

PennDOT e-Notification

Bureau of Business Solutions and Services
Highway/Engineering Applications Division



PSLRFD

No. 016
July 5, 2016

Release of Version 2.10.0.0

The Department's LRFD Prestressed Concrete Girder Design and Rating (PSLRFD) program has been revised as described in the attached "Summary of May 2016 Revisions – Version 2.10.0.0".

The new program has been placed on PennDOT servers for use by the Districts. Consultants and others, who have a current license agreement for **PSLRFD Version 2.9.0.0**, can obtain the updated version by submitting an Update Request form along with the **update fee of \$500 for private organizations and \$50 for governmental agencies**. Updates for **PSLRFD Version 2.8.0.0 or earlier** will require an **additional fee**. For PSLRFD update fee details, refer to the following link: <http://penndot.engrprograms.com/home/Ordering/PSLRFD.htm>. The update fee is waived for federal and state transportation agencies.

The Software Update Request form can be obtained on the PennDOT Engineering Software Support website at <http://penndot.engrprograms.com> by clicking on "Ordering/Updating" and, then on "Update Form".

Please note that the software is no longer provided on a CD. Once payment is received, an e-mail will be sent with download instructions. The new installation will require a License Key that will be provided in the e-mail. A valid e-mail address must be provided on the Update Form in order to receive the download instructions.

Please direct any questions concerning the above to:

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Attachment

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 2016 REVISIONS - VERSION 2.10.0.0

Since the release of PSLRFD Version 2.9.0.0 several revision requests and user requested enhancements have been received. This release of PSLRFD Version 2.10.0.0 contains the following revisions and enhancements.

Specification Revisions

1. The PSLRFD program has been updated to the AASHTO LRFD Bridge Design Specifications Seventh Edition 2014 and the April 2015 PennDOT Design Manual Part 4.
2. The Assumptions and Limitations section in Chapter 2 of the User's Manual now notes that Blast Loading is not considered by the program. (Request 577)
3. The shear distribution factor for interior I-beams is now computed by the lever rule when the number of beams is three. (Request 579)
4. The program now does not consider sections to be under-reinforced or over-reinforced. Previously, sections having a "c/de" ratio greater than 0.42 were considered to be over-reinforced as defined in AASHTO Article 5.7.3.3.1. AASHTO Article 5.7.3.3 notes that Article 5.7.3.3.1 was deleted in 2005. (Request 580)
5. The variation of the resistance factor, ϕ , for sections in the transition zone between tension-controlled and compression-controlled is now defined by the net tensile strain in the extreme tension steel and the compression-controlled and tension-controlled strain limits. Previously, the variation in the resistance factor was expressed in terms of the ratio dt/c . (Request 581)
6. The cracking moment, M_{cr} , now includes three factors to account for 1) variability in the flexural cracking strength of concrete, 2) variability of prestress, and 3) the ratio of nominal yield stress of reinforcement to the ultimate tensile strength of the reinforcement. Previously, the factored flexural resistance was required to be at least equal to the lesser of 1.33 times the factored moment and 1.2 times the cracking moment. The 1.2 factor has been removed from the cracking moment. (Request 582)
7. The modulus of rupture used to determine the cracking moment is now computed as 0.24 times the square root of the compression strength of the concrete. Previously, a coefficient of 0.37 was used rather than 0.24. (Request 583)
8. Distribution factor range of applicability violations now result in a warning message noting the violation requires the approval of the District Bridge Engineer. Previously, these violations required approval of the Chief Bridge Engineer. (Request 584)

9. Violations of the maximum deck slab overhang length now result in a warning message noting the violation requires the approval of the District Bridge Engineer. Previously, these violations requires approval of the Chief Bridge Engineer. (Request 585)
10. Computation of the factored interface shear force is now based on the procedure in AASHTO Article 5.8.4.2 rather than the classical strength of material approach. The Slab Beam Interface parameter of the MCG command now includes the option for a cast-in-place slab on a roughened surface. The minimum area of interface shear reinforcement now considers the lesser of $0.05A_{cv}/f_y$, $1.33V_{ui}/\phi$, and $0.019 \text{ in}^2 \text{ per in.}$ (Request 586)
11. The calculated tensile stress in mild steel reinforcement at the service limit state is now limited to $0.60f_y$ when computing the allowable spacing for control of cracking by distribution of reinforcement. (Request 593)
12. The program is now correctly checking the overhang limit for design runs of adjacent box beams based on DM-4 Article 9.7.1.5.1P. Previously, the program incorrectly measured the overhang to the centerline of beam for adjacent box beams, instead of the centerline of the adjacent box beam web. (Request 598)

Rating Revisions

13. The controlling shear rating location is now the same in the Rating Summary Report and the Bridge Load Rating Report. Previously, when the controlling shear rating location was at a “d” critical location for a symmetrical structure, rarely one of the reports would identify the controlling shear location at the symmetrical “d” critical location in the opposite end of the span. (Request 560)
14. The shear ratings now correctly compute the component of effective prestressing force resisting shear for draped strands with debonding. (Request 578)

Documentation Revisions

15. For obsolete input parameters, the User Manual and Engineering Assistant help now notes “this parameter is no longer used” in the Chapter 5 Description and all other description, upper and lower limits, units, and defaults have been removed to avoid confusion. (Request 569)
16. The User Manual now includes Windows 10 in the list of supported Windows operating systems in Chapter 4. (Request 603)

Input Revisions

17. The program is now able to be run with a very long file name and/or path name, up to 256 characters in length. Previously, a path and file name combination over 204 characters would result in a program crash. (Request 602)

Output Revisions

18. Crack control debonding is now reported in the PRESTRESSING DATA output report for all strand types for analysis runs. Previously, crack control debonding was not reported in the PRESTRESSING DATA output report for draped or straight strand analysis runs. (Request 564)
19. The PRESTRESSING DATA output report for a draped design run that does not having any draped strands now prints completely without errors. Previously, the program would abort when this condition occurred. (Request 574)
20. The Flexural Resistance output table now includes the location of the neutral axis used to determine the nominal flexural resistance of the section. Previously, only the neutral axis location for elastic stresses on an uncracked section was given in the Section Properties output. (Request 521)
21. The Debonded/Draped Strand Output Table is now reporting the correct number of straight strands in the Straight/Debonded portion of the output table. Previously, when the strand rows in the Straight/Debonded portion of the output table also had draped strands in the same row, the draped strands were incorrectly reported with the straight/debonded strands. (Request 601)

Strand Design Revisions

22. The beam table for PennDOT I-beams now includes available strand patterns having mixed even and odd strand rows and the strand design routines now produce symmetrical strand patterns with mixed even and odd strand rows are present. (Request 571)

Distribution Factor Revisions

23. The moment distribution factor for exterior beams no longer considers cross frame action. (Request 567)

Plank Beam Revisions

24. The program now sets variables used to compute negative moment capacity correctly for plank beams. Previously, a 2-span plank beam design run would result in abort error message. (Request 575)

Programming Revisions

25. The program is now compatible with BRADD version 3.2.2.0 and 3.2.3.0. (Requests 576, 607)
26. The program is now verified to be compatible with APRAS NextGen. (Request 390)