

Part 1 General

- .1 This section covers the removal of existing asphalt concrete pavement.

Part 2 Products

Not Used.

Part 3 Execution

3.1 PREPARATION

- .1 Prior to commencing removal operation, inspect and verify with Departmental Representative areas, depths and lines of asphalt concrete pavement to be removed.

3.2 EQUIPMENT

- .1 The cold planing shall be accomplished using a cold-milling machine. The cold-milling machine shall be a self-driven rotating drum type, capable of removing asphalt 100 mm thick and at least 1200 mm wide in a single pass. Cutting depth shall be adjustable from 0 mm to 100 mm over the length of the drum. The machine shall have automatic grade control and be able to load milled material directly into trucks, or be able to windrow the material for subsequent pick-up by other equipment.

3.3 REMOVAL

- .1 Remove existing asphalt pavement to lines and grades as indicated.
- .2 Prior to paving operations commencing, a transverse butt joint must be constructed. If a transverse vertical cut is milled in the existing pavement at the limit of the work area the contractor shall immediately construct with hot mix asphalt concrete a temporary smooth 1.5 m long taper. The temporary taper must be removed prior to paving of the milled area.
- .3 Lanes shall be completed to the same location at the end of the day's cold milling operation where it is intended to have both lanes milled.
- .4 All residue left by the cold planing process shall be removed immediately from the road. Mechanical sweeping shall be performed at the end of each day's operations. Low points in the asphalt as a result of cold planing operations, where water ponding may occur, shall have the shoulder milled for draining rainfall. Any guide rail contaminated as a result of cold planing or sweeping operations shall be cleaned to the satisfaction of the Departmental Representative. Any milled material that is lost over the shoulder shall be immediately retrieved and disposed of in an approved manner.
- .5 The Contractor shall dispose of residue at an approved waste disposal area provided by the Contractor at his own expense.
- .6 The Contractor shall continuously maintain the work site free of pot holes and standing water and in a condition providing for a safe and efficient flow of traffic, from the time of removal, until such time as the new asphalt concrete is placed. Hot mix asphalt concrete

shall be placed in the pot holes; cold mix or RAP are acceptable only as a temporary repair. Areas cold milled must be paved within 7 days of the cold milling operation. Signage indicating the driving condition of the milled surface shall be posted. Milled and aged asphalt concrete surfaces shall be treated with bituminous tack coat in accordance with Section 32 12 13.16 – Asphalt Tack Coat prior to the placing of asphalt concrete.

- .7 Use equipment and methods of removal and hauling which do not tear, gouge, break or otherwise damage or disturb underlying pavement.
- .8 Prevent contamination of removed asphalt concrete pavement and granular base by topsoil, underlying gravel or other materials.
- .9 Provide for suppression of dust generated by removal process.
- .10 Compact underlying material in areas of complete removal of asphalt concrete.
- .11 In areas where localized pavement removal is carried out within the traffic lane ensure traffic is restricted from area until the surface is restored.

3.4 TRAFFIC CONTROL

- .1 Maintain at least one lane of alternating two-way traffic at construction sites at all times as specified in Section 01 55 26 – Traffic Regulations.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 31 05 16 – Aggregate Materials

1.2 REFERENCES

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM C117-04, Standard Test Methods for Material Finer Than 75µm (No. 200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C127-15, Test Method for Specific Gravity and Absorption of Coarse Aggregate
 - .3 ASTM C131/C131M-14, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
 - .4 ASTM C136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .5 ASTM C535-01, Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
 - .6 ASTM D422-63 (2007), Standard Test Method for Particle-Size Analysis of Soils.
 - .7 ASTM D5821-13, Standard Test for Determining the Percentage of Fractured Particles in Coarse Aggregate.
 - .8 ASTM D698-07e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort 600kN-m/m³.
 - .9 ASTM D1883-07, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.
 - .10 ASTM D4318-05, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
 - .11 ASTM D1557-07, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort 27,000 kN-m/m³.
- .2 Canadian Standards Association (CSA)
 - .1 CSA A23.2-23A, Method of Test for the Resistance of Fine Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus.
- .3 Canadian General Standard Board (CGSB)
 - .1 CGSB 8.1-88, Sieves, Testing, Woven Wire, Inch Series.
 - .2 CGSB 8.2-M88, Sieves, Testing, Woven Wire, Metric Series.
- .4 Nova Scotia Department of Public Works
 - .1 TPW TM-1, Test Method for the Resistance of Coarse Aggregate to Degradation in the Micro-Deval Apparatus.
 - .2 TPW TM-2, Modified Petrographic Number

- .3 TPW TM-3, Test Method for the Determination of Percent Fractured Particles in Processed Coarse Aggregate.

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 31 05 16 – Aggregate Materials.
- .2 Stockpile minimum 50% of total aggregate required prior to beginning operation. Maintain minimum of 1000 tonne in stockpile until last 1000 tonne is placed.

Part 2 Products

2.1 MATERIALS

- .1 Granular sub-base material: Crushed and screened quarried rock. Material to consist of hard and durable stone and sand particles. Material shall be tested in accordance with ASTM C117 and ASTM C136 and shall conform to the following gradation table:

<u>Sieve Size μm</u>	<u>Percent Pass</u>
80 000	100
56 000	70 - 100
28 000	50 – 80
14 000	35 - 65
5 000	20 – 50
160	3 – 10
80	2 - 5

- .2 Granular material shall conform to the physical properties requirements listed in the following table:

<u>Property</u>	<u>Test Method</u>	<u>Sub-base</u>
Absorption (% Maximum)	ASTM C127	1.75
Los Angeles Abrasion (loss % Maximum)	ASTM C131	40
Fractures Particles, one face, (% Minimum)*	TPW TM-3	80
Plasticity Index	ASTM D4318	3
Petrographic Number (Maximum)	TPW TM-2	150
Micro-Deval (% Max.)	TPW TM-1	20

*The fractured particle shall have at least one well defined fresh face resulting from fracture, with the face comprising no less than 20% of the particle surface area. Particles with smooth faces and rounded edges, or with only small chips removed will not be considered as fractured.

- .3 Materials shall be considered unsuitable even though particle sizes are within the specified gradation limits if particle shape or any other characteristic precludes satisfactory compaction.
- .4 Materials shall conform to the gradation requirements and to the physical requirements stated. The gradation shall not show marked fluctuations from opposite extremes of the limiting sizes, and the plotted curve shall flow in a manner free from acute changes in direction.

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 200 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 Place and compact shouldering to match cross slope.
- .11 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.
- .2 Compact to density of not less than 100% maximum dry density attained using the method prescribed herein as "Control Strip".
- .3 Shape and roll alternately to obtain smooth, even and uniformly compacted sub-base.
- .4 Apply water as necessary during compaction to obtain specified density.
- .5 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Departmental Representative.
- .6 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.3 CONTROL STRIP METHOD

- .1 A Control Strip is a lift of granular sub-base course constructed on a 200 m section, minimum 3 m wide, of prepared surface selected by the Departmental Representative.
- .2 A maximum dry density "Control Density" shall be established on a lift of granular sub-base course using the equipment and method of compaction as prescribed herein for construction of a Control Strip.
- .3 A Control Strip shall be constructed at the beginning of work. One or more Control Strips shall be constructed whenever a change is made in the type or source of material or any change in the compaction equipment used. Each Control Strip shall remain in place and become a portion of the completed sub-base course.
- .4 No additional lift shall be placed until the control density is determined and the compacted lift is approved by the Departmental Representative.
- .5 The Control Strip moisture content shall be adjusted to produce necessary compaction as directed by the Departmental Representative. The surface of the granular sub-base course shall be kept moist until testing is complete.
- .6 To determine the Control Density, a minimum of six moisture and density tests shall be taken at random locations by the Departmental Representative, using nuclear equipment. Test results shall be averaged to determine the in-place maximum dry density.
- .7 The type and mass of the compaction equipment used shall be such that uniform density is obtained throughout the depth of the layer being compacted.
- .8 Minimum compaction equipment shall be a vibratory steel roller(s) weighing not less than 6 t, having a vibratory capacity of at least 1500 VPM with a minimum dynamic or centrifugal force of 8000 kg, operated in a vibratory mode, at a speed not exceeding 8 km/h.
- .9 Control Density Determination.
 - .1 A lift of granular sub-base course shall be spread over the entire Control Strip section. Once the Control Strip lift has been completely spread, the measurements of the Control Density shall commence and continue during repeated passes of the compaction equipment until a maximum dry density is achieved.
 - .2 A pass shall be one complete coverage of the Control Strip layer with the compaction equipment.
 - .3 Testing of the Control Strip shall be discontinued when the average dry density between each series of passes increases by less than 10 kg/m³, continually decreases, or remains constant.
 - .4 The maximum dry density shall be the Control Density used to determine the percent compaction in other areas of the project for the same lift and thickness in other areas of the project for the same lift and thickness and same class of gravel as that used in the Control Section.

3.4 SITE TOLERANCES

- .1 Finished sub-base surface to be within a tolerance of +/-25 mm of dimensions as indicated but not uniformly high or low.

3.5 PROTECTION

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

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 31 05 16 – Aggregate Materials

1.2 MEASUREMENT AND PAYMENT

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM C117-04, Standard Test Methods for Material Finer Than 75µm (No. 200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C127-15, Test Method for Specific Gravity and Absorption of Coarse Aggregate.
 - .3 ASTM C131/C131M-14, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
 - .4 ASTM C136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .5 ASTM C535-01, Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
 - .6 ASTM D422-63 (2007), Standard Test Method for Particle-Size Analysis of Soils.
 - .7 ASTM D5821-13, Standard Test for Determining the Percentage of Fractured Particles in Coarse Aggregate.
 - .8 ASTM D698-07e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort 600kN-m/m³.
 - .9 ASTM D1883-07, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.
 - .10 ASTM D4318-05, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
 - .11 ASTM D1557-07, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort 27,000 kN-m/m³.
- .2 Canadian Standards Association (CSA)
 - .1 CSA A23.2-23A, Method of Test for the Resistance of Fine Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus.
- .3 Canadian General Standard Board (CGSB)
 - .1 CGSB 8.1-88, Sieves, Testing, Woven Wire, Inch Series.
 - .2 CGSB 8.2-M88, Sieves, Testing, Woven Wire, Metric Series.
- .4 Nova Scotia Department of Transportation and Infrastructure Renewal
 - .1 TPW TM-1, Test Method for the Resistance of Coarse Aggregate to Degradation in the Micro-Deval Apparatus.

- .2 TPW TM-2, Modified Petrographic Number
- .3 TPW TM-3, Test Method for the Determination of Percent Fractured Particles in Processed Coarse Aggregate.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 31 05 16 – Aggregate Material.
- .2 Storage minimum 50% of total aggregate required prior to beginning operation. Maintain minimum of 1000 tonne in stockpile until last 1000 tonne is placed.

Part 2 Products

2.1 MATERIALS

- .1 Aggregate Base Material to meet the following requirements:
 - .1 Crushed and screened quarried rock. Material to consist of hard and durable stone and sand particles. Material shall be tested in accordance with ASTM C117 and ASTM C136 and shall conform to the following gradation table:

<u>Sieve Size µm</u>	<u>Percent Pass</u>
----------------------	---------------------

20 000	100
14 000	50 – 90
5 000	20 – 50
160	5 – 12
80	3 - 5

- .2 Granular material shall conform to the physical properties requirements listed in the following table:

<u>Property</u>	<u>Test Method</u>	<u>Sub-base</u>
Absorption (% Maximum)	ASTM C127	1.75
Los Angeles Abrasion (loss % Maximum)	ASTM C131	40
Fractured Particles, one face, (% Minimum)*	TPW TM-3	80
Plasticity Index	ASTM D4318	3
Petrographic Number (Maximum)	TPW TM-2	150
Micro-Deval (% Maximum)	TPW TM-1	20

*The fractured particle shall have at least one well defined fresh face resulting from

fracture, with the face comprising no less than 20% of the particle surface area. Particles with smooth faces and rounded edges, or with only small chips removed will not be considered as fractured.

- .3 Materials shall be considered unsuitable even though particle sizes are within the specified gradation limits if particle shape or any other characteristic precludes satisfactory compaction.
- .4 Materials shall conform to the gradation requirements and to the physical requirements stated. The gradation shall not show marked fluctuations from opposite extremes of the limiting sizes, and the plotted curve shall flow in a manner free from acute changes in direction.

Part 3 Execution

3.1 PLACING

- .1 Place aggregate base after granular sub-base is inspected and approved by Departmental Representative.
- .2 Construct aggregate 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 aggregate base material on crown line or high side of one-way slope.
- .6 Place aggregate 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 200 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 Place and compact shouldering to match cross slope. Compacted shouldering to be flush with asphalt concrete surface.
- .11 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.
- .2 Compact to density of not less than 100% maximum dry density attained using the method prescribed herein as "Control Strip"..
- .3 Shape and roll alternately to obtain smooth, even and uniformly compacted sub-base.
- .4 Apply water as necessary during compaction to obtain specified density.

- .5 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Departmental Representative.
- .6 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.3 CONTROL STRIP METHOD

- .1 A Control Strip is a lift of aggregate base course constructed on a 200 m section, minimum 3 m wide, of prepared surface selected by the Departmental Representative.
- .2 A maximum dry density "Control Density" shall be established on a lift of aggregate base course using the equipment and method of compaction as prescribed herein for construction of a Control Strip.
- .3 A Control Strip shall be constructed at the beginning of work. One or more Control Strips shall be constructed whenever a change is made in the type or source of material or any change in the compaction equipment used. Each Control Strip shall remain in place and become a portion of the completed base course.
- .4 No additional lift shall be placed until the control density is determined and the compacted lift is approved by the Departmental Representative.
- .5 The Control Strip moisture content shall be adjusted to produce necessary compaction as directed by the Departmental Representative. The surface of the aggregate base course shall be kept moist until testing is complete.
- .6 To determine the Control Density, a minimum of six moisture and density tests shall be taken at random locations by the Departmental Representative, using nuclear equipment. Test results shall be averaged to determine the in-place maximum dry density.
- .7 The type and mass of the compaction equipment used shall be such that uniform density is obtained throughout the depth of the layer being compacted.
- .8 Minimum compaction equipment shall be a vibratory steel roller(s) weighing not less than 6 t, having a vibratory capacity of at least 1500 VPM with a minimum dynamic or centrifugal force of 8000 kg, operated in a vibratory mode, at a speed not exceeding 8 km/h.
- .9 Control Density Determination.
 - .1 A lift of aggregate base course shall be spread over the entire Control Strip section. Once the Control Strip lift has been completely spread, the measurements of the Control Density shall commence and continue during repeated passes of the compaction equipment until a maximum dry density is achieved.
 - .2 A pass shall be one complete coverage of the Control Strip layer with the compaction equipment.
 - .3 Testing of the Control Strip shall be discontinued when the average dry density between each series of passes increases by less than 10 kg/m³, continually decreases, or remains constant.
- .10 The maximum dry density shall be the Control Density used to determine the percent compaction in other areas of the project for the same lift and thickness in other areas of

the project for the same lift and thickness and same class of gravel as that used in the Control Section.

3.4 SITE TOLERANCES

- .1 Finished aggregate base surface to be within a tolerance of +/-10 mm of dimensions as indicated but not uniformly high or low.

3.5 PROTECTION

- .1 Maintain finished aggregate base in condition conforming to this section until succeeding material is constructed, or until acceptance by Departmental Representative.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 33 00 – Submittal Procedures
- .2 Section 01 74 21 – Construction/Demolition Waste Management and Disposal
- .3 Section 07 15 00 – Bridge Deck Waterproofing
- .4 Section 32 12 16 – Asphalt Paving
- .5 Section 32 12 18 – Asphalt Concrete Paving of Bridge Decks

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM D140-01, Standard Practice for Sampling Bituminous Materials.
 - .2 ASTM D244, Test Methods for Emulsified Asphalts.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-16.2-M89, Emulsified Asphalts, Anionic Type, for Road Purposes.
- .3 Nova Scotia Department of Transportation and Infrastructure Renewal (NSTIR)
 - .1 Standard Specification, Highway Construction and Maintenance.

1.3 SUBMITTALS

- .1 Submit samples in accordance with Section 01 33 00.
- .2 Submit two – 1L samples of asphalt tack coat material proposed for use in new, clean, airtight, sealed, wide mouth jars made with plastic to Departmental Representative at least 2 weeks prior to beginning work.
- .3 Sample asphalt tack coat material to: ASTM D140.
- .4 Provide access on tank truck for Departmental Representative to sample asphalt material to be incorporated into Work, in accordance with ASTM D140.

1.4 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.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with ASTM D140.
- .2 Provide, maintain and restore asphalt storage area.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for disposal in accordance with Section 01 74 21.
- .2 Divert unused asphalt from landfill to facility capable of recycling materials.

Part 2 Products

2.1 MATERIALS

- .1 Anionic emulsified asphalt: to NSPW Rapid Setting Emulsified Asphalt RS-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 with uniform pressure.
 - .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 5L 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 Apply asphalt tack coat evenly to pavement surface at rate of 0.14 litres/m² or as directed by Departmental Representative.
- .4 Paint contact surfaces of curbs, gutters, headers, manholes and like structures with thin, uniform coat of asphalt tack coat material.
- .5 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.
- .6 Apply asphalt tack coat only on unfrozen surface.

- .7 Evenly distribute localized excessive deposits of tack coat by brooming as directed by Departmental Representative.
- .8 Where traffic is to be maintained, treat no more than one half of width of surface in one application.
- .9 Tack coat shall only be applied to the extent that it can be covered with asphalt concrete prior to the end of the day.
- .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.
- .13 Provide advance warning to adjacent landowners of tack operations schedule.
- .14 Provide adequate signage to warn general public of tack application. Provide adequate personnel to assist the public in avoiding walking through tacked areas and subsequent damage to footwear and tracking into buildings.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 33 00 – Submittal Procedures
- .2 Section 01 74 21 – Construction/Demolition Waste Management and Disposal
- .3 Section 32 01 16 – Removal of Existing Asphalt
- .4 Section 32 12 13.16 – Asphalt Tack Coat
- .5 Section 32 12 18 – Asphalt Concrete Paving of Bridge Decks

1.2 REFERENCES

- .1 American Association of State Highway and Transportation Officials (AASHTO)
 - .1 AASHTO M320-10, Standard Specification for Performance Graded Asphalt Binder.
 - .2 AASHTO R29-02, Standard Specification for Grading or Verifying the Performance Graded of an Asphalt Binder.
 - .3 AASHTO T245-97(2004), Standard Method of Test for Resistance to Plastic flow of Bituminous Mixtures Using Marshall Apparatus.
 - .4 AASHTO M157, Requirements for Mixing Plants for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures.
 - .5 AASHTO T283, Resistance of Compacted Bituminous Mixture to Moisture Induced Damage.
- .2 Asphalt Institute (AI)
 - .1 AI MS-2-1994 Sixth Edition, Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types.
- .3 ASTM International
 - .1 ASTM C88-05, Standard Test Method for Soundness of Aggregates by Use of Sodium Sulphate or Magnesium Sulphate.
 - .2 ASTM C117-04, Standard Test Method for Material Finer Than 0.075mm (No.200) Sieve in Mineral Aggregates by Washing.
 - .3 ASTM C123-04, Standard Test Method for Lightweight Particles in Aggregate.
 - .4 ASTM C127-07, Standard Test Method for Specific Gravity and Absorption of Coarse Aggregate.
 - .5 ASTM C128-07a, Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Fine Aggregate.
 - .6 ASTM C131-06, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
 - .7 ASTM C136-06, Standard Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .8 ASTM C207-2006, Standard Specification for Hydrated Lime for Masonry Purposes.

- .9 ASTM D75, Practices for Sampling Aggregates.
- .10 ASTM D140, Practice for Sampling Bituminous Materials.
- .11 ASTM D546, Test Method for Sieve Analysis of Mineral Filler for Road and Paving Materials.
- .12 ASTM D1559, Test Method for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus.
- .13 ASTM D2041, Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures.
- .14 ASTM D2419-09, Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
- .15 ASTM D2726, Test Method for Bulk Specific Gravity of Compacted Bituminous Mixtures Using Saturated Surface-Dry Specimens.
- .16 ASTM D2950, Test Method for Density of Bituminous Concrete in Place by Nuclear Method.
- .17 ASTM D3203-94(2005), Standard Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures.
- .18 ASTM D3515, Specification for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures.
- .19 ASTM D4469, Method for Calculating Percent Asphalt Absorption by the Aggregate in an Asphalt Paving Mixture.
- .20 ASTM D4791-05e1, 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-8.1-88, Sieves Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2-M88, Sieves Testing, Woven Wire, Metric.
- .5 Nova Scotia Department of Transportation and Infrastructure Renewal (NSTIR)
 - .1 Standard Specifications Highway Construction and Maintenance.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00.
- .2 Submit with tender:
 - .1 Source of supply of PGAB. Supplier must be on NSTIR's list of approved suppliers.
- .3 Certificates of Approval:
 - .1 Submit certificate of approval for the Asphalt Concrete Plant from the Nova Scotia Department of the Environment prior to the commencement of work.
 - .2 Submit written approval for the Material Transfer Vehicle from the NSTIR.
- .4 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for asphalt mixes and aggregate and include product characteristics, performance criteria, physical size, finish and limitations.

- .2 Submit current test result data and certification that PGAB meets the requirements of this section.
- .3 Submit manufacturer's test data and certification that hydrated lime meets requirements of this Section.
- .4 Submit asphalt concrete mix design and trial mix test results to Departmental Representative for review at least 4 weeks prior to beginning work.
- .5 Samples:
 - .1 Submit samples in accordance with Section 01 33 00.
 - .2 Inform Departmental Representative of proposed source of aggregates and provide access for sampling at least 4 weeks prior to beginning Work.
 - .3 Submit samples of following materials proposed for use at least 4 weeks prior to beginning Work.
 - .1 One 1 L container of PGAB.
 - .2 90 kg of hydrated lime.

1.4 WASTE MANGEMENT AND DISPOSAL

- .1 Separate waste materials for disposal in accordance with Section 01 74 21.
- .2 Divert unused asphalt concrete from landfill to facility capable of recycling materials.

1.5 DEILVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with NSTIR Standard Specification, Division 4 Section 2 - Performance Graded Asphalt Binder (PGAB) and Division 4 Section 4 – Asphalt Concrete Hot Mixed – Hot Placed (Method Specification).

Part 2 Products

2.1 MATERIALS

- .1 Asphalt Tack Coat: Rapid Setting Emulsified Asphalt RS-1 in accordance with Section 32 12 13.16 – Asphalt Tack Coat
- .2 Asphalt Binder: Performance Graded Asphalt Binder PG58-28, in accordance with NSTIR Standard Specification, Division 4 Section 2 – Performance Graded Asphalt Binder (PGAB).
- .3 Asphalt Concrete: hot mixed, hot-placed combination of mineral aggregates, uniformly coated and mixed with an asphaltic binder in a suitable mixing plant. Asphalt materials and aggregates shall meet the requirements of NSTIR Standard Specification, Division 4 Section 4 - Asphalt Concrete Hot Mixed – Hot Placed (Method Specification).
- .4 Composition of Asphalt Concrete: to grading and asphalt content to meet requirements of NSTIR Standard Specification, Division 4 Section 4 - Asphalt Concrete Hot Mixed – Hot Placed (Method Specification), Asphalt Mix Type B-HF and Asphalt Mix Type D-HF, as indicated.

2.2 EQUIPMENT

- .1 General: All equipment involved in the manufacture, transporting, placing, compaction, finishing and measurement shall be capable of producing a carefully controlled mixture thoroughly mixed to be free from segregation and contamination and then placed and compacted to a uniform density and smooth finish. Equipment shall be in accordance with NSPW Standard Specification, Division 4 Section 4 - Asphalt Concrete Hot Mixed – Hot Placed (Method Specification).
- .2 Material Transfer Vehicle (MTV) shall be used in the placement of all asphalt concrete on this project.

Part 3 Execution

3.1 PREPARATION

- .1 Temporary Erosion and Sedimentation Control:
 - .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to sediment and erosion control plan.
 - .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
 - .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- .2 Reshape granular roadbed in accordance with Section 32 11 23, Aggregate Base Courses.
- .3 When paving over existing asphalt surface, clean pavement surface to approval of Departmental Representative.
 - .1 When levelling course is not required, patch and correct depressions and other irregularities to approval of Departmental Representative before beginning paving operations.
- .4 Prior to placing mix, prepared surface shall be free from standing water and cleaned of all loose and foreign material.
- .5 Construct transverse keyed joints in existing asphalt concrete surface at each end of construction. Keyed joints shall be cut at a 45 degree transverse angle at a depth of 50 mm and tapered over 10 m.
- .6 Paving after October 31st and before May 15th requires approval by the Departmental Representative.

3.2 TRANSPORTATION OF MIX

- .1 Loading, Transporting and Unloading: in accordance with Clause 5. 2 of NSPW Standard Specification, Division 4 Section 4 - Asphalt Concrete Hot Mixed – Hot Placed (Method Specification).

3.3 PLACING

- .1 Obtain Departmental Representative's approval of base prior to placing asphalt.

- .2 Apply Asphalt Tack Coat in accordance with Section 32 12 13.16 to all asphalt surfaces, existing and new asphalt concrete, prior to placing the next lift of mix.
- .3 Place asphalt concrete to thicknesses, grades and lines as indicated in accordance with Contract Drawings.
- .4 Place asphalt concrete in accordance with NSTIR Standard Specification, Division 4 Section 4 - Asphalt Concrete Hot Mixed – Hot Placed (Method Specification).
 - .1 Material Transfer Vehicle (MTV) shall be used in the placement of all asphalt concrete on this project.

3.4 COMPACTING

- .1 Compact asphalt concrete in accordance with NSTIR Standard Specification, Division 4 Section 4 - Asphalt Concrete Hot Mixed – Hot Placed (Method Specification).

3.5 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.

3.6 DEFECTIVE WORK

- .1 Correct irregularities which develop before completion of rolling by loosening surface mix and removing or adding material as required.
 - .1 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.
 - .1 Segregated areas shall be removed by cold milling the full width of the lane and full depth of the lift in which the work is being performed. The asphalt concrete mix used to replace the segregated material shall be the same mix type and thickness as that removed.
- .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 GENERAL

- .1 This section consists of the application of asphalt concrete on the bridge deck (John Paul Lane Bridge) after the waterproofing membrane and tack coat are applied.

1.2 RELATED SECTIONS

- .1 Section 07 15 00 – Bridge Deck Waterproofing
- .2 Section 32 12 13.16 – Asphalt Tack Coat
- .3 Section 32 12 16 – Asphalt Paving

1.3 REFERENCES

- .1 Nova Scotia Department of Public Works (NSPW)
 - .1 Standard Specifications Highway Construction and Maintenance.

Part 2 Products

2.1 MATERIALS

- .1 Asphalt Tack Coat: Rapid Setting Emulsified Asphalt RS-1 in accordance with Section 32 12 13.16 – Asphalt Tack Coat
- .2 Asphalt Binder: Performance Graded Asphalt Binder PG58-28, in accordance with NSPW Standard Specification, Division 4 Section 2 – Performance Graded Asphalt Binder (PGAB).
- .3 Asphalt Concrete: hot mixed, hot-placed combination of mineral aggregates, uniformly coated and mixed with an asphaltic binder in a suitable mixing plant. Asphalt materials and aggregates shall meet the requirements of NSPW Standard Specification, Division 4 Section 4 - Asphalt Concrete Hot Mixed – Hot Placed (Method Specification) and Division 4 Section 8 – Asphalt Concrete Paving of Bridge Decks.
- .4 Composition of Asphalt Concrete: to grading and asphalt content to meet requirements of NSPW Standard Specification, Division 4 Section 4 - Asphalt Concrete Hot Mixed – Hot Placed (Method Specification), Asphalt Mix Type D-HF, as indicated.

Part 3 Execution

3.1 CONSTRUCTION

- .1 Equipment, Transportation of Mix, Placing and Compacting to be in accordance with Section 32 12 16 – Asphalt Paving.
- .2 Apply tack coat in accordance with Section 07 15 00 Bridge Deck Waterproofing.
- .3 Apply a tack coat of RS-1 emulsion to asphalt surface prior to placing the next lift of mix.

- .4 Place asphalt concrete paving of bridge deck and approach slabs in accordance with manufacturer's specifications of bridge deck waterproofing.
- .5 The deck shall be paved with Asphalt Mix Type D-HF at 2 lifts of 40 mm / lift.
- .6 Trucks or pavers shall not start, stop or turn too quickly on the deck as it could cause a rupture of the waterproofing. The paver shall travel at a maximum speed of 4 m per minute to provide maximum traction.
 - .1 Material Transfer Vehicle (MTV) shall be used in the placement of all asphalt concrete on this project.
- .7 Breakdown rolling of the asphalt concrete shall commence when the mat cools to 105°C, using a steel wheel roller weighing a minimum of 7 ton. The steel wheel roller shall make only one pass over the mat, running off the deck to stop and turn. Vibratory rollers are not permitted to be used on bridge decks. Final rolling shall be performed with a rubber-tired roller, also running off the deck to stop and turn.
- .8 The final lift of asphalt mix shall provide a smooth transition between bridge and approaches.
- .9 Within 24 hours of paving of the deck and approach slabs, seal the interface between the asphalt concrete and the face of the curb by pouring waterproofing along the joint such that the material extends 25 to 50 mm from the face of the curb and to a thickness of 2 to 4 mm above the asphalt concrete.
- .10 Finish Tolerances and Defective Work to be in accordance with Section 32 12 16 – Asphalt Paving.

END OF SECTION

Part 1 General

1.1 GENERAL

- .1 This section consists of the application of water to the surface of the work to suppress dust.

1.2 RELATED SECTIONS

- .1 Section 31 24 13 - Roadway Embankments
- .2 Section 32 11 16.01 - Granular Sub-Base
- .3 Section 32 11 23 - Aggregate Base Courses

Part 2 Products

2.1 MATERIALS

- .1 Water: in accordance with Departmental Representative's approval.

Part 3 Execution

3.1 APPLICATION

- .1 Apply water with equipment approved by Departmental Representative at rate of 1L/m² for liquid when directed by Departmental Representative.
- .2 Failure of the Contractor to provide adequate dust control measures resulting in suspension of Work will be the responsibility of the Contractor.

END OF SECTION

Part I General

1.1 WORK INCLUDED

- .1 To complete finish grading to contours and elevations as shown on Drawings, as specified, or as required, and summarized but not restricted to:
 - .1 Preparation of Subgrade for areas to be hydroseeded.
 - .2 Preparation of Subgrade, provision and placement of planting soil mixture in planting pits.

1.2 RELATED WORK

- .1 Section 01 35 43 Environmental Procedures
- .2 Section 31 11 00 Clearing and Grubbing
- .3 Section 31 24 13 Roadway Embankments
- .4 Section 32 92 19.16 Hydraulic Seeding
- .5 Section 32 93 10 Planting of Trees, Shrubs, and Groundcovers

1.3 REFERENCES

- .1 ASTM D698-12e1 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft³ (600 kN-m/m³))

1.4 SOURCE QUALITY CONTROL

- .1 Protect site, soils and imported material from contamination by invasive plant species. Remove all invasive plant species introduced to the work site. Invasive plant species is defined as vegetative material not native to nor currently found within the project site and which aggressively spreads, is fast growing and/or is difficult to eradicate, such as Japanese knotweed, purple loosestrife, goutweed, glossy buckthorne, scotch pine, garlic mustard, etc.
- .2 The Contractor shall submit representative samples of planting soil that is to be used on the project to a Soil Plant Testing Laboratory acceptable to the Departmental Representative. Prior to using these materials on site they must meet the requirements as indicated in the project specifications. Information to be obtained from testing includes the following:
 - .1 Soil type classification.
 - .2 Percent organic matter.
 - .3 Chemical soil test.
 - .4 Recommendation for soil amendments and fertilizers.
- .3 Contractor to pay for costs of testing.

- .4 Perform pH test to determine required treatment to bring pH value of soil to 6.0 to 7.5 level
- .5 Submit two copies of soil analysis and recommendations for corrections to Departmental Representative.

1.5 SCHEDULING

- .1 No planting soil is to be placed before soil testing results have been provided by Contractor and approved by the Departmental Representative.

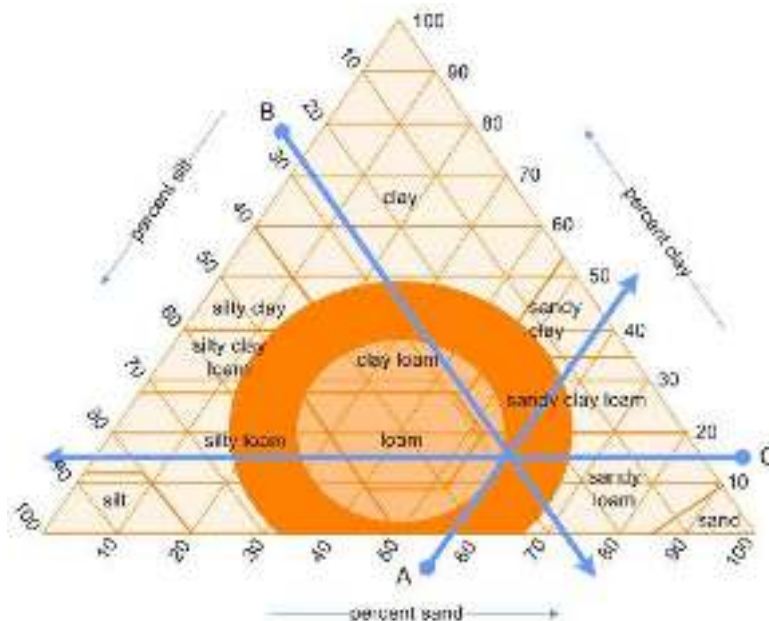
1.6 PROTECTION

- .1 Prevent damage to trees, landscaping, natural features, bench marks, existing pavement, culverts, and utility lines which are to remain. Make good any damage.
- .2 Protect newly graded and filled areas from washouts and settlements caused by rain and water drainage. Fill and grade settled or washed out areas to required levels and slopes under Work of this Section.

Part 2 Products

2.1 MATERIALS

- .1 Topsoil shall conform to the following characteristics unless otherwise specified. Be natural, fertile, friable and classified as either a loam or sandy loam texture as per Standard Topsoil Triangle.



- .2 Planting soil shall contain not less than 20%, or more than 40%, by weight of decayed organic matter (humus). All materials shall be taken from a well-drained, arable site, free from subsoil, debris, vegetation, toxic materials, and stones and roots over 25mm max.

dimension. Planting soil shall be free of grassy weeds such as quack grass and noxious weeds. Material shall have a pH of between 6.0 and 7.5. If material does not meet minimum specifications it must be amended with an approved material and tested at the expense of the Contractor.

- .3 Manure: Well-rotted, unleached cattle manure, not less than eight months or more than two years old, free of harmful chemicals and substances, containing no more than 25% straw, leaves or other materials unsuitable for planting use.
- .4 Peat moss:
 - .1 Derived from partially decomposed fibrous or cellular stems and leaves of sphagnum mosses.
 - .2 Elastic and homogeneous, brown in colour.
 - .3 Free of wood and deleterious material which could inhibit growth.
 - .4 Shredded particle minimum size 6mm.
- .5 Bonemeal: Raw bonemeal, finely ground with a minimum analysis of 2% nitrogen and 20% phosphoric acid.
- .6 Planting Soil Mixture for trees and shrubs. Planting soil can be manufactured by mechanically mixing: 6 parts topsoil, with 1 part well-rotted manure, and 3 parts peat moss.
 - .1 Incorporate bonemeal at rate of 2.75 kg per cu. meter
 - .2 Incorporate fertilizer at rate determined by soil sample test.

Part 3 Execution

3.1 GENERAL

- .1 Ensure organic stripping backfill material has been placed, compacted and prepared to a tolerance of 75mm of grades indicated.
- .2 Consolidate each layer to minimum 95% Standard Proctor Density.
- .3 Establish areas of proposed tree reinstatement and shrub reinstatement with Departmental Representative.
- .4 Imported planting soil shall be free of invasive plant species. Source of topsoil is to be inspected prior to arrival on site so as to permit inspector to see species growing in soil.

3.2 PREPARATION OF SUBGRADE & FINISH GRADING

- .1 Grade Subgrade, eliminating uneven areas and low spots, ensuring positive drainage. Remove soil contaminated with toxic materials. Dispose of removed materials from site as required by the Nova Scotia Department of Environment.
- .2 Cultivate entire area that is to receive hydroseeding to depth of 100mm. Repeat cultivation in those areas where equipment used for hauling and spreading has compacted soil.

- .3 Remove surface debris, roots, vegetation, branches and stones in excess of 75mm dimension.

3.3 PREPARATION OF PLANTING PITS

- .1 Excavate planting pits for new planting to dimensions and spacing indicated on Drawings.
- .2 Plant new material and backfill with planting soil. Refer to Section 32 93 10.

3.4 SURPLUS MATERIALS

- .1 Dispose of surplus topsoil not required for fine grading and landscaping off-site.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 33 00 – Submittal Procedures

1.2 SUBMITTALS

- .1 Product Data.
 - .1 Submit product data in accordance with Section 01 33 00 – Submittal Procedures.
 - .2 Submit statement which certifies that each bag of seed and each bag of fertilizer for use on this project is fully labeled in accordance with the Canada Seed Act and Fertilizer Act. All product to be date stamped as to date of manufacture. Product must be less than one year from date of manufacture.
 - .3 Submit manufacturer's instructions, printed product literature and data sheets for seed, mulch, tackifier, fertilizer, liquid soil amendments and micronutrients.
 - .4 Submit in writing to Departmental Representative 10 days prior to commencing work:
 - .1 Volume capacity of hydraulic seeder in litres.
 - .2 Amount of material to be used per tank based on volume.
 - .3 Number of tank loads required per hectare to apply specified slurry mixture per hectare.

1.3 QUALITY ASSURANCE

- .1 Qualifications: Landscape contractor to be a Member in Good Standing of Nova Scotia Horticultural Trades Association.
- .2 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .3 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .4 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements.

1.4 SCHEDULING

- .1 Schedule hydraulic seeding to coincide with preparation of soil surface.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements:
 - .1 Labelled bags of fertilizer identifying mass in kg, mix components and percentages, date of bagging, supplier's name and lot number.

- .2 Inoculant containers to be tagged with expiry date.
- .3 Storage and Handling Requirements:
 - .1 Store fertilizer in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.

1.6 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 fertilizer from landfill to official hazardous material collections site approved by Departmental Representative.
- .3 Do not dispose of unused fertilizer into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

Part 2 Products

2.1 SEED

- .1 Canada No. 1 Grade to Government of Canada Seeds Act and Seeds regulations where applicable having a minimum germination of 80% and minimum purity of 85%. Seed mixture shall consist of 1.5 kg per 100 m² and conform to the following:

<u>Name</u>	<u>Proportion by Weight</u>
Creeping Red Fescue	40%
Timothy	15%
Tall Fescue	15%
Kentucky Blue Grass	10%
Alsike Clover	10%
Red Top	5%
Perennial Rye	5%

2.2 WATER

- .1 Free of impurities that would inhibit plant growth.

2.3 SEED FERTILIZER

- .1 To Canada “Fertilizers Act” and “Fertilizers Regulations”.
- .2 Complete synthetic, slow release within 35% of nitrogen content in water soluble form.
- .3 Fertilizer shall be formulated 15-25-15 for seeding done April 15 to September 1 and 10-20-20 thereafter.

2.4 SEED MULCH

- .1 Fibre: 100% recycled newsprint (cellulose) or wood fibre coloured green with environmentally acceptable dye, contain no toxic or growth inhibiting chemicals or compounds.
- .2 Capable of dispersing in water to form homogeneous slurry.
- .3 Capable of forming an absorptive mat ground cover allowing water percolation.

2.5 SEED TACKIFIER

- .1 Water diluted liquid dispersion containing polyvinyl acetate polymer emulsion.

2.6 EQUIPMENT

- .1 Truck (hydraulic):
 - .1 Slurry tank: approved commercial hydraulic equipment.
 - .1 Capable of continually agitating the mixture during hydroseeding operation to ensure homogeneous slurry is produced.
 - .2 Pumps capable of maintaining continuous non-fluctuating flow of solution.

Part 3 Execution

3.1 WORKMANSHIP

- .1 Do not spray onto structures, signs, guide rails, fences, plant material, utilities and other than surfaces intended.
- .2 Clean-up immediately, any material sprayed where not intended, to satisfaction of Departmental Representative.
- .3 Do not perform work under adverse field conditions such as wind speeds over 10 km/h, frozen ground or ground covered with snow, ice or standing water.
- .4 Protect seeded areas from trespass until plants are established.

3.2 PREPARATION OF SURFACES

- .1 Do not perform work under adverse field conditions such as wind speeds over 10 km/h, frozen ground or ground covered with snow, ice or standing water.
- .2 Fine grade areas to be seeded free of humps and hollows.
- .3 Remove deleterious materials such as sticks, roots, or large rocks and loosen top 50 mm of soil to remove hardened or crusted soil.
- .4 Surface to be scarified parallel to the contour of the slope with a minimum indentation of 25 mm and at a maximum spacing of 150 mm.
- .5 Cultivated areas identified as requiring cultivation to depth of [25] mm.
- .6 Ensure areas to be seeded are moist to depth of 150 mm before seeding.
- .7 Obtain Departmental Representative's approval of grade before starting to seed.

3.3 PREPARATION OF SLURRY

- .1 Measure quantities of materials by weight or weight-calibrated volume measurement satisfactory to Departmental Representative. Supply equipment required for this work.
- .2 Charge required water into seeder. Add material into hydraulic seeder under agitation. Pulverize mulch and charge slowly into seeder.
- .3 After all materials are in the seeder and well mixed, charge tackifier into seeder and mix thoroughly to complete slurry.

3.4 HYDRAULIC SEEDING

- .1 Seed during local growing season when natural moisture is available and temperature is suitable to ensure germination and growth.
- .2 Measure all quantities of material by weight or by weight-calibrated volume measurement.
- .3 Charge seeder with water, and while agitating, slowly add mulch, seed, fertilizer and lime until all components are thoroughly mixed.
- .4 When required, add erosion control agent to seed and mix thoroughly to complete seeding slurry.
- .5 Slurry application per 100 m²:
 - .1 Seed – 1.5 kg or as recommended by seed supplier.
 - .2 Fertilizer – Not less than 6.25 kg.
 - .3 Mulch – 10 kg.
 - .4 Erosion control agent – as recommended by manufacturer.
 - .5 Water – minimum 100 litres.
 - .6 Lime – as determined by soil analysis.
- .6 Apply slurry uniformly, blending into existing grassed areas. Slurry shall be thick enough to prevent grass seed from drying and blowing but not to impact germination and growth. Reshoot areas where application is not uniform.
- .7 Remove slurry from items and areas not designated to be sprayed.

3.5 MAINTENANCE DURING ESTABLISHED PERIOD

- .1 Perform the following maintenance operations from time of application to acceptance:
 - .1 Repair dead or bare spots to allow establishment of seed prior to acceptance.
 - .2 Water to maintain soil moisture conditions for optimum establishment, growth and health of plant material without causing shrinkage or erosion.
 - .3 Fertilize seeded areas 10 weeks after germination provided plants have mature true leaves. Spread half the required amount of fertilizer in one direction and the remainder at right angles.
 - .4 Control weeds by mechanical means utilizing acceptable integrated pest management practices.

3.6 ACCEPTANCE

- .1 Seeded areas will be accepted provided that:
 - .1 Growth is properly established and seeded areas are free of ruts and erosion.
 - .2 Area is free of bare and dead spots and 98% weed free subject.
 - .3 Minimal surface soil is visible when grass has been cut to a height of 50 mm.
- .2 Areas seeded in the fall will be accepted the following spring, one month after the start of growing season provided that acceptance conditions have been met.

3.7 MAINTENANCE DURING WARRANTY PERIOD

- .1 Perform following operations from time of acceptance until end of warranty period:
 - .1 Repair and reseed dead or bare spots to satisfaction of Departmental Representative.
 - .2 Fertilize seeded areas as required Spread half of required amount of fertilizer in one direction and remainder at right angles and water as well.

END OF SECTION