

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.
- .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 REFERENCES

- .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, sulphur 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.
- .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 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.

1.2 SCHEDULING

- .1 Schedule sodding to coincide with preparation of soil surface.

PART 2 PRODUCTS

2.1 SOD

- .1 Number One Grade Turfgrass Nursery Sod: grass that has been seeded and cultivated in nursery sod fields as a turfgrass sod. At the time of sale, it should be in healthy condition. Sod this quality may contain up to 1 broadleaf weeds per 40 square metres and up to 1% native grasses. Sod should be of sufficient shoot density that no surface soil will be visible from a standing position when mowed to a height of 4 cm. The mowing height range should be 3 to 7 cm, The thickness of the soil portion of the sod should not exceed 15mm. Thickness of the soil portion of the sod may vary with field and environmental conditions at time of harvest but should not exceed 1.5cm. Note that the soil portion is generally composed of at least 50% volume of grass roots.

2.2 FERTILIZER

- .1 Complete commercial specially blended for promoting root development of newly seeded of sodded areas.
- .2 Formulation ratio: 80% scu for spring & early fall planting, 100% scu for fall planting (6-24-6)

PART 3 EXECUTION

3.1 PLACEMENT

- .1 Time Limitations: Turfgrass sod shall be harvested, delivered and installed/transplanted within a period of 24 hours, unless a suitable preservation method is approved prior to delivery. Turfgrass sod not transplanted within this period shall be inspected and approved by the Departmental Representative prior to its installation.

- .2 Sod shall be placed in rows perpendicular to the slope, smooth and even with adjoining areas, and with joints staggered. Sections to be butted closely without overlapping or gaps between sections. Irregular or thin sections shall be cut out. If necessary, existing lawn or adjoining areas shall be cut out to accommodate sod. Sod shall never be placed over existing grass or lawn.
- .3 Sod shall be rolled with a roller having a mass of 50 kg/m of width. Repeated rolling to correct irregularities in grade is not permitted.
- .4 Sod shall be watered within 4 hours of placing to obtain moisture penetration through sod into top 100mm of topsoil. The Contractor is responsible for watering until project work is substantially complete.
- .5 For slopes steeper than 3 horizontal to 1 vertical, stake sod in place with wooden stakes
- .6 Sodded areas will be accepted upon completion of third mowing provided that growth is properly established, and the area is free of bare and dead spots and without weeds. Areas sodded in the fall will be accepted the following Spring, one month after start of growing season, providing that acceptance conditions are fulfilled.

3.2 MAINTENANCE

- .1 Furnish all labor, material and equipment required to complete the work described herein, in strict accordance with the drawings and/or terms of the contract.
- .2 Watering: The general contractor shall supply adequate water to the site. The single-most important factor in the successful rooting of newly installed turfgrass sod is adequate, regular watering. Watering should begin immediately after installation. The amount of water required will vary depending upon season, weather, temperature, wind, slope and turfgrass variety. The general contractor shall designate the party responsible to ensure adequate water supply and application.
 - .1 First Week: The contractor shall provide all labor and arrange for all watering necessary for rooting of the turfgrass sod. Soil on sod pads shall be kept moist at all times. In the absence of adequate rainfall, watering shall be performed daily or as often as necessary during the first week and in sufficient quantities to maintain moist soil to a depth of at least 4 inches (100 mm). Watering should be done during the heat of the day to prevent wilting.
 - .2 Second and Subsequent Weeks: The contractor shall water the turfgrass sod as required to maintain adequate moisture in the upper 4 inches (100 mm) of soil, necessary for the promotion of deep root growth.
 - .3 Mowing: The first mowing shall not be attempted until the turfgrass sod is firmly rooted and securely in place. Not more than 30 percent of the grass leaf shall be removed by the initial or subsequent mowings. Care shall be taken to assure cutting blades are maintained in a sharp condition.

.4 Fertilize areas as follows:

Month	Day	Day	Rate	Ratio
01	01	15	500 kg/ha	3:0:0
02	01	15	687 kg/ha	3:1:3
03	01	15	500 kg/ha	1:2:3

Continue at Month 03 rate and ratio until end of project

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