



MEMO

May 9, 2016

To: District Engineers

From: Gregg A. Freeby, P.E.
Division Director, Bridge Division

Subject: Revised Prestressed Concrete Beam Designs Standard Drawings

Revised prestressed concrete beam designs standard drawings, with revision dates of May 2016, are posted on the TxDOT web site and available for immediate use.

These standard drawings are revised as such:

- Standard designs of prestressed beams using a three-tiered approach, executed in these steps:
 - Straight strands, non-debonded – when stress and concrete strength limits are exceeded, proceed to,
 - Straight strands, with debonding – when stress and concrete strength limits are exceeded, proceed to,
 - Harped strands,in accordance with new design procedures described in the December 15, 2015 memo from Gregg A. Freeby, attached. For the straight strand scenarios, the designs also reduced web stresses by raising straight web strands.

The revised standard drawings are:

- IGND and IGSD for all roadway widths, for I-Girders

These revised standard drawings apply to designs initiated on June 1, 2016 and beyond.

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

FDOT Mono font is available to TxDOT users in a LANDesk package and to external engineering users from the Bridge Standards web page. Refer to the August 29, 2013 memo, posted on the Bridge Standards web page, for more information on FDOT fonts.

For questions or comments concerning these standard drawings, please contact Taya A. Retterer, P.E. at 512/416-2719 or Jon T. Ries, at 512/416-2191.

Note: Original Signed By Gregg A. Freeby

OUR GOALS

MAINTAIN A SAFE SYSTEM ▪ ADDRESS CONGESTION ▪ CONNECT TEXAS COMMUNITIES ▪ BEST IN CLASS STATE AGENCY

An Equal Opportunity Employer

CC:

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



MEMO

December 15, 2015

To: District Engineers

From: Gregg A. Freeby, P.E.
Division Director, Bridge Division

Subject: New Design Procedures for Prestressed Concrete Beams and Girders

The Bridge Division would like to make all designers that prepare bridge plans for TxDOT aware of two upcoming design changes for Prestressed Concrete Beams and Girders.

Use of 0.6" Diameter Strand for all Prestressed Beams and Girders

Effective for designs initiated on February 1, 2016 and beyond, all prestressed beams and girders will be designed with 0.6 in. diameter strand only. The design benefits of 0.6 in. diameter strand are increased span lengths and positive net camber. Additionally, specifying 0.6 in. diameter strand for all prestressed beams reduces the chance of fabrication errors in jobs with many lengths of beams. The Precast Concrete Manufacturers' Association of Texas has provided their support to this design change.

Standard designs for all beam types that are provided on the Bridge Standards webpage will be updated to 0.6 in. diameter strand by this date. Superstructure section depths for standard designs are not affected by this change, nor are there any changes in abutment, bent, or span details on the standard drawings.

Templates for I-Girders within *PGSuper*® will be updated to have 0.6 in. diameter strand as the default by this date also.

These bridge standard drawings will be available on the Bridge Standards web page in MicroStation® "dgn" and Adobe® Acrobat® "pdf" formats. See <http://www.dot.state.tx.us/business/standardplanfiles.htm>.

Updated Design Procedure for Prestressed Concrete I-Girders

The Bridge Division is adopting a more robust and flexible, flexural design procedure for Prestressed I-Girders. The updated design procedure evaluates straight strand-debonded designs, in addition to traditional harped strand designs, using a three-tiered approach, executed in these steps:

- Straight strands, non-debonded – when stress and concrete strength limits are exceeded, proceed to,
- Straight strands, with debonding – when stress and concrete strength limits are exceeded, proceed to,
- Harped strands.

OUR GOALS

MAINTAIN A SAFE SYSTEM ▪ ADDRESS CONGESTION ▪ CONNECT TEXAS COMMUNITIES ▪ BEST IN CLASS STATE AGENCY

An Equal Opportunity Employer

For the straight strand scenarios, the procedure will also evaluate raising straight web strands to reduce end stresses. By retaining harped strands as the final option, the I-Girders will still achieve the lengths and loadings previously seen.

The Precast Concrete Manufacturers' Association of Texas has provided their support to this design procedure change. For Fabricators, debonded designs for I-Girders will allow them to optimize the use of prestressing strand and their prestressing beds, consequently reducing the production cost of the girders. Additionally, debonded strand girders are safer to fabricate than harped strand girders.

Programming and testing of the three-tiered procedure in *PGSuper*® is currently underway. The Bridge Division expects the next release of *PGSuper*® to be available in spring 2016. Also, the three-tiered design procedure is not being implemented in the *Prestressed Concrete Beam Design/Analysis Program (PSTRS14)*.

The three-tiered design procedure only applies to I-Girders; the remainder of the TxDOT prestressed beam inventory will continue to be designed with straight-debonded strand. Standard designs for I-Girders, provided on the Bridge Standards webpage, will be revised to reflect the three-tiered design procedure. Announcement and direction for use will be made at that time.

For questions or comments concerning this guidance, please contact Jamie F. Farris, P.E. at 512/416-2433.

Note: Original Signed By Gregg A. Freeby

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