

# PENNDOT e-Notification

Bureau of Design  
Engineering Computing Management Division



## BRADD

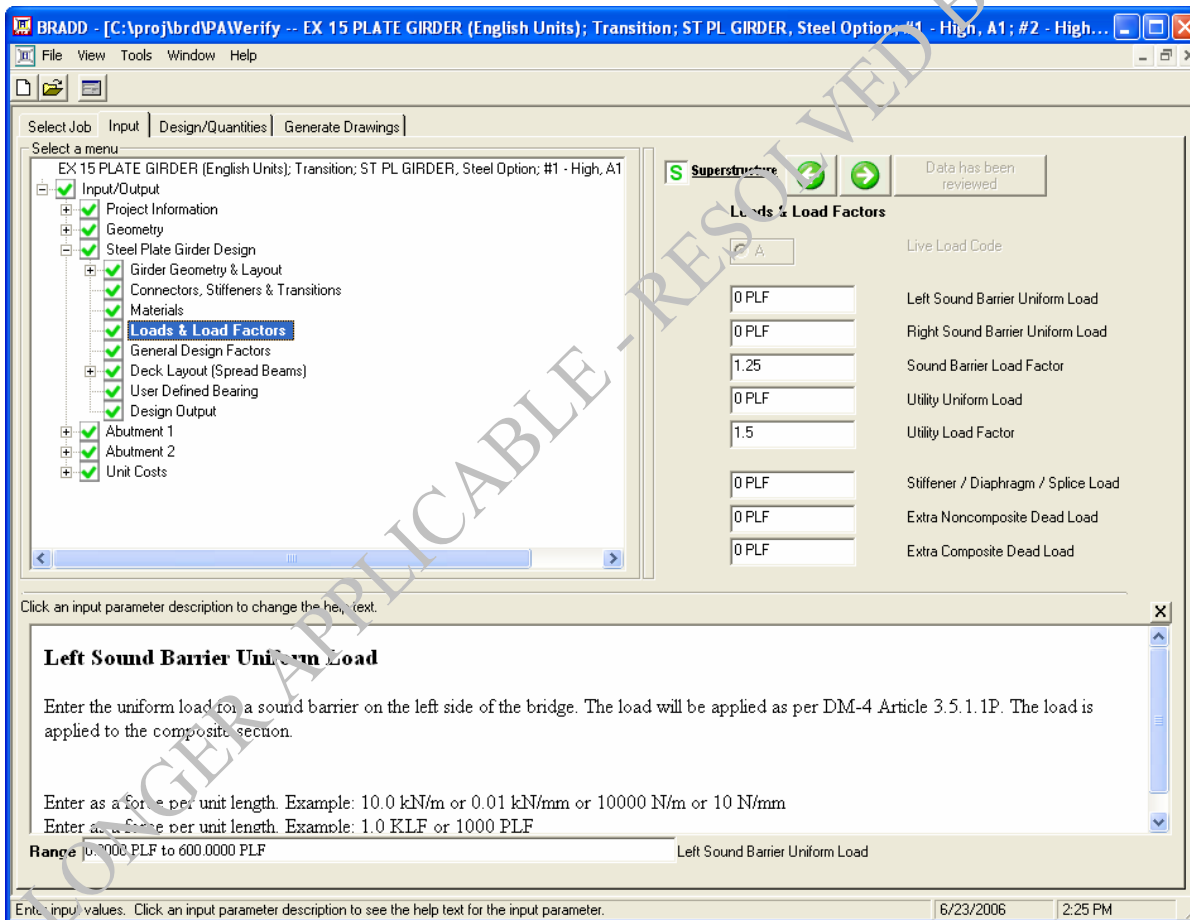
No. 014

June 27, 2006

## Problem with Sound Barrier Loads and Deck Design

### Problem Statement:

BRADD has a user input value for the left and right sound barrier uniform loads, as seen on the menu below. This is available for P/S box beams, P/S I beams, Steel Plate Girders and Steel Rolled Beams.



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The upper limit for these input items is set at 600 PLF (8.829kN/m). This limit was set so that BRADD's deck design would be in agreement with BD-601M Sheet 1 of 9 Note 28, which limits the mass of the sound barrier. However it has come to our attention that BRADD does not account for the additional deck design procedure listed as a part of Note 28, as given below, which is required for a valid deck design using BD-601M. BRADD uses the tables and notes on Sheets 8 and 9 of BD-601M as is to establish the standard deck thickness, reinforcement and the designated maximum allowance overhang length based on the beam spacing, "S". BRADD does not make any of the subsequent changes listed in Note 28 under "DECK DESIGN PROCEDURE".

**Note 28, Sheet 1 of 9, BD-601M:**

28. CONCRETE SOUND BARRIER SHOWN ON BC-779M AND BD-679M MAY BE MOUNTED ON THE TOP OF BARRIER AS DETAILED ON SHEET 4. STANDARD REINFORCEMENT MAY BE USED AS FOLLOWS:

LIMITATIONS

- HEIGHT OF SOUND BARRIER (ABOVE TOP OF BARRIER)  $\leq$  3050 mm (10')
- MASS OF SOUND BARRIER PLUS THE MASS OF BARRIER AND DECK SLAB IN EXCESS OF THE TYPICAL BARRIER  $\leq$  900 kg PER METER OF LENGTH (600 LB. PER FOOT OF LENGTH)

DECK DESIGN PROCEDURE

- USING THE TABLES AND NOTES ON SHEETS 8 AND 9, ESTABLISH STANDARD DECK THICKNESS, REINFORCEMENT AND THE DESIGNATED MAXIMUM ALLOWANCE OVERHANG LENGTH BASED ON THE BEAM SPACING, S
- INCREASE THE DESIGNATED DECK THICKNESS BY 10 mm ( $\frac{1}{2}$ " ), AND USE THIS THICKNESS ACROSS FULL WIDTH OF BRIDGE
- DECREASE THE DESIGNATED MAXIMUM ALLOWABLE OVERHANG LENGTH,  $S_o$ , BY 175 mm (7")
- INCREASE THE LENGTH OF S7 BARS BY 225 mm (9")

WHERE CONDITIONS EXCEED THE ABOVE LIMITATIONS, PERFORM SPECIAL DECK DESIGN.

**Problem Workaround:**

Currently, the workaround is to manually modify the results from BRADD to account for the additional design criteria. The BRADD input for the "Extra Noncomposite Dead Load" can be used to account for the extra  $\frac{1}{2}$ " (10 mm) deck thickness across the full width of the bridge. The overhang defined in the framing plan input can also be modified as necessary to account for the required change in  $S_o$ .

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**Problem Resolution:**

This issue will be addressed in a future release of BRADD.

Please direct any questions to:

**Jay M. Fitzgerald, P.E.****BRADD Manager***Engineering Computing Management Division**Bureau of Design**Pennsylvania DOT**Harrisburg, PA***Phone:** (717)787-7057 | **Fax:** (717)783-8217**E-mail:** [jafitzgera@state.pa.us](mailto:jafitzgera@state.pa.us)

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