

Viaducts Of Delhi Metro

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ABSTRACT

If Delhi, the capital city is the crowning glory of India, the Delhi Metro will be one of its brightest jewels. It is on its way to becoming a most valuable asset of the city. Destined to improve the quality of life of its residents, it is directly or indirectly promoting their health, welfare and safety on a day to day basis. Be they commuters on the way to office, housewives on the move picking up and dropping their offspring to school or business-men trying to reach a meeting in time, the Delhi Metro promises to get them there quickly, safely, reliably and without hassles.

The Master Plan of Delhi's MRTS envisages 8 lines covering a total length of 245km. The plan is to be implemented in 4 phases by 2021.

The first phase, consisting of 66km length is on target and scheduled for completion at the end of 2005. Several sections are already commissioned while the remaining are in an advanced stage.

While the precast concrete box section was the major structural form in Line 1, the precast segmental U-girder became the focus in Line 3. Reference maybe made to Figs 1 and 2 showing an artist's impression of the two forms. The main advantages of using the U-girder form can be summarized as follows:

- a) Rail Level Lowered
- b) Noise pollution reduced
- c) Safety against accidental derailment conditions
- d) The top flange acts as part of platform slab at stations and as an evacuation walkway from trains in-between station
- e) The formwork is considerably simplified

The Delhi Metro is a Designer's Delight. Apart from a significant technology upgradation of bridge construction in urban situation, the sheer variety of construction is a pleasure to behold. Long overhead precast, prestressed concrete segmental viaducts weave through crowded parts of the city and crossing over the River Yamuna is a prestressed concrete incrementally launched bridge. The viaducts also span across major arterial roads by continuous bridges built by cantilever construction Fig.3 & 4. An integral bridge which eliminates bearings and expansion joints and incorporates a skew of as high as 70° is another landmark structure.

Apart from concrete constructions several composite structures using steel as the primary longitudinally spanning member introduce further variety. Both Trusses and U-shaped built-up Girders have been used, depending upon the span.

The paper discusses the technological innovations, environmental impact, aesthetics and durability and how this large project is a 'concrete triumph' which is being completed on schedule with no cost over-runs.

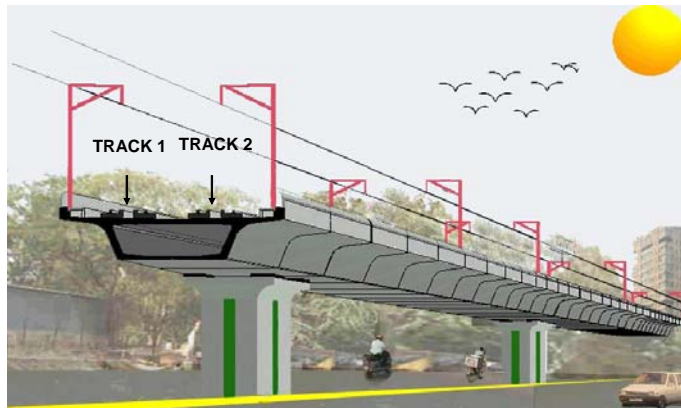


Fig.1: DMRC Line 1: Viaduct Using Segmental Box Girder Artist's Impression

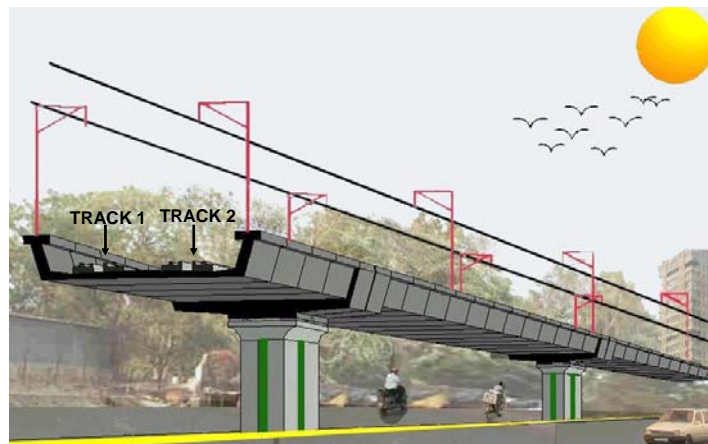


Fig.2: DMRC Line 3: Viaduct Using Segmental U-Girder Artist's Impression



Fig.3: Line 1 Cast-in-Situ 3 span Continuous Structure (32.5m+46.2m+32.5m)



Fig.4: Line 3: Cast-In-Situ 4-Span Segmental Construction (38.5m+55.0m+38.5m+38.5m)