

Canada



Manitoba 

THE CITY OF WINNIPEG

BID OPPORTUNITY

BID OPPORTUNITY NO. 84-2005

**KENASTON UNDERPASS PROJECT
STERLING LYON PARKWAY WEST OF KENASTON BOULEVARD – ROADWORKS
AND LAND DRAINAGE,
KENASTON BOULEVARD ROAD DETOUR - ROADWORKS,
CN RIVERS SUBDIVISION RAIL DETOUR – GRADE PREPARATION**

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PART B
BIDDING PROCEDURES

PART B - BIDDING PROCEDURES

B1. PROJECT TITLE

- B1.1 KENASTON UNDERPASS PROJECT
STERLING LYON PARKWAY WEST OF KENASTON BOULEVARD – ROADWORKS AND
LAND DRAINAGE,
KENASTON BOULEVARD ROAD DETOUR - ROADWORKS,
CN RIVERS SUBDIVISION RAIL DETOUR – GRADE PREPARATION

B2. SUBMISSION DEADLINE

- B2.1 The Submission Deadline is 12:00 noon Winnipeg time, May 10, 2005.
- B2.2 Bid Submissions determined by the Manager of Materials to have been received later than the Submission Deadline will not be accepted and will be returned upon request.
- B2.3 The Contract Administrator or the Manager of Materials may extend the Submission Deadline by issuing an addendum at any time prior to the time and date specified in B2.1.

B3. SITE INVESTIGATION

- B3.1 Further to GC:3.1, the Bidder may view the Site (except on private properties) without making an appointment.
- B3.2 There will be a non-mandatory site meeting held to view the Department of National Defence (DND) loading dock on Tuesday, May 3, 2005 at 10:00 a.m. Meet at DND entrance gate on Taylor Avenue just west of Kenaston Boulevard.
- B3.3 The Bidder is not authorized to enter private property such as DND lands, CN right-of-way or private residences.
- B3.4 If desired, the Bidder may arrange to view DND and/or CN land by contacting the Contract Administrator.

B4. ENQUIRIES

- B4.1 All enquiries shall be directed to the Contract Administrator identified in D3.1.
- B4.2 If the Bidder finds errors, discrepancies or omissions in the Bid Opportunity, or is unsure of the meaning or intent of any provision therein, the Bidder shall notify the Contract Administrator of the error, discrepancy or omission, or request a clarification as to the meaning or intent of the provision at least five (5) Business Days prior to the Submission Deadline.
- B4.3 Responses to enquiries which, in the sole judgment of the Contract Administrator, require a correction to or a clarification of the Bid Opportunity will be provided by the Contract Administrator to all Bidders by issuing an addendum.
- B4.4 Responses to enquiries which, in the sole judgment of the Contract Administrator, do not require a correction to or a clarification of the Bid Opportunity will be provided by the Contract Administrator only to the Bidder who made the enquiry.
- B4.5 The Bidder shall not be entitled to rely on any response or interpretation received pursuant to B4 unless that response or interpretation is provided by the Contract Administrator in writing.

B5. ADDENDA

- B5.1 The Contract Administrator may, at any time prior to the Submission deadline, issue addenda correcting errors, discrepancies or omissions in the Bid Opportunity, or clarifying the meaning or intent of any provision therein.
- B5.2 The Contract Administrator will issue each addendum at least two (2) Business Days prior to the Submission Deadline, or provide at least two (2) Business Days by extending the Submission Deadline.
- B5.2.1 Addenda will be available in Adobe Acrobat (.pdf) format at The City of Winnipeg, Corporate Finance, Materials Management internet site at <http://www.winnipeg.ca/matmgt>.
- B5.2.2 The Bidder is responsible for ensuring that he has received all addenda and is advised to check the Materials Management Division's Bid Opportunities internet website for addenda shortly before submitting his Bid.
- B5.3 The Bidder shall acknowledge receipt of each addendum in Paragraph 9 of Form A: Bid. Failure to acknowledge receipt of an addendum may render a Bid non-responsive.

B6. SUBSTITUTES

- B6.1 The Work is based on the Plant, Materials and methods specified in the Bid Opportunity.
- B6.2 Substitutions shall not be allowed unless application has been made to and prior approval has been granted by the Contract Administrator in writing.
- B6.3 Requests for approval of a substitute will not be considered unless received in writing by the Contract Administrator at least five (5) Business Days prior to the Submission Deadline.
- B6.4 The Bidder shall ensure that any and all requests for approval of a substitute:
- (a) provide sufficient information and details to enable the Contract Administrator to determine the acceptability of the Plant, Material or method as either an approved equal or alternative;
 - (b) identify any and all changes required in the applicable Work, and all changes to any other Work, which would become necessary to accommodate the substitute;
 - (c) identify any anticipated cost or time savings that may be associated with the substitute;
 - (d) certify that, in the case of a request for approval as an approved equal, the substitute will fully perform the functions called for by the general design, be of equal or superior substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance;
 - (e) certify that, in the case of a request for approval as an approved alternative, the substitute will adequately perform the functions called for by the general design, be similar in substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance.
- B6.5 The Contract Administrator, after assessing the request for approval of a substitute, may at his sole discretion grant approval for the use of a substitute as an "approved equal" or as an "approved alternative", or may refuse to grant approval of the substitute.

- B6.6 The Contract Administrator will provide a response in writing, at least two (2) Business Days prior to the Submission Deadline, only to the Bidder who requested approval of the substitute.
- B6.6.1 The Bidder requesting and obtaining the approval of a substitute shall be entirely responsible for disseminating information regarding the approval to any person or persons he wishes to inform.
- B6.7 If the Contract Administrator approves a substitute as an “approved equal”, any Bidder may use the approved equal in place of the specified item.
- B6.8 If the Contract Administrator approves a substitute as an “approved alternative”, any Bidder bidding that approved alternative shall base his Total Bid Price upon the specified item but may also indicate an alternative price based upon the approved alternative. Such alternatives will be evaluated in accordance with B15.
- B6.9 No later claim by the Contractor for an addition to the Total Bid Price because of any other changes in the Work necessitated by the use of an approved equal or an approved alternative will be considered.

B7. BID SUBMISSION

- B7.1 The Bid Submission consists of the following components:
- (a) Form A: Bid;
 - (b) Form B: Prices, hard copy;
 - (c) Form G1: Bid Bond and Agreement to Bond, or
Form G2: Irrevocable Standby Letter of Credit and Undertaking, or
a certified cheque or draft;
- B7.2 All components of the Bid Submission shall be fully completed or provided, and submitted by the Bidder no later than the Submission Deadline, with all required entries made clearly and completely in ink, to constitute a responsive Bid.
- B7.3 The Bid Submission shall be submitted enclosed and sealed in an envelope. The envelope shall be clearly marked with the Bid Opportunity number and the Bidder's name and address.
- B7.3.1 Samples or other components of the Bid Submission which cannot reasonably be enclosed in the envelope may be packaged separately, but shall be clearly marked with the Bid Opportunity number, the Bidder's name and address, and an indication that the contents are part of the Bidder's Bid Submission.
- B7.3.2 A hard copy of Form B: PRICES must be submitted with the Bid Submission. If there is any discrepancy between the PDF version of the Form B: PRICES and the Excel version of the Form B: PRICES, the PDF version shall take precedence.
- B7.4 Bid Submissions submitted by facsimile transmission (fax) or internet electronic mail (e-mail) will not be accepted.
- B7.5 Bid Submissions shall be submitted to:
- The City of Winnipeg
Corporate Finance Department
Materials Management Division
185 King Street, Main Floor
Winnipeg MB R3B 1J1

B8. BID

- B8.1 The Bidder shall complete Form A: Bid, making all required entries.
- B8.2 Paragraph 2 of Form A: Bid shall be completed in accordance with the following requirements:
- (a) if the Bidder is a sole proprietor carrying on business in his own name, his name shall be inserted;
 - (b) if the Bidder is a partnership, the full name of the partnership shall be inserted;
 - (c) if the Bidder is a corporation, the full name of the corporation shall be inserted;
 - (d) if the Bidder is carrying on business under a name other than his own, the business name and the name of every partner or corporation who is the owner of such business name shall be inserted.
- B8.2.1 If a Bid is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B8.2.
- B8.3 In Paragraph 3 of Form A: Bid, the Bidder shall identify a contact person who is authorized to represent the Bidder for purposes of the Bid.
- B8.4 Paragraph 11 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.
- B8.4.1 The name and official capacity of all individuals signing Form A: Bid shall be printed below such signatures.
- B8.4.2 All signatures shall be original and shall be witnessed except where a corporate seal has been affixed.
- B8.5 If a Bid is submitted jointly by two or more persons, the word "Bidder" shall mean each and all such persons, and the undertakings, covenants and obligations of such joint Bidders in the Bid Submission and the Contract, when awarded, shall be both joint and several.

B9. PRICES

- B9.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B: Prices.
- B9.1.1 For the convenience of Bidders, and pursuant to Clause B7.3.2 and B15.4.2, an electronic spreadsheet of Form B: PRICES (Excel format) is available with the Documents for this Bid Opportunity at the Materials Management Division's Bid Opportunities internet website at <http://www.winnipeg.ca/matmgt>.
- B9.2 The quantities listed on Form B: Prices are to be considered approximate only. The City will use said quantities for the purpose of comparing Bids.

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

B10. QUALIFICATION

B10.1 The Bidder shall:

- (a) undertake to be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba;
- (b) be responsible and not be suspended, debarred or in default of any obligation to the City;
- (c) be financially capable of carrying out the terms of the Contract;
- (d) have all the necessary experience, capital, organization, and equipment to perform the Work in strict accordance with the terms and provisions of the Contract;
- (e) have successfully carried out work, similar in nature, scope and value to the Work; and
- (f) employ only Subcontractors who:
 - (i) are responsible and not suspended, debarred or in default of any obligation to the City (a list of suspended or debarred individuals and companies is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division internet site at <http://www.winnipeg.ca/matmgt>); and
 - (ii) have successfully carried out work similar in nature, scope and value to the portion of the Work proposed to be subcontracted to them, and are fully capable of performing the Work required to be done in accordance with the terms of the Contract;
- (g) have a written workplace safety and health program in accordance with The Workplace Safety and Health Act (Manitoba);

B10.2 Further to B10.1(g), the Bidder shall, within three (3) Business Days of a request by the Contract Administrator, provide proof satisfactory to the Contract Administrator that the Bidder has a workplace safety and health program meeting the requirements of The Workplace Safety and Health Act (Manitoba), by providing:

- (a) a valid COR certification number under the Certificate of Recognition (COR) Program - Option 1 administered by the Manitoba Heavy Construction Association's Safety, Health and Environment Program; or
- (b) a valid COR certification number under the Certificate of Recognition (COR) Program administered by the Manitoba Construction Safety Association; or
- (c) a report or letter to that effect from an independent reviewer acceptable to the City. (A list of acceptable reviewers and the review template are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division internet site at <http://www.winnipeg.ca/matmgt>.)

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

B10.4 The Bidder shall provide, on the request of the Contract Administrator, full access to any of the Bidder's equipment and facilities to confirm, to the Contract Administrator's satisfaction, that the Bidder's equipment and facilities are adequate to perform the Work.

B11. BID SECURITY

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

- (a) a bid bond, in the amount of at least ten percent (10%) of the Total Bid Price, and agreement to bond of a company registered to conduct the business of a surety in Manitoba, in the form included in the Bid Submission (Form G1: Bid Bond and Agreement to Bond); or
- (b) an irrevocable standby letter of credit, in the amount of at least ten percent (10%) of the Total Bid Price, and undertaking issued by a bank or other financial institution registered to conduct business in Manitoba and drawn on a branch located in Manitoba, in the form included in the Bid Submission (Form G2: Irrevocable Standby Letter of Credit and Undertaking); or
- (c) a certified cheque or draft payable to "The City of Winnipeg", in the amount of at least fifty percent (50%) of the Total Bid Price, drawn on a bank or other financial institution registered to conduct business in Manitoba.

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

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

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

B11.3 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.

B11.4 The City will not pay any interest on certified cheques or drafts furnished as bid security or subsequently retained as performance security.

B12. OPENING OF BIDS AND RELEASE OF INFORMATION

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

B12.1.1 Bidders or their representatives may attend.

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

B12.2 After the public opening, the names of the Bidders and their Total Bid Prices as read out (unevaluated, and pending review and verification of conformance with requirements) will be available in Adobe Acrobat (pdf) format on the Closed Bid Opportunities page at The City of Winnipeg, Corporate Finance, Materials Management Division internet site at <http://www.winnipeg.ca/matmgt>.

B12.3 After award of Contract, the name(s) of the successful Bidder(s) and the Contract Amount(s) will be available on the Closed Bid Opportunities page at The City of Winnipeg, Corporate Finance, Materials Management Division internet site at <http://www.winnipeg.ca/matmgt>.

B12.4 The Bidder is advised that any information contained in any Bid Submission may be released if required by City policy or procedures, or by other authorities having jurisdiction.

B13. IRREVOCABLE BID

B13.1 The Bid(s) submitted by the Bidder shall be irrevocable for the time period specified in Paragraph 10 of Form A: Bid.

B13.2 The acceptance by the City of any Bid shall not release the Bids of the next two lowest evaluated responsive Bidders and these Bidders shall be bound by their Bids on such Work until a Contract for the Work has been duly executed and the performance security furnished as herein provided, but any Bid shall be deemed to have lapsed unless accepted within the time period specified in Paragraph 10 of Form A: Bid.

B14. WITHDRAWAL OF BIDS

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

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

B14.1.2 The City will assume that any one of the contact persons named in Paragraph 3 of Form A: Bid or the Bidder's authorized representatives named in Paragraph 11 of Form A: Bid, and only such person, has authority to give notice of withdrawal.

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

- (a) retain the Bid Submission until after the Submission Deadline has elapsed;
- (b) open the Bid Submission to identify the contact person named in Paragraph 3 of Form A: Bid and the Bidder's authorized representatives named in Paragraph 11 of Form A: Bid; and
- (c) if the notice has been given by any one of the persons specified in B14.1.3(b), declare the Bid withdrawn.

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

B15. EVALUATION OF BIDS

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

- (a) compliance by the Bidder with the requirements of the Bid Opportunity;
- (b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B10;
- (c) Total Bid Price;
- (d) economic analysis of any approved alternative pursuant to B6.

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

- B15.3 Further to B15.1(b), the Award Authority shall reject any Bid submitted by a Bidder who does not demonstrate, in his Bid Submission or in other information required to be submitted, that he is responsible and qualified.
- B15.4 Further to B15.1(c), the Total Bid Price shall be the sum of the quantities multiplied by the unit prices for each item shown on Form B: Prices.
- B15.4.1 If there is any discrepancy between the Total Bid Price written in figures, the Total Bid Price written in words and the sum of the quantities multiplied by the unit prices for each item, the sum of the quantities multiplied by the unit prices for each item shall take precedence.
- B15.4.2 The electronic Form B: PRICES and the formulas imbedded in that spreadsheet are only provided for the convenience of Bidders. The City of Winnipeg 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.

B16. FEDERAL/PROVINCIAL CLAUSES

- B16.1 Further to GC:6, the Contractor shall prepare and maintain proper and accurate accounts of records, including invoices, statements, receipts and vouchers, in accordance with generally accepted accounting principles for at least five (5) years from Total Performance. The Contractor agrees that representatives of the Province of Manitoba and the Government of Canada, their Management Committee and their authorized representatives, to the extent possible under the legislation applicable to Manitoba, will have free access to the Site and to any documentation, including accounts and records, relevant for the purpose of audit of the Work.
- B16.2 GC 3.2 is hereby amended by deleting 3.2 (a) and substituting the following thereof:
- (a) Does so in good faith and that to the best of his knowledge, no member of the House of Commons or the Senate of Canada will be admitted to any share or part of any contract made pursuant to this Contract, or any benefit arising from it and no member of Council or any officer or employee of the City has any pecuniary interest, direct or indirect, in the Contract.

B17. AWARD OF CONTRACT

- B17.1 The Award Authority will give notice of the award of the Contract by way of a letter of intent, or will give notice that no award will be made.
- B17.2 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.
- B17.2.1 Without limiting the generality of B17.2, 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.

- B17.3 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.
- B17.4 The award of this Contract is contingent upon the Federal Government approving funding for the Work from the Canada Strategic Infrastructure Fund. If sufficient funding for this Contract is not approved by the Federal Government, the City shall have the right to not award the Contract.

PART C
GENERAL CONDITIONS

PART C - GENERAL CONDITIONS

C1. GENERAL CONDITIONS

- C1.1 The General Conditions for Construction Contracts (Revision 2000 11 09) are applicable to the Work of the Contract.
- C1.2 The *General Conditions for Construction Contracts* are available in Adobe Acrobat (.pdf) format on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division internet site at <http://www.winnipeg.ca/matmgt>.

PART D

SUPPLEMENTAL CONDITIONS

PART D - SUPPLEMENTAL CONDITIONS

GENERAL

D1. GENERAL CONDITIONS

- D1.1 In addition to the General Conditions for Construction Contracts, these Supplemental Conditions are applicable to the Work of the Contract.
- D1.2 The General Conditions are amended by striking out "The City of Winnipeg Act" wherever it appears in the General Conditions and substituting "The City of Winnipeg Charter".
- D1.3 The General Conditions are amended by striking out "Tender Package" wherever it appears in the General Conditions and substituting "Bid Opportunity".
- D1.4 The General Conditions are amended by striking out "Tender Submission" wherever it appears in the General Conditions and substituting "Bid Submission".
- D1.5 The General Conditions are amended by deleting GC:6.16 and GC:6.17.
The City of Winnipeg is now within the jurisdiction of the Manitoba Ombudsman pursuant to The Ombudsman Act.

D2. SCOPE OF WORK

- D2.1 The Work to be done under the Contract shall consist of:
- (a) Construction of Sterling Lyon Parkway west of Kenaston Boulevard including auxiliary lanes on Kenaston Boulevard, turning lane on westbound Taylor Avenue, and widening of Shaftesbury Boulevard and McCreary Road and Wilkes intersection.
 - (b) Construction of Kenaston Boulevard road detour.
 - (c) Construction of grade for CN rail detour.
 - (d) Construction of Clarke Transport access road.
 - (e) Landscaping on Sterling Lyon Parkway West of Kenaston Boulevard and Clarke Transport access road.
- D2.2 The major components of the Work are as follows:
- (a) Construction of Sterling Lyon Parkway west of Kenaston Boulevard
 - (i) Clearing and Grubbing
 - (ii) Excavation and pavement removal
 - (iii) Installation of land drainage sewers, manholes, ditch outlets, and subdrains
 - (iv) Compaction of existing sub-grade
 - (v) Installation of catch basins, catchpits and connection pipe
 - (vi) Placement of separation/ reinforcement fabric
 - (vii) Placement of sub-base and base course material
 - (viii) Construct barrier curb and splash strips utilizing slip-form paving equipment
 - (ix) Placement of asphalt pavement (average thickness: 180 mm)
 - (x) Placement of 230 mm plain-dowelled concrete pavement
 - (xi) Placement of 250 mm plain-dowelled concrete pavement (auxiliary lanes on Kenaston Boulevard only)
 - (xii) Placement of asphalt overlay on Taylor Avenue (average thickness: 50 mm)

- (b) Construction of Kenaston Boulevard road detour
 - (i) Clearing and Grubbing
 - (ii) Excavation and pavement removal
 - (iii) Compaction of existing sub-grade
 - (iv) Installation of catch basins, catchpits and connection pipe
 - (v) Placement of separation/ reinforcement fabric
 - (vi) Placement of sub-base and base course material
 - (vii) Construct barrier curb utilizing slip-form paving equipment
 - (viii) Placement of asphalt pavement (average thickness: 100 mm)
 - (ix) Installation of precast concrete traffic barriers and end treatments
 - (x) Installation of aluminum balanced barrier rail
- (c) Construction of grade for CN rail detour
 - (i) Clearing and Grubbing
 - (ii) Excavation and pavement removal
 - (iii) Compaction of existing sub-grade
 - (iv) Installation of culverts
 - (v) Placement of suitable site material
 - (vi) Placement of sub-ballast
 - (vii) Abandon existing DND loading dock
- (d) Construction of Clarke Transport access road
 - (i) Clearing and Grubbing
 - (ii) Excavation
 - (iii) Compaction of existing sub-grade
 - (iv) Installation of catchpits and connection pipe
 - (v) Placement of separation/ reinforcement fabric
 - (vi) Placement of sub-base and base course material
 - (vii) Construct splash strip for asphalt pavement utilizing slip-form paving equipment
 - (viii) Placement of asphalt pavement (average thickness: 180 mm)
 - (ix) Placement of 230 mm plain-dowelled concrete pavement
- (e) Landscaping on Sterling Lyon Parkway West of Kenaston Boulevard and Clarke Transport access road
 - (i) Placement of topsoil
 - (ii) Placement of seed and sod
 - (iii) Planting of trees and plants
 - (iv) Maintenance of landscaping

D3. CONTRACT ADMINISTRATOR

- D3.1 The Contract Administrator is UMA Engineering Ltd., represented by:
Wayne Jaworski, C.E.T.
Senior Design Technologist
1479 Buffalo Place, Winnipeg, Manitoba, R3T 1L7
Telephone No. (204) 284-0580
Facsimile No. (204) 475-3646

D3.2 At the pre-construction meeting, Wayne Jaworski, C.E.T. 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 24 hours a day to respond to an emergency.

D5. NOTICES

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

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

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

The City of Winnipeg
Chief Administrative Officer Secretariat
Administration Building, 3rd Floor
510 Main Street
Winnipeg MB R3B 1B9
Facsimile No.: (204) 949-1174

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

The City of Winnipeg
Corporate Services Department
Legal Services Division
185 King Street, 3rd Floor
Winnipeg MB R3B 1J1
Facsimile No.: (204) 947-9155

D6. FURNISHING OF DOCUMENTS

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

SUBMISSIONS

D7. SAFE WORK PLAN

- D7.1 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 GC:4.1 for the return of the executed Contract.
- D7.2 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 internet site at <http://www.winnipeg.ca/matmgt>

D8. INSURANCE

- D8.1 The Contractor shall provide and maintain the following insurance coverage at all times during the performance of the Work and throughout the warrant period except for all claims made policies, which shall be maintained for a minimum period of twenty-four (24) months after the date of Total Performance:
- (a) Commercial General Liability insurance, in the minimum amount of ten million dollars (\$10,000,000.00) inclusive. The said Commercial General Liability insurance shall include coverage for products and completed operations, blanket contractual liability, cross liability, non-owned automobile, and unlicensed motor vehicle liability. The said Province of Manitoba, the Federal Government of Canada and their ministers, officers, employees and agents, the Department of National Defence, Canadian National Railway, and the Contract Administrator as additional insureds.
 - (b) All Risk Course of Construction insurance in the amount of one hundred percent (100%) of the total Contract price written in the name of the Contractor and the City of Winnipeg and shall include, the Province of Manitoba, the Federal Government of Canada and their ministers, officers, employees and agents, the Department of National Defence, Canadian National Railway, and the Contract Administrator as additional insureds.
 - (c) Automobile Liability insurance for owned automobiles used for or in connection with the Work in the amount of at least two million dollars (\$2,000,000.00).
- D8.2 Deductibles shall be borne by the Contractor.
- D8.3 The Contractor shall not cancel, materially alter or cause each policy to lapse without providing at least thirty (30) Calendar Days prior written notice to the Contract Administrator.
- D8.4 The Contractor shall provide the City Solicitor with evidence of insurance detailing all insurance requirements, in a form satisfactory to the City Solicitor, at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in GC:4.1 for the return of the executed Contract.
- D8.5 GC:17 is hereby amended by adding the following:
- (a) The Contractor agrees at all times to indemnify and save harmless Her Majesty in the Right of Canada and Her Majesty in the Right of Manitoba, its officers, servants, employees or agents, from and against all claims and demands, loss, costs, damages, actions, suits or other proceedings by whomsoever brought or prosecuted in any manner

based upon, or occasioned by any injury to persons, damage to or loss or destruction of property, economic loss or infringement of rights caused by or arising directly or indirectly from:

- (i) The performance of this Contract or the breach of any term or condition of this Contract by the Contractor, its officers, employees, agents and subcontractors; and
- (ii) Any omission or other wilful or negligent act of the Contractor and its officers, employees, agents and subcontractors except to the extent to which such claims and demands, losses, costs, damages, actions, suit, or other proceedings relate to the act of negligence of an officer, employee or agents of Her Majesty in the Right of Canada or Her Majesty in the Right of the Province of Manitoba in the performance of his or her duties.

D9. PERFORMANCE SECURITY

D9.1 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 Manitoba, 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.

D9.2 If the bid security provided in his Bid Submission was not a certified cheque or draft pursuant to B11.1(c), the Contractor shall provide the City Solicitor with the required performance security within seven (7) Calendar Days of notification of the award of the Contract by way of letter of intent and prior to the commencement of any Work on the Site and in no event later than the date specified in the GC:4.1 for the return of the executed Contract.

D10. SUBCONTRACTOR LIST

D10.1 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 GC:4.1 for the return of the executed Contract.

D11. DETAILED WORK SCHEDULE

D11.1 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.

D11.2 The detailed Work Schedule shall consist of the following:

- (a) A Gantt chart for the Work based on the C.P.M. schedule; and acceptable to the Contract Administrator.

D11.3 Further to D 11.2, the Gantt chart shall show the time on a weekly basis, required to carry out the Work for 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

D12. COMMENCEMENT

D12.1 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.

D12.2 The Contractor shall not commence any Work on the Site until:

- (a) the Contract Administrator has confirmed receipt and approval of:
 - (i) evidence that the Contractor is in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba;
 - (ii) evidence of the workers compensation coverage specified in GC:6.14;
 - (iii) the twenty-four (24) hour emergency response phone number specified in D4.2.
 - (iv) the Safe Work Plan specified in D7;
 - (v) evidence of the insurance specified in D8;
 - (vi) the performance security specified in D9;
 - (vii) the subcontractor list specified in D10; and
 - (viii) the detailed work schedule specified in D11.

- (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.

D12.3 The City intends to award this Contract by May 17, 2005.

D12.4 The Contractor shall commence Work on May 30, 2005 subject to possession of property. It is assumed that all property will be in the City of Winnipeg's possession by June 15, 2005.

D13. RESTRICTED WORK HOURS

D13.1 Further to clause 3.10 of CW 1130, the Contractor shall require written permission 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.

D13.2 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.

D14. WORK BY OTHERS

D14.1 Work by others on or near the Site will include but not necessarily be limited to:

- (a) Manitoba Hydro- hydro pole/ tower relocation and street lighting on Wilkes Avenue and Sterling Lyon Parkway and temporary street lighting on Kenaston Boulevard road detour.

- (b) MTS-Allstream - extension of ducts on west side of Kenaston Boulevard extending West on Sterling Lyon Parkway to Clarke Transport access road and lowering of cables on McCreary Road.
- (c) City of Winnipeg Geomatics Branch.
- (d) Public Works contract (Bid Opportunity #83-2005) including Sterling Lyon Parkway East of Kenaston Boulevard, forcemain construction and auxiliary lanes on Kenaston Boulevard and utility relocation on Department of National Defence Lands.
- (e) City of Winnipeg Public Works contract feedermain relocation.
- (f) CN installation of ballast and track components and railway signals on detour and on Shaftesbury Boulevard.
- (g) Traffic services by City of Winnipeg
- (h) New and relocated traffic signals plant by City of Winnipeg.
- (i) Manitoba Hydro – gas utility relocations on Kenaston Boulevard and lowering on McCreary Road

D15. SEQUENCE OF WORK

D15.1 Further to GC:6.1, the sequence of Work shall be as follows:

D15.1.1 The Work shall be divided into 4 phases. Each phase shall be subdivided into stages.

D15.1.2 Phase I- Sterling Lyon Parkway West of Kenaston Boulevard

- (a) Stage I- Construct Sterling Lyon Parkway from station 1+080 to station 1+500 and the auxiliary lanes on Kenaston Boulevard.
- (b) Stage II- Construct Sterling Lyon Parkway from station 1+500 to Kenaston Boulevard including Clarke Transport Access Road.

D15.1.3 Phase II- Wilkes and Shaftesbury/ McCreary Intersection

- (a) Stage I- Construct Stage 1 of Wilkes & Shaftesbury/ McCreary intersection as shown on the Drawings. Close Wilkes at Kenaston Boulevard and open Sterling Lyon Parkway to traffic.
- (b) Stage II- Construct Stage 2 of Wilkes & Shaftesbury/ McCreary intersection as shown on the Drawings. Work to be co-ordinated with rail crews who will be installing the crossing and signals during this stage.

D15.1.4 Phase III- Road and Rail Detours

- (a) Stage I- Construct road detour and rail embankment in areas shown on the Drawings.
- (b) Stage II- Complete rail detour infill at Kenaston to accommodate rail crews and then construct road tie-ins (Kenaston Boulevard closed to traffic from Sterling Lyon to Taylor for one weekend during this stage).
- (c) Stage III- Complete centre median at Taylor and finish all miscellaneous curb work and backfill.
- (d) Stage IV- Open road detour to traffic (Phase II, Stage I must be complete by this time).

D15.1.5 Phase IV- Landscaping

D15.2 The Contractor shall coordinate with the identified activities and modify his proposal in order to minimize disruptions.

D16. CRITICAL STAGES

- D16.1 The Contractor shall achieve critical stages of the Work in accordance with the following requirements:
- (a) Sterling Lyon Parkway – Sta. 1+080 to Sta. 1+500 and Kenaston Boulevard auxiliary lanes – Contractor will start construction on May 30, 2005 and must be completed by September 16, 2005.
 - (b) Sterling Lyon Parkway- Sta.1+500 to Kenaston Boulevard including Clarke Transport access road - Contractor will start construction on June 15, 2005 and must be completed by September 16, 2005.
 - (c) Sterling Lyon Parkway- Stage 1 of Shaftesbury Boulevard/ McCreary Road Intersection - Contractor will start construction on July 15, 2005 and must be completed by September 16, 2005.
 - (d) Kenaston Boulevard road detour and CN rail detour - Contractor will start construction on June 30, 2005 and must be completed by September 19, 2005.
 - (e) Sterling Lyon Parkway- Stage 2 of Shaftesbury Boulevard/ McCreary Road Intersection - Contractor will start construction on September 16, 2005 and must be completed by October 17, 2005.
- D16.2 When the Contractor considers the Work associated with the critical stages listed in D16.1 to be completed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Completion. 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.
- D16.3 The date on which the critical stage Work has been accepted by the Contract Administrator as being completed to the requirements of the Contract is the date on which completion of the critical stage has been achieved.

D17. SUBSTANTIAL PERFORMANCE

- D17.1 The Contractor shall achieve Substantial Performance by October 17, 2005, excluding landscaping Works to be completed in 2006.
- D17.2 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.
- D17.3 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.

D18. TOTAL PERFORMANCE

- D18.1 The Contractor shall achieve Total Performance by July 7, 2006.
- D18.2 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.

D18.3 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.

D19. LIQUIDATED DAMAGES

D19.1 If the Contractor fails to achieve 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) Substantial Performance – three thousand dollars (\$3,000)
- (b) Total Performance – one thousand dollars (\$1,000)

D19.2 The amounts specified for liquidated damages in D19.1 are based on a genuine pre-estimate of the City's losses in the event that the Contractor does not achieve Substantial Performance or Total Performance by the days fixed herein for same.

D19.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

D20. SCHEDULED MAINTENANCE

D20.1 The Contractor shall perform the following scheduled maintenance in the manner and within the time periods required by the Specifications:

- (a) Reflective Crack Maintenance During Two Year Maintenance Warranty Period as specified in CW 3250-R6.
- (b) Landscaping Maintenance as specified in E26 to E32.

D20.2 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

D21. JOB MEETINGS

D21.1 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.

D21.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he deems it necessary.

D22. PRIME CONTRACTOR – THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA)

D22.1 Further to GC:6.26, the Contractor shall be the Prime Contractor and shall serve as, and have the duties of the Prime Contractor in accordance with The Workplace Safety and Health Act (Manitoba).

WARRANTY

D23. WARRANTY

- D23.1 Notwithstanding GC:13.2, the warranty period shall begin on the date of Substantial Performance and shall expire two (2) years thereafter unless extended pursuant to GC:13.2.1 or GC:13.2.2, in which case it shall expire when provided for thereunder.
- D23.2 Notwithstanding GC:13.2 or D23.1, the Contract Administrator may permit the warranty period for a portion or portions of the Work to begin prior to the date of Substantial 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.
- D23.2.1 In such case the date specified by the Contract Administrator for the warranty period to begin shall be substituted for the date specified in GC:13.2 for the warranty period to begin.

FORM H1: PERFORMANCE BOND
(See D9)

KNOW ALL MEN BY THESE PRESENTS THAT

_____ ,
(hereinafter called the "Principal"), and

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

_____ dollars (\$_____.)

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

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

_____ day of _____, 20____, for:

BID OPPURTUNITY NO. 84-2005

KENASTON UNDERPASS PROJECT
STERLING LYON PARKWAY WEST OF KENASTON BOULEVARD – ROADWORKS AND LAND DRAINAGE,
KENASTON BOULEVARD ROAD DETOUR - ROADWORKS,
CN RIVERS SUBDIVISION RAIL DETOUR – GRADE PREPARATION

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

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

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

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

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

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

_____ day of _____, 20____ .

SIGNED AND SEALED
in the presence of:

(Witness)

(Name of Principal)

Per: _____ (Seal)

Per: _____

(Name of Surety)

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

**FORM H2: IRREVOCABLE STANDBY LETTER OF CREDIT
(PERFORMANCE SECURITY)
(See D9)**

(Date)

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

RE: PERFORMANCE SECURITY – 84-2005

KENASTON UNDERPASS PROJECT
STERLING LYON PARKWAY WEST OF KENASTON BOULEVARD – ROADWORKS AND LAND
DRAINAGE,
KENASTON BOULEVARD ROAD DETOUR - ROADWORKS,
CN RIVERS SUBDIVISION RAIL DETOUR – GRADE PREPARATION

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

(Page 1 of 2)

(See D10)

KENASTON UNDERPASS PROJECT
STERLING LYON PARKWAY WEST OF KENASTON BOULEVARD – ROADWORKS AND LAND
DRAINAGE,
KENASTON BOULEVARD ROAD DETOUR - ROADWORKS,
CN RIVERS SUBDIVISION RAIL DETOUR – GRADE PREPARATION

<u>Portion of the Work</u>	<u>Name</u>	<u>Address</u>
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SURFACE WORKS:

Supply of Materials:

Concrete

Asphalt

Base Course & Subbase

Subballast

Geotextile Fabric

Precast Concrete Traffic Barriers

Trees, Shrubs and Ground Covers

Sod

Seed

Installation/Placement:

Concrete

Asphalt

Base Course & Subbase

Subballast

Landscaping

UNDERGROUND WORKS:

Supply of Materials:

Catchpits, Catchbasins, Manholes

Frames and Covers

PART E
SPECIFICATIONS

PART E - SPECIFICATIONS

GENERAL

E1. APPLICABLE SPECIFICATIONS, STANDARD DETAILS AND DRAWINGS

- E1.1 *The City of Winnipeg Standard Construction Specifications* in its entirety, whether or not specifically listed on Form B: Prices, shall apply to the Work.
- E1.1.1 *The City of Winnipeg Standard Construction Specifications* is available in Adobe Acrobat (.pdf) format on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division internet site at <http://www.winnipeg.ca/matmgt>.
- E1.1.2 The version in effect three (3) business days before the Submission Deadline shall apply.
- E1.1.3 Further to GC:2.4(d), Specifications included in the Bid Opportunity shall govern over *The City of Winnipeg Standard Construction Specifications*.
- E1.2 The following Drawings are applicable to the Work:

Drawing Number	Drawing Name/Title	Drawing Original Sheet Size
P-3258-60	Cover Sheet-Drawing Index	A1
P-3258-61	Site Plan-Project Location	A1
P-3258-62	Drawing Key Plan-Drawing Sheet Layout	A1
Sterling Lyon Parkway West of Kenaston Boulevard – Pavement		
P-3258-63	Horizontal Geometry Sta. 0+350 to Sta. 0+950	A1
P-3258-64	Horizontal Geometry Sta. 0+950 to Sta. 2+050	A1
P-3258-65	Horizontal Geometry Sta. 2+050 to Kenaston Boulevard	A1
P-3258-66	Horizontal Geometry – Kenaston Blvd. Auxiliary Lanes	A1
P-3258-67	Horizontal Geometry – Clarke Transport Access	A1
P-3258-68	Horizontal & Vertical Alignment – Sta. 0+350 to Sta. 0+650	A1
P-3258-69	Horizontal & Vertical Alignment – Sta. 0+650 to Sta. 0+950	A1
P-3258-70	Horizontal & Vertical Alignment – Sta. 0+950 to Sta. 1+250	A1
P-3258-71	Horizontal & Vertical Alignment – Sta. 1+250 to Sta. 1+550	A1
P-3258-72	Horizontal & Vertical Alignment – Sta. 1+550 to Sta. 1+800	A1
P-3258-73	Horizontal & Vertical Alignment – Sta. 1+800 to Sta. 2+050	A1
P-3258-74	Horizontal & Vertical Alignment – Sta. 2+050 to Sta. 2+300	A1
P-3258-75	Horizontal & Vertical Alignment – Sta. 2+300 to Kenaston Blvd.	A1
P-3258-76	Horizontal & Vertical Alignment – McCreary Rd./Shaftesbury Blvd.	A1
P-3258-77	Horizontal & Vertical Alignment – Access to Clarke Transport	A1
P-3258-78	Horizontal & Vertical Alignment – Kenaston Blvd. S Bnd Acceleration Lane	A1
P-3258-79	Horizontal & Vertical Alignment – Kenaston Blvd. S Bnd to W Bnd Turn Lane	A1
Taylor Avenue East of Kenaston Boulevard – Pavement		
P-3258-80	Hor & Vert Alignment, Geometry & Section – Taylor Avenue W Bnd to S Bnd Turn Lane	A1
Sterling Lyon Parkway West of Kenaston Boulevard – Land Drainage System		
P-3258-81	Land Drainage System – Sta. 0+350 to Sta. 0+650	A1
P-3258-82	Land Drainage System – Sta. 0+650 to Sta. 0+950	A1
P-3258-83	Land Drainage System – Sta. 0+950 to Sta. 1+250	A1
P-3258-84	Land Drainage System – Sta. 1+250 to Sta. 1+550	A1
P-3258-85	Land Drainage System – Sta. 1+550 to Sta. 1+800	A1

Drawing Number	Drawing Name/Title	Drawing Original Sheet Size
P-3258-86	Land Drainage System – Sta. 1+800 to Sta. 2+050	A1
P-3258-87	Land Drainage System – Sta. 2+050 to Sta. 2+300	A1
P-3258-88	Land Drainage System – Sta. 2+300 to Kenaston Blvd.	A1
P-3258-89	Land Drainage System – MH, CB, CP, DI Schedule	A1
P-3258-90	Land Drainage System – MH, CB, CP, DI Schedule	A1
P-3258-91	Land Drainage System – Ditch Inlet-Details & Sections	A1
Kenaston Boulevard – Road Detour		
P-3258-92	Horizontal Geometry – Sta. 0+950 to Sta. 1+450	A1
P-3258-93	Horizontal Geometry – Sta. 1+450 to Sta. 2+000	A1
P-3258-94	Horizontal & Vertical Alignment – Sta. 0+950 to Sta. 1+150	A1
P-3258-95	Horizontal & Vertical Alignment – Sta. 1+150 to Sta. 1+450	A1
P-3258-96	Horizontal & Vertical Alignment – Sta. 1+450 to Sta. 1+750	A1
P-3258-97	Horizontal & Vertical Alignment – Sta. 1+750 to Sta. 2+000	A1
CN Rivers Subdivision Mile 5.18 Rail Detour		
P-3258-98	Horizontal & Vertical Alignment – Sta. 0+450 to Sta. 0+700	A1
P-3258-99	Horizontal & Vertical Alignment – Sta. 0+700 to Sta. 1+000	A1
P-3258-100	Horizontal & Vertical Alignment – Sta. 1+000 to Sta. 1+215	A1
Sections, Details & Construction Staging		
P-3258-101	Wilkes Avenue Pavement Cross Sections	A1
P-3258-102	Sterling Lyon Parkway Pavement Cross Sections	A1
P-3258-103	Sterling Lyon Parkway Pavement Cross Sections	A1
P-3258-104	SLP/McCreary Rd./Shaftesbury Blvd.-Pavement Cross Sections	A1
P-3258-105	Kenaston Boulevard-Pavement Cross Sections	A1
P-3258-106	Clarke Transport/CN Mainline Detour-Pavement Cross Sections	A1
P-3258-107	Kenaston Boulevard Road Detour-Pavement Cross Sections & Median Detail	A1
P-3258-108	Access Gate & Land Drainage System-Details & Sections	A1
P-3258-109	Sterling Lyon Parkway - Pavement-Details & Sections	A1
P-3258-110	Aluminum Balanced Barrier Rail-Post and Rail Transition Layout	A1
P-3258-111	Aluminum Balanced Barrier Rail-Details	A1
P-3258-112	Energite Barrels-Plan and Details	A1
P-3258-113	Construction Staging-Stage I at Shaftesbury Blvd.	A1
P-3258-114	Construction Staging-Stage II at Shaftesbury Blvd.	A1
P-3258-115	Staging-Kenaston Boulevard Road Detour	A1
Landscaping-Sterling Lyon Parkway West of Kenaston Boulevard		
P-3258-116	Landscape Plan – 0+400 to 0+950	A1
P-3258-117	Landscape Plan – 0+950 to 1+550	A1
P-3258-118	Landscape Plan and Planting Details – 1+550 to 2+050	A1
P-3258-119	Landscape Plan and Paving Pattern Detail – 2+050 to Kenaston Blvd.	A1
P-3258-120	Landscaping at Shaftesbury Blvd. and Access to Clarke Transport	A1
P-3258-121	Landscape Plan – 0+550 to 1+150 (Kenaston Blvd.)	A1

E1.3 The following Drawings contained in Appendix “B” are applicable to the Work:

Drawing Number	Drawing Name/Title	Drawing Original Sheet Size
CW-315	Precast Concrete Portable Traffic Barrier	11 x 17”
QSTSCVR-U	Quadguard System w/ Tension Strut Backup	8.5” x 11”
35-40-18	Transition Assy, 4 Offset, QG	8.5” x 11”

Drawing Number	Drawing Name/Title	Drawing Original Sheet Size
35-40-07	Quadguard System Diaphragm Assy, QG	8.5" x 11"
35-40-05	Quadguard System Nose Assy, QG	8.5" x 11"
35-40-04	Quadguard System Fender Panel Assy, QG	8.5" x 11"
35-40-03	Quadguard System Backup Assy, TS, QG	8.5" x 11"
35-40-06 Sheet 1	Quadguard System Monorail Assy, QG	8.5" x 11"
35-40-06 Sheet 2	Quadguard System Monorail Assy, QG	
35-40-06 Sheet 3	Quadguard System Monorail Assy, QG	8.5" x 11"
35-40-11	Quadguard System Optional 8" Concrete Pad for Tension Strut Backup	8.5" x 11"
3540260-0000	Quadguard System PCMB Anchor Assembly	8.5" x 11"

E2. GEOTECHNICAL REPORT

- E2.1 Further to GC:3.1, 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 25 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 a heater and air conditioner so that the room temperature can be maintained between either 16-18°C or 24-25 °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, 3 m x 1.2 m table, 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.
 - (i) The building shall have a land line telephone connection for use with a telephone or facsimile machine. All service charges, connection fees, taxes, usage fees, etc. (excluding long distance charges) shall be borne by the Contractor.
- 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 the Contract is completed.

- E3.4 The office facilities for the Contract Administrator shall be stabilized in a manner sufficient to prevent such structures from being overturned by wind forces as specified in the National Building Code of Canada (NBC). The stabilization method the Contractor intends to utilize shall be designed by a professional engineer registered in the Province of Manitoba.

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

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. No measurement for payment will be made for this work.
 - (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 Kenaston Boulevard will be closed to traffic from Taylor Avenue to Sterling Lyon Parkway from 22:00 September 16, 2005 to 06:00 September 19, 2005 to accommodate the completion of the Kenaston Boulevard road detour. The Contractor shall barricade and sign the street "Road Closed" in accordance with the Manual of Temporary Traffic Control.
- E6.1.2 Maintain a minimum of one lane of traffic in both directions on Wilkes Avenue and Sterling Lyon Parkway as shown on the Staging Drawings. The Wilkes Avenue/ Shaftesbury Boulevard/ McCreary Road intersection will be closed to traffic from 22:00 October 14, 2005 to 06:00 October 17, 2005 and the Contractor shall barricade and sign the street "Road Closed" in accordance with the Manual of Temporary Traffic Control.
- E6.1.3 Maintain a minimum of two lanes of traffic in each direction on Kenaston Boulevard during A.M. and P.M. peak periods and a minimum of one lane in each direction at all other times during the construction of auxiliary lanes.
- E6.1.4 The Contractor shall attempt to maintain intersecting street and private approach access 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 24 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.

E7. WATER USED BY CONTRACTOR

E7.1 Further to clause 3.7 of CW 1120-R1, the Contractor shall pay for all costs associated with obtaining water in accordance with the Waterworks By-law. Sewer charges will not be assessed for water obtained from a hydrant.

E8. SURFACE RESTORATIONS

E8.1 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.

E9. INFRASTRUCTURE SIGNS

E9.1 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 end of Sterling Lyon Parkway construction west of Kenaston Boulevard as directed by the Contract Administrator. When the Contract Administrator considers the Work 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

E10. EARTHWORK AND GRADING

DESCRIPTION

E10.1 General

E10.1.1 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.

E10.2 Definitions

E10.2.1 Topsoil Excavation- The excavation of surface soil, organic growth, or other material designated by the Contract Administrator as overburden, the stockpiling of topsoil for re-use on site, and the satisfactory disposal of surplus and unsuitable material such as brush, grass, weeds and all other organic growth and any surface topsoil.

E10.2.2 Common Excavation- The excavation of all material encountered within the limits of grading following topsoil excavation, the on-site placement or the stockpiling of suitable site material, and the satisfactory disposal of surplus and unsuitable site material such as frost heaving clays, silts, rock, rubble, rubbish and any surplus suitable site material.

E10.3 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

E10.4 Fill Material

E10.4.1 Fill material for embankment construction, sideslope construction and boulevard fill shall be obtained from site excavation of a type approved by the Contract Administrator.

E10.4.2 Approved clay fill material shall be uniform in texture and suitable for compaction.

CONSTRUCTION METHODS

E10.5 Clearing and Grubbing

E10.5.1 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.

E10.6 Excavation

E10.6.1 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.

E10.6.2 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.

- E10.6.3 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.
- E10.6.4 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 subgrade shall not be steeper than 1:15.
- E10.6.5 The limits of excavation will be taken as a vertical plane 450 millimetres 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.
- E10.6.6 Utilize equipment of a size and type as required to complete the work in reasonable time as approved by the Contract Administrator.
- E10.6.7 Dispose of material removed from Site in accordance with Section 3.4 of CW 1130.
- E10.6.8 There is a possibility that the Fort Whyte Centre may accept clean fill (unsuitable site common excavation) on their property. The Contractor may contact Bill Elliott at 989-8351 if he wishes to make arrangements for disposal of unsuitable site common excavation.
- E10.6.9 Contractor to note that there is a former dump site shown on the Drawings along Sterling Lyon Parkway. The exact extent and quantity of material is unknown. The excavation of this material will be considered unsuitable site material and should be disposed of in accordance with this Specification and CW 1130.
- E10.7 Removal of Existing Pavement
- E10.7.1 Removal of existing pavement be done and paid for in accordance with CW 3110.
- E10.8 Preparation of Existing Ground Surface
- E10.8.1 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.
- E10.8.2 Where the existing ground surface is sloped 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.
- E10.8.3 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.
- E10.8.4 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.
- E10.8.5 Where existing roadbeds are being widened and existing embankments 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.
- E10.8.6 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.

E10.9 Embankment

- E10.9.1 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.
- E10.9.2 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.
- E10.9.3 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.
- E10.9.4 After the preparation of the sub-grade is complete, trench excavation for sub drain installation can commence in accordance with CW 3120.

E10.10 Compaction

- E10.10.1 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.
- E10.10.2 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.
- E10.10.3 Where the moisture content of the embankment material is too high, the material shall be thoroughly worked until the optimum moisture content is achieved.
- E10.10.4 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.

E10.11 Finishing and Maintaining

- E10.11.1 The Contractor shall, as soon as practicable, bring the excavations and embankments to the correct widths, lines and grades as shown on the Drawings.
- E10.11.2 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.

E10.12 Boulevard Grading

- E10.12.1 Boulevard grading shall be done and paid for in accordance with CW 3110.

E10.13 Ditch Grading

- E10.13.1 Ditch grading shall be done and paid for in accordance with CW 3110.

E10.14 Placing Stockpiled Topsoil

- E10.14.1 After grading of boulevards, sideslopes and ditches, load, haul and place previously stockpiled topsoil in locations shown on the Drawings to a uniform depth of 50 mm.
- E10.14.2 Condition topsoil in accordance with E29.

E10.15 Quality of Sub-grade and Embankment Material

- E10.15.1 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 E10.13 of this specification.
- E10.15.2 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.
- E10.15.3 The frequency and number of tests will be determined by the Contract Administrator.
- E10.15.4 The field density of the compacted layers will be verified by Field Density Tests in accordance with ASTM Standard D698, 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).
- E10.15.5 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

E10.16 Topsoil Excavation

- E10.16.1 Topsoil excavation will be measured on a volume basis and paid for at the Contract Unit Price for "Topsoil Excavation". The volume to be paid for will be the total number of cubic metres of existing topsoil excavated in accordance with this specification, accepted and measured by the Contract Administrator.
- E10.16.2 The volume of topsoil excavation will be measured by cross-sections in its original position and computed by the method of Average End Areas.
- E10.16.3 Stockpiling of suitable topsoil material for reuse or disposal of surplus and unsuitable material will be included in the payment for "Topsoil Excavation".

E10.17 Placing Stockpiled Topsoil

- E10.17.1 Placing previously stockpiled topsoil will be measured on a volume basis and paid for at the Contract Unit Price for "Placing Stockpiled Topsoil". The volume to be paid for will be the total number of cubic metres of topsoil excavated from the stockpile and placed on boulevards, slopes, ditches, and berms or graded areas as specified on the Drawings, accepted and measured by the Contract Administrator.
- E10.17.2 The volume of stockpiled topsoil placed will be measured by cross-sections in its original position in the stockpile and computed by the method of Average End Areas.
- E10.17.3 Disposal of surplus material left in the stockpile will be included in the payment for "Topsoil Excavation" as specified in Section E10.18 of this specification.
- E10.17.4 Additional screening or processing of the stockpiled topsoil prior to or after final placing as directed by the Contract Administrator will be measured and paid for in addition to the unit price for the "Placing Stockpiled Topsoil" (See E29).

E10.18 Common Excavation

- E10.18.1 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

- (i) Suitable Site Material
- (ii) Unsuitable Site Material

- E10.18.2 The volume of common excavation will be measured by cross-sections in its original position and computed by the method of Average End Areas.
- E10.18.3 Only material excavated within the limits of excavation will be included in the payment for the "Items of Work" listed for common excavation.
- E10.18.4 Disposal of surplus common excavation will be included in the payment for unsuitable site material common excavation.
- E10.18.5 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.
- E10.18.6 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.
- E10.19 Fill Material
- E10.19.1 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

- (i) Suitable Site Material

- E10.19.2 The volume of fill material will be measured by cross-sections and computed by the method of Average End Areas.
- E10.19.3 Only material placed within the limits of excavation will be included in the payment for the "Items of Work" listed for fill material.
- E10.19.4 No measurement or payment will be made for materials rejected by the Contract Administrator.
- E10.19.5 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.
- E10.20 Preparation of Existing Ground Surface
- E10.20.1 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 of square metres of existing ground prepared in accordance with this specification, accepted and measured by the Contract Administrator.
- E10.20.2 Bench cuts will not be paid for directly but will be considered as included in the payment for "Preparation of Existing Ground Surface".

E11. STAGING OF WILKES AVENUE/SHAFTESBURY BOULEVARD/MCCREARY ROAD INTERSECTION

DESCRIPTION

E11.1 General

E11.1.1 This specification covers the construction of temporary asphalt pavements for the construction staging at the intersection of Wilkes Avenue, Shaftesbury Boulevard and McCreary Road and the connection to Sterling Lyon Parkway.

E11.1.2 Referenced Standard Construction Specifications

- (a) CW 3110- Sub-Grade, Sub-Base and Base Course Construction
- (b) CW 3410- Asphaltic Concrete Pavement Works

MATERIALS

E11.2 Base Course Material

E11.2.1 All base course material used for temporary pavements shall be in accordance with Section 2.2 of CW 3110.

E11.3 Asphalt Pavement

E11.3.1 All asphaltic concrete used for temporary pavements shall be Type 1A in accordance with Section 6 of CW 3410.

CONSTRUCTION METHODS

E11.4 Temporary Pavements

E11.4.1 Topsoil excavation, common excavation, fill material, and preparation of existing ground surface shall be done and paid for in accordance with specification E10 and the Drawings.

E11.4.2 Supply and placing base course and removal of asphalt pavement shall be done and paid for in accordance with CW 3110 and the Drawings.

E11.4.3 Asphalt pavement construction shall be done and paid for in accordance with CW 3410 and the Drawings.

E11.5 Reuse of Base Course Material

E11.5.1 Once the detour pavements are no longer required and the asphalt pavement has been removed, the Contractor will excavate the base course from the detour and stockpile it for reuse on other portions of the Work as directed by the Contract Administrator.

E11.5.2 Care must be taken to avoid fouling the base course with clay or other deleterious materials.

E11.5.3 Placement of the base course material at its new location will be in accordance with Section 3.5 of CW 3110.

MEASUREMENT AND PAYMENT

E11.6 Reuse of Base Course Material

E11.6.1 The stockpiling, hauling, placing and compaction of base course material from the Sterling Lyon Parkway detour will be measured on a volume basis and paid for at the Contract Unit

Price for "Reuse of Base Course from Sterling Lyon Parkway Staging". The volume to be paid for will be the total number of cubic metres of base course material stockpiled and placed in accordance with this specification, accepted and measured by the Contract Administrator.

- E11.6.2 The volume of base course reused will be measured by cross-sections and computed by the method of Average End Areas.
- E11.6.3 No measurement or payment will be made for materials rejected by the Contract Administrator.

E12. CONCRETE CURBS AND MEDIANS ON ASPHALT PAVEMENT

DESCRIPTION

- E12.1 General
- E12.1.1 This specification shall cover the construction of concrete curbs, splash strips, monolithic medians and bull-noses on asphaltic concrete pavements.
- E12.1.2 Referenced Standard Construction Specifications
(a) CW 3310- Portland Cement Concrete Pavement Works

MATERIALS

- E12.2 General
- E12.2.1 All materials including concrete and reinforcing steel shall conform to Sections 5 and 6 of CW 3310.

CONSTRUCTION METHODS

- E12.3 General
- E12.3.1 All concrete curbs and medians on asphalt pavements shall be constructed as shown on the Drawings in accordance with Section 9 and 10 of CW 3310.

MEASUREMENT AND PAYMENT

- E12.4 Concrete Pavements, Median Slabs, Bull-noses and Safety Median
- E12.4.1 Construction of concrete median slabs and bull-noses on asphalt pavement will be measured on an area basis and paid for at the Contract Unit Price per square metre for the "Items of Work" listed here below. 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.

Items of Work

- (i) "Construction of Monolithic Concrete Median Slabs for Asphalt Pavement"
- (ii) "Construction of Monolithic Concrete Bull-noses for Asphalt Pavement"

- E12.5 Concrete Curbs, Curb and Gutter, and Splash Strips
- E12.5.1 Construction of concrete curbs and splash strips on asphalt pavement will be measured on a length basis and paid for at the Contract Unit Price per metre for the "Items of Work" listed here below. 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.

Items of Work

- (i) "Construction of Splash Strips for Asphalt Pavement (180 mm height)"
- (ii) "Construction of Modified Splash Strips for Asphalt Pavement (180 mm height)"
- (iii) "Construction of Ramp Curb for Asphalt Pavement (15 mm height)"
- (iv) "Construction of Mountable Curb for Asphalt Pavement (125 mm height)"

E13. REMOVAL, SALVAGING AND INSTALLATION OF FENCING AND GATES

DESCRIPTION

E13.1 General

E13.1.1 This specification covers the removal, salvaging and installation of chain link fencing, wood fence and gates.

E13.1.2 Referenced Standard Construction Specifications

- (a) CW 3550- Chain Link Fencing

MATERIALS

E13.2 Barbed Wire

E13.2.1 Barbed wire shall be 2 mm diameter galvanized steel wire to ASTM A121, 4 point barbs with 125 mm spacing.

CONSTRUCTION METHODS

E13.3 Removal and Salvage of Existing Chain Link Fence

E13.3.1 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.

E13.3.2 The Contractor shall remove the fence posts and concrete bases. The post holes 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.

E13.3.3 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.

E13.3.4 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.

E13.4 Installation of Salvaged Chain Link Fencing and Gates

E13.4.1 Install chain link fence and gates in accordance with CW 3550.

E13.4.2 New fence posts shall be supplied and installed to match the removed posts.

E13.4.3 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.

E13.5 Removal and Salvage of Wood or Steel Fence

E13.5.1 The Contractor shall remove and salvage the fence posts and rails as shown on the Drawings at approximate Station 0+800 on the south side of Sterling Lyon Parkway. The post holes remaining following the removal of the fencing shall be backfilled and compacted to the satisfaction of the Contract Administrator.

E13.5.2 All salvaged wood or steel fencing material shall be stockpiled at locations designated by the Contract Administrator.

E13.5.3 All wood or steel fence 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.

E13.5.4 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.

E13.6 Installation of Salvaged Wood or Steel Fencing

E13.6.1 Install salvaged wood or steel fencing in locations designated by the Contract Administrator at approximate Station 0+875 on the south side of Wilkes Avenue. in such a manner as to replicate as near as possible the existing fence appearance to the satisfaction of the Contract Administrator.

E13.6.2 The wood fence must be installed the same day that it is removed in order to keep the private property secured. If this is not possible, the Contractor shall install a temporary fence at the proposed location at his own cost.

E13.7 Access Gate

E13.7.1 Supply and install access gate as shown on the Drawings at approximately Station 0+955 on the north side of Wilkes Avenue.

E13.7.2 Prior to commencing installation of the access gate, the Contractor shall verify that the gate can be installed in accordance with the Drawings. This shall include contacting all utilities and other Owners of underground facilities in order to ensure that the proposed location of the posts is not in conflict with other existing facilities. Should there be a conflict between the proposed post location and any underground facility, the Contract Administrator must be notified immediately.

MEASUREMENT AND PAYMENT

E13.8 Remove & Salvage Chain Link Fence

E13.8.1 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.

E13.8.2 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".

E13.9 Install Salvaged Chain Link Fence

E13.9.1 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.

E13.9.2 No measurement or payment will be made for new chain link fence materials needed to replace unsatisfactory or damaged chain link fences.

E13.9.3 No measurement or payment will be made for barbed wire. Barbed wire shall be included in payment for installing the salvaged chain link fence.

E13.10 Remove and Salvage Existing Wood or Steel Fence

E13.10.1 The removal and salvaging of existing wood or steel fences will be measured on a length basis and paid for at the Contract Unit Price for "Remove and Salvage Wood Fence" or "Remove and Salvage Steel Fence". The length to be paid for will be the total number of metres of wood or steel fence removed and salvaged in accordance with this specification, accepted and measured by the Contract Administrator.

E13.10.2 The cost of backfilling post holes and disposing of damaged or surplus fence materials shall be included in the payment for "Remove and Salvage Wood Fence".

E13.11 Installation of Salvaged Wood or Steel Fence

E13.11.1 The installation of salvaged wood or steel fence will be measured on a length basis and paid for at the Contract Unit Price for "Install Salvaged Wood Fence" or "Install Salvaged Steel Fence". The length to be paid for will be the total number of metres of salvaged wood or steel fence installed in accordance with this Specification, accepted and measured by the Contract Administrator.

E13.11.2 No measurement or payment will be made for new material needed to replace unsatisfactory or damaged fence material.

E13.12 Access Gates

E13.12.1 The supply and installation of access gates shall be measured on a unit basis and paid for at the Contract Unit Price for "Access Gate". The number to be paid for shall be the total number of access gates supplied and installed in accordance with this Specification, accepted and measured by the Contract Administrator.

E14. INSTALLATION OF INTERLOCKING PAVING STONES ON A LEAN CONCRETE BASE

DESCRIPTION

E14.1 General

E14.1.1 This specification shall supplement and amend City of Winnipeg Standard Construction Specification CW 3335 "Installation of Interlocking Paving Stones on a Lean Concrete Base".

E14.1.2 Referenced Standard Construction Specifications

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

E14.1.3 Referenced Standard Detail

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

MATERIALS

E14.2 Interlocking Paving Stones

- E14.2.1 Paving stones shall be Barkman Concrete "Roman Pavers" as found in the Barkman Concrete Ltd. 2004 Catalogue. The outside course shall be natural colour in a soldier course pattern. Inside courses shall be sierra grey in colour and in random pattern #1.
- E14.2.2 Paving stones shall conform to the requirements of CAN3-A231.2, Precast Concrete Pavers.
- E14.2.3 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.

E14.3 Other Materials

- E14.3.1 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

E14.4 Installation of Paving Stones on a Lean Concrete Base

- E14.4.1 Install paving stones on a lean concrete base in accordance with CW 3335 and SD-240B.

MEASUREMENT AND PAYMENT

E14.5 Supply and Installation of Interlocking Paving Stones

- E14.5.1 Supply and installation of interlocking paving stones shall be measured and paid for in accordance with CW 3335.
- E14.6 Supply and Installation of Lean Concrete Base
- E14.6.1 Supply and installation of lean concrete base shall be measured and paid for in accordance with CW 3335.

E15. SUPPLY & INSTALL "ENERGITE" BARRELS

DESCRIPTION

E15.1 General

- E15.1.1 This specification covers the supply and installation of new "Energite" energy attenuating barrels at the locations shown on the Drawings (on Shaftesbury Boulevard and on Kenaston road detour).
- E15.1.2 Referenced Standard Construction Specifications
 - (a) CW 3110- Sub-grade, Sub-Base and Base Course Construction
 - (b) CW 3410- Asphaltic Concrete Pavement Works

MATERIALS

E15.2 "Energite" Barrels

E15.2.1 Energy attenuating barrels shall be "Energite III" complete with appropriate cone insert and lid manufactured by Energy Absorption Systems, Inc., c/o Lecol, Toronto, Ontario, Phone (416) 694-4420, Fax (416) 694-4523, Toll Free (877) 532-6526.

E15.3 Sand

E15.3.1 Sand shall be Normal Density Fine Aggregate conforming to the requirements of CSA CAN3-A23.1-M77. Rock salt shall be uniformly mixed with the sand to yield a 95% sand, 5% rock salt by volume mixture for use in the barrels.

E15.4 Granular Base Course

E15.4.1 Granular base course material for the pad shall be supplied in accordance with CW 3110.

E15.5 Asphalt Pavement

E15.5.1 Hot mix asphaltic concrete for the pad shall be Type IA asphaltic concrete pavement in accordance with CW 3410.

CONSTRUCTION METHODS

E15.6 General

E15.6.1 The Contractor shall coordinate his activities on Shaftesbury Boulevard with the Canadian National (CN) and arrange to install the "Energite" barrels immediately following the installation of the new railway protection devices by CN.

E15.6.2 The Contractor shall construct a 150 mm thick granular base course pad, topped with 75 mm of Type IA asphaltic concrete pavement as shown on the Drawings.

E15.6.3 Following construction of the pad, the Contractor shall mark the location of each barrel on the pad as shown on the Drawings to ensure that maintenance crews will replace damaged barrels at the appropriate locations. The Contractor shall then place each barrel on the pad.

E15.6.4 The 90 kg and 180 kg barrels shall be secured to their final positions with three 450 mm long drift pins complete with washers as supplied by the Contractor and driven through the bottom of the barrel into the asphalt pad. The appropriate core insert shall then be inserted into each barrel.

E15.6.5 Each barrel shall be filled with measured weights of the sand/ rock salt mixture, ensuring that the specified weights as shown on the Drawings are placed in each barrel.

E15.6.6 The covers on each barrel shall be securely fastened down by means of three pop rivets or three 38 mm long screws as supplied by the Contractor.

E15.6.7 The Contractor shall clean the site of any loose material.

MEASUREMENT AND PAYMENT

E15.7 Granular Base Course

E15.7.1 Granular base course for the pad shall be measured and paid for in accordance with CW 3110.

E15.8 Asphalt Pavement

E15.8.1 Asphalt pavement for the pad shall be measured and paid for in accordance with CW 3410.

E15.9 "Energite" Barrels

E15.9.1 Supply and installation of "Energite" barrels will be measured on a unit basis and paid for at the Contract Unit Price per unit for the "Items of Work" listed here below. The number to be paid for will be the total number of "Energite" barrels supplied and installed in accordance with this specification, accepted and measured by the Contract Administrator.

Items of Work

Supply & Install "Energite" Barrels

- (i) 640 kg barrel
- (ii) 320 kg barrel
- (iii) 180 kg barrel
- (iv) 90 kg barrel

E15.9.2 No measurement or payment will be made for the sand/ rock salt mixture. The supply and installation of this material shall be included in the payment for "Supply and Install "Energite" Barrels".

E16. DITCH INLET STRUCTURE

DESCRIPTION

E16.1 General

E16.1.1 This specification shall cover the installation of the new ditch inlet structure on Sterling Lyon Parkway (approximate Station 1+500).

E16.1.2 Referenced Standard Construction Specifications

- (a) CW 1130- Site Requirements
- (b) CW 2030- Excavation Bedding and Backfill

MATERIALS

E16.2 Precast Ditch Inlet Structure

E16.2.1 Supply precast ditch inlet structure as shown on the Drawings.

E16.3 Miscellaneous Metals

E16.3.1 Steel

- (a) Structural steel shapes and accessories shall conform to CSA Standard G40.21-92, 300 MPa, except 350 MPa Class C for H.S.S. steel shapes, Grade W Structural Quality Steels (2C).
- (b) All metal shall be free from scale, buckles, pits and other defects. All structural steel shall be hot dip galvanized upon completion of component fabrication.

E16.3.2 Fasteners

- (a) Anchor bolts and other fasteners shall be stainless steel and shall conform to ASTM A276 Type 316 unless otherwise shown on the Drawings.

E16.3.3 Galvalloy

- (a) Galvalloy shall be supplied by Metalloy Products Company, P.O. Box#3093, Terminal Annex, Los Angeles, California. Locally, this is available from Welders Supplies Ltd., 25 McPhillips Street.

E16.4 Miscellaneous Materials

- E16.4.1 Supply all miscellaneous materials as noted on the Drawings.

E16.5 Backfill

- E16.5.1 Backfill shall be in accordance with CW 2030, Class 2 backfill except compaction shall be to a density of 95% of the maximum dry density as determined by the Standard Proctor Compaction Test.

CONSTRUCTION METHODS

E16.6 Disposal of Excavated Material

- E16.6.1 Disposal of excavated material shall be in accordance with CW 1130.

E16.7 Miscellaneous Metals

E16.7.1 Assembly

- (a) Material intended for use in the various assemblies shall be straight, clean, sharply defined profiles, assembled in such a way that no disfigurements will show in the finished work, or impair the strength. Upon completion of fabrication and assembly, all exposed steel shapes shall be hot dip galvanized.

E16.7.2 Welding

- (a) All steel welding shall conform to CSA Standard W.59-M1989. The fabricator shall be fully approved by the Canadian Welding Bureau, in conformance with CSA Standard W.47.1. Welding shall be done by currently licensed welders only. Welding spatter and other fabricator burrs where exposed shall be ground or filed smooth and left ready for subsequent operations.

E16.7.3 Hot Dip Galvanizing

- (a) All exposed steel, after fabrication, shall be hot dip galvanized in accordance with the requirements of CAN/CSA G164-92 to a minimum net retention of 600 grams per square metre (2 oz./ft²).

E16.7.4 Galvalloy Procedure

- (a) Areas of galvanizing damaged by field welding or otherwise shall be repaired by coating with Galvalloy material in accordance with the following procedure.
- (b) The surface to be coated shall be treated to approximately 157°C (315°F) then rubbed with a bar of Galvalloy allowing a small amount to flow. The Galvalloy shall then be spread by brushing briskly with a wire brush, and brushed sufficiently to obtain a bright finish. The process shall be repeated three times to ensure a proper thickness is achieved.
- (c) Temperatures shall be kept below 177°C (350°F) at all times.
- (d) All heating of structural steelwork shall be done in the presence of the Contract Administrator.

- E16.7.5 Installation
- (a) Erect miscellaneous metal components square, plumb, straight and true, accurately fitted, with tight joints.
 - (b) Provide anchorage such as dowels, anchor clips, bar anchors, expansion bolts and shields as shown on the Drawings and as approved by the Contract Administrator.
 - (c) Hand items over for casting into concrete or building into masonry to appropriate trades.

MEASUREMENT AND PAYMENT

E16.8 Ditch Inlet Structure Construction

- E16.8.1 Construction of the ditch inlet structure will be measured on a lump sum basis and paid for at the Contract Lump Sum Price for the "Items of Work" listed here below. The lump sum price paid shall be for supplying all materials and performing all operations necessary to complete the works including any items incidental to the work in accordance with this specification, accepted by the Contract Administrator.

Items of Work

Construction of Ditch Inlet Structure

- (i) Precast Ditch Inlet Structure
- (ii) Safety Grate

- E16.8.2 There shall be no additional measurement or payment for miscellaneous metals for the ditch inlet structure. It shall be included in payment for precast ditch inlet structure.
- E16.8.3 There shall be no measurement or payment for backfill. Backfill shall be included in payment for the precast ditch inlet structure.

E17. SPECIAL MANHOLE

DESCRIPTION

E17.1 General

- E17.1.1 This specification covers the installation of the special manhole shown on the Drawings at approximate Station 1+500 on Sterling Lyon Parkway West.
- E17.1.2 Referenced Standard Construction Specifications
- (a) CW 2130- Gravity Sewers
 - (b) CW 3610 – Installation of Culverts

MATERIALS

E17.2 Oversized Manhole Frame and Cover

- E17.2.1 The special manhole shall have a 750 mm clear opening manhole cover (Titan Foundry TF 116).

CONSTRUCTION METHODS

E17.3 General

- E17.3.1 The special manhole shall be constructed to the size and dimensions noted on the Drawings.
- E17.3.2 The Contractor shall note that the connection is below normal water levels in the 1350 mm LDS pipe. The Contractor shall plug and dewater the 1350 mm LDS as necessary to complete the required work.

MEASUREMENT AND PAYMENT

E17.4 Special Manhole

- E17.4.1 Supply and installation of the special manhole including frames, covers, rungs, risers, reducers, adjusting rings, base, benching and other accessories and appurtenances will be measured on a vertical length basis and paid for at the Contract Unit Price per vertical metre for "Remove and Replace Special Manhole". Length to be paid for will be the total number of vertical metres of manhole supplied and installed in accordance with this specification, accepted and measured by the Contract Administrator.
- E17.4.2 Measurement of special manholes will be from the lowest sewer invert to the top of the finished rim elevation.
- E17.4.3 Couplings and connections to the existing 1350 mm LDS and the proposed 1630 mm x 1120 mm CSP into the 1650 mm diameter riser section of the manhole will be included in the payment for "Remove and Replace Special Manhole".
- E17.4.4 Removal of the existing manhole will be included in the payment for "Remove and Replace Special Manhole".
- E17.4.5 Dewatering of the existing pipe necessary to install the new manhole will be included in the payment for "Remove and Replace Special Manhole".
- E17.4.6 Corrugated steel pipe shall be measured and paid for in accordance with CW 3610.

E18. CONCRETE FLARED END SECTIONS

DESCRIPTION

E18.1 General

- E18.1.1 This specification covers the installation of concrete flared end sections with or without safety grates on exposed concrete sewer pipes.
- E18.1.2 Referenced Standard Construction Specifications
 - (a) CW 2130- Gravity Sewers

MATERIALS

E18.2 Concrete Flared End Section

- E18.2.1 Concrete flared end sections shall be supplied in accordance with the Drawings.

E18.3 Safety Grate

- E18.3.1 Safety grates shall be supplied in accordance with the Drawings.

CONSTRUCTION METHODS

E18.4 Concrete Flared End Section

E18.4.1 Concrete flared end sections including gaskets shall be installed on the ends of concrete land drainage sewers as shown on the Drawings or as directed by the Contract Administrator.

E18.5 Safety Grate

E18.5.1 Safety grates shall be installed on concrete flared end sections where shown on the Drawings or as directed by the Contract Administrator.

E18.5.2 The inlet end of the pipe, if entering a closed system, will have a safety grate.

MEASUREMENT AND PAYMENT

E18.6 Concrete Flared End Section

E18.6.1 Concrete flared end sections with or without 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

- (i) 450 mm c/w safety grate
- (ii) 600 mm
- (iii) 600 mm c/w safety grate
- (iv) 750 mm
- (v) 900 mm

E19. NON-PERFORATED DRAINAGE PIPE & DRAINAGE TRENCHES

DESCRIPTION

E19.1 General

E19.1.1 This specification covers the installation of drainage trenches and non-perforated drainage pipes.

E19.1.2 Referenced Standard Construction Specifications

- (a) CW 2030- Excavation Bedding and Backfill
- (b) CW 2130- Gravity Sewers
- (c) CW 3120- Installation of Sub Drains
- (d) Approved Products for Surface Works

MATERIALS

E19.2 Drainage Fabric

E19.2.1 Drainage fabric shall be in accordance with Section 2.5 of CW 3120.

E19.2.2 Storage and handling of geotextile fabric shall be in accordance with Sections 2.2, 2.3 and 2.4 of CW 3120.

E19.3 Drainage Material

E19.3.1 Drainage material shall be in accordance with Section 2.6 of CW 3120.

E19.4 Non-Perforated Drainage Pipe

E19.4.1 Supply 150 millimetre diameter gasketed bell and spigot Polyvinyl Chloride (PVC) pipe in accordance with CAN/CSA B182.2 and ASTM D3034, SDR 35.

E19.5 Pipe Appurtenances

E19.5.1 Supply fittings for the drainage pipe, including bends, caps, tees, elbows and couplings in accordance with Section E19.4 of this specification.

E19.5.2 Screens to be installed on both ends of non-perforated drainage pipe shall be supplied as shown on the Drawings.

E19.6 Cement Patching Compound

E19.6.1 Supply cement patching compound in accordance with Section 2.10 of CW 2130.

CONSTRUCTION METHODS

E19.7 Installation of Drainage Trench

E19.7.1 Excavate drainage trenches in accordance with Section 3.1 of CW 3120.

E19.7.2 Install drainage fabric in accordance with Section 3.2 of CW 3120.

E19.7.3 Complete placement of drainage material, ensuring no damage occurs to the drainage fabric, in 150 mm lifts and compact to the satisfaction of the Contract Administrator.

E19.8 Installation of Non-Perforated Drainage Pipe

E19.8.1 Install non-perforated drainage pipe to line and grade shown on the Drawings or as directed by the Contract Administrator.

E19.8.2 Assemble pipe in accordance with manufacturer's instructions so when complete the drainage pipe will have a smooth and uniform invert.

E19.8.3 Install drainage pipe with Class B bedding with sand and Class 5 backfill in accordance with CW 2030.

E19.8.4 Install screens on both ends of the drainage pipe as shown on the Drawings.

E19.8.5 Where shown on the Drawings, connections to proposed LDS sewers and manholes shall be installed in accordance with CW 2130.

MEASUREMENT AND PAYMENT

E19.9 Drainage Trench

E19.9.1 Installation of drainage trenches will be measured on a length basis and paid for at the Contract Unit Price for "Drainage Trench". The length to be paid for will be the total number of linear meters of trench installed in accordance with this specification, accepted and measured by the Contract Administrator.

E19.9.2 Measurement for drainage trenches will be made horizontally at grade above the centreline of the trench.

- E19.9.3 No measurement or payment will be made for drainage fabric removed and replaced due to improper installation or damaged materials.
- E19.9.4 Drainage fabric and drainage material supplied and installed will be included in the payment for "Drainage Trench".
- E19.10 Non-Perforated Drainage Pipe
- E19.10.1 Supply and installation of non-perforated drainage pipe will be measured on a length basis and paid for at the Contract Unit Price for "Non-Perforated Drainage Pipe". The length to be paid for will be the total number of metres of drainage pipe supplied and installed in accordance with this specification, accepted and measured by the Contract Administrator.
- E19.10.2 Measurement for the length of drainage pipe installed will be made horizontally at grade above the centreline of the pipe.
- E19.10.3 No measurement or payment will be made for drainage pipe removed and replaced due to improper installation or damaged materials.
- E19.10.4 Pipe appurtenances and screens supplied and installed will be included in the payment for "Non-Perforated Drainage Pipe".
- E19.10.5 Connecting to proposed land drainage sewers and manholes will be included in the payment for "Non-Perforated Drainage Pipe".

E20. INSTALLATION OF CULVERTS

DESCRIPTION

- E20.1 General
- E20.1.1 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.
- E20.1.2 Referenced Standard Construction Specifications
- (a) CW 2030 – Excavation Bedding and Backfill
 - (b) CW 3610- Installation of Culverts
- E20.1.3 Referenced Standard Detail
- (a) SD 002 – Standard Trench and Excavation Backfill Classes.

MATERIALS

- E20.2 Bedding and Backfill
- E20.2.1 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

- E20.3 Beveled Ends
- E20.3.1 Further to CW 3610, all CSP culvert ends shall be beveled as shown on the Drawings.

E20.4 Bedding and Backfill

- E20.4.1 The backfilling for corrugated steel pipe 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.
- E20.4.2 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 1.2 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.

MEASUREMENT AND PAYMENT

E20.5 Beveled Ends

- E20.5.1 There shall be no measurement or payment for beveled ends. Beveled ends shall be included in the payment for the supply and installation of CSP culverts.
- E20.5.2 The supply and installation of culverts will be measured and paid for in accordance with CW 3610.

E21. REMOVAL OF EXISTING CULVERTS

DESCRIPTION

E21.1 General

E21.1.1 This specification covers the removal of existing culverts.

E21.1.2 Referenced Standard Construction Specifications

(a) CW 2030- Excavation Bedding and Backfill

CONSTRUCTION METHODS

E21.2 Removal of Existing Culverts

E21.2.1 The Contractor shall remove and salvage existing culverts designated for removal within the limits of the Contract and as shown on the Drawings.

E21.2.2 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.

E21.2.3 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.

E21.2.4 Culverts that are deemed unsalvageable by the Contract Administrator shall be removed and disposed of off site.

E21.2.5 Salvaged culverts shall be delivered to the City of Winnipeg, Public Works Department, South West District Yard, 1539 Waverley Street. Contact Tom Lamboo (Phone: 986-3667) (Cell: 794-4070) to arrange delivery.

MEASUREMENT AND PAYMENT

E21.3 Removal of Existing Culverts

E21.3.1 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.

E21.3.2 Salvaging and delivery or disposal of the culverts shall be included in payment for "Removal of Existing Culverts" and no further payment shall be made.

E22. NON-WOVEN GEOTEXTILE FABRIC

DESCRIPTION

E22.1 General

E22.1.1 This specification covers the placement of non-woven geotextile fabric to protect existing pavements and under rip rap pads.

E22.1.2 Referenced Standard Construction Specifications

(a) CW 3120- Installation of Subdrains

(b) Approved Products for Surface Works

MATERIALS

E22.2 Non-Woven Geotextile Fabric

E22.2.1 Non-woven geotextile fabric shall conform to the requirements of drainage fabric in Sections 2.1 to 2.5 of CW 3120.

CONSTRUCTION METHODS

E22.3 Non-Woven Geotextile Fabric

E22.3.1 Install non-woven geotextile fabric in locations shown on the Drawings or as directed by the Contract Administrator.

E22.3.2 Install fabric in the longest continuous practical length, free from tension, stress, folds, wrinkles and creases.

E22.3.3 Overlap joints a minimum of 600 mm.

E22.3.4 Install pins and place piles of sub-base material as required to hold the fabric in place.

E22.3.5 Cut or fold fabric to conform to curves.

E22.3.6 Construction vehicles shall not be permitted directly on the fabric.

E22.3.7 Remove or replace fabric improperly installed or damaged as directed by the Contract Administrator.

MEASUREMENT AND PAYMENT

E22.4 Non-Woven Geotextile Fabric

E22.4.1 Supply and installation of non-woven geotextile fabric for protection of existing pavements will be measured on an area basis and paid for at the Contract Unit Price per square metre for "Non-Woven Geotextile Fabric". The area to be paid for will be the total number of square metres of fabric supplied and installed in accordance with this specification, accepted and measured by the Contract Administrator.

E22.4.2 No measurement will be made for non-woven geotextile fabric installed under rip rap pads. This will be included in payment for placement of rip rap.

E22.4.3 Measurement for the area of fabric installed will be made on the finished surface and will not include the area of fabric overlapping joints.

E22.4.4 Only material placed within the designated limits will be included in the payment for "Non-Woven Geotextile Fabric".

E22.4.5 No measurement or payment will be made for geotextile fabric removed and replaced due to improper installation or damaged materials.

E23. SUPPLY AND INSTALLATION OF PRECAST CONCRETE BARRIERS, ALUMINUM BALANCED BARRIER AND “QUADGUARD SYSTEM” CRASH CUSHIONS

DESCRIPTION

E23.1 General

E23.1.1 This specification covers the supply and installation of precast concrete barriers, aluminum balanced barrier and “Quadguard System” crash cushions.

E23.1.2 Referenced Standard Construction Specifications:

- (a) CW 3650 – Installation of Aluminum Balanced Barrier

MATERIALS

E23.2 Precast Concrete Barriers

E23.2.1 One hundred twenty-five (125) precast concrete barriers and pins, as shown on the Drawings, will be supplied by the City of Winnipeg. The Contractor can arrange to pick them up, load and deliver them to the Site from the City of Winnipeg Bridge Yard at 849 Ravelstone Avenue West by contacting Mike Terleski at 794-8510.

E23.2.2 The Contractor shall supply and place the remaining fifty-four (54) precast concrete barriers (165 m), including pins, in accordance with the Drawings.

E23.3 “Quadguard System”

E23.3.1 “Quadguard” 4-Bay 610 mm wide system with tension strut backup and one left 4” offset transition panel (80 km/hr design speed units shall be manufactured by Energy Absorption Systems, Inc., c/o Lecol, Toronto, Ontario, Phone (416) 694-4420, Fax (416) 694-4523, Toll Free (877) 532-6526.

E23.3.2 Additional miscellaneous spare parts for the “Quadguard System” to be supplied shall include the following items:

Item	Quantity
Diaphragm	1
Bolt Assembly	8
Nose	5
Bolt Assembly	10
Fender Panel	2
Bolt Assembly	8
Mushroom Assy.	8
Type I Cartridge	5
Type II Cartridge	3

E23.4 Aluminum Balanced Barrier

E23.4.1 Aluminum balanced barrier rails and posts will be supplied by the City of Winnipeg. The Contractor can arrange to pick them up, load and deliver them to the Site from the City of Winnipeg Bridge Yard at 849 Ravelstone Avenue West by contacting Mike Terleski at 794-8510.

E23.4.2 Additional parts, to be supplied by the Contractor, necessary for the installation of the aluminum balanced barrier shall include the following items:

Item	Quantity
Rail Clamp Bars	78
Rail End Caps	2
13-13 x 25 mm Long s/s Hex Head Cap Screw.	188
27 O.D. 14 mm I.D. x 2 mm Thick s/s Washer	188

CONSTRUCTION METHODS

E23.5 Precast Concrete Barriers

- E23.5.1 The Contractor shall be responsible for loading (at the City Yard), hauling and unloading, placing, as well as storing of the precast concrete median barriers once they have been received. The Contractor shall supply all necessary equipment for loading, hauling, unloading and storing of the barriers.
- E23.5.2 The Contractor shall be responsible for the securing and replacement of the precast concrete barriers should they be lost, stolen or damaged after they have been received for the duration of the Contract.
- E23.5.3 Precast concrete barriers shall be installed at locations shown on the Drawings. The barriers shall be properly aligned, pinned together and seated firmly to the median surface, to the satisfaction of the Contract Administrator.

E23.6 "Quadguard System"

- E23.6.1 The Contractor shall supply and install the number of "Quadguard" units listed in Form B: Prices in accordance with the attached Drawings (Appendix B) and the manufacturer's current assembly drawings. The remaining units not to be installed and the additional miscellaneous spare parts to be supplied shall be delivered and unloaded by the Contractor to the Winnipeg Bridge Yard at 849 Ravelstone Avenue West (Contact Mike Terleski at 986-5004 to make arrangements for delivery).

E23.7 Aluminum Balanced Barrier

- E23.7.1 The Contractor shall install aluminum balanced barrier in accordance with the details shown on the Drawings and CW 3650.

MEASUREMENT AND PAYMENT

E23.8 Supply and Installation of Precast Concrete Barriers

- E23.8.1 Supply and installation of precast concrete barriers will be measured on a length basis and paid for at the Contract Unit Price per metre for the "Items of Work" listed here below. The length to be paid for will be the total number of metres of barrier supplied, loaded, hauled and installed in accordance with this specification, accepted and measured by the Contract Administrator.

Items of Work

Precast Concrete Traffic Barriers

- (i) Supply New Barriers
- (ii) Install New Barriers
- (iii) Install City Supplied Barriers

E23.9 Supply and Installation of "Quadguard System"

- E23.9.1 Supply and Installation of the "Quadguard System" will be measured on a unit basis and paid for at the Contract Unit Price per unit for the "Items of Work" listed here below. The

number to be paid for will be the total number of units supplied and installed in accordance with this specification, accepted and measured by the Contract Administrator.

Items of Work

“Quadguard System” Crash Cushions

- (i) Supply Quadguard System
- (ii) Install Quadguard System
- (iii) Supply Additional Miscellaneous Spare Parts

E23.9.2 The supply and installation of all materials listed in the Bill of Materials for the “Quadguard System” including the concrete anchor pad will be included in the price bid for the “Quadguard System”.

E23.10 Aluminum Balanced Barrier

E23.10.1 Installation of aluminum balanced barrier rails and posts shall be measured and paid for in accordance with CW 3650 except that the supply of additional parts necessary for installation listed in this Specification will be included in the payment for the installation of balanced barrier rails.

E24. SUB-BALLAST MATERIAL

DESCRIPTION

E24.1 General

E24.1.1 This specification covers the supply and placement of sub-ballast material for use on the railway detour subgrade.

MATERIALS

E24.2 Sub-Ballast Material

E24.2.1 Sub-Ballast shall be crushed or screened pit run gravel, containing no more than 3% organics by weight as determined by ASTM C-123.

E24.2.2 Gradations to be within the following limits:

SIEVE SIZE	Percent Passing
75 mm (3")	100%
25 mm (1")	60%-90%
4.75 mm (#4)	35%-60%
425 µm (#40)	10%-40%
75 µm (#200)	0%-5%

CONSTRUCTION METHODS

E24.3 Placement

E24.3.1 Do not place granular material until finished subgrade surface is inspected and approved by the Contract Administrator.

E24.3.2 Place material only on a clean unfrozen surface, properly shaped and compacted and free from snow and ice.

- E24.3.3 Place using methods which do not lead to segregation or degradation of material.
- E24.3.4 Place material to full width of section in uniform layers not exceeding 300 mm loose thickness and compact to specified density. Contract Administrator may authorize thicker lifts if specified compaction can be achieved.
- E24.4 **Compaction**
 - E24.4.1 Compact full width to density not less than 95% maximum dry density in accordance with Standard Proctor Compaction Test (ASTM D698).
 - E24.4.2 Apply water as necessary during compaction to obtain specified density. If material is excessively moist, aerate by scarifying with suitable equipment until moisture content is corrected.
 - E24.4.3 In areas not accessible to rolling equipment, compact to specified density with approved mechanical tampers.

MEASUREMENT AND PAYMENT

- E24.5 **Sub-Ballast Material**
 - E24.5.1 The supplying, placing and compaction of sub-ballast material will be measured on a weight basis and paid for at the Contract Unit Price for "Supplying and Placing Sub-Ballast Material". The weight to be paid for will be the total number of tonnes of sub-ballast material supplied and placed in accordance with this specification, accepted and measured by the Contract Administrator.
 - E24.5.2 The weight to be paid for will be the total number of tonnes of sub-ballast material as measured on a certified weigh scale.
 - E24.5.3 Only material placed on finished subgrade surface will be included in the payment for "Supplying and Placing Sub-Ballast Material".
 - E24.5.4 No measurement or payment will be made for materials rejected by the Contract Administrator.

E25. ABANDONMENT OF EXISTING DND LOADING DOCK

DESCRIPTION

- E25.1 **General**
 - E25.1.1 This specification shall cover the removal of the existing loading dock on Department of National Defence (DND) property for the construction of the rail detour.
 - E25.1.2 Referenced Standard Construction Specifications
 - (a) CW 1130 Site Requirements

CONSTRUCTION METHODS

- E25.2 **Abandonment of Loading Dock**
 - E25.2.1 The Contractor shall be required to demolish, remove and dispose of the existing concrete loading dock including all associated concrete items (i.e. retaining wall and concrete deadman) shown on the Drawings. The loading dock shall be removed to a maximum depth of 0.50 m below the subgrade elevation.
 - E25.2.2 All items removed shall be disposed of by the Contractor in accordance with CW 1130.

MEASUREMENT AND PAYMENT

E25.3 Abandonment of Loading Dock

- E25.3.1 The removal and disposal of the existing DND loading dock will be measured on a lump sum basis and paid for at the Contract Lump Sum Price for "Abandonment of Existing DND Loading Dock". The lump sum price paid shall be for performing all operations necessary to complete the works including any items incidental to the work in accordance with this specification, accepted by the Contract Administrator.

E26. SODDING

DESCRIPTION

E26.1 General

- E26.1.1 This specification shall amend and supplement City of Winnipeg Standard Construction Specification CW 3510-R8 "Sodding", and shall cover all aspects of sod supply and installation, including preparation of finish grade, watering and rolling, and 30-day maintenance.
- E26.1.2 Referenced Standard Construction Specifications
(a) CW 3510- Sodding
- E26.1.3 Referenced Standard Details
(a) SD-243- Sodding Details

MATERIALS

E26.2 Turf Grass Sod

- E26.2.1 Turf grass sod shall conform to CW 3510-R8.
- E26.2.2 Sod shall be a mixture of 95% Kentucky bluegrass, using equal proportions of any three Class 2 cultivars, and 5% Creeping Red fescue.

CONSTRUCTION METHODS

E26.3 Preparation of Finish Grade, Placement of Sod, Watering and Rolling and 30-Day Maintenance

- E26.3.1 Finish grading, sod placement, watering and rolling and 30-day maintenance shall conform to CW 3510-R8 and SD-243.
- E26.3.2 Install one width of sod, 600 mm, along all pavements following installation of topsoil or completion of soil amendments, and prior to installation of plant material and seed.

METHOD OF MEASUREMENT

E26.4 Turf Grass Sod

- E26.4.1 Measure sod greater than 600 mm width (c/w 100 mm imported topsoil) in accordance with CW 3510-R8.
- E26.4.2 Measure edge sod < or = 600 mm width with 50 mm imported or conditioned topsoil, or soil amendments, on an area basis for the number of square metres of sod, including 50 mm soil base.

BASIS OF PAYMENT

E26.5 Turf Grass Sod

- E26.5.1 Payment for supply and installation of sod, including 30-day maintenance will be in accordance with CW 3510-R8.
- E26.5.2 Payment shall be in accordance with the following:
 - (a) 75% of quantity following supply and placement of sod, and
 - (b) 25% of quantity following termination of the 30 day maintenance period.
- E26.5.3 Payment for edge sod will be at the Contract Unit Price for "Edge Sod" which shall be compensation in full for supplying all materials and performing all operations specified, and all other items incidental to the Work of this Specification.

E27. SEEDING

DESCRIPTION

E27.1 General

- E27.1.1 This specification shall amend and supplement City of Winnipeg Standard Construction Specification CW 3520-R6 "Seeding", and shall cover all aspects of supply and installation of seed, including preparation of finish grade, hydro mulching, and maintenance.
- E27.1.2 Referenced Standard Construction Specifications
 - (a) CW 3520- Seeding

MATERIALS

E27.2 General

- E27.2.1 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.
- E27.2.2 Obtain Contract Administrator's approval for any proposed adjustments to the seed mix species or cultivars.
- E27.3 Turf Grass Seed Mix (for touch-up seeding)
 - E27.3.1 Turf grass seed mix shall conform to CW 3520-R6.
 - E27.3.2 Turf grass seed shall be a mixture of the following species:
 - (a) 60% Kentucky bluegrass (*Poa pratensis*), including equal proportions of any three Class 1 or 2 cultivars;
 - (b) 30% Creeping Red fescue (*Festuca rubra*), and
 - (c) 10% Perennial ryegrass (*Lolium perenne*), using any of the recommended cultivars.
- E27.4 Trefoil and Clover Seed Mix (for future roadway areas)
 - E27.4.1 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 perenne* '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').

E27.5 Ditch Seed Mix

E27.5.1 Ditch Seed Mix shall be a mixture of the following species and cultivars:

- (a) 25% Creeping Red fescue (*Festuca rubra*);
- (b) 20% Mustang Tall fescue (*Festuca arundinacea* 'Mustang');
- (c) 15% Fiesta II Perennial ryegrass (*Lolium perenne* 'Fiesta II');
- (d) 15% Kentucky bluegrass (*Poa pratensis*), any Class 2 cultivar;
- (e) 10% Victory Chewings fescue (*Festuca commutata* 'Victory');
- (f) 10% White clover (*Trifolium repens*), and
- (g) 5% Timothy (*Phleum pretense*).

E27.6 Salt-tolerant Prairie Grass Seed Mix

E27.6.1 Salt-tolerant Native Grass Seed Mix shall include proportions of 10% to 25%, each, of at least three of the following salt-tolerant native grass species:

- (a) Alkalai Cord Grass (*Spartina gracilis*);
- (b) Switch Grass (*Panicum virgatum*);
- (c) Whitetop (*Scolochloa festucacea*);
- (d) Basin Wildrye (*Elymus cinereus*);
- (e) Nuttall's Alkali Cordgrass (*Puccinellia nuttali*);

Plus 15% – 20%, each, of at least two of the following additional native grass species:

- (a) Canada Wildrye (*Elymus canadensis*);
- (b) Blue grama (*Bouteloua gracilis*);
- (c) Side-oats grama (*Bouteloua curtipendula*);
- (d) Awned wheatgrass (*Agropyron trachycaulum* var. *unilaterale*);
- (e) Indian Grass (*Sorghastrum nutans*), and
- (f) Green Needle Grass (*Stipa viridula*).

E27.6.2 Salt-tolerant Prairie Grass Seed Mix available from: Prairie Habitats, P.O. Box 1, Argyle, MB, R0C 0B0; Tel. (204) 467-931; Fax. (204) 467-5004.

E27.7 Trefoil and Vetch Over-seed Mix

E27.7.1 Trefoil and Vetch Over-seed Mix shall be a blend of the 50% Birdsfoot trefoil and 50% Crown vetch.

E27.8 Cover Crop (Nurse Crop)

E27.8.1 Use Annual ryegrass as a cover crop in all seeded areas.

E27.9 Herbicides and Insecticides

E27.9.1 Herbicides and insecticides shall be in accordance with CW 3520-R6.

E27.10 Hydro Mulch

E27.10.1 Mulch, water and tackifier shall be in accordance with CW 3520-R6.

CONSTRUCTION METHODS

E27.11 Turf Grass Seed Mix: Imported Topsoil and Finish Grading; Seeding and Hydro Mulching, and Maintenance

E27.11.1 Imported topsoil and finish grading; seeding and hydro mulching, and maintenance for Turf Grass Seed Mix shall conform to CW 3520-R6.

E27.11.2 Use turf grass seed for restoration seeding in damaged sod areas and turf grass areas during the 2-year long-term Maintenance Period, as required to obtain acceptable turf areas or as instructed by the Contract Administrator.

E27.12 Ditch Seed Mix : Site Topsoil; Seeding and Hydro Mulching, and Maintenance

E27.12.1 Seed with a Brillion Seeder, or equal, on 50 mm compacted depth of site topsoil, placed over scarified sub-grade and conditioned in accordance with the Topsoil, Planting Soil, Soil Amendments and Finish Grading Specification in Ditch Seed areas. Preparation of seed bed as per CW 3520-R6.

E27.12.2 Seeding and hydro mulching, and maintenance of areas designated as "Ditch Seed Mix" shall conform to CW 3520-R6:

- (a) Sow Ditch Seed Mix at 1.0 kg/100 square metres (100 kg/hectare), and
- (b) Sow cover crop at 0.6 kg/100 square metres.

E27.13 Salt-tolerant Prairie Grass Seed Mix, and Trefoil and Clover Seed Mix: Soil Amendments, Seeding and Hydro Mulching

E27.13.1 Soil amendments shall be as per Imported Topsoil, Planting Soil, Soil Amendments and Finish Grading Specification (refer to specification E29).

E27.13.2 Seeding and hydro mulching shall be in accordance with CW 3520-R6:

- (a) Sow native seed mix, and Trefoil and Clover Seed Mix at 1.0 kg/100 square metres (100 kg/hectare), and
- (b) Sow cover crop at 0.6 kg/100 square metres (60 kg/hectare).

E27.13.3 Maintenance shall be in accordance with Section E27.15 of this specification.

E27.14 Seeding with Trefoil and Vetch Over-seed Mix

E27.14.1 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.

E27.15 Maintenance of Areas Seeded with Salt-tolerant Prairie Grass Seed Mix, Trefoil and Clover Seed Mix

E27.15.1 The Contractor shall water seeded and hydro mulched areas as required to obtain optimum soil moisture levels for germination and continued growth of flowers and grasses. Control the watering to prevent seed washouts.

- E27.15.2 The Contractor shall mow native seed and seed mix areas, and Trefoil and Clover Seed Mix areas, once annually, in October, removing cut material that would smother grass and legumes.
- E27.15.3 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 wildflowers and grasses.
- E27.16 Chemical Weed Control
- E27.16.1 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.
- E27.16.2 Use only chemicals approved by Agriculture Canada.
- E27.17 Termination of Long-Term Maintenance Period
- E27.17.1 The maintenance period shall be terminated after the following criteria have been met:
- (a) The certified seed sowed meets the requirements of CW 3520-R6;
 - (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

- E27.18 Turf Grass Seed Mix
- E27.18.1 Measure Turf Grass Seed Mix in accordance with CW 3510-R8.
- E27.18.2 There will be no separate measurement for turf grass seed mix that is used for restoration seeding in damaged sod on turf grass.
- E27.18.3 The cost of turf grass seed mix used for such restoration seeding will be included in the maintenance cost for sod or seeded areas.
- E27.19 Ditch Seed Mix with Imported Topsoil
- E27.19.1 Ditch seed mix with imported topsoil shall be measured on an area basis. The total area to be paid for shall be the number of square metres of ditch seed mix with 50 mm of imported topsoil seeded and maintained in accordance with this Specification, measured and accepted by the Contract Administrator.
- E27.20 Salt-tolerant Native Grass Seed Mix, and Trefoil and Clover Seed Mix
- E27.20.1 Salt-tolerant Prairie Grass Seed Mix, and Trefoil and Clover Seed Mix shall be measured on an area basis for each type of seed mix. The total area to be paid for each type of seed mix shall be the number of square metres seeded and maintained in accordance with this specification and accepted by the Contract Administrator, as computed from measurements made by the Contract Administrator.

E27.20.2 No measurement shall be made for seed placed outside the limits of placement unless directed by the Contract Administrator.

E27.21 Trefoil and Vetch Over-seeding Mix

E27.21.1 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.

E27.21.2 No measurement shall be made for seed placed outside the limits of placement unless directed by the Contract Administrator.

E27.22 Nurse or Cover Crop Seeding

E27.22.1 There will be no separate measurement for nurse or cover crop seeding. Seeding of a nurse crop will be included in payment for other seeding operations.

E27.23 Herbicides and Insecticides

E27.23.1 There will be no separate measurement for materials, equipment and operations related to the use of herbicides and insecticides.

BASIS OF PAYMENT

E27.24 Turf Grass Seed Mix, Ditch Seed Mix, Native Grass Seed Mix and Trefoil and Clover Seed Mix

E27.24.1 Supply, placement and maintenance of turf grass seed mix, ditch seed mix, native grass seed and grass and wildflower seed mixes, 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 and CW2510-R8.

Items of Work

Seeding

- (a) Turf Grass Seed Mix (for touch-up seeding)
- (b) Ditch Seed Mix (with conditioned topsoil)
- (c) Ditch Seed Mix (with imported topsoil)
- (d) Salt-tolerant Prairie Grass Seed Mix
- (e) Trefoil and Clover Seed Mix

E27.25 Trefoil and Vetch Over-seeding

E27.25.1 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.

E28. TREES, SHRUBS AND GROUND COVERS

DESCRIPTION

E28.1 General

E28.1.1 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.

E28.2 Nomenclature

E28.2.1 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.

E28.3 Source Quality Control

E28.3.1 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".

E28.3.2 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.

E28.3.3 The Contractor shall notify Contract Administrator of source of plant material at least seven (7) days in advance of shipment.

E28.3.4 Acceptance of plant material at source does not prevent rejection of same plant material on site prior to or after planting operations.

E28.3.5 Imported plant material must be accompanied with necessary permits and import licenses. Conform to federal and provincial regulations.

E28.4 Shipment and Pre-Planting Care

E28.4.1 Coordinate shipping of plants and excavation of holes to ensure minimum time lapse between digging and planting.

E28.4.2 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.

E28.4.3 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.

E28.4.4 Remove broken and damaged roots with sharp pruning shears. Make clean cut and cover cuts over 50 mm diameter with wound dressing.

E28.4.5 Keep roots moist and protect from sun and wind. Heel-in trees and shrubs that cannot be planted immediately in shaded areas; water well.

E28.5 Replacement

- E28.5.1 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 2005 that has failed to grow satisfactorily and has not been replaced by October 31, 2007 would be required to be replaced in the Spring of 2008.

MATERIALS

E28.6 Water

- E28.6.1 Water shall be potable and free of minerals that may be detrimental to plant growth.

E28.7 Fertilizer

- E28.7.1 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.

E28.8 Root Ball Burlap

- E28.8.1 Root ball burlap shall be 150 g Hessian burlap.

E28.9 Anti-desiccant

- E28.9.1 Anti-desiccant shall be wax-like emulsion to provide film over plant surfaces reducing evaporation but permeable enough to permit transpiration.

E28.10 Wound Dressing

- E28.10.1 Wound dressing shall be horticultural accepted non-toxic, non-hardening emulsion.

E28.11 Plant Material

- E28.11.1 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.

- E28.11.2 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.

- E28.11.3 Nursery stock shall be No. 1 grade trees, shrubs and vines.

- E28.11.4 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.

- E28.11.5 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.

- E28.11.6 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.

- E28.11.7 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.
- E28.11.8 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.
- E28.11.9 All parts of the plants shall be moist and show live, green cambium tissue when cut.
- E28.11.10 At least one (1) plant of each variety supplied shall bear a tag showing both the botanical and common name of the plant.
- E28.11.11 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. 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

E28.12 Workmanship

- E28.12.1 The Contractor shall stake out location of trees, shrubs and planting beds as per the Drawings. Obtain Contract Administrator's approval prior to excavating.
- E28.12.2 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.
- E28.12.3 The Contractor shall apply anti-desiccant in accordance with material manufacturer's instructions.
- E28.12.4 The Contractor shall coordinate planting operations; keep the site clean and planting holes drained, and immediately remove soil or debris spilled onto pavement.

E28.13 Planting Time

- E28.13.1 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.
- E28.13.2 Plant material imported from region with warmer climatic conditions may only be planted in early spring.
- E28.13.3 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.
- E28.13.4 When permission has been obtained, trees, shrubs and ground covers growing in containers may be planted throughout growing season.
- E28.13.5 Plant only under conditions that are conducive to health and physical conditions of plants.
- E28.13.6 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.

E28.14 Excavations

- E28.14.1 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.
- E28.14.2 Trees: excavate to depth of at least 200 mm deeper than height of root ball, with a surface width of two times the diameter of the root ball. Backfill around trees with planting soil mixture.
- E28.14.3 Provide drainage for planting holes in heavy soil if natural drainage does not exist. Have method approved.
- E28.14.4 Protect the bottoms of excavations against freezing.
- E28.14.5 Remove water that enters excavations prior to planting. Ensure source of water is not ground water.

E28.15 Planting

- E28.15.1 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.
- E28.15.2 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.

- E28.15.3 Place plant material to depth equal to depth they were originally growing in nursery or in locations collected.
- E28.15.4 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.
- E28.15.5 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.
- E28.15.6 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.
- E28.15.7 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.
- E28.15.8 Construct 100 mm deep saucers around the outer edge of planting pits to assist with maintenance watering.
- E28.15.9 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.
- E28.16 Pruning
- E28.16.1 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.
- E28.17 Standards
- E28.17.1 All roots shall be cleanly cut; split roots are not acceptable.
- E28.17.2 Branches and trunks shall be tied and protected; broken or abraded branches or trunks are not acceptable.
- E28.17.3 Planting shall be protected from drying conditions; desiccated material not acceptable.
- E28.17.4 All plants shall be free of insects and disease: galls, blight and other manifestations of insect infestation or disease not acceptable.
- E28.18 Wood Chip Mulch
- E28.18.1 All planting beds shall be covered with a 50 mm depth of wood chip mulch to the limits shown on the planting details.

- E28.18.2 Wood chip mulch shall extend under all tree limbs, but shall not be installed within 150 mm of the tree trunk.
- E28.18.3 The saucers of all trees not planted in beds shall be covered with a 50 mm depth of wood chip mulch.
- E28.19 Maintenance
- E28.19.1 Watering
- 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.
- E28.19.2 Weeding
- Keep mulched shrub beds and tree saucers weed-free by manually removing weeds during the maintenance period.
- E28.19.3 Insects and Diseases
- Spray plants to combat pests and diseases. Use organic chemical insecticides approved by Agriculture Canada.
- E28.19.4 Adjustments
- Make adjustments requested by the Contract Administrator, including straightening trees, tightening guy wires and removing tree stakes.
- E28.19.5 Maintenance Period
- 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

- E28.20 Trees, Shrubs and Vines
- E28.20.1 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.
- E28.20.2 Supply and installation of fertilizer for plant material will be included in payment for the plant material.

E29. TOPSOIL, PLANTING SOIL, SOIL AMENDMENTS AND FINISH GRADING

DESCRIPTION

- E29.1 General
- E29.1.1 This specification shall amend and supplement City of Winnipeg Standard Construction Specification CW 3540-R3 "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.

- E29.1.2 Referenced Standard Construction Specifications
(a) CW 3540- Topsoil and Finish Grading for Establishment of Turf Areas

MATERIALS

E29.2 Site Topsoil

- E29.2.1 Stockpiled on-site topsoil and imported topsoil shall conform to CW 3540-R3.

E29.3 Peatmoss

- E29.3.1 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.

E29.4 Sand

- E29.4.1 Sand shall be hard, granular, sharp sand to CSA A82.56-M1976, well-washed and free of impurities, chemicals and organic matter.

E29.5 Bonemeal

- E29.5.1 Bonemeal shall be raw, finely ground with a minimum chemical analysis of 3% nitrogen and 20% phosphoric acid.

E29.6 Wood Chip Mulch

- E29.6.1 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 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.
- E29.6.2 The Contractor shall supply a wood chip mulch sample to the Contract Administrator for approval prior to installation.

E29.7 Fertilizer

- E29.7.1 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 and Ditch Seed Mix (City Specification) with imported topsoil;
 - (b) Ditch Seed Mix with site topsoil;
 - (c) Horticultural trees and shrubs with planting soil mix;
 - (d) Native grasses and wildflower seeding with soil amendment; and
 - (e) Tifeoil and Clover Seed Mix with soil amendments.

E29.8 Chemical Application

- E29.8.1 Roundup or similar chemical herbicides approved by Agriculture Canada shall be used only with the approval of the Contract Administrator.

E29.9 Erosion Control Blanket

- E29.9.1 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.

E29.10 U-Staples

E29.10.1 Use U staples to anchor the reinforced composite mat to slopes.

E29.11 Straw Wattle

E29.11.1 Use Stenlog or other bio-degradable straw wattle (150 mm diameter).

E29.12 Plastic Edging

E29.12.1 Use heavy-duty 125 mm deep black PVC garden edging with rolled top.

CONSTRUCTION METHODS

E29.13 Imported Topsoil and Finish Grading

E29.13.1 Installation of imported topsoil in areas to receive sod (or turf grass seed), including preparation of existing grade, placing topsoil, applying fertilizer and finish grading shall conform to CW 3540-R3.

E29.14 Conditioning Site Topsoil

E29.14.1 Conditioning of site topsoil shall involve the following operations:

- (a) Break up site topsoil, cross cultivate, using a disc or harrow to obtain a friable soil base for seeding;
- (b) Remove any stones, branches, large roots, debris or other material deleterious to obtaining smooth grass surfaces and good plant growth;
- (c) Mix in fertilizer as recommended by soil testing laboratory.

E29.14.2 Install imported or site topsoil to 50 mm compacted depth in areas to be seeded with Ditch Seed Mix.

E29.15 Planting Soil Mixture for Trees, Shrubs and Vines

E29.15.1 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.

E29.16 Construction of Planting Beds

E29.16.1 Excavate planting beds to a depth of 300 mm.

E29.16.2 Install planting soil mixture, loosely compacted, 300 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.

E29.16.3 Install 50 mm wood chip mulch in all beds following planting operations.

E29.17 Soil Amendment for Native Seeding

E29.17.1 Soil amendment for native grass and wildflower seeding, as well as Trefoil and Clover Mix shall consist of a mix of 60% peat moss and 40% sand, loose by volume.

- E29.17.2 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
- E29.17.3 Spread 30 mm of peat moss and 20 mm sand over the area of soil amendments.
- E29.17.4 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.
- E29.17.5 Grade to eliminate rough spots and low spots and to maintain positive drainage.
- E29.17.6 Consolidate seedbed to required bulk density using equipment approved by the Contract Administrator. Leave surfaces smooth, uniform and firm against deep foot-printing.

E29.18 Erosion Control Blanket

- E29.18.1 Install erosion control blanket in accordance with the Drawings and the manufacturer's specifications in all areas where slopes exceed 3:1.

E29.19 Straw Wattle

- E29.19.1 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.
- E29.19.2 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.
- E29.19.3 Dog leg terminal ends of straw wattle up the slope to prevent channeling of sedimentation.
- E29.19.4 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.
- E29.19.5 Avoid damage to wattles. Damaged areas of wattles should be cut and tied off, then treated as terminal ends.

E29.20 Plastic Edging

- E29.20.1 Install 125 mm plastic edging with rolled top to separate planting beds from sod or seeded areas.

METHOD OF MEASUREMENT

E29.21 Imported Topsoil and Fine Grading

- E29.21.1 There shall be no separate measurement for work associated with imported topsoil and finish grading as described in this specification.

E29.22 Conditioning of Site Topsoil

- E29.22.1 Conditioning of previously spread site topsoil will be measured on an area basis for the number of square metres of ditch and boulevard conditioned in accordance with the Drawings and this specification and accepted by the Contract Administrator, as computed by the Contract Administrator.

E29.23 Planting Soil Mixture

- E29.23.1 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, all in accordance with the Drawings and this specification, and accepted by the Contract Administrator, as computed by the Contract Administrator.

E29.23.2 There will be no separate measurement for planting soil mixture used in planting individual trees and shrubs that are not planted in beds.

E29.24 Wood Chip Mulch

E29.24.1 Supply and installation of wood chip mulch shall be measured on an area basis for the number of square metres of 50 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.

E29.24.2 There will be no separate measurement for wood chip mulch used in individual trees saucers.

E29.25 Soil Amendments for Native Seeding

E29.25.1 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.

E29.26 Erosion Control Blanket

E29.26.1 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.

E29.27 Straw Wattle

E29.27.1 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.

E29.28 Plastic Edging

E29.28.1 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

E29.29 Conditioning of Site Topsoil

E29.29.1 Conditioning of site topsoil will be paid for at the Contract Unit Price for "Conditioning of Previously Spread Site Topsoil", which price shall be payment in full for supplying all labour, equipment and materials and performing all operations as herein specified, including finish grading, and all other work included in the work of this specification.

E29.30 Planting Soil Mixture

E29.30.1 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.

E29.31 Wood Chip Mulch

E29.31.1 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.

E29.32 Soil Amendments for Native Seeding and Trefoil and Clover Seed Mix

E29.32.1 Soil amendments will be paid for at the Contract Unit Price for "Soil Amendments for Native Seeding and Trefoil and Clover Seed Mix", 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.

E29.33 Erosion Control Blanket

E29.33.1 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.

E29.34 Straw Wattle

E29.34.1 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.

E29.35 Plastic Edging

E29.35.1 Plastic edging will be paid for at the Contract Unit Price for "Plastic Edging", 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.

E30. CHEMICAL CONTROL OF VEGETATION

DESCRIPTION

E30.1 General

E30.1.1 This specification covers the requirements for the application of herbicides for broad area weed control prior to seeding operations.

E30.2 Safety Requirements

E30.2.1 Comply with Federal, Provincial, pesticide control regulations. Provide Material Safety Data sheets (MSDS) for all chemicals to be used.

E30.2.2 Obtain Provincial Pesticide Applications License and any other permits and licenses necessary to complete work.

E30.2.3 Comply with label directions on the use of herbicide products.

E30.2.4 Comply with label directions as to ambient temperature ranges for application.

MATERIALS

E30.3 Delivery and Storage

E30.3.1 Deliver, store and maintain packaged materials with manufacturer's seals and labels intact.

- E30.3.2 Prevent damage, adulteration and soiling of material during delivery, handling and storage.
- E30.3.3 Store material in accordance with label directions, including those on maximum and minimum storage temperatures.
- E30.3.4 Store herbicide products in original containers as supplied by manufacturer and keep sealed until used.
- E30.3.5 Store herbicide products in sheltered, well ventilated, controlled access location.
- E30.3.6 Do not store herbicides near feeds and food stuffs, agricultural plants, seeds, fungicides, insecticides, fertilizers or other agricultural chemicals.
- E30.3.7 Identify storage area as pesticide storage facility for fire protection purposes.
- E30.3.8 Post in a prominent place a list of medical and fire department telephone numbers.
- E30.3.9 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.
- E30.4 Herbicides
 - E30.4.1 Select appropriate herbicides to achieve specified control requirement. Refer to Manitoba Guide to Chemical Weed Control.
 - E30.4.2 Herbicide products used must be registered for such use by Agriculture Canada under Pest Control Products Act.
 - E30.4.3 Do not use herbicides containing sodium chlorate.
- E30.5 Adjuvants
 - E30.5.1 Adjuvants shall be compatible with herbicide product used.
- E30.6 Spray Equipment
 - E30.6.1 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.
 - E30.6.2 Backpack Sprayer: Sprayer shall have hose and handgun for spot treatment.
 - E30.6.3 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

- E30.7 Notice of Spray Operation
 - E30.7.1 Post areas to be treated with signs placed at each road access and 100 m intervals around perimeter.
 - E30.7.2 Indicate on signs that spray program is being implemented.
 - E30.7.3 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.

E30.8 Environmental Protection

- E30.8.1 Application may continue only when wind velocities range between 2 and 10 km/h.
- E30.8.2 Do not spray when air turbulence will prevent uniform application.
- E30.8.3 Do not apply herbicides within 65 m of wells, rivers, streams, lakes, marshes or other environmentally sensitive areas unless otherwise sanctioned by provincial permit.
- E30.8.4 In case of herbicide spill, notify Contract Administrator and Provincial Ministry of Environment verbally immediately and subsequently in writing.
- E30.8.5 Do not allow drifting beyond target area. Use mechanical method to minimize herbicide drift.
- E30.8.6 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.
- E30.8.7 Do not apply sterilants to slopes greater than 3 to 1 where killing vegetation would lead to erosion problems.

E30.9 Application of Herbicides

- E30.9.1 Treat areas as indicated with appropriate herbicides.
- E30.9.2 Calibrate equipment to achieve manufacturer's recommended application rates.
- E30.9.3 Confine herbicide application to areas as indicated to achieve specified control requirements.
- E30.9.4 Space successive passes to provide uniform coverage of treated area.
- E30.9.5 Use flagmen or other aids as necessary to indicate successive passes.
- E30.9.6 Where roots of desirable vegetation run under treatment area, use contact herbicides.
- E30.9.7 Ensure formulation and rate of sterilant will not lead to leaching outside treatment area.
- E30.9.8 Retreat areas in accordance with label directions until specified control requirements are achieved.
- E30.9.9 Use flags or other aids as necessary to indicate successive passes.

E30.10 Control Requirements

- E30.10.1 For weed control, achieve within 30 days of treatment, minimum of 90% kill of target plants without damaging installed plant material.
- E30.10.2 For soil sterilization, achieve within 12 months of treatment, 100% kill of vegetation.

E30.11 Waste Disposal

- E30.11.1 Triple rinse empty herbicide containers with diluent and add rinsate to spray mixture in tank.
- E30.11.2 Puncture and crush glass plastic metal containers making them unsuitable for further use.
- E30.11.3 Dispose of containers in accordance with provincial requirements.
- E30.11.4 Do not rinse or wash spray tanks and equipment on site.

E30.12 Report

- E30.12.1 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

E30.13 Chemical Control of Vegetation

- E30.13.1 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.

E30.14 Spot Weed Control

- E30.14.1 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.

BASIS OF PAYMENT

E30.15 Chemical Control of Vegetation

- E30.15.1 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.

E31. LONG TERM SCHEDULED MAINTENANCE OF PLANT MATERIAL, PLANTING BEDS, SOD, SEEDED TURF GRASS AND OTHER SEEDED AREAS

DESCRIPTION

E31.1 General

- E31.1.1 This specification covers the maintenance of plant material, planting beds, sod, seeded turf grass and other seeded areas following acceptance of the work by the Contract Administrator.

E31.1.2 Referenced Standard Construction Specifications

- (a) CW 3510- Sodding
- (b) CW 3520- Seeding

MATERIALS

E31.2 Materials

E31.2.1 The Contractor shall provide all necessary materials and equipment including: additional topsoil, soil ameliorates, mulches, sod, seed, fertilizers and pesticides, and tractors, mowers, hand mowers, trimmers, fertilizer spreaders pruning tools, water trucks, hoses, water metres and any other items necessary for the maintenance of the areas indicated in this specification.

CONSTRUCTION METHODS

E31.3 Provision of Maintenance Personnel

E31.3.1 The Contractor shall provide all necessary personnel for the ongoing maintenance operations.

E31.4 Capability of Personnel

E31.4.1 Maintenance personnel should have at least one year of experience in landscape 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.

E31.4.2 The maintenance foreman shall be familiar with native plantings and plant identification techniques.

E31.5 Maintenance Period

E31.5.1 Maintain plantings, sod, seeded turf grass, native grass and wildflower areas, and trefoil and clover areas, as well as unit paving 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.

E31.6 Maintenance Schedule

E31.6.1 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.

E31.7 Recording Maintenance Operations

E31.7.1 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

E31.8 Traffic

E31.8.1 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).

E31.9 Maintenance of Trees, Shrubs, Vines and Planting Beds

E31.9.1 Maintain trees, shrubs, vines and planting beds as indicated in E28.19.

E31.9.2 Watering Trees, Shrubs and Vines

- (a) Newly planted trees, shrubs and vines 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.

E31.9.3 Fertilizing, Pruning and Spraying Deciduous Trees and Shrubs

- (a) Because of the specialized nature of such operations, employ a qualified local arborist. (Refer to E30)

E31.9.4 Pruning Deciduous Trees and Shrubs

- (a) Prune in accordance with E28.16 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.

E31.9.5 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. 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.

E31.9.6 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.

E31.9.7 Straightening

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

- E31.9.8 Mulching Wood Chip
- (a) Add wood chip mulch to planting bed areas as required to maintain an even fresh surface.
- E31.9.9 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.
- E31.10 Long-Term Maintenance of Sod and Turf Grass Areas
- E31.10.1 Maintain sod areas as specified in CW 3510-R8 Sodding.
- E31.10.2 Mowing
- (a) Mow sod to a height of 65 mm just prior to overseeding with Birdsfoot Trefoil and Crown Vetch.
 - (b) Cut grass once in the fall or as directed by the Contract Administrator.
- E31.10.3 Fertilize sod areas in the spring and late fall as follows:
- (a) Spring: 16-20-0
 - (b) Fall: 10-6-4
- E31.10.4 Weed Control
- (a) The Contractor shall spray sod areas with broadleaf weed controls once in the spring or late summer prior to overseeding with Birdsfoot Trefoil and Crown Vetch, or more frequently as required or directed by the Contract Administrator. Use environmentally friendly chemical agents approved by Agriculture Canada.
 - (b) Spot spray only to control noxious weeds following overseeding with Trefoil and Vetch.
- E31.10.5 Insect Control
- (a) Control damaging insects as required with chemical agents approved by Agriculture Canada.
- E31.10.6 Remove leaves from sod areas or thoroughly mulch in the fall.
- E31.10.7 Spring Sand/Salt Cleanup and Sod Repair
- (a) Remove salt and sand from all sod areas in the spring: typically around April 15. Replace damaged sod, or top-dress and over-seed with a Kentucky bluegrass and Creeping Red fescue seed mix, as required by the Contract Administrator.
- E31.10.8 Standard
- (a) At the end of the required maintenance period uniform stands of grass must be well established in all sod areas or resodding/reseeding will be required at the Contractor's expense and to the satisfaction of the Contract Administrator. Scattered bare spots, none of which is larger than 100 mm square will be allowed up to a maximum of three (3) percent of any turf grass area.
 - (b) Defective sod shall be replaced and the area so replaced shall be maintained for a 30-day period in the next growing season.

- (c) Reseeded areas shall be maintained until accepted by the Contract Administrator based on the establishment requirements outlined in CW 3520-R6
- (d) Any areas re-sodded after September 15th which do not show an even stand of live growth and/or adequate root development in that year shall have the maintenance period commence on May 15th of the following year or such date as mutually agreed upon by all parties, at which time all sod must show an even stand of live growth.
- (e) Re-seed areas which fail to show trefoil and vetch upon completion of the two year maintenance period.

E31.11 Maintenance of Native Grass and Wildflower Seeded Areas and Trefoil and Clover Areas

- E31.11.1 Repair and reseed dead or bare spots to the satisfaction of the Contract Administrator.
- E31.11.2 Eliminate weeds by hand or chemical means. Spot treat localized weedy areas, only, with Roundup, 2-4D or Diacamba.
- E31.11.3 Water only as required for seed establishment and seed maintenance in periods of severe drought.
- E31.11.4 Mowing
 - (a) Mow native grass and wildflower areas, and trefoil and clover areas in the late fall, or as directed by the Contract Administrator to remove excessive weed growth.
 - (b) Remove cuttings.
 - (c) Mow native grass and wildflower areas, and trefoil and clover areas to a height of 100 mm.

E31.12 General Cleanup

- E31.12.1 Cleanup garbage and debris throughout site during the two-year maintenance period.
- E31.12.2 Remove soil or grass clippings from walkway areas.
- E31.12.3 Dispose of collected garbage and clippings at a recognized solid waste disposal site.

METHOD OF MEASUREMENT

E31.13 General Maintenance of Trees, Shrubs and Vines, Planting Beds, Sod and Turf Grass Areas, and General Cleanup.

- E31.13.1 Trees, Shrubs and Vines, and Planting Beds
 - (a) Two year general maintenance of trees, shrubs and vines, 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.
- E31.13.2 Sod and Seeded Turf Areas
 - (a) Two year general maintenance of sod and ditch seed areas, including scheduled mowing, watering, fertilizing, weed and insect control, and removal of leaves will be measured twice each season, for the six month annual growing season for work completed in each area.
- E31.13.3 Native Grass and Wildflower Areas and Trefoil and Clover Areas
 - (a) Two year general maintenance of native grass and wildflower areas, trefoil and clover areas, including mowing once in the fall or as required to control excessive weed

growth, spot weed control, and removal of cuttings will be measured twice each season, for the six month annual growing season for work completed in each area each year.

E31.13.4 General Cleanup

(a) Two-year general cleanup of landscaped areas, including removal of garbage and debris and grass clippings in the roadway corridor will be measured twice each season, for the six-month annual growing season, for the entire project area.

E31.13.5 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.

E31.14 Spring Cleanup

E31.14.1 Spring cleanup will be measured on an annual basis for the two year maintenance period for each recorded cleanup completed in accordance with this specification and accepted by the Contract Administrator, as computed by the Contract Administrator.

BASIS OF PAYMENT

E31.15 General Maintenance of Trees, Shrubs and Herbaceous Material, Sod, and Seeded Areas, and General Clean-Up

E31.15.1 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

- (i) General Plant Material and Planting Bed Maintenance
- (ii) General Sod Maintenance
- (iii) General Maintenance of Salt Tolerant Prairie Grass
- (iv) General Maintenance of Trefoil and Clover Areas
- (v) General Clean-up Operations

E31.16 Spring Cleanup

E31.16.1 Spring Cleanup will be paid for at the Contract Unit Price for "Annual Spring Cleanup of Landscaped Areas", pro-rated to the percentage of area completed, which price will include supply of all labour, equipment and materials and performing all operations herein described, and all other items incidental to the Work included in this specification.

E32. PLANT MATERIAL WARRANTY

DESCRIPTION

E32.1 General

E32.1.1 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.

E32.2 Timing

E32.2.1 Warranty shall be for two (2) years, commencing upon acceptance of installed plant material.

E32.3 Warranty

E32.3.1 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.

E32.4 End-of-Warranty Inspection

E32.4.1 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.

E32.5 Replacement

E32.5.1 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.

E32.5.2 Replace plant material in the following spring or fall as directed.

E32.5.3 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.

E32.5.4 Continue such replacement and warranty until plant material is acceptable.

E32.5.5 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

E32.6 Warranty

E32.6.1 Warranties on plant material will not be measured or paid for.

E32.6.2 Warranties on plant material shall be included in payment for the supply and installation of plant material.

E33. WORK ON CN RIGHT-OF-WAY

E33.1 The Contractor shall be responsible to meet all CN requirements, included in Appendix C. The Contractor is advised that the requirements are applicable to all the Contractor's personnel and equipment crossing CN tracks and property.

E33.2 The Railway will provide a Protecting Foreman for the protection of the Railway's plant and equipment and the cost of such shall be borne by the Contractor (see E33.10.3 in Appendix C).

E34. DITCH INLET GRATES

DESCRIPTION

E34.1 General

E34.1.1 This Specification covers the supply and installation of ditch inlet grates on catchbasins.

MATERIALS

E34.2 Ditch Inlet Grate

E34.2.1 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 Shoppost Iron Works MK-A1 or approved equal.

CONSTRUCTION METHODS

E34.3 Ditch Inlet Grates

E34.3.1 The Contractor shall be required to supply and install ditch inlet grates on drainage inlets shown on the Drawings.

E34.3.2 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.

E34.3.3 The ditch inlet grate shall be securely fastened to the drainage inlets as shown on the Drawings and as approved by the Contract Administrator.

E34.3.4 Any galvanized surfaces that are damaged shall be coated with a galvanizing compound approved by the Contract Administrator.

MEASUREMENT AND PAYMENT

E34.4 Ditch Inlet Grates

E34.4.1 The supply and installation of ditch inlet grates will not be measured for payment and shall be included in the payment for catchbasins.

E35. RAISING AND LOWERING HYDRANTS

DESCRIPTION

E35.1 General

E35.1.1 This specification covers the raising and lowering of existing hydrants.

E35.1.2 Referenced Standard Construction Specification

(a) CW 3210 – Adjustment of Pavement and Boulevard Structures

CONSTRUCTION METHODS

E35.2 Raising of Hydrants

E35.2.1 Raise hydrants at the locations and to the grades as shown on the Drawings or as directed by the Contract Administrator. Hydrants shall be raised by removing the upper hydrant body and inserting the appropriate extension section complete with stem extension. The

extension section shall incorporate a break-away traffic flange to be located approximately 50 mm above the ground surface. Adjust the isolation valve box as specified in CW 3210.

E35.3 Lowering of Hydrants

- E35.3.1 Remove hydrants that are indicated on the Drawings as requiring lowering or as directed by the Contract Administrator. Replace with new hydrants to the appropriate bury depth. Adjust the isolation valve box as specified in CW 3210.

MEASUREMENT AND PAYMENT

E35.4 Raising or Lowering Hydrants

- E35.4.1 Raising or lowering of hydrants will be measured on a unit basis for each type of adjustment made and paid for at the Contract Unit Price for "Raising of Hydrant" or "Lowering of Hydrant". The number to be paid for shall be the total number of each type of adjustment made in accordance with this specification, measured and accepted by the Contract Administrator.
- E35.4.2 Adjustment of isolation valve boxes shall be measured and paid for in accordance with CW 3210.

E36. PROVISIONAL ITEMS

- E36.1 The Provisional Items listed on Form B: Prices and described by the City of Winnipeg Standard Construction Specifications are a part of the Contract.
- E36.2 The Contractor will not order any material or perform any work listed under their provisions without prior notification from the Contract Administrator. All work carried out will be within the construction areas listed in the Specifications.
- E36.3 The City reserves the right to diminish all or any portion of the work listed as Provisional Items and no claim shall be made for damages on ground of loss of anticipated profit or any other ground.

E37. EXISTING SERVICES AND UTILITIES

- E37.1 Further to Section 3.3 of CW 1120 of the General Requirements, information shown on the Construction Drawings is supplied by the City of Winnipeg and from the Department of Defence (DND) to the best of their knowledge from record information. It is hereby expressly understood that the information provided with respect to the type of, or location of, services shall be accepted by the Contractor at his own risk, and both the City of Winnipeg and DND shall assume no responsibility for the accuracy or completeness of the information contained therein.
- E37.2 Existing municipal infrastructure piping depth, at some locations, are unknown and have been estimated for design purposes. When requested by the Contract Administrator, the Contractor shall expose existing piping at the proposed tie-in locations and any other locations as directed, at the commencement of construction to allow for design grade elevations to be modified.
- E37.3 When working in close proximity to shallow bury utilities, the Contractor shall contact the utility and obtain confirmation if site supervision from the utility is required. Requirements for utility supervision, utility coordination and locates, exposing of utility by means of hand or hydro-vac excavation, and similar requirements shall be the responsibility of the Contractor.
- E37.4 All costs associated with this Work item shall be included in the Unit Price Bid for installation of culverts and/or sewer service pipe.

E38. SAFETY PRECAUTIONS

E38.1 Further to Section 3.1 of CW 1130 of the General Requirements, the Contractor shall ensure that any excavation left open or exposed overnight, over a weekend or any length of time unattended shall have full and adequate safety precautions provided. These precautions shall include but not be limited to covering the excavation with timber planks or steel plates and erecting a barricade completely around the excavation complete with signing in accordance with the City of Winnipeg Manual of Temporary Traffic Control.

E39. ENVIRONMENTAL PROTECTION PLAN

E39.1 The Contractor shall plan and implement the Work of this Contract strictly in accordance with the requirements of the Environmental Protection Plan as herein specified.

E39.2 The Contractor is advised that at least the following Acts, Regulations and By-laws apply to the Work and are available for viewing on line at the applicable web sites or at the office of the Contract Administrator.

E39.2.1 Federal

- (a) Canadian Environmental Assessment Act (CEAA) c.37
- (b) Transportation of Dangerous Goods Act and Regulations c.34
- (c) Railway Safety Act
- (d) Notice of Railway Works Regulations

E39.2.2 Provincial

- (a) The Dangerous Goods Handling and Transportation Act D12
- (b) The Endangered Species Act E111
- (c) The Environmental Act c.E125
- (d) The Fire Prevention Act F80
- (e) The Manitoba Heritage Resources Act H39-1
- (f) The Manitoba Noxious Weeds Act N110
- (g) The Manitoba Nuisance Act N120
- (h) The Public Health Act c.P210
- (i) The Workplace Safety and Health Act W210
- (j) And current applicable associated regulations (Note: Provincial regulations updated as of September 1999)

E39.2.3 Municipal

- (a) The City of Winnipeg By-law No. 2480/79 and all amendments up to and including 7976/2000
- (b) The City of Winnipeg By-law No. 1573/77 and all amendments up to and including 7670/2000
- (c) And any other applicable Acts, Regulations and By-laws.

E39.3 The Contractor is advised that the Environmental Approval for this project has been received.

E39.4 The Contractor is advised that the Environmental Screening Report for the Kenaston Underpass Project, dated March 2005, applies to the Work and is available for viewing at the office of the Contract Administrator. A specific reference of the Environmental Screening Report Table 6.3 is

included in Appendix D and describes the mitigation measures to be adhered to by the Contractor.

E39.5 The Contractor is advised that the following environmental protection measures apply to the Work.

(a) Materials Handling and Storage

- (i) Storage of construction materials shall be confined to the defined laydown areas as shown on the Drawings.
- (ii) Construction materials shall not be deposited or stored on or near drainage ditches unless written acceptance from the Contract Administrator is received in advance.
- (iii) Construction materials and debris shall be prevented from entering the land drainage system. In the event that materials and/or debris inadvertently enter the land drainage system, the Contractor shall be required to remove the material and restore the land drainage system to its original condition.

(b) Fuel Handling Storage

- (i) The Contractor shall obtain all necessary permits from Manitoba Environment for the handling and storage of fuel products and shall provide copies to the Contract Administrator.
- (ii) All fuel handling and storage facilities shall comply with The Dangerous Goods and Transportation Act Storage and Handling of Petroleum Products Regulation and any local land use permits.
- (iii) Fuels, lubricants and other potentially hazardous materials as defined in The Dangerous Goods and Transportation Act shall be stored and handled within the approved storage areas.
- (iv) The Contractor shall ensure that all fuel storage containers are inspected daily for leaks and spillage.
- (v) Products transferred from the fuel storage area(s) to specific Work sites shall not exceed the daily usage requirement.
- (vi) When servicing requires the drainage or pumping of fuels, lubricating oils or other fluids from equipment, a groundsheet of suitable material (such as HDPE) and size shall be spread on the ground to catch the fluid in the event of a leak or spill.
- (vii) Refuelling of mobile equipment and vehicles shall take place at least 100 metres from a watercourse.
- (viii) The area around storage sites and fuel lines shall be distinctly marked and kept clear of snow and debris to allow for routine inspection and leak detection.
- (ix) A sufficient supply of materials, such as absorbent material and plastic oil booms, to clean up minor spills shall be stored nearby on site. The Contractor shall ensure that additional material can be made available on short notice.

(c) Waste Handling and Disposal

- (i) The construction area shall be kept clean and orderly at all times during and at completion of construction.
- (ii) At no time during construction shall personal or construction waste be permitted to accumulate for more than one day at any location on the construction site, other than at a dedicated storage area as may be approved by the Contract Administrator.
- (iii) The Contractor shall, during and at the completion of construction, clean up the construction area and all resulting debris shall be deposited at a Waste Disposal Ground operating under the authority of Manitoba Regulation #150/91. Exceptions are liquid industrial and hazardous wastes which require special disposal methods (refer to Section 30.5.D).
- (iv) Indiscriminate dumping, littering, or abandonment shall not take place.

- (v) No on-site burning of waste is permitted.
 - (vi) Waste storage areas shall not be located so as to block natural drainage.
 - (vii) Runoff from a waste storage area shall not be allowed to cause siltation of a watercourse.
 - (viii) Waste storage areas shall be left in a neat and finished appearance and/or restored to their original condition to the satisfaction of the Contract Administrator.
 - (ix) Equipment shall not be cleaned near watercourses; contaminated water from onshore cleaning operations shall not be permitted to enter watercourses.
- (d) Dangerous Goods/Hazardous Waste Handling and Disposal
- (i) Dangerous goods/hazardous waste are identified by, and shall be handled according to, The Dangerous Goods Handling and Transportation Act and Regulations.
 - (ii) The Contractor shall be familiar with The Dangerous Goods Handling and Transportation Act and Regulations.
 - (iii) The Contractor shall have on site staff who are trained and certified in the handling of the dangerous/hazardous goods, when said dangerous/hazardous goods are being utilized on site for the performance of the Work.
 - (iv) Different waste streams shall not be mixed.
 - (v) Disposal of dangerous goods/hazardous wastes shall be at approved hazardous waste facilities.
 - (vi) Liquid hydrocarbons shall not be stored or disposed of in earthen pits on site.
 - (vii) Used oils shall be stored in appropriate drums, or tankage until shipment to waste oil recycling centres, incinerators, or secure disposal facilities approved for such wastes.
 - (viii) Used oil filters shall be drained, placed in suitable storage containers, and buried or incinerated at approved hazardous waste treatment and disposal facilities.
 - (ix) Dangerous goods/hazardous waste storage areas shall not be located so as to block natural drainage.
 - (x) Runoff from a dangerous goods/hazardous waste storage area shall not be allowed to cause siltation of a watercourse.
 - (xi) Dangerous goods/hazardous waste storage areas shall be left in a neat and finished appearance and/or restored to their original condition to the satisfaction of the Contract Administrator.
- (e) Emergency Response
- (i) The Contractor shall ensure that due care and caution is taken to prevent spills.
 - (ii) The Contractor shall report all major spills of petroleum products or other hazardous substances with significant impact on the environment and threat to human health and safety (as defined in Table 1 below) to Manitoba Environment, immediately after occurrence of the environmental accident, by calling the 24-hour emergency phone number (204) 945-4888.
 - (iii) The Contractor shall designate a qualified supervisor as the on-site emergency response coordinator for the project. The emergency response coordinator shall have the authority to redirect manpower in order to respond in the event of a spill.
 - (iv) The following actions shall be taken by the person in charge of the spilled material or the first person(s) arriving at the scene of a hazardous material accident or the on-site emergency response coordinator.
 - (i) Notify emergency-response coordinator of the accident:
 - identify exact location and time of accident
 - indicate injuries, if any

- request assistance as required by magnitude of accident (Manitoba Environment 24-hour Spill Response Line (204) 945-4888, Police, Fire Department, Ambulance, company backup)
- (ii) Attend to public safety:
 - stop traffic, roadblock/cordon off the immediate danger area
 - eliminate ignition sources
 - initiate evacuation procedures if necessary
- (iii) Assess situation and gather information on the status of the situation, noting:
 - personnel on site
 - cause and effect of spill
 - estimated extent of damage
 - amount and type of material involved
 - proximity to waterways, sewers and manholes
- (iv) If safe to do so, try to stop the dispersion or flow of spill material:
 - approach from upwind
 - stop or reduce leak if safe to do so
 - dyke spill material with dry, inert absorbent material or dry clay soil or sand
 - prevent spill material from entering waterways and utilities by dyking
 - prevent spill material from entering manholes and other openings by covering with rubber spill mats or dyking
- (v) Resume any effective action to contain, clean up, or stop the flow of the spilled product.
- (v) The emergency response coordinator shall ensure that all environmental accidents involving contaminants shall be documented and reported to Manitoba Environment according to The Dangerous Goods Handling and Transportation Act Environmental Accident Report Regulation 439/87.
- (vi) When dangerous goods are used on site, materials for containment and cleanup of spill material (e.g. absorbent materials, plastic oil booms, and oversized recovery drums) shall be available on site.
- (vii) Minor spills of such substances that may be contained on land with no significant impact on the environment may be responded to with in-house resources without formal notification to Manitoba Environment.
- (viii) City emergency response, 9-1-1, shall be used if other means are not available.

Table 1
Spills that must be Reported to the
Manitoba Conservation as Environmental Accidents

Classification	Hazard	Reportable Quantity/Level
1	Explosives	All
2.1	Compressed Gas (flammable)	100 L*
2.2	Compressed Gas	100 L*
2.3	Compressed Gas (toxic)	All
2.4	Compressed Gas (corrosive)	All
3	Flammable Liquids	100 L
4	Flammable Solids	1 kg
5.1 PG** I & II	Oxidizer	1 kg or 1 L
PG III	Oxidizer	50 kg or 50 L
5.2	Organic Peroxide	1 kg or 1 L
6.1 PG I	Acute Toxic	1 kg or 1 L
PG II & III	Acute Toxic	5 kg or 5 L
6.2	Infectious	All

Table 1		
Spills that must be Reported to the Manitoba Conservation as Environmental Accidents		
Classification	Hazard	Reportable Quantity/Level
7	Radioactive	Any discharge or radiation level exceeding 10 mSv/h at the package surface and 200 uSv/h at 1 m from the package surface
8	Corrosive	5 kg or 5 L
9.1	Miscellaneous (except PCB mixtures)	50 kg
9.1	PCB Mixtures	500 g
9.2	Aquatic Toxic	1 kg or 1 L
9.3	Wastes (chronic toxic)	5 kg or 5 L
* Container capacity (refers to container water capacity)		
** PG = Packing Group(s)		

(ix) Noise

- (i) Noise-generating activities shall be limited to the hours indicated in the City of Winnipeg Noise Bylaw, and the Province of Manitoba Environment Act Licence, unless otherwise accepted in advance by the Contract Administrator.
- (ii) The Contractor shall be responsible for scheduling Work to avoid potential noise problems and/or employ noise reduction measures to reduce noise to acceptable limits. The Contractor shall also demonstrate to the Contract Administrator that Work to be performed during the night-time period, on Sundays, and Holidays as stated in the Licence shall not exceed the approved limit.

(x) Dust

- (i) Duct control practices implemented by the Contractor during construction shall include regular street cleaning and dampening of construction access roads and Work areas with water or approved chemicals at an adequate frequency to prevent the creation of dust.
- (ii) Only water or chemicals approved by the Contract Administrator shall be used for dust control. The use of waste petroleum or petroleum by-products is not permitted.
- (iii) The Contractor shall ensure that trucks which are used to haul excavated material and backfill material to and from the Work site utilize tarpaulin covers during transport to prevent material from falling onto the street and creating dust.
- (iv) Stockpiled soils shall be covered with tarpaulin covers to prevent the creation of dust.

(xi) Erosion Control

- (i) The Contractor shall develop a sediment control plan prior to beginning construction to the satisfaction of the Contract Administrator.
- (ii) Sediment control fencing, or other such erosion control structures, shall be employed wherever construction activity increases the potential for runoff to carry sediment into a drainage channel or other watercourse. The Contractor shall inspect all such structures daily during heavy construction activity in the areas of the structures and after a heavy rainfall to ensure their continued integrity.
- (iii) All areas disturbed during construction shall be landscaped and revegetated with native and/or introduced plant species in order to restore and enhance the Site and protect against soil erosion unless otherwise indicated.
- (iv) The disturbed surface shall be revegetated so as to create a dense root system in order to defend against soil erosion on the right-of-way and any other disturbed areas susceptible to erosion.

- (v) The loss of topsoil and the creation of excessive dust by wind during construction shall be prevented by the addition of temporary cover crop, water or tackifier, if conditions so warrant
- (xii) Runoff Control
 - (i) Measures shall be undertaken to ensure that runoff containing suspended soil particles is minimized from entering the land drainage system to the extent possible to the satisfaction of the Contract Administrator.
 - (ii) Areas that are heavily disturbed and vulnerable to erosion or gullying shall be dyked to redirect surface runoff around the area prior to spring runoff.
 - (iii) Construction activities on erodible slopes shall be avoided during spring runoff and heavy rainfall events.
- (xiii) Vegetation
 - (i) Right-of-way clearing shall be restricted to areas identified on the Construction Drawings.
 - (ii) Rare, endangered, or threatened plant species shall be protected as specified in the Environmental Screening Report, if encountered.
 - (iii) Vegetation shall not be disturbed without written permission from the Contract Administrator.
 - (iv) The Contractor shall protect plants or trees which may be at risk of accidental damage as specified in the Environment Screening Report. Such measures may include protective fencing or signage and shall be approved in advance by the Contract Administrator.
 - (v) Herbicides and pesticides shall not be used adjacent to any surface watercourse.
 - (vi) Trees or shrubs shall not be felled into watercourses.
 - (vii) Areas where vegetation is removed during clearing, construction decommissioning activities, shall be revegetated as soon as possible in accordance with the landscaping plans forming part of the Contract, or as directed by the Contract Administrator.
 - (viii) Trees damaged during construction activities shall be examined by bonded tree care professionals. Viable trees damaged during construction activities shall be pruned according to good practice by bonded tree care professionals.
 - (ix) Damaged trees which are not viable shall be replaced at the expense of the Contractor.
- (xiv) Landscaping
 - (i) Construction waste (excluding common construction gravel, sand, etc.) shall be removed to a minimum depth of 600 mm below final grade in all areas that are to be backfilled with suitable material and revegetated in accordance with Standard City Practice.
 - (ii) The Contractor shall adhere to the landscaping plan for maintenance of initial stages and development stages of the plant community.
- (xv) Heritage Resources
 - (i) If heritage material is located during the construction and soil removal process, all Work shall cease and the Contractor shall immediately contact the Contract Administrator. The Historic Resources Branch, Manitoba Culture, Heritage and Tourism, or the Project Archaeologist, shall be contacted by the Contract Administrator to determine the nature and extent of the archaeological material and to arrange for its recovery. The archaeological remains shall be recovered by salvage excavation upon authorization by the Contract Administrator, having consulted with the Historic Resources Branch, Manitoba Department of Culture, Heritage and Tourism.

- (ii) The Contractor shall be prepared to continue his Work elsewhere on the project while the Archaeologist investigates the finding and determines its heritage value.
- (iii) The Contractor is advised that he may be denied access to such areas of the project until such time as a thorough archaeological investigation is conducted or the find is deemed to have no heritage value.
- (iv) Construction and excavation Work shall not resume until the Contract Administrator, having consulted with the Historic Resources Branch, Manitoba Culture, Heritage and Tourism, or the project archaeologist, authorizes a resumption of Work.
- (v) If human remains are uncovered during the construction and soil removal process, all Work shall cease and the Historic Resources Branch, Manitoba culture, Heritage and Tourism shall be contacted by the Contract Administrator. The Historic Resources Branch shall contact the City of Winnipeg Police.
- (vi) If the human remains are considered forensic, i.e. no foul play suspected, they shall be removed by the Historic Resources Branch, Manitoba Culture, Heritage and Tourism or the project archaeologist and turned over to the Province.
- (vii) If the human remains are considered forensic, the City of Winnipeg Police shall be responsible for their removal.
- (viii) Additional information may be obtained by contacting: Archaeological Assessment Services, Historic Resources Branch.
- (xvi) Construction Traffic
 - (i) Workforce parking shall be limited to the areas designated for such as detailed in the Contract Documents, or as otherwise may be directed by the Contract Administrator.
 - (ii) The Contractor shall adhere to the Standard Provisions of the Standard Construction Specifications, and of the Manual of Temporary Traffic Control in Work Areas on City Streets of the City of Winnipeg, Works and Operations Division.
 - (iii) The Contractor's laydown area, construction site and access road shall be fenced and gated to secure the site and materials and to discourage pedestrian entrance to construction areas and to control any potential hazard to the public, particularly children.
 - (iv) For circumstances where the Contract Administrator has accepted site access of special equipment or material, the Contractor shall provide adequate flagmen for traffic control in the vicinity of any public buildings.
- (xvii) Access
 - (i) The Contractor shall maintain access to affected residential properties.
 - (ii) The Contractor shall provide or maintain general and off-street access to any affected business during construction.

E40. ACCESS TO FORMER PPCLI – CFB WINNIPEG

- E40.1 The Contractor shall note that Work is proposed within the former PPCLI – CFB Winnipeg. Department of National Defense (DND) regulations for access to the former PPCLI site include the following:
- (a) Contractor is to provide the Contract Administrator a list of personnel who will be entering DND Lands for the purpose of conducting construction activities. Contractor shall supply the list two weeks prior to entering the site. Only the personnel identified shall be permitted to enter the DND site. No special pass or escort will be required by DND, but the Contractor's on-site personnel may be asked by DND staff to present picture identification.

- (b) DND requires a minimum of 10 Working Days' notice to complete underground utility locations on DND Lands. The Contractor shall note that the Drawings include information provided by DND to the best of their knowledge from record information. It is hereby expressly understood that the information provided with respect to the type of, or location of services, shall be accepted by the Contractor at his own risk, and DND shall assume no responsibility for the accuracy or the completeness of the information contained herein.
- (c) Contact for entering DND Lands is Teresa Rupa, DND Properties Officer, Phone: 833-2500, ext. 6588.
- (d) Contact for existing utility locations on DND Lands is DND Construction Engineering Operations Director, Phone: 833-2500, ext. 5225.