

# S-10 CONSTRUCTION SPECIFICATION FOR HOT MIX ASPHALT

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### **10.01 SCOPE OF WORK**

This specification covers the requirements for the placement and compaction of hot mix asphalt for pavement construction and other uses in the City of Windsor.

### **10.02 REFERENCES**

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

- OPSS.PROV 308
- OPSS.MUNI 310
- OPSS.MUNI 1003
- OPSS.MUNI 1101
- OPSS.MUNI 1103
- OPSS.MUNI 1150
- OPSS.MUNI 1151

### **10.03 MIX DESIGNS**

The mix design shall be the responsibility of the contractor. The job mix formula selected for use shall produce hot mix that will meet the requirements of OPSS.MUNI 1150 and OPSS.MUNI 1151 with amendment to section 1150.04.01.01.01 Reclaimed Asphalt Pavement Proportions: part a) changed to: RAP will not be permitted for surface course mixes; part b) changed to: A maximum of 15% by mass of RAP shall be permitted for HL 4, HL 8, and medium duty binder courses. OPSS.MUNI 1151 Section 1151.04.01.01 RAP Proportions shall be amended such that RAP will not be permitted in SMA, 12.5FC1, 12.5FC2 or any other surface course Superpave mix and up to a maximum of 15% RAP is permitted in binder course Superpave mixes.

Mix Designs shall be submitted for every project to the City Engineer at least two (2) days prior to the paving. Any changes to the Mix Design shall be submitted to the City Engineer before the mix is used on a City project.

If for any reason the Contractor requests to change designed asphalt paving specified in the Contract, a request in writing at least 48 hours prior to the paving shall be submitted to the City Engineer for approval. The request shall outline the reasons for the request, the substituted mix design for use, and the cost difference between substituted mix and the original Contract mix.

### **10.04 MATERIALS**

Materials shall meet the requirements of OPSS.MUNI 310.

Materials used in the production of Hot Mix Asphalt shall meet the requirements of OPSS.MUNI 1150 for Marshall Mixes and OPSS.MUNI 1151 for Superpave and SMA mixes.

Tack coat material shall meet the requirements of OPSS.MUNI 1103.

HMA found to contain any material of any type other than the materials specified in the Mix Design, including but not limited to Re-Refined Engine Oil Bottoms (REOB), shall require that the HMA be removed and replaced at the Contractor's expense.

### **10.05 EQUIPMENT**

Equipment shall meet the requirements of OPSS.MUNI 310.

### **10.06 CONSTRUCTION**

Construction shall meet the requirements of OPSS.MUNI 310 and the requirements of OPSS.PROV 308 construction specification for Tack Coating and Joint Painting.

Where more than one course of HMA is to be placed in the same day, OPSS.MUNI 310.07.06.02 shall be followed.

**The use of water to cool the HMA shall not be allowed unless approved by the City Engineer.**

## **10.07 QUALITY ASSURANCE**

Quality assurance shall meet the requirements of OPSS.MUNI 310.08 except the following changes:

### **Aggregate Gradation and Asphalt Cement Content Acceptance**

Aggregate gradation and asphalt cement content test results for HMA samples based on LS-282 and LS-292 shall meet the tolerance requirements as specified in Table 7. A total of two borderline test results for the same two attributes representing up to 1000 tonnes of HMA production shall result in the work being deemed rejectable. A total of three borderline test results for the same attribute representing greater than 1000 tonnes up to 5000 tonnes of HMA production shall result in the work being deemed rejectable.

If the HMA is deemed rejectable according to Table 7, both the City and the Contractor shall review, agree, and identify the limits of the rejected HMA that has been placed. Limits of the rejectable HMA based on the first sample shall be represented by the area between the commencement of paving and the second sample. Limits of the rejectable HMA based on the second sample shall be represented by the area between the second sample and the third sample or the completion of the paving, etc. Referee samples within the limits of the affected area shall be delivered to a third party referee laboratory to verify the aggregate gradation or asphalt cement content or both. When the results of the referee samples are deemed rejectable according to Table 7, the HMA pavement shall be removed and replaced with acceptable HMA pavement at the Contractor's costs. Alternatively, the City may accept a payment reduction if a mutual agreement can be made through discussions between the Project Manager and the Contractor.

### **Hot Mix Asphalt Properties Acceptance**

Marshall test results for hot mix samples based on LS test procedures shall meet the requirements specified in Table 8 (in OPSS.MUNI 310). The production air voids for all HMA mixes shall be evaluated according to Table 9.

If the HMA does not meet Table 8 minimum requirements for Marshall stability or Marshall flow or is deemed rejectable for air voids according to Table 9, both the City Engineer and Contractor shall review, agree, and identify the limits of rejected HMA that has been placed. Referee samples within the limits of the affected area shall be delivered by the City to a mutually agreed upon third party referee laboratory to verify Marshall test or air void results or both. When the results from the referee samples do not meet Table 8 minimum requirements or are deemed rejectable according to Table 9, the HMA pavement shall be removed and replaced with acceptable HMA pavement. Alternatively, the City Engineer may accept a payment reduction if a mutual agreement can be made through discussions between the Project Manager and the Contractor.

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The Contractor shall notify the City Engineer 24 hours prior to the commencement of paving operations. A representative of the City's Field Services QA staff will contact the Contractor's QC staff to arrange for a mutually agreeable time to carry out Hot Mix Asphalt (HMA) sampling.

A minimum of one (1) HMA Sample will be taken for each 500 tonnes HMA placed on a project. The minimum number of samples for any project less than 500 tonnes HMA shall be two (2). Plate samples will not be allowed on surface course mixes. Plate samples may be used on binder course mixes, however, bulk shovel samples obtained from the paving equipment and split by Quartermaster equipment is the preferred sampling method. Sampling and splitting equipment shall be free of any chemical agents that will be in contact with the HMA sample. A sample shall be jointly obtained by the QC and QA representatives and shall comprise of the minimum sampling size of HMA as outlined in Table 6 of OPSS.MUNI 310. One box will be held by the Contractor for QC testing, two boxes will be held by the City, one box for QA testing and one box for possible referee testing. Each party will supply clean empty boxes for their respective sample(s). The HMA samples obtained shall be accepted by both parties indicating agreement that sampling was carried out in an acceptable manner and that the samples obtained are accepted for laboratory testing purposes. Should one of the parties not be able to attend the sampling event, the other party may sample, split by Quartermaster and box the HMA samples provided that the party not in attendance has a knowledgeable representative on site to witness and confirm the sampling was carried out in an acceptable manner. The boxes shall be labelled and delivered to the other party's site representative.

Lab testing requirements shall be extraction and gradation including Marshall Compliance Properties or Superpave Volumetrics for each of the samples taken unless otherwise approved by the City Engineer. Test results shall be compared to the Mix Design supplied by the Contractor and to other relevant specifications.

HMA QA sample(s), when possible, will be delivered to the testing laboratory the same day as sampled. Testing laboratories will carry all applicable certifications for the test(s) that they will be performing. Tests will be carried out in accordance with the appropriate LS Standards. Note that a dual agent shall not be allowed in the project QA/QC testing. A maximum period of three (3) working days shall be allowed for completion of the testing and a report will be generated and delivered to the City's Field Services Supervisor forthwith. Upon receipt of the test results, the report shall be shared between the City's Field Services Supervisor and the Contractor. QA test results shall be evaluated against the requirements outlined OPSS.MUNI 310, the contract documents and applicable Standard Specifications. Rejectable QA results will necessitate testing of the referee sample if requested by the Contractor. Within a maximum of period of three (3) working days of receipt of rejectable results, the City Engineer and Contractor shall agree upon a laboratory for referee testing to be carried out. The referee testing laboratory shall carry all applicable certifications for the test(s) that they will be performing and testing of the referee sample shall be carried out in accordance with appropriate LS Standards. A maximum period of three (3) working days shall be allowed for completion of the referee testing and a report will be generated and delivered to the Contractor and the City's Field Services Supervisor. The test report shall

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categorize the results as acceptable or rejectable. Should a local laboratory not be able to accommodate the testing requirements, another laboratory shall be agreed upon by both the Contractor and the City Engineer and retained by the City Engineer. The agreed upon referee testing laboratory shall allow both the Contractor and the City Engineer the opportunity to witness the referee testing of the HMA. If for specific reasons, witnessing of the referee testing cannot be accommodated, the referee testing laboratory shall provide recorded video record of the testing throughout its entirety, which shall include documentation that records the laboratory technician performing all aspects of the work, dates and times of testing.

Referee test results shall be binding on both the Owner and the Contractor.

For outsourced projects in which the City's QA staff is not involved with the inspection and testing, field sampling and laboratory testing of HMA by geotechnical consultants and/or others will follow the same sampling and testing protocols and timelines as noted above. Upon completion of laboratory testing, the test report shall, within the timeframe noted above, be reported to Engineer of Record copying the City Engineer. Referee testing will follow the same protocols as noted above.

At the discretion of the City Engineer, the Contractor may be requested to provide Performance Graded Asphalt Cement (PGAC) tank samples, **which shall be obtained during the production of HMA**. Sampling of a QC, QA and referee sample shall be obtained in accordance with OPSS.MUNI 1101.08.03 in the presence of a representative of the City's QA staff. Quality Assurance Testing for PGAC Grading shall be carried out as outlined in OPSS.MUNI 1101.08.04. In addition to PGAC Grading, additional PGAC testing outlined in OPSS 1101, Table 1 may be carried out from time to time. The Contractor shall be notified when PGAC testing is required and additional samples will be taken to accommodate testing. Test results shall be compared to OPSS.MUNI 1101. The contractor and the City Engineer shall inform each other of their intended testing laboratory. Note that a dual agent shall not be allowed in the project QA/QC testing. The laboratory shall carry all applicable certifications for the test(s) in which they will perform. QA test results shall be evaluated against the requirements outlined in the OPSS.MUNI 1101. Upon completion of the QA testing the results shall be shared with the Contractor. Rejectable results will necessitate testing of the referee sample. Within a maximum period of three (3) days of receipt of rejectable results, the City Engineer and Contractor shall agree upon a laboratory for referee testing to be carried out. The referee testing laboratory shall carry all applicable certifications for the test(s) that they will perform. Testing of the referee sample shall be carried out according to appropriate LS Standards. A report will be generated and delivered to the Contractor and the City's Field Services Supervisor. The report shall categorize the results as acceptable, or rejectable, where applicable. The agreed upon referee testing laboratory shall allow both the Contractor and the City Engineer the opportunity to witness the referee testing of the PGAC. If for specific reasons, witnessing of the referee testing cannot be accommodated, the referee testing laboratory shall provide a recorded video record of the testing throughout its entirety, which shall include documentation that records the laboratory technician performing all aspects of the work, dates and times of testing.

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Referee test results shall be binding on both the Owner and the Contractor.

When requested, the Contractor shall provide the City's QA representative with access to its asphalt plant control room in order to obtain copies of the batching records and to document plant operations during the production of hot mix asphalt for the Contract. If for specific reasons, the City QA representative cannot be granted access to the control room, batching records shall be provided when requested. The information collected from the Contractor's hot mix asphalt control room will be used solely to compare the as-produced mix to the mix design accepted by the City. All information collected by the City's QA representative will be shared with the Contractor and will be kept in strict confidence by the City. The City shall also be granted access to the asphalt plant yard during the construction season, upon request, to routinely sample aggregates, asphalt cement and observe operations.

**10.08 MEASUREMENT FOR PAYMENT**

Measurement for payment shall meet the requirements of OPSS.MUNI 310.

**10.09 BASIS OF PAYMENT**

Basis of payment shall meet the requirements of OPSS.MUNI 310 except as otherwise amended in this document.