

PART E
SPECIFICATIONS

PART E - SPECIFICATIONS

GENERAL

E1. APPLICABLE SPECIFICATIONS, STANDARD DETAILS AND DRAWINGS

- E1.1 *The City of Winnipeg 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 Standard Construction Specifications*.
- E1.2 The following Drawings are applicable to the Work:

<u>Drawing No.</u>	<u>Drawing</u>
Boyd Park Renovation	
L1	Removals Plan
L2	Layout and Materials Plan
L3	Grading Plan
L4	Planting Plan
L5	Wading Pool Renovation
L6	Playground Renewal
L7	Details
E1	Electrical Plan
M-1	Mechanical Site Plan
M-2	Mechanical specification
SS1	Site Services
Sgt. Tommy Prince MM Veterans Park Renovation	
L8	Removals
L9	Layout
L10	Grading
SS2	Site Services

E2. SOILS INVESTIGATION REPORT

- E2.1 Further to GC:3.1, no soil inspection has been done. Contractor to supply soils investigation report if site conditions warrant.

GENERAL REQUIREMENTS

E3. OFFICE FACILITIES

- E3.1 The Contractor shall not be required to supply office facilities for this project

E4. PROTECTION OF EXISTING TREES

- E4.1 The contractor shall take the following precautionary steps to prevent damage from construction activities.

- (a) All trees will have a 2m radius protective zone calculated from the circumference at the base of the trunk which will remain free of digging , trenching, grade changes, stock piling of materials and soil compaction, except as minimum to construct pavement and tree wells, throughout the duration of the Contract. Protective fencing around these areas is required.
- (b) All trees within and immediately adjacent to proposed construction areas and those identified to be at risk by the Contract Administrator, will require 25 x 100 x 2400mm' wood planks strapped to the tree trunk to completely protect the tree trunk from impact damage. (Smaller trees will be similarly protected using proportionally sized wood planks.)
- (c) Excavation shall be performed in a manner that minimizes damage to the existing root systems. Where possible, excavation shall be carried out such that the edge of the excavation shall be a minimum of 2m from the closest edge of the trunk. Where roots must be cut to facilitate excavation, they shall be pruned neatly at the face of excavation.
- (d) Operation of equipment within the dripline of the trees shall be kept to the minimum required to perform the work required. Equipment shall not be parked, repaired, refuelled; construction materials shall not be stored, and earth materials shall not be stockpiled within the driplines of trees. The dripline of a tree shall be considered to be the ground surface directly beneath the tips of its outermost branches. The Contractor shall ensure that the operations do not cause flooding or sediment deposition on areas where trees are located.
- (e) Work on-site shall be carried out in such a manner so as to minimize damage to existing tree branches. Where damage to branches does occur, they shall be neatly pruned.

E4.2 All damage to existing trees caused by the Contractor's activities shall be repaired to the requirements and satisfaction of the Contract Administrator and the City Forester or his designate.

E4.3 No separate measurement or payment will be made for the protection of trees.

E4.4 Where roots are in soil in area of exposure, all roots must be day lighted in the area of exposure through a hydro vac process. This process must be complete by an authorized hydro vac day lighting contractor (badger Day Lighting – 885-0592). Once the roots are day lighted in the area of exposure they must be properly trimmed with sharp tools to prevent crushing or being pulled up by construction equipment. No paint is required. All exposed roots must be mulched until the excavated area is filled with clean earth to avoid exposure to sunlight and desiccation.

E4.5 Auguring under existing trees will be the only acceptable method of underground installations. Any other excavations must be approved by the Forestry Branch.

E5. PROTECTION OF SURVEY INFRASTRUCTURE

E5.1 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.

E5.2 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 am to 4:00 pm 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.

E5.3 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.

E5.4 Outline Protection of survey infrastructure Protection of survey infrastructure 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.

E5.5 Where possible, amounts owed to the City in accordance with the above will be deducted from any Protection of survey infrastructure payments to be made by the City to the Contractor.

E6. PEDESTRIAN SAFETY AND TRAFFIC MANAGEMENT

E6.1 During the project, pedestrian access to all buildings shall be maintained at all times. A Clear pathway unobstructed from any materials or equipment must be provided.

E6.2 Ambulance/Emergency vehicle access must be maintained at all times.

E7. STAKES AND MARKS

E7.1 Further to GC:6.28(h), the Contractor will mark, to the extent he determines to be necessary, the location, alignment and elevation of the Work by means of stakes or marks, for review and approval by Contract Administrator. The Contractor shall make the completed Works conform to the lines and marks thus approved and indicated.

E7.2 The Contractor shall notify the Contract Administrator immediately of the disturbance of any such stakes or marks. The cost of correcting any errors arising out of neglect of the Contractor 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.

E7.3 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 on account of any alleged inaccuracies. If any error is suspected in the Drawings, 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.

E7.4 The Contractor shall determine and provide all dimensions and elevations measured from the stakes or marks

E8. WATER USED BY CONTRACTOR

E8.1 Notwithstanding clause 12 of the Standard Provisions:

E8.2 Water for use by the Contractor may be obtained from the City of Winnipeg waterworks system.

E8.3 Should the Contractor wish to obtain water from a City hydrant, he shall make application either in person or by phoning the Permits Clerk at 986-3184 (8:30 am to 4:30 pm Monday to Friday excluding holidays). The Contractor shall advise the Permits Clerk of the hydrant he wishes to use. The Water Services Divisions of the Water and Waste Department will inspect the hydrant to ensure that the location is suitable and that the hydrant is in good working condition. If the requested hydrant is found to be unacceptable, arrangements will be made for the use of an alternate hydrant.

E8.4 When the application has been approved, the Permits Clerk will contact the Contractor and issue the permit. The permit may not be issued the same day the application is made. The Contractor shall obtain the permit for hydrant use from the Customer Services Division of the

Public Works Department, 107-1155 Pacific Avenue. Permit fees will be charged in accordance with the latest version of the Waterworks By-law. All water used shall be metered and protected against contamination by the use of approved backflow prevention devices. The City will rent the meter to the Contractor at the rate established by the Waterworks By-law. The Contractor shall provide a lockable box, piping, valves, and backflow prevention equipment in accordance with Waterwork's guidelines. The backflow preventer(s) must be tested by a plumber licensed to test backflow preventers. The Permits Clerk can provide a list of licensed plumbers and additional information on the requirements for obtaining a use of hydrant permit.

E8.5 The Contractor shall pay for all water used in accordance with the Waterworks By-law. Sewer charges will not be assessed for water obtained from a hydrant.

E9. SURFACE RESTORATIONS

E9.1 When Total Performance is not achieved in the year the Contract is commenced, the Contractor shall temporarily repair any Work commenced and not completed to the satisfaction of the Contract Administrator. The Contractor shall maintain the temporary repairs in a safe condition as determined by the Contract Administrator until permanent repairs are completed. The Contractor shall bear all costs associated with temporary repairs and their maintenance

E10. TEMPORARY RELOCATION OF AFFECTED STRUCTURES

E10.1 The Contractor shall temporarily relocate any portable structure such as benches, waste receptacles, picnic benches, etc., which will interfere with the construction of the Work and are not identified as items to be relocated. The Contractor Administrator will identify the temporary locations for the portable structures. Following the completion of the applicable Work the Contractor shall replace the structures to the locations designated by the Contract Administrator. These relocations shall be considered incidental to the associated Works and no separate measurement for payment will be made.

E11. TRUCK WEIGHT LIMITS

E11.1 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.

E12. PRE-CONSTRUCTION MEETING

E12.1 The Contractor shall not begin the Work under this Contract. until a pre-construction meeting has been held between representatives of the Contractor, and the Contract Administrator

E13. ACCESS

E13.1 All access is to be on the designated routes through the site. These routes will be determined at the Pre-Construction Meeting.

E13.2 Access to the Site as required by the Contractor shall be provided and maintained by the Contractor at his own expense and approved by the Contract Administrator.

E13.3 The Contractor's operations shall be limited to the minimum area necessary for undertaking the Work and he shall be responsible for all damage resulting from his work on private property. The Contractor shall take such measures as are necessary to ensure safe and convenient pedestrian ingress and egress in maintained to private properties while he is working near them. Any damage caused by the negligence of the Contractor or his Sub-Contractors to the adjacent

Works or properties, shall be promptly repaired by him at his own expense, to the satisfaction of the Contract Administrator.

- E13.4 All necessary precautions shall be exercised by the Contractor so as not to remove, disturb, or damage any existing trees, shrubs, sod, pavements, streets, roads, boulevards, poles, hydrants, water pipes, gas pipes, electrical wires, cables, conduits, sewers or other existing facilities and equipment at the Site of the Work. For all damage incurred in the performance of the Work (either directly or indirectly), the Contractor shall either replace and repair such damage, whichever may be deemed necessary in the opinion of, and acceptable to, the Contract Administrator and the cost of which shall be borne entirely by the Contractor. The Contractor shall also indemnify and save harmless the City from all claims made directly or indirectly against it in respect to any such damage.

E14. SITE CONDITION

- E14.1 The Contractor and all sub-contractors shall examine the Site and make themselves familiar with the existing conditions (both above and below grade) and nature of Work to be done.
- E14.2 Surface and sub-surface conditions shown on the Drawings and included herein are provided for general information and variations there from shall not affect the terms of the Contract.
- E14.3 The Contractor shall set all necessary control lines, benchmarks, survey, elevation stakes and layout in accordance with the individual site conditions and in consultation with the Contract Administrator.

E15. EXISTING UNDERGROUND SERVICES

- E15.1 The Contractor's attention is drawn to the existing underground lines or services that may be located in the area of the Work.
- E15.2 The Contractor shall take all necessary precautions when performing the Work to ensure that no damage is done to these existing services.
- E15.3 No responsibility will be assumed by the City for correctness or completeness of the Drawings, when provided, with respect to the existing utilities, pipes or other objects either underground or on the surface, shall not be liable for the incorrectness and inadequacy thereof. It shall be the responsibility of the Contractor to determine the location of all such utilities, pipes and other objects and to make good any damage done to them.
- E15.4 All costs in connection with this item including location of the existing service, repairs to any existing services damaged by the construction operation, etc. shall be included in the unit prices bid for supply and installation of the items included under this Contract.
- E15.5 The Contractor will be required to make his own arrangements in connection with the temporary use of lighting, power, gas, sewer, water or other utilities, and pay all costs in connection therewith.
- E15.6 All necessary permits, fees and other like expenses as well as the cost of temporary connections to existing facilities shall be arranged and paid for by the Contractor.

E16. PRODUCT APPROVALS

- E16.1 The Contractor shall, following award, prepare a complete list of all material to be used on the project and submit the list to the Contract Administrator seventy two (72) hours prior to start of construction.

- E16.2 The Contractor shall only use material which has been approved by Specification CW3710-R1 or by the Contract Administrator. The list shall provide the product, the manufacturer and the supplier.
- E16.3 Other than required to be done by the Contractor under the Work of this contract, all necessary precautions shall be exercised by the Contractor so as not to remove, disturb, or damage any existing plant material, pavements, streets, roads, boulevard, poles, hydrants, water pipes, gas pipes, electrical wires, cables, conduits, sewers or other existing facilities and equipment at the Site of the Work. For all damage incurred thereto in the performance of the Work, the Contractor shall upon instructions from the Contractor Administrator, either replace and repair such damage, whichever may be deemed necessary in the opinion of, and acceptable to the Contract Administrator and the costs of which shall be borne entirely by the Contractor. The Contractor shall also indemnify and safe harmless the City from all claims made directly or indirectly against it in respect to any such damage.
- E16.4 All workmanship and materials furnished and supplied under this Specification are subject to close and systematic inspection and testing by the Contract Administrator. The Contract Administrator reserves the right to reject any materials or Works which are not in accordance with the requirements of the Specifications.
- E16.5 The Contractor shall wholly be responsible for the supply, safe storage, and handling of all materials set forth in this specification, and the control of all operations incidental thereto notwithstanding any inspection or approval that may have been previously given.

E17. DAMAGE TO STREETS AND STRUCTURES

- E17.1 The Contractor is to be advised of the following existing site features to be retained and protected to the City of Winnipeg Standards:
- | | | |
|-------------|-----------------------------|-----------------|
| a) trees | e) light standards | i) hydro poles |
| b) curbs | f) fire hydrants | j) catch basins |
| c) sidewalk | g) street signs | k) curb inlets |
| d) sod | h) all underground services | |

E18. PERMITS, NOTICES, LICENCES, CERTIFICATIONS, LAWS, AND RULES

- E18.1 The Contractor shall give all necessary notices, obtain all necessary permits and pay all fees in order that the Work may be carried out. The Contractor shall submit all plans required by any inspection authority and obtain approval of same before proceeding with the Work, and pay any cost attached to the inspection of such plans.
- E18.2 The Contractor shall comply with all laws, ordinances, rules, and regulations that would relate to the Works.

E19. EXCAVATION, REMOVALS AND SUBGRADE COMPACTION AND ROUGH GRADING

- E19.1 This specification is supplemental to CW 3110 and CW 3170. The Work of this section comprises the furnishing of all labour, equipment and materials required to complete the excavation and related Work including, but not necessarily confined to, the following:
- E19.1.1 Excavation, removals, disposal, subgrade compaction and rough grading of the existing site for the construction of concrete sidewalk paving, limestone pathways, planting beds, play spaces, swales, etc. to the design requirements noted on the Drawings, approved on Site by the Contract Administrator, less the appropriate surface finish allowance.
- E19.1.2 Stockpile suitable material on Site for reuse (clean topsoil, clean earth fill and gravel fill). Remove and dispose of unsuitable material.

- E19.1.3 Earthwork and Grading of the existing Site to the design elevations shown on the Drawings, less the appropriate surface finish allowance.
- E19.1.4 Earthwork and Grading of the existing Site (cut and fill including compaction of subgrade and fill material) to ensure positive drainage in all paved areas and adjacent sodded/seeded areas and planting beds.
- E19.1.5 Supply and Install imported fill in areas as required to ensure positive drainage.
- E19.1.6 Sawcut, Remove and Dispose of Asphalt Paving.
- E19.1.7 Sawcut, Remove and Dispose of Concrete Sidewalk.
- E19.1.8 Sawcut, Remove, Dispose of sections of concrete wading pool.
- E19.1.9 Excavation, Removal and Disposal of Existing Backlane Paving.
- E19.1.10 Excavation, Removal and Disposal of limestone pathway and infield.
- E19.1.11 Excavate, Dispose and Rough Grade areas for Playground Stone.
- E19.1.12 Excavate and Remove Sand, timbers, and concrete foundation. Rough Grade and Fill areas where old equipment was removed and will not be replaced (in preparation for sod).
- E19.1.13 Remove, Salvage and Reinstall wood bollards.
- E19.1.14 Remove, Salvage and Reinstall site furniture.
- E19.1.15 Remove and Deliver Sports Equipment.
- E19.1.16 Remove and Deliver Lighting. Disposal of foundations.
- E19.1.17 Excavation, Removal and Disposal of Chain Link Fence, salvage mesh for re-use where noted.
- E19.1.18 Remove and dispose of play equipment including foundation, safety surfacing and timber edging.
- E19.2 Construction Methods
 - E19.2.1 The Contractor shall construct the Site within the limits indicated to the design elevations and gradients noted on the Drawings, less the appropriate surface treatment depths specified and shall excavate, remove and dispose of all unsuitable materials of whatever nature encountered.
 - E19.2.2 The Contractor shall construct all sub-grades in accordance with Specification CW 3110. Excavation will be performed as per Item 9.1 of CW 3110. The Contractor shall remove existing pavement in accordance with 9.2 of CW 3110. Unsuitable Excavated material shall be disposed of as per Item 9.3 of CW 3110. The Contractor is advised that there may be a surplus of fill on the Site after the design sub-grade level has been achieved. All surplus material will be disposed of in accordance with Item 9.3 of CW 3110.
 - E19.2.3 The contractor shall restrict his activities strictly to within the limits of the Work, unless receiving prior written approval from the Contract Administrator. The Contractor shall take all precautions to prevent damage to traffic structures, pole lines, existing trees, site services and adjacent property and he shall be liable for any damages occurring in the performance of this Work.
 - E19.2.4 The Contractor and all sub-contractors shall examine the Site and make themselves familiar with the existing conditions and the nature of the Work to be done.
 - E19.2.5 Prevent damage to surface or underground utility lines which are to remain. Make good any damage.

- E19.2.6 The Contractor shall excavate to the design grades shown less the appropriate allowance for surface treatment and shall excavate, remove and dispose of all unsuitable materials of whatever nature encountered.
- E19.2.7 Excavated or graded materials to be approved before use as fill for grading Work. Protect such approved material from contamination. Stockpile in approved locations on Site.
- E19.2.8 All foundations shall be removed to full depth to the satisfaction of the Contract Administrator. Fill all holes resulting from removals with compacted clay fill in seeded or sodded areas and compacted granular fill in paved areas.
- E19.2.9 Excavate and remove existing asphalt, concrete and gravel paving and base courses. Stockpile suitable granular base course material on Site for reuse. Dispose of unsuitable and excess material off Site at a facility approved by the City of Winnipeg.
- E19.2.10 The Contractor shall ensure that upon completion of the removal operations the Site is left in a neat condition free from debris, etc. for approval by the Contract Administrator prior to placing base courses and clean fill.
- E19.2.11 Except for drainage swales, berms and embankments indicated, the design gradient for all other areas shall be considered to be straight grade between the design elevations shown. Changes in grade at swales, berms, embankments and field shall be gently contoured as directed by the Contract Administrator to provide future ease of grass mowing operation.
- E19.2.12 Construction to the new design grades shall be accomplished by the placement of clean fill (imported earth fill required only for Boyd Park) in areas as indicated on the Drawings.
- E19.2.13 In fill areas, where the difference between the existing grade elevation and the design elevation is less than 300mm the Contractor shall scarify the existing ground to a minimum depth of 150mm prior to placement of any fill.
- E19.2.14 The Contractor is advised that there may be useable clay and gravel fill on Site. All suitable material will be reviewed and approved by the Contract Administrator and then re-used on Site. The re-use of this material on Site may reduce the quantity of imported gravel and clean earth fill required. The Contractor shall re-use existing Site material prior to delivering new material to Site.
- E19.2.15 No direct payment will be made for placing and grading of existing fill as all costs for this Work shall be included in the lump sum bid for excavation, removals and rough grading within the limit of the Work.
- E19.2.16 Areas of Fill
- .1 Fill low areas in subgrade of paved areas (concrete, and crushed limestone paving) with compacted gravel sub-base material. Cost incidental to unit price bid for paved areas.
 - .2 Fill low areas in sodded areas with excavated clay material (from site excavations or imported as required) free from roots, muskeg, organic or cohesive matter, building debris, waste materials, rubble, rubbish, frozen portions, soluble materials and rocks larger than 25mm (1") in diameter and capable of sustaining plant and seed growth. Compact to 95% S. P. D. in 150mm (6") lifts. Cost of site excavated materials incidental to unit price bid for excavation removals and rough grading.
 - .3 Construct berms, sloped areas using excavated clay material (from site excavations or imported as required) free from roots, muskeg, organic or cohesive matter, building debris, waste materials, rubble, rubbish, frozen portions, soluble materials and rocks larger than 25mm (1") in diameter and capable of sustaining plant and seed growth. Compact to 95% S. P. D. in 150mm (6") lifts.

- .4 Prior to placing fill over existing ground, scarify surface to depth of 150mm. Maintain fill and existing surface at approximately the same moisture content to facilitate bonding.
- E19.2.17 Compaction shall include the use of sheep's foot or other suitable compaction equipment as approved by the Contract Administrator to achieve a minimum compaction of 98% Standard Proctor Density below all paved areas, and 95% Standard Proctor Density in all other areas disturbed under this Contract.
- E19.2.18 The Contractor shall construct the sub-grade surface to the following depths below the grades shown on the Drawings for each area:
- (a) Shrub bed 400mm
 - (b) Concrete Sidewalk 175mm
 - (c) Limestone Path 250mm
 - (d) Playground area 250mm min.
- E19.2.19 The Contractor is advised that all excavations, removals, disposal, rough grading, compaction and related work for construction of concrete sidewalk, crushed limestone pathway, playground stone areas, concrete edging and planting areas shall be incidental to the unit prices bid for each item as listed in the schedule of prices.
- E19.2.20 Following earth moving, rough grading and compaction the Work areas shall be fine graded to provide a maximum deviation of 50mm in 10 metres from the design grade with no low areas to hold water. The finished surface of all disturbed areas shall be dragged and smoothed in such a manner that there are no loose soil particles greater than 50mm in maximum dimensions.
- E19.2.21 Remove and deliver baseball backstop and benches and basketball hoop, backboard and pole to City of Winnipeg as per the drawings. Fill holes from posts with clean earth fill and compact to 98% SPD.
- E19.2.22 Remove and stockpile existing wood bollards, benches, waste receptacles and picnic tables as per the drawings.
- E19.2.23 Remove and stockpile chain link mesh on fence around wading pool for reinstallation. Only remove sections required for construction of concrete sidewalk paving. All fence posts to remain. Repair fence as required.
- E19.2.24 Remove and dispose of chain link fence as shown on the drawings. Chain link mesh from 3.0m ht. fence to be cleaned and stockpiled for reinstallation. Fill holes from posts with clean earth fill and compact to 98% SPD.
- E19.2.25 Remove and dispose of existing play equipment. Remove existing timbers, safety surfacing and concrete foundations. Fill holes with clean earth fill and compact to 98% SPD.
- E19.2.26 Remove and dispose of removable light bases to minimum 1m below finish grade. Fill holes with clean earth fill and compact to 98% SPD. Disconnect power to lights.
- E19.2.27 Remove and deliver existing permanent lights as per drawings and remove and dispose of existing bases to minimum 1m below finish grade. Fill holes with clean earth fill and compact to 98% SPD. Disconnect power to lights.
- E19.2.28 Remove and salvage wood bollards for reinstallation. Fill holes with clean earth fill and compact to 98% SPD.

- E19.2.29 Excavate, remove and dispose of gravel and painted rock to depth required for construction of concrete sidewalk. Fill holes with compacted granular fill and compact to 98% SPD.
- E19.2.30 Excavate, remove and dispose of existing backlane gravel paving, asphalt/roadway paving, concrete paving, including base courses, and place and compact clean fill, suitable for surface finish, to meet design subgrade.
- E19.2.31 Remove and dispose or deliver/reinstall signage posts and signage as noted on the drawings.
- E19.2.32 If required and at locations directed by the Contract Administrator, the Contractor shall excavate and remove unsuitable subgrade material and replace it with compacted granular material in accordance with Specification CW3110.
- E19.3 Method of Measurement
- E19.3.1 No measurement will be made for excavation, removal, disposal, compaction, rough grading and related work for construction of concrete sidewalk, crushed limestone pathway, playground stone areas, concrete edging and planting areas as this Work is incidental to the unit prices bid for each item as listed in the schedule of prices.
- E19.3.2 Measurement of supply and install compacted clean earth fill and related Work will be on a cubic metre basis.
- E19.3.3 The following items will be measured on an area basis. The area to be paid for shall be the total number of square metres that are excavated in accordance with this Specification as computed from measurements made by the Contract Administrator. No payment will be made for material removed outside of the limits of excavation as established by the Contract Administrator.
- (a) Excavate, remove, dispose and rough grade for sodded areas.
 - (b) Excavate, remove and dispose of asphalt paving and unsuitable/excess base courses.
 - (c) Excavate, remove and dispose of concrete sidewalk paving and base courses
 - (d) Excavate, remove and dispose of limestone infield
 - (e) Excavate, remove and dispose of limestone pathway
 - (f) Sawcut, remove and dispose of concrete wading pool paving for spray park.
 - (g) Excavate, remove and dispose of roadway paving and unsuitable/excess base courses
 - (h) Excavate, remove and dispose of backlane gravel paving and unsuitable/excess base courses.
 - (i) Rough grading for sodded and seeded areas.
 - (j) Strip sod and topsoil, stockpile suitable topsoil for reuse on Site and dispose of unsuitable materials
- E19.3.4 The following items will be measured on a per item basis. The total number of units to be paid for shall be the total number removed in accordance with this Specification as computed from measurements made by the Contract Administrator.
- (a) Remove, clean and stockpile existing site furniture for reinstallation
 - (b) Remove and dispose of bases of removable lights
 - (c) Remove and deliver permanent lights
 - (d) Remove, salvage and reinstall wood bollards

- E19.3.5 The following items will be measured on lump sum basis in accordance with this Specification as computed from measurements made by the Contract Administrator.
- (a) Remove and deliver baseball and basketball equipment.
 - (b) Remove, clean and stockpile for reinstallation chain link mesh at wading pool
 - (c) Remove and dispose of all play equipment (including foundations, safety surfacing and timber edging).
 - (d) Excavate, remove and dispose of gravel and painted rock bed
- E19.3.6 Remove and dispose of chain link fence will be measured on a linear metre basis (including salvaging mesh for reinstallation where noted). The total number of metres to be paid for shall be the total number removed in accordance with this Specification as computed from measurements made by the Contract Administrator.
- E19.3.7 No measurement will be made for stockpiling suitable topsoil, clean earth fill and granular base course as these items are incidental to this specification.
- E19.3.8 No measurement will be made for filling holes/low areas left by excavation and removals operations as this item shall be incidental to this specification.
- E19.3.9 No measurement will be made for the excavation or compaction of the subgrade as this shall be incidental to this specification.
- E19.3.10 No measurement will be made for the removal and disposal or delivery/reinstallation of signage posts and signage as this shall be incidental to this specification.
- E19.3.11 No measurement will be made for disposing of surplus fill and unsuitable material as this shall be incidental to this specification.
- E19.4 Basis of Payment
- E19.4.1 No payment will be made for excavation, removal, disposal, compaction, rough grading and related work for construction of concrete sidewalk, crushed limestone pathway, playground stone areas, concrete edging and planting areas as this work is incidental to the unit prices bid for each item as listed in the schedule of prices.
- E19.4.2 Supply and install compacted clean earth fill and related work will be paid for on a cubic metre basis, measured as specified herein, which shall be payment in full for performing all operations herein described and for all other items incidental to the work included in this specification.
- E19.4.3 The following items will be paid for at the contract unit price per square metre for
- (a) Excavate, remove, dispose and rough grade for sodded areas.
 - (b) Excavate, remove and dispose of asphalt paving and unsuitable/excess base courses
 - (c) Excavate, remove and dispose of concrete sidewalk paving and base courses
 - (d) Excavate, remove and dispose of limestone infield
 - (e) Excavate, remove and dispose of limestone pathway
 - (f) Sawcut, remove and dispose of concrete wading pool paving for spray park
 - (g) Excavate, remove and dispose of backlane gravel paving and unsuitable/excess base courses.
 - (h) Excavate, remove and dispose of roadway paving and unsuitable /excess base courses.
 - (i) Rough grading for sodded and seeded areas.

- (j) Strip sod and topsoil, stockpile suitable topsoil for reuse on Site and dispose of unsuitable materials

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.

E19.4.4 The following items will be paid for at the contract unit price for:

- (a) Remove, clean and stockpile existing site furniture for reinstallation
- (b) Remove and dispose of bases of removable lights
- (c) Remove and deliver permanent lights
- (d) Remove, salvage and reinstall wood bollards

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.

E19.4.5 The following items will be paid for at the contract lump sum price for:

- (a) Remove and deliver baseball and basketball equipment.
- (b) Remove, clean and stockpile for reinstallation chain link mesh at wading pool
- (c) Remove and dispose of all play equipment (including foundations, safety surfacing and timber edging)
- (d) Excavate, remove and dispose of gravel and painted rock bed

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.

E19.4.6 Remove and dispose of chain link fence will be paid for at the contract unit price per linear meter for "Remove and Dispose of Chain Link Fence" as specified herein, which price shall be payment in full for performing all operations herein described (including salvaging mesh for reinstallation where noted) and all other items incidental to the Work included in this Specification.

E19.4.7 No payment will be made for stockpiling suitable topsoil, clean earth fill and granular base course as these items are incidental to this specification.

E19.4.8 No payment will be made for filling holes/low areas left by excavation and removals operations as this item shall be incidental to this specification.

E19.4.9 No payment will be made for the excavation or compaction of the subgrade as this shall be incidental to this specification.

E19.4.10 No payment will be made for the removal and disposal or delivery/reinstallation of signage posts and signage as this shall be incidental to this specification.

E19.4.11 No payment will be made for disposing of surplus fill and unsuitable material as this shall be incidental to this specification.

E20. SAWCUTTING PAVEMENT

E20.1 At the limits of excavation, the Contractor shall sawcut the existing pavement to produce a clean, straight edge when excavated.

E21. CLEARING AND GRUBBING

E21.1 The Removals Plan, Drawing L1 of the Contract Documents, clearly documents the trees that are to remain, and the shrubs that are to be removed by the Contractor.

E21.2 The Contractor is to note that the Clearing and Grubbing is to include the removal of all the individual trees and shrubs shown on the Removals Plan, as well as all the root masses associated with these trees and shrubs.

E21.3 Construction Methods - as per CW 3010-R4

E21.4 Method of Measurement and Basis of Payment

E21.4.1 Clearing and Grubbing will be measured and paid for at the square metre price for "Clear and grub existing shrubs from beds".

E22. ABANDONING EXISTING CATCHBASIN LEADS

E22.1 Further to Specification CW 2130 and Specification CW3210, the Contractor shall abandon existing catchbasins as indicated on drawings or as directed by the Contract Administrator.

E22.2 The Contractor shall abandon the catchbasin leads within 1.0m of the existing sewer by using a "DEBLO" plug or an approved equivalent. The plug shall be inserted from the boulevard side of the roadway and secured in place. The Contractor shall immediately fill in the lead in compliance with City of Winnipeg specifications.

E22.3 The access to the catch basin lead at the boulevard side shall be by shored vertical shaft. The shaft shall be included in the unit price bid.

E22.4 All Work in this section is incidental to the unit price bid for remove and dispose of catch basin.

E23. CONSTRUCTION OF LAND DRAINAGE SEWERS

E23.1 Description

E23.1.1 The Work of this section comprises the furnishing of all labour equipment and materials incidental and required to complete the construction of the Land drainage Sewers and lowering of one existing catch basin as shown on the drawings and hereinafter specified.

E23.2 Construction of Land Drainage Sewers

E23.2.1 Further to Specification CW 2030-R4, CW 2130-R5, CW 2131-R3, CW 2160-R4, and CW2410-R1 the Contractor shall supply and install land drainage sewers, catch basins and the connection to the existing LDS sewer as shown on the drawings and in accordance with the Specifications.

E23.2.2 All land drainage sewers shall be installed by coring below granular areas and within 1.5m of existing or proposed pavement or structures and as shown on the drawings. All costs for coring are incidental to the Contract Unit Price per linear meter for "Supply and install 250mm diameter LDS pipe."

E23.2.3 Catch basins shall be in accordance with SD-225 with modification as required for flow through catch basins.

E23.2.4 Contractor shall lower one existing catch basin as shown on the drawings in accordance with City of Winnipeg specifications and details.

E23.2.5 All access shaft backfill in granular areas and within 1.5m of existing or proposed pavement shall be Class 2 Backfill compacted to 100% standard proctor density in maximum 150mm thick lifts. The Top section shall be constructed as shown on the Drawings and/or as directed by the Contract Administrator.

E23.3 Method of Measurement

- E23.3.1 Supply and Install 250mm dia. and 200mm dia. LDS pipe will be measured on a lineal metre basis. The lineal metres to be paid for shall be the total number of lineal metres that are installed in accordance with this Specification and accepted to the Contract Administrator, as computed from measurements made by the Contract Administrator.
- E23.3.2 Supply and Install Catch Basin will be measured on a per unit basis. The number of units to be paid for shall be the total number of units completed in accordance with this Specification and accepted to the Contract Administrator, as computed from measurements made by the Contract Administrator.
- E23.3.3 Lower existing catch basin will be measured on a per unit basis. The number of units to be paid for shall be the total number of units completed in accordance with this Specification and accepted to the Contract Administrator, as computed from measurements made by the Contract Administrator.
- E23.3.4 Connection to existing City of Winnipeg LDS sewer will be measured on a per unit basis. The number of units to be paid for shall be the total number of units completed in accordance with this Specification and accepted to the Contract Administrator, as computed from measurements made by the Contract Administrator.
- E23.4 Basis of Payment
- E23.4.1 Supply and Install 250mm dia. and 200mm dia. LDS pipe will be paid for at the Contract Unit Price per lineal metre for "Supply and Install 250mm dia. LDS pipe" and "Supply and Install 200mm dia. LDS pipe", 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.
- E23.4.2 Supply and Install Catch Basin will be paid for on a per item basis, for "Supply and Install Catch Basin c/w frame, cover and connections to LDS pipe", 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.
- E23.4.3 Lower Existing Catch Basin will be paid for on a per item basis, for "Lower Existing Catch Basin, 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.
- E23.4.4 Connection to existing City of Winnipeg LDS sewer will be paid for on a per item basis, 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.

E24. MATCHING EXISTING GRADES

- E24.1 Wherever the proposed paving, or sod meets existing building edge, doorway, or property line, the Contractor shall construct the proposed element to an acceptable grade, as directed by the Contract Administrator, to ensure that proper drainage and accessibility are maintained.

E25. CONSTRUCTION FACILITIES AND STAGING

- E25.1 The Contractor shall be responsible for providing his own storage and handling of all his/her construction operations. The use of public right-of-ways will not be allowed.

E26. CAST-IN-PLACE CONCRETE

- E26.1 Description

- E26.1.1 The Work of this section comprises the furnishing of all labour, equipment and materials required to complete the supply and installation of cast-in-place concrete wading pool paving, bases for water spray equipment, footings for site furniture and edging for play area as shown on the drawings and as hereinafter specified, including, but not necessarily confined to the following:
- (a) Stamped Shop Drawings (stamped by registered structural engineer) for all piles, bases and footings. Submit for review and approval by the Contract Administrator prior to construction.
 - (b) Excavation
 - (c) Granular Fill work as required
 - (d) Supply, erection and removal of all formwork as required
 - (e) Design of concrete mixes
 - (f) Supply, placing and curing of concrete for wading pool paving, bases, footing and edger as follows:
 - i) Reinforced concrete wading pool paving
 - ii) Reinforced concrete bases for spray equipment
 - iii) bases for benches and waste receptacles
 - iv) 150mm wide edging around play area
 - (g) Co-ordination of the installation of all electrical and other items to be installed in the concrete works by other trades.
 - (h) Detailing, supply and placing of reinforcing.
 - (i) Supply and installation of all other reinforcing and concrete required and not supplied by other sections.
 - (j) Finishing of all surfaces as specified including: wading pool slab, and edger.
 - (k) Supply and installation of all joint material in concrete work.
 - (l) Supply and installation of Waterstops and Polyethylene Vapour Barriers.
 - (m) Co-ordination of the installation of all mechanical and other items to be installed in the concrete works by other trades.
 - (n) Supply and installation of all other reinforcing and concrete required and not supplied by other sections.
 - (o) Waterproof seal all cuts, cracks, etc in Concrete Pool Surface.
 - (p) Clean-up.
- E26.1.2 The following items of Work are specified under other sections of the specifications and are not included in this section:
- (a) Supply of miscellaneous metal anchors, bolts, inserts, etc.
- E26.2 Materials
- E26.2.1 All concrete work shall be in accordance with CAN3-A23.1-Concrete Materials and Methods of Concrete Constrictions. Proportion normal density concrete in accordance with CAN3-A23.1 to govern the following properties.
- E26.2.2 Concrete for cast-in-place pavement, wading pool paving and edger shall be as follows:
- Cement: Type 50
 - Max. Coarse Aggregate: 20mm
 - Min. Compressive Strength at 28 days + 35 Mpa

Min. Cement Content: 310 kg/cu.m
Max. Water Cement Ratio: 0.45
Class of Exposure: C-2
Max. Slump: 90mm ± 20mm
Air Content: 5 to 8%
Flyash Content: Max 15% of Cementitious Material

E26.2.3 Concrete for cast-in-place bases for water spray equipment as follows:

Cement: Type 50
Max. Coarse Aggregate: 40mm
Min Compressive Strength at 28 days = 25 Mpa
Min. Cement Content: 310 kg/cu.m
Max. Water Cement Ratio: 0.45
Class of Exposure: S-2
Max. Slump: 90mm ± 20mm
Air Content: 4 to 7%
Flyash content: Max 15% of Cementitious Material

E26.2.4 Fine aggregate shall consist of natural sand or manufactured sand and shall conform to all requirements of CAN3.A23.1.

E26.2.5 Coarse aggregate shall consist of hard, strong, uncoated durable particles of crushed stone, gravel or approved combination thereof and shall be free from an excess of thin, elongated or soft pieces, frozen lumps, vegetable matter or other deleterious matter, and shall conform with all the requirements of CAN3-A23.1. Maximum size of coarse aggregate shall be 20 mm.

E26.2.6 Water for concrete shall be clean and free from injurious amounts of oil, acid, alkali, salts, silt, organic matter or other deleterious matter. The quality of the water shall be equal to or better than that of potable water.

E26.2.7 A non-detergent type of air-entraining admixture, supplied in liquid form, shall be metered into the mix. The total air in the placed concrete shall be 5% - 8%.

E26.2.8 Reinforcing steel shall be grade 300 deformed bars or as noted on the Drawings. Detailing of reinforcing steel shall be in accordance with ACI 315. All bars which require bending shall be bent in shops.

E26.2.9 All reinforcing steel shall be straight, clean and free from paint oil, mill scale, excess rust and any injurious defects which may affect its strength or bond.

E26.2.10 Ends of reinforcing steel intended for bonding that are to be left exposed for some time shall be protected from injury, oils or moisture.

E26.2.11 Curing compound shall be Sternson ritcure or approved equal.

E26.2.12 Bonding agent shall be Sternson ST 431 Epoxy Bonding Agent.

E26.2.13 Form Coating Shall be Sternson's Formseal or approved equal.

E26.2.14 Waterstops shall be 150 mm DURAJOINT polyvinyl chloride waterstops by Sternson Construction Products or approved equal.

E26.2.15 Wading pool coating to be Olympic Zeron Epoxy Pool Coating in Ice Blue as supplied by Krevco. Contact Mark Hawkins at 489-1499.

E26.2.16 The Contract Administrator may engage a fully qualified Inspecting Engineer and Testing Laboratory to:

- (a) Inspect the pile excavations to determine that they have been augured to the specified depth, are of the specified size, are clean and level, and meet the design criteria.

- (b) Take test cylinders during concrete placing and carry out compression tests to determine whether concrete produced complies with these Specifications.
- (c) Take compaction tests of compacted granular sub-base and sub-grade material.
- (d) Submit reports to the Contract Administrator of all materials, concrete, and caisson tests and inspections.
- (e) Three concrete test cylinders to be taken for pile cast. One cylinder from each group shall be tested at 7 days, one at 14 days and the remainder at 28 days. Sampling and testing procedures shall be according to CAN3-A23.1 latest edition.

E26.3 Excavation for Piling

- E26.3.1 Excavation for piles shall be done by augering to the sizes shown on the Drawings. Water jetting methods of excavation will not be permitted. The bearing surface shall be inspected and any loose material shall be cleaned out prior to casting concrete.
- E26.3.2 If, in the opinion of the Contract Administrator, casing is required to prevent the sides of the augered hole from sloughing in the casing shall be supplied and installed, at no cost to the City. Sleeving will not be allowed for piles less than 600 mm diameter.
- E26.3.3 The diameter of casing supplied shall be equal to the specified diameter of the foundation being constructed. If required, overboring shall be carried out to allow the installation of the casing, if so approved by the Contract Administrator. No additional payment will be made for overboring. The casing shall be designed to withstand installation, withdrawal and earth pressure forces. The casing shall be withdrawn as the concrete is poured ensuring that the casing is at least 1 metre below the top of the freshly placed concrete until all concrete in the foundation is placed.
- E26.3.4 The pile excavation shall be kept dry at all times. The Contractor shall have on hand sufficient pumps to satisfy this requirement.
- E26.3.5 Rocks or boulders hindering the continuation of drilling shall be removed in whole or part, using approved methods.
- E26.3.6 If the excavation for the pile varies from the location shown on the drawing by more than 75 mm (3"), the excavation shall be enlarged so that the centreline of the reinforcing cage is within 75 mm (3") of its specified location and 75 mm (3") of concrete cover to the reinforcing steel is maintained.

E26.4 Pile Concrete Work

- E26.4.1 The pile concrete shall be cast no later than 24 hours after the excavation has been completed.
- E26.4.2 The reinforcing cage shall be placed in the pile excavation prior to starting the concreting. Spacers shall be provided to keep the reinforcing cage in its correct location.
- E26.4.3 Reinforcing cage shall be placed in the pile excavation prior to starting the concreting. Spacers shall be provided to keep there enforcing cage in its correct location.
- E26.4.4 Reinforcement shall be clean, and free from all coatings, including ice, loose rust, dried concrete, which tend to reduce bond.
- E26.4.5 Reinforcement shall be formed accurately and secured in pile shaft and to required ties and spacers with annealed wire ties or suitable clips so that position and concrete cover, as called for on drawings is assured.
- E26.4.6 Vertical or bent bars shall extend above the top of pile shaft as shown to provide anchorage for the grade beam.

- E26.4.7 Reinforcing bars kinked, twisted, bent past a right angle, or reduced in cross section, will be rejected.
- E26.4.8 Concrete consistency shall be such that concrete works readily into corners and around reinforcement without segregation of materials or the collection of free water on the surface.
- E26.4.9 Do not place concrete until piles, shafts, and/or bells have been inspected.
- E26.4.10 Place concrete using "elephant trunk" or special chutes which will prevent segregation of materials, ensure a practically continuous flow of concrete at the delivery end, and limit the vertical height of free fall of the concrete to 3 metres.
- E26.4.11 Concrete placing shall be continuous from bottom to top of pile or caisson, and puddling or rodding carried on constantly to bring air bubbles to the surface and produce a uniform, homogeneous structure.
- E26.4.12 Mechanical vibration shall be carried out continuously during placing of concrete in piles.
- E26.4.13 Work concrete completely around reinforcement by rodding, spading and mechanical vibration. Vibrators shall vibrate at not less than 5000 impulses per minute and shall be operated by personnel experienced and qualified in their use.
- E26.4.14 Finish exposed pile tops smooth and level at elevations shown on Drawings. Form top of pile or shaft as required.
- E26.4.15 Concrete shall be kept moist for at least the first 7 days after placing and the temperature of the concrete maintained above 10°C during this time.
- E26.4.16 If upper soil stratum is dry and there is danger of the concrete losing moisture thereto, water shall be added to the soil by forming a depression around the pile top and pounding continuously for a period of 7 days.
- E26.4.17 Whenever the temperature of the surrounding air is below or is likely to fall below 5°C during the 4 day period immediately following concrete placing, artificial heating, housing and/or protective covering shall be provided for the pile tops to maintain concrete temperature at or above 10°C.
- E26.4.18 No dependence shall be placed on salt or other chemicals for the prevention of freezing.
- E26.5 Placing of Concrete for Wading Pool Paving
- (a) Placing of concrete shall be in accordance with CAN3-A23.1
 - (b) No concrete shall be placed until formwork, insulation, reinforcing steel, sleeves, hangers, anchors, inserts, etc., required to be built into the concrete have been inspected by the Contract Administrator.
 - (c) Before placing concrete on bearing strata, notify the Contract Administrator so that she may make an inspection of the exposed bearing surface.
 - (d) No concrete shall be placed in water or upon frozen surfaces.
 - (e) Before placing any concrete, all debris shall be removed, forms shall be thoroughly oiled except where form oil will be detrimental to the finished surface. Equipment shall be cleaned or of hardened concrete and foreign material.
 - (f) All concrete shall be thoroughly vibrated during pouring. Precautions shall be taken to prevent separation or loss of ingredients while transporting the concrete. At no time shall concrete be allowed to a free fall of more than 1.5 m.
 - (g) Conveying equipment shall be on temporary runways built over the floor system and runway supports shall not bear upon the fresh concrete.

- (h) Placement of concrete shall be carried out as a continuous operation until the placing of an individual section is completed. Concrete shall be carefully worked around reinforcement and embedded fixtures, along surfaces and into corners of forms. Vibrators shall be used, and operated under experienced supervision; forms must be constructed to withstand their action.

E26.5.1 The Contractor is advised that no joints will be allowed in the slab except as directed on Site in conjunction with the Contract Administrator.

E26.6 Construction Joints

E26.6.1 Location of construction joints to be determined on Site in conjunction with the Contract Administrator.

E26.6.2 All joint shall be complete with a Waterstop and additional reinforcing as shown on the Drawings. No additional joints will be allowed in paving and slabs except as shown on the drawings.

E26.6.3 No joints will be allowed in the wading pool slab except as shown on the drawings.

E26.6.4 All joints in apron slab/sidewalk shall be sawcut at approximately 1.5 m intervals as directed by the Contract Administrator on Site.

E26.6.5 Cold Weather Concreting

E26.6.6 The protection of concrete and concreting operations during cold weather shall be in accordance with CSA A23.1

E26.6.7 Equipment for heating concrete after placement must be in operation before pouring is commenced. Provide sufficient thermometers to be placed in accordance with the Contract Administrator's instructions. Tarpaulins shall not be placed directly on the surface of slabs. Indirect light units only shall be used.

E26.7 Curing and Protection

- (a) Curing shall immediately following the finishing operation as in CSA A23.1, Section 18 and shall continue for a minimum of five (5) days at 10°C.
- (b) When the outside temperature is less than 4°C. the temperature of the concrete shall be maintained between 10°C. and 21°C. for the required curing period.
- (c) When heat required for curing is being removed, the maximum temperature change shall not exceed 2.5°C. per hour or 27°C., in any 24 hour period.
- (d) Unless adequate protection is provided, no concrete shall be placed during rain, sleet or snow.
- (e) Rainwater shall not be allowed to increase the mixing water nor damage the surface finish.

E26.8 Finishing of Pavement

- (a) All pavement shall be finished by a speciality concrete finishing subcontractor.
- (b) The size of finishing crews shall be planned with due regard for the effects of concrete temperatures and atmospheric conditions on the rate of hardening of the concrete.
- (c) Finishes shall be as follows:
 - (a) Wading Pool Paving - Light Brown Finish to match finish of existing pool surface finish

E26.9 Sandblast Concrete Pool Surface

E26.9.1 The new concrete slabs shall cure 28 days prior to sandblasting of concrete pool surface. The Contractor shall sandblast concrete pool surface by method approved by the Contract Administrator. The Contractor must protect all adjacent surfaces, structures, etc. from

damage during sandblasting operations. The finished surface of the pool must be clean and free of all old paint, etc. to the satisfaction of the Contract Administrator

E26.10 Waterproof Seal Cuts and Cracks

E26.10.1 Following completion of sandblasting operations to the satisfaction of the Contract Administrator, the Contractor shall chase all cracks in the pool surface. The Contractor shall then waterproof seal all cuts and cracks, with a sealant approved for use in wading pools, as per manufacturers specifications. Sealant must be approved by the Contract Administrator prior to application

E26.11 Paint on pool coating around edge of wading pool. Extend paint to surface of pool on vertical face of pool edge. Coating to be applied at a rate of 3 sq.m /litre (125 sq.ft./gal).

E26.12 Clean up and Damage

E26.12.1 Immediately on completion of all piles and foundations Contractor shall remove from Site all equipment, timbers, shores, excavated material, unused concrete, rubbish, etc., caused by his operations, and leave the Site clean, level and ready for placing of grade beams.

E26.12.2 This Contractor shall be responsible for making good all areas damaged by his operations in connection with this Contract regardless of the limits of the Contract as shown on the Drawings.

E26.13 Method of Measurement

E26.13.1 Reinforced concrete wading pool paving shall be measured on an area basis. The area to be paid for shall be the total number of square metres of Reinforced concrete wading pool paving placed in accordance with this Specification and the Construction Drawings, as determined by the Contract Administrator.

E26.13.2 C.I.P. concrete bases for water spray park elements shall be measured on a per item basis. The area to be paid for shall be the total number of units placed in accordance with this Specification and the Construction Drawings, as determined by the Contract Administrator.

E26.13.3 Concrete edger for play stone area shall be measured on a lineal metre basis. The length to be paid for shall be the total number of metres of concrete edger placed in accordance with this Specification and the Construction Drawings, as determined by the Contract Administrator.

E26.13.4 Waterproof seal all cuts, cracks etc. in wading pool shall be measured on a lineal metre basis. The length to be paid for shall be the total number of metres of concrete edger placed in accordance with this Specification and the Construction Drawings, as determined by the Contract Administrator.

E26.13.5 Pool coating shall be measured on an area basis. The area to be paid for shall be the total number of square metres of pool coating applied in accordance with this Specification and the Construction Drawings, as determined by the Contract Administrator.

E26.13.6 C.I.P. concrete bases for site furniture shall be measured on a per item basis. The area to be paid for shall be the total number of units placed in accordance with this Specification and the Construction Drawings, as determined by the Contract Administrator.

E26.14 Basis of Payment

E26.14.1 Reinforced concrete wading pool paving will be paid for at the contract unit price per square metre for "Supply and Install Reinforced concrete wading pool paving" 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.

- E26.14.2 C.I.P. concrete bases for water spray park elements will be paid for at the contract unit price for "Supply and Install C.I.P. concrete bases for water spray park elements" 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.
- E26.14.3 Concrete edger for play stone area will be paid for at the contract lineal metre price for "Supply and Install Concrete edger for play stone area" 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.
- E26.14.4 Waterproof seal all cuts, cracks etc. in wading pool will be paid for at the contract lineal metre price for "Waterproof seal all cuts, cracks etc. in wading pool" 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.
- E26.14.5 Pool coating will be paid for at the contract unit price per square metre for "Supply and Install pool coating" 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.
- E26.14.6 C.I.P. concrete bases for site furniture will be paid for at the contract unit price for "Supply and Install C.I.P. concrete bases for site furniture" 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.

E27. CONCRETE SIDEWALK PAVING

- E27.1 The contractor shall refer to City of Winnipeg Specification CW 3325-R2 for the construction of all sidewalk paving on Site.
- E27.2 Compacted granular base course to be incidental to the unit price bid for concrete sidewalk.
- E27.3 Method of Measurement
- E27.3.1 Concrete sidewalk paving shall be measured on an area basis. The area to be paid for shall be the total number of square metres of Concrete Sidewalk placed in accordance with this Specification and the Construction Drawings, as determined by the Contract Administrator.
- E27.4 Basis of Payment
- E27.4.1 Concrete Sidewalk Paving will be paid for at the contract unit price per square metre for "Supply and Install Concrete Sidewalk" 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 including supply and install topsoil and sod in areas disturbed by construction.

E28. CRUSHED LIMESTONE PATHWAY

- E28.1 Description
- E28.1.1 Further to CW 3410 and CW 3110 the Work of this section comprises the furnishing of all labour, equipment and materials incidental and required to complete the construction of limestone pathway as shown on the drawings and as hereinafter specified, including but not necessarily confined to:
- (a) Construction of Crushed Limestone Pathway, including supply and installation of base courses as shown on the Drawings.
 - (b) Supply and Installation of Snap Edge for Seating areas

E28.2 Related Work

E28.2.1 Excavation, Removals and Site Grading

E28.2.2 Topsoil & Finish Grading

E28.2.3 If materials have been tested by an independent testing laboratory within previous 2 months and have successfully passed tests equal to requirements of this specification, submit test certificates from testing laboratory showing suitability of materials for this project.

E28.3 Materials

E28.3.1 Crushed granular material to the following requirements:

- (a) 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;
- (b) Crushed limestone consisting of hard, durable, angular particles, free from clay lumps, cementation, organic material, frozen material and other deleterious materials.
- (c) Granular Levelling Course - Gradations to be within limits specified below when tested to ASTM C136-83 and have a smooth curve without sharp breaks when plotted on semi-log grading chart;

<u>ASTM Sieve Designation</u>	<u>% Passing</u>
20mm (3/4")	100
12.5mm (1/2")	50-75
9.5mm	30-50
6.0mm	10-20
0.425	0-5
0.18	nil
0.075	nil

- (d) Granular Base Course – 2" (50mm) down limestone
- (e) Crushed Limestone Fines – 1/4" (6mm) down.
- (f) Edging to be Snap Edge. Supplied and installed as per manufacturer's specifications, including all installation hardware.

E28.4 Subgrade Inspection

- (a) Verify grades of compacted subgrade (to 100% SPD) for conformity with elevations and sections before placing granular material.
- (b) Proof roll graded subgrade to check for unstable areas, obtain approval of subgrade by Contract Administrator before placing granular base.
- (c) Remove and dispose of unsuitable sub base material as directed by Contract Administrator.

E28.5 Placement and Compaction of Granular and Crushed Limestone

- (a) Place crushed granular base course material (stockpiled and new as required) to a minimum compacted thickness of 6" (150mm). Compact to 100% standard proctor density.
- (b) Place crushed granular levelling course material to a minimum compacted thickness of 2" (50mm). Compact to 100% standard proctor density.
- (c) Crushed Limestone fines to a minimum compacted thickness of 2" (50mm) as finishing course. Compact to 98% standard proctor density.

- (d) Add crushed granular material as required to replace unsuitable subgrade material. Place in layers not exceeding 8" (200mm) thickness and compact to 98% standard proctor.
- (e) Compact subgrade to min. 98% standard proctor density.
- (f) Finished surface to be within ½" (12mm) of specified grade, but not uniformly high or low. Ensure positive drainage on paved areas and in adjacent sodded areas.

E28.6 Edging

- E28.6.1 Install Snap Edging true to grade in location as indicated and as per manufacturer's specification.

E28.7 Field Quality Control

- E28.7.1 Inspection and testing of crushed stone paving will be carried out by designated testing laboratory, cost of testing to be paid for by cash allowance as directed by the Contract Administrator.

E28.8 Acceptance

- E28.8.1 Any Work not satisfactory as specified herein and as determined by the Contract Administrator for initial testing, shall be rectified by the Contractor. This process of inspection and correction shall continue until the Contract Administrator is satisfied that the Work is 100% complete and as per the construction drawings and specifications. All additional tests for failed or unacceptable results will be borne solely by the Contractor.

E28.9 Method of Measurement

- E28.9.1 Crushed Limestone Pathway shall be measured on a cubic metre basis. The area to be paid for shall be the total number of cubic metres of base course (50mm down limestone), levelling course (20mm down limestone), and crushed limestone fines and stockpiled limestone base course placed in accordance with this Specification and the Construction Drawings, as determined by the Contract Administrator.
- E28.9.2 Snap Edge shall be measured on a lineal meter basis. The lineal meter to be paid for shall be the total number of linear meter of Snap Edge placed in accordance with this Specification and the Construction Drawings, as determined by the Contract Administrator.

E28.10 Basis of Payment

- E28.10.1 Crushed Limestone Pathway will be paid for at the contract unit price per cubic metre for "Supply and Install Limestone Base Course, Limestone Levelling Course and Crushed Limestone Fines" and "Install Stockpiled Limestone Base Course" 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 including supply and install topsoil and sod in areas disturbed by construction.
- E28.10.2 Snap Edge will be paid for at the contract unit price per lineal metre for "Supply and Install Snap Edge for Seating Area" 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.

E29. FENCING

E29.1 Description

- E29.1.1 Further to CW 3550 specification for Commercial Grade Chain Link Fencing this specification shall cover the following:
 - (b) 1200mm height chain link fencing

- (c) 3000mm height chain link fencing (new posts, salvaged mesh)
- (d) Fence posts, rails, stretcher bars and mesh are as per manufacturer's specifications.
- (e) Supply and Install wood bollards

E29.2 Installation

E29.2.1 Measure length of fencing to be installed prior to construction. Prefabricate chain link mesh. Install posts as per manufacturer's and City of Winnipeg specifications. Install manufacturer's standard fittings, fasteners and hardware as required. Install gates in locations shown on Drawings. Fence posts to be installed in the ground as per manufacturer's and City of Winnipeg specifications.

E29.2.2 Wood bollards to be installed as per the drawings.

E30.1 Method of Measurement

E29.2.3 1200mm Ht. and 3000mm Ht. Chain Link Fencing shall be measured on a linear metre basis. The numbers to be paid shall be the total number of lineal metres constructed in accordance with the Drawings and Specifications and as measure and accepted by the Contract Administrator.

E29.2.4 Wood Bollards shall be measured on a per unit basis. The numbers to be paid shall be the total number of units installed in accordance with the Drawings and Specifications and as measure and accepted by the Contract Administrator.

E29.3 Basis of Payment

E29.3.1 Supply and install 1200mm ht. chain link fence will be paid for at the contract unit price per lineal metre for "Supply and install 1.2m height Chain Link Fence" 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.

E29.3.2 Supply and install 3000mm ht. chain link fence will be paid for at the contract unit price per lineal metre for "Supply and install 3m height Chain Link Fence" 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.

E29.3.3 Supply and install wood bollards will be paid for at the contract unit price for "Supply and install 200mm wood bollards" 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.

E30. SPORTS/PLAY EQUIPMENT

E30.1 Description

E30.1.1 The Work of this section comprises the furnishing of all labour, equipment and materials required to complete the supply and installation of sports and play equipment as follows:

- (a) Two sets of Mini Soccer Goals (including mark lines for soccer field to City of Winnipeg standards)
- (b) One Junior Play Structure with components as per drawings and as specified herein
- (c) One Senior Play Structure with components as per drawings and as specified herein
- (d) One 3-Bay Swing Set with Tot and belt swings
- (e) Concrete foundations for all play equipment as per manufacturer's recommendations (including stamped structural details). This Work is incidental to cost of supply and install all play equipment listed above.

- (f) Impervious seal around all inground components (incidental to cost of supply and install sports equipment listed above)

E30.1.2 This Work will not include the pre-installation site preparation Work or perimeter edging. However, co-ordination with staff and/or contractors carrying out these Works shall be necessary.

E30.2 General

E30.2.1 The Contractor shall furnish all labour, materials, equipment and services necessary to complete the Work according to the drawings and specifications.

E30.2.2 This specification shall cover the supply and installation of playground equipment as shown on the attached detail and layout drawings as specified herein.

E30.3 Materials

E30.3.1 Posts / Caps

- (a) All posts shall be a minimum of 5" O.D. round or 4" square tubing. All posts shall be fabricated from either aluminum (0.125" min. wall thickness) or galvanized steel (0.120" min. wall thickness) tubing with a baked-on polyester powder coating. The powder coating finish shall meet or exceed ASTM standards for hardness, adhesion, impact and salt spray resistance. Colour scheme as per Detail drawings. All fabrication cuts drill holes and weld joints shall be sprayed with a corrosion resistant coating prior to powder coating. The bottom end of the posts is to be sealed with a moisture barrier.
- (b) Top caps for posts shall be aluminium die cast and powder coated the same as the post colour. All caps shall be factory installed and secured in place with tamper proof, self-sealing rivets.

E30.3.2 Decks

- (a) All decks shall be manufactured from vinyl-coated perforated steel.

E30.3.3 Clamping System

- (a) All deck, rail and play component clamping systems shall be fabricated from zinc plated, and galvanized steel, stainless steel or aluminum, and baked-on polyester powdercoated to match post colour unless noted on Detail drawings. Tamper proof, corrosion resistant fasteners shall be used to retain clamping systems.

E30.3.4 Handrails, Safety Rails and Handloops

- (a) All handrails, safety rails and handloops shall be fabricated using a minimum of 1 1/8" O.D. with a 0.125" wall thickness steel tubing. After all fabrication activities have occurred including end cuts, drill holes, bends and weld joints, all components shall be hot dipped galvanized and baked-on polyester powdercoated. Colours as per Detail drawings.

E30.3.5 Hardware

- (a) All fasteners shall be socketed and tamper proof in design, and either carbon steel plated with zinc/nickel and iridescent chromate finish or stainless steel.

E30.3.6 Poly Components

- (a) Poly components such as slides, hoods, and roofs shall be fabricated from U.V. stabilized, rotationally moulded liner low density polyethylene. All play components must be durable and of heavy duty construction to meet all requirements and specifications.

- (b) Poly components such as play panels shall be fabricated from compression molded solid colour, U.V. stabilized high density polyethylene.

E30.3.7 Sports Components

- (a) Mini Soccer Fields to have ScoreMaster mini soccer goals (2 sets) Model SM-DM-1600-PC

E30.3.8 The following play components, or approved equivalents, are to be included on the GameTime Senior Structure

- (a) One (1) stainless steel Straight Chuter Slide
- (b) Six (6) Toad Stool Seats
- (c) One (1) Loop Ladder Climber
- (d) One (1) Flip Slide with Universal Hood
- (e) Two (2) rung Ladders
- (f) One (1) Offset Archway
- (g) One (1) Bubble Climber
- (h) One (1) 90 degree Loop Climber
- (i) One (1) Corkscrew Climber
- (j) One (1) Cargo net Wall
- (k) One (1) DNA Climber
- (l) One (1) Climbing Pole
- (m) Two (2) 3' ht. Square Platforms
- (n) One (1) 6'ht. Square Platform
- (o) One (1) 5' ht. Triangular Platform

E30.3.9 The following play components, or approved equivalents are to be included on the GameTime Junior Structure

- (a) One (1) Clover Leaf Climber
- (b) One (1) Curved Slide with Universal Hood
- (c) One (1) Fat Pipe Climber
- (d) One (1) Stainless Steel Double Chuter Slide
- (e) One (1) 3' ht. Square Platform

E30.3.10 The following Components or approved equivalents, are to be included on the Swing Set:

- (a) One (1) Triple Bay HD 3-Leg Swing Set
- (b) Two (2) Tot Seats
- (c) Four (4) Belt Seats

E30.4 Source for Soccer Goal Posts:
Crozier Agencies
#8-1865 Sargent Ave..
Winnipeg, MB R3H 0E4
Phone: (204) 774-6084
Fax: (204) 774-6099

E30.5 Colour

- (a) The colours of the playstructures shall be:

Poles: blue
Clamps: blue
Components: red
Plastic: yellow
Accents: red

Canadian Standards Association Guidelines

- E30.6 All playground equipment supplied and the method of installation shall be in accordance with the most recent edition of the "National Standard of Canada, CAN/CSA-Z614-98".
- E30.7 The Contractor shall submit, within two (2) Business Days of request of Contract Administrator, 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.
- E30.8 Installation
- E30.8.1 Install all components as per manufacturer's specifications. Install manufacturer's standard fittings, fasteners and hardware as required. All posts and anchors to be installed in concrete footings as per manufacturer's specification and details. Impervious seal to be applied around all in-ground components, to prevent water seepage, as per manufacturer's specifications.
- E30.8.2 Play structures and Swing Standards shall be installed as per the Canadian Standards Association Guidelines. All posts and other vertical items shall be true to vertical. All decks shall be level

Manufacturer's Shop Drawings and Specifications

- E30.9 The Bidder shall submit, THREE (3) COPIES of the manufacturers' shop drawings and specifications for all the play equipment for review, evaluation and approval purposes within five (5) Business Days of award of Contract. One (1) approved copy will be returned to the successful bidder. Shop drawings shall be drawn to scale and include all components, proposed layout and dimensions.
- E30.10 Review of the shop drawings in no way relieves the Contractor of the final responsibility for correctness of the dimensions, sizes, fabrication details, errors made therein, or for any changes made by the Contract Administrator's drawings or specifications not covered by the Contractor's written notification to the Contract Administrator. No reprint of the Contract Administrator's drawings shall be used as the shop drawings.
- E30.11 Concrete Foundations
- E30.11.1 All playground equipment posts, bases 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. All foundations are to be stamped by a Structural Engineer licensed to practice in the province of Manitoba.
- E30.11.2 The specific concrete requirements shall be:
Sulfate resistant, Type 50 Cement
28 day compressive strength of 30 Mpa
maximum aggregate size of 40mm, nominal
slump 90 20mm
maximum water/cement ratio 0.45

E30.11.3 No separate payment will be made for concrete foundation for play equipment. All Work is incidental to the unit prices bid for the items.

E30.11.4 Installation

- (a) Contractor shall notify the Contract Administrator at least 48 hours prior to installation of concrete, so that footings may be inspected in advance of concrete being poured.
- (b) Play structure posts shall be centered in concrete footing with a minimum 200mm band of concrete on all sides.
- (c) Concrete Bases shall be buried below the top of the protective surfacing and have top corners rounded and all rough edges removed according to CSA standards
- (d) Concrete Bases shall be sized appropriately to withstand constant stresses and prevent any shifting of the components. Bidders shall be prepared to supply detailed dimension and specification for the concrete foundations/footings for all components.

E30.12 Maintenance Kits

E30.12.1 All play equipment 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 equipment, and all special tools necessary for assembly and maintenance.

E30.13 Method of Measurement

E30.13.1 Supply and installation of sports /play equipment and bases shall be measured on a per unit basis. The number of units to be paid shall be the total number of units supplied and installed in accordance with the Specifications and accepted by the Contract Administrator, as computed from measurements made by the Contract Administrator.

E30.14 Basis of Payment

E30.14.1 Supply and Installation of sports equipment shall be paid for on a per item basis as follows:

- (a) Supply and Install Mini Soccer Goals
- (b) Supply and Install Junior Play Structure
- (c) Supply and Install Senior Play Structure
- (d) Supply and Install Swing Set

Measured as specified herein, which price shall be payment in full for supplying all materials (including concrete foundations) and performing all operations herein described and all other items incidental to the Work included in this Specification.

E31. PLAYGROUND STONE

E31.1 Description

E31.1.1 The Work comprises the furnishings of all labour, equipment services and materials required to complete the installation of playground stone within the play structure/swing areas as indicated on the drawings. This Work will not include the pre-installation site preparation work or perimeter C.I.P. concrete edging. However, co-ordination with staff and/or contractors carrying out these Works shall be necessary.

E31.2 General

E31.2.1 Contractor shall visit the Site and verify all data and dimensions and report any errors, omissions or discrepancies to the Contract Administrator prior to any installation.

E31.3 Material

E31.3.1 Playground stone shall be 6mm, composition shall be Typical Birds Hill glacial till material, approximately 70% limestone and 30% granite. Stone shall be washed and screened.

Sieve Analysis:

Sieve Size	Cumulative % Passing
10 mm	100
5 mm	80-90
2.5 mm	5-25
1.25 mm	2-15
.08 mm	0-1

E31.4 Construction Methods

E31.4.1 Playground Stone shall be installed within all the play areas, as defined by the concrete edging, to a minimum installed compacted depth of 250mm (min.300mm in area of senior play structure).

E31.4.2 The installation of the Playground Stone shall be done immediately after the play structure has been installed.

E31.4.3 Installation shall be done by equipment sized to suit the work being done and the stone 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 required after installation of the stone

E31.4.4 Playground stone to be installed as per play equipment manufacturers specifications and as directed by Contract Administrator on Site.

E31.5 Method of Measurement

E31.5.1 Playground Stone will be measured on a volume basis. The quantity to be paid for will be the actual number of cubic meters supplied and installed in accordance with this Specification and accepted by the Contract Administrator, as computed from the measurements made by the Contract Administrator.

E31.6 Basis of Payment

E31.6.1 Playground Stone shall be paid for at the Contract Unit Price per cubic meter for 'Supply and Install 6mm washed playground stone' 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.

E32. WATER SPRAY PARK EQUIPMENT

E32.1 Source:

E32.1.1 Source for all Spray Park Equipment
Playgrounds-R-Us
Winnipeg, Manitoba
Tel (204) 632 7000
Fax (204) 632-7421

E32.2 Materials:

E32.2.1 Spray Equipment includes:

- (a) 1 Vortex Water Trio spray event – model# VOR-0100
- (b) 1 Vortex Spiral Column model # VOR-0504
- (c) 1 Vortex Cattail model # VOR-0514

- (d) 1 Vortex Bull Frog model # VOR-0523
- (e) 1 Magic Touch Bollard model # VOR-0600
- (f) 1 Output Controller 120V model # VOR-0710 10
- (g) 1 Valve Wall Mounted Manifold model # VOR-0804 4

E32.3 Installation

E32.3.1 Install all components as per manufacturer's specifications. Install manufacturer's standard fittings, fasteners and hardware as required. All posts and anchors to be installed on concrete piles as per manufacturer's specification and details. Impervious seal to be applied around all in-ground components, to prevent water seepage, as per manufacturer's specifications.

E32.4 Method of Measurement

E32.4.1 Supply and installation of water spray park equipment and bases shall be measured on a per unit basis. The number of units to be paid shall be the total number of units supplied and installed in accordance with the Specifications and accepted by the Contract Administrator, as computed from measurements made by the Contract Administrator.

E32.5 Basis of Payment

E32.5.1 Supply and Installation of water spray park equipment shall be at the per unit price bid for each item as follows:

- (a) Water Trio
- (b) Spiral Column
- (c) Cattail
- (d) Bull Frog
- (e) Magic Touch Bollard
- (f) Output Controller 120V
- (g) Wall Mounted Manifold

or approved equivalents, 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.

E33. SITE FURNITURE

E33.1 Description

E33.1.1 This specification covers the supply and installation of:

- (a) Waste Receptacles – Ornamental flat iron slat c/w inserts painted black.
- (b) Tache Style Picnic Table, 2440 x 724mm picnic (#52501102), complete with Galvanized Pipe Stake and cap with Pivot Anchoring System
- (c) Handicap Accessible Tache Style Picnic Table, 2440 x 724mm picnic (#52501108), complete with Galvanized Pipe Stake and cap with Pivot Anchoring System
- (d) 1.82m length Tache Style Wooden Benches with Backs

E33.2 General

E33.2.1 Store units in a protected location, immediately upon arrival on the Site.

E33.2.2 Remove from Site any units which have been damaged during transportation and replace.

E33.3 Products

E33.3.1 Relocate existing site furniture as noted on the drawings to locations as specified by Contract Administrator.

E33.3.2 Picnic Tables: Tache tables (#52501102), including Galvanized Pipe Stake and cap with Pivot Anchoring System) is a custom item as supplied by:

City of Winnipeg
Public Works, Equipment and Material Services,
102 1155 Pacific Ave.
Winnipeg, Manitoba R3E 1G6
Ph: (204) 986-5504 Fax: (204) 783-1248
Attn. Bill Dowbyhuz

E33.3.3 Handicapped Picnic Table (#52501108, including Galvanized Bolted Surface Mounted Anchoring System) is a custom item supplied by:

City of Winnipeg
Public Works, Equipment and Material Services,
102 1155 Pacific Ave.
Winnipeg, Manitoba R3E 1G6
Ph: (204) 986-5504 Fax: (204) 783-1248
Attn. Bill Dowbyhuz

E33.3.4 Wood Benches #525 01 074-1.82m length Tache Style bench with backs as supplied by:

City of Winnipeg
Public Works, Equipment and Material Services,
102 1155 Pacific Ave.
Winnipeg, Manitoba R3E 1G6
Ph: (204) 986-5504 Fax: (204) 783-1248
Attn. Bill Dowbyhuz

E33.4 Installation

- (a) Site Furniture shall be installed in locations as indicated on the Construction Drawings.
- (b) Benches and Waste Receptacles to be installed as per City of Winnipeg Specifications and details.
- (c) Tache Bench SCD 120
- (d) Waste Receptacle SCD 119
- (e) Picnic Tables to be installed as per City of Winnipeg Spec and Details using galvanized pipe stake and cap with pivot anchoring system.
- (f) Handicapped Picnic Table to be installed as per City of Winnipeg Spec and Details using galvanized bolted surface mounted anchoring system.
- (g) Protect and maintain site furnishings, including accessories, until acceptance of project Work.
- (h) Immediately remove from site, damaged furnishing and accessories. Replace, repair, re-finish, or otherwise make good to approval of Contract Administrator.

E33.5 Method of Measurement

E33.5.1 Supply and Installation of site furniture will be measured on a unit basis. The number of each item to be paid for will be the total number supplied and placed in accordance with this Specification and accepted by the Contract Administrator, as measured by the Contract Administrator.

E33.6 Basis of Payment

E33.6.1 Supply and Installation of spray park equipment shall be at the per unit price bid for each item as follows:

- (a) Relocate existing site furniture
- (b) 2.44m length Tache Style Picnic Table
- (c) 2.44m length Handicap Accessible Tache Style Picnic Table
- (d) 1.82m length Tache Style Wooden Benches with Backs

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

E34. SITE LIGHTING

E34.1 Description

E34.1.1 This Specification shall cover the furnishing of labour, new material, equipment and services necessary and reasonably implied and incidental to the complete installation of electrical Work shown on the plans and specification including, but not limited to:

- (a) Wiring, trenching, backfilling and surface repair
- (b) Poles
- (c) Lighting Fixtures, mounting, attachments and lamps.

E34.1.2 Supply and Install all devices required for the complete approved system, operating to the complete satisfaction of the Contract Administrator.

E34.1.3 Contractor is to be responsible for any damage caused by improperly carrying out this contract.

E34.2 Materials

E34.2.1 Trenching, backfilling and surface repair to CW 2030.

E34.2.2 Boyd Park Pathway Refer to Drawings L2, E1 and E2 and

- (a) Minimum wire size #12 AWG for All wiring to be copper, TECK90.
- (b) Post Mounted Luminaire c/w
- (c) P.E.C. – STD VP80-120V-150 S c/w 150W HPS lamp and 6 guards.
- (d) Shroud and Lens Frame: shall made of heavy gage spun aluminum. Removable shroud for easy access to the lamp compartment and the lens frame shall be sealed with a neoprene extrusion gasket, providing a weather tight seal.
- (e) Guards: shall be a one piece cast aluminum having a double curved arm. There are four guards in all.
- (f) Holder: shall be made of cast aluminum and shall slip fit onto a 4" diameter tenon.
- (g) Lens: clear prismatic polycarbonate. I.E.S. distributions are available in types 3 or 5.
- (h) Ballast: factory pre wired and tested. Ballast is mounted on a removable heavy gage galvanized steel tray with quick disconnects for easy installation and replacement. Ballast shall be CWA, CWI, HX or reactor type.
- (i) Socket shall be made of porcelain and shall be medium or mogul base, 4KV pulse rated.
- (j) Finish: Fixtures are finished with an electrostatically applied thermoset polyester powder coat with a rust inhibiting process.

- (k) Colour to be Black.
- (l) All exterior hardware shall be stainless steel.
- (m) Direct bury poles to be to Manitoba Hydro Standard Material Specification Technical Requirements. Poles to be manufactured to meet all applicable CSA standards. Round poles to be galvanized steel, straight poles, as supplied by Martec Manufacturing, installed with 4.88m(16') of the pole above finished grade, circular 125mm (5") O.D. cross section and 125mm (5") inside diameter ground sleeve. Poles shall be supplied with a handhole having a minimum dimension of 100x 180mm c/w 38mm wide x 6mm reinforcing ring. Handholes are to be oriented away from pathway. Refer to L3.2 for pole details. Stamped shop drawings for poles and bases by Martec.

E34.2.3 Electrical contractor shall submit shop drawings to Contract Administrator for review prior to ordering equipment

E34.2.4 Pay all utility contribution charges for associated power services. This is incidental to the cost of supply and installation of Luminaires.

E34.3 Construction Methods

E34.3.1 Co-ordinate locations of all light fixtures and trenches with Contract Administrator prior to construction.

E34.3.2 The entire electrical installation shall comply with the latest edition of the Canadian Electrical Code and with all provincial and municipal laws; rules and ordinances. Prepare and submit to the proper authorities all necessary permits and pay all permit fees.

E34.3.3 Grounding shall be in accordance with the latest edition of The Canadian Electrical Code.

E34.3.4 The Electrical Contractor shall carefully examine all drawings relating to the Work. Report at once to the Contract Administrator any defect, discrepancy, omission or interference affecting the Work of the drawing.

E34.3.5 The Contractor shall coordinate with Manitoba Hydro to determine the required service for new lighting.

E34.3.6 Make all arrangements with Manitoba Hydro and pay all associated hydro costs.

E34.3.7 Install designatory lettering on all electrical equipment.

E34.3.8 Trenching, backfilling and surface repair to CW 2030. Trenching to follow line of pathway. All wiring along pathways is to be 1.0m from edge of pathway in line with lighting. Trenching, backfilling, and surface repair shall be incidental to the cost for installing wiring.

E34.3.9 Prepare and submit to the proper authorities all necessary permits and pay all fees.

E34.3.10 Pay all utility contributions. Provide all accessories.

E34.3.11 All new distribution equipment to match existing.

E34.3.12 Fixtures are to be installed to manufacturer's specifications.

E34.3.13 Supply and install, wire and connect all luminaries (to be complete with lamps) as indicated.

E34.3.14 Max. 2% voltage drop for all wiring.

E34.3.15 Make all arrangements to store and unload equipment.

E34.3.16 Provide a completed "as-built" drawing set to the City of Winnipeg at completion of project, including all trench locations, etc.

- E34.3.17 Electrical installation including electrical equipment supplied, installed or connected shall be tested in the presence of the Contract Administrator on completion of the Work.
- E34.3.18 New distribution is to be c/w 15A2P circuit breaker in a weatherproof lockable enclosure. Provide code conforming ground rods, etc.
- E34.3.19 Direct Bury Poles to be buried 1.8 m (6') below grade as per Manitoba Hydro Standard Material Specification Technical Requirements. Centre of poles to be 1.0 m from edge of pathway.
- E34.3.20 Conduits in direct contact with earth or in concrete shall be rigid PVC. Conduits shall be concealed unless otherwise noted on the drawings. Conduits shall not be exposed in any area where concealed work is required without prior written approval. All wiring shall be in conduit.
- E34.3.21 Junction boxes shall be of size and type to suit the requirements of the application. Junction boxes shall be accessible.
- E34.3.22 The Contractor is to provide wiring to CSA standard and electrical poles. Wire and cable shall be copper of standard AWG sizes with 600V (90 Degree C) insulation. Insulation shall be X-Link Polyethylene unless other wise noted on drawings or prohibited by regulations. Aluminum conductors will not be accepted. Minimum wire size shall be #10 AWG.
- E34.3.23 Circuit breakers shall be bolt-in, moulded-case, thermal and magnetic trip and match existing manufacturer. Trip values as shown on drawing. Two or three pole breakers shall have common trip units. Mount a typewritten directory behind a plastic shield on the inside of panelboard doors. All distribution equipment to be sprinkler-proof and match existing.
- E34.3.24 Any cutting and patching in existing walls or floors required for the addition or relocation of electrical equipment shall be the responsibility of the Electrical Contractor.
- E34.3.25 Equipment and material shall be installed as specified.
- E34.3.26 Upon completion and before final payment is made, present to the Contract Administrator a Certificate of Approval for all electrical Work from the inspection department having jurisdiction.
- E34.3.27 The Contractor shall guarantee the satisfactory operation of all Work and apparatus included and installed under this section for a period of twelve (12) calendar months after the date of Total Performance.
- E34.4 Method of Measurement
- E34.4.1 Supply and Installation of Electrical Trenching, Conduit and Wiring, shall be measured on a lineal metre basis. The number of metres to be paid shall be the total number of metres supplied and installed in accordance with the Drawings and Specifications and as measured and accepted by the Contract Administrator.
- E34.4.2 Supply and Installation of Pedestrian Park Lighting will be measured on a per unit basis. The number of units to be paid shall be the total number of units supplied and installed in accordance with the Drawings and Specifications and as measured and accepted by the Contract Administrator.
- E34.4.3 Connection to Existing Power Source will be measured on a lump sum basis in accordance with the Drawings and Specifications and as measured and accepted by the Contract Administrator.
- E34.4.4 Electrical Work for Water Spray Park Equipment will be measured on a lump sum basis in accordance with the Drawings and Specifications and as measured and accepted by the Contract Administrator.
- E34.5 Basis of Payment

- E34.5.1 Supply and Installation of Electrical Trenching, Conduit and Wiring shall be paid for at the Contract Unit Price per lineal metre for "Electrical Trenching, Conduit Wiring, Backfilling, sod repair, etc.", which price shall be payment in full for supply of all materials and performing all operations herein described and for all other items incidental to the Work included in this Specification.
- E34.5.2 Supply and Installation of the Fixtures will be paid for per unit at the Contract Unit Price for "Supply and Install Pedestrian Park Lighting (including luminaire, pole, shroud, base plate, fasteners, foundation, etc.) which price shall be payment in full for supply of all materials and performing all operations herein described and for all other items incidental to the Work included in this Specification.
- E34.5.3 Connection to Existing Power Source will be paid for on a lump sum basis, which price shall be payment in full for completing all operations herein described and all other items incidental to the Work included in this specification.
- E34.5.4 Electrical Works for Water Spray Park Equipment will be paid for on a lump sum basis, which price shall be payment in full for completing all operations herein described and all other items incidental to the Work included in this specification.

E35. SHRUB BED PREPARATION

E35.1 Description

E35.1.1 The following list generally describes the scope of this Section:

- (a) Cultivate subsoil
- (b) Supply and install planting soil mixture in shrub beds and tree pits
- (c) Supply and install Wood Chip Mulch
- (d) Supply and Installation of Black Diamond Edging

E35.2 Submit to the Contract Administrator samples of the following materials:

- (a) Planting Soil Mixture: 1 kg
- (b) Wood Chip Mulch: 500g

E35.3 Delivery and Storage

E35.3.1 Deliver and store fertilizer in waterproof bags showing weight, analysis and name of manufacturer.

E35.4 Materials

E35.4.1 Planting Soil: For planting of shrubs, and trees, mix imported topsoil with 20% peatmoss loose by volume, and 5% sand loose by volume. Incorporate bonemeal into planting soil at rate of 5 lbs /cu.yd. of soil mixture. Planting soil items to be comprised as follows:

- (a) Peatmoss: horticultural grade Class "A" decomposed plant material, fairly elastic and homogeneous. Free of decomposed colloidal residue, weed, sulphur and iron. To have pH value of 5.9 to 7.0, 60% organic matter by weight, moisture content not exceeding 15% and water absorption capacity of not less than 300% by weight on oven dry basis.
- (b) Bonemeal: shall be raw bonemeal, finely ground with a minimum analysis of 3% nitrogen and 20% phosphoric acid.
- (c) Imported topsoil: natural, fertile, agricultural soil typical of locality, capable of sustaining vigorous plant growth, from well drained site that is free of flooding, not in frozen or muddy condition, not less than 6% organic matter to a maximum 25% organic matter by volume, and pH value of 5.9 to 7.0. Free from subsoil, slag or clay,

stones, lumps, live plants and their roots, sticks, crabgrass, couchgrass, noxious weeds and foreign matter.

(d) Sand: hard, granular natural beach sand, washed free of impurities, chemical or organic matter.

E35.4.2 Fertilizer: commercial type with 50% of the elements derived from organic sources.

E35.4.3 Wood Chip Mulch: varying in size from 50-75 mm and 5-20 mm thick, small branches and leaves; or Shredded wood: varying in size from 25-125mm in length, from coniferous trees.

E35.4.4 Black Diamond Plastic Edging or approved flexible poly edging equivalent.

E35.5 Construction Methods

E35.5.1 Remove debris, broken roots, branches, stones in excess of 50mm diameter and other deleterious materials. Remove subsoil that has been contaminated with oil, gasoline or calcium chloride. Dispose of removed materials as directed.

E35.5.2 Excavate shrub pits to a depth of 400mm as per details on drawing L9 and as per Specification E3.

E35.5.3 Construct tree pits as per details on drawing L5.

E35.5.4 Cultivate entire area of shrub bed bottom to 100mm depth.

E35.5.5 Do not spread planting soil mixture until Contract Administrator has inspected sub-grade.

E35.5.6 Spread planting soil mixture with adequate moisture in uniform layers during dry weather over approved, dry, unfrozen sub-grade, where planting is indicated.

E35.5.7 Bring planting soil mixture up to 100 mm finished grade in shrub beds.

E35.5.8 Remove stones, roots, grass, weeds, construction materials, debris and foreign non-organic objects from soil mixture.

E35.5.9 Spread fertilizer at manufacturer's recommended rate of application. Mix fertilizer thoroughly into upper 50mm of planting soil.

E35.5.10 Fine grade entire planting soil area to 100mm below level of Pathway or adjacent sodded area. Eliminate rough spots.

E35.5.11 Compact planting soil to leave surface smooth, uniform, firm against deep foot printing, with a fine, loose texture. Tolerance: plus or minus 15mm of design grade.

E35.5.12 Supply and install 100mm Wood Chip Mulch in tree pits and shrub beds.

E35.5.13 Supply and Install flexible poly edging as per Manufacturer's Specifications.

E35.6 Method of Measurement

E35.6.1 Supply and Install Shrub Bed shall be measured on an area basis. The area to be paid for shall be the total number of square metres in place in accordance with this Specification acceptable to the Contract Administrator, as computed from measurements made by the Contract Administrator.

E35.6.2 Supply and Install flexible poly edging shall be measured on a lineal metre basis. The length to be paid for shall be the total linear metres in place in accordance with this Specification acceptable to the Contract Administrator, as computed from measurements made by the Contract Administrator.

E35.7 Basis of Payment

- E35.7.1 Payment for Supply and Install Shrub Bed will be made at the Contract Unit Price per square metre for 'Supply and Install Shrub bed' which price shall be payment in full for supply of all materials and performing all operations herein described and for all other items incidental to the Work included in this Specification.
- E35.7.2 Payment for Supply and Installation of flexible poly edging will be made at the Contract Unit Price per linear metre for which price shall be payment in full for supply of all materials and performing all operations herein described and for all other items incidental to the Work included in this Specification.

E36. PLANT MATERIAL

E36.1 Description

- E36.1.1 The following list generally describes the scope of this section:
- (a) Supply and installation of trees and shrubs including preparation, digging, transport and planting.
 - (b) Maintenance to Total Performance.
 - (c) Maintenance for 30 days from date of Total Performance
 - (d) Warranty for two (2) full years

E36.2 General

- E36.2.1 Obtain approval of plant material at source.
- E36.2.2 Notify Contract Administrator of source of material at least 7 days in advance of shipment. No Work under this Special Provision is to proceed without approval.
- E36.2.3 Acceptance of plant material at source does not prevent rejection at Site prior to or after planting operations.
- E36.2.4 Source of all plant material to be from an area within the same hardiness zone and soil conditions as Winnipeg.
- E36.2.5 Co-ordinate shipping of plants and excavation of holes to ensure minimum time lapse between digging and planting. 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 would damage bark, break branches or destroy natural shape of plant. Give full support to root ball of large trees during lifting.
- E36.2.6 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.
- E36.2.7 Remove broken and damaged roots with sharp pruning shears. Make clean cut and cover cuts over 50 mm diameter with wound dressing.
- E36.2.8 Keep roots moist and protected from sun and wind. Heel-in shrubs, which cannot be planted immediately, in shaded areas, and water well.

E36.3 Materials

- E36.3.1 Water should be potable and free of minerals, which may be detrimental to plant growth.
- E36.3.2 Quality and Source: Comply with Guide Specification for Nursery Stock, 1982 Edition of Canadian Nursery Trades Association, referring to size and development of plant material and root ball. All plant material to be approved by the Contract Administrator.

- E36.3.3 Measure plants when branches are in their natural position. Height and spread dimensions refer to main body of plant and not from branch tip to branch tip. Use trees and shrubs of No. 1 grade.
- E36.3.4 Use shrubs with strong fibrous root system free of disease, insects, defects or injuries and structurally sound. Plant must have been root pruned regularly, but not later than one growing season prior to arrival on Site.
- E36.3.5 Approval required for plant material, which has been held in cold storage.
- E36.3.6 Deciduous trees in excess of 3 m height must have been dug with large firm ball. Root balls must include 75% of fibrous and feeder root system. This excludes use of native trees grown in light sandy or rocky soil. Secure root balls with burlap, heavy twine and wire basket. Protect root balls against sudden changes in temperature and exposure to heavy rainfall.
- E36.3.7 No tree spade dug material will be accepted.
- E36.3.8 Lift root ball from hole, place in wire basket designed for purpose and line with burlap. Replace root ball and tie basket to ball with heavy rope. Take care not to injure trunk of tree with wire basket ties or rope.
- E36.3.9 Container grown stock is acceptable if containers large enough for root development. Shrubs must have grown in container for minimum of one growing season but not longer than two. Root system must be able to "hold" soil when removed from container. Plants that have become root bound are not acceptable. Container stock must have been fertilized with slow releasing fertilizer.
- E36.4 Construction Methods
- E36.4.1 Stake out location of tree and shrubs as per the Construction Drawings. Obtain approval by the Contract Administrator prior to excavating.
- E36.4.2 Co-ordinate operations. Keep Site clean and planting holes drained. Immediately remove soil or debris spilled onto pavement.
- E36.4.3 When permission has been obtained to plant materials after buds have broken, spray plants with anti-desiccant to slow down transpiration prior to transplanting.
- E36.4.4 Plant only under conditions that are conducive to health and physical conditions of plants.
- E36.4.5 Provide planting schedule. Executing planting operations over long period using limited crew will not be accepted.
- E36.4.6 Prepare Tree Pits to City of Winnipeg and Canadian Nursery Trades Association standards.
- E36.4.7 Provide drainage for planting holes in heavy soil if natural drainage does not exist. Have method approved.
- E36.4.8 Protect bottom of excavations against freezing.
- E36.4.9 Remove water, which enters excavations prior to planting. Ensure source of water is not ground water.
- E36.4.10 Loosen bottom of planting hole to depth of 150 to 200 mm. Cover bottom of each excavation with minimum of 150 mm of topsoil mixture.
- E36.4.11 Plant trees and shrubs vertically with roots placed straight out in hole. Orient plant material to give best appearance in relation to structure, roads and walks.
- E36.4.12 Place plant material to depth equal to depth they were originally growing in nursery.

- E36.4.13 With balled and burlapped root balls, loosen burlap and cut away minimum top 1/2 without disturbing root ball. Cut vertical slits in remaining burlap around root ball at 250mm intervals. Remove all rope, string, or other ties from around trunk. Do not pull burlap or rope from under root ball. With container stock, remove entire container without disturbing root ball. Non bio-degradable wrappings must be removed including wire baskets.
- E36.4.14 Tamp planting soil around root system in layers of 150mm 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.
- E36.4.15 Build 100 mm deep saucer around outer edge of hole to assist with maintenance watering. Install 100mm depth wood chip mulch in saucer as shown on drawings.
- E36.4.16 When planting is completed, give surface of planting saucer dressing of organic 10-15-10 fertilizer at rate of 12 kg/100 m for shrub beds or 40 to 50 g/m² of calliper for trees. Mix fertilizer thoroughly with top layer of planting soil and water in well.
- E36.4.17 Prune trees and shrubs after planting only as required to remove broken diseased or dead branches. Employ clean sharp tools and make cuts flush with main branch, smooth and sloping as to prevent accumulation of water.
- E36.5 Maintenance
- E36.5.1 After completion of planting operation to the satisfaction of the Contract Administrator, the Contractor shall be responsible for the maintenance of the plant material until date of Total Performance and for 30 days from date of Total Performance.
- E36.5.2 Replace any dead or damaged plant material during the maintenance period, including replacement of vandalized material.
- E36.5.3 Water sufficiently to maintain optimum growing conditions. Ensure adequate moisture in root zone at freeze-up.
- E36.5.4 The Contractor shall provide all necessary equipment, including: tractors, mowers, hand mowers, trimmers, fertilizer spreaders, pruning tools, hoses, water meters, and any other items necessary for the maintenance of the plant material indicated in this Specification.
- E36.5.5 The Contractor shall provide all necessary personnel for the ongoing maintenance operations.
- E36.5.6 Personnel should have at least one year of experience in landscape maintenance and should be under the direction of a foreman, in all cases, with not less than five years of experience with similar maintenance operations.
- E36.6 Maintenance Methods
- E36.6.1 Trees and Shrub beds shall be watered bi-weekly, or during the summer, if temperatures are fairly high and there has been no rainfall, water approximately once a week.
- E36.6.2 To determine the need for watering, make a soil test weekly with a one-inch auger. Take a test sample from both the planting soil and from the root ball by drilling to a minimum depth of 600 mm. The soil shall contain enough moisture to hold together when compressed in the hand, but not be muddy.
- E36.6.3 Because of the specialized nature of such operations, fertilizing is to be done by a qualified local arborist.
- E36.6.4 Fertilize in the fall over the surface of the ground surrounding the plants, then soak the area thoroughly, use appropriate analysis fertilizer for autumn planting and spread to a maximum of 0.13 kg per square metre.
- E36.7 Method of Measurement

E36.7.1 Supply and Installation of Plant Material will be measured on a unit basis. The number of units to be paid shall be the total number of each type and size of units supplied and installed in accordance with the Drawings and Specifications and as measured and accepted by the Contract Administrator.

E36.8 Basis of Payment

E36.8.1 Supply and Installation of Plant Material will be paid for at the Contract Unit Price per unit type and size specified for "Supply and Installation of Plant Material", 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.

E37. TOPSOIL AND FINISH GRADING

E37.1 Description

E37.1.1 1. The General Conditions and Standard Provisions of the City of Winnipeg shall apply to and be a part of this Specification

E37.1.2 This Specification shall cover the supply and placing of topsoil for areas to be sodded

E37.1.3 The Contractor shall be responsible for the supply, safe storage and handling of all materials set forth in this Specification. All materials supplied under this Specification shall be subject to inspection and testing by the Contract Administrator. There shall be no charge to the City for any materials taken by the Contract Administrator for inspection and testing purposes.

E37.2 Materials

E37.2.1 Topsoil will be subject to tests for nitrate, phosphate, potassium, sulphate, pH, E.C. (salinity) and volume of organic matter by a testing laboratory designated by the Contract Administrator.

E37.2.2 The Contract Administrator will collect as many samples as are deemed necessary to ensure that a good representation of the entire topsoil shipment is provided for the soil analysis report.

E37.2.3 All soil required shall consist of a screened clay-textured or loam-textured dark topsoil, a fertile, friable material neither of heavy clay nor of very light sandy nature containing by volume, a minimum of 4% for clay loams and 2% for sandy loams to a maximum 25% organic matter (peat, rotted manure or composted material) and capable of sustaining vigorous plant growth. Topsoil shall be free of subsoil contamination, roots, stones over 30mm in diameter or subsoil clay lumps over 30mm in diameter and other extraneous matter. Topsoil shall not contain quack grass rhizomes, Canada thistle roots or other noxious weeds. Salinity rating shall be less than 2.5mmhos/cm. The pH range shall be between 6.0 and 8.0.

E37.2.4 Topsoil shall not be blow dirt taken from wind erosion sites.

E37.2.5 Topsoil shall not be taken from fields abandoned to corn production where such soil may contain soil incorporated herbicides with lasting residual effects such as eradican and atrazine.

E37.2.6 The Contractor shall inform the Contract Administrator of proposed source of topsoil to be supplied. The Contract Administrator reserves the right to reject topsoil not conforming with the requirements of this Specification.

E37.2.7 Chemical fertilizer with an N-P-K analysis of 1-2-1 ratio at a rate to provide 48kg actual Nitrogen, 96kg actual Phosphate and 48kg actual Potassium per hectare.

- E37.2.8 Where Work is to be done in entrance turnaround island and other areas adjacent to roadways, the Contractor shall maintain traffic and ensure that protection is afforded to the road use and that the Contractor's operations in no way interfere with the safe operation of traffic.
- E37.2.9 The Contractor shall supply, erect and maintain all applicable traffic control devices in accordance with the provisions of the latest edition of the "Manual of Temporary Traffic Control in Work Areas on City Streets" issued by the Public Works Department of the City of Winnipeg.
- E37.3 Installation
- E37.3.1 Subsoil shall be graded in accordance with Specification CW 3110 to eliminate uneven areas and low spots, ensuring positive drainage. Any soil contaminated by toxic materials shall be removed and disposed off Site.
- E37.3.2 All surface debris, roots, vegetation, branches and stones in excess of 50mm shall be removed.
- E37.3.3 Grades on the area to receive topsoil which have been previously established in conformance with the Construction Drawings and/or other applicable specifications shall be maintained in a true and even grade.
- E37.3.4 Topsoil shall not be placed until the subgrade has been inspected and approved by the Contract Administrator. The Contractor shall provide the Contract Administrator with a minimum of two (2) working days notice for subgrade inspection.
- E37.3.5 The Contractor shall not place topsoil on areas that are to be sodded unless the Contract Administrator provides the Contractor with written approval or direction to proceed.
- E37.3.6 Topsoil shall be spread with adequate moisture in uniform layers over the approved, unfrozen subgrade, where seeding or sodding is indicated.
- E37.3.7 Topsoil shall be free of roots, grass, weeds, construction materials, debris, foreign non-organic objects and stones over 30mm in diameter.
- E37.3.8 The topsoil mix shall be applied to a minimum of 75mm compacted depth for areas requiring sod and a 100mm compacted depth for seeding areas.
- E37.3.9 Topsoil shall be manually spread around trees, shrubs, and other obstacles.
- E37.3.10 The Contractor shall provide the Contract Administrator with a report for each work Site indicating the fertilizer formulation used, the rate of application and the date of application.
- E37.3.11 Fertilizer shall be spread uniformly over the entire area of topsoil at a rate to provide 48kg actual Nitrogen, 96kg actual Phosphate and 48kg actual Potassium per hectare.
- E37.3.12 Fertilizer shall be thoroughly mixed into the upper 75mm of topsoil prior to the commencement of sodding or seeding operations.
- E37.3.13 The area shall be fine graded and the topsoil loosened. Eliminate rough spots and low areas to ensure positive drainage. Prepare a loose friable bed by means of cultivation and subsequent raking.
- E37.3.14 Topsoil shall be rolled with 50kg roller, minimum 900mm wide, to consolidate it in areas to be seeded or sodded, leaving the surface smooth, uniform, firm against deep foot printing and to the satisfaction of the Contract Administrator.
- E37.4 Clean Up
- E37.4.1 All sidewalk, streets, approaches, driveways and properties near the Work Site shall be kept clean at all times by the Contractor.

E37.4.2 Upon completion of the project, the Contractor shall immediately remove all excess material and debris from the Work Site.

E37.5 Method of Measurement and Basis of Payment

E37.5.1 There shall be no separate measurement for the Work associated with this Specification.

E37.5.2 Payment for Work specified under this Specification is to be included with the price for Sodding or Seeding.

E38. SODDING

E38.1 All Work to be to CW 3510 –R7.

E38.2 Method of Measurement

E38.2.1 Sodding will be measured on an area basis. The area to be paid for shall be the total number of square metres sodded and maintained in accordance with this Specification and accepted by the Contract Administrator, as computed from measurements made by the Contract Administrator.

E38.3 Basis of Payment

E38.3.1 Sodding will be paid for at the Contract Unit Price per square metre for 'Supply and Install Sod', measured as specified herein, which price shall be payment in full for completing all operations herein described and all other items incidental to the Work included in this Specification.

E39. SEEDING

E39.1 All Work to be to CW 3520-R5.

E39.2 Measurement and Payment as per CW 3520-R5.

E40. EXTENDED MAINTENANCE

E40.1 Description

E40.1.1 This Specification shall deal with the maintenance of the trees and shrubs for Two (2) calendar years after the date of the Substantial Performance

E40.1.2 The following generally describes the scope of this Specification:

(a) Maintenance of trees and shrubs

E40.2 Materials and Personnel

E40.2.1 The Contractor shall provide all necessary equipment, including: tractors, trimmers, fertilizer spreaders, pruning tools, water trucks, hoses, water meters, and any other items necessary for the maintenance of the area indicated in this Specification.

E40.2.2 The Contractor shall provide all necessary personnel for the ongoing maintenance operations

E40.3 Work Included

E40.3.1 The following areas shall be part of the maintenance jurisdiction:

(a) The trees and shrubs as indicated on the Construction Drawings

E40.4 Maintenance of Trees and Shrubs

E40.4.1 Watering Trees and shrubs

- (i) All trees and shrubs shall be watered bi-weekly, or during the summer, if temperatures are fairly high and there has been no rainfall, water approximately once a week. Where irrigation is not available this should be executed by leaving a hose, with a gentle rate of flow, running into the saucer of the root ball for about one hour
- (ii) To determine the need for watering, make a soil test weekly with a one-inch auger. Take a test sample from both the planting soil and from the root ball by drilling to a minimum depth of 600 mm. The soil shall contain enough moisture to hold together when compressed in the hand, but shall not be muddy.
- (iii) Fertilizing, Pruning and Spraying Deciduous Trees and Shrubs. Because of the specialized nature of such operations, this should be done by a qualified local arborist
- (iv) Fertilize in the fall over the surface of the ground surrounding the plants, then soak the area thoroughly. Use 10-6-4 analysis fertilizer spreading a maximum of 0.13 kg per square meter.
- (v) Spray trees and shrubs to control insect pests and diseases. Use horticulturally recommended compounds specific for the problem to be contained.
- (vi) Tighten, or remove, turnbuckles or guy wires for trees as required or directed by the Contract Administrator.
- (vii) Straighten trees as required and directed by the Contract Administrator.

E40.4.2 The Contractor shall agree and guarantee to replace and replant any nursery stock found dead or in poor condition at the completion of the maintenance period. "Poor Condition" shall be interpreted as meaning nursery stock in which branches are dead or dying, or have not shown satisfactory growth of leaves. All replacements shall be of same size and species, as specified.

E40.4.3 Upon the end of the required maintenance period, a Site inspection shall be held. If at this time, all material and Works is satisfactory the Contract for maintenance and warranty shall be terminated.

E40.5 Method of Measurement

E40.6 Extended Maintenance will be measured on a lump sum basis and paid for in accordance with this Specification and accepted by the Contract Administrator.

E40.7 Basis of Payment

E40.8 Extended Maintenance will be paid for over two years, at 50% of the Contract Lump Sum Price each year for "Extended Maintenance of Plant Material"; which price shall be payment in full for supply of all materials and performing all operations herein described and for all other items incidental to the Work included in this Specification.