

Part 1 General

1.1 PRODUCTS INSTALLED BUT NOT SUPPLIED UNDER THIS SECTION

- .1 Contractor will supply:
 - .1 Asphalt material delivered to job site by tank truck.

1.2 RELATED REQUIREMENTS

- .1 Section 31 05 16 - Aggregate Materials

1.3 PRICE AND PAYMENT PROCEDURES

- .1 Measurement and Payment:
 - .1 Asphalt material will be paid within the surface area unit price of multiple surface treatment.

1.4 REFERENCES

- .1 ASTM International
 - .1 ASTM C88-13, Standard Test Method for Soundness of Aggregates by Use of Sodium Sulphate or Magnesium Sulphate.
 - .2 ASTM C117-13, Standard Test Method for Materials Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.
 - .3 ASTM C131-14, Standard Test Method for Resistance to Degradation of Small Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
 - .4 ASTM C136-14, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .5 ASTM D140/D140M-15, Standard Practice for Sampling Bituminous Materials.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1-88, Sieves Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2-M88, Sieves Testing, Woven Wire, Metric.
- .3 Ontario Provincial Standard Specification (OPSS)
 - .1 OPSS 1006, Material Specification for Aggregates – Surface Treatment.
 - .2 OPSS 1103, Material Specification for Emulsified Asphalt.

1.5 ADMINISTRATIVE REQUIREMENTS

- .1 Traffic Control: direct traffic through project with warning signs, in accordance with Section 01 35 00.06 - Special procedures for traffic control.
 - .1 Keep traffic off freshly sprayed asphalt.
 - .2 Complete rolling before permitting traffic over newly treated areas.

1.6 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for asphalt material and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Samples:
 - .1 Submit for review and acceptance two 4 L clean, sealed, plastic containers of asphalt material proposed for use to Departmental Representative 5 days prior to commencing work.
 - .2 Provide access on tank truck for Departmental Representative to sample asphalt material to be incorporated into work, in accordance with ASTM D140.
- .4 Certifications: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .5 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures and confirmation that aggregate is compatible with the asphalt material.

1.7 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for flexible paving surface treatment.

1.8 QUALITY ASSURANCE

- .1 Upon request from Departmental Representative, submit manufacturer's test data and certification that asphalt surface treatment material meets requirements of this section.

1.9 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.

Part 2 Products

2.1 EQUIPMENT

- .1 Pressure distributor is:
 - .1 Designed, equipped, maintained, and operated to ensure asphalt material can be:
 - .1 Maintained at even temperature.
 - .2 Applied uniformly on variable widths of surface up to 5 m.
 - .3 Applied at controlled rates from 0.2 to 5.4 L/m², and with allowable variation from specified maximum rate of 0.1 L/m².
 - .4 Distributed in uniform spray without atomization at rate specified and at temperature required.
 - .2 Equipped with meter registering metres of travel per minute, visibly located, to enable truck driver to maintain constant speed required for application at specified rate.
 - .3 Equipped with pump with flow meter graduated in units of 5 L maximum per minute passing through nozzles and readily visible to operator. Ensure pump power unit is independent of truck power unit.
 - .4 Equipped with an easily readable, accurate and sensitive device which registers temperature of liquid in reservoir.
 - .5 Equipped with accurate volume measuring devices or calibrated tank.
 - .6 Equipped with nozzles of same make and dimensions adjustable for fan width and orientation.
 - .7 Cleaned if previously used with incompatible asphalt material.
- .2 Mechanical aggregate spreader:
 - .1 Equip with positive controls to allow aggregate to be deposited uniformly over full width of asphalt material.
 - .2 Self-propelled unit of design approved by Departmental Representative.
 - .3 Supported by 4 minimum wheels with pneumatic tires of 2 axles.
- .3 Rollers:
 - .1 Self-propelled pneumatic tired rollers exerting force of 7 tonnes/m minimum of rolling width, equipped with seven wheels minimum staggered back and front, and tires inflated to 415 kPa.
 - .2 Tandem steel drum rollers as approved by Departmental Representative:
 - .1 Drum diameter: 1 m minimum.
 - .2 Static force: 4.3 tonnes/m minimum of rolling width.
- .4 Power broom: self-propelled pneumatic tired unit, capable of vertical and horizontal angular adjustment.

2.2 MATERIALS

- .1 Asphalt material: HF-150, characteristics according to OPSS 1103, Material Specification for Emulsified Asphalt.
- .2 Aggregate: material to Section 31 05 16 - Aggregate Materials and following requirements, based on OPSS 1006:
 - .1 Crushed stone or gravel.
 - .2 Gradations to be within limits specified when tested to ASTM C136. Sieve sizes to CAN/CGSB-8.1.

Sieve Designation	% Passing
	Class 2
19.0 mm	100
16.0 mm	98-100
13.2 mm	75-95
9.5 mm	50-70
6.7 mm	-
4.75 mm	25-50
2.36 mm	-
1.18 mm	10-40
0.600 mm	-
0.300 mm	2-20
0.150 mm	2-13
0.075 mm	2-7

- .3 Los Angeles Degradation: to ASTM C131, maximum percent loss by mass 25.
- .4 Magnesium sulphate soundness: to ASTM C88, maximum percent loss by mass 15.
- .5 Crushed particles: at least 60 % of particles by mass within following sieve designation ranges to have at least 1 freshly fractured face. Material to be divided into ranges using methods of ASTM C136.
- .6 Flat and elongated particles, with length to thickness ratio greater than 5, maximum percent by mass 8.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's written instructions prior to flexible paving surface treatment installation.
 - .1 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .2 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 PREPARATION

- .1 Temporary Erosion and Sedimentation Control:
 - .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according sediment and erosion control plan, specific to site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.
 - .2 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- .2 Grade granular base course to specified cross-section, allowing a free surface drainage. Blade smooth and compact to achieve desired density.
- .3 Clean paved and primed surfaces of mud, dust and other foreign matter. Immediately before asphalt binder is applied broom or clean as necessary to remove foreign material.

3.3 APPLICATION

- .1 Obtain approval from Departmental Representative, of base surface before applying asphalt surface treatment material.
- .2 Apply treatment only when existing surface is dry when atmospheric temperature in shade is above 10 degrees C and rising or above 15 degrees C if falling, and when weather is clear and dry.
- .3 Schedule work to approval of Departmental Representative.
- .4 Ensure pressure distributor follows string line parallel to centreline, or follows path as directed by Departmental Representative.
- .5 Spread protective covering of building paper or other acceptable material over width of surface, and for sufficient distance back so that spraying nozzles are fully operative when surface to be treated is reached.
 - .1 Remove protective covering when no longer required and dispose of by means acceptable to Departmental Representative.
- .6 Quantities of asphalt material and aggregate to be applied within following ranges.

.1 Double Surface Treatment: Total thickness: 12.5 mm

	Asphalt binder per square metre	Cover aggregate per square metre
First application	1.60-1.80 L	Class 2 16-18 kg
Second application (or single application)	1.45-1.65 L	Class 2 16.5-19 kg

- .7 Apply asphalt material at spraying temperature specified in applicable CGSB standard for type and grade used and at rate specified using pressure distributor.
 - .1 Joints created by the placement of a surface treatment beside an existing surface which is at a different elevation shall be constructed with a minimum of overlap and to the satisfaction of the Departmental Representative.

- .2 Longitudinal joints shall be constructed so that no areas are missed on the centre line, and such that the overlap of binder is kept to a minimum.
- .3 Transverse joints and intersections shall be constructed with a minimum of overlap and such that no areas are missed. After adjustment, Manhole and catchbasin grates, waterstops, curb & gutter etc. shall be covered to protect them from being sprayed.
- .4 The application of binder shall terminate at the same station for both lanes at the end of each day.
- .5 The forward speed of the spreader should not exceed 100m/minute.
- .8 Apply aggregate, in unfrozen condition, immediately following application of asphalt material. Aggregate spreader to be no more than 30 m behind distributor. Apply no more aggregate than can be thoroughly incorporated into and absorbed by asphalt material.
- .9 Ensure aggregate spreader tires do not contact uncovered and newly applied asphalt material.
- .10 Immediately after aggregate is spread, cover deficient areas with additional aggregate.
- .11 Adjust rates of application of asphalt and aggregate as directed by Departmental Representative.
- .12 Compact immediately after aggregate is spread using 3 rollers minimum.
 - .1 Ensure 2 rollers minimum are pneumatic tired type.
- .13 Apply at least 5 roller passes to entire surface treated area.
 - .1 Ensure 2 rollers are no more than 300 m behind spreader.
- .14 Apply subsequent layer of asphalt and aggregate when surface has set sufficiently to approval of Departmental Representative.

3.4 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Sweep excess material from entire surface by means of power brooms at times directed by Departmental Representative and at end of maintenance period.

3.5 MAINTENANCE

- .1 Maintain treated surface as directed by Departmental Representative, for period of 4 days minimum after rolling.
 - .1 Include distribution of aggregate material over surface to absorb free asphalt material.
 - .2 Include covering of areas deficient in aggregate material.
- .2 Ensure embedded material remains stationary during maintenance.

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Issued for Tender
Section 32 01 13.02
FLEXIBLE PAVING SURFACE TREATMENT -
MULTIPLE APPLICATION
Page 7

END OF SECTION