

Attachment 2021-2.0: Defects to be Recommended for Contract Repair Defined for Reinforced Concrete Delamination / Spall / Patched Area

This document provides guidance for recommending contract repairs for defects found on bridge components comprised of reinforced concrete. The purpose of this notification is to promote consistency in the selection of defects recommended for repair and to prioritize the bridges for repair under the Authority's annual maintenance repair contracts. Refer to Attachment 2021-1.0 (Concrete Deterioration Terminology) and AASHTO's Manual for Bridge Element Inspection (2nd Edition, 2019) (MBEI) for detailed definitions of the terminology and Element Inspection Defect Codes listed below. Reference is also made to the Bridge Inspector's Reference Manual (2012) (BIRM) for further guidance on the defects and defect descriptions themselves.

Defect Term (MBEI Defect Code)	Bridge Component	Defects to be Recommended for Contract Repair - Description and Examples
Delamination / Spall / Patched Area (1080)	Top of Deck	Moderate to severe or extensive concrete deterioration on bare decks or on areas of the concrete deck exposed due to wearing surface deterioration. Examples: • Large, deep spalls with exposed rebar. • Temporary repairs (asphalt patches) or concrete patches that may have been repeatedly filled and/or are severely rutted / shoved / deteriorated (see Note 2). • Deep spalls with or without exposed rebar located in or near a wheel path. • Several spalls or clusters of spalls of varying depths covering large areas. • Large, deep spalls with exposed rebar visible through a pothole on the wearing surface. • Large areas of deteriorated wearing surface with pumping concrete (indication of deck spalling beneath).
	Underdeck	Moderate to severe concrete deterioration on bare underdecks or on areas of the concrete deck exposed due to SIP deterioration. There may be exposed and corroded rebar with or without section loss. Examples: • Large spalls with exposed and corroded rebar exhibiting moderate to advanced section loss. • Large areas of delaminated concrete with evidence of active deck contamination (e.g., dampness, leakage staining, efflorescence, rust staining, etc.). • Large quantities of moderate to wide cracking (map, transverse, random, etc.) with signs of active deck contamination (e.g., dampness, leakage staining, efflorescence, rust staining, etc.). • Large spalls with exposed and corroded rebar exhibiting moderate to advanced section loss visible through areas of 100% section loss on the SIP.

	Substructure	Moderate to severe deterioration. There may be exposed and corroded rebar with or without section loss. Examples: • Spall on bearing seat / pedestal with moderate to significant undermining of masonry plates (30% and greater) and/or partial exposure of anchor bolts. • Large, deep spalls with or without exposed and corroded rebar which may be surrounded by delaminated concrete. • Significant quantity of isolated deep spalls at a particular substructure unit (pier cap, column, pile, or abutment) with or without exposed and corroded rebar. • Significant quantities of delaminated concrete that exhibit moderate to severe signs of distress. • Delaminated and cracked previous concrete repairs. • Large area of significant ASR (alkali-silica reactivity).
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Notes:

1. The severity of all defects mentioned above should be evaluated taking into consideration the size of the component, the location, and the effect of the loss of concrete section on the strength and/or serviceability of the component or the bridge when determining the need for repair through contract.
2. Temporary repairs on a concrete deck (asphalt patches) do not waive the need for repair through contract.
3. The inspector should use engineering judgment along with the guidance provided herein to determine the need for contract repair, and the MBEI defect descriptions to assign the defect quantities to the appropriate Condition States. Be advised that the Conditions States alone do not necessarily indicate a repair is needed; rather, the impact of each defect on the strength and/or serviceability of the component or the bridge must be considered. For example, the following concrete substructure defects would be considered “non-impactful” and generally would not be recommended for repair:
 - Delaminated areas with superficial cracking, discoloration, and/or efflorescence.
 - Isolated shallow cover spalls with exposed and lightly corroded rebar.
 - Large edge spalls with exposed and lightly corroded rebar between the bearing pedestals or along the corners of columns.