



MEMORANDUM

TO: District Engineers

DATE: April 28, 2005

FROM: William R. Cox, P.E.

SUBJECT: New and Revised Bridge Railing and Rail Anchorage Standard Drawings (English)

New and revised bridge railing and rail anchorage standard drawings, with a revision/issue date of April 2005, are posted on the TxDOT web site and are available for immediate use.

Significant revisions to rail standards include the following:

- When used in applications with design speeds of 45 mph and less, rail types approved for design speeds in excess of 45 mph (except Type HT) now include details accommodating the low design speed, Test Level 2 (TL-2), metal beam guard fence (MBGF) transition shown on standard drawing MBGF(TL2)-03.
- Rails only approved for design speeds of 45 mph and less now have details accommodating the TL-2 MBGF transition.
- Concrete rail anchorage embedment in abutment wingwalls and cast-in-place retaining walls has been reduced from 1'-3" to 1'-0".
- Intermediate wall joint details for concrete rails have been revised to enhance constructability and long term performance.
- More permissive welding limits have been provided for anchorage reinforcement for rails constructed by slip-forming.

New rail types are:

- Types T221, C221, and B221. These rail types replace Types T201, C201, and B201, respectively. The concrete portion of these rails is taller and wider than the rails they replace. They use the same slab anchorage reinforcement as the Type T501 rail. Type T221 may be used for design speeds in excess of 45 mph. Types C221 and B221 may be used only for design speeds of 45 mph or less.
- Type T401. This rail replaces Types T4(S) and T4(A). The concrete portion of this rail is wider than its predecessor. A three-bolt anchorage for the upper steel rail element facilitates slip-forming, minimizes damage from hits, and facilitates repairs when needed. This rail may be used for design speeds in excess of 45 mph. This rail currently accommodates a steel upper component only. Implementation of an aluminum upper component for this rail type is being evaluated.

- Types T402 and C402. Type C402 is intended as a replacement for Type C4(S), and Type T402 is a traffic version of this combination rail. The concrete portion of these rails is wider than that of the C4(S). They use a three-bolt anchorage, similar to the Type T401 rail. These rails may be used for design speeds in excess of 45 mph.
- Type T77. This aesthetic traffic rail represents implementation of results of TxDOT research projects 0-4288 and 0-4852. It is comprised of two elliptical steel tubes welded to steel posts. The posts are mounted to a short concrete parapet. This traffic rail may be used for design speeds in excess of 45 mph. Please refer to the standard drawing for a listing of geometric restraints on the use of this rail. Predicted cost is higher than for other rail types.

The only significant revision to the following rail-related standard drawings is the accommodation of new rail types:

- TRF
- RW(TRF)
- BBRA-S and BBRA-O
- DTBRA-S and DTBRA-O
- PSBRA
- CGRAD
- RAC

Standard drawing T6-CM has been revised to allow use on curb heights less than 8".

The Rail Anchorage Curb Retrofit (RAC-R) drawing is a new retrofit guide drawing (not a standard drawing). This drawing provides guidance for preparing job-specific details to retrofit a bridge rail to an existing box culvert. This guide drawing is limited to applications with 2' of fill or less due to structural adequacy concerns with existing culvert structures.

The T2/T201 Transition Retrofit Guide (T2/T201TR) and the T202 Transition Retrofit Guide (T202TR) are also new retrofit guide drawings (not standard drawings). These drawings provide guidance for preparing job-specific details to retrofit a Thrie-Beam terminal connector to existing T2, T201, and T202 rails.

Rail types C101, T201, C201, B201, T4(S), T4(A), and C4(S) are no longer provided on standard drawings. Type C101 railing does not meet the intent of the geometric requirements set forth in the *AASHTO LRFD Bridge Design Specifications*. The other listed rail types still meet current crash test requirements and, when requested, will be made available as standard drawings until December 31, 2005. Standard drawing OPA-4, Optional Preset Anchorage System for Types T4 and C4 rails, is also no longer available.

These rail standard drawings and other standard drawings are available from the Bridge Standards (English) web pages in MicroStation® “dgn” and Adobe® Acrobat® “pdf” formats. The *Bridge Railing Manual* is being revised to reflect these changes and will be republished online at <http://manuals.dot.state.tx.us/dynaweb/colbridg/rlg> in June 2005. Please distribute this information to the appropriate district staff and area offices as well as consulting engineers working on TxDOT projects.

If you have questions or comments concerning these standard drawings, please contact John M. Holt, P.E., at (512) 416-2212, or Jon T. Ries at (512) 416-2191. For questions on bridge rail applications, please contact Mark Bloschock, P.E., at (512) 416-2178.

Note: Original signed by William R. Cox

cc: Federal Highway Administration
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