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Load-carrying capacity of RC members in the viaducts of Railway where ASR occurred

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1 Abstract

In Japan, measures against ASR have been started since the late 1980s, but it is no exaggeration to say that all buildings built before that may be affected by ASR. Deterioration and damage due to ASR are remarkable in the section from around TsubameSanjo Station on the Joetsu Shinkansen operating in East Japan Railway Company to around Niigata Station, and there are situations where maintenance management is difficult. Currently, if there are major defects in regular inspections, we will carry out surface treatment etc., but we are starting to study how to prevent the ingress of water at the stage of minor defects in order to prevent the progression of ASR. When waterproofing the surface of a structure in which a crack or the like is generated by ASR, the effects of water blocking effect and reduction of the amount of water in concrete are not well known. In this report, RC slab members exposed and stored for about 15 years (about 40 years after completion) were used as RC beam specimens, and were dried to some extent on the assumption that moisture was blocked, and a loading test was performed. As a result of the loading test, the maximum strength of the RC beam specimen was larger than the calculated shear strength. From this result, it is considered that the damage level of the current ASR does not have the effect of reducing the shear resistance so much.

Keywords: alkali silica reaction(ASR) slab member crack Shear Capacity Water blocking Drying

2 Introduction

It is said that the first damage in Japan by ASR was reported in 1951. At that time, when we surveyed 104 types of aggregates nationwide by chemical methods, it was widely accepted in Japan that there were few aggregates showing ASR, as only 2 types of aggregates in the corresponding area had reacted. For a while after that, there were no reports in Japan of suspicion of ASR. However, in 1982, cracking of highway piers and damage to reinforcing bars were confirmed, and ASR measures were implemented from the late 1980s.

Under these circumstances, in the Joetsu Shinkansen, which opened in November 1982, the viaducts from around Tsubamesanjo Station to around Niigata Station are deteriorated and damaged by ASR, and a great deal of effort is spent on maintenance and management(Figure1). The Niigata is a region with a large amount of aggregate

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