

**Bureau of Project Delivery
Bridge Design and Technology Division**

<p>BRADD No. 050 May 25, 2018</p>	<p>BRADD v3.2.4.0: Debonded Strand Issue & Intermediate Diaphragm Load Issue – Patch Available</p>
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Recently two issues were reported for BRADD v3.2.4.0 and they have been fixed and a free patch is now available for download. See below for details.

Problem #1 Statement:

For certain complex debonding patterns (more than 3 debonding locations designed by PSLRFD) the PSLRFD program was not correctly passing the pattern for each cutoff back to BRADD. For these cases, the debonding pattern in the analysis input file, will be incorrect which could lead to Specification Check Warnings and Errors in the final PSLRFD Analysis run. This problem has been resolved.

Here is a Design Run for the Critical Beam that has a strand pattern with 4 cutoff locations.

DEBONDED STRAND (BEAM DESIG. <3339>)

S t r a i g h t / D e b o n d e d S t r a n d s

Span No.	Row No.	Avail. Strands	Distance from Bottom of Beam to Strand Row / Number of Bonded Strands in each region			
			1st Cutoff	2nd Cutoff	3rd Cutoff	Mid Span
			(1.000)	(2.000)	(3.000)	(4.000)
			to	to	to	to
			(2.000)	(3.000)	(4.000)	(51.000)
1	8	[3]	16.00 1	16.00 1	16.00 1	16.00 1
	7	[3]	14.00 3	14.00 3	14.00 3	14.00 3
	6	[3]	12.00 3	12.00 3	12.00 3	12.00 3
	5	[7]	10.00 7	10.00 7	10.00 7	10.00 7
	4	[13]	8.00 13	8.00 13	8.00 13	8.00 13
	3	[15]	6.00 11{4}	6.00 15	6.00 15	6.00 15
	2	[15]	4.00 8{7}	4.00 10{5}	4.00 15	4.00 15
	1	[13]	2.00 4{2}	2.00 4{2}	2.00 4{2}	2.00 6
Total			50{13}	56{7}	61{2}	63
C.G. (in)			7.48	7.25	6.98	6.83

- NOTES: 1. The values in parentheses are locations along the beam from the left simple bearing measured in (ft).
2. The C.G. values are for the given region and consider any bonded

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- strands to be fully developed.
- 3. The values in braces {} are the total number of strands debonded in each cutoff region.
- 4. For beam design runs, the shear calculations assume crack control debonding of 18 strands within 6.0 in. from the end of the beam; and 2 strands within the region from 6.0 in. to 3.0 ft. from the end of the beam.

For the same BRADD job, the Analysis Run for the Critical Beam has a strand pattern with only 3 cutoff locations, which causes a warning to be displayed below the table and this results in a Specification Check Warning and a Specification Check Error.

DEBONDED STRAND (BEAM DESIG. <3339>)

S t r a i g h t / D e b o n d e d S t r a n d s

Span No.	Row No.	Avail. Strands	Distance from Bottom of Beam to Strand Row / Number of Bonded Strands in each region		
			1st Cutoff	2nd Cutoff	Mid Span
			(-1.000) to (2.000)	(2.000) to (4.000)	(4.000) to (51.000)
1	8	[3]	16.00 1	16.00 1	16.00 1
	7	[3]	14.00 3	14.00 3	14.00 3
	6	[3]	12.00 3	12.00 3	12.00 3
	5	[7]	10.00 7	10.00 7	10.00 7
	4	[13]	8.00 13	8.00 13	8.00 13
	3	[15]	6.00 11{4}	6.00 15	6.00 15
	2	[15]	4.00 8{7}	4.00 15	4.00 15
	1	[13]	2.00 4{2}	2.00 4{2}	2.00 6
Total			50{13}	61{2}	63
C.G. (in)			7.48	6.98	6.83

%WARNING - <DEBONDING ANALYSIS>:
In span 1 for the cutoff located in the region from -1.(ft) to 2.(ft) the n debonded strands (11) exceeds the allowable maximum of 6.

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Problem #1 Workaround:

There is no workaround available because the calculations within the PSLRFD software are incorrect.

Problem #1 Resolution:

A fix for this problem is available in BRADD patch version 3.2.4.3 which can be downloaded for free as a patch from the BRADD website. After the patch is installed the Analysis Runs will have 4 cutoff locations and the strand pattern will now match the Design Run Critical Beam.

DEBONDED STRAND (BEAM DESIG. <3339>)

S t r a i g h t / D e b o n d e d S t r a n d s

Span No.	Row No.	Avail. Strands	Distance from Bottom of Beam to Strand Row / Number of Bonded Strands in each region			
			1st Cutoff	2nd Cutoff	3rd Cutoff	Mid Span
			(-1.000)	(2.000)	(3.000)	(4.000)
			to	to	to	to
			(2.000)	(3.000)	(4.000)	(51.000)
1	8	[3]	16.00 1	16.00 1	16.00 1	16.00 1
	7	[3]	14.00 3	14.00 3	14.00 3	14.00 3
	6	[3]	12.00 3	12.00 3	12.00 3	12.00 3
	5	[7]	10.00 7	10.00 7	10.00 7	10.00 7
	4	[13]	8.00 13	8.00 13	8.00 13	8.00 13
	3	[15]	6.00 11{4}	6.00 15	6.00 15	6.00 15
	2	[15]	4.00 8{7}	4.00 10{5}	4.00 15	4.00 15
	1	[13]	2.00 4{2}	2.00 4{2}	2.00 4{2}	2.00 6
Total			50{13}	56{7}	61{2}	63
C.G. (in)			7.48	7.25	6.98	6.83

- NOTES:
1. The values in parentheses are locations along the beam from the left simple bearing measured in (ft).
 2. The C.G. values are for the given region and consider any bonded strands to be fully developed.
 3. The values in braces {} are the total number of strands debonded in each cutoff region.

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Problem #2 Statement:

In the April 2016 revisions to BD-656M, the thickness of the prestress intermediate diaphragms was changed from 10" to 12". This change was made to the BRADD details and to the BRADD concrete quantity calculations. However, for the PSLRFD input files the DIA command was still specifying a 10" thickness. This problem has been resolved.

DIAPHRAGM DETAILS					
Span No.	Location	Exterior/ Interior	Weight (kip)	Thickness (in)	
1	50.00	E	computed	10.00	

Problem #2 Workaround:

There is no workaround available because the calculations within the BRADD software are incorrect.

Problem #2 Resolution:

A fix for this problem is available in BRADD patch version 3.2.4.3 which can be downloaded for free as a patch from the BRADD website. After the patch is installed the PSLRFD Runs will use 12 inches for the intermediate diaphragm width for the DIA command.

DIAPHRAGM DETAILS					
Span No.	Location	Exterior/ Interior	Weight (kip)	Thickness (in)	
1	50.00	E	computed	12.00	

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Downloading and Installing BRADD Version 3.2.4.3 Patch for Licensees:

1. Close any existing instances of the BRADD program.
2. To download the patch, go to the Downloads page on the BRADD web-site at <http://bradd.engrprograms.com> and select to download the BRADD version 3.2.4.3 Patch (BRADD_v3243_Patch.exe).
3. Save the file on the computer with BRADD v3.2.4.0 installed.
4. Run the patch executable, identifying the root folder where BRADD version 3.2.4.0 is installed (like: "C:\Program Files (x86)\BRADD v3.2.4.0\").

Installing BRADD Version 3.2.4.3 Patch for PENNDOT:

PENNDOT's CADD workstations will be updated by CADD Support.

Please direct any questions to:

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