Origination Form

Specifications

Name:	Oliver Chung	**Standard Specification Section:**	400
Email:	oliver.chung@dot.state.fl.us	**Special Provision:**	
Date:	2026-05-06T17:21:27Z	**Associated Specs:**	N/A

Summary:

Added the recommended methods for sealing vertical cracks in the table 400-3.

Justification:

The current specification does not provide guidance on sealing vertical cracks in structural concrete. Based on the outcomes of research project BED49-977-03, the suggested methods for sealing vertical cracks have been implemented and offer guidance for the Engineer to perform the sealing.

Do the changes affect other types of specifications?

Neither

List Specifications Affected:

Other Affected Documents/Offices	Contacted	Yes/No
Other Standard Plans		No
Florida Design Manual		No
Structures Manual		No
Basis of Estimates Manual		No
Approved Product List		No
Construction Office		No
Maintenance Office		No
Materials Manual		No
Traffic Engineering Manual		No

Are changes in line with promoting and making progress on improving safety, enhancing mobility, inspiring innovation, and fostering talent; explain how?

Yes, It will improve safety. The addition of sealing vertical cracks in structural concrete will enhance public safety and extend the service life of the structure.

What financial impact does the change have; project costs, pay item structure, or consultant fees?

N/A

What impact does the change have on production or construction schedules?

This change will provide the Engineer with clear guidance on sealing vertical cracks. It will reduce the need for EOR requests and allow timely repairs to the structure.

How does this change improve efficiency or quality?

This change will provide the Engineer with clear guidance on sealing vertical cracks. It will reduce the need for EOR requests and allow timely repairs to the structure.

Which FDOT offices does the change impact?

Construction Office, Maintenance Office, and State Materials Office

What is the impact to districts with this change?

N/A

Does the change shift risk and to who?

N/A

Provide summary and resolution of any outstanding comments from the districts or industry.

Comments and Responses are available on the Track the Status of Revisions hyperlink located on the Specifications landing page: https://www.fdot.gov/specifications/default.shtm

What is the communication plan?

Through the established specification revision process (e.g., Internal and Industry Review)

What is the schedule for implementation?

The Standard Specifications eBook and Workbook are effective July 1st every year.

CONCRETE STRUCTURES
(REV 5-6-26)

ARTICLE 400-2 is deleted and the following substituted:

400-2 Materials.

Meet the following requirements:

Concrete ..... Sections 346 and 347
Penetrant Sealer .....Section 413
High Molecular Weight Methacrylate (HMWM)**
..... Section 413
Reinforcing for Concrete .....Section 415
Water.....Section 923
Curing Materials*,** .....Section 925
Epoxy Bonding Compounds** .....Section 926
Post Installed Anchor Systems**.....Section 937
Joint Materials**.....Section 932
Bearing Pads** .....Section 932
Non-Shrink Grout** .....Section 934
Class 5 Applied Finish Coatings**.....Section 975
Galvanizing Compound** .....Section 562
Dowel Bar Assembly** .....Section 931
Geosynthetic Material**.....Section 985

*The Engineer will allow clean sand and sawdust for certain curing, when and as specified.

**Use products listed on the Department's Approved Product List (APL).

SUBARTICLE 400-21.3 is deleted and the following substituted:

400-21.3 Classification of Cracks: The Engineer will define cracks as either horizontal or vertical cracks based on the angle of the repair surface. The Engineer will classify cracks as either nonstructural or structural. In general, nonstructural cracks are cracks 1/2 inch or less deep from the surface of the concrete; however, the Engineer may determine that a crack greater than 1/2 inch deep is nonstructural. In general, structural cracks are cracks that extend deeper than 1/2 inch. As an exception, all cracks in concrete bridge decks that are supported by beams or girders will be classified as nonstructural and repair will be in accordance with 400-21.5.1. However, if the Engineer determines that repair under 400-21.5.1 is unacceptable, repair in accordance with 400-21.5.2.

A crack that is fully or partially underwater at any time during its service life will be classified as a structural crack unless the Environment note on the General Notes sheet in the Plans categorizes the substructure as slightly aggressive, in which case, the nonstructural crack criteria may apply as determined by the Engineer.

Review and comment on the Engineer's crack classification; however, the Engineer will make the final determination.

SUBARTICLE 400-21.5.2 is deleted and the following substituted:

400-21.5.2 Structural Cracks: Submit an Engineering Analysis Scope in accordance with 6-4, signed and sealed by the Contractor's Engineer of Record, to determine the strength and durability of the proposed repair. Upon approval of the EAR and final determination of the Engineer, repair or remove and replace the cracked concrete in accordance with the approved EAR.

Table 400-3
DISPOSITION OF CRACKED CONCRETE OTHER THAN BRIDGE DECKS
[see separate Key of Abbreviations and Footnotes for Tables 400-3 and 400-4]

Elevation Range	Crack Width Range (inch) [2] x = crack width	Cracking Significance Range per LOT [1]											
		Isolated			Occasional			Moderate			Severe		
		~~Less than~~ ≤ 0.005%			≥ 0.005% ~~to~~ < 0.017%			≥ 0.017% ~~-~~ < ~~to <~~ 0.029%			≥ 0.029% ~~or gtr.~~		
		Environment Category											
		SA	**MA**	**EA**	**SA**	**MA**	**EA**	**SA**	**MA**	**EA**	**SA**	**MA**	**EA**
~~Elevation: ≤~~ ~~0 to~~ 6 ft AMHW	x ≤ 0.004	NT	NT	PS [6, 8]	NT	PS [6, 8]	PS [6, 8]	PS [6, 8]	PS [6, 8]				
	0.004 < x ≤ 0.008	NT	PS [6, 8]	EI [3]	PS [6]	EI [3]	EI [3]	PS [6]					
	0.008 < x ≤ 0.012	NT	PS [6]	EI									
	0.012 < x ≤ 0.016	PS [6]	Investigate to Determine Appropriate Repair [4, 5] or Rejection										
	0.016 < x ≤ 0.020												
	0.020 < x ≤ 0.024												
	0.024 < x ≤ 0.028												
	x > 0.028												
~~Elev.: More Than~~ 6 ft ≤ ~~to 12~~ 20 ft AMHW	~~Crack Width~~	**SA**	**MA**	**EA**	**SA**	**MA**	**EA**	**SA**	**MA**	**EA**	**SA**	**MA**	**EA**
	x ≤ 0.004	NT	NT	PS [6, 8]	NT	PS [6, 8]	PS [6, 8]	PS [6, 8]	PS [6, 8]	PS [6, 8]	PS [6, 8]		
	0.004 < x ≤ 0.008	NT	PS [6]	EI [3]	PS [6]	PS [6]	EI [3]	PS [6]	EI [3]				
	0.008 < x ≤ 0.012	NT	PS [6]	EI	EI	EI							
	0.012 < x ≤ 0.016	PS [6]	EI	EI	EI								
	0.016 < x ≤ 0.020	EI	Investigate to Determine Appropriate Repair [4, 5] or Rejection										
	0.020 < x ≤ 0.024												
	x > 0.024 ~~4 < x ≤ 0.028~~												
~~Elev.:~~ Over Land or ~~More~~	~~Crack Width~~	**SA**	**MA**	**EA**	**SA**	**MA**	**EA**	**SA**	**MA**	**EA**	**SA**	**MA**	**EA**
	x ≤ 0.004	NT	NT	NT	NT	PS [6, 8]	PS [6, 8]	PS [6, 8]	PS [6, 8]	PS [6, 8]	PS [6, 8]		
	0.004 < x ≤ 0.008	NT	PS [6]	PS [6]	PS [6]	PS [6]	EI [3]	PS [6]	EI [3]	EI [3]	PS [6]		
	0.008 < x ≤ 0.012	NT	PS [6]	EI	EI	EI	EI	EI	EI				
	0.012 < x ≤ 0.016	PS [6]	EI	EI	EI	EI	EI						

Table 400-3
DISPOSITION OF CRACKED CONCRETE OTHER THAN BRIDGE DECKS
[see separate Key of Abbreviations and Footnotes for Tables 400-3 and 400-4]

	0.016 < x ≤ 0.020	EI	EI	EI	EI	Investigate to Determine Appropriate Repair [4, 5] or Rejection		Reject and Replace
	0.020 < x ≤ 0.024	EI						
	x > 0.024 ~~< x ≤ 0.028~~							

Table 400-4
DISPOSITION OF CRACKED CONCRETE BRIDGE DECKS
[see separate Key of Abbreviations and Footnotes for Tables 400-3 and 400-4]

Elevation Range	Crack Width Range (inch) [2] x = crack width	Cracking Significance Range per LOT [1]											
		Isolated ~~less than~~ ≤ 0.005%			Occasional ≥ 0.005% ~~to~~ < 0.017%			Moderate ≥ 0.017% ~~to~~ < 0.029%			Severe ≥ 0.029% ~~or gtr.~~		
		Environment Category											
		SA	MA	EA	SA	MA	EA	SA	MA	EA	SA	MA	EA
~~Elevation:~~ 12 20 feet or Less AMHW	x ≤ 0.004	NT	NT	NT	NT	NT	NT	NT	NT	NT			
	0.004 < x ≤ 0.008	NT	NT	EI/M	NT	NT	EI/M	EI/M	EI/M	EI/M			
	0.008 < x ≤ 0.012	NT	NT	EI/M	NT	EI/M	EI/M	EI/M	EI/M				
	0.012 < x ≤ 0.016	NT	NT	EI/M	NT	EI/M							
	0.016 < x ≤ 0.020	EI/M	EI/M	EI	EI								
	0.020 < x ≤ 0.024	EI/M	EI	EI	Investigate to Determine Appropriate Repair [4, 5] or Rejection						Reject and Replace		
	0.024 < x ≤ 0.028	EI/M	EI										
	x > 0.028												
~~Elevation:~~ Over Land or More Than 12 20 feet AMHW	Crack Width	SA	MA	EA	SA	MA	EA	SA	MA	EA	SA	MA	EA
	x ≤ 0.004	NT	NT	NT	NT	NT	NT	NT	NT	NT			
	0.004 < x ≤ 0.008	NT	NT	NT	NT	NT	EI/M	NT	EI/M	EI/M			
	0.008 < x ≤ 0.012	NT	NT	EI/M	NT	NT	EI/M	EI/M	EI/M				
	0.012 < x ≤ 0.016	NT	NT	EI/M	NT	EI/M							
	0.016 < x ≤ 0.020	NT	EI/M	EI	EI/M								
	0.020 < x ≤ 0.024	NT	EI/M	EI	Investigate to Determine Appropriate Repair [4, 5] or Rejection						Reject and Replace		
	0.024 < x ≤ 0.028	NT	EI/M										
	x > 0.028												

Key of Abbreviations and Footnotes for Tables 400-3 and 400-4		
Type Abbreviation	Abbreviation	Definition
Repair Method	EI	Epoxy Injection
	M	Methacrylate
	NT	No Treatment Required
	PS	Penetrant Sealer
Environment Category	EA	Extremely Aggressive
	MA	Moderately Aggressive
	SA	Slightly Aggressive
Reference Elevation	AMHW	Above Mean High Water

Footnotes

(1) Cracking Significance Range is determined by computing the ratio of Total Cracked Surface Area (TCSA) to Total Surface Area (TSA) per LOT in percent [(TCSA/TSA) x 100] then by identifying the Cracking Significance Range in which that value falls. TCSA is the sum of the surface areas of the individual cracks in the LOT. The surface area of an individual crack is determined by taking width measurements of the crack at 3 representative locations and then computing their average which is then multiplied by the crack length.

(2) Crack Width Range is determined by computing the width of an individual crack as computed in (1) above and then identifying the range in which that individual crack width falls.

(3) When the Engineer determines that a crack in the 0.004 inch to 0.008-inch width range cannot be injected then for Table 400-3 use penetrant sealer unless the surface is horizontal, in which case, use methacrylate if the manufacturer's recommendations allow it to be used and if it can be applied effectively as determined by the Engineer.

(4) (a) Perform epoxy injection of cracks in accordance with Section 411. Seal cracks with penetrant sealer or methacrylate as per Section 413. (b) Use only methacrylate or penetrant sealer that is compatible, according to manufacturer's recommendations, with previously applied materials such as curing compound or paint or remove such materials prior to application.

(5) When possible, prior to final acceptance of the project, seal cracks only after it has been determined that no additional growth will occur.

(6) Methacrylate shall be used on horizontal surfaces in lieu of penetrant sealer if the manufacturer's recommendations allow it to be used and if it can be applied effectively as determined by the Engineer.

(7) Unless directed otherwise by the Engineer, repair cracks in bridge decks only after the grinding and grooving required by 400-15.2.5 is fully complete.

(8) Cracks on the vertical surface narrower than 0.004 inches will require treatment including topical waterproofing as determined by Engineer.