PENNDOT e-Notification

Bureau of Business Solutions and Services
Highway/Engineering Application Division

pennsylvania
DEPARTMENT OF TRANSPORTATION

STLRFD No. 010 June 24, 2013	**Release of Version 2.2.0.0**

The Department's LRFD Steel Girder Design and Rating Program (STLRFD) has been revised as described on the attached Summary of May 2013 Revisions – Version 2.2.0.0.

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 2.1.0.0, 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 2.0.0.3 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 note that the software will no longer be 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

SUMMARY OF MAY 2013 REVISIONS - VERSION 2.2.0.0

Since the release of STLRFD Version 2.1.0.0 several revision requests and user requested enhancements have been received. This release of STLRFD Version 2.2.0.0 contains the following revisions and enhancements.

Specification Related Revisions

1. The rolled beams used by the program have been revised according to the AISC Steel Construction Manual, 14th Edition, 1st printing.

   The following rolled beams were deleted from those used by the program:

   W40x321 W40x174 W40x466

   W36x848 W36x798 W36x650 W36x527 W36x439 W36x393 W36x359
   W36x328 W36x300 W36x280 W36x260 W36x245 W36x230

   W30x477

   W27x448

   W24x492 W24x408

   W14x808

   The following rolled beams were added:

   W40x397 W40x362 W40x324 W40x327 W40x294

   W36x652 W36x529 W36x487 W36x441 W36x395 W36x361 W36x330
   W36x302 W36x282 W36x262 W36x247 W36x231

   W33x387

   W30x357

   W27x336 W27x281

   W24x370 W24x306

   W21x55 W21x48

   W6x8.5

   See Section 6.22.6 of this User's Manual for a complete list of shapes included in STLRFD (Request 467).

SUMMARY OF MAY 2013 REVISIONS - VERSION 2.2.0.0

2. When computing moment distribution factors for exterior beams, the empirical value for single lane distribution factors for interior beams will no longer be considered as one of the values to check. The single lane distribution factor for an exterior beam is always calculated with the lever rule (Request 479).

3. For plate girder design, if the minimum or maximum flange plate thicknesses are not included on the Plate Thickness Tables (Tables 5.18-1 or 5.18-2), they will be rounded up (for the minimum values) or down (for maximums) to the nearest available thicknesses on the tables. This revision was made to resolve an issue where occasionally a successful design could not be found (Request 506).

4. The calculation of Dn (used in the calculation of the hybrid factor, Rh) will now use the location of the actual elastic neutral axis, not just the location of the neutral axis of the short-term composite section (Request 534).

5. The calculation of the yield moment governed by the flexural capacity of the deck reinforcing, Myr, has been corrected so that it does not appear that the flexural stresses in the flanges exceed yield under Myr (Request 535).

6. When computing the rating tonnage for special live load vehicles, the program will no longer remove the scale allowance. The user enters the axle weights without the scale allowance, so it will not be removed from the total weight of the vehicle (Request 568).

7. An error in the calculation of Cb (moment gradient factor, MOMENT FLEXURAL CAPACITY output report) has been resolved (Request 561).

8. For noncomposite girders, the unfactored stresses at the top and bottom of web include live load stresses (for use with the web nominal flexural resistance from DM-4). These unfactored stresses are now calculated with the same load combination resulting in the most compressive stress in the web. Previously, these stresses could be calculated with different load combinations (for example, the top of web stress was calculated with the positive moment live load effect and the bottom of stress calculated with the negative moment live load effect) (Request 565).

9. A program crash has been resolved for the condition when the neutral axis of the composite section is in the slab (Request 573).

10. For composite sections in negative bending, Myt, the yield moment with respect to the tension flange, is now set to the minimum of My with respect to the top flange or My with respect to the deck reinforcing, as per LRFD Specifications Article D6.2.3 (Request 579).

11. The value of f_n for hybrid factor calculations (LRFD Specifications Article 6.10.1.10.1) is now set properly for the case where D_n is on the opposite side of the yielding flange (Request 580).

Programming Revisions

12. The program is now compiled with Intel FORTRAN Composer XE 2011, Update 9 (Request 567).

Program Output Revisions

13. For program runs that include deck pours, the calculation of the total DC1 moment appearing in the SPLRFD INPUT INFORMATION output report now properly considers the sign of the moment due to the deck pours. Previously, the program was occasionally printing an incorrect total DC1 moment when the instantaneous deck pour moment had an opposite sign than that of the cumulative deck pour moment (Request 466).

14. An incorrect warning message that occurred when the user left the cover plate yield strength blank for a rolled beam with no cover plates has been removed from the program (Request 513).

15. An error in the output report WEB SPECIFICATION CHECK that would only manifest itself when something other than 20th point output is chosen has been resolved (Request 558).

16. Service limit states will no longer print as governing shear rating factors in the RATING FACTORS - SUMMARY report (Request 559).

17. An error causing the report name RATING FACTORS - STRESS FLEXURAL CAPACITY to appear in the list of SPECIFCIATION CHECK FAILURES, when no such errors have occurred, has been resolved (Request 563).

18. An ECONOMIC FEASIBILITY CHECK failure for rolled beams with no cover plates has been resolved. Previously, a failure would be indicated on this report for the "Flange width >= 12.0" check for locations where no cover plate was defined, but the flange width of the shape selected was > 12.0" (Request 572).

19. Chief Bridge Engineer warnings will now appear in the SPECIFICATION CHECK WARNINGS output report at the end of the output file. Previously, Chief Bridge Engineer warnings did not appear and a message "No procedure defined to print MSG" would appear in the screen output whenever a Chief Bridge Engineer warning occurred (Request 575).

20. On the RATING FACTORS - SHEAR CAPACITY output report, the proper failure code for the web handling requirement (D/150 or D/300) will now print. Previously, a failure code would print, but reference the incorrect ratio (Request 582).

21. A Chief Bridge Engineer warning will now appear in the program output for girders that have varying-depth webs where the only varying-depth range is the last range along the girder. The warning was already properly printing for girders with other ranges of varying depth (Request 583).

Example File Revision

22. Example 10 has been revised to use a rolled beam (W36x231) that is available in the AISC Steel Construction Manual, 14th Edition, 1st printing (Request 577).

Program Input Revisions

23. The program now allows the user to enter eight special live loads in a single run (increased from 5) (Request 455).

24. The user now has the option to optimize rolled beam design by depth, rather than solely by weight. This option is available on the DRB (Design Rolled Beam) command (Request 505).

25. An error for the checking of which span lengths have had values entered has been resolved. The program will now report only those spans that do not have span lengths entered (Request 510).

26. The user can no longer enter the same year for recent count and previous count or recent count and future count on the FTL (Fatigue Live) command. This revision was made to prevent the program from crashing (Request 511).

27. A error in assigning the ultimate strength of rolled beams has been resolved. With this revision the NET SECTION FRACTURE CHECK calculations will now use the correct ultimate strength value (Request 571).

28. The default value for "Live Load Code" for design runs of the program has been changed to "E" to ensure inventory rating factors for the ML-80 and TK527 vehicles > 1.0 as specified by DM-4 Sections 3.6.1.2.8P and 3.6.1.2.9P. Additionally, if the user specifies a live load code other than "E" for a design run, a warning message will appear in the program output (Request 576).

29. Additional checks were added to the FTL (Fatigue Life) command to ensure that the previous count year is less than the recent count year and that the future count year is greater than the recent count year (Request 584).

User's Manual Revision

30. An error in the description of the SKW command has been resolved (reference to UDF has been changed to CTL) (Request 556).

31. The User's Manual was recreated to ensure that arrowheads appear correctly on the figures (Request 556).