

**Bureau of Design  
Engineering Computing Management Division**

<p><b>BRADD</b> No. 019 October 31, 2008</p>	<p><b>Incorrect Abutment 2 Bearing Seat Offsets for Box Beam Bridges</b></p>
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**Problem Statement:**

For spread and adjacent box beam bridges, BRADD Version 3.1.3.0 (June 2008) and Version 3.1.3.1 (October 2008) computes incorrect bearing offset values for Abutment 2. The bearing seat offset values are displayed in the following table on the abutment 2 bearing seat elevation drawing.

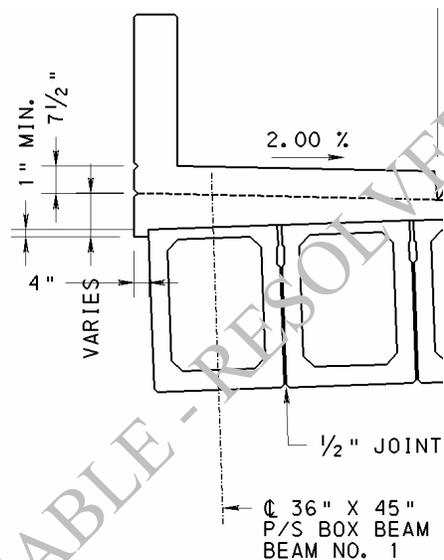
ABUTMENT 2 BEARING SEAT LOCAL									
BEAM NO.	C BEAM OFFSET	BEAM ANGLE	E			F			
			X	Y	ELEV.	X	Y	ELEV.	
1	-18' - 3"	106° - 00' - 00"	0"	0"	47.77	1' - 10 3/8"	9"	47.82	2'
2	-14' - 0 1/2"	106° - 00' - 00"	0"	0"	47.86	1' - 10 3/8"	9"	47.91	2'
3	-9' - 10"	106° - 00' - 00"	0"	0"	47.95	1' - 10 3/8"	9"	48.00	2'
4	-5' - 7 1/2"	106° - 00' - 00"	0"	0"	48.05	1' - 10 3/8"	9"	48.10	2'
5	-1' - 5"	106° - 00' - 00"	0"	0"	48.14	1' - 10 3/8"	9"	48.19	2'
6	2' - 8 7/8"	106° - 00' - 00"	0"	0"	48.14	1' - 10 3/8"	9"	48.10	2'
7	6' - 11 3/8"	106° - 00' - 00"	0"	0"	48.05	1' - 10 3/8"	9"	48.01	2'
8	11' - 1 7/8"	106° - 00' - 00"	0"	0"	47.97	1' - 10 3/8"	9"	47.93	2'
9	15' - 4 3/8"	106° - 00' - 00"	0"	0"	47.88	1' - 10 3/8"	9"	47.84	2'
10	19' - 6 7/8"	106° - 00' - 00"	0"	0"	47.79	1' - 10 3/8"	9"	47.75	2'
11	23' - 9 3/8"	106° - 00' - 00"	0"	0"	47.70	1' - 10 3/8"	9"	47.66	2'

**NOTE:**

C BEAM OFFSET IS MEASURED ALONG THE C BEARING AT THE TOP OF BEARING SEAT ALONG THE PROJECTION OF THE C OF BEAM, PERPENDICULAR TO THE BEAM, ONTO THE BEARING SEAT. NEGATIVE OFFSETS ARE MEASURED TO THE LEFT OF THE TANGENT LINE FACING THE ABUTMENT. C BEAM OFFSET IS MEASURED FROM THE C OF ROADWAY.

Archived copies of all previously distributed e-Notifications can be obtained from the PENNDOT BRADD website at <http://bradd.engrprograms.com/home> and clicking on "e-Notification" and then "Mailing List Archives."

The problem occurs as BRADD computes the horizontal distance between the location of the top and bottom of the centerline of the box beam due to the transverse slope of the beam. In the figure shown below, the bottom of the centerline of the box beam is shifted to the right due to the transverse beam slope. BRADD incorrectly calculates the shift to the left, but only for the abutment 2 bearing seat offsets. Other calculations that are affected include the width of the cheekwalls, the length of horizontal cheekwall reinforcement bars, and the number of vertical reinforcement bars in the cheekwalls.



While verifying the calculations for the patch it was discovered that the sole plate thickness was not being set before making the calculations of the bearing seat offsets and the calculations of the membrane waterproofing quantity. This has been corrected. This change affects the bearing seat offsets for both abutments 1 and 2. The changes to the bearing seat offsets due to this error were very small, in the third decimal place (for example, 0.003). The change in the membrane waterproofing quantity due to this error could add additional square yards to this quantity.

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**Problem Workaround:**

For abutment 2 only, manually calculate the bearing seat offsets, width of the cheekwalls, length of horizontal reinforcement and number of vertical reinforcement bars in the cheekwalls, and update the drawings. For abutment 1, the change to use the correct sole plate thickness in the bearing seat offset calculations produces negligible differences, thus the bearing seat offsets for abutment 1 should not have to be manually recomputed. For adjacent box beams bridges with wall abutments, manually calculate the membrane waterproofing quantity.

**Problem Resolution:**

A fix for this problem is available in version 3.1.3.2. This version can be downloaded as a patch from the BRADD website.

**Installing BRADD Version 3.1.3.2 for Licensees**

To download, go to the Downloads page on the BRADD web-site at <http://bradd.engrprograms.com> and select to download version 3.1.3.2 (BRADD\_3132\_patch.exe). Run this executable on workstations with BRADD version 3.1.3.0 or BRADD version 3.1.3.1 already installed and accept all defaults. (Note: This is an inclusive patch, meaning it also includes the revisions made for BRADD version 3.1.3.1.)

NOTES: To uninstall BRADD, you should uninstall the patches in reverse order starting with ("BRADD Patch v3.1.3.2"), and once all patches are uninstalled then uninstall the full installation ("BRADD v3.1.3.0"). Also, having uninstalled any patch, the full installation will no longer work. In order to run BRADD v3.1.3.0, you will need to uninstall and reinstall that version.

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**Installing BRADD Version 3.1.3.2 for PENNDOT**

PENNDOT's CADD workstations will be updated by PENNDOT's CADD Support Unit. PENNDOT CADD users should contact PENNDOT's BRADD Manager for information or questions regarding the schedule for the rollout of this patch.

Please direct any questions to:

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