



BRIDGE ADVISORY
Construction & Technology Division
Bridge Operations Section

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SUBJECT: Fracture Critical Details (SI&A Item 92A)

ISSUED BY: Fracture Critical Bridge Engineer

REVIEWED BY: Bridge Operations Engineer

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On January 31, the Michigan Bridge Inspection System (MBIS) was enhanced to allow inspection data to be collected for structures having Fracture Critical members, structures having fatigue sensitive members, underwater inspections, and other special inspections. As a result of this development, MDOT is asking all bridge owners to review and update the Federal Structural Inventory and Appraisal (SI&A) Item 92 – Critical Feature Inspections.

For bridges having fracture critical members, Item 92A must be coded 'Y' and the inspection interval in months needs to be shown. Certain bridge types most often will have fracture critical members and these can be identified in the bridge database by SI&A Item 43. Item 43-Structure Type has two components, 43A-Material, and 43B-Type of Design. Any combination of the following Materials and Type of Design may potentially be Fracture Critical.

ITEM 43A

03 Steel
04 Steel Continuous
08 Aluminum

ITEM 43B

03 Girder & Floor Beam – Deck Non Composite
33 Girder & Floor Beam – Composite Girder
25 Girder – Thru
09 Truss - Deck
10 Truss – Thru & Pony
12 Arch - Through
13 Suspension
14 Stayed Girder
15 Movable - Lift
16 Movable - Bascule
17 Movable – Swing

Bridge Owners should review their bridge inventory. After determining if they have the above structure types, these structures should be evaluated to determine if they should be coded as Fracture Critical. This would result in updating Item 92A-Fracture Critical Details and setting an inspection interval.

There are a few structures that may have fracture critical members and the structure type does not match the above list. An example would be a pier having a steel cross girder supporting the superstructure. The Bridge Inspection Reference Manual (BIRM), Section 8 provides information regarding inspection and evaluation of fracture critical structures. The BIRM is available on the National Highway Institutes (NHI) website at the following link:

<http://www.nhi.fhwa.dot.gov/downloads/freebees/10/RM%20Reference%20Manual%202006.pdf>

As per the National Bridge Inspection Standards (NBIS), fracture critical members (FCMs) on bridges must be inspected at intervals not to exceed twenty-four months, and certain FCMs require inspection at less than twenty-four-month intervals, considering such factors as age, traffic characteristics, and known deficiencies.

The following documents are also available on the internet:

- FHWA Reporting and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges, December 1995
 - <http://www.fhwa.dot.gov/BRIDGE/mtguide.pdf>
- Michigan Structure Inventory and Appraisal Coding Guide
 - http://www.michigan.gov/documents/MDOT-Bridge-SIAMANUAL-2_87989_7.pdf
- National Bridge Inspection Standards
 - <http://www.fhwa.dot.gov/bridge/nbis.htm>

It is important that information on the SI&A form be reviewed during a bridge inspection to check the accuracy of the inventory data. SI&A data can be updated through MBIS.