

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 31 05 17 - Aggregate Materials.

1.2 REFERENCES

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM C 117, Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C 131, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
 - .3 ASTM C 136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .4 ASTM D 422-63, Standard Test Method for Particle-Size Analysis of Soils.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1, Sieves, Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2, Sieves, Testing, Woven Wire, Metric.

1.3 WASTE MANAGEMENT AND DISPOSAL

- .1 Divert unused granular material from landfill to local quarry as approved by Contract Administrator.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Granular sub-base material: in accordance with Section 31 05 17 - Aggregate Materials and following requirements:
 - .1 Crushed, pit run or screened stone, gravel or sand.
 - .2 Gradations to be within limits specified when tested to ASTM C 136 and ASTM C 117. Sieve sizes to CAN/CGSB-8.2.
 - .3 Table

Sieve Designation	% Passing			
100mm	-	-	-	-
75mm	100	100	100	-
50mm	-	-	-	100
37.5mm	-	-	-	-
25mm	55-100	-	-	60-100
19mm	-	-	-	-
12.5mm	-	-	-	38-70
9.5mm	-	-	-	-
4.75mm	25-100	25-85	-	22-55
2.00mm	15-80	-	-	13-42
0.425mm	4-50	5-30	0-30	5-28
0.180mm	-	-	-	-
0.075mm	0-8	0-10	0-8	2-10

- .4 Other Properties as follows:
 - .1 Liquid Limit: to ASTM D 4318, Maximum 25.
 - .2 Plasticity Index: to ASTM D 4318, Maximum 6.
 - .3 Los Angeles degradation: to ASTM C 131. Max% Loss by mass: 40.

PART 3 - EXECUTION

3.1 PLACING

- .1 Place granular sub-base after subgrade is inspected and approved by Contract Administrator.
- .2 Construct granular sub-base to depth and grade in areas indicated.
- .3 Ensure no frozen material is placed.
- .4 Place material only on clean unfrozen surface, free from snow or ice.
- .5 Place granular 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. Contract Administrator may authorize thicker lifts (layers) 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 to density of not less than 98% corrected maximum dry density.
- .3 Shape and roll alternately to obtain smooth, even and uniformly compacted sub-base.
- .4 Apply water as necessary during compaction to obtain specified density.
- .5 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Contract Administrator.
- .6 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.3 SITE TOLERANCES

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

3.4 PROTECTION

- .1 Maintain finished sub-base in condition conforming to this section until succeeding base is constructed, or until granular sub-base is accepted by Contract Administrator.

End of Section

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 31 05 17 - Aggregate Materials.
- .2 Section 32 11 19 - Granular Sub-base.

1.2 REFERENCES

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM C 117, Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C 131, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
 - .3 ASTM C 136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .4 ASTM D 698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft³) (600kN-m/m³).
 - .5 ASTM D 4318, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

1.3 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver and stockpile aggregates in accordance with Section 31 05 17 - Aggregate Materials. Stockpile minimum 50% of total aggregate required prior to beginning operation.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Divert unused granular material from landfill to local quarry as approved by Contract Administrator.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Granular base: material in accordance with Section 31 05 17 - Aggregate Materials and following requirements:
 - .1 Crushed stone or gravel.
 - .2 Gradations to be within limits specified when tested to ASTM C 136 and ASTM C 117. Sieve sizes to CAN/CGSB-8.2.
 - .1 Gradation Method # 1 to:

Sieve Designation	% Passing		
	(1)	(2)	(3)
100mm	-	-	-
75mm	-	-	-
50mm	100	-	-
37.5mm	70-100	-	-
25.0mm	-	100	-
19.0mm	50-75	-	100
12.5mm	-	65-100	70-100
9.5mm	40-65	-	-
4.75mm	30-50	35-60	40-70
2.00mm	-	22-45	23-50
0.425mm	10-30	10-25	7-25
0.180mm	-	-	-
0.075mm	3-8	3-8	3-8

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 Place material using methods which do not lead to segregation or degradation of aggregate.
 - .5 Place material to full width in uniform layers not exceeding 150 mm compacted thickness. Contract Administrator 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.
 - .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 Contract Administrator.
 - .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 Contract Administrator.

End of Section

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 03 10 00 - Concrete Forming and Accessories.
- .2 Section 03 20 00 - Concrete Reinforcing.
- .3 Section 03 30 00 - Cast-in-Place Concrete.

1.2 REFERENCES

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM D 698, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft³) (600kN-m/m³).
- .2 Canadian Standards Association (CSA)
 - .1 CAN/CSA-A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Concrete mixes and materials: to Section 03 30 00 - Cast-in-Place Concrete.
- .2 Reinforcing steel: to Section 03 20 00 - Concrete Reinforcing.
- .3 Curing Compound: to Section 03 30 00 - Cast-in-Place Concrete.
- .4 Non-staining mineral type form release agent: chemically active release agents containing compounds that react with free lime to provide water soluble soap.
- .5 Fill material: to Section 31 23 10 - Excavating, Trenching and Backfill.
- .6 Boiled linseed oil: to CAN/CGSB-1.2.
- .7 Kerosene: to CAN/CGSB-3.3.

PART 3 - EXECUTION

3.1 GRANULAR BASE

- .1 Obtain Contract Administrator'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 maximum density to ASTM D 698.

3.2 CONCRETE

- .1 Obtain Contract Administrator's approval of granular base and reinforcing steel prior to placing concrete.
- .2 Do concrete work in accordance with Section 03 30 00 - Cast-in-Place Concrete.
- .3 Immediately after floating, give sidewalk surface uniform broom finish to produce regular corrugations not exceeding 2 mm deep, by drawing broom in direction normal to centre line.
- .4 Provide edging as indicated with 10 mm radius edging tool.
- .5 Slip-form pavers equipped with string line system for line and grade control may be used if quality of work acceptable to Contract Administrator can be demonstrated. Hand finish surfaces when directed by Contract Administrator.

3.3 TOLERANCES

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

3.4 EXPANSION AND CONTRACTION JOINTS

- .1 Install tooled transverse contraction joints after floating, when concrete is stiff, but still plastic, at intervals of 1 m.
- .2 Install expansion joints at intervals of 6 m.
- .3 When sidewalk is adjacent to curb, make joints of curb, gutters and sidewalk coincide.

3.5 ISOLATION JOINTS

- .1 Install isolation joints around manholes and catch basins and along length adjacent to concrete curbs, catch basins, buildings, or permanent structure.
- .2 Install joint filler in isolation joints in accordance with Section 03 30 00 - Cast-in-Place Concrete.
- .3 Seal isolation joints with sealant approved by Contract Administrator.

3.6 CURING

- .1 Cure concrete by adding moisture continuously in accordance with CAN/CSA-A23.1 to exposed finished surfaces for at least 1 day after placing, or sealing moisture in by curing compound approved by Contract Administrator.
- .2 Where burlap is used for moist curing, place two prewetted layers on concrete surface and keep continuously wet during curing period.
- .3 Apply curing compound evenly to form continuous film in accordance with manufacturer's requirements.

3.7 BACKFILL

- .1 Allow concrete to cure for 7 days prior to backfilling.
- .2 Backfill to designated elevations with material approved by Contract Administrator. Compact and shape to required contours as indicated or as directed by Contract Administrator.

End of Section

PART 1 - GENERAL

1.1 SECTION INCLUDES

- .1 Supply and installation of all fill and topsoil as necessary for grading, regarding and repairing damaged sodded areas.
- .2 Furnishing all labour, materials, equipment, supervision, incidentals and all other miscellaneous works required to complete the work as shown and detailed on the drawings and/or as specified herein.

1.2 SOURCE QUALITY CONTROL

- .1 Advise Project Administrator of sources of topsoil to be utilized seven days in advance of starting work.
- .2 Contractor is responsible for soil analysis and related costs, and requirements for amendments to supply topsoil as specified.
- .3 Test topsoil for clay, sand and silt, NPK, Mg, soluble salt content, PH, growth inhibitors, soil sterilants and organic matter.
 - .1 Submit 0.5 kg sample of topsoil to testing laboratory and indicate present use, intended use, type of subsoil and quality of drainage. Prepare and ship sample in accordance with provincial regulations and testing laboratory requirements.
 - .2 Submit 2 (two) copies of soil analysis and recommendations for corrections to the Project Administrator.

1.3 SCHEDULE OF WORK

- .1 Schedule finish grading to permit sodding and/or seeding operations under optimum conditions.

1.4 PROTECTION OF EXISTING FACILITIES

- .1 Protect elements surrounding the work of this section from damage or disfiguration.
- .2 Protect landscaping and other features remaining as final Work.
- .3 Protect existing structures, fences, roads, sidewalks, paving and curbs.
- .4 In the event of damage immediately replace such items or make repairs to the same, at no additional cost to the City.

1.5 DELIVERY AND STORAGE

- .1 Coordinate locations for storage of all materials with Project Administrator.
- .2 Deliver and store fertilizer in waterproof bags accompanied in writing by weight, analysis and name of manufacturer.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Topsoil
 - .1 Shall consist of a screened clay-textured or loam-textured dark topsoil, a fertile, friable material neither of heavy clay nor of very light sandy nature containing by volume, a minimum of 4% to a maximum of 25% organic matter (peat, rotted manure or composted material) and capable of sustaining vigorous plant growth.
 - .2 Ph value: 7.5 to 8.2
 - .3 Contain no toxic elements or growth inhibiting materials.
 - .4 Free from:
 - .1 Debris, roots, stones and clay lumps over 40 mm diameter.
 - .2 Course vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.
 - .3 Subsoil contamination.
 - .4 Quackgrass rhizomes, Canada Thistle roots or other noxious weeds.

- .5 Consistence: friable when moist.
- .6 Salinity rating less than 1.5mmhos/cm.
- .5 Planting mix: 4 parts topsoil with 1 part peatmoss.
- .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 coarse silica sand, medium to coarse textured.
 - .3 Limestone, if required as a result of soil analysis:
 - .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: Synthetic slow release fertilizer with and NPK analysis of 1-2-1 ratio at a rate to provide 48 kg actual Nitrogen, 96 kg actual Phosphate and 48 kg actual Potassium per hectare.

PART 3 - EXECUTION

3.1 PREPARATION OF EXISTING GRADE

- .1 Subsoil shall be fine graded and shaped so that by spreading a uniform depth of topsoil, the final elevations and contours may be achieved. Uneven areas and low spots shall be eliminated to ensure positive grade.
- .2 Verify that grades are correct. If discrepancies occur, notify Project Administrator and do not commence work until instructed by Project Administrator.
- .3 Areas which are to receive topsoil shall be cultivated to a depth of 100 mm. This cultivation shall be repeated and cross cultivated in locations where machinery or equipment has compacted the soil.
- .4 Remove surface debris, roots, vegetation, branches and stones in excess of 40 mm in diameter. Remove any 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.

3.2 SPREADING OF TOPSOIL

- .1 Subgrade shall be inspected and approved by the City prior to spreading topsoil.
- .2 Topsoil shall be evenly spread with adequate moisture, in uniform layers not exceeding 150 mm, over approved, unfrozen subgrade free of standing water, in locations where sodding or planting is indicated.
- .3 Keep topsoil 25 mm below finished grade in areas to be sodded.
- .4 Apply topsoil to the following minimum depths after settlement and 80% compaction:
 - .1 Refer to drawing details.
 - .2 150 mm for seeded and sodded areas.
 - .3 300 mm for flower beds.
 - .4 500 mm for shrub beds.
- .5 Manually spread topsoil/planting soil around trees, shrubs and obstacles.

3.3 SOIL AMENDMENTS

- .1 Any soil amendments required shall be applied to the topsoil at a rate as specified and as determined by the soil sampling. Mix any soil amendments in to the full depth of the topsoil prior to application of fertilizer.

3.4 APPLICATION OF FERTILIZER

- .1 Spread fertilizer over entire area to receive topsoil at a rate as recommended by the manufacturer or as determined by the soil testing.
- .2 Mix fertilizer thoroughly to a minimum depth of 150 mm of the topsoil

3.5 FINISH GRADING

- .1 Areas shall be leveled and graded to provide positive drainage. Leveling shall be in accordance with the contour lines, elevations, drainage direction arrows and other descriptions as shown on the drawings or specified herein.
- .2 Positive surface drainage shall be provided on all areas to be sodded by creating grade not less than 2% unless otherwise shown on the drawings.
- .3 Prepare loose friable bed by means of cultivation and subsequent raking. Roll lightly and rake wherever topsoil is too loose.
- .4 Roll topsoil with a 100 kg, 1000 mm minimum wide roller, to consolidate topsoil in areas to be sodded. Leave a smooth, uniform surface, firm against deep foot printing. Surface shall be even textured.
- .5 The site shall be kept tidy during operations and all excess material shall be disposed of off-site, to a legal dump site at no cost to the City.

3.6 ACCEPTANCE

- .1 Contract Administrator will inspect topsoil in place and determine acceptance of material, depth of topsoil and finish grading.

End of Section

PART 1 - GENERAL

1.1 SECTION INCLUDES

- .1 Supply, preparation, installation and ancillary procedures involved in the total application of sod is areas identified herein or as required to correct damage during construction activities.
- .2 Furnishing all labour, materials, preparation, equipment, supervision, incidentals and all other miscellaneous works required to complete the work as shown and detailed on the drawings and/or as specified herein.

1.2 SOURCE QUALITY CONTROL

- .1 Obtain approval from Contract Administrator of sod at source.
- .2 When proposed source of sod is approved, use no other source without written authorization.

1.3 SAMPLES

- .1 Submit one square metre of sod if requested by Contract Administrator.

1.4 DELIVERY AND STORAGE

- .1 Deliver, unload, and store sod on pallets.
- .2 Deliver sod to site within 24 hours of being lifted and lay sod within 36 hours of being lifted.
- .3 Do not deliver small, irregular, broken or discoloured pieces of sod.
- .4 During wet weather, allow sod to dry sufficiently to prevent tearing during lifting and handling.
- .5 During dry weather, protect sod from drying and water sod as necessary to ensure its vitality and prevent dropping of soil in handling. Dry sod will be rejected.

PART 2 - PRODUCTS

2.1 GENERAL

- .1 The Contractor shall be responsible for the supply, safe storage and handling of all materials set forth in this Specification. All sod supplied under this Specification shall be subject to inspection and testing by the Contract Administrator. There shall be no charge to the City for any materials taken by the Contract Administrator for inspection purposes.
- .2 Sod will be subject to tests for nitrate, phosphate, potassium, sulphate, pH, E.C. (salinity), mineral soil layer thickness and its organic matter content by a testing laboratory designated by the Contract Administrator
- .3 Tests conducted to determine the thickness of the mineral soil layer of the sod and its percent of organic matter shall be done in accordance with standard operating procedures approved by the Contract Administrator for both receiving, and analyzing sod samples.
- .4 Any sod placed on the Work Site that in the opinion of the Contract Administrator does not conform to the Specification detailed herein, shall be rejected by the Contract Administrator and replaced by and at the expense of the Contractor.

2.2 TOPSOIL

- .1 Topsoil shall be supplied in accordance with Section 32 91 21 Topsoil Placement and Grading.

2.3 TURF GRASS SOD

- .1 The Contractor shall supply turf grass sod with a mineral soil layer containing a minimum of seventy (70%) percent inorganic soil. Upon delivery or thirty (30) days following delivery, the salinity rating shall be less than 4.0 mmhos/cm on a saturated paste basis. The pH range shall be between 6.0 – 8.0. Sod supplied shall have been sown in nursery fields with Canada Certified No. 1 or Canada Certified No. 2 grass seed and mixed by percentage (%) of weight to meet the following certified seed blends or mixtures:
 - .1 Athletic grounds, sod shall contain a blend composed of:

- One hundred (100%) percent Kentucky Bluegrass (100% Class 1 cultivars as specified in Clause 2.3.3, 3 cultivars in equal proportion).
- .2 For general park areas and backyards, sod shall contain:
- .1 A blend composed of one hundred (100%) percent Kentucky Bluegrass (100% Class 1 or Class 2 cultivars as specified in Clause 2.3.3, 3 cultivars in equal proportion); or
- .2 A mixture of ninety-five (95%) percent Kentucky Bluegrass (100% Class 2 cultivars as specified in Clause 2.3.3, 3 cultivars in equal proportion) and five (5%) percent Creeping Red fescue.
- .3 Wherever Kentucky Bluegrass is specified, the proportion of the cultivars to be included in the blend shall adhere to the following:
- Class 1 Cultivars** – specified blend of Class 1 cultivars shall consist of equal proportions of any three of the following:
- | | | | | |
|-----------|------------|------------|--------------|---------------|
| Able 1 | Absolute | Allure | Award | Baron |
| Bartitia | Blacksburg | Blackstone | Caliber | Challenger |
| Chateau | Estate | Explorer | Kelly | Liberator |
| Limousine | Midnight | Misty | Northstar | NuGlade |
| Pick 151 | Pick 8 | Platini | Quantum Leap | Rambo |
| Rugby II | Serene | Shamrock | SR 2000 | Total Eclipse |
| Touchdown | Unique | VB 16015 | Wildwood | |
- Class 2 Cultivars** – specified blend of Class 2 cultivars shall consist of equal proportions of any three of the following:
- | | | | | |
|-----------|----------|---------------|-----------|------------|
| A34 | Abbey | Alpine | America | Apollo |
| Arcadia | Ascot | ASP 200 | Banff | Baronie |
| Baruzo | Bluechip | Cardiff | Champagne | Chicago |
| Classic | Compact | Conni | Coventry | Crest |
| Cynthia | Dragon | Eclipse | Fortuna | Glade |
| Goldrush | Haga | Huntsville | Impact | Indigo |
| Jefferson | Kenblue | Langara | Lipoa | Livingston |
| Marquis | Mercury | Moonlight | Nimbus | NuBlue |
| NuStar | Odyssey | Park | Pepaya | Pick 3 |
| Pick 4 | Pick 855 | Princeton 105 | Raven | Rugby |
| Seabring | Sodnet | SR 2100 | SR 2109 | Washington |
- .4 Any variations to the above referenced seed blends or mixtures shall be approved by the Contract Administrator prior to placement of sod.
- .5 Turf grass sod shall be free of disease, turf damaging insects and any grass species, strains or cultivars other than specified herein.
- .6 At the time of delivery, the turf grass sod shall:
- .1 not contain more than ten (10) broadleaf weeds per fifty (50) square metres;
- .2 have been mowed to a height of 50 mm prior to delivery and be of sufficient density that no surface soil will be visible;
- .3 have a uniform inorganic soil layer thickness of not less than 12 mm and not greater than 19 mm and shall be consistent throughout all loads delivered to the work site;
- .4 have the organic thatch layer within the sod not exceed an uncompressed thickness of 12 mm and in all cases, the final rolled and compacted topsoil/sod growing medium shall be maintained at not less than 100 mm in depth.

2.4 HERBICIDES

- .1 Herbicides shall be standard commercial products registered for sale and use in Canada under the Pest Control Products Act.

2.5 PESTICIDES

- .1 Insecticides shall be standard commercial products registered for sale and use in Canada under the Pest Control Product Act.

2.6 OTHER MATERIALS

- .1 Wire mesh: 40mm chicken wire.
- .2 Wooden pegs: 17mm x 17mm x 250mm wood or approved 250mm long steel staples

PART 3 - EXECUTION

3.1 GENERAL

- .1 The Contractor shall not commence sodding operations until the finished topsoil surface has been inspected and approved by the Contract Administrator.
- .2 The Contractor shall provide the Contract Administrator with a minimum of two working days notice for inspection of the finished topsoil surface.

3.2 SITE GRADING

- .1 Site grading will be done and paid for in accordance with Section 31 23 10 Excavating, Trenching and Backfill.

3.3 TOPSOIL AND FINISH GRADING

- .1 Preparation of the finished topsoil surface shall be completed in accordance with Section 32 91 21 Topsoil Placement and Grading.
- .2 To prevent the formation of depressions or water pockets, the Contractor shall smooth out any undulations or irregularities in the topsoil surface prior to placing the sod.

3.4 PLACEMENT OF SOD

- .1 The sod shall be placed evenly and closely packed together, leaving no open joints and no overlap on adjacent pieces of sod. Joints in adjacent rows shall be staggered. A full row of sod, not less than 450 mm in width shall be placed along the perimeter of the sodded area, parallel to planting or walkway areas.
- .2 Where big roll sod is to be placed, the Contractor shall ensure that any reinforcement netting that may be used to assist with the harvesting and/or placement of the sod roll is removed before final placement of the sod.
- .3 On embankments, sod shall be placed lengthwise across the face of the slope. On slopes of 1 vertical to 3 horizontal (18 degrees) or steeper, in every second row on the slope and at the foot of the slope, each piece of sod shall be pegged with two minimum 250 mm long wooden pegs driven into the soil layer of the sod.
- .4 For slopes of 1 vertical to 2 horizontal (26 degrees) or steeper, each piece of sod in every row shall be pegged as indicated above.
- .5 Small, broken or irregular pieces of sod will be rejected.
- .6 All visible joints, low, bare or dead spots shall be repaired to the satisfaction of the Contract Administrator prior to the commencement of the Maintenance Period described in Clause 3.6.
- .7 Sodding operations shall be completed within two working days after placing the sod. This shall be deemed to include watering, rolling, and repairing any visible joints and low, bare or dead spots within the sodded area.
- .8 Sod shall not be placed in a frozen state, or when any other conditions unfavourable to the successful transplanting of sod exist.
- .9 Edge sod to a neat 1 m diameter circular opening at the base of all trees. A full row of sod, not less than 300 mm in width, shall be placed along the perimeter of sodded areas adjacent to the edges of shrub beds.

3.5 WATERING AND ROLLING

- .1 Immediately after placement of sod, the Contractor shall water the area in sufficient quantities and frequencies required to obtain root development and sod growth. All costs to provide water for sodded areas shall be borne by the Contractor. These costs may include hydrant permit and meter rental fees.
- .2 After the sod and topsoil has dried sufficiently to prevent damage, the areas shall be rolled (the edges pounded if necessary) with a mechanical roller minimum weight of 220kg and minimum width

of 760mm to form a uniform even surface and level with adjoining existing grades, sidewalks and curbs.

- .3 Heavy rolling to correct irregularities in grade will not be permitted. Sodded areas near existing fixtures that are unable to be rolled shall be thoroughly tamped to ensure a good bond between topsoil and sod.

3.6 COMMENCEMENT OF THIRTY (30) DAY MAINTENANCE PERIOD

- .1 Immediately after the sod has been placed to the satisfaction of the Contract Administrator, the Contractor shall provide and pay for continuous maintenance of the sodded area until the criteria specified for termination of the maintenance period in Clause 3.9 has been met.
- .2 The Contract Administrator will not allow the Thirty (30) Day Maintenance Period to commence until the following requirements are met:
 - .1 The nursery sod supplied meets the seed mixture requirement specified in Clause 2.3.
 - .2 The sod is free of bare and dead spots.
 - .3 The nursery sod does not contain more than 10 broadleaf weeds per 50 square metres.
 - .4 Sodded area has been rolled to form a firm, uniform even surface.
 - .5 The sod has sufficient shoot density that no surface soil is visible within sod.
 - .6 The height of the top growth of the sod is between 50 - 60 mm.
 - .7 The sodded area is free of any visual obstructions such as leaves.
 - .8 Sodded area is free of any turf damaging insects.
- .3 Any deficient, damaged or vandalized areas shall be resodded by the Contractor within three working days after receiving notification from the Contract Administrator and the area so resodded, shall be further maintained until it meets the criteria specified in Clause 3.9.
- .4 In situations where the start of the Thirty (30) Day Maintenance Period is not granted by the Contract Administrator before the end of a growing season, the Thirty (30) Day Maintenance Period will commence on May 15 of the following year or such date as is mutually agreed upon by all parties, at which time all sodded areas must meet the requirements listed above.

3.7 MAINTENANCE OF SODDED AREA

- .1 The Contractor shall mow the turf area at regular intervals to a height of between 50 - 60 mm. Do not cut more than thirty (30%) percent of the grass height at any one mowing. Remove clippings that will smother grassed areas.
- .2 The Contractor shall water sodded areas in sufficient quantities and frequencies required to maintain sod growth. All costs to provide water for sodded areas shall be borne by the Contractor. These costs may include hydrant permit and meter rental fees.
- .3 The Contractor shall clean and remove all dead vegetation, leaves, debris and snow mold from turf areas to encourage healthy and uniform grass growth.

3.8 SPRING CLEAN UP

- .1 Where termination of the sod maintenance period has not been achieved in accordance with Clause 3.9 prior to the end of a growing season, the Contractor shall complete all operations related to the clean up of the work area in the following spring. This shall include the cleaning and removal of all dead vegetation, leaves, debris, snow mold and any sand or gravel resulting from winter sanding/deicing operations from turf areas to encourage healthy and uniform grass growth.
- .2 All costs for spring clean up operations shall be borne by the Contractor if in the previous year, the termination of the sod maintenance period, in accordance with Clause 3.9 was not achieved in that same year or where the damage was due to defective sod or maintenance not conforming to this Specification.

3.9 TERMINATION OF MAINTENANCE PERIOD

- .1 The Contract Administrator will terminate the sod maintenance period after the following criteria has been met:
 - .1 The work site is clean and the sodded area is free of any visual obstructions such as leaves.
 - .2 The sod is free of bare and dead spots and without more than 10 broadleaf weeds per 50 square metres.

- .3 Grass roots are well anchored into the underlying topsoil and the sodded area has established into a healthy, vigorously growing condition.
 - .4 Sodded areas are free of visible joints.
 - .5 The sod has sufficient shoot density that no surface soil is visible when the grass has been cut to a height of 50 – 60 mm.
 - .6 Sodded area has been cut to a height of 50 – 60 mm within two working days before the final inspection.
 - .7 Sodded area is free of any turf damaging insects.
- .2 If the sodded area does not meet the above criteria, the deficient area shall be resodded within three working days after receiving notification from the Contract Administrator and maintained by and at the expense of the Contractor in accordance with Clauses 3.6 and 3.7 herein.
 - .3 In situations where the termination of the maintenance period is not granted by the Contract Administrator before the end of a growing season, the maintenance period will commence as described in Clause 3.6.

3.10 SITE CLEAN UP

- .1 During both the placement and maintenance of sod, all sidewalks, streets, approaches, driveways and properties near the sodding operation shall be kept clean at all times by the Contractor.
- .2 Upon completion of the project, the Contractor shall immediately remove all excess material, debris and equipment from the work site.

End of Section