

Shoulder Preparation, Type II (Modified) (Continued)

Stations		Side	Average Width to Remove (m)
212+75	217+96	West of Centerline	0.1
222+34	227+36	West of Centerline	0.3
270+68	270+89	West of Centerline	0.1
40+51	41+00	East of Centerline	0.4
89+67	89+93	East of Centerline	0.3
106+22	107+57	East of Centerline	0.2
109+62	110+47	East of Centerline	0.6
159+29	163+41	East of Centerline	0.2
182+44	186+39	East of Centerline	0.2
225+43	227+30	East of Centerline	0.1
254+00	256+95	East of Centerline	0.2
257+78	261+81	East of Centerline	0.1

The shoulders shall be maintained by the Contractor to the 100mm depth below existing surface until the construction of the Cold In-Place Recycling material is placed.

The unit price for "Shoulder Preparation, Type II (Modified)" will be payment in full for performing all operations described herein and those incidental to the work.

COLD IN-PLACE RECYCLING

For the terms of this tender the definitions and wording under the item for Cold In-Place Recycling will be as follows:

- Department- Manitoba Infrastructure and Transportation;
- CIR – Cold In-Place Recycling;
- RAP – Recycled Asphalt Pavement;
- HMA - Bituminous Pavement Class "B"
- Job Mix Formula – Field Produced Mix;
- Foamed Asphalt-a process where heated asphalt cement is expanded from its normal volume by the addition of precise amounts of water.
- Lot Size - A single days production of more than (4) hours
- Sub Lot or Segment - 3 equal size segments of 4 500m² or smaller within a lot.

Description of Work

The location of the CIR for this project will be approximately 29.6km in length between the South Limits of the project station 10+00 northerly to station 306+00. Excluding from the CIR operation will be six sites with Asphalt Surface Treated surface and four sites requiring Surface Preparation, Type "C".

Description of Work (Continued)

The work involved in the CIR will be the reclamation of the existing bituminous travel surface (2 - 3.7m paved lanes). The depth of the recycle shall be 100mm.


All resulting CIR material shall be relayed to a width 4.5m each side of center line as shown in the drawings and as staked on the ground by the Engineer.

The following specifications shall apply to all requirements for cold in-place recycling of existing asphalt pavement; sizing, adding, and mixing of asphalt cement, water (if required); and spreading and compacting the CIR mix.

DESIGN AND SUBMISSION REQUIREMENTS

Mix Design Requirements

Preparation and submission of CIR mix designs for the Department verification and approval is the responsibility of the Contractor.

The mix design shall be carried out in accordance with the Wirtgen Cold Recycling Manual, Appendix A2.3. (see attached). The web link to view the manual is on page 31 of this document. Mix design work shall be completed by a laboratory fully qualified to conduct CIR mix designs with use of foamed asphalt. 

For mix design purposes, prior to commencing the work, the Contractor shall obtain samples that are representative of the material that will be produced during the milling operation. These samples shall be used, along with any corrective aggregate and additive, to establish the design rate of foamed asphalt as a percent by mass of the reclaimed asphalt pavement. The design rate of the foamed asphalt shall be a minimum of 1.0%

The CIR mix shall meet the following physical requirements of Table 1:

Table 1 – CIR Physical Requirements

Property	Minimum Requirement
Dry Tensile Strength at 25C	250 kPa
Wet Tensile Strength	125 kPa
Tensile Strength Ratio (TSR)	50%
Air Void Content	9-11% (NOTE 1)

NOTE 1: Design guideline. A design void content outside of these limits is subject to the approval of the Department.

Submission Requirements

The mix design shall be submitted to the Department a minimum of seven (7) days prior to the start of CIR operations. All costs incurred for the CIR mix design formulation are the responsibility of the Contractor. The Contractor shall not commence CIR operations on the project prior to receiving the Department's written notice that the CIR mix design has been approved. The resulting combination shall, when approved by the Department, be the CIR Job Mix Formula (JMF).

Submission Requirements (Continued)

A new mix design shall be submitted when the asphalt design rate is adjusted by greater than 0.2%. A new mix design shall be submitted if the composition of the existing pavement changes significantly.

Each mix design shall include the following:

- a) Information on the type, of the asphalt cement.
- b) The asphalt content, aggregate, gradation and coarse aggregate crush count of the RAP.
- c) The design addition of corrective aggregate and/or additive, if used.
- d) The design rate of the asphalt cement and foaming characteristics.
- e) All calculations performed to determine the design rate of asphalt cement.
- f) Dry tensile strength, wet tensile strength, tensile strength ratio and air voids of mix (as per Table 1 – CIR Physical Requirements)
- g) The amount of water to be added to the mix.
- h) The maximum field rate adjustment allowed to the design rate without adverse affects to the mix properties.

At the start of production and at any time when the existing pavement significantly changes composition, the target density of the CIR shall be established by the Contractor. The target density shall be provided to the Department within 3 Days of obtaining the sample from the roadway.

MATERIALS

Bituminous Stabilizer

Unless otherwise approved by the Department the type of bituminous stabilizer to be used by the Contractor shall be 150/200 asphalt cement which shall also be used as part of the foaming process.

The Department will supply the asphalt cement in accordance with Specification No.800.3.2.

* At the request of the Contractor the Department will consider the use of an alternate bituminous stabilizer of emulsified asphalt for the CIR providing the reclaimed asphalt pavement material is compatible with the approved Mix Design.

In the event that the Department approves the use of emulsified asphalts as a substitute stabilizer all reference in the CIR process relating to 150/200 asphalt cement and or foamed asphalt shall be replaced with Emulsified Asphalt.

If approved the Department will monitor the resulting CIR mat to verify acceptable standards, failing to meet these standards the Contractor shall revert to the foamed asphalt process using the specified asphalt cement.

No additional payment for emulsion substitution will be made as it will be considered to be included in the unit price for "Cold In- Place Recycling".

Reclaimed Asphalt Pavement (RAP)

Reclaimed asphalt pavement material after processing shall have the following gradation (Table 2):

Table 2 – RAP Gradation

Sieve Size (mm)	% Passing
37.5	100
25	90 – 100

CIR Additive

When required by the mix design, a Portland cement additive shall be incorporated into all CIR mixes at a rate of 1.0 percent by weight of reclaimed pavement material. Other additional rates, to a maximum of 1.5 percent will be allowed if the material characteristics are demonstrated to have been improved in the mix design process. Portland cement shall be Type GU and meet the requirements of CSA 3000 Cementitious Materials Compendium. The incorporation of the Portland cement additive shall be at the Contractor's own expense.

If required Portland Cement additive will be supplied and delivered by the Department.

Corrective Aggregate

Corrective aggregate is only to be used if so specified within the contract documents or the mix properties are demonstrated to be improved. Corrective aggregate may be required for the mix to meet the Department's Bituminous Pavement, Class "C" gradation or to improve the mix design properties. The gradation and amount shall be determined by the contractor.

Corrective aggregates, if required shall be compensated for at a negotiated rate and paid as extra work.

Any corrective aggregate shall be distributed directly in front of the recycling train. The methods used to determine the addition rate of corrective aggregate in accordance with the mix design are subject to the approval of the Department.

Water

The Contractor shall supply and haul all water required for the construction and maintenance of this work. The water shall be clean and free from injurious amounts of oil, alkalis, salts, organic matter or other deleterious materials. All operations for the supply and hauling of water and that incidental to shall be at the contractor's own expense.

EQUIPMENT

Recycling Train

A recycling train is required. This is a train with milling, sizing, and mixing units, used to process the material. The recycling train shall include the following:

- A self-propelled cold milling unit with a cutting drum capable of reclaiming a full lane width of asphalt pavement to the depth specified in the Drawings in a single pass. This machine shall have automatic depth and cross-slope controls and maintain a constant cutting depth. The automatic depth controls shall maintain the cutting depth to within plus or minus 6mm of the depth shown on the Drawings;
- The sizing unit shall be capable of processing the reclaimed asphalt pavement so that all reclaimed material passes the 37.5mm sieve
- An aggregate feed system that measures and regulates either the mass or volume of reclaimed material being added into the mixing unit prior to the addition of the foamed asphalt. If the train is equipped with a scale it shall be calibrated to the manufacturer's tolerance at the start of the Contract and when requested by the Engineer;
- An asphalt cement expansion system capable of optimum expansion and an injection system capable of injecting and blending foamed asphalt uniformly throughout the reclaimed material in the required amount within 0.2% by mass of the reclaimed material feed;
- A means of monitoring and controlling the addition of water;
- A mixing unit equipped with a device capable of producing a uniform and thoroughly blended CIR mix.
- A temperature booster unit capable of maintaining required oil temperatures until it is utilized in the foaming process.

Placing Equipment

Placing of the CIR mix shall be carried out by means of a mechanical paver capable of spreading the mix evenly in front of the screed in one continuous pass to the specified cross fall and grade. The paver shall be equipped with distributing augers for the full width to be paved. The paver shall have a vibratory screed capable of vibrating the full width of mix placed.

When a pick-up machine is used to feed the windrow into the paver hopper, the machine shall be so operated that the entire windrow to the underlying surface is picked up.

Compaction Equipment

The Contractor shall select the appropriate compaction equipment, which shall consist of a minimum of three (3) rollers, to achieve the required compaction of 96% of the laboratory bulk relative density.

Straight Edge

A three (3) meter long commercially made metal straight edge is required for determining conformance to the surface tolerance requirements. When requested, the Contractor shall provide the Engineer with the use of the straight edge.

CONSTRUCTION

General

CIR shall be spread and compacted to the specified width; thickness and cross slope as shown in the detailed drawings and as staked in the field by the Engineer.

All deleterious and loose milled material shall be removed from the milled surfaces at longitudinal and transverse joints after reclaiming operations are completed and before placing the CIR mix.

Overlap between successive passes of the recycling train shall be a minimum of 100mm.

The Contractor shall be responsible for managing and disposing of any excess CIR or reclaimed pavement material in a manner subject to the approval of the Department.

No separate payment will be provided to the Contractor for the disposal of excess materials unless otherwise provided in the Drawings.

Asphalt pavement in areas inaccessible to the reclaiming equipment shall be removed and replaced with acceptable hot mix asphalt (HMA) used for top lift paving, and be approved by the Department. The HMA shall be placed to CIR depth specified in the Drawings in compacted lift thicknesses between 40 and 75 mm.

At the start of production and whenever the existing pavement material significantly changes composition, the laboratory bulk relative density of the CIR shall be verified by the Contractor with material reclaimed from the roadway.

Operational Constraints

The work shall not be carried out when the ambient temperature is less than 10 °C and the surface shall be clean and free of standing water. CIR shall not proceed during periods of rain. After September 1st, written approval shall be obtained from the Engineer prior to CIR paving.

The wearing surface shall not be placed on the CIR mat until the following requirements have been met:

- The CIR mix has been allowed to cure for a minimum of 3 Days;
- The CIR meets physical acceptance criteria listed in Table 1;
- The average in situ moisture content of the CIR is 3% or less with no test value greater than 4% immediately prior to placing the wearing surface;
- The specified density has been achieved during quality control testing with follow up confirmation based on slab or core results;

The wearing surface shall be placed within 30 Days of placing the CIR mat, provided the CIR mix meets the requirements of this specification. The Contractor shall schedule all operations to ensure that prior to seasonal shutdown; all accepted CIR is covered with a wearing surface. A tack coat shall be applied to the CIR mat prior to paving, in accordance with Specification No. 805.

All traffic, including construction traffic, shall be kept off the freshly placed CIR mat until it is able to carry traffic without damage. The Contractor shall be responsible for repair of the damaged CIR mat.

Trial Section

During the first day of production of CIR the Contractor shall demonstrate to the Engineer the ability to successfully carry out CIR according to this specification by placing a trial section within the Contract limits.

The Contractor shall have onsite personnel experienced in CIR work to monitor the trial section, advise on suitability of mixed material, bituminous stabilizer dispersion within the mixed material, moisture control within mixed material, compaction and surface finish. Bulk applications rates are to be determined for bituminous stabilizing agent, water and corrective aggregate (if required) and thickness checks completed for processing depths. This information is to be provided to the Engineer.

The trial section shall be one lane width and 500 m in length. The Contractor shall propose the location of the trial section to the Engineer for approval. The Engineer shall be given a minimum of 48 hours notice prior to placing the trial section.

The Department will allow the Contractor to continue the CIR work based on an acceptable visual assessment of the trial. When the CIR is rejected by visual assessment, the Contractor shall repeat additional trial sections until the CIR meets the requirements of this specification. The Contractor shall use the same equipment materials, and construction methods for the remainder of the CIR operations. If adjustments are made, the Contractor shall produce a new trial section.

The Contractor shall be responsible for the repair, removal, or replacement of an unacceptable trial section.

Mixing

The foamed asphalt shall be added at the design rate. The rate of addition of foamed asphalt shall be field adjusted as required to within 0.2% of the design rate or to the maximum field rate adjustment allowed to the design rate according to the mix design, whichever is less, to produce a uniformly coated CIR mix that can be compacted to the required density.

The Contractor may add water in a controlled manner to facilitate uniform mixing.

Compaction

The CIR shall be compacted to a minimum of 96% of the laboratory bulk relative density as determined by the submitted job mix formula, *ASTM D1188 – Bulk Specific Gravity/Density of Compacted Bituminous Mixtures Using Paraffin-Coated Specimens*.

CIR that cannot be compacted to the required density shall be removed and replaced according to Table 4.

CIR compaction shall also be monitored through use of the target density as determined by a rolling control strip of a minimum 200m in length. The Contractor shall select a compaction pattern which will set the minimum number of passes to be performed. The Engineer will then monitor the wet density of each additional pass using the nuclear density meter. The target density shall be established when additional passes result in an increase of wet density of less than 16kg/m^3 .

The laboratory bulk relative density and target density shall be re-established if there is a significant change in material composition and uniformity

Surface Appearance

The compacted CIR mat shall be smooth and conform to the cross fall and grade specified in the Drawings. The surface of the CIR mat shall be of uniform texture and free of segregation, longitudinal streaks, fat spots, oil spills, roller marks, and other defects.

SAMPLING

All samples, including those handled by a commercial carrier, shall be accompanied by a sample data sheet and any additional documents as specified elsewhere in the Contract Documents. Where not specified or not included on the sample data sheet, samples shall be delivered with a transmittal form identifying the following information:

- Contract Number;
- Name of Contractor, name of contact person and telephone numbers;
- Name of Engineer, and telephone numbers;
- Product sampled. When a sample consists of more than one item, each item shall be individually identified;
- Date sampled, date shipped;
- Sample, Lot and Segment number.

Holes formed from the removal of cores shall be free of excess moisture and deleterious material. The holes shall then be filled and compacted with compatible bituminous material approved by the Department.

Quality Control

The Contractor shall have onsite personnel experienced in the testing methods of CIR, including experience following ASTM testing standards. In addition the inspectors shall be required to follow department practices for operating Nuclear Gauges.

At least (2) days prior to starting any CIR work on the project the Contractor shall arrange a meeting with the department and onsite personal conducting the quality control testing. At this meeting the contractor shall provide a quality control plan for review. The department will then review their operating practices for testing with a Nuclear Gauge on department projects.

Quality control activities and testing is the responsibility of the Contractor throughout every stage of the CIR. Tests that may be performed by the Department to determine compliance with the specifications will be quality assurance tests and will not be considered as quality control tests.

The Contractor shall submit quality control test reports and summaries in writing to the Department prior to 2:00pm, on the next working day.

In the event quality control tests fail specification the Contractor shall suspend CIR operations until the issue is resolved.

The Contractor shall be responsible for all costs associated with quality control and for obtaining quality assurance samples.

Minimum quality control testing frequencies are outlined in Table 3.

Quality Control (Continued)

Table 3 – Minimum Quality Control Frequencies

Test or Action	Frequency	Test Method
Daily Inspection Report	Daily- provided to the Department following day	Note 1
Density of CIR and % Compaction	1 per 300 lineal meter	ASTM D2950
Air Temperature	4 per day	---
Road Surface Temperature	1 per day at start of production	---
Processing Depth Checks	1 per 200m	Note 2
Bulk Application Rates (daily rates and rates since last tests)	1 per 500m	---
Corrective Aggregate Gradation (if applicable)	One per 8 hour shift of crusher operation or minimum 3 tests, whichever is greater	ASTM C136
Marshall Density (75 Blow)	3 per lot (Note 3)	ASTM 6926
Obtain CIR slab or core samples for QA testing of moisture and compaction	1 sample per segment	
Obtain samples of bituminous stabilizer for QA testing	One sample per three lots (Note 3)	As per Section: Sampling, General
Tensile strength testing	At least once per each Mix Design or minimum three per Project	ASTM D6931

Note 1 – Daily Inspection Report. The Contractor shall maintain a daily inspection report documenting the following information where applicable:

- Date;
- Highway and direction of travel;
- Beginning and end stations;
- Air and road temperatures;
- Calibration control settings;
- Processing depth checks;
- Total area treated;
- Water and asphalt counter reading (beginning, end, total);
- Bulk application rates for bituminous stabilizer and corrective aggregate.

Note 2 – To check that the automatic sensor system is functioning correctly, the actual depth of cut shall be physically measured by the Contractor at both ends of the milling drum at least once every 200 meters along the cut length.

Note 3 – Lot Size – A Lot shall consist of a single day's production of more than four (4) hours of CIR processed to a given mix design. Production from a day of less than four (4) hours may be combined with the previous Lot or following Lot as determined by the Engineer. Each Lot shall be divided into a minimum of 3 equal segments of 4 500m² or smaller.

Samples of CIR Mix

At least four (4) days prior to the planned overlay of the CIR mat, the Contractor shall obtain either slab or core samples of the CIR mix for each segment taken at random locations, as directed by the Department. Slab samples shall measure 150 x 150mm and core samples shall measure 150mm in diameter. Each sample shall be dry cut and removed intact from the CIR mat. It shall be packaged in non-absorptive materials to protect sample integrity, sealed in waterproof containers, appropriately labeled, and delivered by the Contractor in good condition to the Department's laboratory (located at 1181 Portage Avenue in Winnipeg) within 24 hours of sampling.

One sample shall be obtained per segment and tested for compaction.

If a sample condition is found to be unsuitable for testing by the laboratory, the Contractor will be notified immediately by the Department to resample that location. The Contractor shall resample that location and resubmit the samples at their own cost.

The Contractor shall carry out quality control sampling and testing of the CIR mat at his own cost.

Holes resulting from the removal of samples shall be repaired using surface course HMA mix type or other material approved by the Department.

QUALITY ASSURANCE

General

Quality Assurance testing will be conducted by the Department. Tests that may be performed by the Department to verify and validate quality control testing conducted by the Contractor.

The Engineer shall reject all visually defective material, mix, or work according to Table 4. Such defective material, mixture, and work shall not be incorporated into the finished work.

Quality assurance samples shall be used to determine compliance for tensile strength, moisture content and compaction.

Acceptance criteria shall be based on the lot mean computed from quality assurance test results for each segment within the lot.

If a tested sample fails to meet the Contract requirements, the Contractor shall be notified of the failure by the Engineer within 24 hours of the Engineer receiving the information. Refer to Table 4 for required repair.

Repair of Unacceptable Cold In-Place Recycling Mat

A CIR mat that is unacceptable shall be repaired or removed and replaced as specified in Table 4.

Repairs shall be for the full width of recycling to the depth specified in Table 4. Removal shall be for the full depth and lane width of recycling. Reprocessing may be considered as a repair method, upon submission of a proposal by the Contractor and approval by the Engineer.

No payment will be provided for any materials used for repair including oil.

Repair of Unacceptable Cold In-Place Recycling Mat (Continued)

Table 4 – Unacceptable CIR and Required Repairs

Distress	Severity	Required Repair
Raveling/Coarse Aggregate Loss (Note 1)	Very Slight to Slight	No action required.
	Moderate to Severe	Mill 50mm and replace with an acceptable binder course hot mix.
	Very Severe	Remove all CIR and replace with an acceptable binder course hot mix.
Segregation (Note 1)	Slight to Medium (Note 1)	No action required.
	Severe (Note 1)	Mill 50mm and replace with an acceptable binder course hot mix.
Compaction is not acceptable.	n/a	Remove all CIR material in the sub lot represented by the test and replace with an acceptable binder course hot mix.
Dry Tensile Strength, Wet Tensile Strength or Tensile Strength ratio are not acceptable.	n/a	Remove all CIR in the sub lot represented by the test and replace with an acceptable binder course hot mix.
Surface Tolerance	n/a	Remove all CIR material in the sub lot represented by the test and replace with an acceptable binder course hot mix.

Notes:

1. Distress and severity definitions according to the Department's Surfacing Condition Rating Manual.
- A. The HMA shall be placed in compacted lift thicknesses between 40 and 75mm.
- B. Removals shall be for the full depth and lane width of recycling.
- C. Repairs shall be for the full width of recycling to the depths indicated.
- D. Reprocessing may be considered as a repair method upon submission of a proposal by the Contractor and approval by THE DEPARTMENT.

Acceptance Criteria for Surface Tolerance

After compaction, the surface of the CIR mat shall be free from deviations exceeding 10mm, as measured in any direction with a 3m straight edge. Refer to Table 4 for required repair.

Acceptance Criteria for Moisture Content

The moisture content shall be determined according to ASTM 1461. The mean moisture content for each lot shall be less than 3.0% with no sub lot moisture content exceeding 4.0%. A lot of CIR material with mean moisture content above 3.0% may be accepted at the discretion of the Engineer.

Acceptance Criteria for Compaction

The compaction of the CIR mix shall be determined according to ASTM D1188. Each Lot of CIR mix shall be compacted to a minimum mean of 96.0% of the laboratory bulk relative density established for the mix with no segment result falling below 95.0%. Refer to Table 4 for required repair.

Measurement and Payment

Measurement of the area of accepted CIR mix placed shall be made in square metres.

Payment will be provided at the unit price bid per square metre for "Cold In-Place Recycling" and shall be full compensation for all labor, sampling and quality control, equipment and material to do the work, including the supply of corrective aggregate (if required), Portland cement or other additive (if required), water, reclamation of existing bituminous pavement, disposal of excess CIR material, HMA placed in areas inaccessible to the reclaiming equipment and all incidental work described under the terms for "Cold In-Place Recycling".

Surface Preparation, Type "C" (Modified)

Surface Preparation, Type "C" (Modified) shall not commence until such time that the asphalt plant arrives on the project.

All operations shall take place in such a manner as to provide a continuous flow of traffic in both directions.

Surface Preparation, Type "C" (Modified) shall consist of incorporating the existing asphalt surface and underlying granular base course (using milling equipment such as a rotomill or road reclaimer) to a maximum depth of 150 mm so that no particle has a dimension greater than 50 mm in any plane. The required width of surface preparation shall be a minimum of 3.7 m each side of centre-line. Granular material beyond this width shall be bladed to the centre and shall be incorporated by road-mixing into the pulverized material. Any additional material required to correct the cross-section will be paid at the applicable unit price for the material being placed.

The mixture of pulverized pavement and granular material shall be re-laid over the entire roadway width and compacted to 98 % AASHTO Standard Dry Density. The contractor shall utilize a grid or vibratory roller in conjunction with the compaction operation.

The department will provide a copy of the Coring Log Sheet to the contractor upon request.

Surface Preparation, Type "C" (Modified) will be measured in stations of 100 m in length along the centreline of the roadway for the length of surface prepared.

The following areas listed below will require surface preparation.

Stations Range		Distance (stations)
From	To	
94+60	104+80	10.2
129+70	140+70	11.0
217+90	221+30	3.4
261+80	263+70	1.9

The unit price for Surface Preparation, Type "C" (Modified) will be payment in full for performing all operations described herein and those incidental to the work.

Bituminous Pavement, Class "C" (Modified)

In General the Bituminous Pavement, Class "C" (Modified), shall be constructed as a (Scratch Coat) 25 mm thin lift levelling course over the completed Cold In-Place Recycled.

Areas of paving outside of the Cold In-Place limits shall be constructed at various depths and lifts as identified on the distribution table for Bituminous Pavements.

Paving shall take place using a bituminous paver capable of placing 4.5 metres paved lane width in a single pass on tangents. The curves located within the project limits require fully paved shoulders totalling 6.2m in lane width.

The contractor will be permitted to use a bituminous paver capable of placing full width pavement of 6.2 meters in a single pass or by paving main lanes and the paved shoulder separately.

The crushed aggregate for Bituminous Pavement, Class "C" (Modified) shall have a top size limit of 100% passing the 16mm sieve.

The unit price for Bituminous Pavement, Class "C" (Modified) will be payment in full for performing all operations described herein and those incidentals to the work.

Bituminous Pavement, Class "B"

The Bituminous Pavement, Class "B" shall be constructed in one lift approximately 50mm in depth.

Bituminous Pavement shall be placed using a bituminous paver capable of placing a 4.5 metre paved lane width in a single pass on tangents.

The curves located within the project limits require fully paved shoulders totalling 6.2m in lane width. The contractor will be permitted to use a bituminous paver capable of placing full width pavement of 6.2 meters in a single pass or by paving main lanes and the paved shoulder separately.

In the event that the contractor decides to pave main lanes separately the contractor shall complete the travel lane prior to paving the shoulder.

Included in the Bituminous Pavement, Class "B" shall be paving of intersections and various approaches located within the project limits.

These operations will be considered incidental to the unit price for "Bituminous Pavement, Class "B".

Bituminous Pavement Smoothness Specification

Notwithstanding Specification No. 800.7.13.1 and No. 800.7.13.2 the following shall apply:

Approval of Finished Surface

The finished surface of each lift of bituminous pavement shall be smooth, free from segregation and roller marks, uniform and true to line and cross-section as shown on the plans or as specified by the Engineer.

After final rolling, the surface profile will be measured with a profile measuring device approved for use by the Department.