



The replaced of substructure of railway viaduct in metropolitan areas

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Summary

In Japan, railway and highway network are important transportation infrastructures supporting metropolitan areas.

This project was construction work conducted by the East Japan Railway Company to build highway structure under the Sobu Line viaduct. In this construction project, we replaced the substructure of railway viaduct with new foundations, new steel reinforced concrete portal piers, and new partially-prestressed concrete through-bridges.

This paper, mainly deals with the replacement of the bases of the existing railway viaduct beam slab sections using the partially-prestressed concrete through-bridges.

Keywords: railway structure; replaced of substructure; under pinning; partially prestressed concrete through-bridge.

1. Introduction

The Tokyo Outer Ring Road (hereafter, the “ORR”), planned by the Ministry of Land, Infrastructure, Transport and Tourism and the East Nippon Expressway Company Limited, is a belt highway with an overall length of approximately 85 kilometres, connecting the area on a radius 15 kilometres from the centre of the Metropolis. The ORR is ranked as one of the three belt highways in the metropolitan area, together with the Metropolitan Inter-City Expressway (also known as Ken-oh Expressway) and the Central Circular Route of the Shuto Expressway, and is expected to play a significant role in, for example, the alleviation of traffic congestion and the reduction of CO₂ emission attributed to auto emission. (Fig.1)



Fig. 1: The ORR

A section of this road extending approximately 12.1 kilometres has been allocated as the Chiba Prefecture Section. At the point this section crosses the JR Sobu Line, an underpass is planned for the ORR (underground section) and National Highway Route 298 (above-ground section). About 800 trains pass on the JR Sobu Line, and it is necessary to construct a safe highway structure. So, this construction work is constructed by the East Japan Railway Company (hereafter, “JR-East”) under commission from the East Nippon Expressway Company to construct highway structure under the Sobu Line viaduct.