic jacks (2 Nos - 100 MT each) and Hillman Rollers (300 MT and 500 MT capacity) for launching operation.
16. Use of latest equipment for correct torqueing of huge number of HSFG bolts.

CHALLENGES IN EXECUTION OF RoB OLIPHENTA:

1. According to a highly accomplished Railway Engineer, this could be the first time a girder of this size is being assembled on trestles at a height of about 20m and launched over a distance of 200m. In normal Railway construction, steel girders are assembled on approach banks or launched member by member by cantilevering across river. This is not feasible because of constraints of space and running Railway traffic below.
2. Non availability of adequate space for storage and assembly of girder is the main constraint: About 3,410 sqm of Railway land is taken on temporary lease at a cost of about Rs 1 Crore.
3. Assembling girder to tight tolerances and tightening of bolts at a height of 20m: Highly skilled personnel capable working such heights specially selected for this job.
4. Manoeuvring high capacity cranes within a highly restricted space for erection of each member.
5. Use of heavy steel trestles to support the girder during camber check and launching.
6. Launching across a very important junction in the city with heavy road traffic at all times.
7. Launching across Railway tracks right at the entry of Secunderabad station which operates a number of trains in a limited period.
8. Use of long front and rear nosing girders as counterweight of main girder during launching. These shall be dismantled immediately after launching.
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HMR Oliphenta RoB – Transforming the landscape of Secunderabad



A snapshot of HMR Oliphenta RoB



HMR Oliphenta RoB with dimensions of length 82.6 m, width 17.3m and height 10.55m spanning across 8 existing and 5 future tracks.

L&T Metro Rail (Hyderabad) Limited:

L&T Metro Rail (Hyderabad) Limited is a subsidiary of Larsen & Toubro, an Indian multinational engaged in technology, engineering, construction, manufacturing and financial services with USD 17 billion in revenue. It operates in over 30 countries worldwide. A strong, customer-focused approach and the constant quest for top-class quality have enabled L&T to attain and sustain leadership in its major lines of business for over seven decades.

HYDERABAD**21st September 2017**