



MEMORANDUM

TO: District Engineers

DATE: June 14, 2011

FROM: David P. Hohmann, P.E.

SUBJECT: New Prestressed Concrete X-Beam Standard Drawings

New prestressed concrete X-beam standard drawings with an issue date of June 2011 are posted on the TxDOT web site and are available for immediate use.

X-beams are prestressed concrete box beams developed to maximize span length and performance with spread box beam framing. Compared to current TxDOT box beam cross sections, they have thicker webs, thicker bottom flanges, and accommodate more prestressing strands. They share the same exterior dimensions of the current box beams, with the differences resulting from changes to the internal void form.

Standard X-beam spans utilize spread box beam framing, with beam spacing similar to that of I-girder spans, and come with a conventional 8-inch thick deck that can be built with prestressed concrete panels. X-beam bridges are intended to be a more economical alternative to adjacently framed, or side-by-side, box beam bridges.

Key features of these standard drawings include the following:

- 32-, 38-, 40-, and 44-foot roadway widths are accommodated.
- 0-, 15-, and 30-degree skews are accommodated.
- Span lengths of 40 feet to 110 feet.
- 2- and 3-span units can be formed with details provided on standard drawing XBCS.
- Beam depths of 20-, 28-, 34-, and 40-inches and nominal beam widths of 4- and 5-feet. All standard spans use 5-foot wide beams.

Standard spans are restricted from having a combination of skew and roadway vertical curve and from having changes in roadway cross-slope. This restriction is to simplify the determination of bearing seat elevations and other dimensional controls. A custom bridge design can overcome these restrictions when needed. Geometry and elevations for custom X-beam bridges can be determined using the same tools and methods employed for U-beam bridges.

Spreadsheet STD-BRG.xls is updated to accommodate standard X-beam bridges. This tool will generate the necessary bearing seat elevations and provide a bearing pad taper report.

New standard drawings supporting prestressed X-beam construction are:

- XBEB—elastomeric bearing and bearing seat details
- XBBR-MS—erection bracing and miscellaneous slab details
- XBND—beam design information table for custom bridge designs
- XBTS—thickened slab end details

Bid codes for X-beams have been prepared and payment will be by the linear foot for “PRESTR CONC BOX BEAM” of the type specified (4XB28, 5XB40, etc.) under Item 425, “Precast Prestressed Concrete Structural Members.”

These and other bridge standard drawings are available on the Bridge Standards web pages in MicroStation® “dgn” and Adobe® Acrobat® “pdf” formats. See <http://www.dot.state.tx.us/business/standardplanfiles.htm> .

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.

Note: Original Signed By David P. Hohmann

cc: Federal Highway Administration
Bridge Design Consultants
Administration
Division and Office Directors
Directors of Transportation Planning and Development
District Bridge Engineers
Bridge Division Employees