

ROCKCLIFFE PARK

Phase 2
DC-5275-07

CONTRACT DOCUMENTS

August 2013

NATIONAL CAPITAL COMMISSION
CAPITAL PLANNING AND REAL ASSET MANAGEMENT BRANCH

ROCKCLIFFE PARK Phase 02

Reference Number: DC 5275-07

Date: May 2013

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END OF SECTION

Unit Price Table

Project No: DC-5275-07

May-13

Item	Description	Units	Qty	Unit Price	Amount
1	Mobilization & demobilization	Lump sum	1	\$ -	\$ -
2	Protective measures for Existing vegetation	Lump sum	1	\$ -	\$ -
3	Demolitions and Removals	Lump sum	1	\$ -	\$ -
4	Excavation, Backfilling & Site Grading	Lump sum	1	\$ -	\$ -
5	Catch Basins to be relocalised	Lump sum	1	\$ -	\$ -
6	Granulat A	Lump sum	1	\$ -	\$ -
7	Concrete Unit Pavers	m2	190	\$ -	\$ -
8	Asphalt	m2	1605	\$ -	\$ -
9	Line Painting	Lump sum	1	\$ -	\$ -
10	Concrete Footing and Wall	Lump sum	1	\$ -	\$ -
11	Wall Stone Cladding (limestone)	Lump sum	1	\$ -	\$ -
12	Concrete Stairs	Lump sum	1	\$ -	\$ -
13	Stairs Stone Cladding (Limestone)	Lump sum	1	\$ -	\$ -
14	Concrete Mud Slabs	Lump sum	1	\$ -	\$ -
15	Concrete Curbs	l.m.	240	\$ -	\$ -
16	Limestone Curbs	l.m.	76	\$ -	\$ -
17	Growing medium for planting & finish grading	Lump sum	1	\$ -	\$ -
18	Tsuga Canadensis (1000 mm HT)	Unit	8	\$ -	\$ -
19	Syringa Microphylla (500 mm HT)	Unit	27	\$ -	\$ -
20	Quercus Rubra (1750 mm HT)	Unit	2	\$ -	\$ -
21	Sodding	Lump sum	1	\$ -	\$ -
22	Maintenance and Warrenty for 2 years	Lump sum	1	\$ -	\$ -
23	Bike Rack	Unit	4	\$ -	\$ -
24	Hand Railing	Lump sum	1	\$ -	\$ -
25	Signs (1 to be relocated & 2 new sign to supply and install)	Lump sum	1	\$ -	\$ -
26	Raise concrete base of lamports	Unit	3	\$ -	\$ -
27	Bedrock Excavation	m3	30	\$ -	\$ -

Sub-Total	\$ -
GST 13%	\$ -
TOTAL	\$ -

PART 1 - GENERAL REQUIREMENTS**BASIS OF PAYMENT**

1. Payment of the price per item listed in the Tender form will represent the 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.

ITEM NO 1. MOBILIZATION & DEMOBILIZATION

1. This item includes all general requirements to complete the project including general instructions, shop drawings, safety measures, environmental protection, temporary construction signage and barricades, traffic control, cleaning and reinstatement at completion of the project.
2. Included in this lump sum price are all the general requirements identified on the drawings and specifications and all those required to complete the work of this contract not covered under specific items.
3. Included in this lump sum price is the completion of record drawings at the end of the Contract for provision to the NCC Representative.
4. MEASUREMENT: This item will not be measured but will be paid on a lump sum basis upon the following schedule.
 - 70% for substantial completion of this item
 - 30% for completion and supply of Contract record drawings

ITEM NO 2. PROTECTIVE MEASURES FOR EXISTING VEGETATION

- .1 This item includes existing tree and shrub protection measures as indicated in the contract documents. It includes the protective wood framework to be installed vertically around tree trunk from grade level to height of 2.00m fix with strap or any other system that won't damage tree trunk.
- .2 This item includes root protections of designated trees to dripline during excavation and site grading to prevent disturbance or damage.
- .3 This item includes removal and maintenance of the protective measures
- .4 This item will not be measured but will be paid on a lump sum basis upon the following schedule.
 - 60% for supply and install
 - 20% for maintenance
 - 20% for removal and disposal

ITEM NO 3. DEMOLITION AND REMOVALS

1. This item includes the removal and disposal off site of all items and surfaces require for this work as indicated in the contract document and it also includes removal and disposal off site of all material that could not be reused on-site.
2. This item also includes all stockpiling of reusable material on site as per NCC Representative's instructions.
3. This item also includes salvaging the granite cobble stones and their delivery at Woodroffe NCC's warehouse.
4. This item will not be measured but will be paid on a lump sum basis.

ITEM NO 4. EXCAVATION, BACKFILLING & SITE GRADING

- .1 This item consists of the stripping, common excavation and rough grading allowing for finished ground elevations and specified surface treatments.
- .2 This item includes the hauling, handling and placing, shaping, compacting and trimming

- of earth and excess material and the management of excess material.
- .3 This item includes the proof rolling of the exposed surface, and the sub-excavation as required of any soft areas encountered during proof rolling.
 - .4 This item includes the stripping and reuse of approved earth fill material including compaction.
 - .5 This item includes the stockpiling of acceptable and reusable topsoil material.
 - .6 This item also includes the removal of all excavated non reusable or surplus material, from the site.
 - .7 This item will not be measured but will be paid on a lump sum basis.

ITEM NO 5. RELOCALISATION OF CATCH BASIN

- .1 This item include the supply and placing of new catch basin and appropriate piping connection to existing system.
- .2 This item is inclusive of shop drawings, excavation, trenching, piping, bedding, backfill and other operations necessary to provide for a complete and neat job.
- .3 This item will not be measured but will be paid on a lump sum basis.

ITEM NO 6. SUPPLY, INSTALL AND COMPACT OF GRANULAR 'A'

- 1. This item includes the supply, placement and compaction of OPSS Granular A base material for the asphalt pathway and paved area, as indicated on contract documents.
- 2. It also includes the supply and application of water for the compaction of granular material to the extent indicated and specified in the contract documents.
- 3. This item will not be measured but will be paid on a lump sum basis.

ITEM NO 7. SUPPLY AND INSTALL CONCRETE PREFABRICATED UNIT PAVERS

- 1. This item includes work, material & equipment necessary to complete work as specified in the contract documents.
- 2. This item includes supply and installation of concrete unit pavers & proper placement, leveling course at proper compaction, joint finish, cleaning of the stones, and anchors as indicated in the contract document.
- 3. This item will be measured and will be paid per square metres installed.

ITEM NO 8. SUPPLY AND INSTALL ASPHALT PAVING

- 1. This item consists of supply and installation of asphalt paving OPSS HL3, as indicated in the contract documents.
- 2. This item will be measured and will be paid per square metres installed.

ITEM NO 9. SUPPLY AND INSTALL LINE PAINTING

- 1. This item consists of marking the pavement as shown on drawings and specifications. Lines and symbols are to be painted with to a width of 100 mm.
- .2 This item includes labor, equipment and materials to complete works.
- .3 This item will not be measured but will be paid on a lump sum basis.

ITEM NO 10. SUPPLY AND INSTALL CONCRETE FOOTING AND WALL

- 1. This item includes work, material & equipment necessary to complete work as specified in the contract documents including formwork, shop drawing production, site preparation, and finishing.
- .2 This item will not be measured but will be paid on a lump sum basis.

ITEM NO 11. SUPPLY AND INSTALL WALL STONE CLADDING (LIMESTONE)

- 1. This item includes work, material & equipment necessary to complete work as specified in the contract documents including fasteners, shop drawing production, samples, site

preparation, joints and finishing.

- .2 This item will not be measured but will be paid on a lump sum basis.

ITEM NO 12. SUPPLY AND INSTALL CONCRETE STAIRS

- .1 This item includes work, material & equipment necessary to complete work as specified in the contract documents including formwork, shop drawing production, site preparation, and finishing.

- .2 This item will not be measured but will be paid on a lump sum basis.

ITEM NO 13. SUPPLY AND INSTALL STAIRS STONE CLADDING (LIMESTONE)

1. This item includes work, material & equipment necessary to complete work as specified in the contract documents including fasteners, shop drawing production, samples, site preparation, joints and finishing.

- .2 This item will not be measured but will be paid on a lump sum basis.

ITEM NO 14. SUPPLY AND INSTALL CONCRETE MUD SLAB

1. This item includes work, material & equipment necessary to complete work as specified in the contract documents including formwork, shop drawing production, site preparation, and finishing.

- .2 This item will not be measured but will be paid on a lump sum basis.

ITEM NO 15. SUPPLY AND INSTALL CONCRETE CURBS

1. This item includes work, material & equipment necessary to complete work as specified in the contract documents including formwork, shop drawing production, site preparation, and finishing.

- .2 This item will be measured and will be paid per linear metre of concrete curb installed.

ITEM NO 16. SUPPLY AND INSTALL LIMESTONE CURBS

1. This item includes work, material & equipment necessary to complete work as specified in the contract documents including foundation, samples, site preparation, joints and finishing.

- .2 This item will be measured and will be paid per linear metre of limestone curb installed.

ITEM NO 17. SUPPLY AND INSTALL GROWING MEDIUM FOR PLANTING & FINISH GRADING

1. This unit price item consists of supply, installation and fine grading of imported growing medium and the finish grading to the extent indicated and specified in the Contract documents.

- .2 This item will not be measured but will be paid on a lump sum basis.

ITEM NO 18. TO ITEM NO. 20 SUPPLY AND INSTALL PLANT MATERIAL

- .1 This item includes the supply and installation of trees and shrubs as specified in the contract documents.

- .2 Payment for this item shall be full compensation for all labour, materials and equipment to complete the work. It includes excavation and disposal of subsoil, topsoil placement, soil amendments, planting, mulch, guying, grading, watering, disposal of extra materials, and site clean-up.

- .3 Measurement of Payment: each unit installed.

ITEM NO 21. SUPPLY AND INSTALL SOD

- .1 This item includes supply and install and maintenance of sod as indicated in the contract documents.
- .2 This item will not be measured but will be paid on a lump sum basis and shall be paid base on the following schedule:
 - .1 70% for supply and install, after NCC's Representative's approbation.
 - .2 30% for satisfactory maintenance and establishment of sodded area, after NCC's Representative's approbation.

ITEM NO 22. MAINTENANCE AND WARRENTY FOR 2 YEARS

1. This item includes maintenance of trees and shrubs
2. Payment for two year maintenance program to be 10% of the total value of trees and shrubs planted, paid to the contractor in four equal instalments, at the end of June and October of each year.

ITEM NO 23. SUPPLY AND INSTALL BIKE RACK

1. This item includes the supply and installation of four (4) bike rack, including excavation of cavities for bases and new concrete footing.
- .2 Payments shall be for all labor, equipment and materials necessary to complete this work as indicated in the contract documents.
- .3 This item be paid per unit installed.

ITEM NO 24. SUPPLY AND INSTALL HAND RAILLING

- .1 This item includes the supply and installation of steel hand rails on the stair.
- .2 Payment at the contract price shall be full compensation for all labor, shop drawing, equipment and materials necessary to complete this work as indicated in the contract documents.
- .3 This item will not be measured but will be paid on a lumps sum basis.

ITEM NO 25. SUPPLY AND INSTALL SIGNS (01 to be relocated & 02 new signs to supply and install)

- .1 This item consists of the supply and installation of posts and post mounted signs where indicated on the drawings and includes all related works as specified in the contract documents.
- .2 This item will not be measured but will be paid on a lumps sum basis.

ITEM NO 26. SUPPLY AND INSTALL PEDESTRIAN LIGHT POLE BASE

- .1 This item consists of the supply and installation of a new poured in place concrete light pole base to accommodate new grades including excavation and formwork.
2. Payment at the contract price shall be full compensation for all labor, equipment, the work of a qualify electrician and materials necessary to complete this work as indicated in the Contract Documents.
3. This item will be measured for payment and will be paid per light base.

ITEM 27. BEDROCK EXCAVATION

- .1 This item consists of excavation of the bed rock encounter during work to allow for full depth of concrete base under wall and stair.
- .2 This item includes the removal of all excavated material from the site.
- .3 This item will be measured and will be paid per cubic meter of excavated bedrock.

END OF SECTION

PART 1 - GENERAL**1.1 TIME OF COMPLETION**

- .1 The work of this Contract shall start after **October 5th 2013** and shall be substantially completed by **June 1st 2014**.
- .2 On-site work shall be limited from Monday to Friday, unless approved by the NCC Representative.

1.2 SCOPE OF WORK

- .1 Provide all materials, labour, equipment, and services necessary to complete all work described in the plans and specifications including, but not limited to:
 - .1 Protective measure for Existing vegetation;
 - .2 Demolition and removal of asphalt paving and base, concrete curb, existing retaining wall, existing catch basins, concrete stair and metal railing, and all other item indicated in the contract document.
 - .3 Excavation, backfilling and grading require for the work indicated in the contract document;
 - .4 Installation of two new catch basins and related work;
 - .5 Supply and installation of a new asphalt pathways (including granular base as indicated in the contract document);
 - .6 Supply and installation of new concrete stairs with limestone cladding;
 - .7 Supply and installation of new concrete footing and concrete wall with limestone cladding;
 - .8 Supply and installation of concrete unit paver (including granular base, layering course and anchor or concrete mud slab, as indicated in the contract documents);
 - .9 Relocation of existing trash cans and recycle bin;
 - .10 Supply and installation of top soil, sodding and all plant material;
 - .11 Supply and installation of four (4) bike rack as indicated in the contract document;
 - .12 Supply and installation of steel hand rail on stairs as indicated in the contract document;
 - .13 Supply and installation of new signage as indicated in the contract document;
 - .14 Raising of three (3) concrete base for lamp post and all associates work as indicated in the contract document;
 - .15 Rehabilitation of all disturbed areas

1.3 SPECIAL CONSTRUCTION REQUIREMENTS

- .1 The Contractor will be responsible to protect the subgrade at all times during construction and in particular following moderate to heavy rainfall. Construction traffic on exposed subgrade should be prohibited or limited to equipment which will not damage subgrade.
- .2 The Contractor will be responsible to ensure that the equipment utilized in the site preparation, excavation and construction minimizes any damage or disturbance to the park surface.
- .3 Any damaged areas caused as a result of construction traffic or construction techniques must be repaired to the original or better condition by the Contractor as part of this contract and at no additional cost to the National Capital Commission.
- .4 The Contractor shall be responsible as part of the tender price for the removal from the site of all excavated non reusable or excess material as well as the supply and placement of all required imported fill material required to execute the work of this contract.

GENERAL INSTRUCTIONS

- .5 The Contractor will not be compensated for any additional excavation and/or additional earth or granular backfill materials required as a result of over-excavations not approved and authorized by the NCC Representative prior to undertaking work.

1.4 CODES, PERMITS AND STANDARDS

- .1 Standards referred to in this Specification (CGSB, CSA, ASTM, OPSD, CHBDC etc.) may be examined at the following location:
 - Public Works and Government Services Canada
 - Standards and Specifications Branch
 - Place du Portage - Phase 3, 11 Laurier Street
 - Gatineau, Quebec
 - K1A 0S5
- .2 Perform work in accordance with the National Building Code of Canada 1995 and any other code of provincial or local application provided that in any case of conflict or discrepancy, the more stringent requirements shall apply.
- .3 Work to meet or exceed requirements of:
 - .1 contract documents
 - .2 specified standards, codes and referenced documents
- .4 Contractor is to obtain an entry permit from the National Capital Commission prior to commencing the Work, Contact: Mathieu Brisson, (613) 239-5035.

1.5 DEFINITIONS

- .1 Wherever the term "NCC Representative" appears throughout this specification, it shall be construed to mean an Inspector representing the National Capital Commission and including a duly named consultant on their behalf.
- .2 Wherever the terms "or equal", "or approved equal" appear after specific types of materials and items throughout this specification, they shall be construed to mean as being equal in the opinion of the NCC Representative, in material content, workmanship and quality to that designated as being the minimum acceptable standard, and that the NCC Representative's written approval must be obtained prior to submitting an alternative, 7 days before close of tender.

1.6 TAXES

- .1 Include in the tender amount, all sales and other taxes levied by the Federal, Provincial and Municipal government or other authority. There will be no refunds made by the National Capital Commission to the Contractor for taxes paid by the Contractor.

1.7 PROTECTION

- .1 The Contractor will be held fully responsible by the Owner for any damage to utilities, services, properties, buildings, or structures adjacent to or in the general area of the work, through settlement of ground, vibration or shock resulting from any cause relating to the work carried out under this Contract. Make good and repair all such damage at his own expense.
- .2 The contractor shall supply and install the support system at his own judgment and at his own cost to protect the existing utilities, services, buildings and structures from damage for the duration of the construction. The cost for this item shall be included in the tender price and the contractor shall not make any claim against the Owner for extra work on this item.
- .3 Provide and maintain guardrails, fences, barricades, lights and other devices required for protection of workmen and public in accordance with the requirements of Provincial and Local by-laws and the Canadian Construction Safety Code.
- .4 Protect existing structures against damage until completion of work.
- .5 Take all precautions to protect vegetated areas and specimen trees from any damage.

1.8 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 at his own expense.
- .2 It is understood that restored or replaced work includes labour, equipment and material costs.
- .3 The restored or replaced work shall be completed within 7 days of notification by the NCC Representative.

1.9 CUTTING, FITTING AND PATCHING

- .1 Execute cutting, fitting and patching of work that may be a requirement to make work fit properly together, to receive or be received by other work.
- .2 Where new work connects with existing and where existing work is altered, cut, patch and make good to match existing work.
- .3 Make cuts with clean, true, smooth edges. Make patches inconspicuous in final assembly.

1.10 SITE VISIT

- .1 Parties intending to submit tenders on the work must visit the site and obtain for themselves all information pertaining to existing conditions affecting the proper execution and completion of the work. The submission of a tender shall be deemed as proof that the tenderer and his sub-trades have complied with this requirement. After claims for additional compensation will not be entertained for any items of labour, equipment or materials required to complete the work that could have been reasonably ascertained by a Site Examination.

1.11 WORKMANSHIP

- .1 It is a requirement of this contract that qualified tradesmen execute each type of work specified.
- .2 Example: Landscape contractor for landscape work, mason for stonework, carpenter for carpentry work, etc.
- .3 Work unsatisfactorily completed by unqualified tradesmen will be redone and paid for by the Contractor.

1.12 DOCUMENTS REQUIRED

- .1 Maintain at job site, one copy each of following:
 - .1 Contract drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Change orders.
 - .5 Other modifications to Contract.
 - .6 Field test reports.
 - .7 Manufacturer's installation and application instructions.
 - .8 Copy of current and approved work schedule.
 - .9 Copy of Site Health and Safety Plan approved by NCC Representative

1.13 WORK SCHEDULE

- .1 Provide within 10 working days after Contract award, in form acceptable to NCC Representative, detailed schedule showing anticipated progress stages and final completion of work within time period specified in Contract documents.
- .2 Interim reviews of work progress based on work schedule will be conducted as decided by NCC Representative and schedule updated by Contractor in conjunction with and to approval of NCC Representative.

1.14 CONTRACTOR'S USE OF SITE

- .1 Limited to area immediately surrounding work and areas designated by the NCC Representative for material stockpiling and work equipment parking.
- .2 Do not unreasonably encumber site with materials or equipment during construction.
- .3 Move stored products or equipment interfering with operations of NCC other contractors or agencies and the general public.
- .4 Obtain and pay for use of additional storage or work areas needed for operations.
- .5 Where security is reduced by work, provide temporary means to maintain security of area at all times.

1.15 SETTING-OUT OF WORK

- .1 The Commission shall furnish the Contractor with the reference co-ordinates necessary for laying out the work of this contract (see attached). The Contractor shall employ survey personnel with experience in the use of coordinates to physically lay out work utilizing a total station survey system.
- .2 Contractor shall assume full responsibility for and execute complete layout of work to locations, lines and elevations indicated.
- .3 Provide devices needed to lay out and construct work. Supply such devices as required to facilitate NCC Representative's inspection of work.
- .4 Supply stakes and other survey markers required for laying out work.
- .5 Contractor must obtain NCC Representative's approval of planting beds limits, specimen tree location, and lookout plaza layout prior to commencing work.

1.16 PROJECT MEETINGS

- .1 NCC Representative will arrange project meetings and assume responsibility for setting times and recording and distributing minutes.

1.17 EXISTING SERVICES

- .1 Before commencing work, establish location and extent of service lines in area of work and notify NCC Representative of findings.
- .2 Where unknown services are encountered, immediately advise NCC Representative and confirm findings in writing.
- .3 Where work involves adjusting of existing services, carry out work as directed by the NCC Representative.
- .4 Make good and pay for damage to existing utility lines resulting from work.

1.18 TRAFFIC CONTROL

- .1 Do not infringe on adjacent roads, sidewalks, ramps, loading zones or interfere with normal traffic flow in carrying out the work. If it is necessary to disrupt traffic or occupy those thoroughfares for purposes of unloading materials, etc., obtain permission from the NCC Representative and abide by his instructions regarding the manner, time and delays necessary to carry out these operations. Incidental costs (e.g. for permits, signage, public notification of lane closures, etc) conforming to these requirements will be paid by Contractor.
- .2 Provide a suitable system of protective barricades, lane markings, signs, lights and other such devices to warn and channel traffic and wherever necessary, the services of a flagman to direct and control traffic. Carry out protection in accordance with the requirements of the Provincial and Local by-laws having jurisdiction over this type of work.
- .3 Printed signage must be provided in both English and French
- .4 Install "CLOSED | FERME" signage on pathways when require
- .4 The proposed methods and systems of traffic control and maintenance provisions together with supporting sketches must be submitted to the NCC Representative upon request following tender closing.

1.19 ADDENDA

- .1 Answers to questions directed to the NCC Representative, and any amendments to the drawings and specifications during the tender period will be communicated in the form of addenda to all general contractors tendering. Such addenda to be considered as and read as part of the specifications and thereby included in the contract documents.

1.20 ADDITIONAL DRAWINGS

- .1 The Commission may furnish additional drawings to the Contractor to assist in the proper execution of the work. These additional drawings will be issued for clarification purposes only. Such drawings shall have the same meaning and intent as if they were included with the plans referred to in Contract Documents.

1.21 CONTRACT DOCUMENTS

- .1 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.
- .2 If the drawings and specifications differ, the NCC Representative shall give preference to the Contract document thereof, that best insures the attainment of this contract's objectives.

1.22 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 overhead and indirect charges and incorporated into the unit price bid.
- .2 No separate payment will be made for work performed in respect to any of the special provisions where there is no specific pay item on the schedule of prices. The cost of these works must be appropriated among, and included in, the lump sum bid price.

1.23 ADVERTISING

- .1 No advertising will be permitted on this project.

1.23 COMPACTION AND TESTING OF MATERIALS AND CONCRETE

1. The thickness of fill materials and concrete such as granular, select fill and topsoil, shown on the drawings shall be the real thickness after the materials have been compacted as specified.
2. Compaction and testing of material and concrete will be carefully monitored by NCC Representative throughout contract.

1.25 TEMPORARY UTILITIES

- .1 The Contractor shall make an arrangement for power and water connections and shall bear the costs of all electricity, fuel, water and sanitary facilities required for, or at the site of, the works up to the date of substantial performance as established by the Certificate of Substantial Performance.

1.26 DUST CONTROL

- .1 Apply calcium chloride and/or water with equipment for dust control for the duration of the construction under the direction of the Contractor Administrator.
- .2 Apply water and/or aqueous calcium chloride with distributors equipped with means of shut-off and with spray system to ensure uniform application.
- .2 Deliver calcium chloride to site in moisture-proof bags. Indicate name of manufacturer, name of product, net weight or mass, and percentage of calcium chloride guaranteed by manufacturer.
- .3 Store bags of calcium chloride in weather-proof enclosures
- .4 Place materials defined as hazardous or toxic in designated containers.
- .5 Separate and recycle waste materials in accordance with Section 01560 and 01705

1.27 RECORD DRAWINGS

- .1 As work progress, maintain, accurate record to show deviations from contract documents.
- .2 Just prior to NCC Representative's inspection for issuance of final certificate of completion, supply one (1) set of white prints with all major and minor deviations neatly inked in. The NCC Representative will provide two (2) sets of clean white prints for this purpose.

1.28 GUARANTEES AND WARRANTIES

- .1 Before completion of work, collect all manufacturer's guarantees and warranties, and deposit to NCC Representative.

PART 2 - PRODUCTS

- 2.1 Not used

PART 3 - EXECUTION

- 3.1 Not used

END OF SECTION

**SHOP DRAWINGS, PRODUCT DATA
AND SAMPLES****PART 1 - GENERAL**

- 1.1** Submit to NCC Representative for review, shop drawings, product data and samples specified.
- 1.2** Until submission is reviewed, work involving relevant product may not proceed.
- 1.3 Reference**
- .1 Canadian Construction Documents Committee (CCDC)
- .1 CCDC 2-[94], Stipulated Price Contract.
- 1.4 Shop Drawings**
- .1 Drawings to be originals supplied by contractor, subcontractor, supplier or distributor, illustrating appropriate portion of work:
- .1 Showing fabrication, layout, and setting or erection details as specified in appropriate sections.
- .2 Identify details by reference to sheet or detail number shown on contract documents.
- .3 Maximum sheet size 610 x 915 mm.
- .4 Reproductions for submissions opaque diazo prints.
- 1.5 Shop Drawings Review**
- .1 The review of shop drawings by the Engineer is for the sole purpose of ascertaining conformance with the general concept. This review shall not mean that the Engineer approves the detail design inherent in the shop drawings, responsibility for which shall remain with the Contractor submitting same, and such review shall not relieve the Contractor of responsibility for errors or omissions in the shop drawings or of responsibility for meeting all requirements of the construction and contract documents. Without restricting the generality of the foregoing, the Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of the work of all sub-trades.
- 1.6 Product Data**
- .1 Manufacturer's standard schematic drawings, catalogue sheets, diagrams schedules, performance charts, illustrations and other standard descriptive data may be accepted in lieu of shop drawings.
- .2 Above will only be accepted if they conform to following:
Delete information not applicable to project;
Supplement standard information to provide additional information applicable to project;
Show dimensions and clearances required;
Show performances characteristics and capacities.
- 1.7 Samples and Mock-ups**
- .1 Submit samples in sizes and quantities specified.
- .2 Where colour, pattern or texture is criterion, submit full range of samples.
- .3 Reviewed samples will become standards of workmanship and material against which installed work will be checked on project.
- 1.8 Co-ordination of Submissions**
- .1 Review shop drawings, product data and samples prior to submission.
- .2 Verify:
- .1 Field measurements;
- .2 Field construction;
- .3 Catalogue numbers and similar data.
- .4 Co-ordinate each submission with requirements of work and contract documents. Individual shop drawings will not be reviewed until all related drawings are available.

**SHOP DRAWINGS, PRODUCT DATA
AND SAMPLES**

- .5 Contractor's responsibility for errors and omissions in submission is not relieved by NCC Representative's review of submittals.
- .6 Contractor's responsibility for deviations in submission from requirements of Contract documents is not relieved by NCC Representative's review of submission, unless NCC Representative gives written acceptance of specified deviations.
- .7 Notify NCC Representative in writing at time of submission, of deviations from requirements of Contract documents.
- .8 After NCC Representative's review, distribute copies.

1.9 Submission Requirements

- .1 Schedule submissions at least 10 days before dates reviewed submissions will be needed.
- .2 Submit numbers of papers or electronic copies of shop drawings and product data Contractor requires for distribution, plus 2 copies to be retained by NCC Representative.
- .3 Accompany submissions with transmittal letter, in duplicate, containing:
 - .1 Date;
 - .2 Project title and number;
 - .3 Contractor's name and address;
 - .4 Number of each shop drawings, product data and sample submitted;
 - .5 Other pertinent data.

1.10 Submissions shall include:

- .1 Date and revisions dates;
- .2 Project title and number;
- .3 Name of:
 - .1 Contractor;
 - .2 Subcontractor;
 - .3 Supplier;
 - .4 Manufacturer;
 - .5 Separate detailer when pertinent.
- .4 Identification of product or material;
- .5 Relations to adjacent structure or materials;
- .6 Field dimensions, clearly identified as such;
- .7 Specification Section number;
- .8 Applicable standards, such as CSA or CGSB numbers;
- .9 Contractor's stamp, initialed or signed, verifying review of sub-mission, verification of field measurements and compliance with Contract documents.

END OF SECTION

PART 1 - GENERAL**1.1 REFERENCES**

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

1.2 SUBMITTALS

- .1 Submit site-specific Health and Safety Plan prior to award of contract. Health and Safety Plan must include:
 - .1 Results of site specific safety hazard assessment.
 - .2 Results of safety and health risk or hazard analysis for site tasks and operation found in the scope of work, including possible contact with soils contaminated with hydrocarbons.
- .2 Submit copies of reports or directions issued by Federal and Provincial health and safety inspectors.
- .3 Submit copies of incident and accident reports.
- .4 Submit Material Safety Data Sheets (MSDS) to NCC Representative.
- .5 Names of personnel and alternates responsible for site safety and health, hazards present on site, and use of personal protective equipment.

1.3 SAFETY ASSESSMENT

- .1 Perform site specific safety hazard assessment related to project.

1.4 GENERAL REQUIREMENTS

- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to commencing any site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .2 NCC Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.5 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 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.6 COMPLIANCE REQUIREMENTS

- .1 Comply with Ontario Health and Safety Act and Regulations for Construction Projects.
- .2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.7 UNFORESEEN HAZARDS

- .1 Should any unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province of Ontario having jurisdiction. Advise NCC Representative verbally and in writing.

1.8 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 Province of Ontario having jurisdiction, and in consultation with NCC Representative.

1.9 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.

1.11 PERSONNEL HEALTH, SAFETY, AND HYGIENE

- .1 Training: Ensure personnel entering site are trained in accordance with specified personnel training requirements.
- .2 Personal Protective Equipment:
 - .1 Workers in direct contact with the existing soil within park shall wear a dust mask and gloves along with the other standard PPE.
 - .2 PPE and protective clothing must be kept clean and well maintained.
 - .3 Dispose of or decontaminate PPE worn on site at end of each workday.

1.12 EXCAVATING

- .1 The Contractor shall ensure no person enters an excavation unless another worker is working above ground close to the excavation or to the means of access to it.
- .2 The Contractor shall arrange the locating and marking of gas, electrical and other services prior to commencing an excavation.
- .3 The Contractor shall obtain approval from Consultant before arranging the shut off and disconnection of a service that may pose a hazard.
- .4 The Contractor shall comply with the requirements of Section 230 to 242, O. Reg. 213/91, OHSA.

1.13 CHEMICALS

- .1 The Contractor must provide a list of all chemicals to be used on site and a copy of the Material Safety Data Sheet (MSDS) for each chemical to the Consultant prior to being brought onto the job site.
- .2 The Contractor must ensure each chemical container brought on site is clearly labelled with the identity of the chemical, information for the safe handling of the chemical and the location of the MSDS.
- .3 The Contractor must ensure adequate measures are taken to control the distribution, within the application area or throughout the building, of fumes/vapours before applying flammable, noxious or volatile materials.
- .4 The Contractor may be required to schedule the application of hazardous materials which might affect the well-being of any workers or disrupt work of other Contractors and cannot be adequately controlled to prevent such occurrences to evening or weekend periods.
- .5 The Contractor must ensure workers wear the required personal protective equipment (respiratory protection, protective clothing, hand protection, eye/face protection, etc.) when working with chemicals.
- .6 The Contractor must ensure the safe use and disposal of all chemicals that they are using. No chemicals and/or chemical waste product shall be disposed of on site without prior approval of Consultant.
- .7 The Contractor may not store chemicals and compressed gas cylinders on site without approval of the Consultant. If approved, the Contractor must ensure incompatible chemicals are stored separately.

PART 2 - PRODUCTS

NOT USE

PART 3- EXECUTION

NOT USE

END OF SECTION

PART 1 - GENERAL**1.1 RELATED WORK**

- | | |
|---|------------------|
| .1 Management and Disposal of Excess Material | Section 01 61 10 |
| .2 Excavation and Backfilling | Section 31 23 10 |
| .3 Shrub and Tree preservation | Section 32 01 91 |

1.2 FIRES

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

1.3 DISPOSAL OF WASTES

- .1 Burying of rubbish and waste materials on site is not permitted.
- .2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.
- .3 Waste materials to be as per Section 01 61 10 - Management and Disposal of Excess Material.

1.4 SITE CLEARING AND PLANT PROTECTION

- .1 Protect trees and plants on site and adjacent properties where indicated.
- .2 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.
- .3 Use hydro excavation in root zones of trees to minimize damage to roots as per Section 31 23 10 – Excavation and Backfilling.
- .4 Minimize stripping of soil.
- .5 Restrict tree removal to areas indicated or designated by Contract Administrator.

1.5 PROTECTION OF BIRD NESTING SITES

- .1 No clearing or close cut clearing shall take place during the avoidance time period for nesting habitat removal from May 1 to July 23.
- .2 In the event such clearing is unavoidable during this time period, vegetation to be removed shall be inspected by an avian biologist to determine whether there are any active nesting sites. If clearance is received from the avian biologist, clearing may proceed.
- .3 The NCC will be responsible for retaining the avian biologist. The Contractor shall provide at least 1 week advanced notice of the need for such an inspection.

1.6 DRAINAGE

- .1 Provide temporary drainage and pumping as necessary to keep excavation and site free from water.
- .2 Do not pump water containing suspended materials into adjacent waterway.
- .3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with the requirements of applicable authorities. Cover stockpiles of contaminated or other soil material with tarpaulin, to prevent runoff from entering waterways or storm sewers.

1.7 WORK ADJACENT TO WATERWAYS

- .1 Do not operate construction equipment in watercourses.
- .2 Do not dump excavated fill, waste material or debris in watercourses.

1.8 POLLUTION CONTROL

- .1 Maintain temporary erosion and pollution control features installed under this contract.
- .2 Control emissions from equipment and plant to 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.

1.9 WATERCOURSE PROTECTION

- .1 The Contractor shall ensure that no contamination, waste or other substances which may be detrimental to aquatic life or quality of water shall enter the watercourse as either direct or indirect result of construction and the Contractor shall meet all requirements of Government authorities or agencies with respect to environmental protection.
- .2 The Contractor shall be prepared to immediately clean up any spills of contamination, waste or other substances which may be either detrimental to aquatic life or quality of water. In the event of a spill, the Contractor shall immediately commence a clean-up operation. The Contractor shall be liable for all damages and/or charges laid which result, either directly or indirectly, from the spill, or contamination of any kind which results from their construction operations.
- .3 The Contractor shall not make any claim for extra compensation for the cost of fulfilling the obligations set out herein.

1.10 REVIEW AGENCIES

- .1 Various concerned Government agencies may be on site during construction and the Contractor shall provide easy access and meet the requirements of those agencies without delay.

1.11 EQUIPMENT FUELLING

- .1 Designate an area within the working limits to be used exclusively for fuelling construction equipment. Equipment fuelling shall be at least 5 m away from the watercourse.
- .2 Submit for review a plan for the interception and rapid clean-up of fuel spills should they occur. Maintain the apparatus for cleaning up fuel spills on site. The Contractor shall be liable for all damages and/or charges laid which result, either directly or indirectly, from the spill, or contamination of any kind which results from their construction operations.

PART 2 - PRODUCTS

- 2.1 Not Used

PART 3 - EXECUTION

- 3.1 Not Used

END OF SECTION

**MANAGEMENT AND DISPOSAL OF
EXCESS MATERIAL****PART 1 – GENERAL****1.1 GENERAL CONDITIONS**

- .1 The requirements of this specification take precedence over the requirements of any other specification for the management and disposal of excess material.

1.2 RELATED WORK

- | | | |
|----|-----------------------------------|------------------|
| .1 | Site Work Demolition and Removals | Section 02 41 13 |
| .2 | Site Grading | Section 31 22 13 |
| .3 | Excavation and backfilling | Section 31 23 10 |

1.3 DEFINITIONS

- .1 Bituminous pavement: any combination of asphaltic material and aggregate, excluding asbestos modified asphaltic material.
- .2 Concrete: concrete mixtures produced with Portland cement, which may include blended hydraulic cement, supplementary cement materials, spent debris and silica sand abrasive blasting media from abrasive cleaning of concrete and reinforcing steel, concrete brick, block and associated mortar. Can include embedded steel, and excludes asbestos modified Portland cement concrete mixtures.
- .3 Contaminated soil: encountered soil material with visual or olfactory evidence of contamination, including, but not limited to: the visual presence of ash, coal, garbage, metal or other debris (excluding asphalt encountered during removal of pathways) in the soil matrix, and/or material with a chemical or petroleum odour emanating from the soil matrix.
- .4 Disposable fill: excess material, other than that disposed of at a certified disposal site that is managed in berms and mounds, and as fill, other than in road embankments.
- .5 Earth: all soils except those defined as rock, and excludes stone masonry, concrete and other manufactured materials.
- .6 Excess material: Material removed as a result of Work outlined in the Contract, for which management is not specified. Includes surplus and unsuitable materials.
- .7 Fabricated metal and plastic products: metal and plastic products such as culverts, fence materials, and guide rails. Does not include containers, other packing materials, storage tanks, septic tanks, and ancillary equipment associated with sanitary sewage systems, septic systems, and fuel/lubricant dispensing and storage systems.
- .8 Groundwater: subsurface water and water that occurs beneath the water table in soils and rock formations that are fully saturated.
- .9 Masonry: clay brick, stone and associated mortar.
- .10 Natural wood: plant material, stumps, trunks, branches, and debris, from tree and shrub removal, and wood products that are not treated, coated or glued. Re-use: utilization, processing, re-processing or recycling of excess material into a construction material or other useful product, and management by these means for the Contract and other work.
- .11 Rock: natural beds or massive fragments, of the hard, stable, cemented part of the earth's crust, igneous, metamorphic, or sedimentary in origin, which may or may not be weathered, and includes boulders having a volume of 1 m or greater.
- .12 Waste: excess material managed by re-use or as disposable fill.
- .13 Water body: any body of water or watercourse or wetland, or a portion thereof, and excludes ditches other than those functioning as natural watercourses.

1.4 SUBMITTALS

- .1 Prior to the commencement of excavation work, the Contractor shall submit for the NCC Representative's review and approval:
 - 1. A list of debris disposal sites or recycling facilities and all applicable Certificates of Approval, as issued by the Ministry of the Environment under Part V of the

**MANAGEMENT AND DISPOSAL OF
EXCESS MATERIAL**

- Environmental Protection Act.
2. A list of waste haulers and all applicable Certificates of Approval, as issued by the Ministry of the Environment under Part V of the Environmental Protection Act, with approval to carry contaminated soil, if required.
 - .2 Weigh bills from the soil, natural wood and other materials disposed of at designated facilities must be submitted to the NCC Representative.

1.5 HANDLING AND DISPOSAL OF CONTAMINATED SOIL

- .1 The Contractor shall notify the NCC Representative immediately on the discovery of any contaminated, or suspected contaminated material encountered within the contract limits. Contaminated soil shall be identified based on visual or olfactory evidence of contamination, as defined in Part 1.3.3.
- .2 If contaminated materials or contaminated groundwater are encountered within the construction limits, the Contractor shall remove and dispose of this material at the direction of the NCC Representative. Contaminated soil materials shall be segregated from other excavated materials in one of two ways: 1 – a stockpile of contaminated soil may be placed on a tarpaulin on ground surface, covered and secured with a second tarpaulin at the end of each working day. 2 – contaminated soils may be placed in containers such as roll-off bins or metal drums approved for this purpose. Contaminated groundwater, if encountered, must be containerized in appropriate liquid storage drums, labelled, and secured on site pending testing. Following segregation, materials will be tested for contamination (by the NCC or NCC-assigned representative) to determine appropriate handling or disposal.
- .3 Should disposal of contaminated soil or groundwater be required, it must be conducted following guidelines of the Ontario Ministry of the Environment. Handling and hauling of the material by the Contractor shall be in accordance with Ontario Regulation 347 under the Environmental Protection Act (General - Waste Management), 1990. Disposal of contaminated groundwater shall be in accordance with Regulation 347. If possible, treatment and discharge of contaminated groundwater shall be conducted following the City of Ottawa Sewer Use By-Law No. 2003-514.
- .4 The contaminated materials and/or contaminated groundwater shall be disposed at licensed landfill or treatment facilities.
- .5 The Contractor shall not be entitled to claim for delay to the Contract Work due to meeting the requirements of this specification.

PART 2 - PRODUCTS

- 2.1 Not Used

PART 3 – EXECUTION**3.1 Construction**

- .1 Management of excess material shall be as described below:
 - .1 Earth: May be reused on site as backfilling with NCC representative's approval. Un-used earth has to be disposed off site at an approved disposal facility.
 - .2 Sod, Granular and rock: Manage by disposal off-site at an approved disposal facility (e.g. Trail Road landfill).
 - .3 Bituminous pavement: Manage by disposal off-site.
 - .4 Concrete, masonry, fabricated metal and plastic products: Manage by disposal off site.
 - .5 Granite cobbles: salvage and deliver to NCC warehouse (Woodroffe)
 - .6 Garbage and recycle bins: reinstall as per NCC representative's instruction
 - .7 Where excess materials are suspected of being contaminated or if types of materials are encountered which are not addressed in this specification, direction on management shall be obtained from NCC Representative, and handled in accordance with Part 1.5.
 - .8 Excess material that is a mixture of materials shall be disposed of according to

**MANAGEMENT AND DISPOSAL OF
EXCESS MATERIAL**

- most stringent conditions associated with any one of individual constituents.
- .9 Excess materials shall be managed using methods which prevent their entry into water bodies and other sensitive areas. These may be identified in Contract. Exceptions may be made when materials are re-used in accordance with requirements specified elsewhere in Contract.
 - .10 Notification requirements shall be complied with and approvals, releases, and agreements shall be obtained that are necessary for management of excess material.
 - .2 Management of disposable fill, within Commission's property and on other property designated in Contract, shall be as specified.
 - .3 Management by open burning is not permitted.

END OF SECTION

**MANAGEMENT AND DISPOSAL OF
EXCESS MATERIAL****PART 1 – GENERAL****1.1 GENERAL CONDITIONS**

- .1 The requirements of this specification take precedence over the requirements of any other specification for the management and disposal of excess material.

1.2 RELATED WORK

- | | | |
|----|-----------------------------------|------------------|
| .1 | Site Work Demolition and Removals | Section 02 41 13 |
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- .11 Rock: natural beds or massive fragments, of the hard, stable, cemented part of the earth's crust, igneous, metamorphic, or sedimentary in origin, which may or may not be weathered, and includes boulders having a volume of 1 m or greater.
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1.4 SUBMITTALS

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 - 1. A list of debris disposal sites or recycling facilities and all applicable Certificates of Approval, as issued by the Ministry of the Environment under Part V of the

**MANAGEMENT AND DISPOSAL OF
EXCESS MATERIAL**

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- .3 Should disposal of contaminated soil or groundwater be required, it must be conducted following guidelines of the Ontario Ministry of the Environment. Handling and hauling of the material by the Contractor shall be in accordance with Ontario Regulation 347 under the Environmental Protection Act (General - Waste Management), 1990. Disposal of contaminated groundwater shall be in accordance with Regulation 347. If possible, treatment and discharge of contaminated groundwater shall be conducted following the City of Ottawa Sewer Use By-Law No. 2003-514.
- .4 The contaminated materials and/or contaminated groundwater shall be disposed at licensed landfill or treatment facilities.
- .5 The Contractor shall not be entitled to claim for delay to the Contract Work due to meeting the requirements of this specification.

PART 2 - PRODUCTS

- 2.1 Not Used

PART 3 – EXECUTION**3.1 Construction**

- .1 Management of excess material shall be as described below:
 - .1 Earth: May be reused on site as backfilling with NCC representative's approval. Un-used earth has to be disposed off site at an approved disposal facility.
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 - .3 Bituminous pavement: Manage by disposal off-site.
 - .4 Concrete, masonry, fabricated metal and plastic products: Manage by disposal off site.
 - .5 Granite cobbles: salvage and deliver to NCC warehouse (Woodroffe)
 - .6 Garbage and recycle bins: reinstall as per NCC representative's instruction
 - .7 Where excess materials are suspected of being contaminated or if types of materials are encountered which are not addressed in this specification, direction on management shall be obtained from NCC Representative, and handled in accordance with Part 1.5.
 - .8 Excess material that is a mixture of materials shall be disposed of according to

**MANAGEMENT AND DISPOSAL OF
EXCESS MATERIAL**

- most stringent conditions associated with any one of individual constituents.
- .9 Excess materials shall be managed using methods which prevent their entry into water bodies and other sensitive areas. These may be identified in Contract. Exceptions may be made when materials are re-used in accordance with requirements specified elsewhere in Contract.
 - .10 Notification requirements shall be complied with and approvals, releases, and agreements shall be obtained that are necessary for management of excess material.
 - .2 Management of disposable fill, within Commission's property and on other property designated in Contract, shall be as specified.
 - .3 Management by open burning is not permitted.

END OF SECTION

PART 1 GENERAL**1.1 GENERAL**

- .1 Use new material and equipment unless otherwise specified. All material used in the project should be clean material free of fines.
- .2 Within 7 days of request by NCC Representative, submit following information for materials and equipment proposed for supply :
 - .1 Name and address of manufacturer.
 - .2 Trade name, model and catalogue number.
 - .3 Performance, descriptive and test data.
 - .4 Manufacturer's installation or application instructions.
 - .5 Evidence of arrangements to procure.
- .3 Provide material and equipment of specified design and quality, performing to published ratings and for which replacement parts are readily available.
- .4 Use products of one manufacturer for material and equipment of same type or classification unless otherwise specified.

1.2 MANUFACTURER'S INSTRUCTION

- .1 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods.
- .2 Notify NCC Representative in writing of any conflict between these specifications and manufacturers instructions. NCC Representative will designate which document is to be followed.

1.3 DELIVERY AND STORAGE

- .1 Deliver, store and maintain package material and equipment with manufacturer's seals and labels intact.
- .2 Prevent damage, adulteration and soiling of material and equipment during delivery, handling and storage. Immediately remove rejected material and equipment from site.
- .3 Store material and equipment in accordance with suppliers instructions.
- .4 All materials and equipment used for the purpose of site preparation and project completion must be operated and stored in a manner that prevents any deleterious substance (e.g. petroleum products, silt, debris, etc) from entering the water.
- .4 Touch-up damage factory finished surfaces to NCC Representative's satisfaction. Use primer or enamel to match original. Do not paint over name plates.

1.4 SUBSTITUTION

- .1 No substitutions will be permitted without prior written approval of NCC Representative.
- .2 Proposals for substitution may only be submitted after award of contract. Such requests must include statements of respective costs of items originally specified and the proposed substitution.
- .3 Proposals will be considered by NCC Representative if:
 - .1 Materials selected by tenderer from those specified, are not available;
 - .2 Delivery date of materials selected from those materials specified would unduly delay completion of contract, or;
 - .3 Alternative materials to those specified which are brought to the attention of and considered by the NCC Representative as equivalent to the material specified and will result in a credit to the Contract amount.
- .4 Should proposed substitution be accepted either in part or in whole, assume full responsibility and costs when substitution affects other work on the project. Pay for design or drawing changes required as result of substitution.

- .5 Amounts of all credits arising from approval of substitutions will be determined by NCC Representative and Contract Price will be reduced accordingly.

1.5 CONSTRUCTION EQUIPMENT AND PLANT

- .1 On request, prove to the satisfaction of the NCC Representative that the construction equipment and plant are adequate to manufacture, transport, place and finish work to quality and production rates specified. If inadequate, replace or provide additional equipment or plant as directed.
- .2 Maintain construction equipment and plant in good operating order.
- .3 Activities such as equipment refueling and maintenance must be conducted away from the water to prevent entry of petroleum products, debris, or other deleterious substances into the water. No heavy equipment (including small construction machinery such as "Bobcat") is permitted on the bed of the river for any reason at any time.

1.6 ACCEPTABILITY OF MATERIALS

- .1 All and only "acceptable" materials, as defined by Construction Materials Board Form 1 are eligible for use in this project. CMB Form 1 forms part of Contract documents.

END OF SECTION

**SITE WORK DEMOLITION AND
REMOVALS**

PART 1 - GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

- .1 Environmental Protection Section 32 01 91
- .2 Management and Disposal of Excess Material Section 01 61 10

1.2 Protect existing items designated to remain and materials designated for salvage and relocation. In event of damage, immediately replace such items or make repairs to approval of NCC Representative and at no additional cost to the Commission.

1.3 SITE CONDITIONS

- .1 Contractor to contact appropriate utilities to verify presence and location of all overhead and underground services and establish location for all such services in the field before commencing work. Report any discrepancies to NCC Representative.

PART 2 - PRODUCTS - Not applicable

PART 3 - EXECUTION

3.1 PREPARATION

- .1 Inspect site and verify with NCC Representative items designated for removal and items to be preserved.
- .2 Always protect Rockcliffe Pavilion
- .3 Locate and protect utility lines. Preserve in operating condition active utilities traversing site.
- .4 Notify utility companies before starting any work involving relocation, dismantling or demolition.

3.2 REMOVAL

- .1 Remove items indicated on drawings.
- .2 Do not disturb adjacent items designated to remain in place.

3.3 REMOVAL OF ASPHALT PAVING:

- .1 Square up adjacent surfaces to remain in place by saw cutting or other approved method. Cut must be straight and continuous.
- .2 Remove asphalt and when required: underlying granular materials and base.
- .3 Disposed of material as per specification 01 61 10 – Management and disposal of Excess Material

3.4 REMOVAL OF CONCRETE CURB

- .1 Square up adjacent concrete curb to remain in place by saw cutting or other approved method. Cut must be straight and continuous.
- .2 Remove concrete curb as indicated in the contract document and underlying granular materials and base.
- .3 Disposed of material as per specification 01 61 10 – Management and disposal of Excess Material

3.5 REMOVAL OF CONCRETE STAIRS AND RAILING

- .1 Remove Concrete stairs and railing indicated for removal in the contract document.
- .2 Disposed of material as per specification 01 61 10 – Management and disposal of Excess Material

3.6 REMOVAL OF STONE WALL

- .1 Remove stone wall indicated for removal in the contract document as well as the granular base.
- .2 Disposed of material as per specification 01 61 10 – Management and disposal of Excess

**SITE WORK DEMOLITION AND
REMOVALS**

Material

3.7 REMOVAL OF GRANITE COBBLE STONES

- .1 Remove granite cobble stone pavers indicated for removal in the contract document as well as the granular base.
- .2 Salvage granite cobble stone pavers and bring them to NCC Woodroffe warehouse:
1740 Woodroffe Avenue, Ottawa, Ontario
- .3 Disposed of rest of material as per specification 01 61 10 – Management and disposal of Excess Material

3.8 REMOVAL OF GARBAGE AND RECYCLE BINS

- .1 Remove garbage and recycle bins indicated for removal in the contract documents. Demolish and remove concrete base and granular base.
- .2 Temporary relocate garbage and recycle bins as per NCC representative's instruction
- .3 Disposed of rest of material as per specification 01 61 10 – Management and disposal of Excess Material

3.9 REMOVAL OF PAVERS ADJACENT TO PAVILION

- .1 Remove pavers and granular base adjacent to pavilion as indicated on the contract document.
- .2 Salvage pavers to be reinstalled on new concrete mud slab
- .3 Disposed of rest of material as per specification 01 61 10 – Management and disposal of Excess Material

3.10 REMOVAL OF CEDAR TREE

- .1 Mark on site the trees and shrubs to be removed according to contract document.
- .2 After NCC Representative approbation, remove trees and disposed of material as per specification 01 61 10 – Management and disposal of Excess Material
- .3 Leave ground surface in a condition suitable for immediate grading operations.

3.11 SALVAGE AND RELOCATION

- .1 Carefully dismantle items indicated for salvage or relocation. Stockpile salvaged materials at locations as directed by NCC Representative.
- .2 Contractor may reuse excavated topsoil on site as backfilling material if the soil is not deemed contaminated with foreign material, as defined in Specification 01 61 10 Part 1.3.3, and with NCC Representative's approval.

3.12 DISPOSAL OF MATERIAL

- .1 Dispose of materials not designated for salvage or re-use in work, off-site at approved location.

3.13 RESTORATION

- .1 Upon completion of work, remove debris, trim surfaces and leave work site clean.
- .2 Reinststate areas and existing works outside areas of demolition to match condition of adjacent, undisturbed areas.

END OF SECTION

PART 1 – GENERAL**1.1 DESCRIPTION**

- .1 Examine the drawings and specifications, and supply all galvanized metal guard rails, specified or necessary to complete the work.

1.2 REFERENCES

- .1 ASTM A53 / A53M - 07 Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
- .2 ASTM A307 - 07b: Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength
- .3 ASTM A500 / A500M – 07: Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
- .4 CAN/CSA G40.20/G40.21: General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel
- .5 CAN/CSA-G164-M92 (R2003) Hot Dip Galvanizing of Irregularly Shaped Articles
- .6 CSA S16-01: Limit States Design of Steel Structures
- .7 CSA W48-06: Filler Metals and Allied Materials for Metal Arc Welding
- .8 CSA W59-03: Welded Steel Construction (Metal Arc Welding)

1.3 SHOP DRAWINGS

- .1 Submit shop drawings for the work covered by this section as specified in Section 013300
- .2 The shop drawings must clearly indicate or show the materials, thicknesses, finishes, connections, joints, anchoring method and number of anchoring devices, supports, reinforcements, details and accessories.

PART 2 – PRODUCTS**2.1 MATERIALS**

- .1 Steel sections and plates as per CSA-G40.20/21, Grade 300 W minimum.
- .2 Pipe railing in accordance with ASTM A53, Grade 240MPa.
- .3 Welding material as per CSA W59.
- .4 Welding electrodes: to CSA W48 Series.
- .5 Bolts and anchor bolts as per ASTM A307.
- .6 Non-Shrink Grout: Sika 212 or approved equivalent.

2.2 FINISHES

- .1 Top handrail to be Stainless Steel with No. 4 finish.
- .2 All other steel components, including hardware (hinges, bolts, washers, nuts etc.) must be hot-dip galvanized after fabrication, primed and powder coated finish to match existing color on site.
- .2 Galvanizing: hot dip galvanized with 600 g/m2 zinc coating to CAN/CSA-G164.
- .3 Galvanized metal cleaner: "Sico 771-104" or "Rust-Oleum 3599 industrial pure strength" or approved equivalent by the Engineer.
- .4 Paint:
 - .1 TGIC Polyester powder coat paint system
 - .2 Etch Blast all stainless steel material to receive paint system

METAL WORKS

- .3 Color to match existing ramp on site
- .4 Provide sample for NCC representative approval
- .5 Shop apply paint system.

2.3 FABRICATION

- .1 Examine site and take on-site measurements of all previously executed and adjacent work that may affect the work of this section. Only field measurements must appear on shop drawings. Report any discrepancies between the field measurements and dimensions on drawings.
- .2 Build work square, true, straight and accurate to required dimensions, with joints closely fitted and properly secured.
- .3 Fabricate items from steel unless specified otherwise.
- .4 Fabricate structural steel in accordance with CAN/CSA S16 and in accordance with reviewed shop drawings.
- .5 Where possible, fit and shop-assemble work, ready for erection.
- .6 Ensure exposed welds are continuous over the full length of each joint. File or grind exposed welds smooth and flush.
- .7 Before galvanization, have metal items approved.
- .8 Have all metal elements galvanized following fabrication.

PART 3 – EXECUTION**3.1 GENERAL**

- .1 Structural steel work: in accordance with CSA S16.
- .2 Welding: in accordance with CSA W59.
- .3 Companies to be certified under Division 1 or 2.1 of CSA W47.1 for fusion welding of steel structures.

3.2 CONNECTION TO EXISTING WORK

- .1 Verify dimensions and condition of existing work, report discrepancies and potential problem areas to the Engineer for direction before commencing fabrication.

3.3 ERECTION

- .1 Erect structural steel, as indicated and in accordance with CSA S16 and in accordance with reviewed drawings.
- .2 Install metal work square, plumb, straight, true, and accurately and tightly fitted together and to surrounding work. Verify all dimensions on site prior to proceeding with shop fabrication.
- .3 Supply and install appropriate anchors approved by the Engineer.
- .4 Secure items together on site using bolts as per the latest edition of CSA-S16 and CSA S1653.
- .5 Hand items over to be embedded into concrete together with templates.
- .6 Field cutting or altering structural members: to approval of Engineer.
- .7 Care must be taken not to damage steel galvanization on site. Prevent nicks, dents or scratches. If galvanization is damaged, apply zinc-rich coat to bare metal.
- .8 Continuously seal members by continuous welds where indicated. Grind smooth.
- .9 Clean with mechanical brush and touch up bolts, welds and burned or scratched surfaces with zinc rich primer (2 coats) at completion of erection.

END OF SECTION

PART 1 – GENERAL**1.1 RELATED WORK**

- | | | |
|----|----------------------------|------------------|
| .1 | Excavating and Backfilling | Section 31 23 10 |
| .2 | Unit Paving | Section 32 14 10 |
| .3 | Asphalt paving | Section 32 12 17 |

1.2 DESCRIPTION

- .1 This section is the materials specification for the following granular materials:
- .1 Granular A
 - .2 Granular D (Stonedust)

1.3 REFERENCES

- .1 Ontario Provincial Standard Specification (OPSS):
 - .1 OPSS 1010 Material Specification for Aggregates – Granular A, B, M, and Select Subgrade Material
- .2 Ontario Ministry of the Environment (MOE):
 - .1 Ontario Ministry of the Environment, 2004. Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, March 9

PART 2 – PRODUCTS**2.1 MATERIALS - GENERAL REQUIREMENTS**

- .1 Any granular materials specified for the various works, on the drawings or in other sections of the specifications or by direction of the NCC Representative, shall conform to this material specification for the class of granular material required.
- .2 The materials shall be selected or produced from pits or quarries to conform to the requirements specified herein for each class of granular materials.
- .3 Material retained on the number 4 sieve shall consist of hard durable particles or fragments of stone or gravel.
- .4 Materials that break up when alternatively frozen and thawed or wetted and dried shall not be permitted.
- .5 Fine aggregate passing the Number 4 sieve shall consist of natural or crushed sand, and, material passing the Number 200 sieve shall consist of fine mineral particles.
- .6 The material shall be free from vegetable matter and lumps or balls of clay.
- .7 The material shall be non-plastic and non-frost susceptible.
- .8 Blending to obtain the correct gradation shall be permitted when the Contractor demonstrates that he can produce a correct gradation and has a plant capable of producing to the satisfaction of the NCC Representative.
- .9 The Contractor shall advise the NCC Representative two weeks in advance of his intended use of any materials to allow sufficient time for sampling and testing. The Contractor shall submit samples of granular materials to be used in the works if so requested by the NCC Representative.
- .10 Approval of a sample does not mean acceptance of the whole source. Each load of material received at the job site shall be subject to all the requirements of that material.
- .11 All gradation requirements are shown as percentage by weight passing U.S. Standards Sieves, A.A.S.H.O. M-92-65.

2.2 MATERIALS - SPECIFIC REQUIREMENTS

- .1 Granular "A"
 - .1 These materials shall conform to OPSS 1010.
- .2 Granular "D" (Stonedust):
 - .1 This material shall conform to OPSS 1004.

PART 3 – EXECUTION**3.1 PLACING**

- .1 Place granular material to depth and grade in areas indicated.
- .2 Ensure no frozen material is placed.
- .3 Place material only on clean unfrozen surface, free from snow and ice.
- .4 Place material using methods which do not lead to segregation or degradation of aggregate.
- .5 Spread and shape material in uniform layers of required thickness.
- .6 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.
- .7 Remove and replace that portion of layer in which material becomes segregated during spreading.

3.2 COMPACTION AND TESTING

- .1 Compact to specified density as shown on the contract drawings.
- .2 Compaction and testing as per OPSS 501.
- .3 Shape and roll alternately to obtain smooth, even and uniformly compacted base.
- .4 Apply water as necessary during compacting to obtain specified density. If material is excessively moist, aerate by scarifying with suitable equipment until moisture content is corrected.
- .5 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers.
- .6 Compaction tests to be performed by the NCC Representative or his representative.
- .7 Testing to be performed throughout progress of work to determine adequacy of compaction.
- .8 Co-operate with inspection staff during testing period.

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

3.4 PROTECTION

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

END OF SECTION

PART 1 – GENERAL**1.1 RELATED WORK**

- | | | |
|----|----------------------------|------------------|
| .1 | Excavating and Backfilling | Section 31 23 10 |
| .2 | Unit Paving | Section 32 14 10 |
| .3 | Asphalt paving | Section 32 12 17 |

1.2 DESCRIPTION

- .1 This section is the materials specification for the following granular materials:
- .1 Granular A
 - .2 Granular D (Stonedust)

1.3 REFERENCES

- .1 Ontario Provincial Standard Specification (OPSS):
 - .1 OPSS 1010 Material Specification for Aggregates – Granular A, B, M, and Select Subgrade Material
- .2 Ontario Ministry of the Environment (MOE):
 - .1 Ontario Ministry of the Environment, 2004. Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, March 9

PART 2 – PRODUCTS**2.1 MATERIALS - GENERAL REQUIREMENTS**

- .1 Any granular materials specified for the various works, on the drawings or in other sections of the specifications or by direction of the NCC Representative, shall conform to this material specification for the class of granular material required.
- .2 The materials shall be selected or produced from pits or quarries to conform to the requirements specified herein for each class of granular materials.
- .3 Material retained on the number 4 sieve shall consist of hard durable particles or fragments of stone or gravel.
- .4 Materials that break up when alternatively frozen and thawed or wetted and dried shall not be permitted.
- .5 Fine aggregate passing the Number 4 sieve shall consist of natural or crushed sand, and, material passing the Number 200 sieve shall consist of fine mineral particles.
- .6 The material shall be free from vegetable matter and lumps or balls of clay.
- .7 The material shall be non-plastic and non-frost susceptible.
- .8 Blending to obtain the correct gradation shall be permitted when the Contractor demonstrates that he can produce a correct gradation and has a plant capable of producing to the satisfaction of the NCC Representative.
- .9 The Contractor shall advise the NCC Representative two weeks in advance of his intended use of any materials to allow sufficient time for sampling and testing. The Contractor shall submit samples of granular materials to be used in the works if so requested by the NCC Representative.
- .10 Approval of a sample does not mean acceptance of the whole source. Each load of material received at the job site shall be subject to all the requirements of that material.
- .11 All gradation requirements are shown as percentage by weight passing U.S. Standards Sieves, A.A.S.H.O. M-92-65.

2.2 MATERIALS - SPECIFIC REQUIREMENTS

- .1 Granular "A"
 - .1 These materials shall conform to OPSS 1010.
- .2 Granular "D" (Stonedust):
 - .1 This material shall conform to OPSS 1004.

PART 3 – EXECUTION**3.1 PLACING**

- .1 Place granular material to depth and grade in areas indicated.
- .2 Ensure no frozen material is placed.
- .3 Place material only on clean unfrozen surface, free from snow and ice.
- .4 Place material using methods which do not lead to segregation or degradation of aggregate.
- .5 Spread and shape material in uniform layers of required thickness.
- .6 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.
- .7 Remove and replace that portion of layer in which material becomes segregated during spreading.

3.2 COMPACTION AND TESTING

- .1 Compact to specified density as shown on the contract drawings.
- .2 Compaction and testing as per OPSS 501.
- .3 Shape and roll alternately to obtain smooth, even and uniformly compacted base.
- .4 Apply water as necessary during compacting to obtain specified density. If material is excessively moist, aerate by scarifying with suitable equipment until moisture content is corrected.
- .5 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers.
- .6 Compaction tests to be performed by the NCC Representative or his representative.
- .7 Testing to be performed throughout progress of work to determine adequacy of compaction.
- .8 Co-operate with inspection staff during testing period.

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

3.4 PROTECTION

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

END OF SECTION

PART 1 GENERAL**1.1 RELATED SECTIONS**

- .1 Section 01 61 10 - Management and Disposal of Excess Material
- .2 Section 31 23 10 - Excavating and Backfilling
- .3 Section 31 05 17 – Granular Materials
- .4 Section 32 91 21 – Topsoil and finish grading
- .5 Section 32 01 91 – Shrub and Tree Protection

1.2 REFERENCES

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

1.3 PROTECTION

- .1 Protect existing fencing, landscaping, natural features, bench marks, buildings, pavement, surface or underground utilities which are to remain as directed by NCC Representative. If damaged, restore to original or better condition unless directed otherwise.
- .2 Maintain access roads to prevent accumulation of construction related debris on roads.

PART 2 PRODUCTS**2.1 MATERIALS**

- .1 Fill materials: Granular A and Granular D (stone dust) as per Section 31 05 17 – Granular Materials
- .2 Excavated area on site may be re-used as backfilling material if it is not contained by other foreign materials during excavation and with NCC Representative's approval.

PART 3 EXECUTION**3.1 STRIPPING OF TOPSOIL AND TURF**

- .1 Do not strip or disturb existing soil and turf, unless otherwise indicated.
- .2 Any excavated topsoil from site to be disposed of as per Section 01 61 10 - Management and Disposal of Excess Material.

3.2 GRADING

- .1 Rough grade to levels, profiles, and contours allowing for positive drainage of the paving area under overhanging roof (min2%), as indicated in the contract documents.
- .2 **Contractor to make sure proposed pathway respect Universal Accessibility standards (slope max 5%) as indicated in the contract documents.**
- .3 Compact filled areas to maximum dry density to ASTM D698, as follows:
 - .1 85% under landscaped areas.
 - .2 95 % under paved and walk areas.
- .4 Contractor to rough grade respecting depth below final grade as follow:
 - .1 150mm for sodded area
 - .2 As indicated for paved area and foundations
- .5 Before adding backfilling material, scarify subgrade at 150mm depth in order to facilitate bonding between two materials and maintain same level of humidity.
- .6 Do not disturb soil within branch spread of trees or shrubs to remain.

3.3 SURPLUS MATERIAL

- .1 Remove surplus material and material unsuitable for fill, grading or landscaping as directed by NCC Representative.

3.4 TESTING

- .1 Inspection and testing of soil compaction will be done by a designated lab by NCC representative and as per specification 01 33 00 Shop drawings, products Data and samples

END OF SECTION

PART 1 GENERAL**1.1 RELATED SECTIONS**

- .1 Section 01 33 00 – Shop Drawings, Products Data and Samples.
- .2 Section 01 35 43 - Environmental Protection.
- .3 Section 01 61 10 – Management and Disposal of Excess Material.
- .4 Section 31 05 17 – Granular Materials.
- .5 Section 31 22 13 – Site Grading.
- .6 Section 32 01 91 – Shrub and tree protection.
- .7 Section 32 92 23 – Sodding.

1.2 REFERENCES

- .1 Ontario Provincial Standard Specification (OPSS)
 - .1 OPSS 0212 Construction Specification for Borrow
 - .2 OPSS 1010 Material Specification for Aggregates – Granular A, B, M, and Select Subgrade Material.

1.3 UTILITY LINES

- .1 Before commencing work, establish location and extent of underground utility lines in area of excavation. Notify NCC Representative of findings.
- .2 Advise NCC Representative to re-route existing lines in area of excavation. Costs for such work will be paid by Owner.
- .3 Record locations of maintained and re-routed underground utility lines.
- .4 Make good and pay for damage to existing utility lines resulting from work.

1.4 COMPACTION DENSITIES

- .1 Compaction densities are percentages of maximum densities obtainable from ASTM D698-70

1.5 DEFINITIONS

- .1 Excavation classes: two classes of excavation will be recognized; common excavation and rock excavation.
 - .1 Rock: any solid material in excess of 0.25 m³ and which cannot be removed by means of heavy duty mechanical excavating equipment. Frozen material not classified as rock.
 - .2 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.
- .2 Unclassified excavation: excavation of deposits of whatever character encountered in Work.
- .3 Topsoil: material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.
- .4 Waste material: excavated material unsuitable for use in Work or surplus to requirements.
- .5 Contaminated soil: encountered soil material with visual or olfactory evidence of contamination, including, but not limited to: the visual presence of ash, coal, garbage, metal or other debris (excluding asphalt encountered during removal of pathways) in the soil matrix, and/or material with a chemical or petroleum odour emanating from the soil matrix.
- .6 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.
- .7 Unsuitable materials:
 - .1 Weak and compressible materials under excavated areas.
 - .2 Frost susceptible materials under excavated areas.
 - .3 Frost susceptible materials:
 - .1 Fine grained soils with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to ASTM D422: Sieve sizes to CAN/CGSB-8.2.
 - .2 Table

Sieve Designation

% Passing

	Sieve Designation	% Passing
	2.00 mm	100
	0.10 mm	45 - 100
	0.02 mm	10 - 80
	0.005 mm	0 - 45
.3	Coarse grained soils containing more than 20% by mass passing 0.075 mm sieve.	

1.6 WASTE MANAGEMENT AND DISPOSAL

- .8 Separate and recycle waste materials in accordance with Section 01 61 10 – Management and Disposal of Excess Material.

1.7 PROTECTION OF EXISTING FEATURES

- .1 Protect existing features in accordance with applicable local regulations of excavation.
- .2 Existing buildings and surface features:
- .1 Conduct, with NCC Representative, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, rail tracks, pavement, survey bench marks and monuments which may be affected by Work.
- .2 Protect **existing buildings** (pavilion) and surface features from damage while Work is in progress. In event of damage, immediately make repair to approval of NCC Representative.
- .3 Tree roots or branches to be managed in accordance with: 32 01 91 – Shrub and Tree protection.

1.8 EQUIPMENT

- .1 Excavation equipment shall be suited for the intended work, sized to effectively perform the work and minimize excessive mixing of soils, over-excavation into contaminated soils (if encountered), dust emissions and working around trees.
- .2 Shovels to be equipped with smooth toothless buckets when excavating in soils.
- .3 Haulage vehicles are to be equipped with appropriate tarpaulins of suitable size and design to comply with Section 01 74 11 – Cleaning.
- .4 Haulage vehicles required to access public roadways shall operate by authorization of a Certificates of Approval (Waste Management System), as issued by the Ministry of the Environment under Part V of the Environmental Protection Act.

Part 2 Products**2.1 MATERIALS**

- .1 Properties to Section 31 05 17 – Granular Materials
- .2 Earth Borrow conforming to OPSS 212 and Select Subgrade Material (SSM) conforming to OPSS 1010, free from roots, rocks larger than 75 mm and building debris. If Contractor proposes to use excavated material Contract Administrator's approval will be required before it is used as fill. Contractor to supply imported fill (Earth Borrow and/or SSM) as required to execute the work of this contract and include such requirements and associated costs in the unit price bid.

2.2 STOCKPILING

- .1 Stockpile fill materials in areas designated by Contract Administrator. Stockpile topsoil and granular materials in a manner to prevent segregation. Protect stockpiled fill material from freezing.
- .2 Protect fill materials from contamination.
- .3 If stockpiling of contaminated soil is required, material stockpile must be located in an area designated by the NCC. Contaminated soil materials shall be segregated from other excavated materials by placement on a tarpaulin on ground surface, covered and secured with a second tarpaulin at the end of each working day. Stockpile shall be located and protected in such a way as to prevent infiltration of rainwater, and prevent run-off from stockpile from entering a waterway or storm sewer.

Part 3**Execution****3.1****SITE PREPARATION**

- .1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.
- .2 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly.
- .3 Protect existing site features from damage while work is in progress. In the event of damage, immediately make repairs to the satisfaction of the NCC Representative.

3.2**DEWATERING**

- .1 Protect open excavations against flooding and damage due to surface run-off.
- .2 Provide approved treatment facilities to remove suspended solids or other materials before discharging to storm sewers, water courses or drainage areas.
- .3 If visual or olfactory evidence indicates contaminated water, water is to be containerized on-site in approved liquid drums, labelled, and secured on site pending testing. Following segregation, materials will be tested for contamination (by the NCC or NCC-assigned representative) to determine appropriate handling or disposal.

3.3**EXCAVATION**

- .1 Excavate to lines, grades, elevations and dimensions as indicated.
- .2 Remove concrete, masonry, paving and rubble encountered during excavation in accordance with Section 01 61 10 – Management and Disposal of Excess Material.
- .3 Do not disturb soil within branch spread of trees that are to remain.
- .4 Excavation in proximity to trees:
 - .1 Use hydro excavation methods to excavate around tree roots, or
 - .2 Excavate by hand and cut roots with sharp axe or saw.
- .5 Dispose of unsuitable excavated material off site as per Section 01 61 10– Management and Disposal of Excess Material.
- .6 Dispose of surplus excavated material in approved location on site or off site as per Section 01 61 10 – Management and Disposal of Excess Material.
- .7 Do not obstruct flow of surface drainage or natural watercourses.
- .8 Notify NCC Representative when bottom of excavation is reached.
- .9 Obtain NCC Representative approval of completed excavation.
- .10 Correct unauthorized over-excavation by placing Select Cover Material compacted to not less than 95% of corrected maximum dry density.
- .11 Hand trim, make firm and remove loose material and debris from excavations. Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.

3.4**BACKFILLING**

- .1 Do not proceed with backfilling operations until NCC Representative has inspected and approved installations.
- .2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .3 Do not use backfill material which is frozen or contains ice, snow or debris.
- .4 Place backfill material in uniform layers not exceeding 150 mm compacted thickness. Compact each layer before placing succeeding layer.
- .5 Install drainage system in backfill as indicated.
- .6 Backfill material must be approved by the Contract Administrator, and free from visual or olfactory evidence of contamination.

3.5**RESTORATION**

- .1 Upon completion of Work, remove waste materials and debris in accordance to Section 01 61 10 - Management and Disposal of Excess Materials, trim slopes, and correct defects as directed by NCC Representative.
- .2 Reinstate damaged turf with imported topsoil and seed or sod to elevation which existed before excavation as directed by NCC Representative.
- .3 Clean and reinstate areas affected by Work as directed by NCC Representative.

3.6 INSPECTION AND TESTING

- .1 Testing of materials and compaction will be carried out by testing laboratory designated by NCC Representative.
- .2 NCC will pay costs for inspection and testing
- .3 If soil or groundwater testing is required, based on indication of contamination, NCC will pay costs for such testing.

3.7 SURPLUS MATERIAL

- .1 Dispose of surplus material not required for backfill, grading or landscaping off site.
- .2 Dispose of material unsuitable for fill, grading or landscaping off site.

END OF SECTION

PART 1 GENERAL**1.1 RELATED SECTIONS**

- .1 Section 01 61 10 - Management and Disposal of Excess Material
- .2 Section 31 23 10 - Excavating and Backfilling

1.2 DEFENITION

- .1 Rock: any solid material which cannot be removed by means of heavy duty mechanical excavating equipment. Frozen material not classified as rock.

1.3 SUBMITTALS

- .1 Blasting Operation
 - .1 Submit to NCC Representative for approval, written proposal of operations for removal of rock by blasting, in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Indicate proposed method of carrying out work. Include details on protective measures, time of blasting and other pertinent details.
 - .3 Submit records to NCC Representative at end of each shift. Maintain complete and accurate record of drilling and blasting operations.

**PART 2 PRODUCTS
NA****PART 3 EXECUTION****3.1 PROTECTION**

- .1 Prevent damage to surroundings and injury to persons. Erect fencing, post guards, sound warnings and display signs when blasting to take place.

3.2 ROCK REMOVAL

- .1 In the event that bed rock is encounter during excavation, remove rock to alignments, profiles, and cross sections as indicated in the contract documents.
- .2 Obtain NCC Representative approvals before any bed rock removal.
- .3 Use rock removal procedures to produce uniform and stable excavation surfaces. Minimize over break, and avoid damage to adjacent structures.
- .4 Prepare rock surfaces which are to bond to concrete, by scaling, pressure washing and broom cleaning surfaces.
- .5 Remove boulders and fragments which may slide or roll into excavated areas.
- .6 Correct unauthorized rock removal at no extra cost, in accordance with Section 31 23 10 - Excavating, Trenching and Backfilling.

END OF SECTION

PART 1 – GENERAL

1.1 RELATED WORK

- | | | |
|----|----------------------------|------------------|
| .1 | Excavation and Backfilling | Section 31 23 10 |
| .2 | Environmental Protection | Section 01 35 43 |
| .3 | Site Grading | Section 31 22 13 |

PART 2 – PRODUCTS

PART 3 – EXECUTION

3.1 TREE AND SHRUBS TO BE RETAINED

- .1 Retain and protect all existing trees and shrubs on site. Do not remove any plant without the express authorization of the NCC Representative.

3.2 PROTECTION OF EXISTING TREES

- .1 Do not disturb or compact grade within branch spread of trees or shrubs to remain.
- .2 Protect tree trunks as required with wooden protective cladding installed vertically around the trunk. Install cladding with straps or other device which will not damage the tree.
- .4 Installation of all tree protection shall be completed prior to beginning of any site work.

3.3 ROOT PRUNNING

- .1 In locations where the grade will be lower than the adjacent existing trees, the contractor will expedite the work of this section to reduce the exposure of the root system. Any exposed roots that will be exposed longer than 48 hours, before backfilling will be covered with a landscape fabrics and water daily.
- .2 Contractor to notify NCC representative if roots need to be pruned and to hire a qualified arborist to do so.

3.4 DAMAGES

- .1 The Contractor will compensate the client for any trees damaged by the Contractor during construction. Damages include: Any physical damage on tree bark, branches and roots.
- .2 Contractor to replace any damage tree as per NCC Representative`s instruction

END OF SECTION

PART 1 GENERAL**1.1 RELATED WORKS**

- | | | |
|----|----------------------------|------------------|
| .1 | Excavation and Backfilling | Section 31 23 10 |
| .2 | Granular Materials | Section 31 05 17 |
| .3 | Asphalt paving | Section 32 12 17 |

1.2 PROTECTION

- .1 Prevent damage to buildings, landscaping, curbs, sidewalks, roads and trees. Make good on any damage.

PART 2 PRODUCTS**2.1 MATERIALS**

- .1 Granular "A": as per Section 31 05 17
 .2 Asphalt as per section 32 12 17

PART 3 EXECUTION**3.1 LAYOUT OF PATHWAY**

- .1 Notify NCC Representative after completion of each stage and receive approval of layout prior to proceeding to next stage. Stages:
- .1 Staking of centerline.
 - .2 Subgrade
 - .4 Sub-base
 - .5 Prior to laying of asphalt, NCC Representative to inspect alignment and grades (**maximum slope 5%**)
- .2 All curves shall be true. No tangents will be accepted at the beginning or end of curves. Obtain approval of NCC Representative on site during work.

3.2 INSPECTION

- .1 Check graded subgrade for conformity with elevations and sections before placing granular base materials and obtain approval of NCC Representative.
- 2 Proof roll graded subgrade surface with a heavy smooth drum roller (weight and type of roller to be approved by NCC Representative).
- .1 Check for unstable areas and check for areas requiring additional compaction.

3.3 SUB-BASE

- .1 Refer to section 31 23 10, Excavation and Backfilling

3.4 BASE COURSE

- .1 Place Granular 'A' base materials as indicated to compacted thickness as indicated.
- .2 Place in layers not exceeding 150mm compacted thickness. Compact each layer to 100% maximum dry density as determined by Standard Proctor Density.
- .3 Obtain approval of NCC Representative prior to installing asphalt.

END OF SECTION

PART 1	GENERAL	
1.1	RELATED SECTIONS	
.1	Pathway Construction	Section 32 11 30
.2	Granular Materials	Section 31 05 17
1.2	REFERENCES	
.1	Refer to CAN/CGSB-16.3-M90, Asphalt Cements for Road Purposes.	
.2	ASTM D 995-95b, Specifications for Mixing Plants for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures.	
1.3	PRODUCT DATA	
.1	Submit manufacturer's test data and certification that asphalt cement meets requirements of this section.	
.2	Submit manufacturer's test data and certification that hydrated lime meets requirements of this section.	
.3	Submit asphalt concrete mix design and trial mix test results to Contract Administrator for approval at least 2 weeks prior to commencing work.	
1.4	SAMPLES	
.1	Submit to NCC Representative samples of material for sieve analysis at least 2 weeks before commencing work. In accordance with Section 01 33 00 – Shop drawings, Products Data and Samples	
.2	Inform NCC Representative of proposed source of aggregates and provide access for sampling at least 2 weeks prior to commencing work.	
1.5	DELIVERY, STORAGE AND HANDLING	
.1	Submit to NCC Representative copies of freight and waybills for asphalt cement as shipments are received. NCC Representative reserves right to check weights as material is received.	
PART 2	PRODUCTS	
2.1	MATERIALS	
.1	Asphalt cement to: CAN/CGSB-16.3, HL3	
2.2	MIX DESIGN	
.1	Mix design to be approved by NCC Representative.	
.2	Mix design to be developed by testing laboratory approved by NCC Representative.	
PART 3	EXECUTION	
3.1	PAVEMENT THICKNESS	
.1	Pavements for pathways:	
.1	EB-10S, 50 mm thickness.	
3.2	PLANT AND MIXING REQUIREMENTS	
.1	Batch and continuous mixing plants:	
.1	To ASTM D995.	
.2	Feed aggregates from individual stockpiles through separate bins to cold elevator feeders. Do not load frozen materials into bins.	
.3	Feed cold aggregates to plant in proportions to ensure continuous operations.	
.4	Calibrate bin gate openings and conveyor speeds to ensure mix proportions are achieved.	
.5	Before mixing, dry aggregates to moisture content not greater than 1% by mass or to a lesser moisture content if required to meet mix design requirements.	
.6	Immediately after drying, screen aggregates into hot storage bins in sizes to permit recombining into gradation meeting job-mix requirements.	

ASPHALT PAVING

- .7 Store hot screened aggregates in manner to minimize segregation and temperature loss.
- .8 Heat asphalt cement and aggregate to mixing temperature directed by NCC Representative. Do not heat asphalt cement above 160°C maximum temperature indicated on temperature-viscosity chart.
- .9 Make available current asphalt cement viscosity data at plant. With information relative to viscosity of asphalt being used, NCC Representative to approve temperature of completed mix at plant and at paver after considering hauling and placing conditions.
- .10 Maintain temperature of materials within 5°C of specified mix temperature during mixing.
- .11 Mixing time:
 - .1 In batch plants, both dry and wet mixing times as directed by NCC Representative. Continue wet mixing as long as necessary to obtain thoroughly blended mix but not less than 30 s or more than 75 s.
 - .2 In continuous mixing plants, mixing time as directed by NCC Representative but not less than 45 s.
 - .3 Do not alter mixing time unless directed by NCC Representative.
- .2 Dryer drum mixing plant:
 - .1 To ASTM D995.
 - .2 Load aggregates from individual stockpiles to separate cold feed bins. Do not load frozen materials into bins.
 - .3 Feed aggregates to burner end of dryer drum by means of multi-bin cold feed unit and blend to meet job-mix requirements by adjustments of variable speed feed belts and gates on each bin.
 - .4 Meter total flow of aggregate by an electronic weigh belt system with indicator that can be monitored by plant operator and which is interlocked with asphalt pump so that proportions of aggregate and asphalt entering mixer remain constant.
 - .5 Provide for easy calibration of weighing systems for aggregates without having material enter mixer.
 - .6 Calibrate bin gate openings and conveyor speeds to ensure mix proportions are achieved. Calibrate weigh bridge on charging conveyor by weighing amount of aggregate passing over weigh bridge in set amount of time. Difference between this value and amount shown by plant computer system to differ by not more than plus or minus 2%.
 - .7 Make provision for conveniently sampling full flow of materials from cold feed.
 - .8 Provide screens or other suitable devices to reject oversize particles or lumps of aggregate from cold feed prior to entering drum.
 - .9 Provide system interlock stop all feed components if either asphalt or aggregate from any bin stops flowing.
 - .10 Accomplish heating and mixing of asphalt mix in approved parallel flow dryer-mixer in which aggregate enters drum at burner end and travels parallel to flame and exhaust gas stream. Control heating to prevent fracture of aggregate or excessive oxidation of asphalt. Equip system with automatic burner controls and provide for continuous temperature sensing of asphalt mixture at discharge, with printing recorder that can be monitored by plant operator. Submit printed record of mix temperatures at end of each day.
 - .11 Mixing period and temperature to produce uniform mixture in which particles are thoroughly coated, and moisture content of material as it leaves mixer to be less than 2%.
- .3 Temporary storage of hot mix:
 - .1 Provide mix storage of sufficient capacity to permit continuous operation and designed to prevent segregation.
 - .2 Do not store asphalt mix in storage bins in excess of 3 h.
- .4 While producing asphalt mix for this project, do not produce mix for other users unless separate storage and pumping facilities are provided for materials supplied to this project.
- .5 Addition of anti-stripping agent:

ASPHALT PAVING

- .1 Plant to be equipped with pugmill to thoroughly mix aggregates and lime prior to entering the plant.
- .2 Plant to be equipped with suitable conveyor systems capable of supplying aggregates and lime at constant rate.
- .3 Plant and equipment used for addition of lime to be equipped with covers to control loss of lime.
- .4 Plant to be equipped to control rate of lime incorporation to within 1/4%.
- .5 Add water to aggregate prior to entering pugmill.
- .6 Add water to lime sufficiently in advance to permit time to slake prior to entering pugmill.

3.3**EQUIPMENT**

- .1 Pavers: mechanical self-powered pavers capable of spreading mix within specified tolerances, true to line, grade and crown indicated.
- .2 Rollers: sufficient number of type and weight to obtain specified density of compacted mix.
- .3 Vibratory rollers:
 - .1 Minimum drum diameter: 1200 mm.
 - .2 Maximum amplitude of vibration (machine setting): 0.5 mm for lifts less than 40 mm thick.
- .4 Haul trucks: sufficient number and of adequate size, speed and condition to ensure orderly and continuous operation and as follows:
 - .1 Boxes with tight metal bottoms.
 - .2 Covers of sufficient size and weight to completely cover and protect asphalt mix when truck fully loaded.
 - .3 In cool weather or for long hauls, insulate entire contact area of each truck box.
 - .4 Use only trucks which can be weighed in single operation on scales supplied.
- .5 Hand tools:
 - .1 Lutes or rakes with covered teeth for spreading and finishing operations
 - .2 Tamping irons having mass not less than 12 kg and bearing area not exceeding 310 cm² for compacting material along curbs, gutters and other structures inaccessible to roller. Mechanical compaction equipment, when approved by NCC Representative, may be used instead of tamping irons.
 - .3 Straight edges, 4.5 m in length, to test finished surface.

3.4**PREPARATION**

- .1 Prepare granular bed.
- .2 Apply tack coat prior to paving.
- .3 Prior to laying mix, clean surfaces of loose and foreign material.

3.5**TRANSPORTATION OF MIX**

- .1 Transport mix to job site in vehicles cleaned of foreign material.
- .2 Paint or spray truck beds with limewater, soap or detergent solution, or non petroleum based commercial product, at least daily or as required. Elevate truck bed and thoroughly drain. No excess solution to remain in truck bed.
- .3 Schedule delivery of material for placing in daylight, unless NCC Representative approves artificial light.
- .4 Deposit mix from surge or storage silo to trucks in multiple drops to reduce segregation. Do not dribble mix into trucks.
- .5 Deliver material to paver at uniform rate and in an amount within capacity of paving and compacting equipment.
- .6 Deliver loads continuously in covered vehicles and immediately spread and compact. Deliver and place mixes at temperature within range as directed by NCC Representative, but not less than 135°C.

3.6**PLACING**

- .1 Obtain NCC Representative's approval of base prior to placing asphalt.

ASPHALT PAVING

- .2 Place asphalt concrete to thickness, grades and lines as indicated as directed by NCC Representative.
 - .3 Placing conditions:
 - .1 Place asphalt mixtures only when air temperature is above 5°C.
 - .2 When temperature of surface on which material is to be placed falls below 10°C, provide extra rollers as necessary to obtain required compaction before cooling.
 - .3 Do not place hot-mix asphalt when pools of standing water exist on surface to be paved, during rain, or when surface is damp.
 - .4 Place asphalt concrete in compacted lifts of thickness as indicated.
 - .4 When hand spreading is used:
 - .1 Use approved wood or steel forms, rigidly supported to assure correct grade and cross section. Use measuring blocks and intermediate strips to aid in obtaining required crosssection.
 - .2 Distribute material uniformly. Do not broadcast material.
 - .3 During spreading operation, thoroughly loosen and uniformly distribute material by lutes or covered rakes. Reject material that has formed into lumps and does not break down readily.
 - .4 After placing and before rolling, check surface with templates and straightedges and correct irregularities.
 - .5 Provide heating equipment to keep hand tools free from asphalt. Control temperature to avoid burning material. Do not use tools at higher temperature than temperature of mix being placed.
- 3.7 COMPACTING**
- .1 Roll asphalt continuously following most recently edition of Transport Ontario Standards.
 - .2 Do not change rolling pattern unless mix changes or lift thickness changes. Change rolling pattern only as directed by NCC Representative.
- 3.8 FINISH TOLERANCES**
- .1 Finished asphalt surface to be within 5 mm of design elevation but not uniformly high or low.
 - .2 Finished asphalt surface not to have irregularities exceeding 5 mm when checked with 4.5 m straight edge placed in any direction.
- 3.9 DEFECTIVE WORK**
- .1 Correct irregularities which develop before completion of rolling by loosening surface mix and removing or adding material as required. If irregularities or defects remain after final compaction, remove surface course promptly and lay new material to form true and even surface and compact immediately to specified density.
 - .2 Repair areas showing checking, rippling, or segregation.
 - .3 Adjust roller operation and screed settings on paver to prevent further defects such as rippling and checking of pavement.

END OF SECTION

PART 1- GENERAL**1.1 RELATED WORKS**

- .1 Excavating and Backfilling Section 31 23 10
- .2 Granular Materials Section 31 05 17

1.2 PROTECTION

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

1.3 SAMPLES

- .1 Submit a full-size sample of each type of unit paver used
- .2 Install a mock-up of pavers layout for NCC Representative approval's before commencement of work.

PART 2- PRODUCTS**2.1 MATERIALS**

- .1 Concrete unit pavers:
 - .1 Compliant with the requirements of with CSA A231.2-06, NQ 2624-900 [1991] and to following:
 - .2 Permacon Mondrian Slab
 - Dimension : 50mm x 190mm x 380mm
 - 50mm x 380mm x 380mm
 - 50mm x 380mm x 570mm
 - Range color: Richmond grey
 - Or approved equivalent.
- .2 On granular base:
 - .1 Granular laying course shall be stone dust as per Section 31 05 17.
 - .2 Granular base shall be Granular A as per Section 31 05 17
- .3 On concrete mud slab
 - .1 Poor in place concrete as per Structural plan & details
- .4 Pavers Anchors for pavers around the pavilion.

PART 3- EXECUTION**3.1 SUBGRADE**

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

3.2 GRANULAR BASE

- .1 Place base to compacted thicknesses as indicated on drawings.
- .2 Compact to a density of not less than 95% Standard Density in accordance with ASTM D698.
- .3 Shape and roll alternately to obtain a smooth, even and uniformly compacted granular base and ensure conformity of grades with finish surface.
- .4 Apply water as necessary during compaction to obtain specified density. If granular base is excessively moist, aerate by scarifying with suitable equipment until moisture content is corrected.
- .5 In areas not accessible to rolling equipment, compact to specified density with approved mechanical tampers.
- .6 Ensure top of granular base does not exceed plus or minus 10 mm of finished grade, less combined thickness of granular laying course plus surface course.

3.3 LAYING COURSE

- .1 Place stone dust laying course to compacted thickness as indicated on drawings.
- .2 Ensure laying course is dry (4-8% moisture content) prior to placement of unit pavers.

3.4 SURFACE COURSE

- .1 Install unit paving true to grade, in location, layout and pattern as indicated on drawings. Joints not to exceed 5 mm.
- .2 Where required, cut unit pavers accurately without damaging edges.
- .3 Tamp down and level pavers with mechanical plate vibrator on minimum 19 mm thick plywood until pavers are true to grade and free of movement.
- 4 Fill spaces between pavers by sweeping in stonedust. Completely fill joints by watering down paving surface.
- .5 Surface of finished pavement: free from depressions exceeding 5 mm as measured with 3 m straight edge.
- .6 Sweep surface course clean.

END OF SECTION

PART 1- GENERAL**1.1 RELATED WORKS**

- .1 Cast-in-place Concrete Section 03 30 00
- .2 Granular Material Section 31 05 17

1.2 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM).
 - .1 ASTM D 698-91(1998), Test Method For Laboratory Compaction Characteristics of Soil Using Standard Effort 600kN-m/m³ ASTM
- .2 Canadian Standards Association (CSA International).
 - .1 CAN/CSA-A23.1/A23.2-94, Concrete Materials and

PART 2- PRODUCTS**2.1 MATERIAL**

- .1 Concrete mix and materials: to conform to section 03 30 00 – Cast-in-Place Concrete.
- .2 Granular foundation materials: to conform to section 31 05 17 – Granular Material

PART 3- EXECUTION**3.1 PREPARATION**

- .1 Complete preparation of work area conforming to section 31 23 10 – Excavating, Trenching and Backfilling.

3.2 GRANULAR FOUNDATION

- .1 Before applying granular foundation, have sub-grade approved by NCC Representative.
- .2 Apply granular foundation respecting indicated lines, widths and depths.
- .3 Compact granular foundation to at least 95% of maximum density, to ASTM D 698 standards.

3.3 CONCRETE

- .1 Before pouring concrete, have granular foundation approved by NCC Representative.
- .2 Concrete work to be completed in accordance with section 03 03 10 – Cast-in- Place Concrete.
- .3 Round edges in accordance with indications using an iron edge having a radius of 10 mm.

3.4 TOLERANCES

- .1 Finished concrete surface not to have irregularities exceeding 3 mm when checked with 3 m straight edge placed in any direction.

3.5 EXPANSION AND CONTROL JOINTS

- .1 Construct expansion and control joints to indications or following directives of NCC representative.
- .2 Once concrete is dry, cut control joints with saw as indicated on plans, at 2 m spacing.
- .3 Adjacent sidewalk, curb and gutter joints to coincide with those in adjacent pavement unless indicated or directed otherwise.

3.6 ISOLATION JOINTS

- .1 Provide isolation joints around manholes and catch basins, along curbs, gutters, buildings and other permanent structures.
- .2 Install joint filler in isolation joints in accordance with section 03 30 00 – Cast-in-Place Concrete.
- .3 Seal isolation joints with sealant approved by NCC Representative.

3.7 CONCRETE CURING

- .1 Ensure concrete curing by continually exposing finished surfaces to humid conditions, in accordance with requirements of CAN/CSA-A23.1 standards, for at least 1 day after concrete has been laid, or by sealing with a curing compound approved by NCC Representative.
- .2 If burlap is used to ensure curing of concrete in humid conditions, place two layers of pre-moistened burlap on concrete surface and keep wet during curing period.
- .3 Apply curing compound evenly to form a continuous film, in accordance with manufacturer's requirements.

3.8 BACKFILLING

- .1 Let concrete harden for a period of 7 days before backfilling.
- .2 Backfill with materials approved by NCC Representative to indicated grades, compaction and profiles following indicated contour and directives of NCC Representative.

END OF SECTION

LIMESTONE CURBS**PART 1 - GENERAL****1.1 WORK SPECIFIED ELSEWHERE**

- .1 Section 00 13 40 Shop Drawings, Product Data, Samples and Mock-Ups
- .2 Section 32 05 17 Granular material

1.2 QUALITY ASSURANCE

- .1 Contractor or limestone subcontractors to provide only skilled stone masons, supervised by foremen experienced in type of work specified.
- .2 Submit samples for approvals according to section 01 33 00 – Shop drawings, product data and samples.
- .3 Provide adequate, acceptable equipment and labour forces to carry out the work expeditiously.
- .4 Only limestone installations matching approved sample will be acceptable for the project.

1.3 DELIVERY AND STORAGE

- .1 Pack finished limestone carefully using all necessary precautions to prevent damage during loading, in transit and when in storage before installation.
- .2 Provide the necessary protection for limestone stored for prolonged periods to prevent staining or damage.

PART 2 - PRODUCTS**2.1 Materials**

- .1 Limestone:
 - .1 new limestone to ASTM C568, Category II medium density. St-Marc-des-Carrière quarry or approved equal.
 - .2 Color: grey / buff
 - .3 Medium honed finish.
- .2 Caulking: polyurethane, one-part moisture curing, CAN/CGSD-19.13-M87, Type II, Class 'A' (Tremco Vulkem 116), grey colour (submit samples). Colour to match stone. Primer: Tremco, Vulkem Primer No. 171
- .3 Granular material : 31 05 17

PART 3 - EXECUTION**3.1 GRANULAR BASE**

- .3 Place granular base material to lines, widths, and depths indicated or as directed.
- .4 Compact granular base to at least 100% maximum density in accordance with ASTM D698-07e1, Method C.

3.2 LAYOUT AND APPROVAL

- .1 Layout and have Engineer review alignment and profile of the curb/bands/coping/bullnoses well in advance of working to layout.
- .2 Erect string-lines for assistance in sighting and make minor adjustments if required.

3.3 CURB STONE

- .1 Set limestone curbs to the approved string-line using bricks or concrete blocks to adjust grade.
- .2 Supply brick spalls or other approved material for minor adjustments to line and grade. The use of timber wedges will not be permitted.
- .3 Trim curbs to lengths required for joints to be in specified locations, where required by drawings.
- .4 Clean all sawn faces of rust stains and iron particles.

LIMESTONE CURBS**3.6 JOINTS**

- .1 Limestone:
 - .1 Minimum width of joint between curb stones: 6 mm.
 - .2 Prepare the ends of limestone curb stones to be approximately square with the planes of the front face and top of the curb on tangents, and radially on curved alignments, so that when placed end to end with the specified 6-mm minimum spacing, no more than 10 mm shall show in the joint for the full width of the top surface and entire exposed front face.

3.7 CAULKING

- .1 Prime surfaces mix and apply caulking in accordance with Manufacturer's directions.
- .2 All joints between curbstones to be caulked flush with surface.
- .3 Clean up runs or spills to Engineer's approval.
- .4 Caulk around catchbasin frames as detailed.
- .5 Caulking must be applied to dry surfaces.

END OF SECTION

PART 1

GENERAL

1.1 RELATED WORK

- .1 Environmental Protection Section 01 35 43
- .2 Asphalt Surfaces Section 32 12 17

1.2

REFERENCES

- .1 CGSB 1-GP-5M-77, Thinner, Petroleum Spirits, Low Flash (R/84).
- .2 CGSB 1-GP-12c-68, Standard Paint Colors.
- .3 CGSB 1-GP-71-83, Method of Testing Paints and Pigments.
- .4 CGSB 1-GP-74M-79, Paint, Traffic, Alkyd.

PART 2

PRODUCTS

2.1 MATERIAL

- .1 Paint:
 - .1 To CGSB 1-GP-74M, alkyd traffic paint.
 - .2 Color: white
 - .3 Upon request, NCC Representative will supply a qualified product list of paints applicable to work. Qualified paints may be used but NCC Representative reserves right to perform further tests.
- .2 Thinner: to CGSB 1-GP-5M.

2.2

EQUIPMENT REQUIREMENT

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

PART 3

EXECUTION

3.1 CONDITIONS OF SURFACES

- .1 Pavement surface to be dry, free from ponded water, frost, ice, dust, oil, grease and other foreign materials.

3.2

APPLICATION

- .1 Lay out pavement markings and obtain approval by NCC Representative.
- .2 Unless otherwise approved by NCC Representative, apply paint only when air temperature is above 10°C, wind speed is less than 60 km/h and no rain is forecast within next 4 h.
- .3 Apply traffic paint evenly at rate of 3 m²/L.
- .4 Do not thin paint unless approved by NCC Representative.
- .5 Symbols and letters to conform to dimensions indicated.
- .6 Paint lines to be of uniform color and density with sharp edges.
- .7 Width of paint lines to be **65 mm**.
- .8 Thoroughly clean distributor tank before refilling with paint.

3.3

TOLERANCE

- .1 Paint markings to be within plus or minus 12 mm of dimensions indicated.
- .2 Remove incorrect markings as indicated by NCC Representative.

3.4

PROTECTION OF WORK

- .1 Protect pavement markings until dry.

END OF SECTION

PART 1- GENERAL**1.1 RELATED WORKS**

- .1 Submittal Procedures Section 01 33 00

1.2 SECTION INCLUDES

- .1 Materials and installation of standard manufactured catalogue items such as bike racks and signage.

1.3 SUBMITTALS

- .1 Submit product data in accordance with Section 01 33 00 – Submittal Procedures.
.2 Submit required shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
.3 Indicate dimensions, sizes, assembly, anchorage and installation details for each furnishing specified.
.4 Provide maintenance data for care and cleaning of site furnishings.

PART 2- PRODUCTS**2.1 BIKE RACK**

- .1 Acceptable Material: Steel bicycle rack parking system. Standard two bicycle capacity, **model MBR102, black colour, manufactured by Maglin Site Furniture inc.** or approved equivalent.
.2 Finish: Hot dipped galvanized and painted
.3 Attachment: Steel plate with anti-vandalism mechanical anchors.

2.2 SIGNAGE

- .1 References: National Capital Commission standard sign and sign support specifications 1500, 4100, A11 and A32
.2 Signage:
.1 "Universal Access Parking stall to the left" to be installed on road: **3120L-A34-S1.2** x 1
.2 "Universal Access Parking Stall" to be installed in front of UA stall: **3120-A23-S1.2** x 1

PART 3- EXECUTION**3.1 INSTALLATION**

- .1 Assemble furnishings in accordance with manufacturer's instructions.
.2 Install furnishing true, plumb, anchored and firmly supported, as indicated by the NCC Representative.
.3 Touch-up damaged finishes to approval of the NCC Representative.

END OF SECTION

PART 1 - GENERAL**1.1 RELATED WORK SPECIFIED ELSEWHERE**

- .1 Excavating & Backfilling Section 31 23 10
- .2 Sodding Section 32 92 23

1.2 TESTING

- .1 Obtain NCC Representative's initial approval of imported topsoil at source.
- .2 Test imported topsoil for NPK, Mg, soluble salt content, organic matter and pH value prior to delivery to site.
 - .1 Submit 0.5 kg sample of topsoil to testing laboratory and indicate intended use.
 - .2 Determine requirements for amendments to bring pH value of soil to 5.5 to 7.7 level.
 - .3 Submit two copies of soil analysis and recommendations for corrections to NCC Representative.
 - .4 Inspections and testing of topsoil will be carried out by testing laboratory designated by NCC Representative.
 - .5 National Capital Commission will pay cost of testing.

1.3 SCHEDULING OF WORK

- .1 Schedule placing of topsoil to permit immediate sodding operations.

1.4 DELIVERY AND STORAGE

- .1 Deliver and store fertilizer in waterproof bags, showing weight, analysis and name of manufacturer.

PART 2 - PRODUCTS**2.1 MATERIALS**

- .1 Imported topsoil: friable loam, neither heavy clay nor of very light sandy nature containing minimum of 10% organic matter for sandy loams to maximum of 25% by volume. Free from subsoil, roots, grass, weeds, toxic materials, stones, foreign objects and an acidity range (Ph) of 5.5 to 7.5. Topsoil containing crabgrass, couch grass or other noxious weeds, not acceptable.
- .2 Lime: Ground agricultural limestone containing minimum 85% of total carbonates, 90% passing 1.0 mm sieve, 50% passing 0.125 mm sieve by weight.
- .3 Sulphur: Horticultural Grade

PART 3 - EXECUTION**3.1 PREPARATION**

- .1 Grade subgrade, eliminating uneven areas and low spots, ensuring positive drainage. Remove stones larger than 50 mm diameter and other deleterious materials. Remove subsoil that has been contaminated with oil, gasoline or calcium chloride. Dispose of removed materials as directed by the NCC Representative.
- .2 Core aerate in those areas where equipment used for hauling and spreading has compacted the select cover material layer.

3.2 REUSE OF EXISTING TOPSOIL

- .1 Unless otherwise indicated existing topsoil may be reused on site. Any excavated topsoil is to be handled as per Section 31 23 10 - Excavating and Backfilling and Section 01 61 10 - Management and Disposal of Excess Material.

3.3 SPREADING OF TOPSOIL

TOPSOIL AND FINISH GRADING

- .1 Do not spread topsoil until NCC Representative has inspected and approved subgrade.
- .2 Spread topsoil with adequate moisture in uniform layers during dry weather over approved, dry, unfrozen subgrade, where planting, sodding or seeding are indicated.
- .3 Bring topsoil up to finished grade.
- .4 Apply topsoil to the following minimum depths:
 - .1 150 mm for sodding
 - .2 See detail for shrubs and trees saucer
- .5 Remove stones, roots, grass, weeds, construction materials, debris and foreign non-organic objects from topsoil.
- .6 Manually spread topsoil around trees, plants, surface utilities and other obstacles.

3.4 SOIL AMENDMENTS

- .1 If required, apply lime, sulphur or other soil amendment at rate determined from soil sample test.
- .2 Mix soil amendment well into full depths of topsoil by cultivating prior to application of fertilizer.

3.5 FINISH GRADING

- .1 Fine grade entire topsoiled area to contours and elevations as indicated or as directed. Eliminate rough spots and low areas to ensure positive drainage.
- .2 Roll topsoil with 50 kg roller, minimum 900 mm wide, to compact and retain surface.
- .3 Leave surface smooth, uniform, firm against deep foot printing, with fine loose texture.

3.6 SURPLUS MATERIAL

- .1 Dispose of surplus imported topsoil not required for fine grading/landscaping off site.

END OF SECTION

PART 1- GENERAL**1.1 RELATED WORK**

- .1 Topsoil and Finish Grading Section 02911

1.2 SCHEDULING

- .1 Schedule sod laying to coincide with preparation of soil surface.
 .2 Schedule sod installation when frost is not present in ground.

PART 2- PRODUCTS**2.1 MATERIALS**

- .1 Turfgrass Nursery Sod types:
 .1 Number One Kentucky Bluegrass Sod: Nursery Sod grown solely from seed of cultivars of Kentucky Bluegrass, containing not less than 50% Kentucky Bluegrass cultivars.
 .2 Water:
 .1 Potable.
 .3 Fertilizer:
 .1 To Canada "Fertilizers Act" and "Fertilizers Regulations".
 .2 Complete, synthetic, slow release with 65% of nitrogen content in water-insoluble form.
 .4 Pegs: 19 x 19 x 200 mm wooden pegs.

PART 3- EXECUTION**3.1 PREPARATION**

- .1 Verify that grades are correct and prepared in accordance with Section 32 12 17 - Topsoil and Finish Grading. If discrepancies occur, notify NCC Representative and do not commence work until instructed by NCC Representative.
 .2 Do not perform work under adverse field conditions such as frozen soil, excessively wet or dry soil or soil covered with snow, ice, or standing water.
 .3 Fine grade surfaces free of humps and hollows to smooth, even grade, elevations indicated, surface to drain naturally.
 .4 Remove and dispose of weeds; debris; stones 50 mm in diameter and larger; soil contaminated by oil, gasoline and other deleterious materials; off site.
 .5 Cultivate fine grade approved by Contract Administrator to 25 mm depth immediately prior to sodding.

3.2 SOD PLACEMENT

- .1 Lay sod within 24 h of being lifted.
 .2 Lay sod sections in rows, longitudinally, along contours of slopes, joints staggered. Butt sections closely without overlapping or leaving gaps between sections. Cut out irregular or thin sections with sharp implements.
 .3 Roll sod as directed by Contract Administrator. Provide close contact between sod and soil by light rolling. Use of heavy roller to correct irregularities in grade is not permitted.

3.3 FERTILIZING PROGRAM

- .1 Fertilize during establishment and warranty periods to following program:
 One (1) month after sodding apply 2: 1: 1 at a rate of 0.5kg/100m².

3.5 MAINTENANCE DURING ESTABLISHMENT PERIOD

SODDING

- .2 Water sodded areas in sufficient quantities and at frequency required to maintain optimum soil moisture condition to depth of 75 to 100 mm.
- .3 Cut grass to 50 mm when it reaches height of 75 mm. Remove clippings which will smother grassed areas as directed by Contract Administrator.
- .4 Maintain sodded areas weed free 95%.
- .5 Fertilize areas in accordance with fertilizing program. Spread half of required amount of fertilizer in one direction and remainder at right angles.

3.6 ACCEPTANCE

- .1 Turfgrass Nursery Sod areas will be accepted by NCC Representative provided that:
 - .1 Sodded areas are properly established.
 - .2 Sod is free of bare and dead spots and without weeds.
 - .3 No surface soil is visible from height of 1200 mm when grass has been cut to height of 50 mm.
 - .4 Sodded areas have been cut minimum 2 times, and within 24 h prior to acceptance.
- .2 Areas sodded in fall will be accepted in following spring one month after start of growing season provided acceptance conditions are fulfilled.

END OF SECTION

PART 1 GENERAL**1.1 RELATED SECTIONS**

- | | | |
|----|----------------------------|------------------|
| .1 | Topsoil and Finish Grading | Section 31 91 21 |
| .2 | Plant Material Maintenance | Section 32 92 12 |

1.2 SOURCE QUALITY CONTROL

- .1 The Contractor shall commence sourcing the specified material immediately upon award of the Contract.
- .2 No substitutions will be considered unless the Contractor can demonstrate to the NCC Representative's satisfaction that a prolonged and widespread search for the specified cultivars has been undertaken.
- .3 Obtain approval of source of plant material. Acceptance of plant at its source does not prevent rejection on site prior to or after planting operations.

1.3 SHIPMENT AND PRE-PLANTING CARE

- .1 Protect plant materials against abrasion, exposure and extreme temperature change during transit.
- .2 Keep roots moist and protected from sun and wind

1.4 STORAGE AND PROTECTION

- .1 Protect plant materials from frost, excessive heat, wind and sun during delivery.
- .2 Immediately store and protect plant material which will not be installed within 1 hour after their arrival on site, in storage locations approved by NCC Representative.
- .3 Protect plant material from damage during transportation
 - .1 When delivery distance is less than 30 km, and vehicle travels at speeds under 80 km/h, tie tarpaulins around plants or over vehicle box.
 - .2 When delivery distance exceeds 30 km or vehicle travels at speeds over 80 km/h, use enclosed vehicle where practical.
 - .3 Protect foliage and root balls using anti-desiccants and tarpaulins, where use of enclosed vehicle is impractical due to size and weight of plant material.
- .4 Protect stored plant material from frost, wind and sun and as follows:
 - .1 For bare root plant material, preserve moisture around roots by heeling-in or burying roots in topsoil, and watering to full depth of root zone.
 - .2 For pots and containers, maintain moisture level in containers.
 - .3 For balled and burlapped, and wire basket root balls, place to protect branches from damage. Maintain moisture level in root zones.

PART 2 PRODUCTS**2.1 PLANT MATERIALS**

- .1 Comply with Guide Specification for Nursery Stock, latest edition, of Canadian Nursery Trades Association referring to size and development of plant material and root ball.
- .2 Use plants with strong fibrous root systems free of disease, insects, defects or injuries and structurally sound. Plants must have been root pruned regularly, but not later than one growing season prior to arrival on site.
- .3 Substitution to plant material as indicated on planting plan are not permitted unless written approval has been obtained as to type, variety and size.
- .4 Size indicated are the minimum allowable after pruning.

2.2 BONEMEAL

- .1 Raw bonemeal finely ground with a minimum analysis of 4% nitrogen and 20% phosphoric acid.

2.3 WATER

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

2.4 STAKES

- .1 Steel T-Bars, 40 x 40 x 5 x 2440 mm.

2.5 GUYING COLLAR

- .1 Galvanized 3 mm wire encased in 2 ply rubber hose.

2.7 TRUNK PROTECTION

- .1 Plastic; perforated spiraled strip.
- .2 Burlap: clean, minimum 2.5 kg/m² mass and 150mm wide, and twice fastener.

2.8 MULCH

- .1 Mulch will be composed of fragments of Cedars type 'Shredded Cedar mulch' as manufactured by 'Lanark Cedar' or equivalent approved by the NCC. It will be free from seeds, gravel, rod or other foreign matter. A sample must be supplied to the engineer for approval prior to the commencement of the planting.

2.9 TOPSOIL

Topsoil according to section 32 91 21

2.10 ANTI-DESICCANT

- .1 Wax-like emulsion to provide film over plant surfaces reducing evaporation but permeable enough to permit transpiration

PART 3 EXECUTION**3.1 PRE-PLANTING PREPARATION**

- .1 Ensure plant material is found acceptable by the NCC Representative.
- .2 Remove damaged roots and branches from plant material.
- .3 Apply anti-desiccant to deciduous trees leaves, in accordance with manufacturer's instructions.

3.2 PLANTING TIME

- .1 Plant material shall be planted from May 15 to June 15 or from August 15 to October 1, unless otherwise approved by the NCC Representative
- .2 The contractor shall arrange for all plant species recommended for spring only digging, to be dug and containerized in the spring, immediately upon award of the Contract. Affected genus species include, but are not limited to : *Quercus* and *Salix*
- .3 The foliage of deciduous trees which have broken buds shall be sprayed with anti-desiccant to slow down transpiration prior to transplanting.

3.3 EXCAVATION

- .1 Excavate planting holes to width and depth as indicated on drawings.
- .2 The sides of the planting hole shall be scarified so that water and roots can readily penetrate.
- .3 Place one generous handful of bonemeal in the bottom of each shrub planting hole and two generous handfuls in the bottom of each tree hole. Mix bonemeal thoroughly with soil.

3.4 PLANTING

- .1 Planting trees and shrubs vertically at the places indicated, with the way they produce the best possible effect with the surrounding structures such as buildings, roads and sidewalks.
- .2 For burlapped root balls, cut away top one third of wrapping and wire basket without damaging root ball. Do not pull burlap or rope from under root ball.
- .3 For container stocks or root balls in non-degradable wrapping, remove entire container or wrapping without damaging root ball.
- .4 Plant materials vertically in locations as indicated. Position and dispose plant material to give best appearance in relation to structures, roads and sidewalks.
- .5 For trees and shrubs:

TREE & SHRUB PLANTING

- .1 Backfill soil in 150 mm layers. Tamp each layer to eliminate air pockets. When two thirds of depth of planting pit has been backfilled, fill remaining space with water. After water has penetrated into soil, backfill to finish grade.
- .2 Form watering recipient (saucer) as indicated.
- .6 Spread 75mm of mulch over all areas of bare soil. Mulch heavily contaminated with soil is not acceptable.
- .7 Water plant material thoroughly.
- .8 After soil settlement has occurred, fill with soil to finish grade.
- .9 Remove dead and injured branches and branches that rub causing damage to bark.
- .10 Dispose of burlap, wire and container material off site.

3.4 TRUNK PROTECTION

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

3.5 TREE SUPPORTS

- .1 Install tree supports as indicated.
- .2 Use single stake tree support for deciduous trees less than 3 m,
 - .1 Place stake on prevailing wind side, at a 150 mm distance from trunk.
 - .2 Drive stake minimum 300 mm into undisturbed soil beneath roots. Ensure stake is secure, vertical and not split.
 - .3 Install 150 mm long guying collar 1500 mm above grade.
 - .4 Thread Type 1 guying wire through guying collar tube. Twist wire to form collar and secure firmly to stake. Cut off excess wire.
- .3 After tree supports have been installed, remove broken branches with clean, sharp tools.

3.6 MAINTENANCE DURING ESTABLISHMENT PERIOD

- .1 Perform following maintenance operations from time of planting until the project has been approved by the NCC Representative per section 32 92 12
 - .1 Water to maintain soil moisture conditions, for optimum establishment, growth and health of plant material without causing erosion.
 - .2 Remove weeds.
 - .3 Replace or re-spread damaged, missing or disturbed mulch.
 - .4 For non-mulched areas, cultivate as required to keep top layer of soil friable.
 - .5 Remove dead or broken branches from plant material.
 - .6 Keep trunk protection and guy wires in proper repair and adjustment.
 - 7 Remove and replace dead and unhealthy plants. Make replacements in same manner, as specified for original planting.

3.5 FINAL INSPECTION

- .1 At final inspection, plant material shall be acceptable when it is properly installed, unbroken, shows adequate formation of buds and is free from blight of any description. All planting areas shall be free of weeds, litter and in good order.

END OF SECTION

**PLANT MAINTENANCE AND
WARRANTY****PART 1 - GENERAL****1.1 RELATED WORKS**

- .1 Trees, shrub and ground cover planting Section 32 93 10

1.2.1 WARRANTY

- .1 All plant material shall be warranted for a period of two years from the date of substantial performance.
- .2 The warranty shall cover any defects in materials and workmanship.
- .3 A warranty inspection will be carried out at the end of the warranty period.
- .4 Extend warranty on replacement plant material.

1.3 DURATION

- .1 Plant material maintenance shall begin immediately after each portion of planting has been completed and shall continue throughout the maintenance and warranty period to the satisfaction of the NCC Representative.

PART 2 - PRODUCTS**2.1 MATERIALS**

- .1 Water: shall be free from any contaminants which could adversely affect plant growth.
- .2 Pruning Tools: shall be designed specifically for horticultural purposes and shall be clean, sharp and in proper, safe, working order. Pruning equipment shall be capable of producing clean, flush cuts without tearing or fraying the bark.

PART 3 - EXECUTION**3.1 OPERATIONAL CONSTRAINTS**

- .1 Do each maintenance operation continuously and complete within a reasonable time period.
- .2 No maintenance equipment, materials or other miscellaneous items may be stored on site.
- .3 All debris, waste and other extraneous material resulting from the maintenance operation shall be removed from the site daily upon completion of maintenance.
- .4 The Contractor shall be fully acquainted with all relevant Provincial and Municipal By-laws and Regulatory Codes relating to the work of this contract, and will be required to comply with such by-laws and codes without extra compensation.
- .5 Notify the NCC Representative immediately of damage incurred by pest, disease, mechanical or vandalism.

3.2 INTERIM REPLACEMENT OF PLANT MATERIAL

- .1 Throughout the maintenance and warranty period, units of plant material that are found to be unacceptable will be replaced by the Contractor.
- .2 At the discretion of the NCC Representative, plant material that is identified as dead or in a poor or diseased condition shall be immediately removed from the site.

3.3 WATERING

- .1 Water all plant material immediately after installation and on a weekly basis for the next 4 weeks. Ensure the root zone is thoroughly saturated. Repair any damage caused by watering operations.
- .2 During the warranty period, thoroughly water plant material whenever natural precipitation falls below 20 mm per week (Sunday to Saturday) for 2 consecutive weeks. Precipitation data shall be as per Environment Canada from the Macdonald-Cartier Airport weather station.

**PLANT MAINTENANCE AND
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3.4 WEEDING

- .1 All weeds, dead plants, leaves, branches, paper and other refuse within planting beds shall be removed by hand and disposed of off the Contract site.
- .2 At a minimum, weeding shall occur:
 - .1 Twice from June 1 to August 15;
 - .2 A final weeding shall be completed immediately prior to the final warranty inspection
- .3 The application of herbicides or mechanical weed removers is prohibited.

3.5 PRUNING

- .1 Prune off dead and injured branches in accordance with accepted arboricultural practices.

3.6 PEST MANAGEMENT

- 1 Monitor plant materials throughout the warranty period for any sign of disease or insect problems. Practice IPM.
- .2 The use of pesticides shall not be permitted.

3.7 WINTER PREPARATION

- .1 In the fall, the Contractor is responsible for completion of the following:
 - .1 Ensure all plant material is watered before freeze-up.

3.8 INCIDENTAL MAINTENANCE

- .1 The Contractor shall, in general, be responsible for any incidental maintenance to ensure healthy plant growth and a satisfactory appearance of plant material.

3.9 REINSTATEMENT

- .1 Any damage to vegetation, hard surfaces, structures or services caused as a result of the Contractor's work methods and practices for plant material maintenance shall be reinstated or repaired to the satisfaction of the NCC Representative. The cost of such reinstatement or repair shall be solely at the Contractor's expense.

3.10 FINAL WARRANTY INSPECTION

- .1 A one-time inspection of all plant material shall be carried out by the NCC Representative upon completion of the maintenance and warranty period.
- .2 Plant material shall be **acceptable** when it is undamaged, shows adequate growth and formation of buds, and is free from blight of any description. All planting beds and tree pits shall be free of weeds, litter and in good order, including the removal of all tree supports.
- .3 Plant material shall be **unacceptable** when it does not meet this quality standard.
- .4 Units of plant material that are found to be unacceptable will be replaced by the Contractor at the earliest opportunity. The NCC Representative reserves the right to extend the Contractor's maintenance and warranty responsibilities for an additional one-year for replacement plant material.
- .5 In the event that this inspection is satisfactory to the NCC Representative, and that there are no outstanding commitments to the contracted works, the Contractor will be given final approval of the maintenance and warranty requirements.
- .6 Where, in the opinion of the NCC Representative, the Contractor has failed to complete obligations as detailed in this Specification; and further, fails to rectify said deficiency within two days of written notification from the NCC Representative, the Contract Administrator reserves the right to retain others to complete the work and deduct incurred expenses from monies owing to the Contractor.

END OF SECTION

PART 1 - GENERAL**1.1 Related Work**

- .1 Section 31 23 10 – Excavation, Trenching and Backfilling
- .2 Section 31 05 17 – Granular Materials

1.2 References

- .1 ASTM C139-05, Specification for Concrete Masonry Units for Construction of Catch Basins and Manholes.
- .2 ASTM C478M-06, Specification for Precast Reinforced Concrete Manhole Sections.
- .3 CAN/CSA-A23.1-04/A23.2-04, Concrete Materials and Methods for Concrete Construction.
- .4 OPSS 407-[November 2004], Construction Specification For Maintenance Hole, Catch Basin, Ditch Inlet And Valve Chamber Installation.
- .5 OPSD 400.020 Cast Iron, Square Frame with Square Flat Grate, OPSD 401.010 Cast Iron, Square Frame with Circular Closed Cover (Type A), OPSD 600.110 Concrete Barrier Curb and OPSD 705.010 Precast Concrete Catch Basin.

1.3 Scheduling of Work

- .1 Schedule work to minimize interruptions to existing services and to maintain existing flow during construction.

1.4 Submittals

- .1 Provide submittals in accordance with Section 01 33 00 – Submittal Procedures
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Quality assurance submittals:
 - .1 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

PART 2 - PRODUCTS**2.1 Materials**

- .1 Precast Catch Basin sections: To ASTM C 139 ASTM C 478M:
 - .1 600mm x 600mm Precast Catchbasin
- .2 Mortar:
 - .1 Masonry Cement: to CAN/CSA-A3002.
- .3 Adjusting rings: to ASTM C 478M.
- .4 Concrete Brick: to CAN3-A165 Series.
- .5 Frames, gratings, covers to dimensions as indicated and following requirements:
 - .1 Metal gratings and covers to bear evenly on frames.
 - .1 Frame with grating or cover to constitute one unit.
 - .2 Assemble and mark unit components before shipment.
 - .2 Manhole frames and covers: cover cast without perforations and complete with two 25 mm square lifting holes to OPSS 407.
 - .3 Catch basin frames and covers: to OPSS 407.
- .6 Granular bedding and backfill: in accordance with Section 31 05 17 – Granular Materials and following requirements:

PART 3 - EXECUTION**3.1 MANUFACTURER'S INSTRUCTION**

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 Excavating and Backfilling

- .1 Excavate and backfill in accordance with Section 31 23 10 – Excavating Trenching and Backfilling and as indicated.
- .2 Confirm height of outlet hole on site
- .3 Obtain approval of Engineer before installing catch basins and pipe.

3.3 Installation

- .1 Construct units in accordance with details indicated, plumb and true to alignment and grade.
- .2 Complete units as pipe laying progresses.
- .3 Dewater excavation to approval of Engineer and remove soft and foreign material before placing concrete base.
- .4 Set precast concrete base on 150 mm minimum of granular bedding compacted to 95% PMP.
- .5 Catchbasin: set catchbasin to line and grade shown on drawings.
- .6 Installing units in existing systems:
 - .1 Where new unit is installed in existing run of pipe, ensure full support of existing pipe during installation, and install new unit as specified.
 - .2 Make joints watertight between new pipe unit and existing unit.
- .7 Set frame and cover to required elevation on no more than four courses of brick.
 - .1 Make brick joints and join brick to frame with cement mortar.
 - .2 Parge and make smooth and watertight.
- .8 Place frame and cover on top section to elevation as indicated.
 - .1 If adjustment required use concrete ring.
- .9 Clean units of debris and foreign materials.
 - .1 Remove fins and sharp projections.
 - .2 Prevent debris from entering system.

END OF SECTION