

PART E
SPECIFICATIONS

PART E - SPECIFICATIONS**GENERAL****E1. APPLICABLE SPECIFICATIONS, STANDARD DETAILS AND DRAWINGS**

E1.1 *The City of Winnipeg Works and Operations Division Standard Construction Specifications* in its entirety, whether or not specifically listed on Form B: Prices, shall apply to the Work.

E1.1.1 Division 2 - Standard Provisions, Provision CW 1100 of The City of Winnipeg Works and Operations Division Standard Construction Specifications shall apply to the Work.

E1.1.2 Further to GC:2.4(d), Specifications included in the Tender Package shall govern over The City of Winnipeg Works and Operations Division Standard Construction Specifications.

E1.2 The following Drawings are applicable to the Work:

<u>Drawing Title</u>	<u>Drawing No.</u>	<u>File Name</u>	<u>Size</u>
EXISTING SITE PLAN	L1		A1
LAYOUT PLAN	L2		A1
GRADING PLAN	L3		A1
DETAILS	L4		A1
FOUNDATION AND FRAMING PLANS	S1		A1
SECTIONS AND DETAILS	S2		A1
DECK SECTION AND NOTES	S3		A1

E2. VERIFICATION OF WEIGHTS

E2.1 All Material which is paid for on a weight basis shall be weighed on a scale certified by Consumer & Corporate Affairs, Canada.

E2.1.1 All weight tickets shall have the gross weight and the time and date of weighing printed by an approved electro/mechanical printer coupled to the scale.

E2.1.2 The tare weight and net weight may either be hand written or machine printed. All weights, scales and procedures shall be subject to inspection and verification by the Contract Administrator. Such inspection and verification may include, but shall not be limited to:

- (a) checking Contractor's scales for Consumer & Corporate Affairs certification seals;
- (b) observing weighing procedures;
- (c) random checking of either gross or tare weights by having such trucks or truck/trailer(s) combinations as the Contract Administrator shall select weighed at the nearest available certified scale;
- (d) checking tare weights shown on delivery tickets against a current tare.

E2.2 The Contractor shall ensure that each truck or truck/trailer(s) combination delivering Material which is paid for on a weight basis carries a tare not more than one (1) month old.

E2.2.1 The tare shall be obtained by weighing the truck or truck/trailer(s) combination on a certified scale and shall show:

- (a) upon which scale the truck or truck/trailer(s) combination was weighed;

- (b) the mechanically printed tare weight;
- (c) the license number(s) of the truck and trailer(s);
- (d) the time and date of weighing.

E3. TRUCK WEIGHT LIMITS

- E3.1 The City shall not pay for any portion of Material which results in the vehicle exceeding the maximum gross vehicle weight allowed under *The City of Winnipeg Traffic By-Law*, unless such vehicle is operating under special permit.

E4. DAMAGE TO EXISTING STRUCTURES AND PROPERTY

- E4.1 Further to Clause GC6.28(a) of the General Conditions, special care shall be taken to avoid damage to existing adjacent structures and properties during the course of the Work.
- E4.2 Any damage caused by the Contractor or his Subcontractors to the adjacent structures or properties shall be promptly repaired by the Contractor at his own expense to the satisfaction of the Contract Administrator.

E5. WINNIPEG WATERWAY AUTHORITY PERMIT

- E5.1 The Contract Administrator is in the process of obtaining the Winnipeg Waterway Authority Permit for the project. Once the permit is obtained the Contract Administrator shall provide the Contractor with a copy of the permit for the project and the Contractor shall be governed by the Permit's requirements (relative to locations for stockpiling materials, etc.).

E6. SITE PREPARATION

GENERAL

- E6.1 Description
- E6.1.1 This Specification shall cover all aspects of the Site preparation Work, including equipment mobilization and demobilization, erection and maintenance of safety fence, removal of vegetation, trees, and debris on the bank, snow clearing, access development, and Site restoration.

EXECUTION

- E6.2 Mobilization and Demobilization
- E6.2.1 The mobilization and demobilization of all equipment necessary to complete the Work is covered under this specification, including installation, maintenance and removal of the Contract Administrator's Site trailer.
- E6.3 Site Access
- E6.3.1 The location of access points for the construction equipment and materials, and the methodology to facilitate construction shall be subject to the approval of the Contract Administrator. All material excavated for access ramps shall be hauled away from the Site at no additional cost. Care shall be taken to prevent damage to existing Site facilities, services and roads. In the event of damage to existing Site facilities or services caused by the Contractor's access and construction activities, the Contractor shall be held liable, and shall be required to provide appropriate restoration, to the satisfaction of the Contract Administrator. The Contractor shall be required to submit his proposed access

methodology for review and approval prior to initiation of the Work to ensure that temporary slope stability conditions are not jeopardized at the Site or on adjacent lands.

- E6.3.2 If the Contractor chooses to use rockfill for a construction access ramp at the shoreline, the volume, location and geometry of the fill shall be such that riverbank stability is not jeopardized. It may be possible to salvage a portion of this rockfill for use as riprap, provided the size specification is satisfied, and that there is no contamination. All contaminated rockfill used for access shall be hauled and disposed off site. No separate payment will be made for any rockfill used as access and hauled off site. All procedures associated with the access to the lower bank, including fill placement and salvage of riprap, shall be subject to the approval of the Contract Administrator.

E6.4 Vegetation and Debris Removal

- E6.4.1 All vegetation, trees, and debris shall be removed from the Site prior to excavation and fill placement. The Contractor shall load and haul all trees, stumps, roots, logs, brush, rubbish, and any other surface litter that may be on the slope away from the Site, and dispose of these materials at dumps located by the Contractor and approved by the Contract Administrator. All material shall be disposed off site immediately upon collection, and stockpiling at the Site will not be permitted. The Contract Administrator shall identify the limits of the tree and vegetation removal. No trees or vegetation outside these limits shall be disturbed or damaged.

E6.5 Snow and Ice Removal

- E6.5.1 Snow and ice cover shall be cleared from the riverbank prior to laying the geotextile fabric for the placement of the rockfill riprap. The methodology to clear the snow shall be subject to the approval of the Contract Administrator. The Contractor shall also be responsible for clearing snow at the Site for equipment access.
- E6.5.2 Ice at the shoreline of the river shall be broken and cleared before excavation and placement of the rockfill riprap below ice level. Care shall be taken to ensure that the ice is removed, and does not become trapped below the rockfill.

E6.6 River Safety

- E6.6.1 The Contractor is responsible for all Site safety issues associated with working along the river. This shall include but not necessarily limited to the erection and maintenance of a safety fence and appropriate signage to restrict access to the Site for the duration of the project. The fence shall enclose the entire Site, with appropriate gates or openings that are closed at the end of each day. Appropriate signs shall be erected to warn all recreation users and pedestrians that an open water hazard exists. The installed fencing shall consist of Dupont Number L70 orange plastic safety fence or approved equal, with a mesh spacing of 45 mm and a minimum height of 1.2 m supported by steel posts driven or set into the ground or ice. The posts shall be sized and spaced to adequately support the fence upright, regardless of the conditions. Upon completion of the construction, the fence shall be removed from the Site. The Site safety procedures shall be subject to the approval of the Contract Administrator and the City of Winnipeg Harbormaster.

E6.7 Site Restoration

- E6.7.1 The Site shall be restored to a condition at least equivalent to its original condition prior to construction, as approved by the Contract Administrator. This may include, but not necessarily limited to, landscaping, grading repairs, and Site trailer removal.

METHOD OF MEASUREMENT

- E6.8 The Site Preparation will be measured on a lump sum basis, and shall include all Items of Work completed in accordance with this Specification and accepted by the Contract Administrator.

BASIS FOR PAYMENT

- E6.9 Site preparation will be paid for at the Contract Unit Price for each "Items of Work", listed below, which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.

Items of Work:

- i) Site Preparation

E7. PROTECTION OF EXISTING TREES

GENERAL

E7.1 Description

- E7.1.1 This specification covers the protection of existing trees. 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 hereinafter specified.

CONSTRUCTION METHODS

E7.2 Preservation

- E7.2.1 Existing trees shall be protected and preserved as is.

E7.3 Trunk Protection

- E7.3.1 All trees will have a 1.0m radius protective zone calculated from the circumference at the base of the trunk which will remain free of digging, trenching, grade changes, stock piling of materials and soil compaction throughout the duration of the contract. Protective fencing around these areas is required. All trees within and immediately adjacent to, proposed construction areas will require 1x6x8' wood planks strapped to the tree trunk to completely protect the tree trunk from impact damage. (smaller trees will be similarly protected using proportionally sized wood planks).

E7.4 Overhead Branch and Limb Protection

- E7.4.1 Tree limbs and branches overhanging the construction area shall not be damaged. The responsibility to ensure that the above ground portions of trees are not damaged is that of the agent involved in the actual Work.

E7.5 Excavation

- E7.5.1 During all excavation a representative from the City of Winnipeg Forestry Branch shall be present at all times unless otherwise agreed upon by the Contract Administrator, Forestry Branch and Contractor prior to commencement of construction.

E7.6 Notification

- E7.6.1 The Contract Administrator is to be notified 48 hours in advance of any large equipment to be working in the vicinity of the existing trees. The Contractor shall provide adequate personnel on foot to supervise equipment operators in the vicinity of the trees to ensure that there is no damage whatsoever to the existing trees.
- E7.6.2 Special care is required during excavation to ensure existing tree root structure is not damaged. Should root pruning be required the Contractor must notify the Contract Administrator at least three (3) Working Days to ensure proper root pruning techniques are employed.

METHOD OF MEASUREMENT

- E7.7 No measurement will be made for protection of existing trees.

BASIS FOR PAYMENT

- E7.8 No separate payment will be made for protection of existing trees.

E8. CONCRETE DOCK**GENERAL****E8.1 Description**

- E8.1.1 This Specification shall cover the requirements for supply and installation of a permanent concrete dock, including temporary railing. 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 hereinafter specified.

MATERIALS**E8.2 General**

- E8.2.1 Materials shall be supplied as noted on the drawings.
- E8.2.2 The Contractor shall be responsible for the supply, safe storage and handling of all materials set forth in this Specification.

CONSTRUCTION METHODS**E8.3 Quality Control****E8.3.1 Inspection**

- (a) All workmanship and all materials furnished and supplied under this Specification are subject to close and systematic inspection by the Contract Administrator including all operations from the selection of materials through the final acceptance of the specified Work. The Contractor shall be wholly responsible for the control of all operations incidental thereto notwithstanding any inspection of approval that may have been previously given.

E8.3.2 Access

- (a) The Contract Administrator shall be afforded full access for the inspection of materials at the Site to determine whether the material is being selected and placed in accordance with this Specification.

METHOD OF MEASUREMENT

- E8.4 The supply and construction of the concrete dock will be measured on a lump sum basis, and shall include all Items of Work completed in accordance with this Specification and accepted by the Contract Administrator.

BASIS OF PAYMENT

- E8.5 The supply and construction of the concrete dock will be paid for at the Contract Unit Price for each "Items of Work", listed below, which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.

Items of Work:

- i) Concrete Dock

E9. TIMBER DOCKS**GENERAL****E9.1 Description**

- E9.1.1 This Specification shall cover the requirements for supply and installation of Timber Dock. The items specified herein include steel frame floating docks, and all appurtenances for connections, floatation and boat mooring.

MATERIALS**E9.2 Warranty**

- E9.2.1 The Contractor shall warrant all materials supplied for the Timber Docks specified herein for a period of one (1) year. All materials shall be free from manufacturers defects, deterioration, rust damage, and shall withstand normal usage for the specified period.

- E9.2.2 The dock system will be removed annually during winter ice conditions. Floatation units shall also be warranted to float under the above conditions for the period specified.

E9.3 Design Criteria

- E9.3.1 The Contractor shall be responsible for the design of the Timber Dock. The design shall include the calculations to maintain the buoyancy under the loads specified below. All dock connections shall be designed to connect to the steel channels cast into the face of the concrete dock and to withstand the specified vertical loads, wind and impact loads as follows:

- E9.3.2 The timber docks floatation and connections shall be designed to support live loads equal to 25 lbs per square foot uniformly distributed on the deck or a point load of 400 lbs distributed over a 2 foot x 2 foot portion of the dock, such that a minimum freeboard of 8 inches is maintained.

- E9.3.3 Under uniform dead plus live loading, the dock shall float level in the water within a tolerance of not more than 1" in 10 feet. Under concentrated live loading at the ends of floats, allowable twisting shall not exceed 1" per foot of float width. The connecting hardware shall be designed to withstand the forces due to the twisting limits specified above.
- E9.3.4 Dock connections shall be designed to withstand a perpendicular wind load of 50 pounds per linear foot applied to the entire length of the dock.
- E9.3.5 All docks and dock connections shall be designed to withstand an impact load of 3600 lbs applied at the location creating the largest moment to connections.
- E9.3.6 When considering wind and impact simultaneously a load reduction factor of .70 may be applied to the calculation.
- E9.3.7 All dock connections including shall be designed to withstand the loads induced by the loading criteria specified above. System connections include, but are not limited to those connections specification drawings.
- E9.3.8 The timber docks shall be able to accommodate fluctuations and move freely up and down the cast in place channels.
- E9.4 Submittals
- E9.4.1 The contractor shall submit shop drawings for all components of the docking system specified herein to the Consultant a minimum of 2 weeks prior to fabrication. The shop drawings shall include all details of connection hardware, floatation units, structural support and supporting design calculations. Drawings shall be stamped by a Registered Professional Engineer (Manitoba).
- E9.5 Reference Standards
- E9.5.1 The following reference standards shall apply to the Work
- (a) Welding and Welding Certification: CSA W59-M1989 / CSA W47.1-1983.
 - (b) Galvanizing: CAN/CSA G164-M92.
 - (c) HSS: G40.21-50W Class C.
- E9.6 Galvanized Steel Framed Docks
- E9.6.1 General:
- (a) The docks shall be supplied to the following dimensions: 22'x5'. All dock sections shall have welded steel frames, metal brackets and braces, and shall have adequate structural capacity for the design loads specified. Steel frame and dock connections shall be hot dipped galvanized after fabrication.
- E9.6.2 Timber:
- (a) Use timber graded and stamped in by agencies approved to grade lumber by the Canadian Lumber Standards Administration Board of the CSA.
 - (b) Species: Cedar
 - (c) Grade: Grade 2 or better
 - (d) Grading Authority: AFPA

- (e) Headers shall be one piece. Stringers may have spliced connections. No two splices shall occur at the same location of the dock section, stagger splice connections accordingly.
- (f) Galvanized bolts and nuts to ASTM A307-92a. Countersunk head bolts or Stove bolts to CSA B34-67
- (g) Plates, shapes, bars shall be fabricated from steel conforming to CAN/CSA-G40, 20-M92 and CAN/CSA-G40.21-M92, Grade 300W.
- (h) Flotation to be provided by totally enclosed styrofoam injected polyethylene billets, impervious to petroleum products. Flotation billets to be protected against damage when removing docks for winter storage by skids or other means:
 - (i) Buoyancy material: expanded polystyrene, homogeneous and free of voids.
 - (ii) Minimum mass density: 14 kg/m³.
 - (iii) Maximum water absorption: 4% by volume.
 - (iv) Minimum flexural strength: 120 kPa.
 - (v) Minimum compressive strength: 70 kPa at 10% deformation.
 - (vi) Buoyancy per unit: 65 kg

- E9.6.3 Floats shall have skid plates installed.
- E9.6.4 Structural tubular (square or rectangular) steel framing material to be hot dipped galvanized after fabrication. Bolted connections to be made with cadmium plated or stainless steel fasteners.
- E9.6.5 A side skirt to be provided all around the dock perimeter to conceal structural members and flotation elements.
- E9.6.6 Deck, side skirts and deck nailers to be constructed with tight knot decking grade cedar. Nailers to be attached to steel framing with stainless steel fasteners.
- E9.6.7 Deck fasteners to be countersunk, stainless steel deck screws.
- E9.6.8 HDPE Casings: ASTM D-1248, Standard specification for Polyethylene Plastics Molding and Extrusion Materials.
- E9.6.9 Channel Connections
- (a) All dock connections shall be supplied in accordance with the following:
 - (i) Plates, shapes, bars, pins: fabricated from steel conforming to CAN/CSA-G40.20-M92 and CAN/CSA-G40.21-M92, Grade 300W.
 - (ii) Bolts and nuts: Cadmium plated or Stainless Steel
 - (iii) Washers: pressed steel (cadmium plated)
- E9.6.10 Extruded Rubber Bumpers: SSR Marine Fenders, series 100 "D" shape, DB-50, colour black running horizontally the length of dock

EXECUTION

E9.7 Steel Framed Timber Docks

- E9.7.1 Dock to be manufactured to the size and dimensions shown on the drawings.

- E9.7.2 Construct dock square, true, straight and accurate to the required size, with all joints closely fitted and properly secured.
- E9.7.3 Except where specified, use of shims, wedges, or short pieces of timber is not permitted.
- E9.7.4 Drill holes for bolts the same diameter as the bolt, except where specified otherwise.
- E9.7.5 Lay deck planks in one piece.
- E9.7.6 Project all bolts at least 1/4 inch beyond nut.
- E9.7.7 Place a washer under the head of each bolt and under nuts in contact with wood.
- E9.7.8 All steel plates, brackets etc. to be hot dip galvanized after fabrication and prior to installation.
- ~~E9.7.9~~ Buoyancy Unit: Connect units to each float with galvanized bolts.
- E9.7.10 Docks shall have necessary lifting eyes to allow docks to be hoisted from the water.
- E9.7.11 Dock manufacturer to allow for design and installation of an attachment system between that will accommodate normal fluctuations in water levels (0.5M above and below RSWL) and current and all anticipated loads, and that can be safely and easily connected or disconnected as necessary. Design of connection to be developed in collaboration with Owner's representatives.
- E9.8 Channel Connections
- E9.8.1 Build Work square, true, straight and accurate to withstand the design loads specified, with all joints closely fitted and properly secured. Do welding in accordance with CSA W59-M1989.

METHOD OF MEASUREMENT

- E9.9 The supplying and installation of Timber Docks will be measured on a unit basis. The amount to be paid for shall be the total number of units installed in accordance with this Specification, and as accepted by the Contract Administrator.

BASIS OF PAYMENT

- E9.10 The supplying and installation of Timber Docks will be paid for at the Contract Unit Price for each "Items of Work", listed below, measured as specified herein, which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.

Items of Work:

- i) Timber Docks

E10. EARTHWORK AND GRADING

GENERAL

- E10.1 Description
- E10.1.1 This specification shall cover all Work associated with general Site preparation and grading. The Contractor shall furnish all superintendence, overhead, labour, materials,

equipment, tools, supplies and all things necessary for and incidental to the satisfactory performance and completion of all Work hereinafter specified. This specification shall supplement CW3170-R3.

CONSTRUCTION METHODS

E10.2 General

E10.2.1 The Contractor shall grade to the levels and contours allowing for surface treatment as shown on the drawings. Existing topsoil shall be stockpiled on-Site as directed by the Contract Administrator. Prior to placing any fill over existing ground the Contractor shall scarify to surface to a depth of 150mm. Moisture content of filling and existing surface material shall be the same in order to facilitate proper bonding.

E10.2.2 All fill shall be clean fill.

E10.3 Compaction

E10.3.1 Compact fill and undisturbed areas to Standard Proctor Density to ASTM D698-78 as follows:

- (a) Landscaped Areas - 85%
- (b) Paved Areas - 95%

E10.4 Approvals

E10.4.1 The Contractor shall stake grades and receive approval from the Contract Administrator prior to any construction.

E10.4.2 The Contract Administrator shall approve grading would prior to installation of topsoil and/or surfacing materials.

METHOD OF MEASUREMENT

E10.5 Earthwork and Grading will be measured on a square meter basis. The amount to be paid for shall be the total number of square metres constructed in accordance with this Specification and as accepted by the Contract Administrator.

BASIS OF PAYMENT

E10.6 Payment for Earthwork and Grading shall be paid for at the contract unit price for the "Items of Work" listed below, which price shall include all costs of labour and material supply, including fill, and all other items incidental to the Work included in this specification.

Items of Work:

- i) Earthwork and Grading

E11. LIMESTONE RETAINING WALL / CURB

GENERAL

E11.1 Description

E11.1.1 This Specification shall cover the supply and installation of Tyndall Stone blocks as retaining walls and pathway curb. It shall also cover the removal and reinstallation of portions of existing limestone retaining walls. The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour,

materials, equipment, tools, supplies, and all other things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified.

MATERIALS

E11.2 General

E11.2.1 All Tyndall Stone shall be buff coloured Manitoba Tyndall Limestone as quarried and supplied by Gillis Quarries Ltd. to ASTM C568-79 Category II, High Density Sound Hard Stone, free of clay pockets.

E11.3 Tyndall Stone Blocks

E11.3.1 Block Tyndall Stone limestone retaining wall shall be 500mm x 570mm x 1200mm length with cut ends and rustic top and face. Edge and drill marks shall be trimmed to the satisfaction of the Contract Administrator.

E11.4 Tyndall Stone Curb

E11.4.1 Block Tyndall Stone limestone curb shall be 300mm x 300mm x (1200 -1900 mm) random length with rustic top, bottom, and sides. The ends shall be sawn. The colour shall be buff. Spacers (drainage blocks) for curb are to be 150mm x 200mm x 300mm, sawn cut all sides.

E11.5 Granular Base

E11.5.1 Granular base shall follow the gradation and requirements of base course material specified in CW 3110-R5.

E11.6 Geotextile

E11.6.1 The geotextile shall consist of a woven geotextile fabric, used as a separator between the coarse granular drain material and the surrounding subgrade or backfill materials. Geotextile shall be in accordance with CW 3710-R3 'Products Approved for Use in Surface Works'.

CONSTRUCTION METHODS

E11.7 Removal and Reinstallation of Existing Tyndall Stone Blocks

E11.7.1 Existing Tyndall Stone blocks which are to be relocated shall be handled in such a manner as to prevent damage. They shall be reinstalled at the locations shown on the drawings and in accordance with the drawings and specifications included for new Tyndall stone blocks.

E11.8 Subgrade Preparation

E11.8.1 Subgrade preparation shall conform to the compaction requirements and levels required for the installation of granular base.

E11.9 Granular Base

E11.9.1 Granular base shall be placed to the compacted thickness indicated on the Contract Drawings and specified in CW 3110 except that layers shall not exceed 150 mm of compacted thickness.

E11.10 Tyndall Stone Blocks and Curb

- E11.10.1 All Tyndall Stone blocks shall be placed on the prepared granular base. The blocks shall be level and plumb with the top at required elevation. For the Tyndall Stone blocks the drill marks shall be facing the walkway. The top of the block shall be set to required elevation with face plumb and top level to adjacent surface. The geotextile shall continue under blocks and curbs to sufficient length indicated on the Contract Drawings. The fabric shall be installed as shown on the Contract Drawings with a minimum 300 mm overlap at all seams. All Tyndall Stone blocks shall be installed at locations indicated on the Contract Drawings and each block shall appear, upon completion, to be aligned properly with adjacent blocks. If the blocks are on a curved section the blocks shall be mitre cut to approximate radius and placed to ensure uniform curvature for the length. Joints shall be chiseled on Site as required to provide a smooth transition from block to block. Topsoil shall be used to backfill the full length of the wall and to the height shown on the Drawings. The contractor shall chisel the Tyndall Stone faces and tops as required to provide a uniform appearing transition from block to block.

QUALITY CONTROL

E11.11 Fabrication and Manufacture

- E11.11.1 The Tyndall Stone shall be manufactured accurately to sizes, shapes, and details as indicated on Contract Drawings. Except where Contract Drawings call for slopes, angles or curves all stone shall be cut square, with exposed faces true. Beds and joints shall be dressed straight and at right angles to faces for each stone. The stones shall be cut and drilled as required for the installation of electrical and mechanical Work. Each stone shall be numbered on the back or bed with non-staining paint to correspond to the numbering on the shop drawings.

E11.12 Submittals

- E11.12.1 Two 200 mm x 200 mm x 12 mm samples shall be submitted for acceptance by Contract Administrator prior to commencing Work. Samples shall indicate range of colour and finish to be supplied.

METHOD OF MEASUREMENT

- E11.13 The supplying and placing of Tyndall Stone blocks will be measured on a length basis. The length to be paid for shall be the total number of linear metres of Tyndall Stone blocks installed in accordance with this Specification, and as accepted by the Contract Administrator as measured in the field.

BASIS OF PAYMENT

- E11.14 The supplying and placing of Tyndall Stone blocks will be paid for at the Contract Unit Price for each "Items of Work", listed below, measured as specified herein, which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.

Items of Work:

- i) Tyndall Stone Retaining Wall – R&R
- ii) Tyndall Stone Retaining Wall - New
- iii) Tyndall Stone Curb

E12. ASPHALT PATHWAYS**E12.1 Description**

- (a) This Specification shall cover the removal of existing and the supply and installation of new asphaltic concrete paving, base course and geotextile fabric for park pathway areas as indicated on the Drawing. 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 and in accordance with CW 3110-R5 'Sub-grade, Sub-base, and Base Course Construction' and CW 3410-R5 'Asphaltic Concrete Pavement Works'.

MATERIALS**E12.2 General**

- (a) All materials shall conform to CW 3110-R5 and CW 3410-R5 and this Specification. Where the two do not agree, this Specification shall take precedence. 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.

E12.3 Asphaltic Concrete Pavement

- (a) Asphaltic Concrete Pavement Installation shall conform to CW 3410-R5 'Asphaltic Concrete Pavement Works' and as specified for Type I paved surface.

E12.4 Granular Base Course

- (a) Granular base course for asphalt pathway and sidewalk shall conform to CW 3110-R5 'Sub-grade, Sub-base, and Base Course Construction' for crushed limestone base course material.

E12.5 Geotextile Fabric

- (a) Geotextile shall be in accordance with CW 3710-R3 'Products Approved for Use in Surface Works'.

CONSTRUCTION METHOD**E12.6 General**

- E12.6.1 Construction method shall conform to Specification CW 3110-R5 'Sub-grade, Sub-base, and Base Course Construction' and CW 3410-R5 'Asphaltic Concrete Pavement Works'. Installation shall be for asphalt park pathway and for asphalt sidewalks.

E12.7 Sub-Grade

- E12.7.1 Prepare compacted sub-grade to the lines and grades as shown on the drawings. Contract Administrator is to review sub-grade preparation prior to placement of granular base.

E12.8 Geotextile Fabric

- E12.8.1 Geotextile fabric shall be installed on top of a compacted subgrade along the length and width of the asphalt path and sidewalk prior to installation of granular base.
- E12.8.2 Fabric shall extend to full width of granular base course. Pin in place every 750mm O.C.
- E12.8.3 Where joining fabric pieces is required overlap seam 300mm minimum.

E12.9 Granular Base

E12.9.1 Place granular base material to the lines and grades as shown on the drawings. Extend base minimum 300mm beyond width of asphalt overlay. Compact material to a minimum of 95 percent Standard Proctor Density.

E12.10 Asphaltic Concrete Paving

E12.10.1 Construction method shall conform to Specification CW 'Asphaltic Concrete Pavement Works'. The surface upon which new asphaltic concrete paving mix is to be placed shall be approved by the Contract Administrator prior to paving operations.

METHOD OF MEASUREMENT

E12.11 The supplying and placing of Asphalt Pathway will be measured on an area basis. The area to be paid for shall be the total number of square metres of asphalt pathway installed in accordance with this Specification, accepted by the Contract Administrator, as measured in the field.

E12.12 The removal of existing asphalt paths and the preparation of sub-base and supply and installation of granular base and geo-textile fabric and all other Work associated for Asphalt Pathway is considered incidental to the Works and no separate measurement and payment will be made.

BASIS OF PAYMENT

E12.13 The supplying and installation of Asphalt Pathway shall be paid for at the Contract Unit Price per square metre for the "Items of Work", measured as specified herein, which price shall be payment in full for supplying all materials and for performing all operations herein described and all other items incidental to the Work included in this Specification.

Items of Work:

- i) Asphalt Pathway

E13. UNIT PAVERS**GENERAL****E13.1 Description**

E13.1.1 This Specification shall cover the supply and installation of unit pavers, on the concrete dock structure as indicated on the Drawing. 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 and in accordance with CW 3335.

MATERIALS

E13.2 General

E13.2.1 All materials shall conform to CW 3335 and this Specification. Where the two do not agree, this Specification shall take precedence.

E13.3 Concrete Pavers

E13.3.1 Concrete Pavers shall be Barkman "Holland", colour: natural, as supplied by Barkman Concrete Ltd., Winnipeg.

E13.3.2 Pavers shall be installed in a herringbone pattern, with a double perimeter soldier course.

E13.4 Sand Bedding

E13.4.1 Sand bedding shall be in accordance with Specification CW3335.

E13.5 Equipment

E13.5.1 All equipment shall conform to Specification CW 3335.

CONSTRUCTION METHODS

E13.6 General

E13.6.1 Construction methods shall conform to Specification CW 3335. All joints shall be tight.

METHOD OF MEASUREMENT

E13.7 The supplying and placing of Unit Pavers will be measured on a square metre basis. The area to be paid for shall be the total number of square metres of Unit Pavers installed in accordance with this Specification and as accepted by the Contract Administrator.

BASIS FOR PAYMENT

E13.8 The supplying and placing of Unit Pavers shall be paid for at the Contract Unit Price per square metre for the "Items of Work", measured as specified herein, which price shall be payment in full for supplying all materials and for performing all operations herein described and all other items incidental to the Work included in this Specification.

Items of Work:

i) Unit Pavers