Media Release
February 11, 2018

Overcoming several locational hurdles and space constraints, L&T has successfully completed the crucial Lakdi-ka-pul Metro ROB, thus bridging the only remaining gap of corridor-I between Ameerpet and LB Nagar, stated MD, HMRL Mr.NVS Reddy who inspected ROB works today (Sunday).

At Lakdi-ka-pul the tracks of India Railways are in a deep cutting (about 26 ft) below the road level and no space was available for laying the foundations and Metro Rail pillars on both sides of the Railway track due to presence of busy road on one side and MMTS station, RR district collectorate building and a private hospital on the other side. Further, Indian Railways has put a condition that the foundation depth of the Metro Rail pillars on both sides of the track shall be atleast 10 feet below the Indian Railway track's level for future expansion of their tracks etc. The area has hard granite rock and to cut the hard granite rock to a depth of 43 feet posed a serious challenge for the Metro Rail engineers. Since the foundations had to be laid adjacent to busy road with heavy traffic, the deeply dug up pits had to be secured with special shoring and shuttering mechanism consisting of heavy steel beams with extra protection so that the road would not cave in at any point of time during the construction of the Metro pillars on both sides of the railway track.

Another important engineering challenge was to design a special type of integrated Metro pillar and the viaduct above as a single monolithic structure unlike all other bridge pillars which have bearings to take care of and transfer different kinds of forces. Normally any bridge pillar will have bearings to accommodate and take care of vertical and horizontal forces and to design and construct a bridge pillar without bearings is an engineering nightmare, averred several bridge experts. Since this kind of monolithic bridge pillar without bearings was being done for the first time in the country, Indian railways and it's structural engineering consultants RITES repeatedly checked the design and imposed many tough conditions which were successfully met by the L&T design engineers.

Tackling all the engineering challenges, the 392 feet long Lakdi-ka-pul ROB was successfully completed by using specially fabricated 'Bridge Builder' as it was done in case of Begumpet Metro ROB, stated Mr.NVS Reddy. Movement and erection of the 'Bridge Builder' device weighing about 100 tons and heavy duty cranes to lift the precast segments etc., with all safety precautions and without causing disruption to the round-the-clock train, MMTS operations, passengers and the heavy road traffic was a big challenge, he

emphasized. The 'Bridge Builder' was specially designed and completed load testing initially in the Uppal casting yard for all the safety parameters and structural safety before bringing it to the Lakdi-ka-pul site and mounting on the already built Metro viaduct. The whole bridge was divided into three parts with the main portion (span) over the railway lines being 171 feet and both ends being 118 feet and 103 feet respectively.

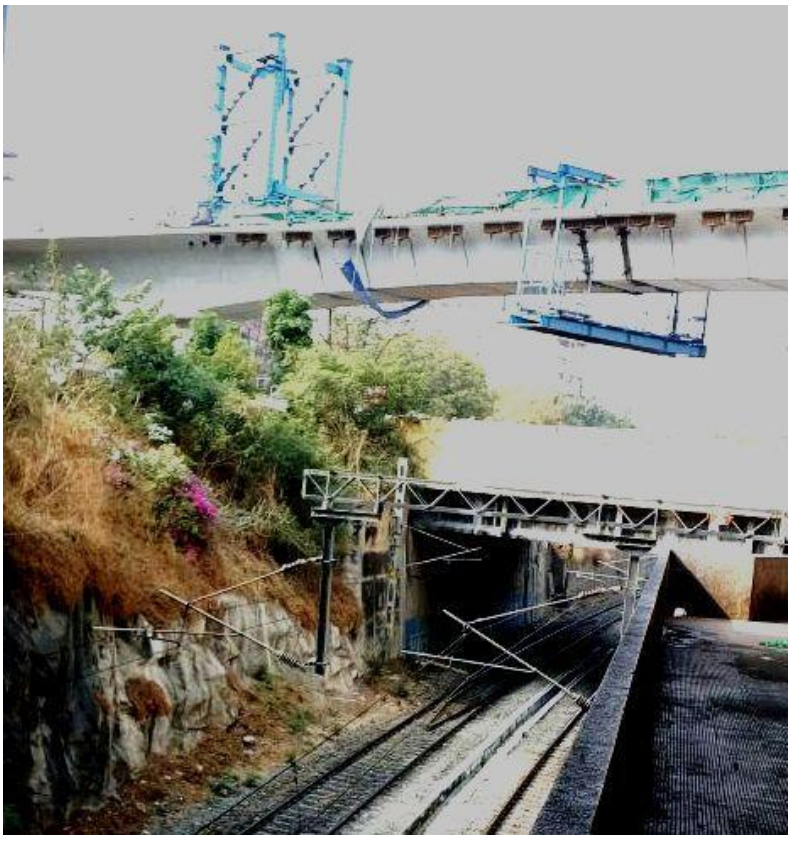
After erecting the Bridge Builder on both sides, it was anchored safely with proper counter weights, imported special steel bars called MacAlloy steel bars etc., to ensure the stability of the Bridge Builder against overturning. 13 segments weighing 45 tons each were incrementally launched as a cantilever hanging bridge from both sides with utmost care and safety standards. Each precast segment was lifted in tandem by cranes and placed on a trolley on top of the deck slab with temporary tracks for moving the segment forward to the centre of the Bridge Builder. Thereafter, the segment was carefully rotated from inside and lowered to its designated position. Once the segment was properly placed in its position, it was glued and attached to the already completed portion of viaduct with HTS cables (steel wires) and pre-stressed, so that the new segment became an integral part of the viaduct.

Then the so attached segment itself became the support base for moving the Bridge Builder forward and the next segment was again erected and attached in a similar manner. All the 13 precast segments were thus attached to the earlier portion of the bridge incrementally one after one from both Lakdi-ka-pul and Khairatabad sides and they became a long cantilever hanging bridge till both sides reached the midpoint. Indian Railways could give only '3 hour blocks' for launching each segment after stopping trains beyond midnight once a week, depending upon the feasibility. After so launching all the segments from both sides, in situ concreting was done for casting the middle segment by making use of a special anchoring platform.

Mr.NVS Reddy congratulated L&T's railway bridge team led by it's ROB experts Mr.K.M.Rao and Mr.Y.Kondalu, both ex-railway bridge engineers, for successfully completing a challenging ROB with high precision and safety. This will facilitate bridging the crucial gap to carry out further track laying, electrification and signaling works in the stretch between Khairatabad and Lakdi-ka-pul Metro stations for commissioning Metro train operations in the remaining 16 km stretch between Ameerpet and LB Nagar of Corridor 1, he added.

Public Relations Officer
Hyderabad Metro Rail Ltd

Completed view of Metro ROB using ‘Bridge Builder’ at Lakdi-ka-pul



A view of Metro ROB above MMTS at Lakdi-ka-pul

MD, HMRL Mr.NVS Reddy inspecting the 'Bridge Builder' used for constructing the Metro ROB at Lakdi-ka-pul on Sunday (February 11, 2018)

MD, HMRL Mr.NVS Reddy interacting with L&T bridge engineers on top of the Lakdi-ka-pul ROB on Sunday (February 11, 2018)

MD, HMRL Mr.NVS Reddy inspecting the Metro ROB works at Lakdi-ka-pul on Sunday (February 11, 2018)

MD, HMRL Mr.NVS Reddy inspecting the track works on the viaduct connecting ROB at Lakdi-ka-pul on Sunday (February 11, 2018)