

PART 1 - GENERAL

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| <u>1.1 WORK INCLUDED</u> | .1 | This section specifies requirements for constructing asphalt concrete pavement. Work includes fine grading, supply and placing of prime or tack coat, hot mix asphalt concrete, and pavement markings. |
| <u>1.2 RELATED SECTIONS</u> | .1 | Earthwork Section 31 20 00 |
| | .2 | Reinstatement Section 32 98 00 |
| <u>1.3 REFERENCE STANDARDS</u> | .1 | CAN/CGSB 1-74-2001, Alkyd Traffic Paint. |
| | .2 | Nova Scotia Transportation and Infrastructure Renewal Standard Specification - Highway Construction and Maintenance. |
| | .3 | Transportation Association of Canada: Manual of Uniform Traffic Control Devices for Canada. |

PART 2 - PRODUCTS

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| <u>2.1 MATERIALS</u> | .1 | Asphalt materials: Nova Scotia Transportation and Infrastructure Renewal Standard Specification - Highway Construction and Maintenance. |
| | .2 | Paint for pavement marking: to CGSB 1-GP-74M, colour as directed. |
| <u>2.2 ASPHALT CONCRETE</u> | .1 | Asphalt concrete mix: to Nova Scotia Transportation and Infrastructure Renewal Standard Specification - Highway Construction and Maintenance, Division 4, Section 4, and type indicated. |
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PART 3 - EXECUTION

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| <u>3.1 GENERAL</u> | .1 | Use workers skilled in placing asphalt concrete. |
| <u>3.2 FINE GRADING</u> | .1 | Fine grade gravel surface to within 10mm of elevations and cross sections indicated immediately prior to placement of asphalt materials. Add or remove gravel as required. Compact to 100% Standard Proctor Density or as directed by the Departmental Representative. |
| <u>3.3 ADJUSTING TOPS OF CASTINGS</u> | .1 | Prior to placing asphalt surface course:
.1 Adjust manhole covers and catch basin frames to match asphalt surface, using manufactured or cast-in-place grade rings.
.2 Adjust valve boxes to finished asphalt surface. Raise or lower top sections of valve boxes. |
| <u>3.4 PRIME COAT</u> | .1 | When required by the Project Documents, apply prime coat to Nova Scotia Transportation and Infrastructure Renewal Standard Specification - Highway Construction and Maintenance, Division 4, Section 5. |
| <u>3.5 TACK COAT</u> | .1 | Apply tack coat on existing asphalt concrete to Nova Scotia Transportation and Infrastructure Renewal Standard Specification - Highway Construction and Maintenance, Division 4, Section 1. Apply tack coat to contact surface of curbs, castings and structures. |
| <u>3.6 PAVING</u> | .1 | Transport, place and compact asphalt concrete mix to Nova Scotia Transportation and Infrastructure Renewal Standard Specification - Highway Construction and Maintenance. Construct pavement within specified tolerances to lines, elevations, cross sections and dimensions at locations indicated. |
| | .2 | Thickness of asphalt courses not to vary more than 6mm from thickness indicated, with average thickness as indicated. |
| | .3 | Finished asphalt surfaces to be within 6mm of design elevation, but not uniformly high or low. Finished asphalt surface not to have irregularities exceeding |

3.6 PAVING (Cont'd)	.3	(Cont'd) 6mm when checked with a 3 metre straightedge placed in any direction.
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3.7 PAVEMENT MARKINGS	.1	Apply temporary markings as soon as possible.
	.2	Allow asphalt concrete to cure a minimum of seven (7) days before application of permanent markings paint. Surface to be dry and clean prior to application. Apply paint at application rate indicated with spray gun to lines and at locations indicated. Dimensions and colour to Transportation Association of Canada Manual of Uniform Traffic Control Devices for Canada, Part C.

PART 1 - GENERAL

<u>1.1 WORK INCLUDED</u>	.1	This section specifies requirements for preparation of subgrade, provision, placement, and fine grading of topsoil for seeded lawn areas. Work includes supply and placement of materials, complete with all related components and accessories.
<u>1.2 RELATED SECTIONS</u>	.1	Earthwork Section 31 20 00
	.2	Seeding and Sodding Section 32 92 00
	.3	Reinstatement Section 32 98 00
<u>1.3 REFERENCE STANDARDS</u>	.1	Canadian Nursery Landscape Association - Canadian Standards for Nursery Stock - latest edition.
	.2	Cornell University (CU)-Soil standards or equivalent.
	.3	Canadian Council of Ministers of the Environment, 2005; Guidelines for Compost Quality. ISBN 1-896997-60-0; Canadian Council of Ministers of the Environment.
<u>1.4 SOURCE QUALITY CONTROL</u>	.1	Inform Departmental Representative of proposed source of topsoil to be supplied and provide access for sampling.
	.2	Arrange to have testing of topsoil. More testing carried out by Nova Scotia Department of Agriculture laboratory or other approved laboratory.
	.3	Test topsoil from source prior to stripping and stockpiling for clay, sand and silt, coarse fragments, particle size, nitrogen (N), phosphorus (P), potassium (K), magnesium (Mg) and organic matter.
	.4	Perform pH test to determine acidity or alkalinity and required treatment to bring pH value of soil that is required. Test stockpiled soil after it has been spread in place.

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| 1.4 SOURCE QUALITY CONTROL
(Cont'd) | .5 | Submit two (2) copies of soil analysis and provide recommendations for corrections to the Departmental Representative. |
| | .6 | Implement approved recommendations as required. |
| 1.5 DELIVERY, STORAGE AND PROTECTION | .1 | Schedule deliveries to minimize storage at job site without causing delays. |
| | .2 | Protect newly graded and filled areas from washouts and settlements caused by rain and water damage. Fill and grade settled or washed out areas to required levels and slopes as specified. |
| 1.6 SCHEDULING | .1 | Schedule topsoiling and finish grading operations to coincide with sodding, and operations. |
| 1.7 SAMPLES | .1 | Submit samples in accordance with Section 01 33 00 for topsoil. |
| PART 2 - PRODUCTS | | |
| 2.1 TOPSOIL | .1 | Imported, manufactured or site prepared from friable loam that is neither heavy clay nor of very light sandy in nature free from debris, vegetation, toxic materials and stones and roots over 50mm maximum dimension and any other deleterious materials that might inhibit plant growth and development. Limit the organic matter to a maximum of 20% by volume. |
| | .2 | Topsoil to be rated to Canadian System for Soil Classification. Refer to soil rating chart in Clause 2.2.3. "B" rated soil is recommended as a minimum for sodded areas and an "A" rated soil is recommended for seeded areas, or as specified in the Project Documents. Manufacture topsoil or topsoil derived from site sources is to be improved as necessary to meet topsoil qualifications above. |
| | .3 | Topsoil Suitability - Standard Topsoil Triangle:
.1 This rating indicates the kind and severity of limitations if the soil is used without corrective measures to grow "normal" landscaping stock (i.e., excluded rhododendrons, blueberries, and other plants |

- 2.1 TOPSOIL (Cont'd)
- .3 (Cont'd)
- .1 (Cont'd)
- with special soil requirements). It does not account for socio-economic factors such as markets or accessibility that make some materials desirable for development regardless of related development costs.
- .2 The degree of limitation or soil suitability is determined by the most restrictive (least suitable) rating assigned to any of the listed soil properties. The cumulative effect of individual soil properties may act to further downgrade a soil.

Soil Factor	Rating			
	A	B	C	D
pH	6-7.5	5-7.5	4-7.5	4-7.5
Organic Matter	4.0-8.0	2.0-8.0	1.0-8.0	u/a
Coarse Fragments	<5%	<10%	<20	20-50%

Definitions:

- pH: as measured in water.
- Organic Matter: Walkley Black method or equivalent (% by weight)
- Coarse Fragments: Particles over 2mm in diameter (% by volume)

- 2.2 MANURE
- .1 Well rotted, unleached livestock manure, not less than eight (8) months or more than two (2) years old, free of harmful chemicals and substances, containing no more than 25% straw, leaves or other materials unsuitable for planting use.

- 2.3 FERTILIZER
- .1 Complete non-toxic, non-burning, slow release fertilizer.
- .2 Fertilizer analysis for hydroseeding areas, sodding areas and planting areas as determined from soil sample test.
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PART 3 - EXECUTION

- 3.1 GENERAL
- .1 Where required, raise subgrade to rough grade levels with landscape fill, deposit in layers not exceeding 200mm. Consolidate each layer to minimum 95% Standard Proctor Density.
- 3.2 PREPARATION OF EXISTING GRADE FOR SODDING
- .1 Verify subgrade elevations are correct.
- .2 Grade soil. Eliminate uneven areas and low spots to ensure positive drainage.
- .3 Cultivate entire area which is to receive topsoil to a depth of 100mm where practical. Repeat cultivation in those areas where equipment used for hauling and spreading has compacted the soil.
- .4 Remove surface debris, roots, vegetation, branches, and stones in excess of 50mm in diameter.
- 3.3 PLACING TOPSOIL
- .1 Do not spread approved topsoil until subgrade has been approved by the Departmental Representative.
- .2 Spread planting soil mixture with adequate moisture in uniform layers over approved, unfrozen subgrade where planting is indicated.
- .3 Place topsoil to the depths indicated in Clause 3.3.2, as per Section 32 90 00, Planting of Trees, Shrubs, and Groundcover for individual plant pits.
- .4 Lightly compact topsoil. Keep topsoil 25mm below finished grade for sodded areas. For seeded areas, bring topsoil to finished grade.
- 3.4 FERTILIZER
- .1 Fertilizer type and rate of application to be determined from soil test and approved by the Departmental Representative.
- .2 Spread fertilizer uniformly over entire area of topsoil.
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- 3.5 FINISH GRADING .1 Fine grade entire topsoil area to contours and elevations as indicated or directed. Eliminate rough spots and low areas to ensure positive drainage.
- .2 Prepare loose friable bed by means of raking prior to sodding.
- .3 Leave surface smooth, uniform, and firm against deep foot printing, with a fine loose texture using approved equipment.
- 3.6 ACCEPTANCE .1 The Departmental Representative will inspect and test topsoil in place and determine acceptance of material, depth, and finish grading.
- 3.7 CLEAN UP .1 Remove surplus materials at no additional cost to the Contract.

PART 1 - GENERAL

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| <u>1.1 WORK INCLUDED</u> | .1 | This section specifies requirements for seeding and sodding. Work includes supply and placement of sods, complete with all related components and accessories. |
| <u>1.2 RELATED SECTIONS</u> | .1 | Earthwork: Section 31 20 00 |
| | .2 | Topsoiling and Finish Grading: Section 32 91 19 |
| | .3 | Reinstatement Section 32 98 00 |
| <u>1.3 REFERENCE STANDARDS</u> | .1 | Canadian Nursery Landscape Association - Canadian Standards for Nursery Stock - latest edition. |
| <u>1.4 SOURCE QUALITY CONTROL</u> | .1 | Obtain approval of sod sources. |
| <u>1.5 DELIVERY, STORAGE AND PROTECTION</u> | .1 | Schedule deliveries to minimize storage at job site without causing delays. |
| <u>1.6 SCHEDULING</u> | .1 | Schedule sodding operations to coincide with topsoil operations. |
| <u>1.7 SAMPLES</u> | .1 | Submit samples in accordance with Section 01 33 00 for sod. |
| | .2 | Provide product data for seed, mulch, tackifier, and fertilizer. |
| | .3 | Submit 300mm x 300mm sample of sod to the Engineer or designated consultant for approval prior to harvesting. |
| | .4 | Obtain Engineer's approval of source of seed and sod. |

- 1.8 WARRANTY .1 Provide warranty that expressly states the sodded areas will be maintained to remain healthy and free of defects for one full growth season from final acceptance date or other as specified in Project Documents.

PART 2 - PRODUCTS

- 2.1 SOD .1 Number (#1) Kentucky Bluegrass - nursery sod grown from one or more Kentucky Bluegrass cultivars or Kentucky Bluegrass/Fine Fescue Sod - grown from a seed mixture containing 90-95% by weight of Kentucky Bluegrass cultivars and 5-10% by weight of creeping red chewing or hard fescue cultivars.
- 2.2 WATER .1 Free of impurities that would inhibit plant growth.
- 2.3 SOD FERTILIZER .1 Complete synthetic, slow release with maximum 35% water soluble nitrogen.
- .2 Ratio for spring sodding: 1:2:2; fall sodding: 1:4:4.
- .3 Ratio for year one maintenance applications: May 3:0:0, July 3:1:3, September 1:2:3, or as recommended by the Nova Scotia Agricultural College Soils Department or by an approved soils lab.
- 2.4 WOODEN PEGS .1 17 x 17 x 150mm or approved 150mm long steel staples.
- 2.5 HERBICIDE .1 Type, rate, and method of application subject to approval by the Departmental Representative and applicable government agencies.

PART 3 - EXECUTION

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| <u>3.1 FIELD CONDITIONS</u> | .1 | Do not perform work under adverse field conditions such as frozen ground or ground covered with snow, ice or standing water, or temperatures which inhibit sod growth unless otherwise approved by the Departmental Representative. |
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| <u>3.2 PREPARATION OF SURFACES</u> | .1 | To Section 32 91 19 - Topsoiling and Finish Grading. |
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| <u>3.3 SODDING</u> | .1 | Topsoiling and finish grading to Section 32 91 19. |
| | .2 | Apply fertilizer at rate recommended by soil sample test. |
| | .3 | Lay sod as soon as possible after lifting to ensure proper establishment. |
| | .4 | Where new sodding abuts existing lawn, cut edge of existing sod with sharp tool in straight line. Lay new sod flush with level of existing lawn. |
| | .5 | Lay sod in rows, parallel with contours, smooth and flush with adjoining areas, and with joints staggered. Butt sections closely without overlapping or leaving gaps between sections. Butt sections against curb flush with top of curb, ensure topsoil is well compacted behind curbing. Cut out irregular or thin sections with a sharp knife, edger or equivalent. Where sod abuts concrete curb, compact soil behind curb and lay top of sod flush with top of curb. |
| | .6 | Provide close contact between sod and soil by light rolling. Use of heavy roller to correct irregularities in grade is not permitted. |
| | .7 | Water sod immediately after laying as dictated by weather conditions to obtain moisture penetration through sod into 100mm of topsoil. |
| | .8 | Roll sod with a roller having a mass of 50 kg/m of width. Repeated rolling to correct irregularities in grade is not permitted. |

3.4 SOD PLACEMENT
ON SLOPES AND
PEGGING

- .1 For slopes steeper than (1) horizontal or (2) vertical, install and secure with mesh, in area indicated, in accordance with the manufacturer's instructions.
- .2 Start laying sod at bottom of slopes.
- .3 Peg sod on slopes steeper than (3) horizontal to (1) vertical, within 1 m of catch basins and within 1 m of drainage channels and ditches to the following pattern:
 - .1 100mm below top edge at 200mm on center for first sod sections along contours of slopes.
 - .2 Not less than 3-6 pegs per square metre.
 - .3 Not less than 6-9 pegs per square metre in drainage structures.
 - .4 Adjust pattern as directed by the Departmental Representative.
 - .5 Drive pegs to 20mm above soil surface of sod section.

3.5 MAINTENANCE
DURING
ESTABLISHMENT
PERIOD

- .1 Perform the following maintenance operations from time of seeding and or sodding to acceptance:
 - .1 Repair dead or bare spots to allow establishment of seed and sod 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 Cut and mulch grass to 50mm, a minimum of twice, when it reaches a height of 70mm.
 - .4 Fertilize seeded areas after first cutting in accordance with fertilizing program. Spread half the required amount of fertilizer in one direction and the remainder at right angles.
 - .5 Fertilize sodded areas one (1) month after sodding. Spread evenly at manufacturer's suggested rate. Postpone fertilizing until next spring if application falls within a four (4)-week period prior to expected end of growth season.
 - .6 Control weeds utilizing acceptable integrated pest management practices.
 - .7 Where continued maintenance is required after final acceptance, commence maintenance immediately following installation of work. Continue it for one year following final acceptance at Project completion.
 - .8 Notify the Departmental Representative upon completion of maintenance period to arrange inspection and transfer maintenance responsibility to Owner.
 - .9 Where Municipal (By-laws) Regulations prohibit the use of Federally or Provincially approved pesticides, and the available (alternative)

- 3.5 MAINTENANCE .1 (Cont'd)
DURING .9 (Cont'd)
ESTABLISHMENT
PERIOD non-pesticide controls are not acceptable to the
(Cont'd) Contractor, the application of pesticides to control
weeds, insects, fungus and disease will be deemed to
be removed from Maintenance during Establishment
Period.
- 3.6 ACCEPTANCE .1 Grassed areas will be accepted upon completion of
the second mowing provided that:
.1 Growth is properly established.
.2 Area is free of bare and dead spots and 98%
weed free subject to section 3.8.9.
.3 Minimal surface soil is visible when grass has
been cut to a height of 50mm.
- .2 Areas sodded in the fall will be accepted the
following spring, one (1) month after the start of
growing season provided that acceptance conditions
have been met.
- .3 Continue maintenance and mowing until acceptance.
- 3.7 CLEAN UP .1 Remove surplus materials at no additional cost to
the contract.

PART 1 - GENERAL

- 1.1 WORK INCLUDED .1 This section specifies requirements for reinstatement of surfaces, property, and structures damaged or disturbed by operations under this Contract. Work includes but is not limited to reinstatement of paved, gravelled and grassed surfaces; sidewalks, curbs and gutters; and ditches and culverts.
- 1.2 RELATED SECTIONS .1 Earthwork: Section 31 20 00
- .2 Asphalt Concrete Paving: Section 32 12 16
- .3 Topsoiling and Finish Grading: Section 32 91 19
- .4 Sodding: Section 32 92 00
- 1.3 REFERENCE STANDARDS .1 Nova Scotia Transportation and Infrastructure Renewal Specification - Highway Construction and Maintenance.

PART 2 - PRODUCTS

- 2.1 MATERIALS .1 Gravels: to Section 31 20 00.
- .2 Asphalt Concrete Materials: to Nova Scotia Transportation and Infrastructure Renewal Specification, Division 4, Section 4 - Highway Construction and Maintenance.
- .3 Topsoiling and Finish Grading: to Section 32 91 19.
- .4 Seeding and Sodding: to Section 32 92 00.
- 2.2 MIXES .1 Asphalt Concrete:
- .1 Roads: to Section 32 12 16
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PART 3 - EXECUTION

- 3.1 GENERAL
- .1 Reinststate all surfaces to lines, elevations and dimensions which existed prior to construction and to match abutting surfaces.
 - .2 Make good all damage or disturbances to surfaces, survey markers, properties and structures disturbed during construction.
- 3.2 GRAVEL SURFACES
- .1 Place, spread, and fine grade to minimum compacted thickness of 150mm for shoulders and other gravel surfaces. Compact to 100% Standard Proctor Density.
- 3.3 ASPHALT
CONCRETE SURFACES
- .1 Make vertical saw cut to full depth of asphalt concrete in straight lines. Cut back 300mm minimum from edge of excavation or beyond to eliminate tension cracks.
 - .2 Place or remove gravel to depth indicated.
 - .3 Shape, fine grade and compact gravel surface to 100 percent Standard Proctor Density.
 - .4 Clean contact surfaces and apply tack coat prior to placing asphalt concrete.
 - .5 Place and compact hot-mix, hot-placed asphalt concrete to Section 32 12 16 to the thickness shown on the Project Drawings.
- 3.4 ASPHALT
CONCRETE CURBS
- .1 Cut back existing curb to full cross section, clean asphalt concrete contact surfaces and apply tack coat prior to placing asphalt concrete curb.
 - .2 Place hot-mix, hot-placed asphalt concrete to Nova Scotia Transportation and Infrastructure Renewal Standard Specification - Highway Construction and Maintenance. Use curb machine having mould dimensions equal to those of the existing asphalt concrete curb. Hand placing not permitted unless approved by Engineer.

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| 3.5 LANDSCAPED
SURFACES | .1 | Fine grade to smooth surface all areas to be reinstated. |
| | .2 | Reinstate landscaped surfaces to Sections 32 91 19 and 32 92 00. |