PennDOT e-Notification

Bureau of Business Solutions and Services
Highway/Engineering Applications Division

pennsylvania
DEPARTMENT OF TRANSPORTATION

BSP No. 001 June 29, 2015	**Release of Version 2.0.0.0**

The Department's Beam Section Properties (BSP) program has been revised as described in the attached "Summary of March 2015 Revisions – Version 2.0.0.0".

The new version has been placed on PennDOT servers for use by the Districts. Consultants and others, who have a current license agreement for **BSP Version 1.3 or earlier**, can obtain the updated version by submitting an Update Request form along with an **update fee of $50 for private organizations and governmental agencies**. 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:

Robert F. Yashinsky, P.E.
PennDOT Bureau of Business Solutions and Services
Highway/Engineering Applications Division
Phone: (717) 787-8407 | Fax: (717) 705-5529
e-mail: ryashinsky@pa.gov

Attachment

SUMMARY OF MARCH 2015 REVISIONS – VERSION 2.0.0.0

The last standalone version of BSP (version 1.3) was released in April 1997. However, there have been several subsequent unreleased BSP versions, which addressed issues for the Department's LRFD superstructure programs (PSLRFD and STLRFD) and BAR7. BSP Version 2.0.0.0 contains the following revisions as well as the revisions listed for the unreleased versions.

1. New input fields have been added for the Slab Concrete Density and the Beam Concrete Density. These parameters are used to compute concrete modulus of elasticity and account for different slab and beam concrete weights when computing the composite section properties for prestressed concrete beams. Previously, the slab and beam concrete where assumed to have the same density. (REV012)

2. The top beam section modulus equation for a transformed composite prestressed concrete section was corrected to account for a negative distance from the composite n.a. to the top of beam and to avoid a negative section modulus. (REV013)

3. Section properties for prestressed concrete double-tee (NEXT) beams have been added. (REV016)

4. A new input parameter was added to allow the haunch concrete to be considered when computing composite section properties for prestressed concrete beam only. The haunch width is set to the beam W2 dimension. (REV017)

5. Upgraded to Intel Visual Fortran Composer XE 2013 SP1 Update 3 and Microsoft Visual Studio .NET 2012. (REV018)

6. The program has been enhanced to provide a PDF output file in addition to the text output file. The PDF file makes it easier to print and paginate the program output.

7. **The method of calling the engineering program DLL from the Engineering Assistant has been changed for compatibility with EngAsst v2.5.0.0 which uses Microsoft's .NET Framework, version 4.5. Because of this, BSP will no longer work with EngAsst v2.4.0.6 or v2.4.0.9 unless the EngAsst "Edit / Run EXE – Command Window" option is selected. BSP will no longer work with EngAsst v2.4.0.0 and earlier.**

BSP Version 1.5.0.3 (May 2009) contained the following revisions:

1. Intel Visual Fortran v10.1 conversion. (REV007)

2. The web thickness used when determining the shear capacity (W3) is now set for prestressed box beams with circular voids. (REV008)

3. Variable ANC can now be used by calling programs to pass the beam concrete to slab concrete modular ratio for prestressed concrete beams when the concrete densities are different. (REV009)

4. Reformat the prestressed concrete beam section modulus output to allow larger numbers. (REV010)

5. An input check for the Slab/Beam f'c for prestressed and reinforced concrete sections was added to avoid a divide-by-zero error. (REV011)

BSP Version 1.5.0.2 (June 2006) contained the following revisions:

1. The torsional constant for Steel built-up sections and WF sections with cover plates were corrected to consider built-up sections of the beams as a single element. (REV003)

2. Added negative flexure section properties for reinforced concrete T-beams for use in AASHTO Standard Engine. (REV004)

3. Added positive and negative flexure section properties for reinforced concrete I-beams for use in AASHTO Standard Engine. (REV005)

4. Added input and output modules for reinforced concrete sections. (REV006)

BSP Version 1.5.0.1 (March 2005) contained the following revisions. Revisions 1 through 5 were required for use by BAR7.

1. BSP now computes section properties for encased steel I-beams. (BAR7 only - Rev. 1.5.01)

2. Section properties for steel beams with unsymmetrical flanges can now be computed. (BAR7 only - Rev. 1.5.02)

3. Section properties for reinforced concrete tee-beams and slabs can now be computed. (BAR7 only - Rev. 1.5.03)

4. The location of the plastic neutral axis for steel beams is now accessible to BAR7 through calls to BSP. (BAR7 only - Rev. 1.5.04)

5. The area of the compression flange and the area of tension flange for steel beams are now accessible to BAR7 through calls to BSP. (BAR7 only - Rev. 1.5.05)

6. Section losses\bolt holes are now considered when computing the area of tension flange for steel beams. (Rev. 1.5.06)

7. The depth of web in compression used to compute the radius of gyration of the compression flange plus one-third of the web in compression (r_t) for a non-composite steel beam is now computed using the non-composite neutral instead of the composite neutral axis. (Rev. 1.5.07)

8. BSP source code was updated to current PENNDOT programming standards compatible with Windows XP and has been converted to a Windows DLL. (Rev. 001)

9. The beam concrete to slab concrete modular ratio is now applied to the negative flexure longitudinal stiffness parameter (Kg). (Rev. 002)

BSP Version 1.5.0.0 (February 204) contained the following revisions.

1. When the composite neutral axis is located in the slab for a prestressed concrete section, the program continues and computes the composite section properties. Previously, the program would not compute composite properties in such a case. (Rev. 1.4.01)

2. If the area of the longitudinal slab reinforcement is entered as zero for a steel section, the distance from the neutral axis to center of gravity of the longitudinal slab reinforcement and the section modulus at the center of gravity of the longitudinal slab reinforcement is set zero. (Rev. 1.4.02)

3. Version 1.4 Revision 2 (see Summary of Revisions – Version 1.4 on page 5) resulted in problems when computing distribution factors for the superstructure programs (PSLRFD and STLRFD). Therefore, BSP was revised to use the composite longitudinal stiffness parameter, K_g, for non-composite sections. (Rev. 1.4.03)

4. When the composite neutral axis is located in the slab, the slab concrete below the neutral axis is assumed to be cracked and is, therefore, not considered in the composite section properties. (Rev. 1.4.04)

5. A new prestressed concrete section type was added for Bulb Tee beams. Dimensions for PCEF standard bulb tees are available by entering the appropriate beam designation. (Rev. 1.4.05)

6. The moment of inertia calculation for the haunch in a prestressed concrete section was corrected to use the haunch width instead of the W2 beam dimension. (Rev. 1.4.06)

7. The moment of inertia about the y-axis of the slab is now included in the torsional constant for a composite prestressed concrete I-beam, Bulb-Tee and plank sections. (Rev. 1.4.07)

8. The beam designation input field for prestressed concrete beams was expanded to accommodate Bulb-Tee beam designations. (Rev. 1.4.08)

9. The default location of the shear key for adjacent prestressed concrete box beams less than 33" (840 mm) deep was changed in compliance with BC-775M. The shear key location for 12" (305 mm) plank beams remains the same. (Rev. 1.4.09)

10. The longitudinal stiffness, K_g, for composite steel beam sections is only printed once for each, the positive and negative flexure after the composite section properties. Previously, the same longitudinal stiffness was printed both after the basic beam section properties and after the composite section properties. (Rev. 1.4.10)

11. The depth of the section parameter passed to the plastic moment capacity module for steel sections is reset to the depth of the basic beam after the composite plastic moment capacity is computed. This change does not affect the standalone BSP program, but was required for repeated calls to BSP from the STLRFD program. (Rev. 1.4.11)

BSP Version 1.4 (February 2003) contained the following revisions:

1. A correction was made to plastic moment resistance calculation for built-up steel sections when the plastic n.a. goes through the vertical legs of the angles.

2. For non-composite sections (both steel and prestressed concrete), the longitudinal stiffness parameter, K_g, is set equal to the moment of inertia of basic beam instead of zero and is printed.

3. The longitudinal mild steel prestressed beam was converted to use "soft" metric bars in accordance with the revised BD-661 dual unit standard.