

An Estimation of the Corrosion Rate by Airborne Salt around Bridge Section

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Summary

Weathering steel has a unique property of preventing rust by rust, and the use of unpainted weathering steel is important to reduce the life cycle cost of infrastructures. However, state of corrosion is different in different parts of bridge. Accordingly, evaluation for quantity of corrosion is needed at each part of the bridge. This paper discusses the relation between corrosion rate and airborne salt around bridge section, and proposes approach to evaluate corrosion rate by airborne salt.

Keywords: weathering steel; corrosion; airborne salt.

1. Introduction

Life cycle cost including the cost for maintenance is important factor when steel bridges are constructed in Japan. Bridges with unpainted weathering steel are increasingly made because it is able to reduce the painting cost. Under appropriate corrosive environment, atmospheric corrosion resistance is demonstrated by rust of weathering steel. However, in marine coastal areas with frequent high rainfall, high humidity or persistent fog, weathering steel cannot have the corrosion resistance.



Fig. 1: Position of Bridge for observation

Quality of rust is different in each part of bridge. In strong corrosive environment, this tendency appear because corrosive conditions such as amount of airborne salt, rainfall and humidity are different in each part of bridge.

Corrosion factors such as airborne salt, humidity or time of wetness at planning location for construction of bridge can be known by observation of nature. However, amount of airborne salt, humidity or time of wetness are influenced by direction of bridge, clearance under bridge, and so on. Thus, the corrosion environment is changed after bridge has been completed.

In this paper, airborne salt around the bridge section is calculated by numerical simulation technique. The precision of airborne salt that is estimated with numerical simulation around section of the bridge is discussed by comparison between numerical result and observed result of airborne salt around the section of bridge.