PennDOT e-Notification

Bureau of Business Solutions and Services
Highway/Engineering Applications Division

pennsylvania
DEPARTMENT OF TRANSPORTATION

ABLRFD

No. 019
June 15, 2015

Release of Version 1.14.0.0

The Department's LRFD Abutment and Retaining Wall Analysis and Design (ABLRFD) program has been revised as described in the attached "Summary of April 2015 Revisions – Version 1.14.0.0".

The new version has been placed on PENNDOT servers for use by the Districts. Consultants and others, who have a current license agreement for **ABLRFD Version 1.13.0.x**, can obtain the updated version by submitting an Update Request form along with an **update fee of $500 for private organizations and $50 for governmental agencies**. Updates for **ABLRFD Version 1.12.0.0 or earlier** will require an **additional fee**. For ABLRFD update fee details, refer to the following link: http://penndot.engrprograms.com/home/Ordering/ABLRFD.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 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 APRIL 2015 REVISIONS - VERSION 1.14.0.0

Since the release of ABLRFD Version 1.13.0.1 several revision requests and user requested enhancements have been received. This release of ABLRFD Version 1.14.0.0 contains the following revisions and enhancements.

Input Revisions

1. For Analysis runs the Footing Datum parameter on the CTL command should be left blank. But if it was entered the program would print a warning that it should be left blank and then it would proceed to use the input value causing confusion. To resolve this, the program has been revised to internally set the footing datum to top of footing for Analysis runs when the Footing Datum parameter on the CTL command is entered by the user. (Request 369)

Output Revisions

2. For pedestal footings a new footnote has been added to the Flexural Strength output table for Design and Analysis runs, and to the Reinforcement Design Details / Footing output for Analysis runs, stating that the program does not analyze perpendicular direction reinforcement for pedestal footings because the program assumes the footing and pedestal are made integral using transverse shear keys and dowels per DM-4 10.6.5.2P. (Request 192)

3. The page layout of the output file has been enhanced to allow for more characters per page width and more lines per page in the PDF output file. The new layout has 102 characters per page width and 83 lines per page. The Table of Contents now includes a second level which is converted to a second level of bookmarks to assist in navigating the PDF file. (Request 388)

4. The FACTORED FORCES output table has been revised to show the Vertical over Horizontal Load Ratio for the Service limit states for pile and caisson foundation types. Previously, the program would only output a flag and footnote during an analysis run if the ratio check was violated. (Request 392)

Loading Revisions

5. The program has been revised to prevent a divide by zero error when the calculated area for the Wind on Substructure is less than or equal to zero. Previously, the program would populate portions of the output reports with a Not a Number (NaN) output value and produce incorrect results. This issue was rare and would only occur for certain input files. (Request 383)

Stem Revisions

6. The program has been revised to correctly consider the capacity of the minimum temperature and shrinkage reinforcement in the front face of a stem if a negative moment is encountered during a design run. Previously, the program would attempt to compare the positive calculated capacity for the temperature and shrinkage reinforcement to the negative applied load resulting in errors. (Request 362)

7. A new geometry check has been added to the design loop to prevent the backwall for a Type 2 Abutment from overhanging the end of the heel when the toe projection is being increased. Previously, the program would stop with an error indicating the backwall overhangs the end of the heel. (Request 373)

8. The calculation of the Stem Thickness at Location D during the design loop has been revised to be consistent with the calculations performed in the stem routines. Previously, the discrepancy in the calculation would sometimes cause the program to halt with a geometry check error. (Request 374)

Bearing Resistance and Stability Revisions

9. The equations and documentation for bearing resistance of spread footings on two sand layers, Soil Condition 6 and 7, have been revised to be consistent with the methodology in the *Principles of Geotechnical Engineering, Third Edition by Braja Das*. Previously, the equations and documentation were inconsistent with methodology in the Das textbook resulting in an overestimation of the bearing resistance. This request fixes the issues documented in e-Notification 018. (Request 385)

10. The bearing resistance phi factor for the Service Limit states has been revised to be 1.0. Previously, the program would apply the same bearing resistance phi factor to all limit states. (Request 371)

11. The program has been revised to increase the allowable kern for stability checks for the Extreme Limit state to 2/3rds the footings base width per AASHTO 10.6.4.2 and 11.6.5. This revision affects spread footings and pedestal footings. (Request 375)

12. The allowable kern for the Final Stage stability checks has been revised for all limit states, except the Extreme Limit State, to be in accordance with 2014 AASHTO 11.6.3.3. This revision affects spread footings and pedestal footings. (Request 391)

Pile/Caisson Revisions

13. The program has been revised to no longer consider the Service Limit State when checking the Factored Axial Resistance and Factored Lateral Resistance for pile/caisson foundation design and analysis runs. Previously, the program would resize a pile/caisson pattern or footing size if the Factored Axial Resistance or the Factored Lateral Resistance was insufficient for the Service Limit State. (Request 366)

14. The pile/caisson design loop has been revised to allow for increasing the footing thickness when the Service Load Ratio check controls a design iteration. Per DM-4 6.15.1P the Service Load Ratio is the ratio of the SERVICE-I limit state unfactored vertical load to horizontal load and this ratio much be greater than 2.4. Previously, when the Service Load Ratio was less than 2.4, the program would increase the footing width without first trying to increase the footing thickness, causing some designs to be inefficient. (Request 372)

User Manual Revisions

15. The default value for the Inclination Factor parameter on the SOI command in the ABLRFD User Manual has been changed to “Y” to be consistent with the program and the Engineering Assistant configuration files. (Request 384)