

PCB DEFLECTION PROGRAM

Purpose:

The purpose of the *PCB Deflection Program* is to determine the maximum deflection of the portable concrete barrier (PCB) that occurs when a vehicle impacts a barrier. Barrier deflection is the distance barrier moves (displacement) during an impact. When a vehicle impacts a barrier, a certain amount of force is exerted on the barrier. This force is called the *Impact Severity* and is dependent on the *vehicle mass*, *speed*, and *impact angle*.

As a general rule, if the expected deflection exceeds the available allowable room for deflection then the barrier should either be anchored, or moved to where the expected deflection is equal to or less than the available allowable deflection, or another type of barrier be selected that provides an acceptable deflection.

Instructions:

- Open the *PCB Deflection Program*.

The **Input Form** appears:

Project No: Calculation of Portable Concrete Barrier Deflection Input Form

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Typical Highway Configurations

- 2 Lane 2 Way
- 3 Lane Undivided
- 4 Lane Undivided
- 5 Lane Undivided
- Multilane Divided

Type of Pavement

- Asphalt
- Concrete

Type of PCB

- NCDOT F-Type (NJ)
- Oregon Tall F-Type

Number of Lanes (n) ft

Lane Width (w) ft

Barrier Offset (L) ft

Design Speed (Vd) Mph

Calculate Maximum Deflection

Forward

Explanations

—If undivided road, n=total number of lanes
—If divided road, n= number of lanes in one direction

Figure

Offset (L)

Lane Widths

PCB

Assumption: A minimum of 200 ft of barrier is used.

- In the *Project No.* box, input the T.I.P. project #.
- Select *Typical Highway Configuration*.
Note: Refer to Roadway Plans and the Planning Documents for information.
- Select *Type of Pavement*.
Note: Refer to Roadway Plans and the Planning Documents (existing/proposed pavement).

- Select **Type of PCB**.
Note: The selected type of barrier will depend on foremost deflection, lateral offset, surface conditions, and terrain effects.
- In the **Number of Lanes** box, input a total number of lanes.
Note: For undivided roadways (including center turn lane sections) use total number of lanes in both directions. For divided facilities use total number of lanes only in the direction the barrier is located.
- In the **Lane Width** box, input the width of a one travel lane (ft).
Note: Refer to Roadway Plans and the Planning Documents for information.
- In the **Barrier Offset** box, input the distance between an edge of travel lane and PCB (ft).
Note: A minimum offset of 2 ft from the edge of travel lane to PCB is desirable. PCB may be placed on the existing shoulder offset 2 ft from a travel lane which would place it on an unpaved portion. Barrier should not be placed on any surface other than asphalt or concrete. (NOTE: When using temporary pavement for PCB placement, make sure to contact NCDOT Pavement Management Unit for applicable pavement design).
- In the **Design Speed** box, input the design speed limit (Mph).
Note: Refer to Roadway Title Sheet for information.
- Click **Calculate Maximum Deflection** button.
The **Output Form** appears:

The screenshot shows a software interface titled "Output Form". At the top, there are four buttons: "Back", "Maximum Barrier Deflection", "Print", and "Exit". The "Maximum Barrier Deflection" button is active and displays the value "34.73 in". Below this, there is a diagram of a "2 Lane 2 Way Road" with arrows indicating traffic flow in both directions. The diagram shows two lanes in each direction, separated by a center line, with a barrier placed between the lanes.

- Note: Use **Back** button, to return to the Input Form screen.
Use **Forward** button, to return to the Output Form screen.*
- Click **Print** button to print out a copy for the project file.