

PART 1 - GENERAL

1.1 DESCRIPTION

- .1 This section specifies requirements for supplying, transporting and placing granular base and subbase material to lines, grades and typical cross-sections indicated on the Drawings or as indicated by the Departmental Representative.

1.2 REFERENCE STANDARDS

- .1 ASTM D698-07a¹, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
- .2 New Brunswick Department of Transportation and Infrastructure (NBDTI formally NBDOT) Standard Specifications, latest edition.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Type 1 Gravels: Departmental Representative approved, off-site material that meets the requirements of NBDTI Standard Specification for 31.5mm Crushed Rock Aggregate Base, Item 201.2.4.1 and Item 201.2.2 or 31.5mm Crushed Gravel Aggregate Base, Item 201.2.4.2 and Item 201.2.2.
- .2 Type 2 Gravels: Departmental Representative approved, off-site material that meets the requirements of NBDTI Standard Specification for 75mm Crushed Rock Aggregate Subbase, Item 201.2.4.1 and Item 201.2.2 or 75mm Crushed Gravel Aggregate Subbase, Item 201.2.4.2 and Item 201.2.2.
- .3 Compacted Sand: Material shall be free of ice, clay, organic matter or other objectionable material, and shall conform to the following standards:

- .1 Gradation per ASTM C136:

Sieve Designation	% Passing
9.5mm	100
4.75mm	90-100
300µm	10-40
150µm	3-15
75µm	0-7

- .2 The material shall be compacted in accordance with NBDTI Standard Specification Item 936 to a minimum of 95% of the maximum dry density.

PART 3 - EXECUTION

3.1 INSPECTION OF UNDERLYING SUBGRADE

- .1 Do not place granular subbase until finished subgrade surface is inspected and approved by Departmental Representative.

3.2 PLACING

- .1 Place material only on a clean unfrozen surface, properly shaped and compacted and free from snow and ice.
- .2 Place using methods which do not lead to segregation or degradation of aggregates.
- .3 Place base and subbase gravel in uniform layers not exceeding 150mm and 225mm, respectively, to compacted depth shown on Drawings. Grade intermediate gravel courses to within 25mm of elevations and cross-sections indicated, but not uniformly high or low. Compact to 100% maximum dry density.
- .4 Shape each layer to a smooth contour and compact to specified density before succeeding layer is placed.
- .5 Remove and replace that portion of a layer in which material becomes segregated during spreading.

3.3 COMPACTING

- .1 Compact to density not less than 100% maximum dry density, corrected for oversized particles.
- .2 Shape and roll alternately to obtain a smooth, even and uniformly compacted layer.
- .3 Apply water as necessary during compacting to obtain specified density. If material is excessively moist, aerate by scarifying with suitable equipment until moisture content is corrected.
- .4 In areas not accessible to rolling equipment, compact to specified density with approved mechanical tampers.

3.4 FINISH TOLERANCES

- .1 Finished base surface shall be within plus or minus 12mm of established grade but not uniformly high or low.
- .2 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.5 MAINTENANCE

- .1 Maintain finished base in a condition conforming to this section until succeeding material is applied.

END OF SECTION

PART 1 GENERAL

1.1 REFERNCES

- .1 Agriculture and Agri-Food Canada
 - .1 The Canadian System of Soil Classification, Third Edition, 1998.
- .2 Canadian Council of Ministers of the Environment
 - .1 PN1340-2005, Guidelines for Compost Quality.

1.2 WASTE MANAGEMENT AND DISPOSAL

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

PART 2 PRODUCTS

2.1 TOPSOIL

- .1 Topsoil for seeded areas and planting beds: mixture of particulates, micro-organisms and organic matter which provides suitable medium for supporting intended plant growth.
 - .1 Soil texture based on The Canadian System of Soil Classification, to consist of 20 to 70 % sand, minimum 7 % clay, and contain 2 to 10 % organic matter by weight.
 - .2 Contain no toxic elements or growth inhibiting materials.
 - .3 Finished surface free from:
 - .1 Debris and stones over 50 mm diameter.
 - .2 Course vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.
 - .4 Consistence: friable when moist.

2.2 SOIL AMENDMENTS

- .1 Fertilizer:
 - .1 Fertility: major soil nutrients present in following amounts:
 - .2 Nitrogen (N): 20 to 40 micrograms of available N per gram of topsoil.
 - .3 Phosphorus (P): 40 to 50 micrograms of phosphate per gram of topsoil.
 - .4 Potassium (K): 75 to 110 micrograms of potassium per gram of topsoil.

.5 Calcium, magnesium, sulfur and micro-nutrients present in balanced ratios to support germination and/or establishment of intended vegetation.

.6 Ph value: 6.5 to 8.0.

.2 Peatmoss:

.1 Derived from partially decomposed species of Sphagnum Mosses.

.2 Elastic and homogeneous, brown in colour.

.3 Free of wood and deleterious material which could prohibit growth.

.4 Shredded particle minimum size: 5 mm.

.3 Sand: washed coarse silica sand, medium to coarse textured.

.4 Organic matter: compost Category A, B in accordance with CCME PN1340, unprocessed organic matter, such as rotted manure, hay, straw, bark residue or sawdust, meeting the organic matter, stability and contaminant requirements.

.5 Use composts meeting Category B requirements for land fill reclamation and large scale industrial applications.

.6 Limestone:

.1 Ground agricultural limestone.

.2 Gradation requirements: percentage passing by weight, 90% passing 1.0 mm sieve, 50% passing 0.125 mm sieve.

.7 Fertilizer: industry accepted standard medium containing nitrogen, phosphorous, potassium and other micro-nutrients suitable to specific plant species or application or defined by soil test.

2.3 SOURCE QUALITY CONTROL

.1 Advise Departmental Representative of sources of topsoil and manufactured topsoil to be utilized with sufficient lead time for testing.

.2 Contractor is responsible for amendments to supply topsoil as specified.

.3 Soil testing by recognized testing facility for PH, P and K, and organic matter.

.1 Soil sampling, testing and analysis to be in accordance with Provincial standards.

PART 3 EXECUTION

3.1 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

- .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.

3.2 STRIPPING OF TOPSOIL

- .1 Begin topsoil stripping of areas as indicated after area has been cleared of trees, brush, weeds, and grasses.
- .2 Stockpile in locations as directed by Departmental Representative.
 - .1 Stockpile height not to exceed 2 m.
- .3 Disposal of unused topsoil is to be in an environmentally responsible manner but not used as landfill as directed by Departmental Representative.
- .4 Protect stockpiles from contamination and compaction.

3.3 PREPARATION OF EXISTING GRADE

- .1 Verify that grades are correct.
 - .1 If discrepancies occur, notify Departmental Representative and do not commence work until instructed by Departmental Representative.
- .2 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.
- .3 Remove debris, roots, branches, stones in excess of 50 mm diameter and other deleterious materials.
 - .1 Remove soil contaminated with calcium chloride, toxic materials and petroleum products.
 - .2 Remove debris which protrudes more than 75 mm above surface.
 - .3 Dispose of removed material off site.
- .4 Cultivate entire area which is to receive topsoil to minimum depth of 100 mm.
 - .1 Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.

3.4 PLACING AND SPREADING OF TOPSOIL/PLANTING SOIL

- .1 Place topsoil after Departmental Representative has accepted subgrade.
- .2 Spread topsoil in uniform layers not exceeding 150 mm.
- .3 For sodded areas keep topsoil 15 mm below finished grade.
- .4 Spread topsoil as indicated to following minimum depths after settlement.
 - .1 150 mm for seeded areas.

- .2 135 mm for sodded areas.
- .3 300 mm for flower beds.
- .4 500 mm for shrub beds.
- .5 Manually spread topsoil/planting soil around trees, shrubs and obstacles.

3.5 FINISH GRADING

- .1 Grade to eliminate rough spots and low areas and ensure positive drainage.
 - .1 Prepare loose friable bed by means of cultivation and subsequent raking.
- .2 Consolidate topsoil to required bulk density using equipment approved by Departmental Representative.
 - .1 Leave surfaces smooth, uniform and firm against deep footprinting.

3.6 ACCEPTANCE

- .1 Departmental Representative will inspect and test topsoil in place and determine acceptance of material, depth of topsoil and finish grading.

3.7 SURPLUS MATERIAL

- .1 Dispose of materials except topsoil not required where directed by Departmental Representative.

3.8 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

PART 1 GENERAL

1.1 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Product Data.
 - .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Provide product data for:
 - .1 Seed.
 - .2 Mulch.
 - .3 Tackifier.
 - .4 Fertilizer.

1.2 QUALITY ASSURANCE

- .1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .3 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements.

1.3 SCHEDULING

- .1 Schedule hydraulic seeding to coincide with preparation of soil surface.
- .2 Schedule hydraulic seeding using grass mixtures between dates recommended by the Provincial Agricultural Department.

1.4 WASTE MANAGEMENT AND DISPOSAL

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

- .1 Seed: "Canada pedigreed grade" in accordance with Government of Canada Seeds Act and Regulations.
 - .1 Grass mixture: "Certified", "Canada No. 1 or 2 Lawn Grass Mixture" in accordance with Government of Canada "Seeds Act" and "Seeds Regulations".

- .1 Mixture composition:
 - .1 60% by weight - Kentucky bluegrass (minimum 3 varieties).
 - .2 20 % by weight - Fescues (80% creeping red, 20% tall).
 - .3 20 % by weight - perennial rye.
- .2 Mulch: specially manufactured for use in hydraulic seeding equipment, non-toxic, water activated, green colouring, free of germination and growth inhibiting factors with following properties:
 - .1 Type I mulch:
 - .1 Made from wood cellulose fibre.
 - .2 Organic matter content: 95% plus or minus 0.5%.
 - .3 Value of pH: 6.0.
 - .4 Potential water absorption: 900%.
 - .2 Type II mulch:
 - .1 Made from newsprint, raw cotton fibre and straw, processed to produce fibre lengths of 15 mm minimum and 25 mm maximum. Greater proportions of ingredients to be straw.
- .3 Tackifier: water dilutable, liquid dispersion water soluble vegetable carbohydrate powder.
- .4 Water: free of impurities that would inhibit germination and growth.
- .5 Fertilizer:
 - .1 To Canada "Fertilizers Act" and "Fertilizers Regulations".
 - .2 Complete synthetic, slow release with 35% of nitrogen content in water-insoluble form.

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 Fine grade areas to be seeded free of humps and hollows. Ensure areas are free of deleterious and refuse materials.
- .2 Ensure areas to be seeded are moist to depth of 150 mm before seeding.

- .3 Obtain Departmental Representative approval of grade and topsoil depth before starting to seed.

3.3 SLURRY APPLICATION

- .1 Hydraulic seeding equipment:
 - .1 Slurry tank.
 - .2 Agitation system for slurry to be capable of operating during charging of tank and during seeding, consisting of recirculation of slurry and/or mechanical agitation method.
 - .3 Capable of seeding by 50 m hand operated hoses and appropriate nozzles.
 - .4 Tank volume to be certified by certifying authority and identified by authorities "Volume Certification Plate".
- .2 Slurry mixture applied per hectare.
 - .1 Seed: Grass Legume mixture 81.65 kg or as recommended by seed supplier.
 - .2 Mulch: Type I or II 1000 kg.
 - .3 Tackifier: 300 kg or as recommended by supplier.
 - .4 Water: Minimum 1000 L.
 - .5 Fertilizer: 50 kg of nitrogen.
 - .6 Lime as determined by soil analysis.
- .3 Apply slurry uniformly, at optimum angle of application for adherence to surfaces and germination of seed.
 - .1 Using correct nozzle for application.
 - .2 Using hoses for surfaces difficult to reach and to control application.
- .4 Blend application 300 mm into adjacent grass areas or sodded areas previous applications to form uniform surfaces.
- .5 Re-apply where application is not uniform.
- .6 Remove slurry from items and areas not designated to be sprayed.
- .7 Protect seeded areas from trespass satisfactory to Departmental Representative.
- .8 Remove protection devices as directed by Departmental Representative.

3.4 MAINTENANCE DURING ESTABLISHMENT PERIOD

- .1 Perform following operations from time of seed application until acceptance by Departmental Representative.
- .2 Grass Mixture:
 - .1 Repair and reseed dead or bare spots to allow establishment of seed prior to acceptance.
 - .2 Mow grass to 50 mm whenever it reaches height of 70 mm. Remove

clippings which will smother grass as directed by Departmental Representative.

.3 Fertilize seeded areas after first cutting.

.4 Control weeds by mechanical means utilizing acceptable practices.

.5 Water seeded area to maintain optimum soil moisture level for germination and continued growth of grass. Control watering to prevent washouts.

3.5 ACCEPTANCE

.1 Seeded areas will be accepted by Departmental Representative provided that:

.1 Plants are uniformly established. Seeded areas are free of rutted, eroded, bare or dead spots.

.2 Areas have been mown.

.3 Areas have been fertilized.

.2 Areas seeded in fall will achieve final acceptance in following spring, one month after start of growing season provided acceptance conditions are fulfilled.

3.6 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 Mow areas seeded, remove clippings, as directed by Departmental Representative.

3.7 CLEANING

.1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

- .1 The Work to be done under this Section consists of furnishing all materials, labour, tools and equipment and performing all operations necessary for the complete reinstatement of surfaces and structures disturbed by work of this Contract.
- .2 Repair damage or disturbance to surfaces, properties and structures, within limits of the Site or elsewhere on other properties occupied, traversed or otherwise used by the Contractor during the Contract period to a condition equal to or better than that before work began, at no additional cost to the Contract.

1.2 REFERENCE STANDARDS

- .1 New Brunswick Department of Transportation and Infrastructure (NB DTI formally NBDOT) Standard Specifications, latest edition.

1.3 MAINTENANCE

- .1 Contractor shall take care and maintain all reinstated areas until final acceptance of the work.
- .2 Repair damaged areas to the approval of the Departmental Representative.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Granular material: as specified in Section 32 11 19.

PART 3 - EXECUTION

3.1 GENERAL

- .1 Reinstatement all surfaces to lines, elevations and dimensions which existed prior to construction.
- .2 Raise manhole covers and valve boxes to suit grade.

3.2 GRAVEL SURFACES

- .1 Reinstatement gravel surfaces by placing 200mm compacted thickness of gravel at an elevation such that gravel surface is smooth and even with adjacent surfaces.
- .2 Place and compact gravel for surfaces in accordance with the requirements of Section 32 11 19.

3.3 ASPHALT SURFACES

- .1 Keep surface of asphalt paved roads and surfaces in good condition by repairing settlement of trench backfilling as described in Section 31 23 10.
- .2 Carry out final reinstatement of asphalt surfaces as follows:
 - .1 Cut back broken edges of original pavement to full depth, in straight lines. Cut back 300mm minimum from edge of excavation to eliminate tension cracks. Clean contact surfaces and apply tack coat before placing asphalt concrete.
 - .2 Before placing final surface material, remove existing gravel to a depth indicated over disturbed area, grade and re- compact. Add gravel to compacted depths indicated. Compact to not less than 98% maximum dry density.
 - .3 Supply, place, roll and compact asphalt mixture in accordance with NBDTI Standard Specifications.
 - .4 Compact asphalt concrete in lifts not exceeding 50mm in thickness.
 - .5 Ensure finished surface is even, dense and matches grade of existing road or surface, as approved by the Departmental Representative.

END OF SECTION