PART 1 – GENERAL

1.1 RELATED REQUIREMENTS
.1 Section 31 14 13 – Soil Stripping and Stockpiling.

1.2 REFERENCES
.1 ASTM International
.1 ASTM D6938-10, Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
.2 Ontario Provincial Standard Specifications (OPSS)
.1 OPSS 206 (November 2013) - Construction Specification For Grading.
.2 OPSS 501 (November 2014) - Construction Specification For Compacting

1.3 ACTION AND INFORMATION SUBMITTALS
.1 Submit in accordance with Section 01 33 00 – Submittal Procedures.

1.4 EXISTING CONDITIONS
.1 Examine subsurface investigation report which is available for inspection from the Departmental Representative.
.2 Known underground and surface utility lines and buried objects are as indicated on site plan.
.3 Refer to dewatering in Section 31 23 33.02 – Excavating, Trenching and Backfilling for Site Servicing.

PART 2 – PRODUCTS

2.1 MATERIALS
.1 Fill material in accordance with Section 31 23 33.02 – Excavating, Trenching and Backfilling for Site Servicing.
.2 Excavated or graded material existing on site suitable to use as fill for grading work if approved by Departmental Representative.

PART 3 – EXECUTION

3.1 EXAMINATION
.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for rough grading installation in accordance with manufacturer's written instructions.
.1 Visually inspect substrate in presence of Departmental Representative.
.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
.3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 GRADING
.1 Rough grade to levels, profiles, and contours allowing for surface treatment as indicated
.2 Rough grade to following depths below finish grades:
.1 100 mm for grassed areas.
.2 400 mm for flowerbeds.
.3 100 mm for shrub beds.
.4 See pavement structure for asphalt and gravel paving.

.3 Slope rough grade away from building as indicated on grading plans.
.4 Grade ditches to depth as indicated on grading plan.
.5 Prior to placing fill over existing ground, scarify surface to depth of 150 mm minimum before placing fill over existing ground. Maintain fill and existing surface at approximately same moisture content to facilitate bonding.
.6 Exposed roadway subgrade surface shall be heavily proof rolled with a large vibratory roller (minimum 8 tonnes). Following proof role, a 300 mm thick layer of granular base material meeting OPSS requirements for Granular A shall be placed and compacted in maximum 200 millimetre thick lifts to at least 98 percent of the standard Proctor dry density value.
.7 Do not disturb soil within branch spread of trees or shrubs to remain.

3.3 TESTING .1 Inspection and testing of soil compaction will be carried out by qualified professional at the cost of the Contractor. No measurement for payment will be made for the work of this section. All costs associated with the work of this section shall be deemed to be included in the Balance of Project.
.2 Submit testing procedure, frequency of tests to Departmental Representative for approval.

3.4 CLEANING .1 Progress Cleaning: clean in accordance with Section 01 74 11 – Cleaning.
.1 Leave Work area clean at end of each day.

3.5 PROTECTION .1 Maintain access roads to prevent accumulation of construction related debris on roads.

- END OF SECTION -

PART 1 – GENERAL

1.1 RELATED REQUIREMENTS
- .1 Section 32 11 16.01 - Granular Subbase.
- .2 Section 32 12 16.02 – Asphalt Paving for Building Sites.

1.2 MEASUREMENT PROCEDURES
- .1 [intentionally left blank]

1.3 REFERENCES
- .1 American Society for Testing and Materials (ASTM)
  - .1 ASTM C117-95, Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.
  - .2 ASTM C131-96, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
  - .3 ASTM C136-96a, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  - .4 ASTM D698-00a, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft^3) (600kN-m/m^3).
  - .5 ASTM D6938-10, Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
  - .6 ASTM D1557-00, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft^3) (2,700kN-m/m^3).
  - .7 ASTM D1883-99, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.
  - .8 ASTM D4318-00, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
  - .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.
- .3 Ontario Provincial Standard Specifications (OPSS)
  - .1 OPSS 206 (November 2013) - Construction Specification For Grading.
  - .2 OPSS 501 (November 2014) - Construction Specification For Compacting.
  - .3 OPSS 1001 (November 2013) - Material Specification For Aggregates - General.
  - .4 OPSS 1010 (November 2013) - Material Specification For Aggregates - Base, Subbase, Select Subgrade, And Backfill Material

1.4 DELIVERY, STORAGE, AND HANDLING
- .1 Deliver and stockpile aggregates as directed by Departmental Representative.

PART 2 – PRODUCTS

2.1 MATERIALS
- .1 Granular base: material in accordance with the following requirements:
  - .1 Crushed stone or gravel to OPSS Granular A specifications.
  - .2 Gradations to be within OPSS limits.

PART 3 – EXECUTION

3.1 SEQUENCE OF OPERATION

.1 Place granular base after sub-base surface is inspected and approved by Contract Administrator.

.2 Placing
- .1 Construct granular base 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 For spreading and shaping material, use spreader boxes having adjustable templates or screeds which will place material in uniform layers of required thickness.
- .5 Place material to full width in uniform layers not exceeding 150 mm compacted thickness. Departmental Representative may authorize thicker lifts (layers) if specified compaction can be achieved.
- .6 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.
- .7 Remove and replace that portion of layer in which material becomes segregated during spreading.

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

.4 Compacting
- .1 Compact to density not less than 100% maximum dry density in accordance with ASTM D698/D1557.
- .2 Shape and roll alternately to obtain smooth, even and uniformly compacted base.
- .3 Apply water as necessary during compacting to obtain specified density.
- .4 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Departmental Representative.
- .5 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.2 SITE TOLERANCES

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

3.3 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 RELATED SECTIONS
- .1 Section 32 11 16.01 - Granular Subbase.
- .2 Section 32 11 23 – Aggregated Base Courses.

1.2 MEASUREMENT PROCEDURES
- .1 [intentionally left blank]

1.3 REFERENCES
- .1 American Society for Testing and Materials International, (ASTM)
  - .1 ASTM D140-01, Standard Practice for Sampling Bituminous Materials.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-16.2-M89, Emulsified Asphalts, Anionic Type, for Road Purposes.
- .3 Ontario Provincial Standard Specifications (OPSS)
  - .1 OPSS 310 (November 2012) - CONSTRUCTION SPECIFICATION FOR HOT MIX ASPHALT.
  - .2 OPSS 1101 (November 2013) - Material Specification For Performance Graded Asphalt Cement.
  - .3 OPSS 1151 (November 2006) - Material Specification For Superpave And Stone Mastic Asphalt Mixtures.
  - .4 OPSS 1010 (November 2013) - Material Specification For Aggregates - Base, Subbase, Select Subgrade, And Backfill Material.

1.4 SUBMITTALS
- .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit asphalt concrete mix design to Departmental Representative for approval.
- .3 Materials to be tested by testing laboratory approved by Departmental Representative.
- .4 Submit test certificates showing suitability of materials at least 4 weeks prior to commencing work.
- .5 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .6 Inform Departmental Representative of proposed source of aggregates and provide access for sampling at least 4 weeks prior to commencing work.
- .7 Submit samples of following materials proposed for use at least 4 weeks prior to commencing work:
  - .1 One 5 L container of asphalt cement.
- .8 Provide access on tank truck for Departmental Representative to sample asphalt material to be incorporated into Work, in accordance with ASTM D140

PART 2 – PRODUCTS

2.1 MATERIALS
- .1 Granular base and sub-base material: to meet following requirements:
  - .1 Crushed or screened stone, gravel or sand to OPSS Granular A and B Type II specifications.
  - .2 Gradations: within OPSS limits.
- .2 Mineral filler for asphalt concrete:
  - .1 Shall be according to OPSS 1003.
- .3 Asphalt cement: performance graded asphalt cement per OPSS 1101.
- .4 Asphalt prime: to CAN/CGSB-16.1, grade RM-20 CAN/CGSB-16.2, grade SS-1.
- .5 Sand blotter: clean granular material passing 4.75 mm sieve and free from organic matter or other deleterious materials.
- .6 Asphalt tack coat: to CAN/CGSB-16.2, grade SS-1.

.7 Water: clean, potable, free from foreign matter

2.2 EQUIPEMENT

.1 Pavers: mechanical grade controlled 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 Vibratory rollers for parking lots and driveways:
- .1 Minimum drum diameter: 750 mm.
- .2 Maximum amplitude of vibration (machine setting): 0.5 mm for lifts less than 40 mm thick.

.4 Haul trucks: of sufficient number and 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.

.5 Suitable hand tools.

.6 Pressure distributor (for tack coat) to be:
- .1 Designed, equipped, maintained and operated so that asphalt material can be:
  - .1 Maintained at even temperature.
  - .2 Applied uniformly on variable widths of surface up to 5 m.
  - .3 Applied at readily determined and controlled rates from 0.2 to 5.4 L/m^2 with uniform pressure, and with an allowable variation from any specified rate not exceeding 0.1 L/m^2.
  - .4 Distributed in uniform spray without atomization at temperature required.
- .2 Equipped with meter, registering metres of travel per minute, visibly located to enable truck driver to maintain constant speed required for application at specified rate.
- .3 Equipped with pump having flow meter graduated in units of 5 L or less per minute passing through nozzles and readily visible to operator. Pump power unit to be independent of truck power unit.
- .4 Equipped with an easily read, accurate and sensitive device which registers temperature of liquid in reservoir.
- .5 Equipped with accurate volume measuring device or calibrated tank.
- .6 Equipped with nozzles of same make and dimensions, adjustable for fan width and orientation.
- .7 Equipped with nozzle spray bar, with operational height adjustment.
- .8 Cleaned if previously used with incompatible asphalt material.

2.3 MIX DESIGN

.1 MIX DESIGN TO OPSS 1151.04.02.

.2 Job mix formula to be approved by Departmental Representative.

.3 Do not change job-mix without prior approval of Departmental Representative. When change in material source proposed, new job-mix formula to be approved by Departmental Representative.

PART 3 – EXECUTION

3.1 SUBGRADE SURFACE PREPARATION AND INSPECTION

.1 Verify grades of items set in paving area for conformity with elevations and sections before placing granular base and sub-base material.

.2 Obtain approval of subgrade by Departmental Representative before placing granular sub-base and base.

3.2 GRANUAL SUB-BASE AND GRANULAR BASE

.1 Place granular base and sub-base material on clean unfrozen surface, free from snow and ice.

.2 Place granular base and sub-base to compacted thickness as indicated. Do not place Frozen material.

.3 Place in layers not exceeding 150 mm compacted thickness. Compact to density not less than 98 % maximum dry density in accordance with ASTM D 698.

.4 Finished base surface to be within 10 mm of specified grade, but not uniformly high or low.

3.3 ASPHALT PRIME

.1 Cutback asphalt:

.1 Heat asphalt prime for pumping and spraying in accordance with CAN/CGSB-16.1.

.2 Apply cutback asphalt prime to granular base, at rate directed by Departmental Representative, but do not exceed 2.2 L/m².

.3 Apply on dry surface, unless otherwise directed by Departmental Representative.

.2 Emulsified asphalt:

.1 Dilute asphalt emulsion with clean water at 1:1 ratio for application. Mix thoroughly by pumping or other method approved by Departmental Representative.

.2 Apply diluted asphalt emulsion at rate directed by Departmental Representative but do not exceed 5 L/m².

.3 Apply on damp surface unless otherwise directed by Departmental Representative.

.3 Do not apply prime when air temperature is less than 5 degrees C or when rain is forecast within 2 hours.

.4 If asphalt prime fails to set within 24 hours, spread sand blotter material in amounts required to absorb excess material. Sweep and remove excess blotter material.

3.4 ASPHALT TACK COAT

.1 Obtain Departmental Representative's approval of surface before applying asphalt tack coat .

.2 Apply asphalt tack coat only on clean and dry surface.

.3 Dilute asphalt emulsion with water at 1:1 ratio for application.

.1 Mix thoroughly by pumping or other method approved by Departmental Representative.

.4 Apply asphalt tack coat evenly to pavement surface and do not to exceed [0.7] L/m^2.

.5 Paint contact surfaces of curbs, gutters, headers, manholes and like structures with thin, uniform coat of asphalt tack coat material.

.6 Do not apply asphalt tack coat when air temperature is less than 10 degrees C or when rain is forecast within 2 hours of application.

.7 Apply asphalt tack coat only on unfrozen surface.

.8 Evenly distribute localized excessive deposits of tack coat by brooming as directed by Departmental Representative.

.9 Where traffic is to be maintained, treat no more than one half of width of surface in one application.

.10 Keep traffic off tacked areas until asphalt tack coat has set.

.11 Re-tack contaminated or disturbed areas as directed by Departmental Representative.

.12 Permit asphalt tack coat to set before placing asphalt pavement

3.5 PLANT AND MIXING REQUIREMENTS

.1 In accordance with ASTM D 995.

3.6 ASPHALT CONCRETE PAVING

.1 Obtain approval from Departmental Representative before placing asphalt mix.
.2 Place asphalt mix only when base or previous course is dry and air temperature is above 7 degrees C.
.3 Place asphalt concrete in compacted layers not exceeding 50 mm (one lift).
.4 Compact each course with roller as soon as it can support roller weight without undue cracking or displacement.
.5 Compact parking lot and driveway asphalt concrete to required density. Roll until roller marks are eliminated.
.6 Keep roller speed slow enough to avoid mix displacement and do not stop roller on fresh pavement.
.7 Moisten roller wheels with water to prevent pick up of material.
.8 Compact mix with hot tampers or other equipment approved by Departmental Representative, in areas inaccessible to roller.
.9 Finish surface to be within 10 mm of design elevation and with no irregularities greater than 10 mm in 4.5 m.
.10 Repair areas showing checking, rippling or segregation as directed by Departmental Representative.

3.7. TESTING

.1 Inspection and testing of soil compaction will be carried out by qualified professional at the cost of the Contractor.
.2 Submit testing procedure, frequency of tests to Departmental Representative for approval.

3.8 PROTECTION

.1 Keep vehicular traffic off newly paved areas until paving surface temperature has cooled below 38 degrees C. Do not permit stationary loads on pavement until 24 hours after placement.
.2 Provide access to buildings as required. Arrange paving schedule so as not to interfere with normal use of premises.

- END OF SECTION -

PART 1 – GENERAL

1.1 RELATED SECTIONS
.1 Section 32 92 23 – Sodding

1.2 MEASUREMENT PROCEDURES
.1 [intentionally left blank]

1.3 PAYMENT PROCEDURES
.1 [intentionally left blank]

1.4 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 Ontario Provincial Standard Specifications (OPSS)
  .1 OPSS 206 (November 2013) - Construction Specification For Grading.
  .2 OPSS 802 (November 2010) - Construction Specification For Topsoil.

1.5 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) (50)), and contain no toxic or growth inhibiting contaminates.
  .4 Composed bio-solids to: CCME Guidelines for Compost Quality, Category (A) (B).

1.6 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.

1.7 QUALITY ASSURANCE
.1 Pre-installation meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements.

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 Soil texture based on The Canadian System of Soil Classification, to consist of 20 to 70% sand, minimum 7% clay, and contain 2 to 10% organic matter by weight.
  .2 Contain no toxic elements or growth inhibiting materials.
  .3 Finished surface free from:

.1 Debris and stones over 50 mm diameter.
.2 Course vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.
.4 Consistence: friable when moist.

2.2 SOURCE QUALITY CONTROL
.1 Advise Departmental Representative of sources of topsoil to be utilized with sufficient lead time for testing.
.2 Contractor is responsible for amendments to supply topsoil as specified.
.3 Soil testing by recognized testing facility for PH, P and K, and organic matter.
.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 sediment and erosion control plan, specific to site, that complies with requirements of authorities having jurisdiction.
.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 PREPARATION OF EXISTING GRADE
.1 Verify that grades are correct.
.1 If discrepancies occur, notify Departmental Representative and do not commence work until instructed by Departmental Representative.
.2 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.
.3 Remove debris, roots, branches, stones in excess of 50 mm diameter and other deleterious materials.
.1 Remove soil contaminated with calcium chloride, toxic materials and petroleum materials.
.2 Remove debris which protrudes more than 75 mm above surface.
.3 Dispose of removed material off site.
.4 Cultivate entire area which is to receive topsoil to minimum depth of 100 mm.
.1 Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.

3.3 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 to following minimum depths after settlement.
.1 150 mm for seeded areas.
.2 135 mm for sodded areas.
.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.
.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.

3.5 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.

3.7 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 REQUIREMENTS
.1 Section 32 91 19.13 – Topsoil Placement and Grading.

1.2 REFERENCES
.1 Ontario Provincial Standard Specification (OPSS)
.1 OPSS 803 (November 2010) – Construction Specification for Sodding.

1.3 ADMINISTRATIVE REQUIREMENTS
.1 Scheduling
.1 Schedule Sod laying to coincide with preparation of soil surface.
.2 Schedule sod installation when frost is not present in ground.

1.4 ACTION AND INFORMATIONAL SUBMITTALS
.1 Submit in accordance with Section 01 33 00 – Submittal Procedures.

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: Nursery Sod grown solely from seed of cultivars of Kentucky Bluegrass, containing not less than 50% Kentucky Bluegrass cultivars.
.2 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 cultivar[s].
.3 Number One Named Cultivars: Nursery Sod grown from certified seed.

.2 Turf Grass Nursery Sod quality:

.1 Not more than 1 broadleaf weed and up to 1% native grasses per 40 square metres.
.2 Density of sod sufficient so that no soil is visible from height of 1500 mm when mown to height of 50 mm.
.3 Mowing height limit: 35 to 65 mm.
.4 Soil portion of sod: 6 to 15 mm in thickness.

PART 3 – EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for sod installation in accordance with manufacturer's written instructions.
- .1 Visually inspect substrate in presence of Departmental Representative.
- .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 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.

.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 existing elevations, to tolerance of plus or minus 8 mm, for Turf Grass Nursery Sod.

.4 Remove and dispose of weeds; debris; stones 50 mm in diameter and larger; soil contaminated by oil, gasoline and other deleterious materials; [off site] [in location as directed by Departmental Representative in accordance with Section 01 74 11 - Cleaning.

3.4 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 Provide close contact between sod and soil by light rolling. Use of heavy roller to correct irregularities in grade is not permitted.

3.5 SOD PLACEMENT ON SLOPES AND PEGGING

.1 Install and secure geotextile fabric in areas indicated, in accordance with manufacturer's instructions.

.2 Start laying sod at bottom of slopes.

.3 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 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.

3.6 FERTILIZING PROGRAM

.1 Fertilize during establishment and warranty periods.

3.7 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
- .1 Leave Work area clean at end of each day.
- .2 Keep pavement and area adjacent to site clean and free from mud, dirt, and debris at all times.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .1 Clean and reinstate areas affected by Work.

3.8 PROTECTION BARRIERS

.1 Protect newly sodded areas from deterioration with snow fence on rigid frame as directed by Departmental Representative.

.2 Remove protection 2 weeks after installation or after inspection as directed by Departmental Representative.

3.9 MAINTENANCE DURING ESTABLISHMENT PERIOD

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

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

.2 Cut grass to 50 mm when or prior to it reaching height of 75 mm.

.3 Maintain sodded areas weed free 95%.

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

.5 Temporary barriers or signage to be maintained where required to protect newly established sod.

3.10 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 50 mm.

.4 Sodded areas have been cut minimum 2 times prior to acceptance.

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

.4 When environmental conditions allow, all sodded areas showing shrinkage cracks shall be top-dressed and seeded with a seed mix matching the original.

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

3.9 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 resod dead or bare spots to satisfaction of Departmental Representative.

.3 Cut grass and remove clippings as directed by Departmental Representative to height as follows:

.1 Turf Grass Nursery Sod:

.1 50 mm during normal growing conditions.

.2 Commercial Grade Turf Grass Nursery Sod:

.1 60 mm during normal growing conditions.

.3 Cut grass at 2 week intervals or as directed by Departmental Representative, but at intervals so that approximately one third of growth is removed in single cut.

.4 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.

- END OF SECTION -