

Innovatively Engineered and Architectural Infrastructure Development in a Dense Urban Corridor

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Summary

This paper describes the conceptual design of a Precast Segmental Flyover in densely populated urban corridor in Hyderabad, India. The emphasis is on the innovative design that formed the basis for development of aesthetic design which could merge easily with the surroundings and cause the least disturbance to the existing structures as well as the environment. The stretch over which the flyover has come up is one of the busiest roads in Hyderabad where the traffic demand has drastically shot up due to the commissioning of an International Airport. The geometrical design ensured that negligible acquisition was required of the real estate that was already part of one of the busiest stretches in the city. The innovative architectural engineering concepts in the design that led to the development of a sleek and aesthetic structure meeting Architectural requirements are described. This infrastructure development has led to an improvement in environmental condition as a result of elimination of traffic snarls and landscaping has become possible below the flyover due to the least space occupied by it thereby minimising carbon emissions and improving the climate

Keywords: innovative; engineering; aesthetic; precast segmental; flyover; curvature; bearings; piers; urban.

1. Introduction

The Punjagutta flyover comprises of 3 to 4 span continuous units with precast segmental decking, flared slender RCC piers supported on open foundations. The main flyover 1.235 km forms a 'Y' link at the NFCL junction before bifurcating the structure into two lanes, forming a 300 m arm towards Banjara Hills and ends at Jubilee Hills. The flyover is composed of two sections, both uni-directional, with the 2-lane deck 535 m long from Jubilee Hills to Topaz building. The main flyover is for vehicles starting after Hotel Grand Kakatiya and crosses over three junctions of Rajiv Gandhi statue, Punjagutta crossroads and NFCL with the option of going towards Vengal Rao Park or Chutney's at the merger point. The philosophy of the design has essentially been to allow the form to follow function and the engineering innovations introduced improve appearance while exploiting the functional basis.

2. General Arrangement

The precast segmental flyover generally comprises of 4 span continuous module each span varying from 32.5 m to 40 m supported on flared flower vase shaped piers of height ranging from 6 to 8 m above ground. The precast segmental decking is in M60 grade concrete constructed using the span by span method with a complete dead load continuity. The tall piers also are designed to be slender to occupy minimal space on the ground necessitating the adoption of M60 grade concrete. The pot-pfe bearings are used and the modular strip seal expansion joints are spaced at minimum 120 m to improve the riding quality.