

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 31 22 13 - Rough Grading.

1.2 DEFINITIONS

- .1 Clearing consists of cutting off trees and brush vegetative growth to not more than a specified height above ground and disposing of felled trees, previously uprooted trees, brush and stumps, and surface debris.
- .2 Grubbing consists of excavation and disposal of stumps and roots, boulders and rock fragments larger than 300 mm Ø to not less than a specified depth below existing ground surface.

1.3 STORAGE AND PROTECTION

- .1 Prevent damage to fencing, trees, landscaping, natural features, bench marks, existing buildings, existing pavement, utility lines, site appurtenances, water courses, and root systems of trees, which are to remain.
 - .1 Repair any damaged items to approval of Contract Administrator.
 - .2 If damaged, replace any trees designated to remain, as directed by Contract Administrator.

Part 3 Execution

3.1 PREPARATION

- .1 Site was previously a City of Winnipeg storage yard. No trees exist on site, but rocks may need to be removed. Inspect site and verify with Contract Administrator if rock removal is required.
- .2 Locate and protect utility lines. Preserve in operating condition active utilities traversing site.
- .3 Notify utility authorities before starting clearing and grubbing.

3.2 GRUBBING

- .1 Grub out visible rock fragments, foundations, concrete, and boulders, greater than 300 mm in greatest dimension, but less than 0.25 m³.

3.3 REMOVAL AND DISPOSAL

- .1 Remove cleared and grubbed materials off site. Recycle materials if possible.

3.4 FINISHED SURFACE

- .1 Leave ground surface in condition suitable for grading operations or stripping of topsoil.

3.5 CLEANING

- .1 Remove all debris, cleared materials and equipment off site. Leave site clean and tidy ready for topsoil stripping and rough grading.

END OF SECTION

Part 1 General

1.1 DESCRIPTION

- .1 This specification shall cover the supply and installation of crushed granular paving.

1.2 RELATED SECTIONS

- .1 Section 32 91 19 - Topsoil Placement and Finish Grading

1.3 REFERENCES

- .1 ASTM International
 - .1 ASTM C136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .2 ASTM C117-04, Standard Test Method for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.
 - .3 ASTM D4318-05, Standard Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
 - .4 ASTM D698-07e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.
- .3 City of Winnipeg Standard Construction Specifications, current edition.
 - .1 CW 3110 - Sub-Grade, Sub-Base and Base Course Construction.
 - .2 CW 3130 - The Supply and Installation of Geotextile Fabrics.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver and stockpile aggregates in locations that are accessible to construction, but will not damage existing structures or landscape elements designated to remain. Stockpile minimum 50% of total granular material required prior to beginning operation.

1.5 TESTING

- .1 The inspection and testing of crushed granular paving will be carried out by a testing laboratory appointed by the Contractor and approved by the Contract Administrator. Testing laboratory to be certified in accordance with CSA A283. The Contractor shall coordinate the timing of this testing in an efficient way.
- .2 The inspection and testing of crushed granular paving will be paid for by the Contractor.
- .3 Test each course at fifteen (5) locations as directed by the Contract Administrator.
- .4 Areas that fail minimum compaction requirements shall be re-compacted and tested by the Contractor at no cost to The City.

Part 2 Products

2.1 MATERIALS

- .1 Crushed granite surface
- .2 Crushed limestone base course to CW 3110.
- .3 Non-woven geotextile fabric to CW 3130.

Part 3 Execution

3.1 INSTALLATION

- .1 Ensure sub-grade preparation conforms to levels and compaction required per CW 3110. Obtain approval of subgrade from Contract Administrator prior to commencing crushed stone walkway installation.
- .2 Place geotextile and granular base course immediately after sub-grade is inspected and approved by Contract Administrator.
- .3 Install crushed granular paving walkway in close coordination with planting medium placement and finish grading per Section 32 91 19.
- .4 Layout crushed granular paving walkway on site for Contract Administrator's approval. Obtain approval of layout and make any necessary adjustments prior to proceeding.
- .5 Place granular base course as indicated on Drawings. Spread and compact granular base course in uniform layers not exceeding 100mm.
- .6 Compact each layer in accordance with CW 3110. Add water as necessary between passes to achieve required compaction.
- .7 Submit compaction test results to Contract Administrator for review and approval prior to proceeding with limestone surface installation.
- .8 Place granite surface and compact as indicated on the Drawings.
- .9 Compact each layer in accordance with CW 3110. Add water as necessary between passes to achieve required compaction.

3.2 SURPLUS MATERIAL

- .1 Remove surplus material and material unsuitable for fill, grading or landscaping off site.

3.3 ACCEPTANCE

- .1 Obtain approval of crushed granular paving from Contract Administrator prior to proceeding with soft landscape installation.
- .2 Produce final compaction test results for deficient areas prior to proceeding with soft landscape installation.

3.4

CLEANING

- .1 Upon completion of installation, remove construction and accumulated environmental dirt, surplus materials, rubbish, tools and equipment barriers in accordance with Section 01 74 00 – Cleaning and Waste Processing.

END OF SECTION

Part 1 General

1.1 DESCRIPTION

- .1 This specification shall cover the supply and installation of painted parking stall lines, and painted accessible parking symbols.

1.2 RELATED SECTIONS

- .1 CW 3410- R12 – Asphaltic Concrete Pavement Works

1.3 REFERENCES

- .1 CAN/CGSB-1.5-M91, Low Flash Petroleum Spirits Thinner.
- .2 CGSB1-GP-12c-68, Standard Paint Colours.
- .3 CGSB1-GP-71-83, Method, of Testing Paints and Pigments.
- .4 CGSB1-GP-74M-79, Paint, Traffic, Alkyd.

1.4 SUBMITTALS

- .1 Proof of Non-Toxic Composition:
 - .1 Product data confirming chemical composition for traffic paint conforms to the latest health and environmental standards.

1.5 SAMPLES

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit to Contract Administrator following material sample quantities at least two (2) weeks prior to commencing work.
 - .1 One painted sample of each type of paint.
 - .2 Sampling to CGSB1-GP-71.
- .3 Mark samples with name of project and its location, paint manufacturer's name and address, name of paint, CGSB specification number and formulation number and batch number.

Part 2 Products

2.1 MATERIALS

- .1 Paint:
 - .1 To CGSBI-GP-74M, alkyd traffic paint.
- .2 Colour:
 - .1 White CGSBI – GP – 12C; yellow 505-308;
- .3 Thinner: to CAN/CGSB-1.5.

Part 3 Execution

3.1 EQUIPMENT REQUIREMENTS

- .1 Paint applicator to be an approved pressure type mobile distributor capable of applying paint in single, double and dashed lines. Applicator to be capable of applying marking components uniformly, at rates specified, and to dimensions as indicated, and to have positive shut-off.

3.2 CONDITION OF SURFACES

- .1 Pavement surface to be dry, free from ponding water, frost, ice, dust, oil, grease and other foreign materials. Clean paved areas as necessary to achieve acceptable surface preparation.

3.3 TRAFFIC CONTROL

- .1 Barricade areas to be painted to all vehicular traffic during installation and for 4 hours after installation.

3.4 APPLICATION

- .1 Lay out parking stall lines, accessible parking symbols and pavement games as indicated on the Drawings. Obtain Contract Administrator's approval prior to painting.
- .2 Unless otherwise approved by Contract Administrator, apply paint only when air temperature is above 10°C, wind speed is less than 60 km/h and no rain is forecast within the next eight (8) hours.
- .3 Apply traffic paint evenly at rate of 3 sq.m. per litre. Do not thin paint unless approved by Contract Administrator.
- .4 Paint lines to be 100mm wide, of uniform colour and density with sharply defined edges.
- .5 Paint parking stall lines yellow. Paint accessible parking symbols white.
- .6 Thoroughly clean distributor tank before refilling with paint of a different colour.

3.5 TOLERANCE

- .1 Paint markings to be within plus or minus 6mm of dimensions indicated, straight and true and aligned with fixed features such as curbs, sidewalks and walls.
- .2 Remove incorrect markings and re-apply at no extra cost to The City.

3.6 PROTECTION OF COMPLETED WORK

- .1 Protect pavement markings until dry.

3.7 CLEANING

- .1 Upon completion of installation, remove construction and accumulated environmental dirt, surplus materials, rubbish, tools and equipment barriers in accordance with Section 01 74 00 – Cleaning and Waste Processing.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Fence framework, fabric, and accessories.
- .2 Gates and related hardware.

1.2 RELATED REQUIREMENTS

- .1 Section 03 30 00 - Cast-in-Place Concrete: Concrete anchorage for posts

1.3 REFERENCES

- .1 ASTM International (ASTM)
 - .1 ASTM A123/A123M-15 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
 - .2 ASTM A153/A153M-16a Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
 - .3 ASTM A505-16 Standard Specification for Steel, Sheet and Strip, Alloy, Hot-Rolled and Cold-Rolled, General Requirements for
 - .4 ASTM A653/A653M-15e1 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
 - .5 ASTM A853-04(2010) Standard Specification for Steel Wire, Carbon, for General Use

1.4 SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide data on fabric, posts, accessories, fittings and hardware.
- .3 Shop Drawings: Indicate plan layout, spacing of components, hardware anchorage, and schedule of components.

1.5 QUALITY ASSURANCE

- .1 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for recycling in accordance with Section 01 74 20 – Waste Management and Disposal.

Part 2 Products

2.1 MANUFACTURERS

- .1 Omega II Fence Systems; Product: Omega 10.

2.2 SYSTEM DESCRIPTION

- .1 Vertical grating fence with rectangular design made up of 2000 wide by 2500 mm high self-supporting panels fabricated of round horizontal steel bars welded to flat steel vertical bars.

2.3 MATERIALS AND COMPONENTS

- .1 Fence Panels: Welded construction.
 - .1 Horizontal Bars: 4.88 mm diameter, spaced at 132 mm o.c. to AISI 1018 and ASTM A853.
 - .2 Vertical Bars: 25 wide by 3 mm thick flat bar, spaced at 62 mm o.c. to ASTM A505
 - .3 Frame: 25 wide by 4 mm thick plate, to AISI 1008 and ASTM A505.
 - .4 Panel height allows for 100 mm clear at bottom of panel to ground.
- .2 Posts: 79 wide by 6 mm thick flat bar, complete with base plate.
- .3 Gates:
 - .1 Gate Frames: 38 by 38 mm galvanized steel square tube horizontals, and 50 by 50 mm galvanized steel square tube verticals, minimum 1.57 mm wall thickness; complete with top caps.
 - .2 Gate Posts: Manufacturer's standard size based on gate opening size.
 - .3 Gate Panel: as specified for fence panel, welded to gate frame.
 - .4 Hinges, latches, and accessories: Manufacturer's standard for size and weight of gate; hot dip galvanized.
 - .1 Hinges: 180 deg opening, minimum two per gate.
 - .2 Latch: lever-type with U-shape closer to gate in closed position, with padlock hasp.

2.4 FABRICATION

- .1 Fasten fence panels to posts at with six galvanized carriage bolts and nuts, and support brackets.

2.5 FINISHES

- .1 Finish: Hot-dipped galvanized to ASTM A123.
 - .1 Horizontal Bars: minimum 425 g/sq m coating.
 - .2 Vertical Bars: minimum 460 g/sq m coating.
 - .3 Frame: minimum 530 g/sq m coating.
 - .4 Posts: minimum 705 g/sq m coating.
- .2 Hardware: Galvanized to ASTM A153/A153M, minimum 550 g/sq m coating.

Part 3 Execution

3.1 INSTALLATION

- .1 Install fence panels and gates to manufacturer's written instructions.

3.2 ERECTION TOLERANCES

- .1 Section 01 73 00: Tolerances.
- .2 Maximum Variation From Plumb: 6 mm.
- .3 Maximum Offset From True Position: 25 mm.

3.3 ADJUSTING

- .1 Adjust gate to operate smoothly and without binding.
- .2 Ensure latches engage accurately and securely without forcing or binding.
- .3 Lubricate hinges and other moving parts.

END OF SECTION

Part 1 General

1.1 DESCRIPTION

- .1 This specification shall cover the supply and installation of: table and chairs, picnic table and benches, lounge chairs and ottomans, bike racks, waste receptacles, and log stumps.

1.2 SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit product data for: table and chairs, picnic table and benches, lounge chairs and ottomans, bike racks, and waste receptacles. Product data to indicate dimensions, sizes, assembly, anchorage and installation details for each furnishing specified.
- .3 Order all furnishings immediately after award of Contract once product data sheets are reviewed by the Contract Administrator.
- .4 Provide templates, patterns, fixing diagrams as required or requested and list hardware and miscellaneous items.
- .5 Submit samples for:
 - .1 Log stumps
 - .2 Paint sample of stain for log stumps.

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Deliver materials to site, suitably packaged, clearly marked indicating manufacturer name and any other identifying symbols or information. Do not deliver materials long before they are required on site. Cause no delays to scheduling.
- .2 Store materials in a dry location off the ground, and prevent damage.
- .3 Replace immediately all materials damaged, or unfit for use during delivery or storage.

Part 2 Products

2.1 SITE FURNITURE

- .1 Bike Racks: Emerson Bike Rack by Landscape Forms, powdercoated silver, surface mounted. Landscape Forms ph 1-416-968-6655 or email LeeD@landscapeforms.com. <http://www.landscapeforms.com/en-US/product/Pages/Concord-Collection-Emerson-Bike-Rack.aspx>
- .2 Waste and Recycling Receptacle: Select Recycling System by Landscape Forms – triple unit, powdercoated silver, surface mounted. Signage placement: 8” x 8” Multi-Use Opening. Signage choices: 01 “Paper”, 06 “Aluminum Glass Plastic” and 13 “Waste Only”. Landscape Forms Contact Lee Day: ph 1-416-968-6655 or email LeeD@landscapeforms.com. <http://www.landscapeforms.com/en-US/product/Pages/Select-Recycling-System.aspx>

2.2 READING AREA ELEMENTS

- .1 Log Stump: 300 to 900mm DIA. tamarack or hardwood, smooth finish top, set above grade 300-450 height. Stain Colour: to be determined from full range of colours. Contractor to submit log samples to Contract Administrator for approval prior to Construction.

Part 3 Execution

3.1 RELATED WORK

- .1 Ensure that all related work has been approved by the Contract Administrator prior to commencing site furniture, and log stump installation.

3.2 GENERAL SITE FURNITURE INSTALLATION

- .1 Assemble furnishings in accordance with manufacturer's instructions. Obtain Contract Administrator approval of assembled furnishings prior to mounting.
- .2 Stake out or mark site furniture locations on site for Contract Administrator approval prior to installation.
- .3 Install all furnishings true, plumb, anchored and firmly supported to the manufacturers express written specifications, and as shown on the Drawings.
- .4 Touch-up damaged finishes with matching paint available from the supplier, to approval of Contract Administrator.

3.3 READING AREA ELEMENTS INSTALLATION

- .1 Log Stump: Install at locations indicated on the Drawings. Verify layout on site with Contract Administrator prior to installation. Install logs over compacted granular and backfill with compacted ¼ down granular.

3.4 CLEANING

- .1 Upon completion of installation, remove construction and accumulated environmental dirt, surplus materials, rubbish, tools and equipment barriers in accordance with Section 01 74 00 – Cleaning and Waste Processing.

3.5 ACCEPTANCE

- .1 Site furnishings, including log stumps, will be subject to a thorough field inspection and will not be accepted until all workmanship and deficiencies have been addressed.

END OF SECTION

Part 1 General

1.1 DESCRIPTION

- .1 This specification shall cover the supply and installation of reflective metal traffic and information signs and site interpretation signs as indicated on the Drawings.

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A276-91a, Specification for Stainless and Heat-Resisting Steel Bars and Shapes.
 - .2 ASTM B209M-92a, Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - .3 ASTM B210M-92a, Specification for Aluminum-Alloy Drawn Seamless Tubes.
 - .4 ASTM B211M-92a, Specification for Aluminum and Aluminum-Alloy Bar, Rods and Wire.
- .2 Canadian Standard Association (CSA)
 - .1 CAN/CSA-G40.21-M92, Structural Quality Steels.
 - .2 CAN/CSA-G164-M92, Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CSAW47.2-M1987, Certification of Companies for Fusion Welding of Aluminum.
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.94-M89, Xylene Thinner (Xylol).
 - .2 CAN/CGSB-1.99-92, Exterior and Marine Phenolic Resin Varnish.
 - .3 CAN/CGSB-1.104-M91, Semigloss Alkyd Air Drying and Baking Enamel.
 - .4 CAN/CGSB-1.132-M90, Zinc Chromate Primer, Low Moisture Sensitivity.
 - .5 CGSB1-GP-12c-65, Standard Paint Colours.
 - .6 CGSB31-GP-3M-88, Corrosion Preventive Compound, Cold Application, Soft Film.
 - .7 CGSB31-GP-101Ma-89, Chemical Conversion Films for Aluminum and Aluminum Alloys.

1.3 SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit product data for reflective metal signs indicating dimensions, sizes, assembly, anchorage, colour and installation details for each sign type specified.
- .3 Contract Administrator shall submit original artwork to the Contractor in format required by sign fabricator (vector based Illustrator, DXF, DWG and PDF formats possible). Contact Aileen Zubriski at 204-944-9907 to obtain graphic data.
- .4 Submit product data and shop drawings for exterior interpretive signs indicating dimensions, sizes, assembly, anchorage, graphic quality, finish and installation details. Sample to be min 300x300mm.

1.4 QUALITY ASSURANCE

- .1 All workmanship and all materials furnished and supplied under this Specification shall be of the highest standards and are subject to close and systematic inspection and testing by the Contract Administrator including all operations, from the selection of materials, through to final acceptance of the work.

- .2 Strict conformance to the Specification will be enforced. The Contractor shall be wholly responsible for the control of all operations incidental thereto notwithstanding any inspection or approval that may have been previously given.
- .3 The Contract Administrator reserves the right to reject any materials or works that are not in accordance the requirements of this Specification.

Part 2 Products

2.1 REFLECTIVE METAL SIGNS

- .1 Aluminum Metal Panel: 0.90 gauge thick metal plate, sign grade, aluminum panel 5052 H36 or H38, size and shape as indicated on drawings.
- .2 Sheeting: 3M Brand Scotchlite Series 3200 Engineering Grade Reflective Sheeting, or equivalent, complete with permanent pressure sensitive adhesive backing. Sheeting colours as noted on drawings. Sheeting to comply with ASTM D4956-90.
- .3 Inks: Matched, UV stable, waterproof transparent inks as required. 3M Scotchlite 700 series, enamel baked ink system or approved equal in accordance with B6.
- .4 Artwork: to be provided in digital (DXF or EPS) format or any other standard, cross-platform required by manufacturer. This artwork is the property of The City, and shall not be reproduced in any quantity or for any purpose outside the parameters of this Contract without the express written permission of The City.
- .5 Final Design of artwork for parking signs to be coordinated with the Contract Administrator and The City.
- .6 Mounting Hardware:
 - .1 Schedule 63mm diameter, hot dipped galvanized sign posts.
 - .2 Hot-dipped galvanized screws capable of securely fixing signage in place. Sizes as noted on Drawings.

Part 3 Execution

3.1 REFLECTIVE METAL SIGNS FABRICATION AND INSTALLATION

- .1 Debur, degrease, & etch edges of sign plates to accept reflective sheeting decals in accordance with decal manufacturer's recommendations.
- .2 Apply sheeting in accordance with manufacturer's specifications. Decals shall be centred precisely on base plate. Trim sheeting to form clean, smooth edge along perimeter of base plates.
- .3 Install cast-in-place concrete pile bases. Concrete as per section 03 30 00 – Cast-in-Place Concrete.
- .4 Fasten signage as indicated on Drawings. Confirm sign orientation on site with Contract Administrator.

3.2 TOUCH UP

- .1 Clean any damaged sign frame surfaces with wire brush and touch-up with clear exterior zinc rich sealant.
- .2 Touch up graphic signs as recommended by the sign product supplier.
- .3 Signs that can not be touched up in the field to the Contract Administrators satisfaction will need to be removed , reproduced and reinstalled prior to final approval.

3.3 CLEANING

- .1 Upon completion of installation, remove construction and accumulated environmental dirt, surplus materials, rubbish, tools and equipment barriers in accordance with Section 01 74 00 – Cleaning and Waste Processing.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 03 30 00 – Cast-in-Place Concrete.
- .2 Section 03 30 01 – Concrete Walks, Curbs, and Gutters.
- .3 Section 31 22 13 – Rough Grading.

1.2 REFERENCES

- .1 Agriculture and Agri-Food Canada
 - .1 The Canadian System of Soil Classification, Third Edition, 1998.
- .2 Canadian Council of Ministers of the Environment
 - .1 PN1340-2005, Guidelines for Compost Quality.
- .3 U.S. Environmental Protection Agency (EPA)/Office of Water
 - .1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.3 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Quality control submittals:
 - .1 Soil testing: submit certified test reports showing compliance with specified performance characteristics and physical properties as described in PART 2 - SOURCE QUALITY CONTROL.
 - .2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.4 QUALITY ASSURANCE

- .1 Pre-installation meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements in accordance with Construction Progress Schedules – Horizontal Bar Chart.

Part 2 Products

2.1 IMPORTED TOPSOIL

- .1 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 Topsoil shall be free of subsoil contamination, roots, stones, or clay lumps over 40 mm in diameter and other extraneous matter. Salinity rating less than 2.5 dS/m and a pH range of 6.5-8.0. Topsoil shall not contain quack grass rhizomes, Canada thistle roots or other noxious weeds.
 - .3 Fertility: major soil nutrients present in following amounts:
 - .1 Nitrogen N: 20 to 40 micrograms of available N per gram of topsoil.
 - .2 Phosphorus P: 40 to 50 micrograms of phosphate per gram of topsoil.

- .3 Potassium K: 75 to 110 micrograms of potassium per gram of topsoil.
- .4 Calcium, magnesium, sulphur and micro-nutrients present in balance ratios to support germination and/or establishment of intended vegetation.
- .4 Topsoil shall not be blown dirt deposited in ditches along wind erosion sites.
- .5 Topsoil shall not be taken from fields abandoned to corn production where such soil may contain soil-incorporated herbicides with lasting residual effects such as Eradicane and Atrazine.
- .6 Contain no toxic elements or growth inhibiting materials.
- .7 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.
- .8 Consistence: friable when moist.

2.2 SOIL AMENDMENTS FOR IMPORTED AND STOCKPILED TOPSOIL

- .1 Fertilizer:
 - .1 Synthetic slow release starter fertilizer with a N-P-K analysis of 12-36-15 ration at a rate of 4 kg/ 100 m² (8 lb / 100 ft. 2)
- .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 minimum size: 5 mm.
- .3 Sand: washed coarse silica sand, medium to course textured.
- .4 Organic matter: compost Category B in accordance with CCME PN1340, unprocessed organic matter, such as rotted manure, hay, straw, bark residue or sawdust, meeting the organic matter, stability and contaminant requirements.
- .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 Contract Administrator of sources of imported topsoil and site topsoil to be utilized with sufficient lead time for testing.
- .2 Contractor is responsible for amendments to the planting medium as specified.
- .3 Planting mix testing shall be completed by a by recognized testing facility for pH, P and K, organic matter, and conductivity.
- .4 Testing of planting mix will be carried out by testing laboratory designated by Contract Administrator as set out in Section 01 21 00 Allowances.
 - .1 Planting medium sampling, testing and analysis to be in accordance with Provincial standards.

Part 3 Execution

3.1 PLANTING MIX

- .1 Planting beds and seeded areas:
 - .1 45% Topsoil (imported or stockpiled)
 - .2 35% Peat
 - .3 15% Sand
 - .4 5% Compost
- .2 All components of planting medium mix must be well mixed, following crushing and screening.
- .3 Test soil after mixing to determine amendments necessary after placement.

3.2 PREPARATION OF EXISTING GRADE

- .1 Verify that subgrades are correct.
 - .1 If discrepancies occur, notify Contract Administrator immediately.
- .2 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.
- .3 Remove debris, roots, branches, stones in excess of 50 mm diameter and other deleterious materials.
 - .1 Remove soil contaminated with calcium chloride, toxic materials and petroleum products.
 - .2 Remove debris which protrudes more than 75 mm above surface.
 - .3 Dispose of removed material off site.
- .4 Cultivate entire area which is to receive planting medium to minimum depth of 150 mm.
 - .1 Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.

3.3 PLACING AND SPREADING OF PLANTING MEDIUM

- .1 Place planting medium after Contract Administrator has accepted subgrade.
- .2 Spread topsoil in uniform layers not exceeding 150 mm.
- .3 For sodded areas keep topsoil 15 mm below finished grade.
- .4 Spread topsoil to following minimum depths after settlement.
 - .1 100 mm for seeded areas.
 - .2 100 mm for sodded areas.
 - .3 300 mm for shrub beds.
- .5 Manually spread topsoil/planting soil around trees, shrubs and obstacles.

3.4 SOIL AMENDMENTS

- .1 Apply lime, sulphur or other soil amendment at rate determined and recommended by the soil testing laboratory.
- .2 Mix soil amendment well into full depth of planting medium by cultivating or rototilling prior to application of fertilizer.

3.5 APPLICATION OF FERTILIZER

- .1 Spread fertilizer over entire area of planting medium at rate determined by soil testing.
- .1 Incorporate into top 50mm depth of planting media by means of cultivation or raking.

3.6 FINISH GRADING

- .1 Grade to eliminate rough spots and low areas and ensure positive drainage.
 - .1 Prepare loose friable bed by means of cultivation and subsequent raking.
- .2 Consolidate topsoil to required bulk density using equipment approved by Contract Administrator.
 - .1 Leave surfaces smooth, uniform and firm against deep footprinting.

3.7 ACCEPTANCE

- .1 Contract Administrator will inspect and take final samples to test installed planting mix to determine acceptance of material, depth of topsoil and finish grading.
- .2 Should tests deem planting mix does not meet the physical and chemical requirements of this specification the Contractor shall amend mix and pay for additional testing until such time as mix meets requirements and is accepted by the Contract Administrator.
- .3 Obtain final approval of topsoil placement and finish grading from Contract Administrator prior to installing all soft landscape finishes.

3.8 SURPLUS MATERIAL

- .1 Dispose of materials except topsoil not required off site.

3.9 CLEANING

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.
- .2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

Part 1 General

1.1 DESCRIPTION

- .1 This specification shall cover the supply and installation of mixed grassland and mixed fescue areas, as indicated on the Drawing L-100 Site Layout & Materials Plan.

1.2 SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit product data for:
 - .1 Seed.
 - .2 Fertilizer.
- .3 Submit samples for:
 - .1 Mixed Grassland Seed Mix
 - .2 Butterfly Garden Wildflower Mix
 - .3 Eco-Lawn Seed Mix

1.3 QUALITY ASSURANCE

- .1 Installer:
 - .1 Seed

Part 2 Products

2.1 TOPSOIL

- .1 Topsoil per Section 32 91 19 – Topsoil Placement and Finish Grading.

2.2 MIXED GRASSLAND SEED

- .1 All seed is to be Certified Canada No. 1 in accordance with Government of Canada “Seeds Act” and “Seeds Regulations”, having minimum purity of 97%, free of disease, weed seeds, or other foreign materials and meeting the standard mix blend listed below.
- .2 Mixed Grassland Seed:
 - .1 90% Pickseed native grass mix ‘Mixed Grassland’, as supplied by Pickseed Western Canada, 1-204-633-0088, www.pickseed.com. Seed ratio of 1.8kg/100m².
 - .2 10% Prairie Originals Butterfly Garden wildflower mix, as supplied by Prairie Originals, 1-866-296-0928, www.prairieoriginals.com:
- .3 Mixed Fescue Seed:
 - .1 100% Sage Garden ‘Eco-Lawn’ mix, as supplied by Sage Garden Herbs, 1-204-257-2715, www.herbs.mb.ca. Seed ratio of 2kg/100m².
- .4 All seed to be delivered in packages individually labeled in accordance with “Seeds Regulations” and indicating name of supplier and date bagged.

- .5 All seed to be from local sources.
- .6 Provide the following product data for each type of seed mix:
 - .1 Seed Analysis
 - .1 % of pure seed by weight.
 - .2 % of germination or % of pure living seed.
 - .3 Year of seed production.
 - .2 Seed Tags Starting
 - .1 Date when tagged.
 - .2 Location.
 - .3 Weight.
 - .4 Name and address of distributor.
 - .5 % of seed variety by weight in seed mixture.

2.3 WATER

- .1 Free of impurities that would inhibit germination and growth.

2.4 HERBICIDES

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

2.5 FERTILIZER

- .1 Synthetic start-up slow release fertilizer with a N-P-K analysis of 12-36-15 ratio at a rate of 4 kg per 100 m² which is 8 Pounds per 100 sq ft., to Canada "Fertilizers Act" and "Fertilizers Regulations".

2.6 SNOW FENCE

- .1 Barrier Material: plastic UV stabilized, high density polyethylene web snow fence, international orange colour, 1.22 meter height, or approved equal in accordance with B6.
- .2 Snow Fence Supports: rolled steel T-bar fence posts, or approved equal in accordance with B6.

2.7 HYDRO MULCH

- .1 Per section 32 92 20 - Hydro Mulching.

2.8 EQUIPMENT

- .1 All equipment shall be of a type approved by the Contract Administrator and shall be kept in good working order. Ensure equipment will not damage existing vegetation.

Part 3 Execution

3.1 SCHEDULING

- .1 Schedule seeding immediately following planting medium placement and finished grading, within forty-eight 48 hours.

- .2 If seed installation cannot be completed within 48 hours and weeds germinate in the seeded areas, weed eradication via manual and chemical means, soil sterilization and soil re-fertilization measures shall be completed by the Contractor, at no additional cost to The City.
- .3 Schedule seeding immediately prior to 32 92 20 - Hydro Mulching.
- .4 Schedule installation of snow fence immediately after Hydro Mulching.

3.2 SEED BED PREPARATION

- .1 Do not perform work under adverse field conditions such as frozen soil, excessively wet or dry soil covered with snow, windy conditions, ice, or standing water.
- .2 Remove and dispose of weeds; debris; stones 50mm in diameter and larger; soil contaminated by oil, gasoline and other deleterious materials; off site as directed by Contract Administrator.
- .3 Fine grade surface free of humps and hollows to smooth, even grade per Section 32 91 19 – Topsoil Placement and Finish Grading.
- .4 Verify that finish grades are correct and planting medium has no settled adversely since acceptance. If discrepancies occur, notify Contract Administrator and do not commence seeding until instructed by Contract Administrator.
- .5 Cultivate and roll seed bed prior to seeding.
- .6 Fertilize areas to be seeded two (2) weeks or less, prior to seeding operations, with starter fertilizer.

3.3 SEED PLACEMENT

- .1 The Contractor shall not commence seeding operations until the finished surface is inspected and approved by the Contract Administrator.
- .2 The Contract Administrator shall be notified minimum seventy-two (72) hours prior to commencing seeding, and will provide full time monitoring of seeding operations. The Contractor is not to proceed with any Work under this section without the Contract Administrator present on site.
- .3 Sow all seed mixes using a "Brillion" type mechanical landscape seeder, which accurately places seed at specified depth and rate and rolls in single operation.
- .4 Sow half of the required amount of seed in one direction and remainder at right angles to the original pass.
- .5 Incorporate seed by light raking in cross directions. Blend applications into existing adjacent grass areas to form uniform surfaces where applicable.
- .6 Consolidate seeded areas by rolling area to form a uniform even surface, level with adjoining curbs, sidewalks or sod, using equipment approved by the Contract Administrator.

- .7 Seeding operations shall be completed within a forty-eight hour period after the commencement of operations. This shall be deemed to include the application of seed, hydro mulching, and snow fence installation.
- .8 Install snow fence around seeded areas to prevent foot traffic and access during seed establishment. Maintain snow fence until final acceptance.

3.4 MAINTENANCE DURING ESTABLISHMENT PERIOD

- .1 Perform following operations from time of installation until acceptance by Contract Administrator:
 - .1 Water seeded area in sufficient quantities and at frequency required to maintain optimum soil moisture condition to depth of 75 to 100mm.
 - .2 Repair and reseed dead or bare spots to allow establishment of seed prior to acceptance.
 - .3 For the first growing season, mow the weeds when they reach 200-300mm cut to 100-150mm, approximately four (4) to six (6) times within the first year, or once every three (3) weeks.
 - .4 In the second growing season year, mow the seeded areas very low, about 2.5cm or 1 inch. Do not mow the planted perennials.
 - .5 If weeds are still present in the second year, mow in mid June to a height of 30 cm / 12". Do not mow the planted perennials.
 - .6 Maintain seeded areas 95% weed free.
 - .7 Fertilize as recommended by soil test results.

3.5 FINAL ACCEPTANCE

- .1 Final acceptance of seeded areas shall be performance based not time based.
- .2 Seeded areas will be accepted provided that:
 - .1 Seeded areas meet the seed mixture requirements specified when a 1 x 1 meter random sample is taken at three (3) locations on site.
 - .2 Seeded areas are properly established and turf is free of rutted, eroded, bare or dead spots and free of all noxious weeds.
 - .3 Seeded area show signs of vigorous and even growth to the satisfaction of the Contract Administrator.
 - .4 Seeded area has been cut at least twice (proof must be provided).
 - .5 Seeded area has been fertilized at least once (proof must be provided).

3.6 CLEANING

- .1 Upon completion of installation, remove construction and accumulated dirt, surplus materials, rubbish, tools and equipment barriers in accordance with section 01 74 00 – Cleaning and Waste Processing.

END OF SECTION

PART 1 General

1.1 RELATED SECTIONS

- .1 Section 32 92 19 - Mechanical Seeding.

PART 2 Products

2.1 MULCH

- .1 Wood cellulose fibre product free of germination or growth inhibiting ingredients and shall form, after application, a blotter-like ground cover which will allow absorption and percolation of water. Acceptable products: Silva-Fibre, or approved equal in accordance with B6.

2.2 TACKIFIER

- .1 All wood cellulose fibre mulch shall be applied in a slurry containing a tackifier at a rate as directed by the manufacturer. Acceptable products: Terra Tack II, Turf Master Hydroseal or Curisol AH, or approved equal in accordance with B6.

PART 3 Execution

3.1 CONSTRUCTION METHOD

- .1 Obtain approval of seeding by the Contract Administrator prior to hydro mulching operations.
- .2 Apply hydro mulch within 24 hours of seeding.
- .3 Prior to beginning hydro mulching operations, the Contractor shall place marker stakes throughout the project site to delineate the area to be covered by each tank load of slurry mix. Each tank load of mix shall be completely and evenly discharged over the entire area bounded by the stakes. Materials shall be mixed as required and installed to meet the following rates of application and as required by mulch and tackifier manufacturer's specifications:
 - .1 Mulch: 2000 kg/ha; (20 kg/100 m²).
 - .2 Tackifier: 50 kg/ha; (0.5 kg/100 m²).
 - .3 Water: As required to completely suspend all material.

END OF SECTION

Part 1 General

1.1 DESCRIPTION

- .1 This specification shall cover the supply and installation of sod over topsoil at high traffic entry areas on the Transcona Library Site as noted on L-100 Site Layout & Materials Plan.

1.2 RELATED SECTIONS

- .1 Section 32 91 19 – Topsoil and Finished Grading

1.3 SUBMITTALS

- .1 Submittals in accordance with section 01 33 00 – Submittal Procedures.
- .2 Submit:
 - .1 Sod sample.
 - .2 Install approved sample in one square meter mock-ups and maintain in accordance with maintenance requirements during establishment period.
- .3 Obtain approval of sample by Contract Administrator.

1.4 QUALITY ASSURANCE

- .1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

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 100% Kentucky Bluegrass cultivars with a minimum of three (3) number one named Kentucky Bluegrass cultivars.
 - .2 Turf Grass Nursery Sod quality:
 - .1 Not more than 2 broadleaf weeds or 10 other weeds per 40 square meters.
 - .2 Density of sod sufficient so that no soil is visible from height of 1500 mm when mown to height of 50mm.
 - .3 Mowing height limit: 35 to 65mm.
 - .4 Soil portion of sod: 6 to 15mm in thickness.
 - .3 Water: potable
 - .4 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 approval from Contract Administrator of sod at source.
- .2 When proposed source of sod is approved, use no other source without written authorization from Contract Administrator.

Part 3 Execution

3.1 PREPARATION

- .1 Verify that grades are correct and prepared in accordance with section 32 91 19. If discrepancies occur, notify Contract Administrator and do not commence work until instructed by Contract Administrator.
- .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, per section 32 91 19.
- .4 Remove and dispose of weeds; debris; stones 50mm in diameter and larger; soil contaminated by oil, gasoline and other deleterious materials; off site in location as directed by Contract Administrator.

3.2 SOD PLACEMENT

- .1 Lay sod within 24 hours of being lifted if air temperature exceeds +20° 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 with 90 kg roller.

3.3 ESTABLISHMENT PERIOD

- .1 Perform the following operations from time of installation until thirty (30) days following the issuance of Certificate of Substantial Completion.
- .2 Water sodded areas in sufficient quantities and at frequency required to maintain optimum soil moisture condition to depth of 75 to 100mm.
- .3 Cut grass to 50mm when or prior to it reaching height of 75mm. Remove clippings which will smother sodded areas.
- .4 Maintain sodded areas weed free 95%.

3.4 ACCEPTANCE

- .1 Turf Grass Nursery Sod areas will be accepted by the Contract Administrator provided that:
 - .1 Sod has clearly rooted into the planting medium below and growing vigorously.
 - .2 Sod is free of bare and dead spots with no surface soil visible from height of 1500mm after grass has been cut to 50mm ht.
 - .3 Sodded areas have been cut a minimum two (2) times.

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

3.5 CLEANING

- .1 Upon completion of installation, remove construction and accumulated environmental dirt, surplus materials, rubbish, tools and equipment barriers in accordance with section 01 74 00 – Cleaning and Waste Processing.

END OF SECTION

Part 1 General

1.1 DESCRIPTION

- .1 This specification shall cover the maintenance of trees and shrubs, planting beds, and sodded areas. In general, work shall include spring-cleaning, watering, mowing, weed control, pest and disease control, pruning, and winter preparation.

1.2 RELATED SECTIONS

- .1 32 93 10 Trees, Shrubs and Groundcover Planting
- .2 32 92 19 Mechanical Seeding
- .3 32 92 21 Sodding

1.3 MAINTENANCE PERIOD

- .1 Provide maintenance of sodded areas, planting beds, shrubs, perennials and groundcovers from date of installation until one (1) year after the date of issuance of Certificate of Total Performance.
- .2 This maintenance is in addition to the maintenance during establishment period specified in Section 32 92 20 and 32 92 21.
- .3 Maintenance Period begins on the first day of the month after which the 30 day establishment period is completed in sections 32 92 20 and 32 92 21.

1.4 PROTECTION

- .1 Prevent damage to all completed site amenities including site fencing, trees, landscaping, naturalize areas, lawns, bench marks, buildings, pavement, play features, site furnishings, site lighting, surface and underground utilities. Make good any damage.

Part 2 Products

2.1 MATERIALS

- .1 Materials to conform to the requirements of related specification Sections.
- .2 Herbicide: (for control of weed flushes). To meet Manitoba Non-Essential Pesticide and Herbicide use regulations MR 286/2014 or latest. Go to the following site for additional resources: <http://www.gov.mb.ca/agriculture/crops/guides-and-publications/#wclta>

2.1 EQUIPMENT

- .1 Provide all equipment to properly execute work and maintain such equipment in a workable, safe condition during use of this project.
- .2 Obtain approval by Contract Administrator of equipment to be used to execute work. Use only approved equipment.

Part 3 Execution

3.1 GENERAL

- .1 Schedule start up meeting with Contract Administrator prior to proceeding with maintenance procedures
- .2 Keep detail log record of maintenance operations with time, location, operation, amount of material and equipment used.
- .3 Submit log record to Contract Administrator on weekly bases and in compliance with specification Section 01 33 00 Submittal Procedures.
- .4 Prepare a Maintenance Operations Log Book for the maintenance crew foreman to fill out upon each maintenance visit to Sage Creek School listing time in, time out and operations completed. House log book at the Sage Creek School main office and train the foreman to complete this task upon each visit.
- .5 Program timing of operations to growth, weather conditions and use of site. Do each operation continuously and complete within reasonable time period.
- .6 Do each operation continuously and complete within reasonable time period.
- .7 Store equipment and materials off site unless express provisions to store equipment on site have been reached with The City.
- .8 Collect and dispose of debris or excess material off site during every visit. Do not leave refuse on the site or dump maintenance by product or debris into the Facilities waste and recycling bins.

3.2 SPRING CLEANING

- .1 Sodded Areas: Rake areas and remove dead vegetation, leaves and debris. Do heavy raking with flexible grass rake on areas with "snow mould". Roll lightly areas where grass plants have lifted due to frost action.
- .2 Planting Beds: Clean beds and planters of debris, refuse and dead plant material. Weed as necessary and top up mulch where degraded to below the original specified depths.

3.3 WATERING

- .1 Apply water as required to supplement rainfall and to maintain optimum growing conditions. In general, water once a week to achieve rates as indicated. Allow soil to adequately dry between watering to prevent over saturation without creating water stress.
- .2 Sodded Areas:
 - .1 During establishment period, water as required to maintain moisture penetration of 100mm. Ensure minimum moisture penetration of 100mm for each application.
 - .2 Thereafter, water as required to replenish available moisture to a depth of 100mm (approximately 25mm precipitation per week).
- .3 Planting Beds:

- .1 Water heavily once a week after 30 day establishment period is complete.
- .2 Provide supplemental water during extended periods with no precipitation.

- .4 Apply water in soft spray to avoid packing of soil. Do not impede use of sidewalk and other paved areas.

3.4 MOWING OF SODDED AREAS

- .1 Mow sod at regular intervals to maintain grass to a height of 50 mm. Cut grass before it reaches 75 mm height. Remove grass clippings. Hand trim or use edger for grass adjacent to buildings, pavement, trees, fences. Trim grass edges around planting beds neatly in lines as in original layout.
- .2 Sod cutting operations include picking up and disposal of paper and refuse accumulated on landscaped areas prior to mowing.

1.2 SEEDED AREAS

- .1 Maintenance of seeded areas is not part of this section and shall be completed by the pre-qualified certified installers identified in section 32 92 17 Mechanical Seeding.

3.5 FERTILIZING

- .1 To Canada "Fertilizers Act" and "Fertilizers Regulations".
- .2 Rate, ratio and frequency as recommended by soil test results and plant health.

3.6 WEED CONTROL

- .1 Maintain site free of weeds using manual weeding operations in planting beds and sodded areas. Do not allow weeds to establish for a period longer than 3 weeks.
- .2 Apply herbicide in keeping with provincial regulations only when it will not cause damage to other plantings. Do not use of dicamba and picloram solutions.

3.7 PEST AND DISEASE CONTROL

- .1 Control pests and disease through pruning or application of pesticides. Use species specific pesticides where possible. Use only pesticides of low mammalian toxicity that meet MB Non-Essential Pesticide Regulation MR 286/2014. Strictly follow manufacturer's written instructions.

3.8 WINTER PREPARATION

- .1 Rake and assemble leaves after they have been shed by trees. Remove from site.
- .2 Clean out planting beds. Remove debris from site.
- .3 Protect trees from rodent damage using approved plastic protector beyond snow line or by applying rodent repellent sprays. Use spray to protect shrubs as required.
- .4 Water planting beds and trees thoroughly during the fall season. Ensure adequate moisture in root zones of plant material prior to freeze-up.
- .5 Apply anti-desiccant to evergreen trees and shrubs susceptible to winter desiccation.

3.9 FINAL ACCEPTANCE

- .1 The Contract Administrator, owner and soft landscape Contractor will conduct a one year plant warranty and landscape maintenance review.
- .2 Sodded and Planted Areas installed under sections 32 92 20 to 32 92 21 will be accepted by the Contract Administrator provided that:
 - .1 Sodded areas are healthy and vigorous and meet the acceptance standards specified in Section 32 92 21 - Sodding.
 - .2 Trees, shrubs and groundcovers are showing growth and vigour satisfactory to the Contract Administrator.
- .3 Sodded and Planted Areas will not be considered accepted until the Contract Administrator issues a final report stipulating that the installation is complete and accepted as maintained.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 31 22 13 - Rough Grading.
- .3 Section 32 91 19 – Topsoil Placement and Finish Grading.

1.2 REFERENCES

- .1 Agriculture and Agri-Food Canada (AAFC).
 - .1 Plant Hardiness Zones in Canada-2000.
- .2 Canadian Nursery Landscape Association (CNLA).
 - .1 Canadian Standards for Nursery Stock-2006, 8th Edition

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 Guying assembly including clamps, collar, guying wire, anchors and wire tightener.
 - .4 Wood chip mulch.
- .3 Submit samples for:
 - .1 Wood chip mulch.

1.4 QUALITY ASSURANCE

- .1 Obtain approval or plant material at source.
- .2 Notify Contract Administrator of source of material at least seven (7) days in advance of shipment. No work under this Section is to proceed without approval.
- .3 Acceptance of plant material at source does not prevent rejection on site prior to or after planting operations.
- .4 Imported plant material must be accompanied with necessary permits and import licenses. Conform to federal and provincial regulations.

1.5 STORAGE AND PROTECTION

- .1 Protect plant material from frost, excessive heat, wind and sun during delivery.
- .2 Immediately store and protect plant material which will not be installed within 4 hours after arrival at site in storage location approved by Contract Administrator.
- .3 Protect plant material from damage during transportation:

- .1 When 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 When 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.
- .4 Protect stored plant material from frost, wind and sun and as follows:
 - .1 For pots and containers, maintain moisture level in containers.
 - .2 For balled and burlapped and wire basket root balls, place to protect branches from damage. Maintain moisture level in root zones.

1.6 SCHEDULING

- .1 Obtain approval of species alternatives prior to ordering plant material.
- .2 Order plant material as soon as possible after award of Contract to ensure plant availability.
- .3 Obtain approval from Contract Administrator of schedule 14 days in advance of shipment of plant material.
- .4 Schedule to include:
 - .1 Quantity and type of plant material.
 - .2 Shipping dates.
 - .3 Arrival dates on site.
 - .4 Planting Dates.

1.7 WARRANTY

- .1 The Contractor shall warrant that plant material as itemized on plant list will remain free of defects in accordance with General Conditions, for twelve (12) months, after the date of Substantial Performance, providing adequate maintenance has been provided.
- .2 End-of-warranty inspection will be conducted by Contract Administrator.
- .3 The Contract Administrator 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.
- .4 All replacement plant material subject to an additional one (1) year of warranty.

Part 2 Products

2.1 PLANT MATERIAL

- .1 Type of root preparation, sizing, grading and quality: comply to Canadian Standards for Nursery Stock.
 - .1 Source of plant material: grown in Zone 2b in accordance with Plant Hardiness Zones in Canada.
 - .2 Plant material must be planted in zone indicated as appropriate for its species.
- .2 Plant material: free of disease, insects, defects or injuries and structurally sound with strong fibrous root system.

- .3 Trees: with straight trunks, well and characteristically branched for species except where specified otherwise.

2.2 PLANTING MEDIUM MIX

- .1 Planting soil mix: as specified in Section 32 91 19 – Topsoil Placement and Finish Grading.

2.3 WATER

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

2.4 STAKES

- .1 Wooden, 76mm (3") dia. x 2.4m (8').

2.5 WIRE TIGHTENER

- .1 PG wire tightener.

2.6 GUYING WIRE

- .1 9 gauge, flexible, non-corrosive stand wire.

2.7 CLAMPS

- .1 U-bolt: galvanized, 12 mm diameter, c/w curved retaining bar and hex nuts.

2.8 ANCHORS

- .1 Drive-in type.
 - .1 13 mm diameter x 75 mm long, aluminum.

2.9 TRUNK PROTECTION

- .1 Tube: plastic, 100 mm diameter, nylon reinforced, cut on site.

2.10 GUYING COLLAR

- .1 Plastic, 12mm diameter, nylon reinforced garden house over guy wire.

2.11 MULCH

- .1 Wood chip: varying in size from 50 mm to 75 mm and 6 mm to 16 mm thick, free of bark, small branches and leaves.

2.12 FERTILIZER

- .1 Synthetic commercial type as per Section 32 92 19 – Topsoil Placement and Finish Grading.
- .2 Horticultural bonemeal; raw bonemeal, finely ground with minimum analysis of 3% nitrogen and 10% phosphoric acid.

2.13 ANTI-DESICCANT

- .1 Wax-like emulsion.

2.14 FLAGGING TAPE

- .1 Fluorescent, orange colour surveyors flagging tape, length as required.

2.15 SOURCE QUALITY CONTROL

- .1 Obtain approval from Contract Administrator of plant material prior to planting.
- .2 Imported plant material must be accompanied with necessary permits and import licenses. Conform to Federal, Provincial or Territorial regulations.

Part 3 Execution

3.1 RELATED WORK

- .1 Obtain approval of site grading, and tree and shrub planting holes and beds prior to commencing work in this section.

3.2 PRE-PLANTING PREPARATION

- .1 Ensure plant material is acceptable to Contract Administrator.
- .2 Remove damaged roots and branches from plant material.
- .3 Apply anti-desiccant to conifers and deciduous trees in leaf in accordance with manufacturer's instructions.

3.3 EXCAVATION AND PREPARATION OF PLANTING BEDS

- .1 Establishment of sub-grade for planting beds is specified in Section 31 22 13 - Rough Grading.
- .2 Preparation of planting beds is specified in Section 32 91 19 – Topsoil Placement and Finish Grading.
- .3 For individual planting holes:
 - .1 Stake out location and obtain approval from Contract Administrator prior to excavating.
 - .2 Excavate to depth and width as indicated.
 - .3 Remove 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 Contract Administrator if water source is ground water.

3.4 PLANTING

- .1 For jute burlapped root balls, cut away top one third of wrapping and wire basket without damaging root ball. Do not pull burlap or rope from under root ball.
- .2 For container stock or root balls in non-degradable wrapping, remove entire container or wrapping without damaging root ball.

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- .3 Plant vertically in locations as indicated. Orient plant material to give best appearance in relation to structure, roads and walks.
 - .4 For trees and shrubs:
 - .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.
 - .5 For ground covers, backfill soil evenly to finish grade and tamp to eliminate air pockets.
 - .6 Water plant material thoroughly to fully saturate soil for an area the minimum of double the width of the rootball.
 - .7 After soil settlement has occurred, fill with additional topsoil to achieve finish grades.
 - .8 Dispose of burlap, wire and container material off site.

3.5 TRUNK PROTECTION

- .1 Install trunk protection on deciduous trees as indicated.
- .2 Install trunk protection prior to installation of tree supports when used.

3.6 TREE SUPPORTS

- .1 Install tree supports as indicated.
- .2 Use 2 stakes tree support for deciduous trees less than 3 m.
 - .1 Place stakes along prevailing wind side and 150 mm from trunk.
 - .2 Drive stakes minimum 150 mm into undisturbed soil beneath roots. Ensure stake are secure, vertical and unsplit.
 - .3 Install 150 mm long guying collar 1500 mm above grade.
 - .4 Thread Type 1 guying wire through guying collar tube. Twist wire to form collar and secure firmly to stake. Cut off excess wire.
- .3 Use three guy wires and anchors for coniferous trees over 1.5 m height as shown on the detail drawing.
 - .1 Install flagging tape to guys as indicated.
- .4 After tree supports have been installed, remove broken branches with clean, sharp tools.

3.7 MULCHING

- .1 Obtain approval of planting before mulching material is applied.
- .2 Ensure soil settlement has been corrected prior to mulching with wood chip mulch.
- .3 Loosen soil in planting beds and remove debris and weeds. Spread mulch to minimum thickness of 75 mm. Mulch material susceptible to blowing must be moistened and mixed with water before applying. When mulching is placed in fall, place immediately after planting. When mulch is placed in spring, wait until soil has warmed up.

3.8 WARRANTY PERIOD

- .1 All plantings under this section of work will be inspected by the Contract Administrator immediately after thirty (30) day establishment period.
- .2 A Certificate of Total Performance will be issued at the end of the inspection and the completion of associated replacements / adjustments.
- .3 The date of the certificate of total performance will mark the beginning of the one (1) year warranty period.
- .4 A plant warranty inspection scheduled and led by the Contract Administrator will be conducted as close to one year after the issuance of the certificate of total performance as possible.

3.9 ACCEPTANCE

- .1 Trees, shrubs, perennials, grasses, groundcovers and vines will be inspected at substantial performance and at the end of the one (1) year maintenance period. Trees, shrubs, perennials, grasses, groundcovers will be accepted by the Contract Administrator, provided that:
 - .1 Plants are showing vigorous well rounded new growth.
 - .2 Plants are free of disease or pests.
 - .3 Plants show no signs of malnutrition or stress.
- .2 After the warranty inspection the Contractor shall replace trees, shrubs, perennials and grasses that do not meet the standards in 3.11.1 with new plant material as originally specified at no additional cost to The City. All replacement plants shall be subject to a thirty (30) day establishment maintenance period and an additional one (1) year warranty period from the date of replacement.

END OF SECTION