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Life cycle management of reinforced concrete bridge structures located in the salt attack environment

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In these thirty years in Japan reinforced concrete bridge structures constructed near the coastal lined have shown severe damage due to air born salt from the sea. Different counter measures have been taken by the government and the authorities who are in charge of maintaining the structures. The counter measures, however, were not good enough to protect the structures for a long time. In less than ten years the repaired structure showed again the deterioration. Because of the lack of knowledge and experience in the first stage ineffective counter measures were taken repeatedly. The author has been involved in the committees of the government and authorities as well as the committees of Japan Society of Civil Engineers and Japan Concrete Institute for solving the salt attack problems of reinforced concrete structures. At the same time, he has been studied on the salt attack problems and cooperated to establish design guidelines and codes against the salt attack problems of concrete structures. Based on his experience and research establishments he is going to discuss (1) what has happened on concrete structures in salt attack environments, (2) what has been taken for the counter measures and how much cost has been given, (3) how to predict the chloride ion behavior coming into concrete, (4) how to estimate the residual strength of concrete structures after corrosion of reinforcing bars due to infusion of chloride ion, and (5) what is a rational way to maintain the damaged concrete structures by salt attack.

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