

Part 1 General

1.1 REFERENCES

- .1 Canadian Standards Association (CSA International).
 - .1 CSA G30.5-M1983(R1998), Welded Steel Wire Fabric for Concrete Reinforcement.
- .2 Department of Justice Canada (Jus).
 - .1 Canadian Environmental Protection Act (CEPA), 1999, c. 33.
 - .2 Fertilizers Act (R.S. 1985, c. F-10).
 - .3 Fertilizers Regulations (C.R.C., c. 666).
 - .4 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.
- .3 Health Canada - Pest Management Regulatory Agency (PMRA).
 - .1 National Standard for Pesticide Education, Training and Certification in Canada (1995).
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
 - .1 Material Safety Data Sheets (MSDS).

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit monthly written reports on maintenance during warranty period, to Departmental Representative identifying:
 - .1 Maintenance work carried out.
 - .2 Development and condition of plant material.
 - .3 Preventative or corrective measures required which are outside Contractor's responsibility.
- .3 Submit WHMIS MSDS.

1.3 QUALITY ASSURANCE

- .1 Health and Safety:
 - .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Waste Management and Disposal:
 - .1 Waste Management: separate waste materials for reuse and recycling.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

1.5 MAINTENANCE DURING WARRANTY PERIOD

- .1 From time of acceptance by Departmental Representative to end of warranty period, perform following maintenance operations.
 - .1 Water to maintain soil moisture conditions for optimum growth and health of plant material without causing erosion.
 - .2 Apply pesticides in accordance with National Standard for Pesticide Education, Training and Certification in Canada, Federal, Provincial and Municipal regulations as and when required to control insects, fungus and disease. Obtain product approval from Departmental Representative prior to application.
 - .3 Apply fertilizer in early spring at manufacturer's suggested rate.
 - .4 Remove dead, broken or hazardous branches from plant material. Dispose of debris through alternative disposal.

Part 2 Products

2.1 MATERIALS

- .1 Fertilizer:
 - .1 To Canada Fertilizer Act and Fertilizers Regulations.
 - .2 Complete, commercial, slow release with 35 % of nitrogen content in water-insoluble form.
- .2 Anti-desiccant: commercial, wax-like emulsion.
- .3 Wood rails and bracing: 38 x 89 x 2400 mm length, untreated wood.
- .4 Welded wire fabric (WWF): 100 x 100mm to CSA G30.5.
- .5 Steel 'T'-bar posts: 1800mm length, painted.
- .6 Snow fence: standard plastic fencing, orange in colour, 1.2m high, supported by 1.8m long vertical steel T-bars driven 0.6m into the ground at a maximum spacing of 2.0m, braced at every 4.0m maximum.

Part 3 Execution

3.1 IDENTIFICATION AND PROTECTION

- .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .2 Before commencing work, conduct, with Departmental Representative, condition survey of existing trees, plants, and lawns. Identify which trees, plants, and areas of lawns must by necessity be disturbed by work. The remainder of trees, plants, and areas of lawn are to be protected as indicated.
- .3 Before commencing work, install tree protection fencing as detailed and general location as indicated so as to provide complete separation of work areas from areas to be protected.

- .4 All equipment, material and personnel shall remain outside the areas to be protected, except as may be required to maintain the health of trees, plants and lawn within those areas. Maintain tree protection fencing in good condition for the duration of the contract. Only remove tree protection fencing after all construction activity is complete unless otherwise approved by the Departmental Representative.
 - .1 The Contractor shall not store fuel within the dripline of any tree, and exhaust fumes from all equipment must NOT be directed towards any tree's canopy.
- .5 The contractor shall be responsible for watering, fertilizing, mowing and otherwise tending to all trees, plants, and areas of lawn to be protected for the duration of construction.

3.2 ROOT CURTAIN SYSTEM

- .1 Identify limits for required construction excavation as approved by Departmental Representative.
- .2 Prior to construction excavation, hand dig trench minimum 500 mm wide x 1500 mm deep, along perimeter of excavation limits.
- .3 Prune exposed roots cleanly at side of trench nearest plants to be preserved. Pruned ends to point obliquely downwards.
- .4 Install wooden posts and welded wire fabric against construction edge of trench.
- .5 Securely attach biodegradable burlap on plant side of wire mesh.
- .6 Prepare homogeneous mixture of fertilizer, parent material and organic matter.
 - .1 Add organic matter to mixture to achieve 7-9% organic matter content by weight.
 - .2 Incorporate with mixture grade 2:12:8 ratio fertilizer (dry) at rate of 1.5kg/m³.
- .7 Backfill with homogeneous mixture between curtain wall and plants to be preserved in layers not exceeding 150 mm in depth. Compact each layer to 95% Standard Proctor Density.
- .8 Protect root curtain from damage during construction operations.
- .9 Water plants and root curtain sufficiently during construction to maintain optimum soil moisture condition until backfill operations are complete.
- .10 Remove root curtain before backfill operations. Ensure root curtain is cut down to 300 mm below finished grade and remove cut material.

3.3 PRUNING

- .1 Prune crown of any tree where root pruning is required to compensate for root loss while maintaining general form and character of plant. Dispose of debris through composting or mulching.

3.4 ANTI-DESICCANT

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

END OF SECTION

Part 1 General**1.1 RELATED REQUIREMENTS**

- .1 Section 04 04 12.1 – Masonry Mortar and Grout

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International).
 - .1 CSA A23.1/A23.2-00, Concrete Materials and Methods of Construction/Methods of Test for Concrete.
 - .2 CSA A179-94(R2009), Mortar and Grout for Unit Masonry.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit method of identification of each unique stone paver to be removed and its original location, and method of record keeping for approval by the Departmental Representative.
- .3 Indicate layout, pattern and relationship of paving joints to fixtures and project formed details.
- .4 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .5 Prepare 1m x 1 m full size mockup sample of each type paving unit type as indicated. Mock-up may be used as final product if acceptable to Departmental Representative.

Part 2 Products**2.1 SALVAGED MATERIALS**

- .1 Granite Paver and Flagstone (natural stone): granite irregular and random rectangular shapes, 125 mm thick with either sawn finish surface, or fine axed surface (8 cut work).
 - .1 Pavers are by type are:
 - .1 Lightest Grey Granite
 - .2 Medium Grey Granite
 - .3 Granite similar to monument granite
 - .4 Random darkest pink and grey granite.
 - .2 All granite was originally supplied from quarries located in Canada. The contractor shall satisfy himself that he can source additional granite if required to match the existing stone if any stone pavers are broken or lost during the salvaging or reinstatement.
 - .3 Pavers that are damaged by during the work of this contract shall be replaced at the cost of the contractor.
- .2 Mortar for bedding: in accordance with Section 04 05 12.1 Masonry Mortar and Grout

Part 3 Execution**3.1 PROTECTION**

- .1 Prevent damage to monuments, landscaping, curbs, sidewalks, trees, fences, roads and adjacent property. Make good any damage.

3.2 REMOVAL OF PAVERS AT CORE HOLES AND STORAGE

- .1 Confirm location of core holes to be installed and identify pavers required to be removed to allow coring.
- .2 At each location record the location and carefully remove each paver, mark with an identifier that cannot be removed on an unexposed face of the paver then record the location of each stone so that it can be returned to its location during reinstatement of the paving.
- .3 Prepare a shop drawing sketch indicating the location of each stone removed. This drawing will be used to guide the reinstatement of the stones. Provide copies of the shop drawing to the Departmental Representative.
- .4 Clean stone pavers of any mortar, dirt, and debris on all sides and faces prior to storage.
- .5 Store all pavers removed in an organized manner to coincide with the reinstatement process
 - .1 Store pavers on wood platforms/pallettes provided by the Contractor so that the stone will be at least 100mm above the ground.

3.3 CONCRETE SLAB

- .1 Ensure that concrete slab and core holes have been filled and completed and accepted by the Departmental Representative prior to reinstatement of the paver units.
- .2 Completely clean the exposed concrete slab and core holes of any debris, dirt or extraneous material.

3.4 BEDDING MORTAR

- .1 All granite shall be set in mortar as specified.
- .2 Mix water, glue, and add air entrainment to mortar in accordance with the specification and manufacturer's instructions.
- .3 Maintain temperature of work area above 5°C for installation and curing until set.
- .4 Only install mortar bed in small batches and ensure proper moisture content to the approval of the Departmental Representative.

3.5 REINSTATEMENT OF STONE PAVEMENT SURFACE COURSE

- .1 Granite Pavers and Flagstone .
 - .1 Install stones with joints to match existing surrounding jointing of similar stones..

- .2 Each piece of granite shall be thoroughly cleaned and well wetted immediately preceding setting and all concrete on which granite is to be laid must be wetted before applying mortar.
- .3 All granite of floors and steps shall be set on a full mortar bed as indicated on the drawings and all vertical joints filled with mortar, except at the expansion joints where the joint shall be filled with a none bituminous elastic material to the approval of the Departmental Representative.
- .4 Surface of finished pavement: shall meet and match profile, slope and at absolute level of adjacent stone pavers.
- .5 The paver blocks shall be installed in accordance the approved shop drawings for the reinstatement so that the stones match the original layout of the pavers.
- .6 Sweep surface clean and check final elevations for conformance to specifications and drawings and to the approval of the Departmental Representative.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Canadian Standards Association (CSA International).
 - .1 CSA-A231.2-06, Precast Concrete Pavers.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Product Data:
 - .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Manufacturer's Instructions:
 - .1 Submit manufacturer's installation instructions.

1.3 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials.
- .2 Fold up metal banding, flatten and place in designated area for recycling.

Part 2 Products

2.1 CONCRETE PAVERS

- .1 Concrete pavers: to CSA-A231.2 and as follows:
 - .1 Size: 450 mm x 450 mm x 38mm height.
 - .2 Shape: square.
- .2 Manufactured in moulds, with spacers, suitable for installation and delivered on site in cubes of laying panels, in protective wrapping.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 INSTALLATION OF CONCRETE PAVERS

- .1 Lay pavers on flattened surface in locations as indicated.

3.3 CLEANING

- .1 Remove and dispose of loose, extraneous materials from surfaces to be cleaned.
- .2 Apply cleaning compounds appropriate for removal of various contaminants encountered in accordance with manufacturer's recommendations.

- .3 Final surface to be free of contamination.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Ontario Provincial Standard Specifications
 - .1 OPSS.MUNI 1010-13 - Aggregates - Base, Subbase, Select Subgrade, and Backfill Material
 - .2 OPSS 1315-08 - White Pigmented Curing Compounds for Concrete
 - .3 OPSS.MUNI 1350-08 - Concrete - Materials and Production

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Inform Departmental Representative of proposed source of materials and provide access for sampling at least 2 weeks prior to commencing work.
- .3 If materials have been tested by independent testing laboratory within the current calendar year and have passed tests equal to requirements of this specification, submit test certificates from testing laboratory showing suitability of materials for this project.

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Waste Management and Disposal:
 - .1 Separate waste materials for recycling.

Part 2 Products

2.1 MATERIALS

- .1 Concrete mixes and materials: in accordance with OPSS 1350.
 - .1 Minimum specified 28-Day compressive strength: 30 MPa.
 - .2 Coarse Aggregate: 19.0 mm nominal maximum size.
- .2 Curing compound shall be according to OPSS 1315.
- .3 Granular base: OPSS Granular 'A', in accordance with OPSS 1010.
- .4 Non-staining mineral type form release agent: chemically active release agents containing compounds that react with free lime to provide water-soluble soap.

Part 3 Execution

3.1 GRADE PREPARATION

- .1 Do grade preparation work in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.

3.2 GRANULAR BASE

- .1 Obtain Departmental Representative's approval of subgrade before placing granular base.
- .2 Place granular base material to lines, widths, and depths as indicated.
- .3 Compact granular base to 98% SPMDD.

3.3 CONCRETE

- .1 Obtain Departmental Representative approval of granular base prior to placing concrete.
- .2 Wet the granular base immediately prior to concrete placement, without leaving any standing water.
- .3 Concrete shall be placed, consolidated, and finished in a manner that ensures uniform consistency. Any excess concrete beyond the sidewalk edge shall be removed. Concrete shall be placed by a continuous pour method. Where concrete placing is interrupted for more than 45 minutes, a straight cold-joint shall be made at one of the indicated sawcut locations.
- .4 Concrete shall not be placed against any material which is at a temperature above 35 °C or against any material whose temperature is below 0 °C.
- .5 Finishing of the concrete surface shall take place while the concrete is sufficiently plastic to achieve the desired grades, elevations, and texture.
- .6 The surface of the sidewalk shall be uniform, dense, free from undulations and projections, struck off true to grade and cross-section, and finished with a float.
- .7 Excessive fines and water shall not be drawn to the surface.
- .8 Surface evaporation retardants shall not be used as an aid for finishing concrete.
- .9 The application of water, cement, or combination of both to the concrete surface shall not be permitted as a finishing aid.
- .10 Localized defects shall be repaired using concrete.
- .11 The sidewalk shall be given a float finish, with 6mm radius tooled edges.
- .12 The presence of footprints or other marks in the completed sidewalk shall require sawcutting, removal, and replacement of the complete sidewalk bay.

3.4 TOLERANCES

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

3.5 EXPANSION AND CONTRACTION JOINTS

- .1 Sawcut joints as indicated after concrete has set sufficiently to avoid ravelling, but before shrinkage cracks develop.

3.6 CURING

- .1 Apply curing compound evenly to form continuous film, in accordance with manufacturer's requirements.

3.7 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

Part 1 General**1.1 RELATED REQUIREMENTS**

- .1 Section 32 92 23 – Sodding
- .2 Section 32 93 10.1 Salvage and Reinstatement of Trees, Shrubs and Groundcovers

1.2 REFERENCES

- .1 Definitions:
 - .1 Compost: mixture of soil and decomposing organic matter used as fertilizer, mulch, or soil conditioner.
 - .1 Compost is processed organic matter containing 40% or more organic matter as determined by Walkley-Black method or loss on ignition (LOI) test. Product must be sufficiently decomposed (stable) so further decomposition does not adversely affect plant growth (C:N ratio below 50), and contain no toxic or growth inhibiting contaminants.
 - .2 Composed bio-solids must meet the requirements as per CCME Guidelines for Compost Quality, Category (A)
- .2 Reference Standards:
 - .1 Agriculture and Agri-Food Canada
 - .1 The Canadian System of Soil Classification 1998.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for topsoil, peat moss, fertilizer, sand, limestone and compost including chemical composition size.
- .3 Test and Evaluation Reports:
 - .1 Submit soil and soil amendment reports.
 - .2 Submit agronomic testing of compost in accordance with The Compost Quality Alliance.
 - .1 Test results include analysis of: pH, C:N ratio, moisture, particle size, soluble salts and sodium.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Delivery and Acceptance Requirements: labelled bags of fertilizer identifying mass in kg, mix components and percentages, date of bagging, supplier's name and lot number.
- .2 Storage and Handling Requirements:

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- .1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Replace defective or damaged materials with new.

Part 2 Products**2.1 TOPSOIL**

- .1 Topsoil for grassed areas and planting beds: mixture of particulates, micro organisms and organic matter which provides suitable medium for supporting intended plant growth.
 - .1 Soil texture: The Canadian System of Soil Classification, to consist of 30 to 60% 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 SOIL AMENDMENTS

- .1 Fertilizer:
 - .1 Industry accepted standard medium containing nitrogen, phosphorous, potassium and other micro-nutrients suitable to specific plant species or application or defined by soil test.
 - .2 Fertility: major soil nutrients present in following amounts:
 - .1 Nitrogen (N): 20 to 40 micrograms available per gram of topsoil.
 - .2 Phosphorus (P): 40 to 50 micrograms per gram of topsoil.
 - .3 Potassium (K): 75 to 110 micrograms per gram of topsoil.
 - .4 Calcium, magnesium, sulfur and micro-nutrients present in balanced ratios to support germination and/or establishment of intended vegetation.
 - .5 Ph value: 7.0 to 7.5.
- .2 Peatmoss:
 - .1 Derived from partially decomposed species of Sphagnum Mosses.
 - .2 Elastic and homogeneous, brown in colour.
 - .3 Free of wood and deleterious material which could prohibit growth.
 - .4 Shredded particle size: 5 mm minimum.
- .3 Sand: washed coarse silica sand, medium to coarse textured.
- .4 Compost:
 - .1 Category A

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

2.3 SOURCE QUALITY CONTROL

- .1 Advise Departmental Representative of sources of topsoil, peat moss, compost, lime manufactured topsoil to be utilized with sufficient lead time 5 days minimum 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 All required testing will be carried out by testing laboratory designated by Departmental Representative . Soil sampling, testing and analysis to be in accordance with Provincial standards. Departmental Representative will pay for cost of tests as specified in Section 01 29 83 - Payment Procedures for Testing Laboratory Services.

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 top soil placement and growth plants and grass 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 SOIL AMENDMENTS

- .1 For planting beds and turf : apply and thoroughly mix soil amendments into full specified depth of topsoil at following rates:
 - .1 10 m³ of compressed peatmoss per 100 cu m of topsoil for planting beds.

3.3 INSTALLATION & FINE GRADING

- .1 Scarify acceptable subgrade to 100mm depth below topsoil bed.
- .2 Install soil in 150mm lifts to finish depths:
 - .1 Planting beds: 500mm
 - .2 Sodded areas: 200mm
- .3 Fine grade to meet and match existing drainage pattern, profiles and slopes of planting beds and turf areas soil and to be ready for planting and sodding.

3.4 ACCEPTANCE

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

3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
 - .1 Clean and reinstate areas affected by Work.

END OF SECTION

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Part 1 General**1.1 RELATED REQUIREMENTS**

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

1.2 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.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Samples.
 - .1 Submit:
 - .1 Sod for each type specified.
 - .1 Install approved samples in 1 square metre mock-ups and maintain in accordance with maintenance requirements during establishment period.
 - .2 Obtain approval of samples by Departmental Representative .
- .3 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements of seed mix, seed purity, and sod quality.
- .4 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties of seed mix, seed purity, and sod quality.

1.4 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Landscape Planting Supervisor: Landscape Industry Certified Technician with Softscape Installation designation.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials in accordance with supplier's recommendations.

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- .2 Replace defective or damaged materials with new.

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 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: minimum 15 mm in thickness.
- .2 Water:
 - .1 Supplied by Departmental Representative at designated source.
- .3 Fertilizer:
 - .1 To Canada "Fertilizers Act" and Fertilizers Regulations.
 - .2 Complete, synthetic, slow release with 65 % of nitrogen content in water-insoluble form.

2.2 SOURCE QUALITY CONTROL

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

Part 3 Execution**3.1 INSTALLERS**

- .1 Use installers who are Member in Good Standing of a Provincial Horticultural Trades Associations e.g Landscape Ontario.

3.2 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.

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- .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.

3.3 PREPARATION

- .1 Verify that grades are correct and prepared in accordance with Section 32 91 19.13- Topsoil Placement and Grading. If discrepancies occur, notify Departmental Representative and commence work when instructed by Departmental Representative .
- .2 Do not perform work under adverse field conditions such as frozen soil, excessively wet soil or soil covered with snow, ice, or standing water.
- .3 Fine grade surface free of humps and hollows to smooth, even grade, to contours elevations indicated, to tolerance of plus or minus 8 mm, for Turf Grass Nursery Sod plus or minus 15 mm for Commercial Grade Turf Grass Nursery, surface to drain naturally.
- .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.

3.4 SOD PLACEMENT

- .1 Ensure sod placement is done under supervision of certified Landscape Planting Supervisor.
- .2 Lay sod within 24 hours of being lifted if air temperature exceeds 20 degrees C.
- .3 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.
- .4 Roll sod as directed by Departmental Representative . Provide close contact between sod and soil by light rolling. Use of heavy roller to correct irregularities in grade is not permitted.

3.5 FERTILIZING PROGRAM

- .1 Fertilize during establishment and warranty periods in accordance with sod suppliers instructions

3.6 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.

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3.7 PROTECTION BARRIERS

- .1 Protect newly sodded areas from deterioration with snow fence on rigid frame as directed by Departmental Representative .
- .2 Remove protection after inspection as directed by Departmental Representative .

3.8 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 98%.
 - .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.
 - .5 Temporary barriers or signage to be maintained where required to protect newly established sod.

3.9 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.
- .2 Areas sodded in fall will be accepted in following spring one month after start of growing season provided acceptance conditions are fulfilled.
- .3 When environmental conditions allow, all sodded areas showing shrinkage cracks shall be top-dressed and seeded with a seed mix matching the original.
- .4 Areas sodded in fall will be accepted in following spring one month after start of growing season provided acceptance conditions are fulfilled.

3.10 MAINTENANCE DURING WARRANTY PERIOD

- .1 Perform following operations from time of acceptance until end of warranty period:
- .2 Repair and resod dead or bare spots to satisfaction of Departmental Representative .

END OF SECTION

Part 1 General**1.1 RELATED REQUIREMENTS**

- .1 Section 32 91 19.13 Topsoil Placement and Grading

1.2 REFERENCES

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

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Scheduling: obtain approval from Departmental Representative of schedule 7 days in advance of shipment of plant material.
- .2 Schedule to include:
 - .1 Removal of plants to heeling-in bed.
 - .2 Planting Dates.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for trees, shrubs, ground cover, fertilizer, mycorrhiza, anti-desiccant, anchoring equipment, and mulch and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Samples:
 - .1 Submit samples of mulch

1.5 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Landscape Contractor: to be a Member in Good Standing of Provincial Horticultural Trades Association.
 - .2 Landscape Planting Supervisor: Landscape Industry Certified Technician with Softscape Installation designation.
 - .3 Landscape Maintenance Supervisor: Landscape Industry Certified Technician with Ornamental Maintenance designation.

National War Memorial Structural Upgrades**SALVAGE AND REINSTATEMENT OF
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1.6 DELIVERY, STORAGE AND HANDLING

- .1 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
 - .1 Protect plant material from frost, excessive heat, wind and sun during delivery.
 - .2 Protect plant material from damage during transportation:
 - .1 Delivery distance is less than 30 km and vehicle travels at speeds under 80 km/h, tie tarpaulins around plants or over vehicle box.
 - .2 Delivery distance exceeds 30 km or vehicle travels at speeds over 80 km/h, use enclosed vehicle where practical.
 - .3 Protect foliage and root balls using anti-desiccants and tarpaulins, where use of enclosed vehicle is impractical due to size and weight of plant material.
- .2 Storage and Handling Requirements:
 - .1 Immediately store and protect plant material which has been dug and which will not be re-installed within 1 hours of digging in heeling-in location approved by Departmental Representative .
 - .2 Protect stored plant material from frost, wind and sun and as follows:
 - .1 For bare root plant material, preserve moisture around roots by heeling-in or burying roots in sand or topsoil and watering to full depth of root zone.
 - .2 For pots and containers, maintain moisture level in containers. Heel-in fibre pots.
 - .3 For balled and burlapped and wire basket root balls, place to protect branches from damage. Maintain moisture level in root zones.

1.7 WARRANTY

- .1 For the work of this section 32 93 10.1, the 12 month warranty period is extended to 24 months.

Part 2 Products**2.1 PLANT MATERIAL**

- .1 Shrubs from site as indicated dug and salvaged with a full root system and solid earth rootball balled and burlapped.
- .2 Perennials and groundcovers from site as indicated dug and salvaged with full root ball either potted or transplanted directly to heeling-in bed.

2.2 WATER

- .1 Free of impurities that would inhibit plant growth.

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2.3 MULCH

- .1 To match existing mulch used on the site.

2.4 FERTILIZER

- .1 Synthetic commercial type as recommended by soil test report .
 - .1 Ensure new root growth is in contact with mycorrhiza.
 - .2 Use mycorrhiza as recommended by manufacturer's written recommendations.

2.5 ANTI-DESICCANT

- .1 Wax-like emulsion.

Part 3 Execution**3.1 EXAMINATION**

- .1 Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts are acceptable for planting 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 and after receipt of written approval to proceed from Departmental Representative .

3.2 TRANSPLANTING AND HEELING-IN OF SALVAGED PLANT MATERIAL

- .1 Construct heeling-in bed on soft landscape surface (lawn or planting bed) to lines and profiles indicated in location on site approved by the Departmental Representative.
- .2 Inspect plant material to be salvaged with Departmental Representative prior to digging.
- .3 Dig plant material to be salvaged by hand to obtain the maximum root ball possible for each plant. Shrubs to be string-balled or balled and burlapped. Perennials to be potted or immediately transplanted to heeling-in bed.
- .4 Remove damaged roots and branches from plant material.
- .5 Apply anti-desiccant to conifers and deciduous trees in leaf.
- .6 Locate and protect utility lines.
- .7 Notify and acquire written acknowledgment from utility authorities before beginning excavation of planting pits for trees and shrubs.
- .8 Temporary Erosion and Sedimentation Control:

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- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.
- .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.
- .9 Install 200mm mulch over heeling-in bed after transplanting of plants is complete.
- .10 Water, fertilize, prune and maintain plant material until plant material can be re-instated in original locations. Follow maintenance procedures indicated in this specification.
- .11 Warrant survival of salvaged plant material in accordance with the warranty set out.
- .12 Replace any plant material that does not survive with plant material of the same original species and to size to match the existing plant material to the satisfaction of the Departmental Representative.

3.3 EXCAVATION AND PREPARATION OF PLANTING BEDS

- .1 Preparation of planting beds in accordance with Section 32 91 19.13 - Topsoil Placement and Grading.
- .2 For individual planting holes:
 - .1 Stake out location and obtain approval from Departmental Representative prior to excavating.
 - .2 Excavate to depth and width as indicated.
 - .3 Remove subsoil, rocks, roots, debris and toxic material from excavated material that will be used as planting soil for trees and individual shrubs. Dispose of excess material.
 - .4 Scarify sides of planting hole.
 - .5 Remove water which enters excavations prior to planting. Notify Departmental Representative if water source is ground water.

3.4 REINSTATEMENT PLANTING

- .1 For bare root stock, place 50 mm backfill soil in bottom of hole.
 - .1 Plant trees and shrubs with roots placed straight out in hole.
- .2 For jute burlapped root balls, cut away top one third of wrapping and wire basket without damaging root ball.
 - .1 Do not pull burlap or rope from under root ball.
- .3 For container stock or root balls in non-degradable wrapping, remove entire container or wrapping without damaging root ball.
- .4 Plant vertically in locations as indicated.

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- .1 Orient plant material to give best appearance in relation to structure, roads and walks.
- .5 For trees and shrubs:
 - .1 Backfill soil in 150 mm lifts.
 - .1 Tamp each lift to eliminate air pockets.
 - .2 When two thirds of depth of planting pit has been backfilled, fill remaining space with water.
 - .3 After water has penetrated into soil, backfill to finish grade.
 - .2 Form watering saucer as indicated.
- .6 For ground covers, backfill soil evenly to finish grade and tamp to eliminate air pockets.
- .7 Water plant material thoroughly.
- .8 After soil settlement has occurred, fill with soil to finish grade.
- .9 After complete, remove heeling-in bed and reinstate area to match existing with either sod or planting bed.

3.5 MULCHING

- .1 Ensure soil settlement has been corrected prior to mulching.
- .2 Spread mulch as indicated.

3.6 MAINTENANCE DURING ESTABLISHMENT PERIOD

- .1 Perform following maintenance operations from time of planting to acceptance by Departmental Representative .
 - .1 Water to maintain soil moisture conditions for optimum establishment, growth and health of plant material without causing erosion.
 - .1 For evergreen plant material, water thoroughly in late fall prior to freeze-up to saturate soil around root system.
 - .2 Remove weeds monthly.
 - .3 Replace or respread damaged, missing or disturbed mulch.
 - .4 For non-mulched areas, cultivate as required to keep top layer of soil friable.
 - .5 If required to control insects, fungus and disease, use appropriate control methods in accordance with Federal, Provincial and Municipal regulations. Obtain product approval from Departmental Representative prior to application.
 - .6 Remove dead or broken branches from plant material.
 - .7 Keep trunk protection and guy wires in proper repair and adjustment.
 - .8 Remove and replace dead plants and plants not in healthy growing condition. Make replacements in same manner as specified for original plantings.

3.7 MAINTENANCE DURING WARRANTY PERIOD

- .1 From time of acceptance by Departmental Representative to end of warranty period, perform following maintenance operations.
 - .1 Water to maintain soil moisture conditions for optimum growth and health of plant material without causing erosion.
 - .2 Reform damaged watering saucers.
 - .3 Remove weeds monthly.
 - .4 Replace or respread damaged, missing or disturbed mulch.
 - .5 For non-mulched areas, cultivate monthly to keep top layer of soil friable.
 - .6 If required to control insects, fungus and disease, use appropriate control methods in accordance with Federal, Provincial and Municipal regulations. Obtain product approval from Departmental Representative prior to application.
 - .7 Apply fertilizer in early spring as indicated by soil test.
 - .8 Remove dead, broken or hazardous branches from plant material.
 - .9 Keep trunk protection and tree supports in proper repair and adjustment.
 - .10 Remove trunk protection, tree supports and level watering saucers at end of warranty period.
 - .11 Remove and replace dead plants and plants not in healthy growing condition. Make replacements in same manner as specified for original plantings.
 - .12 Submit monthly written reports to Departmental Representative identifying:
 - .1 Maintenance work carried out.
 - .2 Development and condition of plant material.
 - .3 Preventative or corrective measures required which are outside Contractor's responsibility.

3.8 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

3.9 CLOSEOUT ACTIVITIES

- .1 Submit maintenance reports for trees, shrubs, and other plantings.

END OF SECTION