

**NATIONAL CAPITAL COMMISSION
COMMISSION DE LA CAPITALE NATIONALE**

**EMERALD ASH BORER REPLACEMENT PROGRAM
SPRING 2019**

LOT #3

**Bruce Pit
Dartmoor and Shetland
Greenbelt Pathway East
Ottawa River Pathway
Rosabella Avenue
Shirley's Bay
Watts Creek East**

**CONTRACT SPECIFICATIONS
FOR TENDER**

March 2019

Canada

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PRODUCT INFORMATION

Aiglon Indigo ProMonarques modifié v2 – CCN (available in French only) 1

INFORMATION SHEETS

Common Buckthorn

Poison Ivy

Stinging Nettle

Tick Safety

West Nile Virus

Wild Parsnip

Giant Hogweed

Basis of Payment

- .1 Payment at the price per item listed in the Tender Form shall be full compensation for all labour, services and equipment as well as the supply, delivery and installation of all materials required for the proper execution of this Contract.

1.0 SITE PREPARATION

1.1 Mobilization and General Requirements

- .1 This item includes, but may not be limited to, steps to obtain permits, implementation of safety measures, environmental protection, temporary facilities, signage, cleaning, layout, utility locates, contractor testing, testing of materials, moving equipment, supply of a spill kit on-site, site reinstatement, demobilization, aeration of compacted soils, and all other requirements identified in the contract documents not covered under specific items.
- .2 This item will not be measured but will be paid on a monthly lump sum as progress is made.

1.2 Invasive species removal at Watts Creek East

- .1 This item includes all labor, materials, tools, and equipment necessary for the removal and off-site disposal, including dumping fees, of designated invasive plant material (primarily Buckthorn roots) left behind after the preliminary invasive species removal operations of the fall/winter 2018-2019.
- .2 This item includes the protection of desirables species present within areas designated for invasive species removal.
- .3 Refer to specification Section 32 94 00, Invasive Species Removal.
- .4 This item will be measured and paid for on a square meter basis.

1.3 Installation and removal of temporary fencing and signage including transport of materials and from NCC storage facility

- .1 This item includes the collection, transport and installation of temporary fencing, posts and signage from the designated NCC storage facility: 1740 Woodroffe Avenue, Ottawa, Ontario Contact Brian Huff, tel. 613-946-8713 prior to pick up or delivery.
- .2 This item includes the removal, transport and drop-off of temporary fencing and signage at the designated NCC storage facility upon completion of the contract.
- .3 This item includes the supply of installation hardware and accessories as required.
- .4 This item includes a 2 year warranty on all parts supplied by the Contractor.
- .5 This item includes maintenance of the fence in working order for the duration of the contract.
- .6 Fencing type shall be either, tall modular metal fencing to protect planting areas from wildlife or welded wire mesh fencing to protect planting areas from beavers as directed on site by the NCC representative.
- .7 This item will be measured and paid for on a linear meter.

2.0 SOFTSCAPE

2.1 Supply and Install Plant Material

- .1 This item includes the supply and installation of all plant material as indicated in the contract documents.
- .2 This item includes the supply and installation of all plant accessories as indicated in the contract documents.
- .3 The NCC will provide and deliver the mulch on designated planting sites as per drawings. The contractor installs and maintains the mulch.
- .4 This item includes the maintenance and warranty of all plant material in accordance with the contract documents to ensure healthy plant material.
- .5 This item will be measured and payed on a per unit basis as follows:
 - .1 80% of the contract planting sum, upon receipt and approval of plant materials by the Purchaser and completion of planting of all the plant materials.
 - .2 10% of the contract planting sum, after the first warranty year once the replanting of replacement material (if required) is completed.
 - .3 10% of the contract planting sum after final acceptance, following the warranty period (see 2.5 Section 32 93 10, Tree and Shrub Planting), once the replanting of replacement material (if required) is completed.

3.0 OTHERS

3.1 Supply and install topsoil at Watts Creek East

- .1 This item includes the supply and installation of topsoil, where necessary, per specification section 32 93 10, Tree and Shrub Planting and 32 94 00 Invasive species removal followed by planting of trees and shrubs.
- .2 This item will be measured and paid for on a cubic meter basis of topsoil supplied and installed.

3.2 Supply and install seeding

- .1 This item includes mowing the areas to seed, supply the seed mix and seed the areas, as per the contract documents.
- .2 This item will be measured and paid for on a square meter basis.

END OF SECTION

PART 1 - GENERAL

1.1 TIME OF COMPLETION

- .1 Begin work as soon as possible and complete locates, site preparation, planting operations, installation of tree accessories and mulching requirements **on or before October 15th, 2019.**
- .2 Tree maintenance is the responsibility of the Contractor until the end of the warranty period as per Section 32 93 10 Tree and Shrub Planting.

1.2 DESCRIPTION OF WORK

- .1 Work under this Contract covers but is not limited to:
 - .1 Supply, plant, and maintain trees and shrubs as per the contract documents including the installation of mulch supplied by the NCC;
 - .2 Tree and shrub planting operations as per contract documents. See attached plans for general site locations. Exact planting location of each large-sized caliper deciduous tree or 1.5-2.0m high coniferous tree to be staked by a NCC representative;
 - .3 The installation, maintenance and removal of fencing, posts and signage supplied by the NCC including the transport of materials to and from the designated NCC storage facility;
 - .4 Repair any damages to assets occurring during work as per Article 1.9 Damages;
 - .5 Maintenance of the tree support systems, tree guards and winter protection must be according to Section 32 93 10, Tree and Shrub Planting;
 - .6 Drawings and specifications are complementary. Items shown or mentioned in one and not in the other are deemed to be included in the contract work.

1.3 DEFINITIONS

- .1 Wherever the term "NCC representative" appears throughout these specifications, it shall be interpreted to mean an Inspector representing the National Capital Commission (NCC) or a duly named consultant on their behalf.
- .2 Wherever the terms "equal", or "approved equivalent" appear after specific types of materials and items throughout this specification, they shall be interpreted to mean being equal or superior in the opinion of the NCC representative, in material content, workmanship and quality to that designated as being the minimum acceptable standard, and his/her written approval must be obtained prior to submitting an alternative, five (5) days before close of tender.

1.4 COMMUNICATION

- .1 The successful bidder shall ensure he has been informed and is aware of the official NCC representative. The only contact for the successful contractor is the official NCC representative. The contractor will be notified if the official NCC representative changes. Site problems and deficiencies shall be reported to the NCC representative immediately.
- .2 The successful bidder shall arrange with the NCC representative, in conjunction with the NCC Contracting Officer, a communication link. The communication link must be established for urgent situations which may arise during operations. Furthermore, the

contractor shall identify the level of authority of his personnel. The site crew shall have a communication device in order to permit the NCC representative to communicate with them at all time during the working hours.

- .3 Provide within five (5) working days after Contract award, schedule showing anticipated progress stages and final completion of work within time period required by Contract documents.

1.5 CODES

- .1 Perform work in accordance with the National Building Code of Canada 2015 and any code of provincial or municipal application. In any case of conflict or discrepancy, the more stringent requirement shall apply.
- .2 Meet or exceed requirements of:
 - .1 Contract documents;
 - .2 Specified standards, codes and referenced documents;
- .3 Obtain and pay for permits, inspector's approvals, public utilities locates, and other licenses required for this project and also pay any charges incidental to such permits. Provide copy of permits to the NCC Representative;
- .4 The NCC site access permit is necessary and will be supplied at no charge by the NCC.

1.6 COMPLIANCE – LAWS REGULATIONS AND PERMITS

- .1 The Contractor will operate in accordance with all Federal, Provincial and Municipal codes and standards. Proper safety precautions must be exercised at all times, with extra precautions taken to protect the general public.
- .2 This Tender Document and the Contract resulting there from are to be interpreted, construed, governed by, and the relation between parties is to be determined in accordance with the laws of the Province of Ontario and of Quebec (where applicable) and such federal laws applicable therein.
- .3 The Contractor must obtain, at his/her cost, all the licenses and permits required in respect to the execution of the work in the provinces of Ontario and Quebec.

1.7 EXISTING SERVICES

- .1 Before commencing work, the Contractor is responsible for establishing locations and identifying extents of all utility/ service lines in area of work. Once completed, the Contractor must notify NCC representative of findings;
- .2 Contact City and Provincially approved public/ private utility providers to determine location and extents of their service lines;
- .3 Where unknown services are encountered, immediately advise NCC representative and confirm findings in writing;
- .4 Identify by use of marking paint, identification flags or other standard industry approved manner;
- .5 Where work involves adjusting of existing services, carry out work as directed by the NCC representative.
- .6 Repair all damage caused by work to existing public services at Contractor expenses.

1.8 PROTECTION

- .1 Protect existing structures against damage until completion of work.
- .2 Take all precautions to protect vegetated areas and trees from any damage.
- .3 Take all necessary precautions in order to prevent mud accumulation on asphalt roads and pathways. Clean immediately any soil accumulation.
- .4 Provide and maintain guard-rails, fences, barricades, lights and other devices required for protection of workmen and public in accordance with the requirements of provincial and Local by-law and the Canadian Construction Safety Code.
- .5 The contractor is responsible for the supply, installation and maintenance of traffic control devices necessary for the protection of the public and the work site. Traffic control must be in accordance with the Manual of Uniform Traffic Control Devices for Canada.
- .6 Contractor to keep a spill kit on site at all times.

1.9 DAMAGES

- .1 Damages caused to existing plant material, landscaping, lawns, roadways, pathways, structures, finishes and public utilities due to work of this contract, will be restored to their original condition, replaced or adequate compensation made to affected parties by the Contractor, as determined by NCC representative and to the satisfaction of the NCC.
- .2 It is understood that restored work includes labour, equipment and material cost.
- .3 The restored or replaced work shall be completed within seven (7) days of notification by the NCC representative.

1.10 EMPLOYEES

.1 General

- .1 Any employee hired by the Contractor shall communicate in one of the two official languages of Canada, be experienced in dealing with the public, respect all health and safety requirements and regulations, and act in a manner that does not adversely affect the reputation of the NCC or its representatives and employees.
- .2 Any employee hired by the Contractor will be relieved of his/her duties and immediately replaced by the Contractor, if in the opinion of the NCC, this employee is unqualified or is acting in a manner contrary to the best interests of the NCC, the requirements of this contract, or if the employee does not meet the requirements stated above.
- .3 The Contractor shall ensure that he/she is able to demonstrate at any time to the NCC that he/she is in compliance with the experience requirements as indicated above and in **1.10.4** by providing any and all proof of work experience for all of his/her employees.

.2 Security Risks

- .1 The Contractor shall ensure that none of the Employees of the Contractor and others for whom the Contractor is responsible and who are to perform the Contractor's obligations under this Contract constitute a security risk and shall, at the request of the NCC, ensure that all Employees of the Contractor and others for whom the Contractor is responsible who are to perform the Contractor's obligations under this Contract complete the NCC's security screening process in order that the NCC may obtain a security assessment of that person before accessing any site included in this Contract.
- .2 There are three levels of screening: Reliable status, site access or secret. It will be determined depending on the site where the work is performed or the type of task required. At the minimum, the NCC shall require Reliability clearance. The NCC shall process the clearances once the individuals have been identified. The appointed individuals shall receive appropriate instructions and training from NCC Security.

.3 Work Dress

- .1 All field employees of the Contractor shall be neatly dressed, at the Contractor's expense and wear approved safety equipment when required. All employees shall wear an appropriate standard uniform adapted to their area of activity with the company name prominently displayed.

.4 Training and Experience

- .1 The Contractor shall have at least one full-time field employee/ foreperson assigned to this contract, who is certified as having successfully completed his/her post-secondary training in horticulture/arboriculture, **and** have at least five (5) years of relevant horticultural/arboriculture work experience in the field. This employee will be on site for all planting operations and be responsible for ensuring all specifications and best practices are followed. **Proof of education, certification, field experience and references shall be supplied by the contractor with submission.**
- .2 Other supportive field employees shall have appropriate experience and skills to perform the duties of the Contract with supervision. They shall have at least one (1) season of experience (such workers must be supervised at all times by horticulture-trained and certified employees/foreperson).
- .3 Unsatisfactory work, completed by unqualified tradesmen will be redone and paid for by the Contractor.

.5 NCC Regulations

- .1 The Contractor shall ensure its agents and employees are familiar with and comply with *NCC Traffic and Property Regulations*, *NCC Animal Regulations* and other specific directives relating to its facilities and services.

1.11 PRODUCTS SUPPLIED

- .1 Contractor's duties:
 - .1 Unless otherwise directed by NCC representative, order products in quantities and at times compatible with specifications, construction schedule and site storage capacity.
 - .2 Unload the material on site and ensure the material handling.

1.12 VEHICLES AND EQUIPMENT

- .1 The Contractor shall provide all vehicles and equipment required to fulfil the contractual obligations of this Contract. This includes any vehicles and equipment and/or tools required for transportation purposes and/or for providing Maintenance services as requested in this Contract, such as watering, etc. The Contractor shall assume all risks inherent to the use of general or specialized vehicles and/or equipment. All vehicles and equipment used by the Contractor shall be kept in a clean condition, exempt of rust and shall meet all provincial (Ontario & Quebec) safety standards. The company name shall be prominently displayed on all road vehicles. Contractor vehicles shall be parked only on hard surfaces in designated areas and not on soft surfaces such as sod and fields.
- .2 The Contractor will minimize unnecessary idling of vehicles in accordance with municipal by-laws in this matter.

1.13 PAYMENT

- .1 This is a unit price Contract. Any minor or miscellaneous items indicated on the drawings as being part of the work of this Contract must be included by the Contractor in his or her overhead and indirect charges and incorporated into the various unit rates.
- .2 The estimated quantities set forth in the tender are provisional. If the quantity of work to be done and materials to be supplied exceeds or are less than the estimated quantity, the contractor shall proceed with the work after approval by NCC representative. Payment will be made for the actual amount of work done and materials supplied at the unit prices set forth in the contract.
- .3 Upon completion of the requirements the contractor may invoice the NCC. Terms of payment are Net 30 days.

1.14 CONSTRUCTION SAFETY MEASURES

- .1 Observe construction safety measures required by *Canadian Construction Safety Code*, Provincial Government, Worker's Compensation Board and municipal authority's. In any case of conflict or discrepancy, the more stringent requirement shall apply.

1.15 DISPOSAL OF WASTE

- .1 The NCC encourages that when possible material be recovered, reused or recycled. We encourage the contractor to compost organic waste generated by this contract except for invasive plants which are to be disposed of as per item 4.1 .2 .6 of Tree and Shrub Planting or at the direction of the NCC Representative. Remaining waste must be transported to a landfill site approved and designated by the municipality.

1.16 SITE VISIT

- .1 It is highly recommended that interested parties visit the sites prior to submitting a bid.

1.17 REQUIRED DOCUMENTS

- .1 Maintain at job site, one copy of each of the following:
 - .1 Contract drawings
 - .2 Specifications
 - .3 Addenda
 - .4 Change orders and other modifications to Contract
 - .5 Copy of current and approved work schedule
 - .6 Permits

1.18 GUARANTEES AND WARRANTIES

- .1 Before completion of Work, collect all Manufacturer's guarantees and warranties, and submit to NCC Representative.
- .2 All non-planting work shall be warranted for a period of two (2) years from the date of written preliminary acceptance by the NCC Representative. A warranty inspection will be carried out at the end of the warranty period.
- .3 All planting work shall be warranted according to specification 32 93 10.

PART 2 - PRODUCTS

- .1 Not used

PART 3 - EXECUTION

- .1 Not used

END OF SECTION

PART 1 – GENERAL

1.01 RELATED REQUIREMENTS

- .1 Particular requirements for inspection and testing to be carried out by testing laboratory designated by NCC Representative are specified under various sections.

1.02 APPOINTMENT AND PAYMENT

- .1 NCC Representative will appoint and pay for services of testing laboratory except as follows:
 - .1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
 - .2 Inspection and testing performed exclusively for Contractor's convenience.
 - .3 Testing, adjustment and balancing of conveying systems, mechanical and electrical equipment and systems.
 - .4 Mill tests and certificates of compliance.
 - .5 Tests specified to be carried out by Contractor under supervision of NCC Representative.
- .2 Where tests or inspections by designated testing laboratory reveal Work not in accordance with contract requirements, pay costs for additional tests or inspections as required by NCC Representative to verify acceptability of corrected work.

1.03 CONTRACTOR'S RESPONSIBILITIES

- .1 Provide labour, equipment and facilities to:
 - .1 Provide access to Work for inspection and testing.
 - .2 Facilitate inspections and tests.
 - .3 Make good Work disturbed by inspection and test.
 - .4 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.
- .2 Notify NCC Representative sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.
- .3 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.
- .4 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and approved by NCC Representative.

PART 2 - PRODUCTS

- .1 Not used

PART 3 - EXECUTION

- .1 Not used

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- .1 Shop drawings and product data
- .2 Samples
- .3 Certificates and transcripts

1.02 ADMINISTRATIVE

- .1 Submit to NCC Representative submittals listed in the specifications for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Do not proceed with Work affected by submittal until review is complete.
- .3 Present shop drawings, product data, samples and mock-ups in SI Metric units.
- .4 Where items or information is not produced in SI Metric units converted values are acceptable.
- .5 Review submittals prior to submission to NCC Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
- .6 Notify NCC Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Verify field measurements and affected adjacent Work are coordinated.
- .8 Contractor's responsibility for errors and omissions in submission is not relieved by NCC Representative's review of submittals.
- .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by NCC Representative review.
- .10 Keep one reviewed copy of each submission on site.

1.03 SHOP DRAWINGS AND PRODUCT DATA

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

- .2 Where indicated, submit drawings stamped and signed by professional engineer registered or licensed in Ontario, Canada.
- .3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.4 Allow 5 days for NCC Representative's review of each submission.
- .5 Adjustments made on shop drawings by NCC Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to NCC Representative and wait for written approval prior to proceeding with Work.
- .6 Make changes in shop drawings as NCC Representative may require, consistent with Contract Documents. When resubmitting, notify NCC Representative in writing of revisions other than those requested.
- .7 Accompany submissions with transmittal letter containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample.
 - .5 Other pertinent data.
- .8 Submissions include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
 - .5 Details of appropriate portions of Work as applicable:
 - .1 Fabrication.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Capacities.
 - .5 Performance characteristics.
 - .6 Standards.
 - .7 Operating weight.
 - .8 Wiring diagrams.
 - .9 Single line and schematic diagrams.

- .10 Relationship to adjacent work.

1.04 SAMPLES

- .1 Submit for review samples as requested in respective specification Sections. Label samples with origin and intended use.
- .2 Deliver samples prepaid to NCC Representative's business address.
- .3 Notify NCC Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .4 Where colour, pattern or texture is criterion, submit full range of samples.
- .5 Adjustments made on samples by NCC Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to NCC Representative prior to proceeding with Work.
- .6 Make changes in samples which NCC Representative may require, consistent with Contract Documents.
- .7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.05 PHOTOGRAPHIC DOCUMENTATION

- .1 When requested by NCC Representative, submit electronic color digital photography in jpg format at standard resolution as work progresses and at milestones or to indicate issues.
- .2 Project identification: name and number of project and date of exposure indicated.

PART 2 - PRODUCTS

- .1 Not used

PART 3 - EXECUTION

- .1 Not used

END OF SECTION

PART 1 - GENERAL

1.01 REFERENCE STANDARDS

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations
- .2 Province of Ontario
 - .1 Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O. 1990, c.0.1, as amended and O. Reg. 213/91 as amended - Updated 2005.

1.02 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Name of on-site Health and Safety Officer if it is someone other than site construction supervisor.
 - .2 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications. NCC Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.03 FILING OF NOTICE

- .1 File Notice of Project with Province of Ontario authorities prior to beginning of Work.
- .2 Contractor shall agree to install proper site separation and identification in order to maintain time and space at all times throughout life of project.

1.04 SAFETY ASSESSMENT

- .1 Perform site specific safety hazard assessment related to project.
- .2 Check site for hazardous plants listed below and familiarize workers with information sheets provided.
 - .1 Common Buckthorn
 - .2 Poison Ivy
 - .3 Stinging Nettle
 - .4 Tick Safety
 - .5 West Nile Virus
 - .6 Wild Parsnip
 - .7 Giant Hogweed

1.05 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.

- .2 Contractor will be responsible and assume the role Constructor as described in the Ontario Occupational Health and Safety Act and Regulations for Construction Projects.

1.06 COMPLIANCE REQUIREMENTS

- .1 Comply with Ontario Occupational Health and Safety Act, R.S.O. 1990, c. 0.1 and Ontario Regulations for Construction Projects, O. Reg. 213/91.
- .2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.07 UNFORSEEN HAZARDS

- .1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Ontario and advise NCC Representative verbally and in writing

1.08 POSTING OF DOCUMENTS

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Ontario, and in consultation with NCC Representative.

1.09 CORRECTION OF NON-COMPLIANCE

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by NCC Representative.
- .2 Provide NCC Representative with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 NCC Representative may stop Work if non-compliance of health and safety regulations is not corrected.

1.10 WORK STOPPAGE

- .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

PART 2 - PRODUCTS

- .1 Not used

PART 3 - EXECUTION

- .1 Not used

END OF SECTION

PART 1 - GENERAL

1.01 FIRES

- .1 Fires and burning of rubbish on site are not permitted.

1.02 DRAINAGE

- .1 Develop and submit erosion and Sediment Control Plan (ESC).
- .2 Storm Water Pollution Prevention Plan (SWPPP) may be substituted for erosion and sediment control plan.
- .3 Provide temporary drainage and pumping required to keep excavations and site free from water.
- .4 Ensure pumped water into waterways, sewer or drainage systems is free of suspended materials.
- .5 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.03 SITE CLEARING AND PLANT PROTECTION

- .1 Protect trees and plants on site and adjacent properties as indicated.
- .2 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage.
 - .1 Avoid unnecessary traffic, dumping and storage of materials over root zones.
- .3 Minimize stripping of topsoil and vegetation.
- .4 Do not remove trees unless authorized in writing by NCC Representative.

1.04 WORK ADJACENT TO WATERWAYS

- .1 Construction equipment to be operated on land only.
- .2 Waterways to be kept free of excavated fill, waste material and debris at all times.

1.05 POLLUTION CONTROL

- .1 Maintain temporary erosion and pollution control features installed under this Contract.
- .2 Control emissions from equipment and plant in accordance with local authorities' emission requirements.
- .3 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

1.06 HISTORICAL/ ARCHAEOLOGICAL CONTROL

- .1 Some planting sites have pre-contact archeological potential.
- .2 The NCC archaeologist will ensure monitoring of planting work in archaeologically sensitive zones identified at Shirleys Bay, as outlined in the Archeological Monitoring Zones drawing. Provide work schedule seven days before planned work in these areas.
- .3 If archaeological resources or human remains are discovered by planting work beyond the limits of these zones or at other sites included in the project, all work at the location concerned will be halted immediately and the NCC archaeologist will be notified forthwith at Archaeology-Archeologie@ncc-ccn.ca. Work shall not be resumed at that location until measures for the protection of those resources or remains have been put in place.

1.07 NOTIFICATION

- .1 Various Government agencies may be on-site during construction to ensure compliance with requirements. Contractor shall provide timely and easy access.

PART 2 - PRODUCTS

- .1 Not used

PART 3 - EXECUTION

- .1 Not used

END OF SECTION

PART 1- GENERAL

1.01 INSTALLATION AND REMOVAL

- .1 Inform NCC Representative of need for supplemental or other staging area.
- .2 Provide construction facilities in order to execute work expeditiously.
- .3 Remove from site all such work after use.

1.02 CONSTRUCTION PARKING

- .1 Parking will not be permitted on soft surfaces at the site.
- .2 Provide and maintain adequate access to project site.

1.03 EQUIPMENT, TOOL AND MATERIALS STORAGE

- .1 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
- .2 Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

1.04 SANITARY FACILITIES

- .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
- .2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.05 CONSTRUCTION SIGNAGE

- .1 Signs and notices for safety and instruction in both official languages Graphic symbols to CAN/CSA-Z321.
- .2 Maintain approved signs and notices in good condition for duration of project, and dispose of off- site on completion of project or earlier if directed by NCC Representative.
- .3 No other signs or advertisements, other than warning signs, are permitted on site.

1.06 PROTECTION AND MAINTENANCE OF TRAFFIC

- .1 Protect travelling public from damage to person and property.
- .2 Provide a flag person for planting sites near the trails / bike path.

PART 2 - PRODUCTS

.1 Not used

PART 3 - EXECUTION

.1 Not used

END OF SECTION

PART 1 - GENERAL

1.01 PROJECT CLEANLINESS

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris.
- .2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by NCC Representative. Do not burn waste materials on site.
- .3 Clear snow and ice from access.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Provide on-site containers for collection of waste materials and debris.
- .6 Provide and use marked separate bins for recycling.
- .7 Dispose of waste materials and debris off site.
- .8 Clean areas prior to start of finishing work, and maintain areas free of dust and other contaminants during finishing operations.
- .9 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .10 Provide adequate ventilation during use of volatile or noxious substances.
- .11 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .12 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate nearby building systems.

1.02 FINAL CLEANING

- .1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Remove waste products and debris and leave Work clean and suitable for occupancy.
- .3 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .4 Remove waste products and debris including subs waste.
- .5 Remove waste materials from site at regularly scheduled times.
- .6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

- .7 Remove stains, spots, marks and dirt from surfaces.
- .8 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
- .9 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
- .10 Remove dirt and other disfiguration from exterior surfaces.
- .11 Sweep and wash clean paved areas.

1.03 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and/or recycling.

PART 2 - PRODUCTS

- .1 Not used

PART 3 - EXECUTION

- .1 Not used

END OF SECTION

PART 1 - GENERAL

1.01 SCHEDULING

- .1 Schedule seeding to coincide with preparation of soil surface.
- .2 Schedule seed installation when frost is not present in ground.
- .3 Schedule seeding before forecasted rain.

1.02 QUALITY ASSURANCE

- .1 Submit in accordance with submittal procedures the following:
 - .1 Product data for seed mix.

PART 2 - PRODUCTS

2.01 SEED

- .1 The seed mix will be Aiglon Indigo ProMonarques modified NCC Seed Mix by Aiglon Indigo (Ph: 819-385-4509), or approved equivalent.
- .2 Packages will be individually labeled in accordance with 'Seeds Regulations' and indicate clearly the name of the supplier, species, content, grade and mass.

2.02 EQUIPMENT

- .1 Use appropriate manual equipment. NCC Representative to approve all proposed equipment for the work.

PART 3 - EXECUTION

3.01 WORKMANSHIP

- .1 Do not perform work under adverse field conditions such as frozen soil, excessively wet soil or soil covered with snow, ice, or standing water.
- .2 Additional care shall be taken when seeding adjacent to watercourses or paved area to ensure that seed does not spread or blown onto those areas.

3.02 SEED BED PREPARATION

- .1 Mow the selected area to 5cm or less.

3.03 SEEDING

- .1 Seed with a manual seed spreader at the rate recommended by the supplier.
- .2 Do not hydro-seed.

3.04 ACCEPTANCE

- .1 The Contractor shall monitor the seeded areas until acceptance by the NCC Representative.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCE STANDARDS

- .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-latest edition.

1.2 SCOPE OF WORK

- .1 Provide labour, material, services and equipment necessary to complete the work of this section including but not limited to:
 - .1 Installation of tree and shrub material and plant accessories as itemized on the plant list and in accordance with specifications, details and drawings.
 - .2 Plant the sites in the **following order** :
 - a) Bruce Pit
 - b) Watts Creek East
 - c) Shirley's Bay
 - d) Other sites

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 The Contractor must provide the NCC Representative with confirmation of the supplier's order for the plants within two weeks of the signing of the contract.
 - .1 The confirmation of the plant order must include the following information:
 - 1. The name and address of the supplier;
 - 2. For each species of plant: quantity, height / caliper, scientific name, rooting type
- .2 Scheduling: 7 days in advance of shipment of plant material, obtain approval from NCC Representative.
 - .1 Schedule to include:
 - .1 Quantity, species and size plant material.
 - .2 Shipping dates.
 - .3 Arrival dates on site.
 - .4 Planting Dates.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labeled with the species name for the plants, manufacturer's name and address for other products.
 - .1 Co-ordinate with NCC representative the shipping of plants and excavation of holes to ensure minimum time lapse between digging and planting.
 - .2 Abundant watering must be done before the plants leave the nursery or the Contractor's shop to the job sites. Regular watering should be done when the plants are stored to keep the root systems moist.
 - .3 Protect plant material from frost, excessive heat, wind and sun during delivery.

- .4 Protect plant material from damage during transportation:
 - .1 Delivery distance is less than 30 km and vehicle travels at speeds under 80 km/h, tie tarpaulins around plants or over vehicle box.
 - .2 Delivery distance exceeds 30 km or vehicle travels at speeds over 80 km/h, use enclosed vehicle where practical.
 - .3 Protect foliage and root balls using anti-desiccants and tarpaulins, where use of enclosed vehicle is impractical due to size and weight of plant material.
 - .4 Tie branches of trees securely and protect plant material against abrasion, exposure and extreme temperature change during transit. Avoid binding of planting stock with rope or wire which would damage bark, break branches or destroy natural shape of plant. Give full support to root ball of large trees during lifting.
 - .5 Protect the trunk with a wax cardboard during transportation
- .2 Storage and Handling Requirements:
 - .1 Immediately store and protect plant material which will not be installed within 1 hour and after arrival at site in storage location approved by NCC Representative.
 - .2 Protect stored plant material from frost, wind and sun and as follows:
 - .1 For bare root plant material, preserve moisture around roots by heeling-in or burying roots in sand or topsoil and watering to full depth of root zone.
 - .2 For pots and containers, maintain moisture level in containers. Heel-in fibre pots.
 - .3 For balled and burlapped and wire basket root balls, place to protect branches from damage. Maintain moisture level in root zones.
 - .4 Store in shaded areas.

PART 2 - PRODUCTS

2.1 PLANT MATERIAL SUPPLIED BY THE CONTRACTOR

- .1 Notify NCC representative of source of plant material in the next two (2) weeks following the signature of the contract and purchase order. No work under this Section is to proceed without approval.
- .2 Trees and shrubs to be from a certified nursery approved in writing by the NCC representative.
- .3 NCC representative reserves the right to inspect the plants at the source.
- .4 Obtain approval by NCC representative of plant material on site before commencing installation.
- .5 Acceptance of plant material on site or at the source does not prevent rejection prior to or after planting operations due to damage to root balls, branch structure, bark, or the like by the Contractor.
- .6 **Plants shall conform to the varieties specified in the plant list** (See Schedule of Items and Prices) and be legibly tagged with their proper name and size. No substitutions will be accepted without prior written approval of the NCC representative.

2.2 PLANT MATERIAL

- .1 **Size:** Refer to the Schedule of Items and Prices and planting schedules on the drawings for the plant sizes included in this contract.
- .2 **Quality:** Comply with the latest edition of the *Canadian Standards for Nursery Stock*, published by the Canadian Nursery and Landscape Association (CNLA), referring to size and development of plant material and root ball. Measure plants when branches are in their natural position.
- .3 **Source:**
 - .1 Trees (large stock deciduous and coniferous trees) are to be **obtained from the same climatic zone as the National Capital Region (5a) or a lower climatic zone**, according to Agriculture Canada Plant Hardiness Zone Map;
 - .2 Trees and shrubs (container stock) shall be grown from seeds collected from seed **zone 36** in accordance with the Seed Zone Boundary Map (Ontario Ministry of Natural Resources). Upon request, the supplier shall provide proof of seed collection zone (expect for this proof to be requested).
- .4 **Additional plant material qualifications:**
 - .1 Use trees with strong fibrous root system free of disease, insects, defects or injuries and structurally sound. Use trees with straight trunks, well and characteristically branched for species. Plants must have been root pruned regularly, but not later than one growing season prior to arrival on site;
 - .2 Plant material that has come out of dormant stage and is too far advanced will not be accepted unless prior approval is obtained by the NCC representative.
- .5 **Container-grown stock:**
 - .1 Acceptable if containers large enough for root development. Trees must have grown in container for minimum of one growing season but no longer than two. Root system must be able to 'hold' soil when removed from container. Plants that have become root bound are not acceptable. Container stock must have been fertilized with slow releasing fertilizer.
- .6 **Balled and bur lapped:**
 - .1 Coniferous and broad-leaved evergreens over 500 mm tall must be dug with soil ball. Deciduous trees in excess of 3 m height must have been dug with large firm ball. Root balls must include 75% of fibrous and feeder root system. This excludes use of native trees grown in light sandy or rocky soil. Secure root balls with wrap ball in double layer of burlap and drum lace with minimum 10 mm diameter rope. Protect root balls against sudden changes in temperature and exposure to heavy rainfall.
 - .2 Tree spade dug material – at source: Dig plant material with hydraulic spade or clam. Root balls to satisfy the CNLA standards or as approved by NCC representative. Lift root ball from hole, place in a standard wire basket designed for purposes and line with burlap. Replace root ball and tie basket to ball with heavy rope. Do not damage trunk of tree with basket ties or rope. **Field-collected plant materials will not be accepted.**

2.3 PLANT ACCESSORIES

- .1 **Water:** Free of impurities that would inhibit plant growth.
- .2 **Topsoil:** Mixture of mineral 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 25% sandy loam and contain 5-10% organic matter by weight;
 - .2 pH value: 5.5 to 6.5;
 - .3 Contain no toxic elements or growth inhibiting materials;
 - .4 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;
 - .3 Of cut grass, crabgrass, couch grass, or other noxious weeds;

- .3 **Staking and guying materials:**
 - .1 Stakes: Wood Stake (untreated wood-spf), 50mm x 50mm x 2.44m;
 - .2 Wires: Flat, woven polypropylene: DeepRoot; *ArborTie*, or approved equivalent. Color: Green.

Note: All caliper-sized deciduous and coniferous trees 1.5m to 2.0m in height will require staking and guying. No bare root plants will require staking and guying.

- .4 **Trunk protection:**
 - .1 SURTRONC from Dendrotik (1 800 653-7066) or approved equivalent. Fine mesh wrap around guard protecting against rodents and deer. The well ventilated mesh prevents development of pests and diseases. Anti-UV treated polyolefins.

Color: Black.

Size: diameter: 15cm

Height : 80cm S1580 Surtronic.

This protection will be loosely installed (not in contact with tree trunk) and joined with tie-wraps at the top, bottom and every 20cm in between (black- plus one identifier see 2.3.7) to ensure protection from both animals and other mechanical damage.

- .5 **Burlap** (winter protection): Non-treated 150 g Hessian burlap
- .6 **Mulch:** Supplied and delivered by the NCC.
- .7 **Tree Identification:** Each tree planted as a part of this contract will have a unique identifier (tie-wrap style) of a **PINK** cable tie with a minimum width of .19". This identifier will be affixed to deciduous trees on the trunk protection and conifers on a branch in the crown- not so tight as to limit growth, but visible.

2.4 REPLACEMENT

- .1 When replacements are required under the assigned warranty and maintenance category, it is the responsibility of the Contractor to supply a list of trees that he/she plans to replace based on warranty criteria on two occasions:
 - .1 6 months after acceptance of the planting
 - .2 1 year later.These lists will be approved by the NCC Representative who may make changes.
- .2 Regardless of warranty or maintenance categories, replace all plant material damaged by the following means:
 - .1 During loading and unloading operations;
 - .2 During transportation;
 - .3 During planting operations;
 - .4 During other works performed by the Contractor.
- .3 Not covered under the terms of the warranty are trees that die or are damaged beyond repair by mechanical means (vehicles, mowing etc.) carried out by parties other than the Contractor. This will be determined by the NCC representative and followed by site remediation (refer to section 4.1.2.2).
- .4 Replace plant material from approved source immediately if appropriate, or during the next planting season.

2.5 WARRANTY PERIOD

There may be a variety of warranty terms expected as part of this contract, depending on the accessibility of the planting locations for maintenance purposes and which party supplies the plant material. See the Schedule of Items and Prices for the warranty periods and maintenance requirements for each area. The terms of each warranty period category are as follows:

WG1

- .1 The Contractor warrants that plant material will remain free of defects for a period of **two growing seasons** from the date of completion of planting.
- .2 The Contractor must replace any tree or shrub that shows more than 30% dieback in live crown or has failed to grow or establish satisfactorily as determined by the NCC representative
- .3 Please consult the Schedule of Items and Prices for the maintenance category required for areas or plants assigned the WG1 warranty category.
- .4 The NCC representative will conduct several inspections until the end-of-warranty period, ending in the **Fall of 2021**.
- .5 **When trees are replaced, extend warranty on replacement plant material for a period equal to the original warranty period.** Continue such replacement and warranty until plant material is acceptable.

WG2

- .1 The NCC representative will conduct several inspections until the end-of-warranty period, ending in the **Fall of 2021**.
- .2 During warranty period, remove from site and replace qualifying plant material (see .3 below) that has died, shows more than 30% dieback in live crown or has failed to grow or establish satisfactorily as determined by the NCC representative.
- .3 The Contractor warrants this plant material for two (2) years as such:
 - .1 A maximum of 25% of the plant total within all the planting areas of a project site can be replaced based on warranty criteria in any one warranty year per site. No carryover year to year.

Example:

An inventory performed in Fall 2019 of 100 trees planted in Spring 2019 reveals that thirty (30) trees qualify for replacement. Twenty-five (25) trees will be replaced in Spring 2020 (25%). In Fall 2020, an additional five (5) new trees qualify for replacement. Fall 2020 inventory reveals (5) new trees qualify for warranty replacement and five (5) new trees will be replaced in Spring 2021. All other stipulations to warranty replacements apply such as Section 2.4.

PART 3 - EXECUTION

All Specifications below must be adhered to. Any proposed changes to these specs must be submitted at time of tender and approval required before changes are made. Any specification that is omitted will be noted, reparations made whenever possible. A warning will be given followed by an Unsatisfactory Performance Report for specifications not being followed (specific to the infraction).

3.1 WORKMANSHIP

- .1 Coordinate operations. Keep site clean and planting holes drained. Immediately remove debris spilled onto pavement.
- .2 Remove surplus materials from worksite.
- .3 Tree planting and associated work will be accomplished following industry best management practices for horticulture/arboriculture in relation to tree planting, and as directed by the NCC representative.

3.2 PLANTING PROCEDURE

- .1 Refer to planting details on drawings.
- .2 Water 10-20 minutes before planting and again immediately after planting to prevent drying of roots.
- .3 Depth - the rootball should sit on undisturbed soil to limit any shifting or settling. It is crucial that this depth be established properly as the trees trunk flare must be above grade and the trees uppermost structural roots should be within 25-75mm of grade.
- .4 When planting container stock, remove entire plant from container without disturbing root ball. Non bio-degradable wrappings must be removed (wire). With balled and burlapped root balls, loosen burlap and cut away minimum top 2/3 without disturbing root ball. Do not pull burlap or rope from under root ball.

- .5 If there is evidence that roots are circling they should be loosened and spread out, even cut if necessary.
- .6 Backfill with excavated soil. Add topsoil (section 2.3.2) as required.
 - .i Begin backfilling around base of rootball to ensure stability and tamp (bottom 100mm of hole).
 - ii. Water to slurry and tamp in lifts of 150mm.
 - iii. Fill in and gently tamp top portion of hole.
- .7 Build a saucer around outer edge of hole to assist with maintenance watering, as per details. Rake out saucer at end of warranty period.
- .8 The Contractor is responsible for the removal of any other undesirable materials from the tree and planting site (ex: twine, rope, flagging tape, wire basket, burlap, large stones, etc.)

****If any suspected contamination at the site is discovered during excavation, the NCC must be notified immediately****

For further detail on planting please consult the International Society of Arboriculture's Best Management Practises for Tree Planting.

3.3 TREE SUPPORT

- .1 Immediately after planting, supply and install tree supports for all large deciduous and coniferous trees.
- .2 For trees smaller than 5 gallons, guy and stake only those plants designated by the NCC Representative. A maximum of 30% of those caliper trees may require staking.
- .3 Place stake on prevailing wind side of tree.
- .4 Drive stake minimum 500 mm into undisturbed soil beneath roots, at the outside edge of the root ball.
- .5 Ensure stake secure and vertical. Stakes will be a minimum of 1m in height but will be lower than the trees crown.
- .6 Install *DeepRoot-ArborTie* or approved equivalent. Cut off excess material.
- .7 Include tightening of guying materials to bring trees and plants to upright position.

3.4 MULCHING

- .1 Obtain approval of planting before mulching material is applied, if required. Spread mulch to minimum thickness as detailed on the drawings. No mulch should be piled around or in contact with the root flare of the tree. Mulch material susceptible to blowing must be moistened and mixed with topsoil before applying.
- .2 If there is enough material on-site, rake the chipped wood to form a pile in designated areas indicated by a NCC representative. Then, the Contractor must disperse these wood chips around the newly planted trees. If the on-site wood chips have all been utilized, complete the mulching process with purchased mulch after receiving approval from the NCC Representative.

3.5 TRUNK PROTECTION

- .1 Install trunk protection on caliper deciduous trees and container's deciduous trees.

PART 4 - MAINTENANCE

4.1 GENERAL

- .1 The Contractor shall prepare a maintenance schedule / tracking chart for each area with a list of all required items from the corresponding maintenance category, and a column to indicate the dates that each item is carried out. This chart template will need to be approved by the NCC Representative prior to planting and thereafter provided to the Representative every month for the duration of the maintenance period for tracking and reporting purposes.
- .2 Maintenance requirements in this contract may vary from planting area to planting area, depending on accessibility of the planting locations for maintenance purposes. See the Schedule of Items and Prices for maintenance requirements for each planting. The terms of each maintenance category are as follows:

ME1: Maintenance category ME1 is typically applied to planting areas with access appropriate for regular maintenance with pick-up trucks and water trucks, but consult the Schedule of Items and Prices for confirmation of the areas subject to ME1. From time of substantial acceptance by the NCC representative to end of warranty period, perform maintenance operations as described.

- .1 At no additional cost to the Commission, the Contractor shall, as soon as conditions permit during the specified planting period (spring or fall), remove and replace any trees which are not found to be in acceptable health or overall condition (section 2.5), as determined jointly by the Contractor and by the NCC representative, during the warranty period
- .2 Trees that die or suffer damage that will ultimately result in the death of the tree that are not covered under warranty will be removed in their entirety - this includes but is not limited to the tree, the root ball, mulch, and tree support system. The site will be remediated to its pre-planting condition- soil and seed when complete.
- .3 Watering per Section 4.2
- .4 Winter protection per Section 4.3
- .5 Remove all competing vegetation to grade, once in the spring or fall following planting, and once again a year later, in a 1m diameter around each plant. The use of brush saws may be required for the removal of woody vegetation.
- .6 All parts of invasive plants that are removed must be placed immediately into plastic garbage bags at the site of removal and then disposed of in the designated landfill. Do not stockpile or drag invasive plants around the planting site.
- .7 For non-mulched areas, cultivate to keep top layer of soil friable;
- .8 Repair/ replace tree support systems (stakes and ties) if required;
- .9 Top-up or re-spread damaged or missing mulch;
- .10 Remove dead, broken or hazardous branches from plant material;
- .11 Keep trunk protection and tree supports in proper repair and adjustment;

- .12 Remove and replace: dead plants; plants displaying low vigour and vitality; and if the tree's crown appears 1/3 dead. Make replacements in same manner as specified for original plantings.

ME2: Maintenance category ME2 is typically applied to planting areas that are too difficult for water trucks to access, but consult the Schedule of Items and Prices for confirmation of the areas subject to ME2. From time of acceptance by the NCC representative to end of warranty period, perform maintenance operations as described.

- .1 Items 1-2 and 4-11 as per ME1.
- .2 Watering will be undertaken according to section 4.2 at time of planting at the exact planting site. After initial installation, watering will **not** be expected due to lack of access.

4.2 WATERING :

- .1 Apply water using a soft spray nozzle to avoid packing of the soil.
- .2 Ensure that water penetrates the soil to a depth of 300 mm in the area from the trunk to the outer extent of the dripline.
- .3 **Water as needed and confirm soil humidity using a moisture probe with gauge.**
However, in order to obtain optimal results, we suggest the following watering frequency:
 - a. Water weekly from May 1st to August 31st;
 - b. During drought conditions (no rain for 3 consecutive days), water trees twice (2) weekly;
 - c. Water deciduous trees biweekly from September 1st until mid-October;
 - d. Water coniferous trees biweekly from September 1st until mid-October.
 - e. After September 1st, during drought conditions (no rain for 5 consecutive days), water trees on the 6th day.
- .4 Replace and repair any sod, mulch, paving or other materials disturbed by watering procedures.
- .5 Repair damaged watering saucers;

4.3 WINTER PROTECTION

- .1 Install winter protection (burlap) on all coniferous trees.
- .2 To be installed beginning of December and to be removed beginning of April.
- .3 To be done every winter during the warranty period.

4.4 MAINTENANCE AT THE END OF WARRANTY PERIOD

The following tasks are required for ALL maintenance and warranty categories:

- .1 At the end of warranty period, before the final inspection, remove all tree supports systems (stakes and ties), remove any weeds or grass that has grown into the mulched area, and top up all mulch to original specs.
- .2 Remove tie-wraps on tree protection and leave tree protection.

- .3 Remove all coloured cable ties identifying the trees from sites indicating a completion of contract responsibilities- with the exception of any trees that warranties have been extended on- those will be removed once warranty and maintenance obligations are fulfilled.

4.5 FINAL INSPECTION AND ACCEPTANCE

- .1 At the end of the two year warranty period, and once the Contractor has requested in writing, the NCC representative will perform the final inspection. Once final inspection is completed, and observed deficiencies or repairs required according to the NCC representative are completed, he will advise in writing that the requirements of this contract are complete and approve payment of remaining *hold back*.

END OF SECTION

PART 1 - GENERAL

1.1 SCOPE OF WORK

- .1 Provide labour, material, services and equipment necessary to complete the work of this section including but not limited to:
 - .1 Removal and disposal of invasive plant material (primarily Buckthorn roots) in areas indicated in the tender documents and as directed on site by the NCC Representative.

PART 2 - PRODUCTS

2.1 SILT FENCING

- .1 Silt fencing shall be provided by the NCC. Collect fencing from NCC warehouse located at 1740 Woodroffe, Ottawa.

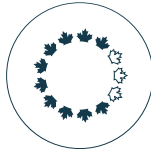
PART 3 - EXECUTION

3.1 METHODOLOGY

- .1 Before work commencement, install silt fencing in proximity of the bank in accordance with the direction of the representative of the NCC. Furthermore, a site visit must take place before work commencement so that the NCC representative identifies the work area to the contractor.
- .2 The work is divided into three different categories:
 - .1 Stump with diameter of 5 cm or more: Using a small excavator, wrap the stump with a metal chain (or other resistant chain material) connected to the excavator to lift the stump and roots at the same time.
 - .2 Stump with diameter of less than 5 cm: With a Pullerbear™ tool, hoe, spade grub or similar tools, uproot invasive species including the root system.
 - .3 Young stems of invasive species: The use of a brush cutter may be necessary in the case where many young invasive plants are present near to the planting area. It is then required to clear this plant competition to favor the new trees and shrubs to be planted.
- .3 Once the aerial and underground portions of the plants have been removed from the soil, these residues should be piled in a windrow in an acceptable and authorized location by the NCC.
- .4 If roots from native species are pulled out of the ground while the invasive species roots are being pulled, these roots should be cut cleanly at the ground level or be buried back into the ground. Tools must be disinfected with a solution of 70% ethyl alcohol.

- .5 All invasive species waste will have to be chipped (including the roots) and this material must be hauled off-site to a NCC pre-approved landfill site.
- .6 Following the removal, an opening in the ground will be created. When planting trees or shrubs in areas where roots have been removed, it is not necessary for the ground to be flat. High points and depressions are acceptable; however some soil may need to be added to ensure that the rootball is completely covered. Add topsoil as required to fill air pockets and compact by firmly stepping on it, and plant a tree or shrub in accordance with the planting plan and specifications provided by the NCC. Apply mulch around the newly planted trees or shrubs to prevent germination of invasive species seeds according to contract drawings.
- .7 Clean sludge, dirt and plant material from equipment and tools before leaving a site infested with invasive species. High pressure air hoses, mobile cleaning stations which retain water runoff, and brushes or brooms are acceptable cleaning methods.

END OF SECTION



**NATIONAL CAPITAL COMMISSION
COMMISSION DE LA CAPITALE NATIONALE**

DRAWINGS & PLANTING LISTS

BRUCE PIT - PLANTING PLAN/ Bruce Pit - Plan de plantation

Do not plant west of existing page wire fence/
Ne plantez pas à l'ouest de la clôture

Keep planting minimum 4 meters away from pathway/
Planter à au moins 4 mètres du sentier

Mix of trees and shrubs to plant -
species see plant list as per plant list /
Mélange d'arbres et d'arbustes à planter -
pour les espèces voir la liste de plantation

Access point and pathway/Accès au site et sentier



Bruce Pit Plant list/ Liste de plantation

Key/Clé	Latin Name/Nom latin	English Name/Nom anglais	French Name/Nom français	Qty/Qté	Size/Grandeur	Comments/Remarques
Trees/Arbres						
	Acer rubrum	Red Maple	Érable rouge	8	60mm W/B	
	Acer saccharum	Sugar Maple	Érable à sucre	6	60mm W/B	
	Betula alleghaniensis	Yellow Birch	Bouleau jeune	5	50mm W/B	
	Betula papyrifera	White Birch	Bouleau à papier	5	50mm W/B	
	Fagus grandifolia	American Beech	Hêtre à grandes feuilles	6	60mm W/B	
	Ostrya virginiana	Ironwood	Ostryer de Virginie	6	50mm W/B	
	Quercus rubrum	Red Oak	Chêne rouge	8	60mm W/B	
	Picea glauca	White Spruce	Épinette blanche	7	175cm W/B	
	Pinus strobus	White Pine	Pin blanc	14	180cm W/B	
	Tsuga canadensis	Eastern Hemlock	Pruche de Canada	5	180cm W/B	
			Total	70		
Shrubs/Arbustes						
	Clematis virginiana	Virgin's bower	Clématite de Virginie	4	1 gal.	
	Cornus sericea	Red Osier Dogwood	Cornouiller stolonifère	12	2 gal.	
	Physocarpus opulifolius	Common Ninebark	Physocarbe feuille d'obier	12	2 gal.	
	Symphoricarpos albus	Snowberry	Symphorine	8	2 gal.	
			Total	36		

DARTMOOR and SHETLAND - PLANTING PLAN/ Dartmoor et Shetland - Plan de plantation



Planting area #1 :
Mix of trees and shrubs to plant -
species see plant list / Zone de
plantation #1: Mélange d'arbres et
d'arbustes à planter - pour les espèces
voir la liste de plantation

Planting area #2 :
Mix of trees and shrubs to plant -
species see plant list / Zone de
plantation #2: Mélange d'arbres et
d'arbustes à planter - pour les espèces
voir la liste des plantation

Planting area #3 :
Mix of trees and shrubs to plant -
species see plant list / Zone de
plantation #3: Mélange d'arbres et
d'arbustes à planter - pour les
espèces voir la liste de plantation

Drain location/
Drainage existant

Existing mast/
Mât existant

Access point/
Accès au site

Drain location/
Drainage existant

Drain location/
Drainage existant

Access point/
Accès au site

Dartmoor and Shetland - Planting list/ Liste de plantation

Planting Area #1, mix and arrange/Zone de plantation #1, mélanger et placer

Trees and Shrubs/Arbres et arbustes

Key/Clé	Latin Name/Nom latin	English Name/Nom anglais	French Name/Nom français	Qty/Qté	Size/Grandeur	Comments/Remarques
	Acer rubrum	Red Maple	Érable rouge	12	60mm W/B	
	Acer saccharinum	Silver Maple	Érable argenté	12	60mm W/B	
	Populus balsamifera	Balsam Poplar	Peuplier baumier	5	50mm W/B	
	Picea glauca	White Spruce	Épinette blanche	9	180cm W/B	
	Cornus sericea	Red Osier Dogwood	Cornouiller stolonifère	21	3 gal.	
	Salix discolor	Pussy Willow	Saule noire	25	3 gal.	
	Viburnum lentago	Nannyberry	Viorne flexible	10	3 gal.	
Total				94		

Planting Area #2, mix and arrange/Zone de plantation #2, mélanger et placer

Trees and Shrubs/Arbres et arbustes

	Acer rubrum	Red Maple	Érable rouge	12	120cm CT	
	Acer saccharinum	Silver Maple	Érable argenté	14	120cm CT	
	Carya cordiformis	Bitternut Hickory	Caryer cordiforme	12	120cm CT	
	Quercus macrocarpa	Bur oak	Chêne à gros glands	12	120cm CT	
	Picea mariana	Black Spruce	Épinette noire	9	120cm CT	
	Cornus sericea	Red Osier Dogwood	Cornouiller stolonifère	12	2 gal.	
	Cornus racemosa	Gray Dogwood	Cornouiller à grappes	8	2 gal.	
	Salix discolor	Pussy Willow	Saule noire	6	2 gal.	
	Viburnum lentago	Nannyberry	Viorne flexible	10	2 gal.	
	Viburnum trilobum	Highbush Cranberry	Viorne trilobée	10	2 gal.	
Total				105		

Planting Area #3, mix and arrange/Zone de plantation #3, mélanger et placer

Trees and Shrubs/Arbres et arbustes

	Acer rubrum	Red Maple	Érable rouge	14	120cm CT	
	Acer saccharinum	Silver Maple	Érable argenté	14	120cm CT	
	Carya cordiformis	Bitternut Hickory	Caryer cordiforme	12	120cm CT	
	Quercus macrocarpa	Bur Oak	Chêne à gros glands	14	120cm CT	
	Picea mariana	Black Spruce	Épinette noire	12	120cm CT	
	Cornus racemosa	Gray Dogwood	Cornouiller à grappes	6	2 gal.	
	Cornus sericea	Red Osier Dogwood	Cornouiller stolonifère	6	2 gal.	
	Salix discolor	Pussy Willow	Saule noire	6	2 gal.	
	Viburnum lentago	Nannyberry	Viorne flexible	6	2 gal.	
	Viburnum trilobum	Highbush Cranberry	Viorne trilobée	6	2 gal.	
Total				96		

GREENBELT PATHWAY EAST - PLANTING PLAN/
Sentier de la Ceinture de-Verdure Est - Plan de plantation

Mix of trees and shrubs arrange along pathway, 3m or more from the pathway, see planting list. To separate the quantity of plants equally on both sides of the path. / Mélange d'arbres et d'arbustes, planter le long du sentier à 3m et plus du bord du sentier - voir la liste de plantation. Séparer la quantité de plantes également de part et d'autre du sentier.

Seed mix to apply (manual seeding / Mélange de semences (semis manuel)

Avoid planting in natural ditches/
Éviter de planter dans les fossés naturels

Mix of trees and shrubs arrange along pathway, 3m or more from the pathway, see planting list. To separate the quantity of plants equally on both sides of the path. / Mélange d'arbres et d'arbustes, planter le long du sentier à 3m et plus du bord du sentier - voir la liste de plantation. Séparer la quantité de plantes également de part et d'autre du sentier.

Seed mix to apply (manual seeding / Mélange de semences (semis manuel)

30 CO
Plant along the road, on east side of ditch, in equal distances, within NCC property/
Planter le long de la route, du côté est du fossé, à égale distance, sur la propriété de la CCN

GEORGE-ETIENNE CARTIER

REGIONAL ROAD 174

ST. JOSEPH

Greenbelt Pathway East - Plant List

Sentier de la Ceinture de-Verdure Est - Liste de plantation

Key/Clé	Latin Name/Nom latin	English Name/Nom anglais	French Name/Nom français	Qty/Qté	Size/Grandeur	Comments/Remarques
Trees/Arbres						
CO	Celtis occidentalis	Hackberry	Micocoulier occidental	30	75mm W/B	
Mix of trees and shrubs - divide for east and west side of pathway/ Mélange d'arbres et d'arbustes - diviser entre les cotés est et ouest du sentier						
	Acer rubrum	Native Red Maple	Érable rouge	10	60mm W/B	
	Acer saccharum	Sugar Maple	Érable à sucre	10	60mm W/B	
	Acer saccharinum	Silver Maple	Érable argenté	10	60mm W/B	
	Amelanchier canadensis	Downy Serviceberry	Amélanchier arborescent	17	30mm W/B	
	Betula alleghaniensis	Yellow Birch	Bouleau jeune	10	50mm W/B	
	Betula papyrifera	Paper Birch	Bouleau à papier	30	50mm W/B	
	Populus tremuloides	Trembling Aspen	Peuplier faux-tremble	30	50mm W/B	
	Prunus serotina	Black Cherry	Cerisier tardif	10	50mm W/B	
	Picea glauca	White spruce	Épinette blanche	16	175cm W/B	
	Pinus strobus	Eastern White Pine	Pin blanc	16	175cm W/B	
	Thuja occidentalis	Eastern White Cedar	Thuya occidentale	15	200cm W/B	
	Cornus sericea	Red Osier Dogwood	Cornouiller stolonifère	30	2 gal.	
	Hammelis virginiana	Common Witchhazel	Hammélis de Virginie	30	5 gal.	
	Spirea alba	Narrow-leaved Meadowsweet	Reine des prés à feuilles étroites	120	2 gal.	
Total				354		
Other/Autres						
pm	Aiglon Indigo ProMonarques Seed Mix Modified v. 2 - NCC/Mélange ProMonarques Modifié v2 - CCN			15	kg	7500 m², manual seed/semis manuel

OTTAWA RIVER PATHWAY - PLANTING PLAN/ Sentier de la Rivière-des-Outaouais - Plan de plantation

Gas easement in this area n-
do not plant / Servitude de gaz
dans ce secteur- ne pas
planter

1QB,
3Cos, 6Spa,

3QR, 1PS, 1TO
12Cos, 12Spa

1BP, 1AR, 2BP
12Cos, 10Spa

2PS, 1TO

1AR, 1QR, 2PS, 1TO
6Cos, 12Spa

2AR, 1BP, 2TO
3Cos, 3Spa

2AS, 1QB, 1PB
12Cos, 3Spa

2AR, 1PS, 1TO
6Cos, 3Spa

Windbreak planting, mix and divide into 4
areas, see planting list for species /
Aménagement d'un brise-vent, mélanger
et diviser les plantes entre les 4 sections,
voir la liste de plantation pour les espèces

Tile drain in this area - avoid
planting/
Fossé de drainage dans ce
secteur- éviter de planter

pm

Ottawa River Pathway - Plant List/

Sentier de la Rivière-des-Outaouais - Liste de plantation

Key/Clé	Latin Name/Nom latin	English Name/Nom anglais	French Name/Nom français	Qty/Qté	Size/Grandeur	Comments/Remarques
Trees/Arbres						
AR	Acer rubrum	Red Maple	Érable rouge	6	75mm W/B	
AS	Acer saccharum	Sugar Maple	Érable à sucre	1	75mm W/B	
BP	Betula papyrifera	White Birch	Bouleau à papier	5	50mm W/B	
QB	Quercus alba	White Oak	Chêne blanch	3	50mm W/B	
QR	Quercus rubra	Red Oak	Chêne rouge	4	50mm W/B	
PS	Pinus strobus	White Pine	Pin blanc	6	180cm W/B	
TO	Thuja occidentalis	Eastern White Cedar	Thuya occidental	6	180cm W/B	
Cos	Cornus sericea	Red Osier Dogwood	Cornouiller stolonifère	24	2 gal.	
Spa	Spirea alba	Narrow-leaved Meadowsweet	Spirée blanche	24	2 gal.	
Total				79		
Windbreak planting - mix and divide between four areas/						
Plantation de brise-vent - mélangez et divisez en quatre zones						
	Acer rubrum	Red Maple	Érable rouge	6	200cm CT	
	Amelanchier canadensis	Downy Serviceberry	Amélanchier arborescent	12	30mm CT	
	Betula papyrifera	White Birch	Bouleau à papier	12	150cm CT	
	Carya ovata	Shagbark Hickory	Caryer ovale	12	30mm CT	
	Ostrya virginiana	Ironwood	Ostryer de Virginie	8	150cm CT	
	Populus tremuloides	Trembling Aspen	Peuplier faux-tremble	12	30mm CT	
	Prunus serotina	Black Cherry	Cerisier tardif	12	30mm CT	
	Abies concolor	White fir	Sapin argenté	16	150cm CT	
	Pinus strobus	White pine	Pin blanc	16	150cm CT	
	Thuja occidentalis	Eastern White Cedar	Thuya occidental	12	150cm CT	
	Spirea alba	Narrow-leaved Meadowsweet	Spirée blanche	24	2 gal.	
	Cornus sericea	Red Osier Dogwood	Cornouiller stolonifère	24	2 gal.	
	Sambucus canadensis	American Elder	Sureau du Canada	24	3 gal.	
	Rhus aromatica	Fragrant Sumac	Sumac aromatique	24	2 gal.	
	Viburnum lentago	Nannyberry	Viorne lentago/Alisier sur tige	24	2 gal.	
Total				238		
Other/Autres						
pm	Aiglon Indigo ProMonarques Seed Mix Modified v. 2 - NCC/Mélange ProMonarques Modifié v2 - CCN			4	kg	2000 m ² , manual seed/semis manuel

LEGEND / LÉGENDE

NCC PROPERTY LINE /
LIMITE DE PROPRIÉTÉ DE LA CCN

1.2m HIGH CHAIN LINK FENCE /
CLÔTURE GRILLAGÉE DE 1.2m DE HAUTEUR

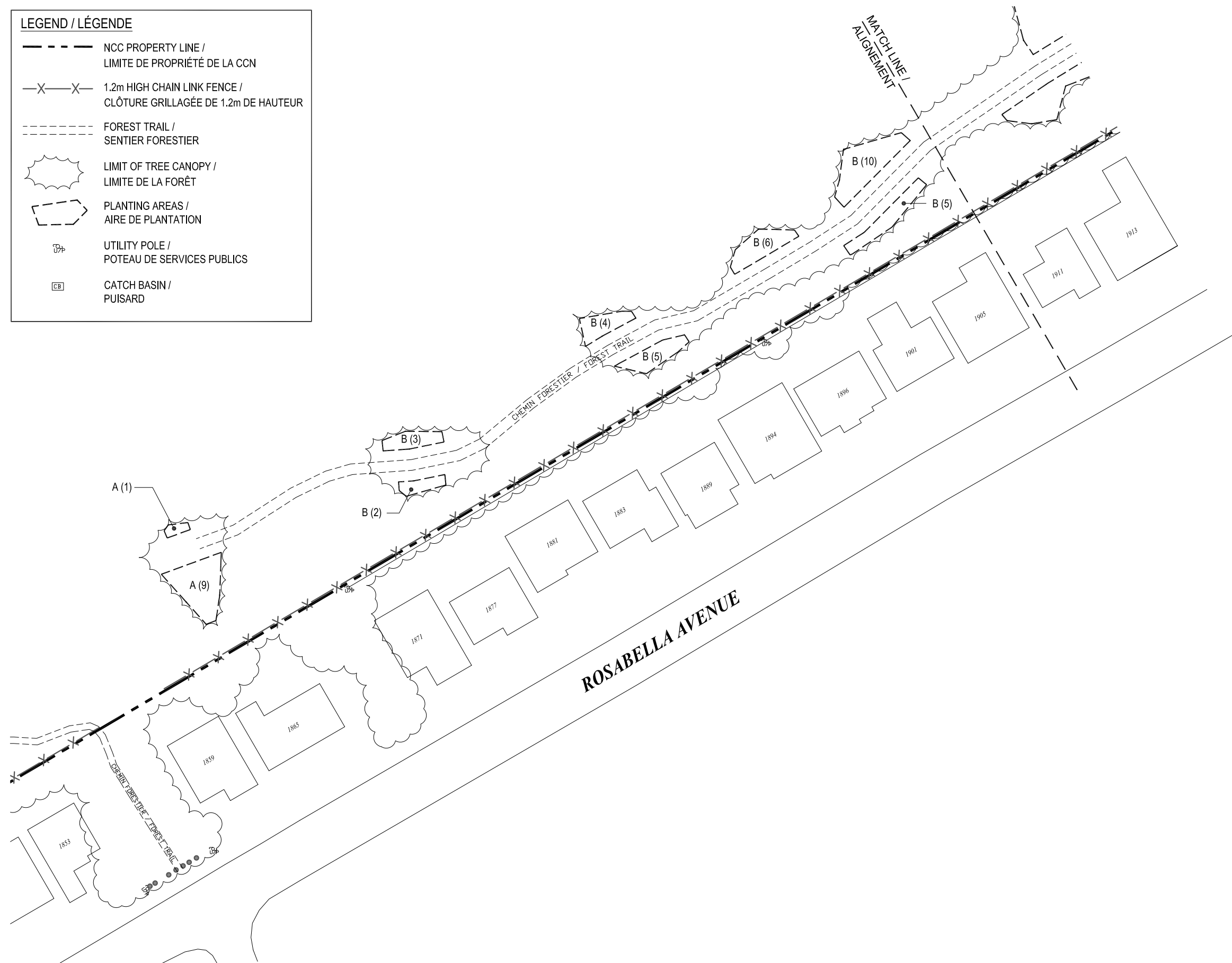
FOREST TRAIL /
SENTIER FORESTIER

LIMIT OF TREE CANOPY /
LIMITE DE LA FORÊT

PLANTING AREAS /
AIRE DE PLANTATION

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POTEAU DE SERVICES PUBLICS

CATCH BASIN /
PUISARD

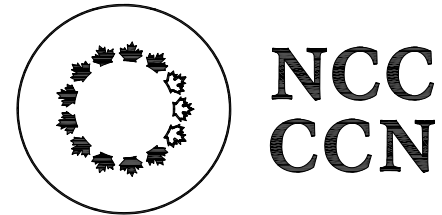


1

L1

PLAN

SCALE / ÉCHELLE - 1:750



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ROSABELLA ASH TREE REPLACEMENTS |
REPLACEMENT DES FRÊNES PRÈS DE
L'AVE ROSEBELLA

drawing
dessin

PLANTING PLAN |
PLAN DE PLANTATION

approved by approuvé par SL		
designed by conçu par JH		
drawn by dessiné par JH		
date	JAN. 2019	scale échelle AS NOTED

NCC project no.
no. du projet de la CCN DC-

sheet no.
no. de la feuille L1

LEGEND / LÉGENDE

NCC PROPERTY LINE /
LIMITE DE PROPRIÉTÉ DE LA CCN

1.2m HIGH CHAIN LINK FENCE /
CLÔTURE GRILLAGÉE DE 1.2m DE HAUTEUR

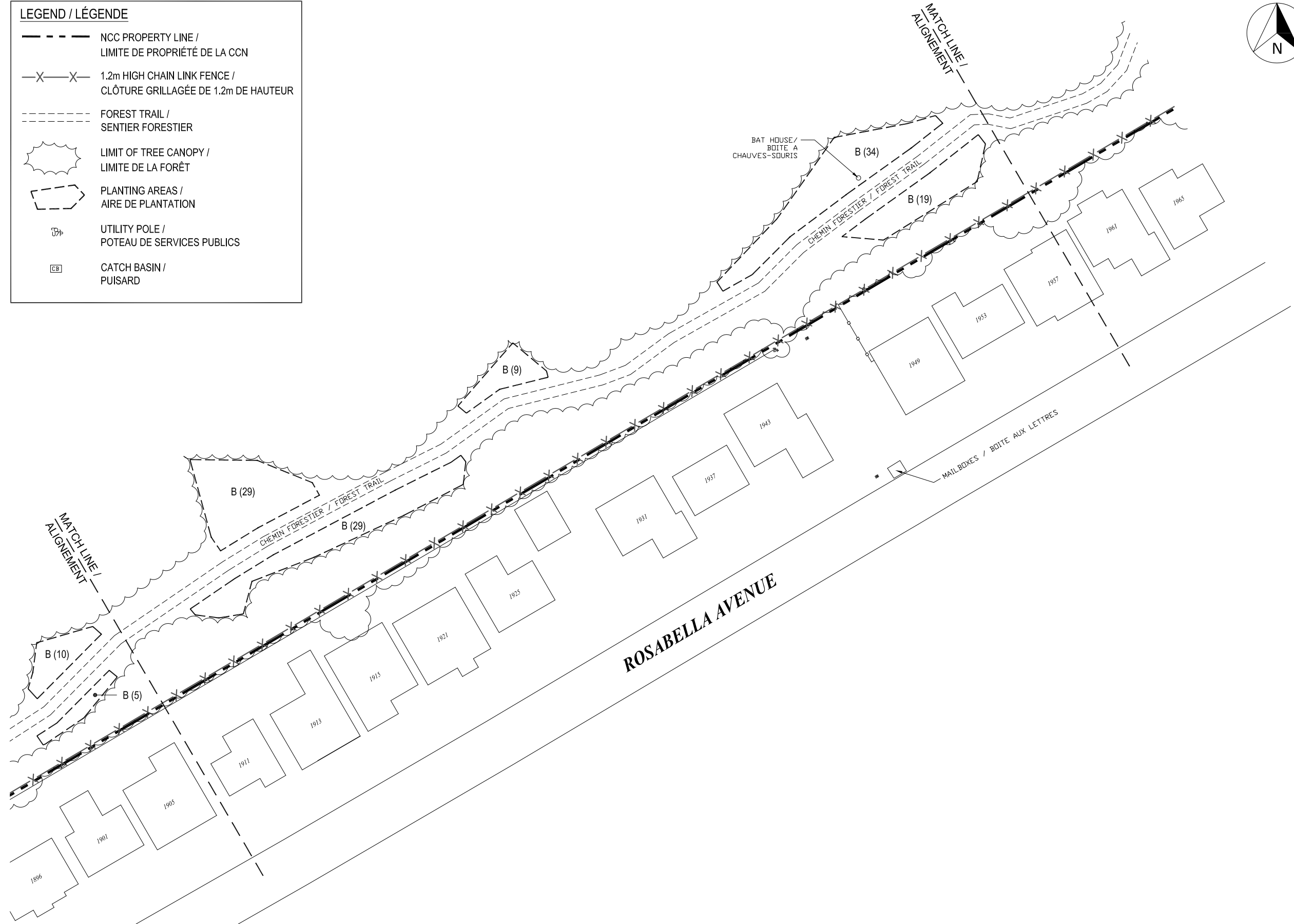
FOREST TRAIL /
SENTIER FORESTIER

LIMIT OF TREE CANOPY /
LIMITE DE LA FORÊT

PLANTING AREAS /
AIRE DE PLANTATION

UTILITY POLE /
POTEAU DE SERVICES PUBLICS

CATCH BASIN /
PUISARD

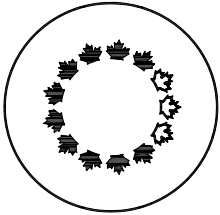


1

PLAN

L2

SCALE / ÉCHELLE - 1:750



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no. du projet de la CCN no. de la feuille

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L2

LEGEND / LÉGENDE

NCC PROPERTY LINE /
LIMITE DE PROPRIÉTÉ DE LA CCN

1.2m HIGH CHAIN LINK FENCE /
CLÔTURE GRILLAGÉE DE 1.2m DE HAUTEUR

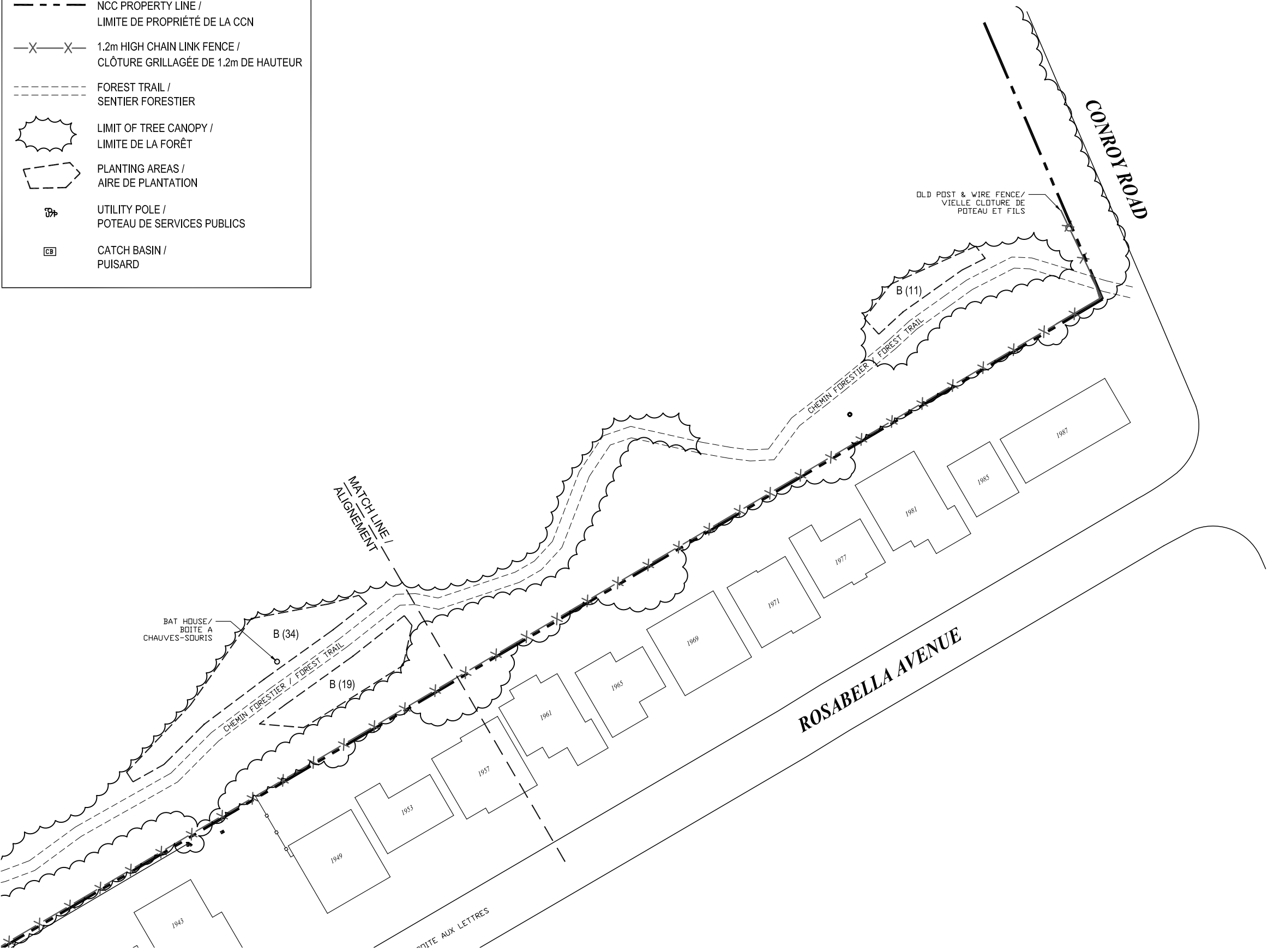
FOREST TRAIL /
SENTIER FORESTIER

LIMIT OF TREE CANOPY /
LIMITE DE LA FORÊT

PLANTING AREAS /
AIRE DE PLANTATION

UTILITY POLE /
POTEAU DE SERVICES PUBLICS

CATCH BASIN /
PUISARD

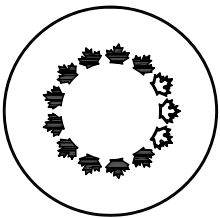


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L3

PLAN

SCALE / ÉCHELLE - 1:750



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PLAN DE PLANTATION

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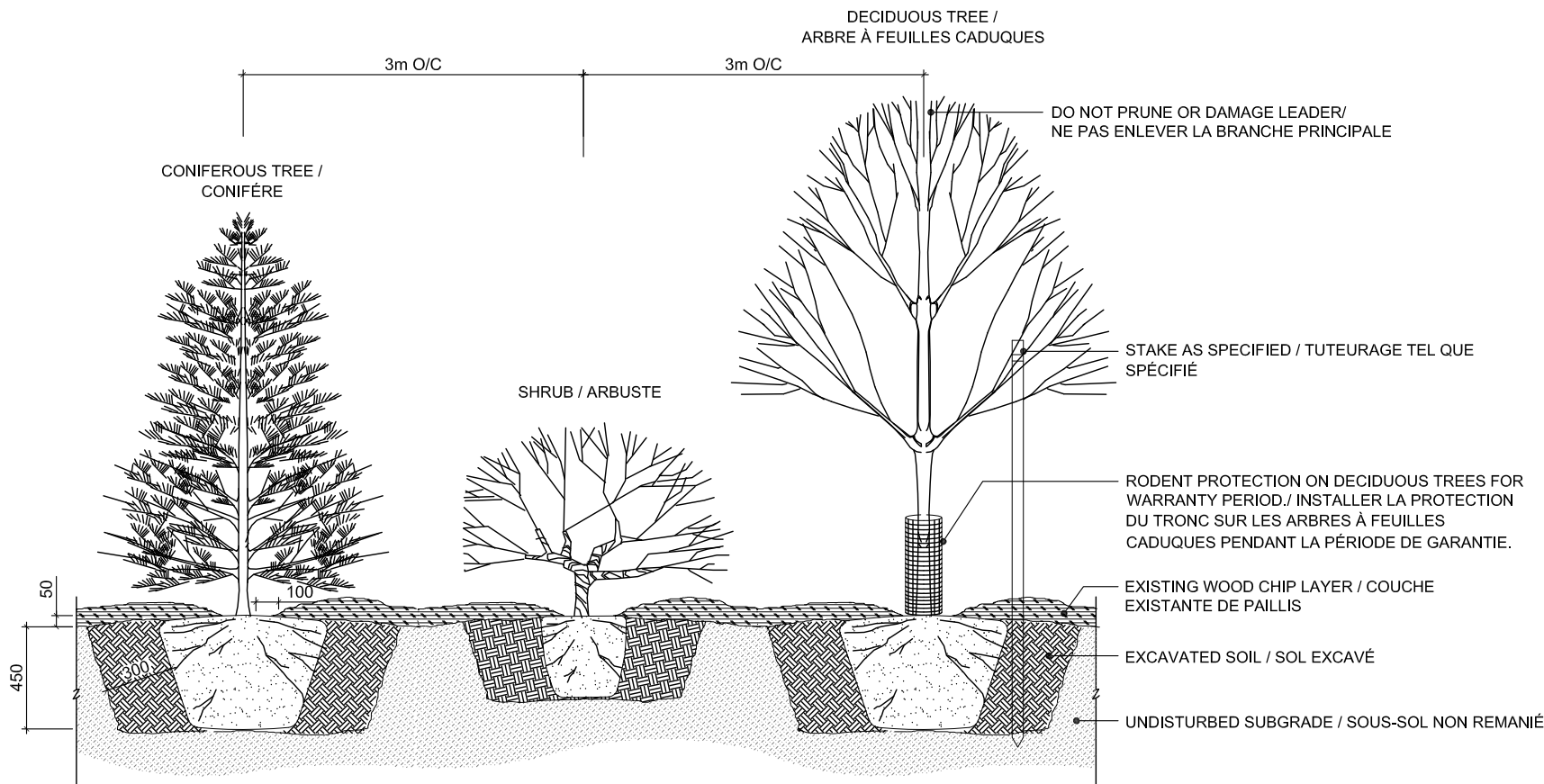
NCC project no.

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no. du projet de la CCN no. de la feuille

DC-

L3



- NOTES / REMARQUES:
1. WATER PLANTS 10-20 MINUTES BEFORE PLANTING AND AGAIN IMMEDIATELY AFTER PLANTING. / ARROSER LES PLANTES 10-20 MINUTES AVANT LA PLANTATION ET ENCORE IMMEDIATEMENT APRÈS LA PLANTATION.
 2. REMOVE POT FROM ROOTBALL PRIOR TO PLANTING./ ENLEVER LE POT DE LA MOTTE RACINAIRE AVANT LA PLANTATION.
 3. SCARIFY SIDES AND BOTTOM OF PLANTING PIT./ SCARIFIER LES CÔTÉS ET LE FOND DE LA FOSSE.
 4. PLANT TREES, SHRUBS AND PERENNIALS AT ELEVATION EQUAL TO THAT OF APPARENT NURSERY GROWING CONDITION. TRUNK FLARE MUST BE ABOVE GRADE./ PLANTER LES ARBRES, LES ARBUSTES ET LES VIVACES AU MÊME NIVEAU QUE LES CONDITIONS DE CROISSANCE À LA PÉPINIÈRE. LE COLLET DU TRONC DOIT ÊTRE AU-DESSUS DU SOL.
 5. BACKFILL AROUND ROOTBALL WITH EXCAVATED SOIL. WATER TO SLURRY AND TAMP IN LAYERS TO REMOVE AIR POCKETS./ REMBLAYER AUTOUR DE LA MOTTE RACINAIRE AVEC LE SOL EXCAVÉ. ARROSER JUSQU'A L'OBTENTION D'UNE BOUE ET TAPER EN COUCHE AFIN D'ENLEVER LES POCHES D'AIR.
 6. PRUNE DEAD, DISEASED OR BROKEN BRANCHES ONLY./ ÉLAGUER LES BRANCHES MORTES, MALADES OU CASSÉES SEULEMENT.
 7. REMOVE ALL NURSERY TAGS AFTER ACCEPTANCE BY NCC REPRESENTATIVE./ ENLEVER TOUTES LES ÉTIQUETTES DE LA PÉPINIÈRE APRÈS L'APPROBATION DU REPRÉSENTANT DE LA CCN.
 8. PULL-BACK MULCH 100mm AROUND TREE TRUNK./ RETIRER LE PAILLIS 100mm AUTOUR DU TRONC.

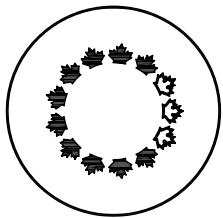
1
L4

REFORESTATION PLANTING / PLANTATION DE REBOISEMENT

SCALE / ÉCHELLE • 1:30

GENERAL NOTES / NOTES GÉNÉRALES:

1. All general site information and conditions have been compiled from the NCC's base plans. / Le fond de plan et le relevé du terrain existant proviennent de la base de données de la CCN.
2. Do not scale these drawings. / Ne pas prélever de mesures à l'échelle sur ces dessins.
3. The contractor must verify existing conditions before beginning work and notify the NCC Construction Supervisor of any errors, omissions or inconsistencies. / L'entrepreneur doit vérifier les conditions existantes sur le site avant le début des travaux et aviser le Superviseur de Construction de la CCN de toute erreur, omission ou contradiction.
4. All dimensions are approximate and must be verified by the Contractor on site before commencing work. / Toutes les dimensions sont approximatives et doivent être validées sur place avant les travaux.
5. The contractor is responsible for confirming the exact location of all underground services listed and not listed in this plan, and for obtaining the necessary clearances and permits from the utility companies before commencing work. / L'entrepreneur est responsable de la confirmation de l'emplacement exacte de tous les services souterrains indiqués et non indiqués dans le présent plan, et d'obtenir les permissions requises auprès des sociétés pertinentes d'approvisionnement de services.
6. Site work layout must be approved by the NCC Landscape Architect before commencing work. / L'implantation des ouvrages devra être fait sur le site en compagnie de l'architecte paysagiste de la CCN avant de commencer les travaux.
7. The contractor is not to remove any vegetation from the site without the approval of the NCC Landscape Architect. / L'entrepreneur ne doit éliminer aucune végétation existante sur le site sans l'approbation de l'architecte paysagiste de la CCN.
8. Contractor shall guarantee all plant material for a period of two (2) full years from the date of final acceptance. / L'entrepreneur doit garantir tout le matériel végétal pendant une période de deux (2) années complètes à compter de la date d'acceptation définitive.
9. Reinstatement all areas and items damaged as a result of construction activities to the satisfaction of the NCC Representative. / Rétablissez toutes les zones et objets endommagés à la suite des activités de construction à la satisfaction de le représentant de la CCN.
10. All dimensions are in mm unless otherwise noted. / Toutes les dimensions sont en mm, sauf indication contraire.
11. Take the necessary precautions when working in wet, forested areas. Beware of standing water, excessive mosquitos and poison ivy. / Prendre les précautions nécessaires lors de travaux dans les zones humides et boisées. Faire attention à l'eau stagnante, les moustiques excessifs et l'herbe à puce.



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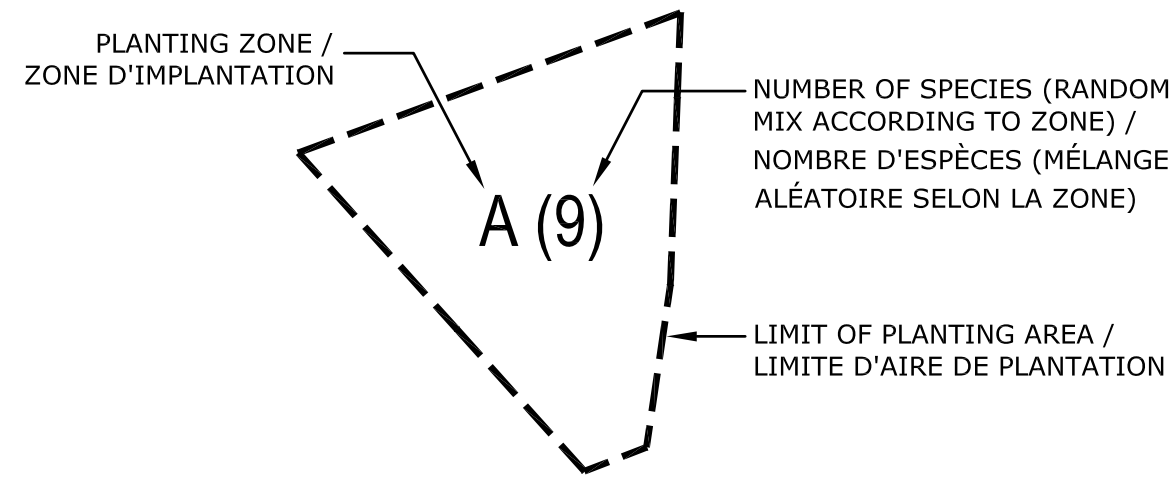
ROSABELLA ASH TREE REPLACEMENTS |
REMPLACEMENT DES FRÊNES PRÈS DE
L'AVE ROSEBELLA

drawing
dessin

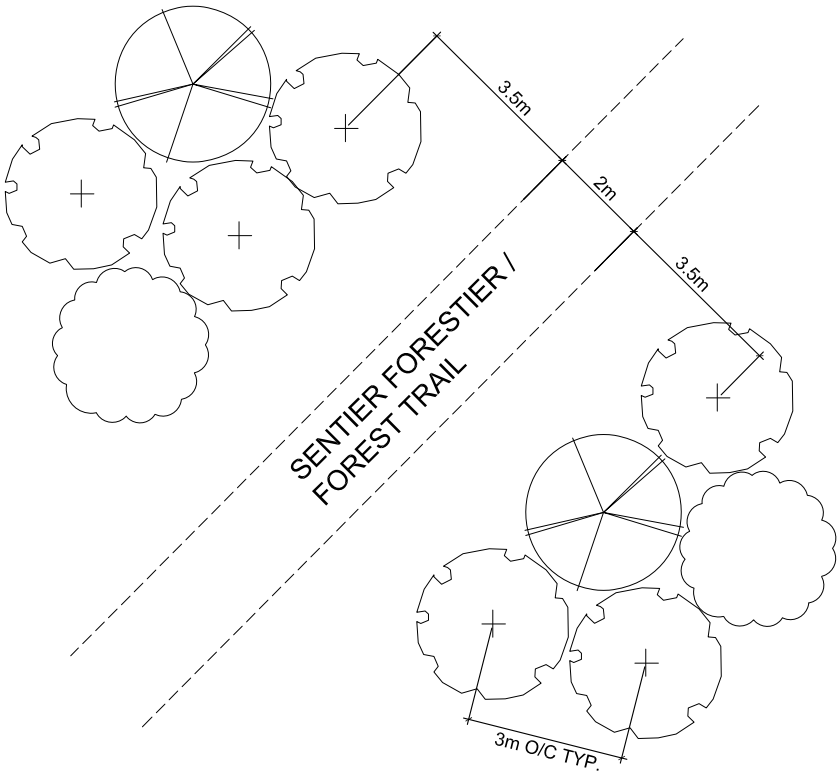
PLANTING DETAILS |
DÉTAILS DE PLANTATION

approved by approuvé par	SL
designed by conçu par	JH
drawn by dessiné par	JH
date	JAN. 2019
scale échelle	AS NOTED
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DC-	

L4

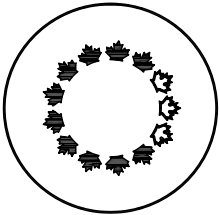


1 PLANTING KEY | CLÉ DE PLANTATION
L5
SCALE / ÉCHELLE - NTS



- NOTES / REMARQUES:
- FOREST TRAIL IS APPROXIMATELY 2m WIDE. / LE SENTIER FORESTIER EST ENVIRON 2m DE LARGEUR.
 - PLANT TREES & SHRUBS 3.5m AWAY FROM FOREST TRAIL EDGE (4.5m AWAY FROM TRAIL CENTRE LINE). / PLANter LES ARBRES ET LES ARBUSTES À 3.5m DU BORD DU SENTIER FORESTIER (4.5m DU CENTRE LIGNE DU SENTIER).
 - ENSURE PROPER SPACING BETWEEN TREES & SHRUBS AS INDICATED IN PLANTING TABLE. / CONSULTEZ LE TABLEAU DE PLANTATION POUR L'ESPACEMENT DES ARBRES ET ARBUSTES.

2 PLANTING LAYOUT / SCHÉMA DE PLANTATION
L5
SCALE / ÉCHELLE - NTS



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ROSABELLA ASH TREE REPLACEMENTS |
REMPLACEMENT DES FRÊNES PRÈS DE
L'AVE ROSEBELLA

drawing
dessin

PLANTING DETAILS |
DÉTAILS DE PLANTATION

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dessiné par JH

date JAN. 2019 scale
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L5

Rosabella Ave Plant List/ Liste de plantation

Planting Zone A/ Zone de plantation A - Dry/Sec

Trees/Arbres

Key/Clé	Latin Name/Nom latin	English Name/Nom anglais	French Name/Nom français	Qty/Qté	Size/Grandeur	Comments/Remarques
BA	Betula alleghaniensis	Yellow Birch	Bouleau jaune	2	3g	
PRS	Prunus serotina	Black Cherry	Cerisier tardif	2	3g	
QM	Quercus macrocarpa	Burr Oak	Chêne à gros fruits	2	7g	
TC	Tsuga canadensis	Hemlock	Pruche	2	7g	
Total trees				8		

Shrubs/Arbustes

AC	Amelanchier canadensis	Shadblow Serviceberry	Amélanchier	2	3g	
Total shrubs				2		

Planting Zone B/ Zone de plantation B - Wet/Humide

Trees/Arbres

Key/Clé	Latin Name/Nom latin	English Name/Nom anglais	French Name/Nom français	Qty/Qté	Size/Grandeur	Comments/Remarques
AR	Acer rubrum	Red Maple	Érable rouge	33	7g	
ASA	Acer saccharinum	Silver Maple	Érable argenté	33	5g	
PB	Populus balsamifera	Balsam Poplar	Peuplier baumier	17	3g	
SD	Salix discolor	Pussy Willow	Saule discolor	12	3g	
SN	Salix nigra	Black Willow	Saule noir	12	3g	
TO	Thuja occidentalis	Eastern White Cedar	Thuya occidental	17	5g	
Total trees				124		

Shrubs/Arbustes

Am	Aronia melanocarpa	Black Chokeberry	Aronie noire	6	2g	
Ca	Cornus amomum	Silky Dogwood	Cornouiller	6	3g	
Cos	Cornus sericea	Red Osier Dogwood	Cornouiller stolonifère	6	3g	
Iv	Ilex verticillata	Winterberry	Houx verticillé	6	2g	
Lb	Lindera benzoin	Spicebush	Lindera benzoin	6	2g	
Mg	Myrica gale	Bayberry	Myrique	6	2g	
VI	Viburnum lentago	Nannyberry	Viorne flexible	6	3g	
Total shrubs				42		

SHIRLEYS BAY - PLANTING PLAN #1/

Baie Shirleys - Plan de plantation #1



SHIRLEYS BAY - PLANTING PLAN #2/ Baie Shirleys - Plan de plantation #2



CRICLOW

Mix of trees as per plant list, plant on both sides of Riverdown Drive.
Install deer fence/
Mélange d'arbres - voir la liste de plantation, planter des deux côtés de la rue Riverdown. Installer une clôture à chevreuils.

**Shirleys Bay - Plant list/
Baie Shirleys - Liste de plantation**

Key/Clé	Latin Name/Nom latin	English Name/Nom anglais	French Name/Nom français	Qty/Qté	Size/Grandeur	Comments/Remarques
Shirleys Bay parking area/ Zone de stationnement à la baie Shirleys						
AR	Acer rubrum	Native Red Maple	Érable rouge	17	30mmCT	
PG	Picea glauca	White Spruce	Épinette blanche	7	120cmCT	
PS	Pinus strobus	Eastern White Pine	Pin blanc	3	120cmCT	
Total				27		

**Mix of trees and shrubs for Shirley Boulevard - north side only/
Mélange d'arbres et d'arbustes pour le boul. Shirley - côté nord seulement**

Acer rubrum	Red Maple	Érable rouge	8	50mm W/B	
Acer saccharum	Sugar Maple	Érable à sucre	16	50mm W/B	
Acer saccharinum	Silver Maple	Érable argenté	16	50mm W/B	
Amelanchier canadensis	Downy Serviceberry	Amélanchier arborescent	30	50mm W/B	
Carpinus caroliniana	Blue-beech	Charme de Caroline	15	50mm W/B	
Betula aleghaniensis	Yellow Birch	Bouleau jaune	10	50mm W/B	
Betula papyrifera	White Birch	Bouleau à papier	10	50mm W/B	
Ostrya virginiana	Ironwood	Ostryer de Virginie	20	250cm CT	
Populus tremuloides	Trembling Aspen	Peuplier faux-tremble	16	50mm W/B	
Prunus serotina	Black Cherry	Cerisier tardif	26	50mm W/B	
Quercus macrocarpa	Bur Oak	Chêne à gros fruits	16	60mm W/B	
Picea glauca	White spruce	Épinette blanche	16	160cm W/B	
Pinus strobus	White Pine	Pin blanc	16	160cm W/B	
Thuja occidentalis	Eastern White Cedar	Thuya occidental	16	160cm W/B	
Cornus alba 'Sibirica'	Red Twig Dogwood	Cornouiller stolonifère 'Sibirica'	30	2 gal.	
Sambucus canadensis	American Elder	Sureau du Canada	30	3 gal.	
Total				291	

**Mix of trees and shrubs for Riverdown Drive - divide into both sides of road/
Mélange d'arbres et d'arbustes pour la rue Riverdown - séparez les quantités entre les deux côtés de la rue**

Amelanchier canadensis	Downy Serviceberry	Amélanchier arborescent	10	50mm W/B	
Carpinus caroliniana	Blue-beech	Charme de Caroline	16	50mm W/B	
Ostrya virginiana	Ironwood	Ostryer de Virginie	15	150cm CT	
Prunus serotina	Black Cherry	Cerisier tardif	8	50mm W/B	
Quercus macrocarpa	Bur Oak	Chêne à gros fruits	9	60mm W/B	
Thuja occidentalis	Eastern White Cedar	Thuya occidental	8	150cm W/B	
Tsuga canadensis	Eastern Hemlock	Pruche du Canada	15	150cm W/B	

Cornus alba 'Sibirica'	Red Twig Dogwood	Cornouiller stolonifère 'Sibirica'	10	2 gal.
Sambucus canadensis	American Elder	Sureau du Canada	10	3 gal.
		Total	101	

Shirley's Bay - Planting Plan 1. Archaeological Monitoring Zones



Imagery/Imagerie: 2017 Aerial image

Published/Publié : 2019/2/5

Disclaimer: The NCC does not guarantee this information to be correct, current, or complete. The maps are only intended for internal use as a general reference and are not intended or suitable for site-specific, financial or legal decisions. Any use is at the user's own risk.
Limitation de responsabilité : La Commission de la capitale nationale (CCN) ne garantit pas que cette information est correcte, actuelle, ou complète. Les cartes sont seulement destinées à l'utilisation interne pour fin de référence générale et ne sont pas destinées ou prévu afin de prendre des décisions propres à un site, financières ou légales. Toutes utilisation est aux risques de l'utilisateur.

WATTS CREEK EAST - PLANTING PLAN #1

Ruisseau Watts est - Plan de plantation #1



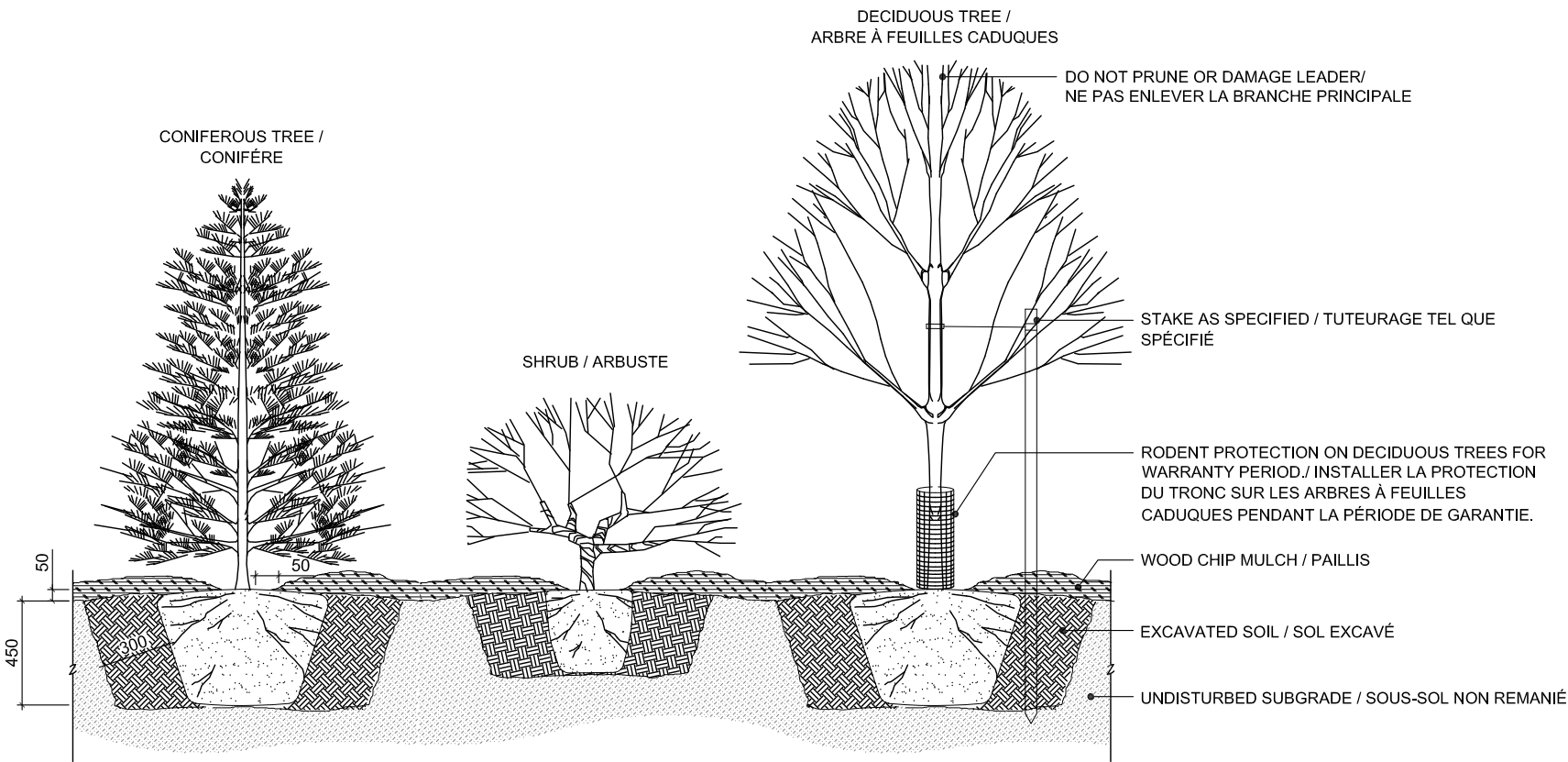
WATTS CREEK EAST - PLANTING PLAN #2

Ruisseau Watts est - Plan de plantation #2



**Watts Creek East - Plant List/
Ruisseau Watts Est - Liste de plantation**

Key/Clé	Latin Name/Nom latin	English Name/Nom anglais	French Name/Nom français	Qty/Qté	Size/Grandeur	Comments/Remarques
Trees/Arbres						
AR	Acer rubrum	Native Red Maple	Érable rouge	12	60mm W/B	
ASA	Acer saccharinum	Silver Maple	Érable argenté	12	60mm W/B	
AS	Acer saccharum	Sugar Maple	Érable à sucre	29	50mm W/B	
AS	Acer saccharum	Sugar Maple	Érable à sucre	3	75mm W/B	
AA	Amelanchier canadensis	Downy Serviceberry	Amélanchier arborescent	30	50mm W/B	
BA	Betula alleghaniensis	Yellow Birch	Bouleau jaune	16	50mm W/B	
BP	Betula papyrifera	Multistem Paper Birch or Canoe Birch	Bouleau à papier	16	50mm W/B	
JN	Juglans nigra	Black Walnut	Noyer noir	5	50mm W/B	
OY	Ostrya virginiana	Ironwood	Ostryer de Virginie	10	250cm CT	
PT	Populus tremuloides	Trembling Aspen	Peuplier faux-tremble	16	50mm W/B	
PRS	Prunus serotina	Black Cherry	Cerisier tardif	8	50mm W/B	
QB	Quercus bicolor	Swamp White Oak	Chêne bicolore	12	50mm W/B	
QR	Quercus rubra	Red Oak	Chêne rouge	12	50mm W/B	
PG	Picea glauca	White Spruce	Épinette blanche	26	175cm W/B	
PSY	Pinus strobus	Eastern White Pine	Pin blanc	24	175cm W/B	
TO	Thuja occidentalis	Eastern White Cedar	Thuya occidental	10	200cm W/B	
Total				241		
Shrubs/arbustes						
Cos	Cornus sericea	Red Osier Dogwood	Cornouiller stolonifère	51	3 gal.	
Py	Physocarpus opulifolius	Common Ninebark	Physocarbe feuille d'obier	40	3 gal.	
Rt	Rhus typhina	Staghorn Sumac	Sumac vinigrier	50	3 gal.	
Roa	Rosa acicularis	Prickly Wild Rose	Rosa acicularis	60	1 gal.	
Ruo	Rubus odoratus	Flowering Raspberry	Ronce odorante	100	1 gal.	
Sc	Sambucus canadensis	American Elder	Sureau du Canada	14	3 gal.	
Spa	Spiraea alba	Narrow-leaved Meadowsweet	Reine des prés à feuilles étroites	30	3 gal.	
Vi	Viburnum lentago	Nannyberry	Viorne flexible	57	3 gal.	
Vt	Viburnum trilobum	Highbush Cranberry	Viorne trilobée	57	3 gal.	
Total				459		
Other/autres						
pm	Aiglon Indigo ProMonarques Seed Mix Modified v. 2 - NCC/Mélange ProMonarques Modifié v2 - CCN			4	kg	2000 m², manual seed/semis manuel



NOTES / REMARQUES:

1. WATER PLANTS 10-20 MINUTES BEFORE PLANTING AND AGAIN IMMEDIATELY AFTER PLANTING. / ARROSER LES PLANTES 10-20 MINUTES AVANT LA PLANTATION ET ENCORE IMMEDIATEMENT APRÈS LA PLANTATION.
2. REMOVE POT FROM ROOTBALL PRIOR TO PLANTING. / ENLEVER LE POT DE LA MOTTE RACINAIRE AVANT LA PLANTATION.
3. SCARIFY SIDES AND BOTTOM OF PLANTING PIT. / SCARIFIER LES CÔTÉS ET LE FOND DE LA FOSSE.
4. PLANT TREES, SHRUBS AND PERENNIALS AT ELEVATION EQUAL TO THAT OF APPARENT NURSERY GROWING CONDITION. TRUNK FLARE MUST BE ABOVE GRADE. / PLANTER LES ARBRES, LES ARBUSTES ET LES VIVACES AU MÊME NIVEAU QUE LES CONDITIONS DE CROISSANCE À LA PÉPINIÈRE. LE COLLET DU TRONC DOIT ÊTRE AU-DESSUS DU SOL.
5. BACKFILL AROUND ROOTBALL WITH EXCAVATED SOIL. WATER TO SLURRY AND TAMP IN LAYERS TO REMOVE AIR POCKETS. / REMBLAYER AUTOUR DE LA MOTTE RACINAIRE AVEC LE SOL EXCAVÉ. ARROSER JUSQU'A L'OBTENTION D'UNE BOUE ET TAPER EN COUCHE AFIN D'ENLEVER LES POCHES D'AIR.
6. PRUNE DEAD, DISEASED OR BROKEN BRANCHES ONLY. / ÉLAGUER LES BRANCHES MORTES, MALADES OU CASSÉES SEULEMENT.
7. REMOVE ALL NURSERY TAGS AFTER ACCEPTANCE BY NCC REPRESENTATIVE. / ENLEVER TOUTES LES ÉTIQUETTES DE LA PÉPINIÈRE APRÈS L'APPROBATION DU REPRÉSENTANT DE LA CCN.
8. DO NOT INSTALL MULCH WITHIN 50mm OF TREE TRUNK. / NE PAS INSTALLER LE PAILLIS À MOINS DE 50mm AUTOUR DU TRONC.

1 PLANTING DETAIL / DÉTAIL DE PLANTATION

SCALE / ÉCHELLE - 1:30

GENERAL NOTES / NOTES GÉNÉRALES:

1. All general site information and conditions have been compiled from the NCC's base plans. / Le fond de plan et le relevé du terrain existant proviennent de la base de données de la CCN.

2. Do not scale these drawings. / Ne pas prélever de mesures à l'échelle sur ces dessins.

3. The contractor must verify existing conditions before beginning work and notify the NCC Construction Supervisor of any errors, omissions or inconsistencies. / L'entrepreneur doit vérifier les conditions existantes sur le site avant le début des travaux et aviser le Superviseur de Construction de la CCN de toute erreur, omission ou contradiction.

4. All dimensions are approximate and must be verified by the Contractor on site before commencing work. / Toutes les dimensions sont approximatives et doivent être validées sur place avant les travaux.

5. The contractor is responsible for confirming the exact location of all underground services listed and not listed in this plan, and for obtaining the necessary clearances and permits from the utility companies before commencing work. / L'entrepreneur est responsable de la confirmation de l'emplacement exacte de tous les services souterrains indiqués et non indiqués dans le présent plan, et d'obtenir les permissions requises auprès des sociétés pertinentes d'approvisionnement de services.

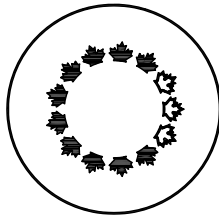
6. Site work layout must be approved by the NCC Landscape Architect before commencing work. / L'implantation des ouvrages devra être fait sur le site en compagnie de l'architecte paysagiste de la CCN avant de commencer les travaux.

7. The contractor is not to remove any vegetation from the site without the approval of the NCC Landscape Architect. / L'entrepreneur ne doit éliminer aucune végétation existante sur le site sans l'approbation de l'architecte paysagiste de la CCN.

8. Reinstatement all areas and items damaged as a result of construction activities to the satisfaction of the NCC Representative. / Rétablissez toutes les zones et objets endommagés à la suite des activités de construction à la satisfaction de le représentant de la CCN.

9. All dimensions are in mm unless otherwise noted. / Toutes les dimensions sont en mm, sauf indication contraire.

10. Take the necessary precautions when working in wet, forested areas. Beware of standing water, excessive mosquitos and poison ivy. / Prendre les précautions nécessaires lors de travaux dans les zones humides et boisées. Faire attention à l'eau stagnante, les moustiques excessifs et l'herbe à puce.



NCC
CCN

National Capital Commission
Commission de la capitale nationale

Capital Planning Branch
Direction de l'aménagement de la capitale

Pierre Vaillancourt
Director | Directeur

consultant
expert-conseil

issued or revised
émis ou révisé

1	FOR TENDER / POUR APPEL D'OFFRE	03/20/2019
no.	description	date

project
projet

ASH TREE REPLACEMENTS |
REMPLACEMENT DES FRÊNES
LOT 3 (ALL SITES EXCEPT ROSABELLA AVE /
TOUS LES SITES SAUF AVE ROSABELLA)

drawing
dessin

PLANTING DETAIL |
DÉTAIL DE PLANTATION

approved by
approuvé par NCC

designed by
conçu par NCC

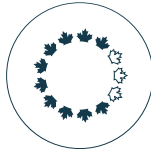
drawn by
dessiné par NCC

date JAN. 2019 scale
échelle AS NOTED

NCC project no.
no. du projet de la CCN no. de la feuille

DC-

L1



NATIONAL CAPITAL COMMISSION
COMMISSION DE LA CAPITALE NATIONALE

PRODUCT INFORMATION

F I C H E T E C H N I Q U E

Mélange ProMonarques Modifié v2 - CNN

%	Nom latin	Poids
0,30%	Achillea millefolium	3
0,30%	Asclepias incarnata	3
7,50%	Asclepias syriaca	75
11,65%	Doellingeria umbellata	117
0,50%	Eupatorium perfoliatum	5
0,30%	Euthamia graminifolia	3
7,50%	Helenium autumnale	75
2,50%	Liatris spicata	25
1,00%	Monarda fistulosa	10
5,00%	Rudbeckia hirta	50
1,40%	Solidago nemoralis	14
4,66%	Symphotrichum cordifolium	47
1,40%	Symphotrichum novae-angliae	14
1,00%	Verbena hastata	10
5,00%	Andropogon gerardii	50
15,00%	Elymus canadensis	150
20,00%	Elymus trachycaulus	200
15,00%	Schizachyrium scoparium	150
100 %		1000

Taux de semis recommandé	Semis mécanique	Semis manuel	Semis hydraulique
kg/ha	20	26	40
g/m ²	2	3	4

Détails techniques d'après le nombre de semences

% semences indigènes	% semences de graminées et cie	% semences de fleurs dicotylées	% semences annuelles
99.6%	14%	86%	0%

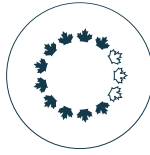
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NATIONAL CAPITAL COMMISSION
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INFORMATION SHEETS

Common Buckthorn

(*Rhamnus cathartica*)

Common buckthorn (also known as European buckthorn) is a small shrub or tree native to Eurasia. It was introduced to North America in the 1880s as an ornamental shrub and was widely planted for fencerows and windbreaks in agricultural fields. Since then it has spread aggressively throughout southern Ontario and in other provinces.

Common buckthorn can thrive in a wide range of soil and light conditions, enabling it to invade a variety of habitats. It is most often found in woodlands and open fields, where it forms dense stands under which few other plants can grow. Buckthorn can spread widely with the help of birds and animals that eat its fruit, carry the seeds long distances and deposit them in their droppings. Stands of buckthorn can invade roadsides, riverbanks, mature forests, farm fields and hydro corridors.



Common buckthorn leaves and flowers.
Photo: Credit Valley Conservation Area

Range

Outside its native range, common buckthorn is found in Canada as far west as Saskatchewan and as far east as Nova Scotia. It also grows throughout the northeastern and north central United States.

Impacts of Common Buckthorn

- Buckthorn thrives in a variety of habitats and forms dense thickets that crowd and shade out native plants. It can alter nitrogen levels in the soil, creating better conditions for its own growth and discouraging the growth of native species.
- It produces large numbers of seeds that germinate quickly and prevent the natural growth of native trees and shrubs.
- The shrub can host oat rust, a fungus that causes leaf and crown rust and affects the yield and quality of oats.
- The soybean aphid, an insect that damages soybean crops, can use buckthorn as a host plant to survive the winter.



Common buckthorn, showing typical deep green foliage in fall, dominates the lower layers of forests. Photo: Wasyl Bakowsky, MNR

Because it can affect agricultural crops, common buckthorn is listed as a noxious weed under Ontario's Weed Control Act.

How to Identify Common Buckthorn

- Buckthorn is usually the first shrub to leaf out in the spring and the last to drop its leaves late in the fall.
- It often grows two to three metres tall. Occasionally it reaches six metres, with a trunk up to 25 centimetres in diameter.
- Smooth, dark green leaves are finely toothed, 2.5 to six centimetres long, and arranged in opposing pairs along the stem.
- Most branches older than one year end in a short, sharp thorn.
- Flowers have two to six small yellowish-to-green petals.
- Common buckthorn produces clusters of berry-like black fruit in late summer and fall.

Common buckthorn resembles another invasive species, glossy buckthorn (*Frangula alnus*), and a much smaller native shrub, alder-leaved buckthorn (*Rhamnus alnifolia*).

Check the chart below to identify common buckthorn, glossy buckthorn and alder-leaved buckthorn.

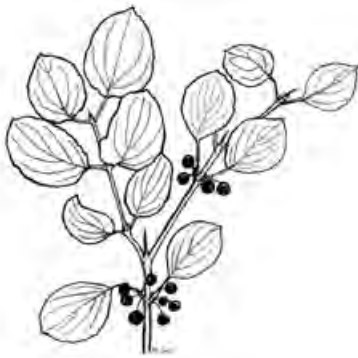


Illustration by Andrea Kingsley



Illustration by Andrea Kingsley



Illustration by Andrea Kingsley

Common buckthorn

(*Rhamnus cathartica*) (invasive)

- Grows in drier areas
- Often two to three metres tall; can reach six metres
- Twigs end in sharp thorn
- Usually opposite leaves with finely toothed edges

Glossy buckthorn

(*Frangula alnus*) (invasive)

- Grows in wet areas
- Often two to three metres tall; can reach six metres
- No sharp thorn on end of twig
- Alternate, shiny leaves with smooth, wavy edges

Alder-leaved buckthorn

(*Rhamnus alnifolia*) (native)

- Grows in very wet areas
- Up to one metre tall
- No sharp thorn on end of twig
- Alternate, shiny leaves with toothed edges
- Small growths (stipules) at base of leaves

What You Can Do

- Learn how to identify common buckthorn, glossy buckthorn and other invasive plants, and how to effectively manage these species on your property. See *The Landowner's Guide to Controlling Invasive Woodland Plants*. Go to ontario.ca/invasivespecies, click on **Here's a list of things you can do to help fight invasive species**, and click on the title.
- Avoid using invasive plants in gardens and landscaping.
- Buy native or non-invasive plants from reputable garden suppliers. Native plants provide habitat and food sources for native wildlife. See *Grow Me Instead: Beautiful Non-Invasive Plants for Your Garden*. Go to ontario.ca/invasivespecies, click on **Here's a list of things you can do to help fight invasive species**, and click on the title.
- Dispose of invasive plants in the garbage. Do not put them in the compost or discard them in natural areas. Discarded flowers may produce seeds.
- When hiking, prevent the spread of invasive plants by staying on trails and keeping pets on a leash.
- If you've seen common buckthorn or other invasive species in the wild, please contact the Invading Species Hotline at 1-800-563-7711, or visit www.invadingspecies.com to report a sighting.

Other Resources:

www.invasivespeciescentre.ca
ontario.ca/invasivespecies
www.ontarioinvasiveplants.ca
www.invadingspecies.com

For More Information:

Please contact the Invading Species Hotline at 1-800-563-7711.

Photo: Greg Bales, MNR



Common buckthorn
ripe fruit cluster.

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Cette publication est également disponible en français.

Poison Ivy Fact Sheet

Poison ivy grows in woods, fields and along roadsides and riverbeds. It can be a high-climbing woody vine, a small low-growing shrub or ground cover. Poison ivy grows in every region of the United States except the Southwest, Hawaii and Alaska.



Distinguishing Characteristics – “Leaves of three let them be”

- Three thin, pointy and shiny leaves; however, the shape, texture and color of leaves can vary.
- Leaves are reddish in spring, green in summer and orange, red or bronze in the fall.

Jennifer Anderson @ USDA-NRCS PLANTS Databasepdf'd

Toxicity

- Most people are sensitive to the oily resin or sap of poison ivy (urushiol). Urushiol is found year round in all parts of the plant including the roots, stems, flowers and leaves.
- Animals are not sensitive to poison ivy, but people can get poison ivy from an animal's hair or fur.

Potential Exposures

- Exposures are more common in the spring and summer.
- A person can get a rash by touching any part of the poison ivy plant or anything that has come in contact with poison ivy and still has the oily resin on it. Examples include sporting or camping equipment, gardening tools, shoes, clothes and pets or contaminated surfaces.
- Contact with fluid-filled blisters that develop does not spread poison ivy.
- Smoke from burning poison ivy can cause irritation to the eyes, skin, nose and throat and difficulty breathing. This irritation can sometimes be severe.

Symptoms



- A rash may develop between 1 hour and 5 days after contact. The rash can vary in severity and usually starts with itching, redness and swelling sometimes followed by tiny pimples or blisters.
- Delayed symptoms may appear if skin comes in contact with contaminated items or surfaces.

Treatment

- Immediately after exposure (within 10-15 minutes) wash exposed areas, including nails, with cool water and soap.
- Wash contaminated surfaces with rubbing alcohol and clothes and shoes with hot water and soap.
- See your health care provider if symptoms are severe or persist and for treatment advice.
- If you experience difficulty breathing, swelling in the throat, dizziness or weakness call 911.

Prevention

- Learn to recognize poison ivy and avoid exposure.
- Always wear vinyl gloves when removing plants (urushiol can penetrate rubber).
- Wear long pants, long sleeves, socks, closed shoes, hat when walking in areas with poison ivy.
- Do not burn poison ivy.

Contact the Northern New England Poison Center for information or questions at 1-800-222-1222 or visit www.nnepc.org.

Stinging Nettle Safety

Stinging nettle has fine hairs on the leaves and stems that contain irritating chemicals, which are released when the plant comes in contact with the skin. The hairs, or spines, of the stinging nettle are normally very painful to the touch.

Precaution: Avoid this plant to avoid getting stung!

Reaction/Response:

- Reddening and intense itching of short duration
- Sensitive individuals may experience swelling and burning
- Wash affected area or immediately apply a baking soda paste to soothe stinging sensation
- A prolonged tingling sensation may persist on the affected skin for more than 12 hours, even after visible symptoms have faded.

Leaves:

- Fine toothed, tapered, ~3-15 cm heart-shaped leaves
- Thin catkins of tiny green flowers grow from the leaf stems

Height: Generally 1 metre but can grow up to 2 metres depending on location and soil condition.

Habitat:

- Generally in the same locations every year.
- Thrive in rich soil, moist woodlands, thickets, disturbed areas, along partially shaded trails and riversides
- Blooms between June and September.

Control:

- Remove plants by hand -- wear gloves to protect skin from the stinging hairs
- Ensure the underground portion (rhizomes) are removed or the plants will regrow
- Close mowing can prevent the development of fruit
- Be aware cultivating the soil may spread the rhizomes, thus increasing the size of the population
- Repeated cultivation works best as a control for this weed



Fact sheet distributed by Occupational Health Clinics for Ontario Workers (OHCOW). 1-877-817-0336 www.ohcow.on.ca

Sources: Stinging nettle | University of Maryland Medical Center <http://umm.edu/health/medical/altmed/herb/stinging-nettle#ixzz3Uwiz4rys>. University of Maryland Medical Center <http://www.ediblewildfood.com/stinging-nettle.aspx>

Stinging Nettles of Florida0 IFAS Extension –University of Florida-Wendy B. Zomlefer

Burning & Stinging Nettles Statewide Integrated Pest Management Program-University of California Agriculture Natural Resources.

Tick Safety in the Greenbelt

What are ticks?

Closely related to spiders, ticks are a group of about 900 species of parasites in the class Arachnida. These small animals rely on the blood of host animals such as deer, hare, and mice to live. Ticks attach to animals by waiting on shrubs and grasses until an appropriate host brushes by, then finding a good location to cut into the host and feed on the host's blood. In the Capital Region, the blacklegged tick, or deer tick (*Ixodes scapularis*), is the main concern, due to the potential for it to transmit Lyme disease.



Why should you be concerned?

Ticks are a vector of various diseases. Susceptible hosts can become infected while ticks are feeding. Lyme disease, caused by bacterial infection spread by the blacklegged tick, is an illness that, left untreated, can cause severe symptoms such as nervous system disorders, mental issues, and paralysis.



What can you do to reduce the risk?

When walking in tick habitat (shrubby and brushy areas where host animals such as deer and mice can be found), simple measures can help to reduce the risk of getting bitten:

- Apply insect repellent.
- Wear long-sleeved shirts and long pants.
- Tuck pant legs into socks.

After any activity in tick habitat, a thorough check for ticks is always a good idea.

What to do if you are bitten by a tick?

If you are bitten by a tick, the best course of action is to remove the tick as soon as possible, since Lyme disease will usually manifest only from infected ticks that have been attached for more than 24 hours. This is done by grasping the tick with tweezers or a tick remover as close to your skin as possible, and gently pulling it straight out. After the tick is removed, disinfect or wash the area well with soap and water.

For more information about ticks and Lyme disease, including signs and symptoms, please visit:



West Nile virus



Anyone bitten by a mosquito carrying the West Nile virus can experience symptoms that range from nothing at all to high fever, tremors, muscle weakness and more.

Learn how to protect yourself and reduce your risk of getting West Nile.

How you get West Nile virus

West Nile virus is carried by mosquitoes. The mosquitoes become infected by feeding on an infected bird. If an infected mosquito bites you, it will pass the disease onto you. Everyone in Ontario who spends time near infected mosquitos could get West Nile.

Symptoms

Four out of five people do not show any symptoms. Others see symptoms 2-15 days after being bitten by an infected mosquito.

Common symptoms include:

- fever
- headache
- body ache
- nausea
- vomiting
- rash on chest, stomach or back

Approximately one in 150 people will have serious symptoms including:

- high fever
- severe headache
- muscle weakness
- stiff neck
- confusion
- tremors
- numbness
- sudden sensitivity to light

How to avoid West Nile virus

Cover up

Cover up when going outside between the hours of dusk and dawn (when most mosquitoes feed). Remember to wear:

- a long-sleeved shirt or jacket and long pants (tucked into your socks for extra protection)
- light-coloured clothing
- if you will be outside for a long time, wear special clothing that is designed to protect you from bugs

Clean up

- once a week, get rid of standing water around your home (mosquitoes lay their eggs in stagnant water, even small amounts)
- keep bushes and shrubs clear of overgrowth and debris (adult mosquitoes like to rest in dense shrubbery)
- turn your compost pile often

Use insect repellent

- use a bug repellent containing DEET or icaridin
- always read and follow all the label directions when using any insect repellent or ask a pharmacist for help when choosing an insect repellent product

If you think you have West Nile virus

If you think you've contracted the West Nile virus, contact:

- your doctor or other health care provider
- your local public health unit (PHU)
- Telehealth Ontario – a free service which uses registered nurses to answer your health concerns around the clock
 - toll free 1-866-797-0000
 - TTY 1-866-797-0007

Wild Parsnip

(*Pastinaca sativa*)

Wild parsnip is an invasive plant native to Europe and Asia. It was likely brought to North America by European settlers, who grew it for its edible root. Since its introduction, wild parsnip has escaped from cultivated gardens and spread across the continent.

Wild parsnip roots are edible, but the sap of the plant can cause severe burns. Collecting the plant from the wild should only be done with extreme care. See the section Protective Clothing below.

Wild parsnip, which is also known as poison parsnip, is a member of the carrot/parsley family. It typically grows a low, spindly rosette of leaves in the first year while the root develops. In the second year it flowers on a tall stalk and then dies. The plant can form dense stands and spreads quickly in disturbed areas such as abandoned yards, waste dumps, meadows, open fields, roadsides and railway embankments. Its seeds are easily dispersed by wind and water, and on mowing or other equipment.

Like giant hogweed and other members of the carrot family, it produces sap containing chemicals that can cause human skin to react to sunlight, resulting in intense burns, rashes or blisters.

Range

In North America, scattered wild parsnip populations are found from British Columbia to California, and from Ontario to Florida. It has been reported in all provinces and territories of Canada except Nunavut. The plant is currently found throughout eastern and southern Ontario, and researchers believe it is spreading from east to west across the province.



Flowers grow in yellowish-green clusters

Photo: Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Impacts of Wild Parsnip

- The plant can form dense stands that outcompete native plants, reducing biodiversity.
- Stem, leaves, and flowers contain chemicals that can increase skin sensitivity to sunlight and cause severe dermatitis.
- Wild parsnip reduces the quality and saleability of agricultural forage crops such as hay, oats, and alfalfa.
- Chemical compounds in the plant are known to reduce weight gain and fertility in livestock that eat it.

How to Identify Wild Parsnip

- Grows up to 1.5 metres tall.
- The single green stem is two to five centimetres thick and smooth with few hairs.
- Compound leaves are arranged in pairs, with sharply toothed leaflets that are shaped like a mitten.

- Yellowish green flowers form umbrella-shaped clusters 10 to 20 centimetres across.
- Seeds are flat and round.

Check the chart below to know how to identify wild parsnip.



Giant Hogweed
(*Heracleum mantegazzianum*)

Cow Parsnip
(*Heracleum maximum*)

Wild Parsnip
(*Pastinaca sativa*)

Queen Anne's Lace
(*Daucus carota*)

Angelica
Angelica spp.

	Giant Hogweed (<i>Heracleum mantegazzianum</i>)	Cow Parsnip (<i>Heracleum maximum</i>)	Wild Parsnip (<i>Pastinaca sativa</i>)	Queen Anne's Lace (<i>Daucus carota</i>)	Angelica <i>Angelica</i> spp.
Height	2.5 to 5 m	1 to 2.5 m	0.5 to 1.5 m	0.3 to 1.5 m	1.2 to 2.1 m
Flowers	Large, white umbrella-shaped flower clusters 30 to 90 cm across, made up of 50 to 150 small flower clusters	White umbrella-shaped flower cluster 10 to 30 cm across, made up of 15 to 30 small clusters	Yellowish-green flower clusters 10 to 20 cm across	White flower cluster 5 to 10 cm across. Pale pink before fully opened. Often single purple flower in centre of flower cluster	Greenish-white globe-like flower clusters 8 to 25 cm across
Leaves	Prominently spiked edges Up to 1.5 m long Leaflets grow right out of each side of main stem, with no leaf stalk	Leaves have lobes shaped like a hand with fingers, with fuzzy undersides Up to 0.5 m long and wide Leaf blade separated from main stem by leaf stalk	Leaves consist of 2 to 5 pairs of leaflets that grow across from each other along the stem, and one diamond-shaped leaflet on the end Leaflets toothed and often shaped like a mitten	Leaves are staggered along the stem (alternate) Leaves consist of leaflets that are finely divided into narrow segments. Each segment of the lower leaves is further divided into fine lobes, resulting in a feathery appearance	Alternate leaves, divided into 2 to 3 leaflets
Stem	Hollow, 5 to 15 cm thick Prominent purple blotches Distinct, coarse, bristly hairs	Hollow, 5 cm thick at base Green, few to no purple spots Soft and fuzzy hairs	Green, 2.5 to 5 cm thick Smooth with few hairs	Green, 1 to 2.5 cm thick Covered with fine bristly hairs	Purple or purple blotched Smooth (no hairs)
Lifecycle	Biennial (lives for 2 years) or perennial (lives longer than 2 years)	Perennial	Biennial/Perennial	Biennial	Perennial
Origin	Invasive	Native	Invasive	Invasive	Native

Wild Parsnip Removal and Management

If you have small clusters of wild parsnip on your property (fewer than 100 plants), you may be able to manage the plant yourself. Wear protective clothing and dispose of plants carefully, as described below. To remove larger infestations (thousands of plants), you will likely need a professional exterminator and repeated treatments over several years.

Note: To manage wild parsnip effectively, learn how to identify the plant in both its first-year stage as a small rosette of leaves, and in its second year, as a tall flowering plant. The area must be monitored for several seasons to ensure complete eradication.

Protective Clothing

Wear protective clothing, including waterproof gloves, long-sleeved shirts, pants and eye protection. A disposable spray suit over your normal clothing provides the best protection. Spray suits are commercial-grade waterproof coveralls. After working around the plant, remove your protective clothing carefully to avoid transferring any sap from your clothing onto your skin. Wash your rubber gloves with soap and water, then take off your spray suit or outer clothing. Wash your rubber gloves again and then take them off. Finally, take off your protective eye wear. Put non-disposable clothing in the laundry and wash yourself immediately with soap and water.

Mechanical Control

For a small infestation in a yard or garden (fewer than 100 plants), dig out as much of the taproot as you can with a sharp shovel or spade. Digging is most effective in the spring when the soil is moist and the taproot is more easily removed. Follow-up digging will be required every few weeks to deal with re-growth (if the taproot was not completely removed) or missed plants.

Pulling up the plants is impractical for larger infestations, but mowing can be effective if begun just after peak blooming, but before the seeds set in the late summer or early fall. Cut plants will likely re-sprout after mowing, so it is important to combine mowing with other control methods.

Another method of control is to cover the dug or mowed areas with black plastic to smother new growth of all plants. The plastic should be left in place for at least one season to ensure the roots are smothered. The area must be replanted after the plastic is removed to replace desirable plants and rehabilitate the soil.

Chemical Control

In Ontario, herbicide use, storage and disposal is regulated under the Pesticides Act. While many uses of herbicides are banned, certain herbicides may be used to control plants that are poisonous to humans who touch them, such as wild parsnip. Herbicides that may be used for this purpose include those containing the active ingredient glyphosate. If you are considering using a pesticide, read the product label before buying it to ensure it can legally be used on wild parsnip.

Herbicides containing glyphosate can be an effective tool to control larger populations of wild parsnip. Glyphosate is a broad spectrum herbicide that kills green plants that it comes into contact with. New seedlings will often germinate and emerge after glyphosate has been applied, meaning that follow up applications may be required.

For the best results, apply herbicide to the leaves of actively growing plants in the spring, followed by a summer application for missed plants that are still growing. Herbicide treatments may need to be repeated in following years. Follow directions on the product label and provincial and federal laws when using herbicides.

Disposal

DO NOT burn or compost wild parsnip plants that have been cut down or dug up. If possible, leave the stems to dry out completely at the site. Carefully dispose of plant material in black plastic bags and leave in direct sun for a week or more. Contact your municipality to determine if the bagged plants can be sent to your local landfill site.

What You Can Do

- Learn how to identify wild parsnip and other invasive plants.
- Stay on trails and away from areas known to have wild parsnip or other invasive species.
- Inspect, clean and remove mud, seeds and plant parts from clothing, pets (including horses), vehicles (including bicycles) and equipment such as mowers and tools. Before travelling to new areas, clean vehicles and equipment in a place where plant seeds or parts aren't likely to spread, such as in a driveway or at a car wash. It's very important to carefully wash any sap from clothing, equipment and pets.
- Avoid disturbing soil and removing plants from natural areas; they may be rare native plants or even invasive plants.



Compound leaves are arranged in pairs

Photo: Ohio State Weed Lab Archive, The Ohio State University, Bugwood.org



Wild Parsnip

Photo: Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

- If you think you have wild parsnip on your property or if you see it in your community, please call the Invading Species Hotline at 1-800-563-7711, or report your sighting online at www.invadingspecies.com. You will be asked to send in photos for identification. **DO NOT** touch, cut or collect parts of the plant for identification purposes.



Yellowish-green flowers turn into round, flat brown seeds

Photo: Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Other Resources:

www.invasivespeciescentre.ca

ontario.ca/invasivespecies

www.ontarioinvasiveplants.ca

www.invadingspecies.com

Ministry of the Environment pesticides information for homeowners

www.ene.gov.on.ca/environment/en/category/pesticides/STDPROD_085338.html#1

Ministry of the Environment fact sheet Managing Pests in Lawns and Gardens

www.ene.gov.on.ca/environment/en/resources/STD01_076153.html

For More Information:

Please contact the Invading Species Hotline at 1-800-563-7711.

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Giant Hogweed

(*Heracleum mantegazzianum*)



Photo courtesy of Patrick Hodge, MNR

Similar Species

There are a number of plants that look very similar to Giant hogweed such as Cow parsnip, Purplestem angelica, Woodland angelica, Valerian, Lovage, and Queen Anne's-Lace (also known as Wild carrot). However, these plants are not as large as a mature Giant hogweed, which grows up to 5.5 metres tall under ideal conditions. The white flower clusters resemble those of Queen Anne's-Lace, but tend to be more widely spaced and can form a flower-head almost one metre wide.

Distribution

Giant hogweed has a scattered distribution across southern and central Ontario, south of the line from Manitoulin Island to Ottawa.

Giant hogweed (*Heracleum mantegazzianum*), also known as Giant cow parsnip is a perennial plant and a member of the carrot family. It is a garden ornamental from southwest Asia that is naturalizing in North America and becoming more common in southern and central Ontario. Giant hogweed has the potential to spread readily and grows along roadsides, ditches and streams. It invades old fields and native habitats such as open woodlands.



Giant hogweed stem. Note coarse hairs.
Photo courtesy of Ron Black, MNR



Giant hogweed stalk and flower clusters.
Photo courtesy of Karen Rimmer

Biology

Seeds may take several years to germinate and are viable in the soil for up to 15 years. During the first year, the plant produces a rosette of leaves up to one metre high. After 2 to 5 years the plant produces flowers. As it grows a large root, thick hollow stems and large lobed leaves are formed. The stems of the plant are covered with reddish-purple flecks and stiff hairs filled with sap. Sap may also collect in the hollow stem bases. Giant hogweed flowers once in its lifetime, unless the flower clusters are damaged before opening. Once the plant produces seeds it dies. Each plant can produce up to 120,000 winged seeds (typically 50,000). Seeds dropped in streams can float for three days. They can move long distances via water in ditches and streams. Seeds can also be spread up to 10 metres by the wind.

Natural Resource Impacts

There is evidence that Giant hogweed can shade out native plants, although scientists have not done extensive research on its impact in Ontario or Canada. In the United Kingdom it grows in areas bordering lakes, streams, and wetlands and causes rocks, soil and other material on stream banks to fall into streams. This threatens salmon spawning sites. Similar impacts may occur in Ontario.

Health Concerns

The clear watery sap of Giant hogweed contains toxins that can cause severe dermatitis (inflammation of the skin). You can get severe burns if you get the sap on your skin and the skin is then exposed to sunlight. Symptoms occur within 48 hours and consist of painful blisters. Purplish scars may form that last for many years. Eye contact with the sap has been reported (in the media and by various web sites) to cause temporary or permanent blindness. However, evidence of permanent blindness linked to exposure to Giant hogweed cannot be substantiated by any existing research. Coming in contact with Cow parsnip and Wild parsnip can cause similar reactions.

Prevention

Do not purchase, trade or grow Giant hogweed in your garden. Only buy native or non-invasive garden plants. When you transport soil, sand or gravel make sure it is free of Giant hogweed – both plant parts and seeds.

Removal and Management

If you have Giant hogweed on your property, it is recommended that you hire a professional exterminator to remove it. The plant will be removed safely and as few seeds as possible will be spread. Reducing a large population of Giant hogweed will take a long term commitment. The best time to remove the plant is in late April or early May. It is usually less than 30 centimetres tall, easier to dig up, and more susceptible to herbicides at this time of year. It is also cooler in the spring than in the summer so wearing protective clothing is more comfortable.

Protective clothing: Wear protective clothing, including waterproof gloves, long sleeve shirts, pants, and eye protection. It is ideal to wear a disposable “spray suit” coverall over top of your normal clothing (spray suits are commercial grade waterproof coveralls). Remove protective clothing carefully to avoid transferring any sap from your clothing onto your skin. Wash your rubber gloves with soap and water, and then take off your spray suit or outer clothing. Wash your rubber gloves again and then take them off. Finally, take off your protective eye wear. Put non-disposable clothing in the laundry and wash yourself immediately with soap and water.

Mechanical control:

Spring Removal (i.e. early May):

Use a spade to remove as much of the root as possible. Digging up older plants can be difficult since roots can grow deeper than one metre. The plant might re-grow from the root and you may need to dig repeatedly to remove it completely. Or, you can cover the dug area with black plastic to smother out new growth. If it's possible to use machinery, mow new growth every two weeks.

Summer Removal (i.e. early July):

- *Plants without flowers:* If the infestation is small dig the stems and roots out and dry them thoroughly before disposing of them.
- *Plants with flowers:* To prevent seeds from growing and spreading, remove flower heads before they ripen (when they are white). **Note: If the flower heads have changed from white to green, seeds are being produced and it will be very hard to remove the seed heads and/or cut the plant without spreading the seeds.** Return to the area regularly and remove any new growth.



Giant hogweed stalk and flower clusters.
Photo courtesy of Karen Rimmer.

Control Using Herbicides:

Herbicides can be used to control plants (like Giant hogweed) that are poisonous to the touch. Glyphosate is effective at controlling the top-growth of Giant hogweed. Foliar herbicide applications are most effective in spring on actively growing plants, followed with a subsequent summer application for missed plants or plants that have re-grown. Since glyphosate is non-selective and removes only the green vegetation that it comes into contact with, new seedlings will often germinate and emerge after glyphosate has been applied. If areas treated with glyphosate are covered in mulch 10 to 14 days after application, it will reduce seedling germination and growth. Herbicide treatments may need to be repeated in following years. If a plant is flowering, herbicides are not effective and control methods should focus on carefully removing the flower heads. Follow label directions and relevant provincial and federal legislation when using herbicides.

Disposal:

Do Not Burn. Do Not Compost. Carefully remove flower heads from stems and place them in black plastic bags. Make sure not to drop any seeds while you are doing this. Seal the bags tightly and leave them in direct sunlight for about a week. Allow stems and roots to dry out thoroughly before disposing of them. Call your municipality to find out if bags containing Giant hogweed can be sent to your local municipal landfill site.

In the event of any direct exposure/contact to this plant

If you get sap on your skin wash the area well with soap and water. Keep the affected area out of the sun. If photo dermatitis (inflammation of the skin caused by exposure to sunlight) occurs, see a doctor.

If you get sap in your eye, flush your eye with water immediately and see a doctor immediately.



Giant hogweed seedling.
Photo courtesy of Rachel Gagnon, Ontario Invasive Plant Council.

If you think you have Giant hogweed on your property or if you see it in your community please call the Invading Species Hotline at 1-800-563-7711 or report your sighting online at www.invadingspecies.com/Report.cfm. You will be asked to send in photos for identification. Do not collect parts of the plant for identification.

The Ontario Ministries of Agriculture, Food and Rural Affairs, Health and Long Term Care, Environment, and Natural Resources are working together with our partners (in particular Ontario Federation of Anglers and Hunters, Ontario Invasive Plant Council, Municipalities and Conservation Authorities) to provide information on the identification and control of Giant hogweed.

Other Resources

Ontario Invasive Plant Council

Invading Species Awareness Program

ontario.ca/invasivespecies

Ontario Ministry of Agriculture, Food
and Rural Affairs

Ontario Weeds

For More Information

Contact the Invading Species Awareness
Program hotline at 1-800-563-7711.