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:

Drawing No.	Drawing
C0010	General Plan
C0011	Raphael Street – 45 m South of Comdale Avenue to 113 m North of Fairfield Avenue
C0012	Colby Avenue – 113 m North of Fairfield Avenue to 80 m East of Barnes Street
C0013	Colby Avenue – 80 m East of Barnes Street to Shore Street
C0014	Barnes Street – 30 m North of Fairfield Avenue to 40 m North of Lee Boulevard
C0015	Typical Cross- Sections, Details

PART 1 – CITY FUNDED WORK – PRE-APPROVED

E2. CLEARING AND GRUBBING

E2.1 Description

(a) This Specification shall amend and supplement Specification CW 3010-R4.

E2.2 The entire Site should be cleared and grubbed as shown in the drawings. The following applies to all trees outside the clearing and grubbing limits:

E2.2.1 The Contractor shall not stockpile materials and soil or park vehicles on boulevards within 2 m of trees.

E2.2.2 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.

E2.2.3 Where roots must be cut to facilitate an excavation, they shall be neatly pruned at the face of the excavation.

E2.2.4 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.

E2.2.5 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.

E2.2.6 All damages to existing trees caused by the Contractor's construction activities shall be repaired at the Contractors expense.

E2.2.7 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.

E2.3 All tree shrubs and bushes within the clearing and grubbing limits should be removed.

E3. WATERMAINS

E3.1 Description

(a) This Specification shall amend and supplement Standard Specification CW 2110-R7 and CW 2125.

E3.2 Materials

E3.2.1 Watermains

(a) The following pipe materials shall be considered approved for watermains:

(i) Polyvinyl Chloride Class 150 conforming to American Water Works Association Standard C 900, ASTM Specification D-1784 shall be Bell & Spigot with gaskets conforming to ASTM Specification F 477.

(b) The following pipe material shall be considered approved for 20 mm to 50 mm diameter watermain:

(i) Annealed copper type "K" conforming to ASTM Specification B88.

E3.2.2 Hydrants

(a) All hydrants shall be of a type approved for use in the City of Winnipeg.

E3.2.3 Valves

(a) All gate valves shall conform to American Water Works Association Standard C 509 and shall be of a type approved for use in the City of Winnipeg.

E3.2.4 Fittings

(a) All bends, crosses, tees, reducers and specials shall conform to AWWA Standard C-110 and shall be of a type approved for use in the City of Winnipeg.

(b) All fasteners, tie rods, clamps, nuts, and bolts used to prevent movement shall be stainless steel conforming to ANSI Specification 303 and ASTM Specification A320 (AISI Type 316).

(c) Pipe couplers for watermains shall be Dresser Style 38, Rockwell (Smith-Blair), ROBAR, or approved equal.

(d) All couplers shall be supplied complete with a fusion bonded epoxy coating, in accordance with AWWA C 213.

(e) All fittings (including couplers) shall be wrapped with 8 mil thick polyethylene in conformance with AWWA Standard C105.

E3.3 Construction Methods

E3.3.1 Bedding and Backfill

(a) The bedding and backfill for watermains installed in open trenches shall be Class 4 as shown in Standard Drawing SD-001 and specified in Section CW 2110-R7, Clause 3.3 and Section CW 2030-R6, Clause 3.8.4. Governed by his compaction equipment and the type and strength of pipe, the Contractor shall ensure that there is adequate cover on the pipe to prevent damage during compaction operations.

E3.3.2 Cored Sections

(a) The watermain shall be installed by coring at all existing and proposed road crossings and at locations shown on the Construction Drawings. Coring shall be as specified in Section CW 2110-R7, Clause 3.4.

E3.3.3 Installation in Open Trench with Class 2 Backfill as an Alternate to Installation in Cored Hole

(a) Where field conditions are such that a cored hole cannot be made, the Contractor, after receiving written approval from the Contract Administrator, shall install the pipe in an open trench with Class 2 backfill.

E3.3.4 Connection to Existing Plugs

(a) Connections are to be made to existing plugs as shown on the drawings. The Contractor shall remove any existing plugs in tees, crosses, and stubs; as shown on the drawings and connect the proposed watermain. No extra payment will be made for the connection to existing plugs.

(b) Upon receipt of adequate notice, City Work forces shall turn existing watermains off and on as required for the Contractor, at no cost to the Contractor. At no time shall the Contractor operate the valves on the existing watermain system or new valves tied into the existing system.

E3.3.5 Installation of Valves

(a) Valves shall be installed in the locations shown on the Construction Drawings and shall be installed in accordance with Section CW 2110-R7. Where possible, valves are not to be installed in pavement.

(b) The top of the false valve spindle shall extend to between 150 mm and 450 mm below the top of the valve box. Direction to open and close shall conform to Standard Drawing SD-008.

E3.3.6 Installation of Hydrants

(a) Hydrants shall be installed at the locations shown on the Construction Drawings. The Work shall be performed in accordance with Specification CW 2110-R7, and as shown in Standard Drawing SD-006 or SD-007. Depth of bury shall be to suit the watermain profile and the hydrant shall be placed so that the pumper nozzle faces the street. The finished flange elevation shall be between 50 mm and 150 mm above proposed finished grade. No extra payment will be made for any extensions or adjustments required to meet this grade. Hydrant leads greater than 2.0 m will be paid for at the unit price for 150 mm watermain, Class 4 backfill.

E3.3.7 Plugs

(a) Plugs shall be supplied and installed complete with blocking at the locations shown on the Construction Drawings.

E4. WASTEWATER SEWERS

E4.1 Description

(a) This Specification shall amend and supplement Standard Specification CW 2130-R8 and CW 2145-R1.

E4.2 Material

(a) All concrete pipe shall be the class specified on the Construction Drawings. Classes shall conform to ASTM Specification C14 and C76.

(b) All PVC pipe shall be SDR-35 conforming to ASTM Specification D3034.

(c) All risers shall be 150 mm diameter.

E4.3 Construction Methods

E4.3.1 Bedding and Backfilling

(a) The bedding and backfilling for wastewater sewers installed in open trenches shall be Class 4 as shown in Standard Drawing SD-001 and specified in Section CW 2030-R6, Clause 3.8.4.

(b) Governed by his compaction equipment and the type and strength of pipe, the Contractor shall ensure that there is adequate cover on the pipe to prevent damage during compaction operations.

(c) In locations where the vertical separation between the wastewater sewer and land drainage sewer exceeds 1.0 m and the wastewater sewer trench undermines the trench bottom of the land drainage sewer, the bedding and backfilling for the wastewater sewer shall be as CW 2030-R6, Clause 3.11.2, Installation of Parallel Mains. The lower trench is to be backfilled with granular material to the invert of the higher pipe as shown on the Construction Drawings.

E4.3.2 Cored Sections

(a) All sewer pipe 375 mm diameter and smaller crossing existing or proposed pavement and at locations shown on the Construction Drawings shall be installed by coring. Coring shall be as specified in Section CW 2130, Clause 3.4.

E4.3.3 Installation in Open Trench with Class 2 Backfill as an Alternate to Installation in Cored Hole

(a) Where field conditions are such that a cored hole cannot be made, the Contractor, after receiving written approval from the Contract Administrator, shall install the pipe in an open trench with Class 2 backfill.

E4.3.4 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 short stubs and plugs. A short stub will be considered as one pipe length. Payment shall be allowed for longer stubs to be plugged for future connections.

E4.3.5 Connecting to Existing Stubs

(a) The Contractor shall remove existing plugs and connect to existing sewers where shown on the Construction Drawings. The Contractor shall note that the existing wastewater sewer on Barnes Street may be surcharged. The Contractor shall plug and dewater the stub ends as necessary to complete the required corrections. Where required by the Contract Administrator, trench shoring shall be used to protect existing pavement. No additional payment will be made for connecting to existing stubs.

E4.3.6 Connections to Existing Manholes/Sewers

(a) The Contractor shall connect to existing manholes or sewers as shown on the Construction Drawings. This Work shall be performed in a workmanlike manner according to the dictates of good practice. Existing manhole floors shall be rechanneled and properly benched, the junction area shall be grouted to form a smooth joint, all debris including concrete and excavated material, shall be removed and the vicinity of the connection shall be left in a tidy condition.

(b) The Contractor shall plug all proposed sewer mains at the point of connection to existing sewer mains until the proposed system has been inspected and accepted by the Contract Administrator and the City.

E4.3.7 Sewer Connection Risers

(a) Risers shall be installed on wastewater sewers at the locations necessary for lot servicing as directed by the Contract Administrator, in accordance with Standard Drawing SD-015.

E5. LAND DRAINAGE SEWERS

E5.1 Description

(a) This Specification shall amend and supplement Standard Specification CW 2130-R8 and CW 2145-R1.

E5.2 Material

(a) All concrete pipe shall be the class specified on the Construction Drawings. Classes shall conform to ASTM Specification C 14 and C 76.

(b) All PVC pipe shall be SDR-35 conforming to ASTM D3034.

E5.3 Construction Methods

E5.3.1 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-001 and specified in Section CW 2030-R6, Clause 3.8.4.

(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.

E5.3.2 Cored Sections

(a) All sewer pipe and catchbasin leads 375 mm diameter and smaller crossing existing or proposed pavement and at locations shown on the Construction Drawings shall be installed by coring. Coring shall be as specified in Section CW 2130-R6, Clause 3.4.

E5.3.3 Installation in Open Trench with Class 2 Backfill as an Alternate to Installation in Cored Hole

(a) Where field conditions are such that a cored hole cannot be made, the Contractor, after receiving written approval from the Contract Administrator, shall install the pipe in an open trench with Class 2 backfill.

E5.3.4 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 short stubs and plugs. A short stub will be considered as one pipe length. Payment shall be allowed for longer stubs to be plugged for future connections.

E5.3.5 Connections to Existing Stubs

(a) The Contractor shall remove existing plugs and connect to existing sewers where shown on the Construction Drawings. Where required by the Contract Administrator, trench shoring shall be used to protect existing pavement. The Contractor shall note that land drainage sewer connections are generally below the normal water level of the lake. The Contractor shall plug and dewater the stub ends as necessary to complete the required connections. No additional payment will be made for connecting to existing stubs unless otherwise noted.

E5.3.6 Connections to Existing Manholes/Catchbasins/Sewers

(a) The Contractor shall connect to existing manholes, catchbasins or sewers as shown on the Construction Drawings. The Work shall be performed in a workmanlike manner according to the dictates of good practice. Existing manhole floors shall be rechanneled and properly benched, the junction area shall be grouted to form a smooth joint, all debris including concrete and excavated material shall be removed and the vicinity of the connection shall be left in a tidy condition.

(b) The Contractor shall plug all proposed sewer mains at the point of connection to existing sewer mains until the proposed system has been inspected and accepted by the Contract Administrator and the City.

(c) The Contractor shall note that most of the corrections are below the normal water level of the lake. The Contractor shall plug and dewater the manhole/catchbasin/sewer as necessary to complete the required connections.

E6. SEWER MANHOLES

E6.1 Description

(a) This Specification shall amend and supplement Standard Specification CW 2130-R8, CW 2140-R1 and CW 2145-R1.

E6.2 Materials

(a) Manhole frames and covers shall have machined seating surfaces and shall be in accordance with Standard Drawings SD-010 and SD-011.

(b) All manholes shall be constructed with a 750 mm x 150 mm ring immediately below the frame and cover.

E6.3 Construction Methods

E6.3.1 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 levelled 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 3 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) linear metres 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.

E6.3.2 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.

E6.3.3 Curb Clearance

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

E7. SUBGRADE, SUBBASE AND BASE COURSE CONSTRUCTION

E7.1 Description

(a) This Specification shall amend and supplement Specification CW 3110-R7.

E7.2 Construction Methods

E7.2.1 Excavation

(a) Excavation shall consist of street excavation, boulevard excavation, lot grading and associated works as herein specified.

E7.2.2 Street Pavement Excavation

(a) This shall be done in accordance with Specification CW 3110-R7.

E7.2.3 Ditching

(a) Where shown on the Drawings, ditching shall be excavated to provide a runoff channel away from paved roads.

E7.2.4 Excavation for Boulevards

(a) Boulevards are defined as areas between the back of the curb and the property line. Excavation for boulevards shall be to the lines and grades shown on the drawings and/or as required.

(b) Excavation for boulevards shall be done in conjunction with, and at the same time as, the excavation for pavement. The Contractor will ensure that a windrow of sufficient volume of subgrade material is left on the boulevard for backfilling behind the curb. There shall be no separate measurement of quantities for boulevard excavation and fill. In cut sections, the excavation quantity shall be calculated from cross sections. In fill sections, the approved material placed shall be classified as disposal of excavation and no measurement shall be made. Boulevards shall be filled with earth, free from broken concrete, cinders, gravel or other foreign material. The boulevard shall be graded from the top of the curb to the proposed elevation at the property line so as to allow drainage from the property over the adjoining curb. The finished surface shall not vary more than 25 mm from a straight grade between the above limits.

(c) Payment for sloping and grading of boulevards shall be included in the price for excavation.

E7.2.5 Lot Grading

(a) The lots shall be graded to the lines and grades as shown on the lot grading plan with an allowance made for future basement excavation. A blade grader shall be employed to shape the final grade to within 25 mm of the grades staked by the Contract Administrator.

(b) Excavation shall be paid for at the unit price bid for "Excavation". The fill sections shall be considered as disposal areas for excavated material and no measurement or payment will be made for this item.

(c) Payment for the shaping and grading of the lots will be measured on an area basis at the Contract Unit Price per square meter. The area to be paid is the total number of square meters of the lots accepted and measured by the Contract Administrator.

E7.2.6 Utility Trenches

(a) The Contractor shall install all conduits for utility crossings in the right-of-ways. The conduit shall be 1.5 m below the finished gutter elevation of the road. End caps and planks to be placed at each end. The conduit shall be installed by trenchless methods under pavement areas and as per CW 2030-R6, Clause 3.8.4 under all other areas. The Contractor shall be responsible for further settlement during the warranty period.

(b) Utility crossings shall be laid out at the time of construction by the Contract Administrator.

(c) If utility crossings are missed or installed incorrectly by the Contractor, the utilities will reinstall the crossing at the Contractor’s expense with no liability to the utility.

(d) The utility shall supply all conduit, end caps and marking planks.

E7.2.7 Base Course

(a) All granular base course for reinforced concrete pavement or plain dowelled concrete pavement shall be placed and compacted as specified to a finished thickness of 100 mm.

E7.3 Method of Measurement and Basis of Payment

E7.3.1 Excavation

(a) Excavation shall include street excavation, boulevard excavation and lot grading as specified herein. The width of pavement excavation for payment purposes shall be considered to be the width of pavement plus 1800 mm.

E7.3.2 Ditching

(a) Ditching shall be measured in linear metres.

E8. PORTLAND CEMENT CONCRETE PAVEMENT WORKS

E8.1 Description

(a) This Specification shall amend and supplement Specification CW 3310-R7.

E8.2 Construction Procedures

E8.2.1 Reinforced Concrete Pavement

(a) Reinforced concrete pavement shall be 150 mm thick for 7.5 mm wide streets, for lanes, for lane approaches and for residential approaches.

(b) Reinforced concrete pavement shall be 200 mm thick for 8.0 mm wide streets and for all approaches abutting an 8.0 m wide street excluding residential approaches.

E8.2.2 Concrete Lip Curb

(a) Lip curb is to be placed on all streets 7.5 m wide except on radii of less than 10.0 m. Lip curb shall be constructed in accordance with the Standard Drawing SD-202. In all cul-de-sacs, lip curb shall have a vertical height of 75 mm as detailed on Standard Detail SD-202A.

E8.2.3 Concrete Modified Barrier Curb

(a) Modified barrier curb is to be placed on all radii greater than 10.00 m, on all streets greater than 7.5 m wide and at locations shown on the Construction Drawings with Standard Detail SD 203B.

E9. TEMPORARY SPILLWAY

E9.1 Temporary Spillways shall be construction where shown on the Drawings. Spillways shall conform to the design shown on the Detail Drawing. Spillways shall be measured and paid on a unit basis.

PART 2 – CITY FUNDED WORK – APPROVAL PENDING

E10. BUILDING CONNECTIONS

E10.1 Description

(a) This Specification shall amend and supplement Standard Specification CW 2110-R7 and CW 2130-R8.

E10.2 Material

E10.2.1 Sewer Service

(a) The following pipe is approved for sewer service:

(i) PVC pipe SDR 35 conforming to ASTM Specification D 3034.

E10.2.2 Pipe Joints

(a) All sewer pipe joints shall be the rubber gasket type.

E10.2.3 Water Connection

(a) The following pipes are approved for water connection:

(i) Annealed copper type “K” conforming to ASTM Specification B 88.

(b) All Fittings shall be the standard brass compression or flared type.

E10.2.4 Pipe Size

(a) All sewer service pipe shall be 150 mm diameter.

(b) Water service pipe shall be 20 mm diameter.

E10.2.5 Sand

(a) Sand for bedding and backfill shall be in accordance with Specification CW 2030-R6.

E10.2.6 Wooden Service Markers

(a) Wooden markers for curb stops shall be 100 mm x 100 mm x 3000 mm minimum size.

E10.3 Construction Methods

E10.3.1 Bedding and Backfilling

(a) The bedding and backfilling for building connections installed in an open trench shall be Class 4 as shown in Standard Drawing SD-001 and specified in Section CW 2030, Clause 3.8.4.

E10.3.2 Pipe Installation

(a) Where possible sewer and water connections shall be installed in the same trench or cored hole.

(b) Where building connections are laid across recently excavated trenches, particular care shall be taken to compact the backfill under the building service.

E10.3.3 Cored Sections

(a) All building connections crossing existing or proposed pavement shall be installed by coring. Coring shall be as specified in Section CW 2130-R8, Clause 3.4.

E10.3.4 Installation in Open Trench with Class 2 Backfill as an Alternate to Installation in Cored Hole

(a) Where field conditions are such that a cored hole cannot be made, the Contractor, after receiving written approval from the Contract Administrator; shall install the pipe in an open trench with Class 2 backfill.

E10.3.5 Curb Stops

(a) Curb stops shall be installed in accordance with CW 2110-R7 except that the curb stop box shall not be installed. A 100 mm x 100 mm x 3000 mm wooden marker shall be placed adjacent to the curb stop and shall extend from the invert of the service to a minimum of 0.5 m above the ground level. Curb stops shall be installed such that the stop is aligned perpendicular to the property line.