CBA
No. 003
January 7, 2019

Release of Version 3.7.0.0

The Department's Continuous Bridge Analysis (CBA) program has been revised as described in the attached "Summary of December 2018 Revisions – Version 3.7.0.0".

The new version has been placed on PennDOT servers for use by the Districts. Consultants and others, who have a current license agreement for **CBA Version 3.6.0.x**, can obtain the updated version by submitting an Update Request Form along with the **update fee of $50 for both private organizations and governmental agencies**. Updates for **CBA Version 3.5 or earlier** will require an **additional fee**. For update fee details, refer to the CBA Fee Schedule. The update fee is waived for federal and state transportation agencies.

Once payment is received, an e-mail will be sent with download instructions. A valid e-mail address must be provided on the Update Form to receive the download instructions.

Please direct any questions concerning the above to:

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Attachment

Since the release of CBA Version 3.6.0.5, several error reports and user requested enhancements have been received. This release of CBA Version 3.7.0.0 contains the following revisions.

General Program Revisions

1. The program was revised to avoid a crash due to a zero-array subscript for a known influence line analysis when the load type is PHL93 (CBAREV040).

2. The Engineering Assistant configuration file (fields.ini) was revised to allow negative values for fixed-end moments and reactions (CBAREV045).

3. Update to the current GNDLL libraries (CBAREV044).

4. When the CONT at the BEAM DATA AND DESIGN LIVE LOADS card is equal to H, CBA adds the following edit checks to prevent the user from entering unstable hinge locations of HINGE LOCATIONS Card (CBAREV048).

   a. The hinge location cannot be located at the begin bearing of the begin span (i.e. span 1)
   b. The hinge location cannot be located at the end bearing of the end span (i.e. the last span)
   c. More than two hinge locations in any interior span (including the locations on top of these supports at each end of the span) are not allowed.
   d. More than one hinge locations in any begin or end span (including the locations on top of these supports at each end of the span) are not allowed.
   e. The number of hinge locations in all spans cannot exceed the number of spans – 2.

   When the CONT at the BEAM DATA AND DESIGN LIVE LOADS card is equal to H, CBA will allow hinge locations on top of the interior supports if the bridge is stable (CBAREV048).

   Note: It is still possible to unstable hinge locations (such as two adjacent spans with one hinge at each span), which may cause a program crash. More work is required to prevent all possible unstable hinge scenarios.

Load Revisions

5. Added the following loading types (LOADING CODE) for these new standard live loads at the BEAM DATA AND DESIGN LIVE LOAD data card (CBAREV041).

   1. D for PA58, risk-based posting vehicle
   2. E for EV2, single rear axle emergency vehicle,
   3. F for EV3, tandem rear axle emergency vehicle
   4. G for SU6TV, heavy-duty tow and recovery vehicle.

6. Added a new loading type, H, to automatically evaluate the 13-axle, 330 kips GVW permit design vehicle: PA2016-13 which has two varying axle spacings between its truck axles 7-8 and 10-11. (CBAREV043).

7. The program shall use the following logic for Special Live Load (LOAD TYPE = 9) about the use of SEC LANE LOAD and H20 or HS20 uniform or concentrated lane loads (CBAREV047):

   Case 1. STD = true (user enters S): (WSD or LFD) => truck load effect or lane load effect governs
       1a. If the user enters nothing (i.e. BLANK) at SPEC LANE LOAD:
           => use the default value (0.64 kip/ft or 9.3 kN/m) of standard H or HS lane load.
           => use the default value [(18 kip and 26 kip) or (80 kN and 115 kN)] of standard H or HS concentrated loads for moment and shear.
       1b. If the user enters something at SPEC LANE LOAD:
           => use the user-entered value to represent the standard H or HS lane load,
           => use the values of CONC LOAD MOMENT and CONC LOAD SHEAR to
              represent the standard H or HS concentrated loads for moment and shear.

   Case 2. STD = false (user enters N or leave it blank): (LRFD) => truck load effect plus lane load effect govern
       2a. If the user enters nothing (i.e. BLANK) at SPEC LANE LOAD:
           => use 0 to represent the standard H or HS lane load.
           => use 0 to represent the standard H or HS concentrated load for moment and shear.
           => any user-entered values of design lane load, CONC LOAD MOMENT,
              and CONC LOAD SHEAR will be ignored.
       2b. If the user enters something at SPEC LANE LOAD:
           => use the user-entered value to represent the standard H or HS lane load.
           => use the user-entered value of CONC LOAD MOMENT and /or CONC LOAD SHEAR to represent the standard H or HS concentrated loads for moment and shear.

Program Revision

8. This program has been converted to the Intel(R) Visual Fortran Compiler (2017 Update 5) version 17.0.5.267 (IA-32) using Microsoft Visual Studio Professional 2017 version 15.4.4 (CBAREV046).