

**IOWA DEPARTMENT OF TRANSPORTATION**

To Office Bridges and Structures

Date January 4, 2007

Attention All Employees

Ref No. 521.31

From Gary Novey

Office Bridges and Structures

Subject MM No. 157 (HS25 Loading on Substructures)

As part of the conversion to design using the AASHTO Load and Resistance Factor Design (LRFD) specifications, superstructures for the following bridges shall now be designed using the LRFD specifications:

1. Straight welded steel girder bridges
2. Non-standard rolled steel bridges
3. Pretensioned prestressed concrete bridges
4. Continuous concrete slab bridges

In addition, until we have adopted LRFD design for the complete bridge, substructures shall be designed for HS-25 live loading under the AASHTO standard specifications.

HS-25 loading shall be defined as:

1. The lane load shall be taken as a uniform load of 800 pounds per linear foot of load lane and a concentrated load of 22,500 pounds for moment and 32,500 pounds for shear [AASHTO-I 3.7.1.2, 3.7.1.3, and Figure 3.7.6B].
2. The HS truck shall have a front axle weight of 10,000 pounds and two following axles of 40,000 pounds each. Axle spacing shall be the same as for HS-20 loading [AASHTO-I 3.7.6 and Figure 3.7.7A].
3. The Alternate Military Loading shall remain without increase, as given in the specifications [AASHTO-I 3.7.4].

The following revised design specifications and general note shall be used:

**E50C: Specifications and design stresses, LRFD superstructure and standard substructure bridge**

**SPECIFICATIONS:**

DESIGN: SUBSTRUCTURE: AASHTO STANDARD SERIES OF 2002.  
SUPERSTRUCTURE: AASHTO LRFD SERIES OF 2004.

CONSTRUCTION: IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2001, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS,

DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

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DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 2002 AND AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SERIES OF 2004.

REINFORCING STEEL IN ACCORDANCE WITH STANDARD AASHTO SECTION 8 AND LRFD AASHTO SECTION 5, GRADE 60.

CONCRETE IN ACCORDANCE WITH STANDARD AASHTO SECTION 8 AND LRFD AASHTO SECTION 5,  $f'_c = 3,500$  PSI, EXCEPT BRIDGE DECK AND PRESTRESSED BEAM CONCRETE AS NOTED.

PRESTRESSED CONCRETE BEAMS, SEE DESIGN SHEET?

BRIDGE DECK  $f'_c =$

STRUCTURAL STEEL IN ACCORDANCE WITH STANDARD AASHTO SECTION 10 AND LRFD AASHTO SECTION 6. ASTM A709 GRADE 36, GRADE 50, AND GRADE 50W (AASHTO M270 GRADE 36, GRADE 50, AND GRADE 50W ).

These standard bridge design notes are to be used on the front estimate sheet where the superstructure is designed using LRFD and the substructure is designed using the Standard Specifications [OBS MM No. 157].

**E104C: Live load, HL-93 superstructure and HS-25 substructure**

THE BRIDGE SUBSTRUCTURE IS DESIGNED FOR HS-25 LOADING, PLUS 20 LBS. PER SQUARE FOOT OF ROADWAY FOR FUTURE WEARING SURFACE.

THE BRIDGE SUPERSTRUCTURE IS DESIGNED FOR HL-93 LOADING, PLUS 20 LBS. PER SQUARE FOOT OF ROADWAY FOR FUTURE WEARING SURFACE.

Use these notes for the design live load requirement for all new bridges on primary highways, where the superstructure is designed using LRFD and the substructure is designed using the Standard Specifications [OBS MM No. 157].

All new projects that have not yet been started shall meet this requirement. In addition, any project currently under design will be assessed to determine the need to meet these requirements. However, in general, only interstate projects may require redesign.

If you have any questions, please check with me.

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