

Method of Test for Determining Surface Smoothness Deviations of PCC Pavement and Bridge Decks

1. Scope:

This test is for determining longitudinal and transverse surface deviations of PCC Pavement and bridge decks.

2. Apparatus:

2.1 10' straightedge.

2.2 Steel shims of 1/16", 1/8", 3/16", and 1/4" with an allowable tolerance of ± 0.010 " in thickness. The shims shall be a minimum size of approximately 1 1/4" wide and 3" long.

2.3 Viking 10' Hi-Lo detector.

3. Procedure:

Determine if High-Lo detector will be used or if only the straightedge will be used. If only the straightedge is to be used, follow section 3.3.

NOTE: The Hi-Lo detector is used to determine the location of possible deficient areas (Bumps/dips) to be checked with a 10' straightedge. If the area to be checked is small the location of deficient areas may be determined with the straightedge without first identifying areas using the hi-lo machine.

3.1 Calibration of the Hi-Lo detector.

A. Prior to moving to the work site, the Hi-Lo detector shall be checked in accordance with the manufacturer's instructions.

B. On the project prior to use.

(1) Place the detector on a flat, straight metal reference beam. The beam should be checked with the 10' straightedge prior to calibration.

(2) Verify the machine using shims of 1/16", 1/8", 3/16", and 1/4" or a combination of 1/16" and 1/8" shims. Place these shims longitudinally under the wheels.

The machine should be verified through the entire range of 1/16", 1/8", 3/16", and 1/4" for both the high and low positions.

- (3) Mark the new height and depths accurately on the indicator plate of the detector. Narrow strips of colored adhesive tape are suggested for use in making the marks, as they can readily be removed and replaced when further verification requires slight changes on the indicator plate. The verification should be done each time the machine is unloaded, after moving it from one place to another.

3.2 Operation of the Hi-Lo detector.

- A. The Hi-Lo detector should be pushed in a longitudinal direction over the approximate center of the wheel paths in each traffic lane. The detector should be kept in an erect position, approximately perpendicular to the pavement surface.
- B. A deviation of 1/8" is where the needle of the Hi-Lo detector swings just past the 1/8" mark of the indicator plate on either the high or low side. Also, when the indicator needle is riding on the high side and swings to the low side (or vice versa) with a total movement indicating a change of 1/8" or more, within a longitudinal distance of less than 10', the questionable areas should be marked for checking with the 10' straightedge.

3.3 Straightedging.

- A. Locating an amount of surface deviation for either longitudinal or transverse direction.
 - (1) The areas in question shall be checked with a 10' straightedge laid either parallel or perpendicular to the centerline of the roadway. Lay shim flat on the pavement surface approximately perpendicular to the straightedge.

During the checking operation, the straightedge shall be at rest and supported by only its own weight.

A surface deviation amount is determined by the largest shim or combination of shims that can pass freely under the straightedge. Mark the areas where the surface deviation exceeds the permissible deviation.

NOTE: Refer to examples in Figures 1a, 1b & 2.

4. Report:

Document the general location of the entire area checked. Document all specific locations where the surface deviation exceeds the permissible deviation on a DOT-29 form.

5. References:

DOT-29

Sample ID 2229835
File No.

Longitudinal Surface Deviation

DOT - 29
9-14

PROJECT PH 0066(00)15 COUNTY Aurora, Ziebach PCN B015
DATE 06/14/2016 11:00 am TESTED BY Tester, One Location Sta. 50+00 to 100+00

Station	Direction Tested	Lane Width	Length of Deviation	Depth of Deviation		Deficient Area (Sq. YD.)	Remarks
				Total	Permissible		
66+35	L	12.0	4.0	3/16	1/8	5.3	price adjust
	L	6.0	3.5	3/16	1/8	2.3	Outside WP - price adjust
72+20	L	12.0	7.0	1/4	1/8	9.3	price adjust
	L	12.0	6.5	3/16	1/8	8.7	price adjust
72+88	T	6.0	3.0	1/4	1/8	2.0	Grind
72+95	T	4.0	2.5	5/16	1/8	1.1	Grind
73+16	T	1.0	6.0	5/16	1/4	0.7	Edge - price adjust
	T	.5	4.0	3/8	1/4	2.3	Edge - price adjust
76+25	L	8.0	4.5	3/8	1/4	4.0	Shoulder - price adjust
80+10	L	6.0	3.5	1/8	1/8	2.3	Inside WP>1/8" price adj
	L	6.0	4.0	1/8	1/8	2.7	Inside WP>1/8" price adj

Direction Tested - longitudinal (L) or transverse (T)
Lane or Shoulder Width = affected width to nearest 0.5
Length Deviation = nearest 0.5'
Depth of Deviation Total = max measured under straightedge to nearest 1/16"
Depth of Deviation Permissible = specification

$$\text{Sq Yd} = (\text{Length} \times \text{Width})/9$$

Figure 1

LONGITUDINAL SURFACE DEVIATION

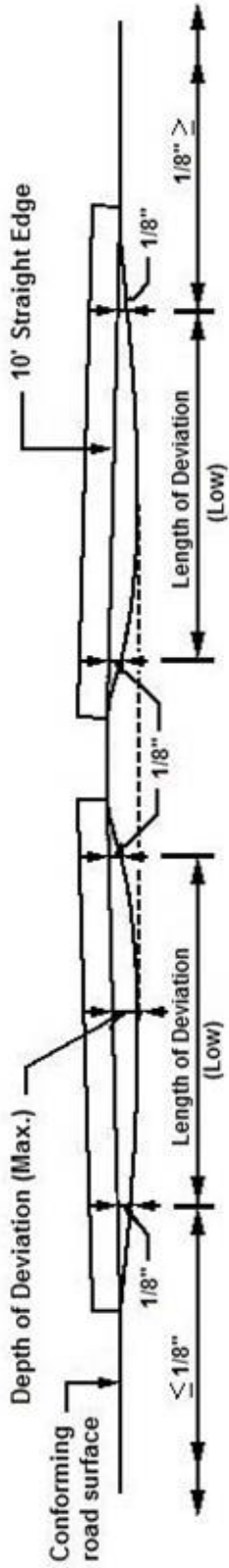


Figure 1A

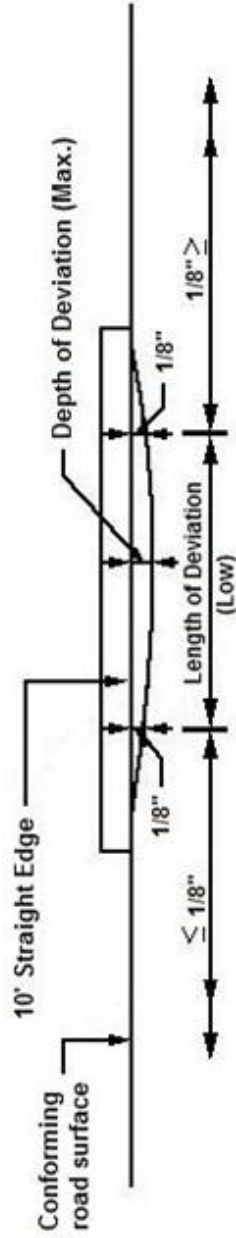


Figure 1B

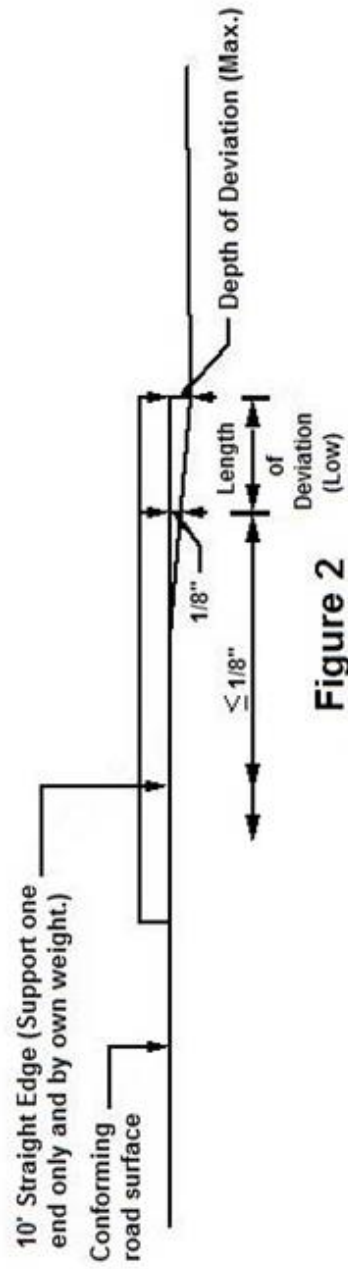


Figure 2