

## **1 GENERAL**

### **1.01 SECTION INCLUDES**

- .1 Materials and installation for asphalt concrete paving for airport runways.

### **1.02 RELATED SECTIONS**

- .1 Section 32 12 13.16 - Asphalt Tack Coats.

### **1.03 MEASUREMENT FOR PAYMENT**

- .1 Asphalt Paving: As specified including all plant, labour, materials and equipment will constitute a unit price per square metre of surface asphalt concrete actually incorporated into Work for measurement purposes & per tonne for base coat asphalt actually incorporated into the work. A separate unit price will be associated for each course of surface asphalt. Include incidental to this all cost for testing and,
  - .1 Supply of all materials.
  - .2 Handling, storage, crushing, stockpiling and preparation of all materials.
  - .3 Cold milling/planing of existing asphalt surfaces including transportation and disposal at an approved facility of all asphalt materials. Cold milling to be included in surface asphalt square metre unit price.
  - .4 Preparation of all joints with hot asphalt cement, together with cutting and removal of pavement where a joint is required as a result of a break in paving operations. Preparation and tack coat to be included in surface asphalt square metre unit price.
  - .5 Mixing, transportation, placing and compacting of asphalt mixtures.
  - .5 Testing of asphalt placement and compaction to be performed in accordance with 01 29 83 and considered incidental to the work and included in square metre cost of surface and base asphalt placement unit price respectively.
  - .6 All other cost arising from requirements of this section for which payment is not otherwise specifically provided.

### **1.04 REFERENCES**

- .1 American Association of State Highway and Transportation Officials (AASHTO)
  - .1 AASHTO T245 (2015), Resistance to Plastic flow of Bituminous Mixtures Using Marshall Apparatus.
  - .2 AASHTO M320-17, Standard Specification for Performance Graded Asphalt Binder.
  - .3 AASHTO R29-15, Standard Specification for Grading or Verifying the Performance Graded of an Asphalt Binder
- .2 Asphalt Institute (AI)
  - .1 AI MS2-2015 Seventh Edition, Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types.
- .3 American Society for Testing and Materials International, (ASTM)

- .1 ASTM C 88, Standard Test Method for Soundness of Aggregates by Use of Sodium Sulphate or Magnesium Sulphate.
- .2 ASTM C 117, Standard Test Method for Material Finer Than 0.075mm (No.200) Sieve in Mineral Aggregates by Washing.
- .3 ASTM C 123, Standard Test Method for Lightweight Particles in Aggregate.
- .4 ASTM C 127, Standard Test Method for Specific Gravity and Absorption of Coarse Aggregate.
- .5 ASTM C 128, Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Fine Aggregate.
- .6 ASTM C 131, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
- .7 ASTM C 136, Standard Method for Sieve Analysis of Fine and Coarse Aggregates.
- .8 ASTM D 995, Standard Specification for Mixing Plants for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures.
- .9 ASTM D 2419, Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
- .10 ASTM D 3203, Standard Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures.
- .11 ASTM D 4791, Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.
- .12 ASTM D4867//D4867M, Standard Test Method for Effect of Moisture on Asphalt Concrete Paving Mixtures.
  
- .4 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-8.2-M88, Sieves Testing, Woven Wire, Metric.
  - .2 CAN/CGSB-16.3-M90, Asphalt Cements for Road Purposes.

### **1.05 PRODUCT DATA**

- .1 Submit viscosity-temperature chart for asphalt cement to be supplied showing either Saybolt Furol viscosity in seconds or Kinematic Viscosity in centistokes, temperature range 105 to 175 degrees C at least 1 week prior to beginning Work.
- .2 Submit manufacturer's test data and certification that asphalt cement meets requirements of this Section.
- .3 Submit asphalt mix design and trial mix test results to DR for approval at least 1 week prior to commencing work.

### **1.06 SAMPLES**

- .1 Inform DR of proposed source of aggregates and provide access for sampling at least 1 week prior to beginning Work.
- .2 Submit samples of following materials proposed for use at least 2 weeks prior to beginning Work.
  - .1 One 5 L container of asphalt cement.

### **1.07 WASTE MANAGEMENT AND DISPOSAL**

- .1 Divert unused asphalt from landfill to facility capable of recycling

materials.

## 2 PRODUCTS

### 2.01 MATERIALS

- .1 Asphalt cement: Performance graded asphalt cement to AASHTO M320, grade PG58-28 when tested to AASHTO R29.
- .2 Aggregate Materials with the following requirements:
  - .1 Crushed stone or gravel consisting of hard, durable angular particles, free from clay lumps, cementation, organic material, frozen material and other deleterious materials.
  - .2 Gradations to be within limits specified when tested to ASTM C 136 and ASTM C 117 and to have a smooth curve without sharp breaks when plotted on semi-log grading chart.
  - .3 Table 

Sieve Designation	% passing surface Course
12.5 mm	93 - 100
9.5 mm	75 - 92
4.75 mm	55 - 75
2.00 mm	32 - 55
0.425 mm	16 - 25
0.180 mm	5 - 20
0.075 mm	3 - 8
  - .4 Coarse aggregate: aggregate retained on 4.75 mm sieve and fine aggregate is aggregate passing 4.75 mm sieve when tested to ASTM C 136.
  - .5 When dryer drum plant or plant without hot screening is used, process fine aggregate through 4.75 mm sieve and stockpile separately from coarse aggregate.
  - .6 Separate stockpiles for coarse and fine aggregates not required for sheet asphalt.
  - .7 Do not use aggregates having known polishing characteristics in mixes for surface courses.
  - .8 Sand equivalent: ASTM D 2419. Min: 50.
  - .9 Magnesium Sulphate soundness: to ASTM C 88. Max% loss by mass:
    - .1 Coarse aggregate surface course: 12 %.
    - .2 Fine aggregate, surface course: 16 %.
  - .10 Los Angeles degradation: Grading B, to ASTM C 131. Max % loss by mass:
    - .1 Coarse aggregate, surface course: 25.
  - .11 Absorption: to ASTM C 127. Max % by mass:
    - .1 Coarse aggregate, surface course: 1.75 %.
  - .12 Loss by washing: to ASTM C 117. Max % passing 0.075 mm sieve:
    - .1 Coarse aggregate, surface course: 1.5.
  - .13 Lightweight particles: to ASTM C 123. Max % by mass less than 1.95 relative density:
    - .1 Surface course: 1.5 %.
  - .14 Flat and elongated particles: to ASTM D 4791, (with length to thickness ratio greater than 4): Max% by mass:
    - .1 Coarse aggregate, surface course: 20 %.
  - .15 Crushed fragments: at least 60 % of particles by mass within each of following sieve designation ranges, to have at least 1 freshly fractured face. Material to be divided into ranges, using methods of ASTM C 136.

Passing	Retained on
25 mm	12.5 mm
12.5 mm	4.75 mm
  - .16 Regardless of compliance with specified physical requirements, fine

- aggregates may be accepted or rejected on basis of past field performance.
- .3 Mineral filler:
    - .1 Finely ground particles of limestone, hydrated lime, Portland cement or other approved non-plastic mineral matter, thoroughly dry and free from lumps.
    - .2 Add mineral filler when necessary to meet job mix aggregate gradation or as directed to improve mix properties.
    - .3 Mineral filler to be dry and free flowing when added to aggregate.
  - .4 Anti-stripping agent: may be required to limit the potential stripping of asphalt. An anti-stripping additive will be required if one of the following conditions occurs as determined by AASHTO T 283:
    - The tensile strength ratio of the hot mix asphalt concrete is less than 0.80
    - There is visual evidence of stripping. Acceptable specimens shall have a visual stripping rating of 1.0 or lower based on a scale from 0 to 10 (with 0 being no visual stripping and 10 being fully stripped).Hydrated lime to ASTM C 207 type N or approved liquid anti-stripping additive may be used for the purpose. Add lime at rate of approximately 1% of dry weight of aggregate. The liquid anti-stripping additive application rate added to the hot mix asphaltic concrete shall be the greater of 0.5% of additive by weight of asphalt cement, or the recommended percentage as determined from Lottman test results. Approved liquid anti-stripping additives include the products AD-here LOF 6500 (ARR-MAZ Custom Chemicals) and Redicote C-3082 (Akzo Nobel Chemicals). All other products must be approved by DR.

In addition to AASHTO T 283 requirements, the asphalt hot mix containing anti-stripping additive shall pass a boiling water test in accordance with ASTM D3625 Standard Practice for the Effect of Water on Bituminous-Coated Aggregate Using Boiling Water within the mix design procedure. The pass criterion for ASTM D 3625 is 95% or greater retained bitumen coating of aggregate. An additional rate of anti-strip and/or an alternate anti-stripping additive will also be required if the aggregate is known to be prone to stripping from past performance and the minimum application rate was insufficient. Modified Lottman Tests (AASHTO T 283) and Boiling Water Tests (ASTM D3625) shall also be conducted on field produced samples of hot mix. All field produced samples shall also pass the requirements above.
  - .5 Water: to approval of DR.
  - .6 Asphalt Tack Coat: Anionic emulsified asphalt: to ASTM D977, grade: RS-1.

## 2.02 EQUIPMENT

- .1 Pavers: mechanical grade controlled self-powered pavers capable of spreading mix within specified tolerances, true to line, grade and crown indicated.
- .2 Rollers: sufficient number of type and weight to obtain specified density of compacted mix.
- .3 Vibratory rollers:
  - .1 Minimum drum diameter: 1200 mm.

- .2 Maximum amplitude of vibration (machine setting): 0.5 mm for lifts less than 40 mm thick.
  
- .4 Cold-milling machine: Shall be self-driven rotating drum type, capable of removing asphalt up to 100 mm thick and at least 1200 mm wide in a single pass. Cutting depth shall be adjustable from 0 to 100 mm over the length of the drum. The machine shall have automatic grade control and be capable of loading milled material directly into trucks.
  
- .5 Haul trucks: sufficient number and of adequate size, speed and condition to ensure orderly and continuous operation and as follows:
  - .1 Boxes with tight metal bottoms.
  - .2 Covers of sufficient size and weight to completely cover and protect asphalt mix when truck fully loaded.
  - .3 In cool weather or for long hauls, insulate entire contact area of each truck box.
  
- .6 Hand tools:
  - .1 Lutes or rakes with covered teeth for spreading and finishing operations.
  - .2 Mechanical compaction equipment, approved by DR, shall be used instead of tamping irons for areas not accessible by rollers.
  - .3 Straight edges, 4.5 m in length, to test finished surface.

**2.03 MIX DESIGN**

- .1 Mix design to be provided by contractor and approved by DR.
- .2 Mix design to be developed by testing laboratory approved by DR.
- .3 Design of mix: by Marshall method to requirements below.
  - .1 Compaction blows on each face of test specimens: 75.
  - .2 Mix physical requirements:

<u>Property</u>	<u>Airfield Pavements</u>
Marshall Stability at 60°C kN min	8.0
Flow Value mm	2-4
Air Voids in Mixture, %	2-4
Voids in Mineral Aggregate, % min	15 surface course
Index of Retained Stability, % min.	80
  - .3 Measure physical requirements as follows:
    - .1 Marshall load and flow value: to AASHTO T245.
    - .2 Compute void properties on basis of specific gravity of aggregate to ASTM C 127 and ASTM C 128. Make allowance for volume of asphalt absorbed into pores of aggregate.
    - .3 Index of Retained Stability: measure in accordance with ASTM D4867 (TSR Average of conditioned and freeze thaw values, minimum 80%.
  - .4 Do not change job-mix without prior approval of DR. When change in material source proposed, new job-mix formula to be approved by DR.
  - .5 Return plant dust collected during processing to mix in quantities acceptable to DR.

### 3 EXECUTION

#### 3.01 PLANT AND MIXING REQUIREMENTS

- .1 Batch and continuous mixing plants:
  - .1 To ASTM D 995.
  - .2 Feed aggregates from individual stockpiles through separate bins to cold elevator feeders. Do not load frozen materials into bins.
  - .3 Feed cold aggregates to plant in proportions to ensure continuous operations.
  - .4 Calibrate bin gate openings and conveyor speeds to ensure mix proportions are achieved.
  - .5 Before mixing, dry aggregates to moisture content not greater than 1 % by mass or to lesser moisture content if required to meet mix design requirements.
  - .6 Immediately after drying, screen aggregates into hot storage bins in sizes to permit recombining into gradation meeting job-mix requirements.
  - .7 Store hot screened aggregates in manner to minimize segregation and temperature loss.
  - .8 Heat asphalt cement and aggregate to mixing temperature directed by DR. Do not heat asphalt cement above 160 degrees C.
  - .9 Make available current asphalt cement viscosity data at plant. With information relative to viscosity of asphalt being used, DR to approve temperature of completed mix at plant and at paver after considering hauling and placing conditions.
  - .10 Maintain temperature of materials within 5 degrees C of specified mix temperature during mixing.
  - .11 Mixing time:
    - .1 In batch plants, both dry and wet mixing times as directed by DR. Continue wet mixing as long as necessary to obtain thoroughly blended mix but not less than 30s or more than 75s.
    - .2 In continuous mixing plants, mixing time as directed by DR but not less than 45s.
    - .3 Do not alter mixing time unless directed by DR.
- .2 Dryer drum mixing plant:
  - .1 To ASTM D 995.
  - .2 Load aggregates from individual stockpiles to separate cold feed bins. Do not load frozen materials into bins.
  - .3 Feed aggregates to burner end of dryer drum by means of multi-bin cold feed unit and blend to meet job-mix requirements by adjustments of variable speed feed belts and gates on each bin.
  - .4 Meter total flow of aggregate by an electronic weigh belt system with indicator that can be monitored by plant operator and which is interlocked with asphalt pump so that proportions of aggregate and asphalt entering mixer remain constant.
  - .5 Provide for easy calibration of weighing systems for aggregates without having material enter mixer.
  - .6 Calibrate bin gate openings and conveyor speeds to ensure mix proportions are achieved. Calibrate weigh bridge on charging conveyor by weighing amount of aggregate passing over weigh bridge in set amount of time. Difference between this value and amount shown by plant computer system to differ by not more than plus or minus 2 %.
  - .7 Make provision for conveniently sampling full flow of materials from

- cold feed.
- .8 Provide screens or other suitable devices to reject oversize particles or lumps of aggregate from cold feed prior to entering drum.
- .9 Provide system interlock stop on feed components if either asphalt or aggregate from any bin stops flowing.
- .10 Accomplish heating and mixing of asphalt mix in approved parallel flow dryer-mixer in which aggregate enters drum at burner end and travels parallel to flame and exhaust gas stream. Control heating to prevent fracture of aggregate or excessive oxidation of asphalt. Equip system with automatic burner controls and provide for continuous temperature sensing of asphalt mixture at discharge, with printing recorder that can be monitored by plant operator. Submit printed record of mix temperatures at end of each day.
- .11 Mixing period and temperature to produce uniform mixture in which particles are thoroughly coated, and moisture content of material as it leaves mixer to be less than 0.5%.
  
- .3 Temporary storage of hot mix:
  - .1 Provide mix storage of sufficient capacity to permit continuous operation and designed to prevent segregation.
  - .2 Do not store asphalt mix in storage bins in excess of 3 hours.
  
- .4 While producing asphalt mix for this Project, do not produce mix for other users unless separate storage and pumping facilities are provided for materials supplied to this project.
  
- .5 Mixing tolerances:
  - .1 Permissible variation in aggregate gradation from job mix (percent of total mass).
    - .1 4.75 mm sieve and larger 5.0
    - .2 2.00 mm sieve 4.0
    - .3 0.425 mm sieve 3.0
    - .4 0.180 mm sieve 2.0
    - .5 0.075 mm sieve 1.0
  - .2 Permissible variation of asphalt cement from job mix: 0.25%.
  - .3 Permissible variation of mix temperature at discharge from plant: 5 degrees C.

### **3.02 PREPARATION**

- .1 Surfaces shall be cold milled prior to paving and all cuts shall be automatically controlled for grade and slope during removal operation. The surface remaining after planing shall have a constant and continuous cross fall matching the intended surface cross fall and an even texture free of grooves and/or ridges in all directions. Contractor shall notify the DR at least 48 hours in advance of carrying out cold milling operations.
- .2 Contractor shall sweep the surface to remove any loose or bonded asphalt material left by cold milling operations and immediately prior to applying tack coat.
- .3 Cold planning should be carried out to depths and grades as shown on the drawings and as instructed by the DR.
- .4 Apply tack coat prior to paving in accordance with Section 32 12 13.16.

- .5 Prior to laying mix, clean surfaces of loose and foreign material.

### **3.03 TRANSPORTATION OF MIX**

- .1 Transport mix to job site in vehicles cleaned of foreign material.
- .2 Paint or spray truck beds with limewater, soap or detergent solution, or non petroleum based commercial product, at least daily or as required. Elevate truck bed and thoroughly drain. No excess solution to remain in truck bed.
- .3 Schedule delivery of material for placing in daylight, unless DR approves artificial light.
- .4 Deliver material to paver at uniform rate and in an amount within capacity of paving and compacting equipment.
- .5 Deliver loads continuously in covered vehicles and immediately spread and compact. Deliver and place mixes at temperature within range as directed by DR, but not less than 135 degrees C.

### **3.04 PLACING**

- .1 Obtain DR's approval of base and tack coat prior to placing asphalt.
- .2 Place asphalt concrete to thicknesses, grades and lines as indicated or as directed by DR.
- .3 Placing conditions:
  - .1 Place asphalt mixtures only when air temperature is above 5 degrees C.
  - .2 When temperature of surface on which material is to be placed falls below 10 degrees C, provide extra rollers as necessary to obtain required compaction before cooling.
  - .3 Do not place hot-mix asphalt when pools of standing water exist on surface to be paved, during rain, or when surface is damp.
- .4 Place asphalt concrete in compacted lifts of thickness as follows:
  - .1 Surface course in 1 layer of 40 mm.
  - .2 Base course of 80 mm 1 or 2 layers.
- .5 Where possible do tapering and levelling where required in lower lifts. Overlap joints by not less than 300 mm.
- .6 On airport runways and taxiways, aprons and parking lots commence spreading at high side of pavement or at crown and span crowned centerlines with initial strip.
- .7 Spread and strike off mixture with self propelled mechanical finisher.
  - .1 Construct longitudinal joints and edges true to line markings.
  - .2 When using pavers in echelon, have first paver follow marks or lines, and second paver follow edge of material placed by first paver. Work pavers as close together as possible and in no case permit them to be more than 30 m apart.
  - .3 Maintain constant head of mix in auger chamber of paver during placing.
  - .4 If segregation occurs, immediately suspend spreading operation until

- cause is determined and corrected.
- .5 Correct irregularities in alignment left by paver by trimming directly behind machine.
  - .6 Correct irregularities in surface of pavement course directly behind paver. Remove by shovel or lute excess material forming high spots. Fill and smooth indented areas with hot mix. Do not broadcast material over such areas.
  - .7 Do not throw surplus material on freshly screeded surfaces.
- .8 When hand spreading is used:
- .1 Use approved wood or steel forms, rigidly supported to assure correct grade and cross section. Use measuring blocks and intermediate strips to aid in obtaining required cross-section.
  - .2 Distribute material uniformly. Do not broadcast material.
  - .3 During spreading operation, thoroughly loosen and uniformly distribute material by lutes or covered rakes. Reject material that has formed into lumps and does not break down readily.
  - .4 After placing and before rolling, check surface with templates and straightedges and correct irregularities.
  - .5 Provide heating equipment to keep hand tools free from asphalt. Control temperature to avoid burning material. Do not use tools at higher temperature than temperature of mix being placed.

### **3.05 COMPACTING**

- .1 Roll asphalt continuously.
- .2 Do not change rolling pattern unless mix changes or lift thickness changes. Change rolling pattern only as directed by DR
- .3 Establish actual density achieved by coring in order to determine if additional or other rolling equipment is required to achieve density of not less than 93% of bulk density of cores as a percent of the Theoretical Maximum Relative Density.
- .4 General:
  - .1 Provide at least two rollers and as many additional rollers as necessary to achieve specified pavement density. When more than two rollers are required, one roller must be pneumatic tired type.
  - .2 Start rolling operations as soon as placed mix can bear weight of roller without excess displacement of material or cracking of surface.
  - .3 Operate roller slowly initially to avoid displacement of material. Do not exceed 5 km/h for breakdown and intermediate rolling for static steel-wheeled and pneumatic tired rollers. Do not exceed 9 km/h for finish rolling.
  - .4 For lifts 50 mm thick and greater, adjust speed and vibration frequency of vibratory rollers to produce minimum of 25 impacts per metre of travel.
  - .5 Overlap successive passes of roller by at least one half width of roller and vary pass lengths.
  - .6 Keep wheels of roller slightly moistened with water to prevent pick-up of material but do not over-water.
  - .7 Do not stop vibratory rollers on pavement that is being compacted with vibratory mechanism operating.
  - .8 Do not permit heavy equipment or rollers to stand on finished surface

- before it has been compacted and has thoroughly cooled.
- .9 After traverse and longitudinal joints and outside edge have been compacted, start rolling longitudinally at low side and progress to high side. Ensure that all points across width of pavement receive essentially equal numbers of passes of compactors.
  - .10 When paving in echelon, leave unrolled 50 to 75 mm of edge which second paver is following and roll when joint between lanes is rolled.
  - .11 Where rolling causes displacement of material, loosen affected areas at once with lutes or shovels and restore to original grade of loose material before re-rolling.
- .5 Breakdown rolling:
- .1 Begin breakdown rolling with static steel wheeled roller immediately following rolling of transverse and longitudinal joint and edges.
  - .2 Operate rollers as close to paver as necessary to obtain adequate density without causing undue displacement.
  - .3 Operate breakdown roller with drive roll or wheel nearest finishing machine. When working on steep slopes or super-elevated sections.
  - .4 Use only experienced roller operators.
- .6 Intermediate rolling:
- .1 Use pneumatic-tired, steel wheel or vibratory rollers and follow breakdown rolling as closely as possible and while paving mix temperature allows maximum density from this operation.
  - .2 Rolling to be continuous after initial rolling until mix placed has been thoroughly compacted.
- .7 Finish rolling:
- .1 Accomplish finish rolling with two-axle or three-axle tandem steel wheeled rollers while material is still warm enough for removal of roller marks. If necessary to obtain desired surface finish, use pneumatic-tired rollers as directed by DR
  - .2 Conduct rolling operations in close sequence.

### 3.06 JOINTS

- .1 General:
- .1 Remove surplus material from surface of previously laid strip. Do not deposit on surface of freshly laid strip.
  - .2 Construct joints between asphalt concrete pavement and Portland cement concrete pavement as indicated.
  - .3 Paint contact surfaces of existing structures such as manholes, curbs or gutters with bituminous material prior to placing adjacent pavement.
  - .4 Paint joint face with thin coat of hot asphalt cement or preheat joint face with approved heater prior to placing fresh mix.
- .2 Transverse joints:
- .1 Offset transverse joint in succeeding lifts by at least 600 mm.
  - .2 Cut back to full depth vertical face and tack face with thin coat of hot asphalt prior to continuing paving.
  - .3 Compact transverse joints to provide smooth riding surface. Use methods to prevent rounding of compacted surface at joints.
  - .4 Stagger joint locations minimum 2 m.

- .3 Longitudinal joints:
  - .1 Offset longitudinal joints in succeeding lifts by at least 150 mm.
  - .2 Cold joint is defined as joint where asphalt mix is placed, compacted and left to cool below 100 degrees C prior to paving of adjacent lane.
    - .1 If cold joint can not be avoided, cut back by saw cutting previously laid lane, by at least 150 mm, to full depth vertical face, and tack face with thin coat of hot asphalt of adjacent lane.
  - .3 Overlap previously laid strip with spreader by 100 mm.
  - .4 Before rolling, carefully remove and discard coarse aggregate in material overlapping joint with lute or rake.
  - .5 Roll longitudinal joints directly behind paving operation.
  - .6 When rolling with static or vibratory rollers, have most of drum width ride on newly placed lane with remaining 150 mm extending onto previously placed and compacted lane.
- .4 Construct feather joints so that thinner portion of joint contains fine graded material obtained by changed mix design or by raking out coarse aggregate in mix. Place and compact joint so that joint is smooth and without visible breaks in grade.
- .5 Construct butt joints as specified.

### **3.07 FINISH TOLERANCES**

- .1 Finished asphalt surface to be within 5 mm of design elevation but not uniformly high or low.
- .2 Finished asphalt surface not to have irregularities exceeding 5 mm when checked with 4.5 m straight edge placed in any direction.

### **3.08 DEFECTIVE WORK**

- .1 Correct irregularities which develop before completion of rolling by loosening surface mix and removing or adding material as required. If irregularities or defects remain after final compaction, remove surface course promptly and lay new material to form true and even surface and compact immediately to specified density.
- .2 Repair areas showing checking, rippling, or segregation.
- .3 Adjust roller operation and screed settings on paver to prevent further defects such as rippling and checking of pavement.

**END OF SECTION**