



Development of flexible structure to reinforce and change height of RC viaduct column

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Summary

In this report, we report on the technological development in which we utilize an existing RC rigid-frame viaduct.

We plan to shift about 3.5km of a service route on the Senseki Line that was damaged by the tsunami of The Tohoku-pacific Ocean Earthquake. We will utilize the existing RC rigid-frame viaduct at the bridge approach. Therefore, we will plan to cut the existing viaduct and raise slab aspect height. However, in the cross-section of the existing columns, it has been found that aseismic performance is insufficient. Therefore, we developed a structure with a widened cross-section by deploy reinforcement steel materials in the other periphery of the columns.

Keywords: RC rigid-frame viaduct, columns, aseismic performance, drop panel

1. Introduction

The Tohoku-pacific Ocean Earthquake (Tohoku Earthquake) that occurred on March 11, 2011, caused widespread tsunami damage along the coast of the Tohoku district. The Senseki Line that runs near the shoreline of The East Japan Railway Company suffered serious tsunami damage. Though approximately three years have passed since the Tohoku Earthquake, operations are still suspended along this section. We plan to shift about 3.5km of the service route on the Senseki Line.

In the section to be removed, there are 5 block viaducts with total length of 296 m that connect to Narusegawa Bridge, built in 1997. Rail levels of 3 block viaducts from the railhead are changed due to the removal plan. These are called existing R1, existing R2 and existing R3 (hereinafter as Ex-R1, Ex-R2 and Ex-R3) from the railhead. Figure 1 shows the ground plan of the existing viaduct and section to be removed line, and Figure 2 shows longitudinal profile.

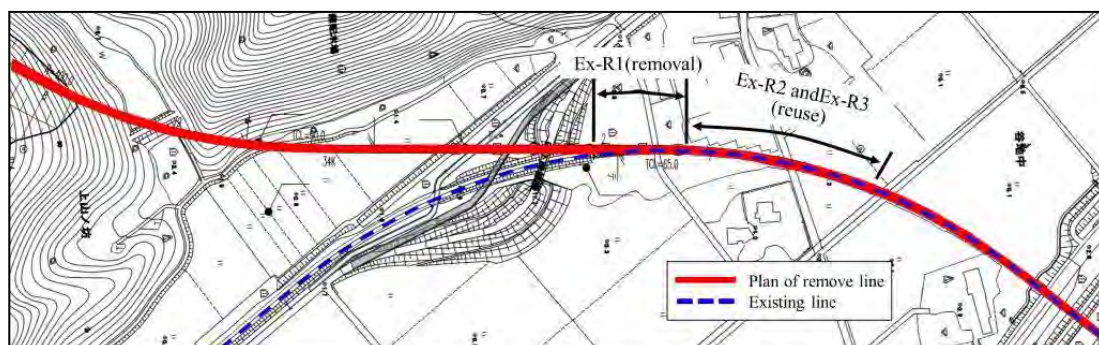


Figure 1 Ground plan of existing viaducts and removal line