

**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 Further to GC:2.4(d), Specifications included in the Bid Opportunity shall govern over *The City of Winnipeg Standard Construction Specifications*.
- E1.2 The following Drawings are applicable to the Work:

<u>Drawing No.</u>	<u>Drawing</u>
LD-2992	Caisson Details

#### E2. SOILS INVESTIGATION REPORT

- E2.1 Geotechnical information obtained from test holes drilled in the vicinity of the project is described on test hole logs included in Part G.
- E2.2 Test Hole 29 (TH-29) was drilled on February 27, 2004 in the vicinity of the proposed Works, with a piling drill rig.
- E2.3 Groundwater levels in piezometers in the tests holes are included in Part G
- E2.4 The test holes logs and groundwater levels are provided to supplement the Bidders evaluation of the site conditions in the Work area. The information is considered accurate at the locations and time of the test drilling. However, variations in subsurface conditions may exist between test holes and groundwater levels can vary seasonally.
- E2.5 The report *Lord Avenue Community Ring Dike, Submission to Waterways Authority* is available for review at the office of the Contract Administrator.

### GENERAL REQUIREMENTS

#### E3. OFFICE FACILITIES

- E3.1 The Contractor shall supply office facilities meeting the following requirements:
- shall be conveniently located near the site.
  - shall have a table and chairs and be suitable for conducting job meetings
  - shall be heated
  - the Contractor's lunch room facilities may be used for an office.
- E3.2 Method of Measurement and Basis of Payment
- E3.2.1 No separate measurement or payment shall be made for supply of an office facility. This facility shall be considered incidental to the Work.

**E4. MOBILIZATION, DEMOBILIZATION, SEDIMENT CONTROL, SITE RESTORATION**

**E4.1 Description**

E4.1.1 This Specification covers the following:

- (a) Mobilization and demobilization to site.
- (b) Construction and maintenance of an access ramps from Lord Avenue to the Work area on the vacant lot.
- (c) Restoration of the access ramp and other disturbed areas following construction.
- (d) Control of sediment releases from the site

E4.1.2 The Work to be done 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.

**E4.2 Materials**

E4.2.1 Sod: CW 3510-R7

E4.2.2 Topsoil: CW 3540-R2

E4.2.3 Clean Limestone: Clean crushed hard durable limestone with a maximum diameter of 150 mm, and a maximum of 2% finer than 0.075 mm and meeting the following physical properties:

- (a) minimum bulk specific gravity of 2.6 (ASTM C127),
- (b) maximum Los Angeles abrasion loss of 35% (ASTM C131),
- (c) maximum soundness loss of 13% (ASTM C88)

E4.2.4 Geotextile shall meet or exceed the following properties.

<b>NON-WOVEN GEOTEXTILE PROPERTIES</b>			
	<b>ASTM Test Method</b>	<b>Units</b>	<b>Minimum Average Roll Values</b>
<b>PHYSICAL</b>			
Grab Tensile Strength	D-4632	N	890
Grab Tensile Elongation	D-4632	%	50
Mullen Burst	D-3786	kPa	2750
Puncture	D-4833	N	575
Trapezoidal Tear	D-4533	N	355
UV Resistance	D-4355	% @ hrs <sup>1</sup>	70/500
<b>HYDRAULIC</b>			
Apparent Opening Size	D-4751	mm	0.150
Permitivity	D-4491	sec <sup>-1</sup>	1.4
Flow Rate	D-4491	L/sec/m <sup>2</sup>	54

<sup>1</sup> Percent grab tensile strength retained per hours of UV exposure following conditioning in accordance with ASTM D-4355.

### E4.3 Construction Methods

#### E4.3.1 Access to Work Area

- (a) Access to the Work area shall be through the vacant lot between 32 and 38 Lord Ave.
- (b) Access to the Work area other than through the vacant lot shall not be constructed with out prior approval of the Contract Administrator. No additional payment shall be made to construct and maintain additional access ramps.
- (c) Methods and procedures that prevent damage or risk of damage to existing trees, existing infrastructure and existing facilities, and private property shall be employed during construction and maintenance of the ramps. This may include installing fencing to identify the edges of the ramps and prevent inadvertent entry of construction equipment into treed areas or into private property.
- (d) The Contractor shall obtain prior approval to remove trees required to construct the access ramps.
- (e) The Contractor shall monitor the site access ramps to prevent public access during working hours. The access ramps shall be secured with fencing or barricades at Lord Avenue to prevent public access during non-working hours.
- (f) Fills shall not be placed for the construction or maintenance of the ramps without prior approval by the Contract Administrator.

#### E4.3.2 Sediment Control

- (a) All Work shall be planned and carried out in a manner that will mitigate the potential for the release of sediments into the river.
- (b) Sediment control measures shall be implemented to meet the requirements of Fisheries and Oceans Canada.
- (c) The Contractor shall monitor his Work and implement appropriate sediment control measures as site conditions warrant. Such measures may include installation of silt fences, straw bales or other measures as required in the event that there is runoff from the site due to thawing conditions or rain.
- (d) The Contractor shall be responsible for maintaining sediment control measures at the site to prevent sediment releases from areas disturbed as a result of his Work.
- (e) As a minimum silt fences shall be installed between the river and edges of Work areas and all areas where the vegetation has been disturbed or soils are exposed, including the access ramps.
- (f) The silt fences shall be attached to secure stakes and trenched in to the ground or secures with sand bags such that there are no gaps and the fencing will not be undermined. The silt fences shall be inspected, maintained and repaired as required.
- (g) During rain storms the Contractor shall inspect the silt fences at least daily and more frequently if required. Sediments shall be removed from silt fences as required, during or immediately following each rain storm. All trapped sediments shall be removed from the site.
- (h) The contractor shall monitor, maintain, repair, etc. the sediment control measures until disturbed areas are restored to and accepted by the Contract Administrator.

- (i) Water and sediments from caisson shafts shall not be allowed to flow into the river.
- (j) Water from caissons shall be disposed of and paid for in accordance with E5.

#### E4.3.3 Flooding of Work Area

- (a) The Contractor is advised that there is a potential for the Work area to be flooded following periods of precipitation.
- (b) The weather and river level forecasts shall be monitored to be prepared for possible flooding.
- (c) No Work shall be undertaken in flooded areas.
- (d) The Contractor shall take all necessary precautions to prevent release of sediments into the river from flooded areas of the Work site.
- (e) As a minimum all fine grained soils shall be removed from the Work site prior to flooding.
- (f) Disturbed areas and areas with exposed soils shall be covered with geotextile secured with clean 150 mm limestone.
- (g) Upon resumption of Work all geotextile and limestone shall be recovered where possible.

#### E4.3.4 Site Restoration

- (a) Upon completion of the construction Work, all surplus or waste materials, and materials containing fine-grained sediments shall be removed from the site.
- (b) Access ramps shall be restored by removing all fills or surfacing materials placed during construction, the affected areas shall be graded to the pre-construction grades and topsoil and sod shall be installed in accordance with CW3510-R7.
- (c) Repair the fence and replace the hedge on the vacant replaced to original condition.
- (d) Replace any trees removed.

#### E4.3.5 Berm Restoration

- (a) The disturbed area on the berm shall be cleaned by removing all soil cuttings.
- (b) Reinstall all salvaged riprap to restore preconstruction grades.
- (c) Cover disturbed areas on berm with one layer of geotextile, overlapping joints a minimum of 0.5 m.
- (d) Cover geotextile with 150 mm thick layer of clean 150 mm limestone.

#### E4.4 Method of Measurement and Basis of Payment

E4.4.1 No separate measurement or payment shall be made for mobilization and demobilization, site preparation, site restoration, sediment control measures, or other miscellaneous Work required. This Work shall be measured as a lump sum. It shall be paid for at the Contract Lump Sum Price for "Mobilization, Demobilization, Site Preparation, Site Restoration, Sediment Control", which shall be full payment for all operations described herein and other items incidental to the Work included in this Specification.

E4.4.2 The Contractor shall only be paid once for mobilization and demobilization. No additional payment shall be made for additional mobilization and demobilization resulting from associated or associated with interruptions of the Work due to flooding or other conditions.

- E4.4.3 Crushed limestone shall be measured on a weight basis. The weight paid for shall be the total number of tonnes of crushed limestone placed in accordance with this Specification as accepted by the Contract Administrator. Payment shall be at the Contract Unit Price for "Clean 150 mm Limestone", which shall be full payment for all operations described herein and other items incidental to the Work included in this Specification.
- E4.4.4 Geotextile shall be measured on an area basis. The area shall be the area as measured on the ground after installation. The area paid for shall be the total number of square meters placed in accordance with this Specification as accepted by the Contract Administrator. Payment shall be at the Contract Unit Price for "Geotextile", which shall be full payment for all operations described herein and other items incidental to the Work included in this Specification.
- E4.4.5 The Contractor shall be paid for Geotextile and Crushed Limestone used to prevent erosion and sediment losses during flooding. Measurement and payment shall be in accordance with E4.4.3 and E4.4.4.

## **E5. CAISSONS**

### **E5.1 Description**

E5.1.1 This Specification covers the following items relating to construction of concrete caissons:

- (a) Drilling of the caisson shafts.
- (b) Use and installation of casing to prevent cave-ins
- (c) Installation of structural steel
- (d) Supply and placement of concrete
- (e) Disposal of water from caisson shafts

### **E5.1.2 Materials**

- (a) Structural steel: Supplied by the City of Winnipeg. The Contractor shall take receipt of the steel from Water and Waste Department, 598 Plinquet Street, Winnipeg, Manitoba and transport it to the Site.
- (b) Concrete: CW 2160-R5, Mix B for "Pipe foundations, skin coats, base blocks, thrust blocks, buttresses and anchors", Type 50 cement.

### **E5.2 Construction Methods**

#### **E5.2.1 Drilling Shafts**

- (a) The caissons are to be constructed on the stabilization berm along the river edge which is constructed from 150 mm crushed limestone and covered with large diameter riprap.
- (b) Conduct Work so as to minimize disturbance to existing riprap and 150 mm crushed limestone.
- (c) Salvage limestone riprap and sufficient quantities of 150 mm down limestone for restoring the berm.
- (d) Drill caisson shafts to depths and dimensions shown on the drawings unless otherwise directed by the Contract Administrator.
- (e) The Contractor shall not be compensated for drilling larger diameter or deeper holes unless approved by the Contract Administrator.
- (f) Employ methods as required, and as acceptable to the Contract Administrator, to advance caisson shafts through boulders or dense till. Additional payment shall not be paid for this Work.

#### E5.2.2 Casing

- (a) The contractor is advised that the groundwater pressures in the underlying bedrock are near ground level on top of the berm.
- (b) Cave-ins of the shaft walls shall not be permitted and casing shall be installed as required to prevent cave-ins of shaft walls and to prevent inflows of water from the river and water bearing soils.
- (c) The Contractor shall not be compensated for drilling oversized shafts to accommodate installation of the casing.
- (d) Casings shall remain in shafts until the concrete has been placed.
- (e) Casings shall be removed by slow even lifting to prevent developing voids in plastic concrete.

#### E5.2.3 Structural Steel

- (a) Inspect and remove all dirt, oil or other foreign matter from steel prior to placing in caisson shaft.
- (b) Structural steel shall be centered in caisson shafts and held up from base of shaft and held secure during placement of concrete
- (c) Trim the steel to the proper length if required.

#### E5.2.4 Placing Concrete

- (a) Place concrete to prevent segregation of concrete by tremie method or pumping to bottom of caisson.
- (b) In caissons with water, concrete shall be tremied or pumped to bottom of caisson to completely displace water.
- (c) Tremie pipe shall have a smooth surface and be kept clean of dirt and concrete.
- (d) The tremie pipe shall be kept below the top of placed concrete and shall be marked to aid in determining depth of pipe.
- (e) Concrete shall not fall through water above placed concrete.
- (f) Interruption in placing concrete shall not exceed 30 minutes.
- (g) Additional concrete placed to fill voids beyond the design dimensions of the caissons shall be paid for, provided the Contract Administration is satisfied that the Contractor has taken reasonable measures to prevent creation of the voids or oversized holes.

#### E5.2.5 Disposal of Water

- (a) The Contractor shall take necessary measures to minimize inflow of water into the caisson shafts.
- (b) Sediment laden water pumped from the caisson shafts shall not be released directly into the river but shall be removed from site and disposed of in accordance with applicable by-laws and regulations.

#### E5.2.6 Disposal of Excavated Material

- (a) All excavated material, except that which is to be salvage for restoration, shall be disposed of off site. No materials shall be disposed of on site.
- (b) Depositing materials in the river shall not be permitted.
- (c) Stock piles of excavated materials shall be kept to a minimum by promptly removing excavated material from the site. Immediately remove any stock piled material if instructed to do so by the Contract Administrator.

**E5.3 Testing**

- (a) The Contractor shall provide sufficient advance notification of placing concrete so that the Contract Administrator can schedule concrete tests.
- (b) The cost of concrete testing shall be paid by the City of Winnipeg.

**E5.4 Method of Measurement and Basis of Payment**

- E5.4.1 Construction of caissons shall be measured and paid for on a unit basis. The number paid for shall be the total number of caissons constructed in accordance with this Specification as accepted by the Contract Administrator. Payment shall be at the Contract Unit Price for "Construct Caissons", which shall be full payment for all operations described herein including drilling shafts, removing and disposing of drill cuttings, installation of steel, and all other items incidental to the Work included in this Specification.
- E5.4.2 Supply and placing concrete shall be measured and paid for on a volume basis. The number of cubic metres paid for shall be the total number cubic meters placed accordance with this Specification, based on truck measure and as accepted by the Contract Administrator. Payment shall be at the Contract Unit Price for "Caisson Concrete", which shall be full payment for all operations described herein and all other items incidental to the Work included in this Specification.
- E5.4.3 Disposal of water removed from caisson shafts shall be measured on volume basis. The volume paid for shall be the total number of cubic metres of water removed in accordance with this Specification based on tanker truck measure, as accepted by the Contract Administrator. Payment shall be at the Contract Unit Price per cubic metre for "Removal and Disposal of Water from Caissons" which shall be full payment for all operations described herein and all other items incidental to the Work included in this Specification.

**E6. RIPRAP**

**E6.1 Description**

- E6.1.1 This Specification covers supply and installation of riprap to raise the existing ice break.
- E6.1.2 The work to be done 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.

**E6.2 Materials**

E6.2.1 Riprap shall be manufactured from hard durable limestone or dolomite conforming to CW 3615-R2, Clause 5.2 with the following amendments:

- (a) meets the physical requirements for Clean 150 mm Limestone specified in E4.2.3 and gradation requirements, as follows:

Gradation Requirements Riprap	
Canadian Metric Sieve Size	Percent of Total Dry Weight Passing Each Sieve
500 000	100
300 000	40 - 60
50 000	0-5



### E6.3 Acceptance of Material

- (a) The Contractor shall supply a representative sample of riprap or provide access to the quarry manufacturing the riprap at least ten (10) Business Days prior to the commencement of the Construction.
- (b) The Contract Administrator shall perform the necessary tests to determine compliance with the specified properties.

### E6.4 Construction Methods

E6.4.1 Riprap shall be placed in accordance with CW 3615-R2, Clause 9.2 to raise the existing ice break as shown on the drawings.

### E6.5 Method of Measurement and Basis of Payment

E6.5.1 Supply and installation of riprap will be measured and paid for in accordance with CW 3110-R5, Clauses 12.5 (c) and 13.5 (c). Payment shall be at the Contract Unit Price per tonne for "Supply and Install Riprap"

## E7. VERIFICATION OF WEIGHTS

E7.1 All Material which is paid for on a weight basis shall be weighed on a scale certified by Consumer & Corporate Affairs, Canada.

E7.1.1 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.

E7.1.2 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.

E7.2 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.

E7.2.1 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.

## E8. TRUCK WEIGHT LIMITS

E8.1 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.