AMENDMENT TO OPSS 313, APRIL 2021

Special Provision No. 103F56 April 2025

Cross Slope Tolerance

313.02 REFERENCES

Section 313.02 of OPSS 313 is amended by the addition of the following:

Ontario Ministry of Transportation Publications

MTO Forms:
PH-CC-886A Cross Slope Acceptance Form
PH-CC-886B Cross Slope Re-Test Acceptance Form

313.03 DEFINITIONS

Section 313.03 of OPSS 313 is amended by the addition of the following definitions:

Cross Slope means the average grade between the roadway crown or centreline and the edge of pavement. Used interchangeably with crossfall.

Electronic Level means a device which is capable of measuring the gradient of a flat surface and indicating the measured gradient numerically via a built-in interface.

313.06 EQUIPMENT

313.06.02 Diamond Grinding

Subsection 313.06.02 of OPSS 313 is deleted in its entirety and replaced by the following:

A diamond grinder shall be power-driven, self-propelled, and designed for grinding HMA. It shall be equipped with a grinding head with at least 50 diamond blades per 300 mm of shaft. The grinding head shall be at least 1.2 m wide. The diamond grinder shall be equipped with the capability to adjust the depth, slope, and cross slope to remove HMA to the specified profile and cross slope, and it shall also include a slurry pick-up system.

313.07 CONSTRUCTION

313.07.07.02 Paving

313.07.07.02.01 General

The first paragraph in Clause 313.07.07.02.01 of OPSS 313 is deleted in its entirety and replaced by the following:

Levelling, binder, and surface courses shall be laid by means of mechanical self-propelled pavers. Prior to roller compaction, obvious defects in the HMA placed shall be corrected. Irregularities in the alignment and grade along the outside edges shall be corrected. Excess HMA shall not be cast onto the surface of the freshly

laid mat. After final compaction of each course, the surface shall be smooth and true to the specified crown location, grade, cross slope, uniform in texture, and shall be free of all defects, including, but not limited to, cracks, segregation, fat spots, oil spills, chatter, and roller marks.

313.08 QUALITY ASSURANCE

313.08.01 Acceptance Criteria

Subsection 313.08.01 of OPSS 313 is amended by the addition of the following:

h) Cross Slope

Subsection 313.08.01 of OPSS is amended by the addition of the following clauses:

313.08.01.08 Cross Slope

313.08.01.08.01 Lot Size for Cross Slope

The cross slope of each through lane of the final surface course or binder course of HMA that is to be opened to traffic for a period of 2 months or longer, including all binder courses to be open to traffic over winter, shall be divided into lots having a maximum length of 1000 m. The size and location of the cross slope measurement lots and sublots for each lane shall be established by the Contract Administrator, based on the Contractor's plan to perform the work and shall include both tangent and superelevated sections. Tangent and superelevated tangent segments of Highway shall be treated as separate lots.

The number of sublots in a lot shall be based on an average measurement frequency of 100 m (i.e., a 1000 m lot shall have 10 sublots). The minimum number of sublots in any lot shall be five.

The following locations shall be exempt from inclusion in lots:

Locations Exempt from Cross Slope Verification				
Highway	Township	Start Chainage	End Chainage	Lane(s)

[* Designer Fill Ins for Above Table - See Notes to Designer]

313.08.01.08.02 Acceptance Measurement

The cross slope shall be measured by the Contract Administrator at a random location within each sublot. For each sublot measurement, the lane, station, design cross slope, time of calibration, and measured cross slope shall be recorded on MTO form PH-CC-886A, Cross Slope Acceptance Form by the Contract Administrator. A separate form shall be used for each lot.

The cross slope shall be measured using a 3 m straight edge affixed securely to a minimum 1.22 m long electronic level capable of displaying the measured cross slope to the nearest 0.1 percent slope and to an accuracy of ± 0.2 degrees. Electronic levels shall be calibrated a minimum of once per Day of use according to the electronic level manufacturer's instructions. The time of calibrations shall be recorded on MTO form PH-CC-886A, Cross Slope Acceptance Form.

The cross slope for each sublot shall be measured on the surface of the completed HMA by placing the level at the centre of the lane and perpendicular to the Roadway centreline. Measurements shall be recorded to the nearest 0.1 percent slope.

Alternatively, the cross slope may be calculated based on elevations obtained by survey methods using an automatic level, total station, or equivalent methodology. Survey equipment shall have a vertical accuracy of 2.5 mm per km and shall have been confirmed as in good working order in advance. Cross slope shall be determined by deducting the elevation difference between the edges of the lane and dividing the difference by the width of the lane.

All traffic control required to complete the cross slope measurements shall be provided by the Contractor at no additional cost to the Owner.

313.08.01.08.03 Basis of Acceptance

Cross slope measurements shall be taken immediately after final compaction and cooling of the asphalt. Acceptance calculations shall be entered on MTO form PH-CC-886A, Cross Slope Acceptance Form by the Contract Administrator. A copy of the completed form shall be provided to the Contractor within 3 Business Days of the completion of the lot.

313.08.01.08.03.01 Acceptance of Lots

Acceptance of final surface or binder course HMA shall be based on the differences between the design and measured cross slope. On tangent roadways and roadways with superelevation less than 5.7%, the average of the difference in percent slope between the design and measured cross slope sublot measurements of any lot shall not be less (shallower) than 0.3 or greater (steeper) than 0.7. On roadways with superelevation of 5.7% or greater, the difference for any lot in percent slope between the design and measured cross slope shall not be greater or less than 0.3. Any lot with a difference exceeding these limits is rejectable and shall be repaired according to the Repair clause.

313.08.01.08.03.02 Acceptance of Sublots

On tangent roadways and roadways with superelevations less than 5.7%, the difference in percent slope between the design and measured cross slope of any sublot shall not be less (shallower) than 0.4 or greater (steeper) than 0.8. On roadways with superelevations of 5.7% or greater, the difference for any sublot between the design and measured cross slope shall not be greater or less than 0.4 Any sublot with a difference exceeding these limits is rejectable and shall be repaired.

313.08.01.08.04 Re-Testing

Where a lot or sublot is rejectable, the Contractor may request re-testing. The request shall be made in writing to the Contract Administrator as soon as possible and no later than 3 Business Days from the receipt of MTO form PH-CC-886A, Cross Slope Acceptance Form notifying of a rejectable lot or sublot.

Re-testing shall consist of measurements taken simultaneously by the Contractor and Contract Administrator using the methods specified in the Acceptance Measurement clause. For each sublot measurement, the lane, station, design cross slope, and measured cross slope shall be recorded on MTO form PH-CC-886B, Cross Slope Re-Test Acceptance Form by the Contract Administrator. The selected method of re-testing shall be the same for both the Contractor and Contract Administrator. The Contractor's and Contract Administrator's

measuring equipment shall be correlated for accuracy prior to measurements and the difference in percent slope readings between the two shall not be greater than 0.1.

Where an individual sublot is found to be rejectable and re-testing is requested, the location of the rejectable sublot shall be re-measured. Additionally, four locations equally spaced 25 m apart, in the same lane shall be taken for a total of five measurements over a length of 100 m; two measurements upstream and two measurements downstream. The total length of the sublot to be re-measured shall be centred on the original location of the rejectable sublot measurement. If the difference in percent slope between the design and measured cross slope average of the Contractor and Contract Administrator's electronic level readings meets the sublot acceptance requirements in the Basis of Acceptance clause for cross slope, then the re-tested sublot shall be considered acceptable. Otherwise, the sublot shall be considered rejectable.

Where a lot is found to be rejectable and re-testing is requested, each sublot within the lot shall be re-measured. If the average of the Contractor and Contract Administrator's measurements is within acceptable limits as specified in the Basis of Acceptance clause for cross slope, the re-tested lot shall be considered acceptable. Otherwise, the lot shall be considered rejectable.

Re-testing shall be at no additional cost to the Owner.

Results of re-testing shall be considered final.

313.08.01.08.05 Repair

At least 5 Business Days prior to beginning any cross slope-related repairs, a written proposal shall be submitted to the Contract Administrator with the sublot and resurfacing locations including the limits and length of each resurfacing area. Cross slope repairs consisting of removal and replacement of asphalt shall encompass the entire lane width of any rejectable lot(s) or sublot(s). Diamond grinding may be performed over partial lane widths. Resurfacing repairs shall not commence until the Contract Administrator has provided the Contractor with written permission. If permission to commence repairs is denied, then the Contract Administrator shall provide the reason(s) in writing. All full depth repairs to a rejectable lot shall be made within 1 month of the initial paving of the lot. Repairs by diamond grinding shall take place upon completion of paving for the construction season. Longer timelines for repair shall be approved by the Contract Administrator. Upon completion of remedial repairs, the Contract Administrator shall re-measure the repaired areas to confirm that the repairs meet the acceptance criteria of this specification and all other HMA requirements as specified in the Contract Documents.

Alternatively, a proposal for the repair of rejectable lot(s) and sublot(s) by diamond grinding to a maximum depth of 5 mm may be submitted in writing to the Contract Administrator. The submission shall fully detail the limits and depths of diamond grinding to be performed and demonstrate that the diamond grinding shall meet all HMA requirements specified in the Contract Documents, including hot mix thickness requirements. Slurry produced from diamond grinding shall be removed from the site and managed as specified in the Contract Documents. Diamond griding shall not start unless the Contract Administrator has given written permission. If permission is denied, then the Contract Administrator shall provide the reason(s) in writing.

After repair, the cross slope of any lot that has been subject to repair shall be re-measured according to the Acceptance Measurement clause, using new sublot locations determined at random by the Contract Administrator.

NOTES TO DESIGNER:

* Designer Fill-In:

- Enter locations exempt from cross slope measurement. Spiral transition, tangent runouts, bridge decks and approach slabs should be exempt, as should intersections and any locations of resurfacing where cross slope correction is not intended and within 10 m of tie-in to existing adjacent or parallel pavement. Other specific locations may be identified as appropriate.

- Limits of exempt locations should be as shown in the sample table below:

Locations Exempt from Cross Slope Verification				
Highway	Township	Start	End	Lane(s)
1	Anytown	10+123	10+345	1, 2, 3
1	Anytown	10+567	10+678	3

WARRANT: With OPSS 313, at the discretion of the Head, Project Delivery in consultation with the Regional Head of Geotechnical Section, for all hot mix asphalt and hot-in-place recycling contracts, requiring at least one kilometre of paving, where at least a portion of the Contract will have a posted speed limit for the in-service pavement greater than 60 km/hour and it includes at least one lift of hot mix asphalt or one lift of hot-in-place recycled asphalt.