

spacing of 1 1/2 inch and a minimum spacing of 3/8 inch with no more than 50 percent of the spaces exceeding 1 inch . The width of tines shall be 1/8 ± 1/64 inch. The depth of groove produced in the concrete shall be 3/16 inch maximum and 1/16 inch minimum, measured in accordance with DOTD TR 229.

Provide the same finish on the adjacent concrete shoulders as the travel lane. Visually inspect the tine texture on the shoulders.

Correct all pavements not meeting the above requirements by retining if concrete is still fresh or by mechanical grooving if the concrete has set. Restore the texture to specified depth, width, and spacing.

**601.03.10 Curing:** Immediately after completing the surface finishing, uniformly spray all exposed pavement surfaces with white pigmented curing compound as soon as surface bleed water evaporates, or within one-half hour if evaporation occurs quickly. Apply curing compound to exposed edges without spraying any exposed tie bars. Do not apply curing compound during rainfall or to surfaces with standing water. Maintain curing continuously for 72 hours.

Apply curing compound under pressure by mechanical sprayers at the rate recommended by the manufacturer, but in no case less than 1 gallon per 100 square feet of surface area. Use the fully atomizing type of spraying equipment with a tank agitator. Immediately prior to and during application thoroughly mix the compound, stirring continuously by mechanical methods.

Hand spraying is allowed on small irregular widths or shapes and on surfaces exposed by form removal. Thoroughly agitate the curing compound prior to placing in the sprayer.

After application of curing compound, resulting pavement surfaces shall have a uniform appearance of a “blank white sheet of paper.” Immediately reapply additional compound to all deficient areas during the curing period.

**601.03.11 Surface Tolerance (IRI):**

**601.03.11.1 General:** This subsection outlines the measurement of surface roughness, quality control requirements, corrective actions, and acceptance criteria for PCCP. Use the International Roughness Index (IRI) to determine the amount of roughness in a measured longitudinal profile. In the direction of travel, measure the longitudinal surface profile in inches per mile and report as the IRI; all in accordance with DOTD TR 644.

**601.03.11.2 Equipment:** In accordance with TR 644, furnish a DOTD certified inertial profiler for quality control and acceptance testing. The inertial profiler shall measure both wheel paths simultaneously with laser height sensing equipment at a constant speed within the certified range. Due to the surface texture of PCCP, lasers with a footprint greater than a single point are recommended for accurate readings. Profilers require a current DOTD decal indicating the date of certification and the profiler’s system parameter settings.

Furnish a 10-foot metal static straightedge for quality control and acceptance testing for transverse cross slope, grade, and individual longitudinal bumps in excess of 1/4 inch in 10 feet. Additionally, bumps are not to exceed 1/4 inch in 10 feet for non-IRI pavements including but not limited to bike paths, detour roads, parking areas, sidewalks, turning lanes, turn outs, and shoulders.

### **601.03.11.3 Quality Control;**

**601.03.11.3.1 Longitudinal Smoothness:** Run the certified profiler and evaluate the raw IRI data using the ProVAL “25-foot sliding baseline” to identify areas of localized roughness as defined by Table 601-2 for each wheelpath. Correct deficiencies in accordance with Table 601-2 and modify construction operations to mitigate deficiencies.

Any individual bump, which is more than 1/4 inch when tested with a 10-foot metal static straightedge, is a deficiency, which requires correction.

Have quality control IRI results available for assessment by the engineer as requested.

**601.03.11.3.2 Correction of Deficient Areas:** Correct areas to meet the requirements of Table 601-2 and the 1/4 inch in 10 feet straight edge bump requirement. Correct transverse, cross slope, or grade deficiencies to meet specifications. Make corrections by removing and replacing the PCCP full depth, or by diamond grinding and reestablishing surface texture and depth. Make corrections at no direct pay.

In cases involving minor dips and extreme vertical curves where grinding will not improve the surface profile, provide the engineer a justification plus a ProVAL screen shot for the area showing the 25-foot sliding baseline and corresponding 25-foot profilograph along with a request to accept as constructed.

Although omitted from corrective action, these areas still contribute to the overall IRI results.

### **601.03.11.4 Acceptance:**

**601.03.11.4.1 Longitudinal Surface Tolerance Acceptance:** Measure the mainline continuously from start to finish in the direction of travel for each lane for the project’s entire length. Perform the measurement under the observation and in the presence of the certified DOTD inspector. For projects that qualify for 102 percent pay, in accordance with Table 601-1 and allowable grinding in accordance with Table 601-2, the Materials and Testing Section will verify the testing results. Measure the surface tolerance for acceptance at the completion of the project after all corrective actions.

Profiler system parameter settings shall be verified before and during each run by the DOTD inspector. The inspector will witness and document the daily setup procedure and pre-operation tests performed by the contractor in accordance with the manufacturer’s procedures and DOTD TR 644. A copy of the manufacturer’s

setup, pre-operation, and general operating procedures for measuring surface tolerance, along with a copy of DOTD TR 644, shall be available at all times during measurement. Place a start and stop mark at the beginning and end of each travel lane so that the Department can rerun measurements.

The mainline longitudinal surface tolerance IRI specification requirements are in Table 601-1.

The Department will view the mainline PCCP's IRI raw data with the ProVAL 25-foot sliding base line to identify areas of localized roughness as defined by Table 601-2 for deficiencies. Submit to the engineer for approval the locations and screen shots for any allowed uncorrected deficiencies in accordance with 601.03.11.3.2. Although grinding for some areas may be deemed unnecessary by the engineer the measured roughness for such areas will still contribute to the total IRI for the project. In addition, the Department will check for 1/4 inch bumps at locations determined by the engineer. Correct deficiencies in accordance with 601.03.11.3.2.

A DOTD inspector will be present for the acceptance testing and will immediately receive a copy of the raw data, the "\*.erd" file and any files with information about the project, the operator, the equipment, the settings, daily pre-operation results, and a copy of the IRI results via USB flash drive. In addition to the data transferred by USB storage device, provide the engineer a paper copy of the IRI report. Acceptance for the project will be in accordance with Tables 601-1 and 601-2. The Department may elect to perform and utilize independent ride quality test results for acceptance at any time.

**601.03.11.4.2 Exclusions:** Take the IRI acceptance measurement in its entirety, without exclusions. The Department will then review the profile report obtained for each lane. In special cases or extenuating circumstances, the engineer may isolate or exclude sections of the profile. These include the following:

- Bridges, including the approach slabs
- Curb and gutter sections, just the affected wheel path, and adjacent areas
- Manholes, catch basins, valve and junction boxes
- Intersections of a different grade
- Structures located in the roadway which cause abrupt deviations in the profile
- Ramps less than 1500 feet
- Sections where the project engineer determines that attaining smoothness is beyond the contractor's reasonable control.

The roughness in excluded areas will not be included in the total IRI used for payment purposes, but shall meet the requirements of 601.03.11.3.2 and Table 601-

2. The quantity represented by the roadway length excluded will not receive any bonus pay adjustment for surface tolerance.

**601.03.12 Removing Forms:** Keep the forms in place for at least 12 hours and until concrete has set sufficiently to avoid damage or prior to opening to traffic as allowed by 601.03.13. Remove forms carefully to avoid damage to pavement. Repair all superficial damage with mortar composed of one part cement and two parts fine aggregates. After removal of forms, immediately cure sides of the slab in accordance with 601.03.10.

**601.03.13 Opening to Traffic:** Allow traffic on the pavement after 14 days or when test specimens, complying with 601.03.7, attain a compressive strength of 3,000 psi when tested in accordance with DOTD TR 230 or a flexural strength of 550 psi when tested in accordance with AASHTO T-97. Saw initial stress relief joints and clean the pavement prior to opening to traffic. If full width joints are cut, seal before opening to traffic.

**601.03.14 Acceptance Requirements:**

**601.03.14.1 General:** Conduct sampling for DOTD testing on each pavement lot for thickness, concrete strength, and surface tolerance. Sample in accordance with the DOTD Sampling Manual. Correct all pavement that is obviously defective, or remove and replace to full depth, to the satisfaction of the engineer. Times and locations will be established by the engineer.

A pavement lot is an identifiable area of approximately 4,000 square yards paid under the same item. The final area of pavement placed is a lot if it is at least 2,000 square yards; otherwise, it will be included in the previous lot. The engineer may redefine the lot limits when sequences of construction prevent timely sampling and testing.

Consider intersections, entrances, crossovers, ramps, and any other identifiable placement as separate lots.

**601.03.14.2 Concrete Strength and Thickness:**

**601.03.14.2.1 Compressive Strength:** Determine the 28-day compressive strength and thickness of pavements from hardened cores. The Department, in accordance with DOTD TR 225, will identify random concrete core locations and determine the diameter, thickness, and strength. Cut the cores in the presence of a DOTD representative. The DOTD representative will take immediate possession of the cores for thickness and strength determinations. Notify the District Laboratory Engineer at least five days prior to the start of coring operations.

The engineer will divide each pavement lot into five equal sections. Obtain one core from each section after meeting surface tolerances. Provide additional cores required by the Department to isolate thickness, strength or other pavement deficiencies, or for recutting of deficient cores at no direct pay. Patch all core holes using an approved pavement or structural concrete mixture meeting the requirements