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| West Gate Visitor | ASPHALT PAVING FOR | Sect 32 12 16.02 |
| Reception Centre | BUILDING SITES | Page 1 |
| Fundy National Park | | R.075853.001 |

PART 1 - GENERAL

1.1 General

- .1 Keep vehicular traffic off newly paved areas until paving surface temperature has cooled below 38°C. Do not permit stationary loads on pavement until 24 hours after placement.

1.2 Scope

- .1 This Section shall cover the supply of labour, material and equipment required to provide asphaltic concrete for all the areas indicated on the site plan as being asphalt.

1.3 Layout

- .1 The General Contractor shall be responsible for laying out all asphalt areas and confirming existing grades are as indicated on the Site Plan.

1.4 Fine Grading

- .1 Excavate and remove any material required in order to allow the placing of the gravel base at the proper elevation.

PART 2 - PRODUCTS

2.1 Materials

- .1 All materials to be according to New Brunswick department of Transportation standard specifications, current edition.
- .2 Bituminous tack coat, aggregates and asphalt binders asphalt cement shall be as per New Brunswick Department of Transportation Item 260 Asphalt Concrete and 259 Bituminous Tack Coat. Grade of asphalt shall be as recommended and accepted by the Department of Transportation.
- .3 Asphaltic material: hot mixed, hot laid combination of mineral aggregates, uniformly coated and mixed with an asphaltic binder

| | | |
|---------------------|--------------------|------------------|
| West Gate Visitor | ASPHALT PAVING FOR | Sect 32 12 16.02 |
| Reception Centre | BUILDING SITES | Page 2 |
| Fundy National Park | | R.075853.001 |

in a suitable mixing plant. Asphaltic materials and aggregates shall meet the requirements of Section 201 of the New Brunswick Department of Transportation standard specification.

- .4 Composition of mixture: to grading and asphalt content requirements in Table 260-7, item 260 of the New Brunswick Transportation standard Specification. Base course asphalt shall be Mix Type B, thickness shown on drawings. seal course asphalt shall be Mix Type D, thickness shown on drawings.
- .5 Type 1: Class A granular Material in accordance with Section 201 of the New Brunswick Department of Transportation standard specifications.
- .6 Type 2: Class B granular sub base material in accordance with section 201 of New Brunswick Department of Transportation standard specifications.

PART 3 - EXECUTION

3.1 General

- .1 Coordinate with the geotechnical engineer to carry out the New Brunswick DTI standard specifications construction control testing requirements and ensure compliance with the General Provisions and Contract Specifications for Highway Construction. Have the geotechnical engineer issue Certification of Compliance.

3.2 Subgrade Surface Preparation and Inspection

- .1 Verify grades of granular sub-base and base before placing asphalt.
- .2 Finish base surface to be within 10 mm of specified grade, but not uniformly high or low.

3.3 Asphalt Prime

- .1 Obtain Consultant's approval of granular base surface before applying asphaltic primer.
- .2 Apply prime coat at a temperature of not less than 27 deg. C nor more than 45 deg. C.

- .3 Do not apply prime coat when air temperature is less than 10 deg. C or on a wet surface.
- .4 Permit prime coat to cure before placing asphalt paving mixtures.

3.4 Asphalt Concrete Paving

- .1 Supply and place Class "B" granular material for sub-base as indicated on drawings, compacted to 95% modified proctor.
- .2 Supply and place the Class "A" granular material for the base course as indicated on drawings, compacted to 100% standard proctor.
- .3 Fine grade and compact the gravel base course in accordance with Section 203 New Brunswick Department of Transportation standard specifications.
- .4 Place bituminous tack coat to requirements as outlined in item 259 New Brunswick Department of Transportation standard specifications.
- .5 Supply and place hot mix asphaltic concrete base and seal materials to requirements as outlined in item 260 of New Brunswick Department of Transportation standard specifications.
- .6 The asphaltic concrete shall be finished to the following limits:
 - .1 Slope: Per finish contour lines and spot elevations +/- 25mm.
 - .2 No irregularities greater than 3mm in 3m.
 - .3 Thickness: .3 +/- 6mm for the base course and +/-mm for the surface course.
 - .4 all asphalt shall be sloped such that water does not pond.
- .7 Repair areas showing checking, rippling or segregation as directed by Engineer.

3.5 Joints

- .1 Remove surplus material from surface of previously laid strip. Do not deposit on surface of freshly laid strip.
 - .2 Paint contact surfaces of existing structures such as manholes, curbs or gutters with bituminous material prior to placing adjacent pavement.
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- .3 For cold joints, cut back to full depth vertical face and tack face with hot asphalt.
- .4 For longitudinal joints, overlap previously laid strip with spreader by 25 to 50 mm.
- .5 Cold plane existing asphaltic concrete across the width of existing and new asphalt interface as directed on drawings.

3.6 Workmanship

- .1 The work shall be completed to the satisfaction of the Owner's Engineer according to the above Specifications. Any areas which do not meet the Specification are to be cut out and replaced as directed.

3.7 Cleanup

- .1 Clean up and remove from the premises, rubbish and surplus materials resulting from the work of this Section.

3.8 Testing

- .1 Inspection and testing of asphalt pavement will be carried out by designated testing laboratory.
- .2 Asphalt pavement shall meet or exceed 92% of the mean maximum theoretical relative density.
- .3 Costs of test will be paid for by Owner.

3.9 Protection

- .1 Keep vehicular traffic off newly paved areas until paving surface temperature has cooled below 38° C. Do not permit stationary loads on pavement until 24 h after placement.
- .2 Provide access to buildings as required. Arrange paving schedule so as not to interfere with other work.

PART 1 - GENERAL

1.1 Work Included

- .1 This Section specifies requirements for excavation, supply and installing granular base and sandstone base, compacting, sidewalk and concrete curb construction and curing.

1.2 Reference Standards

- .1 Do cast-in-place concrete work in accordance with CAN/CSA-A23.1-M90, and testing in accordance with CAN/CSA-A23.2-M90, except where specified otherwise.

1.3 Protection

- .1 Protect existing adjacent surfaces designated to remain. In event of damage, immediately replace or make repairs at no extra cost and to the approval of the Consultant. Prior to the start of construction carry out a condition survey with the consultant and confirm the work to be carried out.

PART 2 - PRODUCTS

2.1 Granular Bedding

- .1 Granular bedding: Granular Class A as per DTI item 201 or approved equal. Refer to Section 31 23 33.01 - Excavating, Trenching and Backfilling.

2.2 Select Borrow

- .1 Select Borrow shall be Type 3 Fill. Refer to Section 31 23 33.01 - Excavating, Trenching and Backfilling.

2.3 Formwork

- .1 Formwork:
 - .1 Formwork lumber: plywood and wood formwork materials conforming to CAN3-A23.1.
 - .2 Form release agents: chemically active release agents containing compounds that react with free lime present in concrete to provide water insoluble soaps, preventing set of film of concrete in contact with form.
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2.4 Reinforcing

- .1 Reinforcing:
 - .1 Welded steel wire fabric: to CSA G30.5-M. Provide in flat sheets only.
 - .2 Chairs and bolsters shall be of adequate strength to support reinforcing construction conditions.
 - .3 Dowels for joints: smooth, round mild steel bars to ASTM A307.

2.5 Concrete

- .1 Portland cement: Type 10, to CAN3-A5, except high-early strength cement, if permitted, shall be Type 30.
- .2 Water: potable.
- .3 Aggregates: to CAN/CSA-A23.1-M90. Coarse aggregates to be normal density.
- .4 Air entraining mixture: to CAN3-A266.1-M.
- .5 Chemical admixtures: to CAN3-A266.2-M, Authority to approve accelerating or set retarding admixtures during cold and hot weather placing.
- .6 Supplementary cementing materials and their use: to CAN3-A23.5-M.
- .7 Non-shrink grout: pre-mixed compound consisting of non-metallic aggregate, portland cement, water reducing and plasticizing agents, of pouring consistency, capable of developing compressive strength of 30 MPa at 28 days.
- .8 Curing compound: to ASTM C309, Type 2.
- .9 Premoulded isolation joint fillers: to ASTM D1751, 1/2" thick, non-extruding, resilient, bituminous type.

2.6 Concrete Mix

- .1 Proportion normal density concrete in accordance with CAN/CSA-A23.1M90, Alternative 1, to give following properties: for concrete in exterior curbs and sidewalks.
 - .1 Use type 10 cement.
 - .2 Minimum compressive strength at 28 days: 32 MPa.
 - .3 Minimum cement content: CAN/CSA-A23.1-M90.
 - .4 Class of exposure: C-2.
 - .5 Nominal size of coarse aggregate: 20 mm.
 - .6 Slump at time and point of discharge: 80 mm \pm 30 mm.
 - .7 Air content: 5% to 8% maximum.
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- .8 Chemical admixtures: in accordance with CAN3-A266.4-M.
- .9 Maximum water-cement ratio 0.45.

- .2 Do not change concrete mix without prior approval of Consultant. Should change in material source be proposed, new mix design will be provided to be approved by Consultant.

2.7 Curing Compound

- .1 Cure concrete by adding moisture continuously in accordance with CAN/CSA-123.1 to exposed finished surfaces for at least 1 day after placing.
- .2 Where burlap is used for moist curing, place two prewetted layers on concrete surface and keep continuously wet during curing period.

PART 3 - EXECUTION

3.1 Excavation

- .1 Excavate to the lines and grades shown on the drawings, topsoil and organics from removing under new sidewalk.
- .2 Compact surface of subgrade to 100% Standard Proctor Density.

3.2 Inspection of Existing Sub-grade Surface

- .1 Do not place sandstone material until finished subgrade is inspected and approved.

3.3 Select Borrow and Granular Base

- .1 Place select borrow to bring subgrade to grades required for granular base, compact to 100% Standard Proctor. Place granular base material to lines and widths and depths indicated and compact to 100% Standard Proctor Density.

3.4 Forming

- .1 Concrete for curb to be shaped by forms of either wood or metal construction or by use of a slip form paver. Extruding equipment and mule configuration to be approved before construction begins.
 - .2 Concrete for sidewalk and patio to be shaped by wood or metal forms.
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- .3 Form vertical surfaces to full depth using forming material that will not deform under loading by plastic concrete.
- .4 Securely position forms to required lines and grades.
- .5 Horizontal and vertical alignment of the forms prior to placing concrete shall not vary more than 6 mm from the correct alignment and grade.
- .6 Coat forms with approved form release agent.
- .7 Obtain approval of forms before placing concrete.

3.5 Concrete Workmanship

- .1 Obtain Consultant's approval before placing concrete. Place concrete in accordance with CAN/CSA-A23.1.
- .2 Test concrete once for each day concrete is poured. Test results will be considered representative of the complete days pour.

3.6 Reinforcing

- .1 Accurately place isolation joint steel in positions required and hold firmly during placing, compacting and setting of concrete.

3.7 Curing Concrete

- .1 Apply curing compound to finished surfaces at a rate recommended by manufacturer, as soon as the water sheen has left the concrete surface.
- .2 Cure and protect concrete to CAN/CSA-A23.1-M90 unless otherwise directed. Thirty days after concrete placement, sweep the sidewalk clean and apply two coats 50/50 boiled linseed oil and kerosene to sidewalks. Allow 2 days between applications.

3.8 Finishing Concrete

- .1 Trowel finish exposed surfaces to a smooth uniform finish, free of open texturing and exposed aggregate. Do not work more mortar to surface than required. Do not use neat cement as a drier to facilitate finishing. Broom finish concrete surface to provide evenly textured, non-skid surface.
 - .2 Round edges, including edges of joints, with 1/4 inch radius edging tool.
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- .3 Finish surfaces to prevent ponding.

3.9 Construction Joints

- .1 Control joints to be minimum of one quarter of section thickness.
- .2 Install joints as directed at intervals of:
 - .1 Isolation joints, 15 metres or as required.
 - .2 Transverse control joints equal to width of sidewalk.
- .3 Space curb control joints every 3 metres.
- .4 Install isolation joint filler around manholes and catchbasins and along length adjacent to concrete curbs, catchbasins, or permanent structure.
- .5 At the end of each concrete pour install isolation joint dowels to form cold pour construction joint.
- .6 Refer to drawings for patio control joints.

3.10 Defective Work

- .1 Concrete is defective when:
 - .1 Concrete contains excessive honeycombing or embedded debris.
 - .2 The strength level fails to meet the criteria of CAN/CSA-A23 M-90.
 - .3 Concrete air content is less than the minimum specified.
 - .4 Defective concrete will be required replaced.

3.11 Clean-up

- .1 Upon completion of work, remove debris and surplus excavated material, trim surfaces and leave work site clean and tidy.

PART 1 - GENERAL

1.1 Work Included

- .1 This Section specifies requirements for furnishing all materials, labour, tools and equipment and performing all operations necessary to provide and apply pavement markings where shown on the Drawings and as specified.

1.2 References

- .1 CGSB-1.5-M91, Low Flash, Petroleum Spirits, Thinner.
- .2 CGSB-1-GP-71, Method of Testing Paints and Pigments.
- .3 CGSB-1-GP-74M, Paint, Traffic, Alkyd.
- .4 CGSB-1-GP-12C-68, Standard Paint Colours.

1.3 Samples

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit to Engineer following material sample quantities at least 4 weeks prior to commencing work.
 - .1 Two 1 L samples of each type of paint.
 - .2 Sampling to CGSB 1-GP-71.
- .3 Mark samples with name of project and its location, paint manufacturer's name and address, name of paint, CGSB specification number and formulation number and batch number.

PART 2 - PRODUCTS

2.1 Materials

- .1 Paint:
 - .1 To CGSB 1-GP-74M, alkyd traffic paint.
 - .2 Colour:
 - .1 Centrelines: to CGSB 1-GP-12C, yellow 505-308.
 - .2 Directional arrows, stop lines, parking lines, cross walks and between lanes of traffic travelling same direction: to CGSB 1-GP-12, white, 513-301.
 - .3 Thinner: to CAN/CGSB-1.5.
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PART 3 - EXECUTION

3.1 Condition of Surface

- .1 Pavement surface to be free from surface water, frost, ice, dust, oil, grease and other foreign material.

3.2 Application

- .1 Layout pavement markings as indicated on drawings.
- .2 Unless otherwise directed by Engineer, apply paint only when air temperature is above 10°C and no rain is forecast.
- .3 Apply traffic paint evenly at rate recommended by paint manufacturer.
- .4 Do not thin paint unless approved by Engineer.
- .5 Paint lines to be 100 mm wide, of uniform colour and density with sharp edges.
- .6 Thoroughly clean distributor tank before refilling with paint of different colour.

3.3 Tolerance

- .1 Paint markings to be within plus or minus 12 mm of dimensions indicated.
- .2 Remove incorrect markings as directed.

3.4 Protection of Completed Work

- .1 Protect pavement markings until dry.

PART 1 - GENERAL

1.1 Source Quality Control

- .1 Advise Consultant of sources of topsoil to be utilized 7 days in advance of starting work.
- .2 Contractor is responsible for soil analysis and requirements for amendments to supply topsoil as specified.

1.2 Scheduling Work

- .1 Scheduling placing of topsoil and finish grading to permit sodding and seeding operations under optimum conditions.

PART 2 - PRODUCTS

2.1 Topsoil

- .1 Topsoil for seeded areas: mixture of mineral 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 45% sand and contain 2 to 10% organic matter by weight.
 - .2 Fertility: major soil nutrients present in following ratios:
 - .1 Nitrogen (N): 20 to 40 micrograms of available N per gram of topsoil.
 - .2 Phosphorus (P): 10 to 20 micrograms of phosphate per gram of topsoil.
 - .3 Potassium (K): 80 to 120 micrograms of potash per gram of topsoil.
 - .4 Calcium, magnesium, sulfur and micro-nutrients present in balanced ratios to support germination and/or establishment of intended vegetation.
 - .3 Ph value: 6.0 to 7.5
 - .4 Contain no toxic elements or growth inhibiting materials.
 - .5 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.
 - .6 Consistence: friable when moist.

2.2 Soil Amendments

- .1 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.
- .2 Sand: washed course silica sand, medium to course textured.
- .3 Limestone:
 - .1 Ground agricultural limestone containing minimum calcium carbonate equivalent of 85%.
 - .2 Gradation requirements: percentage passing by weight, 90% passing 1.0 mm sieve, 50% passing 0.125 mm sieve.
- .4 Fertilizer:
 - .1 Complete, commercial, with 35% soluble nitrogen.

PART 3 - EXECUTION

3.1 Stripping of Topsoil

- .1 Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected.
- .2 Commence topsoil stripping of areas as directed by Consultant after area has been cleared of brushweeds and grasses and removed from site.
- .3 Strip topsoil to depths as directed by Consultant. Avoid mixing topsoil with subsoil.
- .4 Stockpile in locations as directed by Consultant. Stockpile height not to exceed 2 m.
- .5 Dispose of unused topsoil on site.
- .6 Protect stockpiles from contamination and compaction.

3.2 Preparation of Existing Grade

- .1 Verify that grades are correct. If discrepancies occur, notify Consultant and do not commence work until instructed by Consultant.
 - .2 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.
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- .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 Course cultivate entire area which is to receive topsoil to 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/Planting Soil

- .1 Place topsoil after Consultant has accepted subgrade.
- .2 Spread topsoil in uniform layers not exceeding 150 mm, over unfrozen subgrade free of standing water.
- .3 For sodded areas keep topsoil 15 mm below finished grade.
- .4 Spread topsoil as indicated to following minimum depths after settlement and 80% compaction:
 - .1 150 mm for seeded areas other than right-of-way and drainage easements
 - .2 135 mm for sodded areas
 - .3 500 mm for shrub and tree planting areas
 - .4 100 mm for seeded right-of-way and drainage easements
- .5 Manually spread topsoil/planting soil around trees, shrubs and obstacles.

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.
- .2 Consolidate topsoil to required bulk density using equipment approved by Consultant. Leave surfaces smooth, uniform and firm against deep footprinting.

3.5 Acceptance

- .1 Consultant will inspect and test topsoil in place and determine acceptance of material, depth of topsoil and finish grading. Approval of topsoil material subject to soil testing and analysis.
 - .2 Testing of topsoil will be carried out by testing laboratory designated by Engineer. Soil sampling, testing and analysis to be in accordance with Provincial regulations and standards.
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|---------------------|-----------------------|------------------|
| West Gate Visitor | TOPSOIL PLACEMENT AND | Sect 32 91 19.13 |
| Reception Centre | GRADING | Page 4 |
| Fundy National Park | | R.075853.001 |

Engineer will pay for cost of tests as specified in Section 01
29 80 - Payment Procedures: Testing Laboratory Services.

3.6 Restoration of Stockpile Sites

- .1 Restore stockpile sites acceptable to Consultant.

3.7 Surplus Material

- .1 Dispose of surplus materials off site.

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|---------------------|---------|------------------|
| West Gate Visitor | SEEDING | Section 32 92 19 |
| Reception Centre | | Page 1 |
| Fundy National Park | | R.075853.001 |

PART 1 - GENERAL

1.1 Related Work

- .1 Section 31 22 13 - Rough Grading

PART 2 - PRODUCTS

2.1 Materials

- .1 Grass seed: Certified Canada No. 1 Grade to Government of Canada, Seeds Regulations and having minimum germination of 75% and minimum purity of 97%. Packages are to be labeled in accordance with "Seed Regulations" and indicating name of Supplier and date bagged.
- .2 Water: potable, free of impurities that would inhibit germination.
- .3 Fertilizer: complete synthetic, slow release fertilizer with maximum 35% water soluble nitrogen. Ratio: 2:1:1. Rate: 0.5 kg of nitrogen per 100 sq.m. and as per Paragraph 2.3
- .4 Lime: Havelock Agricultural Lime.

2.2 Grass Seed Mixture

- .1 40% Kentucky Bluegrass (Must be a blend of three varieties of certified seed in equal quantities. Standard of acceptance for certified Kentucky Bluegrass seed includes: Barren, Impact, Shamrock, Acadia, Goldrush, Bluechip, Nu Glad, Absolute, Award, SR2100, Liberator, RugbyII. 10% Turf Type Tall Fescue 10% Turf Type Hand Fescue 20% Creeeping Red Fescue 20% Turf Type Perennial Rye Grass Seed at a rate of 3 kg per 100 sq.m.

2.3 Soils Test

- .1 Obtain soils test of area to be seeded from the Charlottetown Department of Agriculture. Obtain one test per 3 acre area to seed. Adjust lime and fertilizer requirements as recommended in the test report. Provide copy of reports to the Architect.

PART 3 - EXECUTION

3.1 Workmanship

- .1 Keep site well drained.
- .2 Clean up immediately soil or debris spilled onto pavement, dispose of deleterious materials.

3.2 Preparation of Surfaces

- .1 Cultivate areas to be seeded to 100mm depth. Fine grade free of humps and hollows and free of deleterious and refuse material.
- .2 Obtain Architect's approval of topsoil grade and depth before starting seeding.
- .3 Hand or machine rake as required to remove any rocks or deleterious materials greater than 20mm in any dimension.

3.3 Seeding

- .1 Seed areas as soon as possible.
 - .2 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.
 - .3 For manual seeding:
 - .1 Use "Cyclone" type manually operated seeder.
 - .2 Use manually operated, water ballast, landscaping type, smooth steel drum roller.
 - .4 For Hydro seeding:
 - .1 Slurry application per 100 square meters.
 - .1 Seed - 1.5kg
 - .2 Fertilize r - 15kg of Nitrogen
 - .3 Mulch - 1 3kg.4
 - .4 Erosion Control Agent - 3kg
 - .5 Water - minimum 100 liters
 - .6 Apply slurry uniformly, blending into grassed areas
 - .5 Sow during calm weather (winds less than 10 km/h) using equipment suitable for area involved. Sow half of required amount of seed in one direction and remainder at right angles.
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Incorporate seed into soil to a minimum depth of 5 mm simultaneously or within one hour after seeding operation.

- .6 Blend applications 150 mm. into adjacent grass areas to form uniform surfaces.
- .7 Water with fine spray, avoiding washing out of seed. Apply enough water to ensure penetration of minimum 50 mm.
- .8 Cover seeded areas within the drainage easements and street right-of-way with hay mulch.
- .9 Protect seeded areas against damage. Remove this protection after lawn areas have been accepted by Architect.
- .10 Reseed at 2 week intervals where germination has failed.

3.4 Acceptance

- .1 Areas will be accepted by Architect provided that:
 - .1 Seeded areas are uniformly established and turf is free of rutted, eroded, bare or dead spots and free of weeds.
 - .2 No surface soil is visible when grass has been cut to height of 40 mm.
 - .3 Seeded areas have been cut at least twice, the last cut being carried out within 48 h of acceptance.
 - .4 Areas have been fertilized.
- .2 Areas seeded in fall will be accepted in following spring one month after start of growing season provided acceptance conditions are fulfilled.