

Part 1 General

1.1 DEFINITIONS

- .1 Granular Sub-base: Design depth of granular material constructed immediately on the prepared subgrade and prior to construction of granular base material.
- .2 Granular Base: Design depth of granular material constructed immediately on granular sub-base.

1.2 SOURCE APPROVAL AND PRODUCTION SAMPLING

- .1 Refer to Section 31 05 16 - Aggregate Materials.

1.3 PROCESSING, HANDLING AND STOCKPILING

- .1 Refer to Section 31 05 16 - Aggregate Materials.

Part 2 Products

2.1 MATERIALS

- .1 Granular base: aggregate to be 20mm crushed gravel. Gradation to be in accordance with Section 31 05 16 - Aggregate Materials.
 - .1 Liquid limit: ASTM D423, maximum 25.
 - .2 Plasticity index: ASTM D424, maximum 6.
 - .3 Los Angeles Abrasion: ASTM C131, maximum % loss by weight -45.
 - .4 Crushed fragments: minimum 60% of fragments retained on 5000 µm sieve to have at least two freshly fractured faces.
- .2 Granular Sub-base: aggregate shall consist of native fill sand and 75mm or 150mm pitrun gravel. Gradation to be in accordance with Section 31 05 16 – Aggregate Materials.
 - .1 Liquid limit: ASTM D423, maximum 25.
 - .2 Plasticity index: ASTM D424, maximum 6.
 - .3 Los Angeles Abrasion: ASTM C131, maximum % loss by weight -45.
 - .4 Crushed fragments: minimum 60% of fragments retained on 5000 µm sieve to have at least two freshly fractured faces.

Part 3 Execution

3.1 PLACEMENT AND INSTALLATION

- .1 Place granular sub-base after subgrade surface is inspected and approved in writing by Departmental Representative.
- .2 Place granular base after granular sub-base surface is inspected and approved in writing by Departmental Representative.
- .3 Placing:
 - .1 Construct granular material to depth and grade in areas indicated.
 - .2 Ensure no frozen material is placed.
 - .3 Place material only on clean unfrozen surface, free from snow and ice.
 - .4 Begin spreading base material on crown line or on high side of one-way slope.
 - .5 Place material using methods which do not lead to segregation or degradation of aggregate.
 - .6 For spreading and shaping material, use spreader boxes having adjustable templates or screeds which will place material in uniform layers of required thickness.
 - .7 Place material to full width in uniform layers not exceeding 150mm compacted thickness.
 - .1 Departmental Representative may authorize thicker lifts (layers) if specified compaction can be achieved.
 - .8 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.
 - .9 Remove and replace that portion of layer in which material becomes segregated during spreading.
- .4 Compaction Equipment:
 - .1 Ensure compaction equipment is capable of obtaining required material densities.
- .5 Compacting:
 - .1 Refer to Section 31 05 16 – Aggregate Materials for densities.
 - .2 Shape and roll alternately to obtain smooth, even and uniformly compacted material.
 - .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 mechanical tampers approved in writing by Departmental Representative.
- .5 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance. Verify density by proof rolling.
- .6 Proof rolling:
 - .1 For proof rolling use standard roller of 45400 kg gross mass with four pneumatic tires each carrying 11350 kg and inflated to 620 kPa. Four tires rranged abreast with centre to centre spacing of 915 mm (max).
 - .2 Obtain written approval from Departmental Representative to use non standard proof rolling equipment.
 - .3 Proof roll at level in granular material as indicated.
 - .1 If use of non standard proof rolling equipment is approved, Departmental Representative to determine level of proof rolling.
 - .4 Make sufficient passes with proof roller to subject every point on surface to three separate passes of loaded tire.
 - .5 Where proof rolling reveals areas of defective base, sub-base or subgrade:
 - .1 Remove base, sub-base and subgrade material to depth and extent as directed by Departmental Representative and replace with new materials to requirements of Section 31 24 13 – Roadway Embankments and this section at no extra cost to Owner.

3.2 RESTORATION OF GRAVEL ROADS

- .1 Excavating, trenching and backfilling as per Section 31 23 33.01 - Excavating, Trenching and Backfilling.
- .2 Place 150 mm of granular base material, in lifts not greater than 75 mm, to match existing pre-construction elevations and road widths.
- .3 Refer to Section 31 05 16 – Aggregate Materials for compaction requirements.
- .4 Shape and grade the base to match existing road grade.

3.3 SITE TOLERANCES

Finished compacted surface to be within plus or minus 10 mm of established grade and cross section but not uniformly high or low.

3.4 PROTECTION

- .1 Maintain finished base in condition conforming to this Section until succeeding material is applied or until acceptance by Departmental Representative.

END OF SECTION

Part 1 General

1.1 QUALITY ASSURANCE

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials in accordance with manufacturer's recommendations.
 - .2 Store and protect fence and gates from damage.
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

- .1 Wire fence and gates: Farm-field type: to CSA G42, standard 748.
 - .1 Barbed wire: to ASTM A121.
 - .1 Galvanized steel.
 - .2 Wire size: 2 mm diameter.
 - .3 Barbs: 4 point at 125 mm spacing.
- .2 Timber components: construction grade, pressure-treated timber.
- .3 Timber posts:
 - .1 Sound, seasoned wood, peeled and with ends cut square or as indicated.
 - .2 Intermediate posts: 2.5 m long and 125 mm minimum diameter at small end.
 - .3 Corner, end, gate and anchor posts: 2.7 m long and 200 mm minimum diameter at small end.
 - .4 Straight, free from splits, shakes and excessive knots. Existing knots trimmed flush with surface.
 - .5 Cleats for anchoring corner, gate, end and anchor posts: 38 x 140 x 910 mm.
 - .6 Braces for end, corner and gate posts: 89 x 89 mm 3 m long.
 - .7 Posts to be treated in accordance with CAN/CSA O80 Series.

2.2 ERECTION OF FENCE

- .1 Erect fence along lines as indicated on drawings or as directed by Departmental Representative DCC Representative Consultant.
- .2 Installation of posts:
 - .1 Space intermediate posts at 5 m.
 - .2 Space corner, end and gate posts 3 m from adjacent post.
 - .3 Locate and erect gate posts as indicated.
 - .4 Install posts true to line and plumb with 1.5 m of post projecting above ground.
- .3 Fencing with wood posts:
 - .1 Excavate post holes by methods approved by Departmental Representative.
 - .2 Slant of post tops to be perpendicular to fence line and facing inward.
 - .3 Install cleats for anchoring at corner, gate, end and anchor posts as required.
 - .4 Backfill around posts and compact to same density as surrounding ground. Dispose of surplus material as directed by Departmental Representative.
 - .5 Install braces at end, corner and gate posts. Join braces into posts and spike securely.
 - .6 Erect wires and stretch to have uniform tension. Splice wires as required.
 - .7 Attach top wires to posts with 2 staples minimum. Fasten other wires to posts and cross braces with at least one staple. Staple wires securely at end, anchor and gate posts.
 - .8 Stretch 2 strands of barbed wire along tops of posts and double staple on posts.

2.3 INSTALLATION OF GATES

- .1 Install gates in locations as indicated on drawings
 - .1 Install on level ground with ground clearance of 300 mm maximum.

2.4 CLEANING

- .1 Clean and trim areas disturbed by operations. Dispose of surplus material and repair damaged areas as directed by Departmental Representative.

- .2 Touch up:
 - .1 Clean damaged galvanized surfaces with wire brush removing loose and cracked coatings.
 - .1 Apply 2 coats of organic zinc-rich coating

END OF SECTION

Part 1 General

1.1 DEFINITIONS

- .1 Topsoil: material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.

Part 2 Products

2.1 TOPSOIL

- .1 Topsoil for seeded areas: mixture of particulates, micro organisms and organic matter which provides suitable medium for supporting intended plant growth.
 - .1 Contain no toxic elements or growth inhibiting materials.
 - .2 Finished surface free from:
 - .1 Debris and stones over 50 mm diameter.

Part 3 Execution

3.1 STRIPPING OF TOPSOIL

- .1 Commence topsoil stripping of areas as directed by Departmental Representative after area has been cleared of brush, weeds and grasses and removed from site.
- .2 Strip topsoil to depths as directed by Departmental Representative. Avoid mixing topsoil with subsoil where textural quality will be moved outside acceptable range of intended application.
- .3 Stockpile in locations as directed by Departmental Representative. Stockpile height not to exceed 2 m.
- .4 Disposal of unused topsoil is to be in an environmentally responsible manner.
- .5 Protect stockpiles from contamination and compaction.

3.2 PREPARATION OF EXISTING GRADE

- .1 Verify that grades are correct. 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. Remove soil contaminated with calcium chloride, toxic materials

and petroleum products. Remove debris which protrudes more than 75 mm above surface. Dispose of removed material off site.

- .4 Cultivate entire area which is to receive topsoil to minimum depth of 100 mm. Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.

3.3 PLACING AND SPREADING OF TOPSOIL

- .1 Place topsoil after Departmental Representative has accepted subgrade.
- .2 Spread topsoil in uniform layers not exceeding 150 mm.
- .3 Spread topsoil as indicated to following minimum depths after settlement.
- .4 Topsoil shall be free of lumps. Lumps of soil shall be broken down and spread to grade prior to seeding.

3.4 FINISH GRADING

- .1 Grade to eliminate rough spots and low areas and ensure positive drainage. Prepare loose friable bed by means of cultivation and subsequent raking.

3.5 ACCEPTANCE

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

3.6 SURPLUS MATERIAL

- .1 Dispose of materials except topsoil not required off site.

END OF SECTION

Part 1 General

1.1 PRODUCT DATA

- .1 Submit product data in accordance with Section 01 33 00

Part 2 Products

2.1 GRASS SEED

- .1 Seed Mixture: Certified Canada No. 1 mixture, free of disease, weed seeds, or foreign matter, minimum germination of 75%, minimum purity of 97%, and conforming to the mixes below or approved alternatives. All seed must be from a recognized seed firm, meeting the requirements for the Seeds Act for Canada No. 1 Seed. Seed shall be certified No. 1 grade. A germination test may be requested and all lawn seed must comply with federal and provincial seed laws.
 - .1 For standard roadway and Highway ditch landscaping and steep slopes "Canada #1 Mix":
 - .1 30% Argyll Kentucky Bluegrass
 - .2 30% Kentucky Bluegrass
 - .3 30% Creeping Red Fescue
 - .4 10% Annual Rye Grass
 - .2 Do not seed in farmed areas.

2.2 WATER

- .1 Free of impurities that would inhibit germination and growth.

2.3 FERTILIZER

- .1 To Canada "Fertilizers Act" and Fertilizers Regulations".
- .2 Complete synthetic, slow release with 35% of nitrogen content in water-insoluble form, ratio 2:1:1.

Part 3 Execution

3.1 WORKMANSHIP

- .1 Do not perform work under adverse field conditions such as frozen soil, excessively wet or dry soil or soil covered with snow, ice or standing water.

- .2 Remove and dispose of weeds; debris; stones 50 mm in diameter and larger; soil contaminated by oil, gasoline and other deleterious materials; off site.

3.2 SEED BED PREPARATION

- .1 Verify that grades are correct. If discrepancies occur, notify Departmental Representative and do not commence work until instructed by Departmental Representative.
- .2 Fine grade surface free of humps and hollows to smooth, even grade, and to tolerance of plus or minus 30 mm, surface draining naturally.
- .3 Cultivate fine grade approved by 25 mm depth immediately prior to seeding.

3.3 SEED PLACEMENT

- .1 For mechanical seeding:
 - .1 Use "Brillion" type mechanical landscape seeder which accurately places seed at specified depth and rate and rolls in single operation.
 - .2 Use agricultural, water ballast type roller, not less than 500 mm diameter smooth steel drum, width not less than width of landscape seeder. Ballast as directed by Departmental Representative.
 - .3 Use equipment and method acceptable to Departmental Representative.
- .2 For manual seeding:
 - .1 Use "Cyclone" type manually operated seeder.
 - .2 Use manually operated, water ballast, landscaping type, smooth steel drum roller. Ballast as directed by Departmental Representative.
 - .3 Use equipment and method acceptable to Departmental Representative.
- .3 Sow seed uniformly at rate of 24 kg/1000 m².
- .4 Blend applications 150 mm into adjacent grass areas to form uniform surfaces.
- .5 Sow half of required amount of seed in one direction and remainder at right angles, each pass at a rate of 12 kg/1000 m².
- .6 Embed seed into soil to depth of 10 mm. Not less than 85% of seed to be placed at specified depth and covered by soil.
- .7 Consolidate mechanically seeded areas by rolling area if soil conditions warrant or if directly by Departmental Representative with equipment approved by Departmental Representative immediately after seeding.

- .8 Consolidate manually seeded areas by rolling area with equipment approved by Departmental Representative immediately after seeding.
- .9 Sow during calm wind conditions.

3.4 FERTILIZING PROGRAM

- .1 Approximately six weeks after germination, apply suggested organic supplementary fertilizer 27-14-0 at a rate determined by topsoil analysis.

3.5 MAINTENANCE DURING ESTABLISHMENT PERIOD

- .1 Perform following operations from time of seed application until acceptance by Departmental Representative.
 - .1 Water seeded area to maintain optimum soil moisture level for germination and continued growth of grass. Control watering to prevent washouts. Contractor responsible for supplying water.
 - .2 Repair and reseed dead or bare spots to allow establishment of seed prior to acceptance.
 - .3 Cut grass to 60 mm height.
 - .4 Fertilize seeded areas after first cutting in accordance with fertilizing program. Spread half of required amount of fertilizer in one direction and remainder at right angles.
 - .5 Eliminate weeds by mechanical or chemical means.

3.6 ACCEPTANCE

- .1 Seeded areas will be accepted by Departmental Representative provided that:
 - .1 Areas are uniformly established and turf is free of rutted, eroded, bare or dead spots and free of weeds.
 - .2 Areas have been cut at least once.
 - .3 Areas have been fertilized.

3.7 MAINTENANCE DURING WARRANTY PERIOD

- .1 Perform following operations from time of acceptance until end of warranty period:
 - .1 Water seeded area to maintain optimum solid moisture level for continued growth of grass. Control watering to prevent washouts.
 - .2 Repair and reseed dead or bare spots to satisfaction of Departmental Representative.
 - .3 Cut grass to 60 mm whenever it reaches height of 75 mm.

- .4 Fertilize seeded areas in accordance with fertilizing program.; Spread half of required amount of fertilizer in one direction and remainder at right angles.
- .5 Eliminate weeds by mechanical or chemical means.

END OF SECTION