PART 1 - GENERAL

1.1 Related

.1 Section 32 11 23 Aggregate Base Courses

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM C 117-03, Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.

.2 ASTM C 131-01, 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/C136M, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.4 ASTM D 422-63(1998), Standard Test Method for Particle-Size Analysis of Soils.

.5 ASTM D 698-00a, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbs/ft^3) (600kN-m/m^3).

.6 ASTM D 1557-12el, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbs/ft^3) (2,700kN-m/m^3).

.7 ASTM D 1883-16, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.

.8 ASTM D 4318-17, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

1.3 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 22 - Construction/Demolition Waste Management And Disposal.

.2 Divert unused granular material from landfill to local facility as approved by Departmental Representative.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Granular base material: in accordance with Section 32 11 23 - Aggregate Base course 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 Granular base: Type 1 Gravel to NSTIR Standard Specification for Highway Construction and Maintenance,latest edition.

PART 3 - EXECUTION

3.1 PLACING

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

.2 Construct granular 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 base materials using methods which do not lead to segregation or degradation.

.6 For spreading and shaping material, use spreader boxes having adjustable templates or screeds which will place material in uniform layers of required thickness.

.7 Place material to full width in uniform layers not exceeding 150 mm compacted thickness. Engineer Consultant may authorize thicker lifts (layers) if specified compaction can be achieved.

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

3.1 PLACING (Cont'd)

.9 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 Efficiency of equipment not specified to be proved at least as efficient as specified equipment at no extra cost and written approval must be received from Departmental Representative before use.

.3 Equipped with device that records hours of actual work, not motor running hours.

.4 Compact to density of not less than 98% corrected maximum dry density.

.5 Shape and roll alternately to obtain smooth, even and uniformly compacted base.

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

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

.8 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 25 mm of elevation as indicated but not uniformly high or low.

3.4 PROTECTION

.1 Maintain finished base in condition conforming to this section until succeeding base is constructed, or until granular base is accepted by Departmental Representative.

END

PART 1 - GENERAL

1.1 Related Sections — Section 32 11 16.01 Granular Sub base

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM C 117-03, Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.

.2 ASTM C 131-01, 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/C136M, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.4 ASTM D 698-12e2, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbs/ft^3) (600kN-m/m^3).

.5 ASTM D 1557-12e1, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbs/ft^3) (2,700kN-m/m^3).

.6 ASTM D 1883-16, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.

.7 ASTM D 4318-17, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

1.3 DELIVERY, STORAGE, AND HANDLING

.1 Stockpile minimum 50% of total aggregate required prior to beginning operation.

.2 Store cement in weathertight bins or silos that provide protection from dampness and easy access for inspection and identification of each shipment.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 22 - Construction/Demolition Waste Management And Disposal.

.2 Divert unused granular material from landfill to local facility as approved by Departmental Representative.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Granular base: material in accordance with Section 32 11 23 - Aggregate Base Courses 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-8.1 CAN/CGSB-8.2.

PART 3 - EXECUTION

3.1 SEQUENCE OF OPERATION

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

.2 Placing
.1 Construct granular base to depth and grade in areas indicated.
.2 Ensure no frozen material is placed.
.3 Place material only on clean unfrozen surface, free from snow and ice.
.4 For spreading and shaping material, use spreader boxes having adjustable templates or screeds which will place material in uniform layers of required thickness.
.5 Place material to full width in uniform layers not exceeding 150 mm compacted thickness. Departmental Representative may authorize thicker lifts (layers) if specified compaction can be achieved.
.6 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.
.7 Remove and replace that portion of layer in which material becomes segregated during spreading.

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

.4 Compacting
.1 Compact to density not less than 100% corrected maximum dry density maximum dry density in accordance with ASTM D 698 ASTM D 1557.
.2 Shape and roll alternately to obtain smooth, even and uniformly compacted base.

3.1 SEQUENCE OF OPERATION (Cont'd)

.4 (Cont'd)

.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 Engineer Consultant.

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

3.2 SITE TOLERANCES

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

3.3 PROTECTION

.1 Maintain finished base in condition conforming to this Section until succeeding material is applied or until acceptance by Departmental Representative.

END

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Requirements and procedures for re-installing precast concrete pavers and installing new concrete pavers.

1.2 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 74 22 - Construction/Demolition Waste Management and Disposal.

1.3 REFERENCES

.1 American Society for Testing and Materials International, (ASTM).
.1 ASTM 136/C136M, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
.2 ASTM C 979/C979M-16, Standard Specification for Pigments for Integrally Colored Concrete.

.2 Canadian Standards Association (CSA International).
.1 CSA A23.1/A23.2-2014, Concrete Materials and Methods of Concrete Construction/Method of Test for Concrete.
.2 CSA A179-04(R2014), Mortar and Grout for Unit Masonry.
.3 CSA A283-06 (R2016), Qualification Code for Concrete Testing Laboratories.

1.4 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

.2 Indicate layout, pattern and relationship of paving joints to fixtures and project formed details.

1.5 SUBMITTALS

.1 Product Data:
.1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
.2 Submit following sampling and testing data:
.1 Concrete pavers.
.2 Aggregate setting bed.

1.5 SUBMITTALS (Cont'd)

.1 Product Data:(Cont'd)

.3 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's:

.1 For cleaning compounds.

.2 Samples:

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

.2 Submit full size sample of each type of paver indicated and joint materials involving colour selection.

.3 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

1.6 QUALITY ASSURANCE

.1 Qualifications:

.1 Installer: company or person specializing in precast concrete paver installations with 5 years documented experience approved by manufacturer.

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

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

.4 Mock-ups:

.1 Construct mock-up in accordance with Section 01 45 00 - Quality Control.

.2 Install 3 x 3 m area mock-up.

.3 Mock-up will be used:

.1 To judge workmanship, substrate preparation, operation of equipment and material application.

.2 To determine joint sizes, lines, laying patterns.

.3 Locate where directed where indicated.

.4 Allow 24 hours for inspection of mock-up before proceeding with work.

.5 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may not remain as part of finished work.

1.6 QUALITY ASSURANCE (Cont'd)

.4 Mock-ups:(Cont'd)
.3 Mock-up will be used:(Cont'd)
.5 (Cont'd)
Remove mock-up and dispose of materials when no longer required and when directed by Departmental Representative.

.5 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements. Comply with Section.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 22 - Construction/Demolition Waste Management and Disposal.

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

PART 2 - PRODUCTS

2.1 MANUFACTURERS

.1 Source limitations: Obtain each type of paver, joint material, and setting material from single source with resources to provide materials and products of consistent quality in appearance and physical properties.

2.2 PAVERS

.1 Size: 200mm x 100mm x 60mm.

.2 Colour: Northern.

.3 Acceptable products:
.1 Classic northern, as manufactured by Oaks Landscape Products.
.2 or equal product approved by Departmental Representative.

2.3 ACCESSORIES

.1 Joint Filler: Polymeric sand, colour to match existing paver joint filler.

2.4 AGGREGATE SETTING BED MATERIALS

.1 Graded aggregate for base: hard, durable, crushed stone particles, conforming to the gradation of concrete sand as specified in CAN/CSA A23.1, Section 5.3.2 and ASTM C136.

Sand shall be free of lumps, cementation,

2.5 CLEANING COMPOUND

.1 Clear, organic solvent, designed and recommended by manufacturer for cleaning concrete pavers of encountered contamination.

.2 Acid based chemical detergent, designed and recommended by manufacturer for removal of contamination encountered on pavers.

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 PREPARATION

.1 Regrade and compact existing granular base. Provide new gravel where required to replace unsuitable base material.

.2 Proceed with unit paver installation only after edges and base conditions have been inspected and approved by Departmental Representative.

3.3 INSTALLATION OF CONCRETE PAVERS

.1 Lay pavers in running bond pattern with soldier course edge at designated locations. Joints between pavers: max.5mm.

.2 Compact subgrade uniformly by tamping with plate vibrator.

.3 Installation by hand only:
.1 Prepare installation sequence and obtain approval of sequence by Departmental Representative.

3.3 INSTALLATION OF CONCRETE PAVERS (Cont'd)

.3 Installation by hand only:(Cont'd)
.2 Place paver pallets and other materials outside of work area.
.3 Place setting bed to a max. thickness of 25mm, taking care that moisture content remains constant and density is loose an uniform until pavers are set and compacted.
.4 Inspect pavers and remove chipped, broken or otherwise damaged pavers as directed by Departmental Representative if structural performance or aesthetics is adversely compromised.
.5 Replace pavers removed without altering layout and structural quality.

.4 Maximum 9 mm variation in finish grade of surface of adjacent pavers, and between paver surface grade.

.5 Surface elevation of pavers: 3 to 4 mm above adjacent drainage inlets, concrete collars or channels.

.6 Polymeric sand placement:
.1 After pavers have been placed, sweep polymeric sand into joints, remove excess material remaining on surface prior to activation.
.2 Do not allow traffic on installed pavers until joints have been filled.

3.4 CLEANING

.1 Carry out cleaning at times and conditions recommended by manufacturer of cleaning compound , after installation and as directed by Departmental Representative.

.2 Remove and dispose of loose, extraneous materials from surfaces to be cleaned.

.3 Apply cleaning compounds appropriate for removal of various contaminants encountered in accordance with manufacturer's recommendations.

.4 Final surface to be free of contamination.

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

3.5 FIELD QUALITY CONTROL

.1 Retain concrete testing laboratory accredited in accordance with CSA A238.

.2 Sample and test in accordance with CSA-A231.2.

END

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 31 14 11: Earthwork and Related Work.

1.2 REFERENCES

.1 ASTM D698-12e2, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort(600kN-m/m^3).

.2 ASTM D751-06(2011), Standard Test Methods for Coated Fabric.

.3 ASTM D5034-09 (2017), Standard Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test).

.4 CGSB 41-GP-29Ma-83, Tubing, Plastic, Corrugated, Drainage.

.5 ASTM C1372-16, Standard Specification for Dry Cast Segmental Retaining Wall Units.

.6 National Concrete Masonry Association (NCMA) Design Manual for Segmental Walls, Second Edition.

1.3 SAMPLES

.1 Submit samples in accordance with Section 01 33 00.

.2 Submit full size sample of each type wall unit.

1.4 SHOP DRAWINGS

.1 Submit shop drawings stamped by a Professional Engineer registered in the Province of Nova Scotia in accordance with Sections 01 33 00 and 01 78 00.

.2 Indicate layout, pattern and relationship of joints to fixtures and project formed details.

.3 Include manufacturer's test data.

1.5 PROTECTION

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

.2 Provide access to buildings at all times. Coordinate schedule to minimize interference with normal use of premises.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Precast concrete modular retaining unit: to CAN/CSA- A231.1/A231.2, smooth face.
.1 Size: Coping unit - 1000mm x 185mm x 430mm. Std unit - 1000mm x 185mm x 375mm.
.2 Colour: timberwood
.3 Acceptable products:
.1 Oaks Proterra smooth

.2 Precast concrete steps: to CAN/CSA-A231.1/A231.2, smooth face.
.1 Size: - 1200mm x 165mm x 400mm. Std unit - 1000mm x 185mm x 375mm.
.2 Colour: timberwood textured
.3 Acceptable Products: Oaks aria step

.3 Granular Material: to OPSS 1010, for:
.1 Granular A, maximum size 13.2 19.0mm.

.4 Filter fabric:
.1 Synthetic fibre: rot-proof, unaffected by action of oil or salt water and not subject to attack by insects or rodents.
.2 Fabric: woven construction supplied in rolls of minimum 3.8m width, 130m length, minimum thickness of 0.5mm and minimum weight of 160g/m^2.
.3 Seams: sewn or overlapped in accordance with manufacturer's recommendations.
.4 Physical properties:
.1 Breaking load and elongation: to ASTM D5034 Grab Test Method 25mm square jaws, constant rate of travel 300mm per minute.
.1 Stronger principal direction, 800 N.
.2 Elongation minimum 22 percent.
.2 Bursting strength: To ASTM D751, using Diaphragm Bursting Tester 1500N.
.3 Permeability: 2.2 x 10.

.5 Flexible plastic tubing and fittings: to CGSB 41-GP-29Ma. Type3 perforated with polyester sock

2.1 MATERIALS (Cont'd)

.5 (Cont'd) filter and Type 1 non-perforated, corrugated, nominal inside diameter 100 mm.

.6 Butyl tape: type recommended by wall manufacturer.

.7 Coping adhesive: Product supplied or recommended by segmental retaining wall manufacturer for adhering coping units to units below.

PART 3 - EXECUTION

3.1 SUBGRADE

.1 Ensure that subgrade preparation conforms to levels and compaction required to allow for installation of granular base and required depth of granular base behind wall.

3.2 EXCAVATION

.1 Excavate for footing to a minimum depth of 250 mm below finished grade at front of wall, or until firm original soil is reached.

.2 Excavate the width of the wall plus 350 mm minimum behind the wall for compacted granular backfill behind the wall.

.3 Where poor soils or running water is encountered, consult a soils engineer for recommendations on modifying the design to account for these problems.

3.3 GEOTEXTILE FILTER

.1 Install geotextile filter to separate native soil from the backfill material.

.2 Ensure the geotextile covers the top of the backfill and separates it from the topsoil.

3.4 GRANULAR BASE

.1 Sub-base minimum thickness: 150 mm as indicated.

.2 Spread and compact crushed stone or gravel in uniform layers not exceeding 150 mm compacted thickness.

3.4 GRANULAR BASE (Cont'd)

.3 Compact to a density of not less than 98% Standard Proctor Density in accordance with ASTM D698.

.4 Apply water as necessary during compaction to obtain specified density. If subgrade is excessively moist, aerate by scarifying with suitable equipment until moisture content is corrected.

3.5 INSTALLATION

.1 Ensure granular laying course is dry (4-8% moisture content) prior to placement of units.

.2 Level the first course and place the top of the unit flush with the desired finished grade in front of the wall.

.3 Install units true to grade, in location, layout and pattern as indicated.

.4 Where required, cut units accurately without damaging edges.

.5 Tubing laying:
.1 Ensure tubing interior and coupling surfaces are clean before laying.
.2 Lay perforated tubing to minimum slope of 1:100. Face perforations and coupling slots downward.
.3 Lay non-perforated tubing to slope of 1:100, from perforated tubing to disposal source. Make joints watertight.
.4 Do not use shims to establish tubing slope.
.5 Use fittings recommended by manufacturer.
.6 Install end plugs at ends of collector drains.
.7 Protect tubing ends from damage and ingress of foreign material.
.8 Connect non-perforated tubing to sewer by appropriate adapters manufactured for this purpose.

.6 Filter bed backfill:
.1 Place coarse filter material after tubing installation is approved by Departmental Representative.
.2 Avoid crushing flexible tubing during backfill operations. Consolidate by hand tamping lightly. Prevent displacement of tubing. Do not use a vibratory plate compactor. Place the

3.5 INSTALLATION (Cont'd)

.6 Filter bed backfill:(Cont'd)
.2 (Cont'd)
backfill in maximum 100 mm lifts and compact with a hand tamper.

.7 Backfill the wall with crushed granular fill as the height increases every two courses. Ensure compaction of the backfill as specified above. Do not use a vibratory plate compactor. Place the backfill in maximum 100 mm lifts and compact with a hand tamper.

.8 Landscape the exposed excavation to promote surface water runoff over the top of the wall. Do not allow unusual surcharge loading in the tributary area served by the wall.

.9 Use coping units manufactured for purpose.

END

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 32 92 23 Sodding.

1.2 WASTE MANAGEMENT AND DISPOSAL

.1 Divert unused soil from landfill to facility approved by Departmental Representative.

PART 2 - PRODUCTS

2.1 TOPSOIL

.1 Imported Topsoil: mixture of particulates, micro organisms and organic matter which provides suitable medium for supporting intended plant growth.

.1 Soil texture based on The Canadian System of Soil Classification, to consist of 20 to 70% sand, minimum 7% clay, and contain 2 to 10% organic matter by weight.

.2 Contain no toxic elements or growth inhibiting materials.

.3 Finished surface free from:

.1 Debris and stones over 50 mm diameter.

.2 Course vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.

.4 Consistency: friable when moist.

PART 3 - EXECUTION

3.1 PREPARATION OF EXISTING GRADE

.1 Verify that grades are correct. If discrepancies occur, notify Departmental Representative and do not commence work until instructed by Departmental Representative.

.2 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.

.3 Remove debris, roots, branches, stones in excess of 100 mm diameter and other deleterious materials. Remove soil contaminated with calcium chloride, toxic materials and petroleum products. Remove

3.1 PREPARATION OF EXISTING GRADE (Cont'd)

.3 (Cont'd) debris which protrudes more than 100 mm above surface. Dispose of removed material off site.

.4 Cultivate entire area which is to receive topsoil to minimum depth of 100 mm. Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.

3.2 PLACING AND SPREADING OF TOPSOIL

.1 Place topsoil after Departmental Representative has accepted subgrade.

.2 For all new turfgrass areas:
.1 Place 100mm consolidated depth imported topsoil unless otherwise noted.

.3 Manually spread topsoil around trees, shrubs and obstacles.

3.3 FINISH GRADING

.1 Grade to eliminate rough spots and low areas and ensure positive drainage. Prepare loose friable bed by means of cultivation and subsequent raking.

.2 Consolidate topsoil to required bulk density using equipment approved by Departmental Representative.

3.4 ACCEPTANCE

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

3.5 SURPLUS MATERIAL

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

3.6 CLEANING

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

END

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 32 91 21 - Topsoil Placement and Grading.

1.2 SCHEDULING

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

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

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. than 40% Kentucky Bluegrass cultivars and 30% Chewing Fescue or Creeping Red Fescue cultivars.

.2 Sod establishment support:
.1 Geotextile fabric: biodegradable, mm square mesh.
.2 Wooden pegs: 17 x 8 x 200 mm.
.3 Biodegradable starch pegs: 17 x 8 x 200 mm.

2.2 SOURCE QUALITY CONTROL

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

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

PART 3 - EXECUTION

3.1 PREPARATION

.1 Verify that grades are correct and prepared in accordance with Section 32 91 21- Topsoil Placement and Grading. If discrepancies occur, notify Departmental Representative and do not commence work until instructed by Departmental Representative.

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

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

3.2 SOD PLACEMENT

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

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

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

3.3 SOD PLACEMENT ON SLOPES AND PEGGING

.1 Start laying sod at bottom of slopes.

ON SLOPES AND

.1 (Cont'd)
to 1 vertical, within 1 m of catch basins and within 1 m of drainage channels and ditches to following pattern:
.1 100 mm below top edge at 200 mm on centre for first sod sections along contours of slopes.
.2 Not less than 3-6 pegs per square metre.
.3 Not less than 6-9 pegs per square metre in drainage structures. Adjust pattern as directed by Departmental Representative.
.4 Drive pegs to 20 mm above grade.

3.4 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.

END

PART 1 - GENERAL

1.1 SUMMARY

.1 Section Includes:
.1 Materials and installation for tree and shrub planting, tree support, mulching and maintenance.
.2 Sustainable requirements for construction and verification.

1.2 REFERENCES

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

1.3 SUBMITTALS

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

.2 Submit product data for:
.1 Fertilizer.
.2 Anti-desiccant.
.3 Mulch.
.4 Topsoil.

.3 Submit samples for:
.1 Mulch.
.2 Topsoil.

1.4 QUALITY ASSURANCE

.1 Health and Safety:

.1 Do construction occupational health and safety in accordance with Section 01 35 29 - Health and Safety Requirements.
.2 Divert unused wood and mulch materials from landfill to recycling composting facility approved by Departmental Representative.

1.5 SCHEDULING

.1 Obtain approval from Departmental Representative of relocation schedule 2 days in advance of relocation operation.

1.6 WARRANTY

.1 The Contractor hereby warrants that plant material as itemized on plant list will remain free of defects for 1 full growing season, one time only providing adequate maintenance has been provided.

.2 End-of-warranty inspection will be conducted by Departmental Representative.

.3 Departmental Representative 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 is not sufficient to ensure future survival.

PART 2 - PRODUCTS

2.1 PLANTING SOIL

.1 Topsoil as specified in Section 32 91 21.

2.2 MULCH

.1 Shredded wood bark: varying in size from 25 to 125 mm in length, from coniferous trees.

2.3 FERTILIZER

.1 Synthetic commercial type as recommended by soil test report manufacturer.

2.4 SOURCE QUALITY CONTROL

.1 Obtain approval from Departmental Representative of root ball excavation area prior to relocation.

PART 3 - EXECUTION

3.1 PRE-PLANTING PREPARATION

.1 Do construction occupational health and safety in accordance with Section 01 35 29 - Health and Safety Requirements.

.2 Ensure root ball size acceptable to Departmental Representative.

.3 Remove damaged roots and branches from trees.

3.2 EXCAVATION AND PREPARATION OF PLANTING BEDS

.1 For individual planting holes:
.1 Stake out location and obtain approval

from Departmental Representative prior to 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.

3.3 PLANTING

.1 Plant vertically in locations as indicated. Orient plant material to give best appearance in relation to structure, roads and walks.
.1 Backfill soil in 150 mm lifts. Tamp each lift to eliminate air pockets. When two thirds of depth of planting pit has been backfilled, fill remaining space with water. After water has penetrated into soil, backfill to finish grade.
.2 Form watering saucer as indicated.

.2 Water plant material thoroughly.

.3 After soil settlement has occurred, fill with soil to finish grade.

3.4 TREE SUPPORTS

.1 Install tree supports as indicated.

.2 Use single stake tree support for deciduous trees less than 3m in height and evergreens less than 2m in height.
.1 Place stake on prevailing wind side and 300mm minimum from trunk.
.2 Drive stake 600mm minimum into undisturbed soil beneath roots.
.1 Ensure stake is secure, vertical and unsplit.
.3 Install 150mm long guying collar 1500mm above grade.
.4 Thread Type 1 guying wire through guying collar tube.
.1 Twist wire to form collar and secure firmly to stake. Cut off excess wire.
.5 Use 3 guy wires and anchors for deciduous trees greater than 3m in height and evergreens 2m in height.
.6 Install guying collars above branch to prevent slipping at approx. 2/3 height for evergreens and 1/3 height for deciduous trees.
.7 Saw off tops of anchors which extend in excess of 100mm above grade.
.8 Install flagging tape to guys as indicated.
.9 After tree supports have been installed, remove broken branches with clean, sharp tools.

3.5 MULCHING

.1 Ensure soil settlement has been corrected prior to mulching.

.2 Spread mulch to min. 50mm depth.

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.
.2 For evergreen plant material, water thoroughly in late fall prior to freeze up to saturate soil around root system.
.3 Remove weeds (monthly).
.4 Replace or re-spread damaged, missing or disturbed mulch.

3.6 MAINTENANCE DURING ESTABLISHMENT PERIOD (Cont'd)

.1 (Cont'd)

.5 Remove dead or broken branches from plant material.

.6 Keep guy wires in proper repair and adjustment.

.7 Remove and replace deadplants and plants not in healthy growing condition. Make adjustments 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 the following maintenance operations:

.1 Water to maintain soil moisture conditions for optimum growth and health of plant material without causing erosion.

.2 Remove weeds (monthly).

.3 Replace or re-spread damaged, missing or disturbed mulch.

.4 Remove dead or broken branches from plant material.

.5 Keep guy wires and stakes in proper repair and adjustment.

.6 Remove and replace dead plants and plants not in healthy growing condition. Make adjustments in same manner as specified for original plantings.

.7 Apply fertilizer in early spring as indicated by soil test.

END