PART 1 - GENERAL

1.1 GENERAL

.1 Comply with requirements of Division 1.

1.2 RELATED SECTION

.1 Section 32 92 23 - Sodding.

1.3 REFERENCES

.1 Canadian Standards Association (CSA International).
- .1 CSA G30.5-M1983(R1998), Welded Steel Wire Fabric for Concrete Reinforcement.

.2 Department of Justice Canada (Jus).
- .1 Canadian Environmental Protection Act (CEPA), 1999, c. 33.
- .2 Fertilizers Act (R.S. 1985, c. F-10).
- .3 Fertilizers Regulations (C.R.C., c. 666).
- .4 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

.3 Health Canada - Pest Management Regulatory Agency (PMRA).
- .1 National Standard for Pesticide Education, Training and Certification in Canada (1995).

.4 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
- .1 Material Safety Data Sheets (MSDS).

1.4 DEFINITION

.1 Mycorrhiza : association between fungus and roots of plants. This symbiosis, enhances plant establishment in newly landscaped and imported soils.

1.5 SUBMITTALS

.1 Make submittals in accordance with Division 1.

.2 Submit monthly written reports on maintenance during warranty period, to Departmental Representative identifying:
- .1 Maintenance work carried out.
- .2 Development and condition of plant material.
- .3 Preventative or corrective measures required which are outside Contractor's responsibility.

.3 Submit WHMIS MSDS in accordance with Divisions 1 and 2.

.4 Coordinate submittal requirements and provide submittals required by Division 1.

1.6 QUALITY ASSURANCE

.1 Health and Safety:
- .1 Do construction occupational health and safety in accordance with Division 1.

.2 Sustainable Requirements:
- .1 Construction requirements: in accordance with Division 1.
- .2 Verification: contractor's verification in accordance with Division 1.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Store and manage hazardous materials in accordance with Division 1.

.2 Waste Management and Disposal:
- .1 Provide waste management and disposal in accordance with Division 1.

1.8 SCHEDULING

.1 Obtain approval from Departmental Representative of schedule indicating beginning of Work.

1.9 MAINTENANCE DURING WARRANTY PERIOD

.1 From time of acceptance by Departmental Representative to end of warranty period, perform following maintenance operations.
- .1 Water to maintain soil moisture conditions for optimum growth and health of plant material without causing erosion.
- .2 Apply fertilizer in early spring at manufacturer's suggested rate.
- .3 Remove dead, broken or hazardous branches from plant material. Dispose of debris through mulching.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Select Backfill material: common fill material approved from site excavation or borrow pits.
- .1 Excavated soil from the site, free from roots, rocks larger than 75 mm, building debris, and toxic ingredients (salt, oil, etc). Excavated material shall be approved by Departmental Representative before use as fill.

.2 Peatmoss:
- .1 Derived from partially decomposed species of Sphagnum Mosses.
- .2 Elastic and homogeneous.
- .3 Free of wood and deleterious material which could prohibit growth.
- .4 Shredded minimum particle size: 5 mm.

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

.4 Anti-desiccant: commercial, wax-like emulsion.

.5 Filter Cloth:
- .1 Type 1: 100 % non-woven needle punched polyester, 2.75 mm thick, 240 g/m^2 mass.
- .2 Type 2: biodegradable burlap.

.6 Wood posts: 38 mm x 89 mm x 2400 mm, untreated wood.

.7 Welded wire fabric (WWF): 100 x 100 mm to CSA G30.5.

PART 3 - EXECUTION

3.1 IDENTIFICATION AND PROTECTION

.1 Do construction occupational health and safety in accordance with Division 1.

.2 Identify plants and limits of root systems to be preserved as approved by Departmental Representative.

.3 Protect plant and root systems from damage, compaction and contamination resulting from construction as approved by Departmental Representative.

.4 Ensure no pruning is done inside drip line. If pruning inside drip line is required consult an arborist or Canadian Certified Horticultural Technician (CCHT) as approved by Departmental Representative.

3.2 ROOT CURTAIN SYSTEM

.1 Identify limits for required construction excavation as approved by Departmental Representative.

.2 Prior to construction excavation, hand dig trench minimum 500 mm wide x 1500 mm deep, along perimeter of excavation limits.

.3 Prune exposed roots cleanly at side of trench nearest plants to be preserved. Pruned ends to point obliquely downwards.

.4 Install wooden posts and welded wire fabric against construction edge of trench.

.5 Securely attach filter fabric on plant side of wire mesh.

.6 Prepare homogeneous mixture of fertilizer, parent material and organic matter.
- .1 Add organic matter to mixture to achieve 7-9% organic matter content by weight.
- .2 Incorporate with mixture grade 2:12:8 ratio fertilizer (dry) at rate of 1.5kg/m^3.

.7 Backfill with homogeneous mixture between curtain wall and plants to be preserved in layers not exceeding 150 mm in depth. Compact each layer to 85% Modified Proctor Density.

.8 Protect root curtain from damage during construction operations.

.9 Water plants and root curtain sufficiently during construction to maintain optimum soil moisture condition until backfill operations are complete.

.10 Protect root curtain during backfill operations. Ensure root curtain is cut down to 300 mm below finished grade and remove cut material.

3.3 TRENCHING AND TUNNELING FOR UNDERGROUND SERVICES

.1 Centre line location and limits of trench/tunnel excavation to be approved by Departmental Representative prior to excavation. Tunnel excavation to extend 2000 mm from edge of trunk on either side.

.2 Excavate manually within zone of root system. Do not sever roots greater than 40 mm diameter except at greater than 500 mm below existing grade. Protect roots, and cut roots cleanly with sharp disinfected tools.

.3 Excavate tunnel under centre of tree trunk using methods and equipment approved by Departmental Representative.

.4 Minimum acceptable depth to top of tunnel: 1000 mm.

.5 Backfill for tunnel and trench to 85% Modified Proctor Density. Avoid damage to trunk and roots of tree.

.6 Complete tunnelling and backfilling at tree within 2 weeks of beginning Work.

3.4 LOWERING GRADE AROUND EXISTING TREE

.1 Begin Work in accordance with schedule approved by Departmental Representative.

.2 Cut slope not less than 500 mm from tree trunk to new grade level retaining wall.

.3 Excavate to depths as indicated. Protect from damage root zone which is to remain.

.4 When severing roots at excavation level, cut roots with sharp tools.

.5 Cultivate excavated surface manually to 15 mm depth.

.6 Prepare homogeneous soil mixture consisting by volume of:

- .1 60 % excavated soil cleaned of roots, plant matter, stones, debris.
- .2 25 % coarse, clean sterile sand.
- .3 15 % organic matter.
- .4 Grade 2:12:8 fertilizer at rate of 1.5 kg/m^3.

.7 Place soil mixture over area of excavation to finished grade level. Compact to 85% Standard Proctor Density.

.8 Water entire root zone to optimum soil moisture level.

.9 Install surface cover of seeding or sodding in accordance with Division 32.

3.5 PRUNING

.1 Prune crown to compensate for root loss while maintaining general form and character of plant. Dispose of debris through mulching.

3.6 ANTI-DESICCANT

.1 Apply anti-desiccant to foliage where applicable and as directed by Departmental Representative.

3.7 VERIFICATION

.1 Verification requirements in accordance with Division 1, include:
- .1 Materials and resources.
- .2 Storage and collection of recyclables.
- .3 Construction waste management.
- .4 Local/regional materials.
- .5 Low-emitting materials.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

.1 This Section specifies requirements for supply, producing and placing gravel or quarried stone as a granular base and sub-base to lines, grades and typical cross sections indicated on the drawings.

1.2 RELATED SECTIONS

.1 Construction Waste Management and Disposal: Section 01 74 22

.2 Asphalt Paving: Section 32 12 16

1.3 REFERENCES

.1 Nova Scotia Transportation and Infrastructure Renewal Standard Specification - Highway Construction and Maintenance.

.2 American Society for Testing and Materials (ASTM)
- .1 ASTM C117-2013, Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.
- .2 ASTM C131-2014, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
- .3 ASTM C136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- .4 ASTM D422-63(2007), Standard Test Method for Particle-Size Analysis of Soils.
- .5 ASTM D1557-2012, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft^3) (2,700kN-m/m^3).
- .6 ASTM D1883-07e2, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.
- .7 ASTM D4318-10, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

.3 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 22.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Granular base and sub-base material:
- .1 Quarried crushed and screened rock.
- .2 Gradations to be within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes to CAN/CGSB-8.2.

.3 Table

Type 1 (Granular Base):

Sieve Size (mm)	% Passing
20 000	100
14 000	50-85
5 000	20-50
160	5-12
80	3-8

Type 2 (Granular Sub-Base):

Sieve Size (mm)	% Passing
80 000	100
56 000	70-100
28 000	50-80
14 000	35-65
5 000	20-50
160	3-10
80	0-7

.4 Other Properties as follows:

.1 Liquid Limit: to ASTM D4318, Maximum 25.

.2 Plasticity Index: to ASTM D4318, Maximum 6.

.3 Los Angeles degradation: to ASTM C131. Max. % Loss by mass: 35.

.4 Particles smaller than 0.02 mm: to ASTM D 422, Maximum 3%.

.5 Soaked CBR: to ASTM D1883, Min 40 when compacted to 100% of ASTM D1557.

PART 3 - EXECUTION

3.1 PLACING

.1 Place granular base and sub-base after roadway subgrade is inspected and approved by Departmental Representative.

.2 Construct granular base and sub-base to depths and grades in areas indicated.

.3 Do not place any frozen material.

.4 Place material only on clean unfrozen surface, free from snow or ice.

.5 Place granular base and sub-base materials using methods which do not lead to segregation or degradation.

.6 Place material to full width in uniform layers not exceeding 150 mm compacted thickness. Departmental Representative may authorize thicker lifts if specified compaction can be achieved.

.7 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.

.8 Remove and replace portion of layer in which material has become segregated during spreading.

3.2 COMPACTION

.1 Compaction equipment to be capable of obtaining required material densities.

.2 Compact granular sub-base to density of not less than 98% corrected maximum dry density in accordance with ASTM D1557.

.3 Compact granular base to density of not less than 100% corrected maximum dry density in accordance with ASTM D1557.

.4 Shape and roll alternately to obtain smooth, even and uniformly compacted material.

.5 Apply water as necessary during compaction to obtain specified density.

.6 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Departmental Representative.

.7 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.3 PLACEMENT TESTING

.1 Provide material testing to minimum limits as follows:

Material	Compaction Test Frequency	Moisture Content Test Frequency
Type 1	1 per 10m³ placed	1 per 30m³ placed
Type 2	1 per 10m³ placed	1 per 40m³ placed

3.4 SITE TOLERANCES

.1 Finished base and sub-base surfaces to be within 10mm of elevations as indicated but not uniformly high or low.

3.5 PROTECTION

.1 Maintain finished base and sub-base in condition conforming to this section until respective succeeding materials are constructed.

3.6 SCHEDULING WORK

.1 Placement of granular base shall not commence until heavy civil works, building construction and other large vehicle/heavy traffic activities have been completed. Minimize contamination of granular materials.

.2 Do not use any portion of the granular base for temporary access during construction. Provide granular materials as required for such temporary access at no additional cost to the Contract.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

.1 This method covers measurement of loss of Marshall Stability resulting from action of water on compacted asphalt paving mixtures containing penetration grade asphalt cement.

.2 Numerical index of retained stability is obtained by comparing stability of specimens determined in accordance with usual Marshall procedures with stability of specimens that have been immersed in water for prescribed period.

1.2 RELATED SECTIONS

.1 Asphalt Paving: Section 32 12 16

1.3 REFERENCES

.1 American Association of State Highway and Transportation Officials (AASTHO)
.1 AASHTO T245-2013, Standard Method of Test for Resistance to Plastic flow of Bituminous Mixtures Using Marshall Apparatus.

PART 2 - PRODUCTS

2.1 EQUIPMENT

.1 One (1) or more water baths with automatic controls for immersing specimens. Baths normally used for Marshall test are suitable for test.

.2 Scale and water bath with suitable accessory equipment for weighing test specimens in air and in water to determine their densities.

.3 Flat transfer plates of glass or metal. Keep one plate under each specimen during immersion period and during subsequent handling, except when weighing and testing, to prevent breakage or distortion of specimens.

.4 Apparatus required to conduct Marshall test.

PART 3 - EXECUTION

3.1 PREPARATION OF TEST SPECIMENS

.1 Prepare at least eight (8) specimens for each test in accordance with AASHTO T245, except where specified otherwise.

3.2 TEST PROCEDURE

.1 Do Marshall testing in accordance with AASHTO T245.

.2 Weigh each specimen in air and in water. Weigh in water as rapidly as possible to minimize absorption.

.3 Calculate specific gravity of each specimen as follows:
- .1 Specific Gravity = A / (A-B)
- .2 Where A = weight of specimen in air in grams
- .3 B = weight of specimen in water in grams

.4 Sort each set of 8 specimens into 2 groups of 4 specimens each so that average specific gravity of specimens in group one (1) is essentially same as that of group two (2).

.5 Test group one (1) specimens for Marshall stability. Calculate S1 = Marshall stability of group one (1) (average).

.6 Immerse group two (2) specimens in water for 24 h at 60°C, then test immediately for Marshall stability. Calculate S2 = Marshall stability of group two (2) (average).

3.3 TEST FREQUENCY

.1 Provide one (1) test for each respective B-HF and C-HF mix design sample.

3.4 TEST REPORT

.1 Report test results to Departmental Representative.

.2 Report numerical index of retained stability as resistance of asphaltic paving mixtures to detrimental effect of water, expressed as percentage of original stability retained after immersion period.

.3 Calculate index as follows:
- .1 Index of Retained Stability = S2/S1 x 100.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED WORK

.1 Excavating, Trenching and Backfilling: Section 31 23 10

.2 Granular Materials: Section 32 11 00

1.2 REFERENCES

.1 Nova Scotia Department of Transportation and Infrastructure Renewal, Standard Specification.

.2 AASHTO T166-2013, Standard Method of Test for Bulk Specific Gravity (Gmb) of Compacted Hot Mix Asphalt (HMA) Using Saturated Surface-Dry Speciments.

.3 ASTM D2172-2011, Standard Test Methods for Quantitative Extraction of Bitumen from Bituminous Paving Mixtures.

.4 ASTM D2489-2008, Standard Practice for Estimating Degree of Particle Coating of Bituminous-Aggregate Mixtures.

.5 ASTM D3203-2011, Standard Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures.

1.3 SAMPLES

.1 At least three (3) weeks prior to commencing work, inform Departmental Representative of proposed source of aggregates, liquid asphalt and asphalt cement and provide access for sampling.

.2 Preliminary approval of any sample or samples of any material does not constitute a final approval of the material or its source of supply.

.3 All materials to be incorporated into the work will be continuously and regularly sampled and tested in the field and in the laboratory and comply with the requirements of the material specification.

1.4 MATERIAL CERTIFICATION

.1 At least three (3) weeks prior to commencing work, submit viscosity-temperature chart for asphalt cement to be supplied showing either Saybolt Furol viscosity in seconds or Kinematic Viscosity in centistokes, temperature range 105 to 175°C.

.2 Submit manufacturer's test data and certification that asphalt cement meets requirements of this section.

1.5 MIX DESIGNS

.1 Submit mix designs for asphalt Type B-HF and Type C-HF to Departmental Representative for record.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Asphalt material: hot mixed, hot-laid combination of mineral aggregates, uniformly coated and mixed with an asphaltic binder in a suitable mixing plant. Asphalt materials and aggregates shall meet the requirements of Division 4, Section 4 of the Nova Scotia Department of Transportation and Infrastructure Renewal Specification.

.2 Composition of asphalt mixture: to grading and asphalt content requirements in Table 4.4.1-Physical Requirements of Asphalt Concrete of the Nova Scotia Department of Infrastructure Renewal Specification, Type B-HF and Type C-HF mix. Minimum Marshall Stability to be 7.5 kN @ 60°C formulated for truck route traffic.

.3 Liquid asphalt primer: to requirements in Table 4.5.1 of the Nova Scotia Department of Transportation and Infrastructure Renewal Specification.

.4 Liquid asphalt tack coat: to same requirements as liquid asphalt primer.

PART 3 - EXECUTION

3.1 EQUIPMENT

.1 Pavers: mechanical self-powered pavers capable of spreading mix within specified tolerances, true to line, grade and crown indicated.

.2 Rollers: sufficient number of rollers of type and weight to obtain specified density of compacted mix.

.3 Haul trucks: of adequate size, speed and condition to ensure orderly and continuous operation and as follows:

.1 Boxes with tight metal bottoms.

.2 Covers of sufficient size and weight to completely cover and protect asphalt mix when truck fully loaded.

.3 In cool weather or for long hauls, insulate entire contact area of each truck box.

3.2 PREPARATION

.1 Make vertical saw cut to full depth of asphalt concrete in straight lines. Cut back 300 mm minimum from edge of excavation or beyond to eliminate tension cracks.

.2 Remove additional existing asphalt in locations where longitudinal strips less than 1 m wide and/or asphalt "islands" less than 10 m2 in size occur after saw cutting and replace with new asphalt.

.3 Cold mill an additional 300 mm wide by 40 mm deep longitudinal strip along all saw cut joints to facilitate an overlap joint in the surface asphalt.

.4 Place or remove gravel to depth indicated.

.5 Shape, fine grade and compact gravel surface to 100 percent standard proctor density.

3.3 PLACING

.1 Obtain Departmental Representative's approval of granular base and preparation prior to placing asphalt.

.2 Before placing asphalt, clean surface of loose and foreign material. Apply liquid asphalt primer to Nova Scotia Department of Transportation and Infrastructure Renewal specifications. Application rate: 1.0 l/m².

.3 Apply liquid asphalt tack coat to Nova Scotia Department of Transportation and Infrastructure Renewal Standard Specification between Class B-HF binder and Class C-HF surface courses, and as primer at all cold joints. Application rate: 0.5 l/m².

.4 Place asphalt concrete in compacted lifts to thicknesses, grades and lines as indicated or as directed by Departmental Representative.

.5 Place catch basin and manhole covers, and water distribution system fittings into final position prior to placement of Type C-HF asphalt.

.6 Placing conditions:
.1 Place asphalt mixtures only when air temperature is above 5°C.
.2 When temperature of surface on which material is to be placed falls below 10°C, provide extra rollers as necessary to obtain required compaction before cooling.
.3 When the air temperature is 5°C, or less, or after the 31st of October, the Contractor will not be permitted to lay any asphalt pavement, unless otherwise directed by the Departmental Representative.
.4 Do not place hot-mix asphalt when pools of standing water exist on surface to be paved, during rain, or when surface is damp.

.7 Place, roll and compact asphalt concrete in accordance with Division 4, Section 4, Province of Nova Scotia, Department of Transportation and Infrastructure Renewal, Standard Specification.

.8 Rake all joints.

.9 The minimum density acceptable shall be 95% of the theoretical Maximum Relative Density determined according to ASTM D3203.

3.4 ASPHALT TESTING

.1 Provide testing of placed asphalt in accordance with the following frequency table:

Test	Standard	Frequency (Type B-HF asphalt)	Frequency (Type C-HF asphalt)
Bulk Specific Gravity	AASHTO T166	50 tonnes	25 tonnes
Bitumen Content	ASTM D2172	200 tonnes	100 tonnes
Aggregate Coating	ASTM D2489	200 tonnes	100 tonnes
Air Voids	ASTM D3203	200 tonnes	75 tonnes

3.5 DIS-SIMILAR JOINTS

.1 Apply 2mm x 50mm TOK tape against faces of surfaces to be asphalted against.

3.6 ASPHALT PATCHING

.1 Remove existing asphalt by saw cutting in straight lines and removing cut asphalt with suitable excavating equipment to full depth of asphalt.

.2 Provide tack coat on edges of saw cut.

.3 Reinstate asphalt to full depth of existing asphalt using mix type C-HF asphalt concrete.

.4 Dispose of excavated asphalt at approved disposal site.

3.7 FINISH TOLERANCES - GENERAL

.1 Finished asphalt surface to be within 6 mm of design elevation but not uniformly high or low.

.2 Finished asphalt surface not to have irregularities exceeding 6 mm when checked with a 3 m straight edge placed in any direction.

3.8 FINISH TOLERANCES

.1 Finished asphalt to meet requirements of 3.3.

.2 Maximum slope tolerances for operational safety:
.1 0.5% +/- 0.1%, any area measured using 5m straight edge.

.3 No ponding of rainwater exceeding 0.20m² surface area is to be observed within boundary of paved areas.

3.9 PROTECTION

.1 Restrict traffic during setting period to prevent damage as directed by the Departmental Representative.

3.10 DEFECTIVE WORK

.1 Correct irregularities which develop before completion of rolling by loosening surface mix and removing or adding material as required. If irregularities or defects remain after final compaction, remove surface course promptly and lay new material to form a true and even surface and compact immediately to specified density.

.2 Repair areas showing checking or rippling.

.3 Adjust roller operation and screed settings on paver to prevent further defects such as rippling and checking of pavement.

.4 If, at any time before the Work is finally accepted, any ravelling, shoving or other fault develops in the pavement as laid, remove all mixed materials in such places, cut edges of joints square and paint with tack coat. Place fresh asphalt mixture and compact. Do all such removal and replacement of unsatisfactory material at no additional expense to the Contract.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED WORK

.1	Section 03 30 00	Cast-In-Place Concrete
.2	Section 32 11 16	Granular Base and Sub-Base Materials
.3	Section 31 23 33	Excavating, Trenching and Backfilling:

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Concrete mixes and materials: use concrete mix designed to produce 35MPa compressive cylinder strengths at 28 days. Concrete to have 19 mm maximum size coarse aggregate, maximum water/cement ratio of 0.45 and 75 mm maximum slump at the time and point of deposit. The minimum cement content shall be 340 kg/m³.

.2 Joint filler and Curing Compound: to Section 03 35 00 – Concrete Finishing.

.3 Granular base: Type 1, see detail.

.4 Non-staining mineral type form release agent: chemically active release agents containing compounds that react with free lime to provide water soluble soap. Nox-crete, Rickform, CPD Acrylic Cure or approved equal. Ordinary oils will not be permitted.

.5 Curing Compounds: Sealtight CS-309 curing and sealing compound and Sealtight HIAC acrylic concrete sealer, CPD Acrylic Seal or approved equal.

PART 3 - EXECUTION

3.1 MOCK-UP

.1 Pour sample panel 1000 mm x 1000 mm x 150 mm for approval by Departmental Representative. Do not pour any pads until cured mock-up has been deemed acceptable.

3.2 GRADE PREPARATION

.1 Place fill in maximum 150 mm layers and compact to at least 95% of Modified Proctor density.

3.3 GRANULAR BASE

.1 Obtain Departmental Representative's approval of subgrade before placing granular base.

.2 Place granular base material to lines, widths, and depths as indicated.

.3 Compact granular base to at least 95% of Modified Proctor Density.

3.4 CONCRETE

.1 Obtain Departmental Representative's approval of granular base prior to placing concrete.

.2 Do concrete work in accordance with Section 03 30 00 – Cast-in-Place Concrete and as specified herein.

.3 Round perimeter edges.

.4 Immediately after floating, give concrete surface uniform broom finish to produce regular corrugations not exceeding 2 mm deep, by drawing broom in direction indicated.

3.5 TOLERANCES

.1 Finish surfaces to within 3 mm in 3000 mm as measured with straightedge placed on surface.

3.6 EXPANSION AND CONTRACTION JOINTS

.1 Install saw cut contraction joints after concrete has curved, as indicated.

.2 Discoloration of concrete will not be permitted. Any repairs may be made by using concrete grout from the same concrete mix while concrete is still plastic and the finish shall match that of the adjoining concrete section.

3.7 CURING

.1 Cure concrete by adding moisture to exposed finished surfaces for at least 1 day after placing, or sealing moisture in by curing compound approved by Departmental Representative.

.2 Where burlap is used for moist curing, place two pre-wetted layers on concrete surface and keep continuously wet during curing period.

.3 Apply curing compound evenly to form continuous film. Follow manufacturer's instructions. Two applications, the second shall be applied in a perpendicular direction to the first application.

3.8 BACKFILL

.1 Allow concrete to cure for 7 days prior to backfilling.

.2 Backfill to designated elevations with material approved by Departmental Representative. Compact and shape to required contours as indicated or as directed by Departmental Representative.

3.9 FINISHING

.1 Before the set has completed, the plastic concrete will be worked to a smooth finish using a wooden float. The finished surface (i.e. the exposed surfaces) will be broom finished.

.2 Finish exposed surfaces to a smooth uniform finish, free from open texturing and exposed aggregate. Do not work more mortar to surface than required and do not use neat cement as a drier to facilitate finishing.

.3 Finish surfaces to within 6 mm in 3000 mm from line, level or grade as measured with a straight edge placed on surface. Where not indicated provide minimum 1.0% cross-slope in sidewalk surfaces.

.4 Round perimeter edges with 12 mm radius edging tool where not butting against a concrete paver surface. Maintain square edge for adjoining pavers.

.5 Only apply treatment when air temperature above 10º C. Apply second coat only when previous coat has thoroughly dried.

.6 Install saw cuts, contraction joints after concrete has cured, as directed or indicated.

3.10 PROTECTION

.1 Concrete shall be protected from all elements, including vandalism until completion of the contract. Concrete damage before final acceptance of the work shall be removed and replaced by the Contractor at no extra cost to the Departmental Representative.

.2 The replacement of full section, i.e. from joint to joint shall be required and construction joint will be provided at either end of the replaced section.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 32 12 16.02 – Asphalt Paving for Building Site.

1.2 REFERENCES

.1 Canada Green Building Council (CaGBC)
- .1 LEED Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations (including Addendum 2007).

.2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-1.5-99, Low Flash Petroleum Spirits Thinner.
- .2 CAN/CGSB 1.74-01, Alkyde Traffic Paint.

.3 Green Seal Environmental Standards (GS)
- .1 GS-11-2008, 2nd Edition, Paints and Coatings.

.4 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
- .1 Material Safety Data Sheets (MSDS).

.5 The Master Painters Institute (MPI)
- .1 Architectural Painting Specification Manual - current edition.

.6 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
- .1 SCAQMD Rule 1113-A2007, Architectural Coatings.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 – Submittal Procedures.

.2 Product Data:
- .1 Submit manufacturer's printed product literature and data sheets for pavement markings and include product characteristics, performance criteria, physical size, finish and limitations. Submit two copies of WHMIS MSDS.

1.4 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00 – Closeout Procedures.

.2 Operations and Maintenance Data: submit information on materials relative to work of this Section for inclusion in operations and maintenance manual.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Division 1 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 off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Replace defective or damaged materials with new.

.4 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, and packaging materials as specified in accordance with Division 1.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Paint:
- .1 To MPI -EXT 2.1B, Alkyd zone/traffic marking.
- .2 Paints: in accordance with MPI recommendation for surface conditions.
  - .1 Paints: maximum VOC limit 100 g/L to SCAQMD Rule 1113 to GS-11.
- .3 Colour: to MPI listed, yellow (no parking/warning) white (stalls) and blue (H/C symbol).
- .4 Upon request, Departmental Representative will supply qualified product list of paints applicable to work. Qualified paints may be used but Departmental Representative reserves right to perform further tests.

.2 Thinner: to MPI listed manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates and surfaces to receive pavement markings previously installed under other Sections or Contracts are acceptable for product installation in accordance with MPI instructions prior to pavement markings installation.
- .1 Visually inspect substrate in presence of Departmental Representative.

.2 Pavement surface: dry, free from water, frost, ice, dust, oil, grease and other deleterious materials.

.3 Proceed with Work only after unacceptable conditions have been rectified.

3.2 EQUIPMENT REQUIREMENTS

.1 Paint applicator: approved pressure type mobile with positive shut-off distributor capable of applying paint in single, double and dashed lines and capable of applying marking components uniformly, at rates specified, and to dimensions as indicated.

.2 Distributor: capable of applying reflective glass beads as overlay on freshly applied paint.

3.3 TRAFFIC CONTROL

.1 Keep traffic away from areas to be painted until paint has cured.

3.4 APPLICATION

.1 Pavement markings: Departmental Representative lay out pavement markings.

.2 Unless otherwise approved by Departmental Representative, apply paint only when air temperature is above 10 degrees C, wind speed is less than 60 km/h and no rain is forecast within next 4 hours.

.3 Apply traffic paint evenly at rate of 3 m^2/L.

.4 Do not thin paint unless approved by Departmental Representative.

.5 Symbols and letters to dimensions indicated.

.6 Paint lines: of uniform colour and density with sharp edges.

.7 Thoroughly clean distributor tank before refilling with paint of different colour.

.8 Apply glass beads at rate of 0.5 kg/l of painted area immediately after application of paint.

3.5 TOLERANCE

.1 Paint markings: within plus or minus 12 mm of dimensions indicated.
.2 Remove incorrect markings as directed by Departmental Representative.

3.6 CLEANING

.1 Progress Cleaning: clean in accordance with Division 1.
  .1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Division 1.
.3 Waste Management: separate waste materials for reuse and recycling in accordance with Division 1.
  .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.7 PROTECTION OF COMPLETED WORK

.1 Protect pavement markings until dry.

.2 Repair damage to adjacent materials caused by pavement marking application.

END OF SECTION

PART1 - GENERAL

1.1 GENERAL

.1 Comply with requirements of Division 1.

1.2 RELATED SECTIONS

.1 N/A.

1.3 SUBMITTALS

.1 Submit product data in accordance with Division 1.

.2 Submit shop drawings in accordance with Division 1.

.3 Indicate dimensions, sizes, assembly, anchorage and installation details for each furnishing specified.

.4 Provide maintenance data for care and cleaning of site furnishings for incorporation into manual specified in Division 1.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Division 1.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

.4 Separate for reuse and recycling and place in designated containers Steel, Metal, Plastic and waste in accordance with Waste Management Plan.

.5 Fold up metal banding, flatten and place in designated area for recycling.

PART 2 - PRODUCTS

2.1 BENCH

.1 Model: 117-60 Steel Bench, as manufactured by DuMor Inc., 1-800-598-4018. Or approved equal.

- .1 11 and 13 Gauge steel tubing
- .1 Size: 50 mm (2 inch) O.D. schedule 40 steel pipe
- .2 Finish: All steel members coated with zinc rich expoxy, then finished with polyester powder coating.
- .3 Mounting: surface mount (S-2) as per manufacturer hardware package.
- .4 Quantity: One (1).
- .5 Colour: Deep Red

2.2 BICYCLE RACK

.1 Model: 125-30, as manufactured by DuMor Inc., 1-800-598-4018, or approved equal.
- .1 Size: 73.02 mm (2-7/8 inches) O.D. schedule 40 steel pipe
- .2 Finish: Polyester powder coating over steel tubing.
- .3 Mounting: surface mount as per manufacturer hardware package.
- .4 Quantity: One (1).
- .5 Colour: Deep Red.

2.3 BOLLARD SLEEVES

.1 R-7101 Plastic (HDPE) Sleeve, available through Reliant Foundry,Unit 207, 6450-148th Street, Surrey, British Columbia, Canada V3S-7G7. Toll-Free: 1-888-735-5680 or approved equal.
- .1 Install over concrete filled 114 mm dia. steel bollards as detailed.
- .2 Quantity: (10) Ten.
- .3 Colour: Yellow with red striping.

PART 3 - EXECUTION

3.1 INSTALLATION

.1 Assemble furnishings in accordance with manufacturer's instructions.

.2 Install furnishing true, plumb, anchored as per manufacturer’s directions and as located in plans

.3 Touch-up damaged finishes to approval of Departmental Representative.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 31 22 13 - Rough Grading

1.2 TESTING PROCEDURES

.1 Testing of topsoil: Departmental Representative will pay for cost of tests as specified in Section 01 45 00 – Testing and Quality Control.

1.3 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.

.3 U.S. Environmental Protection Agency (EPA)/Office of Water
1. EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.4 DEFINITIONS

.1 Compost:
1. Mixture of soil and decomposing organic matter used as fertilizer, mulch, or soil conditioner.
2. Compost is processed organic matter containing 40% or more organic matter as determined by Walkley-Black or Loss On Ignition (LOI) test.
3. Product must be sufficiently decomposed (i.e. stable) so that any further decomposition does not adversely affect plant growth (C:N ratio below 25, and contain no toxic or growth inhibiting contaminates.
4. Composed bio-solids to: CCME Guidelines for Compost Quality, Category (A) (B).

1.5 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Quality control submittals:
1. Soil testing: submit certified test reports showing compliance with specified performance characteristics and physical properties as described in PART 2 - SOURCE QUALITY CONTROL.
2. Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.6 QUALITY ASSURANCE

.1 Perform Work in accordance with the projects Erosion and Sedimentation Control Plan as specified at Section 01 57 14.

.2 Pre-installation meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements in accordance with Division 1.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Division 1.

.2 Divert unused soil amendments from landfill to official hazardous material collections site approved by Departmental Representative.

.3 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 Existing Topsoil: if available, to be used on all areas **in amended form**, salvaged topsoil to meet following criteria:

1. 50% sand maximum and 3 to 10% organic content.
2. Fertility: major soil nutrients present in following ratios:
   - .1 Nitrogen (N): 20 to 40 micrograms of available N per gram of topsoil.
   - .2 Natural 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 – 7.5
4. Contain no toxic elements or growth inhibiting materials.
5. Free from:
   - .1 Debris and stones over 10 mm diameter.
   - .2 Coarse vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.
6. Consistence: friable when moist.
7. Double screen salvaged topsoil to remove all stones over 10 mm diameter.

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. Natural Phosphate products (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: 5.5 to 7.5.

.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 course 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 Limestone:
1. Ground agricultural limestone.
2. Gradation requirements: percentage passing by weight, 90% passing 1.0 mm sieve, 50% passing 0.125 mm sieve.

.6 Fertilizer: industry accepted “phosphate free” 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 existing topsoil and to supply topsoil as specified.

.3 Soil testing by recognized testing facility for PH, P and K, and organic matter. Soil test to identify amendments necessary to meet requirements for topsoil as specified.

.4 Testing of topsoil will be carried out by testing laboratory designated by Departmental Representative.
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 airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction sediment and erosion control drawings sediment and erosion control plan, specific to site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.

.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 brush weeds and grasses and removed from site.

.2 Strip topsoil to depths as directed by Departmental Representative.
1. Avoid mixing topsoil with subsoil where textural quality will be moved outside acceptable range of intended application.

.3 Stockpile in locations as indicated.
1. Stockpile height not to exceed 2000-3000 mm.

.4 Disposal of unused topsoil is to be in an environmentally responsible manner but not used as landfill as directed by Departmental Representative.

.5 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 25 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 50 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 compaction to 85% Modified Proctor Density.
1. 200 mm for sodded areas.

.5 Manually spread topsoil/planting soil around trees, shrubs and obstacles.

3.5 SOIL AMENDMENTS

.1 Apply soil amendments with rules as specified and as determined by soil sample test.

3.6 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 foot printing.

3.7 ACCEPTANCE

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

3.8 SURPLUS MATERIAL

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

3.9 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 RELATED SECTIONS

.1 Section 32 91 19.13 - Topsoil Placement and Grading.

1.2 SUBMITTALS

.1 Samples.
- .1 Submit samples in accordance with Section 01 00 01 - Submittal Procedures.
- .2 Submit:
  - .1 Sod for type specified.

.2 Install approved samples in one square metre mock-ups and maintain in accordance with maintenance requirements during establishment period.
- .1 Obtain approval of samples by Departmental Representative.

1.3 QUALITY ASSURANCE

.1 Perform Work in accordance with the projects Erosion and Sedimentation Control Plan as specified at Section 01 57 14.

.2 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.3 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.4 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements.

1.4 SCHEDULING

.1 Schedule sod laying to coincide with preparation of soil surface.

.2 Schedule sod installation when frost is not present in ground.

.3 No phosphates to be used in fertilizers.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Division 1.

.2 Divert unused fertilizer from landfill to official hazardous material collections site approved by Departmental Representative.

.3 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 Number One Turf Grass Nursery Sod: sod that has been especially sown and cultivated in nursery fields as turf grass crop.

.1 Turf Grass Nursery Sod types:

.1 Number One Kentucky Bluegrass Sod - Fescue Sod: Nursery Sod grown solely from seed mixture of cultivars of Kentucky Bluegrass and Chewing Fescue or Creeping Red Fescue, containing not less than 40% Kentucky Bluegrass cultivars and 30% Chewing Fescue or Creeping Red Fescue cultivars.

.2 Number One Named Cultivars: Nursery Sod grown from certified seed.

.3 Mow sod at height directed by Departmental Representative within 36 hours prior to lifting, and remove clippings

.2 Sod establishment support:

.1 Wooden pegs: 17 mm x 8 mm x 200 mm.

.3 Water:

.1 Supplied by Contractor at designated source.

.4 Fertilizer:

.1 To Canada "Fertilizers Act" and "Fertilizers Regulations".

.2 Complete, synthetic, slow release with 65 % of nitrogen content in water-insoluble form.

2.2 SOURCE QUALITY CONTROL

.1 Obtain approval from Departmental Representative of sod at source.

.2 When proposed source of sod is approved, use no other source without written authorization from Departmental Representative.

PART 3 - EXECUTION

3.1 PREPARATION

.1 Verify that grades are correct and prepared in accordance with Section 32 91 19.13 - Topsoil Placement and Grading. If discrepancies occur, notify Departmental Representative and do not commence work until instructed by Departmental Representative.

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

.3 Fine grade surface free of humps and hollows to smooth, even grade, to contours and elevations indicated, to tolerance of plus or minus 8 mm for Turf Grass Nursery, surface to drain naturally.

.4 Remove and dispose of weeds; debris; stones 25 mm in diameter and larger; soil contaminated by oil, gasoline and other deleterious materials; off site.

3.2 SOD PLACEMENT

.1 Lay sod within 24 hours of being lifted if air temperature exceeds 20 degrees C.

.2 Lay sod sections in rows, joints staggered. Butt sections closely without overlapping or leaving gaps between sections. Cut out irregular or thin sections with sharp implements.

.3 Roll sod as directed by Departmental Representative. Provide close contact between sod and soil by light rolling. Use of heavy roller to correct irregularities in grade is not permitted.

3.3 SOD PLACEMENT ON SLOPES AND PEGGING

.1 Start laying sod at bottom of slopes.

.2 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, or as indicated, to following pattern:

.1 100 mm below top edge at 200 mm on centre 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. Adjust pattern as directed by Departmental Representative.

.4 Drive pegs to 20 mm above soil surface of sod sections.

3.4 FERTILIZING PROGRAM

.1 Fertilizer:

.1 Complete commercial synthetic fertilizer with minimum 65% insoluble nitrogen – No phosphate fertilizers to be used.

.2 Formulation ratio: 1:4:4

.3 Bonemeal: finely ground with minimum analysis of 20% phosphoric acid. Ratio for 1 year maintenance applications:

.4

Date	Rate	Ratio
May 2016	N @ 60 kg/ha	3:0:0
June2016	N @ 60 kg/ha	3:1:3
July 2016	N @ 60 kg/ha	3:1:3
Sept 2016	N @ 25 kg/ha	1:2:3
October 2016	N @ 25 kg/ha	1:1:6

Date is adjustable depending upon construction schedule. These dates should be met when work has been completed.

3.5 MAINTENANCE DURING ESTABLISHMENT PERIOD

.1 Perform following operations from time of installation until acceptance.

.2 Water sodded areas in sufficient quantities and at frequency required to maintain optimum soil moisture condition to depth of 75 mm to 100 mm.

.3 Cut grass to 70 mm when or prior to it reaching height of 90 mm. Remove clippings which will smother grassed areas as directed by Departmental Representative. Note; all areas to receive establishment mowing – future mowing in areas designated for naturalization to be done on an annual basis only as necessary e.g. detention pond, majority of site away from building, swales in no mow areas.

.4 Maintain sodded areas weed free 95%.

.5 Fertilize areas in accordance with fertilizing program. Spread half of required amount of fertilizer in one direction and remainder at right angles and water in well.

3.6 ACCEPTANCE

.1 Turf Grass Nursery Sod areas will be accepted by Departmental Representative provided that:

- .1 Sodded areas are properly established.
- .2 Sod is free of bare and dead spots.
- .3 No surface soil is visible from height of 1500 mm when grass has been cut to height of 70 mm.
- .4 Sodded areas have been cut minimum 2 times but as often as required during establishment period prior to acceptance.

.2 Areas sodded in fall will be accepted in following spring one month after start of growing season provided acceptance conditions are fulfilled.

3.7 MAINTENANCE DURING WARRANTY PERIOD

.1 Perform following operations from time of acceptance until end of warranty period:

- .1 Water sodded Turf Grass Nursery Sod areas at weekly intervals to obtain optimum soil moisture conditions to depth of 100 mm.

.2 Repair and re-sod dead or bare spots to satisfaction of Departmental Representative.

.3 Cut grass and remove clippings that will smother grass Departmental Representative to height as follows:

- .1 Turf Grass Nursery Sod:
  - .1 70 mm during normal growing conditions.
- .2 Cut grass at 2 week intervals, but at intervals so that approximately one third of growth is removed in single cut.
- .3 Fertilize areas in accordance with fertilizing program. Spread half of required amount of fertilizer in one direction and remainder at right angles and water in well.
- .4 Eliminate weeds by mechanical means to extent acceptable to Departmental Representative.

3.8 CLEANING

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

END OF SECTION