

Memo

To: Bridge Design Engineers

From: Arielle Ehrlich 
State Bridge Design Engineer

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MEMO TO DESIGNERS (2017-02): Post-Installed Anchorages for Reinforcing Bars

For bridge projects that require attachment of a new concrete element to an existing concrete element (e.g., attaching a new bridge barrier to an existing deck), adhesive anchorages with epoxy coated bars have often been used to make the connection. Recently, it was noted that adhesive manufacturers do not warrant their products for bars that have an epoxy coating, which means the design strengths reported in the literature do not apply to epoxy coated bars. Until research and testing of epoxy coated bars with adhesive anchorages is done to provide answers on this issue, use the attached table to determine the bar type, testing level, and pay item when post-installed anchorages for reinforcing bars are required for a bridge project.

Generally, the table guidance is based on the following:

- For cases where the rebar being anchored must resist significant tension and has high exposure to deicing salts and the existing concrete element has epoxy coated rebar, stainless steel rebar is required with a high level of testing that confirms adequate tensile resistance.
- For cases where the rebar being anchored must resist significant tension and has low exposure to deicing salts or the existing concrete element has uncoated rebar, uncoated rebar is required with a high level of testing that confirms adequate tensile resistance.
- For cases where the rebar being anchored must resist little or no tension, an epoxy coated rebar is required with a low level of testing that confirms adequate placement procedures.

For all other bars in the new concrete element (those that are not being anchored), provide epoxy coated rebar regardless of whether the existing element contains uncoated or epoxy coated bars.

Use of this guidance is to begin immediately for all repair projects in the final design phase.

If you have any questions, please contact Dave Dahlberg (dave.dahlberg@state.mn.us) or (651) 366-4491) or me.

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Post-Installed Anchorages for Reinforcing Bars - Bar Type and Testing Level

Type of Construction	Existing Structure Rebar Type	Anchored Rebar Location	Anchored Rebar Type	Anchorage ② Testing Level	Pay Item
Barrier anchored to bridge deck or approach panel	Epoxy coated bars in deck or approach panel	Front face of barrier	Stainless	H	2433.502 ANCH TYPE REINF BARS (STAINLESS TYPE H) EACH
		Back face of barrier ①	Epoxy coated	L	2433.502 ANCH TYPE REINF BARS (TYPE L) EACH
	Uncoated bars in deck or approach panel	Front face of barrier	Uncoated	H	2433.502 ANCH TYPE REINF BARS (TYPE H) EACH
		Back face of barrier ①	Epoxy coated	L	2433.502 ANCH TYPE REINF BARS (TYPE L) EACH
Bridge barrier end posts anchored to abutments	All types	Any location	Uncoated	H	2433.502 ANCH TYPE REINF BARS (TYPE H) EACH
Pier crash struts anchored to pier footings	Epoxy coated bars in columns	Vertical dowels in tension	Stainless	H	2433.502 ANCH TYPE REINF BARS (STAINLESS TYPE H) EACH
	Uncoated bars in columns	Vertical dowels in tension	Uncoated	H	2433.502 ANCH TYPE REINF BARS (TYPE H) EACH
Pier cap repairs	All types	Bars resisting significant tension	Uncoated	H	2433.502 ANCH TYPE REINF BARS (TYPE H) EACH
		Other bars	Epoxy coated	L	2433.502 ANCH TYPE REINF BARS (TYPE L) EACH
Infill walls for strengthening piers	All types	Any location	Epoxy coated	L	2433.502 ANCH TYPE REINF BARS (TYPE L) EACH
Abutment paving bracket reconstruction	All types	Any location	Epoxy coated	L	2433.502 ANCH TYPE REINF BARS (TYPE L) EACH
Abutment end block reconstruction	All types	Any location	Epoxy coated	L	2433.502 ANCH TYPE REINF BARS (TYPE L) EACH
Prestressed concrete beam repairs	All types	Any location	Epoxy coated	L	2433.502 ANCH TYPE REINF BARS (TYPE L) EACH
All other situations	To be determined on a case-by-case basis				

① Install back face bars at twice the front bar spacing, not to exceed 2'-0"

② H = High level of testing to confirm adequate resistance to tensile loads

L = Low level of testing to confirm adequate placement procedures

Refer to special provision SB2018-2433.8 for testing requirements