Dr. K.L. Rao Memorial Lecture for IE (India), Oct. 2012

Abstract
Infrastructure Projects for Common Wealth Games (2010)

by
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1.0 Introduction

The 19th Common Wealth Games (CWG 2010) were held in Delhi from 3 to 14 Oct 2010. About 6500 athletes and officials representing 71 Common Wealth nations and dependencies competed in 17 sports disciplines and 272 events. This was the largest sports event ever held in India. It was also the first time that Common Wealth games were held in the country. Holding an event of this magnitude is an expensive exercise with the enhancement of the host country's image being the main motivation. The hosting of such a mega event requires the development of games village, sporting venues and ofcourse large infrastructure projects.

The infrastructure projects in the city had to be planned on an ambitious scale as 'mobility within Delhi was perceived as difficult and congested' and evaluated as a 'risk area'.

Major flyovers, traffic interchanges and metro (MRTS) structures contributed significantly in uplifting the image as well as the visual quality and character of the city of Delhi. Archeological monuments in the city of Delhi had to be specially catered to in the concept, design and construction of these infrastructure projects.

It is proposed to give a brief exposure to the major traffic interchanges, elevated road, elevated corridor and MRTS structure which constituted the landmark projects of the games. These projects employed a variety of techniques and were constructed in an incredibly short time. Tandon Consultants Pvt Ltd acted as the Design Consultants for six of these projects while they were proof checkers for the seventh.

The projects include:

1) Three Level Grade Separator at Ghazipur Intersection on NH-24 (Fig.1)

2) Barapulla Elevated Corridor to connect Games Village to J.L.N. Stadium (Fig.2)

3) Badarpur Elevated Corridor to connect Delhi to Haryana (Fig.3)

4) Mukarba Chowk Grade Separator to disperse traffic at Delhi Border (Fig.4)

5) Flyover at Intersection of NH-24 and Bund Road near Commonwealth Games Village (Fig.5)

6) Underpass at Rotary Near Domestic Airport Along Road Connecting to Dwarka (Fig.6)

7) Extardosed Bridge at Moolchand Intersection for Delhi Metro (Fig.7)

2.0 Underlying Concepts

The most important elements constituted the concepts related to the enhancement of environmental performance of these infrastructure projects. These elements are identified below:

- Evolving structural shapes that would be aesthetic and enhance the quality of the environment
- Developing concepts that would result in a reduce period of construction.
- Conservation of natural resources
- Conservation of Archeological monuments and heritage structures
- Utilising the space occupied by the city's landfill and garbage dump for socially relevant purposes

- Minimising structures and maximising ground level roads and embankments to reduce costs and environmental impact
- Use of fly ash and geogrids in embankments thereby enhancing sustainability
- Use of blast furnace slag cement thereby utilizing industrial by-product
- Encouraging pedestrians, cyclists and public transportation in preference to personal motorized vehicles
- Signal – free junction for movements of traffic in all directions thereby reducing pollution from stationary vehicles
- Integrating existing structures, facilities and water bodies as part of the overall design concept
- Delhi falls in Seismic Zone IV and all the structures cater to the requirement of earthquake resistant design.

3.0 Identification of Innovative Technologies:

- Precast segmental superstructure where practical for speedy construction
- Diaphragm wall for speedy, safe and traffic friendly construction of under ground structures using "top-down" techniques
- Segment lifter employed for the first time in country for speedy construction and no disturbance to existing traffic for some of the balanced cantilever construction spans
- Integral structure bridges for enhanced seismic performance, durability and safety during construction
- Elastomeric bearings as seismic dampers
- Mechanised slip formed crash barriers for speedy and well finished construction.

4.0 Conclusion

How some of these ideas were translated into the projects identified earlier will form the subject of the proposed presentation.

Fig.1 Three Level Grade Separator at Ghazipur Intersection on NH-24

Fig.2 Barapulla Elevated Corridor to connect Games Village to J.L.N. Stadium

Fig.3 Badarpur Elevated Corridor to connect Delhi to Haryana

Fig.4 Mukarba Chowk Grade Separator to disperse traffic at Delhi Border

Fig.5 Flyover at Intersection of NH-24 and Bund Road near Commonwealth Games Village

Fig.6 Underpass at Rotary near Domestic Airport Along Road Connecting to Dwarka

Fig.7 Extardosed Bridge at Moolchand Intersection for Delhi Metro