THE CITY OF WINNIPEG

BID OPPORTUNITY

BID OPPORTUNITY NO. 216-2005

VIMY RIDGE MEMORIAL PARK PLAYGROUND AREA

TABLE OF CONTENTS

PART B - BIDDING PROCEDURES

B1. PROJECT TITLE

B1.1 VIMY RIDGE MEMORIAL PARK PLAYGROUND AREA

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, March 28th, 2006

B2.2 Bid Submissions determined by the Manager of Materials to have been received later than the Submission Deadline will not be accepted and will be returned upon request.

B2.3 The Contract Administrator or the Manager of Materials may extend the Submission Deadline by issuing an addendum at any time prior to the time and date specified in B2.1.

B3. SITE INVESTIGATION

B3.1 Further to GC:3.1, the Bidder may view the Site without making an appointment.

B3.2 Bidder may view the interior of the mechanical room on Monday, March 20th at 1:30 pm.

B4. ENQUIRIES

B4.1 All enquiries shall be directed to the Contract Administrator identified in D3.1.

B4.2 If the Bidder finds errors, discrepancies or omissions in the Bid Opportunity, or is unsure of the meaning or intent of any provision therein, the Bidder shall notify the Contract Administrator of the error, discrepancy or omission, or request a clarification as to the meaning or intent of the provision at least five (5) Business Days prior to the Submission Deadline.

B4.3 Responses to enquiries which, in the sole judgment of the Contract Administrator, require a correction to or a clarification of the Bid Opportunity will be provided by the Contract Administrator to all Bidders by issuing an addendum.

B4.4 Responses to enquiries which, in the sole judgment of the Contract Administrator, do not require a correction to or a clarification of the Bid Opportunity will be provided by the Contract Administrator only to the Bidder who made the enquiry.

B4.5 The Bidder shall not be entitled to rely on any response or interpretation received pursuant to B4 unless that response or interpretation is provided by the Contract Administrator in writing.

B5. ADDENDA

B5.1 The Contract Administrator may, at any time prior to the Submission Deadline, issue addenda correcting errors, discrepancies or omissions in the Bid Opportunity, or clarifying the meaning or intent of any provision therein.

B5.2 The Contract Administrator will issue each addendum at least two (2) Business Days prior to the Submission Deadline, or provide at least two (2) Business Days by extending the Submission Deadline.

B5.2.1 Addenda will be available on the Bid Opportunities page at The City of Winnipeg, Corporate Finance, Materials Management Branch internet site at http://www.winnipeg.ca/matmgt.

B5.2.2 The Bidder is responsible for ensuring that he has received all addenda and is advised to check the Materials Management Branch internet site for addenda shortly before submitting his Bid.

B5.3 The Bidder shall acknowledge receipt of each addendum in Paragraph 10 of Form A: Bid.Failure to acknowledge receipt of an addendum may render a Bid non-responsive.

B6. SUBSTITUTES

B6.1 The Work is based on the Plant, Materials and methods specified in the Bid Opportunity.

B6.2 Substitutions shall not be allowed unless application has been made to and prior approval has been granted by the Contract Administrator in writing.

B6.3 Requests for approval of a substitute will not be considered unless received in writing by the Contract Administrator at least five (5) Business Days prior to the Submission Deadline.

B6.4 The Bidder shall ensure that any and all requests for approval of a substitute:

(a) provide sufficient information and details to enable the Contract Administrator to determine the acceptability of the Plant, Material or method as either an approved equal or alternative;

(b) identify any and all changes required in the applicable Work, and all changes to any other Work, which would become necessary to accommodate the substitute;

(c) identify any anticipated cost or time savings that may be associated with the substitute;

(d) certify that, in the case of a request for approval as an approved equal, the substitute will fully perform the functions called for by the general design, be of equal or superior substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed Work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance;

(e) certify that, in the case of a request for approval as an approved alternative, the substitute will adequately perform the functions called for by the general design, be similar in substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed Work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance.

B6.5 The Contract Administrator, after assessing the request for approval of a substitute, may in his sole discretion grant approval for the use of a substitute as an “approved equal” or as an “approved alternative”, or may refuse to grant approval of the substitute.

B6.6 The Contract Administrator will provide a response in writing, at least two (2) Business Days prior to the Submission Deadline, only to the Bidder who requested approval of the substitute.

B6.6.1 The Bidder requesting and obtaining the approval of a substitute shall be entirely responsible for disseminating information regarding the approval to any person or persons he wishes to inform.

B6.7 If the Contract Administrator approves a substitute as an “approved equal”, any Bidder may use the approved equal in place of the specified item.

B6.8 If the Contract Administrator approves a substitute as an “approved alternative”, any Bidder bidding that approved alternative shall base his Total Bid Price upon the specified item but may also indicate an alternative price based upon the approved alternative.Such alternatives will be evaluated in accordance with B15.

B6.9 No later claim by the Contractor for an addition to the Total Bid Price because of any other changes in the Work necessitated by the use of an approved equal or an approved alternative will be considered.

B7. BID SUBMISSION

B7.1 The Bid Submission consists of the following components:

(a) Form A: Bid;

(b) Form B: Prices;

(c) Form G1: Bid Bond and Agreement to Bond, or
Form G2: Irrevocable Standby Letter of Credit and Undertaking, or
a certified cheque or draft;

B7.2 All components of the Bid Submission shall be fully completed or provided, and submitted by the Bidder no later than the Submission Deadline, with all required entries made clearly and completely in ink, to constitute a responsive Bid.

B7.3 The Bid Submission shall be submitted enclosed and sealed in an envelope clearly marked with the Bid Opportunity number and the Bidder's name and address.

B7.3.1 Samples or other components of the Bid Submission which cannot reasonably be enclosed in the envelope may be packaged separately, but shall be clearly marked with the Bid Opportunity number, the Bidder's name and address, and an indication that the contents are part of the Bidder’s Bid Submission.

B7.4 Bid Submissions submitted by facsimile transmission (fax) or internet electronic mail (e-mail) will not be accepted.

B7.5 Bid Submissions shall be submitted to:

The City of Winnipeg
Corporate Finance Department
Materials Management Branch
185 King Street, Main Floor
Winnipeg MB R3B 1J1

B8. BID

B8.1 The Bidder shall complete Form A: Bid, making all required entries.

B8.2 Paragraph 2 of Form A: Bid shall be completed in accordance with the following requirements:

(a) if the Bidder is a sole proprietor carrying on business in his own name, his name shall be inserted;

(b) if the Bidder is a partnership, the full name of the partnership shall be inserted;

(c) if the Bidder is a corporation, the full name of the corporation shall be inserted;

(d) if the Bidder is carrying on business under a name other than his own, the business name and the name of every partner or corporation who is the City of such business name shall be inserted.

B8.2.2 If a Bid is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B8.2.

B8.3 In Paragraph 3 of Form A: Bid, the Bidder shall identify a contact person who is authorized to represent the Bidder for purposes of the Bid.

B8.4 Paragraph 12 of Form A: Bid shall be signed in accordance with the following requirements:

(a) if the Bidder is a sole proprietor carrying on business in his own name, it shall be signed by the Bidder;

(b) if the Bidder is a partnership, it shall be signed by the partner or partners who have authority to sign for the partnership;

(c) if the Bidder is a corporation, it shall be signed by its duly authorized officer or officers and the corporate seal, if the corporation has one, should be affixed;

(d) if the Bidder is carrying on business under a name other than his own, it shall be signed by the registered owner of the business name, or by the registered owner's authorized officials if the owner is a partnership or a corporation.

B8.4.1 The name and official capacity of all individuals signing Form A: Bid shall be printed below such signatures.

B8.4.2 All signatures shall be original and shall be witnessed except where a corporate seal has been affixed.

B8.5 If a Bid is submitted jointly by two or more persons, the word "Bidder" shall mean each and all such persons, and the undertakings, covenants and obligations of such joint Bidders in the Bid Submission and the Contract, when awarded, shall be both joint and several.

B9. PRICES

B9.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B: Prices.

B9.2 The quantities listed on Form B: Prices are to be considered approximate only. The City will use said quantities for the purpose of comparing Bids.

B9.3 The quantities for which payment will be made to the Contractor are to be determined by the Work actually performed and completed by the Contractor, to be measured as specified in the applicable Specifications.

B9.4 Notwithstanding GC.12.2.3(c), prices on Form B: Prices shall not include the Manitoba Retail Sales Tax (MRST, also known as PST), which shall be extra where applicable.

B10. QUALIFICATION

B10.1 The Bidder shall:

(a) undertake to be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba;

(b) be responsible and not be suspended, debarred or in default of any obligation to the City;

(c) be financially capable of carrying out the terms of the Contract;

(d) have all the necessary experience, capital, organization, and equipment to perform the Work in strict accordance with the terms and provisions of the Contract;

(e) have successfully carried out Work, similar in nature, scope and value to the Work;

(f) employ only Subcontractors who:

(i) are responsible and not suspended, debarred or in default of any obligation to the City (a list of suspended or debarred individuals and companies is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Branch internet site at http://www.winnipeg.ca/matmgt); and

(ii) have successfully carried out Work similar in nature, scope and value to the portion of the Work proposed to be subcontracted to them, and are fully capable of

performing the Work required to be done in accordance with the terms of the Contract;

(g) have a written workplace safety and health program in accordance with The Workplace Safety and Health Act (Manitoba);

B10.2 The Bidder shall be prepared to submit, within three (3) Business Days of a request by the Contract Administrator, proof satisfactory to the Contract Administrator of the qualifications of the Bidder and of any proposed Subcontractor.

B10.3 The Bidder shall provide, on the request of the Contract Administrator, full access to any of the Bidder's equipment and facilities to confirm, to the Contract Administrator's satisfaction, that the Bidder's equipment and facilities are adequate to perform the Work.

B10.4 Further to B10.1(g), the Bidder shall, within three (3) Business Days of a request by the Contract Administrator, provide proof satisfactory to the Contract Administrator that the Bidder has a workplace safety and health program meeting the requirements of The Workplace Safety and Health Act (Manitoba), by providing:

(a) a valid COR certification number under the Certificate of Recognition (COR) Program - Option 1 administered by the Manitoba Heavy Construction Association's Safety, Health and Environment Program; or

(b) a valid COR certification number under the Certificate of Recognition (COR) Program administered by the Manitoba Construction Safety Association; or

(c) a report or letter to that effect from an independent reviewer acceptable to the City. (A list of acceptable reviewers and the review template are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Branch internet site at http://www.winnipeg.ca/matmgt.)

B11. BID SECURITY

B11.1 The Bidder shall provide bid security in the form of:

(a) a bid bond, in the amount of at least ten percent (10%) of the Total Bid Price, and agreement to bond of a company registered to conduct the business of a surety in Manitoba, in the form included in the Bid Submission (Form G1: Bid Bond and Agreement to Bond); or

(b) an irrevocable standby letter of credit, in the amount of at least ten percent (10%) of the Total Bid Price, and undertaking issued by a bank or other financial institution registered to conduct business in Manitoba and drawn on a branch located in Winnipeg, in the form included in the Bid Submission (Form G2: Irrevocable Standby Letter of Credit and Undertaking); or

(c) a certified cheque or draft payable to "The City of Winnipeg", in the amount of at least fifty percent (50%) of the Total Bid Price, drawn on a bank or other financial institution registered to conduct business in Manitoba.

B11.1.1 If the Bidder submits alternative bids, the bid security shall be in the amount of the specified percentage of the highest Total Bid Price submitted.

B11.2 The bid security of the successful Bidder and the next two lowest evaluated responsive and responsible Bidders will be released by the City when a Contract for the Work has been duly executed by the successful Bidder and the performance security furnished as provided herein.The bid securities of all other Bidders will be released when a Contract is awarded.

B11.2.1 Where the bid security provided by the successful Bidder is in the form of a certified cheque or draft pursuant to B11.1(c), it will be deposited and retained by the City as the performance security and no further submission is required.

B11.2.2 The City will not pay any interest on certified cheques or drafts furnished as bid security or subsequently retained as performance security.

B11.3 The bid securities of all Bidders will be released by the City as soon as practicable following notification by the Contract Administrator to the Bidders that no award of Contract will be made pursuant to the Bid Opportunity.

B12. OPENING OF BIDS AND RELEASE OF INFORMATION

B12.1 Bid Submissions will be opened publicly, after the Submission Deadline has elapsed, in the office of the Corporate Finance Department, Materials Management Branch, or in such other office as may be designated by the Manager of Materials.

B12.1.1 Bidders or their representatives may attend.

B12.1.2 Bid Submissions determined by the Manager of Materials, or his designate, to not include the bid security specified in B11 will not be read out.

B12.2 After the public opening, the names of the Bidders and their Total Bid Prices as read out (unevaluated, and pending review and verification of conformance with requirements) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Branch internet site at http://www.winnipeg.ca/matmgt.

B12.3 After award of Contract, the name(s) of the successful Bidder(s) and the Contract Amount(s) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Branch internet site at http://www.winnipeg.ca/matmgt.

B12.4 The Bidder is advised that any information contained in any Bid Submission may be released if required by City policy or procedures, by The Freedom of Information and Protection of Privacy Act (Manitoba), by other authorities having jurisdiction, or by law.

B13. IRREVOCABLE BID

B13.1 The Bid(s) submitted by the Bidder shall be irrevocable for the time period specified in Paragraph 11 of Form A: Bid.

B13.2 The acceptance by the City of any Bid shall not release the Bids of the next two lowest evaluated responsive Bidders and these Bidders shall be bound by their Bids on such Work until a Contract for the Work has been duly executed and the performance security furnished as herein provided, but any Bid shall be deemed to have lapsed unless accepted within the time period specified in Paragraph 11 of Form A: Bid.

B14. WITHDRAWAL OF BIDS

B14.1 A Bidder may withdraw his Bid without penalty by giving written notice to the Manager of Materials at any time prior to the Submission Deadline.

B14.1.1 Notwithstanding GC:23.3, the time and date of receipt of any notice withdrawing a Bid shall be the time and date of receipt as determined by the Manager of Materials.

B14.1.2 The City will assume that any one of the contact persons named in Paragraph 3 of Form A: Bid or the Bidder's authorized representatives named in Paragraph 12 of Form A: Bid, and only such person, has authority to give notice of withdrawal.

B14.1.3 If a Bidder gives notice of withdrawal prior to the Submission Deadline, the Manager of Materials shall:

(a) retain the Bid Submission until after the Submission Deadline has elapsed;

(b) open the Bid Submission to identify the contact person named in Paragraph 3 of Form A: Bid and the Bidder's authorized representatives named in Paragraph 12 of Form A: Bid; and

(c) if the notice has been given by any one of the persons specified in B14.1.3(b), declare the Bid withdrawn.

B14.2 A Bidder who withdraws his Bid after the Submission Deadline but before his Bid has been released or has lapsed as provided for in B13.2 shall be liable for such damages as are imposed upon the Bidder by law and subject to such sanctions as the Chief Administrative Officer considers appropriate in the circumstances.The City, in such event, shall be entitled to all rights and remedies available to it at law, including the right to retain the Bidder's bid security.

B15. EVALUATION OF BIDS

B15.1 Award of the Contract shall be based on the following bid evaluation criteria:

(a) compliance by the Bidder with the requirements of the Bid Opportunity (pass/fail);

(b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B10 (pass/fail);

(c) Total Bid Price;

(d) economic analysis of any approved alternative pursuant to B6.

B15.2 Further to B15.1(a), the Award Authority may reject a Bid as being non-responsive if the Bid Submission is incomplete, obscure or conditional, or contains additions, deletions, alterations or other irregularities.The Award Authority may reject all or any part of any Bid, or waive technical requirements if the interests of the City so require.

B15.3 Further to B15.1(b), the Award Authority shall reject any Bid submitted by a Bidder who does not demonstrate, in his Bid Submission or in other information required to be submitted, that he is responsible and qualified.

B15.4 Further to B15.1(c), the Total Bid Price shall be the sum of the quantities multiplied by the unit prices for each item shown on Form B: Prices, adjusted, if necessary, as follows:

(a) if the lowest evaluated responsive Bid submitted by a responsible and qualified Bidder is within the budgetary provision for the Work, no adjustment will be made to the Total Bid Price; and/or

(b) if the lowest evaluated responsive Bid submitted by a responsible and qualified Bidder exceeds the budgetary provision for the Work, the Total Bid Price of all responsive Bids submitted by responsible and qualified Bidders will be adjusted by progressively deducting items listed as Separate Prices in Form B: Prices, in the order listed herein until a Total Bid Price within the budgetary provision is achieved:

Item	Description
29.	Pavement Animal Graphics;
67.	Light Standards;
22.	Shrub Bed Topsoil;
23.	Wood Chip Mulch;
25.	False Spirea;
74.	Garbage Enclosure;
69.	Light Standards;
30.	Pavement Games Graphics;
59.	WQMS Filtration System.

B15.4.1 If there is any discrepancy between the Total Bid Price written in figures, the Total Bid Price written in words and the sum of the quantities multiplied by the unit prices for each item, the sum of the quantities multiplied by the unit prices for each item shall take precedence.

B16. AWARD OF CONTRACT

B16.1 The City will give notice of the award of the Contract by way of a letter of intent, or will give notice that no award will be made.

B16.2 The City will have no obligation to award a Contract to a Bidder, even though one or all of the Bidders are determined to be responsible and qualified, and the Bids are determined to be responsive.

B16.2.1 Without limiting the generality of B16.2, the City will have no obligation to award a Contract where:

(a) the prices exceed the available City funds for the Work;

(b) the prices are materially in excess of the prices received for similar Work in the past;

(c) the prices are materially in excess of the City's cost to perform the Work, or a significant portion thereof, with its own forces;

(d) only one Bid is received; or

(e) in the judgment of the Award Authority, the interests of the City would best be served by not awarding a Contract.

B16.3 Where an award of Contract is made by the City, the award shall be made to the responsible and qualified Bidder submitting the lowest evaluated responsive Bid.

PART C - GENERAL CONDITIONS

C1. GENERAL CONDITIONS

C1.1 The *General Conditions for Construction Contracts* (Revision 2000 11 09) are applicable to the Work of the Contract.

C1.1.2 The *General Conditions for Construction Contracts* are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Branch internet site at http://www.winnipeg.ca/matmgt.

PART D - SUPPLEMENTAL CONDITIONS

GENERAL

D1. GENERAL CONDITIONS

D1.1 In addition to the *General Conditions for Construction Contracts*, these Supplemental Conditions are applicable to the Work of the Contract.

D1.2 The General Conditions are amended by striking out “The City of Winnipeg Act” wherever it appears in the General Conditions and substituting “The City of Winnipeg Charter.”

D1.3 The General Conditions are amended by striking out “Tender Package” wherever it appears in the General Conditions and substituting “Bid Opportunity.”

D1.4 The General Conditions are amended by striking out “Tender Submission” wherever it appears in the General Conditions and substituting “Bid Submission.”

D1.5 The General Conditions are amended by deleting GC:6.16 and GC:6.17.The City of Winnipeg is now within the jurisdiction of the Manitoba Ombudsman pursuant to The Ombudsman Act.

D2. SCOPE OF WORK

D2.1 The Work to be done under the Contract shall consist of redevelopment of the playground area in Vimy Ridge Memorial Park.

D2.2 The major components of the Work are as follows:

(a) demolition and removal of existing paving, play structures, swings, wading pool, light standard bases, site furnishings and fencing;

(b) site grading, land drainage, underground storm work;

(c) asphaltic concrete paving, concrete pavement, bases, headers and piles, crushed granular pads, and pavement painting installation.;

(d) chain link fence modification and installation;

(e) shrub beds, shrubs, tree aeration, sod, seed and wood chip installation;

(f) play area installation, including play structures, playground safety base gravel and sand;

(g) waterplay area installation including wading pool, waterplay components and splash pad;

(h) waterplay components and wading pool mechanical installation;

(i) site lighting and electrical installation;

(j) site furnishing installations including chess table, bike racks, benches, garbage enclosure and waste receptacles;

(k) site furnishing relocation including picnic table, barbecue and lawn bowling gate; and

(l) interior wall removal.

D3. CONTRACT ADMINISTRATOR

D3.1 The Contract Administrator is Hilderman Thomas Frank Cram, represented by:

Natasa Juck
Landscape Architect
Hilderman Thomas Frank Cram
500-115 Bannatyne Avenue East
Winnipeg MB R3B 0R3

Telephone No. (204) 944-9907
Facsimile No. (204) 957-1467

D3.2 At the pre-construction meeting, Contract Administrator will identify additional personnel representing the Contract Administrator and their respective roles and responsibilities for the Work.

D4. CONTRACTOR'S SUPERVISOR

D4.1 At the pre-construction meeting, the Contractor shall identify his designated supervisor and any additional personnel representing the Contractor and their respective roles and responsibilities for the Work.

D5. NOTICES

D5.1 Except as provided for in GC:23.2.2, all notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the Contractor shall be sent to the address or facsimile number identified by the Contractor in Paragraph 2 of Form A: Bid.

D5.2 All notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the City, except as expressly otherwise required in D5.3, D5.4 or elsewhere in the Contract, shall be sent to the attention of the Contract Administrator at the address or facsimile number identified in D3.1.

D5.3 All notices of appeal to the Chief Administrative Officer shall be sent to the attention of the Chief Financial Officer at the following address or facsimile number:

The City of Winnipeg
Chief Administrative Officer Secretariat
Administration Building, 3rd Floor
510 Main Street
Winnipeg MB R3B 1B9

Facsimile No.: (204) 949-1174

D5.4 All notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications required to be submitted or returned to the City Solicitor shall be sent to the following address or facsimile number:

The City of Winnipeg
Corporate Services Department
Legal Services Division
185 King Street, 3rd Floor
Winnipeg MB R3B 1J1

Facsimile No.: (204) 947-9155

D6. FURNISHING OF DOCUMENTS

D6.1 Upon award of the Contract, the Contractor will be provided with five (5) complete sets of the Bid Opportunity. If the Contractor requires additional sets of the Bid Opportunity, they will be supplied to him at cost.

SUBMISSIONS

D7. INSURANCE

D7.1 The Contractor shall provide and maintain the following insurance coverage:

(a) commercial general liability insurance, in the amount of at least five million dollars ($2,000,000.00) all inclusive, with The City of Winnipeg being added as an additional insured, with a cross-liability clause, such liability policy to also contain a contractual liability, an unlicensed motor vehicle liability and a products and completed operations endorsement to remain in place at all times during the performance of the Work and throughout the warranty period;

(b) automobile liability insurance for owned and non-owned automobiles used for or in connection with the Work in the amount of at least two million dollars ($2,000,000.00) at all times during the performance of the Work and until the date of Total Performance.

D7.2 Deductibles shall be borne by the Contractor.

D7.3 The Contractor shall provide the City Solicitor with a certificate of insurance of each policy, in a form satisfactory to the City Solicitor, at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in GC:4.1 for the return of the executed Contract.

D7.3.1 The certificate of insurance for the commercial general liability insurance must clearly state "operations to include demolition work".

D7.4 The Contractor shall not cancel, materially alter, or cause each policy to lapse without providing at least fifteen (15) Calendar Days prior written notice to the Contract Administrator.

D8. PERFORMANCE SECURITY

D8.1 The Contractor shall provide and maintain performance security until the expiration of the warranty period in the form of:

(a) a performance bond of a company registered to conduct the business of a surety in Manitoba, in the form attached to these Supplemental Conditions (Form H1: Performance Bond), in the amount of fifty percent (50%) of the Contract Price; or

(b) an irrevocable standby letter of credit issued by a bank or other financial institution registered to conduct business in Manitoba and drawn on a branch located in Winnipeg, in the form attached to these Supplemental Conditions (Form H2: Irrevocable Standby Letter of Credit), in the amount of fifty percent (50%) of the Contract Price; or

(c) a certified cheque or draft payable to “The City of Winnipeg”, drawn on a bank or other financial institution registered to conduct business in Manitoba, in the amount of fifty percent (50%) of the Contract Price.

D8.1.1 Where the performance security is in the form of a certified cheque or draft, it will be deposited by the City. The City will not pay any interest on certified cheques or drafts furnished as performance security.

D8.2 If the bid security provided in his Bid Submission was not a certified cheque or draft pursuant to B11.1(c), the Contractor shall provide the City Solicitor with the required performance security within seven (7) Calendar Days of notification of the award of the Contract by way of letter of intent and prior to the commencement of any Work on the Site but in no event later than the date specified in GC:4.1 for the return of the executed Contract.

D9. SUBCONTRACTOR LIST

D9.1 The Contractor shall provide the Contract Administrator with a complete list of the Subcontractors whom the Contractor proposes to engage (Form C: Subcontractor List) at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in the General Conditions for the return of the executed Contract.

SCHEDULE OF WORK

D10. COMMENCEMENT

D10.1 The Contractor shall not commence any Work until he is in receipt of a letter of intent from the Award Authority authorizing the commencement of the Work.

D10.2 The Contractor shall not commence any Work on the Site until:

(a) the Contract Administrator has confirmed receipt and approval of:

(i) evidence that the Contractor is in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba;

(ii) evidence of the workers compensation coverage specified in GC:6.14;

(iii) evidence of the insurance specified in D7;

(iv) the performance security specified in D8; and

(v) the Subcontractor list specified in D9.

(b) the Contractor has attended a pre-construction meeting with the Contract Administrator, or the Contract Administrator has waived the requirement for a pre-construction meeting.

D10.3 The Contractor shall commence the Work on the Site within seven (7) Working Days of receipt of the letter of intent.

D11. SUBSTANTIAL PERFORMANCE

D11.1 The Contractor shall achieve Substantial Performance by September 1, 2006**.**

D11.2 When the Contractor considers the Work to be substantially performed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Substantial Performance. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be re-inspected.

D11.3 The date on which the Work has been certified by the Contract Administrator as being substantially performed to the requirements of the Contract through the issue of a certificate of Substantial Performance is the date on which Substantial Performance has been achieved.

D12. TOTAL PERFORMANCE

D12.1 The Contractor shall achieve Total Performance by September 15, 2006**.**

D12.2 When the Contractor or the Contract Administrator considers the Work to be totally performed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Total Performance. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be re-inspected. All inspections that are required upon completion of the first inspection for total performance will be assessed the appropriate liquidated damages cost.

D12.3 The date on which the Work has been certified by the Contract Administrator as being totally performed to the requirements of the Contract through the issue of a certificate of Total Performance is the date on which Total Performance has been achieved.

D13. LIQUIDATED DAMAGES

D13.1 If the Contractor fails to achieve Total Performance in accordance with the Contract by the day fixed herein for Total Performance, the Contractor shall pay the City four hundred dollars ($400.00) per Working Day for each and every Working Day following the day fixed herein for Total Performance during which such failure continues.

D13.2 The amount specified for liquidated damages in D13.1 is based on a genuine pre-estimate of the City's losses in the event that the Contractor does not achieve Total Performance by the day fixed herein for same.

D13.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

D14. SCHEDULED MAINTENANCE

D14.1 The Contractor shall perform the following scheduled maintenance in the manner and within the time periods required by the Specifications:

(a) maintenance of shrub beds as specified in E25: Landscape Maintenance;

(b) maintenance of sod as specified in E25: Landscape Maintenance; and

(c) maintenance of top-dressed and seeded areas as specified in E25: Landscape Maintenance.

D14.2 Determination of Substantial Performance and Total Performance shall be exclusive of scheduled maintenance identified herein. All scheduled maintenance shall be completed prior to the expiration of the warranty period. Where the scheduled maintenance cannot be completed during the warranty period, the warranty period shall be extended for such period of time as it takes the Contractor to complete the scheduled maintenance.

CONTROL OF WORK

D15. JOB MEETINGS

D15.1 Regular weekly job meetings will be held at the Site. These meetings shall be attended by a minimum of one representative of the Contract Administrator, one representative of the City and one representative of the Contractor. Each representative shall be a responsible person capable of expressing the position of the Contract Administrator, the City and the Contractor respectively on any matter discussed at the meeting including the Work schedule and the need

to make any revisions to the Work schedule. The progress of the Work will be reviewed at each of these meetings.

D15.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he deems it necessary.

D16. PRIME CONTRACTOR – THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA)

D16.1 Further to GC:6.26, the Contractor shall be the Prime Contractor and shall serve as, and have the duties of the Prime Contractor in accordance with The Workplace Safety and Health Act (Manitoba).

WARRANTY

D17. WARRANTY

D17.1 Notwithstanding GC:13.2, the Contract Administrator may permit the warranty period for a portion or portions of the Work to begin prior to the date of Total Performance if:

(a) a portion of the Work cannot be completed because of unseasonable weather or other conditions reasonably beyond the control of the Contractor but that portion does not prevent the balance of the Work from being put to its intended use; or

(b) shrubs and sod are installed after September 15th, and the 30 day maintenance will commence the following spring.

D17.2 In such case, the date specified by the Contract Administrator for the warranty period to begin shall be substituted for the date specified in GC:13.2 for the warranty period to begin.

FORM H1: PERFORMANCE BOND
(See D8)

KNOW ALL MEN BY THESE PRESENTS THAT

_____
(hereinafter called the "Principal"), and

_____ ,
(hereinafter called the "Surety"), are held and firmly bound unto **THE CITY OF WINNIPEG** (hereinafter called the "Obligee"), in the sum of

_____

_____ dollars ($_____.____)

of lawful money of Canada to be paid to the Obligee, or its successors or assigns, for the payment of which sum the Principal and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS the Principal has entered into a written contract with the Obligee dated the

_____ day of _____ , 20____ , for:

BID OPPORTUNITY NO. 216-2005

VIMY RIDGE MEMORIAL PARK PLAYGROUND AREA

which is by reference made part hereof and is hereinafter referred to as the “Contract.”

NOW THEREFORE the condition of the above obligation is such that if the Principal shall:

(a) carry out and perform the Contract and every part thereof in the manner and within the times set forth in the Contract and in accordance with the terms and conditions specified in the Contract;
(b) perform the Work in a good, proper, workmanlike manner;
(c) make all the payments whether to the Obligee or to others as therein provided;
(d) in every other respect comply with the conditions and perform the covenants contained in the Contract; and
(e) indemnify and save harmless the Obligee against and from all loss, costs, damages, claims, and demands of every description as set forth in the Contract, and from all penalties, assessments, claims, actions for loss, damages or compensation whether arising under "The Workers Compensation Act", or any other Act or otherwise arising out of or in any way connected with the performance or non-performance of the Contract or any part thereof during the term of the Contract and the warranty period provided for therein;

THEN THIS OBLIGATION SHALL BE VOID, but otherwise shall remain in full force and effect. The Surety shall not, however, be liable for a greater sum than the sum specified above.

AND IT IS HEREBY DECLARED AND AGREED that the Surety shall be liable as Principal, and that nothing of any kind or matter whatsoever that will not discharge the Principal shall operate as a discharge or release of liability of the Surety, any law or usage relating to the liability of Sureties to the contrary notwithstanding.

IN WITNESS WHEREOF the Principal and Surety have signed and sealed this bond the

_____ day of _____ , 20____ .

SIGNED AND SEALED
in the presence of:

_____
(Witness)

_____
(Name of Principal)

Per: _____ (Seal)

Per: _____

_____
(Name of Surety)

By: _____ (Seal)
(Attorney-in-Fact)

FORM H2: IRREVOCABLE STANDBY LETTER OF CREDIT
(PERFORMANCE SECURITY)
(See D8)

_____
(Date)

The City of Winnipeg
Corporate Services Department
Legal Services Division
185 King Street, 3rd Floor
Winnipeg MB R3B 1J1

RE: PERFORMANCE SECURITY - BID OPPORTUNITY NO. 216-2005

VIMY RIDGE MEMORIAL PARK PLAYGROUND AREA

Pursuant to the request of and for the account of our customer,

_____ ,
(Name of Contractor)

_____
(Address of Contractor)

WE HEREBY ESTABLISH in your favour our irrevocable Standby Letter of Credit for a sum not exceeding in the aggregate

_____

_____ Canadian dollars.

This Standby Letter of Credit may be drawn on by you at any time and from time to time upon written demand for payment made upon us by you. It is understood that we are obligated under this Standby Letter of Credit for the payment of monies only and we hereby agree that we shall honour your demand for payment without inquiring whether you have a right as between yourself and our customer to make such demand and without recognizing any claim of our customer or objection by the customer to payment by us.

The amount of this Standby Letter of Credit may be reduced from time to time only by amounts drawn upon it by you or by formal notice in writing given to us by you if you desire such reduction or are willing that it be made.

Partial drawings are permitted.

We engage with you that all demands for payment made within the terms and currency of this Standby Letter of Credit will be duly honoured if presented to us at:

_____
(Address)

and we confirm and hereby undertake to ensure that all demands for payment will be duly honoured by us.

All demands for payment shall specifically state that they are drawn under this Standby Letter of Credit.

Subject to the condition hereinafter set forth, this Standby Letter of Credit will expire on

_____ .
(Date)

It is a condition of this Standby Letter of Credit that it shall be deemed to be automatically extended from year to year without amendment from the present or any future expiry date, unless at least 30 days prior to the present or any future expiry date, we notify you in writing that we elect not to consider this Standby Letter of Credit to be renewable for any additional period.

This Standby Letter of Credit may not be revoked or amended without your prior written approval.

This credit is subject to the Uniform Customs and Practice for Documentary Credit (1993 Revision), International Chamber of Commerce Publication Number 500.

_____
(Name of bank or financial institution)

Per: _____
(Authorized Signing Officer)

Per: _____
(Authorized Signing Officer)

FORM C: SUBCONTRACTOR LIST
(See D9)

VIMY RIDGE MEMORIAL PARK PLAYGROUND AREA

Name	Address

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
L-00	Cover Sheet
L-01	Demolition Plan
L-02	Site Layout & Planting Plan
L-03	Grading Plan
L-04	Layout Plan Waterplay Area
L-05	Junior Play Area Layout
L-06	Senior Play Area Layout
L-07	Waterplay Area Grading Detail
L-08	Construction Details
L-09	Construction & Planting Details
L-10	Construction Details
M-1	Layout Plan Waterplay Area Mechanical
M-2	Details
M-3	Pump Room & Water Quality Management Details
E-1	Lighting and Power Layout

GENERAL REQUIREMENTS

E2. LAYOUT OF WORK

E2.1 Further to CW 1130-R1, Paragraph 3.15, Stakes and Marks, the Contractor shall set all necessary control lines, benchmarks, survey elevation stakes and layout in consultation with the Contract Administrator as required.

E3. PEDESTRIAN AND TRAFFIC CONTROL

E3.1 General Description

E3.1.1 This Specification shall supplement Specification CW 1130-R1 and shall cover the supply, installation, maintenance, and removal of temporary traffic and pedestrian control.

E3.1.2 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.

E3.2 Materials

E3.2.1 General

.1 All barricades, signs, flashers, and other equipment shall be in accordance with the "Manual of Temporary Control in Work Areas on City Streets."

E3.2.2 Snow Fence

.1 Plastic netting, UV stabilized, high density polyethylene, international orange colour, 1.22 m height, complete with steel stakes to suit size.

E3.3 Construction Methods

E3.3.1 General

.1 The Contractor shall maintain safe pedestrian access to the building within the area under construction at all times.

.2 The Contractor will be responsible for the placement of all required signing and barricades, for traffic control in the construction area.

E3.3.2 Snow Fencing

.1 Erect snow fencing surrounding the areas under construction and any excavations deeper than 500 mm.

.2 Snow fencing shall be placed so as to present no hazard to vehicles or pedestrians and shall be kept securely fastened and neat in appearance at all times.

E3.3.3 Temporary Plywood Ramps

.1 Where asphaltic concrete paving or any other aspect of the Work impedes access to buildings, temporary plywood ramps shall be erected and the Work shall be staged in such a manner that access is maintained. Notify the affected building owner of the estimated duration of temporary ramping prior to commencing this Work.

E3.4 Quality Control

E3.4.1 All workmanship and all materials furnished and supplied under this Specification are subject to the 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 works which are not in accordance with the requirements of this Specification. The Contractor shall maintain all traffic control as specified herein.

E3.4.2 If, in the opinion of the Contract Administrator, the traffic control is not in accordance with this Specification, the Work in the affected area shall be stopped and shall not resume until such time as the traffic control deficiencies are corrected to the satisfaction of the Contract Administrator. No contract time extensions will be granted as a result of lost time due to Work stoppages because of inadequate traffic control by Contractor.

E3.5 Method of Measurement

E3.5.1 The supply, erection and maintenance of all pedestrian and traffic control, including ramps, snow fencing, and signs, shall be incidental. No measurement or payment will be made for this Work.

E4. TREE PROTECTION

E4.1 Description

E4.1.1 This Specification shall cover the protection of existing trees including boulevard trees, within the limits of Work as indicated on the Drawings.

E4.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies and all other things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified and in accordance with E5: Sitework Demolition, Removals and Relocations and E7:Tree Aeration.

E4.2 Materials

E4.2.1 In accordance with the Drawings.

E4.3 Construction Methods

E4.3.1 The Contractor shall protect existing trees in areas where excavation Work is being done.

E4.3.2 The Contractor shall not stockpile materials and soil or park vehicles and equipment within 2 m of trees.

E4.3.3 Mature tree trunks of existing trees shall be strapped with 25 x 150 x 2,400 mm wood planks. Smaller trees shall be similarly protected using appropriately sized wood planks.

E4.3.4 Excavation shall be performed in a manner that minimizes damage to the existing root systems. Where roots must be cut to facilitate excavation, they shall be pruned neatly at the face of excavation.

E4.3.5 Operation of equipment within the dripline of the trees shall be kept to the minimum required to perform the Work required. Equipment shall not be parked, repaired, refuelled; 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.

E4.3.6 Work on Site shall be carried out in such a manner so as to minimize damage to existing tree branches. Where damage to tree branches does occur, the Contractor shall prune the damaged branch and coat the cut with an appropriate wound dressing to prevent infection.

E4.3.7 All damage to existing trees caused by the Contractor's activities shall be repaired to the requirements and satisfaction of the Contract Administrator and the City Forester or his designate.

E4.3.8 Elm trees cannot be trimmed between April 1 and July 31, inclusive.

E4.4 Method of Measurement

E4.4.1 Tree Protection shall be on a Lump Sum basis, in accordance with this Specification, and as accepted by the Contract Administrator. No separate measurement will be made for this Work.

E4.5 Basis of Payment

E4.5.1 Tree Protection shall be paid for at the Contract Lump Sum Price for "Tree Protection," which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification.

E5. SITEWORK DEMOLITION, REMOVALS AND RELOCATIONS

E5.1 General Description

E5.1.1 This Specification shall supplement CW 3010-R4 and CW 3110-R7, and shall cover the requirements for demolition, salvage, removal and disposal wholly or in part of various items designated to be removed or partially removed and for backfilling resulting trenches, holes and pits.

E5.1.2 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, and in accordance with E17: Crushed Limestone.

E5.1.3 Contact the following City of Winnipeg staff, two (2) weeks prior to demolition: Superintendent of Centralized Services, Mr. Rob Zanewich at 986-5084 and Foreman of Centralized Services, Mr. J. Martin at 986-3835.

E5.2 Equipment

E5.2.1 All equipment shall be of a type reviewed by the Contract Administrator and shall be kept in good working order.

E5.2.2 The size, weight, and destructive capabilities of the equipment shall be matched to the type of removal to be done.

E5.3 Construction Methods

E5.3.1 Scope of Work

.1 The Work under this Specification shall include the following items as shown within the limit of Work on the Drawings or otherwise directed by the Contract Administrator:

(a) Removal and disposal of existing play equipment, including play structure, slide, swing set, sand table, timbers, pea gravel, sand, signage and associate concrete foundation;

(b) Removal and disposal of the existing paving materials, including concrete pavement, asphalt pavement, turfstone, concrete pavers and crushed gravel;

(c) Removal and disposal of existing chain link and post and chain fencing;

(d) Removal and salvage for pick up by City, of existing light standard bases and removal and disposal of existing piles;

(e) Removal of existing concrete wading pool, including all related underground mechanical, hardware and conduits;

(f) Removal of existing site furnishings, (benches and waste receptacles) for pick-up by the City; and

(g) Relocation of existing site furnishings (gates, picnic tables, barbecue and lawn bowling gate) as directed by the Contract Administrator.

(h) removal and disposal of interior wall: refer to mechanical drawings. Two non structural block walls in existing pump house – 104" height, and 89" length each.

E5.3.2 Fees and Permits

.1 The Contractor shall obtain and pay for all licenses and permits necessary for the demolition Work.

.2 The Contractor shall comply with all Municipal, Provincial, and Federal Government regulations relating to the demolition of structures.

E5.3.3 Explosives

.1 The use of explosives is prohibited.

E5.3.4 Safety Precautions

.1 The Contractor shall provide flagmen, barricades, railings, and whenever necessary, warning signs at excavation holes, plywood access ramps and /or other construction necessary to secure the safety of workers, the public, and personnel alike and shall comply with all Provincial Statutes applicable to the Work of this nature. The Contractor shall provide all other protective measures as may be required by any law in force in Manitoba.

E5.3.5 Protection of Existing Structures

.1 Protect existing items designated to remain and materials designated for salvage. In event of damage to such items, immediately replace or make repairs to approval of the City and at no cost to the City.

E5.3.6 Preparation of Site

.1 Inspect Site and verify with Contract Administrator items designated for removal, disposal, salvage and items to remain.

.2 Locate and protect utility lines. Preserve in operating condition active utilities traversing Site.

.3 **Notify utility companies before starting demolition. Utilities to provide clearance before any excavation is done.**

.4 **Notify Geomatics Service Branch at 986-4826 to obtain clearance and mark survey infrastructure before any excavation.**

E5.3.7 Removals

.1 Remove items as indicated on the Drawings and as directed by the Contract Administrator. Do not disturb adjacent items designated to remain in place.

.2 In removal of pavements:

(a) square up adjacent surface to remain in place by saw-cutting or other method reviewed by Contract Administrator;

(b) protect adjacent joints and load transfer devices; and

(c) protect underlying granular materials.

.3 Removal of Site Furnishings:

(a) remove concrete footing to depth of 300 mm below proposed finish grading.

E5.3.8 Pick-up of Materials

.1 Materials designated to be removed and/or picked up by others shall be detached and stored on Site. Contractor shall protect said items from damage and shall provide five (5) working days notice of date items are available for pick-up to: Ernie Kulczycki, Foreman, Electrical Maintenance, Public Works Department 986-2113 for dismantling and salvage of the light standards and Bill Stein, Foreman III, Park Services North Area, Public Works Department 986-6064 for the pick-up / salvage of the removed benches / site furnishings.

E5.3.9 Relocations

.1 Relocated picnic tables and barbecue removed / dismantled and protected from damage and stored by Contractor where necessary until reinstallation. Installed complete with a crushed limestone pad, as directed by the Contract Administrator, in accordance with E17: Crushed Limestone.

E5.3.10 Disposal of Materials

.1 The Contractor shall promptly dispose of materials not designated for salvage or re-use in Work, off-site.

.2 Trim disposal areas to approval of Contract Administrator.

E5.3.11 Backfill

.1 Backfill in areas as indicated in accordance with Excavation Bedding and Backfill - CW 2030-R6.

E5.3.12 Restoration

.1 Restore areas and existing works outside areas of demolition to match condition of adjacent undisturbed areas.

E5.3.13 Site Cleanup

.1 Upon completion of Work, remove debris, trim surfaces and leave Work Site clean.

E5.4 Method of Measurement

E5.4.1 Removal and Disposal of Play Equipment

.1 The removal and disposal of existing play equipment, including the play structure, slide, swing set, sand table, timbers, pea gravel, sand, signage and associated footings backfill as necessary to repair holes, shall be on a Lump Sum basis, removed and disposed of in accordance with this Specification, and as accepted by the Contract Administrator. No separate measurement will be made for this Work.

E5.4.2 Removal and Disposal of Paving Materials

.1 The removal and disposal of existing paving materials, including concrete pavement, asphalt pavement, turfstone, concrete pavers and crushed gravel, shall be measured on a Surface Area basis. The surface area to be paid for shall be the number of square metres removed in accordance with this Specification, and accepted by the Contract Administrator, as calculated by measurements made by the Contract Administrator.

E5.4.3 Removal and Disposal of Fencing

.1 The removal and disposal of existing fencing, including chain link fencing and post and chain fencing, shall be measured on a Linear Metre basis. The length to be paid for shall be the total linear metres of chain link and post and chain fencing that is removed and disposed of in accordance with this Specification, and as accepted by the Contract Administrator, as calculated by measurements made by the Contract Administrator.

E5.4.4 Removal and Disposal of Existing Concrete Bases and Piles for Existing Light Standards

.1 The removal and disposal of existing concrete bases and piles for existing light standards shall be measured on a Unit Price basis. The number of concrete bases and piles to be paid for shall be the total number of concrete bases and piles that are removed and disposed of in accordance with this Specification, and as accepted by the Contract Administrator, as calculated by measurements made by the Contract Administrator.

E5.4.5 Removal and Disposal of Wading Pool

.1 The removal and disposal of existing wading pool, including all related underground mechanical, hardware and conduits, shall be on a Lump Sum basis, removed and disposed of in accordance with this Specification, and as accepted by the Contract Administrator. No separate measurements shall be made for this Work.

E5.4.6 Removal of Site Furnishings for Pick-up by Others

.1 The removal and salvage of existing site furnishings, including benches and waste receptacles with bases, shall be measured on a Unit Price basis. The number of removed items to be paid for shall be the total number of items removed in accordance with this Specification, and as accepted by the Contract Administrator, as calculated by measurements made by the Contract Administrator.

E5.4.7 Removal and Relocation of Site Furnishings and Gates

.1 The removal and relocation of existing of site furnishings, including picnic table, barbecue and lawn bowling gate, shall be measured on a Unit Price basis. The removed and relocated items to be paid for shall be the total number of items removed and relocated in accordance with this Specification, and as accepted by the Contract Administrator, as calculated by measurements made by the Contract Administrator.

E5.4.8 Removal and Disposal of Interior Walls

.1 Removal and disposal of interiors walls shall be on a Lump Sum basis, removed and disposed of in accordance with this Specification, and as accepted by the Contract Administrator. No measurements shall be made for this Work.

E5.5 Basis of Payment

E5.5.1 Removal and Disposal of Play Equipment

.1 The removal and disposal of existing play equipment, including the play structure, slide, swing set, sand table, timbers, pea gravel, sand and signage, shall be paid for at the Contract Lump Sum Price for “Removal of Play Equipment,” which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification.

E5.5.2 Removal and Disposal of Paving Materials

.1 The removal and disposal of existing paving materials, including concrete pavement, asphalt pavement, turfstone, concrete pavers and crushed gravel, shall be paid for at the Contract Unit Price per square metre for “ Removal of Paving Materials,” which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification.

E5.5.3 Removal and Disposal of Fencing

.1 The removal and disposal of existing fencing, including chain link fencing and post and chain fencing, shall be paid for at the Contract Unit Price per linear metre for “Removal of Fencing,” which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification.

E5.5.4 Removal and Disposal of Existing Concrete Bases and Piles for Existing Light Standards

.1 The removal and disposal of existing concrete bases and piles for existing light standards shall be paid for at the Contract Unit Price per unit, for “Removal of Light Standard Concrete Bases and Piles,” which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification.

E5.5.5 Removal and Disposal of Wading Pool

.1 The removal and disposal of existing wading pool, including all related underground mechanical, hardware and conduits, shall be paid for at the Contract Lump Sum Price for “Removal of Wading Pool,” which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification.

E5.5.6 Removal of Site Furnishings for Pick-up by Others

.1 The removal of existing site furnishings for pick-up by others, including benches and waste receptacles, shall be paid for at the Contract Unit Price per unit for “Removal of Site Furnishings for Pick-up,” which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification.

E5.5.7 Removal and Relocation of Site Furnishings and Gates

.1 The removal and relocation of existing of site furnishings, including picnic table, barbecue and lawn bowling gate, shall be paid for at the Contract Unit Price per unit for “Relocation of Site Furnishings and Gates,” which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification.

E5.5.8 Removal of Interior Walls

.1 The removal of interiors walls shall be paid for at the Contract Lump Sum Price for "Removal of Interior Walls" which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification.

E6. CLEARING AND GRUBBING

E6.1 General Description

E6.1.1 This Specification shall cover the removal from the Site of shrubs, stumps, roots, logs, brush, rubbish and all other surface litter within the full limit of the Work, as shown on the Drawings, and the disposal of same in a manner hereinafter specified, and shall supplement CW 3010-R4. Cleaning and grubbing of elm trees shall be performed in compliance with E4.3.8.

E6.2 Construction Methods

E6.2.1 Before commencement of any Work, the Contractor shall consult with the Contract Administrator as to which shrubs shall remain on the Site and be protected, if any. Those so designated shall be protected against damage from all construction activity.

E6.2.2 The Contractor shall restrict his activities strictly to within the limit of the Works, unless receiving prior written approval from the Contract Administrator. The Contractor shall take all precautions to prevent damage to traffic, structure, pole lines, adjacent property and to shrubs designated to remain, and he shall be liable for any damages occurring during the performance of this Work.

E6.2.3 The Contractor shall cut down all shrubs except those designated by the Contract Administrator to remain, and grub out all stumps and roots. The Contractor shall load and haul all stumps, roots, logs, brush, rubbish and all other surface litter from the Site and dispose of these materials at dumps located by the Contractor and reviewed by the Contract Administrator. Any materials dropped or spilled on any streets during the hauling operations shall be promptly clean up by and at the expense of the Contractor, to the satisfaction of the Contract Administrator.

E6.2.4 The Contractor shall ensure that upon completion of the clearing and grubbing operations, the Site shall be left free of any hazardous depressions and in a neat condition.

E6.3 Method of Measurement

E6.3.1 Clearing and Grubbing shall be incidental to E8: Site Grading. No measurement or payment will be made for this Work.

E6.4 Basis of Payment

E6.4.1 Clearing and Grubbing is incidental to Site Grading, which price shall be included in the price for supply and installation of “Site Grading.” No separate payment will be made.

E7. TREE AERATION

E7.1 General Description

E7.1.1 This Specification shall include materials and installation for fertilizing and preserving root systems of trees affected by changing grades or excavation within the limit of Work as indicated on the Drawings.

E7.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all other things necessary for and incidental to the satisfactory performance and completion of all Work as specified herein and in accordance with E20: Topsoil and Finish Grading, E22: Seeding, E23: Sodding and E24: Tree Pruning.

E7.1.3 Contract Administrator to review schedule indicating commencement of Work.

E7.2 Maintenance and Guarantee Period

E7.2.1 Maintenance shall occur between the date of installation and the termination of the Construction.

E7.2.2 Water to maintain soil moisture conditions for optimum growth and health of plant material without causing erosion.

E7.2.3 Collect and dispose of debris or excess materials on a daily basis during Construction.

E7.2.4 Remove and dispose of dead, broken or hazardous branches from plant material.

E7.3 Materials

E7.3.1 In accordance with Drawing L-09 “Construction & Planting Details” and this Specification.

E7.3.2 Topsoil: In accordance with E20: Topsoil and Finish Grading.

E7.3.3 Fill

.1 In accordance with CW 3110-R7 and this Specification.

.2 Common Fill: Pervious soil, free from roots, rocks larger than 75 mm, building debris, and toxic ingredients such as salt, oil, etc. Excavated material shall be reviewed by Contract Administrator prior to installation.

.3 Washed Gravel: Clean round hard stone, 20 mm.

E7.3.4 Fertilizer

.1 To Canada Fertilizer Act and Fertilizers Regulations.

.2 Complete, commercial slow release fertilizer with 35% nitrogen content in water-soluble form.

E7.3.5 Peatmoss

.1 Derived from partially decomposed species of Sphagnum mosses.

.2 Elastic and homogeneous.

.3 Free of wood and deleterious material which could prohibit growth.

.4 Shredded minimum particle size: 5 mm.

E7.3.6 Anti-desiccant: commercial, wax-like emulsion.

E7.3.7 Drainpipe per drawing: Complete with snap couplings.

E7.3.8 Geotextile: (Type 1) 100% non-woven needle punched polyester, 2.75 mm thick, 240 g/m^2 mass or (Type 2) biodegradable burlap.

E7.3.9 Wood Posts: 38 x 89 x 2400 mm length, untreated wood.

E7.3.10 Welded Wire Fabric (WWF): 100 x 100 mm, to CSA G30.5

E7.4 Construction Methods

E7.4.1 Curtain Wall for Roof Protection Adjacent to Construction Excavation

.1 Contract Administrator to review trees, limits of root systems, and extents of driplines to be preserved, prior to installation.

.2 Contract Administrator to review proposed limits for required construction excavation prior to excavation.

.3 Protect plant and root systems from damage, compaction and contamination resulting from construction.

.4 Ensure no pruning is done inside dripline. If pruning inside dripline is required, pruning shall be done in accordance with E24: Tree Pruning.

.5 Prior to construction excavation, hand dig trench minimum 500 mm wide x excavation depth, along perimeter of excavation limits. Root pruning shall be done in accordance with E24: Tree Pruning.

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

.7 Install wooden posts and welded wire fabric against construction edge of trench.

.8 Securely attach Type 2 geotextile on plant side of wire mesh.

.9 Prepare homogeneous mixture of fertilizer, parent material and organic matter. Add organic matter to mixture to achieve 7% to 9% organic matter content by weight. Incorporate 2:12:8 ratio (dry) fertilizer at a rate of 1.5 kg/m^3.

.10 Backfill with homogeneous mixture between curtain wall and plants to be preserved in layers not exceeding 150 mm in depth. Compact each layer to 85% Standard Proctor Density.

.11 Protect root curtain from damage during construction operations.

.12 Water plants and root curtain sufficiently during construction to maintain optimum soil moisture condition until backfill operations are complete.

.13 Protect root curtain during backfill operations. Ensure root curtain is cut down to 300 mm below finished grade and cut material is removed.

E7.4.2 Air Layering System

.1 Using manual methods, carefully remove turf, plants, leaves and organic matter in area of root system, and slightly loosen topsoil surface. Avoid damage to root system.

.2 Place perforated PVC drainpipe 100ø with geotextile wrap (sock).

.3 Ensure open ends of horizontal pipe system are left exposed for air circulation to root system.

.4 Protect openings from blockage during construction.

.5 Install culvert around trunk of tree. Allow minimum of 150 mm between the trunk and culvert.

.6 Place clean washed gravel on surface of original ground and horizontal pipe system to limits. Depths shown on drawings.

.7 Place Type 1 geotextile over surface of granular layer.

.8 Place common fill over geotextile to required depth without disturbing or damaging drain pipe system. Avoid damage to geotextile.

.9 Complete topsoil and sodding / seeding over area of sub-surface system within one week of placing fill.

E7.4.3 Trenching and Tunnelling for Underground Services

.1 Use only for trees greater than 150 mm diameter, but not for trees with major tap roots.

.2 Centre line location and limits of trench/tunnel excavation to be reviewed by Contract Administrator prior to excavation. Tunnel excavation to extend 2000 mm from edge of trunk on either side, where possible.

.3 Excavate manually within zone of root system. Do not sever roots greater than 40 mm diameter except at greater than 500 mm below existing grade. Protect roots, and cut roots cleanly with sharp disinfected tools.

.4 Excavate tunnel under centre of tree trunk using methods and equipment reviewed by Contract Administrator.

.5 Minimum acceptable depth to top of tunnel: 1000 mm.

.6 Backfill for tunnel and trench to 85% Standard Proctor Density. Avoid damage to trunk and roots of tree.

.7 Complete tunnelling and backfilling at tree within two (2) weeks of beginning Work.

E7.4.4 Lowering Grade Around Existing Tree

.1 Begin Work in accordance with schedule reviewed by Contract Administrator.

.2 Cut slope not less than 2 m from tree trunk to new grade level.

.3 Excavate to depths as indicated. Root zone that is to remain shall be protected from damage.

.4 When severing roots at excavation level, cut roots with sharp tools.

.5 Cultivate excavated surface manually to 15 mm depth.

.6 Prepare homogeneous soil mixture consisting by volume of:

(a) 60% excavated soil cleaned of roots, plant matter, stones, debris.

(b) 25% coarse, clean sterile sand.

(c) 15% organic matter.

(d) Grade 2:12:8 fertilizer at rate of 1.5 kg/m^3.

.7 Place soil mixture over area of excavation to finished grade level. Compact to 85% Standard Proctor Density.

.8 Water entire root zone to optimum soil moisture level.

.9 Install surface cover of seeding / sodding in accordance with E22: Seeding and E23: Sodding.

E7.4.5 Pruning

.1 Prune in accordance with E24: Tree Pruning.

.2 Prune crown to compensate for root loss while maintaining general form and character of plant.

E7.4.6 Anti-Desiccant

.1 Apply anti-desiccant to foliage where applicable.

E7.4.7 Supervision

.1 All work related to the protection and preservation of plant material shall be supervised in accordance with E24: Tree Pruning. Contractor shall comply with any resulting direction or instruction.

E7.5 Method of Measurement

E7.5.1 Tree Aeration will be measured on a Unit Basis. The area to be paid for shall be the total number of aerated trees installed in accordance with this Specification and accepted by the Contract Administrator, as calculated by measurements made by the Contract Administrator.

E7.6 Basis for Payment

E7.6.1 Tree Aeration will be paid for at the Contract Unit Price per unit for "Tree Aeration," and measured as specified herein which price shall be payment in full for supplying all materials and performing all operations herein describe and all of the items incidental to the Work included in this Specification.

E8. SITE GRADING

E8.1 Description

E8.1.1 This Specification shall cover the excavation and installation of fill for areas as indicated on the Drawings and in compliance with E7.

E8.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all other things necessary for and incidental to the satisfactory performance and completion of all Work as specified herein and in accordance with CW 3170-R3, CW 2130-R9, and CW 2140-R2. Cross Reference Tree Aeration E for area where grading results in raised grades.

E8.2 Materials

E8.2.1 All materials shall conform to CW 3170-R3.

E8.3 Equipment

E8.3.1 All equipment to conform to CW 3170-R3.

E8.4 Construction Method

E8.4.1 Rough grade to patterns and elevations as indicated on the Drawings allowing for installation of materials specified and in accordance with CW 3170-R3 Earthwork and Grading.

E8.5 Method of Measurement

E8.5.1 Site Grading will be measured on a Surface Area Basis. The area to be paid for shall be the total number of square metres graded in accordance with this Specification and accepted by Contract Administrator, as calculated by measurements made by the Contract Administrator.

E8.6 Basis for Payment

E8.6.1 Site Grading will be paid for at the Contract Unit Price per square metre for "Site Grading," and measured as specified herein which price shall be payment in full for supplying all materials and performing all operations herein describe and all of the items incidental to the Work included in this Specification.

E9. CATCH BASINS, AREA DRAINS AND TRENCH DRAINS

E9.1 Description

E9.1.1 This Specification shall cover the supply and installation of catch basins, area drains, trench drains; abandoning existing catch basins: connections to existing catch basins/manholes and leads including fittings, appurtenances and related Work as indicated on the Drawings.

E9.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all other things necessary for and incidental to the satisfactory performance and completion of all Work as specified herein and in accordance with CW 2130-R9, CW 2140-R2 and CW 3170-R3.

E9.2 Materials

E9.2.1 Catch Basins

.1 All materials shall conform to CW SD025.

.2 Where delays in construction do not allow for immediate seeding and sodding after catch basin installation, drain inlet protection shall be installed to prevent erosion.

E9.2.2 Area Drains

.1 Pre-cast Concrete Pit: Barkman Concrete Ltd., Rain Drain Model 45-4010. Supplied by Barkman Concrete Ltd., 909 Gateway Road, Phone: 667-3310.

.2 Grate: Catch Basin Grate and Angle-iron Frame with anchors Model TK-1 bolt-down, cut to dimension 11” x 15-1/2” x 1-1/2” thick. Grate Finish: black asphalt paint. Frame Finish: Hot dipped galvanized. Supplied by Titan Foundry 1350 Fife Street. Phone: 633-5535.

.3 Where delays in construction do not allow for immediate seeding and sodding after area drain installation, drain inlet protection shall be installed to prevent erosion.

E9.2.3 Drain Inlet Protection

.1 NDS Part No. Gravelbag filled to 1/2 to 3/4 full, with 3/4” crushed gravel or 1/4” pea gravel.

E9.2.4 Trench Drains, Grates & Splash Pads

.1 C.I.P. Concrete Trench: shall conform to Drawing L-10 “Construction Details” and to E12: Concrete Headers and Bases.

.2 Grate: Trench Grate and Angle-iron Frame with anchors Model CNK bolt-down, 152 mm width. Finish: Shot blast to bare metal. Black asphaltum finish. Supplied by Titan Foundry 1350 Fife Street. Contact: Richard, Phone: 633-5535.

.3 Splash Pads: All materials shall conform to E10: Concrete Pavement and the Drawings

E9.2.5 Abandoning Existing Catch Basins

.1 All materials shall conform to CW 2130-R9.

E9.2.6 Connections to Existing Catch Basins/Manholes

.1 All materials shall conform to CW 2130-R9.

E9.2.7 Leads

.1 All materials shall conform to CW 2130-R9, except where specified otherwise on the Drawings.

.2 Provide sand bedding and granular backfill as required to complete the Work.

E9.2.8 Tees

.1 All materials shall conform to CW 2130-R9.

E9.3 Construction Methods

E9.3.1 The Contractor shall obtain all applicable permits prior to installation.

E9.3.2 Conform to CW 2130-R9 except where otherwise noted on the Drawings.

E9.4 Method of Measurement

E9.4.1 Catch Basins

.1 The supply and installation of catch basins shall be measured on a Unit Basis. The number of catch basins to be paid for shall be the total number of catch basins that are installed in accordance with this Specification and accepted by the Contract Administrator, as calculated form measurements made by the Contract Administrator.

E9.4.2 Area Drains

.1 The supply and installation of area drains shall be measured on a Unit Basis. The number of area drains to be paid for shall be the total number of area drains that are installed in accordance with this Specification and accepted by the Contract Administrator, as calculated from measurements made by the Contract Administrator.

E9.4.3 Drain Inlet Protection

.1 The supply and installation of drain inlet protection shall be incidental to catch basins and area drains. No separate measurement shall be made for this Work.

E9.4.4 Trench Drains, Grates & Splash Pads

.1 The supply and installation of trench drains, grates and splash pads shall be measured on a Unit Basis. The number of trench drains and grates to be paid for shall be the total number that are installed in accordance with this Specification and accepted by the Contract Administrator, as calculated form measurements made by the Contract Administrator.

E9.4.5 Abandoning Existing Catch Basins

.1 The abandonment of existing catch basin shall be measured on a Unit Basis. The number of catch basins to be paid for shall be the total number of existing catch basins that are abandoned in accordance with this Specification and accepted by the Contract Administrator, as calculated from measurements made by the Contract Administrator.

E9.4.6 Connections to Existing Catch Basins/Manholes & Existing Main

.1 Connections to existing catch basins/manholes shall be on Lump Sum Basis. The connections to be paid for shall be the total number of connections that are installed in accordance with this Specification and accepted by the Contract Administrator. There shall be no separate measurements made by the Contract Administrator.

E9.4.7 Leads

.1 The supply and installation of leads shall be measured on a Lineal Basis. The length of leads to be paid for shall be the total linear metres that are installed in accordance with this Specification and accepted by the Contract Administrator, as calculated form measurements made by the Contract Administrator.

(a) 250 mm ø

(b) 100 mm ø

E9.4.8 Sand Bedding & Backfill

.1 The supply and installation of tees, sand begging and backfill shall be incidental to leads. No separate measurement shall be made.

E9.5 Basis of Payment

E9.5.1 Catch Basins

.1 Construction of catch basins will be paid for at the Contract Unit Price per unit for "Catch Basins," 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.

E9.5.2 Area Drains

.1 Construction of area drains will be paid for at the Contract Unit Price per unit for "Area Drains," 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.

E9.5.3 Drain Inlet Protection

.1 The supply and installation of drain inlet protection shall be incidental to catch basins and area drains. No separate payment shall be made.

E9.5.4 Trench Drains, Grates & Splash Pads

.1 Construction of trench drains and gates will be paid for at the Contract Unit Price per unit for "Trench Drains c/w grate and concrete splash pad," 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.

E9.5.5 Abandoning Existing Catch Basins

.1 Abandoning existing catch basins will be paid for at the Lump Sum Price per unit for "Abandoning Existing Catch Basins," 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.

E9.5.6 Connections to Existing Catch Basins/Manholes & Existing Main

.1 Connections to existing catch basins will be paid for at the Lump Sum Price for "Connections to Existing Catch Basins/Manholes & Existing Main," 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.

E9.5.7 250 Dia. PVC Lead

.1 Construction of leads will be paid for at the Contract Unit Price per lineal metre for "250 Dia. PVC Lead," 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.

E9.5.8 100 Dia. PVC Lead

.1 Construction of leads will be paid for at the Contract Unit Price per lineal metre for "100 Dia. PVC Lead," 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.

E9.5.9 Tees

.1 The supply and installation of tees shall be incidental to leads. No separate payment shall be made.

E10. CONCRETE PAVEMENT

E10.1 General Description

E10.1.1 This Specification shall cover the supply of material and construction of concreting operations and associated base Work relating to the wading pool and waterplay area as specified herein and as indicated on the Drawings.

E10.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies co-ordination of installation of all mechanical and other items to be installed in concrete works by other trades, and all other things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified and in accordance with CW 3310-R9.

E10.2 Sampling

E10.2.1 Prepare a 900 mm x 900 mm sample piece specified for review by the Contract Administrator prior to pouring of concrete pavement. The Contractor will be required to reconstruct the slab if the specified finish does not meet the approval of the Contract Administrator. Upon approval of the sample slab finish, this sample shall be utilized as the minimum standard of acceptance for the contract work as determined by the Contract Administrator. Work that does not meet these requirements may be rejected. Following completion of the concrete work, the slab shall be removed and disposed of off-site by the Contractor. All costs in connection with this Work shall be included in the lump sum prices bid for the project.

E10.3 Materials

E10.3.1 Concrete

.1 Reinforced concrete pavement in accordance with CW3310-R9.

E10.3.2 Epoxy-Coating

.1 All reinforcing steel shall be shop-coated with epoxy conforming to the requirements of CW 3310-R9.

E10.3.3 Joint Sealing

.1 The joint sealant shall be an elastomeric sealant suitable for outdoor use Dow Corning Silicone or approved equal.

E10.3.4 Concrete Strength & Workability

.1 Concrete for all Work shall conform to the requirements of Type 1 Concrete in accordance of CW 3310-R9.

E10.3.5 Waterstops

.1 Heavy-duty, high grade PVC with continuous galvanized wire loop fastening system for mechanical attachment to reinforcing steel or formwork.

E10.4 Construction Methods

E10.4.1 All concrete placing to confirm with construction of Reinforced Concrete Pavement in accordance with CW3310-R9.

E10.4.2 Joint Sealant

.1 Install backer rods immediately after cleaning and before sealant installation in accordance with CW3110-R9.

.2 The joint shall be taped prior to sealant application and removed immediately after application.

.3 Depth of joint sealant shall be between 10mm and13mm, as directed by the Contract Administrator.

E10.4.3 Finish

.1 Finish to be a smooth trowel finish to achieve a non-slip, non-abrasive surface. The finished surface of the hardened concrete slabs shall be measured for roughness by the Contract Administrator in accordance with CW 3310-R9.

.2 All waterplay area construction shall be in accordance with the Canadian Electrical Code (latest).

E10.5 Method of Measurement

E10.5.1 The supply and installation of concrete pavement, shall be measured on a Lump Sum basis, installed in accordance with this Specification, and as accepted by the Contract Administrator. No measurement will be made for this Work.

E10.6 Basis of Payment

E10.6.1 The supply and installation of concrete pavement, shall be paid for at the Contract Lump Sum Price for “Concrete Pavement Wading Pool & Splash Pad c/w 'A' Base,” which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification.

E11. CAST-IN-PLACE CONCRETE PILES

E11.1 General Description

E11.1.1 The Work covered under this section shall include all concreting operations related to construction of cast-in-place concrete pile foundations for light fixtures in accordance with this Specification and as shown on the Drawings.

E11.1.2 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 Works as hereinafter specified and in accordance with the latest revision of CW 3110 and CW 2160.

E11.2 Materials

E11.2.1 General

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

E11.2.2 Handling and Storage of Materials

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

E11.2.3 Testing and Approval

.1 All materials supplied under this Specification shall be subject to inspection and testing by the Contract Administrator or by the Testing Laboratory designated by the Contract Administrator. There shall be no charge to the City for any materials taken by the Contract Administrator for testing purposes.

.2 All materials shall conform to CSA Standard CAN3-A23.1.

.3 All testing of materials shall conform to CSA Standard CAN3-23.2.

E11.2.4 Cement

.1 Cement shall be Type 50, Sulphate-Resistant Cement, conforming to the requirements of CSA Standard CAN3-A5.

E11.2.5 Supplementary Cementing Materials

.1 Use of pozzolans, fly ash, or silica fume will not be permitted for use in structural concrete supplied under this Specification.

E11.2.6 Water

.1 Water used for mixing concrete shall be clean and free from injurious amounts of oil, acid, alkali, organic matter, or other deleterious substances. It shall be equal to potable water in physical and chemical properties.

E11.2.7 Aggregate

.1 The Contractor shall furnish in writing to the Contract Administrator, the location of the sources where aggregate will be obtained, in order that same may be inspected and reviewed by the Contract Administrator. Changes in the source of aggregate supply during the course of the Contract will not be permitted without notification in writing to and the expressed approval of the Contract Administrator.

(a) Fine Aggregate

(i) Fine aggregate shall consist of sand having clean, hard, strong, durable, uncoated grains; free from injurious amounts of dust, soft or flaking particles, shale, alkali, organic matter, loam, or other deleterious substances.

(ii) Fine aggregate shall be well-graded throughout and shall conform to the following grading requirements:

Gradation of Fine Aggregates:

Canadian Metric Sieve Size	Percent of Total Dry Weight Passing Each Sieve
10000	100%
5000	95% – 100%
2500	80% – 100%
1250	50% – 90%
630	25% – 65%
315	10% – 35%
160	2% – 10%
80	0% – 3%

(b) Coarse Aggregate (20 mm Nominal)

(i) Coarse aggregate shall conform to the requirements of CAN3-A23.1, Section 5, Aggregates. Coarse aggregate shall be clean and free from alkali, organic, or other deleterious matter, shall have an absorption not exceeding 3%, and shall conform to the following gradation requirements:

Gradation of 20 mm Coarse Aggregate:

Canadian Metric Sieve Size	Percent of Total Dry Weight Passing Each Sieve
28000	100%
20000	90% – 100%
10000	25% – 60%
5000	0% – 10%
2500	0% – 5%
80	0% – 1%

E11.2.8 Admixtures

.1 No admixtures other than air-entraining agent shall be used without the written authorization of the Contract Administrator, unless otherwise specified in these Specifications. It shall be the Contractor's responsibility to ensure that any admixture is compatible with all other constituent materials.

E11.2.9 Reinforcing Steel

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

.2 All reinforcing steel shall conform to the requirements of CSA Standard G30.12, Grade 400 MPa, Billet-Steel Bars for Concrete Reinforcement.

E11.2.10 Miscellaneous Materials

.1 Miscellaneous materials shall be of the type specified on the Drawings or directed by the Contract Administrator.

E11.3 Concrete Mix Design

E11.3.1 Proportioning of fine aggregate, coarse aggregate, cement, water, and air entraining agent shall be such that yield concrete has the required strength and workability as follows:

(i) Minimum Compressive Strength at 28 days = 35 MPa;

(ii) Maximum Water/Cement Ratio = 0.45;

(iii) Minimum Cement Content = 340 kg/m^3;

(iv) Slump = minimum 125 mm + 25 mm;

(v) Aggregate: 40 mm nominal;

(vi) Air Content: 5.0% to 8.0%; and

(vii) Cement - Type 50.

E11.4 Equipment

E11.4.1 All equipment shall be of a type reviewed by the Contract Administrator and shall be kept in good working order.

E11.5 Construction Methods

E11.5.1 Location and Alignment of Piles

.1 Piles shall be placed in the positions shown on the Drawings and as directed by the Contract Administrator in the field.

.2 The deviation of the axis of any finished pile shall not differ by more than 1º from the vertical.

E11.5.2 Buried Utilities

.1 The Contractor shall exercise extreme caution when constructing the pile foundations in the vicinity of existing buried utilities. The Drawings do not indicate the complete extent of existing buried utilities. The Contractor shall be responsible for obtaining the exact location of the buried utilities from the appropriate Utility Authority prior to installing the piles.

.2 The Contractor shall be responsible for all costs that may be incurred for repair/ rectification of any damage caused to the existing buried utilities as a result of the Contractor's operations in constructing cast-in-place concrete piles, as determined by the Contract Administrator.

E11.5.3 Excavation

.1 Excavations for piles shall be made with equipment designed to remove a core of the diameter shown on the Drawings. All piles shall be drilled for the minimum length indicated on the Drawings.

.2 Upon reaching the required elevation, the bottom of the bore shall be cleaned and, if called for, belled out to the required dimensions and elevations as shown on the Drawings or as directed by the Contract Administrator in the field.

.3 All excavated material from the piles shall be promptly hauled from the Site to disposal area reviewed by the Contractor Administrator as located by the Contractor.

E11.5.4 Sleeving

.1 Steel sleeving shall be used to temporarily line the bore to prevent bulging or caving of the walls and to protect men at Work in the bore.

.2 The sleeving shall be designed by the Contractor and constructed to resist all forces that may tend to distort it.

.3 The sleeving shall be withdrawn as the concrete is placed in the bore. The sleeving shall extend at least 1 m below the top of the freshly deposited concrete at all times.

E11.5.5 Bores

.1 The clearance between the face of the bore hole and the sleeving shall not exceed 75 mm.

.2 Inspection of Bores

(a) Concrete shall not be placed in a bore until the bore has been inspected and approved by the Contract Administrator.

(b) The Contractor shall have available suitable light for the inspection of each bore throughout its entire length.

(c) All improperly set sleeving, bore, or bottom shall be corrected to the satisfaction of the Contract Administrator.

E11.5.6 Placing Reinforcing Steel

.1 Reinforcement shall be:

(a) Placed in accordance with the details shown on the Drawings,

(b) Rigidly fastened together, and

(c) Lowered into the bore intact before concrete is placed.

.2 Spacers shall be utilized to properly locate the reinforcing steel cage in the bore.

.3 The supply and placement of epoxy-coated reinforcing steel in the piles including beam dowels will be considered incidental to the construction of cast-in-place concrete piles and no separate measurement or payment will be made.

E11.5.7 Placing Anchor Bolts

.1 The anchor bolts shall be aligned with a steel template matching the bolt holes in the light standard base plate. The setting template shall be held in place by the top and bottom nuts of the anchor bolts. Extreme care shall be used in this operation.

.2 Placement of anchor bolts without the steel template will not be permitted.

.3 The threaded portion of the anchor bolts shall be coated with oil, before the concrete is poured, to minimize the fouling of threads splattered by concrete residue. The portion of anchor bolts projecting from the pile shall be fully threaded.

E11.5.8 Installation of Conduits

.1 The supply and installation of poly conduits in the concrete piles will be considered incidental to the Work of this Specification. The Contractor should include the cost of this Work in the construction of concrete pile foundation works.

.2 The number of plastic conduits to be installed in each base will be stipulated on the Drawings. The conduits shall enter 600 mm minimum below ground level and shall protrude through the centre of the concrete base. All conduits so terminated above ground shall be plugged by means of plastic cap plugs, which are to fit snugly into the end of the conduit.

E11.5.9 Forms

.1 The top 600 mm of the piles in the ground and the portion above the ground surface shall be formed with tubular forms (Sonotube).

.2 The forms shall be sufficiently rigid to prevent lateral or vertical distortions from the loading environment to which they shall be subjected. Forms shall be set to the design grades, lines, and dimensions, as shown on the Drawings.

E11.5.10 Placing Concrete

.1 Care shall be taken to ensure that the reinforcing steel is vertically aligned and properly positioned prior to placement of the concrete.

.2 Concrete shall not have a free fall of more than 2.0 m and shall be placed so that the aggregates will not separate or segregate. The slump of the concrete shall not exceed 180 mm. The concrete shall be vibrated for the top 3.0 m of the pile.

.3 Concrete shall be placed to the elevations as shown on the Drawings. The top surface of the pile shall be finished smooth and even with a hand float.

.4 The shaft shall be free of water prior to placing of concrete. Concrete shall not be placed in or through water unless authorized by the Contract Administrator. In the event that tremie concrete is allowed by the Contract Administrator, the concrete shall be placed as specified herein.

E11.5.11 Tremie Concrete

.1 The shaft of the pile shall be pumped clear of water so that the bottom can be cleaned. Pumping shall then be stopped and water shall be allowed to come into the bore until a state of equilibrium is reached. Concrete shall then be placed by means of a tremie pipe. The tremie pipe shall have a suitable gate in the bottom to prevent water from entering the pipe. The bottom of the pipe shall be maintained below the surface of the freshly placed concrete. the pipe shall be capable of being raised or lowered quickly in order to control the flow of concrete.

.2 Tremie concrete shall only be poured up to the water level or as directed by the Contract Administrator. Pumps shall then be lowered into the bore and the excess water pumped out. The laitance that forms on top of the tremie shall then be removed and the remainder of the concrete shall be placed in the dry.

E11.5.12 Protection of Newly Placed Concrete

.1 Newly laid concrete threatened with damage by rain, snow, fog, or mist shall be protected with a tarpaulin or other approved means.

E11.5.13 Curing Concrete

.1 The use of curing compound will not be allowed on concrete areas that are to receive additional concrete.

.2 Concrete shall be protected from the harmful effects of sunshine, drying winds, surface dripping or running water, vibration, and mechanical shock. concrete shall be protected from freezing until at least 5 days after the end of the curing period.

.3 Changes in temperature of the concrete shall be uniform and gradual and shall not exceed 3ºC in one (1) hour or 20ºC in 24 hours.

.4 Immediately after stripping and patching, formed surfaces shall receive an application of the approved curing compound. After the finishing is completed, the surface shall be promptly covered with a minimum of a single layer of clean, damp polyester blanket.

E11.5.14 Form Removal

.1 Forms shall not be removed for a period of at least 24 hours after the concrete has been placed. Removal of forms shall be done in a manner to avoid damage to, or spalling of, the concrete.

.2 The minimum strength of concrete in place for safe removal of forms shall be 20 MPa.

.3 Field-cured test specimens, representative of the in-place concrete being stripped, will be tested to verify the concrete strength.

E11.5.15 Cold Weather Concreting

.1 Protection of concrete shall be considered incidental to its placement. The temperature of the concrete shall be maintained at or above 10°C for a minimum of three (3) days or till the concrete has reached a minimum compressive strength of 20 MPa, by whatever means are necessary. Concrete damaged as a result of inadequate protection against weather conditions shall be removed and replaced by the Contractor at his own expense. Also, concrete allowed to freeze prior to the three (3) days will not be accepted for payment.

E11.6 Quality Control

E11.6.1 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 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 Works that are not in accordance with the requirements of this Specification.

E11.6.2 The Contractor shall be responsible for making a thorough inspection of materials to be supplied under this Contract. All material shall be free of surface imperfections and other defects.

E11.7 Method of Measurement

E11.7.1 Construction of Cast-in-Place Concrete Piles

.1 There shall be no separate measurement for Work associated with the construction of cast-in-place concrete piles. This Work shall be considered incidental to the supply and installation of Site Lighting and electrical light fixtures, which are supported by cast-in-place concrete piles. No separate measurement or payment will be made.

E11.8 Basis of Payment

E11.8.1 Construction of Cast-in-Place Concrete Piles

.1 The construction of cast-in-place concrete piles is incidental to the supply and installation of Site Lighting (E13) and electrical light fixtures. No separate payment for the construction of cast-in-place concrete piles will be made.

E12. CONCRETE HEADERS, BASES AND RAMPS

E12.1 General Description

E12.1.1 This Specification shall cover the supply of material and construction of concrete headers, bases and ramps.

E12.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all other things necessary for and incidental to the satisfactory performance and completion of all Work as specified herein and in accordance with CW 3110-R9 and CW 3325-R2.

E12.2 Materials

E12.2.1 The Contractor shall be responsible for the supply, safe storage and handling of all materials, testing and approvals in accordance with CW 3325-R2, Sections 5 and 7.

E12.3 Equipment

E12.3.1 All equipment used by Contractor to be in accordance with CW 3325-R2, Section 9.

E12.4 Construction Method

E12.4.1 Construct Portland cement concrete works as shown on the Drawings and as directed by the Contract Administrator. Construct to the requirements of CW 3325-R2.

E12.5 Method of Measurement

E12.5.1 Concrete Headers

.1 Construction of Concrete headers shall be measured on a Lineal Length Basis. The length to be paid for shall be the total number of lineal metres constructed in accordance with this Specification and accepted by the Contract Administrator, as calculated from measurements made by the Contract Administrator.

E12.5.2 Concrete Bases

.1 There shall be no separate measurement for Work associated with the construction of Concrete bases. This Work shall be incidental to the supply and installation of Site Furnishings (E13), which site furnishings these bases are supporting. No separate measurement or payment will be made.

E12.5.3 Concrete Ramps

.1 Construction of Concrete Ramps shall be measured on a Unit Basis, The number of concrete Ramps to be paid for shall be the total number of Concrete Ramps that are installed.

E12.6 Basis of Payment

E12.6.1 Concrete Headers

.1 Construction of Concrete headers will be paid for at the Contract Unit Price per lineal metre for “Concrete Headers,” 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.

E12.6.2 Concrete Bases

.1 Construction of Concrete bases is incidental to the supply and installation of Site Furnishings (E13), which price shall be included in the price for supply and installation of Site Furnishings. No separate payment will be made.

E12.6.3 Concrete Ramps

.1 The supply and installation of Concrete Ramps shall be paid for at the Contract Unit Price per unit for the "Items of Work", measured as specific herein, which price shall be payment in full for supplying all materials and performing all operation herein described and all other items incidental to the Work included in this Specification.

E13. SITE FURNISHINGS AND SITE LIGHTING

E13.1 General Description

E13.1.1 This Specification shall cover the supply and installation of benches, chess table, bicycle racks, waste receptacles, garbage enclosure, bollards and light fixtures, including supply and installation of services enclosure and additional circuit and tenching, as indicated on the Drawings.

E13.1.2 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 specified herein, and in accordance with E11: Cast-in-Place Concrete Piles, Drawing E-1, and E17: Crushed Limestone.

E13.2 Materials

E13.2.1 Benches

.1 Victoria Series 60" Seat, model 9875, manufactured by *Recycle* Design, supplied by Sudden Fun Recreation Equipment Ltd. Box 48298 Midlake R.P.O. Calgary, Alberta T2X 3C7, Phone (403) 254-0500. Cedar "Durawood" slats with black powder coated aluminum frame or approved equal.

E13.2.2 Chess Table

.1 Timberform 2005-E Parkway table, complete with 2095 gameboard Contact Columbia Cascade at: 1-800-547-1940 or approved equal.

E13.2.3 Bike Racks

.1 Custom bicycle rack, part no. 12730gb – “custom”, manufactured and supplied by Cycle-Safe, Inc., Grand Rapids, MI, Phone: 888-950-6531. PolyArmor coating to be semi-gloss black. In-ground mount or approved equal.

E13.2.4 Waste Receptacles

.1 City of Winnipeg Central Manufacturing Repair Facility Trash Basket 52S01051 (or approved equal). Contact Aaron Lennon, Phone: 986-5505 or 986-5504.

E13.2.5 Grout

.1 Non-shrink, non-metallic grout, premixed, factory-packaged, non-staining, non-corrosive, nongaseous grout complying with ASTM C 1107. Provide grout, recommended in writing by manufacturer, for exterior applications.

E13.2.6 Crushed Limestone

.1 In accordance with E17: Crushed Limestone.

E13.2.7 Garbage Enclosure

.1 In accordance with the Drawings.

E13.2.8 Steel Bollards

.1 Standard steel bollard 100ø filled with concrete and round top. Finish with red oxide primer and two coats black enamel.

E13.2.9 Light Fixtures

.1 In accordance with the with E11: Cast-in-Place Concrete Piles and the Drawings.

E13.3 Construction Methods

E13.3.1 All Work is to be located and installed in accordance with the Drawings using approved non-rusting, vandal resistant fasteners to ensure solid, durable, finished Work suitable for the purpose intended.

E13.3.2 Site Furnishings with in-ground mounts, shall be placed into a concrete pile. Diameter and depth to suit post diameter and length. Waste receptacles, chess table, and picnic tables to be installed with limestone pad, as directed by the Contract Administrator.

E13.3.3 Site Furnishings with surface mounts, such as benches, shall be installed on concrete bases as shown on the drawings.

E13.3.4 All furnishings and fixtures to be installed plumb and true to correct elevations and location, as directed by the Contract Administrator. The Contractor shall confirm proposed locations of all Site Furnishings with Contract Administrator prior to installation.

E13.3.5 All furnishings and fixtures to be carefully handled so that no parts will be bent, broken, or otherwise damaged. Hammering, which will injure or distort fixture, is prohibited.

E13.3.6 Light Fixtures to be installed:

.1 On new concrete piles as shown on the Drawings; and

.2 On existing piles bases as shown on the Drawings.

E13.3.7 Install as per manufacturers' instructions.

E13.4 Method of Measurement

E13.4.1 The supply and installation of benches, chess table, bicycle racks, waste receptacles, garbage enclosure, bollards and light standards shall be measured on a Unit Basis. The number of benches, chess table, bicycle racks, waste receptacles, garbage enclosure, bollards and light fixtures to be paid for shall be the total number of benches, chess table, bicycle racks, waste receptacles, garbage enclosure, bollards and light fixtures that are installed in accordance with this Specification and accepted by the Contract Administrator, as calculated from measurements made by the Contract Administrator.

E13.4.2 Supply and installation of services enclosure and additional circuits will be on a Lump Sum Basis, as accepted by the Contract Administrator. No separate measurement will be made for this Work.

E13.5 Basis of Payment

E13.5.1 The supply and installation of benches, chess table, bicycle racks, waste receptacles, garbage enclosure, bollards and light standards shall be paid for at the Contract Unit Price per unit for the "Items of Work" listed below, measured as specified herein, which price shall be payment in full for supplying all materials and performing all operation herein described and all other items incidental to the Work included in this Specification.

E13.5.2 Items of Work (Site Furnishings):

.1 Benches

.2 Chess Table

.3 Bicycle Racks

.4 Waste Receptacles

.5 Garbage Enclosure

.6 Steel Bollards

E13.5.3 Items of Work (Site Lighting):

.1 Light Standards, c/w New Concrete Piles

.2 Light Fixtures, on Existing Concrete Piles

E13.5.4 Supply and installation of services enclosure and additional circuits will be paid for at the Lump Sum Price for "Services Enclosure and Additional Circuits Trenching", which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.

E14. PLAY EQUIPMENT

E14.1 General Description

E14.1.1 This Specification shall cover the supply and installation of play equipment and as indicated on the Drawings.

E14.1.2 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 specified herein and in accordance E12: Concrete Headers and Bases, and E31: Aquatic Play Systems

E14.2 Canadian Standards Association Guidelines

E14.2.1 All playground apparatus supplied and the method of installation shall be in accordance with the National Standard of Canada, CAN/CSA-Z614, “Children’s Play Spaces and Equipment,” latest edition.

E14.2.2 All play equipment and waterplay area construction shall be in accordance with the Canadian Electrical Code (latest).

E14.2.3 The Contractor shall submit, with his Bid, a written statement confirming compliance with this guideline and shall be prepared, if requested, to provide data supporting compliance within ten (10) working days of such a request, at no cost to the City.

E14.3 Shop Drawings

E14.3.1 The Contractor shall submit Shop Drawings for review by the Contract Administrator, demonstrating intended below ground construction for waterplay and play equipment components prior to installation.

E14.4 Maintenance Kits

E14.4.1 All play apparatus shall include the supply of maintenance kits. Maintenance kits shall include maintenance manuals, complete manufacturer's parts lists, touch-up paint, PVC repair paint, 10% extra of each bolt, washer and any other hardware utilized on the play apparatus, and all special tools necessary for assembly and maintenance.

E14.5 Materials

E14.5.1 Junior Play Area

.1 In accordance with Drawing L-05 “Junior Play Area Layout:”

.1 Navigator Reach Panel by Landscape Structures or approved equal;

.2 Chimes Reach Panel by Landscape Structures or approved equal;

.3 Turtle Sand Table by Landscape Structures or approved equal;

.4 Superscoop by Landscape Structures or approved equal;

.5 Accessible Superscoop by Landscape Structures or approved equal;

.6 Custom Heavy Duty Playbooster complete with 5” O.D. round aluminum posts, TenderTuff coated steel decks and handbars, Permalene Panels and all components as shown on the Drawings, as per Playgrounds R’ Us quotation # 040907J, to attach to existing structure, colour TBA;

.7 T-Rex Tuffrider by Landscape Structures or approved equal;

.8 Fire Engine Tuffrider by Landscape Structures or approved equal;

.9 Heavy Duty 2.4 m ht. Sportsplay Swing Unit with 4 place tri-pod triple end support legs, complete with galvanized 3 1/2” O.D. top beam and 2 3/8” O.D. legs, powder-coated painted yoke fittings, swing hangers with greaseless bearings and 1/4” plated chain, 2 slash proof belt seats and 2 infant seats by Landscape Structures or approved equal; and

.10 Turtle Boulder Climber by Rockcraft Designs or approved equal.

E14.5.2 Senior Play Area

.1 In accordance with Drawing L-06 “Senior Play Area Layout:”

.1 Spacenet by Landscape Structures or approved equal;

.2 Heavy Duty 3 m ht. Sportsplay Swing Unit with 4 place tri-pod triple end support legs, complete with galvanized 3 1/2” O.D. top beam and 2 3/8” O.D. legs, powder-coated painted yoke fittings, swing hangers with greaseless bearings and 1/4” plated chain and 2 slash proof belt seats by Landscape Structures or approved equal; and

.3 Double Humpty Climber by Landscape Structures or approved equal.

E14.6 Construction Method

E14.6.1 The assembly and installation of play equipment and waterplay equipment components shall conform to the manufacturer's specifications and shall be in accordance with the most recent edition of the "National Standard of Canada, CAN/CSA-Z614."

E14.6.2 The play equipment and waterplay equipment shall be installed by supplier only.

E14.6.3 All Work is to be located and installed in accordance with the Drawings. The Contractor shall confirm play equipment and waterplay equipment locations with the Contract Administrator prior to their installation.

E14.6.4 Contractor is responsible for coordinating installation with supplier and sub-trades.

E14.6.5 All manufactured waterplay equipment shall be installed in accordance with manufacturers' specifications and Mechanical Specifications.

E14.7 Safety and Health Regulations

E14.7.1 Further to General Conditions GC.5.02(9) of the Standard Construction Specifications of the City of Winnipeg, and E3: Pedestrian and Traffic Control, the Contractor shall comply with the following:

.1 The City of Winnipeg's Safety in the Workplace Policy for Alcohol or any Mood or Mind Altering Drug in the Workplace;

.2 The City of Winnipeg Safety Manual;

.3 The Parks and Open Space Division, Public Works Safety Regulations; and

.4 The Province of Manitoba Workplace, Safety and Health Act.

E14.7.2 The Contract Administrator and the City of Winnipeg Public Works, Parks and Open Space Division Safety Officer has the authority to enforce all the above listed safety and/or health regulations.

E14.7.3 The Contractor is advised that these safety regulations are available for viewing by contacting the Contract Administrator.

E14.8 Quality Control

E14.8.1 All workmanship and all materials furnished and supplied under this Specification are subject to the 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 works which are not in accordance with the requirements of this Specification.

E14.9 Warranty

E14.9.1 The warranties shall be signed and dated, and submitted to the Contract Administrator prior to Total Performance completion.

E14.9.2 Contractor is responsible for ensuring that all equipment is installed in accordance with the manufacturer's installation instructions. Any failures of items listed below, within the warranty periods noted, that are due to inappropriate installation are the responsibility of the Contractor.

.1 Landscape Structures Inc.

(a) 100-Year Limited Warranty for all stainless steel fasteners, aluminium posts, clamps, beams and caps, against structural failure due to corrosion/natural deterioration or manufacturing defects.

(b) 15-Year Limited Warranty for all plastic and steel components, including TuffTimbersTM, against structural failure due to corrosion/natural deterioration or manufacturing defects.

(c) TenderTuffR coating against structural failure due to natural deterioration or manufacturing defects. For Wiggle Ladders, Chain Ladders and Swing Chain, the warranty shall also include cosmetic failure, and failure due to wear and tear from normal use.

(d) 3-Year Limited Warranty for all other parts such as CableCoreTM Products, Swing seats and hangers, Wiggle Ladders, Chain Ladders and Swing Chain, Track Ride trolleys and bumpers, all rocking equipment including Sway FunTM, PVC belting material, etc. against failure due to corrosion or natural deterioration or manufacturing defects.

.2 SportsPlay Equipment Inc.

(a) Limited one-year warranty against defects in material and workmanship.

.3 Vortex International Warranty:

Refer to E31: Aquatic Play Systems

.4 Spacenets by Corocord

(a) 5-Year Warranty on nets & connectors against material or manufacturing defects.

(b) 10-Year Warranty on steel posts against material or manufacturing defects.

E14.10 Method of Measurement

E14.10.1 The supply and installation of all play equipment shall be measured on a Unit Basis. The number of play equipment units to be paid for shall be the total number of play equipment and that are installed and refurbished in accordance with this Specification and accepted by the Contract Administrator, as calculated from measurements made by the Contract Administrator.

E14.11 Basis of Payment

E14.11.1 The supply and installation of play equipment shall be paid for at the Contract Unit Price per unit for the “Items of Work” listed below, measured as specified herein, which price shall be payment in full for supplying all materials and performing all operation herein described and all other items incidental to the Work included in this Specification.

E14.11.2 Items of Work:

.1 Navigator Panel
.2 Chimes Panel
.3 Turtle Sand Table
.4 Superscoop
.5 Accessible Superscoop
.6 PlayBooster Structure – refurbish
.7 T-Rex Tuffrider
.8 Fire Engine Tuffrider
.9 2.4 ht. Swing Set
.10 Turtle Boulder
.11 Spacenet
.12 3.0 ht. Swing Set
.13 Double Humpty Climber

E15. PLAYGROUND SAFETY BASE

E15.1 General Description

E15.1.1 This Specification shall cover supply and installation of pea gravel in the designated areas as specified herein and as shown on the Drawings.

E15.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all other things necessary for and incidental to the satisfactory performance and completion of all Work as specified herein.

E15.1.3 All materials supplied under this Specification shall be of a type reviewed by the Contract Administrator and shall be subject to inspection and testing by the Contract Administrator.

E15.2 Materials

E15.2.1 Safety Base shall be Playground Stone, composition shall be Typical Birds Hill glacial till material, approximately 70% limestone and 30% granite. Stone shall be washed and screened.

E15.2.2 Safety Base shall meet the following gradation specifications:

Sieve Size	Cumulative % Passing
10 mm	100
5 mm	15
2.5 mm	5
1.25 mm	4
.08 mm	1

E15.3 Equipment

E15.3.1 All equipment shall be of a type reviewed by the Contract Administrator and shall be kept in good working order.

E15.4 Construction Method

E15.4.1 The installation of the Safety Base shall be done immediately after the play structures have been installed. Installation shall be done by equipment sized to suit the Work being done. The safety base shall be spread by hand in the immediate vicinity of the play structures so as not to damage same, and they shall be swept clean as required after installation of the pea gravel.

E15.4.2 Clear sub-grade of all debris and compact sub-grade.

E15.4.3 Compacted sub-grade shall be reviewed by Contract Administrator prior to Safety Base installation.

E15.4.4 Coordinate Safety Base installation with play equipment installation.

E15.4.5 Spread Safety Base to minimum 300 mm depth, as indicated, on compacted clay sub-grade.

E15.4.6 Rake gravel smooth for an even surface.

E15.5 Method of Measurement

E15.5.1 The supply and installation of Safety Base shall be measured on a Volumetric Basis. The area to be paid for shall be the total number of cubic metres installed in accordance with this Specification and accepted by the Contract Administrator, as calculated from measurements made by the Contract Administrator.

E15.6 Basis of Payment

E15.6.1 The supply and installation of Safety Base shall be paid for at the Contract Unit Price per cubic metre for "Safety Base," measured as specified herein, which price shall be payment in full for supplying all materials and performing all operation herein described and all other items incidental to the Work included in this Specification.

E16. PLAY SAND

E16.1 General Description

E16.1.1 This Specification shall cover supply and installation of Play Sand in designated sand area as specified herein and as shown on the Drawings.

E16.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all other things necessary for and incidental to the satisfactory performance and completion of all Work as specified herein.

E16.1.3 All materials supplied under this Specification shall be of a type reviewed by the Contract Administrator and shall be subject to inspection and testing by the Contract Administrator.

E16.2 Materials

E16.2.1 Play Sand shall be a natural, washed sand of rounded particles, free of fines, clay, silt, stones, or other debris. Representative type #2 washed sand as produced by Franceschini Bros. of Mississauga, or approved equal.

E16.2.2 Play Sand shall meet the following gradation specifications:

Sieve Size	% Passing
6.7 mm	100
4.75 mm	99.9
2.36 mm	97-100
1.18 mm	70-90
600 um	25-60
300 um	5-25
150 um	0-3
75 um	0-1

E16.3 Equipment

E16.3.1 All equipment shall be of a type reviewed by the Contract Administrator and shall be kept in good working order.

E16.4 Construction Method

E16.4.1 The installation of play sand shall be done immediately after the play structures have been installed. Installation shall be done by equipment sized to suit the Work being done. Play sand shall be spread by hand in the immediate vicinity of the play structures so as not to damage same. The play structures shall be swept clean as required after installation of playground sand.

E16.4.2 Clear sub-grade of all debris and compact sub-grade.

E16.4.3 Compacted sub-grade shall be reviewed by Contract Administrator prior to installation of play sand.

E16.4.4 Coordinate playground sand installation with play equipment installation.

E16.4.5 Spread play sand to minimum 600 mm depth, as indicated, on compacted clay sub-grade.

E16.4.6 Depth of sand is to be maintained until Final Acceptance is given by the City.

E16.4.7 Sand shall be spread evenly over the entire surface within the sandbox perimeter, yielding an even, level surface.

E16.4.8 Sand shall be placed in such a manner as to avoid contamination by existing sand or other material.

E16.5 Method of Measurement

E16.5.1 The supply and installation of play sand shall be measured on a Volumetric Basis. The area to be paid for shall be the total number of cubic metres installed in accordance with this Specification and accepted by the Contract Administrator, as calculated from measurements made by the Contract Administrator.

E16.6 Basis of Payment

E16.6.1 The supply and installation of play sand shall be paid for at the Contract Unit Price per cubic metre for "Play Sand," measured as specified herein, which price shall be payment in full for supplying all materials and performing all operation herein described and all other items incidental to the Work included in this Specification.

E17. CRUSHED LIMESTONE

E17.1 General Description

E17.1.1 This Specification shall cover the supply of material and construction of crushed limestone base / surface under Site Furnishings and base under Asphalt Concrete Pavement, as indicated herein and as shown on the Drawings.

E17.1.2 The Work to be done by the Contractor under this specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies and all other things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified and in accordance with E8: Site Grading.

E17.2 Sampling

E17.2.1 Prepare sample of crusher fines for review by the Contract Administrator prior to pouring to ordering materials.

E17.3 Quality Control

E17.3.1 The Contractor shall be responsible for the supply, safe storage and handling of all materials set forth in this Specification. All materials shall be handled and stored in a careful and workmanlike manner, to the satisfaction of the Contract Administrator.

E17.3.2 All materials supplied under this Specification shall be subject to inspection and testing by the Contract Administrator. There shall be no charge for any materials taken by the Contract Administrator for testing purposes.

E17.3.3 All materials shall be reviewed by the Contract Administrator at least ten (10) days before any construction is undertaken. If, in the opinion of the Contract Administrator, such materials, in whole or in part, do not conform to the Specification detailed herein then such material shall be rejected by the Contract Administrator and replaced by the Contractor at his own expense.

E17.3.4 Quality control tests will be used to determine the acceptability of each base and surface course layer, as placed and compacted by the Contractor, before the succeeding layer may be applied.

E17.3.5 The Standard Proctor Maximum Dry Density for the base and surface course material shall be determined at the optimum moisture content in accordance with ASTM Standard D698. The field density of each base and surface course layer shall be a percentage of the applicable Proctor Density, as specified in Methods of this Specification.

E17.3.6 The field density of the compacted layers shall be verified by Field Density Tests in accordance with ASTM Standard D1556, Test for Density of Soil in Place by the Sand-Cone Method, or ASTM Standard D2922, Test of Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

E17.3.7 The frequency and number of tests to be made shall be as determined by the Contract Administrator.

E17.3.8 Holes made by the removal of samples from the layers shall be promptly filled by the Contractor with appropriate material and thoroughly compacted so as to conform in every way with the adjoining compacted material.

E17.4 Corrective Action

E17.4.1 The Contractor shall, at his own expense, correct such Work or replace such materials found to be defective under this Specification to the satisfaction of the Contract Administrator.

E17.5 Materials

E17.5.1 Limestone Dust

.1 Limestone dust surface course material shall consist of sound, hard, crushed limestone and shall be free from organic or soft material which would disintegrate through decay or weathering. The surface course material to be supplied by the Contractor shall be well-graded throughout and shall conform to the following grading requirements.

ASTM Metric Sieve Size (mm)	**% of Total Dry Weight** Passing Each Sieve
9.5	100%
4.75	50 - 100
1.18	20 - 55
0.300	10 - 30
0.075	0. ≤ 12

.2 The material passing the 0.30 mm sieve shall have a liquid limit not greater than twenty-five (25) and a plasticity index not greater than six (6).

.3 The aggregate retained on the 4.75 mm sieve shall contain not less than thirty-five percent (35%) crushed aggregate as determined by actual particle count. Crushed aggregate shall be considered as that aggregate having at least one fractured face.

E17.5.2 Granular 'A' Base Material

.1 Base course material shall consist of sound, hard, crushed limestone and shall be free from organic or soft material which would disintegrate through decay or weathering. The base course material to be supplied by the Contractor shall be well-graded throughout and shall conform to the following grading requirements.

ASTM Metric Sieve Size (mm)	**% of Total Dry Weight** Passing Each Sieve
25.0	100%
19.0	80 – 100
4.75	40 – 70
2.36	25 – 55
0.300	13 – 30
0.075	5 – 15

E17.6 Construction Methods

E17.6.1 Preparation of Subgrade

.1 The bottom of the excavated sections shall be inspected and reviewed by the Contract Administrator before the Contractor may begin compaction of the subgrade. In the areas of suitable subgrade material, the full width of the bottom of the excavation shall be thoroughly mixed and compacted to a minimum of ninety-five percent (95%) of Standard Proctor Maximum Dry Density. In the areas of unsuitable subgrade material, a layer of granular subbase material of 300 mm in compacted thickness, or greater thickness as directed by the Contract Administrator, shall be placed immediately over the unsuitable sub-grade material and compacted to a minimum of ninety-five percent (95%) of Standard Proctor Maximum Dry Density.

.2 Material shall be compacted at the optimum moisture content or at a moisture content up to two percent above the optimum moisture content.

.3 Any layer which has been rejected by the Contract Administrator shall be either re-compacted or removed and replaced by and at the expense of the Contractor to the satisfaction of the Contract Administrator.

.4 Any material that has been placed over a compacted layer which has not been inspected, tested and reviewed by the Contract Administrator shall be removed by and at the expense of the Contractor.

.5 The compacted subgrade shall be trimmed to the elevation o, to the satisfaction of the Contract Administrator.

E17.6.2 Granular 'A' Base

.1 Granular base shall be installed to a compacted depth of 130 mm after subgrade preparation and compacted to 100% of the Standard Proctor Density. The granular base shall be shaped and rolled alternately to ensure conformity of grades with finish surface. Water shall be applied as necessary to obtain compaction. If the granular base is excessively moist, it shall be aerated by scarifying with suitable equipment until the moisture content is corrected. Reviewed mechanical tampers shall be used to compact the granular base in areas not accessible to rolling equipment. The top of the granular base shall be within 10 mm of the required finished base course grade.

E17.6.3 Limestone Dust

.1 Limestone dust shall be installed to a compacted thickness of 20 mm after granular base installation. Limestone dust shall be compacted to 100% of the Standard Proctor Density. The water content shall be maintained at optimum.

E17.6.4 Method of Measurement

E17.6.5 Supply and installation of Crushed Limestone shall be incidental to Site Furnishings and Asphaltic Concrete Pavement. No separate measurement will be made.

E17.7 Basis of Payment

E17.7.1 Crushed Limestone is incidental to Site Furnishings and Asphaltic Concrete Pavement (50 mm) c/w 'A' Base, which price shall be included in the price for supply and installation of “Site Furnishings" and "Asphaltic Concrete Pavement (50 mm) c/w 'A' Base.” No separate payment will be made.

E18. ASPHALTIC CONCRETE PAVEMENT

E18.1 General Description

E18.1.1 This Specification shall cover the preparation of hot-mixed, hot-laid, asphaltic concrete paving mix for, and all placing operations relating to, asphaltic concrete pavements and overlays as specified herein and as indicated on the Drawings.

E18.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies and all other things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified and in accordance with CW 3410-R5.

E18.2 Sampling

E18.2.1 At least one (1) week prior to commencing Work, inform Contract Administrator of proposed source of aggregates and provide access for sampling.

E18.2.2 If materials have been tested by an independent testing laboratory within previous two (2) months and have successfully passed tests equal to requirements of this Specification, submit test certificates from testing laboratory showing suitability of materials for this project.

E18.3 Submittals

E18.3.1 Submit mix design for asphalt concrete to Contract Administrator for review.

E18.4 Protection

E18.4.1 Keep all traffic off newly paved areas until paving surface temperature has cooled below 38˚C. Do not permit stationary loads on pavement until 48 hours after placement.

E18.4.2 Arrange paving schedule so as not to interfere with normal use of premises.

E18.5 Materials

E18.5.1 Asphalt concrete materials: for Type 1A Asphalt to City of Winnipeg Specifications CW 3410-R5 - Asphaltic Concrete Pavement Works.

E18.5.2 All new asphalt shall be dusted with cement.

E18.6 Construction Method

E18.6.1 Preparation of Existing Asphalt for overlay

.1 Pressure wash existing pavement to ensure surface is clean of all dirt, oil and debris prior to the application of new asphaltic concrete.

E18.6.2 Asphalt Primer

.1 Liquid cut back asphalt:

.2 Apply cut back asphalt prime to granular base at rate directed, but do not exceed 2.2 L/m^2.

.3 Apply on dry surface unless otherwise directed.

.4 Do not apply primer when air temperature is less than 5˚C or when rain is forecast within 2 hours.

E18.6.3 Asphalt Concrete

.1 Contract Administrator to review existing surface and primer before installation of asphalt.

.2 Place asphalt mix only when base or previous course is dry and air temperature is above 5˚C.

.3 Asphaltic Concrete Overlay: Place asphaltic concrete in one (1) compacted layer of 25 mm thickness.

.4 Asphaltic Concrete Pavement: Place asphaltic concrete in one (1) compacted layer of 50 mm thickness.

.5 Minimum 120°C mix temperature required when spreading.

.6 Maximum 160°C mix temperature permitted at any time.

.7 Compact each course with roller as soon as it can support roller weight without undue cracking or displacement.

.8 Roller, power driven, minimum mass of 4.5 tonnes, minimum wheel width 600 mm.

.9 Roll until roller marks are eliminated. Compact to density not less than 95% of density obtained with Marshall specimens prepared in accordance with ASTM D1559-82 from samples of mix being used.

.10 Keep roller speed slow enough to avoid mix displacement and do not stop roller on fresh pavement.

.11 Moisten roller wheels with water to prevent mix adhesion.

.12 Compact mix with hot tampers or other reviewed equipment in areas inaccessible to roller.

.13 Finish surface smooth, true to grade to within 10 mm and with no irregularities greater than 10 mm in 4.5 m. Ensure positive drainage as indicated on Drawing L-3.

.14 Cement dust all asphalt surfaces upon completion.

E18.6.4 Joints

.1 Cut bituminous course to full depth in neat lines to expose fresh vertical surfaces. Remove broken and loose material.

.2 Paint exposed vertical edge of asphaltic joints, edges of manholes and catch basin frames, curbs and similar items with hot asphalt cement or emulsified asphalt prime prior to placing asphalt courses.

.3 Where paving comprises two courses, overlap longitudinal joints minimum 150 mm.

.4 Carefully place and compact hot asphaltic material against joints.

E18.6.5 Cement Dusting

.1 Asphalt shall be dusted with cement prior to line painting. Cement dusting of the asphalt shall be considered incidental to the placement of the asphalt and no additional payment will be made.

E18.7 Method of Measurement

E18.7.1 Asphaltic Concrete Overlay

.1 The supply and installation of Asphaltic Concrete Overlay (25 mm) shall be measured on an Area Basis. The area to be paid for shall be the total number of square metres installed in accordance with this Specification and accepted by the Contract Administrator, as calculated form measurements made by the Contract Administrator.

E18.7.2 Asphaltic Concrete Pavement

.1 The supply and installation of Asphaltic Concrete Pavement (50 mm) c/w 'A' Base shall be measured on an Area Basis. The area to be paid for shall be the total number of square metres installed in accordance with this Specification and accepted by the Contract Administrator, as calculated form measurements mad e by the Contract Administrator.

E18.8 Basis of Payment

E18.8.1 Asphaltic Concrete Overlay

.1 The supply and installation of Asphaltic Concrete Overlay shall be paid for at the Contract Unit Price per square metre for “Asphaltic Concrete Overlay (25 mm),” measured as specified herein, which price shall be payment in full for supplying all materials and performing all operation herein described and all other items incidental to the Work included in this Specification.

E18.8.2 Asphaltic Concrete Pavement

.1 The supply and installation of Asphaltic Concrete Pavement shall be paid for at the Contract Unit Price per square metre for “Asphaltic Concrete Pavement (50 mm) c/w 'A' Base,” measured as specified herein, which price shall be payment in full for supplying all materials and performing all operation herein described and all other items incidental to the Work included in this Specification.

E19. PAVEMENT PAINTING

E19.1 Description

E19.1.1 This Specification shall cover the painting of pavement games and pavement animals as indicated herein and on the Drawings.

E19.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all other things necessary for and incidental to the satisfactory performance and completion of all Work as specified herein.

E19.2 Materials

E19.2.1 Paint

.1 Hi-Hide PlexiColour Line Paint – non-textured, as supplied by Cords Park Mark Ltd., or approved equal.

.2 Colours

(a) White: to CGSB 1-GP-12C+Amdt-Dec-84 white 513-301.

(b) Yellow: to CGSB 1-GP-12C+Amdt-Dec-84 yellow 513-302.

(c) Red: Hi-Hide PlexiColour.

(d) Blue: Hi-Hide PlexiColour.

(e) Green: Hi-Hide PlexiColour.

(f) Black: Hi-Hide PlexiColour.

.3 Colour locations and distribution as directed by Contract Administrator.

E19.2.2 Thinner: to CGSB 1-GP-5M.

E19.2.3 Stencils

.1 Stencil Material may be plastic, latex rubber core or plywood material or approved equal.

.2 Reviewed Stencil material must be capable of adhering to undulating and uneven surfaces.

.3 Reviewed Stencil material must be of a thickness and quality capable of withstanding repeat use.

E19.2.4 Alcohol: Isopropyl alcohol.

E19.2.5 Supplementary Adhesive

.1 Reviewed, water soluble adhesive compatible with stencil material, conforming with the safety and protection requirements of the City of Winnipeg, the Manitoba Occupational Health and Safety Act and the Workers Compensation Act.

E19.2.6 Stencil Artwork

.1 Stencil artwork to be provided by the Contract Administrator, as full size paper prints of the graphics.

.2 The Contractor is responsible for obtaining all number and letter stencils required.

.3 All stencil artwork is the property of the City of Winnipeg and shall not be reproduced in any other form except with written approval from the City of Winnipeg. Stencils shall be returned to the City of Winnipeg via the Contract Administrator prior to request for final payment.

E19.3 Construction Method

E19.3.1 Site Conditions

.1 Application of pavement graphics is only to be done under conditions conducive to a clean and accurate installation. Pavement surface to be free from water, frost, ice, dust, grease, oil and other foreign materials.

E19.3.2 Protection of Existing Structures

.1 Protect existing structures. In the event of damage to such items, immediately replace or make repairs to approval of the City, and at no cost to the City.

E19.3.3 Pavement Markings and Graphics Layout

.1 All pavement markings and graphics are to be laid out and installed in accordance with the Drawings. The Contractor shall confirm the layout of all pavement markings and graphics with the Contract Administrator prior to installation.

E19.3.4 Stencil Manufacture

.1 Prepare stencil from graphics provided by Contract Administrator. Ensure all out edges are smooth and free of irregularities. Obtain approval from Contract Administrator of stencils prior to application.

E19.3.5 Application of Stencil

.1 Obtain Contract Administrator's approval of layout, location and orientation, of pavement markings and graphics prior to application. Apply in accordance with manufacturer's written instructions, using reviewed supplementary adhesive in cases of heavy humidity or cool temperatures. Use care to accurately place stencils, since repositioning will weaken bond. Roll or tamp stencil in place as directed by manufacturer. Avoid damaging or dislodging stencil edges when weeding out pattern. Apply heat or pressure as directed by manufacturer to re-adhere any portions of stencil not firmly fixed to pavement.

E19.3.6 Equipment Requirements

.1 Paint applicator to be an reviewed pressure type distributor capable of applying paint in single and dashed lines and that will ensure uniform application and having a positive shut-off.

.2 Spray applicator for stencil graphics.

E19.3.7 Application

.1 Lines and graphics as indicated on Drawings.

.2 Unless otherwise reviewed by Contract Administrator, apply paint only when air temperature is above 10˚ C and no rain is forecast.

.3 Apply paint evenly at a rate of 3m2/L.

.4 Do not thin paint unless reviewed by Contract Administrator.

.5 Graphics and letters to conform to dimensions indicated.

.6 Paint lines and graphics to be of uniform colour and density with sharp edges.

.7 Apply paint using specified equipment only.

E19.3.8 Tolerances

.1 Paint markings to be within ± 6 mm of dimensions specified.

E19.3.9 Protection of Completed Work

.1 Protect pavement markings and graphics until dry.

E19.3.10 Site Clean-Up

.1 Upon completion of Work, fully remove all materials and debris to leave Worksite clean.

E19.4 Method of Measurement

E19.4.1 Pavement Game Graphics

.1 The supply and installation of pavement game graphics will be on a Lump Sum Basis, as accepted by the Contract Administrator. No separate measurements will be made for this Work.

E19.4.2 Pavement Animal Graphics

.1 The supply and installation of pavement animal graphics will be will be on a Lump Sum Basis, as accepted by the Contract Administrator. No separate measurements will be made for this Work.

E19.5 Basis of Payment

E19.5.1 Pavement Game Graphics

.1 The supply and installation of pavement game graphics will be paid for at the Lump Sum Price for “Pavement Game Graphics,” which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.

E19.5.2 Pavement Animal Graphics

.1 The supply and installation of pavement animal graphics will be paid for at the Lump Sum Price for “Pavement Animal Graphics,” which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.

E20. TOPSOIL AND FINISH GRADING

E20.1 General Description

E20.1.1 This Specification shall cover the supply and installation of topsoil for areas to be sodded, seeded and shrub beds as specified herein and as indicated on the Drawings, and in accordance with CW 3540-R2.

E20.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies and all other things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified and in accordance with CW 3540-R2.

E20.2 Protection

E20.2.1 Protect elements surrounding the Work of this section from damage or disfiguration.

E20.2.2 Protect landscaping and other features remaining as final Work.

E20.3 Source Quality Control

E20.3.1 Inform Contract Administrator of proposed source of topsoil to be supplied and provide sample for review by Contract Administrator prior to installation.

E20.3.2 Test topsoil for clay, sand and silt, NPK, Mg, soluble salt content, pH value, growth inhibitors and soil sterilants.

E20.4 Submittals

E20.4.1 Submit 0.5 kg sample of topsoil to testing laboratory and indicate present use and intended use. Prepare and ship sample in accordance with provincial regulations and testing laboratory requirements.

E20.4.2 Submit two (2) copies of soil analysis and recommendations for corrections to Contract Administrator.

E20.5 Delivery and Storage

E20.5.1 Deliver and store fertilizer in waterproof bags accompanied in writing by weight, analysis and name of manufacturer.

E20.6 Materials

E20.6.1 Topsoil: In accordance with CW 3540-R2.

E20.6.2 In accordance with CW3540-R2.

E20.6.3 Mulch: Woodchip mulch: chips from hardwood trees, free of bark, branches and leaves, varying in size from 50-75 mm (2" to 3") by 6-20 mm (1/4"-3/4") thick.

E20.7 Construction Method

E20.7.1 In accordance with CW3540.

E20.7.2 Place topsoil in excavated shrub beds to depth of 300 mm. Topsoil with 75 mm woodchips.

E20.7.3 Finish Grading

.1 Fine grade entire topsoiled area to contours and elevations as indicated on Drawing L-03 “Site Grading.” Eliminate rough spots and low areas to ensure positive drainage to catch basins and area drains.

.2 Prepare loose friable bed by means of rototilling and subsequent raking. Roll lightly and rake wherever topsoil is too loose.

.3 Leave surface smooth, uniform, firm against deep foot printing, with a fine loose texture.

E20.7.4 Surplus Material

.1 Dispose of surplus topsoil and stone fill not required for fine grading and landscaping off Site.

E20.8 Method of Measurement

E20.8.1 Topsoil for Sodded and Seeded Areas

.1 There shall be no separate measurement for Work associated with topsoil for seeded and sodded areas. This Work shall be incidental to Seeding and Sodding. No separate measurement will be made.

E20.8.2 Topsoil for Shrub Beds

.1 Supply and placement of topsoil for shrub beds will be measured on an Area Basis. The area to be paid for shall be the total number of square metres placed in accordance with this Specification and accepted by the Contract Administrator, as calculated from measurements made by the Contract Administrator.

E20.9 Basis of Payment

E20.9.1 Topsoil for Sodded and Seeded Areas

.1 Topsoil for seeded and sodded areas is incidental to Seeding and Sodding, which price shall be included in the price for supply and installation of “Seeding” and “Sodding.” No separate payment will be made.

E20.9.2 Topsoil for Shrub Beds

.1 Topsoil for shrub beds will be paid for at the Contract Unit Price per square metre for "Shrub Bed Topsoil" measured as specified herein, which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.

E21. PLANTING OF SHRUBS

E21.1 General Description

E21.1.1 This Specification shall cover the supply and installation of shrubs in shrub beds in areas as specified herein and as indicated on the Drawings.

E21.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies and all other things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified herein.

E21.2 Related Sections

E21.2.1 E20: Topsoil and Finish Grading.

E21.2.2 E22: Seeding.

E21.2.3 E23: Sodding.

E21.2.4 E25: Landscape Maintenance.

E21.3 Reference Standards

E21.3.1 Nomenclature: to "International Code of Nomenclature for Cultivated Plants.”

E21.3.2 Size and Development of Shrubs: to "Canadian Nursery Trades Association: Canadian Standards for Nursery Stock", latest edition, by Landscape Canada.

E21.4 Inspection By Contract Administrator

E21.4.1 The Contract Administrator will inspect plants at the following stages:

E21.4.2 Plants at source.

E21.4.3 Installed plants before commencement of maintenance period.

E21.4.4 At end of maintenance period.

E21.4.5 Notify Contract Administrator 48 hours in advance of each required inspection.

E21.5 Delivery, Storage and Handling

E21.5.1 Handle plants with reasonable care and skill to prevent injuries to trunk, branches and roots. Damaged plant material to be immediately replaced at no cost tot he Owner.

E21.5.2 Protect plants during shipment and until planted on Site, with tarpaulin or other suitable covering to prevent excessive drying from sun and wind, and breakage from wind and equipment.

E21.5.3 Do not use plants whose soil balls have been cracked or broken before or during planting or when burlap ropes required in connection with their transplanting have been removed.

E21.5.4 Replace damaged plants at no cost to Contract Administrator.

E21.5.5 Do not transport shrubs in open trucks when the temperature is in excess of 25ºC, or at speeds in excess of 60 km/h.

E21.6 Warranty

E21.6.1 Replace plants when found dead or not in healthy and satisfactory growing condition during warranty period specified in General Conditions of Contract.

E21.7 Maintenance Period

E21.7.1 As specified in E25: Landscape Maintenance.

E21.8 Materials

E21.8.1 Plants - General

.1 Supply nursery grown plants unless specifically designed as "collected."

.2 Supply plants conforming to federal and provincial regulations.

.3 Nursery Grown Plants:

(a) All plants shall be No. 1 Grade, nursery grown, under proper cultural practices with respect to fertile soil, ample spacing, regular cultivation, weed, pest and disease control, adequate moisture and pruning in accordance with good horticultural practices as advocated by the Canadian Nursery Trades Association and the Manitoba Landscape Nursery Trades Association.

(b) Plants true to type, structurally sound, well balanced, healthy, vigorous, of normal growth habits, densely foliated and healthy well developed root system.

(c) Plants free of disease, insect infestations, insect eggs, rodent damage, sun scald, frost cracks and other abrasions or scars to bark.

(d) Heeled-in plants or plants from cold storage will not be accepted.

(e) Plants which have been top worked, unnaturally sheared or colour treated are not acceptable.

E21.8.2 Plants - Characteristics

.1 Shrubs: natural form, typical of genus, species and variety; minimum of four canes.

E21.8.3 Plant Measurement

.1 All plants shall conform to measurements specified in plant list.

.2 Measure shrubs, in millimetres, with branches in their normal positions.

E21.8.4 Plants - Soil Balls

.1 Container grown plants:

(a) Grown in containers for minimum of three months.

(b) Established root system which will "hold" soil when removed from container.

(c) Container sized in proportion to plant size.

(d) Root-bound plants are not acceptable.

E21.8.5 Topsoil

.1 Topsoil: refer to E20: Topsoil and Finish Grading.

E21.8.6 Planting Mix

.1 Refer to E20: Topsoil and Finish Grading.

E21.8.7 Water

.1 Water: Obtain water from source on Site supplied by City.

E21.8.8 Plant Accessories

.1 Wood Chip Mulch: wood chips from hardwood trees, free of bark, branches and leaves, varying in size from 50 to 75 mm by 6 to 20 mm thick. Provide sample bag prior to installation for approval.

E21.9 Execution

E21.9.1 Preparation

.1 Locate and stake locations of electrical services, utility lines and other underground obstructions.

.2 If underground services interfere with planting plan, notify Contract Administrator, stop Work in area and await further instructions.

.3 Stake out locations of planting beds.

.4 Protect bench marks and hubs which form part of legal Site survey.

E21.9.2 Preparation of Shrub Beds

.1 Shrub Beds: excavate minimum of 300 mm deep, scarify bottom to 150 mm depth.

.2 Place planting mix in planting beds to required elevations. Slope grade away from building.

E21.9.3 Planting

.1 Place plants at same depth they were originally grown. Face for best appearance.

.2 Container plants: remove containers and keep soil ball intact while placing plant in pit.

.3 Do not install any plants closer than 750 mm to edge of walkways, driveways or building foundations.

E21.9.4 Mulching

.1 Obtain approval of planting before mulching material is applied. Loosen soil in shrub beds and remove debris and weeds. Spread mulch to minimum thickness of 75 mm as indicated on Drawing. Mulch material susceptible to blowing must be moistened and mixed with topsoil before applying. When mulching is placed in fall, place immediately after planting. When mulch is placed in spring, wait until soil has warmed up.

E21.9.5 Maintenance

.1 Perform maintenance as specified in E25: Landscape Maintenance.

E21.9.6 Clean-up

.1 Remove excess materials from Site.

.2 Leave Site in neat condition.

E21.10 Method of Measurement

E21.10.1 Supply and Installation of Wood Chip Mulch

.1 Supply and installation of wood chip mulch will be measured on an Area Basis. The area to be paid for shall be the total number of square metres placed in accordance with this Specification and accepted by the Contract Administrator, as calculated from measurements made by the Contract Administrator.

E21.10.2 Supply and Installation of Shrubs

.1 The supply and installation of shrubs shall be measured on an Unit Basis. The number of shrubs to be paid for shall be the total number of shrubs planted, in accordance with this Specification and accepted by the Contract Administrator, as calculated from measurements made by the Contract Administrator.

E21.11 Basis of Payment

E21.11.1 Supply and Installation of Wood Chip Mulch

.1 Wood chip mulch will be paid for at the Contract Unit Price per square metre for "Wood Chip Mulch" measured as specified herein, which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.

E21.11.2 Supply and Installation of Shrubs

.1 Shrubs will be paid for at the Contract Unit Price per unit for the "Items of Work" listed below, measured as specified herein, which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.

Items of Work:

.1 False Spirea

.2 Meyer Lilac

E22. SEEDING

E22.1 General Description

E22.1.1 This Specification shall cover the supply and installation of seed for areas as specified herein and as indicated on the Drawings, and in accordance with CW 3520-R5.

E22.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies and all other things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified and in accordance with CW 3520-R5.

E22.2 Materials

E22.2.1 General: All materials shall conform to CW 3520-R5 and this Specification. Where the two do not agree, this Specification shall take precedence.

E22.2.2 Seed for general park areas, boulevards, medians and interchange areas, as per CW 3520-R5.

E22.3 Construction Method

E22.3.1 Construction method shall conform to CW 3520-R5.

E22.4 Method of Measurement

E22.4.1 Supply and placement of seed will be measured on an Area Basis. The area to be paid for shall be the total number of square metres placed in accordance with this Specification and accepted by the Contract Administrator, as calculated from measurements made by the Contract Administrator.

E22.5 Basis of Payment

E22.5.1 Seeding will be paid for at the Contract Unit Price per square metre for "Seeding" measured as specified herein, which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.

E23. SODDING

E23.1 General Description

E23.1.1 This Specification shall cover the supply and installation of sod for areas as specified herein and as indicated on the Drawings, and in accordance with CW 3510-R7.

E23.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies and all other things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified and in accordance with CW 3510-R7.

E23.2 Materials

E23.2.1 Nursery sod for general park areas, boulevards, medians and interchange areas, as per CW 3510-R7.

E23.3 Construction Method

E23.3.1 Construction method shall conform to CW 3510-R7.

E23.4 Method of Measurement

E23.4.1 Supply and placement of sod will be measured on an Area Basis. The area to be paid for shall be the total number of square metres placed in accordance with this Specification and accepted by the Contract Administrator, as calculated from measurements made by the Contract Administrator.

E23.5 Basis of Payment

E23.5.1 Sodding will be paid for at the Contract Unit Price per square metre for "Sodding" measured as specified herein, which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.

E24. TREE PRUNING

E24.1 General Description

E24.1.1 This Specification shall cover the requirements for tree pruning of all dead limbs, root girdling and care of wounds within the limit of Work as specified herein and as indicated on the Drawings.

E24.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all other things necessary for and incidental to the satisfactory performance and completion of all Work as specified herein and in accordance with Canadian Nursery Landscape Association (CNLA), the International Society of Arboriculture (ISA), and E7**:** Tree Aeration.

E24.1.3 Prior to the commencement of Work, the Contractor and authorized pruning personnel shall attend one Site meeting in conjunction with Contract Administrator to identify trees to be pruned and scope of Work.

E24.2 Qualifications

E24.2.1 All personnel performing pruning procedures shall possess Canadian Nursery Landscape Association certification.

E24.2.2 All personnel shall possess safety certificate or equivalent as approved by local hydro utility where trees to be pruned are within 1 m of overhead energized conductors.

E24.3 Field Sample

E24.3.1 Contractor shall provide field sample of pruning on one specimen for review by Contract Administrator.

E24.3.2 Field sample shall identify:

.1 Knowledge of target areas including branch bark ridge and branch collars.

.2 Technique for selection process and pruning used to establish desired form and shape for particular species.

E24.3.3 Acceptance of Work will be determined by Contract Administrator from field sample.

E24.4 Tool Maintenance

E24.4.1 Ensure that tools are clean and sharp throughout pruning operation. Do not use tools that will crush or tear bark.

E24.4.2 Disinfect tools before each tree is pruned.

E24.4.3 On diseased plant material, disinfect tools before each cut.

E24.5 Construction Method

E24.5.1 Prune as directed by Contract Administrator and in accordance with:

.1 Pruning Ornamentals (#483), current edition, Ontario Ministry of Agriculture, Food and Rural Affairs.

E24.5.2 Where discrepancies occur between standard and these Specifications, these Specifications shall govern.

E24.5.3 Notify Contract Administrator immediately of conditions detrimental to health of plant material or operations.

E24.5.4 Prune during plant dormant period or after leaves have matured. Avoid pruning during leaf formation, at time of leaf fall, or when seasonal temperature drops below minus 10˚C.

E24.5.5 Use the following for heavy bleeder species such as *Acer*, *Betula*, *Tilia*, *Ulmus*, and *Populus* species:

.1 Prune when in full leaf.

.2 Retain natural form and shape of plant species.

.3 Do not: flush cut branches, crush or tear bark, cut behind branch bark ridge, damage branch collars, or damage branches to remain.

E24.5.6 Pruning

.1 Remove dead, dying, diseased and weak growth from plant material designated by Contract Administrator in order to promote healthy growth.

.2 Remove live branches that are:

(a) Interfering with healthy development and structural strength including branches crossed or rubbing more important branches;

(b) Weak in structure including narrow crotches;

(c) Obstructing development of more important branches; and/or

(d) Broken.

.3 Remove live branches to re-establish natural species form, including:

(a) One or more developing leaders;

(b) Multiple growth due to previous topping;

(c) Branches extending outward from natural form; and/or

(d) Undesirable sucker growth.

.4 Remove loose branches, twigs and other debris lodged in tree.

.5 Remove vines.

.6 For branches under 50 mm in diameter:

(a) Locate branch bark ridge and make cuts smooth and flush with outer edge of branch collar to ensure retention of branch collar;

(b) Cut target area to bottom of branch collar at angle equal to that formed by line opposite to branch bark ridge;

(c) Make cuts on dead branches smooth and flush with swollen callus collar. Do not injure or remove callus collar; and

(d) Do not cut lead branches unless directed by Contract Administrator.

.7 For branches greater than 50 mm in diameter:

(a) Make first cut on lower side of branch 300 mm from trunk, one third diameter of branch;

(b) Make second cut on upper side of branch 500 mm from trunk until branch falls off;

(c) Make final cut adjacent to and outside branch collar;

(d) Ensure that trunk bark and branch collar are not damaged or torn during limb removal. Repair areas which are damaged, or remove damaged area back to next branch collar; and/or

(e) Remove additional growth designated by Contract Administrator.

E24.5.7 Root Girdling

.1 For girdling roots one-quarter size of trunk diameter or larger, V-cut girdling root one-half way through at point where root is crossing.

.2 Remove exposed portion of girdling root as directed by Contract Administrator after cleanly cutting root flush with grade on each side of parent root. Do not injure bark or parent root.

E24.5.8 Care of Wounds

.1 Shape bark around wound to oblong configuration ensuring minimal increase in wound size. Retain peninsulas of existing live bark.

E24.5.9 Clean-Up

.1 Collect and dispose of pruned material daily and remove from Site.

E24.6 Method of Measurement

E24.6.1 Tree pruning, root girdling and care of wounds will be measured on a Lump Sum Basis, in accordance with this Specification, and as accepted by the Contract Administrator. No measurement shall be made for this Work.

E24.7 Basis for Payment

E24.7.1 Tree pruning, root girdling and care of wounds will be paid for at the Lump Sum Price for "Tree Pruning," which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.

E25. LANDSCAPE MAINTENANCE

E25.1 General Description

E25.1.1 This Specification shall cover the maintenance of shrub beds, and sodded and seeded areas, as specified herein and as indicated on the Drawings, following acceptance of the Work and issuance of the Certificate of Substantial Performance.

E25.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies and all other things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified.

E25.1.3 The Contractor shall maintain all areas with the limit of Work as indicated on the Drawings, in accordance with these Specifications, and as directed by the Contract Administrator.

E25.1.4 In general, the Work shall include mowing, weed control, fertilizing, overseeding as required, and maintenance of shrub beds.

E25.2 Maintenance and Guarantee Period

E25.2.1 Maintenance shall occur between the date of installation and up to a period of one (1) year for shrub beds from date of the issuance of the Certificate of Substantial Performance; and thirty (30) days from date of the issuance of the Certificate of Substantial Performance, or until turf is established in accordance with CW 3510-R8, for sodded and seeded areas. The guarantee period for plant materials will be coincidental to the maintenance period.

E25.3 Materials and Equipment

E25.3.1 Materials shall conform to E20: Topsoil and Finish Grading, E21: Planting of Shrub Beds, E22: Seeding and E23 Sodding.

E25.3.2 Provide all equipment to properly execute Work. Maintain such equipment in a workable, safe condition while in use during this project.

E25.3.3 Contract Administrator shall review equipment to be used to execute Work prior to execution.

E25.4 Construction Method

E25.4.1 General

.1 Provide weeding services within 48 hours and re-seeding within five (5) days of the request by the Contract Administrator. Monitor the Site and advise the Contract Administrator of conditions that might void the Contractor's warranty.

.2 The Contractor shall maintain a log noting times, dates, equipment used, and quantity of materials used and areas treated for each maintenance application. Forms shall be provided by Contract Administrator. Submit log to Contract Administrator upon request. Contractor shall notify Contract Administrator of the exact time Contractor proposes to commence each application.

.3 Schedule operations in accordance with growth, health, weather conditions, and use of Site.

.4 Perform each operation continuously and completely within a reasonable time period.

.5 Store equipment and materials off Site.

.6 Collect and dispose of debris or excess material on daily basis.

E25.4.2 Mowing

.1 Do not mow areas seeded with grasses during establishment period.

.2 Mow grass at height of 50 - 60 mm, do not allow to grow past 80 mm. Do not cut more that 1/3 of the grass height at any one mowing, unless otherwise directed by the Contract Administrator.

.3 Do not remove clippings from grassed areas.

E25.4.3 Weed Control

.1 The Contractor shall apply herbicide when broadleaf weeds start developing in competition with grasses.

.2 Apply herbicide in accordance with manufacturer's instructions and the Manitoba Agriculture Guide to Chemical Weed Control latest edition.

.3 Use 2.4D Amine or MCPA Amine herbicide for susceptible broadleaf weeds.

.4 Use a mixture containing 2.4-D Amine or MCPA Amine. Mecoprop and Dicamba for 2.4-D resistant plants.

.5 Avoid use of pure Dicamba solutions near trees.

.6 Do not apply to newly seeded turf until after the second mowing, or as directed by the Contract Administrator.

.7 Do not water within 24 hours after application.

.8 Apply when winds are less than 20 km/h and air temperature is above 10°C.

E25.4.4 Fertilizing

.1 Apply 2:11 ratio fertilizer at rate of 0.2 kg nitrogen/100 m^2.

.2 Apply in early spring as soon as frost is out of ground.

.3 Make supplementary application of 0.2 kg nitrogen/100 m^2 towards end of August.

.4 Use mechanical spreading equipment.

.5 Check calibration to ensure specified rate is spread evenly. Rectify uneven spreading as soon as it becomes apparent. Spread additional fertilizer over areas affected or rake out excess application.

.6 Water immediately after fertilizing to obtain moisture penetration of 40-50 mm.

E25.4.5 Reseeding

.1 Overseed areas by means of broadcasting where germination has failed as directed by the Contract Administrator.

.2 Seed mixes and rates to E22: Seeding.

E25.4.6 Shrub Beds

.1 Cultivate shrub beds, keep free of weeds. Eliminate perennial grass and weeds and their roots.

.2 Water plants weekly; apply sufficient water to saturate root zone.

.3 Areas with no irrigation system: supply labour, all hoses and attachments necessary to provide adequate watering.

.4 Water to be obtained from source on Site, supplied by City.

.5 Maintain mulch to depth of 75 mm.

.6 Control disease and insects. Where possible use physical methods to eliminate cause of insect infestation. If chemical treatment is necessary apply in accordance with manufacturer's recommendations and government regulations.

.7 Promptly replace plants which require replacement under specified warranty.

E25.4.7 Extension of Maintenance Period

.1 At the end of the maintenance period, all sodded and seeded areas must show signs of growth satisfactory to the Contract Administrator and in accordance with E21: Planting of Shrubs, E22: Seeding and E23: Sodding.

.2 Unsatisfactory areas shall be replaced and maintained by and at the expense of the Contractor, to the satisfaction of the Contract Administrator.

E25.5 Method of Measurement

E25.5.1 Landscape Maintenance will be measured on a Lump Sum Basis, in accordance with this Specification, and as accepted by the Contract Administrator. No measurement shall be made for this Work.

E25.6 Basis of Payment

E25.6.1 Landscape Maintenance will be paid for at the Contract Lump Sum Price for "Landscape Maintenance," which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.

E26. MECHANICAL GENERAL CONDITIONS

E26.1 Scope of Work

E26.1.1 Provide and install all Work relating to the equipment, piping, controls, cutting and patching of the exterior pool and splash pad systems, the interior mechanical systems and the aquatic play features as shown on the drawings. The aquatic play features shall be provided by the mechanical contractor with assistance to the General Contractor of the installation including setting the features to be plumb, anchoring of the features to the concrete, and installation and connection of the required water services. The general contractor shall provide the concrete systems and the electrical contractor shall provide the line voltage wiring. All of the exterior wiring to the units shall be line voltage.

E26.2 Trial Unsage

E26.2.1 Contract Administrator / Owner may use equipment and systems for test purposes prior to acceptance. Supply labour, material, and instruments required for testing.

E26.3 Protection of Openings

E26.3.1 Protect equipment and systems openings from dirt, dust, and other foreign materials with materials appropriate to system.

E26.4 Painting

E26.4.1 Prime and touch up marred finished paintwork to match original.

E26.4.2 Restore to new condition, finishes which have been damaged too extensively to be merely primed and touched up.

E26.5 Demonstration and Operating and Maintenance Instructions

E26.5.1 Supply tools, equipment and personnel to demonstrate and instruct operating and maintenance personnel in operating, controlling, adjusting, trouble-shooting and servicing of all systems and equipment during regular Work hours, prior to acceptance.

E26.5.2 Where specified elsewhere E26, manufacturers to provide demonstrations and instructions.

E26.5.3 Use operation and maintenance manual, as-built drawings, audio visual aids, etc. as part of instruction materials.

E26.5.4 Instruction duration time requirements as specified in appropriate sections.

E26.5.5 Where deemed necessary, Contract Administrator / Owner may record these demonstrations on video tape for future reference.

E26.6 Closeout Submittals

E26.6.1 Provide separately bound Mechanical As-Built drawings and as-built specifications manual.

E26.6.2 Operation and maintenance manual to be reviewed by, and final copies deposited with, Contract Administrator before final inspection.

E26.6.3 Operation data to include:

.1 Control schematics for each system including environmental controls.

.2 Description of each system and its controls.

.3 Description of operation of each system at various loads together with reset schedules and seasonal variances.

.4 Operation instruction for each system and each component.

.5 Description of actions to be taken in event of equipment failure.

E26.6.4 Maintenance data shall include:

.1 Servicing, maintenance, operation and trouble-shooting instructions for each item of equipment.

.2 Data to include schedules of tasks, frequency, tools required and task time.

.3 Data shall also include a project specific equipment data-base containing equipment model numbers, serial numbers and parts listings of suggested maintenance spares.

E26.6.5 Performance data to include

.1 Equipment manufacturer's performance data sheets with point of operation as left after commissioning is complete.

.2 Equipment performance verification test results.

.3 Special performance data as specified elsewhere.

.4 Testing, adjusting and balancing reports as specified in Section 15950 - Testing, Adjusting and Balancing.

E26.6.6 Approvals

.1 Submit 2 copies of draft Operation and Maintenance Manual to Contract Administrator for approval. Submission of individual data will not be accepted unless so directed by Contract Administrator.

.2 Make changes as required and re-submit as directed by Contract Administrator.

.3 Bind data in 3 ring binder with indexed tabs, table of contents, and contact personnel for repair and maintenance. Make Changes as required by Contract Administrator and resubmit 5 final copies.

E26.7 Shop Drawings and Product Data

E26.7.1 Submit shop drawings and product data in accordance with established protocol.

E26.7.2 Shop drawings and product data shall show:

.1 Mounting arrangements.

.2 Operating and maintenance clearances, e.g., access door swing spaces.

E26.7.3 Shop drawings and product data shall be accompanied by:

.1 Detailed drawings of bases, supports, and anchor bolts.

.2 Acoustical sound power data, where applicable.

.3 Points of operation on performance curves.

.4 Manufacturer to certify as to current model production.

.5 Certification of compliance to applicable codes.

E26.8 Cleaning

E26.8.1 Systems shall be protected by the installer during construction to prevent entry of construction debris. All systems shall be clean at the time of takeover.

E26.9 As-Built Drawings

E26.9.1 Site Records:

.1 Contract Administrator will provide 1 set of reproducible mechanical drawings. Provide sets of white prints as required for each phase of the Work. Mark there on all changes as Work progresses and as changes occur. This shall include changes to existing mechanical systems, control systems and low voltage control wiring.

.2 Use different colour erasable pencils for each service.

.3 Make available for reference purposes and inspection at all times.

.4 Transfer information to reproducibles, revising reproducibles to show all Work as actually installed.

E26.9.2 As-built drawings:

.1 Prior to start of Testing, Adjusting and Balancing (TAB), finalize production of as-built drawings.

.2 Identify each drawing in lower right hand corner in letters at least 12 mm high as follows: - "AS BUILT DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW MECHANICAL SYSTEMS AS INSTALLED" (Signature of Contractor) (date).

.3 Submit to Contract Administrator for approval and make corrections as directed.

.4 TAB to be performed using as-built drawings.

.5 Submit completed reproducible as-built drawings with Operating and Maintenance Manuals.

E26.9.3 Submit copies of as-built drawings for inclusion in final TAB report.

E26.10 Existing Systems

E26.10.1 Contract Administrator shall arrange Site visit to view existing systems in buildings and on Site in order to understand the intent of the project. Failure to do so and visible conditions that become problematic will not be accepted as grounds for extras.

E26.11 Method of Measurement

E26.11.1 There shall be no separate measurement for Work associated with the Mechanical General Conditions. This Work shall be incidental to the supply and installation of "Mechanical Equipment".

E26.12 Bases of Payment

E26.12.1 All Work associated with Mechanical General Conditions will be considered incidental and no payment will be made.

E27. MECHANICAL IDENTIFICATION

E27.1 General

E27.1.1 References

.1 Canadian General Standards Board (CGSB).

(a) CAN/CGSB-1.60-[M89], Interior Alkyd Gloss Enamel.

(b) CAN/CGSB-24.3-[92], Identification of Piping Systems.

(c) CAN/CGA B149.1-[M95].

(d) CAN/CGA B149.2-[M91].

E27.1.2 Product Data

.1 Submit product Data in accordance with Submittal Procedures.

E27.2 Products

E27.2.1 Identification of Piping Systems

.1 Identify contents by background colour marking, pictogram (as necessary), legend; direction of flow by arrows. To CAN/CGSB 24.3 except where specified otherwise.

E27.2.2 Pictograms:

.1 Where required, to Workplace Hazardous Materials Information System (WHMIS) regulations.

E27.2.3 Legend:

.1 Block capitals to sizes and colours listed in CAN/CGSB 24.3.

E27.2.4 Arrows showing direction of flow:

.1 Outside diameter of pipe or insulation less than 75 mm: 100 mm long x 50 mm high.

.2 Outside diameter of pipe or insulation 75 mm and greater: 150 mm long x 50 mm high.

.3 Use double-headed arrows where flow is reversible.

E27.2.5 Extent of background colour marking:

.1 To full circumference of pipe.

.2 Length to accommodate pictogram, full length of legend and arrows.

E27.2.6 Materials for background colour marking, legend, arrows:

.1 Pipes and tubing 20 mm and smaller: Waterproof and heat-resistant pressure sensitive plastic marker tags.

.2 All other pipes: Pressure sensitive plastic-coated cloth, vinyl with protective overcoating, waterproof contact adhesive undercoating, suitable for ambient of 100%RH and continuous operating temperature of 150° C and intermittent temperature of 200° C.

E27.2.7 Colours and Legends:

.1 Where not listed, obtain direction from Contract Administrator.

.2 Colours for legends, arrows: To following table:

Background colour	Legend, arrows
Yellow	BLACK
Green	WHITE
Red	WHITE

.3 Background colour marking and legends for piping systems:

Contents	Background colour marking	Legend
Splash Pad Supply	Green	SPS
Splash Pad return	Green	SPR
Wading Pool Supply	Green	WPS
Wading Pool Return	Green	WPR
Domestic cold water supply	Green	DOM. CWS
Waste water	Green	WASTE WATER
Sanitary	Green	SAN

E27.3 Valves

E27.3.1 Plastic Laminates, or brass tags with 12 mm stamped identification data in black.

E27.3.2 Include flow diagrams for each system, of approved size, showing charts and schedules with identification of each tagged item, valve type, service, function, normal position, location of tagged item.

E27.4 Controls Components Identification

E27.4.1 Identify all systems, equipment, components, controls, sensors with system nameplates specified in this section.

E27.4.2 Inscriptions to include function and (where appropriate) fail-safe position.

E27.5 Language

E27.5.1 Identification to be in English.

E27.6 Execution

E27.6.1 Timing:

.1 Provide identification only after all painting has been completed.

E27.7 Location of Identification on Piping

E27.7.1 On long straight runs in open areas in equipment rooms to ensure that at least one is visible from any one viewpoint in operating areas.

E27.7.2 At least once in each small room through which piping passes.

E27.7.3 On both sides of visual obstruction or where run is difficult to follow.

E27.7.4 On both sides of separations such as walls, floors, partitions.

E27.7.5 At beginning and end points of each run and at each piece of equipment in run.

E27.7.6 At point immediately upstream of major manually operated or automatically controlled valves, dampers, etc. Where this is not possible, place identification as close as possible, preferably on upstream side.

E27.7.7 Identification to be easily and accurately readable from usual operating areas and from access points.

.1 Position of identification to be approximately at right angles to most convenient line of sight, considering operating positions, lighting conditions, risk of physical damage or injury and reduced visibility over time due to dust and dirt.

E27.8 Valves

E27.8.1 Valves: Secure tags with non-ferrous chains or closed "S" hooks.

E27.8.2 Install one copy of valve schedules mounted in frame behind non-glare glass where directed by Contract Administrator. Provide one copy (reduced in size if required) in each operating and maintenance manual.

E27.8.3 Number valves in each system consecutively.

E27.9 Method of Measurement

E27.9.1 There shall be no separate measurement for Work associated with the Mechanical Identification. This Work shall be incidental to the supply and installation of "Mechanical Equipment".

E27.10 Basis for Payment

E27.10.1 All Work associated with Mechanical Identification will be considered incidental and no payment will be made.

E28. INSTALLATION OF PIPEWORK

E28.1 References:

E28.1.1 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.

E28.2 Execution

E28.2.1 Connections to Equipment

.1 In accordance with manufacturer's instructions unless otherwise indicated.

.2 Use valves and either unions or flanges for isolation and ease of maintenance and assembly.

E28.3 Drains

E28.3.1 Install piping with grade in direction of flow except as indicated or specified otherwise.

E28.3.2 Install drain valve at low points in piping systems, at equipment and at section isolating valves.

E28.4 Pipework Installation

E28.4.1 Screwed fittings to be jointed with Teflon tape.

E28.4.2 Protect openings against entry of foreign material.

E28.4.3 Install so that equipment can be isolated and removed without interruption to operation of any other equipment or systems.

E28.4.4 Assemble piping using fittings manufactured to ANSI standards.

E28.4.5 Saddle type branch fittings may be not be used.

E28.4.6 Install exposed piping, equipment, rectangular cleanouts and similar items parallel or perpendicular to building lines.

E28.4.7 Install concealed pipework so as to minimize furring space, maximize headroom, conserve space.

E28.4.8 Except where indicated otherwise, slope piping in direction of flow for positive drainage and venting.

E28.4.9 Except where indicated, install so as to permit separate thermal insulation of each pipe.

E28.4.10 Group piping wherever possible and as indicated.

E28.4.11 Ream pipes, remove scale and other foreign material before assembly.

E28.4.12 Use eccentric reducers at pipe size changes to ensure positive drainage and venting.

E28.4.13 Valves:

.1 Install in accessible locations.

.2 Install with stems above the horizontal position unless otherwise indicated.

.3 Valves to be accessible for maintenance without removing adjacent piping.

.4 Use gate, ball, or butterfly valves at for isolating purposes except where otherwise specified.

.5 Install butterfly valves between weld neck flanges to ensure full compression of liner.

E28.4.14 Check Valves:

.1 Install silent check valves on discharge of pumps and in vertical pipes with downward flow and elsewhere as indicated.

.2 Install swing check valves in horizontal lines on discharge of pumps and elsewhere as indicated.

E28.5 Sleeves

E28.5.1 General: Install where pipes pass through masonry, concrete structures, fire rated assemblies, and elsewhere as indicated.

E28.5.2 Material: Schedule 40 black steel pipe.

E28.5.3 Construction: Foundation walls and where sleeves extend above finished floors - to have annular fins continuously welded on at mid-point.

E28.5.4 Sizes: 6 mm minimum clearance all round between sleeve and uninsulated pipe or between sleeve and insulation.

E28.5.5 Installation:

.1 Concrete, masonry walls, concrete floors on grade: Terminate flush with finished surface.

.2 Other floors: Terminate 25 mm above finished floor.

.3 Before installation, paint exposed exterior surfaces with heavy application of zinc-rich paint to CAN/CGSB-1.181.

E28.5.6 Sealing:

.1 Foundation walls and below grade floors: Fire retardant, waterproof non-hardening mastic.

.2 Elsewhere: Provide space for firestopping. Maintain fire rating integrity.

.3 Sleeves installed for future use: Fill with lime plaster or other easily removable filler.

.4 Ensure no contact between copper pipe or tube and sleeve.

E28.6 Pressure Testing of Equipment and Pipework

E28.6.1 Advise Contract Administrator 48 hours minimum prior to performance of pressure tests.

E28.6.2 Pipework: Test as specified by in relevant section of Division 15.

E28.6.3 Maintain specified test pressure without loss for four 24 hours minimum unless specified for longer period of time by Contract Administrator.

E28.6.4 Prior to tests, isolate equipment and other parts which are not designed to withstand test pressure or media.

E28.6.5 Conduct tests in presence of Contract Administrator or the assigned representative.

E28.6.6 Bear costs for repairs or replacement, retesting, and making good. Contract Administrator to determine whether repair or replacement is appropriate.

E28.6.7 Insulate or conceal Work only after approval and certification of tests by Contract Administrator.

E28.7 Existing Systems

E28.7.1 Connect into existing piping systems at times directed by Contract Administrator.

E28.7.2 Request written approval 10 days minimum, prior to commencement of Work.

E28.7.3 Be responsible for damage to existing plant by this Work.

E28.7.4 Ensure daily clean-up of existing areas.

E28.8 Method of Measurement.

E28.8.1 Installation of Pipework shall be paid for at the Lump Sum Basis. The supply and installation of pipework to be paid for shall be the total pipework that has been installed in accordance with this Specification and accepted by the Contract Administrator. There shall be no separate measurement made by the Contract Administrator.

E28.9 Basis of Payment

E28.9.1 Installation of Pipework shall be paid for at the Lump Sum Price for "Mechanical Equipment" as specified herein, which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.

E29. WATER PIPING - PVC

E29.1 References

E29.1.1 American National Standards Institute (ANSI)/American Society of Mechanical Engineers (ASME)

.1 ASTM F 492-95, Specification for Propylene and Polypropylene (PP) Plastic-Lined Ferrous Metal Pipe and Fittings.

E29.2 Product Data

E29.2.1 Submit product data in accordance with Submittal Procedures.

E29.2.2 Submit data for following: valves.

E29.3 Products

E29.3.1 Piping

.1 Rigid Pipe

.1 Above Ground Schedule 80 PVC Pipe.

.2 Buried or embedded: Schedule 80 PVC Pipe

.2 Flexible Pool Supply and Return Pipe: KWH DR17 HDPE pipe.

E29.3.2 Fittings

.1 Rigid Xirtec140 PVC (polyvinyl chloride) used in the manufacture of Schedule 80 fittings is of Type I, Grade 1 compound as stated in ASTM D-1784. Raw material used in molding shall contain the specified amounts of color pigment, stabilizers, and other additives approved by NSF International.

.2 All Schedule 80 Socket fittings shall conform to ASTM D-2467 and ASTM D-2464 for threaded fittings. Both pipe and fittings shall be the product of one manufacturer, as manufactured by IPEX or approved equal.

E29.4 Installation

E29.4.1 Install in accordance with Canadian Plumbing Code Provincial Plumbing Code and local authority having jurisdiction.

E29.4.2 Install pipe Work in accordance with Section 15101 - Installation of Pipe Work, supplemented as specified herein.

E29.4.3 Assemble piping using fittings manufactured to ANSI standards.

E29.4.4 Connect to equipment in accordance with manufacturer's written instructions unless otherwise indicated.

E29.4.5 Buried tubing:

.1 Lay in well compacted washed sand in accordance with AWWA Class B bedding.

.2 Bend tubing to minimize use of fittings.

E29.5 Valves

E29.5.1 Isolate equipment, fixtures and branches with ball valves.

E29.5.2 Balance system using ball valves complete with memory stop. Mark settings and record on as-built drawings on completion.

E29.6 Pressure Tests

E29.6.1 Conform to requirements of Section 15010 - Mechanical General Requirements.

E29.6.2 Test pressure: greater of one (1) time the maximum system operating pressure or 860 kPa.

E29.7 Flushing and Cleaning

E29.7.1 Flush entire system for 8 h. Ensure outlets flushed for 2 h. Let stand for 24 h, then draw one sample off longest run. Submit to testing laboratory to verify that system is clean. Let system flush for additional 2 h, then draw off another sample for testing.

E29.8 Pre Start-up Inspections

E29.8.1 Systems to be complete, prior to flushing, testing and start-up.

E29.8.2 Verify that system can be completely drained.

E29.8.3 Ensure that air chambers, expansion compensators are installed properly.

E29.9 Disinfection

E29.9.1 Flush out, disinfect and rinse system to requirements of authority having jurisdiction.

E29.9.2 Coordinate with Water Mains and Domestic Water Supply Piping.

E29.9.3 Upon completion, provide laboratory test reports on water quality for Contract Administrator approval.

E29.10 Start-up

E29.10.1 Timing: Start up after:

.1 Pressure tests have been completed.

.2 Disinfection procedures have been completed.

.3 Certificate of static completion has been issued.

.4 Water treatment systems operational.

E29.10.2 Provide continuous supervision during start-up.

E29.10.3 Start-up procedures:

.1 Establish circulation and ensure that air is eliminated.

.2 Check pressurization to ensure proper operation and to prevent water hammer, flashing and/or cavitation.

.3 Check control, limit, safety devices for normal and safe operation.

E29.10.4 Rectify start-up deficiencies.

E29.11 Performance Verification

E29.11.1 Timing:

.1 After pressure and leakage tests and disinfection completed, and certificate of completion has been issued by authority having jurisdiction.

E29 11.2 Procedures:

.1 Verify that flow rate and pressure meet Design Criteria.

.2 Adjust pressure regulating valves while withdrawal is maximum and inlet pressure is minimum.

.3 Verify compliance with safety and health requirements.

.4 Confirm water quality consistent with supply standards, verifying that no residuals remain as a result of flushing and/or cleaning.

E29.12 Method of Measurement.

E29.12.1 Water Piping - PVC shall be paid for at the Lump Sum Basis. The supply and installation of Water Piping - PVC to be paid for shall be the total Water Piping - PVC that has been installed in accordance with this Specification and accepted by the Contract Administrator. There shall be no separate measurement made by the Contract Administrator.

E29.13 Basis of Payment

E29.13.1 Water Piping - PVC shall be paid for at the Lump Sum Price for "Mechanical Equipment" as specified herein, which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.

E30. DRAINAGE WASTE AND VENT PIPING

E30.1 General

E30.1.1 Related Sections

.1 E28: Installation of Pipework.

E30.1.2 References

.1 American Society for Testing and Materials (ASTM)

.1 ASTM D 2235-96a, Specification for Solvent Cement for Acrylonitrille-Butadiene-Styrene (ABS) Plastic Pipe and Fittings.

.2 ASTM D 2564-96a, Specification for Solvent Cements for Poly(Vinyl-Chloride) (PVC) Plastic Piping Systems.

.2 Canadian Standards Association (CSA)

.1 CSA-B1800 Series-99, ABS Drain, Waste and Vent Pipe and Pipe Fittings.

.2 CSA-B181.2-M1996, PVC Drain, Waste and Vent Pipe and Pipe Fittings.

.3 CSA-B182.1-M1996, Plastic Drain and Sewer Pipe and Pipe Fittings

E30.2 Products

E30.2.1 Piping and Fittings

.1 For buried DWV piping to:

(a) CSA-B181.1.

(b) CSA-B181.2.

(c) CSA-B182.1.

E30.2.2 Joints

.1 Solvent weld for PVC: to ASTM D 2564.

E30.3 Execution

E30.3.1 Installation

.1 In accordance with Installation of Pipework (E28).

.2 Install in accordance with Canadian Plumbing Code Provincial Plumbing Code and local authority having jurisdiction.

E30.3.2 Testing

.1 Pressure test buried systems before backfilling.

.2 Hydraulically test to verify grades and freedom from obstructions.

E30.3.3 Performance Verification

.1 Cleanouts:

(a) Ensure accessible and that access doors are correctly located.

(b) Open, cover with linseed oil and re-seal.

(c) Verify cleanout rods can probe as far as the next cleanout, at least.

E30.4 Method of Measurement.

E30.4.1 Drainage Waste and Vent Piping shall be paid for at the Lump Sum Basis. The supply and installation of Drainage Waste and Vent Piping to be paid for shall be the Drainage Waste and Vent Piping that has been installed in accordance with this Specification and accepted by the Contract Administrator. There shall be no separate measurement made by the Contract Administrator.

E30.5 Basis of Payment

E30.5.1 Drainage Waste and Vent Piping shall be paid for at the Lump Sum Price for "Mechanical Equipment" as specified herein, which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.

E31. AQUATIC PLAY SYSTEMS

E31.1 General

E31.1.1 The aquatic play equipment shall be suitable for installation in aquatic facilities and public play areas. They shall be specifically designed for use by children and adults and be manufactured by a company that has at least five years experience in the design and engineering of children's aquatic play areas. Products shall be as manufactured by Vortex, or equal, as specified herein.

E31.1.2 Product Construction

.1 Above grade play products shall be manufactured from 304/304L stainless steel. The anchoring system and associated fastening hardware shall be manufactured from 304/304L stainless steel. Rigid centricast fiber reinforced (FRP) and/or molded fiberglass, PVC or filament wound shall not be utilized for any above grade play product structures. The surface finish shall be powder coated or polished stainless steel. Powder coated finishes shall be resistant to chlorinated water, and shall resist fading from sunlight exposure

.2 All grade level aquatic play features shall be manufactured from 304/304L stainless steel. Rigid centricast fiber reinforced (FRP) and/or molded fiberglass, PVC or filament wound shall not be utilized for any grade level play products. The anchoring system and associated fastening hardware shall be manufactured from 304/304L stainless steel. All grade level play products are to be furnished with appropriate winterization caps.

.3 Spray nozzles, caps and heads shall be manufactured from brass and shall use tamper resistant tools for installation and removal.

.4 All Polyethylene, Polyurethane, Elastomers, and Polymers used for paneling, signage or water deflection shall be resistant to chlorinated water and be ultraviolet stabilized to inhibit sunlight fading.

E31.1.3 Play Product Installation

.1 When applicable, templates shall be supplied to facilitate the installation of embedded anchoring equipment.

.2 All play products shall have electrical grounding studs incorporated into their associated anchoring equipment. All play products shall be grounded by the installer per local codes.

.3 All installation conduit wiring including electrical supply panel, PVC connections, piping, elbows, tees, play product assembly if required and other items relating to the installation shall be supplied by the general contractor.

E31.1.4 Commissioning of the Splashpad

.1 Upon completion of construction, the general contractor shall provide the owner/operator adequate training on facility operations and maintenance. The contractor may request that the manufacturer and/or manufacturer's representative provide on-site start-up and training for the owner/operator.

E31.1.5 Product Delivery, Storage, and Handling

.1 All aquatic play products and associated equipment must be properly wrapped and secured in place while in transport to the project Site. Care shall be observed during offloading and handling to prevent excessive stress and abrasions.

.2 At the Site, the play products and associated equipment are to be stored in safe areas, out of the way of traffic and other construction activities, until the actual time of installation. If required, safety barricades or other like precautions must be taken for the protection of public and adjacent property.

.3 Protective wrapping on the aquatic play features must be left in place until construction Work for the Splashpad is complete.

E31.1.6 Splashpad Equipment Warranties

.1 Minimum Warranty Periods

(a) A 25 Year Warranty on stainless steel Play Events/Products, stainless steel anchoring systems and aluminum spheres.

(b) A 10 Year Warranty on the reinforced fiberglass skid, sand filter fiberglass tank and cartridge filter fiberglass tank.

(c) A 5 Year Warranty on brass components including; spray nozzles, spray caps and spray heads. High-density polyethylene components, polyurethane components, and ultra high molecular weight polyethylene components. The Subterranean vault (enclosure and access hatches), stainless steel automated water distribution manifold, drain boxes, strainers, electrical enclosures, and chemical controllers.

(d) A 2 Year Warranty on color coatings, stainless steel hardware & moving parts, fiberglass products, Seeflow Polymers, Soft Touch Elastomers (Toe Gaurds), subterranean water containments system, circulation pumps, chemical injection pumps, chlorinator systems, acid feed systems, polyvinyl chloride (PVC); piping, fittings, ball valves, check valves, cartridge elements, pressure gauges, chemical sensing probes, motor starters, electrical relays, terminal blocks, actuated valves, programmable logic controller (PLC controller), time switches, manual switches, transformers, breakers, electrical wiring and connections.

E31.1.7 Additional Requirements

.1 The manufacturer is required to offer a complete water quality management system to accommodate the specified aquatic play products. This complete Splashpad automation package, consisting of a water containment system, water filtration system, chemical treatment system, water distribution system, operational control and monitoring systems, and a user activated controller to regulate the use of the play events and their hours of operation.

.2 This water quality management system must be pre-assembled and factory tested, and come complete with all the necessary plumbing and pre-wired solenoid valves. The manufacturer must hold and assume responsibility for a separate warranty and have the capacity to provide technical documentation and support for the entire system.

E31.2 Products

E31.2.1 Aquatic Play Features

.1 The contractor shall provide and install the following aquatic play features as manufactured by VORTEX, 328 Avro St., Montreal, Quebec, Canada H9R 5W5, (514) 694-3868

.2 Quantity to be as shown.

.1 VOR-0103 Bucket Trio

.2 VOR-0524 Bullfrog

.3 VOR-0304 Water Tunnel

.4 VOR-0301 Ground Geyser – 2 required.

.5 VOR-0523 Whale Tail

3. All aquatic play features will be constructed of type 304L stainless steel unless otherwise specified.

4. All aquatic play features will be supplied with the necessary anchoring hardware and installation templates, and shipped in a time to accommodate Site Work. The features shall come complete with a water inlet and electrical grounding lugs.

.5 All above ground aquatic play features constructed of type 304L stainless steel shall be sandblasted and will receive a weather resistant polyurethane, baked on, powder-coat finish. Coatings shall have a gloss finish with ultraviolet inhibitors and fire retardants.

6. All embedded aquatic play features shall be constructed of stainless steel 304L.
7. The aquatic play features are to meet ADA compliance, handicap accessible.
8. All grade level aquatic play features shall be furnished with appropriate winterization caps.
9. Nozzles, spray heads, spray caps and winter caps shall be constructed of C360 Brass and be fastened and removed from the play features using tamper resistant tools specifically designed for use with the proprietary nozzles, spray heads, spray caps and winter caps. The nozzles, spray heads, spray caps and winter caps shall be recessed into the aquatic play features to avoid protrusion hazards.
10. All anchoring; hardware, plates and flanges, shall be constructed of stainless steel and will be indicated on the shop drawings, as they may be required to complete installation.
11. An accessory kit shall be provided by the manufacturer of the aquatic play features, consisting of the necessary tamper resistant tools.

E31.2.2 Magic Touch Bollard (Activation Device)

.1 The contractor shall provide and install the following activation devices as manufactured by VORTEX, 328 Avro St., Montreal, Quebec, Canada H9R 5W5, (514) 694-3868.

.2 VOR- 0600 Magic Touch Bollard

.3 The activator shall have no moving parts and run on a low voltage electrical supply such as 24 volts direct current. It shall be the direct interface between the users of the aquatic play area and the aquatic play features. The pre-programmed sequences of the aquatic play features shall be activated only when touched by the user.

.4 Structure: shall be constructed of stainless steel 304/304L tubing with an external diameter of 6 5/8” and a wall thickness of 0.120”. It shall have an overall height of 51” and rise 39” above final grade.

.5 Activation Cap: shall consist of a high impact resistant protection cap and a low voltage sensor. The protection cap shall be constructed of high- density polyurethane with a diameter of 4”. The polyurethane shall be UV resistant, non-porous and nonflammable. It shall be equipped with an integrated threaded housing for the sensor. The sensor shall operate on 24 vdc with no visible or moving parts. It shall have a thermoplastic polyester housing and triple shield sensor protection. The sensitivity shall be adjustable with a LED indication. It shall be integrated and recessed into a handle-sphere. The activation cap shall be secured in place using a specially designed locking ring secured with tamper resistant fasteners.

.6 See drawings for details

E31.2.3 Water Quality Management and Filtration System

.1 VOR-9010056.2000 c/w filter and filter accessories.

E31.2.4 Water Quality Management System

.1 VOR-9010056.2000 without filter and filter accessories.

.2 The contractor shall provide and install the following activation devices as manufactured by VORTEX, 328 Avro St., Montreal, Quebec, Canada H9R 5W5, (514) 694-3868.

.3 The Water Quality Management System shall be factory assembled and water pressure tested before delivery.

.4 All electrical equipment, including circulation pumps, filtration pumps, chemical controllers, chemical feed pumps, electrical solenoid valves, and flow switches, shall be pre-wired and tested before delivery.

.5 All specified flow rates shall be tested and verified before delivery.

.6 All equipment shall be mounted directly onto a corrosion resistant skid using stainless steel hardware prior to delivery.

.7 The Water Quality Management System shall use NSF certified self-priming pump(s), with an integral strainer, to operate the play features.

.8 The pump(s) shall be capable of providing the required flow to operate all play features simultaneously at a minimum of 70 feet head.

.9 The pump shall be wired to the motor starters and the overload relays before delivery.

.10 All pump(s) shall be electronically interlocked to start and stop simultaneously, unless otherwise specified.

.11 The sand filter(s) shall be NSF-listed for swimming pool filters. It shall be capable of maintaining a filtration rate of less than 30 minutes, at the required filtration rate.

.12 A flow control valve and flow meter shall be present to maintain the required filter flow rates.

.13 Influent and effluent pressure gauges shall be present for the sand filter.

.14 A backwash valve kit shall be provided, including a sight glass, flow control valve, and flow meter to control the backwash rate.

.15 An automated chemical controller shall be present on the system, capable of monitoring and adjusting pH and ORP levels.

.16 The chemical controller shall have an alarm system that shall close all valves to the aquatic play features in case of a loss of proper water chemistry.

.17 The chemical controller shall not be capable of injecting chemicals into the system whenever the filter or feature pump is off.

.18 The chemical controller shall be pre-wired to the Splashpad System Controller and feed systems prior to delivery.

.19 The chemical feed systems shall be factory assembled, tested, and mounted to the fiberglass skid prior to delivery.

.20 The 50 gallon chemical reservoirs shall be double-walled polyethylene with a polyethylene lid and vent to atmosphere.

.21 A flow switch shall be present on each pump to monitor flow and shut down the pump system in the event of no flow. It shall be pre-wired to the Splashpad System Controller prior to delivery.

.22 The water distribution system must be fabricated out of Stainless Steel 304/304L and be pre-assembled, factory tested, and come complete with all the necessary plumbing.

.23 See drawings for details

E31.2.5 Splash Pad System Controller

.1 The Touch Pad programmable logic controller shall be mounted and pre-wired to all Water Quality Management System skid mounded components. Sized according to the number of outputs it is required to control, the programmable logic controller shall be factory programmed with a variety of spray sequences designed according to the requirements of the project. It shall have the flexibility to user modify the sequences using either a transportable memory cartridge or via the Touch Pad user interface.

.2 A 24hr/7day user programmable time switch, which shall allow the user to set the operational hours of the facility, shall be incorporated into the operating system. The time switch shall have the ability to be programmed with a different time schedule for each day of the week, and up to 2 time schedules per day.

.3 The operating system shall be capable of interfacing with the supplied automated water chemistry control unit, and other pertinent monitoring equipment and shall display current operating parameters on the touch screen interface. In the event of a chemical or equipment fault the operating system shall disable water flow to the patrons and/or initiate an equipment shut down procedure.

.4 The operating system shall be supplied with a touch pad user interface with controls for each output, activation device(s), and time switch. These selector switches allow the user to select the operational mode of the components (i.e. Hand, Off and Automatic)

.5 The operating system shall be housed in a corrosion resistant NEMA 4X rated enclosure, complete with stainless steel lockable latches.

.6 The operating system shall have the capacity to receive signals from activation devices, operating on 24VDC.

.7 The operating system shall have the capacity to send signals from the controller PLC to actuated valves operating at 24 VAC.

.8 The operating system shall have the ability to automatically purge all water lines based on the user selected time and duration (i.e. every day at 5 am). It shall also, be configured to purge all lines after a user defined period of inactivity (i.e. after 4 hours of inactivity).

.9 The operating system shall have the ability to display “help menu” topics within the touch pad screen window for each relevant function. i.e. an on screen step by step tutorial for backwashing the sand filter.

.10 The operating system shall contain a 120 VAC primary / 24 VAC secondary transformer with built- in electrostatic shield protection.

E31.2.6 Splash Pad Drain c/w Strainer Basket

.1 The contractor shall provide and install the following activation devices as manufactured by VORTEX, 328 Avro St., Montreal, Quebec, Canada H9R 5W5, (514) 694-3868.

.2 VOR- 1000.0001

.3 The activity deck drain(s) shall be fabricated from non-corrosive and non-tarnishing materials. The grating shall provide an anti-skid surface, with openings no larger that 5/16”, and shall be secured to the drain box with stainless steel tamper resistant hardware.

.4 The activity deck drain(s) shall be capable of handling 200 GPM flow at a maximum of 1.5 ft/sec, through an 8” PVC side outlet.

.5 The activity deck drain(s) shall be constructed to accept a removable stainless steel 22 gauge filtration basket, that if so configured, would capture all large debris prior to entering the drain line.

.6 See drawing for details.

E31.2.7 Water Containment System

.1 The contractor shall provide and install the following activation devices as manufactured by VORTEX, 328 Avro St., Montreal, Quebec, Canada H9R 5W5, (514) 694-3868.

.2 VOR- 5312.0000

.3 The 2000 gallon water containment system shall be fabricated form an impermeable potable water quality material and include appropriate check valves, automated water level control device, corrosion resistant access ladder, corrosion resistant lockable access hatch, and be factory assembled and pressure tested prior to delivery.

.4 The water containment system shall have inlets and outlets sized and located per the hydraulic requirements of the Water Quality Management System.

.5 The water containment system shall have an overflow line to connect to the sanitary system.

.6 The water containment system shall be equipped with anchoring straps to securely anchor the water containment system.

.7 See drawings for details.

E31.2.8 Method of Measurement

.1 The supply and installation of the Aquatic Play Features shall be measured on a Unit Price Basis. The number of Aquatic Play Feature Units to be paid for shall be the total number of Aquatic Play Features that are installed in accordance with this Specification and accepted ad counted by the Contract Administrator.

.2 The supply and installation of the Magic Touch Bollard Activation Devise shall be measured on a Unit Price Bases. The number of Magic Touch Bollard Activation Devise Units to be paid for shall be the total number of Magic Touch Bollard Activation Devises that are installed in accordance with this Specification and accepted ad counted by the Contract Administrator.

.3 The supply and installation of the Water Quality Management and Filtration System shall be measured on a Unit Price Bases. The number of Water Quality Management and Filtration System Units to be paid for shall be the total number of Water Quality Management and Filtration Systems that are installed in accordance with this Specification and accepted ad counted by the Contract Administrator.

.4 The supply and installation of the Water Quality Management System shall be measured on a Unit Price Bases. The number of Water Quality Management System Units to be paid for shall be the total number of Water Quality Management Systems that are installed in accordance with this Specification and accepted ad counted by the Contract Administrator.

.5 The supply and installation of the Splash Pad System Controller shall be measured on a Unit Price Bases. The number of Splash Pad System Controller Units to be paid for shall be the total number of Splash Pad System Controllers that are installed in accordance with this Specification and accepted ad counted by the Contract Administrator.

.6 The supply and installation of the Splash Pad Drain c/w Strainer Basket shall be measured on a Unit Price Bases. The number of Splash Pad Drain c/w Strainer Basket Units to be paid for shall be the total number of Splash Pad Drain c/w Strainer Baskets that are installed in accordance with this Specification and accepted ad counted by the Contract Administrator.

.7 The supply and installation of the Water Containment System shall be measured on a Unit Price Bases. The number of Water Containment System Units to be paid for shall be the total number of Water Containment Systems that are installed in accordance with this Specification and accepted ad counted by the Contract Administrator.

E31.2.9 Basis for Payment

.1 The supply and installation of the Aquatic Play Features shall be paid for at the Contract Unit Price per unit for the "Items of Work" listed below, measured as specified herein, which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.

Items of Work

.1 Bucket Trio

.2 Bullfrog

.3 Water Tunnel

.4 Ground Geyser

.5 Whale Tail

.2 The supply and installation of the Magic Touch Bollard shall be paid for at the Contract Unit Price per unit for the "Magic Touch Bollard", measured as specified herein, which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.

.3 The supply and installation of the Water Quality Management and Filtration System shall be paid for at the Contract Unit Price per unit for the "Water Quality Management and Filtration System", measured as specified herein, which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.

.4 The supply and installation of the Water Quality Management System shall be paid for at the Contract Unit Price per unit for the "Water Quality Management System", measured as specified herein, which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.

.5 The supply and installation of the Splash Pad System Controller shall be paid for at the Contract Unit Price per unit for the "Splash Pad System Controller", measured as specified herein, which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.

.6 The supply and installation of the Splash Pad Drain c/w Strainer Basket shall be paid for at the Contract Unit Price per unit for the "Splash Pad Drain c/w Strainer Basket", measured as specified herein, which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.

.7 The supply and installation of the Water Containment System shall be paid for at the Contract Unit Price per unit for the "Water Containment System", measured as specified herein, which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.