

# **PENNDOT e-Notification**

Bureau of Business Solutions and Services  
Highway/Engineering Application Division



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## **BXLRFD**

No. 011  
August 9, 2010

**Release of Version 2.2.0.0**

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The Department's LRFD Box Culvert Design and Rating Program (BXLRFD) has been revised as described on the attached Summary of May 2010 Revisions.

The new program has been placed on PENNDOT servers for use by the Central Office and Districts. Consultants and others, who have a current license agreement for the BXLRFD Version 2.1.0.0 or 2.1.0.1 can obtain BXLRFD Version 2.2.0.0 by paying the license update fee of \$500 for private organizations and \$50 for governmental agencies. Updates for BXLRFD Version 2.0.0.0 will require an update fee of \$1,000 for private organizations and \$100 for governmental agencies. Updates for BXLRFD Version 1.4.0.0, 1.3.0.5, 1.3, 1.2, 1.1, or 1.0 will require an update fee of \$1,500 for private organizations and \$100 (not \$150) for governmental agencies. No update fee is required for Federal and State Transportation Agencies.

The forms for Software Update Request and Request for PennDOT's Engineering Software License can be downloaded at <http://penndot.engrprograms.com>.

Please direct any questions concerning the above to:

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Attachment

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Archived copies of all previously distributed e-Notifications can be obtained from the PENNDOT LRFD and Engineering Programs website at <http://penndot.engrprograms.com/home> and clicking on "e-Notification" and then "Mailing List Archives."

## **SUMMARY OF MAY 2010 REVISIONS - VERSION 2.2.0.0**

Since the release of BXLRFD Version 2.1.0.1 several revision requests and user requested enhancements have been received. This release of BXLRFD Version 2.2.0.0 corrects the following known problems and provides enhancements.

### **Input Revisions**

1. A new load has been added to the program to account for approach slabs supported by culverts. Dead load and Live load can be entered independently for each wall. (Request 179)
2. Minimum toe and heel projection checks have been added to the program for frame culverts. (Request 182)

### **Output Revisions**

3. The output has been modified to now indicate the origins where the slab and wall distances are referenced from. (Request 175)
4. The Allowable Crack Control Spacing has been added to the Output of Intermediate Data file. Previously, the now obsolete Allowable Crack Control Stress was shown. (Request 169)
5. The program has been enhanced to generate a PDF file for each output file. When possible, the PDF file contains bookmarks for easier navigation of the output. The PDF file also makes it easier to print and paginate the program output. (Request 170)
6. The Bottom Slab Steel Area Range values on the Input Summary Table have been revised to show the correct values. Previously, the program would incorrectly show the range values for the Top Slab. (Request 180)
7. The Output of Results parameters shown in the Input Summary table have been corrected. Previously, the Rating Summary and Dead Load Effects and Capacities parameters were shown in the wrong order. (Request 189)

### **Reinforcement Revisions**

8. The program has been revised to prevent the design of shear reinforcement within the walls of a culvert. The program will now increase the wall thickness if the shear capacity

## **SUMMARY OF MAY 2010 REVISIONS - VERSION 2.2.0.0**

is not adequate for DR run types. Previously, the program could potentially design shear steel in the walls of a culvert during a design run, but for an analysis run there was no way to enter the shear steel for the wall. (Request 176)

9. The program has been enhanced to check the development length of wall bars which extend into a strip footing for the controlling face of the wall during design runs. (Request 177)
10. The allowable crack control spacing calculation has been revised to return a large reinforcement spacing when the tensile stress within the reinforcement is less than zero (i.e. bar is in compression). Previously, the program would calculate the allowable crack control spacing with the negative tensile reinforcement stress and incorrectly return a design controlling spacing of zero. (Request 195)

### **General Program Revisions**

11. The BXLRFD program has been revised to no longer support SI unit input files. This is based on a decision by AASHTO Subcommittee on Bridges and Structures to no longer publish updates to the SI unit version 2007 AASHTO LRFD Bridge Design Specifications. (Request 188)

### **User Manual Revisions**

12. The On-Deck Live Load Distribution equation reference in Chapter 3 has been updated to cite the 2007 AASHTO LRFD Bridge Design Specifications. Previously, the equation cited a section of DM-4 that does not exist. (Request 166)