

## INTRODUCTION

Chloride-ions penetrating into bridge decks and corroding the steel have been a major problem. As the steel corrodes it exerts stresses on the surrounding concrete. When the stresses exceed the strength of the concrete, cracks or delaminations occur. This, of course, causes deterioration and spalling of bridge deck surfaces.

Both the Latex and Iowa Method were used to repair bridge decks for this project. The concrete was removed down to the steel and replaced with approximately 1 1/2 inches of low slump or latex modified concrete. The removal of unsound concrete below the top layer of steel was sometimes necessary.

## OBJECTIVE

The objective of this project was to determine if the bridge overlays would provide a cost effective method of rehabilitation. To do this, unsound and delaminated concrete was removed and replaced by an overlay of low slump or latex modified concrete.

## TESTING

Fifteen overlaid bridges were selected in the early 1970's for testing and evaluation. Delamtect, electrical potential and chloride content testing have been conducted biennially. Visual inspection of the bridge decks was made also. Delamination reached a level of approximately 2.0-3.0% after 10 years. The electrical potential mainly stayed below the

30 volts. The above observations are shown in the appendices.

#### DISCUSSION OF RESULTS

The overlays have extended the life of bridge decks requiring rehabilitation. Both the Iowa Method and Latex Method proved to be effective in delaying corrosion and deterring the increase of chloride content in the bridge overlays for a number of years. There were a couple of cases when substantial delamination had occurred that a new epoxy injection was used. This worked very effectively.

The overlays improved the electrical potential. In all cases, the electrical potential shifted to the left after the deck was overlaid, showing reduction in active corrosion. It seems the overlay either reduced the oxygen or the moisture that had been coming in contact with the steel.

There was also a definite chloride reduction around the steel after the overlay was placed.

Bridges built now contain epoxy coated steel. The epoxy coating on the steel has been a valuable asset to the life of the bridge decks by not allowing the chloride-ions to come in contact with the steel.