

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 Title</u>	<u>File number</u>	<u>Size</u>
L1	Removals – Taché Ave. to St. Joseph Street	93-2004_Drawing_L1-R1.pdf	A1
L2	Removals – St. Joseph Street to Aulneau Street	93-2004_Drawing_L2-R1.pdf	A1
L3	Removals – Aulneau Street to Langevin Street	93-2004_Drawing_L3-R1.pdf	A1
L4	General Layout – Taché Ave. to St. Joseph Street	93-2004_Drawing_L4-R1.pdf	A1
L5	General Layout – St. Joseph Street to Aulneau Street	93-2004_Drawing_L5-R1.pdf	A1
L6	General Layout – Aulneau Street to Langevin Street	93-2004_Drawing_L6-R1.pdf	A1
L7	Entry Area –Layout and Details	93-2004_Drawing_L7-R1.pdf	A1
L8	Site Furnishings – Bench Details	93-2004_Drawing_L8-R1.pdf	A1
L9	Site Furnishings – Bike Rack, Waste receptacle and Fence details	93-2004_Drawing_L9-R1.pdf	A1
L10	Median Feature	93-2004_Drawing_L10-R1.pdf	A1
L11	Planting Details	93-2004_Drawing_L11-R1.pdf	A1
C101	Provencher Boulevard/Taché Ave. Geometry and Grading	93-2004_Drawing_C101-R0.pdf	A1
C102	Provencher Boulevard/Taché Ave. Sections and Details	93-2004_Drawing_C102-RB.pdf	A1
E101	Provencher Boulevard/Taché Ave. Gateway Feature Lighting	93-2004_Drawing_E101-RA.pdf	A1

GENERAL REQUIREMENTS

E2. TRAFFIC CONTROL

E2.1 Further to clause 3.6 & 3.7 of CW 1130-R1:

E2.1.1 Maintain a minimum of two (2) lanes of traffic eastbound and westbound on Provencher Boulevard between the rush hour time periods of 7:00-9:00AM and 3:30-5:30 PM during construction times.

E2.1.2 During construction, access to the parking lot at the SW corner of Tache and Provencher, as well as the Shell service station at 174 Provencher must be maintained useable at all times the respective businesses are open. Should the Contractor be unable to maintain vehicular access to these locations he shall review the planned disruption with the Contract Administrator, and take reasonable measures to minimize the impact. The Contractor shall provide a minimum of 24 hours notification to the Contract Administrator, prior to disruption of access.

E2.1.3 Pedestrian and ambulance/emergency vehicle access must be maintained at all times

E2.1.4 Where directed, the contractor shall construct and maintain temporary asphalt ramps to alleviate vertical pavement obstructions such as manholes and planning drop-offs to the satisfaction of the Contract Administrator. No measurement for payment will be made for this work.

E2.1.5 In accordance with the Manual of Temporary of Temporary Traffic Control, the Contractor shall make arrangements with the Traffic Services Section of the City of Winnipeg to place all temporary regulatory signs. The Contractor shall bear all costs associated with the placement of temporary traffic control devices by the Traffic Services Section of the City of Winnipeg in connection with the Works undertaken by the Contractor.

E3. PEDESTRIAN SAFETY & ACCESS TO BUSINESS

E3.1 Throughout the time period of construction a temporary snow fence shall be installed around the excavation area adjacent to any anticipated pedestrian movement. All excavation areas greater in depth than 500mm require protective fencing. The Contractor shall be responsible for maintaining the snow fence in a proper working condition. No separate measurement for payment shall be made for this Work.

E3.2 Special provision may be required in the entry area redevelopment to ensure that access to all business is not interrupted. The Contractor will be responsible for advising the affected businesses when work will occur, and make all reasonable efforts to provide continuous safe access to each entry door.

E4. TRAFFIC MANAGEMENT

E4.1 The Contractor shall be responsible for providing the necessary traffic control and signage to ensure the actual project Site is continuously "fenced" with both barricades on the existing streets and snow fencing along the medians and sidewalks where required. No additional payment for this Work will be made; costs should be included in each division of Work within Form B: Prices.

E5. SAWCUTTING PAVEMENT

E5.1 At the limits of excavation, the Contractor shall saw cut the existing pavement to produce a clean straight edge when excavated.

E5.2 For concrete pavements, the cost of saw cutting and disposal of any surplus material shall be included in the unit price bid for "Concrete Pavement Removal."

E6. SIGN SUPPORT CLAMPS

E6.1 The Contractor shall install all new sign support clamps at the locations as shown on the Drawings or as directed by the Contract Administrator. The City shall supply all sign support clamps. All costs in connection with the installation of sign support clamps shall be included in price bid for "100mm Concrete Sidewalk"

E7. WINNIPEG TRANSIT BUS STOPS

E7.1 The Contractor shall, at the initial Site meeting, determine in conjunction with the representative from Winnipeg Transit, how to maintain temporary transit stops along Provencher Boulevard throughout the Construction time period.

E7.2 All costs in connection with this item of Work shall be incidental to the overall management and operation of the Site during construction.

E8. CONSTRUCTION FACILITIES AND STAGING

E8.1 The Contractor shall be responsible for providing his own storage area for storage and handling of all his construction operations. The use of public right-of-ways will not be allowed.

E9. CONTRACTOR EMPLOYEE PARKING

E9.1 The Contractor shall be responsible for providing employee parking for both his own employees as well as those of any sub-Contractors. Construction vehicles will not be allowed to take up the parking space along Provencher Boulevard, in front of the existing businesses.

E10. WORK BY OTHERS

E10.1 Contractor to co-ordinate with City of Winnipeg Traffic Services and Manitoba Hydro for location of conduit, etc. required to accommodate the relocation and reinstallation of traffic signalization poles at the SE and NE corners of Provencher Boulevard and Tache Ave.. Contractor to coordinate timing of this work with the timing of the new curb and sidewalk installation.

E10.2 All work in this section is to be completed by others. Coordination of the work, by the Contractor, is required. All costs in connection with the coordination shall be considered to be incidental to the "Roadwork and Sidewalk" component of the tender.

E11. REMOVALS

GENERAL

E11.1 This Specification covers the removal of existing concrete, asphalt, granular, curbing, street furniture, fencing, trees, shrubs and excavation as shown on the Drawings. This Specification shall complement Specifications CW 3110-R7, CW 3235-R4 and CW 3240-R4.

E11.2 Scope of Work

E11.2.1 The following Generally describes the Scope of work in this section:

- (a) In addition to the removal of barrier curb, ramp curb and concrete pavement as itemized in "Form B: Schedule of Prices" on a per unit cost, the Contractor is to undertake the removal/salvage of items outlined below on a lump sum basis. The

work described below is a general description of the nature and amount of work that will be necessary to prepare the various locations for new construction. It is the Contractors responsibility to complete the removal process to a degree that allows the new construction to proceed. No extra payment for items not listed will be entertained.

- (b) Main Entry Area Removal and Salvage to include items on both north and south boulevards and central median at the Intersection of Tache Ave.& Provencher Blvd. The Contractor shall remove and/or salvage the following: Limits of work as described on drawing L1.
 - (i) Remove 4 tree well curb surrounds
 - (ii) Remove 4 trees from existing tree wells
 - (iii) Remove Concrete Curb at base of Median Gate Feature approx. 15 L.M.
 - (iv) Remove and Salvage Paving Stones at Median Gate Feature approx. 25 S.M.
 - (v) Remove and Salvage Paving Stones on North and South Boulevard approx. 290 S.M. Uni-décor and 55 S.M. 100 x 200 and 200x200 natural holland stone
 - (vi) Remove Timber Fence approx 11 L.M.
 - (vii) Remove and Salvage 2 wire mesh benches (Deliver to City of Winnipeg East Area Parks Yard – 825 Tache Ave.)-salvage to be determined by City of Wpg-Parks Superintendent
 - (viii) Remove and Salvage 2 “Take Pride” waste receptacles (Deliver to City of Winnipeg – Public Works Yard -1220 Pacific Ave.)
- (c) Boulevard Removals and Salvage to include items on both north and south boulevards from immediately east of the Main Entry Removals Area to Rue Langevin. The Contractor shall remove and/or salvage the following:
 - (i) Remove 2 trees from existing tree wells
 - (ii) Remove Timber Fence approx. 11 L.M. and concrete slabs
 - (iii) Remove precast concrete tree grates from existing tree wells approx 31 tree wells
 - (iv) Remove and Salvage 6 wire mesh benches (Deliver to City of Winnipeg East Area Parks Yard – 825 Tache Ave.)- salvage to be determined by City of Wpg-Parks Superintendent
 - (v) Remove and Salvage 6 “Take Pride” waste receptacles (Deliver to City of Winnipeg – Public Works Yard -1220 Pacific Ave.)
- (d) 174 Provencher
 - (i) Remove 3 tree well curb surrounds at 174 Provencher Blvd.
 - (ii) Remove 2 Trees from existing tree wells at 174 Provencher Blvd.
 - (iii) Remove concrete fence footing at 174 Provencher Blvd approx 27 L.M.
 - (iv) Remove and Salvage Paving Stones at 174 Provencher Blvd, extents shown on the drawings approx. 80 S.M. uni-décor
 - (v) Newspaper boxes and misc street furniture. The contractor will be responsible for notifying or temporarily relocating these items so they do not interfere with the intended work
- (e) Median Area Removals and Salvage to include items on the median immediately east of the Entry Area Removals to Rue Langevin. The Contractor shall remove and/or salvage the following:
 - (i) Empty, Remove and/or Salvage at end of the Annual Flowering Season, 5 (600 x 2400) concrete planters.
 - (ii) Remove and/or Salvage 5 (3000 long) wood benches and supports
 - (iii) Remove and/or Salvage 3 Waste Receptacles and supports

- (iv) Remove and/or Salvage 600 x 600 concrete patio pavers approx. 122 S.M.
- (f) Salvage of all above items as determined by City of Winnipeg Parks Superintendent, Contractor to deliver to East Area Parks Yard – 825 Tache Ave. (Jason Bell – 986-2682
 - (i) Remove plant material and root mass from shrub bed areas approx. 55 S.M.
 - (ii) Remove One (1) Tree Stump

CONSTRUCTION METHODS

- E11.3 All removals shall be completed in accordance with the City of Winnipeg Standard Construction Specifications
- E11.4 All excavation of materials adjacent to private property shall be carried out to ensure no damage to private property. Unnecessary damage during removal will be the responsibility of the Contractor.
- E11.5 The contractor will be responsible for salvage of certain materials. Every effort will be made to ensure maximum salvage, storage and protection of material for re-use.
- E11.6 Paving stone removal for salvage and re-installation at the Provencher/Tache entry shall include only the removal of the existing stones. Paving stones that currently sit on a sand layer bed and lean mix concrete shall be cleaned stockpiled and stored for re-use. No removal of sand base or lean mix concrete base is required, as this will form the base for the new expanded sidewalk area.
- E11.7 In the location of 174 Provencher (Shell Canada) where the paving stones are not on a lean mix concrete, salvage and removal of paving stones, shall include only the salvage of stones for the purpose of relaying on compacted granular and sand base. Care to be taken not to damage curbs and foundation base for electrical lighting.

MEASUREMENT AND PAYMENT

- E11.8 Notwithstanding the City of Winnipeg Standard Construction Specifications, removal of all materials noted will be paid for on a per unit or lump sum basis as noted in Form "B"

E12. EXPOSING EXISTING UNDERGROUND SERVICES AND UTILITIES

- E12.1 The exact location and depth of some of the existing underground services and utilities within the project limits are unknown
- E12.2 The Contractor shall supply all labour, equipment and materials required to expose all underground services and/or utilities sufficiently far enough in advance of the proposed Works to permit the Contract Administrator where necessary, to adjust the alignment and grade to avoid existing lines and ducts.
- E12.3 Where existing underground services and utilities are adjacent to tree wells on Provencher Boulevard excavation shall be carried out in such a manner as to expose the top and edge of pipes, ducts or conduit, to avoid any damage during formwork, and backfilling. Any work which results in damage to underground utilities shall be the sole responsibility of the Contractor.
- E12.4 Hydro watch will be required when the Contractor is performing excavation within 1.0m of any Hydro utilities.
- E12.5 All costs in connection with this item of Work shall be included in the unit price bid for the various bid items.

E13. LAYOUT OF STREETSCAPING WORK

- E13.1 The Contractor will Work from layout information on the drawings and information provided by the Contract Administrator. The Contract Administrator will be responsible for providing the layout and setting grades. The Contractor and the Contract Administrator will continuously check the locations and elevations of all components and paving patterns of the Work included in this Contract. Any discrepancies between the drawings and the on-Site conditions should immediately be brought to the attention of the Contract Administrator.
- E13.2 Throughout the term of the construction contract the Contract Administrator may have a survey crew on the Site, but they will check the Work done by the Contractor's personnel only. The checking of the Work by the Contract Administrator surveyors will not relieve the Contractor of any responsibility of the correctness of the Work. Should any structure or paving or any part thereof be installed in any location other than that shown on the Drawings, then the error shall be rectified by the Contractor all at his own expense and at the satisfaction of, and in a manner specified by the Contract Administrator.
- E13.3 All costs associated with this item of Work shall be included in the unit prices bid for the supply and installation of the various items in the Contract.

E14. EXISTING MANHOLES/CURB STOP BOXES/MISCELLANEOUS ADJUSTMENTS

- E14.1 During the removal and installation of the sidewalk and interlock paving, the Contractor shall take all necessary precautions when working in the vicinity of any existing manholes/curb stop boxes or valve boxes.
- E14.2 Any existing infrastructure in the sidewalk area requiring final adjustments (horizontal and/or vertical) shall be carried out by the Contractor following confirmation by the Contract Administrator and the agreement on a price to carry out the work.
- E14.3 Any curb stop boxes or valve boxes damaged as a result of these adjustments shall be paid for as an extra to the contract.

E15. GRANULAR BASE COURSE ON LEAN MIX CONCRETE

DESCRIPTION

- E15.1 This specification shall amend and supplement CW 3110-R7.

MATERIALS

- E15.2 In accordance with CW 3110-R7

CONSTRUCTION METHODS

- E15.3 Granular base course shall be placed and compacted on top of the existing lean mix concrete in order to form a working surface upon which sand and paving stones will be placed to the elevations on the design drawings.

MEASUREMENT AND PAYMENT

- E15.4 Granular base course placed on the existing lean mix concrete shall be paid at the contract unit price per tonne for "Supplying and Placing Base Course Material."

E16. LEAN-MIX CONCRETE

DESCRIPTION

E16.1 This specification shall amend and supplement CW 3110-R7 and CW 3335.

MATERIALS

E16.2 In accordance with CW 3110-R7 and CW 3335.

CONSTRUCTION METHODS

E16.3 Lean Mix Concrete shall be placed on top of compacted structural soil at tree trench excavation locations as shown on the drawings and at existing tree wells to be removed at the entry gate location. The lean mix concrete shall form a working surface upon which sand and paving stones will be placed to the elevations on the design drawings.

E16.4 In locations where lean mix is to be installed at tree trench excavations, prior to installation of lean mix concrete, compaction of structural soil mix is to be reviewed and approved by Contract Administrator.

E16.5 Refer to E21 for tree trench specifications

MEASUREMENT AND PAYMENT

E16.6 Lean mix concrete shall be paid at the contract unit price per square metre for "Lean Concrete Base."

E17. CONCRETE FORMWORK

GENERAL

E17.1 Related Work

E17.1.1 Cast in Place concrete and Standard City of Winnipeg related specifications

E17.2 Reference Standards

E17.2.1 All concrete formwork is to be done in accordance with CAN/CSA-A23.1 and CAN/CSA-A23.2

MATERIALS

E17.3 Formwork lumber: plywood and wood formwork materials conform to CAN-086.

E17.3.1 Plywood: Douglas Fir to CSA 0121, concrete form grade, square edge, 19mm thick.

E17.4 Form ties: removal or snap-off metal ties, fixed of adjustable length, free of devices leaving holes larger than 25mm dia in concrete surface

E17.5 Formwork release agent: chemically active release agents containing compounds that react with free lime present in concrete to provide water insoluble soaps, preventing concrete from sticking to forms.

CONSTRUCTION METHODS

E17.6 Erection

- E17.6.1 Verify lines, levels and dimensions before proceeding with formwork and ensure dimensions agree with drawings.
- E17.6.2 Construct forms to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CAN/CSA-A23.
- E17.6.3 Align form joints and make watertight. Keep form joints to minimum.
- E17.6.4 Clean formwork in accordance with CAN/CSA-A23:1. Only permitted if in good condition

METHOD OF MEASUREMENT AND PAYMENT

- E17.7 No separate measurement will be made for concrete formwork. Payment for formwork shall be included in the costs for those items for which cast in place concrete is required.

E18. CAST IN PLACE CONCRETE

GENERAL

- E18.1 The "General Conditions and Supplemental Conditions" of this Specification and all documents listed in the Bid Opportunity shall apply to and govern all phases of the Work hereinafter specified and/or shown on the Drawings.
- E18.2 Scope of Work
 - E18.2.1 The Work of this section comprises the furnishing of all labour, equipment and materials required to complete the supply and installation of all cast-in-place concrete including but not limited to: gateway bases, tree pit curbs, concrete piles, fence and site furniture footings, slabs and all foundations, as shown on the Drawings and as hereinafter specified, including, but not necessarily limited to the following:
 - (a) Excavation including disposal of excess material.
 - (b) Sub grade compaction as required.
 - (c) Compacted granular fill work as required.
 - (d) Supply, erection and removal of all formwork as required.
 - (e) Supply, placing and curing of concrete footings for iron fencing and site furniture
 - (f) Concrete bases for entry gates
 - (g) Supply, placing and curing of all landscape curbs and tree wells.
 - (h) Surface preparation and waterproofing of concrete works.
 - (i) Co-ordination of the installation of all electrical and other items to be installed in the concrete works
 - (j) Cleanup.
 - E18.2.2 Provide certification that plant, equipment, materials and mix proportions to be used in concrete complies with specified quality and yield and that strength will comply with requirements of CAN/CSA-A23.1 and that mix design is adjusted to prevent alkali aggregate reactivity problems.
 - E18.2.3 Provide certification that mix proportions selected will produce concrete of specified quality and yield and that strength will comply with CAN/CSA-A23.1 and that mix design is adjusted to prevent alkali aggregate reactivity problems.

E18.3 Construction Quality control and Placement Procedures

E18.3.1 Submit proposed quality control procedures for Contract Administrator's approval

E18.3.2 Submit proposed concrete placement procedures for Contract Administrator's approval

MATERIALS

E18.4 Portland cement to CAN3-A5-M 1983

E18.5 Aggregates to CAN/CSA-A23.1-M90. Coarse aggregates to be normal density.

E18.6 Chemical admixtures to CAN3-A266.2-M78. Contract Administrator to approve accelerating or set retarding admixtures during cold and hot weather placing. Use of calcium chloride is not permitted.

E18.7 Curing and sealing compound to: CAN/CSA-A23.1-M90, CPD Acrylic cure and seal or equal and to ASTM C309-81, Type 1 - chlorinated rubber.

E18.8 Premoulded joint fillers:

E18.8.1 Flexcell Expansion Joint Filler

E18.9 Concrete Mixes

E18.9.1 All concrete Work shall be in accordance with CSA A23.1 Concrete Materials and methods of concrete construction.

E18.9.2 Proportion normal density concrete in accordance with CSA A23.1 to give the following properties:

E18.9.3 Exterior Concrete for all Foundations/piles/footings, Tree wells, bases for entry gate

(a) Cement: Type 50 Sulphate resistant

(b) Maximum Coarse Aggregate: 20mm

(c) Minimum Compressive Strength at 28 days: 32 Mpa

(d) Maximum Water/Cement Ratio: 0.45

(e) Class of Exposure: C-2

(f) Maximum Slump: 80mm \pm 30mm

(g) Air Content: 5-8%

CONSTRUCTION METHODS

E18.10 Workmanship

E18.10.1 Do all concrete Work in accordance with CAN/CSA-A23.1. All testing of concrete shall be done in accordance with CAN/CSA-A23.2. Obtain Contract Administrator's approval before placing concrete. Provide 3 Calendar Days notice prior to placing of concrete.

E18.10.2 Pumping of concrete is permitted only after approval of equipment and mix.

E18.10.3 Ensure reinforcing bars and reinforcement and inserts are not disturbed during concrete placement.

E18.10.4 Do not place load upon new concrete until authorized by Contract Administrator as per City of Winnipeg Standards.

E18.11 Construction Joints

E18.11.1 Joint Fillers

- (a) Furnish filler for each joint in a single piece for depth and width required for joint, unless otherwise authorized by Contract Administrator. When more than one piece is required for a joint, fasten abutting ends and hold securely by stapling or other positive fastening.

E18.12 Finishing of Concrete

E18.12.1 General

- (a) Finish concrete in accordance with CAN/CSA/A23.1.

E18.12.2 Exposed tree curbs, fence footings

- (a) All shall be finished by a specialty concrete finisher.
- (b) Finish of all items shall be smooth and clean with no pits, chips, bumps or other surface imperfections.
- (c) Finish all exposed concrete, gate bases, tree curbs with sandblasted finish

E18.13 Cleanup and Damage

E18.13.1 Immediately on completion of concrete Work the Contractor shall remove from Site all equipment, timbers, shores, excavated materials, unused concrete, rubbish etc. caused by his operations, and leave the Site clean, level and ready for other Works.

E18.13.2 The Contractor shall be responsible for making good all areas damaged by his operations.

METHOD OF MEASUREMENT

E18.14 Cast-in-place concrete (CIP) will be measured and paid for on the following basis:

E18.14.1 Supply and install piles and base for Entry gateway feature-to be paid for on a per unit basis complete for each entry column.

E18.14.2 Supply and install CIP concrete for new tree well curbs – to be paid for on a lineal metre (L.M.) basis

E18.14.3 Supply and install CIP concrete footings for fence installation – to be paid for as part of per lineal metre of fence installation

E18.14.4 Supply and install CIP concrete footings for site furniture installation – to be paid for on a per unit basis for the complete supply and installation of each portion of site furniture

E18.15 The units to be paid for shall be the total number of units installed in accordance with this Specification and acceptable to the Contract Administrator, as computed from measurements made by the Contract Administrator. Cast-in-place concrete will be measured and paid for as noted in Form B: "Prices."

E18.16 The length to be paid for shall be the total number of linear metres installed in accordance with this Specification and acceptable to the Contract Administrator, as computed from measurements made by the Contract Administrator.

E19. CONCRETE COLLARS

GENERAL

- E19.1 The Contractor shall construct a square or rectangular concrete collar around all poles, valves, hydrants, pits, and other appurtenances within the sidewalk paving as directed by the Contract Administrator and/or as shown on the drawings.
- E19.2 The collar shall be 173 mm thick concrete pavement in accordance with CW-3325. The overall outside dimension of the collar shall generally be 150 mm larger than the diameter of the structure being surrounded or as indicated on details and directed by the Contract Administrator. The purpose of the collar is to provide a uniform edge for the installation of paving stones and brick pavers.

METHOD OF MEASUREMENT

- E19.3 No direct payment will be made for construction of concrete collars, as they shall be included in the unit price cost of concrete sidewalk and paving stone installation.

E20. UNIT PAVERS

DESCRIPTION

- E20.1 This Specification shall cover the supply and installation of new unit pavers and concrete slabs as well as the reinstallation of salvaged paving stones from two areas on Provencher Blvd. and bedding course of sand, 6mm limestone and sod joints for areas as indicated on the Drawing. This Specification supplements CW3335.

MATERIALS

- E20.2 Concrete Pavers (new)
- E20.2.1 Holland Stone, colour to be Mahogany, Sizes to be 200mm x 200mm x 57mm depth
- E20.2.2 Holland Stone, colour to be Natural, Sizes to be 100mm x 200mm x 57mm depth
- E20.3 Concrete Slabs (new)
- E20.3.1 Colour to be Charcoal, Sizes to be 450mm x 450mm x 38mm depth
- E20.4 Concrete Pavers (salvaged)
- E20.4.1 Uni-Decor "Standard" stones to be salvaged from two areas of the project site, cleaned, stored and reinstalled.
- E20.4.2 Natural Holland stones to be salvaged from Northeast sidewalk of Tache and Provencher, cleaned, stored and reinstalled.
- E20.5 Compacted Base
- E20.5.1 6mm down Limestone to be used for compacted base in locations where Concrete Slab Pavers are to be installed. Refer to drawings for depth and extents.
- E20.6 Submittals
- E20.6.1 Contractor to submit sufficient samples of "new" pavers to the Contract Administrator to show texture, finish and anticipated range of colour to be supplied for each type of paver specified above.

CONSTRUCTION METHODS

- E20.7 All joints to be tight and not to be wider than 4mm unless otherwise noted on the drawings.
- E20.8 All pavers shall be set flush with contiguous adjacent concrete and curb materials. Sand depth to vary to ensure constant surface finish.
- E20.9 Concrete Slab Pavers to have sod joints. These pavers are located in the median areas only. Concrete Slab Pavers to be installed onto compacted 6mm down limestone. Sod joints to be 100mm wide. Contractor to provide topsoil base for sod joints to a depth of 75mm.
- E20.10 Sod to be as per CW 3510-R7.
- E20.11 Topsoil to be as per CW 3540-R2
- E20.12 Site Storage
- E20.12.1 Upon receipt at the building Site or storage yard, the paving stone shall be stacked on timber or platforms at least 75mm above the ground, and extreme care shall be taken to prevent staining during storage. If storage is to be for a prolonged period, polyethylene or other suitable plastic film shall be placed between any wood and finished surfaces, and shall be used also as an overall protective covering.

MEASUREMENT AND PAYMENT

- E20.13 The supplying and placing of Unit Pavers will be measured on an area basis. The area to be paid for shall be the total number of square metres (S.M.) of Unit Pavers installed in accordance with this Specification, accepted by the Contract Administrator, as computed from the Site. New Pavers shall include the cost to supply product to site and install, while the cost for re-use of existing salvaged pavers shall include all costs to clean, and re-install product on site. There is adequate salvageable product and no allowance will be made for obtaining additional paving stones for this project.
- E20.14 The supply and placement of sand bedding, infill material, 6mm down limestone and sod joints for Unit Pavers is to be included in the unit price costs for each item. No separate measurement and payment will be made.

E21. RENOVATED TREE WELLS, TREE TRENCHES, AND PLANTING BED PREPARATION

GENERAL

- E21.1 This specification shall cover renovated tree wells, tree trench excavation and backfill, shrub planting bed and annual planting bed preparation. The Work to be done by the Contractor under this specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies and all other things necessary for and incidental to the satisfactory performance and completion of all Work as specified.

MATERIALS

- E21.2 All materials supplied under this Specification shall be of a type acceptable to the Contract Administrator, and shall be subject to inspection and testing by the Contract Administrator.
- E21.3 The Contractor shall be responsible for the supply, safe storage and handling of all materials as set forth in this Specification. All materials shall be handled in a careful and Workmanlike manner, to the satisfaction of the Contract Administrator.
- E21.4 Planting Soil

- E21.4.1 Planting Soil shall consist of black top soil, a fertile friable natural loam containing by volume not less than 4% and no more than 25% of organic matter for clay loams, and not less than 2% and no more than 25% for sandy loams, with an acidity value ranging from pH 6.0 to 8.0 and capable of sustaining vigorous plant growth. Soil is to be free of any mixture of subsoil, clay lumps and free of stones and other extraneous matter. It is not to contain couch or crab grass rhizomes.
- E21.5 Structural Soil
- E21.5.1 Structural soil to support lean mix and paving stones will be obtained through the authorized distributor of "CU structural soil mix" – Mr. Dan Lester @ Lester Construction Ltd. –222-4229
- E21.6 Bark Mulch
- E21.6.1 Bark Mulch shall be wood chip mulch free of small branches and leaves and ranging in size from 5mm to 75mm long and 5mm to 20mm thick. Submit sample of mulch for approval by the Contract Administrator prior to shipping to Site.
- E21.7 Filter Fabric
- E21.7.1 Pro Pex 4530 polypropylene non-woven needle punched fabric – Dark Grey
- E21.8 Clean Granular
- E21.8.1 Granular shall be clean and washed granite aggregate free of fines and small particles. Aggregate sizes to be no less than 25mm and no greater than 38mm diameter. Sample of granular material to be provided to Contract Administrator for approval prior to shipment to Site.
- E21.9 Granite Aggregate
- E21.9.1 Granite shall be clean and washed black granite aggregate free of fines and small particles. Aggregate sizes to be no less than 25mm and no greater than 38mm diameter. Sample of granular material to be provided to Contract Administrator for approval prior to shipment to Site.

CONSTRUCTION METHODS

- E21.10 The Contractor shall co-ordinate the installation in accordance with the Drawings and as specified herein.
- E21.11 Planting Bed Preparation
- E21.11.1 General Contractor shall co-ordinate excavation and fill works for planting beds to ensure minimal additional excavation for shrub beds required by landscape sub-Contractor. All remaining areas to be filled shall be in locations and to the depths shown on the drawings.
- E21.11.2 Sub-grade shall be scarified to a minimum depth of 150mm for shrub bed areas.
- E21.11.3 Planting beds areas shall be filled with soil mixture. After filling top of bed shall be set to level shown on drawings. Soil should be lightly compacted and indicated soil depths shall be depths after light compaction.
- E21.11.4 All areas and locations provided for shrub planting shall be staked according to layout shown on the drawings. Fill/excavation shall not proceed until the layout has been inspected and approved by the Contract Administrator. Fill/excavation shall not be undertaken until all underground utilities have been located and protected.

E21.11.5 Shrub Planting Beds to have a minimum depth of 300 mm soil and to be topped with mulch.

E21.11.6 Annual Planting Beds to have a minimum depth of 200 mm soil. No mulch is to be installed in the annual planting beds.

E21.12 Installation of Mulch

E21.12.1 Bark mulch shall be spread to a consistent depth over entire shrub planting bed area, taking care not to damage the plants. No mulch is to be placed on Annual Planting Bed Areas.

E21.13 Tree Trenches

E21.13.1 Contractor shall co-ordinate excavation and fill works for tree trenches to ensure minimal additional excavation for tree trenches required by landscape sub-Contractor. Tree trenches shall be excavated to the finished depths and widths as shown on drawings.

E21.13.2 Sub-grade shall be scarified to a minimum depth of 200mm.

E21.13.3 Trench excavation shall require cutting and removal of existing concrete roadway and or lean concrete mix at entry gates only, as shown on the drawings.

E21.13.4 Tree trench excavation shall be filled with clean granular base, soil mixture, filter-fabric and/or structural soil as noted on the drawings. After filling, top of soil shall be level with surrounding grade of trench concrete curb lip.

E21.13.5 Structural soil to be installed in three trench locations at entry, where lean mix concrete and pavers are to be installed over trench. Structural soil to be compacted in 150mm lifts to elevations shown on the drawings, indicated soil depths shall be depths after compaction.

E21.14 Tree Well Renovation

E21.14.1 Remove existing tree if noted on drawings, precast tree grate, and excavate to widths and depths as shown on the drawings to prepare tree well for planting.

E21.14.2 Protect existing concrete curb surround at the tree well.

E21.14.3 Install clean granular, filter fabric, and soil as shown on the drawings.

E21.15 Granite Aggregate at Existing Tree Wells

E21.15.1 Contractor to prepare surface area of existing tree wells to provide a smooth surface 75mm below top of concrete curb surround. Contractor to ensure no damage to existing trees or roots.

E21.15.2 Install filter fabric around base of tree and cover with 75mm depth granite aggregate. Ensure aggregate is flush with top of concrete curb surround and there is no exposed filter fabric at surface.

MEASUREMENT AND PAYMENT

E21.16 The supply and installation of Tree Trenches, Shrub Bed Preparation and Annual Bed Preparation will be measured on an area basis. The area to be paid for shall be the total number of square metres (S.M.) of Tree Trench Excavation and Backfill to finished grade with structural soil, Tree Trench Excavation and Backfill to finished grade with planting soil, Shrub Bed Preparation and Annual Bed Preparation installed in accordance with this Specification, accepted by the Contract Administrator, as computed from the Site.

- E21.17 The supply and installation of Renovated Tree Wells will be measured on a unit basis. The units to be paid for shall be the total number of units of Renovated Existing Tree Wells complete including all removals, excavation and redevelopment in accordance with this Specification, accepted by the Contract Administrator, as computed from the Site.
- E21.18 The supply and installation of Granite Aggregate at Existing Tree Wells will be measured on a unit basis. The units to be paid for shall be the total number of units of Existing Tree Wells Granite Aggregate complete, soil, fabric and granite mulch installed in accordance with this Specification, accepted by the Contract Administrator, as computed from the Site.
- E21.19 The supply and installation of Tree Trench excavation with lean mix and structural soil will be measured on an area basis. The units to be paid for shall be the total number of square metres (S.M.) Tree Trench excavation complete including all removals, excavation and redevelopment in accordance with this Specification, accepted by the Contract Administrator, as computed from the Site.
- E21.20 The supply and installation of Tree Trench excavation with granular and bark mulch will be measured on an area basis. The units to be paid for shall be the total number of square metres (S.M.) Tree Trench excavation complete, including all removals, excavation and redevelopment in accordance with this Specification, accepted by the Contract Administrator, as computed from the Site.
- E21.21 The removal of excavated material, supply and placement of granular, filter cloth, topsoil, and structural soil is considered incidental, and shall be included in the unit price for "Tree trench excavation and backfill" and no separate measurement and payment will be made.
- E21.22 The supply of mulch, and any required excavation for Shrub bed or annual bed preparation is considered incidental, and shall be included in the unit price for "Shrub bed Preparation" and "Annual bed Preparation"

E22. SUPPLY AND INSTALLATION OF TREES, SHRUBS AND GROUNDCOVERS

GENERAL

- E22.1 This specification shall cover the supply and installation of trees, shrubs, and groundcovers. The Contractor shall furnish all labour, materials, equipment and services necessary to complete the Work as shown on the drawings and specified herein.
- E22.2 All plant material shall be randomly inspected and approved at the source upon request of the Contract Administrator.

MATERIALS

- E22.3 Planting Soil shall consist of black top soil, a fertile friable natural loam containing by volume not less than 4% and no more than 25% of organic matter for clay loams, and not less than 2% and no more than 25% for sandy loams, with an acidity value ranging from pH 6.0 to 8.0 and capable of sustaining vigorous plant growth. Topsoil is to be free of any mixture of subsoil, clay lumps and free of stones and other extraneous matter. It is not to contain couch or crab grass rhizomes.
- E22.4 Water shall be free from organic or chemical contaminants detrimental to healthy plant growth.
- E22.5 Fertilizer – shall be complete synthetic slow release fertilizer with maximum 35% water soluble nitrogen
- E22.6 Rootball burlap shall be 150g, Hessian burlap, biodegradable.

- E22.7 Tree wrapping material to be new, clean, plain burlap strips minimum 2.5 kg/sq.m. mass and 150mm wide.
- E22.8 Anti-dessicant shall be wax-like emulsion to provide film over plant surfaces reducing evaporation but permeable enough to permit transpiration.
- E22.9 Wound dressing shall be horticultural accepted non-toxic, non-hardening emulsion.
- E22.10 Plant Material
- E22.10.1 Trees are to be grown in nurseries under proper cultural practices as recommended by the Canadian Nursery Trade Association.
- E22.10.2 Only those trees will be accepted which have been grown for at least the four (4) previous years in local Manitoba nurseries located in an Agricultural Canada Plant Hardiness Zone designation of 2(a or b) or 3(a or b), and within a 250 kilometres radius of Winnipeg. Trees that have grown in plant hardiness zones 1 and 4 or greater will be rejected.
- E22.10.3 All nursery stock supplied shall be Canadian Prairie nursery grown, and of species and sizes indicated in the plant list on the drawings. Its quality shall be in accordance with the "Guide Specification for Nursery Stock of the Canadian Nursery Trades Association".
- E22.10.4 Any nursery stock dug from native stands, wood lots, orchards, or neglected nurseries and which have not received proper cultural maintenance as advocated by the Canadian Nursery Trades Association shall be designated as "collected plants". The use of "collected plants" will not be permitted unless specified below. Nomenclature of specified nursery stock shall conform to the International Code of Nomenclature for Cultivated Plants and shall be in accordance with the approved scientific names given in the latest edition of Standardized Plant Names. The names of varieties not named therein are generally in conformity with the names accepted in the nursery trade.
- E22.10.5 Plants larger than specified may be used if approved by the Contract Administrator. The use of such plants shall not increase the contract price.
- E22.10.6 All nursery stock shall be measured when the branches are in their normal position. Height and spread dimensions specified refer to the main body of the plant and not from branch tip to root base or from branch tip to branch tip. Where trees are measured by calliper (cal), reference is made to the diameter of the trunk measured 300mm (12") above ground as the tree stands in the nursery.
- E22.10.7 All nursery stock shall be well branched, densely foliated when in leaf, true to type, structurally sound, possess a well developed, undamaged root system and shall be free of disease, insect infestations, rodent damage, sun scald, frost cracks, and other abrasions or scars to the bark. All parts of the nursery stock shall be moist and show live, green cambium when cut. All trees shall have one (1) sturdy, reasonably straight and vertical trunk and a well-balanced crown with fully developed leader. At least one (1) plant of each variety supplied shall bear a tag showing both the botanical and common name of the plant.
- E22.10.8 Trees are to have been root pruned regularly, but not later than one growing season prior to arrival on Site. The Contractor may be required to furnish documentation to the City of Winnipeg on his root-pruning program. Trees in excess of 75 mm calliper are to have been half root pruned during each of two successive growing seasons, the latter at least, one growing season prior to arrival on Site.
- E22.11 Plant Lists : The Contractor shall supply plant material as indicated on the Plant Lists below

Plant List

QUANTITY	BOTANICAL NAME / COMMON NAME	SIZE AND REMARKS
DECIDUOUS TREES		
15	<i>Ulmus americana</i> / American Elm	100mm caliper, min. 3500mm ht., min. 1200mm wide rootball, straight trunk, balanced head. Branch height 1800 above grade.
SHRUBS		
28	<i>Syringa meyeri 'Palibin'</i> / Dwarf "Meyer" Lilac	500mm ht., 5 major basal stems, dense bushy plants, container.
15	<i>Juniperus horizontalls/</i> Hughes juniper	450mm diameter plant, symmetrically branching major basal stems, dense bushy plants, container
VINES AND PERENNIALS		
20	<i>Parthenocissus quinquefolia</i> / Virginia Creeper	2 yr. plants from division. No. 1 grade, well branched, with not less than 3 runners, 18" and up and vigorous, well developed root system.
60	<i>Perennial Mix</i>	. 2 yr. plants variety to be selected based on availability of species

PLANT MATERIAL QUANTITY AND SIZE

E22.11.1 Plant material is to be planted at the quantities and callipers listed on the Plant Lists. Any variation from the specified quantity is to be clearly identified on the Schedule of Prices. Any variations to species, size or calliper of specified trees will require a request for approval from the Contract Administrator.

E22.12 Shipment and Pre-Planting Care

E22.12.1 Shipment of trees and the excavation of holes shall be coordinated to ensure minimum time lapse between digging and planting.

E22.12.2 Branches of trees shall be tied securely, and trees shall be protected against abrasion, exposure and extreme temperature change during transit. Avoid binding of trees with rope or wire that would damage bark, break branches or destroy natural shape of tree. Give full support to root ball of trees during lifting.

E22.12.3 Tree foliage shall be covered with a tarpaulin, and bare roots shall be protected by means of dampened straw, peat moss, sawdust or other acceptable material to prevent loss of moisture during transit and storage.

E22.12.4 Broken and damaged roots shall be removed with sharp pruning shears. Make clean cuts, and cover cuts over 10 mm diameter with a tree wound dressing.

E22.12.5 Roots shall be kept moist and protected from sun and wind. Heel-in trees, which cannot be planted immediately in shaded areas, and water well.

CONSTRUCTION METHODS

E22.13 Workmanship

- E22.13.1 Planting locations shall be staked out or painted on Site by Contractor and approved on-Site by the Contract Administrator prior to installation.
- E22.13.2 Anti-desiccant shall be applied in accordance with material manufacturer's instructions with prior approval of the Contract Administrator.
- E22.13.3 Coordinate operations. Keep site clean and planting holes drained. Immediately remove soil or debris spilled onto pavement, grass or sidewalk.

E22.14 Planting Time

- E22.14.1 When permission has been obtained from the Contract Administrator to plant deciduous trees after buds have broken, plants shall be sprayed with anti-desiccant to slow down transpiration prior to transplanting.
- E22.14.2 Plant only under conditions that are conducive to health and physical conditions of trees.
- E22.14.3 Provide planting schedule to Contract Administrator. Extending planting operations over long period using limited crew will not be accepted..

E22.15 Excavation of Tree Pits

- E22.15.1 The Contractor must obtain all above and below ground clearances from all the utilities as well as the appropriate City of Winnipeg – Public Works Departments in a timely manner so as not to jeopardize the schedule of the complete tree-planting Contract
- E22.15.2 All tree pits are located within tree trenches and tree wells within the sidewalk area.
- E22.15.3 The Contractor shall hand excavate all tree pits located over underground utility lines. Tree Pits not located over underground utilities may be machine excavated. Tree Pits shall be excavated with vertical sides to the full width of the surface area. as shown on the drawings. All excavated material shall be disposed of off Site.

E22.16 Planting Procedure

- E22.16.1 With balled and burlapped root balls and root balls in wire baskets, burlap shall be loosened and cut away from the top 1/3 without disturbing root ball. Each balled specimen shall be handled with great care so that the root balls shall not be broken. Burlap or rope shall not be pulled from under root ball. Non-biodegradable wrapping shall be removed. Broken root balls or balls consisting of loose soil shall not be accepted and shall be replaced. Broken roots of deciduous stock shall be pruned back prior to planting.
- E22.16.2 Where the root ball of plant material is enclosed in wire baskets, the wire baskets shall be removed from the root ball once the tree has been located properly in the pit. Removal shall be by a min. of 4 vertical cuts equally spaced around the baskets without damaging the root ball. Cutting of the 2 lowest horizontal strands of the wire basket before placing the tree in the pit is acceptable provided that the bottom of the root ball will remain intact.
- E22.16.3 After inserting the tree and tamping the root system with topsoil in layer of 150 mm, water shall be poured in until the pit is thoroughly soaked. Filling of the hole shall then be completed and the fill-in soil shall be packed firmly around the roots, leaving a concave surface for convenient watering as shown in drawings. After filling, the planting shall be watered at frequent intervals. No tree pit shall be left open at the end of the Contractor's Work Day.

- E22.16.4 Planting shall be done during periods suitable to weather conditions and locally accepted practice. All nursery stock shall be set plumb in the centre of pits and at levels as shown on the planting details after settlement has taken place.
- E22.16.5 Nursery stock shall be faced to give the best appearance or relationship to adjacent structure and to the approval of the Owner of his representative. Trees shall be placed equal to depth they were originally growing in nursery.
- E22.17 Fertilizing
- E22.17.1 When planting is completed, surface of planting saucer shall be fertilized, meeting the requirements of Specification. Fertilizer shall be mixed thoroughly with top layer of planting soil and watered in well.
- E22.18 Pruning
- E22.18.1 All deciduous trees shall be pruned immediately after planting by a Manitoba licensed Arborist. The amount of pruning shall be limited to the minimum necessary to remove dead or injured branches and to compensate for the loss of roots as a result of transplanting operations. Pruning shall be done in such a manner as to preserve the natural character of the plants. Leaders shall not be removed. Only clean, sharp tools shall be used. All cuts shall be clean and flush, leaving no stubs. Cuts, bruises or scars on the bark shall be traced back to living tissue and removed. The affected areas shall be shaped so as not to retain water and all cuts of more than 25 mm (1") in diameter shall be painted within approved tree paint.
- E22.19 Watering
- E22.19.1 Trees shall be watered during the planting procedure as described above, and once a week thereafter, or more frequently if required, during construction and prior to beginning of the Maintenance Period. The Contractor shall be responsible to properly maintain all plant material installed prior to review and acceptance by the Contract Administrator until the Date of Total Performance.
- E22.20 Protection of all Plants
- E22.20.1 All nursery stock shall be well protected from damage and drying out from time of digging until planted on Site. All roots shall be cleanly cut; split roots are not acceptable.
- E22.20.2 Nursery stock shall be transplanted with care taken to prevent damage. Branches shall be carefully tied in such a manner so as not to break or damage trunks. Points of contact with equipment shall be padded.
- E22.20.3 Nursery stock, which cannot be planted immediately upon arrival at the Site, shall be well protected to prevent drying out and shall be kept moist until commencement of planting.
- E22.20.4 There will be an inspection 30 days after the completion of the initial planting. The Warranty will start at this time for trees that are accepted.

MAINTENANCE AND WARRANTY

- E22.21 The Contractor shall be responsible for the maintenance of the planted material for a period of two (2) years from the date of acceptance of plant material by the Contract Administrator and commencement of the Two Year Maintenance Period. For any areas planted after September 15th, the maintenance period will commence on May 15th of the following year or such date as mutually agreed upon by all parties. Defective plants shall be replaced within ten (10) Calendar Days of notification to the Contractor.

- E22.22 Thirty (30) Calendar days after the planting installation has been completed, the Contract Administrator shall perform an inspection of the plant material to determine if the Work is acceptable to start warranty. Plant material shall be accepted to start warranty when installation in accordance with the Drawings and Specifications, is complete and there is no sign of wilting, chlorosis, pest infestation, transplant shock or any conditions deleterious to longevity and appearance.
- E22.23 The Contractor shall, at his/her expense, maintain the Work against any and all defects or deficiencies resulting from insect infestation, disease and mechanical damage due to improper handling, installation or maintenance, for a period of two (2) years from the date of the acceptance of plant material by the Contract Administrator. Nursery stock damaged by vandalism or reasons beyond the control of the Contractor shall be replaced by the Contractor and paid for in accordance with E 22.26
- E22.24 End-of-Warranty and Maintenance inspection will be conducted by the Contract Administrator and attended by a representative of the City of Winnipeg Forestry Department and the Contractor.
- E22.25 The Contract Administrator reserves the right to request material replacement or extend the Contractor's Maintenance and Warranty responsibilities for an additional third year, if, at the end of the first or second year of maintenance, leaf development and growth are not sufficient to ensure future survival of the tree. Such determination is at the discretion of the Contract Administrator.
- E22.26 Replacements
- E22.26.1 During the Maintenance Period, the Contractor shall remove from Site any plant material that has died or failed to grow satisfactorily as determined by the Contract Administrator and replace as per Specifications within a maximum ten-Calendar Day period from notification.
- E22.26.2 The Contractor shall extend Maintenance and Warranty on replacement tree for a period equal to the original Maintenance and Warranty Periods.
- E22.26.3 The Contractor shall continue such replacement, Maintenance and Warranty until plant material is accepted.

MEASUREMENT AND PAYMENT

- E22.27 The supplying and installation of Plant Material will be measured on a unit price basis and shall be paid for at the Contract Unit Price, installed and accepted in accordance with this Specification, as computed in the field by the Contract Administrator. Plants damaged by vandalism will only be replaced by the contractor if directed by the Contract Administrator and will be measured and paid for at the Unit Price list in Form B "Prices".
- E22.28 The measurement and payment for all sod shall be based on a unit price basis per square metre (S.M.) and shall include topsoil and all services required to prepare the site prior to the installation of sod.

E23. PROTECTION OF EXISTING TREES

GENERAL

- E23.1 The Contractor shall take the following precautionary steps to prevent damage from construction activities to existing boulevard trees within the limits of the construction area:

- E23.1.1 The Contractor shall not stockpile materials and soil or park vehicles and equipment on boulevards within 2 metres of trees.
- E23.1.2 Trees identified to be at risk by the Contract Administrator are to be strapped with 25 x 100 x 2400 wood planks, or suitable protected as approved by the Contract Administrator.
- E23.1.3 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 1.5 times the diameter (measured in inches), with the outcome read in feet, 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.
- E23.1.4 Operation of equipment within the drip line of the trees shall be kept to a 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 drip lines of trees. The drip line 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.
- E23.1.5 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 and treated with an approved tree coating/sealer.
- E23.2 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.
- E23.3 No separate measurement or payment will be made for the protection of trees.
- E23.4 Elm trees cannot be trimmed between April 1 and July 31 inclusive.

E24. LANDSCAPE MAINTENANCE

GENERAL

- E24.1 This specification shall cover the maintenance of trees and sod from the time of installation. Trees and Shrubs shall be maintained for a period of two years from the date of Total Acceptance.
- E24.2 Sod shall be maintained for a period of thirty 30 Calendar days from the date of installation.
- E24.3 The Contractor shall furnish all labour, materials, equipment and services necessary to perform the work according to the drawings and specifications. In general, work shall include:
- (a) Spring cleaning
 - (b) Fertilizing
 - (c) Watering
 - (d) Mowing
 - (e) Weed Control
 - (f) Pest and disease control
 - (g) Tree pruning
 - (h) Winter preparation

E24.4 Protection

E24.4.1 Prevent damage to fencing, other trees, landscaping, benches, buildings, pavement, surface and underground utility facilities.

E24.5 Maintenance Schedule

E24.5.1 The Contractor shall provide a complete written Maintenance schedule to the Contract Administrator prior to the issuing of the Certificate of Substantial Performance.

E24.5.2 All maintenance of trees and shrubs to be supervised by a Manitoba Certified Arborist.

E24.6 Documentation and Reporting

E24.6.1 All maintenance personnel they shall record in a logbook the operations carried out and any conditions that require attention or monitoring. The arborist shall submit a summary of the information as a Monthly Report to the Contract Administrator. Conditions requiring attention should be brought to the Contract Administrator's attention immediately.

E24.6.2 The contractor should review the site regularly and adjust maintenance operations to suit observed conditions. A Site Maintenance Inspection Form (supplied by the Contract Administrator) should be used to record each site visit. Copies of these forms shall be sent to the Contract Administrator biweekly.

E24.6.3 Report in writing any major maintenance procedures intended, minimum one week in advance.

E24.6.4 If any damage, dangerous or potentially dangerous situations are observed the Contractor shall notify the Contract Administrator immediately.

E24.7 Failure to Document and Report

E24.7.1 If the Contractor fails to submit a monthly report it shall be assumed the work was not performed for that time period. Payment for Landscape Maintenance shall be reduced by 1/6th for every month a report is not submitted.

E24.8 Qualifications

E24.8.1 All landscape maintenance personnel shall be skilled in the tasks assigned to them.

E24.9 Certificate of Acceptance

E24.9.1 The Certificate of Acceptance will be issued upon completion of the two (2) year Maintenance Period, provided that trees and sod are well established and rooted, properly pruned and showing vigorous growth satisfactory to the Contract Administrator.

E24.9.2 Unacceptable trees / sod shall be removed and replaced according to the required specifications. Maintenance of replacement items shall be extended for a period equal to the original Maintenance Period as specified herein. The Contract Administrator shall make further inspection after the additional Maintenance Period.

E24.9.3 Replacement and maintenance requirements shall continue until the material is accepted.

MATERIALS

E24.10 General

E24.10.1 Materials are to conform to the requirements of related Specification sections.

E24.11 Fertilizer

- E24.11.1 Sod - Fertilizer shall be complete synthetic slow release fertilizer with maximum 35% water-soluble nitrogen. Composition of the fertilizer shall be formulated particularly for sod in conjunction with soil tests from a recognized testing facility. Fertilizer shall be approved by the City's Area Superintendent prior to application.
- E24.11.2 Trees - Fertilizer shall be complete synthetic slow release fertilizer with maximum 35% water-soluble nitrogen. Composition of the fertilizer shall be formulated particularly for woody plant material in conjunction with soil tests from a recognized testing facility. City's Area Superintendent prior to application.
- E24.12 Bark Mulch
- E24.12.1 Bark mulch shall be locally available tree mulch, free of soil, stones, debris and any other deleterious material.
- E24.13 Condition of Equipment
- E24.13.1 Following Award of the Contract, the Bidder may be required to arrange to have the equipment inspected by the Contract Administrator to verify that the equipment is in good operating condition and meets the requirements of the Specifications.
- E24.13.2 The supply of replacement equipment of equal or larger size, if regular units are under repair, will be the responsibility of the Contractor.

CONSTRUCTION METHODS

E24.14 General

- E24.14.1 Program timing of operations to growth, weather conditions and use of Site.
- E24.14.2 Each operation shall be done continuously and complete within reasonable time period.
- E24.14.3 Store equipment and materials off site.
- E24.14.4 Collect and dispose of debris or excess material each day maintenance is undertaken.

E24.15 Spring Cleaning

- E24.15.1 Any dead vegetation, leaves and debris shall be removed. Heavy raking shall be done with a flexible grass rake on areas with "snow mould". Roll lightly areas where grass plants have lifted due to frost action.

E24.16 Fertilizing - General

- E24.16.1 Soil testing shall be carried out by a recognized testing facility prior to fertilizer application to ensure a properly formulated program.
- E24.16.2 Fertilizer shall be spread evenly at frequency, ratio and rates as recommended by Manufacturer. Use approved mechanical spreading equipment. Check calibration to ensure specified rate is spread evenly. Water immediately after fertilizing. Rectify uneven spreading as soon as it becomes apparent.

E24.17 Watering - General

- E24.17.1 Water shall be applied as required to supplement rainfall and to maintain optimum growing conditions. In general, water once a week to achieve rates as indicated. Allow soil to adequately dry between watering to prevent over saturation without creating water stress.
- E24.17.2 Water shall be applied in a soft spray to avoid packing of soil.
- E24.17.3 Use of the installed irrigation system is prohibited unless approved by the Contract Administrator.

E24.17.4 Do not impede use of sidewalk and other paved areas.

E24.18 Watering of Trees

E24.18.1 Water every third day for first and second month after planting. Thereafter, water once per week between May 1 and October 15.

E24.18.2 A complete record is to be kept of each series of watering for all planted trees noting: 1) location, and 2) date of watering. This record is to be given to the Contract Administrator when requested.

E24.18.3 Apply 40 litres of water per 25mm calliper per application using deep root feeder or low-pressure open flow nozzle and hose. The water stream must not gouge out a hole in the soil and mulch.

E24.19 Weed Control of Trees

E24.19.1 Surface of tree saucers shall be maintained free of weeds. Do not allow weeds to establish for a period longer than one (1 week).

E24.19.2 Obtain written approval of Contract Administrator prior to using any herbicides.

E24.19.3 Do not use dicamba and picloram solutions near trees.

E24.20 Pests and Disease Control

E24.20.1 Obtain written approval of Contract Administrator prior to using any pesticide.

E24.20.2 Control pests and disease through pruning or application of pesticides. Use species-specific pesticides where possible. Use only pesticides of low mammalian toxicity. Strictly follow manufacturer's written instructions.

E24.21 Cultivating Planting Beds and Tree Pits

E24.21.1 Cultivate whenever required to keep top layer of soil, loose, friable and free from weeds. Any operation must be continuous without interruption.

E24.21.2 Cultivate surface of planting bed, and soil areas around trees.

E24.21.3 Remove weeds including their roots.

E24.21.4 Take care not to damage roots of shrubs or flowers. Use small hand tools for areas of closely planted shrubs and/or perennials.

E24.21.5 Collect and dispose of paper and refuse. Remove dead plants, leaves, branches, dead flowers and seedpods.

E24.21.6 Clean, by hand, areas that are covered with mulch. Loosen top layer of mulch without mixing it with soil underneath.

E24.21.7 Add mulch as required to maintain specified thickness.

E24.22 Tree Adjustment

E24.22.1 Straighten any trees that are leaning.

E24.23 Tree Pruning

E24.23.1 The Contractor shall provide a person with a valid Manitoba Arborist's License for each Work crew or Work Site.

E24.23.2 Prune trees as required to remove dead, broken or damaged limbs. Prune back to healthy growth while maintaining balanced crown shape.

E24.23.3 Employ clean sharp tools. Make cuts co-incident with the branch collar near the main stem or branch. Cuts must be smooth and sloping to prevent accumulation of water on cut. Do not leave little stumps ("horns") on trunks or main branches.

E24.24 Bark Mulch

E24.24.1 Bark Mulch shall be installed at the locations and depths shown on the drawings. Mulch shall be installed at a uniform thickness and contained within the areas shown. Mulch spilled on pathways and sodded areas shall be removed.

E24.25 Maintenance of Sod

E24.25.1 The Contractor shall mow the turf area at regular intervals to a height of between 50-60 mm. Do not cut more than thirty percent (30%) of the grass height at any one mowing. Remove clippings that will smother grassed areas.

E24.25.2 The Contractor shall water sodded areas in sufficient quantities and at frequency required to maintain soil under sod continuously moist to a minimum depth of 100 mm. All costs to provide water for sodded areas shall be borne by the Contractor. These costs may include hydrant permit and meter rental fees.

E24.25.3 The Contractor shall clean and remove all dead vegetation, leaves, debris and snow mould from turf areas to encourage healthy and uniform grass growth.

E24.25.4 The Contractor shall apply herbicide when broadleaf weeds start developing in competition with grass. Apply herbicide in accordance with the manufacturer's instructions and the Manitoba Agriculture Guide to Crop Protection and Herbicide Recommendations for Landscape Applicators, latest editions and the following criteria:

- (a) Use 2,4-D Amine or MCPA Amine herbicide for susceptible broadleaf weeds.
- (b) Use a mixture containing 2,4-D Amine or MCPA Amine, Mecoprop and Dicamba for 2,4-D resistant plants
- (c) Do not apply to newly seeded areas until after the second or third mowing.
- (d) Do not water within 24 hours after application.
- (e) Apply when winds are less than 20 km/h and air temperature is above 10 degrees Celsius.
- (f) Avoid use of pure Dicamba solutions near trees and shrubs.
- (g) Given the need for insect control, the Contractor shall have in his possession a Pesticide Applicator's License and a Pesticide Use Permit for pesticide applications related to this specification. Use standard commercial products in accordance with the manufacturer's instructions and the Manitoba Agriculture Guide to Crop Protection (latest edition) for the particular insect/insects involved.
- (h) Copies of the Pesticide Applicator's License and the Pesticide Use Permit must be submitted to the Engineer prior to commencement of pesticide application.
- (i) All persons handling insecticides shall be fully aware of toxicological rules and regulations governing their use.
- (j) The Contractor shall inform the Contract Administrator immediately of any dangerous occurrence.

E24.26 Winter Preparation

E24.26.1 Rake and assemble leaves after trees have shed them. Remove from site.

- E24.26.2 Protect trees from rodent damage using fine wire mesh or approved plastic protector beyond snow line or by applying rodent repellent sprays.
- E24.26.3 Ensure adequate moisture in root zones of trees material prior to freeze-up.
- E24.26.4 Apply anti-desiccant to evergreen trees susceptible to winter desiccation.
- E24.27 Warranty Inspection
- E24.27.1 The Contract Administrator will call one or more annual plant material inspections to identify plant material that requires replacement, extended warranty or final acceptance. For final acceptance of trees after two years, trees should show sufficient leaf development and growth to ensure their future survival.
- E24.28 Measurement and Payment
- E24.28.1 No measurement or separate payment will be made for this Work during the construction period, until acceptance and start of the Maintenance and Warranty period. Payment for Landscape Maintenance, which price shall be payment in full for supplying all materials and for performing all operations herein described and all other items incidental to the work included in this specification.

E25. DRY LAID LIMESTONE PLANTER

GENERAL

- E25.1 This Specification shall cover the supply and installation of Dry Laid Limestone Planters and related granular backfill for areas as indicated on the Drawings.
- E25.2 The supply and installation of granular backfill, filter fabric and all other work associated for Dry Laid Limestone Planter is considered to be included in the works and no separate measurement and payment will be made.
- E25.3 Referenced Specifications:
- | | |
|------------|----------------------------|
| CW 3170-R3 | Earthwork and Grading |
| CW 3540 | Topsoil and Finish Grading |

MATERIALS

- E25.4 Submittals
- E25.4.1 Contractor to submit samples of each product used in the work prior to construction.
- E25.5 Limestone Blocks
- E25.5.1 All Limestone shall be Manitoba Tyndall limestone, blasted rock, as quarried and supplied by Bison Quarries, Stonewall, Manitoba. Material shall be free of clay pockets. Limestone shall be supplied in varying sizes as shown on the drawings.
- E25.5.2 Source of material and samples to be approved by Contract Administrator prior to delivery to site.
- E25.5.3 Face finish to be "rustic"
- E25.5.4 Random shapes shall be suitable for a dry laid planter as approved by the Contract Administrator. Limestone shall be supplied in varying sizes as shown on the drawings. Finished Coarse stones shall be 300mm x 450mm x 125mm± min.

E25.6 Granular Base and Backfill

E25.6.1 Granular base shall follow the gradation and requirements of base course material specified in CW 3110-R5.

E25.7 Clean Stone

E25.7.1 Clean stone shall be 25mm diameter crushed clean limestone.

E25.8 Geotextile Fabric

E25.8.1 Geotextile Fabric shall be in accordance with CW 3710-R3 'Products Approved for Use in Surface Works'.

CONSTRUCTION METHODS

E25.9 General

E25.9.1 The Contractor shall build on site at the final location a portion of the wall, 450mm high x 1500mm long for review by the Contract Administrator prior to final construction of the Dry Laid Limestone Planters. This exposed wall shall consist of four (4) to five (5) courses including cap, stones sized appropriately.

E25.9.2 Verify with Contract Administrator that layout dimensions are correct and subgrade is in proper condition for installation. Do not proceed with installation of limestone until unsatisfactory conditions have been corrected.

E25.10 Excavation

E25.10.1 Excavate to the lines and grades shown on the construction drawings. Obtain the Contract Administrators approval of excavation prior to placement of materials. Proof roll foundation area as directed to determine if remedial work is required.

E25.10.2 Notify the Contract Administrator immediately upon discovery of any silt pockets or other deleterious material. Over-excavation of any deleterious material and replacement with suitable fill, only upon approval by the Contract Administrator.

E25.10.3 Be careful not to disturb embankment and foundation materials beyond lines shown.

E25.11 Granular Base

E25.11.1 Install geotextile fabric on top of compacted subgrade for length of wall. Width of fabric shall extend 150mm beyond front and back faces of wall. Pin in place every 750mm O.C. Where joining of fabric pieces is required overlap seam 150mm minimum.

E25.11.2 Place granular base material to the lines and grades shown on the drawings. Extend base minimum of 200 mm beyond front and back faces of wall.

E25.11.3 Compact material to a minimum of 95 percent Standard Proctor Density.

E25.11.4 Prepare base to ensure full contact to the base surface of the limestone stones.

E25.12 Limestone Blocks

E25.12.1 Place first course of stones on granular base and check alignment and level. Ensure that all blocks are in full contact with gravel base and firmly seated.

E25.12.2 Follow closely with backfill. Maximum stacked vertical height of wall prior to backfill placement and compaction not to exceed 2 courses.

E25.12.3 Placement of blocks shall be tight and firmly set. Gaps between blocks not to exceed 15mm.

E25.12.4 Top of wall shall be set to the heights shown on the drawings or as directed by the Contract Administrator.

E25.13 Geotextile Fabric

E25.13.1 Geotextile fabric shall be installed vertically along the back face of the wall, prior to installation of granular backfill.

E25.13.2 Fabric shall be folded back overtop of granular backfill, 450mm minimum.

E25.13.3 Where joining of fabric is required overlap seams 300mm minimum

E25.14 Granular Backfill

E25.14.1 Place, spread, and compact backfill in such a manner that minimizes the development of slack in the geotextile fabric. Ensure no damage to the geotextile fabric.

E25.14.2 Place and compact backfill in lifts not to exceed 150 mm where hand compaction is used, 200 to 250 mm where heavy compaction equipment is used. Decrease lift thickness where necessary to achieve required density.

E25.14.3 Compact backfill to 95 percent of the maximum density as determined by ASTM D 698. The moisture content of the backfill material prior to and during compaction shall be uniformly distributed throughout each layer and shall be within +0/-3 percentage points dry of optimum.

E25.14.4 Place clean stone at back of wall in locations as shown on the drawings and as approved by Contract Administrator.

E25.14.5 Allow only lightweight hand-operated equipment within 900 mm from the tail of the wall.

E25.14.6 At the end of each day's operation, slope the last lift of reinforced backfill away from the wall to direct runoff away from wall face. Do not allow surface runoff from adjacent areas to enter the wall construction site.

MEASUREMENT AND PAYMENT

E25.15 The supplying and installation of Dry Laid Limestone Planter will be measured on a linear metre (L.M.) basis. The area to be paid for shall be the total number of linear metres of Dry Laid Limestone Planter installed in accordance with this Specification, accepted by the Contract Administrator, as computed in the field by the Contract Administrator

E26. SITE FURNITURE

DESCRIPTION

E26.1 This specification shall cover the supply and installation of Site furnishings. The Contractor shall furnish all labour, materials, equipment and services necessary to complete the Work as shown on the drawings and specified herein. These items shall include the supply and installation of:

- (a) Waste Receptacles
- (b) Free Standing Benches – Type A
- (c) Free Standing Benches – Type B
- (d) Bicycle Racks
- (e) Metal fence refinish on site
- (f) Metal fence repair and refinish off site and install on existing footings

- (g) Metal fence repair and refinish off site and install on new footings
- (h) New metal fence/supply and install on new footings
- (i) Entry gate/complete with all structural and finishes

MATERIAL

E26.2 Shop Drawings

E26.2.1 Shop drawings are required for all custom made furnishings including customized benches, bicycle racks, fence and entry gates

E26.2.2 Drawings showing all sizes and dimensions, position and spacing of reinforcing, openings, connection details, layout plan, finishes, all inserts, and all other relevant information showing immediate adjacent materials for proper coordination shall be submitted to the Contract Administrator within two weeks after award of the contract and prior to fabrications for review and approval by the Contract Administrator. Five copies of each drawing shall be provided.

E26.3 Waste Receptacles

E26.3.1 Waste receptacles shall be Victor Stanley, Inc. ES-242 -136 liter capacity Waste Receptacle, complete with ribbed and moulded plastic liner, standard tapered form lid, (colour - VS Gloss Black), as distributed by Victor Stanley, Inc. P.O. Drawer 330 – Dunkirk, MD 20754 USA, Tel. (301)855-8300, Fax. (410)257-7579. <http://www.victorstanley.com> As this is a test Site for the product, no substitutions or alternatives will be recognized.

E26.4 Bench Type “A”

E26.4.1 The Type “A” bench shall be a custom manufactured unit consisting of a seat assembly: Petoskey backed Bench: (25” x 78”) finish IPE wood as manufactured and distributed by Landscape Forms Inc. (1-800-441-1945) set and fastened to two custom manufactured tyndall stone bench arms. Local distributor Contemporary Interiors, Contact: Josh St. Aubin – 204 – 987-1604.

E26.4.2 Tyndall stone bench arms:

- (a) All tyndall stone shall be Manitoba Tyndall Stone as quarried and supplied by Gillis Quarries Ltd. To ASTM C568-79 Category 11, high density sound hard stone, free of clay pockets. Stones should be cut from matched blocks.
- (b) Proper care shall be exercised, both in transit and site handling, to avoid chipping, cracking and breakage. Any item that is chipped, or broken shall be removed and replaced with an undamaged item.
- (c) Quarried blocks shall be made available for examination to the Contract Administrator on request
- (d) Sawn surfaces shall be cleaned of all rust stains and iron particles. Joint surfaces shall be sawn and free of any contamination and ready for the sealant.
- (e) Anchor bolts and all fastening hardware shall be fabricated of AISI type 302/304 stainless steel
- (f) Slabs to be “pointed” finish on the sides and smooth on top

E26.5 Bench Type “B”

E26.5.1 The Type “B” bench shall be 72” backed Gretchen’s Bench – Freestanding – Surface Mount, with ornamental arm rests, IPE wood finish as manufactured and distributed by Landscape Forms Inc. (1-800-441-1945). All concrete for footings to be as per E18 Cast in

Place Concrete. Local distributor Contemporary Interiors, Contact: Josh St. Aubin – 204 – 987-1604.

E26.6 Bicycle Rack

E26.6.1 Custom manufactured bicycle rack as per drawings. Shop drawings to be submitted for approval prior to construction.

E26.6.2 Material to be Aluminum to dimensions and thickness shown on the drawings.

E26.6.3 Finish to be anodized, colour black.

E26.6.4 All concrete for footings to be as per E18 Cast in Place Concrete.

E26.7 Existing Metal Fence

E26.7.1 Existing metal fencing to be refinished on site at locations shown on drawings.

E26.7.2 Existing Metal Fence repair and refinish off site and shall be installed at same locations onto existing footings or onto new footings, as shown on the drawings. All concrete for new footings to be as per E18 Cast in Place Concrete.

E26.8 New Metal Fence

E26.8.1 New Metal Fencing to be supplied and installed onto new footings as shown on the drawings.

E26.8.2 Posts, Rails and Pickets to be as dimensioned on drawings.

E26.8.3 All metal material, finishing and hardware shall be as per E27 Miscellaneous Metals.

E26.8.4 All concrete for footings to be as per E18 Cast in Place Concrete.

E26.9 Entry Gate

E26.9.1 Entry Gate posts to be supplied and installed as shown on the drawings. Shop drawings to be submitted for approval prior to construction.

E26.9.2 All concrete material and finishing shall be as per E17 Concrete Formwork and E18 Cast in Place Concrete.

E26.9.3 All metal material, hardware and finishing to be as per E27 Miscellaneous Metals.

E26.9.4 Refer to Drawing E101 for all light fixture and associated works.

E26.9.5 Granite Slab

(a) Shop Drawings shall be submitted to the Contract Administrator for review and approval prior to fabrication. All drawings shall show anchoring details, dimensions and identifying number of each pieces of granite. No final sizing or finishing shall be done until the shop drawings for that part of the work have been approved.

(b) Sample of granite shall be submitted to the Contract Administrator for review and approval prior to fabrication. Sample to show texture, finish, and anticipated range of colour to be supplied.

(c) All granite shall be of standard architectural grade, free of cracks, seams, or starts which may impair its structural integrity or function. Colour or other visual characteristics indigenous to the particular material and adequately demonstrated in the sampling phase will be accepted provided they do not compromise the structural or durability capabilities of the material.

(d) Colour and finish shall match the existing granite on the posts of the median gate feature taking into account differences that will be a result of exposure. Available material and scheduling will be considered in the acceptance of a colour sample.

- (e) Dimensional tolerances of panel thickness will be +/- 3mm and panel face variation from rectangular will be +/- 1.5mm.
- (f) Panel is to be inserted in steel channels of the angle frame using neoprene spacers at the base and stainless steel or neoprene spacers along its height to secure it in place.
- (g) Finished granite shall be carefully packed and loaded for shipment using all reasonable and customary precautions against damage in transit. No material which may cause staining or discolouration shall be used for blocking or packing.
- (h) Granite shall be shop cleaned at the time of final fabrication. After installation the contractor shall carefully clean the granite, removing all dirt, stains, and other site incident defacements.
- (i) After the granite is installed, it shall be the responsibility of the Contractor to see that it is properly and adequately protected from damage.

CONSTRUCTION METHODS

E26.10 General

E26.10.1 Pavers to be removed in areas that benches, waste receptacles and bicycle racks are to be installed, extents shown on drawings. Granular base and sand levelling bed to be supplemented, as required to provide a level surface for bench and waste receptacle installation. Contractor to relay paving stones and cut, as required, to suit concrete footing layout. Contractor to ensure positive drainage of sidewalk is maintained with relaying of paving stones.

E26.11 Waste Receptacle

E26.11.1 Waste receptacle shall be set onto sidewalk in locations as noted on the plan or as directed by Contract Administrator and in accordance with manufacturer's instructions. The waste receptacle units shall be secure and level.

E26.12 Bench Type "A"

E26.12.1 Contractor to submit shop drawings for all benches for review and approval prior to any fabrication.

E26.12.2 Shop Drawings to show layout, dimensions and finishing details.

E26.12.3 Benches shall be installed as per the drawings, and shall be set plumb and level. Galvanized washers and/or neoprene spacers to be used as required to set benches level along their length.

E26.13 Bench Type "B"

E26.13.1 Bench Type "B" shall be set onto sidewalk in locations as noted on the plan or as directed by Contract Administrator and in accordance with manufacturer's instructions and as per the drawings, and shall be set plumb and level. Galvanized washers and/or neoprene spacers to be used as required to set benches level along their length.

E26.14 Bicycle Racks

E26.14.1 Bicycle racks shall be installed using hilti chemical fastening system onto concrete surface, as per drawings. Refer to layout drawing for locations. Stainless Steel washers and/or neoprene spacers to be used as required to set bicycle racks plumb.

E26.14.2 Asphalt coating to be spread onto concrete surface beneath base plate. Ensure thick even coating to extents of base plate.

E26.15 Existing Metal Fence Refinished on Site

- E26.15.1 Existing Metal Fence to be refinished on site shall be cleaned of all rust, loose paint and prepared for priming and painting. Once all cleaning work is done, fencing to be inspected by the Contract Administrator prior to finishing work commencing.
- E26.15.2 All debris to be cleaned from site as work progresses to keep private lands and public sidewalks accessible. Protection of private property, buildings, and site contents to be the responsibility of the Contractor to ensure that no damage occurs in and around the immediate area where fence refinishing is taking place. If there is a need to protect an area, or remove site contents the Contractor shall assume the responsibility for contacting the tenant or owner to arrange for the necessary action. If there is damage to any adjacent site or contents the full responsibility for correction shall be the responsibility of the contractor. Contractor to ensure newly painted fence does not get marred or show defects during drying/curing stage. Signing of wet paint or other means once finishing work commences shall be the responsibility of the Contractor.
- E26.16 Existing Metal Fence Repair and Refinish Off Site
- E26.16.1 Existing Metal Fence to be repaired and refinished off site shall be removed from their footings and cut into segments from post to post (approximately 2.0 linear meters). Repairs to be undertaken to provide straight and level pickets, rails and posts. Protection of private property, buildings, and site contents to be the responsibility of the Contractor to ensure that no damage occurs in and around the immediate area where fence refinishing is taking place. If there is a need to protect an area, or remove site contents the Contractor shall assume the responsibility for contacting the tenant or owner to arrange for the necessary action. If there is damage to any adjacent site or contents the full responsibility for correction shall be the responsibility of the contractor.
- E26.16.2 In certain locations (169 Provencher) temporary fencing will be required while the iron fencing is being refurbished. In these instances the contractor will be responsible for the re-installation of temporary fence posts, temporary construction fencing and tie straps for temporary construction fencing. Plastic mesh construction fence may be used as long as it is maintained in good condition, in good appearance, rigid, plumb, and safe throughout the time it is in place. Fences should be min. 1.0m ht., secured top, middle and bottom.
- (a) Contractor to prepare a post mortem assessment outlining extent of repairs, new material required, and irreparable segments. The assessment will be reviewed and approved by the Contract Administrator.
 - (b) All repair work will be done in accordance with industry standards and as per E27 Miscellaneous Metals.
 - (c) Once fence segments have been repaired, new base plates are to be attached to each post as shown on drawings.
 - (d) All metal shall be thoroughly cleaned of rust, rust scale, mill scale, dirt and other contaminants by commercial sand, grit or shot blasting and/or pickling prior to galvanizing. Heavy deposits of oil and grease shall be removed with solvents prior to blasting or pickling.
 - (e) Fence segments to be primed and painted black immediately after sandblasting/cleaning. Refer to E27 Miscellaneous Metals for all finishing specifications.
 - (f) Existing base plates on concrete footings to be cleaned and primed on site.
- E26.16.3 Install refinished fence on existing footings in locations as shown on the drawings. Site weld new base plates to existing plates, prime and paint.
- E26.16.4 Install refinished fence on new footings in locations as shown on the drawings Base plates to be secured to footings using hilti chemical fastening system, threaded rod, washers and nut as noted on the drawings.

- E26.16.5 New Metal Fence
- E26.16.6 New Metal Fence to be fabricated as shown on the drawings. Contractor to verify all site measurements, to be approved by Contract Administrator prior to fabrication.
- E26.16.7 Concrete footings to be staked by Contractor and approved by Contract Administrator prior to construction. Top of footings to be set level through length of fence.
- E26.16.8 Fence segments to be installed straight and level. No site welding to be undertaken on new fence segments. All finishing work to be done prior to installation. Refer to E27 Miscellaneous Metals for all finishing specifications.
- E26.16.9 Install new fence on new footings in locations as shown on the drawings. Base plates to be secured to footings using hilti chemical fastening system, threaded rod, washers and nut as noted on the drawings.
- E26.16.10 Entry Gate
- E26.16.11 Entry Gate Posts to be fabricated as shown on the drawings and as detailed on approved shop drawings.
- E26.16.12 Contractor to coordinate all electrical, concrete, and metal works for entry gates.
- E26.16.13 All supplied items shall be factory assembled to ensure fitment and painted with all accessories and attachments to ensure complete and operational assemblies. Granite slabs and map inserts to be installed after painting and finishing work complete. Contractor to ensure shop drawings for granite slabs and map inserts are coordinated with metal fabrication.
- E26.16.14 Refer to E27 Miscellaneous Metal for fabrication and finishing requirements.
- E26.16.15 Contractor to stake locations of the four gate posts for review and approval by Contract Administrator.
- E26.16.16 AutoCAD drawings for the laser cut patterns will be provided to the Contractor.

MEASUREMENT AND PAYMENT

- E26.17 Waste Receptacles
- E26.17.1 The supplying and installation of Waste Receptacles will be measured on a unit basis and shall be paid for at the Contract Unit Price for Waste Receptacles, supplied and installed, or supplied and delivered to City of Winnipeg, in accordance with this Specification and drawings, accepted by the Contract Administrator, as computed in the field by the Contract Administrator. The price shall include all labour and materials required to remove, reset pavers and install concrete footings.
- E26.18 Bench Type "A" and Type "B"
- E26.18.1 The supplying and installation of Benches will be measured on a unit basis and shall be paid for at the Contract Unit Price for Benches, supplied and installed in accordance with this Specification and drawings, accepted by the Contract Administrator, as computed in the field by the Contract Administrator. . The price shall include all labour and materials required to remove, reset pavers, install concrete footings and set benches.
- E26.19 Bicycle Racks
- E26.19.1 The supplying and installation of Bicycle Racks will be measured on a unit basis and shall be paid for at the Contract Unit Price for Bicycle Racks, supplied and installed or supplied and delivered to City of Winnipeg, in accordance with this Specification and drawings, accepted by the Contract Administrator, as computed in the field by the Contract

Administrator. The price shall include all labour and materials required to remove, reset pavers and install concrete footings.

E26.20 Existing Metal Fence refinish on site

E26.20.1 The refinishing of Existing Metal Fence will be measured on a lineal metre (L.M.) basis and shall be paid for at the Contract Unit Price for Existing Metal fence refinish on site, in accordance with this Specification and drawings, accepted by the Contract Administrator, as computed in the field by the Contract Administrator. The price shall include all labour and materials required to carry out the job, protect, sign and ensure the safety of people and site during work.

E26.21 Existing Metal Fence repair and refinish off site and install on existing footings

E26.21.1 The Repair, Refinishing Off Site and Installation of Existing Metal Fence will be measured on a lineal metre (L.M.) basis and shall be paid for at the Contract Unit Price for Existing Metal Fence Repair off site and Install on Existing Footings and Plates, in accordance with this Specification and drawings, accepted by the Contract Administrator, as computed in the field by the Contract Administrator. The price shall include all labour and materials required to safely remove, transport, evaluate, refinish, reinstall and protect site. Cost should also include the provision of temporary fencing where required.

E26.22 Existing Metal Fence repair and refinish off site and install on new footings

E26.22.1 The Repair, Refinishing Off Site and Installation of Existing Metal Fence will be measured on a lineal metre (L.M.) basis and shall be paid for at the Contract Unit Price for Existing Metal Fence Repair and refinish off site and Install on New Footings, in accordance with this Specification and drawings, accepted by the Contract Administrator, as computed in the field by the Contract Administrator. The cost shall include all labour and materials required to safely remove, transport, evaluate, refinish and reinstall fence and protect site, as well as, the cost of new footings Cost should also include the provision of temporary fencing where required.

E26.23 New metal fence/supply and install on new footings

E26.23.1 The Supply and Installation of New Metal Fence will be measured on a lineal metre (L.M.) basis and shall be paid for at the Contract Unit Price for New Metal Fence Supply & Install on New Footings, in accordance with this Specification and drawings, accepted by the Contract Administrator, as computed in the field by the Contract Administrator. The cost shall include all labour and materials required to construct and install fence as well as, the cost of new footings Cost should also include the provision of temporary fencing where required.

E26.24 Entry gate feature/supply and install complete with all structural and finishes

E26.24.1 The Supply and Installation of Entry Gate Feature will be measured on a unit basis and shall be paid for at the Contract Unit Price for "Entry Gate Feature Supply and Install Complete with all Structural and finishes", in accordance with this Specification and drawings, accepted by the Contract Administrator, as computed in the field by the Contract Administrator.

E27. MISCELLANEOUS METAL

DESCRIPTION

E27.1 This Specification shall cover supply, fabrication, galvanizing, transportation, handling and installation of miscellaneous metal, including all miscellaneous metal elements and incidental component/fasteners, as specified herein.

- E27.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified.
- E27.3 Shop Drawings
- E27.3.1 Contractor shall submit shop drawings for all supply items within two weeks after award of contract and prior to fabrication for review and approval by Contract Administrator.
- E27.3.2 Shop Drawings shall be stamped by a P.Eng., with a Manitoba license.
- E27.3.3 Shop drawings are to clearly indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners and accessories.
- E27.3.4 Indicate welded connections using CISC standard welding symbols. Clearly indicate net weld lengths.

MATERIALS

- E27.4 General
- E27.4.1 The Contractor shall be responsible for the supply, safe storage and handling of all miscellaneous metal materials as set forth in this Specification.
- E27.4.2 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.
- E27.4.3 All metals are to be new materials and free from defects impairing strength, durability and appearance of the best commercial quality for the purpose specified.
- E27.4.4 All supplied items shall be factory assembled to ensure fitment and painted with all accessories and attachments to ensure complete and operational assemblies.
- E27.5 Structural and Miscellaneous Steel
- E27.5.1 Unless otherwise specified, all steel for new members shall meet the requirements of CAN / CSA – G40.20 / G40.21 – M92.
- E27.6 Welding
- E27.6.1 Unless otherwise noted, all welding shall conform to the requirements of CSA Standard W59 – M1989.
- E27.7 Hardware
- E27.7.1 All bolts, nuts, washers, inserts, etc., as required for a complete installation shall be stainless steel, Type 316 unless noted otherwise.
- E27.8 Galvanizing Touch-up
- E27.8.1 Field-applied galvanizing, to touch-up damaged hot-dip galvanizing and to galvanize field welds, shall be done with self-fluxing, low temperature, zinc-based alloy rods in accordance with ASTM A780-80 for "Repair of Damaged Hot Dip Galvanizing Coatings".
- E27.8.2 Approved products for field touch up work are: Galvalloy as manufactured by Metalloy Products Company and Welco Galvanizing Alloy, as manufactured by Thermocote Welco. Locally, both products are available from Welder Supplies Limited, 25 McPhillips Street, Winnipeg, Manitoba.

CONSTRUCTION METHODS

E27.9 Structural and Miscellaneous Steel

E27.9.1 Structural and miscellaneous steel fabrication shall be in accordance with CAN / CSA – S16.1 – M89.

E27.10 Welding

E27.10.1 Welding shall be in accordance with CSA W59 – M1989.

E27.10.2 All welds to be 6mm unless noted otherwise.

E27.10.3 Seal weld all joints

E27.10.4 The welding shop must be certified and qualified in accordance with CSA W47.1 – 1983.

E27.11 Welding to Galvanized Metal

E27.11.1 All field welding to galvanized metal shall be touched up by the Galvalloy process as described in E26.6.1. All Galvalloy repairs shall be made flush with adjacent metal.

E27.12 Finish

E27.12.1 All exposed surfaces shall be smooth and free of sharp edges.

E27.12.2 The exterior surface shall be cleaned of all grease and oil and all loose particles.

E27.12.3 All steel shall be hot-dipped galvanized to meet the requirements of CAN / CSA G164 – M92.

E27.12.4 A primer coat of Intergard 269, or equivalent, shall be applied with a minimum thickness of 2.5 to 3.0 mils.

E27.12.5 A finish coat of black urethane, Interthane 99001A / 99002B or equivalent with a minimum thickness of 1.5 to 2.0 mils.

E27.13 Galvanizing Touch-up Procedure

E27.13.1 Any areas of damaged galvanizing, and all field welds, are to receive field-applied galvanizing as specified herein.

E27.13.2 Surfaces to receive field-applied galvanizing shall be cleaned using a wire brush, a light grinding action, or mild blasting to remove loose scale, rust, paint, grease, dirt, or other contaminants. Preheat the surface to 315°C and wire brush the surface during preheating. Rub the cleaned preheated area with the repair stick to deposit an evenly distributed layer of zinc alloy. Spread the alloy with a wire brush, spatula, or similar tool. Field-applied galvanizing shall be blended into existing galvanizing of surrounding surfaces and shall be buffed and polished if required to match the surrounding surfaces. Care shall be taken to not overheat surfaces beyond 400°C and to not apply direct flame to the alloy rods.

E27.14 Fabrication

E27.14.1 Contractor to verify all dimensions on site prior to shop fabrication.

E27.14.2 Fabricate items of sizes and profiles detailed on the drawings and approved shop drawings with joints neatly fitted and properly secured.

E27.14.3 Supply all components required for proper anchorage of miscellaneous metals. Fabricate anchorage and related components of same material and finish as metal fabrications unless otherwise noted.

E27.14.4 Grind or file exposed welds and metal sections smooth and flush.

E27.15 Installation

- E27.15.1 Install items plumb, square and level to fit accurately and maintain free from distortion or defects detrimental to appearance and performance.
- E27.15.2 Make provision for erections stresses and temporary bracing. Keep work in alignment at all times.
- E27.15.3 Replace items damaged in course of installation
- E27.15.4 Perform all field assembly, bolting and welding to match standard of shop bolting and welding.
- E27.15.5 After installation, touch up field bolts, nuts, welds, and scratched and damaged painted surfaces.
- E27.15.6 Install all items as indicated on the drawings.

MEASUREMENT AND PAYMENT

- E27.16 No separate allowance will be made for metal fabrication, supply, finish and installation. All costs associated with the work in this section shall be included in the individual unit prices for work itemized in "Form B" prices.