Standard Practice for

Evaluating Faulting of Concrete Pavements

AASHTO Designation: R 36-17[1]

Technical Section: 5a, Pavement Measurement

Release: Group 1 (April 2017)

American Association of State Highway and Transportation Officials
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1. SCOPE

1.1. This standard describes a test method for evaluating faulting in jointed concrete pavement surfaces based on manual methods and automated methods.

1.2. Faulting is defined as the difference in elevation across a transverse joint or crack as illustrated in Figure 1.

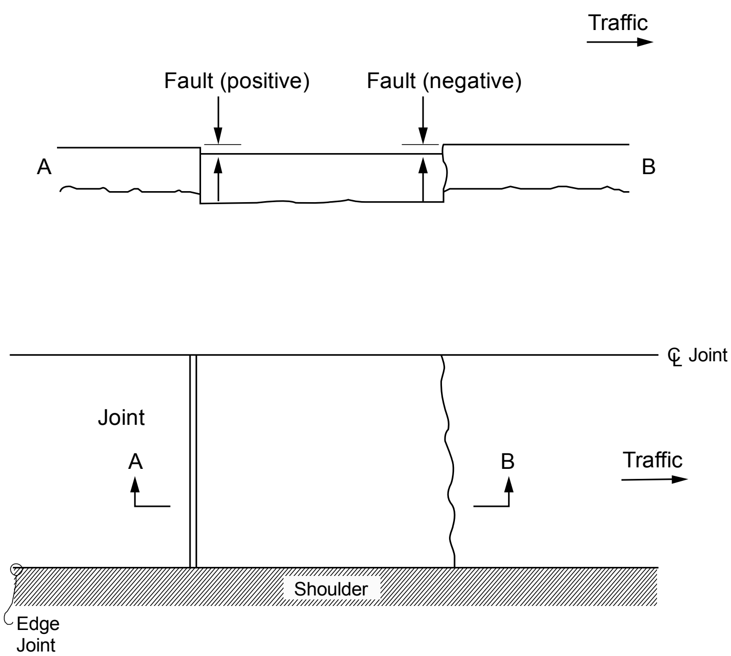

Figure 1—Faulting of Transverse Joints or Cracks (See Section 10.1)

1.3. Detailed specifications are not included for equipment or instruments used to make the measurements. Any equipment that can measure faulting with the accuracy stipulated herein and that can be adequately calibrated is considered acceptable.

1.4. *This standard practice may involve hazardous materials, operation, and equipment. The procedure does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this protocol to establish appropriate safety and health practices and determine the applicability of regulatory limitations related to and prior to its use.*

2. REFERENCED DOCUMENTS

2.1. *AASHTO Standards*:

- M 328, Inertial Profiler
- R 56, Certification of Inertial Profiling Systems
- R 57, Operating Inertial Profiling Systems

3. TERMINOLOGY

3.1. *Definitions*:

3.1.1. *filtering*—filtering technique that excludes the wavelength contents other than those within the selected wave band.

3.1.2. *longitudinal profile*—the set of perpendicular deviations of the pavement surface from an established horizontal reference plane to the lane direction.

3.1.3. *outside wheelpath*—a longitudinal strip of pavement 0.75 m (30 in.) wide and centered 0.875 m (35 in.) from centerline of the lane toward the shoulder.

3.1.4. *spalling*—breakdown or disintegration of slab edges at joints or cracks usually resulting in the loss of sound concrete.

3.2. *Definitions of Terms Specific to this Standard*:

3.2.1. *automated faulting measurement (AFM)*—a module in the Federal Highway Administration (FHWA) Profile Viewing and Analysis (ProVAL) software, used to automatically process longitudinal profiles for faulting computation and reporting based on Method A (see Section 6) of this standard.

3.2.2. *automated faulting program (AFP)*—an Excel-based application developed by Florida Department of Transportation under the AASHTO Technology Implementation Group (TIG) program used to automatically process longitudinal profiles for faulting computation and joint detection reporting based on Method B (see Section 7) of this standard.

3.2.3. *faultmeters*—a type of device for manual fault measurement based on contact-type methodology.

3.2.4. *high-speed inertial profiler (HSIP)*—a vehicle equipped with laser height sensors and accelerometers to measure longitudinal profiles based on non-contact-type technology.

4. MANUAL FAULT MEASUREMENT

4.1. It is each agency's responsibility to designate the lane(s) and direction(s) of travel to be surveyed on the basis of sound engineering principles and pavement management needs within the agency.

4.2. Include the sampling rate level of at least 10 percent of all transverse joints or transverse cracks. The 10 percent sampling rate should be uniformly spaced (preferably every tenth joint or crack or more frequently) throughout the project to assess the condition. The location should be documented along with the measurement.

4.3. Record all faulting measured. It is recommended that a precision for faulting be established such that it is calculated to the nearest 1mm (0.04 in.).

Note 1—Care must be taken to not measure spalling and classify it as faulting.

4.4. Use a faultmeter to measure faulting across transverse joints and cracks in the outside wheelpath of the survey lane at a sampling rate designated by the agency. The faultmeter should be a straightedge type of device as illustrated in Figure 2. An example of faultmeters and their operations are described in Appendix X2.

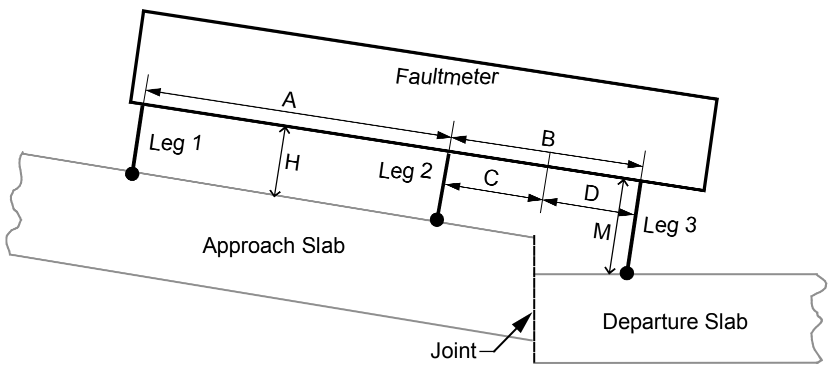

Figure 2—Manual Faulting Measurement with a Generic Faultmeter

4.5. Calculate faulting (F) using the following formula:

$$F = M - H \tag{1}$$

where:

F = faulting, mm (in.);

M = height for measurement Leg 3, mm (in.);

H = height for Leg 1 and Leg 2, mm (in.);

A = distance between Leg 1 and Leg 2, mm (in.);

B = $C + D$; B is recommended to be 300 mm (11.8 in.);

C = distance between Leg 2 and the joint location with a value between 76 mm and 226 mm (3 in. and 8.9 in.); and

D = distance between the joint location and Leg 3 with a value between 76 mm and 226 mm (3 in. and 8.9 in.).

4.6. See Appendix X2 for determining faulting at the joint using the concept of a faultmeter with an inclinometer.

5. AUTOMATED FAULT MEASUREMENT

5.1. It is each agency's responsibility to designate the lane(s) and direction(s) of travel to be surveyed on the basis of sound engineering principles and pavement management needs within the agency.

5.2. *The measurements should comply with the following best practices*:

5.2.1. The HSIP equipment should comply with M 328.

5.2.2. The operation of HSIP equipment should comply with R 57.