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
A-1	Site Plan, Elevations & Section – Building Relocation
A-2	Plan View, Sections & Elevations
S-1	Existing Foundation, New Foundation & Details
E1	Electrical Plan, Elevation & Section
M-1	Mechanical Plan & Elevations
D-1	Borehole Location & Soil Logs

E2. GENERAL REQUIREMENTS

E2.1 GENERAL

E2.1.1 Contractor shall carry out all Work required to construct a new foundation, relocate the existing trailer, and all related Works as per specifications and drawings.

E2.1.2 Further to B14.5 Alternative A – Piled Foundation and Alternative B – Spread Footing Foundation are shown on Drawing S-1.

E2.1.3 Work shall be coordinated to avoid disruption to occupants and access to the building shall be maintained at all times, except during shutdown period from August 3, 2004 to August 31, 2004, at which time the trailer shall be relocated to the new foundation.

E3. SITEWORK SECTION 02000

E3.1 GENERAL

E3.1.1 WORK INCLUDED

(a) Remove and dispose of existing stair and ramp, relocate trailer and related equipment/facilities on to new foundation, and grade and fill existing trailer site as shown on the drawings.

E3.2 PRODUCTS

E3.2.1 MATERIALS

(a) Tie down anchors shall be Minute Man Ground or Concrete Anchors as shown on the drawings and shall include all galvanized strapping and accessories required to tie beams to anchors.

(b) Parking Curbs shall be 8"x5¼"x8' "ASR" (recycled Auto Shredder Residue) curbs such as "Impact-Curb" manufactured by X Potential Products (204)224-3933.

(c) All fill material shall be 3/4" limestone base material as per City of Winnipeg Standard Construction Specifications.

E3.3 EXECUTION

E3.3.1 RELOCATE TRAILER

(a) Contractor shall remove existing stair and deck as shown on the drawings and relocate or dispose of as indicated.

(b) Disconnect all utilities and services including holding tanks and remove from existing location and re-install at new locations.

(c) Contractor shall move trailer and set on new foundation and install as indicated on drawings, including all cribbing, anchors and strapping as required for new installation.

(d) Once trailer is set on new foundation, all utilities and services shall be reconnected.

E3.3.2 GRADE AND FILL EXISTING TRAILER SITE AND INSTALL NEW PARKING CURBS

(a) Contractor shall remove existing stair and deck as shown on the drawings and relocate or dispose of as indicated.

(b) Once trailer and accessories are moved to new locations, all existing holes shall be filled. Area shall be covered and packed with a minimum of six inches of ¾” limestone base, where indicated on the drawings.

(c) Parking curbs shall be installed according to manufacturer recommendations as shown on the drawings.

(d) Existing stairs that are not renewed shall be reinstalled in new locations.

E4. CONCRETE PILES SECTION 02350

E4.1 GENERAL

E4.1.1 WORK INCLUDED

(a) Complete cast in place concrete piling including boring, concrete reinforcing, casing as required, removal of borings.

E4.2 PRODUCTS

E4.2.1 MATERIALS

(a) Cement: to CSA A-5 - Use sulphate resistant cement (Type V).

(b) Water and aggregates to CSA A23.

(c) Reinforcing - new deformed intermediate grade steel to CSA G30.

E4.2.2 CONCRETE MIX

(a) Except where specified otherwise use concrete mix designed to produce 30MPa compressive strength at 28 calendar days. Maximum slump 90mm.

(b) Admixtures to be approved by Contract Administrator, use of calcium chloride not permitted.

(c) The concrete shall be mixed in a revolving type mixer, approved by the Contract Administrator. All the materials, including the water, shall be charged into the mixer before the truck leaves the batching plant. The mixer shall revolve between 8 and 10 rpm continuously and shall be equipped with an accurate counter. No water shall be added to the concrete after the mixer is charged at the plant. All concrete placed in any one day, on the same Contract, shall come from one central plant.

E4.3 EXECUTION

E4.3.1 BORING

(a) Contractor shall provide a minimum of 48 hours (Working day) notice to Contract Administrator prior to drilling or placing concrete to allow for inspection and concrete test arrangements.

(b) Pile holes shall be bored true and plumb in the exact location to elevations as indicated on the drawings. The finished piles shall be minimum diameter as indicated on the drawings at any cross section of the pile.

(c) The piles are designed as friction piles, and shall be placed to depths shown. Length of pile is measured from underside of beam or slab.

(d) If underground water, boulders or caving is encountered, the Contractor must arrange for its removal and proper concrete placing by methods approved by the Contract Administrator at no extra cost to the owner. If piles cannot be placed to depth shown on drawings, then the Contract Administrator shall be notified and he shall determine the modifications necessary. There will be no extra charge to the owner for this modification.

(e) The depth of all pile holes must be measured by the Contractor in the presence of the Contract Administrator before any concrete is poured. The Contractor will show the pile depths on the "As Built" drawings, of pile depths obtained in actual placement.

(f) It shall be the Contractor's responsibility to check for underground utilities and investigate soil conditions for this project. All information shown on plans was used for design purposes only.

E4.3.2 REINFORCING

(a) Pile reinforcing shall be rigidly fastened together and shall be held in position in such a manner as to insure its proper location in the finished pile.

E4.3.3 CONCRETE

(a) Holes must be completely dry when pouring concrete, and completely filled.

(b) Concrete pile tops shall be vibrated for a minimum depth of 3000mm.

(c) In weather below freezing, the Contractor shall keep concrete in piles from freezing and if necessary shall provide heat on pile tops for 4 calendar days.

E4.3.4 FIELD QUALITY CONTROL

(a) A set of field specimens shall be prepared for approximately each day's run of concrete, or more often if required by the Contract Administrator. Generally the number of sets or cylinders required shall be one set for every 20 cubic metres poured.

(b) A set shall consist of four specimens from the same batch of concrete as it goes into the Work. Two of the specimens shall be tested at seven (7) calendar days and the remaining two at twenty-eight (28) calendar days. The specimens shall be cylinders 150mm in diameter and 300mm long.

(c) The concrete test specimens shall be transported by the Contractor, at his own expense, not earlier than 24 hours or later than 4 calendar days after they are made to the National Testing Laboratories, Winnipeg. The cost of laboratory tests shall be paid by the City.

E4.3.5 THE FOLLOWING STRENGTHS SHALL BE MET

(a) The average of all tests representing each class of concrete shall exceed the specified strength by 15 percent minimum.

(b) No three consecutive tests shall fall below the specified strength.

(c) No strength test shall fall below 80 percent of the specified strength.

(d) If the concrete tests fails to meet the strength requirements, the Contract Administrator may:

(i) Change the basic concrete mix for the remainder of the Work.

(ii) Require additional curing for the portions under strength.

(iii) Have cores drilled and test the cores, or

(iv) Have the concrete under strength removed.

E5. CONCRETE REINFORCEMENT SECTION 03200

E5.1 GENERAL

E5.1.1 WORK INCLUDED

(a) Supply and install all reinforcing steel as shown on the drawings for footings and pile caps.

(b) Chairs, hangers, ties, spacers.

E5.1.2 RELATED WORK

(a) Concrete Piles Section 02350

(b) Cast in Place Concrete Section 03300

E5.1.3 REFERENCE STANDARDS

(a) CSA A23 Standards for concrete and reinforce concrete.

(b) CSA W186 Welding of Reinforcing.

E5.1.4 SHOP DRAWINGS

(a) Submit shop drawings in accordance with specifications before fabrication.

E5.2 PRODUCTS

E5.2.1 MATERIALS

(a) Reinforcing bars, deformed billet steel intermediate grade to CSA G30.

(b) Bar supports, spacers, steel adequate for strength and rigidity.

(c) Reinforcing shall be factory epoxy coated where indicated on the drawings.

E5.3 EXECUTION

E5.3.1 PLACING REINFORCEMENT

(a) The bars shall be placed in the exact position and with the spacing shown or required and shall be securely fastened in place at intersections to prevent displacement during the placing of concrete. The bars shall be fastened with annealed wire or other approved devices. Bar supports and spaces shall be set at approved intervals in all beams and slabs to keep the reinforcement in the required position.

(b) All steel reinforcement shall be delivered free from rust other than that which may have accumulated during transit to the Work. Bars having a rust, scale, or other material that may reduce the bond shall be thoroughly cleaned before placing concrete. After delivery at the Work, bars shall be stored on racks and protected from the weather.

(c) Steel reinforcement bars shall be cut and bent cold in the shop and delivered at the Work ready for placing in position.

(d) Completely detailed placing drawings and schedules shall be submitted by the Contractor to the Contract Administrator for approval. No material shall be ordered until the Contract Administrator has approved said drawings and schedules.

E6. CAST-IN-PLACE CONCRETE SECTION 03300

E6.1 GENERAL

E6.1.1 WORK INCLUDED

(a) Concrete work including footings and pile caps.

(b) Formwork, void forms.

(c) Accessories - control joints, inserts.

(d) Coordinate and cooperate with other trades. Install imbedded items, sleeves, anchors, and miscellaneous metal.

E6.1.2 RELATED WORK

(a) Concrete Reinforcement Section 03200

(b) Pile Foundations Section 02350

E6.1.3 REFERENCE STANDARDS

(a) CSA A23 Standards for Concrete-Reinforced Concrete.

E6.1.4 GUARANTEE

(a) All concrete floors shall be guaranteed against dusting, disintegration or any other defects coming within the Contractor's control for a period of 12 months after final acceptance.

E6.2 PRODUCTS

E6.2.1 MATERIALS

(a) Cement: to CSA A5 - Use sulphate resistant cement (Type V) in beams below grade.

(b) Water and aggregates to CSA A23.

E6.2.2 CONCRETE MIX

(a) Except where drawings show other strengths, Concrete Mix shall be designed to produce 30MPa compressive strength at 28 calendar days.

(b) Slump: 100mm unless **otherwise shown on drawings**.

(c) Admixtures to be approved by Contract Administrator. Use of calcium chloride not permitted.

(d) Exterior concrete shall have 5 – 7% air content.

E6.2.3 FORMWORK

(a) For exposed concrete surfaces, forms shall be of G.1.S. fir plywood or steel forms.

E6.3 EXECUTION

E6.3.1 FORMWORK

(a) Forms shall be set to line and grade and shall be so braced and fastened together as to maintain position and shape and to produce true lines. Special care shall be taken to prevent bulging, but if this occurs, the disturbed surfaces shall be corrected without extra cost to the City

(b) Internal spacers and ties shall be made up of bolts and special nuts so arranged that when the forms are removed no holes shall extend through the concrete and no metal

remaining in the concrete shall be within one inch (1") of any concrete surfaces. Wire ties shall not be used. The use of wooden spreaders between the forms will not be permitted where such spreaders will remain in the concrete.

(c) The inside of the forms shall be coated with non-staining mineral oil and this coating shall be applied before the steel reinforcement bars are placed.

(d) Deviation of all cast-in-place concrete shall not be greater than 6mm in 3500mm in vertical and horizontal line. Deviation from a plane surface for grade beams and floors of 4mm in 3000mm is permitted. Variation in cross-section dimension shall be less than 3mm for 150mm members and 6mm for members thicker than 150mm.

(e) Stripping of formwork on supporting members shall not be carried out until after concrete has attained a strength of at least 3/4 of design requirements.

(f) In special cases when rub finish is specified, vertical forms may be removed in not less than 12 hours, providing weather conditions for the curing have been ideal.

(g) Extreme care shall be exercised at all times in the removal of forms to the end that the concrete is not chipped, jarred or damaged in any way.

(h) If excessive construction loads are anticipated, all Work shall be shored to prevent overloading of the members.

(i) When the atmospheric temperature at the Site of the Work is continuously above $10^{o}C$, forms and structures shall be held in place at least four calendar days after placing of concrete, and longer if so required by the Contract Administrator.

(j) When the temperature at the Site of the Work is continuously or intermittently below $10^{o}C$, the forms shall be required held in place for longer periods of time and shall not be struck without the consent of the Contract Administrator.

E6.3.2 CONCRETE

(a) Contractor shall provide a minimum of 48 hours (Working day) notice to Contract Administrator prior to any concrete placement to allow for inspection and concrete test arrangements.

(b) Before placing concrete, all equipment for transporting the concrete shall be cleaned of hardened concrete and foreign materials. All debris and ice shall be removed from the places to be occupied by the concrete. All forms shall be soaked with water, except in freezing weather. Chemicals shall not be used to remove ice from the hardened concrete or the forms.

(c) Concrete shall be handled from the mixer to the place of final deposit as rapidly as practicable, by methods which will prevent the separation or loss of the ingredients. Concrete shall be deposited in the forms, as nearly as practicable, in its final position to avoid rehandling or flowing. Under no circumstances shall concrete that has partially hardened be deposited in the forms.

(d) When concreting is once started, it shall be carried on as a continuous operation until the placing of the section is completed.

(e) Concrete shall be thoroughly compacted by puddling with suitable tools, during placing operations. It shall be thoroughly worked around the reinforcement, imbedded fixtures, and into the corners of the forms

(f) Concrete in walls and tie beams shall be compacted by internal and external mechanical vibrations. Concrete slabs and beams shall be compacted by internal vibrations. Internal vibrators shall operate at a speed of not less than 5,000 vibrations per minute and shall be applied at the point of deposit and in the area of freshly placed concrete.

(g) Pouring concrete during rain will not be permitted. The concrete surfaces shall be protected from rain until the initial set occurs. No concrete to be placed over frozen ground or fill.

(h) All exposed concrete surfaces shall be covered and protected for proper concrete curing. Slabs shall be well watered and covered with burlap or polyethylene for a minimum of five (5) calendar days.

(i) As soon as forms are stripped, all exposed concrete surfaces shall be carefully inspected, mortar projections removed and projecting forming devices removed at least 15mm below surface and patched. Honeycomb areas shall be chipped out to sound concrete, area thoroughly wetted and patched with a mortar. The patch should be kept wet for five (5) calendar days to reduce shrinkage. If honeycombing is excessive, the Contract Administrator may reject the member in question and it shall be replaced by the Contractor.

E6.3.3 COLD WEATHER PROTECTION

(a) The concrete shall reach the forms at a temperature of not less than 20^{o}C and not more than 38^{o}C. Effective means shall be provided for maintaining the temperature of the concrete at all surfaces at not less than 20^{o}C for three (3) calendar days or not less than 10^{o}C for five (5) calendar days after placing.

(b) Concrete shall be kept above freezing for seven (7) calendar days and shall be kept from alternate freezing and thawing for at least fourteen (14) calendar days after placement.

(c) At the end of the specified protection period, the temperature of the concrete shall be reduced gradually at a rate not exceeding 10^{o}C per day until the outside air temperature has been reached.

(d) The Contractor must keep a record of the temperatures inside the enclosure and the outside air temperature. The record shall include the temperatures at several critical points in the enclosure.

(e) CSA combustion type heaters may be used but shall be so constructed and so placed that their combustion gases will not come in contact with surfaces of the concrete. Adequate fire extinguisher and constant attendance shall be maintained to ensure a safe and continuous heating operation. Heaters must be so placed as to prevent local overheating. No direct fired heating units will be accepted. Before any concrete is placed, the enclosure shall be heated for at least twenty four (24) hours and all surfaces coming in contact with the concrete must be at least 5^{o}C.

E6.3.4 CONCRETE FINISHING

(a) Unless otherwise shown, all concrete surfaces shall receive light broom finish. Normally, after forms are removed, concrete fins and projections are to be removed, all form ties filled and all defects repaired.

E6.3.5 FIELD QUALITY CONTROL

(a) A set of field specimens shall be prepared for approximately each day's run of concrete, or more often if required by the Contract Administrator. Generally the number of sets or cylinders required shall be as follows:

Size of Pour	Minimum of Tests
76m^3 or less	1 set per 38m^3
76 to 760m^3	1 set per 153m^3

A set shall consist of four specimens from the same batch of concrete as it goes into the Work. Two of the specimens shall be tested at seven (7) calendar days and the remaining two at twenty eight (28) calendar days. The specimens shall be cylinders 150mm in diameter and 300mm in length.

The concrete test specimens shall be transported by the Contractor, at his own expense, not earlier than twenty four (24) hours or later than four (4) calendar days after they are made to the National Testing Laboratories, Winnipeg. The cost of laboratory tests shall be paid by the City.

(b) The following strengths shall be met:

(i) The average of all tests representing each class of concrete shall exceed the specified strength.

(ii) No three consecutive tests shall fall below the specified strength.

(iii) No strength test shall fall below eighty percent (80%) of the specified strength.

(c) If the concrete tests fail to meet the strength requirements, the Contract Administrator may:

(i) Change the basic concrete mix for the remainder of the Work.

(ii) Require additional curing for the portions under strength.

(iii) Have cores drilled and test the cores.

(iv) Have the concrete under strength removed.

E7. ROUGH CARPENTRY SECTION 06100

E7.1 GENERAL

E7.1.1 WORK INCLUDED

(a) Supply all material, labour, and plant necessary for the framing, furring, sheathing, strapping and cant strips as shown on drawings.

(b) Installation of all door, window and other frames required to be fastened to the wood members.

(c) Supply and installation of finished hardware and specialties.

(d) Wood furring, duct enclosures.

E7.1.2 REFERENCE STANDARDS

(a) All material shall comply with CSA 0141 latest edition, CLA specification, and sawn lumber shall bear grade stamp.

(b) Nailing shall comply with requirement of the National Building Code, Manitoba Building Code, and CSA B11 – latest edition.

(c) All plywood shall comply with CSA 0121 and CSA 0151.

(d) Erect to CSA 086 – latest edition.

(e) All PWF shall be pressure treated in conformance with current CSA Standards.

E7.2 PRODUCTS

E7.2.1 MATERIAL

(a) All sawn lumber shall be No. 1 Common Construction Grade S-P-F – pressure treated wood. All plywood shall be ½" pressure treated wood.

(b) Moisture content of all unless otherwise noted must be either air or kiln dried and moisture content will not be over 12%.

(c) All wood members for framed enclosures, posts, beams, joists, and stringers shall be PWF, pressure treated wood.

(d) All deck material for deck boards, stairs, and ramp shall be "Rhino Deck" , color to be "Barn wood Grey" , which is locally available at Windsor Plywood.

E7.3 EXECUTION

E7.3.1 ERECTION OF STRUCTURAL MEMBERS

(a) Make adequate provision for possible erection stresses.

(b) Construct continuous members from pieces of longest practical length.

(c) Tighten loose connectors.

E7.3.2 STRUCTURAL FRAMING

(a) Install members true to line, levels and elevations. Set plumb. Space uniformly.

(b) All Work shall be performed by skilled tradesmen.

E7.3.3 FURRING AND STRAPPING

(a) Provide wood furring and strapping for duct work as shown on drawings.

(b) Erect plumb and level with shimming as required.

E8. PREFABRICATED VINYL SKIRTING SECTION 13000

E8.1 GENERAL

E8.1.1 WORK INCLUDED

(a) All material, labour, and plant necessary for the supply and installation of vinyl skirting, including all vents and access doors, as shown on the drawings.

E8.2 PRODUCTS

E8.2.1 MATERIAL

(a) All vinyl skirting material shall be “Proguard” by Variform.

(b) Panel color to be verified by Contract Administrator.

(c) All panels shall include wind rods and skirt guards.

E8.3 EXECUTION

E8.3.1 INSTALLATION

(a) Installation of skirting and access doors and vents, shall be in accordance with manufacturer’s recommendations.

E9. PREFABRICATED ALUMINUM RAILING SECTION 13010

E9.1 GENERAL

E9.1.1 WORK INCLUDED

(a) All material, labour and plant necessary for the supply and installation of aluminum railings as shown on the drawings.

E9.2 PRODUCTS

E9.2.1 MATERIAL

(a) All prefabricated aluminum railing material shall be “Pro Built” by Alco Ventures Inc.

(b) Railing color to be slate Grey and pickets shall be wide pickets.

(c) All material shall be included for entire railing system, including all top and bottom rails, wide pickets, corner and intermediate posts, caps, etc.

E9.3 EXECUTION

E9.3.1 INSTALLATION

(a) Installation of railings shall be in accordance with manufacturer’s recommendations.