

5210700 Concrete Barriers, Traffic Railing Barriers and Parapets.  
COMMENTS FROM INTERNAL/INDUSTRY REVIEW

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Charles E. Boyd, P.E.  
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Comments: (2-8-11) I have concerns about the crashworthiness of an Index 410 barrier with 3/8” cracks (shrinkage cracks, presumably) in it. The proposed spec language appears to only address the cosmetics of a cracked barrier without restoring the strength necessary to resist a vehicle impact at the crack.

A 3/8” crack is more like a “true joint” (see Index 410 Sheet 2 of 25) and as such would necessitate the use of Free End Reinforcement on either side of it. But since the locations where these cracks will form cannot be predicted, the use of Free End Reinforcement adjacent to the cracks is not practical.

The two #4 bars running longitudinally thru the barrier would have to yield locally in order for a 3/8” wide vertical crack to form and load transfer thru shear interlock between the exposed aggregate would not seem possible at a 3/8” crack. Thus the crashworthiness of the barrier must be called into question.

Response: By adding the text “unless directed by the Engineer” the Department is assigning the decision about how to address large cracks to the District Construction Engineer with support of other Department offices. The District will decide, with consultation from Structures Design and other offices, how to address larger or more frequent cracks than are desirable to leave in place on a case by case basis. This decision was made by a group of high level Department managers including the State Structures Design Engineer, the State Roadway Design Engineer, State Specifications Engineer and the Director of Construction.

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Thomas, Frances  
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Comments: (3-28-11) Recommend the following in 5210700:

For precast and cast-in-place concrete barrier wall that has been installed, the disposition of concrete cracks shall be in accordance with 400-21. *However, Cracks in unreinforced-concrete barrier walls which are barrier walls that have no vertical reinforcing steel as detailed in Design Standards Index, No 410 do not require repair.*

Response: Disagree. The current wording was set by a group of high level Department managers – see Charles Boyd response - and they consider it to be effective as written.

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Comments: (3-30-11) 5210700, “However, cracks in unreinforced concrete barrier walls which are barrier walls that have no vertical reinforcing steel as detailed in Design Standards Index No. 410, do not require repair.”

More concise wording would be “Cracks in unreinforced concrete barrier walls as detailed in Design Standards Index No. 410 do not require repair.”

Also:

- Which detail in Index 410?
- Sheet 5 calls unreinforced walls “plain” concrete barrier walls. If we refer to an Index, the phrasing should be consistent.
- Do we want a blanket statement that cracks in these types of walls do not require repair? As written, this means all cracks, no matter how severe do not require repair. Would it be better to state that cracks smaller than a certain size do not require repair?

Response: Bullet 1 and 2: The text has been revised to use the term “plain”

Bullet 3: By adding the text “unless directed by the Engineer” the Department is assigning the decision about how to address large cracks to the District Construction Engineer with support of other Department offices. The District will decide, with consultation from the Structures Design and other offices, how to address larger or more frequent cracks than are desirable to leave in place on a case by case basis.

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O'Hagan, David

Comments: (4-5-11) 5210700: This proposed revision has not been discussed between Design and Construction Offices. Past proposals on a minimum median barrier crack width that required repairing had not been agreed upon, and thus previous attempts at modification were withdrawn. This proposal lifts any requirement for repair regardless of crack width, length and depth. Needless to say, this is also unacceptable. Furthermore, as I read it, 521-7 seems to apply only to precast concrete barrier walls. To permit a crack of unspecified minimum size (width, depth, length) to remain in the precast barrier is a safety concern as subsequent handling of the barrier will only compromise its in-place performance, not to mention its ability to be handled at all.

Response: Mr. O'Hagan attended a meeting of Department upper level managers, see Charles Boyd response, at which he supported the revised language of this spec so his concerns have already been addressed as demonstrated by his concurrence at that meeting.

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Marshall Dougherty

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Comments: (5-2-11) The intent of the revision is to emphasize the differences between standard precast wall sections and plain concrete poured-in-place barrier walls (as detailed in Design Standards Index No. 410). I would like to see this single sentence become a separate paragraph, following the existing text, as a way to separate the two types of walls and to emphasize the differences. Also, the word "however" is superfluous and should be removed.

Response: Disagree. The current wording was set by a group of high level Department managers – see Charles Boyd response - and they consider it to be effective as written.

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Bob Dion

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Comments: (5-4-11) Suggest you change 'plain concrete' to 'unreinforced concrete' in the last sentence of 521-7. The Origination Form and the cover memo both mention unreinforced barrier walls.

Response: Agree: will revise.

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Katie Bettman  
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Comment: (5-11-11) Text: "However, do not repair cracks in plain concrete barrier walls as detailed in Design Standards Index No. 410, unless directed by the Engineer." Design Standards 410 does not detail repairing cracks. The statement that was added is confusing. I first looked through 410 to see what was being referenced. I think this could be written clearer.

Response: Agree: will revise.

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Pat McCann  
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Comment: (5-23-11) : I realize the word "plain" is meant to reference un-reinforced concrete. Is this explained anywhere in our documents? If not I would suggest adding "(un-reinforced)" after "plain". Index 410 includes both plain and reinforced walls so we do need to make the distinction.

Response: Agree: will revise.

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