Subject: Resin Capsule Anchorage for Bridge Mounted Sign Structures

Background

The State Bridge Engineer policy memo dated July 21, 2008, Policy for Attachment of New Bridge Mounted Signs to Soffit Slab, Underside of Bridge Decks or Deck Overhangs\(^1\) states:

“Effective immediately, all new bridge mounted signs, including Changeable Message Signs, that are suspended from the bridge soffit, underside of bridge decks or deck overhangs by anchorage into concrete shall be anchored using either cast-in-place anchors or through bolts as appropriate. …resin capsules shall not be used to anchor such sign structures.”

The intent of this policy memo was to prohibit the use of resin capsule anchorage (RCA) in direct, sustained tension applications because of their susceptibility to creep. The picture below provides an example of what is considered direct, sustained tension where the use of a RCA is prohibited. The prohibition in the policy memo does not apply to smaller barrier rail mounted sign structures.

This BCM is intended to address recurring questions that have been received by the DES Signs and Overhead Structure Specialist related to RCA for bridge mounted sign structures since the July 2008 policy memo was written.

\(^1\) See Attachment No.1: Policy Memo dated July 21, 2008, Subject: Policy for Attachment of New Bridge Mounted Signs to Soffit Slab, Underside of Bridge Decks or Deck Overhang.
Guidelines

Bridge mounted signs on Caltrans’ projects typically conform to the two mounting arrangements that are illustrated in the Figure No. 1 and Figure No. 2. They are:

1) RCAs placed into the barrier rail (location A) and into the edge of deck (location B), and into the exterior girder or the underside of the deck overhang (location C). This type of a support system is typically used for bridge mounted signs which are over 100 inches tall. See Figure No. 1.

2) RCAs placed into the edge of deck (location B), and into the exterior girder or the underside of the deck overhang (location C). See Figure No. 2.

Mounting signs consistent with one of these configurations is consistent with the 2008 policy memo. If properly installed, the RCAs will perform as designed with minimal creep that will not impact their capacity.

Figure No. 1
Structure Representative Responsibilities:

- If details deviate from the mounting configurations described above, contact the DES Signs and Overhead Structure Specialist.
- Verify that the RCA is on the Authorized Materials List\(^2\) at: http://www.dot.ca.gov/hq/esc/approved_products_list/pdf/resin_capsules.pdf
- Verify that the proposed system does not interfere with any other embedment or risk damaging the prestressing system.
- Notify the contractor of their authorization for use of the selected RCA.
- Verify that RCAs are installed in accordance with the manufacturer’s recommendations, including using the manufacturer recommended drilling equipment.
- Cored holes are not permitted under any conditions.
- Verify that the holes are clean and dry.
- Do not install RCAs in the rain.
- Verify the size of the hole (diameter and depth).
- Verify that the required embedment depth and minimum edge distances are obtained.
- Ensure that the RCAs are loaded only after the adhesive \textit{cure time} has elapsed (shown in the Authorized Materials List).

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\(^2\) Equivalent terms that may have been used in other documents that have the same meaning would include; Approved Materials List, Pre-Qualified Products List, or Approved Product List.
Memorandum

To: DES DEPUTY DIVISION CHIEFS

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State Bridge Engineer
Division of Engineering Services

Date: July 21, 2008

Subject: Policy for Attachment of New Bridge Mounted Signs to Soffit Slab, Underside of Bridge Decks or Deck Overhangs

Effective immediately, all new bridge mounted signs, including Changeable Message Signs, that are suspended from the bridge soffit, underside of bridge decks or deck overhangs by anchorage into concrete shall be anchored using either cast-in-place anchors or through bolts as appropriate. Cartridge epoxies, chemical adhesives or resin capsules shall not be used to anchor such sign structures.

For the types of bridge mounted signs identified in the preceding paragraph that are in construction, a Contract Change Order shall be issued showing anchorage to the bridge using either cast-in-place anchors or through bolts.

This policy has been developed to increase the structural safety of sign structures that are suspended from bridges.

Contact Madhwesh Raghavendrachar, Senior Bridge Engineer, Structure Design, Division of Engineering Services at 916-227-7116 or mraghave@dot.ca.gov if there are any questions.

c: SD Office Chiefs
   Susan Hida

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