

**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 Division 2 – General Requirements of The City of Winnipeg 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 City of Winnipeg Standard Construction Specifications and the General Requirements are available in Adobe Acrobat (.PDF) format at the City of Winnipeg, Corporate Finance, Materials Management internet site <http://www.winnipeg.ca/matmgt/info.stm>.
- E1.3 The following Drawings are applicable to the Work:

<u>Drawing No.</u>	<u>Drawing</u>
LD - 2974	Stormwater Retention Basin Site Plan
LD - 2975	LDS From Lee Boulevard To Stormwater Retention Basin
LD - 2976	1500 LDS From Fairfield avenue To Stormwater Retention Basin
LD - 2977	Outlet Pipe For Stormwater Retention Basin
LD - 2978	Stormwater Retention Basin Outlet Control Structure Plans, Sections And Notes
LD - 2979	Stormwater Retention Basin Outlet control Structure Details
LD - 2980	Inlet, Outfall And Stormwater Retention Basin Details

#### E2. LAND DRAINAGE SEWERS

- E2.1 Description
- E2.1.1 This Specification shall amend and supplement Standard Specification CW 2130-R7.
- E2.2 Material
- E2.2.1 All pipe material shall conform to the sizes and type shown on the drawings.
- E2.2.2 All concrete pipe shall be the class specified on the construction drawings. Classes shall conform to ASTM Specification C-76.
- E2.2.3 All PVC pipe shall be SDR-35 conforming to ASTM Specification D3034. PVC pipe shall be limited to catch basin leads.
- E2.3 Construction Methods
- E2.3.1 Bedding and Backfilling
- (a) The bedding and backfilling for land drainage sewers installed in open trenches in the boulevard areas shall be Class 4 as shown in standard drawing SD-002 and specified in Section CW 2030- R5.
- (b) Governed by his compaction equipment and the diameter and class of pipe, the Contractor shall ensure that there is adequate cover on the pipe to prevent damage during compaction operations.

- (c) The bedding for land drainage sewer installed in open trenches, the boulevard shall be Class B as shown in standard drawing SD-001 specified in section CW 2030-R5.

E2.3.2 Sewer Stubs and Plugs

- (a) The Contractor shall install sewer stubs and plugs where noted on the construction drawings. No additional payment will be made for plugs.

**E3. SEWER MANHOLES**

E3.1 Description

- E3.1.1 This Specification shall amend and supplement Standard Specification CW 2130-R7.

E3.2 Construction Methods

E3.2.1 Bedding and Backfill

- (a) The manhole base section shall be bedded on a thoroughly compacted 100 mm thick bed of sand. This bedding shall be fully compacted and leveled throughout the full trench width to the exact grade specified so that the base section is uniformly and fully supported and the floor is level.
- (b) The space between the outside of the manhole and the wall of the excavated area shall be backfilled to Class 2 standards. No extra payment will be made for this work, it shall be considered incidental to the price paid for manholes.
- (c) The last two (2) lineal meters of all pipes connecting to manholes shall be backfilled to Class 2 standards. This work shall be paid for as Class 2 backfill for each particular pipe.
- (d) The Contractor shall pay particular attention to backfilling around the manhole to ensure that the required backfill compaction is achieved.

E3.2.2 Connecting PVC Pipe to Manholes

- (a) Where PVC pipe is used, at the entrance to manholes, the pipe end shall be coated with an approved cementing agent to which sand has been added, and shall be allowed to harden prior to grouting the pipe into the manhole. This practice shall promote a suitable bond between PVC pipe and the concrete.
- (b) A pre-treated PVC gasketed "horsecollar" manhole insert conforming generally to the above and providing a watertight bond and joint, shall be considered approved.
- (c) This treatment of PVC pipe at manholes shall be considered incidental to the installation of sewer main. No separate measurement or payment shall be made for this item.

E3.2.3 Curb Clearance

- (a) A minimum clearance of 300 mm shall be maintained between manhole frame and back of curb at all times.

**E4. CONTROL CHAMBER**

E4.1 Description

- E4.1.1 This Specification shall cover the construction of a new reinforced concrete control chamber as shown on the drawings.

E4.2 Materials

- E4.2.1 All materials shall conform to the requirements of this Specification and the requirements of the latest edition of the City of Winnipeg Standard Construction Specification.

E4.2.2 Concrete

- (a) Concrete shall conform to Specification CW 2160-R5 and as outlined in Control Chamber Concrete.

E4.2.3 Reinforcing Steel

- (a) Reinforcing Steel shall conform to Specification CW 2160-R5 and as outlined in Control Chamber Reinforcing Steel.

E4.2.4 Grout

- (a) Grout, if required, shall be Sika Grout 212 or an approved equal, mixed and applied in accordance with the manufacturers instructions and of a consistency suitable for the application intended as approved by the Contract Administrator.

E4.2.5 Bonding Agent

- (a) The bonding agent, if required, shall be ACRYL-STIX or an approved equal.

E4.3 Construction Methods

Excavation for the construction of the control chamber shall be in accordance with the City of Winnipeg Specification CW2030-R5. The method of excavation employed shall include adequate safeguards to prevent caving or sloughing and shall be tight sheeted.

Backfill shall be in accordance with CW 2030-R5 clause 3.8.4 class 4 backfill. The Contractor shall restore excavated or disturbed areas to the original conditions.

The existing 1800mm LDS pipe downstream of the Control Structure shall be dammed if required to prevent water backing up from the pipe in to the excavation for the Control structure.

E4.4 If required, the Contractor shall provide hoarding and heating for concrete work to satisfy the curing and protection requirements specified by CW 2160-R5.

The Contractor shall remove all silt, debris, water and ice from the immediate area of the work.

The Contractor shall provide all pumping, temporary plugs, dams and diversions to construct the work in the dry.

E4.5 Quality Control

All workmanship and all materials furnished and supplied under this Specification are subject to close and systematic inspection from the selection and production of materials through to final acceptance of the specified work. The Contract Administrator reserves the right to reject any materials or works which are not in accordance with the requirements of this Specification.

E4.6 Method of Measurement and Basis of Payment

The construction of the control chamber, including excavation, shoring, backfilling, restoration, removal of existing 2300 mm CSP complete with intake structure and fence, structural concrete, reinforcing steel, metal fabrications, access hatches, appurtenances, damming or blocking of the 1800mm downstream pipe, all other parts, materials and all labour will be measured on a unit basis and will be paid at the lump sum price for "Control Chamber".

**E5. BRACING, SHORING AND CRIBBING FOR THE CONTROL CHAMBER**

- E5.1 All bracing and shoring shall conform to CW 2030-R5 Clause 3.5.
- E5.2 All bracing, shoring and cribbing shall be designed and approved by a Professional Engineer registered in the Province of Manitoba. The Contractor shall submit shop drawings, eight (8) copies, for review to the Contract Administrator of the chosen method for shoring and excavation.
- E5.3 The supply and installation of bracing, shoring and cribbing method chosen by the Contractor shall be paid for at the lump sum price for "Control Chamber" 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.

**E6. CONTROL CHAMBER CONCRETE**

- E6.1 All Structural Concrete shall be 30 MPa, 20 mm nominal aggregate size, in accordance with Specification CW 2160-R5 and paid for under the lump sum price for "Control Chamber." The Lean-Mix Concrete working base for the Control Chamber is described below.
- E6.2 Lean-Mix Concrete Working Base
- E6.2.1 The Contractor shall supply and place a working base of lean-mix concrete as shown on the drawings.
- E6.2.2 The concrete shall be as dry as is practicable and shall be well tamped and screened to give a level working platform for setting up forms and placing reinforcing steel. The Contractor must allow the working base of lean-mix concrete to set for twenty-four (24) hours, before setting up his forms or placing reinforcing steel.
- E6.3 Lean-Mix Concrete Design Requirements
- E6.3.1 Proportioning of fine aggregate, coarse aggregate, cement, and water shall be such as to yield concrete having the required strength and workability, as follows:
- (a) Minimum Compressive Strength @ 28 days = 10 MPa
  - (b) Minimum Cement Content = 100 kg/m<sup>3</sup>
  - (c) Slump = 80 mm
  - (d) Aggregate size: 40 mm Nominal
  - (e) Air Content: Nil

**E7. CONTROL CHAMBER REINFORCING STEEL**

- E7.1 Description
- E7.1.1 The work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies and all things necessary for and incidental to the satisfactory performance and completion of all work as hereinafter specified.
- E7.2 Materials
- E7.2.1 General

The Contractor shall be responsible for the supply, safe storage and handling of all materials set forth in this Specification.

#### E7.2.2 Handling and Storage of Materials

All materials shall be handled in a careful and workmanship like manner, to the satisfaction of the Contract Administrator. Storage of materials shall be in accordance with the requirements of CSA Standard CAN3 A23.1-M00, Storage of Materials, except as otherwise specified herein.

#### E7.2.3 Reinforcing Steel

Reinforcing steel shall be deemed to include all reinforcing bars, tie bars, and dowels.

All reinforcing steel shall be supplied in accordance with the Reinforcing Schedule Drawings.

All reinforcing steel shall conform to the requirements of CSA Standard G30.18-M92, Grade 400 W. If, in the opinion of the Contract Administrator, any reinforcing steel provided for the concrete works exhibits flaws in manufacture or fabrication, such material shall be immediately removed from the site and replaced with acceptable reinforcing steel.

All reinforcing steel shall be straight and free from paint, oil, millscale and injurious defects. Light, rust, surface seams, or surface irregularities will not be cause for rejection provided that the minimum dimensions, cross-sectional area and tensile properties of a hand wire-brushed specimen are not less than the requirements of CSA Standard G30.18-M92.

#### E7.2.4 Bar Accessories

Bar accessories shall be of type approved by the Contract Administrator. They shall be made from a noncorroding material or galvanized steel and they shall not stain, blemish or spall the concrete surface for the life of the concrete.

Bar accessories shall include bar chairs, spacers, clips, wire ties, wire (18 gauge minimum), or other similar devices that may be approved by the Contract Administrator. The supplying and installation of bar accessories shall be deemed to be incidental to the supplying and placing of reinforcing steel.

#### E7.2.5 Placing of Reinforcing Steel

Reinforcing steel shall be placed accurately in the positions shown on the drawings and shall be retained in such positions by means of a sufficient number of bar accessories so that the bars shall be not moved out of alignment during or after the depositing of concrete. The Contract Administrator's decision in this matter shall be final.

Reinforcing steel shall be free of all foreign material in order to ensure a positive bond between the concrete and steel. The Contractor shall also remove any dry concrete which has been deposited on the steel from previous pouring operations before additional concrete may be placed.

Intersecting bars shall be tied positively at each intersection. Splices in reinforcing steel shall be made only where indicated on the drawings. Prior approval of the Contract Administrator shall be obtained where other splices must be made. Welded splices shall conform to CSA Standard W186-M1990, and are subject to prior written approval of the Contract Administrator.

Reinforcing steel shall not be straightened or rebent in a manner that will injure the metal. Bars with bends not shown on the drawings shall not be used. Heating of reinforcing steel will not be permitted without the prior approval of the Contract Administrator as referred to CW 2160-R5 3.4.

E7.3 Quality Control

E7.3.1 Inspection

All workmanship and all materials furnished and supplied under this Specification are subject to close and systematic inspection and testing by the Contract Administrator. 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. The Contract Administrator reserves the right to reject any materials or works which are not in accordance with the requirements of this Specification.

E7.3.2 Access

The Contract Administrator shall be afforded full access for the inspection and control testing of reinforcing steel both fabrication of the steel that is being supplied in accordance with this Specification.

E7.3.3 Quality Testing

Quality control testing will be used to determine the acceptability of the reinforcing steel supplied by the Contractor.

The Contractor shall provide, without charge, the samples of reinforcing steel required for quality control tests and provide such assistance and use of tools and construction equipment as is required.

E7.3.4 Shop Drawings

The Contractor shall submit eight (8) copies of shop drawings for the Contract Administrator's approval two (2) weeks prior to the fabrication of any equipment as is required.

E7.3.5 Method of Measurement

E7.3.6 Supply and Placement of Reinforcing Steel

No measurement will be made for this work.

E7.3.7 Basis of Payment

The supplying and placing of reinforcing steel shall be paid for under the lump sum price for "Control Chamber," 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.

## **E8. METAL FABRICATIONS**

### **E8.1 Description**

This Specification shall cover the supply, fabrication and placement of all metal fabrications.

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.

### **E8.2 Materials**

#### **E8.2.1 General**

The Contractor shall be responsible for the supply, safe storage and handling of all materials set forth in this Specification.

#### **E8.2.2 Handling and Storage of Materials**

All materials shall be handled in a careful and workmanship like manner, to the satisfaction of the Contract Administrator.

#### **E8.2.3 Steel Sections and Plates**

All steel sections and plates to conform to CSA G40.21-M92, Type 300 W.

#### **E8.2.4 Aluminum**

All aluminum shall conform to the Aluminum Association "Specifications for Aluminum Structures" – latest edition. Aluminum for plates shall be Type 6061-T651.

All aluminum surfaces in contact with concrete to be isolated using alkali-resistant bituminous paint meeting the requirements of CGSB 31-GP-3M.

#### **E8.2.5 Galvanizing**

Galvanizing shall be hot dipped, conforming to CSA Specification G164-M92. All components shall be galvanized after fabrication.

#### **E8.2.6 Manhole Rungs**

Rungs shall be in accordance with CW 2130-R7.

#### **E8.2.7 Checkered Plate Cover and Frames**

Checkered plate material shall be aluminum as shown on the drawings. The plate shall have an approved raised oval or multi-grip pattern with edges straight and true. It shall be cut as far as practical to maintain continuity of the pattern at abutting edges.

Pieces shall be of the sizes indicated on the drawings and shall not be built up from scrap pieces.

Angle frames shall be of the same material as the plate. They shall be suitably anchored into the concrete. Care shall be taken in placing the frame to the exact level and location required.

The cover plates shall be hinged as shown. Covers shall be supplied with lifting handles as shown. Exterior covers shall be supplied with a hasp for a padlock.

E8.2.8 Fasteners

All anchor bolts and fasteners shall be 316 stainless steel and of ample section to safely withstand the forces created by operation of the equipment. Quantity and size of the fasteners shall be as recommended by the manufacturer and approved by the Contract Administrator.

E8.2.9 Other Materials: as indicated on the drawings.

E8.3 Construction Methods

E8.3.1 General

Provide items for casting into concrete, to appropriate trades together with setting templates.

Touch up rivets, field welds, bolts and burnt or scratched surfaces after completion of erection, with approved galvanising compound to match supplied finish, to the satisfaction of the Contract Administrator.

E8.4 Shop Drawings

The Contractor shall submit eight (8) copies of shop drawings for the Contract Administrator's approval prior to the commencement of the work.

E8.5 Quality Control

All workmanship and all materials furnished and supplied under this Specification are subject to close and systematic inspection and testing by the Contract Administrator, including all operations from the selection and production of materials through to final acceptance of the specified work. The Contractor shall be wholly responsible for the control for all operations incidental to instructions previously given. The Contract Administrator reserves the right to reject any materials or works which are not in accordance with the requirements of this Specification.

E8.6 Basis of Payment

The supplying, manufacturing and placing of metal fabrications shall be paid for under the lump sum price for "Control Chamber," which price shall be payment in full for supplying all materials and for performing all operations herein described and all other items incidental to the work included in this Specification.

## **E9.      OUTFALLS**

### **E9.1     Description**

This Specification shall cover the construction of the outfalls to the Fairfield storm water retention basin including excavation, bedding, corrugated steel pipe, concrete collar, geotextile, and backfill. 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.

### **E9.2     Materials**

All materials supplied under this Specification shall be subject to inspection and testing by the Contract Administrator.

E9.2.1       CSP shall be aluminized steel type 2, of the diameter and material thickness shown on the drawings.

E9.2.2       Geotextile material shall be nonwoven and meet or exceed the following Specifications:

(a) Grab Tensile Strength	360 N
(b) Grab Tensile Elongation	50%
(c) Mullen Burst	1120 kPa
(d) Puncture	200 N
(e) Trapezoidal Tear	160 N
(f) Apparent Opening Size	0.212 mm
(g) Permittivity	2.2 sec <sup>-1</sup>
(h) Flow Rate	105 L/sec/m <sup>2</sup>

### **E9.3     Equipment**

All equipment shall be kept in good working conditions.

At the locations shown on the drawings, excavate to the required grade, place the bedding material, install the corrugated steel pipe, and construct the concrete collar and backfill the excavation, all as shown on the drawings.

### **E9.4     Quality Control**

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

### **E9.5     Method of Measurement**

The outfalls shall be measured on a lump sum basis for each size and type of outfall, and shall include the CSP, excavation, geotextile, bedding, concrete collar and backfill.

E9.6 Method of Payment

Payment for these items shall be at the Contract Lump Sum Price for "Outfall" for each size as noted in the Form B: Prices.

**E10. STORMWATER RETENTION BASIN EXCAVATION AND SITE GRADING**

E10.1 Description

This Special Provision shall cover the excavation of the Stormwater Retention Basin (SRB) and disposal of the excavated material.

E10.2 Construction Methods

E10.2.1 SRB Excavation

- (a) The Contractor shall excavate the SRB to the lines, grades and contours shown on the construction drawings.
- (b) Where possible excavated material shall be placed on the portion of the Fairfield Subdivision that lies to the West of Raphael Street, as shown on the drawings. Surplus excavated material shall be disposed off the site. The Contractor shall be responsible for the safe transport of all material off the site including all local and provincial regulations concerning the hauling of excavated material on City and Provincial roads. All material shall be disposed of in a safe and legal manner. The Contractor shall note that the Brady Road landfill has indicated that they will accept all clean material from the site, waive all tipping fees for clear material, and will make arrangements with the Contractor to allow for the delivery of material outside the landfill's normal operating hours, if required to suit the Contractor's schedule.

E10.3 Method of Measurement

E10.3.1 Excavation

- (a) Excavation shall be measured on a volume basis and paid for at the Contract unit price per cubic metre for excavation. The volume to be paid for will be the total number of cubic metre excavated accepted and measured by the Contract administrator.
- (b) No measurement will be made for the hauling, placing and compacting of SRB excavation material in fill sites.
- (c) No measurement will be made for snow removal.

E10.4 Basis of Payment

E10.4.1 Excavation

- (a) The price paid for excavation shall be at the unit price bid per cubic metre for excavation.
- (b) No extra payment will be made for the hauling, placing and compaction of SRB excavation material, either West of Raphael Street or off site.
- (c) No extra payment will be made for the removal of snow or delays caused by snow or rain.
- (d) No extra payment will be made for the excavation of frozen material. Excavation of frozen material will be paid for at the Contract unit price for excavation.

**E11. SODDING**

E11.1 Description

This Special Provision shall amend and supplement Standard Specification CW 3510-R7.

E11.2 Construction Procedures

E11.2.1 Existing Subgrade

The subgrade shall be established under SRB excavation. This subgrade shall constitute a rough machine finished surface. Where such subgrade averages 50 mm plus or minus the specified subgrade, all work required to adjust the subgrade shall be the Contractor's responsibility. Preparation of the existing subgrade, as established under SRB excavation shall be executed as hereinafter specified.

E11.2.2 Preparation of the Subgrade

- (a) The Contractor shall assure himself that the subsoil has been graded and uniformly compacted so that it will be parallel to the proposed finished grade.
- (b) The subgrade material shall be loosened and mixed to a depth of 50 mm to 100 mm and all stones over 50 mm in size, sticks and debris shall be removed. No heavy objects except lawn rollers shall be moved over the lawn areas after the subgrade soil has been prepared, unless the subgrade soil is again graded and loosened as specified above before topsoil is spread.

E11.2.3 Placing of Topsoil

- (a) Placing topsoil shall be as per CW 3510-R7, Clause 9.4.

E11.2.4 Placing Sod

- (a) Placing of sod shall be as per CW 3510-R7, Clause 9.5.

E11.3 Acceptance

E11.3.1 Maintenance of Sodded Area

Maintenance of sodded area as per CW 3510-R7.

E11.4 Maintenance Requirements

E11.4.1 Term

The Contractor shall be responsible for the maintenance of the grassed areas, including watering, mowing, cleaning and replanting as necessary, for a period of sixty (60) growing days after the recognized completion date.

E11.4.2 Standard

At the end of this period uniform strands of grass must be established in the sodded areas for resodding will be required at the Contractor's expense to the satisfaction of the Owner. Scattered bare spots, none of which is larger than 0.1 square metre, will be allowed up to a maximum of three (3) percent of any lawn area.

E11.5 Method of Measurement and Basis of Payment

E11.5.1 Sodding

As per CW 3510-R7, Clause 12 and 13 and to include the supply of all material and the performing of all operations as herein described.

**E12. PRECAST TURFSTONE AND MAINTENANCE EQUIPMENT RAMP SECTIONS**

E12.1 Description

E12.1.1 Standard Specification

This Special Provision shall cover the installation of precast Turfstone and ramp section. It should be done as "BOAT RAMP 45-84000" is described in Barkman Concrete Site Furnishing.

E12.2 Material

E12.2.1 Turfstone

Use Barkman "Turfstone" Interlocking Concrete Surfacing as indicated on the construction drawings, or approved equal.

E12.2.2 Precast Equipment Maintenance Pads.

Use Barkman "Boat Ramp Pad" sections 3050 x 360 x 100 connected with Cadmium plated bars and bolt as given

E12.3 Construction Methods

E12.3.1 Turfstone

Installation of Turfstone shall conform to Barkman Concrete

E12.4 Method of Measurement and Basis of Payment

E12.4.1 Excavation

Excavation shall be considered incidental to the installation of Turfstone and precast equipment maintenance pads as shown in the drawings.

E12.4.2 Turfstone

The payment shall also be compensation in full for 150 mm thick compacted crushed limestone subbase and 15 mm sand base.

E12.4.3 Crushed Limestone Subbase

No measurement will be made for the 150 mm thick (compacted thickness) crushed limestone subbase. Installation of crushed limestone subbase shall be considered incidental to the installation of precast equipment maintenance pads.

E12.4.4 Precast Equipment Maintenance Pads.

Precast equipment maintenance pads shall be measured and paid for on an area basis.

**E13. RANDOM STONE RIPRAP**

E13.1 Description

This Specification shall supplement and amend Specification CW 3615-R2.

E13.2 Material

E13.2.1 The rock material used for riprap shall consist of hard, dense, durable limestone. When subjected to the Los Angeles Abrasion test, the limestone shall have a loss of not more than 35%. The riprap shall be crushed limestone, 150 to 300 mm in size, and clean of all soil and fine material.

E13.2.2 Geotextile material shall be non-woven and meet or exceed the following Specifications:

(a) Grab Tensile Strength	360 N
(b) Grab Tensile Elongation	50%
(c) Mullen Burst	1120 kPa
(d) Puncture	200 N
(e) Trapezoidal Tear	160 N
(f) Apparent Opening Size	0.212 mm
(g) Permittivity	2.2 sec <sup>-1</sup>
(h) Flow Rate	105 L/sec/m <sup>2</sup>

E13.3 Construction Methods

E13.3.1 Excavation

Excavation shall be in accordance with CW 3615-R2 clause 9.9.1.

E13.3.2 Geotextile

The Contractor shall place the geotextile by unrolling it on the excavated surface. The material shall be smooth and free of tension, stress, folds, wrinkles, and creases, and in one continuous length. If required, the geotextile may be overlapped 1000 mm over the previously laid strip.

E13.3.3 Rock

The random stone riprap shall be placed in such a manner that the larger stones are uniformly distributed and smaller rocks serve to fill the spaces between the larger rock. Sufficient handwork shall be done to produce a neat and uniform surface.

E13.4 Method of Measurement

E13.4.1 Random Stone Riprap

Random Stone Riprap will be measured on a volume basis. The volume to be paid for shall be the number of cubic metres installed in accordance with this Specification and the drawings and accepted by the Contract Administrator.

E13.4.2 Geotextile

No measurement will be made for the Geotextile material.

E13.5 Basis of Payment

E13.5.1 Riprap

Riprap will be paid for at the Contract Unit Price per cubic metre for "Riprap", 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.

E13.5.2 Geotextile

No separate payment will be made for Geotextile. It shall be considered incidental to the random stone Riprap.

**E14. CLEARING & GRUBBING AND PROTECTION OF EXISTING TREES**

E14.1 Description

This Special Provision shall amend and supplement Specification CW 3010-R4.

E14.1.1 The entire site West of Raphael Street should be cleared and grubbed as shown in the drawings. Care should be taken to not encroach beyond this limit at the existing houses on Lee Boulevard, nor along the West and South of sides of the SRB.

E14.1.2 Outside of the clearing and grubbing limits, the following shall apply:

- The Contractor shall not stockpile materials and soil or park vehicles on boulevards within 2 m of trees.
- Mature tree trunks shall be strapped with 25 X 150 X 2400 mm (1" x 6" x 8') wood planks. Smaller trees shall be similarly protected using appropriately sized wood planks.
- Where roots must be cut to facilitate an excavation, they shall be neatly pruned at the face of the excavation.
- Equipment shall not be parked, repaired or refuelled within the driplines of trees. Construction materials shall not be stored and earth materials shall not be stockpiled within the driplines of trees. The dripline of a tree shall be considered to be the ground surface directly beneath the tips of its outermost branches. The Contractor shall ensure that the operations do not cause flooding or sediment deposition on areas where trees are located.
- Work on site shall be carried out in such a manner so as to minimize damage to existing tree branches. The Contractor shall be responsible for all costs incurred for the pruning of the trees.
- All damages to existing trees caused by the Contractor's construction activities shall be repaired at the Contractors expense.
- No separate measurement or payment will be made for protection of trees outside of the debris and grubbing limits. It shall be considered incidental to the works.

E14.1.3 All tree shrubs and bushes within the clearing and grubbing limits should be removed.

## **E15. DEMOLITION AND REMOVAL OF STRUCTURES**

- E15.1 The Contractor is advised that the demolition of buildings on the SRB site will be carried out by others.
- E15.2 The demolition and removal of structure works are scheduled to begin on Monday February 2, 2004 and be completed by February 6, 2004.
- E15.3 The Contractor shall provide access to the demolition sites for the demolition Contractor.
- E15.4 The Contractor shall schedule his activities around the demolition works.
- E15.5 No claims for loss of time and/on production due to the demolition activities will be considered.

## **E16. DITCH INLET STRUCTURE**

E16.1 Description

- E16.1.1 This specification shall cover the construction of the ditch inlet structure as shown on the drawings. 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.

E16.1.2 Ditch Inlet structures shall consists of the concrete inlet structure installed at the top of ditch inlet manholes. The base and riser section of the ditch inlet manholes are covered in Section E3.

E16.2 Shop Drawings

E16.2.1 The Contractor shall supply five (5) copies of shop drawings of the inlet grate and structural reinforcing for the Contract Administrator's approval two weeks prior to the commencement of the work.

E16.3 Method of Measurement

E16.3.1 Ditch inlet structures shall be measured on a lump sum basis for each structure constructed in accordance with the drawings and his specification, and accepted by the Contract Administrator.

E16.4 Method of Payment

E16.4.1 Payment for this item shall be at the Contract Lump Sum price for "Ditch Inlet structure," measured as specified herein.

**E17. GRADE EXISTING DITCHES**

E17.1 Description

This specification shall cover the grading of existing ditches along Lee Boulevard.

E17.2 Method of Construction

Ditch grading shall be to the lines and grades shown on the drawings. Ditches shall be graded to direct runoff to the proposed ditch inlet structures.

E17.3 Method of Measurement and Basis of Payment

Grading of existing ditches shall be measured and paid on a lineal metre basis. Payment shall include all excavation for grading, disposal of material off-site and sodding of the ditches.