

## SECTION 922

### ASPHALTIC PAVING OF BRIDGE DECKS AND APPROACHES

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## **922.01 SCOPE**

This specification applies to existing, rehabilitated, and new concrete bridge decks where asphaltic paving is being undertaken. The scope of the work covers the Department's requirements for the asphaltic paving of both treated and waterproofed concrete bridge decks and concrete approach slabs with hot or warm mix asphaltic concrete.

For the paving of rehabilitated bridges and their approaches, the supply, transportation, placing and compaction of selected granular base course shall form part of this work. For treated bridge decks the scope includes supply and application of tack coat.

If paving items are contained in a current or ongoing road contract, the approaches including the approach slab, where appropriate, will be paved under the road contract. Otherwise, granular and paving operations up to 40 metres from the abutment back wall, or as indicated in the Contract Documents, shall be included in the bridge contract.

The thickness of paving on decks and approach slabs shall be in accordance with the contract documents with deductions for being outside tolerance as per the Reduced Payment section.

Construction procedures for treated bridge decks is included in this section. Waterproofing of bridge decks shall be as detailed in Section 914.

Asphalt overlays of bridge decks is not permitted without the written approval of the Bridge Office, Highway Design Division for the specific bridge.

## **922.02 MATERIALS**

### **922.02.01 Tack Coat for Treated Bridge Decks and Approaches**

Tack coat shall conform to Section 320.

### **922.02.02 Selected Granular Base Course**

Selected granular base course shall be of GRANULAR “A” or GRANULAR “B” gradation as required. This material shall conform to Section 315.

### **922.02.03 Asphaltic Concrete**

If there are any direct conflicts, this specification will govern. All other requirements of Section 330, 331, 332, 333 and 337, as appropriate, of the specification are applicable.

All materials are subject to inspection, testing or rejection at any time and must be made available for sampling and testing prior to and at any point during the work at the request of the Owner’s Representative to ensure compliance with the applicable specifications.

Asphalt to be placed on a bridge deck, shall conform to the requirements of surface course asphalt, unless otherwise specified in the Contract Documents. All asphalt that will be in contact with bridge deck waterproofing must be WMA and comply with Section 337.

Asphalt for bridge deck are subject to the same price adjustments as per the applicable Section of the specification, however, samples will be taken at the following intervals:

- A loose sample shall be taken daily regardless of daily production tonnage.
- Where applicable, core samples shall be taken on both bridge approaches for each lift for asphalt.
- Additional samples may be taken at the discretion of the Owners Representative.

Asphalt Bridge decks may also be tested using a nuclear gauge as per ASTM D2590. It shall be operated in backscatter mode and percent compaction will be based on the daily MTD for the loose sample.

### **922.02.04 Joint Sealing Compound**

Joint sealing compound shall conform to Section 914.03.06.

### **922.02.05 Asphaltic Concrete Sealant**

Asphaltic concrete sealant shall conform to Section 914.03.07.

## **922.03 EQUIPMENT**

For treated bridge decks only, an accepted pressure distributor may be utilized to place tack coat on the concrete deck. The distributor shall strictly conform to Section 320.03. Over spray along curbs, barriers, and expansion joint dams shall not be permitted. Soil

or gravel shall not be tracked onto the bridge unless otherwise accepted by the Owner's Representative stating the conditions of use.

Equipment for applying tack coat on bridge decks to be waterproofed shall be limited to a manually operated spray rod which shall produce a uniform fog-type spray. The lower part of the spray rod shall be bent 30 degrees to form a section of rod parallel to the deck. The pressurized container which holds the tack coat shall be equipped with a thermometer and pressure gauge.

Pavers shall be equipped with heated vibrating screeds and shall be capable of spreading the mixture, without segregation. Vibratory screeds shall be in operation for all paving on bridge deck and approach slabs.

Contractor shall submit a detailed equipment list to the Owner's Representative during the pre-construction/paving meeting.

All plant and equipment required to supply, produce, transport, place, spread and compact granulars shall conform to Section 315 for "Selected Granular Base Course."

All paving equipment and plant shall conform to Section 330; however, oscillatory rollers shall be used for all paving on bridge decks. Vibratory rollers are not permitted.

The equipment used for filling grooves and sealing the surface adjacent to the curbs/barriers and transverse joint filling with sealant at each expansion joint dam shall be accepted by the Owner's Representative.

## **922.04 CONSTRUCTION PROCEDURES**

### **922.04.01 General**

All concrete surfaces shall be cured in accordance with Section 904.05 and be in a dry condition before the work as described herein may commence. Work shall not be performed during rainy or inclement weather or on wet, snow or frost covered surfaces. Tack coat shall be required between each lift of asphalt

For bridge paving which requires multiple lifts, there shall be a minimum of 12 hours after final compaction between lifts. Any paving that commences before this 12 hour period has elapsed shall be subject to rejection by the Department and no payment shall be made for either lifts of asphalt, tack coat, and waterproofing (if applicable).

## **922.04.02 Surveying Requirements**

The Contractor shall survey the approach slabs and bridge deck both before and after paving in accordance with Section 926. The preliminary survey shall not occur until after all deck repairs are complete.

Payment reductions in accordance with Section 922.06.04 shall be applied based on the results of the surveys.

The survey of the prepared bridge deck shall be accepted by the Owner's Representative before paving will be permitted to proceed.

## **922.04.03 Treated Bridge Decks**

Treated bridge deck construction procedures shall apply to all bridge decks where waterproofing is not carried out. The treatment procedure shall be as outlined herein and shall apply to both the deck and the concrete approach slab.

### **922.04.03.01 Deck Cleaning and Preparation**

Removal and disposal of old asphaltic pavement and deck rehabilitation by overlay shall be in accordance with Section 919.

The Contractor shall sweep the bridge deck and approach slabs either manually or with a power broom. This shall be followed by a cleaning of the deck and approach slabs with oil-free compressed air. Tack coat shall be applied in accordance with Section 320.

### **922.04.03.02 Granulars**

Additional granular material shall be produced, supplied, transported, stored, placed, graded and compacted in accordance with Section 315. The width and thickness of the granular base course and granular shoulders shall be in conformance with the bridge approaches and the standard of roadway to which it is being applied as per the typical cross section. The length shall be in accordance with the length of existing pavement removed and disposed of.

Contaminated granular material shall be excavated and disposed of as directed by the Owner's Representative.

Suitable existing selected granular base course shall be reshaped and recompacted (100% maximum standard proctor dry density, ASTM D698) to grade as established by the Owner's Representative.

### **922.04.03.03 Paving**

All construction procedures related to paving shall conform to Section 330, Section 332, and Section 333 as appropriate except as outlined herein.

In accordance with the Contract Documents, the deck and concrete approach slab grades shall be paved and finished to match the elevations of the concrete expansion joint dams. If the required thickness to reach the expansion joint elevation, for either the approach slab or deck, has a thickness greater than 75 mm it shall be paved in two lifts or as directed by the Owner's Representative. Prior to the commencement of paving the Contractor's surveyor shall profile the prepared surface as per Section 926, (treated or waterproofed) to determine the theoretical asphalt tonnage quantities.

Prior to commencing deck paving operations the Contractor shall cover all deck drains to prevent the entry of asphalt. The covers shall be secured to the deck drains. After breakdown rolling is complete the cover(s) shall be removed from all deck drains and any asphalt that may have infiltrated the drainage system shall be removed. Payment shall be held until the Owner's Representative has verified all asphalt has been removed from the drainage system.

The approaches to the bridge shall be paved first thus avoiding the transfer of foreign particles on the deck.

Paving operations shall proceed downgrade. Paving shall commence as soon as practical after the tack coat has adequately cured and shall not be left for longer than 12 hours.

For paving on bridges with expansion joints, the Contractor shall place a removable filler strip in each expansion joint gap along the full length of each joint. The purpose of the expansion joint filler strip is to prevent the asphalt from entering the flexible expansion joint gap(s). After paving operations are complete, the filler strip shall be removed. The Contractor shall clean the expansion joints and dispose of waste material.

The final profile of the asphalt surface shall be free from bumps and dips and considered a smooth riding surface. Pavement profiles that do not meet these requirements may be rejected at the sole discretion of the Department.

### **922.04.04 Waterproofed Bridge Decks**

#### **922.04.04.01 Waterproofing**

The materials and treatment procedure for the concrete surface preparation, surface conditioner for asphaltic membrane, application of asphalt and rubber membranes,

protection boards and protection board tack coat, the forming and filling of grooves with joint sealing compound and sealing of the asphaltic surface adjacent to the concrete curbs and barriers shall be as outlined in accordance with Section 914.

Approach slabs shall be waterproofed unless otherwise specified in the contract documents. If waterproofing on the concrete approach slabs is not required as per the contract documents, they shall be treated as per Section 922.04.03.

#### **922.04.04.02 Paving**

All construction procedures relating to paving shall be as outlined in Section 922.04.03.03 except as outlined herein.

Paving of the bridge deck should commence as soon as practical after waterproofing operations described in Section 914 have been completed but not more than 24 hours unless otherwise accepted by the Owner's Representative. Care should be taken so as to not damage the installed waterproofing system. Displacement or puncturing of the protection board is not acceptable, and rejection may result in the removal and reapplication of the entire waterproofing system at the Contractor's expense. Turning of vehicles on the bridge deck is prohibited.

Paving operations shall be conducted downgrade in the direction of protection board overlap.

A Material Transfer Vehicle (MTV) must be used in accordance with the requirements of Section 330.07.09. Where it has been determined the MTV shall not be used for paving, trucks shall dump part of their load into the paver and then move away so that the paver does not have to push the truck. Care must be taken to remove any material from the deck that may have spilled in front of the paver's tracks or tires so that it does not perforate the membrane.

The speed of the asphalt spreader shall be kept in the range of 3 to 4 metres per minute in order to provide maximum traction.

The temperature of the asphalt placed on the waterproofed bridge deck shall cool to 115 degrees Celsius before breakdown rolling begins with a suitable oscillating roller. At higher temperatures the protection boards may shift under the roller, resulting in cracking the asphalt around the protection board perimeter if breakdown rolling is attempted too soon. Starting and stopping on the newly paved deck is not permitted.

### **922.04.04.03 Paving Adjacent to Expansion Joint Dams**

In accordance with the contract documents the deck and approach slab grades shall match the height of the concrete expansion dams. Should the thickness of asphalt required be greater than 75mm, paving shall be completed in two lifts or as directed by the Owner's Representative.

### **922.04.05 Forming and Filling Grooves with Joint Sealing Compound**

This operation applies to the joints created adjacent to and for the full length of each curb. The work shall be carried out in accordance with Section 914.04.08.

### **922.04.06 Sealing Surface Of Asphaltic Concrete Adjacent To Curbs and Barriers**

This work shall be carried out in accordance with Section 914.04.09.

### **922.04.07 Transverse Joint Filling**

The groove shall be saw cut across the width of the deck as indicated on the contract drawings and against each concrete face at each expansion joint dam.

The application of sealant or compound shall be carried out when the temperature is at or above 5 degrees Celsius and the joint is dry. Traffic shall be kept off the transverse joint until the sealant has set in accordance with the manufacturer's specification.

## **922.05 MEASUREMENT FOR PAYMENT**

### **922.05.01 Treated Bridge Decks**

Measurement for payment for the asphaltic paving of bridge decks, shall be as outlined in Section 330, Section 332, and Section 333 as appropriate, with the following amendments.

Measurement for payment for the asphaltic paving of bridge decks will be limited to the weighted tonnage of asphalt concrete actually placed on the bridge deck and approach slabs. However payment shall be capped at a maximum of the theoretical tonnage plus 10%. Theoretical tonnage shall be calculated from the profile data as per Section 922.04.02 and the density from the approved mix design. Additionally, asphalt payment shall be subject to the Reduced Payment Criteria as stipulated in Section 922.06.04.

Payment for bridge deck and concrete approach slab sweeping, cleaning, preparation, tack coating, forming and filling grooves with cold applied sealant or joint sealing compound, sealing the surface of asphaltic concrete adjacent to curbs and barriers,

transverse joint forming and filling, the provision for deck drain cover plates and expansion joint filler strips shall be deemed incidental to the work.

Measurement for payment for the production, supply, storage, transportation, placing, grading and compaction of selected granular base course material on new construction projects shall be in accordance with Section 315 for Selected Granular Base Course.

Payment for cutting existing asphaltic pavement, removal, transportation and disposal of old asphaltic pavement will be made in accordance with Section 919.18.

### **922.05.02 Waterproofed Bridge Decks**

Measurement for payment for deck waterproofing shall be as detailed in Section 914.

Measurement for payment for the Asphaltic Paving of Bridge Decks shall be as outlined in Section 330, Section 332, and Section 333 as appropriate, with the following amendments.

Measurement for payment for the asphaltic paving of bridge decks will be limited to the weighted tonnage of asphalt concrete actually placed on the bridge deck and approach slabs. However payment shall be capped at a maximum of the theoretical tonnage plus 10%. Theoretical tonnage shall be calculated from the profile data as per Section 922.04.02 and the density from the approved mix design additionally asphalt payment shall be subject to the Reduced Payment Criteria as stipulated in Section 922.06.04.

Payment for concrete approach slab sweeping, cleaning, preparation, tack coating, forming and filling grooves with joint sealing compound, sealing the surface of asphaltic concrete adjacent to curbs and barriers, transverse joint forming and filling, the provision for deck drain cover plates and expansion joint filler strips shall be deemed incidental to the work.

Measurement for payment for the production, supply, storage, transportation, placing, grading and compaction of selected granular base course material on new construction projects shall be in accordance with Section 315.

## **922.06 BASIS OF PAYMENT**

### **922.06.01 General**

The basis of payment for the asphaltic paving of bridge decks shall be as outlined in Section 330, Section 332, and Section 333 as appropriate, with the amendments as noted herein.

### **922.06.02 Treated Bridge Decks**

The basis of payment at the contract unit price for the asphaltic paving of bridge decks shall include full compensation for all equipment, labour, materials and plant necessary to prepare, sweep and clean the deck, supply and apply tack coat, pave the bridge deck, concrete approach slabs. Included is the forming and filling of approach slab grooves with joint sealing compound, and sealing the asphaltic concrete adjacent to curbs and barriers and transverse joint forming and filling as described above. Also included is the supply and transportation of all blending sand and asphaltic cement from the source to the mixing plant.

The production, supply, storage, transportation, placing, grading and compaction of selected granular base course shall be paid for separately under Section 315.

The basis of payment for cutting existing asphalt, removal, transportation and disposal of old asphaltic pavement on rehabilitation type projects shall be made in accordance with terms outlined elsewhere in the Section 919.18.

The covering of deck drains and expansion joints to prevent the entry of hot mix asphaltic concrete, the removal of the cover plates and filler strips, clean up and disposal of waste material shall be considered incidental to the work.

### **922.06.03 Waterproofed Bridge Decks**

Payment for the waterproofing of bridge decks and all related work shall be as outlined in Section 914.

The basis of payment at the contract unit price for asphaltic paving of waterproofed bridge decks shall include full compensation for all equipment, labour, materials and plant necessary to prepare, sweep and clean the deck, supply and apply tack coat, pave the bridge deck and concrete approach slabs. Included is the forming and filling of approach slab grooves with joint sealing compound and sealing the asphaltic surface adjacent to the concrete curbs and barriers, and transverse joint forming and filling as described above. Also included in the basis of payment is the supply and transportation of all blending sand and asphaltic cement from the source to the mixing plant.

The production, supply, storage, transportation, placing, grading and compaction of selected granular base course shall be provided for separately under Section 315.

The basis of payment for cutting existing asphalt, removal, transportation and disposal of old asphaltic pavement on rehabilitation type projects shall be made in accordance with terms outlined elsewhere in the Section 919.18.

The covering of deck drains and expansion joints to prevent the entry of hot mix asphaltic concrete, the removal of the cover plates and filler strips, clean up and disposal of waste material shall be considered incidental to the work.

#### **922.06.04      Reduced Payment Criteria for Bridge Deck and Approach Slab Paving**

Where deviations occur over 20% of the total bridge deck and/or approach slab area, reductions will apply as per the below table:

<b>Deviation from Specified Thickness</b>	<b>Reductions Applied to Bid Price</b>
Less than 6 mm	None
6 mm to 10 mm	25% reduction
10 mm to 15 mm	50% reduction
15 mm to 20 mm	100% reduction
Greater than 20 mm	Reject and Replace

The Contractor may elect to remove and replace deficient asphalt at their own expense in an attempt to receive full payment for subsequent, properly placed asphalt.

In the event of rejection of the asphalt for either deviations from the asphalt thickness or is not considered a smooth driving surface, the Contractor shall remove and replace the asphalt at their own expense.

If the bridge deck was waterproofed and the asphalt is rejected for any reason, the waterproofing system shall be removed and replaced by the Contractor at their own expense.

Replacement asphalt shall be subject to the same requirements and reductions as stated above up to and including removal and replacement.

If insufficient time remains in the construction season to properly complete asphalt repairs, the rejected asphalt shall remain in place until the following construction season, at which time it shall be removed and replaced at the Contractor's expense. Where asphalt is rejected on waterproofed bridge decks, the Contractor will also be responsible for the removal and replacement of the waterproofing system.