

Report Title

Reducing Cracking in New Bridge Curbs



NHDOT Bridge Maintenance

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Report Link

[https://www.nh.gov/dot/
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Why was it studied?

Early-age cracking has become a routine occurrence on many single span concrete bridge curbs. Cracks that develop early on expose the concrete curb to potential accelerated damage that may reduce its useful life. The objective of this study was to document cracking on several bridge curbs in order to find ways to reduce the propensity of cracking, particularly in the first year after placement.



What was done?

Two variables were tested on new bridge curbs during the study. In each case, one side was constructed using the variable and the other side would serve as a control. One variable was a 14-day wet cure compared to a traditional 7-day wet cure. The



second variable was changing the Portland cement concrete (PCC) mix from the specified 28-day compressive strength of 4000 psi (NHDOT AA) to a mix that had a specified 28-day strength of 3000 psi (NHDOT A). Bridge curbing repaired or constructed during the study were evaluated numerous times over the course of one year.

Two established index values that described the crack's characteristics include a length index that categorized a crack's relative length compared to the curb and an intensity index that categorized a crack's width. These indices were used to assess the severity of the bridge curb cracking.

What did we learn?

The results of this study showed that :

- A 14-day wet cure duration on curbs results in less cracking as compared to control curbs with a 7-day wet cure duration.
- A PCC mix with a lower 28-day compressive strength and lower cementitious materials content results in less cracking compared to control curbs.

How can we use it?

The study has identified two options that can be implemented to potentially reduce early-age cracking on single span concrete bridge curbs. The established monitoring protocol and evaluation process can be used to assess the relative cracking of bridge curbs when comparing two curb construction variables.