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F-1 GENERAL

The Contractor shall be responsible for delegation and coordinating the work of all trades and subcontractors and supply of all materials that shall produce a complete and operating job. The scope of any Division or Section shall not necessarily be the limits of a subcontract or trade, and the Engineer shall not be the arbiter to establish the limits of contacts between Contractor and subcontractor.

The Contractor shall be responsible for ensuring that all his subcontractors and suppliers are familiar with the codes, bylaws, specifications and other regulations governing their work. The Contractor shall coordinate all work to provide minimum interference and maximum useable space and in accordance with manufacturer's recommendations for safety, access and maintenance.

F-2 STANDARD CONSTRUCTION SPECIFICATIONS AND DRAWINGS

At the time of tender closing, the current edition of all standards and specifications (i.e., Canadian Standards Association (CSA), American Society for Testing Materials (ASTM) and such), that are referenced to in these contract documents, shall apply. Where there is a clear conflict between the Standard Specifications and the contract documents, the contract documents shall apply. Where there is ambiguity between the Standard Specifications and any term of these contract documents, the Engineer shall, in the first instance, give an interpretation of the intent of the contract.

F-3 CONTRACT LABOUR AND EQUIPMENT RATES

The successful Contractor will be required to submit to the Engineer, a labour and equipment rental rate list prior to start of construction. These hourly rates submitted will be reviewed by the Engineer, and when approved will be used for work in this contract where no unit prices are provided or where no unit prices can be agreed upon. The labour rate must stipulate whether overtime is included or not. The Engineer may request a breakdown of the labour and equipment rental rates submitted.

F-4 PROJECT CONTACT

Inquiries regarding all aspects of the project shall be directed to:

Marlin Stusek, A.Sc.T.
Engineering Tech II

Office: (306) 694-4450
Email: mstusek@moosejaw.ca

F-5 HOURS OF WORK

Normal days of work for the supply of asphaltic concrete shall be 5 days a week from 7:30 a.m. to 4:00 p.m., Monday through Friday. The Contractor shall be required to provide asphalt mix on weekends and statutory holidays with the provision that preliminary notice is given 48 hours prior to supply and 12 hours confirmation notice is given prior to supply. Applicable premium rates for the supply of asphalt mix on weekends or statutory holidays shall apply. This amount per tonne shall be added to the base price per tonne for any type of asphalt.

F-6 COMMUNICATION

It is the responsibility of the Contractor to provide a list of contact numbers for all supervisory staff to the Public Works – Streets and Roads Supervisor. Any delays in the provision of asphalt mix shall be relayed to the Streets and Roads Supervisor in a timely fashion.

F-7 PRIME CONTRACTOR

The Contractor is the “Prime Contractor”, and the Work of this Contract is to have primary responsibility for the safety of all the workers and the equipment. The City does not anticipate that there will be any contractors, other than those performing the Work of this Contract engaged in work at the “work site” during the performance of the Work of this Contract.

F-8 INSPECTION AND TESTING

- a) The Engineer or his representative shall have access at any time to all parts of the plant for verification of weights or proportions, character of material and

determination of temperatures used in the preparation of mixture. Where tests or determinations are specified, such shall be done by an approved testing laboratory and a written report shall be forwarded to the Engineer.

- b) Analysis of properties of materials shall be performed in accordance with the latest revision of methods adopted by the American Society of Testing Materials, except laboratory test specimens of paving mixtures, which shall be prepared and tested in accordance with the procedures set forth in the Marshall Method of mix design in the Asphalt Institute Manual, "Mix Design Methods for Hot Mix Asphalt Paving, Manual Series No. 2".
- c) If requested by the City Engineer, the contractor shall have an approved testing firm perform the following tests of asphalt aggregate and asphalt mix:
 - i. Penetration Test – (ASTM D5).
 - ii. Sieve Analysis of Aggregates – (ASTM C136).
 - iii. Asphalt Content – (ASTM D2172).
 - iv. Marshall Stability, Flow Index, % Voids Total Mix, % Voids in Mineral Aggregate and Density – (ASTM D1559).
 - v. % Two Crushed Face and Sand Equivalent

F-9 FORCE ACCOUNTS OR EXTRAS

All Force Account work shall be authorized prior to beginning work. All Force Account items must be approved by the Engineer. The Force Account sheets must be signed the day of the work by the Contractor and Engineer. The Force Account sheet shall indicate the equipment used, name of each worker, starting and finishing time and unit costs.

Force Accounts with dollar extensions are to be submitted by the Contractor within two (2) weeks after the work is completed. Payment will be made on the following progress estimate. Force Accounts submitted without preapproval will not be accepted for payment. The City's inspector will also state in his daily report for that day if there were any extras for that day.

F-10 COMMUNICATION

It is the responsibility of the Contractor to ensure a list of contact numbers for all supervisory staff is provided to the Engineer as well as the Public Works – Streets and Roads Supervisor. Any delays in the provision of asphalt mix shall be relayed to the Streets and Roads Supervisor in a timely fashion.

F-11 NOTIFICATIONS

The Contractor must provide notice of asphalt plant shutdown a minimum of 24 hours prior to shutdown. The Contractor shall communicate the duration of the plant shutdown as well as when the plant is expected to commence operation.

F-12 ASPHALTIC MATERIALS

- a) The mineral aggregate for hot plant mix shall consist of coarse aggregate, fine aggregate and mineral filler and shall be crushed gravel and sand, or broken stone. It shall be of reasonably uniform quality throughout and shall consist of hard, strong, durable pieces, free from adhering coatings, flat or elongated pieces and from injurious amounts of clay, loam or other deleterious substances. The stone shall have an affinity for asphalt, or an anti-stripping compound such as quicklime shall be added. Where material from any one source fails to provide aggregate of acceptable gradation, the Contractor shall be required to supplement these materials by the addition of such other material as is required to meet the specification.

- i. Gradation (ASTM C136)

SEIVE DESIGNATION	PERCENT PASSING BY WEIGHT	
	SIZE	MJ2
20 mm	-	-
16 mm	-	-
12.5 mm	100	100
9 mm	79 – 89	98 – 100
5 mm	52 – 62	85 – 95
2 mm	30 – 42	49 – 59
900 µm	13 – 38	32 – 42
400 µm	10 – 26	15 – 26
160 µm	3 – 10	6 – 15
71 µm	2 – 5	3 – 7

- ii. The minimum average sand equivalent (ASTM D2419) for Asphaltic Concrete Pavement Aggregate shall be 45.
- iii. The material retained on the 5 mm sieve shall have a minimum of 70% with one crush face for MJ2 and 80% with two crushed faces for MJ4. Additionally, the material passing the 5 mm sieve shall consist of 70% crushed for MJ4.
- b) Cut back asphalt used as a prime coat shall be Medium Curing Type conforming to ASTM Specification D598.
- c) Emulsified asphalt used as Tack Coat or Fog Coat shall conform to CGSB Specification 16-GP-28. The particular grade of bituminous material shall be determined by the Contractor in consultation with the Engineer, according to the job requirements with respect to construction temperatures and to type of surface. The suggested type of bituminous materials for each type of work is as follows:
- i. Asphalt Cement – Penetration 150-200
 - ii. Primer – MC-30 cut back asphalt
 - iii. Tack Coat and Fog Coat – SS-1 emulsified asphalt.
- d) Cold Mix Asphalt – Aggregate Sieve Analysis for Cold Mix Design specifications will be equivalent to the Hot Mix MJ2 Aggregate sieve analysis. The Cold Mix bitumen content is 6.25% with an allowable tolerance of $\pm 0.25\%$.

The maximum permissible variation from the job mixes formula gradation shall be as follows:

Gradation	MJ2	MJ4
5.0 mm	± 4.0	± 3.0
2.0 mm	± 4.0	± 3.0
900 µm	± 3.0	± 3.0
400 µm	± 3.0	± 3.0
160 µm	± 2.0	± 2.0
71 µm	± 1.5	± 1.5

The Marshall Mix Designs are to be completed in accordance with the latest edition of the Asphalt Institute Manual Series No. 2 (MS-2) ASTM D1559 and ASSHTO T-245. The contractor shall provide the Engineer with a job mix formula for each asphalt type for approval.

Physical properties on the mixes shall meet the requirements on the following table:

Property	ASTM Test Method	MJ2	MJ4
Asphalt Grade	-	150/200 A	150/200 A
Marshall (blows per face)	-	50	50
Marshall Stability (kN) @ 60 °C min.	D1559	8	8
Retained Stability (%) min.	-	75	75
Marshall Flow Index (mm)	D1559	2 – 4	2 – 4
Air Voids in Mixture (%)	D3203	2 – 4	3 – 5
Voids Filled with Asphalt (%)	D3203	75 – 85	75 – 85
Min. Film Thickness (µm)	-	8.5	8.0

The stability and flow shall be evaluated using ASTM D1559. The percentage of voids and the percentage of voids filled with asphalt shall be evaluated using ASTM

D3293 and C128. The minimum asphalt content shall be 5.7% for MJ2 and 6.5% for MJ4.

F-13 ASPHALT MIXING PLANT

Mixing plant in operation shall conform to ASTM Specification D995. The maximum storage time for any mix shall be 24 hours.

F-14 PREPARATION OF MIXTURE

- a) The asphalt cement shall be brought to a temperature of 120 degrees Celsius to 150 degrees Celsius before mixing with aggregate. The temperature between these limits shall be regulated according to the penetration of the asphalt cement and shall be maintained within the limits of penetration specified.
- b) The coarse and fine aggregates shall be fed by feeders to the cold elevator or elevators in their proper proportions and at a rate to permit correct and uniform temperature control of the heating and drying operation. The aggregates shall be dried and delivered to the mixer at a temperature between 120 degrees Celsius and 160 degrees Celsius. The temperature between these limits shall be regulated according to the penetration grade of asphalt, temperature of the atmosphere and workability of the mixture, but shall be as low as possible consistent with proper mixing and laying. Immediately after heating, they shall be screened into bins, with separation on the 5.00 mm sieve and such other coarse sieves as the number of bins permit. All aggregates in the bin that contain sufficient moisture to cause foaming in the mixture shall be removed and replaced in their respective stockpiles.
- c) Each size of hot aggregate and mineral filler, if employed, as well as the hot asphalt cement, shall be measured separately and accurately to the proportions in which they are to be mixed. The order of sequence in which the several aggregates shall be drawn or weighed may vary under different conditions, that is, depending on the type of mixing plant used. The mineral aggregate and the asphalt cement shall be fed into the mixer in such a manner that a thorough and uniform mixture is attained.
- d) A uniform mixture shall be produced in which all aggregate particles are thoroughly coated with asphalt.

- e) The aggregates shall be dried and delivered to the mixer at a temperature between 120 degrees Celsius and 160 degrees Celsius.
- f) The mix temperature at the mixer discharge shall be between 125 degrees Celsius and 135 degrees Celsius.

F-15 MATERIAL TICKETS

The scales shall be satisfactory to the City Engineer, and shall be tested and sealed by the Weights and Measures Inspection Service, Department of Consumer & Corporate Affairs Canada. They shall be tested prior to use under the Contract except that the Engineer may, if the circumstances warrant, allow a short period of use before testing by the Department of Consumer & Corporate Affairs Canada. The scales shall be subject to subsequent testing as aforesaid, as frequently as the Engineer may deem necessary in order to ensure their accuracy. All costs of testing and sealing such scales shall be borne by the Contractor.

The Contractor's truck drivers shall provide material tickets to the Inspector at the time of delivery. In the absence of the Inspector, the Contractor's site supervisor shall collect the delivery tickets and provide such tickets to the Engineer. The Contractor, upon request by the Engineer, shall "weigh out" trucks or transportable containers to determine actual quantities of materials placed, or to determine the amount of material wasted.

The Contractor shall supply a daily summary to show the ticket number, gross, net and tare weights, truck number and cumulative total for the asphalt by type and project for that day.

This information is only required for quantities that are measured and paid for on a per Tonne basis.

F-16 PROGRESS PAYMENTS

The successful bidder is required to submit invoices to the City of Moose Jaw Engineering Department on a monthly basis at month end. A monthly Progress Certificate will be prepared by the Engineer. The Contractor shall provide supporting documentation such as weigh tickets (and summaries), change orders and force account

sheets to the Engineer covering the Progress Payment reporting period. The invoice shall be a complete billing for the previous month's services. Invoices are due and payable 30 days after being received by the City of Moose Jaw.

END OF SPECIFICATIONS