PENNDOT e-Notification
Bureau of Business Solutions and Services
Highway/Engineering Application Division

pennsylvania
DEPARTMENT OF TRANSPORTATION

STLRFD No. 009 August 27, 2012	**Release of Version 2.1.0.0**

The Department's LRFD Steel Girder Design and Rating Program (STLRFD) has been revised as described on the attached Summary of August 2012 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 STLFRD Version 2.0.0.3 & 2.0.0.0, can obtain the updated version for a license update fee of $500 for private organizations and $50 for local governmental agencies and educational institutions. Updates for STLRFD Version 1.7.0.0 or earlier require an additional fee documented on the STLRFD update fee details page (http://penndot.engrprograms.com/home/Ordering/STLRFD.htm). 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 from the web site at http://penndot.engrprograms.com.

Please direct any questions concerning the above to:

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Attachment

SUMMARY OF AUGUST 2012 REVISIONS - VERSION 2.1.0.0

Since the release of STLRFD Version 2.0.0.3 several revision requests and user requested enhancements have been received. This release of STLRFD Version 2.1.0.0 contains the following revisions and enhancements.

Specification Related Revisions

NOTE: Unless otherwise indicated, the specification changes described below are in accordance with LRFD Specifications 5th Edition / 2012 DM-4 requirements

1. The Fatigue limit state has been split into Fatigue-I and Fatigue-II limit states (Request 507).

2. The calculations for the transverse stiffener moment of inertia have been revised and the transverse stiffener area requirements have been removed (Request 508).

3. The live load factor for Strength-IA has been changed from 1.10 to 1.35 (Request 514).

4. For design runs of the program, the input for the span-to-depth check will now default to "No", meaning that the program will not check the span-to-depth ratios of Article 2.5.2.6.3 (Request 515).

5. The program will now print warnings if the user has entered values other than 1.0 for any of the eta factors. The lower limit of 1.1 for the product of the eta factors for the fatigue limit states of nonredundant structures has been removed. The upper limit of 1.16 for the product of the eta factors for strength and service limit states remains (Request 516).

6. The values of V_o and Z_o from Table 3.8.1.1-1 for wind calculations have been updated (Request 517).

7. The constant amplitude fatigue threshold for reinforcement (Equation 5.5.3.2-1) has been revised (Request 518).

8. The horizontal fatigue shear range for transverse stiffener specification checks will now include an allowance for radial loads if the skew of the girder is less than 70 degrees. **NOTE: because of this, the user can now enter SKW commands in conjunction with the UDF (user defined distribution factors) commands. If existing input files using UDF commands are not revised to include SKW commands, the radial load will always be conservatively added to the horizontal fatigue shear range** (Request 520).

9. The bearing stiffener axial resistance calculations have been updated (Request 521).

10. The calculations of the hybrid factor, Rh, have been revised for constructability checks as well as when the yield strength of web is greater than flange yield strengths. Rh is also printed for more resistance calculation methods on the MOMENT FLEXURAL CAPACITY output report (Request 522).

11. The shear-buckling resistance is now checked for all analysis points during the constructability checks, regardless of whether the web is stiffened or unstiffened (Request 523).

12. An additional code reference for the I_{yc} / I_y check has been added to the COMPACTNESS CRITERIA output report (Request 525).

13. An additional check of the compressive stress in the deck (0.6 * f'c) has been added to the FACTORED ANALYSIS RESULTS output report. This value will only print if it is appropriate for the given analysis point / limit state / flexure combination (Request 526).

14. The calculation of M_1 (equations A6.3.3-11, A6.3.3-12) has been revised to check if the moment variation between brace points is concave (Request 527).

15. Additional skew and diaphragm layout requirements for AASHTO Section 6 Appendix A applicability have been added. **NOTE: because of this, the user can now enter SKW commands in conjunction with the UDF (user defined distribution factors) commands. If existing input files using UDF commands are not revised to include SKW commands, no analysis points on those girders will pass applicability checks for Appendix A checks (Request 528).**

16. The upper limit for $\lambda_{pw(Dcp)}$ (A6.2.1-2) has been revised and situations where λ_{rw} equals $\lambda_{pw(Dc)}$ (A6.2.2-4, A6.2.2-5) are now properly handled (Request 529).

17. The St. Venant torsional constant, J, from equation A6.3.3-9 is now multiplied by 0.8 for the situation where I_{yc} / I_{yt} > 1.5 and D/b_{fc} < 2, D/b_{ft} < 2 or b_{ft}/t_{ft} < 10 (Request 530).

18. The AASHTO code references for several of the economic feasibility checks have been updated (Request 531).

19. If the web yield strength is greater than 120 percent of the yield strength of the weaker flange, the web yield strength will be limited to 120 percent of the strength of the weaker flange (Request 532).

20. For plate girder design runs, a warning will be issued if the yield strength of the web is not greater than 36 ksi or 70 percent of the stronger flange, and a chief bridge engineer warning will be issued if the yield strength of the web is greater than the yield strength of the weaker flange (Request 533).

21. The web specification checks of DM-4 Article 6.10.1.9.3P have been added to the program (Request 542).

22. For noncomposite sections, the value of 0.85 * f'c is no longer reported on the FACTORED ANALYSIS RESULTS output report (Request 543).

User's Manual Revisions

23. References to the User's Manual section on the economic feasibility checks (3.7.9) have been corrected elsewhere in the User's Manual as well as in the program output (Request 538).

24. A reference to the "HS20-9.0" vehicle was removed from User Manual Table 3.5-2 (Request 540).

Program Output Revisions

25. Input values for the new SPLRFD command ASR, are provided in the SPLRFD input echo in the STLRFD output. The new SPLRFD ASR command was first available in SPLRFD version 1.4.0.0. Older versions of SPLRFD do not require the input for the ASR command. (Request 536).

26. An output error that occurred for noncomposite girders on the LONGITUDINAL SLAB REINFORCEMENT AT CONTINUOUS SUPPORTS output report has been modified with a more meaningful message (Request 537).

27. The equivalent moment flexural resistances have been back-calculated and printed on the STRESS FLEXURAL CAPACITY (NONCOMPOSITE OR -FLEX OR COMPOSITE/NONCOMPACT) output report. This information has been provided for the bridge load rating table documented in DM-4 Part A Table 1.8.3-1 for noncomposite or non-compact beams (Request 539).

28. A spurious specification check failure message for a symmetrical girder has been removed (Request 546).

29. On the STRESS FLEXURAL CAPACITY output report, the flexural resistance for compression flanges will always print as a negative value (Request 550).

30. A warning code has been added to the STRESS FLEXURAL CAPACITY output report to indicate when the top flange is in tension for a positive flexure condition (Request 554).

Example Input Revision

31. The distributed DC2 load in the Example 2 input file, EX2.DAT, has been changed to 0.252 kips/ft (Request 541).

32. The TTL commands in the input files for examples 6 and 8 now reflect their status as US Units, rather than SI Units (Request 552).