PENNDOT e-Notification

Bureau of Information Systems
Application Development Division

PSLRFD No. 006 September 25 2006	**Release of Version 2.1.0.0**

The Department's LRFD Prestressed Concrete Girder Design and Rating (PSLRFD) program has been revised as described in the attached "Summary of August 2006 Revisions – Version 2.1.0.0".

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 2.0 or 2.0a**, 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 1.4a or earlier** will require a **new license fee of $1,500 for private organizations and $100 for governmental agencies**. The Software Update Request form and Request for PENNDOT's Engineering Software License form can be downloaded from our software support web site at http://penndot.engrprograms.com.

Please direct any questions concerning the above to:

Robert F. Yashinsky, P.E.
PENNDOT Bureau of Information Systems
Application Development Division
Phone: (717)787-8407 | Fax: (717) 705-5529
e-mail: ryashinsky@state.pa.us

Attachment

SUMMARY OF AUGUST 2006 REVISIONS - VERSION 2.1.0.0

Since the release of PSLRFD Version 2.0a several revision requests and user requested enhancements have been received. This release of PSRFD Version 2.1.0.0 contains the following revisions and enhancements.

General Revisions

1. Consistent tolerances are now being used to store and retrieve cross sections internally. Previously, a tolerance issue would cause an occasional program crash. (Request 232)

2. The maximum overhang check for spread box beams now computes the overhang-spacing ratio using the overhang referenced for the centerline of the exterior web of the box beam. (Request 266)

3. The paving notch depth is now based on PennDOT Standard BC-755M. (Request 276)

4. The example input files now run without any warning messages. (Request 313)

5. The program is able to run a 20 span problem. Previously, the latest test version would crash in the analysis sub-modules. (Request 333)

6. The program now computes dead load shears and moments correctly at span twentieth points when concentrated loads are placed between span twentieth points. (Request 339)

Input Revisions

7. The program will now stop with an error when non-composite I-beams are specified. (Request 238)

8. The PSLRFD program will now issue Chief Bridge Engineer Warning if the overhang exceeds 50% of the girder spacing for analysis and design. Specific to design, if the overhang exceeds 62.5 % of the girder spacing, the program will stop with an input error. (Request 311)

9. Only interior support numbers or a zero support number may now be entered for support numbers on the slab reinforcement command (SST). (Request 273)

10. The parapet width is now an optional input item on the GEO command with a default value of 20.25 inches (515 mm). (Request 189)

11. The description for the Deck Width parameter of the CDF command now indicates this parameter is only for non-composite adjacent box beams. (Request 234)

12. The upper limit for span length is now 200 feet (61 m) and a violation of the upper limit now results in a warning message. (Request 290)

13. The program now ensures that the input final allowable tension stresses that consider creep and shrinkage effects are greater than or equal to the input final allowable tension stresses that do not consider creep and shrinkage effects. (Request 124)

14. The input allowable initial tension must now be less than or equal to the input allowable final tension. (Request 327)

15. The maximum jacking force is now 4000 K (17795 kN). (Request 328)

Output Revisions

16. New reaction output reports that summarize the reactions required for bearing pad, abutment and pier designs have been added to the output. (Requests 105/188)

17. For non-composite girders, the analysis results output heading now indicates basic beam properties are being used. Previously the results mistakenly appeared under a composite beam properties output heading. (Request 165)

18. Service I Limit State reactions have been added to the"Factored Analysis Results – Reactions" output table, and uplift is now checked only for Service I Limit State. Also, the column heading for the factored analysis reactions now has a blank line between the "Left or Right" column heading and the beginning of the table data. (Request 199)

19. Final tensile stress failures are now reported in the specification check failure summary. (Request 230)

20. Leaving the deck width blank for a non-composite adjacent box beam run now results in a reported error message in the output file and the program stops. (Request 234)

21. A specification check warning output table similar to the specification check failure output table is provided to give a summary of any warnings contained in the output tables. The warning indicates conditions that do not fail a specification check, but may need to be reviewed by the user. (Request 275)

22. The prestressing data output table for debonded strands now reports the distance from the bottom of the beam to the strand row to two decimals for US units. (Request 287)

23. The PSLRFD program has been revised to include a Required Counterweight table when uplift is detected. (Request 322)

Users Manual Revisions

24. The User Manual now clarifies the allowable overhang for adjacent box beams and plank beams and the input deck overhang. (Request 264)

25. The PSLRFD User Manual has been verified that the explanation on how the user should compute the deflection distribution factor does include the multiple presence factor. (Request 285)

26. The purpose of the principal stress output has been clarified in the User's Manual. (Request 306)

27. The Summary of Revisions for v2.0a is now included in the User Manual. (Request 312)

Continuous Beam Analysis Related Revisions

28. Vehicle axle loads and spacing for standard vehicles are now determined by the Department's Continuous Beam Analysis program, CBA. Previously, this information was stored separately in the PSLRFD program. (Request 210)

29. Increased precision is now used to prepare loading location data for the CBA analysis module. Previously, loads applied exactly at the support were being ignored for some problems. (Request 319)

30. CBA Version 3.6.0.0 has been incorporated into the program. (Request 346, 339, 235, 318)

Beam Section Properties Revisions

31. When computing local span number and span distance from a global distance, tolerances are now considered when comparing distances. Previously, a tolerance issue could sometimes result in slightly unsymmetrical CBA results for a symmetrical bridge. (Request 278)

32. The Department's Beam Section Properties program, BSP Version 1.5.0.1 has been incorporated into the program. (Request 325)

Live Load & Live Load Distribution Revisions

33. For continuous span analysis with simple span check, corresponding moments and shears are used consistently with the live load structure model. Previously, the program was not retrieving the proper corresponding shears for pedestrian loadings. (Request 271)

34. The program now correctly computes deflections and rotations related to pedestrian live load. (Request 236)

35. Live load code “D” may now be specified on the CTL command to have the ML-80 vehicle considered as an additional design vehicle. (Request 170)

36. Live load code “E” may now be specified on the CTL command to have both the ML-80 and TK527 vehicles considered as additional design vehicles. For analysis runs, live load code “F” may now be specified to have the TK527 vehicle used for the analysis. (Request 202)

37. Distribution factor applicability warning messages are no longer printed when the lever rule controls. (Request 231)

38. The range of applicability limits for computing distribution factors is now consistent with DM-4 and the 2002 AASHTO LRFD Interims. (Request 289, 358)

39. The live load with pedestrian deflection specification check now consistently reports failures in the summary of specification checks. Previously, a live load with pedestrian deflection limit table could have appeared in the summary when a failure did not exist in the table. (Request 314)

40. The live load with pedestrian deflection limits output table now reports location distances relative to the left support of the span containing the location. (Request 315)

41. The weight of the ML80 vehicle no longer includes the 3% scale tolerance when computing the rating tonnage. (Request 324)

Miscellaneous Load Revisions

42. For non-composite girders, the following revisions have been made: 1.) Analysis results for future wearing surface is now printed with the non-composite loads, 2.) Entering composite dead loads or miscellaneous composite dead loads now will result in an input error, and 3.) The Total Composite Dead Load output table is no longer produced. (Request 165)

43. The computed exterior diaphragm weight for an exterior beam is now one-half the weight computed for an interior beam. Previously, the interior beam diaphragm weight was being applied to exterior beams. (Request 228)

44. Concentrated diaphragm loads for the last span of a structure which are located at 100% of the simple span length are now placed at the end of the last span. (Request 282)

45. Composite dead loads for simple span analysis of multiple span structures are now applied for each span considering the global position of the load relative to the local position of each span.

Previously, the composite dead loads of the first span were being applied to each span for the simple span analysis. (Request 316)

46. Trapezoidal loads applied for a run using the symmetry option now result in symmetrical loadings. (Request 323)

47. Minimum factored reactions now exclude future wearing surface loads. (Request 353)

Shear Revisions

48. The user entered horizontal shear reinforcement is used to report the provided horizontal shear resistance for beam analysis runs when the shear analysis option is selected. Previously, the program would always design the horizontal shear reinforcement. Also, the horizontal shear output table now includes a column for the maximum nominal shear allowed for each span. For design runs, any columns related to provided spacing or provided shear are no longer printed in the output table. (Request 187)

49. The effective shear depth, d(v), in a design run is now computed based on the neutral axis distance based on the longitudinal slab reinforcement at the support. (Request 272)

50. The controlling shear load case is now based on the ratio of shear resistance to factored shear for both analysis and design. Previously, analysis and design runs were not consistent in determining the controlling shear load case. (Request 272)

51. The shear distribution factors used for each single span analysis of the simple span check now correspond to the shear distribution factors for each span of the continuous span analysis. Previously, the shear distribution factors for the first span were being used for each simple span analysis. (Request 280)

52. During the shear design, the comparison of the factored shear to the shear resistance is now consistently handled. Previously, a tolerance issue would result in the Resistance of Longitudinal Steel output table reporting an Actual Factored Tension value of zero. (Request 286)

Moment Capacity Revisions

53. Computation of negative moment capacity for analysis runs now use the correct variables for the case of the neutral axis being in the web. Previously, the negative moment capacity was always computed assuming the neutral axis was in the flange. (Request 272)

54. Negative moment capacity analysis considering solid rectangular section is now only made for box beams. Previously, the program mistakenly used a solid rectangular section for I Beams. (Request 272)

Prestressing and Reinforcement Revisions

55. Increasing the distance to the first strand row for box beams from the default value now causes the bottom slab thickness to be increased by an equal amount to provide cover for the prestressing strands. Normally, the distance to the first strand row would be increased to account for dapping. For I-beam type girders changing the distance to the first strand row now controls which strand pattern of available strands per row is selected from the beam tables. (Request 233)

56. When computing the maximum allowable strand eccentricity during the design, the correct composite dead load moment at the left transfer location is now used. Previously a symmetrical 2-span structure was designed with different eccentricities between span 1 and span 2. (Request 267)

57. For draped box beams, the final stresses under dead load and prestress within 3 feet of the end of the beam are now reported in the output without a 25% reduction. (Request 326)

58. The maximum number of debonding cutoff locations per half span is now 5 for a design problem. The maximum number of strands that can be debonded is now 30. (Request 329)

59. The required distance for distributing end zone transverse steel in multiple span structures is now based on the beam depth of each span. (Request 265)

60. For positive moment connection reinforcement, the distance to the non-prestressing reinforcement, d(s), is now based on the prestressing steel location at mid-span. Previously, the program would sometimes return an incorrect value for d(s). (Request 277)

61. Longitudinal slab reinforcement for negative moment is now designed considering serviceability requirements. For analysis problems, the allowable and the actual stresses in the longitudinal slab reinforcement are now checked at each analysis point where Service I Limit State moment is negative. (Request 041)

62. For analysis problems, the program now reports both crack control debonding in excess of 25% in the region from 6 inches to 3 feet from the end of the beam, and crack control debonding in excess of 50% in the region from the end of the beam to 6 inches from the end of the beam, when both apply. (Request 216)

63. The program now reports all of the crack control debonding entered for an analysis problem. (Request 317)

Bulb Tee Revisions

64. The program is now able to analyze and design the Department's standard PA Bulb-Tee beams. (Request 284)

65. All standard Bulb Tee beams have been exercised by the program for simple spans using practical ranges of span lengths, beam spacings and concrete strengths for all strand types. (Request 330)

Programming Revisions

66. The program is now compatible with the Department's Automated Permit and Route Analysis System (APRAS). (Request 183)

67. The program may now be run from a network server. (Request 295)

68. The program is now compatible with BRADD v3.1.0. (Request 298)

69. The Intel Visual Fortran compiler is now used to create the program. (Request 331)

Engineering Assistant Revisions

70. A zero may now be entered in EngAsst for the span number on the MCA command. (Request 281)

71. The images used by Engineering Assistant now contain caption text to help identify the image. (Request 299)

72. Files used by the Engineering Assistant program (EngAsst) are now compatible with the Engineering Dataset Manager program (EngMgr). (Request 307)

73. The input tab, SpecLL, is now used by Engineering Assistant to enter the special live load records SLL and SAL. Previously the tab was named SLL. (Request 344)