

MATERIALS & RESEARCH DIVISION

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RESEARCH UPDATE

NUMBER U89-5

BARE DECK PERFORMANCE ROUTE 14 BRIDGE 124

REFERENCE: Report 73-4, August 1973

HISTORY: Bridge 124 on VT Rte 14 in Irasburg was inspected in June 1973 at the request of the Bridge Maintenance Engineer to determine if yearly applications of linseed oil and mineral spirits were effective in protecting the exposed concrete deck. Although there was little visual indication of deterioration on the 5 year old deck a corrosion survey revealed that 9% of the deck had potentials of 0.35 volts or greater, and chloride levels ranged from 0.7 to 3.5 lbs/cy at the rebar level.

The 1973 report concluded that "the linseed oil applications did not provide sufficient waterproofing to protect the exposed deck ..... and that severe corrosion of the reinforcing steel will follow with accompanying deterioration of the concrete".

STATUS: Annual inspections continued on Bridge 124 since the deck was one of only 32 bare decks on the State system and it's performance was compared with a number of decks treated with various experimental waterproofing systems.

The information gathered included the following:

Corrosion Summary

DATE TESTED	AVG POTENTIAL	% $\geq 0.35$	% $\geq 0.40$	% $\geq 0.50$
9-72	.27	9	7	4
7-73	.30	13	9	7
5-74	.27	9	6	5
11-75	.23	7	6	4
5-78	.37	50	28	11
7-79	.36	43	33	12
8-80	.36	45	33	11
7-82	.38	54	31	14
7-83	.31	34	24	8
8-84	.42	72	55	22
7-85	.42	67	51	24
10-88	.45	78	65	39
6-89	.52	90	82	60

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Concrete Delamination

A chain drag survey conducted in 1983 revealed 26 areas with audible delamination totaling 240 sq.ft. or 10% of the deck area. At that time the deck had been patched at two locations. The area of delaminations continued to expand at 3±% per year. By June of 1989, the deck had been patched with bituminous mix at 16 locations averaging 7 sq.ft. per area.

FOLLOW UP: Field monitoring will continue on Bridge 124 since it is the principle structure in the field evaluation of a corrosion inhibiting deicer (DOMTAR TCI, Work Plan 88-R-10). The evaluation will include rate of corrosion testing. A maximum study length of 5 years is anticipated.

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