

A trial construction of high durability railway viaducts with local aggregates

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1 Abstract

We are carrying out a construction project of new railroad viaducts. These new railroad viaducts are constructing using about 110,000 m³ volume concrete. In this construction place, it is difficult for us to get low ASR-reactive aggregates and it is expected to be supplied with snowmelt water on the viaducts in winter. Then we tested ASR-reactive these local aggregates and found an effective mixed ratio of fly-ash is 20% of cement. On the other hand, various side effects were also expected by using fly-ash. For example, initial cracking due to contraction, early strength concrete, bleeding, etc. Therefore, we repeated various tests and examined and carried out a method that could ensure the same construction method and quality as when using ordinary Portland cement, even with fly-ash. Also, we adopted a structure that is unlikely to be affected by rainwater as a structural measure. For example, the entire adoption of a ramen type viaduct that has eliminated bearings, adoption of FRP sound barrier, etc. Then we made it possible to build highly durable railway viaducts by these various measures of materials and structures.

Keywords: Alkali Silica Reaction (ASR), Fly-ash, Andesite, Ramen-viaduct, FRP, Durability

2 Introduction

The Niigata station is located in the city of Niigata prefecture and a base station in the Sea of Japan. At

the Niigata station, the project on construction of railroad viaducts is carried out to approve regional activation by removing of railroad crossings. These new railroad viaducts are constructing using about 110,000 m³ volume concrete.

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