

## LOAD RATING #4, PID 92742

### NOTES FROM MARK STOCKMAN, P.E., P.S., CEAO FEDERAL BRIDGE QA/QC ENGINEER

#### FRACTURE CRITICAL PLAN:

The 2009 Bridge Agreement required a determination and drawing of the Fracture Critical (FC) members to be done by December 31, 2011, and that deadline was met. However, the Metric Plan of Action has a deadline of April 1, 2013 for ALL Fracture Critical Plan (FCP) and Fatigue Prone Detail (FPD) to be complete. The ODOT Inspection Manual calls for a complete FCP, including a Fatigue Prone Detail (FPD), and FHWA (as part of the Metric Review) wants inspection procedures for each bridge (see Item 3 below). So, I have added Tasks 3.1.2 and 3.1.3 on the Task Performance Request Check Sheet to cover these two areas. Please be aware that these two tasks are not specifically Load Rating issues, but they are related specifically to the load rating that was already done on the fracture critical bridges. In other words, to load rate a Fracture Critical bridge and identify the FC members, these two steps would have to be performed (or should have been performed) in the process of load rating. (The load rating had to start with an inspection, and these are components of the inspection). However, because they were not specifically called out as a Task in the past, they were not documented and made part of the final FCP. So, to allow proper completion of the annual BR-86 inspection form and to satisfy future QAR audits, it makes sense that they be singled out as specific tasks, deliverable to the County and made a part of their overall Fracture Critical Plan.

Here is a list of other items worth mentioning:

1) The following bridge types are exempt from load rating:

- Stone structures (regardless of plans) (Method of Analysis = 5, Plan Info Avail = 0)
- Precast round/elliptical concrete pipes (regardless of plans) (Method of Analysis = 5, Plan Info Avail = 0)
- Round Plastic pipes (regardless of plans) (Method of Analysis = 5, Plan Info Avail = 0)
- Concrete and Prestressed concrete (without plans) (Method of Analysis = 5, Plan Info Avail = 0)
- Steel beams with Jack arch decks (without plans) when the beam is encased so it can't be measured (Method of Analysis = 5, Plan Info Avail = 0)
- Deep Culverts with over 6.5' of fill (regardless of plans)

2) If the bridge does not carry Vehicular Traffic, it does not have to be load rated, but be sure it is coded correctly in the BMS Item 95-97, and 100. Type Service code "other" in Item 100 is reserved for non-highway traffic such as conveyor, runway, sewer pipe, etc. Note that if the bridge carries private highway traffic, it is coded as one of the "highway" codes, not "other". Remember also that these non-highway bridges are to be coded as FC=N even though they may be a truss or girder.

3) - The Fracture Critical Plan was identified by FHWA in the Metric Review as "needing improvement". The FC Plan should contain not only the FCM Identification (all counties reported

they had this), but also a Fatigue Prone detail and an Inspection Procedure. These items are added to the checklist under Task 3.1 Plan Preparation.

The Fatigue Prone Detail, FPD, is shown in the FCM/FPD Plan example that is included in Appendix F of the ODOT Bridge Inspection Manual. ODOT considers the FPD as a necessary component in order to answer Survey Box #6 on the BR-86. The absence of a FPD results in a 0 coding (not good).

The Inspection Procedures are described in the AASHTO Manual for Bridge Evaluation, Section 4. Basically, FHWA believes some FCM, Diving, or complex bridges warrant specific procedures for the use of future inspectors. The procedures required in the NBIS for specific types of more complex inspections (fracture critical, underwater and complex bridges) address those items that need to be communicated to an inspection team leader to insure a successful bridge inspection. These inspections must be planned and prepared for, taking into account needed access, inspection equipment, structural details, inspection methods and the required qualifications of inspecting personnel. The AASHTO MBE, Section 4, has general considerations regarding inspection plans. An owner may have general overall inspection procedures in their bridge inspection manual which address common aspects of these more complex inspections; however, each bridge must have written inspection procedures specific to each bridge which address items unique to each bridge. These items should be addressed for each of these types of bridge inspections, either in the bridge specific inspection procedures, or by referring to general inspection procedures (typically in their bridge inspection manual):

4) - Gusset Plate Analyses are supposed to be done, but in case there was some error and they got missed, it is included under Task 4.

5) - Load rating for all types of bridges (except culverts) is under Task 5. Culvert Load rating is under Task 6. Some bridges are coded with Item 63 Structure Type = "Other". Task 5.2.4 is for these bridges, not for bridges with Item 100 Service Type = "other".

6) - Remember that the FHWA requires the load ratings to be signed and stamped by a PE.

7) - We recommend that you do not use this funding for the 80% load rating deadline. If you are using this funding to meet your 80% load rating deadline of October 1, be aware that these funds will finally be authorized only a few months before the October 1 deadline and you should be sure the consultant can perform the load rating by the deadline.

8) - If you want to check the list of bridges that need load rated (as of December 2011), contact Mark Stockman at [mcstockman@gmail.com](mailto:mcstockman@gmail.com)