Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

.2 Section 31 05 16 - Aggregate Materials.

1.2 MEASUREMENT PROCEDURES

.1 Measurement for payment shall be in accordance with Section 01 29 00.

1.3 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM C117-13, Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.

.2 ASTM C131-14, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

.3 ASTM C136-14, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.4 ASTM D422-63(2007)], Standard Test Method for Particle-Size Analysis of Soils.

.5 ASTM D698-12, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft^3) (600kN-m/m^3).

.6 ASTM D1557-12e1, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft^3) (2,700kN-m/m^3).

.7 ASTM D1883-16, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.

.8 ASTM D4318-10, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.2 Divert unused granular material from landfill to local quarry facility as approved by Departmental Representative.

Part 2 Products

2.1 MATERIALS

.1 Granular sub-base material: in accordance with Section 31 05 16 - Aggregate Materials and Section 31 23 33.01 – Excavating, Trenching, and Backfilling and following requirements:

.1 Crushed, pit run or screened stone, gravel or sand.

.2 Gradations to be within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes to CAN/CGSB-8.2.

.3 Other Properties as follows:

.1 Liquid Limit: to ASTM D4318, Maximum 25.

.2 Plasticity Index: to ASTM D4318, Maximum 6.

.3 Los Angeles degradation: to ASTM C131. Max% Loss by mass: 40.

.4 Particles smaller than 0.02 mm: to ASTM D422, Maximum 3%.

.5 Soaked CBR: to ASTM D1883, Min 40 when compacted to 100% of ASTM D1557.

Part 3 Execution

3.1 PLACING

.1 Place granular sub-base after subgrade is inspected and approved by Departmental Representative.

.2 Construct granular sub-base to depth and grade in areas indicated.

.3 Ensure no frozen material is placed.

.4 Place material only on clean unfrozen surface, free from snow or ice.

.5 Begin spreading sub-base material on crown line or high side of one-way slope.

.6 Place granular sub-base materials using methods which do not lead to segregation or degradation.

.7 For spreading and shaping material, use spreader boxes having adjustable templates or screeds which will place material in uniform layers of required thickness.

.8 Place material to full width in uniform layers not exceeding 150 mm compacted thickness. Departmental Representative may authorize thicker lifts (layers) if specified compaction can be achieved.

.9 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.

.10 Remove and replace portion of layer in which material has become segregated during spreading.

3.2 COMPACTION

.1 Compaction equipment to be capable of obtaining required material densities and compaction requirements.

.2 Compaction Equipment to be equipped with device that records hours of actual work, not motor running hours.

.3 Compact to density of not less than 98% maximum dry density in accordance with ASTM D698 unless otherwise specified.

.4 Shape and roll alternately to obtain smooth, even and uniformly compacted sub-base.

.5 Apply water as necessary during compaction to obtain specified density.

.6 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Departmental Representative.

.7 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

.8 For compaction of sub base over the sluiceway, contractor to select compaction equipment to avoid impacting the structural integrity of the sluice.

3.3 PROOF ROLLING

.1 Except where it conflicts with other clauses of this section, for proof rolling use standard roller of 45400 kg gross mass with four pneumatic tires each carrying 11350 kg and inflated to 620 kPa. Four tires arranged abreast with centre to centre spacing of 730 mm maximum.

.2 Obtain approval from Departmental Representative to use non standard proof rolling equipment.

.3 Proof roll at level in sub-base as indicated. If non-standard proof rolling equipment is approved, Departmental Representative to determine level of proof rolling.

.4 Make sufficient passes with proof roller to subject every point on surface to three separate passes of loaded tire.

.5 Where proof rolling reveals areas of defective subgrade:

.1 Remove sub-base and subgrade material to depth and extent as directed by Departmental Representative.

.2 Backfill excavated subgrade with common material and compact in accordance with this section.

.3 Replace sub-base material and compact.

.6 Where proof rolling reveals areas of defective sub-base, remove and replace in accordance with this section at no extra cost.

3.4 SITE TOLERANCES

.1 Finished sub-base surface to be within 10 mm of elevation as indicated but not uniformly high or low.

3.5 PROTECTION

.1 Maintain finished sub-base in condition conforming to this section until succeeding base is constructed, or until granular sub-base is accepted by Departmental Representative.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Materials and application of asphalt tack coat to an existing asphalt or concrete surface prior to asphalt paving.

1.2 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

1.3 MEASUREMENT PROCEDURES

.1 Asphalt tack coat will not be measured separately and shall be considered incidental to the asphalt paving.

1.4 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)

.1 ASTM D140-15, Standard Practice for Sampling Bituminous Materials.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-16.2-M89, Emulsified Asphalts, Anionic Type, for Road Purposes.

1.5 SUBMITTALS

.1 Submit samples if requested in accordance with Section 01 33 00 - Submittal Procedures.

1.6 QUALITY ASSURANCE

.1 Upon request by Departmental Representative, submit manufacturer's test data and certification that asphalt tack coat material meets requirements of this section.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with ASTM D140.

.2 Provide, maintain and restore asphalt storage area.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal, and with the Waste Reduction Workplan.

.2 Divert unused asphalt from landfill to facility capable of recycling materials.

Part 2 Products

2.1 MATERIALS

.1 Anionic emulsified asphalt: to CAN/CGSB-16.2, grade: SS-1.

.2 Water: clean, potable, free from foreign matter.

2.2 EQUIPMENT

.1 Pressure distributor to be:

.1 Designed, equipped, maintained and operated so that asphalt material can be:

.1 Maintained at even temperature.

.2 Applied uniformly on variable widths of surface up to 5 m.

.3 Applied at readily determined and controlled rates from 0.2 to 5.4 L/$m^2$with uniform pressure, and with an allowable variation from any specified rate not exceeding 0.1 L/m^2.

.4 Distributed in uniform spray without atomization 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 having flow meter graduated in units of 5 L or less per minute passing through nozzles and readily visible to operator. Pump power unit to be independent of truck power unit.

.4 Equipped with an easily read, accurate and sensitive device which registers temperature of liquid in reservoir.

.5 Equipped with accurate volume measuring device or calibrated tank.

.6 Equipped with nozzles of same make and dimensions, adjustable for fan width and orientation.

.7 Equipped with nozzle spray bar, with operational height adjustment.

.8 Cleaned if previously used with incompatible asphalt material.

Part 3 Execution

3.1 APPLICATION

.1 Obtain Departmental Representative's approval of surface before applying asphalt tack coat.

.2 Apply asphalt tack coat only on clean and dry surface.

.3 Dilute asphalt emulsion with water at 1:1 ratio for application.

.1 Mix thoroughly by pumping or other method approved by Departmental Representative.

.4 Apply asphalt tack coat evenly to pavement surface at rate as directed by Departmental Representative, but not to exceed 0.7 L/m^2.

.5 Paint contact surfaces of curbs, gutters, headers, manholes and like structures with thin, uniform coat of asphalt tack coat material.

.6 Do not apply asphalt tack coat when air temperature is less than 10 degrees C or when rain is forecast within 2 hours of application.

.7 Apply asphalt tack coat only on unfrozen surface.

.8 Evenly distribute localized excessive deposits of tack coat by brooming as directed by Departmental Representative.

.9 Where traffic is to be maintained, treat no more than one half of width of surface in one application.

.10 Keep traffic off tacked areas until asphalt tack coat has set.

.11 Re-tack contaminated or disturbed areas as directed by Departmental Representative.

.12 Permit asphalt tack coat to set before placing asphalt pavement.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Materials and installation for asphalt concrete paving for roads.

1.2 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

.3 Section 02 41 13 - Selective Site Demolition.

.4 Section 31 05 16 - Aggregate Materials.

.5 Section 32 12 13.16 - Asphalt Tack Coat.

1.3 MEASUREMENT PROCEDURES

.1 Measurement for payment shall be in accordance with Section 01 29 00 and the following:

.2 Asphalt Cement Price Adjustment:

.1 The price of asphalt cement incorporated into hot mix asphalt shall be adjusted for each month in which paving occurs when the price index for that month differs by more than 5% from the price index for the month prior to bid closing. The price adjustment shall be calculated in accordance with the applicable price adjustment formula of paragraph 2.

.2 Price Adjustment formulae:

.1 When the price index for the month in which paving occurs is higher than 105% of the price index for the month prior to bid closing, Canada shall pay the Contractor a compensation of (Example based on a 5% increase):

.1 **PA** = (**IM** -1.05**IB**) x quantity of asphalt cement in tonnes.

.2 When the price index for the month in which paving occurs is less than 95% of the price index for the month prior to bid closing, Canada shall deduct an amount from the monthly payment to the Contractor of (Example based on a 5% decrease):

.1 **PA** = (.95**IB** – **IM**) x quantity of asphalt cement in tonnes

.3 Where:

.1 **PA** = payment adjustment for asphalt cement, in dollars.

.2 **IB** = asphalt cement price index for the month prior to bid closing

.3 **IM** = asphalt cement price index for the month in which paving occurs.

.4 The price index shall be the Asphalt Cement Price Index published monthly by the Ontario Ministry of Transportation (MTO) in the Contract Bulletin displayed on the MTO website at http://www.mto.gov.on.ca. This price index shall be used to calculate the adjustment per ton of all grades of asphalt cement accepted into the Work.

.5 For each month in which a payment adjustment is made, Canada shall use the fixed asphalt cement content of the final job mix formula to determine the asphalt cement quantity that is used.

.6 The payment adjustments shall be made on the monthly Request for Progress Payment form for the months in which hot mix paving occurs.

1.4 REFERENCES

.1 American Association of State Highway and Transportation Officials (AASHTO)

.1 AASHTO M320-10, Standard Specification for Performance Graded Asphalt Binder.

.2 AASHTO R29-15, Standard Specification for Grading or Verifying the Performance Grade (PG) of an Asphalt Binder.

.3 AASHTO T245-15, Resistance to Plastic flow of Bituminous Mixtures Using Marshall Apparatus.

.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 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 Material Finer Than 0.075mm (No.200) Sieve in Mineral Aggregates by Washing.

.3 ASTM C123-14, Standard Test Method for Lightweight Particles in Aggregate.

.4 ASTM C127-15, Standard Test Method for Specific Gravity and Absorption of Coarse Aggregate.

.5 ASTM C128-15, Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Fine Aggregate.

.6 ASTM C131-14, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

.7 ASTM C136-14, Standard Method for Sieve Analysis of Fine and Coarse Aggregates.

.8 ASTM C207-06(2011), Standard Specification for Hydrated Lime for Masonry Purposes.

.9 ASTM D995-95b(2002), Standard Specification for Mixing Plants for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures.

.10 ASTM D2419-14, Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.

.11 ASTM D3203-11, Standard Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures.

.12 ASTM D4791-10, Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.

.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.

1.5 PRODUCT DATA

.1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit manufacturer's test data and certification that asphalt cement meets requirements of this Section.

.3 Submit asphalt concrete mix design and trial mix test results to Departmental Representative for review at least 4 weeks prior to beginning Work.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Submit to Departmental Representative copies of freight and waybills for asphalt cement as shipments are received. Departmental Representative reserves right to check weights as material is received.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.2 Divert unused asphalt from landfill to facility capable of recycling materials.

Part 2 Products

2.1 MATERIALS

.1 Performance graded asphalt cement: to NSTIR Standard Specifications Division 4 Section 4 and AASHTO M320, grade PG58-28 when tested to AASHTO R29.

.2 Aggregates: in accordance with Section 31 05 16 - Aggregate Materials: General and following requirements:

.1 Crushed stone or gravel.

.2 Gradations: to NSTIR Standard Specifications Division 4 Section 4 and within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes to CAN/CGSB-8.2.

.3 Do not use aggregates having known polishing characteristics in mixes for surface courses.

.4 Regardless of compliance with specified physical requirements, fine aggregates may be accepted or rejected on basis of past field performance.

.3 Anti-stripping admixtures:

.1 Anti-stripping admixtures shall be supplied by the Contractor.

.1 The requirements for an anti-stripping admixture is determined at the asphalt concrete mix design stage and shall meet NSTIR Standard Specifications.

.2 The type and dosage of all asphalt cement anti-stripping admixtures shall be noted on the delivery slip.

.4 Asphalt Mixes:

.1 To meet requirements of NSTIR Standard Specifications Division 4, Section 4 according to the following designations:

.1 Surface Lift:

.1 Type "C" Asphalt.

.2 Base lift:

.1 Type "B" Asphalt.

.5 Water supply required for the works shall be supplied by the Contractor. The Contractor will not be permitted to use the local water supply.

.6 Physical Requirements of Asphalt Concrete:

.1 Asphalt concrete mixes shall meet the following physical requirements when tested by the "Marshall Method" using 75 blows per face:

PROPERTY	TYPE B BASE	TYPE C SURFACE
Stability, kN at 60°C, min (ASTM D1559)	7.5	7.5
Flow, mm (ASTM D1559)	2-4	2-4
Voids in Mineral Aggregate, % (ASTM D2041, ASTM D4469)	13	14
Air Voids, % (ASTM D2041)	3-5	3-5
VFA, %	65-78	65-78
Theoretical Density for Calculations Purposes	2.35	2.45

2.2 EQUIPMENT

.1 All equipment and construction methods shall conform with the requirements and practices of the Nova Scotia Department of Transportation & Public Works as stipulated in their Standard

Specification, latest edition, unless these specifications provide otherwise.

.2 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.

.3 Hand tools:

.1 Lutes or rakes with covered teeth for spreading and finishing operations.

.2 Tamping irons having mass not less than 12 kg and bearing area not exceeding 310 cm^2 for compacting material along curbs, gutters and other structures inaccessible to roller. Mechanical compaction equipment, when approved by Departmental Representative, may be used instead of tamping irons.

.3 Straight edges, 3 m in length, to test finished surface.

2.3 MIX DESIGN

.1 Mix design to meet requirements of NSTIR Standard Specifications and this specification and shall be approved by Departmental Representative.

.2 Do not change job-mix without prior approval of Departmental Representative. When change in material source proposed, new job-mix formula to be approved by Departmental Representative.

Part 3 Execution

3.1 PLANT AND MIXING REQUIREMENTS

.1 To meet requirements of NSTIR Standard Specifications, latest edition.

3.2 PREPARATION

.1 Shape granular road bed in accordance with Section 32 11 16.01 – Granular Sub-Base.

.2 If granular base or sub base material is excessively wet and/or does not meet minimum compaction requirements, the areas so affected shall be excavated, filled with new granular material and compacted per Section 32 11 16.01 – Granular Sub-Base.

.3 Apply asphalt tack coat to existing asphalt surfaces prior to paving.

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

3.3 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 Departmental Representative approves artificial light.

.4 Deposit mix from surge or storage silo to trucks in multiple drops to reduce segregation. Do not dribble mix into trucks.

.5 Deliver material to paver at uniform rate and in an amount within capacity of paving and compacting equipment.

.6 Deliver loads continuously in covered vehicles and immediately spread and compact. Deliver and place mixes at temperature within range as directed by Departmental Representative, but not less than 135 degrees C.

3.4 PLACING

.1 Obtain Departmental Representative's approval of base and tack coat prior to placing asphalt.

.2 Place asphalt concrete to proper lines and grades to give compacted depth, crown/superelevation, profile, and cross-section as per these specifications and detailed drawings.

.3 Placing conditions:

.1 Place asphalt mixtures only when air temperature is above 5 degrees C and rising.

.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 Lower course in layer of 75mm.

.2 Surface course in layer of maximum 75mm.

.5 Where possible do tapering and levelling where required in lower lifts. Overlap joints by not less than 300 mm.

.6 Place individual strips no longer than 500m.

.7 Spread and strike off mixture with self-propelled mechanical finisher.

.1 Construct longitudinal joints and edges true to line markings. Departmental Representative to establish lines for paver to

follow parallel to centerline of proposed pavement. Position and operate paver to follow established line closely.

.2 Maintain constant head of mix in auger chamber of paver during placing.

.3 If segregation occurs, immediately suspend spreading operation until cause is determined and corrected.

.4 Correct irregularities in alignment left by paver by trimming directly behind machine.

.5 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.

.6 Do not throw surplus material on freshly screeded surfaces.

.8 Keep spreading of asphalt by hand to a minimum. However, 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.

.9 Asphalt mixture that does not comply with specifications and mixture which cannot be incorporated into the work shall be rejected and removed to an approved recycling facility.

.10 The surface of finished pavement shall be free from depressions exceeding 6 mm as measured with a 3 m straight edge placed in any direction.

3.5 COMPACTING

.1 Quality control testing for the compaction stage of the work shall be the responsibility of the Contractor to ensure that the density conforms to the requirements of this Section.

.2 Quality assurance testing shall be carried out by the Departmental Representative and shall be based on a lot average method:

.1 A lot is defined as the portion of the work being considered for acceptance.

.2 Pavement samples will be taken on the asphalt surface by coring at random sample locations.

.3 The minimum density acceptable shall be 92.5% of the Theoretical Maximum Relative Density determined according to ASTM D3203. The

percent compaction shall be determined by comparing the core densities with the theoretical maximum relative density.

.4 Rolling operations to be carried out in accordance with NSTIR Standard Specifications, latest edition.

.5 Along gutters, the mixture shall be thoroughly compacted by means of hot hand tampers and effectively sealed.

Each course after compaction shall be smooth and true to required grades. It shall have average thickness specified and shall vary no more than 6mm from specified thickness.

3.6 JOINTS

.1 General:

.1 All joints to be in conformance with NSTIR Standard Specification – Latest Edition.

.2 Remove surplus material from surface of previously laid strip. Do not deposit on surface of freshly laid strip.

.3 Paint contact surfaces of existing structures such as manholes, curbs or gutters with bituminous material prior to placing adjacent pavement.

.2 Transverse joints:

.1 Offset transverse joint in succeeding lifts by at least 600mm.

.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.

.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 115 degrees C prior to paving of adjacent lane.

.1 If cold joint cannot 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 25 to 50 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. Location of feather joints as indicated.

.5 Construct butt joints as indicated at location of saw cutting of existing asphalt roadway to remain.

3.7 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 6 mm when checked with 3 m straight edge placed in any direction.

3.8 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

Part 1 General

1.1 SECTION INCLUDES

.1 Requirements for crushed stone surface paving.

1.2 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

.3 Section 31 05 16 - Aggregate Materials.

1.3 MEASUREMENT PROCEDURES

.1 Measurements for payment in accordance with Section 01 29 00.

1.4 REFERENCES

.1 American Society for Testing and Materials International, (ASTM).

.1 ASTM C136-14, Method for Sieve Analysis of Fine and Coarse Aggregates.

.2 ASTM C117-13, Test Method for Material Finer Than 75-micrometers (No.200) Sieve in Mineral Aggregates by Washing.

.3 ASTM D4318-10e1, Standard Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

.4 ASTM D698-12e2, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3).

.5

.2 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-8.2-M88, Sieves Testing, Woven wire, Metric.

1.5 SUBMITTALS

.1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.

.2 Store crushed stone as and where directed by Departmental Representative.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

Part 2 Products

2.1 MATERIALS

.1 Granular base:

.1 Type 2 gravel to NSTIR standard specifications and Sections 31 23 33.01 and 32 11 16.01.

.2 Granular topping:

.1 Type 1 gravel to NSTIR standard specifications and Sections 31 23 33.01 and 32 11 16.01.

Part 3 Execution

3.1 SUBGRADE

.1 Ensure subgrade preparation conforms to levels and compaction required, to allow for installation of granular base.

3.2 GEOTEXTILE FILTER

.1 Install geotextile filter over subgrade in accordance with Section 31 32 19.01 - Geotextiles.

3.3 GRANULAR BASE

.1 Granular base material thickness: 300 minimum as indicated.

.2 Spread and compact granular base material in uniform layers not exceeding 100 mm compacted thickness.

.3 Compact to a density of not less than 100 % Standard Density in accordance with ASTM D698.

3.4 EDGING

.1 Install edging true to grade, in location, layout and pattern as indicated.

3.5 GRANULAR TOPPING

.1 Place granular topping to compacted thickness as indicated of 150 mm minimum.

.2 Place material in uniform layers not to exceed 50 mm compacted thickness.

.1 Compact layer to 100 % Standard Density in accordance with ASTM D698.

3.6 FIELD QUALITY CONTROL

.1 Inspection and testing of crushed stone paving: carried out by designated testing laboratory.

.2 Costs of tests: paid by Departmental Representative.

3.7 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 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.8 PROTECTION

.1 Prevent damage to buildings, landscaping, curbs, sidewalks, trees, fences, roads and adjacent property.

.1 Repair damages incurred.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Requirements for marking of asphalt paving.

1.2 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

.3 Section 32 12 16.16 – Road Mix Asphalt Paving.

1.3 MEASUREMENT FOR PAYMENT

.1 Pavement marking will not be measured separately for payment and is to be considered incidental to the work of Section 32 12 16 – Asphalt Paving.

1.4 REFERENCES

.1 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.5-99, Low Flash Petroleum Spirits Thinner.

.2 CAN/CGSB 1.74-01, Alkyde Traffic Paint.

.2 Health Canada / Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.3 The Master Painters Institute (MPI)

.1 Architectural Painting Specification Manual - current edition.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and 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 off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Replace defective or damaged materials with new.

.4 Packaging Waste Management: remove for reuse and recycling of pallets, crates, padding, and packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

Part 2 Products

2.1 MATERIALS

.1 Paint:

.1 To NSTIR Standard Specification Division 6 Section 6.

.2 Glass Beads:

.1 To NSTIR Standard Specification Division 6 Section 6.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates and surfaces to receive pavement markings previously installed under other Sections or Contracts are acceptable for product installation in accordance with MPI instructions prior to pavement markings installation.

.1 Visually inspect substrate in presence of Departmental Representative.

.2 Pavement surface: dry, free from water, frost, ice, dust, oil, grease and other deleterious materials.

.3 Proceed with Work only after unacceptable conditions have been rectified.

3.2 EQUIPMENT REQUIREMENTS

.1 Paint applicator: approved pressure type mobile with positive shut-off distributor capable of applying paint in single, double and dashed lines and capable of applying marking components uniformly, at rates specified, and to dimensions as indicated.

.2 Distributor: capable of applying reflective glass beads as overlay on freshly applied paint.

3.3 TRAFFIC CONTROL

.1 Road to be Painted prior to allowing passage of live traffic.

3.4 APPLICATION

.1 Pavement markings: to be laid out as directed by Departmental Representative and per NSTIR Standard Specifications.

.2 Unless otherwise approved by Departmental Representative, apply paint only when air temperature is above 10 degrees C, wind speed is less than 50 km/h and no rain is forecast within next 4 hours.

.3 Apply traffic paint evenly at rate of 3 m^2/L.

.4 Do not thin paint unless approved by Departmental Representative.

.5 Symbols and letters to dimensions indicated.

.6 Paint lines: of uniform colour and density with sharp edges.

.7 Thoroughly clean distributor tank before refilling with paint of different colour.

.8 Apply glass beads at rate of 0.5 kg/l of painted area immediately after application of paint.

3.5 TOLERANCE

.1 Paint markings: within plus or minus 12 mm of dimensions indicated.

.2 Remove incorrect markings and reapply as directed by Departmental Representative.

3.6 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 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.7 PROTECTION OF COMPLETED WORK

.1 Protect pavement markings until dry.

.2 Repair damage to adjacent materials caused by pavement marking application.

END OF SECTION