

1 GENERAL

1.1 Related Work

- .1 Section 02311 - Site Grading
- .2 Section 02312 - Topsoil and Finish Grading
- .3 Section 02315 - Excavating, Trenching and Backfilling.
- .4 Section 02620 - Sub-Drainage

1.2 References

- .1 American Society for Testing and Materials (ASTM)
 - .1 Current ASTM D 4491, Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
 - .2 Current ASTM D 4595, Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method.
 - .3 Current ASTM D 4716, Standard Test Method for Determining the (In-Plane) Flow Rate Per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head.
 - .4 Current ASTM D 4751, Standard Test Method for Determining Apparent Opening Size of a Geotextile.
- .2 Canadian General Standards Board (CGSB)
 - .1 Current CAN/CGSB-4.2, Textile Test Methods.
 - .2 Current CAN/CGSB-148.1, Methods of Testing Geotextiles and Geomembranes.
 - .1 No.2, Mass per Unit Area.
 - .2 No.3, Thickness of Geotextiles.
 - .3 No.7.3, Grab Tensile Test for Geotextiles.
 - .4 No.6.1, Bursting Strength of Geotextiles Under No Compressive Load.
- .3 Canadian Standards Association (CSA)
 - .1 Current CAN/CSA-G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel.
 - .2 Current CAN/CSA-G164, Hot Dip Galvanizing of Irregularly Shaped Articles.

1.3 Samples

- .1 Submit samples for City approval in advance of installation.
- .2 Submit a 1 m length sample from full roll width of geotextile material to City for approval prior to installation.
- .3 Indicate manufacturer and source of geotextile material.

1.4 Delivery and Storage

- .1 During delivery and storage, protect geotextiles from direct sunlight, ultraviolet rays, excessive heat, mud, dirt, dust, debris and rodents.

1.5 Measurement for Payment

- .1 Geotextiles will be paid as part of the applicable surfacing, including but not limited to drainage, rock work, planting, granular bases and subbases

and wall installations. Refer to applicable specification sections for inclusion of this item into the measurement for payment.

- 1.6 Waste Management and Disposal
 - .1 Separate and recycle waste materials.

2 PRODUCTS

- 2.1 Materials
 - .1 Geotextile materials to conform to applicable detail:

SILT FENCING TILE DRAIN

- .2 Geotextile: woven or non-woven synthetic fibre fabric, supplied in rolls.
- .3 Generic specifications including physical properties, roll width, roll length, thickness, tensile strength, mass, bursting strength and hydraulic properties as per approved manufacturer's specifications.
- .4 Securing pins and washers or seams: in accordance with manufacturer's recommendations.
- .5 Thread for sewn seams: equal or better resistance to chemical and biological degradation than geotextile.

3 EXECUTION

3.1 Installation

- .1 Place geotextile material by unrolling onto graded surface in orientation, manner and locations indicated.
- .2 Place geotextile material smooth and free of tension stress, folds, wrinkles and creases.
- .3 Place geotextile material on sloping surfaces in one continuous length from toe of slope to upper extent of geotextile.
- .4 Overlap each successive strip of geotextile 450 mm over previously laid strip.
- .5 Join successive strips of geotextile as recommended by approved manufacturer.
- .6 Protect installed geotextile material from displacement, damage or deterioration before, during and after placement of material layers.
- .7 After installation, cover with overlying layer within 4 hours of placement.
- .8 Replace damaged or deteriorated geotextile to approval of the City.

3.2 Protection

- .1 No vehicles permitted directly on geotextile.

END OF SECTION

PART 1 GENERAL

1.1 General

- .1 All existing features, weeds, shrubs, trees, roots, and stumps shall be cleared and grubbed as shown on the Drawings.
- .2 Contractor to install and maintain Terrafix Terrafence sediment control filter fabric fence (or approved equivalent), as illustrated in the drawings. Contractor to remove fence following project completion.

1.2 Scope of Work

- .1 Furnish all labor, materials, equipment and related items required to complete the work indicated on the Drawings and/or as specified in the Specifications. The items of work, shall include, but not be limited to:
 - .1 Removal, disposal or transplant of trees and other materials;
 - .2 Install and maintain appropriate erosion control and protection fencing.
 - .3 Install and maintain tree protection fencing.
 - .4 Install and maintain construction fencing.
 - .4 Pulverizing (Rotodarium or equivalent) of existing sodded/vegetated areas.

1.3 Related Work

- .1 Related work in other sections of these Specifications include but is not limited to:
 - .1 Topsoil & Finish Grading
 - .2 Poured in Place Concrete Paving
 - .3 Asphalt Paving
 - .4 Site Specialites
 - .5 Sodding

1.4 Utilities

- .1 The contractor is responsible to confirm location of all utilities prior to the commencement of work. If unexpected conditions arise, stop work and immediately notify the landscape architect.

1.5 Measure for Payment

- .1 Payment will be made as per the Form of Tender line items identified. Payment includes removal and disposal of materials.

PART 2 PRODUCTS

2.1 Products and Equipment

- .1 Sediment control fencing to be Terrafix Terrafence, or approved equivalent.
- .2 Construction fencing to be Moduloc or approved equivalent.
- .3 Tree protection fencing and signage as per the details.

PART 3 EXECUTION

3.1 Weed and Grass Removal

- .1 Existing turf as illustrated on the plans to be pulverized in place (Rotodarium or equivalent.)
- .3 No herbicides are to be used.

3.2 Clearing and Grubbing

- .1 Remove all imperishable debris that would be unsuitable for bearing including, but not limited to rocks, concrete pipe, residential waste and existing construction.

3.4 Protection

- .1 Protect benchmarks, iron bars and other reference points, and existing work from damage or displacement. If disturbed or destroyed, replace at Contractor's expense. Any benchmarks or survey control points that are disturbed by the work shall be re-surveyed by a Licensed Ontario Land Surveyor. Said benchmark or control point shall be restored by said Licensed Ontario Land Surveyor in accordance with professional standards of practice.
- .2 Construction access is to be off of Bowden Drive. Contractor to repair and restore any damage to silt fence, curbs, sidewalk or sod upon completion of project.

3.5 Protection Fencing

- .1 Contractor to install sediment control fence and replace as required. Erect Terrafix Terrafence (or approved equivalent) as illustrated on drawing.
- .2 Sediment control fence to be erected and maintained for the full duration of construction, inspected after every major rain event, and inspected, at a minimum, once every three weeks. Refer to detail on drawing.
- .3 Install and maintain construction fencing for the duration of construction, Moduloc or approved equivalent, as illustrated. Construction fencing surrounding play area to be installed once play equipment is installed until a successful CSA audit (by others) is achieved.
- .4 Install and maintain tree protection fencing as per plan details.

3.7 Disposal

- .1 Remove and dispose of all materials off site unless otherwise noted on the

- .2 Drawings.
No on-site burning will be permitted.

1 GENERAL

1.1 Related Sections

- .1 Section 02315 - Excavation, Trenching and Backfilling.

1.2 Measurement for Payment

- .1 Site grading will be paid in lump sum based on the estimated volumes listed.

1.3 References

- .1 American Society for Testing and Materials (ASTM)
 - .1 Current ASTM D698, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m³).

1.4 Existing Conditions

- .1 Verify underground and surface utility lines and buried objects that are indicated on drawings.

1.5 Protection

- .1 Protect existing fencing, trees, landscaping, natural features, bench marks, buildings, pavement, surface or underground utility lines which are to remain as indicated on drawings. If damaged, restore to original or better condition.
- .2 Protect newly graded and filled areas from washouts and settlement caused by rain and water drainage. Correct any damage as necessary.
- .3 Maintain access roads to prevent accumulation of construction related debris on roads.
- .4 Place filter fabric over catch basins and manholes to prevent clogging with sediment during the rough and fine grading operations.

2 PRODUCTS

2.1 Materials

- .1 Excavated or graded material existing on site may be suitable to use as fill for grading work with the approval of the Owner.
- .2 Fill material : Type in accordance with Section 02315 - Excavating, Trenching and Backfilling.

- .3 Silt Fencing in accordance with Section 02100 – Site Preparation.

3 EXECUTION

3.1 Stripping of Topsoil

- .1 Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected as determined by the Owner.
- .2 Commence topsoil stripping of areas as indicated on drawings after site has been cleared and temporary silt protection fencing has been properly installed.
- .3 Strip topsoil to depths noted on the drawings.
- .4 Do not mix topsoil with subsoil.
- .5 Stockpile on site.

3.2 Rough Grading

- .1 Rough grade to levels, profiles, and contours allowing for surface treatment as indicated on drawings.
- .2 Rough grade to specific depths below finish grades as per applicable details.
- .3 Grading shall be completed with a Laser Grading System or GPS based system.
- .4 Place fill material in maximum 250mm lifts.
- .5 Slope rough grade away from buildings.
- .6 Grade slopes for landscape areas to a maximum of 3:1 unless otherwise specified on drawings.
- .7 Grade ditches and swales to depths indicated on drawings. Ensure gradient transitions are smooth and drain in the direction indicated on drawings.
- .8 Prior to placing fill over existing ground, scarify surface to depth of 150 mm. Maintain fill and existing surface at approximately same moisture content to facilitate bonding.

- .9 Compact filled and disturbed areas to maximum dry density to ASTM D698, as follows:
 - .1 85% under landscaped areas.
 - .2 Refer to appropriate specifications for pavement areas.
- .10 Do not disturb soil within dripline of trees and shrubs to remain.
- .11 Finished subgrade surface to be free of debris or stones larger than 50mm diameter.
- .12 Remove surplus material and material unsuitable for fill, grading or landscaping off site at Contractor's expense.

3.3 Verification of Constructed Rough Grade

- .1 Provide grade control, and verify that grades are correct. If discrepancies occur, notify the Owner and do not commence work until instructed by the Owner.
- .2 Remove debris, roots, branches, stones in excess of 50 mm diameter and other deleterious materials.
- .3 Obtain approval from Owner of subgrade before commencing with placement of topsoil.

END OF SECTION

1 GENERAL

1.1 Related Work

- .1 Section 02924- Sodding

1.2 Materials

- .1 Contract will use native topsoil, amended as directed. Fertilizer is to be delivered to the job site with manufacturer's labels intact. All material to be approved by the project co-ordinator.

1.3 Scheduling of Work

- .1 Schedule placing of topsoil and finish grading to permit sodding or seeding operations under optimum soil moisture and weather conditions.

1.4 Measurement for Payment

- .1 Payment for rough grading will be paid by lump sum based on estimated volumes. Payment for fine grading and amendments will be paid on a per square meter basis included into the cost of other items, including sodding.

2 PRODUCTS

2.1 Materials

- .1 Topsoil shall be: friable, neither heavy clay nor of very light sandy nature containing minimum of 4% organic matter to a maximum of 20% by volume. Free from subsoil, roots, grass, weeds, toxic materials, stones, foreign objects and with an acidity range (pH) of 5.5 to 7.5.

Soil for the growing medium of the re-constructed soccer field shall additionally have a maximum 40% silt + clay content and shall be tested by a recognized lab to demonstrate suitability to grow turf.

- .2 Planting soil for planting trees and shrubs: mix 9 parts topsoil with 1 part peatmoss. Incorporate bonemeal into planting soil at rate of 3 kg/m³ of soil mixture.

- .3 Peatmoss:

- .1 Derived from partially decomposed fibrous or cellular stems and leaves of 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: 5mm.
- .4 Fertilizer:
 - .1 Complete commercial synthetic slow release fertilizer with minimum 35% water soluble nitrogen.
 - .2 Formulation ratio: 6-14-14 at 10lbs per 1000 sq feet incorporated into the rootzone.
- .5 Bonemeal:
Raw, steamed bonemeal, finely ground with a minimum analysis of 3% nitrogen and 20% phosphoric acid.

3 EXECUTION

- 3.1 Spreading of Native/Imported Topsoil/Planting Soil
 - .1 Spread topsoil after Landscape Architect has inspected and approved subgrade.
 - .2 Spread topsoil with adequate moisture in uniform layers over approved, unfrozen subgrade, where sodding and planting is indicated.
 - .3 Apply topsoil to following depths:
150 mm of topsoil for sodded areas
300mm for reconstructed sports field.
 - .4 Manually spread topsoil/planting soil around trees, shrubs and obstacles.
- 3.2 Application of Fertilizer
 - .1 Mix fertilizer thoroughly to full depth of topsoil.
- 3.3 Finish Grading
 - .1 Fine grade and loosen top soil. Eliminate rough spots and low areas to ensure positive drainage. Prepare loose friable bed for sodding and planting areas, by means of cultivation and subsequent raking.
 - .2 Roll with 50 kg roller, minimum 900 mm wide, to consolidate leaving surface smooth, uniform, firm against deep foot printing, and with a fine loose texture to approval of Landscape Architect.
- 3.4 Restoration of Stockpile Sites
 - .1 Restoration of stockpile sites to include grading, seeding and sodding where required to match proposed surface treatment.
- 3.5 Surplus Material
 - .1 Dispose of materials not required off site.

End of Section

1 GENERAL

1.1 Related Sections

- .1 Section 02072 - Geotextiles.
- .2 Section 02315 - Excavating Trenching and Backfilling.

1.2 Measurement for Payment

- .1 Supply and installation of sub-drainage will be measured horizontally in linear metres for each pipe size and depth class indicated, complete with trenching, bedding, backfill, granular filler material, and geotextile and all other incidental items required to complete the installation as per the details and drawings.

1.3 References

- .1 American Society for Testing and Materials (ASTM)
 - .1 Current ASTM C 136, Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .2 Current ASTM D 698, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m³).
- .2 Canadian General Standards Board (CGSB)
 - .1 Current CAN/CGSB-8.1-[88], Sieves, Testing, Woven Wire, Inch Series.
 - .2 Current CAN/CGSB-8.2-[M88], Sieves, Testing, Woven Wire, Metric.
- .3 Canadian Standards Association (CSA)
 - .1 Current CAN/CSA-B182.1, Plastic Drain and Sewer Pipe and Pipe Fittings.

1.4 Samples

- .1 Submit samples in advance of installation.

1.5 Material Certification

- .1 Certification to be marked on pipe.

1.6 Waste Management and Disposal

- .1 Separate and recycle waste materials.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away from children.

1.7 Measure for Payment

- .1 Payment will be made as per linear quantities identified in the form of tender.

2 PRODUCTS

2.1 Materials

- .1 Sub-drain materials to conform to applicable detail/plan:

GRADING AND DRAINAGE PLAN

- .2 Fully perforated plastic pipe and fittings: to CAN/CSA-B182.1. Nominal pipe sizes as detailed.
- .3 Aggregate for French drain: open graded, hard, durable particles 19mm diameter clear stone as detailed.
- .4 Geotextile filter: to Section 02072- Geotextiles as detailed.

3 EXECUTION

3.1 Trenching

- .1 Excavate,trench and backfill.
- .2 Place filter material after approval of trench by the Township.

3.2 Bedding

- .1 Place aggregate material as detailed.

3.3 Installation of Pipe Sub-drains

- .1 Lay pipe drains on prepared bed, true to line and grade with inverts smooth and free of sags or high points. Ensure barrel of each pipe is in contact with bed throughout full length.
- .2 Commence laying at outlet and proceed in upstream direction.
- .3 Lay bell and spigot pipe with bell ends facing upstream. Do not mortar joints.
- .4 Make joints tight in accordance with manufacturer's instructions.
- .5 Connection to Township owned catchbasins by others.
- .6 Plug open upstream ends of pipes with pre-manufactured plastic caps.
- .7 Surround and cover drain with filter material in uniform 150 mm layers as detailed.
- .8 Backfill remainder of trench as detailed.
- .9 Do not place bedding surround and backfill materials in frozen condition.
- .10 Protect sub-drains against flotation during installation.
- .11 Install "Y" connections to surface as indicated, for flushing.

END OF SECTION

1 GENERAL

- 1.1 Comply with all the requirements of the General Requirements.
- 1.2 Related Work
 - .1 Section 02311 Site Grading
 - .2 Section 02312 Topsoil & Finish Grading
 - .3 Section 02315 Excavating, Trenching and Backfilling
 - .3 Section 02924 Sodding
- 1.3 Obtain approval of all layout work for asphalt paving and finished grade elevations as marked on grade stakes, prior to commencing paving work.
- 1.4 Measurement for Payment

Asphalt paving will be measured as noted in the contract unit price schedule, including all excavation, base preparation, compaction and all incidental items required to complete the installation as shown on the drawings and details.
- 1.4 Testing and Inspection
 - .1 The contractor shall retain the services of a Geotechnical Engineer to test and confirm in writing the suitability of the sub base, including bearing capacity and compaction PRIOR to the installation of asphalt. The contractor shall coordinate all testing. Testing to be conducted for this section of work is as follows:
 - .1 subgrade to be minimum 95% Standard Proctor Density
 - .2 granular A compacted to 100% Standard Proctor Density
 - .3 granular B compacted to 100% Standard Proctor Density
 - .2 The contractor shall retain the services of an Agency acceptable to the Owner to provide written test results to determine conformance with the specifications: Testing to be conducted for this section of work is as follows:
 - .1 asphalt to be tested for content and grain size and mix
- 1.5 Protection
 - .1 Protect all other work from damage and contamination resulting from asphalt work.
 - .2 Make good all damages and clean up contaminated areas at no extra cost.

2 PRODUCTS

- 2.1 Asphalt shall be hot-mixed, hot-laid; install HL 3/HL 4 asphalt, as described in

the details.

- 2.2 Granular base courses shall be free of organic or other deleterious substances and shall conform with Section 02315 Excavation, Trenching and Backfilling.

3 INSTALLATION

3.1 Site Preparation

- .1 Layout all asphalt paving areas and set finished grades by means of grade stakes clearly marked. Report all discrepancies between site conditions and drawings at once. Ensure that positive, adequate surface run-off is provided.
 - .2 Obtain approval of layout and finished grades before proceeding with work.
 - .3 Excavate to the minimum specified depths, after compaction, as shown on drawings. Maintain sub-grade parallel to finished grade in all cases.
 - .4 Remove soft areas in sub-grade and backfill and compact with approved granular; fill all low areas with approved, compacted granular material at a minimum compacted depth of 150 mm.
 - .5 Compact sub-grade uniformly to minimum 95% Standard Proctor Density.
 - .6 Place granular materials to depths shown on drawings and as required by Soils Engineer. Place and compact granular in layers not exceeding 100 mm in depth. Maximum depth of 150 mm of granular A. Extend granular base 300mm beyond limit of asphalt.
 - .7 Keep materials clean and free of deleterious materials at all times.
 - .8 Maintain final grade of granular base course parallel to finished grade.
- 3.2 Place asphalt courses only when the temperatures at the surface are thirty-five degrees Fahrenheit minimum and rising. Suspend paving operations when the temperature drops below the minimum specified above.
- 3.3 Compaction of asphalt mixtures shall be carried out as soon as possible, after spreading of the mixture, as it will bear the roller without checking or undue displacement.
- 3.4 Start rolling parallel to the centre line at the lower side and proceed towards the

- centre of the pavement course, overlapping on successive trips by at least half the width of the rear wheel. Alternate trips of the roller shall be of slightly different lengths and shall be staggered.
- 3.5 Finish rolling shall be accomplished with a minimum number of passes, producing a satisfactory surface.
- 3.6 Start finish rolling longitudinally at the higher edge and proceed towards the lower edge.
- 3.7 Use hot tampers for hand tamping adjacent to curbs, catch basins, manholes and similar structures and in all areas which cannot be covered by the roller.
- 3.8 Finished pavement shall be smooth, true to line and level and free from depressions exceeding 6 mm as measured with a 2.75 metre straight edge paralleling the centre line.
- 3.9 Low or defective areas shall be cut out immediately and replaced with fresh hot mixture, placed and compacted to blend with surrounding areas and thoroughly bonded to it.
- 3.10 Hand tamp edges to 45 degree angle where asphalt adjoins grass or planted areas. Temporarily remove any obstructions interfering with hand tamping operations and restore when operation is complete.
- 3.11 Maintenance
- .1 Maintain all asphalt paving from time of installation until acceptance.
 - .2 Keep paving clean at all times, sweep, scrub and/or scrape and hose down paved areas which have been contaminated by dirt, mud, etc.
- 3.12 Warranty
- .1 Warranty all workmanship and materials for a period of two (2) years from the date of Substantial Completion.
 - .2 Repair all cracks or settlement which occurs during the Warranty period at no additional cost to the Owner.
 - .3 Upon notification by the Owner, repair or make good failure, deterioration or damage to the Owner's satisfaction
- 3.13 Clean Up
- .1 After completion of paving, clean all areas and structures such as curbs, walls, catch basin gratings, manhole covers, etc. from all contamination

resulting from paving operations.

END OF SECTION

1 GENERAL

- 1.1 Section Includes
 - .1 Provision of all labour, materials, equipment and incidental services necessary to supply and install site furnishings.
- 1.2 Protection of Existing Features
 - .1 Building and surface features.
 - .1 Protect surface features which may be affected by work from damage while work is in progress. In the event of damage, immediately make repair to the approval of the landscape architect.
- 1.3 Measure for payment
 - .1 Items will be paid for as per the Unit Schedule. Payment includes installation, excavation (as required) and all materials, labour and incidentals required to complete the work.

2 PRODUCTS

- 2.1 Materials
 - .1 Basketball post and net supplied by Sport Systems Canada (or approved equal) 1-877-600-4667 (<https://www.sportsystemscanada.com/>)
Model: BB-IG-03B,5500-Double Rim, coil spring breakaway goal with mesh
Border and Target: yes
Install as per manufacturer's instructions.

3 EXECUTION

- 3.2 Installation
 - .1 Install as per manufacturer's instructions or as per the details identified on drawings L5.
 - .2 Prior to installation provide layout to the approval of the landscape architect.

1 GENERAL

- 1.1 Related Work
 - .1 Section 02312- Topsoil and Finish Grading:
- 1.2 Source Quality Control
 - .1 Obtain approval from Landscape Architect of sod at source.
 - .2 When proposed source of sod is approved, use no other source without written authorization.
- 1.3 Scheduling
 - .1 Schedule sod laying to coincide with topsoil operations.
- 1.4 Measurement for Payment
 - .1 Nursery sod will be measured in square metres and paid for under item "Sod".
 - .2 Access areas and work zones with high erosion potential will require protection in the form of pegged sod.

2 PRODUCTS

- 2.1 Materials
 - .1 Nursery sod: Quality and source to comply with standards outlined in "Guide Specification for Nursery Stock", Section 17, 1978 edition, published by Canadian Nursery Trades Association.
 - .2 Number one Kentucky Bluegrass/Fescue Sod: sod grown from maximum 40% Kentucky Bluegrass, 30% creeping Red Fescue, supplied by Greenhorizons, 519-653-7494 or approved equivalent.
 - .3 Broken, dry, discoloured pieces will be rejected by Landscape Architect.
 - .4 Wooden pegs 17 x 17 x 200 x 200 mm.
 - .5 Water: potable.
 - .6 Fertilizer: complete synthetic slow release fertilizer with maximum 35% water Soluble nitrogen. Formulation ratio: 21-7-7 with slow release nitrogen at 3lbs per 1000 sq feet.

3 EXECUTION

- 3.1 Laying of Sod
 - .1 Prior to sodding, obtain approval from Landscape Architect that finished grade and depth of topsoil are satisfactory.
 - .2 Lay sod within 24 hr. of being lifted.
 - .3 Sodding during excessively wet conditions, at freezing temperatures or over frozen soil is not acceptable.
 - .4 Lay sod in rows, perpendicular to slope, and with joints staggered. Butt sections closely without overlapping or leaving gaps between sections. Cut out irregular

- or thin sections with sharp implements.
- .5 Provide close contact between sod and soil with light rolling. Use of heavy roller to correct irregularities in grade is not permitted.
- .6 Water sod immediately after laying to obtain moisture penetration to top 100 mm of topsoil.

3.3 Maintenance

- .1 Maintain sodded area from start of installation until final acceptance is awarded from the Landscape Architect for all landscape project items unless otherwise directed by the Landscape Architect.
- .2 Water sodded areas in sufficient quantities and at frequency required to maintain soil under sod continuously moist to depth of 75 mm to 100 mm. This is assumed, at a minimum, to be twice a week for the 4 weeks following installation, and once every two weeks thereafter from June through to September.
- .3 Maintain sodded areas weed free.
- .4 Fertilize sodded areas two weeks after sodding with .2.11 ratio fertilizer. Spread evenly at rate of 1 kg. of nitrogen/100m² and water in well.

3.4 Acceptance

- 1. Sodded areas will be accepted at final inspection by Landscape Architect provided that:
 - .1 Sodded areas are properly established.
 - .2 Sod is free of bare and dead spots and without weeds.
 - .3 No surface soil is visible when grass has been cut to height of 40 mm.
 - .4 Sodded areas have been cut minimum 2 times.
 - .5 Sodded areas have been fertilized.
(Landscape Architect is to be notified 24 hrs in advance by the contractor of when the fertilizer application is to be applied.)

1 GENERAL

1.1 Related Work

- .1 Section 02312: Topsoil and finish grading

1.2 Source Quality Control

- .1 Obtain Landscape Architect's approval of plant material at source.
- .2 Notify Landscape Architect of source of material at least 7 days in advance of shipment. No work under this Section is to proceed without approval.
- .3 Acceptance of plant material at its source does not prevent rejection on site prior to or after planting operations.

1.3 Measure for Payment

- .1 Payment will be unit price for supply and installation of trees and shrubs. Installation includes:
 - .1 Excavations for planting.
 - .2 Supply of peat moss and fertilizer for planting.
 - .3 Tree and shrub placement as shown on planting details.
 - .4 Staking and guying as per specification.
 - .5 Mulching.

1.4 Shipment and Pre-Planting Care

- .1 Coordinate shipping of plants and excavation of holes to ensure minimum time lapse between digging and planting.
- .2 Tie branches of trees and shrubs securely and protect plant material against abrasion, exposure and extreme temperature change during transit. Avoid binding of plant stock with rope or wire which would damage bark, break branches or destroy natural shape of plant. Give full support to root ball of large trees during lifting.
- .3 Cover plant foliage with tarpaulin, and protect roots by means of dampened straw, peatmoss, sawdust, or other acceptable material to prevent loss of moisture during transit and storage.
- .4 Remove broken and damaged roots with sharp pruning shears.
- .5 Keep roots moist and protected from sun and wind. Heel in trees and shrubs, which cannot be planted immediately, in shaded areas and

water well. Heeled in trees and shrubs are to be kept to a minimum on-site. Landscape Architect must be notified prior to any on-site storage of materials.

1.5 Guarantee

- .1 Provide a written guarantee, signed and issued to the owner stating that the plant material as itemized on the plant list is guaranteed against defects for a period of twenty four (24) months from the date of Acceptance.
- .2 End-of-warranty inspection will be conducted by the Landscape Architect.
- .3 Landscape Architect reserves the right to extend Contractor's warranty responsibilities for an additional one year if, at end of initial warranty period, leaf development and growth on trees and shrubs is not sufficient to ensure future survival.

1.6 Replacements

- .1 If any plant material is found either dead or not in satisfactory health as determined by the Landscape Architect, it will, upon request, be immediately removed from the site and replace as soon as conditions permit during the normal planting season.
- .2 Replace dead plant material immediately.
- .3 Extend warranty on replacement plant material for a period equal to the original warranty period.
- .4 Continue such replacement and warranty until plant material is accepted by the Landscape Architect.

2 PRODUCTS

2.1 Materials

- .1 Water: potable and free of minerals which may be detrimental to plant growth.
- .2 Stakes: Wood stakes 40 x 40 x 5 x 2440 mm.

- .3 Guy Wires: steel wire strand at following size.
 - .1 Shrubs and trees under 75 mm caliper use No. 12 galvanized wire (not on podium deck)
- .4 Tree Rings: fabricated from 3 mm galvanized wire encased in two ply reinforced 12 mm diameter rubber garden hose or equivalent.
- .5 Tree Wrapping Material:
Not Applicable
- .6 Mulch: Submit sample prior to shipping to site for approval by Landscape Architect:
 - .1 Shredded bark mulch: free of small branches, leaves and varying in size with no pieces thicker than 12 mm.
- .7 Anti-desiccant: Wax-like emulsion to provide film over plant surfaces reducing evaporation but permeable enough to permit transpiration.
- .8 Fertilizer: 6-24-24 at 12lbs per 1000sq ft incorporated to half rootball depth, and to the dripline of trees.
- .9 Peatmoss:
 - .1 Derived from partially decomposed fibrous or cellular stems and leaves of 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.

2.2 Plant Material

- .1 Quality and Source:
Comply with Guide Specification for Nursery Stock, latest edition of Canadian Nursery Trades Association referring to size and development of plant material and root ball. Measure plants when branches are in their natural position. Height and spread dimensions refer to main body of plant and not from branch tip to branch tip. Use trees and shrubs of No. 1 grade.

- .2 Additional plant material qualifications:
 - .1 Plant material obtained from areas with milder climatic conditions from those of site acceptable only when moved to site prior to the breaking of buds in their original location and heeled-in, in a protected area until conditions suitable for planting.
 - .2 Use trees and shrubs with strong fibrous root system free of disease, insects, defects or injuries and structurally sound. Use trees with straight trunks, well and characteristically branched for species. Plants must have been root pruned regularly, but not later than one growing season prior to arrival on site.
 - .3 Large trees must have been half root pruned during each of two successive growing seasons, the latter at least one growing season prior to arrival on site.
 - .4 Plant material that has come out of dormant stage and is too far advanced will not be accepted unless prior approval obtained.
- .3 Cold Storage:
 - Approval required by Landscape Architect for plant material which has been held in cold storage.
- .4 Container Grown Stock:
 - .1 Acceptable if containers large enough for root development. Trees and shrubs must have grown in container for a minimum of one growing season but not longer than two. Root system must be able to "hold" soil when removed from container. Plants that have been root bound are not acceptable. Container stock must be fertilized with slow releasing fertilizer.
- .5 Balled and Burlapped:
 - Coniferous and broad-leaved evergreens over 500 mm tall must be dug with soil ball.

Deciduous trees in excess of 3 m height must have been dug with large firm ball. Root balls must include 75% of fibrous and feeder root

system. This excludes use of native trees grown in light sandy or rocky soil. Secure root balls with burlap, heavy twine and rope. For large trees: wrap ball in double layer of burlap and drum lace with minimum 10 mm dia. rope. Protect root balls against sudden changes in temperature and exposure to heavy rainfall.

- .6 Substitutions:
Substitutions to plant material as indicated on planting plan are not permitted unless written approval has been obtained from Landscape Architect as to type, variety and size. Plant substitutions must be of similar species and of equal size as those originally specified.

3 EXECUTION

3.1 Workmanship

- .1 Obtain approval prior to excavating.
- .2 Apply anti-desiccant in accordance with material manufacturer's instructions.
- .3 Coordinate operations. Keep site clean and planting holes drained. Immediately remove soil or debris spilled onto pavement.

3.2 Planting Time

- .1 Plant deciduous plant material during dormant period before buds have broken. Plant material noted for spring planting must be planted in dormant period.
- .2 Plant material imported from region with warmer climatic conditions may only be planted in early spring.
- .3 When permission has been obtained to plant deciduous plant material after buds have broken, spray plants with anti-desiccant to slow down transpiration prior to transplanting.
- .4 Plant evergreens in spring before bud break.
- .5 When permission has been obtained, trees and shrubs, and ground covers growing in containers may be planted throughout growing season.

- .6 Plant only under conditions that are conducive to health and physical conditions of plants.
- .7 Provide planting schedule:
Extended planting operations over long period using limited crew will not be accepted.

3.3 Excavation

- .1 Individual shrubs:
excavate planting holes 250 mm deep and at least 250 mm wide.
- .2 Small trees (up to .30 m):
excavate holes 450 mm deep with diameter of 300 mm greater than root spread or root ball.
- .3 Large trees:
excavate to depth of 500 mm with width of 750 mm greater than diameter of root ball. In heavy soils, increasing planting holes by 50 mm for each 100 mm of root ball diameter.

3.4 Planting

- .1 Plant trees and shrubs vertically with roots placed straight out in hole. Orient plant material to give best appearance.
- .2 Place plant material to depth equal to depth they were originally growing in nursery.
- .3 With balled and burlapped root balls, loosen burlap and cut away minimum top 1/3 without disturbing root ball. Do not pull burlap or rope from under root ball. With container stock, remove entire container without disturbing root ball. Non-biodegradable wrappings must be removed.
- .4 Tamp planting soil around root system in layers of 150 mm eliminating air voids. Frozen or saturated planting soil is unacceptable. When 1/3 of planting soil has been placed, fill hole with water. After water has completely penetrated into soil, complete backfilling with mixture of planting soil, peatmoss and 1:4:2 slow release fertilizer.

- .5 Build 100 mm deep saucer around outer edge of hole to assist with maintenance watering.
- .6 When planting is completed, give surface of planting saucer dressing of 1:2:2 fertilizer at rate of 12 kg/100 m.² Mix fertilizer thoroughly with top layer of planting soil and water in well.

3.5 Tree Support

- .1 Tree support is shown on planting details.

3.6 Pruning

- .1 Prune trees and shrubs after planting where damage has occurred during shipping or planting. Postpone pruning, of those trees where heavy bleeding may occur, until in full leaf. Employ clean sharp tools and make cuts flush with main branch, smooth and sloping as to prevent accumulation of water. Remove projecting stubs on trunks or main branches. Remove dead and injured branches and branches that rub causing damage to bark, without changing the plants natural shape. Do not damage lead branches or remove smaller twigs along main branches.

3.7 Mulching

- .1 Obtain approval of planting material installations before mulch is applied. Loosen soil in planting beds and pits and remove debris and weeds. Spread mulch to a minimum thickness of 100 mm. Mulch material susceptible to blowing must be moistened down and mixed with topsoil before applying or will not be acceptable.
- .2 Mulch material sample must be provided to the landscape consultant for approval prior to the successful contractor shipping the material to the site.

3.8 Maintenance

- .1 Water twice a week for first 4 weeks and then sufficiently thereafter to maintain optimum growing conditions (assumed to be once every two weeks thereafter from June through to September). Ensure adequate moisture in root zone at freeze-up.

- .2 Spray plants to combat pests and diseases, as required. Do not use DDT or sprays prohibited by Agriculture Canada.
- .3 Keep stakes and guy wires in proper repair.
- .4 Provide adequate protection against winter damage including damage caused by rodents.
- .5 Maintain plant material from date of planting up to end of warranty period.
- .6 Remove trunk wrapping at end of warranty period.

3.9 Acceptance

- .1 Trees, shrubs and ground covers must be healthy and in a vigorous growing condition at the time the final inspection review for the landscape components of the project is requested.
- .2 Trees, shrubs and ground covers planted in the fall will be evaluated for final acceptance in the following spring one month after start of growing season.

End of Section