

Standard Practice for Evaluating the Performance of Joint Seals in Portland Cement Concrete Pavement

AASHTO Designation: PP25-95^{1, 2}

1. Scope

1.1 This standard covers the evaluation of joint seals in portland cement concrete pavements.

1.2 This standard may be used for evaluation of any joint seal type. However, the research on which the procedures in this practice are based was conducted on hot applied and cold applied, formed in place seals with backer rods.

1.3 This procedure may involve hazardous materials, operations, and equipment. It does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this practice to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

2. Referenced Documents

2.1 AASHTO Standards

- R9 Acceptance Sampling Plans for Highway Construction
- PP24 Evaluating the Need for Joint Resealing on Portland Cement Concrete Pavement

2.2 ASTM Standards

- C125 Standard Terminology Relating to Concrete and Concrete Aggregates
- D3665 Random Sampling of Construction Materials
 - E105 Probability Sampling of Materials
- E122 Choice of Sample Size to Estimate the Average Quality of a Lot or Process
- E141 Acceptance of Evidence Based on the Results of Probability Sampling

3. Terminology

3.1 E (Effectiveness) - joint seal performance

expressed as the percent of the total length of joint seals that are preventing entry of water into the joint.

3.2 Definitions for other terms used in this standard may be found in ASTM C125.

4. Summary of Practice - This standard presents a procedure for the evaluation of joint seals that are installed in portland cement concrete pavement joints. Field measurements and observations are made to quantify the performance of joint seals. Projected life of a treatment is estimated by graphical extrapolation of a function depicting joint seal effectiveness versus time.

5. Significance and Use

5.1 This standard presents detailed procedures for a rapid evaluation of joint seals. Measurements and observations indicated in this standard are used to determine the effectiveness, in percent, with respect to time for the joint seal. A minimum of 1 evaluation each year is needed to provide a projected estimate of performance and service life of joint seals. Mid winter evaluations are the most effective since they provide information during a time of maximum pavement contraction and near maximum joint opening.

5.2 This standard can be used for the evaluation and (or) selection of joint seals, placement configurations, and finishing operations.

5.3 This standard is useful for planning future joint sealing needs.

6. Apparatus

6.1 Measuring wheel or other device for linear measurement of joint seals.

¹ This standard is based on SHRP Product H-349.

² Approved in December 1995, this provisional standard was first published in June 1996.

6.2 Measuring device suitable for measuring the estimated width of joint seals (i.e. dial caliper, metal ruler, etc.).

6.3 Brushes suitable for removing any accumulated traffic debris from joint seal surfaces.

6.4 Traffic control system in accordance with the MUTCD.

6.5 Personal safety equipment required for work performed on roadways open to traffic (i.e. hard hat, reflective clothing etc.).

7. Hazards - Observe the safety procedures required by the Agency and OSHA for activities performed on roadways open to traffic.

8. Sampling

8.1 Determine the dimensions of the pavement lot to be evaluated. Generally, pavement sections that have joint treatments using the same type of sealant, the same installation procedures, the same joint configuration, and similar traffic conditions, are grouped together for evaluation. Width of the lot should be the width of the traveled way in one direction. When different joint treatments or configurations are to be compared, each treatment or configuration is treated separately.

8.2 Stratified patterns for sampling are desirable when a lot contains relatively large lengths or numbers of lengths of pavement. In cases where a lot contains a relatively small length(s) of pavement containing less than 100 joints, a non-stratified pattern may be appropriate.

8.2.1 When a stratified pattern is used, locate the pavement sample segments using a stratified random sampling procedure. If the segment(s) or length(s) of pavement to be sampled dictate a non-stratified pattern, use a random sampling procedure.

8.2.1.1 When stratified random sampling is used, divide the lot of pavement scheduled for evaluation into a minimum of 5 or more equal sublots. Randomly select from each subplot 1 segment of pavement containing a minimum of 5 joints for testing.

8.2.1.2 If the lot (overall length and width) of pavement scheduled for evaluation contains less than

100 joints, the agency may elect to randomly select 1 segment of pavement containing a minimum of 10 joints for testing.

Note 1 - Non random sampling procedures should be used only when all available joints are to be tested. See Note 2.

Note 2 - If the lot of concrete pavement under investigation, or other factors, restricts available joints for testing to less than 30, it is generally desirable to test all available sites when practical.

Note 3 - ASTM D3665 contains a Table of Random Numbers, including instructions for use. AASHTO R9 and ASTM E105, E122, and E141 contain additional information concerning sampling practices.

8.3 When the pavement has been previously evaluated, locate and reevaluate the same sample segment(s) randomly selected from the pavement for the first evaluation. This allows previous sketches and graphs to be updated and compared.

9. Preparations

9.1 Install the traffic control system as required by the MUTCD.

9.2 Determine and record the type of joint seal used. This may require that information be obtained from construction or maintenance records and visually confirmed in the field.

9.3 Determine and record the joint configuration used, i.e. sawcut depth, reservoir depth, and reservoir width.

9.4 Determine and record any other factors concerning installation procedures that the evaluating agency feels may have a significant effect on performance.

10. Procedure

10.1 Sketch a plan view of the sample site including the joints.

10.2 Measure and record the length of joints in the sample.