

Overhead Railway Project with Environmentally-Friendly Concepts

Kuniaki ASAKAWA

Member of Construction Management Office, Tohoku Construction Office, East Japan Railway Company, Miyagi, Japan
ku-asakawa@jreast.co.jp

Kuniaki Asakawa, born in 1980, received his civil engineering degree from the Tokai University, Japan.



Yasuyosi KANEKO

Manager, Shiroishi Work Office, Tohoku Branch, Tekken Corporation, Miyagi, Japan
yasuyoshi-kaneko@tekken.co.jp

Yasuyoshi Kaneko, born in 1973, received his civil engineering degree from the Musashi Institute of Technologies, Japan.



Summary

An elevated railway structure 2.5 km long was constructed in a JR Tohoku Line section including Nagamachi Station. The main considerations of this project were to minimize adverse environmental impact and improve the scenery of the district, while reducing work and concrete volumes. To achieve these targets, newly developed technologies were fully utilized. As a result, the project was completed at reduced cost, within a shorter period of time, and satisfied environmental concerns.

Keywords: viaduct, reduce cost, environment, landscaping, railway

1. Overview of the project

This project was to elevate a section including Nagamachi Station on the JR Tohoku Line for about 2.5 kilometers. This plan is a part of the Sendai Land Readjustment Project for the New City Center planned by the city government and executed by the Urban Renaissance Agency in order to rejuvenate urban functions of the existing populated areas in the large city and to create a new urban center. As a result of this project, the railway now includes grade separation from roads at seven locations. Nagamachi Station has been elevated and was opened to service in September 2006, and a new station, Taishido Station, has been added and was opened to service March 2007. Fig. 1 shows the area surrounding Nagamachi Station before the construction work started, and Fig. 2 shows the development plan.

This project is based on the concept of "consideration of the environment and positive use of innovative technologies". Efforts were made to reduce environmental impact, through the phase of planning and design, while aiming at reduction of concrete consumption and volume of earth excavated. Considerations were also given to create a harmony between old streets and a new town for better landscaping. To achieve these goals, various technologies were developed and used, thereby minimizing environmental impact, and significantly reducing construction cost and time required for the project.

2. Overview of the overhead railway construction

The large railway facilities across the Nagamachi area were relocated, changing the track layout. Considerations were given to the location of the viaduct so that the distance to the adjacent viaduct on the Shinkansen line could be minimized as much as technically possible, to reduce the width of the section dividing the area into west and east for the most efficient use of land.

Also, the plan was designed so as to diminish the volume of construction work as much as possible by minimizing land purchase and relocation of housing units, from the environmental viewpoint.