



CONSTRUCTION SPECIFICATION FOR GRANULAR SEALING

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305.01 SCOPE

This specification covers the requirements for the work of surface preparation and the supply and application of sealer to granular shoulders, shoulder rounding, and other designated areas.

305.01.01 Specification Significance and Use

This specification has been developed for use in provincial- and municipal-oriented Contracts. The administration, testing, and payment policies, procedures, and practices reflected in this specification correspond to those used by many municipalities and the Ontario Ministry of Transportation.

Use of this specification or any other specification shall be according to the Contract Documents.

305.01.02 Appendices Significance and Use

Appendices are not for use in provincial contracts as they are developed for municipal use, and then, only when invoked by the Owner.

Appendices are developed for the Owner's use only.

Inclusion of an appendix as part of the Contract Documents is solely at the discretion of the Owner. Appendices are not a mandatory part of this specification and only become part of the Contract Documents as the Owner invokes them.

Invoking a particular appendix does not obligate an Owner to use all available appendices. Only invoked appendices form part of the Contract Documents.

The decision to use any appendix is determined by an Owner after considering their contract requirements and their administrative, payment, and testing procedures, policies, and practices. Depending on these considerations, an Owner may not wish to invoke some or any of the available appendices.

305.02 REFERENCES

When the Contract Documents indicate that provincial-oriented specifications are to be used and there is a provincial-oriented specification of the same number as those listed below, references within this specification to an OPSS shall be deemed to mean OPSS.PROV, unless use of a municipal-oriented specification is specified in the Contract Documents. When there is not a corresponding provincial-oriented specification, the references below shall be considered to be to the OPSS listed, unless use of a municipal-oriented specification is specified in the Contract Documents.

When the Contract Documents indicate that municipal-oriented specifications are to be used and there is a municipal-oriented specification of the same number as those listed below, references within this specification to an OPSS shall be deemed to mean OPSS.MUNI, unless use of a provincial-oriented specification is specified in the Contract Documents. When there is not a corresponding municipal-oriented specification, the references below shall be considered to be the OPSS listed, unless use of a provincial-oriented specification is specified in the Contract Documents.

This specification refers to the following standards, specifications, or publications:

Ontario Provincial Standard Specifications, Construction

OPSS 304 Single and Double Surface Treatment

Ontario Provincial Standard Specifications, Materials

OPSS 1102 Liquid Asphalt
OPSS 1103 Emulsified Asphalt
OPSS 2510 Tall Oil Pitch Emulsion

Ontario Ministry of Transportation Publications

MTO Laboratory Testing Manual:
LS-100 Rounding-Off of Test Data and Other Numbers

305.03 DEFINITIONS

For the purpose of this specification, the following definitions apply:

Lot means a specific quantity of material or a specific amount of construction obtained from a single source and produced by the same process.

305.05 MATERIALS

Sealer shall consist of one or more of the following materials:

- a) RC-30 and MTO primer according to OPSS 1102.
- b) Emulsified asphalt primer according to OPSS 1103.
- c) Sealer approved by the Owner.
- d) When specified in the Contract Documents, tall oil pitch emulsion (TOP emulsion) according to OPSS 2510.

305.06 EQUIPMENT

The pressure distribution system used for sealer application shall be according to OPSS 304 and, when applicable, shall include an attachment for hand spraying.

Rollers shall be steel-drum or pneumatic-tired according to OPSS 304.

305.07 CONSTRUCTION

305.07.01 Operational Constraints

For sealer to be applied, the following conditions shall exist:

- a) The ambient temperature is a minimum of 5 °C and rising.
- b) The designated area to be sealed is not frozen.
- c) Precipitation is not occurring or imminent and, for TOP emulsion applications, precipitation has not occurred within the 24 hours prior to application.
- d) The surface is free of standing water.
- e) The wind is not strong enough to cause drifting of sealer spray.
- f) The shoulder shall be smooth and conform to the crossfall and grade specified in the Contract Documents.

305.07.02 Surface Preparation

As soon as is practical prior to applying sealer, the granular shoulder shall be rolled with a minimum of two passes. The shoulder rounding surface shall not be rolled.

Immediately prior to the application of RC-30, MTO primer, or emulsified asphalt primer, the granular material to be sealed shall be uniformly dampened.

The moisture content of the granular material to be sealed with TOP emulsion shall be according to the manufacturer's recommendations.

305.07.03 Application

Sealer shall be uniformly applied to the areas specified in the Contract Documents using a pressure distribution system.

RC-30, MTO primer, and emulsified asphalt primer shall be applied at the rate of 3.4 kg/m² for hand sprayed areas and at the rate of 2.6 kg/m² for all other areas.

TOP emulsion shall be applied at a rate of 5.5 L/m² for hand sprayed areas. Machine applied areas shall be applied in 3 coats to deliver a total of 4.5 L/m² minimum.

All inadequately treated areas identified by the Contract Administrator shall be retreated.

Sealer applied to an adjacent pavement surface shall be overlapped 100 mm onto the pavement surface.

The application temperature of the sealer shall be within the following limits:

- a) RC-30 and MTO primer: 30 to 45 °C
- b) Emulsified asphalt primer: Manufacturer's recommendations
- c) TOP emulsion: Ambient
- d) Owner approved sealers: Manufacturer's recommendations

305.07.04 Repair

All damaged sprayed areas shall be repaired and retreated to the satisfaction of the Contract Administrator.

305.07.05 Sampling of Sealer for Acceptance

The size of a lot is a single truck tank load of sealer as shipped to the site.

Samples shall be taken from a sampling spigot on the transfer line or, if one is not available, from the end of the transfer line. Each sample shall be taken after sufficient material has been drawn from the truck tank to purge the transfer line. The Contractor shall supply and fill sample containers, leaving sufficient space to allow for expansion.

Sample containers for liquid asphalt sealer and TOP emulsion shall be triple tight one-litre cans. A minimum of 1 can is required per sample.

Sample containers for emulsified asphalt sealer shall be triple tight, epoxy lined 4-litre pails, or suitable plastic containers of similar capacity that can be closed to prevent any leakage. A minimum of 2 pails are required per sample.

Identification tags, provided by the Contract Administrator, shall be completed and attached to each sample container. Samples shall be delivered within the required time specified in the Contract Documents.

All sample containers shall be supplied with appropriate WHMIS labels.

305.07.06 Management of Excess Material

Management of excess material shall be as specified in the Contract Documents.

305.08 QUALITY ASSURANCE

305.08.01 Testing

The Owner reserves the right to make inspections, take samples, and perform tests at such times and locations as the Owner may consider necessary to ensure that the materials supplied are in accordance with this specification.

Testing, when conducted, shall be at the laboratory specified in the Contract Documents using test methods according to OPSS 1102, OPSS 1103, and OPSS 2510, as applicable.

305.09 MEASUREMENT FOR PAYMENT

305.09.01 Actual Measurement

305.09.01.01 Granular Sealing

Measurement of granular sealer shall be by mass in kilograms or by area in square metres as specified in the Contract Documents.

305.09.02 Plan Quantity Measurement

When measurement is by Plan Quantity, such measurement shall be based on the units shown in the clause under Actual Measurement.

305.10 BASIS OF PAYMENT

305.10.01 Granular Sealing

305.10.01.01 Granular Sealing - Item

Payment at the Contract price for the above tender item shall be full compensation for all labour, Equipment, and Material to do the work.

Sprayed areas damaged by the Contractor's operations or identified by the Contract Administrator as inadequately treated shall be repaired and retreated at no extra cost to the Owner.

Sprayed areas damaged by others shall be repaired and retreated by the Contractor as Additional Work.

305.10.01.02 Payment Adjustment for Asphalt Sealers

305.10.01.02.01 General

Payment for any lot of RC-30, MTO primer, and emulsified asphalt primer that does not meet all Contract requirements shall be subject to a price adjustment. A calculated price adjustment shall be determined through a system of adjustment points based on test results for any lot sample, provided the sample remains in a condition suitable for testing.

Price adjustment shall not be applied when testing is not started within 14 Days of sampling, provided that the sample has been delivered within the required time specified in the Contract Documents.

When more than one test result is available on any one sample, the test result with the least deviation from the specification limit shall be used to calculate the price adjustment.

The total number of adjustment points for each sample shall be divided by 25 to obtain the price adjustment as a percentage for the lot.

A fixed price adjustment of 50% of the Contract price shall be made for lots to which at least one of the following conditions apply:

- a) A lot sample has not been received for testing.
- b) The lot sample contains insufficient material for testing.
- c) The lot sample does not remain in a condition suitable for testing for 14 Days after sampling (e.g., broken emulsion or foamover during distillation).

Prior to the summation, all adjustment points shall be rounded to one decimal place according to LS-100.

305.10.01.02.02 Adjustment Points for RC-30 and MTO Primer

The total number of adjustment points shall be equal to the summation of the number of units that each test deviates from the specification limits times the multiplier as shown in Table 1.

305.10.01.02.03 Adjustment Points for Emulsified Asphalt Primers

The total number of adjustment points shall be equal to the summation of the number of units that each test deviates from the specification limits times the multiplier as shown in Table 2, plus:

- a) 1,000 adjustment points for failure of the Storage Stability Test, 24 hours; and
- b) 1,000 adjustment points for failure of the Particle Charge Test.

The Storage Stability Test and the Particle Charge Test, performed according to OPSS 1103, have a pass or fail criteria.

305.10.01.03 Payment Adjustment for Tall Oil Pitch Emulsion

Payment for any lot of TOP emulsion that does not meet the solids content of OPSS 2510 shall be subject to a price adjustment of 2.5% for every 0.1% less than 8% solids.

TABLE 1
Tests, Units, and Multipliers for RC-30 and MTO Primer

Test	Unit	Multiplier
Residue by Distillation to 360 °C	%	200
Kinematic Viscosity at 60 °C	mm ² s	20
Distillate, as % of total distillate to 360 °C	%	10
to 190 °C	%	10
to 225 °C	%	10
to 260 °C	%	10
to 316 °C	%	10
Residue Penetration at 25 °C	0.1 mm	15
Residue Ductility at 25 °C	cm	10
Residue Solubility	%	10

TABLE 2
Tests, Units, and Multipliers for Emulsified Asphalt Primers

Test	Unit	Multiplier
Residue by Distillation	%	200
Viscosity at 50 °C, less than minimum	SFS	30
Viscosity at 50 °C, greater than maximum	SFS	5
Oil Portion of Distillate, by volume	%	50
Residue Penetration at 25 °C	0.1 mm	15
Flash Point, Open Tag	°C	10
Residue Ductility at 25 °C	cm	10
Residue Solubility	%	10
Note:		
A. SFS = Saybolt Furol Seconds		

**Appendix 305-A, November 2008
FOR USE WHILE DESIGNING MUNICIPAL CONTRACTS**

Note: This is a non-mandatory Commentary Appendix intended to provide information to a designer, during the design stage of a contract, on the use of the OPS specification in a municipal contract. This appendix does not form part of the standard specification. Actions and considerations discussed in this appendix are for information purposes only and do not supersede an Owner's design decisions and methodology.

Designer Action/Considerations

The designer should specify the following in the Contract Documents:

- Areas designated for granular sealing. (305.07.03)
- Number of Business Days for the delivery of samples. (305.07.05)
- Name and location of the testing laboratory. (305.08.01)
- Unit of measurement for granular sealer. (305.09.01.01)

The designer should determine if the following is required and, if so, specify it in the Contract Documents:

- The use of TOP emulsion. (305.05)

TOP emulsion should only be selected where minimal risk of damage by traffic or water erosion is expected. TOP emulsion should only be applied to aggregates meeting the requirements of Granular A, S, or M.

The designer should ensure that the General Conditions of Contract and the 100 Series General Specifications are included in the Contract Documents.

Related Ontario Provincial Standard Drawings

OPSD 210.070 Granular Sealing