

## SUMMARY OF APRIL 2022 REVISIONS – VERSION 3.2.7.0

Since the release of BRADD Version 3.2.6.1, several operational issues have been addressed. This release of BRADD Version 3.2.7.0 contains the following revisions:

1. BRADD has been updated for the December 2019 Release of Design Manual Part 4 (DM-4). (TFS 5743)
2. BRADD has been updated to use PSLRFD version 2.14.0.0 (March 2021) (TFS 5737)
3. BRADD has been updated to use STLRFD version 2.7.0.0 (August 2021) (TFS 5738)
4. BRADD has been updated to use BPLRFD version 1.10.0.0 (May 2020) (TFS 5744)
5. BRADD is now compiled using Visual Studio 2019 and Intel Fortran 2019 which requires Microsoft's .NET Framework 4.7.2 and Microsoft Visual C++ 2017 Redistributable Package (x86). During installation the .NET Framework 4.7.2 and Microsoft Visual C++ 2017 Redistributable Package (x86) will be installed if they are not already present on the PC. (TFS 5741, 5745)
6. For an Integral Abutment bridge, BRADD is now designing lap lengths within intermediate diaphragms for Class AA Concrete (3.5 KSI) and Class AAAP Concrete (4.0 KSI) is used for end diaphragms. (TFS 5703)
7. BRADD was changed so, for Integral Abutment wingwalls, the top of wingwall is now located at the top of the approach slab. For traditional abutment U-wingwalls and Safety wingwalls, the top of wingwall or Safety wingwall is located at the bottom of the approach slab (in accordance with the MASH barrier standards). (TFS 5746, 5748)
8. The Approximate Quantities table detail has been updated to the current master items catalog (Pub 408) item numbers and descriptions after April 2020 changes. (TFS 5759)
9. The following items identified during the BRADD v3.2.6.0 January 2021 drawing review have been addressed:
  - a. A text justification on the Typical Section at Abutment detail has been revised. (TFS 5567)
  - b. The text justifications of several dimensions on the Footing Plan have been revised. (TFS 5594)
  - c. For steel superstructures the word "Dapping" has been removed from the footnote beneath the Table of Beam Elevations detail. (TFS 5595)

- d. For bridges with PA Bulb-Tee beams, the Structure Plan at End of Beam detail was revised to relabel the dimension measured from the PA Bulb-Tee beam to the abutment backwall corbel, from "Top of Flange" to "Web" to accurately reflect where the dimension is measured to on the beam. (TFS 5603)
- e. Various small detailing changes identified from the January 2021 drawing review of the BRADD v3.2.6.0 drawings have been addressed. The following details were revised. (TFS 5719)
  - i. General Plan detail – A duplicate dimension was removed for BRADD Example 3
  - ii. Abutment Plan detail – Section AE-AE and Section DE-DE callout was added to the Abutment Plan detail for BRADD Example 3. Similar changes made for BRADD Example 7, 15 and 17.
  - iii. Section AE-AE Barrier @ Abutment detail and Section DE-DE Barrier @ Abutment detail – The Inside vertical line below the barrier was changed to a breakline for BRADD Example 3. Similar changes made for BRADD Example 17.
  - iv. Plan – Barrier & Slab Detail – Revised the sidewalk longitudinal bar splice so it remains within the sidewalk for BRADD Example 3.
  - v. Section AE-AE Barrier @ Abutment detail and Section CE-CE Barrier @ Abutment detail for BRADD Example 3 – Removed reference to Bearing Seat and added a callout to the Construction Joint & V-Notch. Similar changes were made for BRADD Examples 5, 6 and 12.
  - vi. Right Barrier Detail and Left Barrier Detail – An “End of Deck” callout was added to two of the corners for BRADD Example 5.
  - vii. Wingwall C Plan detail – Two dimension witness lines were adjusted for BRADD Example 9.
  - viii. Abutment Elevation detail – A dimension arrow was moved for the callout of the rear face horizontal abutment corner bars for BRADD Example 12.
  - ix. Section CE-CE Barrier @ Abutment detail for BRADD Example 12 – Added a callout for 1” Below Bottom of Approach Slab.
  - x. Concrete End Diaphragm detail for BRADD Example 13 – Fixed a gap between the barrier vertical line and the top of deck.

- xi. Right Barrier Detail and Left Barrier Detail – A Designer Note was added to the Abutment 2 end for BRADD Example 21.
- 10. The "Box Beam Dap Design Parameters" table from BD-661, sheet 3 of 8 has been implemented in BRADD and BRADD User Manual Table 3.2.8.5-1 "Box Beam Dap Design" has been revised. Previously, BRADD permitted the Distance to First Row of Strands to be a maximum value of 3.5". This has been revised to 3.25" to match the table in BD-661M. (TFS 5756)
- 11. For designs which include crack control debonding the horizontal shear requirements were being increased from the selected critical beam's shear layout leading to specification check errors from PSLRFD. This was due to a shift in the C.G.S. between design and analysis runs. To get required spacings that include the effects from the crack control debonding BRADD will make analysis runs with shear design for all beams after finding a specification check error in the horizontal shear table. (TFS 5762)
- 12. Revised deck slab transverse lap lengths according to e-Notification No. 79. This changed the lap lengths on BD601M, sheet 1 of 12, note 11. (TFS 5733)
- 13. The BRADD Graphical User Interface (GUI) now has the capability to revise specific user input during a database update operation. This text-string substitution was first used to revise the barrier names to match MASH standards. An enhancement was recently made to the GUI to write a version update history file, which notes all version updates as well as these text-string substitutions. The text-string substitutions will also be highlighted with an OK message box. (TFS 5755)