THE CITY OF WINNIPEG

BID OPPORTUNITY

BID OPPORTUNITY NO. 232-2010

INKSTER BOULEVARD WIDENING AND REHABILITATION: PART 1 – BROOKSIDE BOULEVARD TO KEEWATIN STREET, PART 2 – 430 M WEST OF OAK POINT HIGHWAY TO BROOKSIDE BOULEVARD

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PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

B1.1 INKSTER BOULEVARD WIDENING AND REHABILITATION: PART 1 – BROOKSIDE BOULEVARD TO KEEWATIN STREET, PART 2 – 430 M WEST OF OAK POINT HIGHWAY TO BROOKSIDE BOULEVARD

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, May 7, 2010.

B2.2 Bids 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. ENQUIRIES

B3.1 All enquiries shall be directed to the Contract Administrator identified in D3.1.

B3.2 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.

B3.3 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.

B3.4 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.

B3.5 The Bidder shall not be entitled to rely on any response or interpretation received pursuant to B3 unless that response or interpretation is provided by the Contract Administrator in writing.

B4. ADDENDA

B4.1 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.

B4.2 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.

B4.2.1 Addenda will be available on the Bid Opportunities page at The City of Winnipeg, Corporate Finance, Materials Management Division website at http://www.winnipeg.ca/matmgt/bidopp.asp

B4.2.2 The Bidder is responsible for ensuring that he has received all addenda and is advised to check the Materials Management Division website for addenda regularly and shortly before the Submission Deadline, as may be amended by addendum.

B4.3 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.

B5. SUBSTITUTES

B5.1 The Work is based on the Plant, Materials and methods specified in the Bid Opportunity.

B5.2 Substitutions shall not be allowed unless application has been made to and prior approval has been granted by the Contract Administrator in writing.

B5.3 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.

B5.4 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.

B5.5 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.

B5.6 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.

B5.6.1 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.

B5.7 If the Contract Administrator approves a substitute as an “approved equal”, any Bidder may use the approved equal in place of the specified item.

B5.8 If the Contract Administrator approves a substitute as an “approved alternative”, any Bidder bidding that approved alternative may 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.

B5.9 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.

B5.10 Notwithstanding B5.2 to B5.9, in accordance with B6.6, deviations inconsistent with the Bid Opportunity document shall be evaluated in accordance with B14.1(a).

B6. BID COMPONENTS

B6.1 The Bid shall consist of the following components:

(a) Form A: Bid;

(b) Form B: Prices, hard copy;

(c) Bid Security;

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

B6.2 Further to B6.1, the Bidder should include the written correspondence from the Contract Administrator approving a substitute in accordance with B5.

B6.3 All components of the Bid 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, to constitute a responsive Bid.

B6.4 The Bid shall be submitted enclosed and sealed in an envelope clearly marked with the Bid Opportunity number and the Bidder's name and address.

B6.4.1 Samples or other components of the Bid 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.

B6.4.2 A hard copy of Form B: Prices must be submitted with the Bid. If there is any discrepancy between the Adobe PDF version of Form B: Prices and the Microsoft Excel version of Form B: Prices, the PDF version shall take precedence.

B6.5 Bidders are advised not to include any information/literature except as requested in accordance with B6.1.

B6.6 Bidders are advised that inclusion of terms and conditions inconsistent with the Bid Opportunity document, including the General Conditions, will be evaluated in accordance with B14.1(a).

B6.7 Bids submitted by facsimile transmission (fax) or internet electronic mail (e-mail) will not be accepted.

B6.8 Bids shall be submitted to:

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

B7. BID

B7.1 The Bidder shall complete Form A: Bid, making all required entries.

B7.2 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.

B7.2.1 If a Bid is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B7.2.

B7.3 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.

B7.4 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, shall 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.

B7.4.1 The name and official capacity of all individuals signing Form A: Bid should be printed below such signatures.

B7.5 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 and the Contract, when awarded, shall be both joint and several.

B8. PRICES

B8.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B: Prices.

B8.1.1 For the convenience of Bidders, and pursuant to B6.4.2 and B14.4.3, an electronic spreadsheet Form B: Prices in Microsoft Excel (.xls) format is available along with the Adobe PDF documents for this Bid Opportunity on the Bid Opportunities page at the Materials Management Division website at http://www.winnipeg.ca/matmgt

B8.2 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.

B8.3 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.

B8.4 Prices from Non-Resident Bidders are subject to a Non-Resident Withholding Tax pursuant to the Income Tax Act (Canada).

B8.5 Form B: Prices is organized into Parts: Part 1 of the Work and Part 2 of the Work. Bidders shall provide a total price for each Part and, on the summary sheet, a Total Bid Price consisting of the sum of prices for Part 1 and Part 2.

B9. QUALIFICATION

B9.1 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; and

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

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

B9.2 The Bidder and any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:

(a) be responsible and not be suspended, debarred or in default of any obligations 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 Division website at http://www.winnipeg.ca/matmgt/debar.stm

B9.3 The Bidder and/or any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:

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

(b) be fully capable of performing the Work required to be in strict accordance with the terms and provisions of the Contract; and

(c) have a written workplace safety and health program if required pursuant to The Workplace Safety and Health Act (Manitoba).

B9.4 Further to B9.3(c), the Bidder shall, within five (5) Business Days of a request by the Contract Administrator, provide proof satisfactory to the Contract Administrator that the Bidder/Subcontractor 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 administered by the Manitoba Construction Safety Association or by the Manitoba Heavy Construction Association's Safety, Health and Environment Program; or

(b) 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 Division website at http://www.winnipeg.ca/matmgt)

B9.5 The Bidder shall 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.

B9.6 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. BID SECURITY

B10.1 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.

B10.1.1 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.

B10.1.2 All signatures on bid securities shall be original.

B10.1.3 The Bidder shall sign the Bid Bond.

B10.1.4 The Surety shall sign and affix its corporate seal on the Bid Bond and the Agreement to Bond.

B10.2 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.

B10.2.1 Where the bid security provided by the successful Bidder is in the form of a certified cheque or draft pursuant to B10.1(c), it will be deposited and retained by the City as the performance security and no further submission is required.

B10.2.2 The City will not pay any interest on certified cheques or drafts furnished as bid security or subsequently retained as performance security.

B10.3 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.

B11. OPENING OF BIDS AND RELEASE OF INFORMATION

B11.1 Bids will be opened publicly, after the Submission Deadline has elapsed, in the office of the Corporate Finance Department, Materials Management Division, or in such other office as may be designated by the Manager of Materials.

B11.1.1 Bidders or their representatives may attend.

B11.1.2 Bids determined by the Manager of Materials, or his designate, to not include the bid security specified in B10 will not be read out.

B11.2 Following the submission deadline, the names of the Bidders and their Total Bid Prices (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 Division website 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 Division website at http://www.winnipeg.ca/matmgt

B11.4 The Bidder is advised that any information contained in any Bid 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 11 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 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.

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.

B13.1.1 Notwithstanding C23.3, 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.

B13.1.2 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.

B13.1.3 If a Bidder gives notice of withdrawal prior to the Submission Deadline, the Manager of Materials will:

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

(b) open the Bid 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 B13.1.3(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, including the right to retain the Bidder's bid security.

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, or acceptable deviation therefrom (pass/fail);

(b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B9 (pass/fail);

(c) Total Bid Price;

(d) economic analysis of any approved alternative pursuant to B5.

B14.2 Further to B14.1(a), the Award Authority may reject a Bid as being non-responsive if the Bid 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 or minor informalities or irregularities, if the interests of the City so require.

B14.2.1 Any bid with an apparent imbalance between the unit prices in Part 1 and Part 2 may be determined to be non-responsive and rejected by the Award Authority in its sole discretion, acting reasonably.

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 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.

B14.4.1 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.

B14.4.2 Further to B14.1(a), in the event that a unit price is not provided on Form B: Prices, the City will determine the unit price by dividing the Amount (extended price) by the approximate quantity, for the purposes of evaluation and payment.

B14.4.3 The electronic Form B: Prices and the formulas imbedded in that spreadsheet are only provided for the convenience of Bidders. The City makes no representations or warranties as to the correctness of the imbedded formulas. It is the Bidder's responsibility to ensure

the extensions of the unit prices and the sum of Total Bid Price performed as a function of the formulas within the electronic Form B: Prices are correct.

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.

B15.2.1 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, in accordance with B14.

B15.3.1 Following the award of contract, a Bidder will be provided with information related to the evaluation of his Bid upon written request to the Contract Administrator.

B15.4 Approved funding is in place from the Province for Work associated with Part 2, as noted in D2 and identified in Form B: Prices.

PART C - GENERAL CONDITIONS

C0. GENERAL CONDITIONS

C0.1 The *General Conditions for Construction* (Revision 2006 12 15) are applicable to the Work of the Contract.

C0.1.1 The *General Conditions for Construction* are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at http://www.winnipeg.ca/matmgt/gen_cond.stm

C0.2 A reference in the Bid Opportunity to a section, clause or subclause with the prefix "**C**" designates a section, clause or subclause in the *General Conditions for Construction*.

PART D - SUPPLEMENTAL CONDITIONS

GENERAL

D1. GENERAL CONDITIONS

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

D2. SCOPE OF WORK

D2.1 The Work to be done under the Contract shall consist of two parts:

(a) Part 1 – City Funded Work

(b) Part 2 – Provincially Funded Work.

Part 1 – City Funded Work

D2.2 Part 1 – City Funded Work shall consist of:

(a) Pavement Reconstruction.
  (i) Inkster Boulevard from Brookside Boulevard to Keewatin Street.

(b) Land Drainage Sewers.
  (i) Inkster Boulevard from Brookside Boulevard to Keewatin Street.

(c) Multi Use Path Construction.
  (i) Inkster Boulevard from Brookside Boulevard to Keewatin Street.

(d) Noise Wall Construction.
  (i) Inkster Boulevard from Brookside Boulevard to Keewatin Street.

Part 2 – Provincially Funded Work

D2.3 Part 2 – Provincially Funded Work shall consist of:

(a) Pavement Reconstruction.
  (i) Inkster Boulevard (PR 221) from 430m west of Oak Point Highway to Brookside Boulevard.

D2.4 The major components of the Work are as follows:

(a) Pavement Reconstruction
  (i) Topsoil stripping, excavation, pavement removal, and subgrade compaction
  (ii) Placement of geotextile fabric
  (iii) Sub-base and base course construction
  (iv) Construction of 230mm plain dowelled concrete pavement, 250mm plain dowelled concrete pavement, and 275mm plain dowelled concrete pavement (with and without slip-form paving equipment)
  (v) Construction of splash strip (180mm height)
  (vi) Construction of full depth concrete joint and slab repairs on intersecting streets
  (vii) Landscaping

(b) Land Drainage Sewers
  (i) Installation of catchbasins, catchpits, and sewer service pipe
  (ii) Installation of manholes
  (iii) Installation of land drainage sewer pipe

(c) Multi-Use Path Construction
  (i) Topsoil stripping, excavation and subgrade compaction

(ii) Placement of geotextile fabric
(iii) Sub-base and base course construction
(iv) Placement of asphalt pavement (75mm thick)
(v) Landscaping

(d) Noise Wall Construction
(i) Cast-in-place concrete piles
(ii) Precast concrete noise barrier wall
(iii) Landscaping

D3. CONTRACT ADMINISTRATOR

D3.1 The Contract Administrator is AECOM, represented by:

Wayne Jaworski
C.E.T., Senior Design Technologist
99 Commerce Drive, Winnipeg MB R3P 0Y7

Telephone No. (204) 928-7402
Facsimile No. (204) 284-2040

D3.2 At the pre-construction meeting, Wayne Jaworski 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.

D4.2 At least two (2) business days prior to the commencement of any Work on the site, the Contractor shall provide the Contract Administrator with a phone number where the supervisor identified in D4.1 or an alternate can be contacted twenty-four (24) hours a day to respond to an emergency.

D5. NOTICES

D5.1 Except as provided for in C23.2.2, 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 Notwithstanding C21., 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 Financial Officer
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
Internal Services Department
Legal Services Division
Attn: City Solicitor
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. AUTHORITY TO CARRY ON BUSINESS

D7.1 The Contractor shall 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, or if the Contractor does not carry on business in Manitoba, in the jurisdiction where the Contractor does carry on business, throughout the term of the Contract, and shall provide the Contract Administrator with evidence thereof upon request.

D8. SAFE WORK PLAN

D8.1 The Contractor shall provide the Contract Administrator with a Safe Work Plan at least five (5) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

D8.2 The Safe Work Plan shall be prepared and submitted in the format shown in the City's template which is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at http://www.winnipeg.ca/matmgt/safety/default.stm

D9. INSURANCE

D9.1 The City shall provide and maintain the following Project Insurance Coverages:

(a) Builder's Risk Insurance in the amount of one hundred percent (100%) of the total project cost.

(b) Wrap-Up Liability Insurance in an amount of no less that five million dollars ($5,000,000.00).

(i) The Contractor shall be responsible for deductibles up to $50,000.00 maximum of any one loss.

(ii) The City of Winnipeg will carry such insurance to cover all parties engaged in the Work in this Contract. Provision of this insurance by the City of Winnipeg is not intended in any way to relieve the Contractor from his obligations under the terms of the Contract. Specifically, losses relating to deductibles for insurance, as well as losses in excess of limits of coverage and any risk of loss that is not covered under the terms of the insurance provided by the City of Winnipeg remains with the Contractor.

(iii) Wrap-Up Liability insurance shall be maintained from the date of commencement of the Work until one year from the date of Substantial Performance of the Work, after which, if Total Performance has not been met, the responsibility for payment of further insurance premiums shall transfer to the Contractor. The City may reduce any payment to the Contractor by the amount of such further insurance premiums.

(iv) Liability coverage shall be provided for completed operations hazards from the date of Substantial Performance of the Work, as set out in the certificate of Substantial Performance of the Work, on an ongoing basis for a period of six (6) years following Substantial Performance of the Work.

D9.2 Responsibilities of the Contractor:

(a) The Contractor shall provide and maintain 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).

(b) The Contractor is responsible for insuring equipment and tools used on the Project that may be owned, rented, leased or borrowed.

(i) Premiums and deductibles shall be borne by the Contractor.

(ii) Policies shall be taken out with insurers licensed to and carrying on business in the Province of Manitoba;

(iii) The Contractor shall not cancel, or cause any such policy or policies to lapse without a minimum thirty (30) days prior written notice to the City;

(iv) The Contractor shall provide written notice to the City of Winnipeg of any material changes to their policies within thirty (30) days of the change taking effect;

(v) The Contractor shall provide the Contract Administrator with evidence of insurance 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 and said insurance shall be in the form of a Certificate of Insurance and shall be in a form satisfactory to the City Solicitor.

D9.3 Responsibilities of Others, including payment of premiums and deductibles:

(a) All Subcontractors, Consultants and Sub-consultants engaged for the Project are responsible to provide and maintain 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);

(b) All Subcontractors, Consultants and Sub-consultants engaged for the Project are responsible for insuring equipment and tools used on the project that may be owned, rented, leased or borrowed.

D10. PERFORMANCE SECURITY

D10.1 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.

D10.1.1 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.

D10.2 If the bid security provided in his Bid was not a certified cheque or draft pursuant to B10.1(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 and in no event later than the date specified in the C4.1 for the return of the executed Contract.

D11. SUBCONTRACTOR LIST

D11.1 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 or prior to a pre-construction meeting, or 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 C4.1 for the return of the executed Contract.

D12. DETAILED WORK SCHEDULE

D12.1 The Contractor shall provide the Contract Administrator with a detailed work schedule 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.

D12.2 The detailed work schedule shall consist of the following:

(a) a Gantt chart for the Work

acceptable to the Contract Administrator. The Contractor to utilize the Contract provided staging drawings (Appendix B) in the preparation of the work schedule.

D12.3 Further to D12.2(a), the Gantt chart shall show the time on a weekly basis, required to carry out the Work of each trade, or specification division. The time shall be on the horizontal axis, and the type of trade shall be on the vertical axis.

SCHEDULE OF WORK

D13. COMMENCEMENT

D13.1 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.

D13.2 The Contractor shall not commence any Work on the Site until:

(a) the Contract Administrator has confirmed receipt and approval of:
  (i) evidence of authority to carry on business specified in D7;
  (ii) evidence of the workers compensation coverage specified in C6.15;
  (iii) the twenty-four (24) hour emergency response phone number specified in D4.2.
  (iv) the Safe Work Plan specified in D8;
  (v) evidence of the insurance specified in D9;
  (vi) the performance security specified in D10;
  (vii) the subcontractor list specified in D11;
  (viii) the detailed work schedule specified in D12; and

(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.

D13.3 The Contractor shall commence the Work on the Site within seven (7) Working Days of receipt of the letter of intent.

D13.4 The City intends to award this Contract by June 22, 2010.

D13.4.1 If the actual date of award is later than the intended date, the dates specified for Critical Stages, Substantial Performance, and Total Performance will be adjusted by the difference between the aforementioned intended and actual dates.

D13.5 The Contractor shall not commence work on Plan No. 22439, Block 1, Lots 1 and 2, and Plan No. 22439, Block 2, Lot 1, until Manitoba Infrastructure and Transportation has obtained the property. It is assumed that all property will be in the Province's possession by June 30, 2011, for Part 2 of the work. If this property is not in the Province's possession, the City shall have the right to eliminate all or any portion of the Work associated with this property.

D14. RESTRICTED WORK HOURS

D14.1 Further to clause 3.10 of CW 1130, the Contractor shall require written permission forty-eight (48) hours in advance from the Contract Administrator for any work to be performed between 2000 hours and 0700 hours, or on Saturdays, Sundays, Statutory Holidays and or Civic Holidays.

D14.2 In accordance with the Manual of Temporary Traffic Control, Sections 2.03, 2.04, 2.05 and 2.06, should the Traffic Management Branch of the Public Works Department require that work on Regional Streets be carried out at night or on Sundays or on public holidays, where permitted by the City of Winnipeg Police Department, or that work be restricted or suspended during peak traffic hours, no additional compensation will be considered to meet these requirements.

D15. SCHEDULE RESTRICTIONS

D15.1 Feedermain Shutdowns

(a) Feedermain shutdown periods are based on a number of factors including routine maintenance and repair work along the Feedermain and adjacent regional water distribution system, water demand, weather, reservoir operation and other factors. The City shall endeavour to make the specified time periods available to the Contractor to schedule his work requiring removal of the Feedermain from service, without limiting the City's control over the operation of the Feedermains and the regional water infrastructure system, to complete other work, maintain adequate water supply and storage of water and maintain the integrity of the infrastructure. The City shall reserve the right to cancel and/or delay these schedule dates at any time, due to any circumstances that could adversely affect the water supply, including but not limited to high water demand, abnormal weather, failures of related water system components and/or security concerns.

(b) The bidder shall note that it is intended to allow for depressurization of the Feedermain during the construction period, for installation of land drainage sewer components, to safeguard against a catastrophic failure of the pipeline. During normal summer demands, it is anticipated that the Feedermain can be taken out of service, with minimal disruption to water service levels. However, it is noted that during high water demand season, typically between June 1 and September 15, the risk of an emergency reinstatement of the Feedermain is elevated.

(c) The Bidder shall note that short term shutdown periods of less than eight (8) hours in duration that do not require drainage of the Feedermain will be permitted, subject to receipt of specified notification to the Contract Administrator. Such shutdowns may be limited to off-peak periods of the day.

(d) The Bidder shall note that longer term shutdown periods of greater than eight (8) hours in duration that require drainage of the Feedermain will only be permitted during periods of

low water demands, typically between September 15 and June 1. Scheduling of work outside of this window may be permitted by the Contract Administrator, subject to review of demand forecasts, approval of the Water and Waste Department, receipt of detailed work planning and contingency plan.

(e) The Bidder shall note that during portions of the Work involving removal of Feedermain from service, including depressurization or draining of the Feedermain, the Bidder shall be prepared to take immediate actions to be prepared to return the Feedermain to service, upon receipt of notification from the Contract Administrator. This work may include, but is not limited to backfill of adjacent trenches in close proximity to the Feedermain, re-installation of and piping or appurtenances removed for construction and installation of bracing as directed.

D16. WORK BY OTHERS

D16.1 Work by others on or near the Site will include but not necessarily be limited to:

(a) Manitoba Hydro – new street lighting poles, cable, manhole adjustments, and existing pole relocations;

(b) Manitoba Hydro Gas Division – miscellaneous rock wrapping, relocating of gas main, and lowering of gas main and services as necessary;

(c) MTS – miscellaneous relocations and manhole adjustments;

(d) Shaw – miscellaneous relocations;

(e) City of Winnipeg / Manitoba Infrastructure and Transportation Traffic Services – traffic signage and line painting;

(f) City of Winnipeg / Manitoba Infrastructure and Transportation Traffic Signals – temporary and permanent signals work;

(g) City of Winnipeg Geomatics Branch – various Works on survey monuments;

(h) Future Wastewater Interceptor Sewer (West project limit to King Edward Street).

D15.2 The Contractor Administrator will attempt to arrange and coordinate Work to be performed by others so that such Work does not interfere with the Work and Schedule of the Contractor. Where Work by others interferes, as determined by the Contract Administrator, with the Contractor's planned Work, the Contractor shall modify his plans and do other Work. Unless the Contract Administrator determines that there was no opportunity for the Contractor to do a similar amount of Work no consideration will be made to extending the Contract time.

D17. SEQUENCE OF WORK

D17.1 Further to C6.1, the recommended sequence of work is provided in Appendix 'B'.

D17.2 Generally, the recommended sequence of work is as follows:

(a) In 2010, construct the new eastbound lanes of Inkster Boulevard and all land drainage sewers. Start noise barrier wall construction and landscaping in 2010.

(b) In 2011, construct westbound lanes, noise barrier wall, and landscaping.

D18. CRITICAL STAGES

D18.1 The Contractor shall achieve critical stages of the Work in accordance with the following requirements:

(a) Part 2 – Provincially Funded Work as described in D2.3 shall be totally completed by September 16, 2011.

D19. SUBSTANTIAL PERFORMANCE

D19.1 The Contractor shall achieve Substantial Performance by October 31, 2011.

D19.2 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.

D19.3 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.

D20. TOTAL PERFORMANCE

D20.1 The Contractor shall achieve Total Performance by June 15, 2012.

D20.2 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.

D20.3 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.

D21. LIQUIDATED DAMAGES

D21.1 If the Contractor fails to achieve Critical Stage, Substantial Performance or Total Performance in accordance with the Contract by the days fixed herein for same, the Contractor shall pay the City the following amounts per Calendar Day for each and every Calendar Day following the days fixed herein for same during which such failure continues:

(a) Critical Stage - Part 2 – Provincially Funded Work – Three Thousand dollars ($3,000);

(b) Substantial Performance - Three Thousand dollars ($3,000);

(c) Total Performance – One Thousand dollars ($1,000).

D21.2 The amounts specified for liquidated damages in D21.1 are based on a genuine pre-estimate of the City's losses in the event that the Contractor does not achieve critical stages, Substantial Performance or Total Performance by the days fixed herein for same.

D21.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

D22. SCHEDULED MAINTENANCE

D22.1 The Contractor shall perform the following scheduled maintenance in the manner and within the time periods required by the Specifications:

(a) Initial landscape maintenance as specified in CW3510-R9 and CW3520-R7;

(b) Long-term landscape maintenance as specified in E25:

(i) General Plant material and planting bed maintenance.

(c) Reflective crack maintenance during two year warranty period as specified in CW 3250-R7.

D22.2 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

D23. JOB MEETINGS

D23.1 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.

D23.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he deems it necessary.

D24. PRIME CONTRACTOR – THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA)

D24.1 Further to C6.24, 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

D25. WARRANTY

D25.1 Notwithstanding C13.2, the warranty period shall begin on the date of Total Performance and shall expire two (2) years thereafter unless extended pursuant to C13.2 orC13.2.2, in which case it shall expire when provided for thereunder.

D25.2 Notwithstanding C13.2 or D25.1, 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) Substantial Performance has been achieved.

D25.2.1 In such case the date specified by the Contract Administrator for the warranty period to begin shall be substituted for the date specified in C13.2 for the warranty period to begin.

FORM H1: PERFORMANCE BOND
(See D10)

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 for

BID OPPORTUNITY NO. 232-2010

INKSTER BOULEVARD WIDENING AND REHABILITATION: PART 1 – BROOKSIDE BOULEVARD TO KEEWATIN STREET, PART 2 – 430 M WEST OF OAK POINT HIGHWAY TO BROOKSIDE BOULEVARD 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 as to Principal if no seal)

_____
(Name of Principal)

Per: _____ (Seal)

Per: _____

_____
(Name of Surety)

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

FORM H2: IRREVOCABLE STANDBY LETTER OF CREDIT
(PERFORMANCE SECURITY)
(See D10)

_____
(Date)

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

RE: PERFORMANCE SECURITY – BID OPPORTUNITY NO. 232-2010

INKSTER BOULEVARD WIDENING AND REHABILITATION: PART 1 – BROOKSIDE BOULEVARD TO KEEWATIN STREET, PART 2 – 430 M WEST OF OAK POINT HIGHWAY TO BROOKSIDE BOULEVARD

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 J: SUBCONTRACTOR LIST
(See D11)

INKSTER BOULEVARD WIDENING AND REHABILITATION: PART 1 – BROOKSIDE BOULEVARD TO KEEWATIN STREET, PART 2 – 430 M WEST OF OAK POINT HIGHWAY TO BROOKSIDE BOULEVARD

Portion of the Work	Name	Address
SURFACE WORKS:		
Supply of Materials:		
Concrete		
Asphalt		
Base Course and Sub-Base		
Geotextile		
Sod and Seed		
Noise Barrier Wall (Supplier and Type)		
Trees		
Installation/Placement:		
Excavation		
Concrete		
Asphalt		
Sodding and Seeding		
Noise Barrier Wall		
Tree Planting		
Reflective Crack Maintenance		
UNDERGROUND WORKS:		
Supply of Materials:		
Catchbasins		
Culverts		
Frames and Covers		
Concrete LDS		
PVC Sewer Service Pipe		
Installation/Placement:		
Catchbasins		
Culverts		
Cast-in-Place Piles for Noise Barrier Wall		

FORM J: SUBCONTRACTOR LIST
(See D11)

INKSTER BOULEVARD WIDENING AND REHABILITATION: PART 1 – BROOKSIDE BOULEVARD TO KEEWATIN STREET, PART 2 – 430 M WEST OF OAK POINT HIGHWAY TO BROOKSIDE BOULEVARD

Portion of the Work	Name	Address
Concrete LDS		
PVC Sewer Service Pipe		
OTHERS:		

PART E - SPECIFICATIONS

GENERAL

E1. APPLICABLE SPECIFICATIONS AND DRAWINGS

E1.1 These Specifications shall apply to the Work.

E1.2 *The City of Winnipeg Standard Construction Specifications* in its entirety, whether or not specifically listed on Form B: Prices, shall apply to the Work.

E1.2.1 *The City of Winnipeg Standard Construction Specifications* is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at http://www.winnipeg.ca/matmgt/Spec/Default.stm

E1.2.2 The version in effect three (3) Business Days before the Submission Deadline shall apply.

E1.2.3 Further to C2.4(d), Specifications included in the Bid Opportunity shall govern over *The City of Winnipeg Standard Construction Specifications*.

E1.3 The following are applicable to the Work:

Drawing No.	Drawing Name/Title	Drawing (Original) Sheet Size
	Part 1	
1-0	Cover Sheet	A1
1-1	Key Plan, Drawing List, Horizontal and Vertical Control	A1
1-2	Horizontal Geometry Brookside Boulevard to Sta 1+970NM	A1
1-3	Horizontal Geometry Sta 1+970NM to Sta. 2+530NM	A1
1-4	Horizontal Geometry Sta 2+530NM to Sta. 3+040NM	A1
1-5	Horizontal Geometry Sta 3+040NM to Sta. 3+560NM & King Edward St. N/Inkster Blvd. 1:500	A1
1-6	Horizontal Geometry Sta 3+560NM to Keewatin Street	A1
1-7	Horizontal Geometry Brookside Blvd. S/Inkster Blvd.	A1
1-8	Horizontal Geometry Brookside Blvd. N/Inkster Blvd.	A1
1-9	Horizontal and Vertical Alignment Brookside Boulevard to Sta. 1+740NM	A1
1-10	Horizontal and Vertical Alignment Sta 1+740NM to Sta. 1+970NM	A1
1-11	Horizontal and Vertical Alignment Sta. 1+970NM to Sta. 2+250NM	A1
1-12	Horizontal and Vertical Alignment Sta. 2+250NM to Sta. 2+530NM	A1
1-13	Horizontal and Vertical Alignment Sta. 2+530NM to Sta. 2+780NM	A1
1-14	Horizontal and Vertical Alignment Sta. 2+780NM to Sta. 3+040NM	A1
1-15	Horizontal and Vertical Alignment Sta. 3+040NM to Sta. 3+300NM	A1
1-16	Horizontal and Vertical Alignment Sta. 3+300NM to Sta. 3+560NM	A1
1-17	Horizontal and Vertical Alignment Sta. 3+560NM to Sta. 3+820NM	A1
1-18	Horizontal and Vertical Alignment Sta. 3+820NM to Keewatin Street	A1
1-19	Horizontal and Vertical Alignment Brookside Boulevard Sta. 1+180EG to Inkster Boulevard	A1
1-20	Horizontal and Vertical Alignment Brookside Boulevard to Inkster Boulevard to Sta. 1+690EG	A1
1-21	Horizontal and Vertical Alignment King Edward Street N/Inkster Boulevard	A1
1-22	Cross Sections - A, B & C	A1
1-23	Cross Sections - D, E & F	A1
1-24	Cross Sections - G, H & I	A1
1-25	Land Drainage System Brookside Boulevard to Sta. 1+740NM	A1
1-26	Land Drainage System Sta. 1+740NM to Sta. 1+970NM	A1

Drawing No.	Drawing Name/Title	Drawing (Original) Sheet Size
1-27	Land Drainage System Sta. 1+970NM to Sta. 2+250NM	A1
1-28	Land Drainage System Sta. 2+250NM to Sta. 2+530NM	A1
1-29	Land Drainage System Sta. 2+530NM to Sta. 2+780NM	A1
1-30	Land Drainage System Sta. 2+780NM to Sta. 3+040NM	A1
1-31	Land Drainage System Sta. 3+040NM to Sta. 3+300NM	A1
1-32	Land Drainage System Sta. 3+300NM to Sta. 3+560NM	A1
1-33	Land Drainage System Sta. 3+560NM to Sta. 3+820NM	A1
1-34	Land Drainage System Sta. 3+820NM to Keewatin Street	A1
1-35	Land Drainage System Miscellaneous Details	A1
1-36	Structure & Location Schedules 1	A1
1-37	Structure & Location Schedules 2	A1
1-38	Structure & Location Schedules 3	A1
1-39	Structure & Location Schedules 4	A1
1-40	Landscaping Brookside Boulevard (Sta. 1+480) to Sta. 1+740NM	A1
1-41	Landscaping Sta. 1+740NM to Sta. 1+970NM	A1
1-42	Landscaping Sta. 1+970NM to Sta. 2+250NM	A1
1-43	Landscaping Sta. 2+250NM to Sta. 2+530NM	A1
1-44	Landscaping Sta. 2+530NM to Sta. 2+780NM	A1
1-45	Landscaping Sta. 2+780NM to Sta. 3+040NM	A1
1-46	Landscaping Sta. 3+040NM to Sta. 3+300NM	A1
1-47	Landscaping Sta. 3+300NM to Sta. 3+560NM	A1
1-48	Landscaping Sta. 3+560NM to Sta. 3+820NM	A1
1-49	Landscaping Sta. 3+820NM to (Sta. 4+125) Keewatin Street	A1
1-50	Landscaping Brookside Boulevard to Lucas Ave to Sta. 1+180	A1
1-51	Landscaping Brookside Boulevard to Sta. 1+180 to Inkster Boulevard	A1
1-52	Landscaping Brookside Boulevard to Inkster Boulevard to Sta. 1+690	A1
1-53	Landscaping Brookside Boulevard Sta. to 1+690 to Inksbrook Dr.	A1
1-54	Landscaping King Edward Street N/Inkster Boulevard	A1
1-55	Noise Barrier 1 South – Details and Profile	A1
1-56	Noise Barrier 2, 3 & 4 South (to Sta. 2+660) - Profiles	A1
1-57	Noise Barrier 4 South (from Sta. 2 + 660) 5 South - Profiles	A1
1-58	Noise Barrier 4 South (from Sta. 2+660) & 5 South - Profiles	A1
1-59	Noise Barrier 7 North (from Sta. 3+360) - Profiles	A1
	Part 2	
2-1	Horizontal Geometry Sta. 0+440NM to Sta. 0+960NM	A1
2-2	Horizontal Geometry Sta. 0+960NM to Sta. 1+480NM	A1
2-3	Horizontal Geometry Sta. 1+480NM to Sta. 1+740NM & Oak Point Highway S/Inkster Boulevard	A1
2-4	Horizontal Geometry Roy Roche Drive N/Inkster Boulevard & Service Rd. W/Roy Roche Dr.	A1
2-5	Horizontal Alignment Sta. 0+440NM to Sta. 0+960NM	A1
2-6	Horizontal Alignment Sta. 0+960NM to Sta. 1+480NM	A1
2-7	Horizontal Alignment Sta. 1+480NM to Sta. 1+740NM	A1
2-8	Vertical Alignment Sta. 0+440NM to Sta. 0+700NM	A1
2-9	Vertical Alignment Sta. 0+700NM to Sta. 0+960NM	A1
2-10	Vertical Alignment Sta. 0+960NM to Sta. 1+220NM	A1
2-11	Vertical Alignment Sta. 1+220NM to Sta. 1+480NM	A1
2-12	Horizontal Alignment Oak Point Highway S/Inkster Boulevard	A1
2-13	Horizontal and Vertical Alignment Roy Roche Dr N/Inkster Blvd & Service Rd. W/Roy Roche Dr.	A1
2-14	Cross sections - J, K & L	A1
2-15	Cross sections - M, N & O	A1
2-16	Cross sections - P, Q, R & S	A1
2-17	Landscaping Sta. 0+440NM to Sta. 0+700NM	A1
2-18	Landscaping Sta. 0+700NM to Sta. 0+960NM	A1

Drawing No.	Drawing Name/Title	Drawing (Original) Sheet Size
2-19	Landscaping Sta. 0+960NM to Sta. 1+220NM	A1
2-20	Landscaping Sta. 1+220NM to Sta. 1+480NM	A1
2-21	Landscaping Sta. 1+480NM to Sta. 1+740NM	A1
2-22	Landscaping Oak Point Highway S/Inkster Boulevard	A1
2-23	Landscaping Roy Roche Dr. N/Inkster Blvd & Proposed Service Rd. W/Roy Roche Dr.	A1

E1.4 The following figures contained in Appendix 'B' are applicable to the Work:

Figure No.	Figure Name/Title	Drawing (Original) Sheet Size
1-1	Stage 1	A1
1-2	Stage 1	A1
1-3	Stage 1	A1
2-1	Stage 2	A1
2-2	Stage 2	A1
2-3	Stage 2	A1
3-1	Stage 3	A1
3-2	Stage 3	A1
3-2	Stage 3	A1
4-1	Stage 4	A1
4-2	Stage 4	A1
4-3	Stage 4	A1
5-1	Stage 5	A1
5-2	Stage 5	A1
5-3	Stage 5	A1
6-1	Stage 6	A1
6-2	Stage 6	A1
6-3	Stage 6	A1
7-1	Stage 7	A1
7-2	Stage 7	A1
7-3	Stage 7	A1
8-1	Stage 8	A1
8-2	Stage 8	A1
8-3	Stage 8	A1
9-1	Stage 9	A1
9-2	Stage 9	A1
9-3	Stage 9	A1

E1.5 The following figure contained in Appendix 'C' is applicable to the Work:

Figure No.	Figure Name/Title	Drawing (Original) Sheet Size
7989	Traffic Signal Surface Plan	A1

E2. GEOTECHNICAL REPORT

E2.1 Further to C3.1, the geotechnical report is provided to aid the Contractor's evaluation of the pavement structure and/or existing soil conditions. The geotechnical report is contained in Appendix 'A'.

E3. OFFICE FACILITIES

E3.1 The Contractor shall supply office facilities meeting the following requirements:

(a) The field office shall be for the exclusive use of the Contract Administrator.

(b) The building shall be conveniently located near the site of the Work.

(c) The building shall have a minimum floor area of 30 square metres, with two windows for cross ventilation and a door entrance with a suitable lock.

(d) The building shall be suitable for all weather use. It shall be equipped with an electric heater and air conditioner so that the room temperature can be maintained between either 16 - 18^{o}C or 24 - 25^{o}C.

(e) The building shall be adequately lighted with fluorescent fixtures and have a minimum of three wall outlets.

(f) The building shall be furnished with one desk, one drafting table, table 3m X 1.2m, one stool, one four drawer legal size filing cabinet, and a minimum of 12 chairs.

(g) A portable toilet shall be located near the field office building. The toilet shall have a locking door and be for the exclusive use of the Contract Administrator and other personnel from the City.

(h) The field office building and the portable toilet shall be cleaned on a weekly basis immediately prior to each site meeting. The Contract Administrator may request additional cleaning when he deems it necessary.

E3.2 The Contractor shall be responsible for all installation and removal costs, all operating costs, and the general maintenance of the office facilities.

E3.3 The office facilities will be provided from the date of the commencement of the Work to the date of the Contract is completed.

E4. PROTECTION OF EXISTING TREES

E4.1 The Contractor shall take the following precautionary steps to prevent damage from construction activities to existing boulevard trees within the limits of the construction area:

(a) The Contractor shall not stockpile materials and soil or park vehicles and equipment on boulevards within 2 metres of trees.

(b) Trees identified to be at risk by the Contract Administrator are to be strapped with 25 x 100 x 2400mm wood planks, or suitably protected as approved by the Contract Administrator.

(c) Excavation shall be performed in a manner that minimizes damage to the existing root systems. Where possible, excavation shall be carried out such that the edge of the excavation shall be a minimum of 1.5 times the diameter (measured in inches), with the outcome read in feet, from the closest edge of the trunk. Where roots must be cut to facilitate excavation, they shall be pruned neatly at the face of excavation.

(d) 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.

(e) Work on-site shall be carried out in such a manner so as to minimize damage to existing tree branches. Where damage to branches does occur, they shall be neatly pruned.

E4.2 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 No separate measurement or payment will be made for the protection of trees.

E4.4 Except as required in clause E4.1(c) and E4.1(e), Elm trees shall not be pruned at any time between April 1 and July 31.

E5. TRAFFIC CONTROL

E5.1 Further to clauses 3.6 and 3.7 of CW 1130-R1:

(a) Where directed, the Contractor shall construct and maintain temporary asphalt ramps to alleviate vertical pavement obstructions such as manholes and planing drop-offs to the satisfaction of the Contract Administrator. Payment shall be in accordance with CW3410.

(b) In accordance with the Manual of Temporary Traffic Control, the Contractor ("Agency" in the manual) shall make arrangements with the Traffic Services Section of the City of Winnipeg to place all temporary regulatory signs. The Contractor shall bear all costs associated with the placement of temporary traffic control devices by the Traffic Services Section of the City of Winnipeg in connection with the works undertaken by the Contractor.

E6. TRAFFIC MANAGEMENT

E6.1 Further to clause 3.7 of CW 1130-R1:

E6.1.1 Maintain a minimum of one lane of traffic eastbound and one lane of traffic westbound at all times during construction; and

E6.1.2 Where left turn lanes exist, an additional lane to accommodate the left turn storage lane shall be maintained at all times.

E6.1.3 North/South traffic at intersections must be maintained during construction to allow for one lane of traffic in each direction to go straight through and another lane in each direction to turn left. When no work is being performed in the intersection and providing it is safe for vehicles, north and south lane closures in the intersection will not be permitted.

E6.1.4 Intersecting street and private approach access shall be maintained at all times.

E6.1.5 Should the Contractor be unable to maintain pedestrian or vehicular access to a residence or business, he shall review the planned disruption with the business or residence and the Contract Administrator, and take reasonable measures to minimize the impact. The Contractor shall provide a minimum of 72 hours notification to the affected residence or business and the Contract Administrator, prior to disruption of access.

E6.1.6 Pedestrian and ambulance/emergency vehicle access must be maintained at all times.

E9. WATER OBTAINED FROM THE CITY

E9.1 Further to clause 3.7 of CW 1120, the Contractor shall pay for all costs, including sewer charges, associated with obtaining water from the City in accordance with the Waterworks and Sewer By-laws.

E10. SURFACE RESTORATIONS

E10.1 Further to clause 3.3 of CW 1130-R1, when Total Performance is not achieved in the year the Contract is commenced, the Contractor shall temporarily repair any Work commenced and not completed to the satisfaction of the Contract Administrator. The Contractor shall maintain the temporary repairs in a safe condition as determined by the Contract Administrator until permanent repairs are completed. The Contractor shall bear all costs associated with temporary repairs and their maintenance.

E11. INFRASTRUCTURE SIGNS

E11.1 The Contractor shall obtain infrastructure signs from the Traffic Services Sign Shop at 421 Osborne Street. The Contractor shall mount each sign securely to a rigid backing material approved by the Contract Administrator. The Contractor shall fasten each sign to a suitable support and erect and maintain one sign at each street as directed by the Contract Administrator. When the Contract Administrator considers the Work on the street complete, the Contractor shall remove and dispose of the signs and supports. No measurement for payment will be made for performing all operations herein described and all other items incidental to the work described

E12. RECYCLED CONCRETE BASE COURSE MATERIAL

DESCRIPTION

E12.1 General

E12.1.1 Further to CW 3110, this specification covers supply and placement of recycled concrete base course material for Full-Depth Partial Slab Patches (Class A, B, C, & D), miscellaneous concrete slabs and sidewalks.

E12.2 Definitions

E12.2.1 Deleterious material – are materials such as vegetation, organic material, wood, glass, plastic, metal, reinforcing steel, building rubble, brick, salvaged asphalt materials, clay, shale, and friable particles.

E12.3 Referenced Standard Construction Specifications

(a) CW 3110 – Sub-Grade. Sub-Base and Base Course Construction.

(b) CW 3230 – Full-Depth Patching of Existing Pavement Slabs and Joints.

(c) CW 3235 – Renewal of Existing Miscellaneous Concrete Slabs.

(d) CW 3325 – Portland Cement Concrete Sidewalk.

MATERIALS

E12.4 Recycled Concrete Base Course Material

E12.4.1 Recycled concrete base course material when used for Full-Depth Partial Slab Patches (Class A, B, C, & D), miscellaneous concrete slabs and sidewalks will be considered equal to granular or limestone base course material specified in Section 2.2 of CW 3110.

E12.4.2 Recycled concrete base course material will be approved by the Contract Administrator.

E12.4.3 Recycled concrete base course material will consist of sound durable particles produced by crushing, screening, and grading of recovered concrete materials, free from soft material that would disintegrate through decay or weathering.

E12.4.4 The recycled concrete base course material will be well graded and conform to the following grading requirements:

Recycled Concrete Base Course Material Grading Requirements

CANADIAN METRIC SIEVE SIZE	PERCENT OF TOTAL DRY WEIGHT PASSING EACH SIEVE
20 000	100%
5 000	40% - 70%
2 500	25% - 60%
315	8% - 25%
80	6% - 17%

E12.4.5 Recycled concrete base course material when subjected to the abrasion test will have a loss of not more than 35% when tested in accordance with grading B of ASTM C131, Test for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

E12.4.6 The amount of deleterious material will be limited to a maximum of two percent of the total dry weight.

CONSTRUCTION METHODS

E12.5 Placement of Recycled Concrete Base Course Material

E12.5.1 Place and compact recycled concrete base course material as a levelling course to a maximum thickness of 50 millimetres.

E12.5.2 Spread materials uniformly to avoid segregation free of pockets of fine and coarse material.

E12.5.3 Level and compact to the finished elevation. Compact to 100% Standard Proctor Density for Full-Depth Partial Slab Patches (Class A, B, C, & D) and 90% Standard Proctor Density for miscellaneous concrete slabs and sidewalks.

E12.5.4 Maintain the finished material until the pavement or sidewalk is placed.

MEASUREMENT AND PAYMENT

E12.6 Recycled Concrete Base Course Material

E12.6.1 The supplying, placing and compaction of recycled concrete base course material will be measured on a volume basis and paid for at the Contract Unit Price per cubic metre for the "Supplying and Placing Base Course Material" as specified in accordance with CW 3110.

E12.6.2 No measurement or payment will be made for material placed as a levelling course under miscellaneous concrete slabs and sidewalks where the costs are included in accordance with CW 3235 and CW 3325.

E12.6.3 No measurement or payment will be made for materials rejected by the Contract Administrator.

E13. CONCRETE FLARED END SECTIONS

DESCRIPTION

E13.1 General

E11.1.1 This specification covers the installation of concrete flared end sections with safety grates on concrete culverts.

E11.1.2 Referenced Standard Construction Specifications

(a) CW3610 – Installation of Culverts

MATERIALS

E13.2 Concrete Flared End Section

E13.2.1 Concrete flared end sections shall be supplied in accordance with the Drawings.

E13.3 Safety Grate

E13.3.1 Safety grates shall be supplied in accordance with the Drawings.

CONSTRUCTION METHODS

E13.4 Concrete Flared End Section

E13.4.1 Concrete flared end sections including gaskets shall be installed on the ends of concrete culverts as shown on the Drawings or as directed by the Contract Administrator.

E13.5 Safety Grate

E13.5.1 Safety grates shall be installed on concrete flared end sections where shown on the Drawings or as directed by the Contract Administrator.

MEASUREMENT AND PAYMENT

E13.6 Concrete Flared End Section

E13.6.1 Concrete flared end sections with safety grates will be measured on a unit basis for each size of end section and paid for at the Contract Unit Price for "Items of Work" listed here below. The number to be paid for will be to the total number of units installed including gaskets in accordance with this specification, accepted and measured by the Contract Administrator.

Items of Work

Concrete Flared End Sections c/w safety grate

(a) 600 mm

(b) 900 mm

Concrete Flared End Sections w/o safety grate

(a) 900 mm

E14. INSTALLATION OF CULVERTS

DESCRIPTION

E14.1 General

E14.1.1 This specification shall amend and supplement City of Winnipeg Standard Construction Specification CW 3610-R3 "Installation of Culverts", and shall cover supply and installation of culverts.

E14.1.2 Referenced Standard Construction Specifications

(a) CW 2030 – Excavation Bedding and Backfill

(b) CW 3610- Installation of Culverts

E14.1.3 Referenced Standard Detail

(a) SD 002 – Standard Trench and Excavation Backfill Classes.

MATERIALS

E14.2 Bedding and Backfill

E14.2.1 Bedding and initial backfill material shall consist of 20 mm limestone base, as specified in CW 2030, placed on a prepared subgrade and compacted to the thickness and density herein specified.

CONSTRUCTION METHODS

E14.3 Bevelled Ends

E14.3.1 Further to CW 3610, all CSP culvert ends shall be bevelled as shown on the Drawings.

E14.4 Bedding and Backfill

E14.4.1 The backfilling for culverts installed under proposed pavements and private approaches shall be Class 2 as shown in Standard Detail SD-002 and specified in CW 2030, except as noted below.

E14.4.2 The following revisions for bedding and initial backfill apply to Class 2 and Class 4 backfill:

(a) Limestone base material as previously specified shall be used for bedding and initial backfill as opposed to sand.

(b) A minimum thickness of 225 mm of compacted 20 mm limestone bedding shall be placed on the prepared subgrade. A 75 mm blanket of loose uniform bedding material shall then be placed on the compacted bedding to provide fill for the corrugations in the invert.

(c) The backfill material shall be placed in layers not exceeding 300 mm. Backfilling shall be carried out in such a manner as to obtain uniform compaction without soft spots. Compaction shall be 95% of the Standard Proctor Density.

(d) Manual placing and compaction of material shall be used to build up the backfill to encompass the lower part of the pipe. Backfill material shall be placed under the haunches by shovel and compacted firmly by power compaction ("jumping jack") equipment. Valleys of the corrugations and the area immediately next to the pipe must be compacted by hand operated methods. At no time shall heavy compaction equipment be brought closer than 1 m from the CSP.

(e) Backfill shall be so placed and mechanically compacted that the fill rises equally and simultaneously on both sides, including handwork next to the pipe. Layers shall be placed with equipment running parallel to the structure.

(f) When the fill on both sides of the pipe approaches the crown of the pipe, the same techniques of spreading shallow layers and compacting thoroughly shall be followed as the backfill covers the pipe. Light tamping equipment shall be used for the initial layers over the pipe.

(g) No distortion of the structure greater than 2% of the span or rise shall be allowed.

(h) No traffic of any sort shall be permitted over the structure until cover of a minimum depth of 300 mm is properly compacted in place. If the Contractor requires crossings by heavy construction equipment, a minimum of 0.6 m of compacted cover over a length of at least 7.3 m of the structure shall be provided at no extra cost to the City.

(i) All compaction equipment used shall be subject to the approval of the Contract Administrator.

E14.5 Installation of Salvaged Culverts

E14.5.1 Culverts salvaged from other areas of the Site shall be installed where shown on the Drawings or as directed by the Contract Administrator. The salvaged culverts shall be installed in accordance with this Specification in CW 3610.

MEASUREMENT AND PAYMENT

E14.6 Bevelled Ends

E14.6.1 There shall be no measurement or payment for bevelled ends. Bevelled ends shall be included in the payment for the supply and installation of CSP culverts.

E14.6.2 The supply and installation of culverts will be measured and paid for in accordance with CW 3610.

E14.7 Installation of Salvaged Culverts

E14.7.1 The installation of salvaged culverts will be measured on a length basis for each size of culvert and paid for at the Contract Unit Price for "Installation of Salvaged Culverts". Length to be paid for will be the total number of linear metres of salvaged culvert installed,

measured horizontally at grade, in accordance with this Specification, accepted and measured by the Contract Administrator.

E15. REMOVAL AND ABANDONMENT OF EXISTING CULVERTS

DESCRIPTION

E15.1 General

E15.1.1 This specification covers the removal and abandonment of existing culverts.

E15.1.2 Referenced Standard Construction Specifications

(a) CW 2030- Excavation Bedding and Backfill

CONSTRUCTION METHODS

E15.2 Removal of Existing Culverts

E15.2.1 The Contractor shall remove and salvage existing culverts designated for removal within the limits of the Contract and as shown on the Drawings.

E15.2.2 The excavation for the removal of existing culverts outside of proposed pavements shall be backfilled to Class 4 standards in accordance with CW 2030. The excavation for removal of existing culverts under proposed pavements shall be backfilled to Class 2 standards in accordance with CW 2030.

E15.2.3 The culverts shall be removed so as not to damage the pipe sections. Where culverts are coupled, the sections shall be separated prior to removal.

E15.2.4 Culverts that are deemed unsalvageable or surplus by the Contract Administrator shall be removed and disposed of off site.

E15.3 Culvert Abandonment

E15.3.1 The Contractor shall supply and install cement-stabilized flowable fill, filling from both ends of the culvert to completely fill the interior.

MEASUREMENT AND PAYMENT

E15.4 Removal of Existing Culverts

E15.4.1 The removal of existing culverts will be measured on a length basis for each size of culvert and paid for at the Contract Unit Price for “Removal of Existing Culverts”. Length to be paid for will be the total number of linear metres removed, measured horizontally at grade, in accordance with this specification, accepted and measured by the Contract Administrator.

E15.4.2 Salvaging for reuse and disposal of the surplus culverts shall be included in payment for “Removal of Existing Culverts” and no further payment shall be made.

E15.5 Culvert Abandonment

E15.5.1 Culvert abandonment will be measured on a volume basis and paid for per cubic metre at the Contract Unit Price for “Culvert Abandonment”. The volume to be paid will be the total number of cubic metres of cement stabilized flowable fill supplied and installed within each culvert and accepted by the Contract Administrator.

E16. DITCH INLET GRATES

DESCRIPTION

E16.1 General

E16.1.1 This Specification covers the supply and installation of ditch inlet grates on catchbasins and catchpits.

MATERIALS

E16.2 Ditch Inlet Grate

E16.2.1 All steel shall be supplied in accordance with details on the Drawings. All steel shall be hot dip galvanized and all hardware shall be stainless steel. Ditch Inlet Grates shall be Shopost Iron Works MK-A1 or approved equal.

CONSTRUCTION METHODS

E16.3 Ditch Inlet Grates

E16.3.1 The Contractor shall be required to supply and install ditch inlet grates on drainage inlets shown on the Drawings.

E16.3.2 The ditch inlet grate shall be understood to include the supply and installation of all anchor steel, grate steel, and hardware. All concrete material shall be included in the unit price bid for the catchbasins.

E16.3.3 The ditch inlet grate shall be securely fastened to the drainage inlets as shown on the Drawings and as approved by the Contract Administrator.

E16.3.4 Any galvanized surfaces that are damaged shall be coated with a galvanizing compound approved by the Contract Administrator.

MEASUREMENT AND PAYMENT

E16.4 Ditch Inlet Grates

E16.4.1 The supply and installation of ditch inlet grates will not be measured for payment and shall be included in the payment for catchbasins or catchpits.

E17. CONCRETE PAVEMENT

DESCRIPTION

E17.1 General

E17.1.1 This Specification supplements City of Winnipeg Standard Construction Specification CW 3310- Portland Cement Concrete Pavement Works.

CONSTRUCTION METHODS

E17.2 Dowel Assemblies

E17.2.1 Dowel bars for 275 mm thick plain dowelled concrete pavement shall be 38.1 mm in diameter. Dowel bars for 250 mm thick plain dowelled concrete pavement shall be 31.8 mm in diameter. Dowel bars for 230 mm thick plain dowelled concrete pavement shall be 28.6 mm in diameter.

E17.3 Plain Dowelled Concrete Pavement

E17.3.1 The Contractor shall utilize a self-propelled slip form paving equipment capable of paving widths of 3.5 m, 4.0 m and 8.0 m.

E18. INSTALLATION OF INTERLOCKING PAVING STONES ON A LEAN CONCRETE BASE

DESCRIPTION

E18.1 General

E18.1.1 This specification shall supplement and amend City of Winnipeg Standard Construction Specification CW 3335 “Installation of Interlocking Paving Stones on a Lean Concrete Base”.

E18.1.2 Referenced Standard Construction Specifications

(a) CW 3335- Installation of Interlocking Paving Stones on a Lean Concrete Base

E18.1.3 Referenced Standard Detail

(a) SD-240B- Interlocking Paving Stones On Lean Concrete Base

MATERIALS

E18.2 Interlocking Paving Stones

E18.2.1 Paving stones shall be Barkman Concrete “Victorian” as found in the Barkman Concrete Ltd. 2010 Catalogue. The first two outside courses shall be in a soldier course pattern. Inside courses shall be in Random Paving Pattern #1. All pavers to be “Desert Buff” in colour.

E18.2.2 Paving stones shall conform to the requirements of CAN3-A231.2, Precast Concrete Pavers.

E18.2.3 Further to CAN3-A231.2.6.1.1, where concrete pavers are shipped for installation before the pavers are twenty-eight (28) days old, the average compressive strength of these pavers at the time of delivery to the work site shall be not less than 40 MPa.

E18.3 Other Materials

E18.3.1 All other materials, including aggregates for the lean concrete mix, the lean concrete mix, bedding sand and filler sand shall be in accordance with CW 3335.

CONSTRUCTION METHODS

E18.4 Installation of Paving Stones on a Lean Concrete Base

E18.4.1 Install paving stones on a lean concrete base in accordance with CW 3335 and SD-240B.

MEASUREMENT AND PAYMENT

E18.5 Supply and Installation of Interlocking Paving Stones

E18.5.1 Supply and installation of interlocking paving stones shall be measured and paid for in accordance with CW 3335.

E18.6 Supply and Installation of Lean Concrete Base

E18.6.1 Supply and installation of lean concrete base shall be measured and paid for in accordance with CW 3335.

E19. SITE FURNISHINGS

DESCRIPTION

E19.1 Description

E19.1.1 This Specification shall cover all aspects of the supply and installation of benches and waste receptacles along the multi-use pathway.

MATERIALS

E19.2 Benches

E19.2.1 Urbain Design “Avenue” – Nicolet Series, Model No. 19411/SB – in-ground mounted with arm rests (ACC – Public Place Dossier EPNT) and stainless steel anti-theft hardware.

E19.3 Trash Receptacle

E19.3.1 Urbain Design “Public Place” Series, Model No. 184418/SB – in-ground mounted with lid (10C402), side ashtray (101411) and stainless steel anti-theft hardware.

E19.4 Urbain Design site furnishings available from Crozier Agencies, Winnipeg, MB; Tel.: 774-6084.

CONSTRUCTION METHODS

E19.5 Benches and Trash Receptacles

E19.5.1 Install benches and trash receptacles with in-ground mountings as indicated on the Construction Drawings.

METHOD OF MEASUREMENT

E19.6 Benches and Trash Receptacles

E19.6.1 Benches and trash receptacles will be measured on a unit basis for each item supplied and installed and accepted by the Contract Administrator.

BASIS OF PAYMENT

E19.7 Benches and Trash Receptacles

E19.7.1 Benches and trash receptacles to be paid for at the Contract Unit Prices for “Benches” and “Waste Receptacles”, measured as herein specified, which price will be payment in full for supplying and installing site furnishings.

E20. SODDING

DESCRIPTION

E20.1 General

E20.1.1 This specification shall amend and supplement City of Winnipeg Standard Construction Specification CW 3510-R9 “Sodding”, and shall cover all aspects of sod supply and installation, including preparation of finish grade, watering and rolling, and 30-day maintenance.

E20.1.2 Referenced Standard Construction Specifications

(a) CW 3510-R9 Sodding

(b) CW 3540-R5 Topsoil and Finish Grading

E20.1.3 Referenced Standard Details

(a) SD-243- Sodding Details

MATERIALS

E20.2 Turf Grass Sod

E20.2.1 Turf grass sod shall conform to CW 3510-R9.

E20.2.2 Sod shall be a mixture of 95% Kentucky bluegrass, using equal proportions of any three Class 2 cultivars, and 5% Creeping Red fescue.

E20.2.3 Topsoil and fine grading shall conform to CW 3540-R5 (see E23).

CONSTRUCTION METHODS

E20.3 Installation of Topsoil and Finish Grading, Preparation of Finish Grade, Placement of Sod, Watering and Rolling and 30-Day Maintenance

E20.3.1 Install 100 mm topsoil in accordance with E23.

E20.3.2 Finish grading, sod placement, watering and rolling and 30-day maintenance shall conform to CW 3510-R9 and SD-243.

E20.3.3 Install one width of sod, 600 mm, along all pavements (outside sodded areas) following completion of soil amendments, and prior to seeding. (No topsoil)

METHOD OF MEASUREMENT

E20.4 Turf Grass Sod

E20.4.1 Measure sod greater than 600 mm width (c/w 100 mm imported topsoil) in accordance with CW 3510-R9 and E23.

E20.4.2 Measure edge sod less than or equal to 600 mm width over soil amendments on an area basis for the number of square metres of sod.

BASIS OF PAYMENT

E20.5 Turf Grass Sod

E20.5.1 Payment for supply and installation of sod, including 30-day maintenance before acceptance will be in accordance with CW 3510-R9.

E20.5.2 Payment shall be in accordance with the following:

(a) 75% of quantity following supply and placement of sod including topsoil depth as specified in Form B, and

(b) 25% of quantity following termination of the 30 day maintenance period before acceptance.

E21. SEEDING

DESCRIPTION

E21.1 General

E21.1.1 This specification shall amend and supplement City of Winnipeg Standard Construction Specification CW 3520-R7 “Seeding”, and shall cover all aspects of supply and installation of seed, including preparation of finish grade, hydro mulching, and maintenance.

E21.1.2 Referenced Standard Construction Specifications

(a) CW 3520-R7 – Seeding

(b) CW 3540 – Topsoil and Finish Grading

MATERIALS

E21.2 General

E21.2.1 Provide the Contract Administrator with Certificates of Analysis and mix compositions for all seed mixes. Include supplier’s name and telephone contact information, and percentages of each species and cultivar in each mix.

E21.2.2 Obtain Contract Administrator’s approval for any proposed adjustments to the seed mix species or cultivars.

E21.3 Trefoil and Clover Seed Mix (for future roadway areas)

E21.3.1 Trefoil and Clover Seed Mix shall be a mixture of the following species and cultivars:

(a) 40% Creeping Red fescue (*Festuca rubra*);

(b) 20% Reubens Canada bluegrass (*Poa compressa* 'Reubens');

(c) 15% Fiesta II Perennial ryegrass (*Lolium perrenne* 'Fiesta II');

(d) 10% White clover (*Trifolium repens*);

(e) 10% Upstart Birdsfoot trefoil (*Lotus corniculatus* 'Upstart'), and

(f) 5% Emerald Crown vetch (*Coronilla varia* 'Emerald').

E21.4 Salt Tolerant Seed Mix

E21.4.1 Salt Tolerant seed mix shall conform to CW 3520-R7.

E21.4.2 Salt Tolerant seed mix shall be a mixture of the following species:

(a) 70% Fults Alkaligrass *(Puccinellia distans);*

(b) 20% Audubon or Aberdeen Red fescue *(Festuca rubra*);

(c) 10% Perennial Rye Grass *(Lolium perenne)*;

E21.5 Trefoil and Vetch Over-seed Mix

E21.5.1 Trefoil and Vetch Over-seed Mix shall be a blend of the 50% Birdsfoot trefoil and 50% Crown vetch.

E21.6 Cover Crop (Nurse Crop)

E21.6.1 Use Annual ryegrass as a cover crop in all seeded areas.

E21.7 Topsoil and Finish Grading

E21.7.1 Topsoil and finish grading shall be in accordance with CW 3540-R5 (see E23).

E21.8 Herbicides and Insecticides

E21.8.1 Herbicides and insecticides shall be in accordance with CW 3520-R7.

E21.9 Hydro Mulch

E21.9.1 Mulch, water and tackifier shall be in accordance with CW 3520-R7.

CONSTRUCTION METHODS

E21.10 Salt Tolerant Seed Mix : Site Topsoil; Imported Topsoil; Seeding, Hydro Mulching, and Maintenance

E21.10.1 Seed with a Brillion Seeder, or equal, on 50 mm compacted depth of imported topsoil for Part 1 locations, and on 100 mm compacted depth of imported topsoil for Part 2 locations, placed over scarified or pulverized sub-grade to a minimum depth of 50 mm except in areas within the edge of a tree canopy (or drip line) and conditioned in accordance with the Topsoil, Planting Soil, Soil Amendments and Finish Grading Specification in Salt Tolerant Seed areas. Preparation of seed bed as per CW 3520-R7.

E21.10.2 Seeding and hydro mulching, and maintenance of areas designated as "Salt Tolerant Mix" shall conform to CW 3520-R7:

(a) Sow Salt Tolerant Seed Mix at 2.2 kg/100 square metres (220 kg/hectare),

(b) Sow cover crop at 0.6 kg/100 square metres.

E21.11 Trefoil and Clover Seed Mix: Soil Amendments, Seeding, Hydro Mulching, and Maintenance

E21.11.1 Seed with a Brillion Seeder, or equal, on amended soil base, conditioned in accordance with "Topsoil, Planting Soil, Soil Amendments and Finish Grading Specification" in Trefoil and Clover Seed areas.

E21.11.2 Seeding and hydro mulching, and maintenance of areas designated as “Trefoil and Clover Seed Mix” shall conform to CW3520-R7.

(a) Sow Trefoil and Clover seed mix at 1.2 kg/100 square metres (120 kg/hectare),

(b) Sow cover crop at 0.6 kg/100 square metres.

E21.12 Over-seeding with Trefoil and Vetch Over-seed Mix

E21.12.1 Over-seed trefoil and vetch in designated sod areas 90 days after sod installation, or as instructed by the Contract Administrator, using a slit seeder or drill seeder.

E21.12.2 Overseed at a rate of 0.75 kg/100 square metres (75kg/hectare)

E21.13 Maintenance of Areas Seeded with Salt-tolerant Seed Mix and Trefoil and Clover Seed Mix

E21.13.1 The Contractor shall water seeded and hydro mulched areas as required to obtain optimum soil moisture levels for germination and continued growth of legumes. Control the watering to prevent seed washouts.

E21.13.2 The Contractor shall mow salt tolerant seed mix areas when grasses exceed 176 mm in height, move to 125 mm height.

E21.13.3 The Contractor shall mow Trefoil and Clover Seed Mix areas once annually, in October, removing cut material that would smother grass and legumes.

E21.13.4 Additional mowing, at a height of 100 mm, shall be completed upon the direction of the Contract Administrator, as required to remove extensive weed growth and/or to maintain healthy growth of legumes and grasses.

E21.14 Chemical Weed Control

E21.14.1 The Contractor shall use chemical weed control, Roundup, 2-4 D or Diacamba, only as required to spot remove weeds in localized areas. Do not treat large areas seeded with trefoil, clover, vetch and wildflowers with chemical weed control agents following seeding operations, unless directed by the Contract Administrator.

E21.14.2 Use only chemicals approved by Agriculture Canada.

E21.15 Termination of Maintenance Period

E21.15.1 The maintenance period shall be terminated after the following criteria have been met:

(a) The certified seed sowed meets the requirements of CW 3520-R7;

(b) The seeded area is free of debris, including leaves;

(c) The seeded area has a firm, uniform and even surface;

(d) Seeded grasses and legumous plants show healthy, vigorous growth;

(e) The area is free of bare and dead spots and with less than 10 noxious weeds per 50 square metres;

(f) The seeded area has sufficient growth density that bare spots do not exceed 5% of total surface area, and

(g) Seeded areas are free of damaging insects.

METHOD OF MEASUREMENT

E21.16 Salt Tolerant Seed Mix, and Trefoil and Clover Seed Mix

E21.16.1 Salt Tolerant seed mix with imported topsoil and finish grading, depth as specified on Form B: Prices, and trefoil and clover seed mix shall be measured on an area basis. The total area to be paid for shall be the number of square metres of seed mix installed and maintained in accordance with this Specification, measured and accepted by the Contract Administrator.

E21.17 Trefoil and Vetch Over-seeding Mix

E21.17.1 Over-seeding with trefoil and vetch shall be measured on an area basis for the number of square metres of sod over-seeded with trefoil and vetch over-seed mixture. The total area to be paid for shall be the number of square metres over-seeded and maintained in accordance with this specification and accepted by the Contract Administrator, as computed from measurements made by the Contract Administrator.

E21.17.2 No measurement shall be made for seed placed outside the limits of placement unless directed by the Contract Administrator.

E21.18 Cover Crop (Nurse Crop) Seeding

E21.18.1 There will be no separate measurement for cover crop (nurse crop) seeding. Seeding of a nurse crop will be included in payment for other seeding operations.

E21.19 Herbicides and Insecticides

E21.19.1 There will be no separate measurement for materials, equipment and operations related to the use of herbicides and insecticides.

BASIS OF PAYMENT

E21.20 Salt Tolerant Seed Mix and Trefoil and Clover Seed Mix

E21.20.1 Supply, placement and maintenance of salt tolerant seed mix with topsoil and finish grading, and trefoil and clover seed mix will be paid for at the Contract Unit Prices for the "Items of Work" listed here below. Prices shall be payment in full for supplying all materials and performing all operations herein specified, and all other items incidental to the work in accordance with this specification, CW3510-R9 and E23.

Items of Work

Seeding

(a) Salt Tolerant Seed Mix (c/w 50mm imported topsoil)

(b) Salt Tolerant Seed Mix (c/w 100mm imported topsoil)

(b) Trefoil and Clover Seed Mix

E21.21 Trefoil and Vetch Over-seeding

E21.21.1 Supply and over-seeding with trefoil and vetch over-seed mixture will be paid for at the Contract Unit Price for "Trefoil and Vetch Over-seeding", which price shall be payment in full for supplying all materials and performing all operations herein specified, and all other items incidental to the work of this specification.

E22. TREES, SHRUBS AND GROUND COVERS

DESCRIPTION

E22.1 General

E22.1.1 This specification covers the supply and installation of nursery-grown trees, shrubs and groundcover plantings in areas indicated on the Drawings, including preparation, digging, transport and planting, and maintenance.

E22.2 Nomenclature

E22.2.1 Nomenclature of specified nursery stock shall conform to the International Code of Nomenclature for Cultivated Plants and shall be in accordance with the approved scientific names given in the latest edition of Standardized Plant Names. The names of varieties not named therein are generally in conformity with the names accepted in the nursery trade.

E22.3 Source Quality Control

E22.3.1 All nursery stock supplied shall be nursery grown and of species and sizes as indicated on the Drawings. Nursery stock shall be No. 1 Grade material in accordance with the current edition of Landscape Canada's (CNTA) "Guide Specifications for Nursery Stock".

E22.3.2 Any nursery stock dug from native stands, wood lots, orchards, or neglected nurseries, which have not received proper cultural maintenance, shall be designated as "collected plants". Obtain permission of the Contract Administrator to use collected plants.

E22.3.3 The Contractor shall notify Contract Administrator of source of plant material at least seven (7) days in advance of shipment.

E22.3.4 Acceptance of plant material at source does not prevent rejection of same plant material on site prior to or after planting operations.

E22.3.5 Imported plant material must be accompanied with necessary permits and import licenses. Conform to federal and provincial regulations.

E22.4 Shipment and Pre-Planting Care

E22.4.1 Coordinate shipping of plants and excavation of holes to ensure minimum time lapse between digging and planting.

E22.4.2 Tie branches of trees and shrubs securely and protect plant material against abrasion, exposure and extreme temperature change during transit. Avoid binding of planting stock with rope or wire, which would damage bark, break branches or destroy natural shape of plant. Give full support to root balls, especially of large trees, during lifting.

E22.4.3 Cover plant foliage with tarpaulin, and protect bare roots by means of dampened straw, peat, saw dust or other acceptable material to prevent loss of moisture during transit and storage.

E22.4.4 Remove broken and damaged roots with sharp pruning shears. Make clean cut and cover cuts over 50 mm diameter with wound dressing.

E22.4.5 Keep roots moist and protect from sun and wind. Heel-in trees and shrubs that cannot be planted immediately in shaded areas; water well.

E22.5 Replacement

E22.5.1 During the first two (2) years following completion of planting operations, remove from site any plants that have died or failed to grow satisfactorily, as determined by the Contract Administrator. As an example, plant material installed in 2010 that has failed to grow satisfactorily and has not been replaced by October 31, 2011, would be required to be replaced in the spring of 2012.

MATERIALS

E22.6 Water

E22.6.1 Water shall be potable and free of minerals that may be detrimental to plant growth.

E22.7 Fertilizer

E22.7.1 Fertilizer shall be slow release organic. Fertilizer shall contain N-P-K in ratio as recommended by soil test results from an approved agricultural soil testing laboratory.

E22.8 Root Ball Burlap

E22.8.1 Root ball burlap shall be 150 g Hessian burlap.

E22.9 Anti-desiccant

E22.9.1 Anti-desiccant shall be wax-like emulsion to provide film over plant surfaces reducing evaporation but permeable enough to permit transpiration.

E22.10 Wound Dressing

E22.10.1 Wound dressing shall be horticultural accepted non-toxic, non-hardening emulsion.

E22.11 Plant Material

E22.11.1 All plant material specified for this project shall be containerized and/or ball and burlap nursery stock. All plants shall be from the Winnipeg area and the Oak-Aspen Forest Eco-region.

E22.11.2 Comply with latest edition of the “Guide Specification for Nursery Stock”, produced by Landscape Canada (CNTA), referring to quality, size and development of nursery-grown plant material and root balls.

E22.11.3 Nursery stock shall be No. 1 grade trees, shrubs and vines.

E22.11.4 All plant material shall be measured when branches are in their natural position. Height and spread dimensions specified in the Plant List on the Drawings refer to the main body of the plant, and not from branch tip to root base or from branch tip to branch tip. Where trees are measured by calliper (cal.), reference is made to the diameter of the trunk measured at 300 mm above ground as the tree stands properly planted in the nursery.

E22.11.5 All containerized whips and herbaceous plant material shall have a minimum of one full year's growth. Roots shall be healthy, reaching the sides of the containers, and developed such that the root ball can be kept intact during transplanting. Roots shall not encircle each other to the extent of inhibiting plant growth.

E22.11.6 Any plants designated as nursery stock but dug from native stands, wood lots, orchards, or neglected nurseries that have not received proper cultural maintenance, shall be designated as “collected stock”. Material sources are to be approved by Contract Administrator prior to ordering or collecting. The Contractor shall provide all of the necessary nursery certificates to ensure that the plant species comply with this specification.

E22.11.7 All trees shall have one, only, sturdy, reasonably straight and vertical trunk, and a well-balanced crown with fully developed leader, unless designated “multi-stem”. All evergreens shall be symmetrically grown and branched from ground level, up.

E22.11.8 Use trees, shrubs and groundcovers with structurally sound, strong fibrous root systems, and free of disease, insects, defects or injuries, including rodent damage, sun scald, frost cracks, abrasions or scars to the bark. Plants must have been root pruned regularly, but not later than one growing season prior to arrival on site.

E22.11.9 All parts of the plants shall be moist and show live, green cambium tissue when cut.

E22.11.10 At least one (1) plant of each variety supplied shall bear a tag showing both the botanical and common name of the plant.

E22.11.11 Additional Plant Material Qualifications:

(a) Imported Plant Material

(i) Plant material obtained from areas with milder climatic conditions from those of site acceptable only when moved to site prior to the breaking of buds in their original location and heeled-in in a protected area or placed in cold storage until conditions suitable for planting. Obtain Contract Administrator’s approval to use imported plant material.

(b) Cold Storage

(i) Approval required for plant material that has been held in cold storage.

(c) Container-Grown Stock

(i) Acceptable if containers large enough for root development. Trees and shrubs must have grown in container for minimum of one growing season but not longer than two. Root system must be able to hold soil when removed from

container. Plants that have become root bound are not acceptable. Container stock must have been fertilized with slow releasing fertilizer.

(d) Balled and Burlapped Plant Material

(i) Deciduous trees in excess of 3 m height must have been dug with large firm ball. Root balls must include 75% of fibrous and feeder root system. This excludes use of native trees grown in light sandy or rocky soil. Secure root balls with burlap, heavy twine and rope. For large trees: wrap ball in double layer of burlap and drum lace with minimum 10 mm diameter rope. Protect root balls against sudden changes in temperature and exposure to heavy rainfall.

(e) Tree Spade Dug Material

(i) Obtain approval of the Contract Administrator for digging plant material with mechanized digging equipment, hydraulic spade or clam-shell type. This type of digging is typically not acceptable for boulevard tree plantings. Dig root balls to satisfy Landscape Canada (CNTA) standards. Lift root ball from hole, place in wire basket designed for purpose, line with burlap. Tie basket to ball with heavy rope. Take care not to injure trunk of tree with wire basket ties or rope.

(f) Substitutions

(i) Substitutions to plant material as indicated on the Plant List will not be permitted unless written approval has been obtained as to type, variety and size prior to award of Contract. Plant substitutions must be of similar species and of equal size to those originally specified.

CONSTRUCTION METHODS

E22.12 Workmanship

E22.12.1 The Contractor shall stake out location of trees, shrubs and planting beds as per the Drawings. Obtain Contract Administrator's approval prior to excavating.

E22.12.2 The Contractor shall obtain clearances from all utilities, with respect to underground lines located in the areas to be excavated, prior to commencing planting operations.

E22.12.3 The Contractor shall apply anti-desiccant in accordance with material manufacturer's instructions.

E22.12.4 The Contractor shall coordinate planting operations; keep the site clean and planting holes drained, and immediately remove soil or debris spilled onto pavement.

E22.13 Planting Time

E22.13.1 The Contractor shall plant deciduous plant material during dormant period before buds have broken. Plant material noted for spring planting only must be planted in dormant stage.

E22.13.2 Plant material imported from region with warmer climatic conditions may only be planted in early spring.

E22.13.3 When permission has been obtained to plant deciduous plant material after buds have broken, spray plants with anti-desiccant to slow down transpiration prior to transplanting.

E22.13.4 When permission has been obtained, trees, shrubs and ground covers growing in containers may be planted throughout growing season.

E22.13.5 Plant only under conditions that are conducive to health and physical conditions of plants.

E22.13.6 The Contractor shall provide the Contract Administrator with a planting schedule at least two weeks prior to planting operations. Extending planting operations over long period using limited crew will not be accepted.

E22.14 Excavations

E22.14.1 Shrub beds: excavate to minimum depth of 300 mm, as indicated on the Drawings. Individual shrubs shall be planted in 500 mm deep holes backfilled with planting soil mixture.

E22.14.2 Trees: excavate to depth such that the top of the root ball is even with existing grade, with a surface width of two times the diameter of the root ball. Backfill around trees with planting soil mixture.

E22.14.3 The sides of all tree pits shall be scarified to the depth of one shovel blade.

E22.14.4 Provide drainage for planting holes in heavy soil if natural drainage does not exist. Have method approved.

E22.14.5 Protect the bottoms of excavations against freezing.

E22.14.6 Remove water that enters excavations prior to planting. Ensure source of water is not ground water.

E22.15 Planting

E22.15.1 Trees shall be placed on undisturbed soil and to a depth equal to that at which they were originally growing at the nursery.

E22.15.2 For shrubs, loosen bottom of planting hole to depth of 150 to 200 mm. Cover bottom of each excavation with minimum of 150 mm of planting soil mixture.

E22.15.3 Plant trees, shrubs and groundcover vertically, with roots placed straight out in hole. Orient plant material to give best appearance in relation to structures, roads and walkways.

E22.15.4 Place plant material to depth equal to depth they were originally growing in nursery or in locations collected.

E22.15.5 Ball and burlap root balls: loosen burlap and cut away minimum top 1/3 without disturbing root ball. Do not pull burlap or rope from under root ball. With container stock, remove entire container without disturbing root ball. Non-biodegradable wrappings must be removed.

E21.15.6 Tree spade excavated materials:

(a) Tree spade planting shall be permitted only by approval of the Contract Administrator.

(b) Dig tree pit with same mechanical equipment as used to dig plant material. Ensure hole dug is upright as possible. Place in hole a mixture of 40 L of planting soil and fertilizer mixed with water to soupy consistency. This will be forced up sides of ball as root ball is placed in hole.

(c) Loosen bottom of planting hole to depth of 150 to 200 mm. Cover bottom of each excavation with minimum 150 mm topsoil mixture.

E22.15.6 Tamp planting soil mixture around root system in layers of 150 mm eliminating air voids. Frozen or saturated planting soil is unacceptable. When 2/3 of planting soil has been placed, fill hole with water. After water has been completely penetrated into soil, complete backfilling.

E22.15.7 Excavate 200 mm depth an additional 600 mm beyond planting pits around the perimeter of all tree planting pits, and fill with planting soil mixture.

E22.15.8 Construct 100 mm deep saucers around the outer edge of planting pits to assist with maintenance watering.

E22.15.9 When planting is completed apply slow release organic fertilizer at minimum rate of 12 kg/100 m for shrub beds or 50 g/mm of calliper for trees, or as recommended by the soil analysis. Mix fertilizer thoroughly with top layer of planting soil and water in well.

E22.16 Pruning

E22.16.1 Prune trees, shrubs and groundcover after planting, as indicated. Postpone pruning of those trees where heavy bleeding may occur, until in full leaf. Employ clean sharp tools and make cuts flush with main branch, smooth and sloping as to prevent accumulation of water. Remove projecting stumps on trunks or main branches. Remove dead and injured branches and branches that rub causing damage to bark. Trim trees and shrubs without changing their natural shape. Do not damage lead branches or remove smaller twigs along main branches.

E22.17 Standards

E22.17.1 All roots shall be cleanly cut; split roots are not acceptable.

E22.17.2 Branches and trunks shall be tied and protected; broken or abraded branches or trunks are not acceptable.

E22.17.3 Planting shall be protected from drying conditions; desiccated material not acceptable.

E22.17.4 All plants shall be free of insects and disease: galls, blight and other manifestations of insect infestation or disease not acceptable.

E22.18 Wood Chip Mulch

E22.18.1 All planting beds shall be covered with a 100 mm depth of wood chip mulch to the limits shown on the planting details.

E22.18.2 Wood chip mulch shall extend under all tree limbs, but shall not be installed within 150 mm of the tree trunk.

E22.18.3 The saucers of all trees not planted in beds shall be covered with a 100 mm depth of wood chip mulch.

E22.19 Maintenance

E22.19.1 Watering

(a) Plant material shall be watered once a week for first four weeks following installation, and once every second week, thereafter. Ensure adequate moisture in root zone at freeze-up.

E22.19.2 Weeding

(a) Keep mulched shrub beds and tree saucers weed-free by manually removing weeds during the maintenance period.

E22.19.3 Insects and Diseases

(a) Spray plants to combat pests and diseases. Use organic chemical insecticides approved by Agriculture Canada.

E22.19.4 Adjustments

(a) Make adjustments requested by the Contract Administrator, including straightening trees, tightening guy wires and removing tree stakes.

E22.19.5 Maintenance Period

(a) Maintain plant material for a period of two years following acceptance to start maintenance period of planting operations, as determined by the Contract Administrator.

MEASUREMENT AND PAYMENT

E22.20 Trees, Shrubs and Vines

E22.20.1 Supply and installation of trees and shrubs will be measured on a unit price basis for each tree, shrub and vine listed on the Plant List and paid for at the Contract Unit Price for each

species and size shown on the Plant List. The number of trees and shrubs to be paid for will be the total number of trees and shrubs installed in accordance with this specification and accepted by the Contract Administrator, as computed by the Contract Administrator.

E22.20.2 Supply and installation of fertilizer for plant material will be included in payment for the plant material.

E23. TOPSOIL, PLANTING SOIL, SOIL AMENDMENTS AND FINISH GRADING

DESCRIPTION

E23.1 General

E23.1.1 This specification shall amend and supplement City of Winnipeg Standard Construction Specification CW 3540-R5 "Topsoil and Finish Grading for Establishment of Turf Areas", and shall cover supply, preparation and placement of topsoil, planting soil and soil amendments, including preparation of existing grade, finish grading and fertilizer application.

E23.1.2 Referenced Standard Construction Specifications

(a) CW 3540- Topsoil and Finish Grading for Establishment of Turf Areas

MATERIALS

E23.2 Peatmoss

E23.2.1 Peat moss shall be decomposed plant material, fairly elastic and homogenous, free of colloidal residue, wood, sulphur and iron; containing a minimum of 60% organic material by weight, with moisture content not exceeding 15%. Shredded particles shall not exceed 6 mm in size. Minimum pH value of peat shall be 4.5; maximum 6.0.

E23.3 Sand

E23.3.1 Sand shall be hard, granular, sharp sand to CSA A82.56-M1976, well-washed and free of impurities, chemicals and organic matter.

E23.4 Bonemeal

E23.4.1 Bonemeal shall be raw, finely ground with a minimum chemical analysis of 3% nitrogen and 20% phosphoric acid.

E23.5 Wood Chip Mulch

E23.5.1 Wood chip mulch shall be chipped ash, maple, poplar, birch and other deciduous trees. Mulch shall be chipped to sizes ranging from 50mm to 100mm. Mulch may NOT contain stringy twigs and seed, free of non-organic material, wood preservatives or diseased wood. The mulch shall contain no more than 5% of the following materials in total: soil, sawdust, peatmoss, coniferous wood and needles.

E23.5.2 The Contractor shall supply a wood chip mulch sample to the Contract Administrator for approval prior to installation.

E23.6 Fertilizer

E23.6.1 Chemical fertilizers shall have N-P-K compositions as recommended by an agricultural soil-testing laboratory approved by the Contract Administrator provided for each of the following:

(a) Sod (City Specification) with imported topsoil;

(b) Salt-tolerant Seed Mix with imported topsoil;

(c) Salt-tolerant seed mix with site topsoil

(d) Horticultural trees and shrubs with planting soil mix; and

(e) Trefoil and Clover Seed Mix with soil amendments.

E23.7 Chemical Application

E23.7.1 Roundup or similar chemical herbicides approved by Agriculture Canada shall be used only with the approval of the Contract Administrator.

E23.8 Erosion Control Blanket

E23.8.1 Erosion control blanket shall be North American Green C350 Reinforced Composite Mat, or equal: 100% coconut fibre matrix with three-dimensional UV-stabilized polypropylene netting structure. All nets shall have coloured thread stitched along both outer edges (50 to 125 mm from the edge) as an overlap guide to adjacent mats. Roll width: 2.0 m; length: 16.9 m. Roll weight; 16.8 kg.

E23.9 U-Staples

E23.9.1 Use U staples to anchor the reinforced composite mat to slopes.

E23.10 Straw Wattle

E23.10.1 Use Stenlog or other bio-degradable straw wattle (150 mm diameter).

E23.11 Plastic Edging

E23.11.1 Use heavy-duty 125 mm deep black PVC garden edging with rolled top.

CONSTRUCTION METHODS

E23.12 Imported Topsoil and Finish Grading

E23.12.1 Installation of imported topsoil in areas to receive sod (or salt-tolerant grass seed), including preparation of existing grade, placing topsoil, applying fertilizer and finish grading shall conform to CW 3540-R5.

E23.12.2 Install imported topsoil to 50 mm compacted depth in areas to be seeded with Salt-tolerant Seed Mix in Part 1 locations, install imported topsoil to 100 mm compacted depth in areas to be seeded with Salt-tolerant Seed Mix in Part 2 locations.

E23.12.3 Install imported topsoil to 100 mm compacted depth in areas to be sodded >600 mm in Part 1 locations and in areas to be sodded (>600 mm, and < or = 600 mm) in Part 2 locations.

E23.13 Planting Soil Mixture for Trees, Shrubs and Vines

E23.13.1 Planting soil mixture shall be a mix of 75% topsoil and 20% peatmoss, loose by volume. Incorporate 5% sand, or as required, to improve soil texture. Incorporate bonemeal at 3 kg/cubic metre of planting soil mixture.

E23.14 Construction of Planting Beds

E23.14.1 Excavate planting beds to a depth of 500 mm.

E23.14.2 Install planting soil mixture, loosely compacted, 500 mm deep in planting beds with a smooth top surface to match surrounding contours. Level planting soil mixture by hand around existing and newly planted trees and shrubs.

E23.14.3 Install 100 mm wood chip mulch in all beds following planting operations.

E23.15 Soil Amendment for Trefoil and Clover Seed Mix

E23.15.1 Soil amendment for native grass and wildflower seeding, as well as for Trefoil and Clover Mix and related sod edge strips shall consist of a mix of 60% peat moss and 40% sand, loose by volume.

E23.15.2 Cross-cultivate the entire area of soil base (clay) that is to receive soil amendments to a depth of 150 mm. Redo areas where equipment used for hauling and spreading has re-compacted sub-grade

E23.15.3 Spread 30 mm of peat moss and 20 mm sand over the area of soil amendments.

E23.15.4 Roto-till or disc the peat moss and sand into the top 100 to 125 mm of base material and mechanically roll to obtain a level surface.

E23.15.5 Grade to eliminate rough spots and low spots and to maintain positive drainage.

E23.15.6 Consolidate seedbed to required bulk density using equipment approved by the Contract Administrator. Leave surfaces smooth, uniform and firm against deep foot-printing.

E23.16 Erosion Control Blanket

E23.16.1 Install erosion control blanket in accordance with the Drawings and the manufacturer's specifications in all areas where slopes exceed 3:1.

E23.17 Straw Wattle

E23.17.1 Install 300 mm Stenlog or other straw wattle sediment control material in accordance with the manufacturer's specifications around all rip rap areas, drainage inlets and outlets, and catch basins within seeded areas.

E23.17.2 Install straw wattles so that no gaps exist between the soil and the bottom of the wattle, and the ends of adjacent wattles are overlapped 150 mm minimum to prevent water and sediment passing. Achieve a tight seal between the wattle segments.

E23.17.3 Dog leg terminal ends of straw wattle up the slope to prevent channeling of sedimentation.

E23.17.4 Use 300 mm wooden stakes to fasten straw wattle to the soil. Place stakes on each side of the straw wattle, lying across the natural fibre twine, spaced 1200 mm on centre. Leave 30 to 50 mm of wood stake exposed above the wattle.

E23.17.5 Avoid damage to wattles. Damaged areas of wattles should be cut and tied off, then treated as terminal ends.

E23.18 Heavy Duty Plastic Landscape Edger

E23.18.1 Install 125 mm heavy duty plastic landscape edging with rolled top to separate planting beds from sod or seeded areas.

METHOD OF MEASUREMENT

E23.19 Imported Topsoil and Fine Grading

E23.19.1 There shall be no separate measurement for work associated with imported topsoil and finish grading for sod and salt tolerant seeding as described in this specification.

E23.20 Planting Soil Mixture

E23.20.1 Construction of planting beds, and supply and installation of planting soil mixture shall be measured on an area basis for the number of square metres of 300 mm depth planting bed constructed, complete with 300 mm depth planting soil mixture (depth is allowing for settlement), all in accordance with the Drawings and this specification, and accepted by the Contract Administrator, as computed by the Contract Administrator.

E23.20.2 There will be no separate measurement for planting soil mixture used in planting individual trees and shrubs that are not planted in beds.

E23.21 Wood Chip Mulch

E23.21.1 Supply and installation of wood chip mulch shall be measured on an area basis for the number of square metres of 100 mm wood chip mulch installed in planting beds in

accordance with the Drawings and this specification, and accepted by the Contract Administrator, as computed by the Contract Administrator.

E23.21.2 There will be no separate measurement for wood chip mulch used in individual trees saucers.

E23.22 Soil Amendments for Native Seeding

E23.22.1 Soil amendments shall be measured on an area basis for the number of square metres of soil base incorporating peat moss and sand in accordance with the Drawings and this specification, and accepted by the Contract Administrator, as computed by the Contract Administrator.

E23.23 Erosion Control Blanket

E23.23.1 Erosion control blanket will be measured on an area basis for the number of square metres of area covered by erosion control blanket in accordance with the Drawings and this specification, and accepted by the Contract Administrator, as computed by the Contract Administrator.

E23.24 Straw Wattle

E23.24.1 Straw wattle will be measured on a length basis for the number of linear metres of wattle installed in accordance with the Drawings and this specification, and accepted by the Contract Administrator, as computed by the Contract Administrator.

E23.25 Heavy Duty Plastic Landscape Edger

E23.25.1 Plastic edging will be measured on a length basis for the number of linear metres of plastic edging installed in accordance with the Drawings and this specification, and accepted by the Contract Administrator, as computed by the Contract Administrator.

BASIS OF PAYMENT

E23.26 Planting Soil Mixture

E23.26.1 Construction of planting beds and supply and installation of planting soil mixture will be paid for at the Contract Unit Price for “Planting Beds with Planting Soil Mixture”, which price shall be payment in full for supplying all materials and performing all operations herein specified, and all other items included in the work of this specification.

E23.27 Wood Chip Mulch

E23.27.1 Supply and installation of wood chip mulch will be paid for at the Contract Unit Price for “Wood Chip Mulch”, which price shall be payment in full for supplying all materials and performing all operations herein specified, and all other items included in the work of this specification.

E23.28 Soil Amendments Trefoil and Clover Seed Mix

E23.28.1 Soil amendments will be paid for at the Contract Unit Price for “Soil Amendments for Trefoil and Clover Seed Mix and Related Sod Edge Strips”, which price shall be payment in full for supplying all materials and performing all operations herein specified, and all other items included in the work of this specification.

E23.29 Erosion Control Blanket

E23.29.1 Erosion control blanket will be paid for the number at the Contract Unit Price for “Erosion Control Blanket”, which price shall be payment in full for supplying all materials and performing all operations herein specified, and all other items included in the work of this specification.

E23.30 Straw Wattle

E23.30.1 Straw wattle will be paid for at the Contract Unit Price for “Straw Wattle”, which price shall be payment in full for supplying all materials and performing all operations herein specified, and all other items included in the work of this specification.

E23.31 Heavy Duty Plastic Landscape Edger

E23.31.1 Plastic edging will be paid for at the Contract Unit Price for “Heavy Duty Plastic Landsape Edger”, which price shall be payment in full for supplying all materials and performing all operations herein specified, and all other items incidental to the Work of this Specification.

E24. CHEMICAL CONTROL OF VEGETATION

DESCRIPTION

E24.1 General

E24.1.1 This specification covers the requirements for the application of herbicides for broad area weed control prior to seeding operations.

E24.2 Safety Requirements

E24.2.1 Comply with Federal, Provincial, pesticide control regulations. Provide Material Safety Data sheets (MSDS) for all chemicals to be used.

E24.2.2 Obtain Provincial Pesticide Applications License and any other permits and licenses necessary to complete work.

E24.2.3 Comply with label directions on the use of herbicide products.

E24.2.4 Comply with label directions as to ambient temperature ranges for application.

MATERIALS

E24.3 Delivery and Storage

E24.3.1 Deliver, store and maintain packaged materials with manufacturer's seals and labels intact.

E24.3.2 Prevent damage, adulteration and soiling of material during delivery, handling and storage.

E24.3.3 Store material in accordance with label directions, including those on maximum and minimum storage temperatures.

E24.3.4 Store herbicide products in original containers as supplied by manufacturer and keep sealed until used.

E24.3.5 Store herbicide products in sheltered, well ventilated, controlled access location.

E24.3.6 Do not store herbicides near feeds and food stuffs, agricultural plants, seeds, fungicides, insecticides, fertilizers or other agricultural chemicals.

E24.3.7 Identify storage area as pesticide storage facility for fire protection purposes.

E24.3.8 Post in a prominent place a list of medical and fire department telephone numbers.

E24.3.9 Post in a prominent location on the outside of the storage area a list of products stored. Provide a copy of this list to fire department. Keep list up to date.

E24.4 Herbicides

E24.4.1 Select appropriate herbicides to achieve specified control requirement. Refer to Manitoba Guide to Chemical Weed Control.

E24.4.2 Herbicide products used must be registered for such use by Agriculture Canada under Pest Control Products Act.

E24.4.3 Do not use herbicides containing sodium chlorate.

E24.5 Adjuvants

E24.5.1 Adjuvants shall be compatible with herbicide product used.

E24.6 Spray Equipment

E24.6.1 Tank Spray: Do not use air-blast, mist or fog sprayer. Sprayer unit to meet the following requirements:

(a) Sprayer shall have adjustable height boom, hose and handgun for spot treatments, strainers and nozzles to produce spray pattern compatible with job.

(b) Tank shall be equipped with continuous agitation device.

(c) Pressure gauge and regulator shall be capable of maintaining uniform pressure between 100 and 450 kPa.

E24.6.2 Backpack Sprayer: Sprayer shall have hose and handgun for spot treatment.

E24.6.3 Equip spray tank loading pipe with check valve located within one metre of pump or hydrant to prevent siphoning from spray tank resulting in contamination of water source.

CONSTRUCTION METHODS

E24.7 Notice of Spray Operation

E24.7.1 Post areas to be treated with signs placed at each road access and 100 m intervals around perimeter.

E24.7.2 Indicate on signs that spray program is being implemented.

E24.7.3 Put signs in place prior to commencement of spray operation and retain in place for 24 hours after spray operation is completed for each particular area.

E24.8 Environmental Protection

E24.8.1 Application may continue only when wind velocities range between 2 and 10 km/h.

E24.8.2 Do not spray when air turbulence will prevent uniform application.

E24.8.3 Do not apply herbicides within 65 m of wells, rivers, streams, lakes, marshes or other environmentally sensitive areas unless otherwise sanctioned by provincial permit.

E24.8.4 In case of herbicide spill, notify Contract Administrator and Provincial Ministry of Environment verbally immediately and subsequently in writing.

E24.8.5 Do not allow drifting beyond target area. Use mechanical method to minimize herbicide drift.

E24.8.6 When spraying adjacent to desirable vegetation, use sprayer fitted with protective hood suitable to prevent contamination or provide protective covering for such vegetation while spray is in progress.

E24.8.7 Do not apply sterilants to slopes greater than 3 to 1 where killing vegetation would lead to erosion problems.

E24.9 Application of Herbicides

E24.9.1 Treat areas as indicated with appropriate herbicides.

E24.9.2 Calibrate equipment to achieve manufacturer's recommended application rates.

E24.9.3 Confine herbicide application to areas as indicated to achieve specified control requirements.

E24.9.4 Space successive passes to provide uniform coverage of treated area.

E24.9.5 Use flagmen or other aids as necessary to indicate successive passes.

E24.9.6 Where roots of desirable vegetation run under treatment area, use contact herbicides.

E24.9.7 Ensure formulation and rate of sterilant will not lead to leaching outside treatment area.

E24.9.8 Retreat areas in accordance with label directions until specified control requirements are achieved.

E24.9.9 Use flags or other aids as necessary to indicate successive passes.

E24.10 Control Requirements

E24.10.1 For weed control, achieve within 30 days of treatment, minimum of 90% kill of target plants without damaging installed plant material.

E24.10.2 For soil sterilization, achieve within 12 months of treatment, 100% kill of vegetation.

E24.11 Waste Disposal

E24.11.1 Triple rinse empty herbicide containers with dilutent and add rinsate to spray mixture in tank.

E24.11.2 Puncture and crush glass plastic metal containers making them unsuitable for further use.

E24.11.3 Dispose of containers in accordance with provincial requirements.

E24.11.4 Do not rinse or wash spray tanks and equipment on site.

E24.12 Report

E24.12.1 Within 7 days of work completion, submit to Contract Administrator a written report containing following information:

(a) Full name and PCP Registration number of herbicide products used including adjuvants.

(b) Types and makes of application equipment used.

(c) Total amount of herbicide applied and rate of application expressed in kilograms of active ingredients per square metre and in kilograms of product per square metre.

(d) Dates and times treatment commenced and terminated each day.

(e) Summary of daily weather conditions during treatment.

(f) Number of hectares completed each day.

(g) Description of disposal techniques, total number of containers discarded for each chemical, exact location of disposal site.

(h) Names of drivers, mixers and applicators.

(i) Copies of Provincial Applicator's License and pesticide project application permit.

METHOD OF MEASUREMENT

E24.13 Chemical Control of Vegetation

E24.13.1 Broad scale application of chemical herbicides following topsoil installation will be paid for on an area basis. The area paid for shall be the total number of square metres sprayed in accordance with this specification and accepted by the Contract Administrator, as computed by the Contract Administrator.

E24.14 Spot Weed Control

E24.14.1 Application of chemical herbicides to control excessive weed growth in sod or seeded areas, in planting beds or around trees, following completion of planting operations will be included in payments for the general two-year maintenance requirements. (Assume two rounds of hand spraying.)

BASIS OF PAYMENT

E24.15 Chemical Control of Vegetation

E24.15.1 Broadscale application of chemical herbicide following topsoil installation will be paid for at the Contract Unit Price per square metre for "Chemical Application of Herbicide", which payment shall be considered compensation in full for supplying all of the labour, materials, equipment, tools and completing all operations herein described and all other work included in the work of this specification.

E25. LONG TERM SCHEDULED MAINTENANCE OF PLANT MATERIAL AND PLANTING BEDS

DESCRIPTION

E25.1 General

E25.1.1 This specification covers the maintenance of plant material and planting beds following acceptance of the work by the Contract Administrator.

MATERIALS

E25.2 Materials

E25.2.1 The Contractor shall provide all necessary materials and equipment including: additional topsoil, soil ameliorates, mulches, fertilizers and pesticides, and pruning tools, water trucks, hoses, water metres and any other items necessary for the maintenance of the areas indicated in this specification.

CONSTRUCTION METHODS

E25.3 Provision of Maintenance Personnel

E25.3.1 The Contractor shall provide all necessary personnel for the ongoing maintenance operations.

E25.4 Capability of Personnel

E25.4.1 Maintenance personnel should have at least one year of experience in arboriculture/maintenance and should be under the direction of a foreman, in all cases, with not less than five years of experience with similar maintenance operations.

E25.4.2 The maintenance foreman shall be familiar with plant identification.

E25.5 Maintenance Period

E25.5.1 Maintain plantings for a period of two (2) years from the completion of the Maintenance for Establishment period, as determined by the Contract Administrator. Note: Completion shall not occur after October 30, or before May 15 of any year.

E25.6 Maintenance Schedule

E25.6.1 Provide the Contract Administrator a Schedule of Proposed Maintenance Activities for the two-year scheduled maintenance period, based on the requirements outlined herein. The scheduled maintenance period shall not commence until the schedule has been reviewed by the Contract Administrator.

E25.7 Recording Maintenance Operations

E25.7.1 The Contractor shall provide a detailed maintenance log, including but not limited to the following: hours of labour undertaken, number of personnel employed and equipment used. The log will itemize watering, spraying and any other maintenance work. Contractor shall submit logs monthly at regularly scheduled meetings with the Contract Administrator. Maintenance log will be included in payment for the maintenance work

E25.8 Traffic

E25.8.1 Do not conduct maintenance operations during peak traffic periods (Monday to Friday from 07:00 to 09:00 and from 15:30 to 17:30).

E25.9 Maintenance of Trees, Shrubs, and Planting Beds

E25.9.1 Maintain trees, shrubs, vines and planting beds as indicated in E22.19.

E25.9.2 Watering Trees, and Shrubs

(a) Newly planted trees, and shrubs require water to become established; however, watering too often can kill a plant. During the summer, if temperatures are fairly high and there has been no rainfall, water approximately once a week.

(b) Contractor shall determine the need for watering by taking soil tests weekly with a one-inch auger. Take a test sample from both the planting soil and from the tree root balls by drilling to a minimum depth of 600 mm. The soil shall contain enough moisture to hold together when compressed in the hand, but shall not be muddy.

(c) Testing shall be undertaken at a minimum of 10 sites per week at a minimum of 10m between sites. The installed plant material and bioengineering shall not be allowed to dry out to the detriment of the viability of the plant material. Contractor shall monitor and submit lots to the Contract Administrator monthly. Contractor shall water-in plant material works in late fall during the scheduled maintenance period.

(d) Thoroughly soak coniferous trees prior to winter freeze-up.

E25.9.3 Fertilizing, Pruning and Spraying Deciduous Trees and Shrubs

(a) Because of the specialized nature of such operations, employ a qualified local arborist. (Refer to E24)

E25.9.4 Pruning Deciduous Trees and Shrubs

(a) Prune in accordance with E22.16 by thinning out unnecessary limbs or portions of limbs and by cutting back the terminal growth. Cut with pruning shears and with handsaws for limb-wood. When cutting the terminal growth, make the cuts one-quarter inch above the bud or lead twig. Where an entire limb is removed, make the cuts flush with the main stem or trunk.

E25.9.5 Cultivation

(a) Cultivate only as required to reconstruct planting beds or tree saucers, or to remove significant weed growth.

(b) Do not cultivate around plants with a shovel or spade. The tendency is to penetrate too deeply and cause root injury. Cultivate with a hoe or similar tool. When using a hoe never penetrate soil more than 50 mm. Maintain natural elevation of the surrounding area when cultivating. Create a gentle saucer to contain water around the tree root zone.

(c) Avoid pyramiding soil around the base of any plant as this causes water to drain away and will encourage undesirable top root growth.

(d) The boundary between the adjacent sod and soil saucer should be crisp and well formed.

(e) Restore wood chip mulch when cultivation completed.

E25.9.6 Spraying

(a) Spray trees and shrubs to control insect pests and diseases. Use horticultural compounds approved by Agriculture Canada, which are specific for the problem to be contained.

E25.9.7 Straightening

(a) Straighten trees as required or as directed by the Contract Administrator

E25.9.8 Mulching Wood Chip

(a) Add wood chip mulch to planting areas as required to maintain an even fresh surface.

E25.9.9 Weeding

(a) Hand weed and lightly rake a minimum of once per month, or as determined by the Contract Administrator, to remove competition for installed plant material/undesirable plant material. Dispose of undesirable material off-site.

(b) The Contractor shall be responsible for any fines or weed control notices issued for the planting areas. All such notices shall be dealt with by the Contractor in a timely fashion. Copies of any fines and notices shall be provided to the Contract Administrator within five (5) working days of receipt by the Contractor.

E25.9.10 Dispose of waste material at a recognized solid waste disposal site.

METHOD OF MEASUREMENT

E25.10 General Maintenance of Trees, Shrubs and Planting Beds

E25.10.1 Trees, Shrubs and Vines, and Planting Beds

(a) Two year general maintenance of trees and shrubs, and planting beds including fertilizing, pruning, spraying for insects, disease control, cultivation, care of guy wires and turnbuckles, straightening, mulching and watering will be measured twice each season, typically in July and October, for a six month annual growing season from April 15 to October 15 each year.

E25.10.2 All measured work will be in accordance with the Drawings and this specification and accepted by the Contract Administrator, as computed by the Contract Administrator.

BASIS OF PAYMENT

E25.11 General Maintenance of Trees, Shrubs, and Planting Beds

E25.11.1 General maintenance and general clean-up will be paid for at the Contract Unit Prices for the “Items of Work” listed here below. Prices will include supply of all labour, equipment and materials and performing all operations herein described, and all other items included in the Work of this specification.

Items of Work

General Maintenance of Landscaping

(a) General Plant Material and Planting Bed Maintenance

E26. PLANT MATERIAL WARRANTY

DESCRIPTION

E26.1 General

E26.1.1 This specification covers the provision of warranty for all plant material itemized on the Plant List, for the two-year maintenance period and for the individual areas identified within the overall Contract Area.

E26.2 Timing

E26.2.1 Warranty shall be for two (2) years, commencing upon acceptance of installed plant material.

E26.3 Warranty

E26.3.1 The Contractor hereby warrants that the plant material as itemized on the Plant Lists and on the Drawings will remain free of defects for the maintenance period indicated for each area of the Contract.

E26.4 End-of-Warranty Inspection

E26.4.1 Contract Administrator reserves the right to extend the Contractor's warranty responsibilities for an additional year, at the end of the designated warranty period for the appropriate area, if at that time plant material leaf development and growth are not sufficient to ensure future survival.

E26.5 Replacement

E26.5.1 During the warranty period, remove from site any plant material that has died or failed to grow satisfactorily, as determined by the Contract Administrator and replace with healthy plant material of the same species and size.

E26.5.2 Replace plant material in the following spring or fall as directed.

E26.5.3 Extend warranty on replacement plant material for an additional period until the end of the specified warranty period or for one full growing season, whichever is the longer period.

E26.5.4 Continue such replacement and warranty until plant material is acceptable.

E26.5.5 Trees determined by the Contract Administrator to have been damaged by vandalism shall be replaced and such replacement trees will be paid for at the Contract Unit Prices for the species indicated on the Drawings.

MEASUREMENT AND PAYMENT

E26.6 Warranty

E26.6.1 Warranties on plant material will not be measured or paid for.

E26.6.2 Warranties on plant material shall be included in payment for the supply and installation of plant material.

E27. TREE REMOVALS

DESCRIPTION

E27.1 General

E27.1.1 This specification shall supplement CW 3010-R4 Clearing and Grubbing.

CONSTRUCTION METHODS

E27.2 Tree Removals

E27.2.1 Individual trees marked and confirmed for removal in the field by the Contract Administrator shall be removed to a minimum of 200 mm below the proposed grade.

E27.2.2 The Contractor shall arrange for any Elm wood to be disposed of by the City of Winnipeg.

MEASUREMENT AND PAYMENT

E27.3 Tree Removals

E27.3.1 Tree removal will be measured on a unit basis and paid for at the Contract Unit Price for “Tree Removal”. The number to be paid for shall be the total number of trees removed as measured by the Contract Administrator.

E28. OPERATING CONSTRAINTS FOR WORK IN CLOSE PROXIMITY TO FEEDERMAINS

E28.1 Description

E28.1.1 This Section details operating constraints for all work to be carried out in close proximity to the Inkster Feedermain. Close proximity shall be deemed to be any construction activity within a 5 m offset from the centreline of the feedermain.

E28.2 General Considerations for Work in Close Proximity Feedermains

E28.2.1 The Inkster Feedermain is a critical component of the City of Winnipeg Regional Water Supply System and work in close proximity to the pipeline shall be undertaken with an abundance of caution. The pipe cannot be taken out of service for extended periods to facilitate construction and inadvertent damage caused to the pipe would likely have catastrophic consequences.

Work around the Feedermain shall be planned and implemented to minimize the time period that work is carried out in close proximity to the pipe and to ensure that the pipeline is not subjected to excessive construction related loads, including excessive vibrations and/or concentrated or asymmetrical lateral loads during backfill placement.

E28.2.2 The Inkster Feedermain is constructed of Prestressed Concrete Cylinder Pipe conforming to AWWA Standard C301. The Inkster Boulevard Feedermain was installed in two phases, in 1975 from Keewatin Street to King Edward Street and in 1977 from King Edward Street to Brookside Boulevard. The pipe is 600mm Class 12 Lined Cylinder Pipe manufactured by Canron Inc. for both sections.

E28.2.3 AWWA C301 pipe has limited ability to withstand increased earth and live loading. Therefore, every precaution must be undertaken to ensure that applied loading during all phases of construction is within accepted loading parameters.

Loading limitations and calculated loads associated with typical construction equipment is attached to this specification as Appendix A for illustrative purposes. The loading calculations shall be interpreted with caution, however, as many factors can cause applied loads to increase considerably, such as unbalanced loading, variations in wheel base or track width, payload, impact factors due to excessive speed or vibration, etc.

E28.3 Submittals

E28.3.1 Submit proposed construction equipment specifications to the Contract Administrator for review seven (7) days prior to construction. Submittal shall include;

(a) Equipment operating weight and dimensions including wheel or track base, track length or axle spacing, track widths or wheel configurations

(b) Payload weights

(c) Load distributions in the intended operating configuration

E28.3.2 Submit a Construction Method Statement with proposed construction plan including haul routes, excavation equipment locations, loading positioning and base construction sequencing to the Contract Administrator for review seven (7) days prior to construction. Do not commence construction until the Construction Method Statement has been reviewed and accepted by the Contract Administrator.

E28.4 Feedermain Shutdowns

E28.4.1 Provide ten (10) Business Days notification in writing, to the Contract Administrator in advance of requiring Feedermain shutdowns. Shutdowns shall be coordinated with the Water Services Division of the Water and Waste Department.

E28.4.2 For Feedermain shutdowns that require draining of the pipeline, provide access to all facilities for WWD crews, and provide assistance to crews to drain and fill pipelines including operation of drain and blow off valves under direction of WWD crews, and installation of drain hoses and valves as required. Allow a minimum of 24 hours pipe drain time.

E28.4.3 Disinfect all exposed piping and appurtenances as per City of Winnipeg CW 2125 using disinfection by spray or swabbing techniques.

E28.5 Protection of the Feedermain During Construction

E28.5.1 Planning and General Execution

(a) No work shall commence at the site until a Construction Method Statement, has been submitted for review.

(b) The Feedermain location shall be clearly delineated in the field including verification that its datum relative to the proposed pavement are adequately defined. Any deviations from the elevations noted herein shall be reported to the Contract Administrator for review and comment prior to proceeding with proposed construction activities.

(c) Work over the feedermain shall only be carried out with equipment that has been reviewed and quantified in terms of its loading implications on the pipe. All proposed construction equipment must be submitted to the Contract Administrator for review prior to construction. The submissions need to include sufficient data on operational weights, dimensions, and payloads to facilitate assessment that the proposed construction equipment is not in excess of the typical construction loading that this assessment was based on.

(d) For transverse crossings of the feedermain, designate crossing locations and confine equipment crossing the pipe(s) to these locations. Reduce equipment speeds to levels that minimize the effect of impact loading.

(e) For construction work activities either longitudinally or transverse to the alignment of the feedermain, work only with equipment and in the manner stipulated in the accepted Construction Method Statement and the supplemental requirements noted herein.

(f) Subgrade, sub-base and base construction shall be kept in a rut free condition at all times. Construction equipment is prohibited from crossing pipelines or travelling adjacent to the Feedermain if the grade is insufficient to support the equipment without rutting.

(g) Granular material, construction material, soil or other material shall not be stockpiled on the pipelines or within 3 metres of the pipe centerline.

(h) Construction operations should be staged in such a manner as to limit multiple construction loads at one time, (e.g. offset crossings sufficiently from each other, rollers should remain a sufficient distance behind spreaders to limit loads. A reasonable offset distance is 3m between loads).

(i) Stage construction such that the feedermain is not subjected to significant asymmetrical loading at any time.

(j) Where work is in proximity to the feedermain (any work within a 5 m offset is defined as work within the proximity to this feedermain), utilize construction practices and procedures that do not impart excessive vibration loads on the feedermain or that would cause settlement of the subgrade below the feedermain.

(k) The contractor and all site supervisory personnel and equipment operators have to be formally briefed to ensure that they are fully cognizant of the associated restrictions, constraints, and risks associated with working adjacent to and over this pipeline. New personnel introduced after commencement of the project need to be formally orientated as to the significance and constraints associated with working over the feedermain.

E28.5.2 LDS Sewer Installations in Close Proximity and Adjacent to Feedermain

(a) During installation of the LDS sewer, where the Feedermain is within 5 metres of the LDS, and the LDS invert is more than 1 metre deeper than the Feedermain invert, suitable trench shoring or trench shields shall be utilized for LDS installation. Open trench length shall be kept to a minimum. During these installations, the Feedermain will be depressurized. Arrange for service shutdowns as indicated in E28.4.

(b) Excavation spill from LDS installation is not permitted to be stockpiled on or within 3m of the centreline of the Feedermain.

(c) Installation of catchbasins and catchbasin leads shall be carefully executed to ensure the feedermain is not disturbed during construction. Excavations for installation of catchbasins will be within 1 meter horizontally and approximately at or near the invert of the feedermain. Subgrade excavation in the vicinity and over the feedermain should be completed prior to installation of the catchbasins to minimize potential effects of asymmetrical lateral pressures due to differential soil loading. Tight shoring or bracing should also be utilized below subgrade elevation on the feedermain side to prevent loss of sidewall support and/or bedding material adjacent to the feedermain.

(d) Catchbasin leads shall be installed by open cut methods over the feedermain, using hand or soft excavation techniques when within 1 meter vertically of the pipe. A minimum of 0.3 m of vertical separation between the feedermain top and the bottom of the CB lead should be maintained unless otherwise approved by WWD. Under no circumstances shall blind coring be permitted in the vicinity of the feedermain.

E28.5.3 Roadway Excavation

(a) No demolition of any pavement shall be permitted at any location along the route. Where pipe crosses pavement, it should be sawcut out and removed as opposed to conventional in-place demolition.

(b) In general, any excavation within 2.5 metres of the centreline of the feedermain should be completed by backhoe excavator equipped with a smooth bucket, with the nearest edge of the excavator positioned no closer than 2.5 metres to the centreline of the feedermain. While the backhoe may cross the feedermain at designated crossing locations, do not operate backhoe directly over feedermain at heights of cover of less than 2.0 m.

(c) Note that additional precaution shall be exercised where construction cover from the bottom of the proposed subgrade profile is less than 1.2 m over the top of the Feedermain, including areas from Plan Station 2+880 to 3+025. The Contractor shall increase the frequency of subgrade verification as well as probe to verify the elevation of the top of the feedermain. The Contractor shall include this information in their Method Statement.

(d) Any over-excavation should be immediately reported and the Water Service Division of the Water and Waste Department should be provided 72 hours notice prior to moving into these areas in order that they may be prepared for an emergency shutdown should over-excavation either occur or be required. The Contractor shall minimize the time period associated with work in these areas and under no circumstances allow unbackfilled subgrade to remain overnight.

(e) When loading of excavated material into trucks, the trucks shall be offset sufficiently from the pipeline to not impart additional load on the pipe. positioned at existing grade in all areas,

E28.5.4 Subgrade Construction

(a) No heavy equipment operations will be allowed on the subgrade prior to completion of granular road base capable of supporting the equipment, and a minimum of 1.2 metres of cover over the Feedermain. There should be no subgrade compaction where there will be less than 1.0 m of cover over the feedermain (Plan station 2+880 to 3+025). In areas where there will be greater than 1.2 m of cover, the use of a non-vibratory self propelled padfoot type compactor may be acceptable, subject to submission of vehicle specifications including operation weights and dimensions prior to use.

(b) Subgrade conditions should be inspected by personnel with competent geotechnical experience. In the event of encountering unsuitable subgrade materials above the feedermain, proposed design revisions shall be submitted to this office for review to

obtain approval from the Water and Waste Department relative to any change in conditions.

(c) Construction operations shall be staged to minimize the time period between excavation to subgrade and placement of granular sub-base materials. Should bare subgrade be left overnight, measures shall be implemented to protect the subgrade against inadvertent travel over it and to minimize the impact of wet weather.

E28.5.5 Sub-base and Base Course Construction

(a) The placement of sub-base materials should be bladed into place as opposed to end dumped. Equipment utilized for blading granular sub-base into place should be reviewed and approved for use by the Contract Administrator and shall generally work the material with the equipment operating on the granular fill as opposed to the equipment operating off of the subgrade.

(b) In general any sub-base compaction will be limited to static rolling within 2.5 metres of the centreline of the feedermain. The use of static (non-impact loading) compaction techniques is subject to vehicle/equipment load review.

(c) Smaller vibratory equipment may be permitted subject to a construction method statement submission and review by the Contract Administrator.

(d) Careful selection of granular material gradation requirements as well will minimize the level of on-site densification that is required. Well graded manufactured materials (e.g. a crushed limestone) with less than 5% fines typically requires very little on site compactive effort after placement to achieve specified densities.

(e) Any changes in pavement cross section or in pavement grades over the feedermain must be reported for further review.

E28.6 Insulating Feedermains

E28.6.1 Install insulation at all catchbasin installations where the cover around the feedermain in all directions is less than 1.0 m. Insulation shall consist of minimum of 100 mm thick extruded polystyrene insulation, DOW HI 40 or approved Equal Pursuant to B5.

MEASUREMENT AND PAYMENT

E28.7 With the exception of the items listed here below, no measurement or payment will be made for the Works described in this specification. They shall be considered incidental to other items.

E28.8 Insulate Feedermain

E28.8.1 The supply and installation of insulation over the existing feedermain shall be measured and paid for based on the measured plan area in square metres installed in accordance with this specification and accepted by the Contract Administrator and based on the unit price for “Insulate Feedermain”. This unit price shall be payment in full for supplying all materials and for performing all operations herein described and of other items incidental to the Work included in this specification.

E29. EARTHWORK AND GRADING

DESCRIPTION

E29.1 General

E29.1.1 This specification covers all phases of removal and/or placement of all materials necessary for the construction and preparation of embankments, slopes and drainage works.

E29.2 Definitions

E29.2.1 Common Excavation – The excavation of all material encountered within the limits of grading the on-site placement or the stockpiling of suitable site material, and the satisfactory disposal of surplus and unsuitable site material.

E29.3 Referenced Standard Construction Specifications

(a) CW 1130 – Work Site Requirements

(b) CW 3010 – Clearing and Grubbing

(c) CW 3110 – Sub-grade, Sub-base and Base Course Construction

(d) CW 3120 – Installation of Sub Drains

MATERIALS

E29.4 Fill Material

E29.4.1 Fill material for embankment construction, sideslope construction and boulevard fill shall be obtained from site excavation of a type approved by the Contract Administrator.

E29.4.2 Approved clay fill material shall be uniform in texture and suitable for compaction.'

CONSTRUCTION METHODS

E29.5 Clearing and Grubbing

E29.5.1 No earthwork and grading shall commence until clearing and grubbing operations have been completed in accordance with CW 3010 and have been approved by the Contract Administrator.

E29.6 Excavation

E29.6.1 The excavation procedure shall be subject to the approval of the Contract Administrator. Excavation shall continue in as nearly a continuous manner as possible. Excavation at multiple locations at the same time shall be subject to the approval of the Contract Administrator.

E29.6.2 The Contractor shall conduct his excavation procedure in such a manner as to enable the Contract Administrator to inspect the separation of materials such as topsoil for reuse and suitable site material and determine which materials are to be disposed of and which materials are to be used.

E29.6.3 The Contractor shall excavate as required to reach sub-grade levels of pavement and landscaping, and rough grade levels for areas to be graded only.

E29.6.4 During the course of common excavation, the Contractor will be advised by the Contract Administrator as to which areas have an unsuitable sub-grade. In the areas of unsuitable sub-grade, whether in a homogeneous mass or in isolated pockets, extend the excavation to the lower limit of the unsuitable material or to a depth as directed by the Contract Administrator. The transitional longitudinal slope between suitable and unsuitable sub-grade shall not be steeper then 1:15.

E29.6.5 The limits of excavation will be taken as a vertical plane 450 mm beyond the limits of the proposed pavement. Where slip form paving equipment is specified for placement of concrete pavement the limits of excavation will be increased to a vertical plane 750 mm beyond the limits of proposed pavement.

E29.6.6 Utilize equipment of a size and type as required to complete the work in reasonable time as approved by the Contract Administrator.

E29.7 Removal of Existing Pavement

E29.7.1 Removal of existing pavement be done and paid for in accordance with CW 3110.

E29.8 Preparation of Existing Ground Surface

E29.8.1 Before any embankment is placed on original ground having a smooth firm surface, the existing ground shall be scarified or ploughed so as to permit bonding with the new material.

E29.8.2 Where the existing ground surface is slope sufficiently to affect the bond between the old and new materials the original ground on which the embankment is to be placed shall be ploughed deeply or benched before embankment construction is commenced, as directed by the Contract Administrator.

E29.8.3 When embankment is being placed on an existing roadbed, the side slopes of the existing roadbed shall have vegetation removed and then be scarified or ploughed, as directed by the Contract Administrator, to ensure adequate bonding between the new embankment and the existing material.

E29.8.4 Following the excavation and disposal of unsuitable material the surface of the proposed roadbed shall be scarified to a depth of 150 mm, and compacted to the proper density, at the optimum moisture content.

E29.8.5 Where existing roadbeds are being widened and existing embankment extended, the existing slopes shall be stripped of all vegetation and either benched or ploughed as directed by the Contract Administrator so as to form a medium of contact with the new embankment. Vertical cuts for the full depths of embankment shall not be permitted.

E29.8.6 Bench cuts shall consist of excavating horizontal cuts into the slopes of the existing embankment prior to placing widening material thereon. Bench cuts shall be made at vertical intervals of 1.0 m with the base of the first bench being cut approximately 0.5 m above the toe of the existing slope. The base of each bench cut shall extend into the existing slope a minimum width of 2.1 m.

E29.9 Embankment

E29.9.1 Embankment construction shall be understood to mean the placing of suitable site material to obtain the required lines, grades and cross-sections shown on the Drawings.

E29.9.2 Materials shall be deposited and spread in uniform layers of specified thickness, for the full width of the embankment. Each layer shall be shaped to line and cross-section and thoroughly compacted before the succeeding layer is placed.

E29.9.3 Where embankment is being placed on side fill or sloping sections, the lower portion shall be constructed as above, until a full width surface of the specified cross-section is obtained. The embankment shall be completed thereafter with full width layers.

E29.9.4 After the preparation of the sub-grade is complete, trench excavation for sub drain installation can commence in accordance with CW 3120.

E29.9.5 The contractor shall construct earth mound embankment for future signals and advanced warning sign structures as shown on the drawing contained in Appendix C. Suitable fill shall be obtained from the roadway excavation and placed in accordance with this Specification.

E29.10 Compaction

E29.10.1 All material placed in embankments shall be spread and bladed smooth in successive layers not exceeding 150 mm in compacted thickness to the full width of the cross-section, unless otherwise directed by the Contract Administrator.

E29.10.2 Each layer, including the existing sub-grade, shall be compacted to a minimum of ninety-five (95%) percent of Standard Proctor Density. The material shall be compacted at the optimum moisture content, or up to two (2%) percent higher than optimum, as directed by the Contract Administrator.

E29.10.3 Where the moisture content of the embankment material is too high, the material shall be thoroughly worked until the optimum moisture content is achieved.

E29.10.4 Where the moisture content of the embankment material is too low. The material shall be thoroughly reworked to mix the water throughout the material, prior to commencing compaction operations.

E29.11 Finishing and Maintaining

E29.11.1 The Contractor shall, as soon as practicable, bring the excavations and embankment to the correct widths, lines and grades as shown on the drawings.

E29.11.2 All surfaces shall be maintained to the specified grade and cross-section and to the specified density until the project or that portion of the project is accepted.

E29.12 Quality of Sub-grade and Embankment Material

E29.12.1 The Contract Administrator shall determine the Standard Proctor Density for the Sub-grade and embankment materials at the optimum moisture content in accordance with ASTM Standard D698. The field density of each layer will be a percentage of the applicable Standard Proctor Density, in accordance with Section E29.10 of this specification.

E29.12.2 The Contract Administrator shall carry out compaction testing to determine the acceptability of each layer, as placed and compacted before the succeeding layer may be applied.

E29.12.3 The frequency and number of test will be determined by the Contract Administrator.

E29.12.4 The field density of the compacted layers will be verified by Field Density Tests in accordance with ASTM Standard D698m /standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort, or ASTM Standard D2922, Test of Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

E29.12.5 Fill promptly, holes made by the removal of samples from the layers with appropriate material and thoroughly compact so as to conform in every way with the adjoining material.

MEASUREMENT AND PAYMENT

E29.13 Common Excavation

E29.13.1 Common excavation will be measured on a volume basis and paid for at the Contract Unit Price per cubic metre for the “Items of Work” listed here below. The volume to be paid for will be the total number of cubic metres that are excavated in accordance with this specification, accepted and measured by the Contract Administrator.

Items of Work

Common Excavation

(a) Suitable Site Material

(b) Unsuitable Site Material

E29.13.2 The volume of common excavation will be measured by cross-sections in its original position and computed by the method of Average End Areas.

E29.13.3 Only material excavated within the limits of excavation will be included in the payment for the “Items of Work” listed for common excavation.

E29.13.4 Disposal of surplus common excavation will be included in the payment for unsuitable site material common excavation.

E29.13.5 Disposal of material and removal of miscellaneous trees and shrubs will be included in the payment for the “Items of Work” listed for common excavation.

E29.13.6 Excavation of solid bedrock, glacial till, boulders, loose rock, concrete rubble and foundations which are located within the limits of excavation and which require the use of additional or unconventional excavation equipment will be measured and paid for in addition to the unit price for the “Items of Work: listed for common excavation.

E29.14 Fill Material

E29.14.1 Fill material will be measured on a volume basis and paid for at the Contract Unit Price per cubic metre for the “Items of Work” listed here below. The volume to be paid for will be the

total number of cubic metres that are compacted in place in accordance with this specification, accepted and measured by the Contract Administrator.

Items of Work

Fill Material

(a) Suitable Site Material

E29.14.2 The volume of fill material will be measured by cross-sections and computed by the method of Average End Areas.

E29.14.3 Only material placed within the limits of excavation will be included in the payment for the "Items of Work" listed for fill material.

E29.14.4 No measurement or payment will be made for materials rejected by the Contract Administrator.

E29.14.5 Loading, hauling, placing and compaction of suitable site material will be included in the payment for the "Suitable Site Material" listed in the "Items of Work: for fill material.

E29.15 Preparation of Existing Ground Surface

E29.15.1 Preparation of the existing ground surface will be measured on an area basis and paid for at the Contract Unit Price per square metre for "Preparation of Existing Ground Surface". The area to be paid for will be the total number o square metres of existing ground prepared in accordance with this specification, accepted and measured by the Contract Administrator.

E29.15.2 Bench cuts will not be paid for separately but will be considered as included in the payment for "Preparation of Existing Ground Surface".

E30. REUSE OF CRUSHED SUB-BASE MATERIAL

DESCRIPTION

E30.1 General

E30.1.1 This specification covers the reuse of sub-base material used in detours.

E30.2 Reuse of Sub-Base Course Material

E30.2.1 Once temporary pavement used for detours are no longer required and the asphalt pavement has been removed, the Contractor will excavate the sub-base materials from the detour and stockpile it for reuse on other portions of the Work as directed by the Contract Administrator.

E30.2.2 Care must be taken to avoid fouling the sub-base course with clay or other deleterious materials.

MEASUREMENT AND PAYMENT

E30.3 Reuse of Sub-base Material

E30.3.1 The stockpiling, hauling, placing and compaction of sub-base material from detours will be measured on a volume basis and paid for at the Contract Unit Price for "Reuse of Crushed Sub-base Material from Inkster Staging". The volume to be paid for will be the total number of cubic metres of sub-base course material stockpiled and placed in accordance with this specification, accepted and measured by the Contract Administrator.

E30.3.2 The volume of sub-base course reused will be measured by cross-sections and computed by the method of Average End Areas.

E30.3.3 No measurement or payment will be made for materials rejected by the Contract Administrator.

E31. CONCRETE CURBS

DESCRIPTION

E31.1 General

E31.1.1 This specification shall cover the construction of concrete curbs on concrete pavement or on asphaltic concrete pavements.

E31.1.2 Referenced Standard Construction Specifications

(a) CW 3310 – Portland Cement Concrete Pavement Works

MATERIALS

E31.2 General

E31.2.1 All materials including concrete and reinforcing steel shall conform to Sections 5 and 6 of CW 3310.

CONSTRUCTION METHODS

E31.3 General

E31.3.1 All concrete curbs shall be constructed as shown on the Drawing in accordance with Section 9 and 10 of CW 3310.

MEASUREMENT AND PAYMENT

E31.4 Concrete Curbs

E31.4.1 Construction of concrete curbs will be measured on a length basis and paid for at the Contract Unit Price per metre for the “Items of work” listed in Form B: Prices. The price paid 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.

E32. REMOVAL AND DECOMMISSIONING OF EXISTING PARKING FENCE

DESCRIPTION

E32.1 General

E32.1.1 This specification covers the removal, disposal and decommissioning of parking fence and electrical plug-ins located at #2615 Inkster Boulevard.

E32.1.2 Referenced Standard Construction Specifications

(a) CW 3550 – Chain Link Fencing

MATERIALS

E32.2 Not applicable

CONSTRUCTION METHODS

E32.3 Removal, Disposal and Decommissioning of Existing Parking Fence

E32.3.1 The Contractor, prior to commencing the parking fence removal operations, shall disconnect and remove existing electrical service wiring for the existing parking fence and conduit from the panelboard. The existing automobile circuit breakers to be labelled as spare. The Contractor to provide and install any knock-out plugs in the panelboard from the disconnected and removed conduits.

E32.3.2 Existing parking fence designated for removal shall be removed and disposed of off-site as shown on the Drawings and as directed by the Contract Administrator.

E32.3.3 The Contractor shall remove the fence post and concrete bases. The post hole remaining following the removal of the fencing shall be backfilled and compacted with gravel-pitrun to the satisfaction of the Contract Administrator. All concrete rubble shall be removed and disposed of by the Contractor.

E32.3.4 Dispose of Material in Accordance With Section 3.4 of CW 1130.

MEASUREMENT AND PAYMENT

E32.4 Removal and Decommissioning of Existing Parking Fence

E32.4.1 The removal and decommissioning of the existing parking fence will be measured on a length basis and paid for at the Contract Unit Price per metre for "Removal and Decommissioning of Existing Parking Fence". The length to be paid for will be the total number of metres of parking fence removed and disposed of in accordance with this specification, accepted and measured by the Contract Administrator.

E33. ISLAND COVER (HEATED ASPHALT MILLINGS)

E33.1 Approximately 85 mm of heated asphalt milling shall be placed in islands as shown on the Part 2 Drawings to act as cover. The bottom 50 mm of the heated asphalt millings shall be compacted and the top 35 mm shall be placed loosely and raked.

E33.2 The compacted heated asphalt millings shall be placed on a base of unheated asphalt millings. The base shall be 350 mm thick, comprised of two lift of 175 mm each. Each layer of the base shall be compacted with a vibratory packer to the Contract Administrator's satisfaction.

E33.3 The Unit Price per square metre for "Island Cover (Heated Asphalt Millings)" will be payment in full for constructing a plant heated asphalt milling median, as described above and for performing all work necessary or incidental thereto.

E34. REMOVE AND SALVAGE EXISTING TRAFFIC SIGN POSTS AND SIGNS

E34.1 Description and construction Methods

E34.1.1 The Contractor shall remove and salvage all existing sign posts and signs within the Manitoba Infrastructure and Transportation limits (west of Brookside) (Part 2) of the work as shown on the Drawings.

E34.1.2 If there are any concrete post bases, they are to be disposed of off site.

E34.1.3 All removed sign posts and signs are to be stockpiled at a location designated by the Contract Administrator.

MEASUREMENT AND PAYMENT

E34.2 Removing and salvaging existing traffic signs will be measured on an unit basis and paid for at the Contract unit price for "Remove and Salvage Existing Traffic Sign Posts and Signs" which will be payment in full for all operations necessary or incidental thereto, including the disposal of concrete post bases.

E35. CSP BAR SCREENS

DESCRIPTION

E35.1 This Specification shall cover all operations relating to the supply and installation of CSP bar screens.

E35.1.1 The work to be done by the Contractor under this Specification shall include the supply of all materials and the furnishings 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.

MATERIALS

E35.2 As per construction drawings.

CONSTRUCTION METHODS

E35.3 Contractor to install CSP bar screen as indicated on the construction drawings.

MEASUREMENT AND PAYMENT

E35.4 The supply and installation of CSP bar screens will be measured on a unit basis and paid for at the Contract Unit Price per unit for "Supply and Installation of CSP Bar Screens". The number of units to be paid for will be the total number of CSP bar screens supplied and installed in accordance with this specification, accepted and measured by the Contract Administrator.

E36. CONCRETE SPILLWAYS

DESCRIPTION

E36.1 General

E36.1.1 This specification covers the supply and installation of concrete spillways complete with curb inlet grates.

E36.1.2 Referenced Standard Construction Specifications

(a) CW 2160 – Concrete Underground Structures and Works;

(b) CW 3110 – Sub-grade, Sub-base and Base Course Construction; and

(c) CW 3210 – Adjustment of Pavement and Boulevard Structures.

MATERIALS

E36.2 Concrete Spillway

E36.2.1 Concrete and reinforcing steel shall be supplied and installed in accordance with the Drawings and CW 2160-R7.

E36.2.2 Bedding shall be supplied and installed in accordance with the Drawings and for base course material as described in CW 3110-R11.

E36.2.3 Curb inlet grates shall be supplied and installed in accordance with the Drawings and CW 3210-R7.

CONSTRUCTION METHODS

E36.3 Concrete Spillway

E36.3.1 Concrete spillways complete with curb inlet grates shall be constructed in accordance with the Drawings.

MEASUREMENT AND PAYMENT

E36.4 Concrete Spillway

E36.5 The supply and installation of concrete spillways will be measured on a linear metre basis and paid for at the Contract Unit Price per unit for "Concrete Spillway c/w Curb Inlet Grate". The length to be paid for shall be the total number of metres of concrete spillways supplied and installed in accordance with this Specification as measured and accepted by the Contract Administrator.

E36.6 Payment for "Concrete Spillway c/w Curb Inlet Grate" shall include all base course bedding material, concrete, reinforcing steel, curb inlet grate, labour, superintendence and all other incidental items necessary to complete the work described in this Specification.

E36.7 Measurement for length of spillway installed will be made horizontally at grade above the centreline of the spillway from the back of curb to the end of the spillway.

E37. SUPPLY AND INSTALL DETECTABLE WARNING SURFACE TILES

DESCRIPTION

E37.1 This specification covers the supply and installation of detectable warning surface tiles in sidewalk ramps and multi-use path ramps.

SPECIFICATIONS AND DRAWINGS

E37.2 Referenced Standard Construction Specifications and Standard Details

(a) CW 3235 - Renewal of Existing Miscellaneous Concrete Slabs

(b) CW 3240 - Renewal of Existing Curbs

(c) CW 3310 - Portland Cement Concrete Pavement Works

(d) CW 3325 - Portland Cement Concrete Sidewalk

(e) SD-229C - Curb Ramp for Concrete Pavement

(f) SD-229D - Curb Ramp for Asphalt Overlay

E37.3 Attached; SDE Drawings and Installation Manual

(a) SDE-229A - Curb Ramp Layout for Intersections

(b) SDE-229AA - Detectable Warning Surface in Curb Ramps for Intersections

(c) SDE-229AB - Curb Ramp Layout for Offset Intersections

(d) SDE-229BB - Detectable Warning Surface in Curb Ramps for Medians

(e) SDE-229E - Curb Ramp Depressed Curb

(f) Manufacturer's Installation Manual – Armor-Tile Cast in Place Inline Dome Detectable/Tactile Warning Surface Tile.

MATERIALS

E37.4 Acceptable Detectable Warning Surface Tile product is:

2'x 4' (610 x 1220mm) Armor-Tile Cast in Place (yellow).

Available from:

Engineered Plastics Inc.
1400 Cornwall Road Unit 6
Oakville, Ontario L6J 7W5

Attention: Manny Burgio
Ph: 800-682-2525
Fax: 800-769-4463

or

Alsip's Building Products
1 Cole Avenue
Winnipeg, Manitoba

Attention: Jason Alsip
Ph. 204-667-3330

E37.4.1 Detectable warning surface tiles shall be Highway Yellow (USA) or Safety Yellow (Canada).

E37.4.2 Detectable warning surface tiles shall be cast in place type.

E37.4.3 Truncated domes on detectable warning surface tiles shall be in accordance with ADA Accessibility Guidelines (ADAAG).

CONSTRUCTION METHODS

E37.5 General

E37.5.1 Construct curb ramps, sidewalk ramps and multi-use path in accordance with referenced Standard Construction Specifications, Standard Details, and SDE drawings (attached).

E37.5.2 Construct the lip of the depressed curb in accordance with SDE–229E.

E37.5.3 Construct sidewalk ramp grades in accordance with SD-229C and SD-229D.

E37.5.4 Install the detectable warning surface tile in accordance with the amended Manufacturer's Installation Manual (attached). Drill additional 6mm air vent holes in ribs under the tile as required and use vibration to help seat the tile, to facilitate the installation process.

E37.5.5 Trim the corner of the tile at radii in accordance with SDE-229A, SDE-229AA and SDE-228AB

E37.5.6 Install and orient the detectable warning surface tiles as shown on the referenced drawings or as directed by the Contract Administrator.

E37.6 Medians and Refuge Islands:

E37.6.1 Where the distance from back of curb to back of curb is 1.32m or greater, install one detectable warning surface tile 50mm from the back of each curb.

E37.6.2 Where the distance from back of curb to back of curb is less than 1.32m, leaving 50mm between the back of curb and the tile, cut the tile(s) to fill the remaining area between the curbs.

E37.7 Multi-use Paths

E37.7.1 Construct a curb ramp with a depressed curb to the full width of the multi-use path in accordance with SDE-229E.

E37.7.2 Construct a concrete ramp the width of the multi-use path and a minimum of 1.50m deep from back of curb in accordance with SD-229C and SD-229D.

E37.7.3 Install two (2) tiles in each concrete ramp, one (1) on each side for each direction. Place the short edge of each tile 150mm from the edge of the concrete ramp, with both tiles in line with each other transversely across the concrete ramp. The tile(s) nearest the curb must be 50mm from back of curb similar to tile placement in SDE-229A.

E37.7.4 Saw cut the middle of the concrete slab, perpendicular to the curb and to a depth of D/4. Cut additional sawcuts as directed by the Contract Administrator.

MEASUREMENT AND PAYMENT

E37.8 Supply and installation of detectable warning surface tiles will be measured on a unit basis and paid for at the Contract Unit Price for "Detectable Warning Surface Tiles". The number of units to be paid for will be the total number of full or trimmed tiles supplied and installed in accordance with this specification, accepted and measured by the Contract Administrator.

E37.8.1 The area under the detectable warning surface tile is part of the concrete sidewalk ramp and will be paid in accordance with CW 3235 and CW 3325.

E37.8.2 The concrete sidewalk ramp and the concrete ramp for multi-use paths will be paid as 100mm sidewalk in accordance with CW 3235 or CW 3325.

E37.8.3 Curb ramp will be paid in accordance with CW 3240 or CW 3310.

DRAWINGS AND INSTALLATION MANUAL

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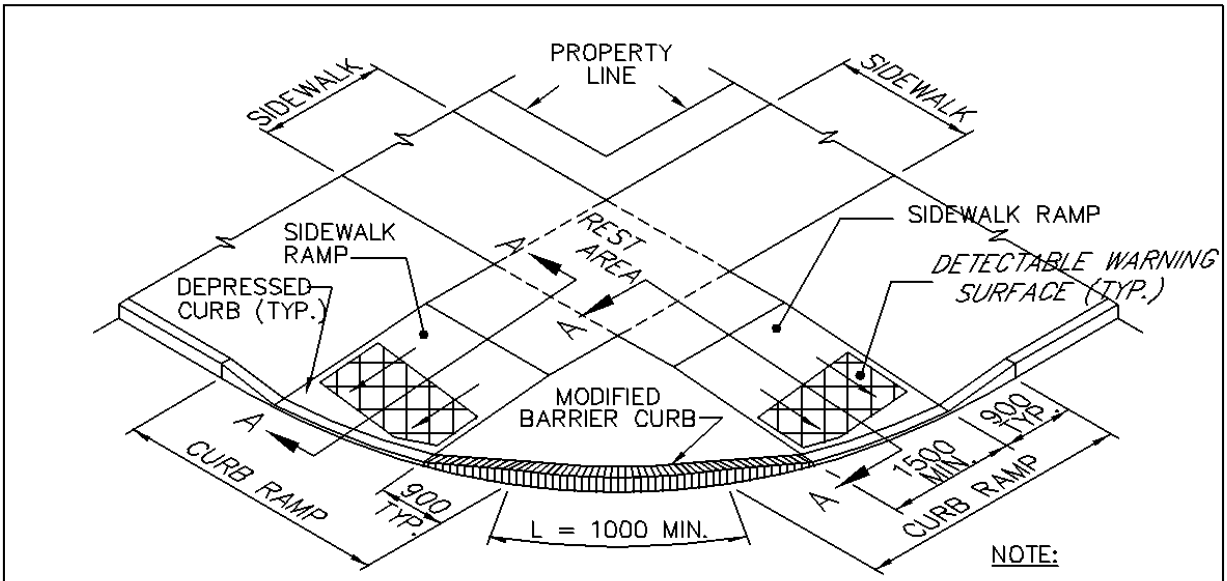
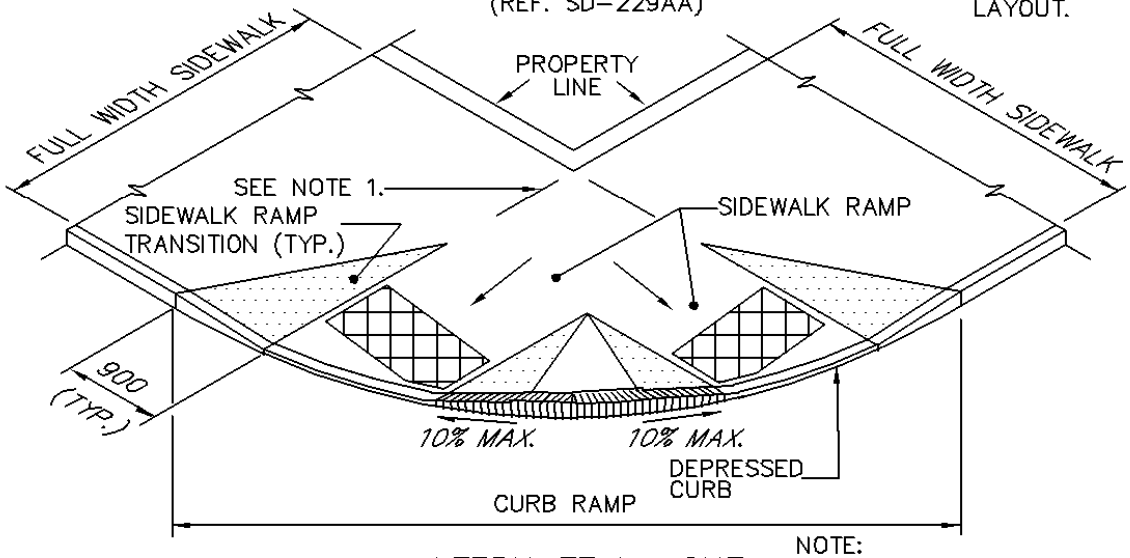


STANDARD LAYOUT
(REF. SD-229AA)

NOTE:

IF L<1000 USE ALTERNATE LAYOUT.



ALTERNATE LAYOUT
(REF. SD-229AA)

NOTE:

1. DEPRESSED CURB RAMP TO LINE UP WITH BACK OF SIDEWALK.
2. FOR SECTION A-A SEE SD-229C & SD-229D
3. SEE SDE-229AA, SDE-229BB & SDE-229E FOR DETECTABLE WARNING SURFACES.

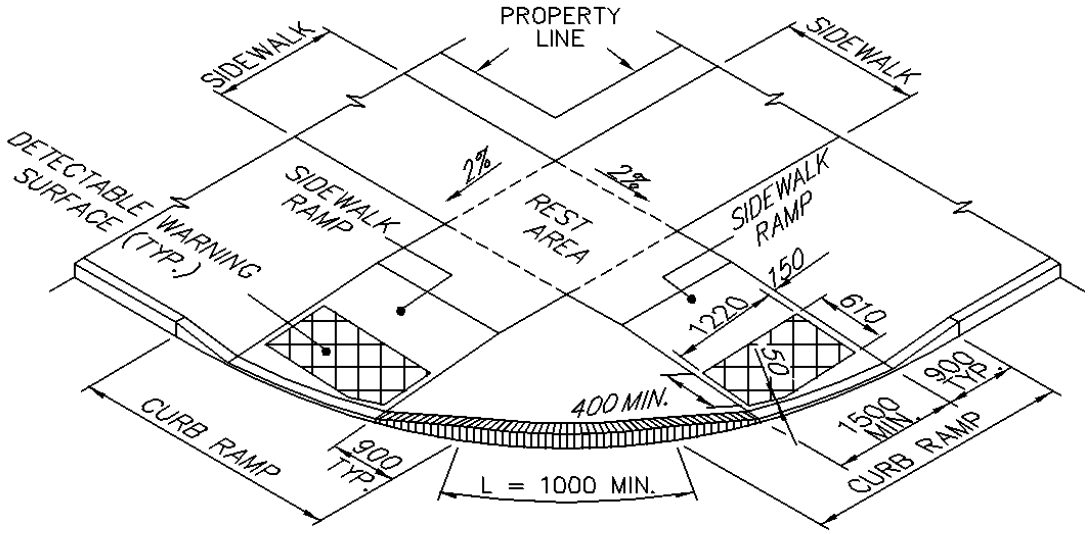
DIMENSIONS ARE IN MILLIMETRES

THE CITY OF WINNIPEG
PUBLIC WORKS DEPARTMENT

Reference Spec. No.
CW 3235, CW 3310, CW 3325
E-SUPPLY & INSTALL DETECTABLE WARNING SURFACE

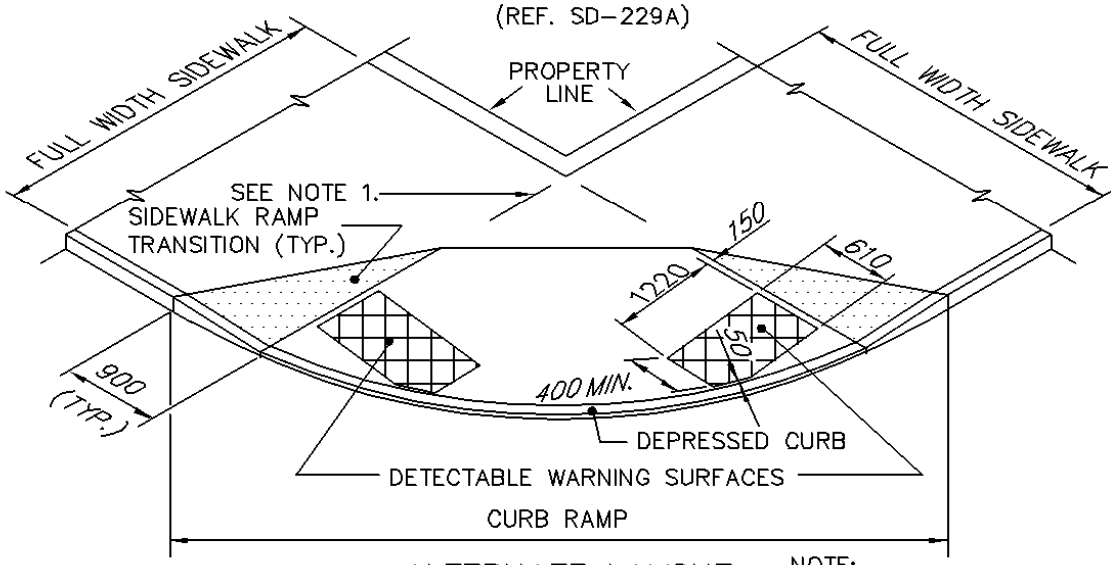
CURB RAMP LAYOUT FOR INTERSECTIONS

Designed By:	Drawn By:	Scale :
B.P.	T.G.A..	N.T.S.
Checked By:	Date:	Drawing No.
F.W.C.	10-02-18	SDE-229A
Approved:		



STANDARD LAYOUT

(REF. SD-229A)



ALTERNATE LAYOUT

(REF. SD-229A)

NOTE:

1. DEPRESSED CURB RAMP TO LINE UP WITH BACK OF SIDEWALK.
2. FOR A 1.83m WIDE SIDEWALK USE A DETECTABLE WARNING SURFACE MEASURING 610 X 1520

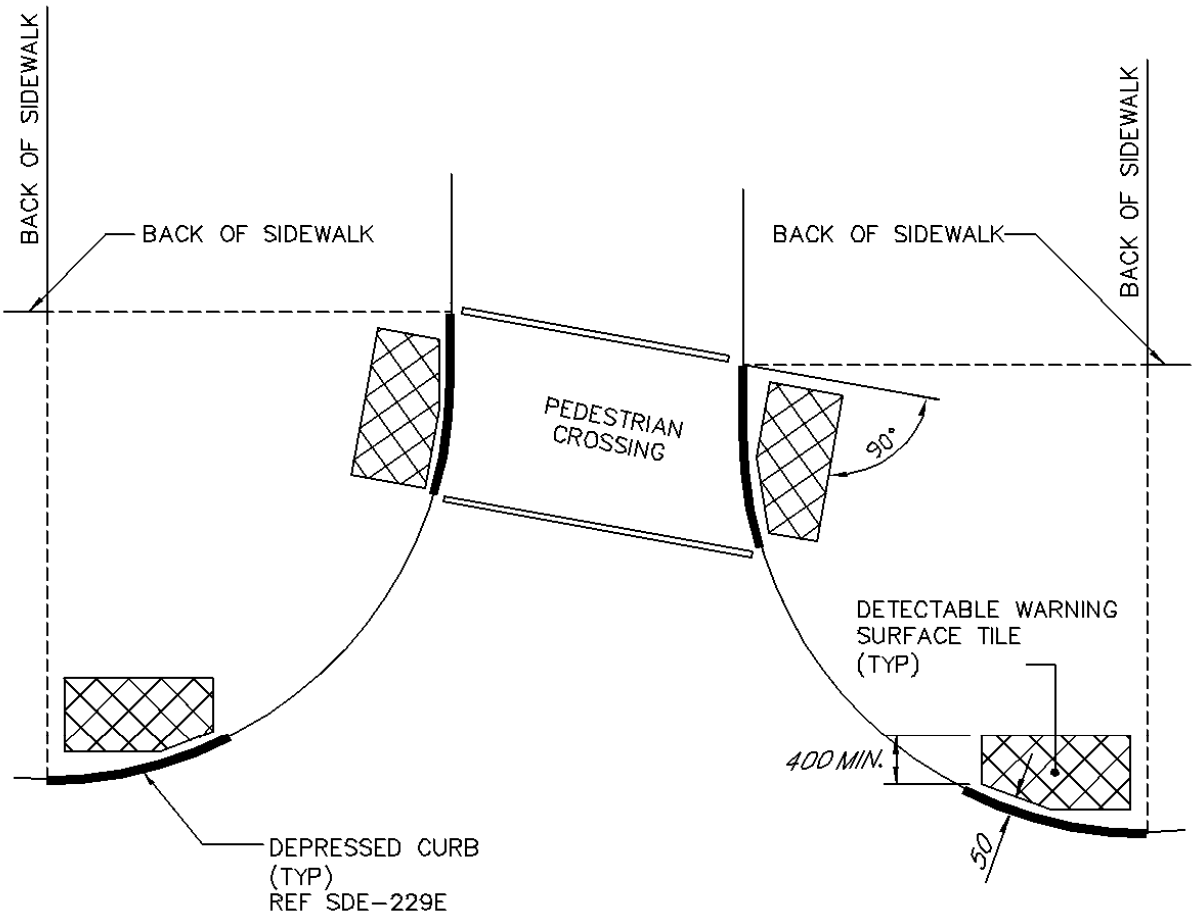
DIMENSIONS ARE IN MILLIMETRES

THE CITY OF WINNIPEG
PUBLIC WORKS DEPARTMENT

Reference Spec. No.
CW 3235, CW 3310, CW 3325
E-SUPPLY & INSTALL DETECTABLE WARNING SURFACE

DETECTABLE WARNING SURFACE IN CURB RAMPS FOR INTERSECTIONS

Designed By: B.P.	Drawn By: T.G.A.	Scale : N.T.S.
Checked By: F.W.C.	Date: 10-02-18	Drawing No. SDE-229AA
Approved:		



NOTES:

1. LOCATE GRATINGS, ACCESS COVERS AND OTHER APPURTENANCES OUTSIDE OF CURB RAMPS, DEPRESSED CURBS, CLEAR SPACE LANDINGS AND GUTTERS AS DIRECTED BY THE CONTRACT ADMINISTRATOR.
2. LOCATE END OF DEPRESSED CURB IN LINE WITH PROJECTED BACK OF SIDEWALK.

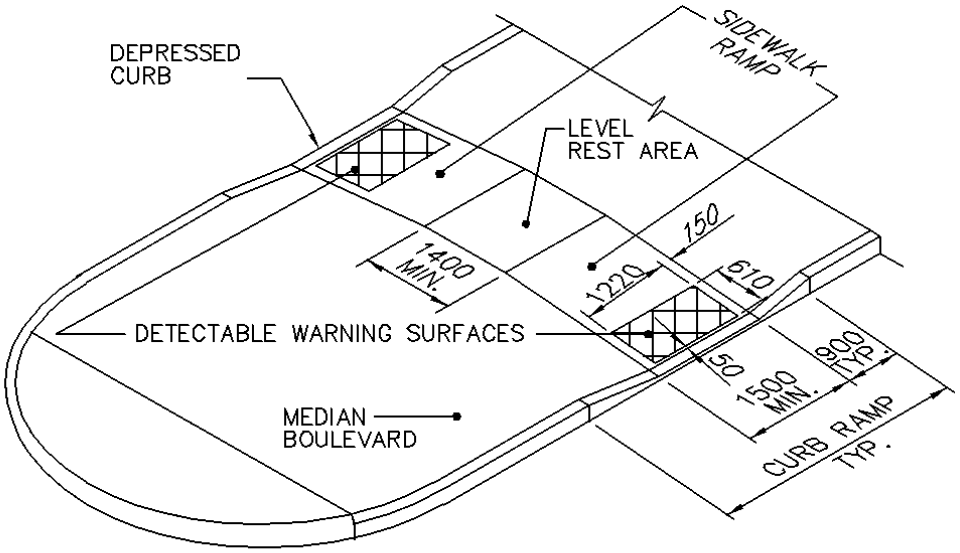
THE CITY OF WINNIPEG
PUBLIC WORKS DEPARTMENT

Reference Spec. No.
CW 3235, CW 3310, CW 3325
E-SUPPLY & INSTALL DETECTABLE WARNING SURFACE

DIMENSIONS ARE IN MILLIMETRES

CURB RAMP LAYOUT FOR OFFSET INTERSECTIONS

Designed By: B.P.	Drawn By: T.G.A.	Scale : N.T.S.
Checked By: F.W.C.	Date: 10-02-18	Drawing No. SDE-229AB
Approved:		



MEDIAN SIDEWALK CROSSING

(REF. SD-229B)

NOTE:

1. FOR NARROW MEDIANS AND REFUGE ISLANDS < 1.32m IN WIDTH, PLACE DETECTABLE WARNING SURFACE FULL WIDTH, MAINTAINING 50mm SPACING FROM BACK OF CURB.

2. DETECTABLE WARNING SURFACE SHALL NOT BE PLACED AT PRIVATE APPROACHES OR ALLEYS.

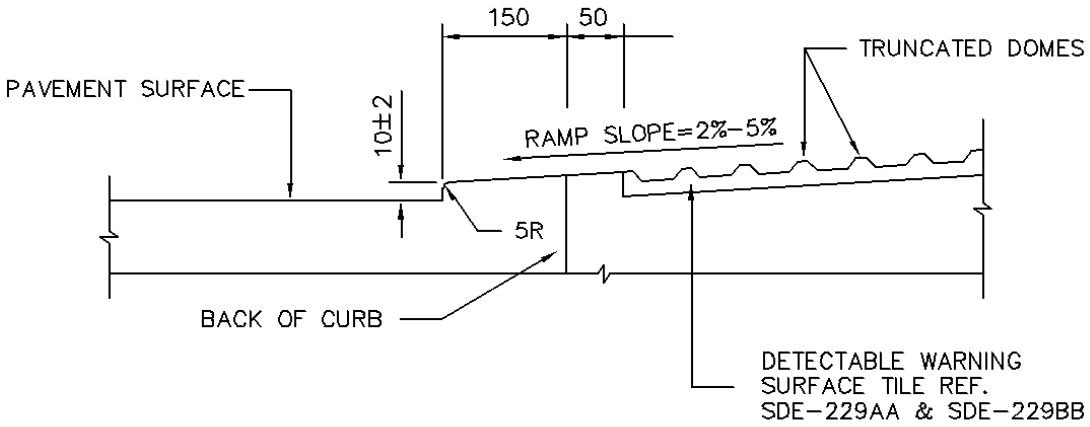
THE CITY OF WINNIPEG
PUBLIC WORKS DEPARTMENT

Reference Spec. No.
CW 3235, CW 3310, CW 3325
E-SUPPLY & INSTALL DETECTABLE WARNING SURFACE

DIMENSIONS ARE IN MILLIMETRES

DETECTABLE WARNING SURFACE IN CURB RAMPS FOR MEDIANS

Designed By:	Drawn By:	Scale :
B.P.	T.G.A.	N.T.S.
Checked By:	Date:	Drawing No.
F.W.C.	10-12-18	
Approved:		SDE-229BB



DEPRESSED CURB

NOTES:

1) SIDEWALK RAMP SURFACE SHALL BE GIVEN A PARALLEL TEXTURED BROOM FINISH.
2) INSTALL DETECTABLE WARNING SURFACE SO THAT THE TOP OF THE TRUNCATED DOMES ARE FLUSH WITH THE SURFACE FO THE ADJACENT SIDEWALK.

THE CITY OF WINNIPEG PUBLIC WORKS DEPARTMENT			
Reference Spec. No. CW 3235, CW 3310, CW 3325 E-SUPPLY & INSTALL DETECTABLE WARNING SURFACE	DIMENSIONS ARE IN MILLIMETRES		
CURB RAMP DEPRESSED CURB	Designed By: B.P.	Drawn By: T.G.A.	Scale : N.T.S.
	Checked By: F.W.C.	Date: 10-02-18	Drawing No. SDE-229E
	Approved:		

Manufacturer's Installation Manual
Armor-Tile Cast In Place
Inline Dome Detectable/Tactile Warning Surface Tile

A. During Cast In Place Detectable/Tactile Warning Surface Tile installation procedures, ensure adequate safety guidelines are in place and that they are in accordance with the applicable industry and government standards.

B. The specifications of the structural embedment flange system and related materials shall be in strict accordance with the contract documents and the guidelines set by their respective manufacturers. Not recommended for asphalt applications.

C. The physical characteristics of the concrete shall be consistent with the contract specifications ~~while maintaining a slump range of 4 - 7 to permit solid placement of the Cast In Place Detectable/Tactile Warning Surface Tile system.~~ An overly wet mix will cause the tile to float. Under these conditions, suitable weights such as 2 concrete blocks or sandbags (25 lb) shall be placed on each tile.

D. Prior to placement of the Cast In Place Detectable/Tactile Warning Surface Tile system, the contract drawings shall be reviewed.

E. The concrete pouring and finishing operations require typical mason's tools, however, a 4' long level with electronic slope readout, 25 lb. weights, and a large non-marring rubber mallet are specific to the installation of the Cast In Place Detectable/Tactile Warning Surface Tile system. A vibrating mechanism such as that manufactured by Vibco can be employed, if desired. The vibrating unit should be fixed to a soft base such as wood, at least 1 foot square.

F. The factory-installed plastic sheeting must remain in place during the entire installation process to prevent the splashing of concrete onto the finished surface of the tile.

G. When preparing to set the tile, it is important that NO concrete be removed in the area to accept the tile. It is imperative that the installation technique eliminates any air voids under the tile. Holes in the tile perimeter allow air to escape during the installation process. Concrete will flow through the large holes in each embedment flange on the underside of the tile. This will lock the tile solidly into the cured concrete.

H. The concrete shall be poured and finished true and smooth to the required dimensions and slope prior to the tile placement. Immediately after finishing concrete, the electronic level should be used to check that the required slope is achieved. The tile shall be placed in accordance with the contract drawings. The Cast In Place Detectable/Tactile Warning Surface Tiles shall be tamped (or vibrated) into the fresh concrete to ensure that the field level of the tile is flush to the adjacent concrete surface. The embedment process should not be accomplished by stepping on the tile as this may cause uneven setting which can result in air voids under the tile surface. ~~The contract drawings indicate that the tile field level (base of truncated dome) is flush to adjacent surfaces to permit proper water drainage and eliminate tripping hazards between adjacent finishes.~~

I. In cold weather climates it is recommended that the Cast In Place Detectable/Tactile Warning Surface Tiles be set deeper such that the top of domes are level to the adjacent concrete on the top and sides of ramp and that the base of domes to allow water drainage. This installation will reduce the possibility of damage due to snow clearing operations.

J. Immediately after placement, the tile elevation is to be checked to adjacent concrete. The elevation and slope should be set consistent with contract drawings to permit water drainage to curb as the design dictates.

K. While concrete is workable, a 3/8" radius edging tool shall be used to create a finished edge of concrete, then a steel trowel shall be used to finish the concrete around the tile's perimeter, flush to the field level of the tile.

L. During and after the tile installation and the concrete curing stage, it is imperative that there is no walking, leaning or external force placed on the tile that may rock the tile causing a void between the underside of tile and concrete.

M. Following tile placement, review installation tolerances to contract drawings and adjust tile before the concrete sets. Two suitable weights of 25 lb each shall be placed on each tile as necessary to ensure solid contact of the underside of tile to concrete.

N. Following the concrete curing stage, protective plastic wrap is to be removed from the tile surface by cutting the plastic with a sharp knife, tight to the concrete/tile interface. If concrete bled under the plastic, a soft brass wire brush will clean the residue without damage to the tile surface.

O. If desired, individual tiles can be bolted together using ¼ inch or equivalent hardware. This can help to ensure that adjacent tiles are flush to each other during the installation process. Tape or caulking can be placed on the underside of the bolted butt joint to ensure that concrete does not rise up between the tiles during installation. Any protective plastic wrap which was peeled back to facilitate bolting or cutting, should be replaced and taped to ensure that the tile surface remains free of concrete during the installation process.

P. Tiles can be cut to custom sizes, or to make a radius, using a continuous rim diamond blade in a circular saw or mini-grinder. Use of a straightedge to guide the cut is advisable where appropriate.

~~Q. Any sound-amplifying plates on the underside of the tile, which are dislodged during handling or cutting, should be replaced and secured with construction adhesive. The air gap created between these plates and the bottom of the tile is important in preserving the detectability properties of the Armor-Tile system as required in various jurisdictions.~~

E38. SUPPLY AND INSTALLATION OF NOISE BARRIER WALLS

DESCRIPTION

E38.1 General

E38.1.1 Prepare Detailed Design and Shop Drawings for the Noise Barrier Wall, including posts and panels, and piles. Detailed Design and Shop Drawings to be prepared and stamped by a Structural Engineer Registered in the Province of Manitoba.

E38.1.2 Construct Noise Barrier Wall complete with cast-in-place piles and pre-cast and/or cast-in-place posts and panels.

E38.1.3 Salvage or demolish redundant backyard fences.

E38.1.4 Construct short lengths of Infill Fences between existing fence lines and the Noise Barrier Wall, as required to maintain separation of yard spaces.

E38.1.5 Restore damaged and undeveloped areas between the Noise Barrier Wall and right-of-way boundaries.

E38.2 Construction Drawings

E38.2.1 Design and construction work shall be generally in accordance with the Construction Drawings for the Inkster Boulevard Noise Barrier Wall.

E38.3 Reference Standards

E38.3.1 City of Winnipeg Standard Construction Specifications- latest revision.

E38.3.2 Guide Specifications for Structural Design of Sound Barriers, 1989 included in Bridge Guide and Manual Interim Specifications – 1992, Published by the American Association of State Highway and Transportation Officials.

MATERIALS

E38.4 Delivery Storage and Handling

E38.4.1 Installer shall check all pre-cast noise barrier wall units upon delivery to ensure that proper material has been received.

E38.4.2 Prevent excessive mud, concrete and similar materials from coming into contact with the pre-cast concrete units.

E38.4.3 Protect materials from damage once on site: damaged materials including cracked, broken or chipped panels must not be used in the noise barrier wall.

E38.5 Schedule

E38.5.1 Provide a bar chart Schedule of Work broken down to indicate the timing of the following components of the work:

(a) Completion of Detailed Design and Shop Drawings.

(b) Removal of Existing Rear Yard/Side Yard Fences in areas affected by noise barrier wall construction, with immediate installation of Temporary Chain Link Fencing.

(c) Construction of Piles and Supply and Installation of Pre-cast Posts.

(d) Supply and Installation of Noise Barrier Wall Panels.

(e) Construction of Infill Fencing, including supply and installation of new material, as required, and removal of un-salvaged materials from existing rear yard fence.

(f) Restoration of Rear Yards and Supply and installation of Topsoil and Seed, as required.

E38.6 Pile and Pile Cap Concrete

E38.6.1 Pile and pile cap concrete shall have a minimum 28 day compressive strength of 32 MPa, consistent with Type B Concrete Mix. Maximum aggregate size shall be 20mm; maximum slump 100mm; air content 4% to 7%.

E38.6.2 As per City of Winnipeg Standard Construction Specifications CW 2160, latest revision.

E38.7 Steel Reinforcement

E38.7.1 All reinforcing bars shall be deformed billet steel conforming to CSA G30.18, Grade 400 W. Bars shall be branded by the manufacturer with bar size and grade of steel, and certified mill reports shall be submitted for record.

E38.7.2 As per City of Winnipeg Standard Construction Specifications CW2160, latest revision.

E38.8 Concrete Posts

E38.8.1 Height of posts above grade shall be as shown on the Construction Drawings.

E38.9 Detailed Design and Shop Drawings.

E38.9.1 The profile on the Construction Drawings provides a guide to spacing and height of noise barrier wall posts.

E38.10 Pre-cast Concrete Noise Barrier Wall Panels

E38.10.1 Pre-cast concrete noise barrier wall panels shall be 686mm high. Thickness shall be determined by the Structural Engineer retained by the Contractor. Show cross-section of panels on Shop Drawings.

E38.10.2 Texture and colour of panels to be as shown on the Construction Drawings. Orientate panels so that strongly textured faces are toward the roadway.

E38.10.3 Tables shown on Construction Drawing No. 1-55 provide a guide for the number of panels required for each type of noise barrier wall section.

E38.11 Exterior Grade Concrete Adhesive

E38.11.1 Construction adhesive used to connect panels and ensure gaps shall be PL Premium as manufactured by QSI Sealants Inc. or approved equivalent with minimum shear strength of 2.0 MPa.

E38.12 Shimming

E38.12.1 Material used for shimming must have a minimum compressive strength of 20 MPa.

E38.13 Topsoil and Sod

E38.13.1 As per City of Winnipeg Standard Construction Specification CW3510.

E38.14 Temporary Rear Yard Chain Link Fencing

E38.14.1 Chain link fencing 1.8 metres high suitable to maintain yard security including preventing access by humans or animals.

E38.15 Pile and Noise Barrier Wall Design

E38.15.1 The Contractor shall be responsible for the detailed design of all elements of the Inkster Noise Barrier Wall, including the size and depth of piles; cross-section of posts; thickness of stacking pre-cast concrete panels, and methods of fastening. The piles shall extend a minimum of 6 metres into the ground and be reinforced full length to prevent frost jacking of the piles. Design calculations, stamped by a Professional Engineer registered in Manitoba, shall be submitted for review. The calculations shall clearly indicate all loadings used in the design and specify all materials to be used.

E38.16 Shop Drawings

E38.16.1 The Contractor shall submit Shop Drawings stamped by a Professional Engineer registered in Manitoba for all design elements to the Contract Administrator at least six weeks before start of noise barrier wall construction.

CONSTRUCTION

E38.17 Layout

E38.17.1 Contract Administrator will lay out the centreline of the noise barrier wall for its entire length, and clearly locate the centre of each pile. Contract Administrator will also provide vertical control to establish the top of pile elevation for each post.

E38.18 Noise Barrier Wall Pile Construction

E38.18.1 Drill holes for piles to dimensions as determined through detailed structural engineering design by the Contractor's Engineer. Insert Sonotube in the upper 2 metres of the pile excavation and maintain in place during installation of reinforcing and placement of concrete

E38.18.2 Install reinforcing steel as indicated on the Shop Drawings. Place vertical steel reinforcement into the pile hole within 13mm of the design horizontal location for the steel prior to placing concrete. Steel bars must be placed and held in the pile as shown on the Construction Drawings with a minimum cover of 75mm.

E38.18.3 Do not pour concrete against frozen soil. Protect concrete from freezing for a minimum of 48 hours after concrete pour.

E38.19 Noise Barrier Wall Post and Panel Construction

E38.19.1 Pre-cast posts shall be embedded in cast-in-place concrete piles. Provide a minimum cover of 100mm concrete between the outside edge of the concrete pile and the embedded post. Length of post embedded to be shown on the Shop Drawings.

E38.19.2 Typically the top of the noise barrier wall will be 2.743 metres above finished grade.

E38.19.3 The height of each post will typically be 50mm above the top of the top panel in each wall section. Where there is a downward slope the height of the post above the downward panels may be up to 100mm. In some cases additional panels may be required to adjust for significant grade change.

E38.19.4 For minor grade changes between posts (up to 100mm) set the bottom panel flush with the higher post finish grade elevation.

E38.19.5 For major grade changes between posts (greater than 100mm) and particularly where an additional panel may be required to achieve a normal fence height (top of panels) of 2.743 metres, set the bottom panel flush with the lower post's finish grade elevation. Excavate between posts to accommodate the lower panel.

E38.19.6 Shim panels as required to maintain true horizontal.

E38.20 Side Yard Fence Infill Construction Including Salvage and Removal of Existing Rear Yard Fences

E38.20.1 Remove rear yard fences located within 1.5 metres and parallel to the noise barrier wall. Remove/salvage material from rear yard fences and from any side yard fencing that impedes noise barrier wall construction, and use salvaged materials in the construction of infill fencing between the ends of the existing side yard fencing to remain and the noise barrier wall.

E38.20.2 Attach/abut infill fence sections to the noise wall as shown in typical detail in the Detailed Design and Shop Drawings.

E38.20.3 Remove excess rear yard fence materials unless otherwise requested by the homeowner. Obtain written confirmation from the homeowner regarding the disposition of such materials if they are to remain.

E38.20.4 Provide new fence posts and new boards as required to complete the infill fencing, matching the existing fencing. Do not reuse rotten or damaged fence components.

E38.20.5 Paint or stain the new fence sections to match existing fencing as required.

E38.21 Temporary Rear Yard Chain Link Fence

E38.21.1 Supply and install 1.8 m high temporary chain link fencing to complete enclosure of rear yards immediately following removal of existing rear yard fencing. For each yard the temporary chain link fencing shall remain in place until infill fencing has been completed so as to maintain rear yard enclosure.

E38.22 Rear Yard Restoration and Landscaping

E38.22.1 Restore all rear yard areas damaged by noise barrier wall and related construction, including removal and restoration of rear yard/side yard fencing.

E38.22.2 Adjust grades in areas being restored to create a gentle slope to the bottom of the noise barrier wall panels. No gaps between the finished grade and the bottom of the noise barrier wall will be allowed.

E38.22.3 Restore damaged areas to condition equal to previous, including supply and installation of topsoil, sod, trees, shrubs, flowers or other landscape materials to replace materials removed or damaged, and fine grading . Where damage caused by noise barrier wall construction is light, prune damaged limbs or branches on trees and shrubs. Prune plants in accordance with City of Winnipeg Specifications for Tree and Shrub Plantings.

METHOD OF MEASUREMENT

E38.23 Noise Barrier Wall Posts and Panels Complete with Pile Foundations

E38.23.1 Supply and installation of noise barrier wall including posts and panels, and cast-in-place pile foundations, will be measured on a lineal metre basis.

E38.24 Temporary and Infill Fence

E38.24.1 Supply and installation of temporary chain link fence and infill fences, the latter using both salvaged and new components, will be included in the unit price per lineal metre for supply and installation of noise barrier wall complete with pile foundations, which price shall also include removal of demolished fence or cleanup of salvaged components as required.

E38.25 Additional Landscaping in Rear Yards

E38.25.1 Restoration of rear yard areas, including supply and installation of all landscaping materials required to complete restoration equal to the prior condition, will be paid for on a lump sum basis and no measurement will be taken for this work.

E38.26 Sodding

E38.26.1 As per CW 3510.

BASIS OF PAYMENT

E38.27 Noise Barrier Wall Posts and Panels Complete with Pile Foundations

E38.27.1 Payment for “Noise Barrier Wall Posts and Panels Complete with Pile Foundations” will be based on the number of linear metres of noise barrier wall installed in accordance with this specification, as measured by the Contract Administrator.

E38.28 Temporary Chain Link Fence and Infill Fence

E38.28.1 Temporary Chain Link Fence and Infill Fence, including salvaged or new infill fence, will be included in the unit price for “Noise Barrier Wall Posts and Panels Complete with Pile Foundations”.

E38.29 Additional Landscaping in Rear Yards

E38.29.1 Additional Landscaping in Rear Yards will be paid for at the Contract Lump Sum Price for “Additional Landscaping in Rear Yards”, measured as specified herein, which price will be payment in full for performing all operations herein described and all other items incidental to the Work.

E38.30 Sodding

E38.30.1 As per CW 3510.

E39. REMOVAL, SALVAGING AND INSTALLATION OF FENCING AND GATES

DESCRIPTION

E39.1 General

E39.1.1 This specification covers the removal, salvaging and installation of chain link fencing and gates.

E39.1.2 Referenced Standard Construction Specifications

(a) CW 3550 – Chain Link Fencing

MATERIALS

E39.2 Barbed Wire

E39.2.1 Barbed wire shall be 2 mm diameter galvanized steel wire to ASTM A 121, 4 point barbs with 125 mm spacing.

CONSTRUCTION METHODS

E39.3 Removal and Salvage of Existing Chain Link Fence

E39.3.1 Existing chain link fencing designated for removal shall be carefully removed and salvaged. All chain link fencing components and all hardware shall be salvaged for reuse and stockpiled at locations designated by the Contract Administrator.

E39.3.2 The Contractor shall remove the fence posts and concrete bases. The post hole remaining following the removal of the fencing shall be backfilled and compacted to the satisfaction of the contract Administrator. All concrete rubble shall be removed and disposed of by the Contractor.

E39.3.3 All chain link fencing materials judged by the Contract Administrator to be in unsatisfactory condition shall be disposed of by the Contractor and replaced with equivalent new materials at the Contractor’s cost.

E39.3.4 In the event of damage to any materials by the Contractor, the contractor shall immediately notify the Contract Administrator and make all repairs or replacements necessary, at his own expense, to the satisfaction of the Contract Administrator. In no case shall the Contractor install a damaged component on the chain link fencing.

E39.4 Installation of Salvaged Chain Link Fencing and Gates

E39.4.1 Install chain link fence and gates in accordance with CW 3550.

E39.4.2 New fence posts shall be supplied and installed to match the removed posts.

E39.4.3 Install 3 strand barbed wire where the existing fence had barbed wire, 0.300 m high on top of the installed fence at the same angle that existing barbed wire was.

MEASUREMENT AND PAYMENT

E39.5 Remove and Salvage Chain Link Fence

E39.5.1 The removal and salvaging of existing chain link fences will be measured on a length basis and paid for at the Contract Unit Price for “Remove & Salvage Chain Link Fence”. The length to be paid for will be the total number of metres of chain link fence removed and salvaged in accordance with this specification, accepted and measured by the Contract Administrator.

E39.5.2 The cost of backfilling post holes and removing and disposing of old fence posts and concrete rubble shall be included in the payment for Remove and Salvage Chain Link Fence”.

E39.6 Install Salvaged Chain Link Fences

E39.6.1 The installation of salvaged chain link fences will be measured on a length basis and paid for at the Contract Unit Price for “Install Salvaged Chain Link Fence”. The length to be paid for will be the total number of metres of salvaged chain link fence installed in accordance with this specification, accepted and measured by the Contract Administrator.

E39.6.2 No measurement or payment will be made for barbed wired. Barbed wire shall be included in payment for installing the salvaged chain link fence.

APPENDIX 'A'

GEOTECHNICAL REPORT

APPENDIX 'B'

SEQUENCE OF WORK FIGURES

APPENDIX 'C'

SIGNALS FIGURE