

PART E
SPECIFICATIONS

PART E - SPECIFICATIONS

GENERAL

E1. SPECIFICATIONS, STANDARD DETAILS AND DRAWINGS

- E1.1 The City of Winnipeg Works and Operations Division Standard Construction Specifications in its entirety, whether or not specifically listed on Form B: Prices, shall apply to the Work.
- E1.1.1 *The City of Winnipeg Standard Construction Specifications* is available in Adobe Acrobat (.pdf) format on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division internet site at <http://www.winnipeg.ca/matmgt>.
- E1.1.2 The version in effect three (3) Business Days before the Submission Deadline shall apply.
- E1.1.3 Further to GC:2.4 (d), Specifications included in the Bid Opportunity shall govern over *The City of Winnipeg Works and Operations Division Standard Construction Specifications*.
- E1.2 The following Drawings are applicable to the Work:
- E1.2.1 Drawings
- (a) L-1 Site Plan
 - (b) L-2 Grading/Drainage Layout
 - (c) L-3 Layout and Planting Plan
 - (d) L-4 Plan Details

E2. TRUCK WEIGHT LIMITS

- E2.1 The City shall not pay for any portion of Material which results in the vehicle exceeding the maximum gross vehicle weight allowed under The City of Winnipeg Traffic By-Law, unless such vehicle is operating under special permit.

E3. PROTECTION OF THE SURVEY INFRASTRUCTURE

- E3.1 Notwithstanding Clause 4 "Protection of Survey bars" of the Standard Provisions: Current legislation, The Surveys Act, places the onus on those undertaking construction to protect the Survey Infrastructure from damage as a result of their activity.
- E3.2 Further to GC:6.28(g), at least 72 hours prior to the commencement of the On-Site work the Contractor shall contact the City of Winnipeg, Geomatics Services Branch at 986-4826 (8:00 a.m. to 4:00 p.m., Monday to Friday, excluding holidays) to obtain underground clearance. Geomatics Services will locate and mark all known outline survey monuments and geodetic control monuments and confirm the physical condition of those monuments upon completion of construction, at no cost to the Contractor.
- E3.3 Where a survey post, bar or control monument lies in the line of the proposed Work and must be disturbed, the Contractor shall provide the Contract Administrator with 48 hours notice to permit referencing for future replacement, at no cost to the Contractor. Failure to provide the specified notice shall result in the Contractor paying for all costs associated with replacing or relocating the disturbed outline survey monuments and geodetic control monuments.

- E3.4 Outline survey monuments and geodetic control monuments at or adjacent to the Site not in the line of the proposed construction that are damaged or disturbed by the Contractor shall be replaced or relocated by the City or its agent and all associated costs shall be paid for by the Contractor. An approximate estimate of the costs involved to restore a legal survey monument is \$1,000 per bar and \$3,000 per control monument. Contractors must ensure their landscaping and other subcontractors are aware of this clearance procedure and the potential restoration costs.
- E3.5 Where possible, amounts owed to the City in accordance with the above will be deducted from any payments to be made by the City to the Contractor.

E4. LAYOUT OF WORK

- E4.1 The Contractor shall set control lines and bench marks by means of stakes, buoys or marks and the Contractor shall make the completed works conform to the lines and marks thus indicated. The Contractor shall furnish all other lines and levels required. The Contractor shall be responsible for the careful preservation of all stakes and marks. Care must be taken that the Contract Administrator be notified immediately of the disturbance of any such stakes or marks; the cost of correcting any errors arising out of neglect of the Contractor or his agent or his employees, to so notify the Contract Administrator shall be borne entirely by the Contractor, as well as the cost of replacing any disturbed stakes or marks.
- E4.2 All layout Work shall be inspected and approved by the Contract Administrator prior to construction.
- E4.3 Before commencing Work the Contractor shall satisfy himself as to the meaning and correctness of all stakes and marks and no claims shall be entertained by the City of Winnipeg on account of any alleged inaccuracies. If any error is suspected in the plans, specifications or the directions of the Contract Administrator, Work shall be discontinued until the errors are rectified, but no claims shall be made on account of any delay occasioned thereby.
- E4.4 All proposed tree planting locations shall be staked with minimum 610 mm height vertical markers, and be approved by the Contract Administrator prior to excavating the tree pit.
- E4.5 The Contractor shall locate and protect all underground utilities prior to commencing construction.
- E4.6 Temporary Fence
- (a) The east property line is to be identified by the installation of 2 meter long t-rail stakes driven firmly into the ground at 6 meter intervals. Install before sodding.

E5. EXISTING SURVEY INFORMATION

- E5.1 The Site plan is based on drawing data supplied by the City of Winnipeg and additional field data added to the drawings by Cynthia Cohlmeier Landscape Architect.

E6. SITE ACCESS

- E6.1 Access to the Work areas shall be off the end of Robson Street. The Contractor may access the Site from other locations, only if authorized by the Contract Administrator.

E7. SITEWORK DEMOLITION AND REMOVALS

E7.1 Description

- E7.1.1 This Specification shall cover the requirements for demolition, salvage, removal and disposal wholly or in part of various items designated to be removed or partially removed and for backfilling resulting trenches, holes and pits.
- E7.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies and all things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified.

E7.2 Equipment

- E7.2.1 All equipment shall be of a type approved by the Contract Administrator and shall be kept in good working order.
- E7.2.2 The size, weight, and destructive capabilities of the equipment shall be matched to the type of removal to be done.

E7.3 Construction Methods

- E7.3.1 Scope of Work
- (a) The Work under this Specification shall include the following and as shown on the Drawing or otherwise directed by the Contract Administrator:
 - (i) Removal and salvage of the existing chain link fencing as indicated on Drawing L-2;
 - (ii) Removal and disposal off site of existing asphalt tennis court as indicated on Drawing L-2;
 - (iii) Removal and disposal off site of existing basketball and tennis equipment, playground slide and foundations, timber playground edging and exposed metal in Monkey Trails as indicated on Drawing L-4 and L-1.
 - (iv) Removal of existing safety bollards as indicated on Drawing L-1.
- E7.3.2 Fees and Permits
- (a) The Contractor shall obtain and pay for all licenses and permits necessary for the demolition work.
 - (b) The Contractor shall comply with all Municipal, Provincial, and Federal Government regulations relating to the demolition of structures.
- E7.3.3 Explosives
- (a) The use of explosives is prohibited.
- E7.3.4 Safety Precautions
- (a) The Contractor shall provide flagmen, guards, barricades, railings, and whenever necessary, warning signs and lights at the excavation holes, plywood access ramps and/or other construction necessary to secure the safety of workers, the public, and personnel alike and shall comply with all Provincial Statutes applicable to the work of this nature. The Contractor shall provide all other protective measures as may be required by any law in force in Manitoba.

- E7.3.5 Protection of Existing Structures
- (a) Protect existing items designated to remain and materials designated for salvage. In event of damage to such items, immediately replace or make repairs to approval of the Owner and at no cost to the Owner.
- E7.3.6 Preparation of Site
- (a) Inspect site and verify with Contract Administrator items designated for removal, disposal, salvage and items to remain.
 - (b) Locate and protect utility lines. Preserve in operating condition active utilities traversing site.
 - (c) Notify utility companies before starting demolition. Utilities to provide clearance before any excavation is done.
 - (d) Notify Geomatics Service Branch at 986-4826 to obtain clearance and mark survey infrastructure before any excavation.
- E7.3.7 Disposal of Materials
- (a) The Contractor shall promptly and legally dispose of materials not designated for salvage or re-use in Work, off-site.
 - (b) The Contractor shall take all necessary precautions to ensure that demolished materials do not enter the surrounding residential complex during demolition and removal operations.
 - (c) Clean disposal areas to approval of Contract Administrator.
- E7.3.8 Backfill
- (a) Backfill in areas as indicated in accordance with Excavation and Backfill - CW 2030R6.
- E7.3.9 Restoration
- (a) Restore areas and existing works outside areas of demolition to match condition of adjacent undisturbed areas.
- E7.3.10 Site Cleanup
- (a) Upon completion of Work, remove debris, trim surfaces and leave work site clean.

E7.4 Method of Measurement

- E7.4.1 Demolition and Removal
- (a) The removal and disposal of existing asphalt, chain link fencing, fibreglass slide, playground edging, basketball equipment, and exposed metal will be paid for on a Lump Sum Basis, as accepted by the Contract Administrator. No measurement will be made for this work.

E7.5 Basis of Payment

- E7.5.1 E8.5.1 Demolition and Removal
- (a) Removal and disposal of the existing asphalt, chain link fencing, fibreglass slide, playground edging, basketball equipment and exposed metal will be paid for at the Contract Lump Sum Price for "Playground Demolition and Removal" which price shall be payment in full for performing all operations herein described and all other items incidental to the work included in this Specification.

E8. SITE GRADING

E8.1 Description

- E8.1.1 This Specification shall cover the excavation and installation of fill for areas as indicated on the Grading/Drainage Layout, L-2 accordance with CW 3170-R3, Earthwork and Grading.
- E8.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all other things necessary for and incidental to the satisfactory performance and completion of all Work as specified herein and in accordance with CW 3170-R3.

E8.2 Materials

- E8.2.1 All materials shall conform to CW-3170-R3.

E8.3 Equipment

- E8.3.1 All equipment to conform to CW 3170-R3.

E8.4 Construction Method

- E8.4.1 Rough grade to patterns and elevations as indicated on the Drawings allowing for installation of materials specified and in accordance with CW-3170-R3 Earthwork and Grading.

E8.5 Method of Measurement

- E8.5.1 Site grading will be measured on a Surface Area Basis. The area to be paid for shall be the total number of square metres graded in accordance with this Specification and accepted by Contract Administrator, as calculated by measurements made by the Contract Administrator.

E8.6 Basis for Payment

- E8.6.1 Site grading will be paid for at the Contract Unit Price per square metre for "Site Grading", and measured as specified herein which price shall be payment in full for supplying all materials and performing all operations herein describe and all of the items incidental to the Work included in this Specification.

E9. CONCRETE HEADER AND BASES

E9.1 General Description

- E9.1.1 This Specification shall cover the supply of material and construction of:
- (a) Portland cement concrete header.
 - (b) Portland cement concrete bases.
- E9.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all other things necessary for and incidental to the satisfactory performance and completion of all Work as specified herein and in accordance with CW 3110-R5 and CW 2160-R4.

E9.2 Materials

- E9.2.1 The Contractor shall be responsible for the supply, safe storage and handling of all materials, testing and approvals in accordance with CW 3325-R2, Sections 5 and 7.

E9.3 Equipment

E9.3.1 All equipment used by Contractor to be in accordance with CW 3325-R2, Section 9.

E9.4 Construction Method

E9.4.1 Construct Portland cement concrete works as shown on the Drawings and as directed by the Contract Administrator. Construct to the requirements of CW 3325-R2.

E9.4.2 Contractor shall notify the City Project Contact at least 48 hours prior to the installation of concrete, so that footings may be inspected in advance of concrete being poured.

E9.4.3 Playstructure posts shall have a minimum of 12" diameter concrete footing and shall be centred in concrete footing to provide a minimum 50 mm (2 inch) band of concrete on all sides.

E9.5 Method of Measurement

E9.5.1 Portland Cement Concrete Headers

- (a) Construction of Portland cement concrete headers shall be measured on a Lineal Length Basis. The length to be paid for shall be the total number of lineal metres constructed in accordance with this Specification and accepted by the Contract Administrator, as calculated from measurements made by the Contract Administrator.

E9.5.2 Portland Cement Concrete Bases

- (a) There shall be no separate measurement for work associated with the construction of Portland cement concrete bases. This work shall be incidental to the supply and installation of site furnishings (:12) play structures (:13), these bases are supporting. No separate measurement or payment will be made.

E9.6 Basis of Payment

E9.6.1 Portland Cement Concrete Headers

- (a) Construction of Portland cement concrete headers will be paid for at the Contract Unit Price per lineal metre for "Cast-in-Place Concrete Playground Header", measured as specified herein, which price shall be payment in full for supplying all materials and for performing all operations herein described and all other items incidental to the Work included in this Specification.

E9.6.2 Portland Cement Concrete Bases

- (a) Construction of Portland cement concrete bases is incidental to the supply and installation of site furnishings, and play structures which price shall be included in the price for supply and installation of site furnishings and play structures. No separate payment for construction of bases shall be made.

E10. CRUSHED LIMESTONE PATH

E10.1 General Description

E10.1.1 This Specification shall cover the construction of crushed limestone paths.

E10.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all other things necessary for and incidental to the satisfactory performance and completion of all Work as specified herein and in accordance with CW 3110-R5.

E10.2 Materials

E10.2.1 Excavation, sub-grade preparation and granular base materials shall conform to CW 3110-R5. Limestone dust topping shall conform to the requirements of the following gradation:

(a)	Sieve Number	Percent Passing
(i)	9.5 mm	100
(ii)	4.75 mm	50 - 100
(iii)	1.18 mm	20 - 55
(iv)	0.30 mm	10 - 30
(v)	0.075 mm	0 - 12

E10.3 Construction Method

E10.3.1 Construct path at location and to details as shown on the Drawings and as directed by the Contract Administrator. Construction to the requirements of CW 3110-R5.

E10.4 Method of Measurement

E10.4.1 Crushed limestone path will be measured on a Surface Area Basis. The surface area to be paid for shall be the number of square metres constructed in accordance with this Specification and accepted by the Contract Administrator, as computed by measurements made by the Contract Administrator.

E10.4.2 Price for crushed limestone surfacing shall include all clearing, excavation, compaction, base construction and topping required for this item of work.

E10.5 Basis of Payment

E10.5.1 The supply and installation of "Crushed Limestone Path" will be paid for at the Contract Unit Price per square metre measured as specified herein, which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification.

E11. TORPEDO SAND SAFETY BASE

E11.1 General Description

E11.1.1 This Specification shall cover supply and installation of Torpedo Sand Safety Base in two (2) designated areas as shown on the Drawings: to top up existing sand in the existing play area, and to fill area where new equipment will be installed.

E11.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all other things necessary for and incidental to the satisfactory performance and completion of all Work as specified herein.

E11.1.3 All materials supplied under this Specification shall be of a type approved by the Contract Administrator and shall be subject to inspection and testing by the Contract Administrator.

E11.2 Materials

E11.2.1 Materials

(a) Torpedo Sand – hard, well-washed and free of impurities, chemical or organic matter.

(i) Sieve Analysis:

<u>Sieve Size</u>	<u>Cumulative % Passing</u>
4 mm	98
8 mm	73
16 mm	4
30 mm	1
50 mm	0-1

E11.3 Equipment

E11.3.1 All equipment shall be of a type approved by the Contract Administrator and shall be kept in good working order.

E11.4 Construction Method for The New Play Area

E11.4.1 The installation of Torpedo Sand shall be done immediately after the play structures have been installed. Installation shall be done by equipment sized to suit the work being done and the Torpedo Sand shall be spread by hand in the immediate vicinity of the play structures so as not to damage the same. The play structures shall be swept clean as

E11.4.2 Clear subgrade of all debris and compact subgrade.

E11.4.3 Obtain approval of compacted subgrade prior to Torpedo Sand installation.

E11.4.4 Coordinate Torpedo Sand installation with play equipment installation.

E11.4.5 Spread Torpedo Sand to minimum thickness indicated. Rake smooth for an even surface.

E11.5 Construction Method for Existing Play Area

E11.5.1 Install torpedo sand as noted on Drawing L-4, Detail 2.

E11.6 Method of Measurement

E11.6.1 The supply and installation of Torpedo Sand Safety Base shall be measured on a Volume Basis. The area to be paid for shall be the total number of cubic metres installed in accordance with this Specification and accepted by the Contract Administrator, as calculated from measurements made by the Contract Administrator.

E11.7 Basis of Payment

E11.7.1 The supply and installation of Torpedo Sand Safety Base shall be paid for at the Contract Unit Price per cubic metre for "Torpedo Sand Safety Base", measured as specified herein, which price shall be payment in full for supplying all materials and performing all operation herein described and all other items incidental to the Work included in this Specification.

E12. SITE FURNISHINGS

E12.1 General Description

E12.1.1 This Specification shall cover the supply and installation of park benches and safety bollards, as indicated on the Drawings.

E12.1.2 The work to be done by the Contractor under this specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies and all things necessary for and incidental to the satisfactory performance and completion of all Work as specified herein.

E12.2 Materials

E12.2.1 Park Benches

- (a) Bonnycastle Backless Bench (SCD – 133) supplied in cedar by the City of Winnipeg.
- (b) To order and arrange for pickup of this equipment contact Mr. Bill Dowbyhuz at 986-5505.

E12.2.2 Waste Receptacles

- (a) Expanded Metal Basket (SCD – 106) Supplied by the City of Winnipeg.
- (b) To order and arrange for pickup of this equipment contact Mr. Bill Dowbyhuz at 986-5505.

E12.2.3 Bollards

- (a) Wooden Safety Bollard SCD-122, with the following provisions:
 - (i) Wood shall be 150 – 200 mm diameter round Pine logs, free of bark. Wood may be ACQ or Wolmanized pressure treated.
 - (ii) 300 mm diameter holes shall be backfilled with 6 mm diameter compacted limestone.
 - (iii) Existing bollards noted for removal may be re-used if in good condition.
- (b) Removable Steel Bollard SCD-132
 - (i) Height to match wooden safety Bollard (900)

E12.3 Construction Methods

E12.3.1 All Work is to be located and installed in accordance with the Drawings using approved non-rusting, vandal resistant fasteners to ensure solid, durable, finished work suitable for the purpose intended.

E12.3.2 All furnishings and fixtures to be installed plumb and true to correct elevations and location, as directed by the Contract Administrator. The Contractor shall confirm proposed locations of all site furnishings with Contract Administrator prior to installation.

E12.3.3 All furnishings and fixtures to be carefully handled so that no parts will be bent, broken, or otherwise damaged. Hammering, which will injure or distort fixture, is prohibited.

E12.4 Method of Measurement

E12.4.1 The installation of park benches, bollards, and waste receptacles shall be measured on a Unit Basis. The number of park benches and waste receptacles to be paid for shall be the total number of park benches and waste receptacles that are installed in accordance with this Specification and accepted by the Contract Administrator, as calculated from measurements made by the Contract Administrator.

E12.5 Basis of Payment

E12.5.1 The installation of park benches, bollards, and waste receptacles shall be paid for at the Contract Unit Price per unit for the "Items of Work" listed below, measured as specified herein, which price shall be payment in full for supplying all materials and performing all operation herein described and all other items incidental to the Work included in this Specification.

- E12.5.2 Items of Work:
- (a) Site Furnishings:
 - (b) Park Bench, complete with bases
 - (c) Waste Receptacle
 - (d) Wooden Safety Bollard
 - (e) Removable Steel Bollard

E13. PLAY STRUCTURES AND EQUIPMENT

E13.1 General Description

- E13.1.1 This Specification shall cover the supply and installation of the following play equipment:
- (a) Swing set, complete with base as indicated on the Drawings.
- E13.1.2 The work to be done by the Contractor under this specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies and all things necessary for and incidental to the satisfactory performance and completion of all Work as specified herein.
- E13.1.3 Canadian Standards Association Guidelines
- (a) All playground apparatus supplied and the method of installation shall be in accordance with the "National Standard of Canada, CAN/CSA-Z614-M98", Children's Play Spaces and Equipment latest edition.
 - (b) The Contractor shall submit, with his Bid, a written statement confirming compliance with this guideline and shall be prepared, if requested, to provide data supporting compliance within ten (10) working days of such a request, at no cost to the City.
- E13.1.4 Maintenance Kits
- (a) All play apparatus shall include the supply of maintenance kits. Maintenance kits shall include maintenance manuals, complete manufacturer's parts lists, touch-up paint, PVC repair paint, 10% extra of each bolt, washer and any other hardware utilized on the play apparatus, and all special tools necessary for assembly and maintenance.

E13.2 Materials

- E13.2.1 Play Structure Equipment
- (a) Arch Belt Swing: Landscape Structures Inc., 2.4 m. high, 12.7cm diameter aluminum arch posts, Models No. 100050AC and 111579C. Colour: red. Galvanized chain (100112A), and double clevis attachments (#132634A) for 2 full bucket seats ((112228A) and 2 slash-proof belt seats (132385A) and concrete footings as supplied by Playgrounds R Us (phone 632-7000) or approved equal.

E13.3 Construction Method

- E13.3.1 General
- (a) The assembly and installation of all play structure equipment and components shall conform to the manufacturer's specifications and shall be in accordance with the most recent edition of the "National Standard of Canada, CAN/CSA-Z614-M98".
- E13.3.2 In accordance with GC 4.0.4, the Contractor shall provide shop Drawings for approval prior to the installation of all play equipment specified herein.

E13.3.3 Layout

- (a) All work is to be located and installed in accordance with the Drawings. The Contractor shall confirm the equipment locations with the Contract Administrator prior to their installation.

E13.3.4 Concrete Bases

- (a) All play equipment posts and anchors are to be set in concrete footings or piles to ensure stability and prevent frost heaving. The current Standard Construction Specifications of the City of Winnipeg, CW 2160-R4 "Concrete to be Used in Underground Works", is to be utilized in the installation of the concrete works for all below ground components of sports and play equipment.
- (b) The specific concrete requirements shall be:
 - (i) sulphate resistant, Type 50 Cement
 - (ii) 28 day compressive strength of 30 MPa
 - (iii) maximum aggregate size of 40 mm, nominal
 - (iv) slump 90 ± 20 mm
 - (v) maximum water/cement ratio 0.45

E13.3.5 Install all manufactured play equipment according to manufacturers' specifications.

E13.4 Safety

E13.4.1 Safety and Health Regulations

- (a) Further to General Conditions GC.5.02(9) of the Standard Construction Specifications of the City of Winnipeg, and SC:26 pedestrian Safety & Access the Contractor shall comply with the following:
 - (i) The City of Winnipeg's Safety in the Workplace Policy for Alcohol or any Mood or Mind Altering Drug in the Workplace;
 - (ii) The City of Winnipeg Safety Manual;
 - (iii) The Parks and Open Space Division, Public Works Safety Regulations; and
 - (iv) The Province of Manitoba Workplace, Safety and Health Act.
- (b) The Contract Administrator and the City of Winnipeg Public Works, Parks and Open Space Division Safety Officer has the authority to enforce all the above listed safety and/or health regulations.
- (c) The Contractor is advised that these safety regulations are available for viewing by contacting the Contract Administrator.

E13.5 Quality Control

- E13.5.1 All workmanship and all materials furnished and supplied under this Specification are subject to the close and systematic inspection and testing by the Contract Administrator including all operations from the selection and production of materials through to final acceptance of the Work. The Contractor shall be wholly responsible for the control of all operations incidental thereto notwithstanding any inspection or approval that may have been previously given. The Contract Administrator reserves the right to reject any materials or works which are not in accordance with the requirements of this Specification.

E13.6 Method of Measurement

- E13.6.1 The supply and installation of all play equipment shall be measured on a Unit Basis. Play equipment units to be paid for shall be the play equipment that is installed and refurbished in accordance with this Specification and accepted by the Contract Administrator, as calculated from measurements made by the Contract Administrator.

E13.7 Basis of Payment

E13.7.1 The supply and installation of play equipment shall be paid for at the Contract Unit Price per unit for the "Items of Work" listed below, measured as specified herein, which price shall be payment in full for supplying all materials and performing all operation herein described and all other items incidental to the Work included in this Specification.

E13.7.2 Items of Work:
(a) Swing set, complete with base

E14. FINISH GRADING AND TOPSOIL

E14.1 General Description

E14.1.1 This Specification shall supplement CW 3540 and shall cover the supply and placing of topsoil under sodded areas and in tree pits and planting areas as indicated on the Drawings.

E14.1.2 The work to be done by the Contactor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all other things necessary for and incidental to the satisfactory performance and completion of all work as hereinafter specified and in accordance with CW 3540.

E14.2 Materials

E14.2.1 Topsoil
(a) Topsoil to conform to the requirements of CW 3540-R2 and with a pH range of 6.0 to 8.0 and a salinity rating of less than 2.5 mmhos/cm.

E14.2.2 Fertilizer
(a) Complete commercial synthetic fertilizer with minimum 35% water soluble nitrogen. Formulation ratio: as recommended by approved soil test analysis or slow release CIL, TurfStarter 16-32-6, 5 lbs/1,000 sq. ft. (2.5 kg/100 m²) or equal. Obtain Contract Administrator's approval of proposed fertilizer prior to delivery to site.

E14.2.3 Peatmoss
(a) Derived from partially decomposed fibrous or cellular stems and leaves of species of sphagnum mosses. Elastic and homogenous, brown in colour - free of wood and deleterious material which could prohibit growth. Shredded particle minimum size: 5 mm.

E14.3 Construction Methods

E14.3.1 Placing and Spreading of Topsoil for Sodding
(a) Place and spread topsoil for sodding in accordance with CW 3510-R7 "Sodding". Schedule placing of topsoil and finish grading to permit sodding operations under optimum conditions. Place topsoil after Contract Administrator has inspected and approved subgrade. Spread topsoil with adequate moisture in uniform layers over unfrozen subgrade free of standing water. Apply topsoil to 100 mm compacted depth for sod. Manually spread topsoil around obstacles.

- E14.3.2 Supply and Preparation of Topsoil for Seeding (Meadow)
- (a) Place topsoil as specified for sodding in E14.3.1.
 - (b) The creation of a clean seedbed is to be considered part of this operation. The soil shall be kept clear of weed seeds through the growing season by regular tiling, or by seeding a cover crop acceptable to the City Naturalist. In the event of drought, the seedbeds are to be watched a minimum of two times to promote weed seed germination.
 - (c) To prepare for seeding, apply glyphosphate in late May or early June, when temperatures are appropriate for maximum effectiveness of the herbicide. Notify the Contract Administrator when this work is complete. Reapply as required, or as instructed by the Contract Administrator, until the seedbed is free of growing vegetation.
 - (d) Should any of the above steps be left out of the work, the placement of topsoil will not be accepted.
- E14.3.3 Placing of Topsoil in Tree and Shrub Beds
- (a) Place topsoil around rootball of each tree and shrub by hand and as shown on Planting Details.
- E14.3.4 Placing of Topsoil in Community Gardens
- (a) Prepare subgrade by tilling or scarifying. Install topsoil as outlined in E14.3.1, dividing the application into two (2) lifts, followed by light compaction.
- E14.3.5 Finish Grading
- (a) The area shall be fine graded and the topsoil loosened. Eliminate rough spots and low areas to ensure positive drainage. Prepare loose friable bed by means of cultivation and subsequent raking. Topsoil shall be rolled with 50 kg roller, minimum 900 mm wide, to consolidate it in areas to be sodded, leaving the surface smooth, uniform, firm against deep foot printing, and with a fine loose texture to the approval of the Contract Administrator.
- E14.3.6 Site Clean-Up
- (a) The site shall be kept clean during operations and all excess material and debris shall be disposed of off site.
- E14.4 Method of Measurement**
- E14.4.1 Supply and Installation of Topsoil for Sodding
- (a) There shall be no separate measurement for the work associated with supply and installation of topsoil for sodding. This work shall be incidental to Sodding (E:16). No separate measurement or payment will be made.
- E14.4.2 Supply and Installation of Topsoil for Seeding.
- (a) Supply and Installation of Topsoil for seeding will be measured on an Area Basis. The area to be paid for shall be the total number of square meters placed in accordance with this specification and accepted by the Contract Administrator, as calculated from measurements made by the Contract Administrator.
- E14.4.3 Supply and Installation of Topsoil in Tree and Planting Beds
- (a) Supply and installation of topsoil in tree and planting beds is incidental to the supply and installation of trees and shrubs (E:17). No separate measurement or payment will be made.

- E14.4.4 Supply and Installation of Topsoil for Community Gardens
- (a) Supply and installation of topsoil in community gardens shall be measured on a Surface Area Basis. The area to be paid for shall be the total number of square metres installed in accordance with this Specification and accepted by the Contract Administrator, as calculated by measurements by the Contract Administrator.

E14.5 Basis of Payment

- E14.5.1 Supply and Installation of Topsoil for Sodding
- (a) Supply and installation of topsoil for sodding is incidental to the supply and installation of sod, which price shall be included in the price for sodding. No separate payment for topsoil for sodding shall be made.
- E14.5.2 Supply and Installation of Topsoil for Seeding
- (a) Supply and Installation of Topsoil for Seeding will be paid for at the Contract Unit Price per square meter for Supply and Installation of Topsoil for seeding measured as specified herein, which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the work included in this Specification.
- E14.5.3 Supply and Installation of Topsoil in Tree and Planting Beds
- (a) Supply and installation of topsoil in tree and Planting Beds is incidental to the supply and installation of trees and shrubs, which price shall be included in the price for trees and vines. No separate payment for topsoil in tree and Planting Beds areas shall be made.
- E14.5.4 Supply and installation of Topsoil in Community Gardens
- (a) The supply and installation of Topsoil shall be paid for at the Contract Unit Price per square metre for "Topsoil", measured as specified herein, which price shall be payment in full for supplying all materials and performing all operation herein described and all other items incidental to the Work included in this Specification.

E15. SODDING

E15.1 General Description

- E15.1.1 This Specification shall cover the supply and installation of cultivated mineral sod in areas as shown on the Drawings and shall conform to CW 3510-R7.
- E15.1.2 The work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all other things necessary for and incidental to the satisfactory performance and completion of all work as hereinafter specified and in accordance with CW 3540-R2.

E15.2 Materials

- E15.2.1 Topsoil as specified E:14.
- E15.2.2 Sod
- (a) The Contractor shall supply mineral based sod that has been sown and cultivated in nursery fields as a turf grass crop and in accordance with the following certified seed mixtures:
 - (b) 100% Canada No. 1 Kentucky Bluegrass or a mixture containing not less than 60% Canada No. 1 Kentucky Bluegrass with the 40% remaining proportion Creeping Red Fescue.

- (c) Nursery sod containing any other grass species, strains or cultivars than specified herein will not be accepted.

E15.3 Construction Method

- E15.3.1 Construction method shall conform to CW 3510-R7.

E15.4 Method of Measurement

- E15.4.1 Sodding will be measured on an Area Basis. The area to be paid for shall be the total number of square metres placed in accordance with this Specification and accepted by the Contract Administrator, as calculated from measurements made by the Contract Administrator.

E15.5 Basis of Payment

- E15.5.1 Sodding will be paid for at the Contract Unit Price per square metre for "Topsoil and Sod" measured as specified herein, which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the work included in this Specification.

E16. TREES AND SHRUBS

E16.1 Description

- E16.1.1 This Specification shall cover the supply and installation of plant material as specified herein and as indicated on the Drawings, and shall supplement the "Guidelines for the Planting of Boulevard Trees - Schedule D", latest edition, available from the City of Winnipeg Forestry Branch. Where these two documents differ, this Specification shall take precedence.
- E16.1.2 The work to be done by the Contactor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all other things necessary for and incidental to the satisfactory performance and completion of all work as hereinafter specified and in accordance with CW 3540-R2.

E16.2 Source Quality Control

- E16.2.1 Obtain Approval of plant material at source.
- E16.2.2 Notify Contract Administrator of source of material at least seven (7) days in advance of shipment. No work under this section is to proceed without approval.
- E16.2.3 Acceptance of plant material at its source does not prevent rejection on site prior to or after planting operations.
- E16.2.4 Trees and shrubs are to be grown in nurseries under proper horticultural practices as recommended by the Canadian Nursery Trades Association.
- E16.2.5 Only those trees and shrubs will be accepted which have been grown for at least the last four (4) previous years in nurseries located in an Agriculture Canada Plant Hardiness Zone designation of 2 (a or b) or 3 (a or b). Trees and shrubs that have grown in Plant Hardiness Zone 4 or greater will be rejected.

E16.3 Shipment and Pre-Planting Care

- E16.3.1 Coordinate shipping of plants and excavation of holes to ensure minimum time lapse between digging and planting.

- E16.3.2 Tie branches of trees and shrubs securely and protect plant material against abrasion, exposure and extreme temperature change during transit. Avoid binding of planting stock with rope or wire which damage bark, break branches or destroy natural shape of plant. Give full support to rootball of large trees and shrubs during lifting.
- E16.3.3 Cover plant foliage with tarpaulin and protect bare roots by means of dampened straw, peatmoss, sawdust or other acceptable material to prevent loss of moisture during transit and storage.
- E16.3.4 Remove broken and damaged roots with sharp pruning shears. Make clean cuts and cover cuts over 10 mm diameter with wound dressing.
- E16.3.5 Keep roots moist and protected from sun and wind. Heel-in trees which cannot be planted immediately in shaded areas and water well.

E16.4 Warranty

- E16.4.1 Further to Article X of GC, the Contractor agrees and warranties to replace and replant any nursery stock found dead or in poor condition for a period of two (2) years from date of Certificate of Total Performance without cost to the Owner. "Poor Condition" shall be interpreted as meaning nursery stock on which branches are dead or dying, or have not shown satisfactory growth in leaves. Exempted is nursery stock damaged by accidental causes or vandalism, which stock shall be replaced at the cost of the Owner.
- E16.4.2 All required replacements shall be by plants of at least the same size and species as specified, and shall be supplied and planted in accordance with the original Drawings and Specifications, and the replaced plant material shall carry an additional two (2) year guarantee. Should the replaced plant material not survive, the Contractor will be responsible to replace it a third time and guarantee it for an additional two (2) years unless it is determined that unique site conditions or inadequate maintenance causes the death of plants.
- E16.4.3 An end-of-warranty inspection will be conducted.
- E16.4.4 Contract Administrator reserves the right to extend Contractor's warranty responsibilities for an additional two (2) years if, at the end of warranty period, leaf development and growth is not sufficient to ensure future survival.

E16.5 Replacements

- E16.5.1 During guarantee period, remove from site any plant material that has died or failed to grow satisfactorily as determined by Contract Administrator.
- E16.5.2 Replace plant material as soon as possible and as directed by the Contract Administrator.
- E16.5.3 Extend guarantee on replacement plant material for a period equal to the original guarantee period.
- E16.5.4 Continue such replacement guarantee until plant material is accepted.

E16.6 Materials

- E16.6.1 Topsoil: E14.2.1
- E16.6.2 Peatmoss: E14.2.3
- E16.6.3 Water: Potable and free of minerals which may be detrimental to plant growth
- E16.6.4 Tree Rings: fabricated from 3 mm galvanized wire encased in two-ply reinforced 12 mm diameter rubber garden hose or equivalent.

- E16.6.5 Stakes: T-Bar steel stakes 38 mm x 38 mm x 5 mm x 2500 mm. Paint with two (2) coats black zinc.
- E16.6.6 Guy Wires and Accessories: Steel wire strand to CSA G4-M1977 3 mm diameter. Horticultural guy wire tightener.
- E16.6.7 Trunk Collar: 150 mm diameter corrugated plastic pipe, 300 mm height.
- E16.6.8 Rootball Burlap: Biodegradable 150 g Hessian burlap.
- E16.6.9 Anti-Desiccant: Wax-like emulsion to provide film over plant surfaces reducing evaporation but permeable enough to permit transpiration.
- E16.6.10 Wound Dressing: Horticulturally accepted non-toxic, non-hardening emulsion.
- E16.6.11 Fertilizer: Slow release formulation of low nitrogen, high phosphorous (eg, 10-50-12). Apply at rate in accordance with manufacturers written instructions.
- E16.6.12 Woodchip Mulch: Woodchips from hardwood, trees, free of bark, branches, and leaves varying in size from 1/4" to 3/4" (6-20 mm) thick.
- E16.6.13 Horticultural Bonemeal: Raw Bonemeal finely ground with minimum analysis of 3% nitrogen and 10% phosphoric acid.

E16.7 Plant Material

- E16.7.1 Quality and Source: Comply with Guide Specification for Nursery Stock, latest edition, of Canadian Nursery Trades Association (CNTA) referring to size and development of plant material and rootball. Height and spread dimensions refer to main body of plant and not from branch tip to branch tip. Use trees of No. 1 grade.
- E16.7.2 Nomenclature of specified trees is to conform to the International Code of Nomenclature for Cultivated Plants and is to be accordance with the approved scientific names given in the latest edition of "Standardized Plant Names".
- E16.7.3 Trees are to be characteristically developed for their species and structurally sound, well branched, healthy and vigorous and densely foliated when in leaf. Each tree is to have a healthy, well developed, fibrous root system which may be verified through a testing procedure that destructively samples one or more randomly selected rootballs.
- E16.7.4 Trees are to have been root pruned regularly, but not later than one growing season prior to arrival on site. Trees in excess of 75 mm calliper are to have been half root pruned during each of two successive growing season, the latter at least, one growing season prior to arrival on site.
- E16.7.5 All parts of plant material are to be moist and show live, green cambium tissue when cut.
- E16.7.6 Trees and shrubs are to be free of disease, insect infestation, rodent damage, sun scald, frost cracks, abrasions, unhealed scars, scars exceeding 5 cm in diameter, major forks or crooks in the trunk, broken branches, or angled leaders. Trees having the above defects will not be accepted by the Contract Administrator.
- E16.7.7 Trees having a leader which has developed at a sharp angle to the trunk as a result of pruning or trunk damage will not be accepted.
- E16.7.8 Tree Spade Dug Material: Dig plant material with mechanized digging equipment of hydraulic spade or clamshell type. Rootballs to satisfy CNTA standards. Lift rootball from hole, place in wire basket designed for purpose and lined with burlap. Tie burlap around rootball and tie basket to ball with heavy rope. Take care not to injure trunk of tree with wire basket ties or rope.

- E16.7.9 Container Grown Stock: Acceptable if container is large enough for root development. Trees and shrubs must have grown in container for minimum of one growing season but no longer than two. Root system must be able to "hold" soil when removed from container. Plants that have become root bound are not acceptable.
- E16.7.10 Deciduous trees in excess of 3 m height must have been dug with large firm ball. Rootballs must include seventy-five percent (75%) of fibrous and feeder root system. This excludes the use of native trees grown in light sandy or rocky soil. Secure rootballs with burlap, heavy twine and rope. For large trees wrap ball in double layer of burlap and drum lace with minimum 10 mm diameter rope. Protect rootballs against sudden changes in temperature and exposure to heavy rainfall.
- E16.7.11 Collected or Native Plant Material: Any nursery stock dug from native stands, wood lots, orchards or neglected nurseries and which have not received proper Association, shall be designated as "collected plants". The use of "collected plants" will not be permitted unless approved by Contract Administrator.
- E16.7.12 Cold Storage: approval required for plant material which has been held in cold storage.
- E16.7.13 Substitutions to plant material as indicated on planting plan are not permitted unless written approval has been obtained as to type, variety and size. Plant substitutions must be of

E16.8 Equipment

- E16.8.1 All equipment shall be of a type approved by the Contract Administrator and shall be kept in good working order.

E16.9 Construction Methods

- E16.9.1 General
- (a) Stake out location of trees and shrubs as per Drawings. Obtain Contract Administrator's acceptance prior to excavating.
 - (b) Apply anti-desiccant in accordance with material manufacturer's instructions, as required.
 - (c) Coordinate operations. Keep site clean and planting holes drained. Immediately remove soil of debris spilled onto street pavement, grass or walks.
- E16.9.2 Planting Time
- (a) Plant only under conditions that are conducive to health and physical conditions of plants.
 - (b) Provide planting schedule. Extending planting operations over long period using limited crew will not be accepted.
 - (c) Install trees and shrubs within 48 hours of removal from the nursery.
- E16.9.3 Excavation
- (a) Excavate tree pits and planting holes as indicated on Detail on Drawings.
 - (b) Protect bottom of excavations against freezing.
 - (c) Remove water which enters excavations prior to planting. Ensure source of water is not ground water or from a broken water pipe.
- E16.9.4 Planting
- (a) Loosen sides of planting holes to a depth of 100 to 150 mm as indicated on Detail on Drawing L-4. Cover bottom of each excavation with bonemeal in amount recommended by manufacturer.

- (b) Plant trees vertically with roots placed straight out in hole. Orient plant material to give best appearance in relation to structure, roads, and walks.
- (c) Place plant material to equal depth they were originally growing in nursery.
- (d) With balled and burlapped rootballs, loosen burlap and remove maximum of 1/3 of the top burlap from rootball without disturbing the rootball. Do not pull burlap or rope from under rootball. With container stock, remove entire container without disturbing rootball. Non-biodegradable wrappings must be removed.
- (e) Tree Spade Excavated Material: dig tree hole with same mechanical equipment as used to dig plant material. Ensure hole dug is upright as possible.
- (f) Tamp planting soil around root system in layers of 150 mm, eliminating air voids. Frozen or saturated planting soil is unacceptable. When 2/3 of planting soil has been placed, fill hole with water. After water has completely penetrated into soil, complete backfilling.
- (g) Each tree is to have an earth saucer at its base having a diameter as large as the excavation with a 100 mm lip formed at the perimeter of the saucer to retain water.

E16.9.5 Fertilizing

- (a) When planting is completed, give surface of planting saucer dressing of fertilizer meeting the requirements of E14.3.3. Mix fertilizer thoroughly with top layer of planting soil and water in well.

E16.9.6 Tree Support

- (a) Staking for Trees and Evergreens: Backfill planting hole 2/3, drive T-rail stake 2' (900 mm) into bottom of pit, taking care not to damage main roots. Place stake on side of prevailing wind. Fasten trunk to stake of anchor with tree ring. Different methods of fastening tree trunk to stake or anchor are acceptable if no damage to bark of tree will occur. Obtain approval prior to using other methods. Guy 2500 height evergreens as shown on L-4.

E16.9.7 Mulching

- (a) Obtain approval of planting before mulching material is applied. Loosen soil in planting beds and pits and remove debris and weeds. Spread mulch to minimum thickness of 75 mm (3") or as indicated on drawing. Mulch material susceptible to blowing must be moistened and mixed with topsoil before applying. When mulching is placed in fall, place immediately after planting. When mulch is placed in spring, wait until soil has warmed.

E16.9.8 Maintenance and Guarantee of Nursery Stock

- (a) The Contractor shall provide all watering, weeding, tightening and repairing tree stakes and rings, removal of dead material and all repairing tree stakes and rings, removal of dead material and all other maintenance operations required for two years after the date of the Certificate of Total Performance. See E17 for additional information.
- (b) The Contractor shall agree and guarantee to replace and replant any nursery stock found dead and/or in poor condition two years from the date of the Certificate of Total Performance, at his cost. "Poor condition" shall be interpreted as meaning nursery stock on which branches are dying, or have not shown satisfactory growth of leaves.
- (c) Exempted is nursery stock damaged by accidental causes or vandalism, which stock shall be replaced at the cost of the Owner.

- (d) All required replacements shall be by plants of at least the same size and species as specified, and shall be supplied and planted in accordance with the original drawings and Specifications, and the replaced material shall carry an additional two-year guarantee and maintenance period.

E16.10 Method of Measurement

E16.10.1 Trees and Shrubs

- (a) Plant Material will be measured on a unit basis. The number to be paid for shall be the total number of each type and size of tree supplied and installed in accordance with the Specification and accepted by the Contract Administration.

E16.11 Basis of Payment

- E16.11.1 The supply and installation of trees and shrubs will be paid for at the Contract unit price for each plant, measured as specified herein, which prices shall be payment in full including all costs for the plant, plant pit and topsoil backfill, tree stakes, rings, pruning, two year maintenance, and all other items incidental to the Work included in this Specification.
- E16.11.2 Twenty five (25) % of the value of all plant material, as itemized on the unit price forms, shall be held back to pay for the two year maintenance period. See E17 and D17.1 for payment during two year maintenance period.
- E16.11.3 Seventy five (75) % of the value of all plant material, as itemized on the unit price forms, will be paid for when the plant material complies with the supply and installation sections of the specification requirements.

Template Version: C120040408

E16.11.4

E16.12 Plant Specification List

No.	Name Common / Scientific	Size	Comments
Trees:			
6	COLORADO SPRUCE <i>Picea glauca</i>	2500 ht	Single upright trunk w/single leader. B&B or tree mover, wire basket. Guy.
4	COLORADO SPRUCE <i>Picea glauca</i>	1800 ht	Single upright trunk w/single leader. B&B or tree mover, wire basket. Single stake.
18	FALL GOLD ASH <i>Fraxinus nigra</i> 'Fall Gold'	60-70mm cal 3500-4500 ht	Min 11 major branches, 2.0 m above grade. B&B or tree mover, wire basket. Double stake.
20	SWEDISH COLUMNAR ASPEN <i>Populus tremula erecta</i>	50-60mm cal	Uniform specimen. B&B or tree mover, wire basket. Double stake.
6	PLAINS COTTONWOOD <i>Populus deltoides</i>	45-50mm cal	Seedless. Min. 9 major branches. B&B or tree mover, wire basket. Single stake.
26	MANITOBA MAPLE <i>ACER NEGUNDO</i>	45-50mm cal 3000-3500 ht	Min. 9 major branches. B&B or tree mover, wire basket. Single stake.
3	LAUREL LEAF WILLOW <i>Salix pentandra</i>	45-50mm cal 3000-3500 ht	Tree form. Min. 9 major branches. B&B or tree mover, wire basket. Single stake.
Shrubs:			
7	Red Elder <i>Sambucus racemosa</i>	3 gal container	Container grown. Min 4 canes of 800 ht.
60	Red Osier Dogwood <i>Cornus sericea</i>	2 gal container	Container grown. Min 3 canes of 700 ht.
85	Snowberry <i>Symphoricarpus occidentalis</i>	1 gal container	Container grown. Min 3 canes.
20	Nannyberry <i>Viburnum lentago</i>	3 gal container	Own root. Container grown. Min 4 canes of 800 ht

E17. TREE AND SHRUB MAINTENANCE SCHEDULE

E17.1 Description

E17.1.1 This specification shall cover the landscape maintenance requirements for all trees and shrubs and associated planting operations.

E17.2 Related Work

E17.2.1 Plant material and planting pits are specified elsewhere in this Specification and form an integral part to all Work described herein.

E17.3 Maintenance Period

E17.3.1 Undertake maintenance from the date of installation for a period of two years past the date of Total Performance.

E17.4 Description of Work

E17.4.1 Maintain trees and shrubs shown on the drawings, to the satisfaction of the Contract Administrator

E17.4.2 Work includes:

- (a) Fertilizing
- (b) Watering
- (c) Weed Control of tree pits, wood chip mulch areas
- (d) Pest and disease control
- (e) Pruning
- (f) Mulching
- (g) Tree support and tie adjustment
- (h) Winter protection

E17.5 Protection

E17.5.1 Prevent damage to fencing, other trees, landscaping, bench marks, building, pavement, surface and underground utility facilities.

E17.6 Materials

E17.6.1 Materials are to conform to the requirements of related specifications.

E17.7 Maintenance Requirements

E17.7.1 Condition of Equipment

- (a) Prior to the commencement of tree and shrub planting, the Contractor will be required to arrange to have the equipment to be supplied under this Contract inspected by the Contract Administrator to verify that the equipment is in good operating condition and meets the requirements of the Specifications.

E17.7.2 Replacement Equipment

- (a) The supply of replacement equipment of equal or larger size, if regular units are under repair, will be the responsibility of the Contractor.

E17.7.3 General Workmanship

- (a) Program timing of operations to growth, weather conditions and use of Site. Do each operation continuously and complete within reasonable time period. Store equipment and materials off-site. Collect and dispose of debris or excess material on daily basis.

E17.8 Fertilizing

- E17.8.1 Apply fertilizer no later than May 30th of each maintenance year.

E17.9 Watering

- E17.9.1 The Contractor shall acquire and pay for all water.
- E17.9.2 Apply water as required to supplement rainfall and to maintain optimum growing conditions. In general, water once a week to achieve rates as indicated below. Allow soil to dry adequately between watering to prevent over-saturation without creating water stress.
- E17.9.3 Subject to the requirements above, the Contractor must water at least once a week inclusive between May 1st and October 30th. A complete record is to be kept of each series of waterings for all planted and transplanted trees, noting: 1) location, and 2) date of watering. This record is to be given to the Contact Administrator when requested.
- E17.9.4 Apply 40 litres of water per 25 mm caliper, per application using deep roof feeder or low pressure open flow nozzle and hose. The water stream must not gouge out a hole in the soil and mulch.
- E17.9.5 Apply 4 litres of water per shrub per application

E17.10 Weed Control

- E17.10.1 Maintain surface of tree pit, shrub bed and mulched areas, free of weeds. Do not allow weeds to establish for a period longer than one (1) week.
- E17.10.2 Do not use dicamba and picloram solutions near trees.

E17.11 Pests and Diseases

- E17.11.1 Obtain written approval of Contract Administrator prior to using any pesticide.
- E17.11.2 Control pests and disease through pruning or application of pesticides. Use species specific pesticides where possible. Use only pesticides of low mammalian toxicity. Strictly follow manufacturer's written instructions.

E17.12 Pruning

- E17.12.1 The Contractor shall provide a person with a valid Manitoba tree Pruner's License for each work crew.
- E17.12.2 Prune trees as required to remove dead, broken or damaged limbs. Prune back to healthy growth while maintaining balanced crown shape.
- E17.12.3 Employ clean sharp tools. Make cuts coincident with the branch collar near the main stem or branch. Cuts must be smooth and sloping to prevent accumulation of water on cut. Do not leave little stumps ("horns") on trunks or main branches.
- E17.12.4 Prune trees according to accepted horticultural practices as outlined in the Pruning Manual, Publication No. 1505 by Agriculture Canada.

E17.13 Mulching

E17.13.1 Add mulch as required to maintain 75 mm thickness

E17.14 Tree Supports and Tie Adjustments

E17.14.1 E18.14.1 Maintain tree supports and ties in proper repair.

E17.14.2 E18.14.2 Remove supports and ties at end of two year maintenance period or earlier if directed by City.

E17.14.3 E18.14.3 Straighten any tree which is leaning.

E17.15 Winter Protection

E17.15.1 Ensure adequate moisture in tree zones prior to freeze-up.

E17.15.2 Apply anti-desiccant to evergreen trees susceptible to winter desiccation as directed by Contract Administrator.

E17.15.3 Provide trunk protection from rodents, acceptable to the Contract Administrator.

E17.16 Maintenance Schedule

E17.16.1 The Contractor shall provide a complete written maintenance schedule to the Contract Administrator prior to the commencement of the two year maintenance period, and must provide weekly reports of all maintenance to the City of Winnipeg, Forestry Department, within one week of the maintenance being provided.

E17.17 Maintenance Period

E17.17.1 The two year maintenance period shall be based on six month growing season per year. The two year maintenance program will consist of a total of 12 months of maintenance. In general the maintenance shall commence on May 1st and terminate on October 30th of each year. In the event of any early spring, whereby the weather conditions are conducive to plant growth, the Contractor shall start the maintenance period at such time as they deem necessary. However, the City of Winnipeg, Forestry Branch, must be notified prior to commencing the maintenance period. Where the maintenance Contract is started prior to May 1st, the actual number of days that the plant material is maintained prior to May 1st will be deducted from the October 30th completion period.

E17.18 Cost of Two Year Maintenance Period

E17.18.1 The cost for the Two Year Plant Maintenance Period will be twenty-five (25) % of the total cost of all the trees and shrubs, as shown in Form B: Prices, items one (1) to three (3) inclusive. The remaining seventy five (75) % value will be paid on a per unit basis, for each plant properly installed, and which plant complies with the specification requirements.

E17.18.2 Where the plant material has been replaced and is covered under the extended warranty period, a proportional amount of holdback will be further maintained, until the plant has survived for a full two years and is accepted.

E17.19 Payment of Two Year Maintenance Period

E17.19.1 The basis of payment cost, will be based on a pro rated basis, based on each full month of maintenance, and the respective proportion of the total twelve (12) months. Progress payments will be made once a year at the end of each growing season.

E18. DAMAGE TO STREETS, STRUCTURES AND TREES

E19.1 The Contractor's attention is drawn to the following existing site features to be retained and protected to the City of Winnipeg Standards:

- .1 trees, shrubs
- .2 curbs
- .3 sod
- .4 hydro poles
- .5 catch basins
- .6 curb inlets
- .7 underground services including land drainage sewer