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# ENGINEERING INSTRUCTION

NEW YORK STATE DEPARTMENT OF TRANSPORTATION

SUBJECT: TECHNICAL POLICY AND PROCEDURES MANUAL  
USERS MANUAL FOR BRIDGE INVENTORY AND  
INSPECTION, PART III - RATING  
Subject Code: 7.35-11 DISTRIBUTION OF LOAD RATINGS

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Distribution:

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APPROVED:



E.V. HOURIGAN, Deputy Chief Engineer (Structures)

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Purpose: This issuance has been prepared to explain the attached results of the Level II Load Rating of a bridge or bridges. It shall accompany all Level II Load Ratings at any time such ratings are distributed.

Load Rating Levels: Load ratings are classified by level, which is a measure of the sophistication of the analysis performed to determine the rating values. Level I load ratings are the most thorough and result from a complete, detailed superstructure analysis and an evaluation of the substructure. The superstructure analysis should take into account the condition of superstructure elements and any design details which might affect load carrying ability. The substructure evaluation is important since it may control the rating in some cases. Load posting, if needed, can only be based on a Level I load rating.

The enclosed ratings are Level II load ratings and are not accurate enough for load posting. Level II load ratings are estimates of the load capacity of the superstructure based on a limited analysis. Level II load ratings do not represent a complete analysis of the superstructure or consider the possibility that the substructure may control the load rating.

It is important that the difference between Level I and Level II load ratings is clearly understood. It is also important to understand that there is no acceptable method available at this time to mass-produce Level I load ratings, nor is there likely to be in the near future. Level I load ratings must be the result of careful inspection and analysis, "hand-crafted" for each bridge.

Attached is a copy of E.I. 81-20, which gives more information on different rating levels and the uses of each.

Inventory Rating and Operating Rating: Bridges are generally rated at two stress levels, one known as the "Inventory Rating" (lower stress rating) and the second as the "Operating Rating" (higher stress rating). In general, the Inventory Rating corresponds to the load which can safely utilize an existing bridge for an indefinite period of time, while the Operating Rating is the absolute maximum permissible load to which a structure should be subjected. Reference should be made to the current "Manual For Maintenance Inspection Of Bridges" prepared by the American Association of State Highway and Transportation Officials (AASHTO) for more precise definitions of these terms and other bridge load rating information. The current "Manual For Maintenance Inspection Of Bridges" can be purchased for \$2.50 by writing to: AASHTO, 444 North Capitol Street, N.W. Suite No. 225, Washington, D.C. 20001.

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Bridge owners are given some latitude in determining the stress level used for bridge posting. Reference should be made to the AASHTO Manual cited above for further details.

Load Rating Information Transmitted: This issuance transmits two copies of Level II load ratings for selected bridges in your Region. This information is presented in two formats, the first a "Detailed Listing" and the second a "One-Line Summary Listing."

1. Detailed Listings - The Detailed Listings show all input data used for the load rating computation and numerous intermediate calculated values. This information will be useful in reviewing bridge ratings and performing follow-up Level I Load Ratings. The Load Ratings shown on the detailed listings are presented in the following format:

\*\*\*Live Load -- HS 20 \*\*\*  
Inventory Rating 1.30 EQUALS 46 TONS  
Operating Rating 2.14 EQUALS 76 TONS

This means that the particular bridge element analyzed is estimated to be able to support 1.3 HS 20 Loadings before being stressed to the Inventory Stress Level. The gross weight of 1.3 HS 20 Loadings is 46 TONS. Likewise, the bridge element is estimated to be able to support 2.14 HS 20 Loadings before it would be stressed to the Operating Stress Level. The gross weight of 2.14 HS 20 Loadings is 76 TONS.

If a computed Inventory Rating is equal to or greater than 1.0 for an HS 20 Loading (State's current design standard), the bridge is only analyzed for the HS 20 Loading. However, if the computed Inventory Rating is less than 1.0 HS 20 Loadings, the bridge is also analyzed for other loading configurations, including an H Loading which simulates a 2-axle truck. Reference should be made to the AASHTO Manual cited above and the New York State "Standard Specification for Highway Bridges" for details on different loading configurations.

2. Summary Listing - The headings on the Summary Listing are explained on the Summary Listing cover sheet titled "Explanation of Headings for Rating Summary Listings". The Summary Listing shows the critical Level II Inventory and Operating Ratings computed for each bridge included in the Detailed Listings. The Summary Listing also shows any existing load posting at the bridge as recorded in the State Inventory File. This listing should be valuable to bridge owners for scanning purposes.

Disposition of Transmittal: One copy of the Detailed Listings and the Summary Listings should be retained in the Regional Office. The Detailed Listings should be separated by BIN and placed in the appropriate BIN files in the Regional Office. The second copy should be sent to the holder of the second copy of the BIN File, if one exists. Normally, there is one file for state bridges, and two for local bridges. The recipient of the second copy should be instructed to place the Detailed Listing rating information in the second copy of the BIN File.

When the owner of a bridge is not the same as the holder of the second BIN File, the Regional Office should instruct those in possession of the second BIN File to notify the bridge owner of the rating results by forwarding to each owner

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a copy of the Summary Listing. In some cases, the appropriate Detailed Listing may also have to be forwarded to the bridge owner (See below).

In the case of bridges inspected by the State, only one BIN folder will exist. When this is true, the bridge owner, if other than the State, shall be given a copy of the Summary Listing, and, if desired, a copy of the Detailed Listings.

A copy of E.I. 81-20 and this memorandum should accompany the transmittal of any rating information.

Required Actions. While the enclosed Level II Load Ratings are not accurate enough to determine postings, they are an important source of information for use by those responsible for bridges as an aid in determining which bridge should receive Level I Load Ratings. One method of accomplishing this is by comparing the approximate capacities indicated to the posted values.

It is the responsibility of those owning bridges to arrange for Level I Load Ratings when they believe such ratings are required. The Structures Division will not perform these ratings for local bridges, and can only perform a very limited number of such ratings for state bridges.

Problems With Enclosed Ratings: If any problems are found with the enclosed load rating data, inform the Structures Design Systems Unit of the Structures Design and Construction Division as quickly as possible, through the Regional Office. When describing a problem, be as specific as possible by stating the exact nature of the problem, as well as the BIN or BINS for which the problem is known to exist. This request for information should not be used as an invitation to request Level I Load Ratings on specific bridges. Bridges with low Level II Load Ratings should be investigated further by the bridge owners.

Only problems directly associated with the Level II Load Ratings program or associated inspection information should be reported.