



**THE CITY OF WINNIPEG**

# **BID OPPORTUNITY**

**BID OPPORTUNITY NO. 438-2006**

**WINNIPEG TRAFFIC WAYFINDER SIGN SYSTEM- INSTALLATION OF POSTS  
INCLUDING PILE FOUNDATION**

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## **PART B - BIDDING PROCEDURES**

### **B1. PROJECT TITLE**

- B1.1 WINNIPEG TRAFFIC WAYFINDER SIGN SYSTEM- INSTALLATION OF POSTS INCLUDING PILE FOUNDATION

### **B2. SUBMISSION DEADLINE**

- B2.1 The Submission Deadline is 12:00 noon Winnipeg time, July 27, 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 The Bidder is advised that the Site is to be viewed prior to submitting a Bid to familiarize the Bidder with the nature of the Work area, and Site access restrictions. Bidders shall note that existing trees are to be protected and proximity of trees to the construction area may limit the type of construction equipment utilized. The Bidder is made aware the City Naturalist and Forestry Branch will require financial compensation for trees or plant material damaged by the Contractor.

### **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.

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>.

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 8 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.

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 B14.
- 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;
- 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.
- 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 owner of such business name shall be inserted.

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 10 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;
- (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.

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

All signatures shall be original.

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.

## **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:

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

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.

## **B11. OPENING OF BIDS AND RELEASE OF INFORMATION**

B11.1 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.

Bidders or their representatives may attend.

B11.2 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>.

B11.3 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>.

B11.4 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.

## **B12. IRREVOCABLE BID**

B12.1 The Bid(s) submitted by the Bidder shall be irrevocable for the time period specified in Paragraph 9 of Form A: Bid.

B12.2 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 for the time period specified in Paragraph 9 of Form A: Bid.

## **B13. WITHDRAWAL OF BIDS**

B13.1 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.



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.

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 10 of Form A: Bid, and only such person, has authority to give notice of withdrawal.

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 10 of Form A: Bid; and
- (c) if the notice has been given by any one of the persons specified in 0(b), declare the Bid withdrawn.

B13.2 A Bidder who withdraws his Bid after the Submission Deadline but before his Bid has been released or has lapsed as provided for in B12.2 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.

#### **B14. EVALUATION OF BIDS**

B14.1 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.

B14.2 Further to B14.1(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.

B14.3 Further to B14.1(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.

B14.4 Further to B14.1(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.

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.

#### **B15. AWARD OF CONTRACT**

B15.1 The City will give notice of the award of the Contract or will give notice that no award will be made.

**B15.2** 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.

Without limiting the generality of B15.2, 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.

**B15.3** 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.

**B15.4** Notwithstanding GC:4, the City will issue a Purchase Order to the successful Bidder in lieu of the execution of a Contract.

**B15.5** The Contract, as defined in GC:1.1, in its entirety shall be deemed to be incorporated in and to form a part of the Purchase Order notwithstanding that it is not necessarily attached to or accompany said Purchase Order.

## **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.

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
- (a) Supply and install Pile foundations, which includes **obtaining the exact location of the buried utilities from the appropriate Utility Authority prior to installing the piles.**
  - (b) Supply and install Breakaway bases;
  - (c) Install Posts.

#### D3. CONTRACT ADMINISTRATOR

- D3.1 The Contract Administrator is ^, represented by:
- Tom Fred  
Project Management Coordinator  
Planning and Land Use Division  
Planning, Property and Development Department  
15-30 Fort Street Winnipeg R3C 4X3
- Telephone No. (204) 986 4171  
Facsimile No. (204) 986 7524
- 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

## **SUBMISSIONS**

### **D6. INSURANCE**

- D6.1 The Contractor shall provide and maintain the following insurance coverage:
- (a) commercial general liability insurance, in the amount of at least two 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;
- D6.2 Deductibles shall be borne by the Contractor.
- D6.3 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 seven (7) Calendar Days from notification of the award of Contract.

D6.4 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.

#### **D7. PERFORMANCE SECURITY**

D7.1 If the Contract Price exceeds twenty-five thousand dollars (\$25,000.00), 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.

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.

D7.2 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 Purchase Order and prior to the commencement of any Work on the Site.

#### **D8. SUBCONTRACTOR LIST**

D8.1 The Contractor shall provide the Contract Administrator with a complete list of the Subcontractors whom the Contractor proposes to engage (Form J: Subcontractor List) at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than seven (7) Calendar Days from notification of the award of Contract.

### **SCHEDULE OF WORK**

#### **D9. COMMENCEMENT**

D9.1 The Contractor shall not commence any Work until he is in receipt of a Purchase Order from the Award Authority authorizing the commencement of the Work.

D9.2 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 D6;
  - (iv) the performance security specified in D7; and
  - (v) the Subcontractor list specified in D8.

- (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.

D9.3 The Contractor shall commence the Work on the Site within seven (7) Working Days of receipt of the Purchase Order.

#### **D10. SUBSTANTIAL PERFORMANCE**

D10.1 The Contractor shall achieve Substantial Performance within Twenty Five (25) consecutive Working Days of the commencement of the Work as specified in D9.

D10.2 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 reinspected.

D10.3 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.

#### **D11. TOTAL PERFORMANCE**

D11.1 The Contractor shall achieve Total Performance within Thirty (30) consecutive Working Days of the commencement of the Work as specified in D9.

D11.2 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 reinspected.

D11.3 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.

#### **D12. LIQUIDATED DAMAGES**

D12.1 If the Contractor fails to achieve Substantial Performance in accordance with the Contract by the day fixed herein for Substantial Performance, the Contractor shall pay the City Five hundred dollars (\$500) per Working Day for each and every Working Day following the day fixed herein for Substantial Performance during which such failure continues.

D12.2 The amount specified for liquidated damages in D12.1 is based on a genuine pre-estimate of the City's losses in the event that the Contractor does not achieve Substantial Performance by the day fixed herein for same.

D12.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

#### **CONTROL OF WORK**

##### **D13. JOB MEETINGS**

D13.1 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.

D13.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he deems it necessary.

**D14. PRIME CONTRACTOR – THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA)**

D14.1 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).



**FORM H1: PERFORMANCE BOND**  
(See D7)

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. 438-2006**

**WINNIPEG TRAFFIC WAYFINDER SIGN SYSTEM- INSTALLATION OF POSTS INCLUDING PILE FOUNDATION**

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 D7)

\_\_\_\_\_  
(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. 438-2006

WINNIPEG TRAFFIC WAYFINDER SIGN SYSTEM- INSTALLATION OF POSTS INCLUDING  
PILE FOUNDATION

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)



## 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 on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Branch 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:

<u>Drawing No.</u>	<u>Drawing Name/Title</u>
3.01	PORTAGE & BROADWAY SIGN PLAN SIGN
3.02	DOWNTOWN WINNIPEG SIGN PLAN MAP
WF-ST-01	CONCRETE PILE FOUNDATION DETAILS
ST-116	TOP RING FORM FOR STANDARD DUTY TRAFFIC SIGN
ST-117	STANDARD DUTY POLE BASE ANCHOR BOLT TEMPLATE

#### E2. WORK

- E2.1 Description
- E2.1.1 The Work covered under this item shall include all operations related to the construction of ninety-one (91) concrete piles and installation of the pre-fabricated structural steel posts for the Winnipeg Traffic Wayfinder Signage System at various locations within Downtown Winnipeg, in accordance with this specification and as shown on the applicable Drawings.
- E2.1.2 The Work to be done by the Contractor under this Specification shall include the supply of all materials, and the furnishing of all superintendence, overhead, labour, equipment, tools, supplies and all other things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified.
- E2.2 Work
- E2.2.1 This section gives a general overview of the work required to be carried out by the Contractor. The detailed specifications for the concrete pile foundations and pre-fabricated structural steel posts is given in subsequent sections.
- E2.2.2 The contractor shall be responsible for the following work:
- Visiting each site location with the Contract Administrator who will mark the location of the structure.
  - Temporary traffic and pedestrian control.
  - Clearance from all utility companies.
  - Construction of cast-in-place concrete pile foundations, complete with anchor bolts.
  - Supply and installation of breakaway base assemblies.
  - Transport and installation of the pre-fabricated structural steel posts at the corresponding locations throughout Downtown Winnipeg.

- (g) Restoration of existing property adjacent to piles.
- (h) Clean-up of Site.

E2.3 Location

<b>STRUCTURE NO.</b>	<b>LOCATION</b>
WF001	S/S Broadway EB East of Osborne St.
WF002	S/S Broadway EB East of Osborne St. (before Legislative Building)
WF003	S/S Broadway EB East of Edmonton St.
WF004	E/S Carlton St. SB South of Broadway
WF005	S/S Broadway EB West of Hargrave St.
WF006	W/S Hargrave St. SB North of York Ave.
WF007	S/S Broadway EB West of Smith St.
WF008	S/S Broadway EB West of Garry St.
WF009	S/S Assiniboine Ave. WB facing SB Traffic on Garry St.
WF010	Median Broadway EB West of Fort St.
WF011	Median Broadway EB West of Main St.
WF012	N/S Broadway WB West of Fort St.
WF013	N/S Broadway WB West of Hargrave St.
WF014	N/S Broadway WB West of Kennedy St.
WF015	E/S Main St. NB Opposite Assiniboine Ave.
WF016	E/S Main St. NB North of Broadway
WF017	E/S Main St. NB South of York Ave.
WF018	E/S Main St. NB North of York Ave.
WF019	E/S Main St. NB South of St. Mary Ave.
WF020	E/S Main St. NB Opposite Graham Ave. (See Note 2)
WF021	E/S Main St. NB South of Lombard Ave. (just south of)
WF022	E/S Main St. NB North of Lombard Ave.
WF023	E/S Main St. NB North of William Ave.
WF024	S/S Market Ave. EB East of Main St.
WF025	E/S Lily St. NB North of James Ave.
WF026	N/S Rupert Ave. WB East of Main St. (See Note 5)
WF027	Median Main St. NB North of James Ave.
WF028	W/S Main St. SB South of Disraeli Fwy.
WF029	S/S Rupert Ave. EB Opposite Martha St.
WF030	W/S Main St. SB South of Pacific Ave.
WF031	N/S Rupert Ave. WB East of Princess St.
WF032	E/S Princess St. SB opposite Elgin Ave.
WF033	W/S Main St. SB North of Portage Ave. (just north of)
WF034	W/S Main St. SB opposite Lombard Ave.
WF035	W/S Main St. SB opposite Pioneer Ave. (See Note 2)
WF036	W/S Main St. SB opposite Water Ave.
WF037	W/S Main St. SB North of St. Mary Ave.
WF038	W/S Main St. SB South of York Ave.
WF039	W/S Main St. SB North of Broadway

WF040	S/S Portage Ave. EB West of Canora St.
WF041	S/S Portage Ave. EB East of Good St.
WF042	S/S Portage Ave. EB West of Balmoral St.
WF043	S/S Portage Ave. EB West of Good St.
WF044	E/S Colony St. NB South of Ellice Ave.
WF045	S/S Ellice Ave. EB East of Edmonton St.
WF046	S/S Portage Ave. EB West of Kennedy St.
WF047	W/S Kennedy St. SB North of St. Mary Avenue
WF048	S/S Portage Ave. EB West of Carlton St.
WF049	W/S Carlton St. SB North of York Ave.
WF050	S/S York Ave. EB West Hargrave St.
WF051	W/S Donald St. SB North of St. Mary Ave.
WF052	S/S Portage Ave. EB West of Garry St.
WF053	E/S Garry St. SB South of Portage Ave.
WF054	W/S Garry St. SB North of St. Mary Ave.
WF055	S/S Portage Ave. EB East of Fort St.
WF056	S/S Portage Ave. EB West of Main St. (See Note 2)
WF057	Median Pioneer Ave. WB East of Waterfront Dr.
WF058	N/S Pioneer Ave. WB West of Waterfront Dr.
WF059	E/S Westbrook St. NB South of Portage Ave. E.
WF060	S/S Pioneer Ave. WB East of Main St.
WF061	S/S Pioneer Ave. WB East of Westbrook St.
WF062	N/S Portage Ave. E. WB East of Main St.
WF063	N/S Portage Ave. WB West of Main St.
WF064	N/S Notre Dame Ave. WB West of Portage Ave.
WF065	E/S Albert St. NB North of Notre Dame Ave.
WF066	N/S Portage Ave. WB West of Garry St.
WF067	N/S Portage Ave. WB East of Vaughan St.
WF068	E/S Vaughan St. NB North of the Promenade
WF069	S/S The Promenade EB East of Vaughan St.
WF070	N/S Portage Ave. WB West of Colony St.
WF071	E/S Balmoral St NB South of Ellice Ave.
WF072	N/S Portage Ave. East of Colony St.
WF073	E/S Smith St. NB North of Navy Way
WF074	E/S Smith St.. NB North of Navy Way (just south of Alleyway)
WF075	E/S Smith St. NB South of York Way
WF076	S/S York Ave. EB East of Garry St
WF077	E/S Fort St. WB North of Graham Ave.
WF078	E/S Smith St. NB South of St. Mary Ave. (see Note 9)
WF079	W/S Smith St. NB North of St. Mary Ave.
WF080	E/S Smith St. NB North of Graham Ave.
WF081	W/S Smith St. NB North of Portage Ave.
WF082	N/S St. Mary Ave. WB West of Main St.
WF083	N/S St. Mary Ave. WB East of Smith St.
WF084	N/S St. Mary Ave. WB East of Hargrave St.
WF085	N/S St. Mary Ave. WB East of Carlton St.
WF086	N/S St. Mary Ave. WB West of Kennedy St.
WF087	E/S Vaughan St. NB South of Graham Ave.



WF088	N/S St. Mary Ave. WB East of Memorial Blvd.
WF089	E/S Memorial Blvd. NB North of St. Mary Ave.
WF090	S/S York Ave. EB West of Waterfront Dr.
WF091	N/S York Ave. EB East of Main St.

### **E3. CONCRETE PILE FOUNDATIONS**

#### **E3.1 Description**

E3.1.1 The Work covered under this Item shall include all concreting operations related to construction of cast-in-place concrete pile foundations in accordance with this Specification and as shown on the Drawings.

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 Works as hereinafter specified.

#### **E3.2 Materials**

##### **E3.2.1 General**

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

##### **E3.2.2 Handling and Storage of Materials.**

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

##### **E3.2.3 Testing and Approval**

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. All materials shall conform to CSA Standard CAN3-A23.1. All testing of materials shall conform to CSA Standard CAN3-23.2.

##### **E3.2.4 Cement**

Cement shall be Type HS, high sulphate-resistant hydraulic cement, conforming to the requirements of CSA A3001-03.

##### **E3.2.5 Supplementary Cementing Materials**

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

##### **E3.2.6 Water**

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.

##### **E3.2.7 Aggregate**

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 tentatively approved 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

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.

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
10,000	100%
5,000	95% - 100%
2,500	80% - 100%
1,250	50% - 90%
630	25% - 65%
315	10% - 35%
160	2% - 10%
80	0% - 3%

(b) Coarse Aggregate (40 mm Nominal)

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 percent, and shall conform to the following gradation requirements:

Gradation of Fine Aggregates	
Canadian Metric Sieve Size	Percent of Total Dry Weight Passing Each Sieve
56,000	100%
40,000	95% - 100%
20,000	30% - 70%
10,000	10% - 0%
5,000	0% - 5%

E3.2.8 Admixtures

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 other constituent materials.

E3.2.9 Reinforcing Steel

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

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

#### E3.2.10 Anchor Bolts, Nuts, and Washers

Anchor bolts, nuts, and washers shall be in accordance with CSA Standard G40.21 Grade 300 W, and shall be hot-dip galvanized full length in accordance with CSA G164 for a minimum net retention of 600 g/m<sup>2</sup>, for the entire length of the anchor bolts. The top 300 mm shall be threaded. The anchor bolts shall be 25 mm (1 inch) nominal diameter with 8 UNC threads. Anchor bolt supply and installation will be incidental to construction of concrete pile foundation and no separate payment will be made.

#### E3.2.11 Nut Covers

The bolts shall be capped with a 1 inch plastic Nut Cover, manufactured by Nova Pole International, Attention: Sandra Atkins, Distributor, 203, 26229 Township Road, Spruce Grove, Alberta. In the case of Alternatives 1, 2, and 3, the nut covers shall be dark blue in colour matching Pantone Colour System PMS 2738. In the case of Alternatives 4, 5, and 6, the nut covers shall be grey in colour matching Pantone Colour System PMS 429C.

#### E3.2.12 Top Ring Form

Top Ring form to be supplied by the Contractor shall be in accordance with City of Winnipeg Standard Drawing ST-116. It will be incidental to construction of new concrete pile foundations and no separate payment will be made.

#### E3.2.13 Anchor Bolt Template

Anchor bolt template to be supplied by the Contractor shall be in accordance with the City of Winnipeg Standard Drawing ST-117. It will be incidental to construction of new concrete pile foundations and no separate payment will be made.

#### E3.2.14 Breakaway Base Assembly

Breakaway base assembly shall be shown on the Drawings and shall include a C-5 Coupler as manufactured by Safety Base Ltd., 1036 Waverley Street, Winnipeg, Manitoba, R3P 0T3, Attention: Brent Poole.

#### E3.2.15 Miscellaneous Materials

Miscellaneous materials shall be of the type specified on the drawings or approved by the Contract Administrator.

### E3.3 Concrete Mix Design

#### E3.3.1 Proportioning of fine aggregate, coarse aggregate, cement, water, and air entraining agent shall be such as yield concrete having the required strength and workability as following:

- (i) Minimum Compressive Strength at 28 days = 35MPa
- (ii) Maximum Water/Cement Ratio = 0.45
- (iii) Minimum Cement Content = 340 kg/m<sup>3</sup>

- (iv) Slump = 80 mm – 30 mm
- (v) Aggregate: 20 mm nominal
- (vi) Air Content: 5.0 to 8.0 percent
- (vii) Cement – Type HS, high sulphate-resistant.

#### E3.4 Equipment

E3.4.1 All equipment shall be of a type approved by the contract Administrator and shall be kept in good working order.

#### E3.5 Construction Methods

##### E3.5.1 Location and Alignment of Piles

- (a) Piles shall be placed in the positions shown on the drawings and as directed by the Contract Administrator in the field.
- (b) Contractor shall satisfy the Contract Administrator, by way of examination at each Site jointly by the Contractor and Contract Administrator (or designate), that the specific Site chosen for the location of the pile is acceptable from a perspective of road user visibility and from a perspective of proximity to existing structures and utilities. Subject to such examination, the location of each specific Site so agreed upon shall be marked by a means such as the insertion of a miniature flag in the boulevard or median when grassed, or by a means such as spray painting in the boulevard or median if concrete-surfaced.
- (c) The centre of the pile shall be no closer than 0.8 m from the inside face of curb of the adjacent roadway for right-hand-side (RHS) mounted signs. For left-hand-sign (LHS) mounted signs, the centre of the pile shall be no closer than 1.8 m from the inside face of the curb adjacent to the roadway.
- (d) The deviation of the axis of any finished pile shall not differ by more than 1 percent from the vertical.

##### E3.5.2 Buried Utilities

- (a) The Contractor shall exercise extreme caution when constructing the pile foundations in the vicinity 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.**
- (b) 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.

##### E3.5.3 Adjacent Property and Site Restoration

- (a) When sidewalk or median slab must be removed in preparation for excavation, the Contractor shall saw-cut the slab surface to a minimum depth of 100 mm at both ends of the designated section, carefully break down the designated concrete slab and remove all loose concrete. Care shall be taken to ensure that the saw-edges are not chipped or broken and that existing tie-bars and dowel rods encountered during this work are not damaged.
- (b) The restoration of existing concrete sidewalks/medians and curbs, as well as boulevard median, interlocking paving stone, or sodding will be incidental to the construction of cast-in place concrete pile foundations, and no separate payment will be made. Granular material for backfilling shall conform to Specification CW 3110, Clause 5.5, "Base Course Material ," except crushed limestone shall not be used.
- (c) Sidewalk or median concrete paving shall be saw cut at least 300 mm all around from the edge of pile and restored flush with adjacent surface level after the new pile has

been installed. When interlocking stone must be removed in preparation for excavation, the Contractor shall, upon construction of the pile, restore the area with interlocking stone having a colour and shape and installation pattern identical to that which was originally in place. Based on the weather conditions, the Contractor shall temporarily restore the Site to the satisfaction of the Contract Administrator until final restoration.

#### E3.5.4 Excavation

- (a) Excavations for piles shall be made with equipment designed to remove a core of the diameter shown on the Drawings.
- (b) Upon reaching the required depth, the bottom of the hole 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.
- (c) All excavated material from the piles shall be promptly hauled from the Site to an approved disposal area as located by the Contractor.
- (d) Upon completion of the cleaning out of the bottom of the hole to the satisfaction of the Contract Administrator, the reinforcement and anchor bolts shall be set in place and the concrete poured immediately. Under no circumstances shall a hole be left to stand open after boring has been completed.
- (e) If any hole is condemned because of caving, it shall be filled with lean-mix concrete and a new hole bored as near as possible to the location shown on the Drawings. Payment will not be made for condemned piles.

#### E3.5.5 Sleeving

- (a) For cast-in-piles greater than 1.0 in diameter, timber or steel sleeving shall be used to temporarily line the hole to prevent bulging or caving of the walls and to protect men at work in the hole.
- (b) The sleeving shall be designed by the Contractor and constructed to resist all forces that may tend to distort it.
- (c) The sleeving shall be withdrawn as the concrete is placed in the bore. The sleeving shall extend at least 1 mm below the top of the freshly deposited concrete at all times.
- (d) The clearance between the face of the bore hole and the sleeving shall not exceed 75 mm.

#### E3.5.6 Inspection of Boreholes

- (a) Concrete shall not be placed in a borehole until it has been inspected and approved by the Contract Administrator.
- (b) The Contractor shall have available suitable light for the inspection of each borehole throughout its entire length.
- (c) All improperly set sleeving, bore, bell, or bottom shall be corrected to the satisfaction of the Contract Administrator.

#### E3.5.7 Placing Reinforcing Steel

- (a) Reinforcement shall be:
  - (i) Placed in accordance with the details shown on the Drawings,
  - (ii) rigidly fastened together, and
  - (iii) lowered into the borehole intact before concrete is placed.
- (b) Spacers shall be utilized to properly locate the reinforcing steel cage in the borehole.

#### E3.5.8 Placing Anchor Bolts

- (a) The Contractor shall fabricate a top steel ring form and steel anchor bolt template for the piles shown on the Drawings. The top steel ring form shall be used for all pile bases. The anchor bolts shall be aligned with the anchor bolt template. Extreme care shall be used in this operation. Placement of anchor bolts without the top steel ring form and steel template will not be permitted.
- (b) 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.

#### E3.5.9 Forms

- (a) The top 600 mm of the piles below the top steel form shall be formed with tubular forms (Sonotube).
- (b) 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 drawing.

#### E3.5.10 Placing Concrete

- (a) Care shall be taken to ensure that anchor bolts are vertically aligned and properly positioned prior to placement of concrete.
- (b) 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 concrete shall be vibrated throughout the entire length of the pile.
- (c) 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.
- (d) The shaft and bell 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.

#### E3.5.11 Tremie Concrete

- (a) The shaft of the pile shall be pumped clear of water so that the bottom can be cleaned and belled. 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.
- (b) Tremie concrete shall only be poured up to the top of the bell or as the Contract Administrator directs. Pumps shall then be lowered into the bore and excess water pumped out. The laitance that forms on top of the tremie shall then be removed and remainder of the concrete shall be placed in the dry.

#### E3.5.12 Protection of Newly Placed Concrete

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

#### E3.5.13 Curing Concrete

- (a) The top of the freshly concrete piles shall be covered and kept moist by means of wet polyester blankets immediately following finishing operations and shall be maintained at above 10 degrees Celsius for at least seven (7) consecutive days thereafter.
- (b) After the finishing is completed, the surface shall be promptly covered with a minimum of a single layer of clean, damp polyester blanket.

- (c) 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 twenty-four hours after the end of the curing period.
- (d) Changes in temperature of the concrete shall be uniform and gradual and shall not exceed 3 degrees in one hour or 20 degrees in twenty-four hours.

E3.5.14 Form Removal

- (a) 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
- (b) The minimum strength of concrete in place for safe removal of forms shall be 20 MPA.
- (c) Field-cured test specimens, representative of the in-place concrete being stripped, will be tested to verify the concrete strength.

E3.5.15 Patching of Formed Surfaces

- (a) Immediately after forms around top of pile has been removed, but before any repairing or surface finishing is started, the concrete surface shall be inspected by the Contract Administrator. Any repair of surface finishing started before this inspection may be rejected and required to be removed.
- (b) All formed concrete surfaces shall have bolts, ties, struts, and all other timber or metal parts not specifically required for construction purposes cut back fifty (50) mm from the surface before patching.
- (c) Minor surface defects caused by honeycomb, air pockets greater than 5 mm in diameter, and voids left by strutting, and tie holes shall be repaired by removing the defective concrete to sound concrete, dampening the areas to be patched and then applying patching mortar. A slurry grout consisting of water and cement, shall be well-brushed onto the area to be patched. When the slurry grout begins to lose the water sheen, the patching mortar shall be applied. It shall be struck-off slightly higher than the surface and left for one hour before final finishing to permit initial shrinkage of the patching mortar and it shall be touched up until it is satisfactory to the Contract Administrator. The patch shall be cured as specified in this Specification, and the final colour shall match the surrounding concrete.

E3.5.16 Cold Weather Concreting

Protection of concrete shall be considered incidental to its placement. The temperature of the concrete shall be maintained at or above 10 degrees for a minimum of three (3) days or until 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.

E3.6 Quality Control

E3.6.1 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.

E3.6.2 The Contractor shall be responsible for making a thorough inspection of materials to be supplied under the Contract. All material shall be free of surface imperfections and other defects.

**E3.7 Measurement and Payment**

**E3.7.1 Construction of Concrete Pile Foundations**

Construction of concrete pile foundations including supply and installation of anchor bolts and breakaway base assemblies will not be measured and paid for separately. They will be considered as part of the complete installation of the Traffic Wayfinder Signage System as specified in Section E2.

**E4. SUPPLY AND INSTALLATION BREAKAWAY BASES AND INSTALLATION OF POSTS**

**E4.1** The Contractor will be responsible for supply and installation of breakaway bases and installation of the posts

**E4.2 Delivery and Erection**

**E4.2.1** The Contractor shall notify the Contract Administrator at least two (2) working days in advance of the anticipated delivery to the Site and erection of the posts.

**E4.2.2** The posts shall be lifted and secured with nylon ropes or other approved methods. Use of steel chains and steel hooks against hot-dip galvanized surfaces and painted surfaces will not be permitted. All posts and brackets shall be wrapped in cardboard during transportation to the Site to protect the coated finish.

**E4.2.3** The Contractor shall ensure that the anchoring nuts of the anchor bolts are tightened according to the "turn-of-nut" method of the AASHTO Code.

**E4.3 Field-Applied Touch-up Galvanizing**

**E4.3.1** Any areas of damaged galvanizing on the posts shall receive field-applied touch-up galvanizing.

**E4.3.2** Surfaces to receive touch-up galvanizing shall be cleaned using a wire brush, a light grinding action, or mild blasting to remove loose scale, rust, paint, grease, dirt, or other contaminants. Preheat the surface to 315 degrees celsius and wire brush the surface during preheating. Rub the cleaned preheated areas with the repair stick to deposit an evenly distributed layer of zinc alloy. Spread the alloy with a wire brush, spatula, or similar tool. Field-applied galvanizing shall be blended into existing galvanizing of surrounding surfaces and shall be buffed and polished if required to match the surrounding surfaces. Care shall be taken to not overheat surfaces beyond 400 degrees celsius and to not apply direct flame to the alloy rods.

**E4.4 Method of Measurement**

The supply and installation of breakaway bases and installation of post shall be measured on a unit basis. The number of posts and breakaway bases to be paid for shall be the total number of posts and breakaway bases that are installed in accordance with this Specification and accepted by the Contract Administrator.

**E4.5 Basis of Payment**

The supply and installation of breakaway bases and installation of post shall be paid for at the Contract Unit Price per unit measured as specified herein, which price shall be payment in full for supplying all materials and performing all operation herein described including all other items incidental to the Work included in this Specification.