



THE CITY OF WINNIPEG

BID OPPORTUNITY

BID OPPORTUNITY NO. 219-2006

WINNIPEG WATER TREATMENT PROGRAM – PROVINCIAL ROAD #207 UPGRADE

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PART B - BIDDING PROCEDURES

B1. PROJECT TITLE

B1.1 WINNIPEG WATER TREATMENT PROGRAM – PROVINCIAL ROAD #207 UPGRADE

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, June 14, 2006.

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

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

B3. SITE INVESTIGATION

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

B4. ENQUIRIES

B4.1 All enquiries shall be directed to the Contract Administrator identified in D4.1.

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

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

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

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

B5. ADDENDA

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

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

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

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

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

B6. SUBSTITUTES

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

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

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

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

- (a) provide sufficient information and details to enable the Contract Administrator to determine the acceptability of the Plant, Material or method as either an approved equal or alternative;
- (b) identify any and all changes required in the applicable Work, and all changes to any other Work, which would become necessary to accommodate the substitute;
- (c) identify any anticipated cost or time savings that may be associated with the substitute;
- (d) certify that, in the case of a request for approval as an approved equal, the substitute will fully perform the functions called for by the general design, be of equal or superior substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance;
- (e) certify that, in the case of a request for approval as an approved alternative, the substitute will adequately perform the functions called for by the general design, be similar in substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance.

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

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

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

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

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

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

B7. BID SUBMISSION

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

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

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

B7.3 The Bid Submission shall be submitted enclosed and sealed in an envelope. 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.

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

B7.5 Bid Submissions shall be submitted to:

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

B8. BID

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

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

- (a) if the Bidder is a sole proprietor carrying on business in his own name, his name shall be inserted;
- (b) if the Bidder is a partnership, the full name of the partnership shall be inserted;
- (c) if the Bidder is a corporation, the full name of the corporation shall be inserted;
- (d) if the Bidder is carrying on business under a name other than his own, the business name and the name of every partner or corporation who is the owner of such business name shall be inserted.

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 12 of Form A: Bid shall be signed in accordance with the following requirements:
- (a) if the Bidder is a sole proprietor carrying on business in his own name, it shall be signed by the Bidder;
 - (b) if the Bidder is a partnership, it shall be signed by the partner or partners who have authority to sign for the partnership;
 - (c) if the Bidder is a corporation, it shall be signed by its duly authorized officer or officers and the corporate seal, if the corporation has one, shall be affixed;
 - (d) if the Bidder is carrying on business under a name other than his own, it shall be signed by the registered owner of the business name, or by the registered owner's authorized officials if the owner is a partnership or a corporation.
- B8.4.1 The name and official capacity of all individuals signing Form A: Bid shall be printed below such signatures.
- B8.4.2 All signatures shall be original and shall be witnessed except where a corporate seal has been affixed.
- B8.5 If a Bid is submitted jointly by two or more persons, the word "Bidder" shall mean each and all such persons, and the undertakings, covenants and obligations of such joint Bidders in the Bid Submission and the Contract, when awarded, shall be both joint and several.

B9. PRICES

- B9.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B: Prices.
- B9.2 The quantities listed on Form B: Prices are to be considered approximate only. The City will use said quantities for the purpose of comparing Bids.
- B9.3 The quantities for which payment will be made to the Contractor are to be determined by the Work actually performed and completed by the Contractor, to be measured as specified in the applicable Specifications.

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 Branch internet site at <http://www.winnipeg.ca/matmgt>); and
 - (ii) have successfully carried out work similar in nature, scope and value to the portion of the Work proposed to be subcontracted to them, and are fully capable of

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

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

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

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

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 Winnipeg, in the form included in the Bid Submission (Form G2: Irrevocable Standby Letter of Credit and Undertaking); or
- (c) a certified cheque or draft payable to "The City of Winnipeg", in the amount of at least fifty percent (50%) of the Total Bid Price, drawn on a bank or other financial institution registered to conduct business in Manitoba.

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

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

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

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

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

B12. OPENING OF BIDS AND RELEASE OF INFORMATION

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

B12.1.1 Bidders or their representatives may attend.

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

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

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

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

B13. IRREVOCABLE BID

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

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

B14. WITHDRAWAL OF BIDS

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

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

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

- B14.1.3** If a Bidder gives notice of withdrawal prior to the Submission Deadline, the Manager of Materials shall:
- (a) retain the Bid Submission until after the Submission Deadline has elapsed;
 - (b) open the Bid Submission to identify the contact person named in Paragraph 3 of Form A: Bid and the Bidder's authorized representatives named in Paragraph 12 of Form A: Bid; and
 - (c) if the notice has been given by any one of the persons specified in B14.1.3(b), declare the Bid withdrawn.

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

B15. EVALUATION OF BIDS

- B15.1** Award of the Contract shall be based on the following bid evaluation criteria:
- (a) compliance by the Bidder with the requirements of the Bid Opportunity (pass/fail);
 - (b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B10 (pass/fail);
 - (c) Total Bid Price;
 - (d) economic analysis of any approved alternative pursuant to B6.
- B15.2** Further to B15.1(a), the Award Authority may reject a Bid as being non-responsive if the Bid Submission is incomplete, obscure or conditional, or contains additions, deletions, alterations or other irregularities. The Award Authority may reject all or any part of any Bid, or waive technical requirements if the interests of the City so require.
- B15.3** Further to B15.1(b), the Award Authority shall reject any Bid submitted by a Bidder who does not demonstrate, in his Bid Submission or in other information required to be submitted, that he is responsible and qualified.
- B15.4** Further to B15.1(c), the Total Bid Price shall be the sum of the quantities multiplied by the unit prices for each item shown on Form B: Prices.
- B15.4.1** If there is any discrepancy between the Total Bid Price written in figures, the Total Bid Price written in words and the sum of the quantities multiplied by the unit prices for each item, the sum of the quantities multiplied by the unit prices for each item shall take precedence.

B16. AWARD OF CONTRACT

- B16.1** The City will give notice of the award of the Contract by way of a letter of intent, or will give notice that no award will be made.
- B16.2** The City will have no obligation to award a Contract to a Bidder, even though one or all of the Bidders are determined to be responsible and qualified, and the Bids are determined to be responsive.
- B16.2.1** Without limiting the generality of B16.2, the City will have no obligation to award a Contract where:
- (a) the prices exceed the available City funds for the Work;

- (b) the prices are materially in excess of the prices received for similar work in the past;
- (c) the prices are materially in excess of the City's cost to perform the Work, or a significant portion thereof, with its own forces;
- (d) only one Bid is received; or
- (e) in the judgment of the Award Authority, the interests of the City would best be served by not awarding a Contract.

B16.2.2 Bidders are advised that award of this Contract is contingent upon the City and the Province entering into an agreement for the Work prior to the expiry of the validity of Bids.

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

PART C - GENERAL CONDITIONS

C1. GENERAL CONDITIONS

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

PART D - SUPPLEMENTAL CONDITIONS

GENERAL

D1. GENERAL CONDITIONS

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

D2. SCOPE OF WORK

- D2.1 The Work shall consist of:
- (a) Upgrade PR 207 from the current Class B-1 classification to a TAC Route classification from Trans Canada Highway #1 to approximately 3.5 km north.
 - (b) Widening of PR 207 and realignment of the Winnipeg Water Treatment Plant intersection and approaches.
 - (c) Construction of new bridge and approach slabs on PR 207 at the aqueduct crossing.
 - (d) Design and construction of cantilevered railway signals.
- D2.2 The major components of the Work are as follows:
- (a) To pulvi-mix existing chip seal road surface and prepare existing base to receive new work.
 - (b) Supply and install new base material and asphalt concrete as specified in the Drawings and Specifications.
 - (c) Supply and install precast piles as specified.
 - (d) Supply and install formwork, reinforcing steel and concrete.
 - (e) Provide selective demolition and infill of existing siphon.
 - (f) Provide all excavation and backfill to complete work of this Contract.
 - (g) Modify existing chain link fencing as noted on Drawings.
 - (h) Supply and install CSP culverts as detailed on Drawings.
 - (i) Supply and install cantilevered railway crossing signals.
 - (j) Supply and install barrier cushions as specified.

D3. DEFINITIONS

- D3.1 When used in this Bid Opportunity:
- (a) “**PR 207**” means Provincial Road 207;
 - (b) “**WTP**” or “**WWTP**” means Winnipeg Water Treatment Plant;

- (c) “**GWWD**” means Greater Winnipeg Water District; and
- (d) “**TGS**” means Manitoba Transportation and Government Service;
- (e) “**Contract Work Schedule**” means a Gantt Charter developed by the Contractor developed using the critical path method which shows the proposed progress of the major items of work which are to be performed under this Contract
- (f) “**Project Master Schedule**” means a schedule developed by the Contract Administrator which includes and coordinates the Contract Work Schedules of several City contracts, including this Contract;
- (g) “**Professional Engineer**” means a professional engineer registered in the Province of Manitoba;
- (h) “**CSP**” means corrugated steel pipe;
- (i) “**Design Engineer**” means Earth Tech (Canada) Inc.;
- (j) “**sta.**” means 100 metre segment of the Work.

D4. CONTRACT ADMINISTRATOR

D4.1 The Contract Administrator is UMA Projects (CM) Ltd., represented by:
Bob Willemsen, C.E.T.
1479 Buffalo Place
Winnipeg, Manitoba, R3T 1L7

Telephone No. (204) 986-7635
Facsimile No. (204) 986-8393

D4.2 At the pre-construction meeting the Contract Administrator will identify additional personnel representing the Contract Administrator and their respective roles and responsibilities.

D5. CONTRACTOR'S SUPERVISOR

D5.1 At the pre-construction meeting, the Contractor shall identify his designated supervisor and any additional personnel representing the Contractor and their respective roles and responsibilities for the Work.

D5.2 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 D5.1 or an alternate can be contacted 24 hours a day to respond to an emergency.

D6. NOTICES

D6.1 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.

D6.2 All notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the City, except as expressly otherwise required in D6.3, D6.4 or elsewhere in the Contract, shall be sent to the attention of the Contract Administrator at the address or facsimile number identified in D4.1.

- D6.3 All notices of appeal to the Chief Administrative Officer shall be sent to 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

- D6.4 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

D7. FURNISHING OF DOCUMENTS

- D7.1 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

D8. SAFE WORK PLAN

- D8.1 The Contractor shall provide the Contract Administrator with a Safe Work Plan at least five (5) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in GC:4.1 for the return of the executed Contract.
- D8.2 The Safe Work Plan shall be prepared and submitted in the format shown in the City's template which is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Branch internet site at <http://www.winnipeg.ca/matmgt>.

D9. INSURANCE

- D9.1 The Contractor shall provide and maintain the following insurance coverage at all times during the performance of the Work and throughout the warranty period, except for all claims made policies, which shall be maintained for a minimum of twenty four (24) months after the date of Total Performance:
- (a) Commercial General Liability insurance in the minimum amount of five million dollars (\$5,000,000) all inclusive. The said Commercial General Liability insurance shall include coverage for products and completed operations, blanket contractual liability, cross liability, non owned automobile liability, and unlicensed motor vehicle liability. The said Commercial General Liability insurance shall include the City of Winnipeg, the Province of Manitoba, the Design Engineer, and the Contract Administrator as additional insureds;
 - (b) All Risks 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 Design Engineer and the Contract Administrator as additional insureds;

- (c) Automobile Liability insurance for owned automobiles use for or in connection with the Work in the amount of at least two million dollars (\$2,000,000).

D9.2 All policies shall be taken out with insurers licensed to and carrying on business in the Province of Manitoba.

D9.3 Deductibles shall be borne by the Contractor.

D9.4 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.

D9.5 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 Site but in no event later than the date specified in GC:4.1 for the return of the executed Contract.

D10. WORK SCHEDULE

D10.1 The Contract Administrator has developed a Project Master Schedule for the project. This schedule will be available in the offices of the Contract Administrator and will be updated as required as the work progresses.

D10.2 The Contractor shall, within 5 business days of award of contract, prepare a detailed Contract Work Schedule for his work based on a critical path method (CPM) approach.

D10.3 The schedule shall conform to the Project Master Schedule and show, in a clear graphical manner, through the use of Gantt charts, in a maximum of weekly stages, the proposed progress of the main items, structures and subtrades of the contract and indicate the labour, construction crews, plant and equipment to be employed. Indicate the delivery date of major pieces of equipment to be supplied. The schedule shall be predicated on the completion of all work on or before the date of Substantial Performance.

D10.4 Upon acceptance by the Contract Administrator, distribute copies of the revised schedule to Subcontractors and other concerned parties.

D10.5 The Contract Work Schedule shall be updated as the work requires and submitted to the Contract Administrator.

D10.6 The Contractor shall instruct recipients to report to the Contractor immediately any problems anticipated by the timetable shown in the Contract Work Schedule.

D10.7 While it is intended that the Contractor shall be allowed, in general, to carry on the Contract in accordance with such general plans as may appear to him to be most desirable, the Contract Administrator, at his discretion, may direct the order in which, and points at which, the work shall be undertaken.

D10.8 This control shall be exercised in the interests of the City so that the work or other Contractors who may be working on the site may be coordinated with the work on this Contract. A program of work will be drawn up and agreed to before the commencement of the Contract.

D10.9 The Contract Administrator shall be notified immediately when the work under the Contract Work Schedule will adversely affect the work of other Contractors and the critical path of the Project Master Schedule as the work under the Contractor's Contract Work Schedule is an integral part of the Project Master Schedule.

D10.10 The Contractor shall be familiar with all other Contract Work Schedules as contracted by the City with other contractors and the critical path of the Project Master Schedule.

D11. PERFORMANCE SECURITY

- D11.1 The Contractor shall provide and maintain performance security until the expiration of the warranty period in the form of:
- (a) a performance bond of a company registered to conduct the business of a surety in Manitoba, in the form attached to these Supplemental Conditions (Form H1: Performance Bond), in the amount of fifty percent (50%) of the Contract Price; or
 - (b) an irrevocable standby letter of credit issued by a bank or other financial institution registered to conduct business in Manitoba and drawn on a branch located in Winnipeg, in the form attached to these Supplemental Conditions (Form H2: Irrevocable Standby Letter of Credit), in the amount of fifty percent (50%) of the Contract Price; or
 - (c) a certified cheque or draft payable to "The City of Winnipeg", drawn on a bank or other financial institution registered to conduct business in Manitoba, in the amount of fifty percent (50%) of the Contract Price.
- D11.1.1 Where the performance security is in the form of a certified cheque or draft, it will be deposited by the City. The City will not pay any interest on certified cheques or drafts furnished as performance security.
- D11.2 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.

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 D5.2.
 - (iv) the Safe Work Plan specified in D8;
 - (v) evidence of the insurance specified in D9;
 - (vi) the detailed work schedule specified in D10;
 - (vii) detailed prices specified in D11; and
 - (viii) the performance security specified in D12.
 - (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 Contractor shall not commence the work on the aqueduct bridge before July 15, 2006.

D13. CRITICAL STAGES

D13.1 The Contractor shall work continuously to achieve critical stages of the Work in accordance with the following requirements:

- (a) Complete aqueduct bridge and re-open PR #207 to through traffic forty-five (45) Calendar Days after July 15, 2006 or Contract Award Date, whichever is later.

D14. SUBSTANTIAL PERFORMANCE

D14.1 The Contractor shall achieve Substantial Performance by September 15, 2006.

D14.2 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.

D14.3 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.

D15. TOTAL PERFORMANCE

D15.1 The Contractor shall achieve Total Performance by October 15, 2006.

D15.2 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.

D15.3 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.

D16. LIQUIDATED DAMAGES

D16.1 If the Contractor fails to achieve the critical stages, 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) Reopen PR 207 to through traffic – one thousand dollars (\$1,000.00);
- (b) Substantial Performance – two thousand, six hundred dollars (\$2,600.00);
- (c) Total Performance – six hundred dollars (\$600.00).

D16.2 The amounts specified for liquidated damages in D16.1 are based on a genuine pre-estimate of the City's losses in the event that the Contractor does not achieve critical stages, Substantial Performance or Total Performance by the days fixed herein for same.

D16.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

D16.4 The City will not pay a bonus if the Contractor reaches the critical stages, Substantial Performance or Total Performance earlier than the dates specified herein.

CONTROL OF WORK

D17. JOB MEETINGS

- D17.1 Regular weekly job meetings will be held at the Deacon Reservoir Construction site. These meetings shall be attended by a minimum of one representative of the Contract Administrator and one representative of the Contractor. Each representative shall be a responsible person capable of expressing the position of the Contract Administrator 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.
- D17.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he deems it necessary.

D18. WORK BY OTHERS

- D18.1 Work by others on or near the Site will include but not necessarily be limited to:
- (a) Relocation of Hydro pole adjacent to existing Cell 3 fence;
 - (b) GWWD railway tie replacement and crossing lengthening activities;
 - (c) MTS underground relocation.

D19. SEQUENCE OF WORK

- D19.1 Further to GC:6.1, the Contractor shall submit with his Contract Work Schedule a plan for the sequencing of Work. Sequence of Work shall include the following:
- (a) Workflow and traffic flow access drawings for Petro Pass and WTP access.
 - (b) Maintain continuous access for vehicles and equipment entering and exiting the WTP site and Petro Pass.
 - (c) The Contractor shall sequence the asphalt installation at the Petro Pass such that one (1) approach remains continuously accessible for vehicle traffic. Truck traffic shall not be permitted on new asphalt until new asphalt has cured.
 - (d) The City will provide access to Cell 3 compound to install new chain link fence posts. Demolition of existing chain link fabric and relocation of existing fabric to new fence posts shall be completed in a continuous manner. Contractor shall maintain continuous presence until Cell 3 compound is secure.
 - (e) Contractor shall provide Contract Administrator five (5) days notice for coordinating work to be completed by GWWD rail services.
- D19.2 Immediately following the completion of the asphaltic concrete work, the Contractor shall clean up the Site and remove all plant, surplus material, waste and debris, other than that left by the City or other contractors.

D20. PRIME CONTRACTOR – THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA)

- D20.1 Further to GC:6.26, the Contractor shall be the Prime Contractor and shall serve as, and have the duties of the Prime Contractor in accordance with The Workplace Safety and Health Act (Manitoba).

FORM H1: PERFORMANCE BOND
(See D11)

KNOW ALL MEN BY THESE PRESENTS THAT

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

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

_____ dollars (\$_____)

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

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

_____ day of _____, 20____, for:

BID OPPORTUNITY NO. 219-2006

WINNIPEG WATER TREATMENT PROGRAM – PROVINCIAL ROAD #207 UPGRADE

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 D11)**

(Date)

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

RE: PERFORMANCE SECURITY – BID OPPORTUNITY NO. 219-2006

WINNIPEG WATER TREATMENT PROGRAM – PROVINCIAL ROAD #207 UPGRADE

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

(Name of Contractor)

(Address of Contractor)

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

_____ Canadian dollars.

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

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

Partial drawings are permitted.

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

(Address)

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

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

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

(Date)

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

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

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

(Name of bank or financial institution)

Per: _____
(Authorized Signing Officer)

Per: _____
(Authorized Signing Officer)

PART E - SPECIFICATIONS

GENERAL

E1. APPLICABLE SPECIFICATIONS, STANDARD DETAILS AND DRAWINGS

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

<u>Consultant Drawing No.</u>	<u>City Drawing No.</u>	<u>Drawing Title</u>
CM G001		CONSTRUCTION SITE LAYOUT
WN-C0164	1-0601N-A-C0164-001-00D	CIVIL - INTERSECTION PLAN
WN-C0165	1-0601N-A-C0165-001-00D	CIVIL - PLAN - PROFILE - WATER TREATMENT PLANT ACCESS ROAD
WN-C0166	1-0601N-A-C0166-001-00D	CIVIL - PLAN - PROFILE - CELL 4 ACCESS ROAD
WN-C0167	1-0601N-A-C0167-001-00D	CIVIL - PLAN - PROFILE - CELL 2 ACCESS ROAD
WN-C0168	1-0601N-A-C0168-001-00D	CIVIL - PLAN - PROFILE - PR #207 WIDENING
WN-C0169	1-0601N-A-C0169-001-00D	CIVIL - SECTIONS - PR #207 STA. 0+120 TO 3+550
WN-C0170	1-0601N-A-C0170-001-00D	CIVIL - PAVEMENT MARKING PLAN
WN-C0171	1-0601N-A-C0171-001-00D	CIVIL - INTERSECTION UTILITY PLAN
WN-C0172	1-0601N-A-C0172-001-00D	CIVIL - RAILWAY CROSSING PLAN - PR #207
WN-C0173	1-0601N-A-C0173-001-00D	CIVIL - RAILWAY CROSSING PLAN - CELL 2 ACCESS ROAD
WN-S0150	1-0601N-A-S0150-001-00D	STRUCTURAL - PR #207 BRIDGE - PLAN AND NOTES
WN-S0151	1-0601N-A-S0151-001-00D	STRUCTURAL - PR #207 BRIDGE - BRIDGE LAYOUT AND ELEVATION
WN-S0152	1-0601N-A-S0152-001-00D	STRUCTURAL - PR #207 BRIDGE - BOREHOLE LOGS
WN-S0153	1-0601N-A-S0153-001-00D	STRUCTURAL - PR #207 BRIDGE - BOREHOLE LOGS
WN-S0450	1-0601N-A-S0450-001-00D	STRUCTURAL - PR #207 BRIDGE - ABUTMENT CONCRETE DETAILS
WN-S0451	1-0601N-A-S0451-001-00D	STRUCTURAL - PR #207 BRIDGE - ABUTMENT REINFORCING AND CONCRETE DETAILS
WN-S0452	1-0601N-A-S0452-001-00D	STRUCTURAL - PR #207 BRIDGE - DECK SLAB DETAILS
WN-S0453	1-0601N-A-S0453-001-00D	STRUCTURAL - PR #207 BRIDGE - APPROACH SLAB DETAILS

E1.3 The following *Manitoba Transportation and Government Services Standard Construction Specifications* are applicable to the Work:

SPECIFICATION NO.	TITLE	DATE
200	Traffic Control	March 2002
300	Clearing and Grubbing	July 2003
400	Removing Culverts and Placing Culverts	March 2002
500	Grading	July 2003
540(l)	Seeding	February 2001
600	Stockpiling Aggregates	June 1998
700	Granular Base Course	March 2002
805	Applying Prime Coat, Blotter, and Tack Coat	July 2003
815	Reclaiming Bituminous Pavement	May 1997
900	Aggregate for Granular Base Course	March 2002
1000 M	Excavation for Structures	May 1984
1002 M	Supplying and Placing Granular Backfill	February 1982
1016 M	Driving Pre-cast Concrete Piles	May 1984
1030 M	Reinforced Concrete	May 1984
1031M	Ready-Mixed Concrete	January 1981
1032 M	Reinforced Concrete Deck Slabs, Approach Slabs, Rigid Frames, End Newel Posts, Curbs, Sidewalks, and Medians	May 1984
1052 M	Asphalt Paving on Bridges	May 1984
1055 M	Hot Poured Rubber Asphalt Waterproofing	May 1984

E1.3.1 The specifications referenced in E1.3 are available at the following internet website:
<http://www.gov.mb.ca/tgs/contracts/specmanual/index.html>.

E1.3.2 All materials shall conform to Manitoba Transportation's Standard Products List.

GENERAL REQUIREMENTS

E2. QUALITY CONTROL

E2.1 The Contractor shall submit a quality control testing plan to the Contract Administrator two days prior to the pre-construction meeting that covers all earthworks, sub-base course, base course, and bituminous pavement. This plan shall be comprehensive and will be approved by the Contract Administrator. An independent testing laboratory shall be used.

E3. TRAFFIC CONTROL

E3.1 Further to Specification 200, the Contractor shall abide by the following:

E3.1.1 The Contractor shall supply a flagperson to accompany the pulvi-mixing operation.

- E3.1.2 All dump trucks on the project shall be equipped with a back-up warning device.
- E3.1.3 The unit price for "Traffic Control, Level IV (Modified)" will be considered payment in full for the work described above and for performing all operations necessary or incidental thereto.

E4. OFFICE AND SITE FACILITIES

- E4.1 The Contractor shall supply office facilities for his own use and also for Concrete Quality Testing. The facilities shall be situated at the area designated on the drawings.

E5. SITE ROADS AND WORK SITE ACCESS

- E5.1 The Contractor shall have access to the Site on Business Days between 07:00 and 18:00 unless otherwise approved by the Contract Administrator.
- E5.2 Access to the work site is restricted and cooperation with other contractors on site is necessary in the best interest of all parties.
- E5.3 The Site is Provincial Road 207, from NE ¼ section 11-10-4E to NW ¼ section 24-10-4E.
- E5.3.1 The WTP Site address is PR 207, Lot 57082, Dugald, Manitoba.
- E5.3.2 Provincial Road 207 is a Class B1 road and is subject to load restrictions which will affect the maximum weight of individual deliveries. However, The City of Winnipeg and Manitoba Transportation and Government Services (TGS) have reached the following agreement to facilitate construction of the Winnipeg Water Treatment Program:
- (a) During the TGS imposed Spring Restriction period, normal (non Spring Restriction) Class B1 highway loadings will be allowed on PR 207 between the entrance to the Site and Highway 1. The Spring Restriction period is normally in place from March 23 to May 26, but it is subject to change due to weather conditions as assessed by TGS. Upon removal of the Spring Restriction, normal Class B1 will continue to be allowed.
 - (b) TGS permits will be required for each construction vehicle in excess of Class B1 highway loading from January 1, 2006 until the upgrade of PR 207 has been completed:
 - (i) The Contract Administrator will provide permit forms to the Contractor.
 - (ii) The Contractor shall complete a permit form for each company retained to transport materials to the Site and shall return them to the Contract Administrator who will submit the permit forms to TGS for processing.
 - (iii) The Contract Administrator will return the completed permit forms to the Contractor and the Contractor shall ensure that each vehicle carries a photocopy of the permit.
 - (iv) The permit fee will be paid directly to TGS by the City of Winnipeg. The Contractor will not be charged for the permit fees.
 - (v) The permit will be good for 1 year from issue.
 - (vi) The Contract Administrator will establish a process to record the date, company name and commodity of each vehicle entering the Site.
- E5.4 TGS will make random permit checks of vehicles using PR 207.
- E5.5 Construction and removal, if necessary, of any additional access roads is the responsibility of the Contractor.

E6. SANITATION FACILITY

E6.1 Portable toilets may be provided by the Contractor. Any portable toilet shall be cleaned on an as required basis and provided with regular maintenance as required to ensure proper operation.

E6.2 Portable toilets shall be located in an area acceptable to the Contract Administrator.

E7. CONDITION, PROTECTION OF, AND ACCESS TO THE AQUEDUCT

E7.1 Condition of the Aqueduct

E7.1.1 The Aqueduct is constructed of reinforced concrete and in some areas, contains numerous cracks. The Aqueduct, therefore, shall be considered as a fragile structure. All work procedures conducted by the Contractor on and/or near the Aqueduct shall be well planned and executed to ensure that the Aqueduct is not subjected to construction related loads, including excessive vibrations and concentrated or asymmetrical lateral loads.

E7.2 Protection of the Aqueduct

E7.2.1 Contractors working in the vicinity of the aqueduct shall ensure that:

- (a) Equipment shall only be permitted to cross the Aqueduct at designated bridge crossing locations and shall come to a complete stop before crossing.
- (b) Granular material, construction material, soil or other material shall not be stockpiled on the Aqueduct or within 10 m of the Aqueduct centreline.
- (c) Construction practices shall not subject the Aqueduct arch to asymmetrical loading at any time.
- (d) Construction practices or procedures at or near the Aqueduct shall not impart excessive vibration loads on the Aqueduct and/or cause settlement of the subgrade below the Aqueduct.

E7.2.2 It is the Contractors' responsibility to ensure that all work crew members understand, observe, and work to the requirements of specifications.

E7.3 Equipment Restrictions

E7.3.1 Equipment must cross the Aqueduct in a responsible and careful manner (i.e. slowly).

E8. ENVIRONMENTAL PROTECTION

E8.1 The Contractor shall be aware that the Aqueduct is for potable water supply and no contamination by fuel, chemicals, etc. shall be permitted at any time. Fuels or chemicals shall not be stored within 30 m of the Aqueduct.

E8.2 The Contractor shall plan and implement the Work of this Contract strictly in accordance with the requirements of the environmental protection measures as herein specified.

E8.3 The Contractor is advised that at least the following Acts, Regulations, and By-laws apply to the Work:

E8.3.1 Federal

- (a) Canadian Environmental Protection Act (CEPA) c.16
- (b) Transportation of Dangerous Goods Act and Regulations c.34

E8.3.2 Provincial

- (a) The Dangerous Goods Handling and Transportation Act D12

- (b) The Endangered Species Act E111
- (c) The Environment Act c.E125
- (d) The Fire Prevention Act F80
- (e) The Manitoba Nuisance Act N120
- (f) The Public Health Act c.P210
- (g) The Workplace Safety and Health Act W120
- (h) Current applicable associated regulations.
- (i) The Fisheries Act
- (j) The Migratory Birds Act
- (k) The Historic Resources Act
- (l) Drinking Water Safety Act

E8.3.3 The Contractor is advised that the following environmental protection measures apply to the Work.

E8.3.4 Materials Handling and Storage

- (a) Construction materials shall not be stored within 10 of the Aqueduct centerline without the approval of the Contract Administrator.

E8.3.5 Fuel Handling and Storage

- (a) The Contractor shall abide by the requirements of Manitoba Conservation storage and handling of Petroleum Products and Allied Products Regulations for handling and storage of fuel products.
- (b) 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.
- (c) 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.
- (d) The Contractor shall ensure that all fuel storage containers are inspected daily for leaks and spillage.
- (e) Products transferred from the fuel storage area(s) to specific work sites shall not exceed the daily usage requirement.
- (f) 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. No repairs within 30 m of aqueduct or watercourse will be permitted.
- (g) Refuelling of mobile equipment and vehicles shall take place at least 30 m from a watercourse.
- (h) 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.
- (i) 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. All refuelling vehicles shall be equipped with a spill response kit.

E8.3.6 Waste Handling and Disposal

- (a) The construction area shall be kept clean and orderly at all times during and at completion of construction.

- (b) 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.
- (c) Indiscriminate dumping, littering, or abandonment shall not take place.
- (d) No on-site burning of waste is permitted.
- (e) Equipment shall not be cleaned within 30 m of watercourses; contaminated water from onshore cleaning operations shall not be permitted to enter watercourses.

E8.3.7 Dangerous Goods/Hazardous Waste Handling and Disposal

- (a) Dangerous goods/hazardous waste are identified by, and shall be handled according to, The Dangerous Goods Handling and Transportation Act and Regulations.
- (b) The Contractor shall be familiar with The Dangerous Goods Handling and Transportation Act and Regulations and meet training requirements for these Regulations.

E8.3.8 Emergency Spill Response

- (a) The Contractor shall ensure that due care and caution is taken to prevent spills.
- (b) The Contractor shall report all major spills of petroleum products or other hazardous substances with the potential for impacting the environment and threat to human health and safety to the Contract Administrator and Manitoba Conservation, immediately after occurrence of the environmental accident, by calling the 24-hour emergency telephone phone number (204) 945-4888.
- (c) 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. (Should include reference to a site-specific Emergency Response Plan and Environmental Protection Plan.)
- (d) 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 Conservation 24-hour Spill Response Line (204) 945-4888, RCMP (Oakbank Detachment) (911), City of Winnipeg Fire Department (911), Springfield Ambulance (911), company backup, contact Contract Administrator.
 - (ii) 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 and the Aqueduct
 - (iii) 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 sorbent material or dry clay soil or sand
 - prevent spill material from entering waterways and utilities by dyking
 - prevent spill material from entering Aqueduct manholes and other openings by covering with rubber spill mats or dyking
- (iv) 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 the Manitoba Conservation according to The Dangerous Goods Handling and Transportation Act Environmental Accident Report Regulation 439/87.

E9. SITE RESTORATION

- E9.1 The Contractor shall remove the temporary site office and storage facilities prior to Total Performance being issued.
- E9.2 The Contractor shall be responsible for ground restoration, as determined necessary by the Contract Administrator.
- E9.3 The Contractor shall be responsible for any damage caused by his forces on roadways or accesses.

SPECIFICATIONS FOR THE CONSTRUCTION OF THE AQUEDUCT BRIDGE

E10. INSPECTION

- E10.1 Construction operations for timber, concrete, steel or other structures shall not be in progress when the Contract Administrator or his representative is not on the site unless otherwise authorized by the Contract Administrator.

E11. BOREHOLE LOGS

- E11.1 The City provides borehole log information shown on the Drawings. The information may not be representative of the soil conditions throughout the site. The following clauses in the referenced specifications are not applicable to this project:
- (a) Specification No. 1000 M, "Specifications for Excavation for Structures", Clause 7.13.
 - (b) Specification No. 1016 M, "Specifications for Driving Precast Concrete Piles", Clause 7.8.

E12. EXCAVATION FOR STRUCTURES

- E12.1 In addition to the work called for in specification No. 1000 M, "Specifications for Excavation for Structures", the Contractor will be responsible under his Contract Price to:
- E12.1.1 Remove and dispose of all surplus excavated material or any other debris on Site as directed by the Contract Administrator.
 - E12.1.2 Maintain the slopes to the elevations and limits as indicated on the Drawings and as directed by the Contract Administrator, as well as transitioning, as required, to meet the existing slopes or new roadway embankment.
- E12.2 Measurement and payment made for excavation of structures shall be incidental to the Work. The remaining items within specification No. 1000 M shall be considered incidental to and paid for under the unit contract price.

E13. PRECAST CONCRETE PILES

E13.1 Notwithstanding and in addition to specification 1016 M, "Specifications for Driving Precast Concrete Piles", the following shall apply:

E13.1.1 Materials

- (a) Precast concrete piles shall be supplied and installed by the Contractor. The Contractor shall submit shop drawings of the piles, connections to abutment cap and pile extension (if required) to the Contract Administrator for approval. Each drawing submitted shall bear the signature and stamp of a qualified Professional Engineer registered in the province of Manitoba. Each pile, its extension (if required) as well as its connection to abutment cap shall have design structural capacity as stated on the Drawing.

E13.1.2 Construction

- (a) At each piling location, a hole shall be bored down to 1.50 m (minimum) below the invert elevation of the aqueduct as shown on the Drawing. The diameter of the pre-bored hole shall be the same as that of the pile.
- (b) Piles shall be inserted into the pre-bored holes and then driven to refusal. A driven pile shall be regarded as reaching refusal when it advances 1 in (25 mm) or less after driven by 15 blows of hammer having a rated energy of 26 ft-kip (35 kJ) per blow. The Contractor shall consult the Contract Administrator for refusal criteria for pile driving equipment having rated energy other than 35 kJ per blow.

E14. VOID FORM

E14.1 Cellular corrugated paper Void Form shall be of a type specified on the Drawings or equivalent as approved by the Contract Administrator.

E14.2 No measurement or separate payment shall be made for supplying and placing void form. The works shall be considered incidental to and paid for under the unit contract price.

E15. MIXING AND PLACING CONCRETE

E15.1 Construction of the abutments, bridge slab and approach slabs shall be in accordance with the specifications 1030 M, 1031 M and 1032 M. All materials required for the constructions shall be furnished by the Contractor from sources approved by the Contract Administrator.

E15.2 Notwithstanding the specifications, referenced above, the contractor will also be responsible for the following:

- E15.2.1 Supplying and applying concrete curing compound with fugitive dye to all exposed horizontal surfaces of the concrete abutments. The compound shall be water-based membrane-forming and of a type approved by the Contract Administrator. It shall conform to the requirements of ASTM C309 and be applied as directed by the manufacturer and in accordance with the specification.
- E15.2.2 Wet-curing of all exposed portions of superstructure concrete, as directed by the Contract Administrator. The curing shall be accomplished by applying a clean damp burlap or polyester blanket within 30 minutes of finishing operations. The burlap or polyester blanket shall receive an additional cover of 4 mil white or opaque polyethylene as soon as the surface conditions permit.
- E15.2.3 Supplying and incorporating water-reducing admixture. Ensuring that the concrete mix does not contain any retarding agent.
- E15.2.4 Ensuring compatibility of all admixtures included in the concrete mix.

- E15.3 No measurement or separate payment shall be made for the works, stated in the above two subsections, as they will be considered incidental to and paid for under the unit contract price.
- E15.4 Should deepening of the abutment caps be required, as a result of unexpected foundation condition, the contractor shall submit shop drawings to the Contract Administrator describing his proposed modifications to the abutment caps. The Contractor shall proceed with the construction of the abutment caps upon approval from the Contract Administrator. The works involved shall be paid for in accordance with GC:12.
- E15.5 No measurement or separate payment shall be made for supplying, mixing and placing lean-mixed concrete working base. The works shall be considered incidental to and paid for under the unit contract price
- E15.6 No measurement or separate payment shall be made for supplying and placing insulator. The works shall be considered incidental to and paid for under the unit contract price.

E16. COMPRESSION SEAL

- E16.1 The contractor shall supply and install preformed compression seals including accessories at the joints between bridge deck and approach slabs. No separate payment will be made for the work as it will be considered incidental to the Contract Unit Price.

E17. HOT POURED RUBBERIZED ASPHALT WATERPROOFING

- E17.1 The hot poured rubberized asphalt water proofing shall be applied on the bridge deck and approach slabs to the limits shown on the Drawings. The asphalt waterproofing shall be "HYDROTECH Flexible Waterproofing Membrane 6125" or an approved equivalent.
- E17.2 Further to specification 1055 M, the Contractor shall supply and install hot poured rubber asphalt waterproofing in accordance with the following:
- (a) Sandblasting to clean concrete surface onto which the asphalt waterproofing is to be applied.
 - (b) Smoothing levelling of the concrete surface by mean of light chipping or grinding or other approved methods.
 - (c) Final cleaning of the concrete surface by mean of high velocity compressed air, immediately prior to the application of the hot poured rubberized asphalt waterproofing.
 - (d) Supplying and installing an approved heavy duty elastomeric sheet which is compatible with the hot poured rubberized asphalt water proofing. The elastomeric sheet shall be "ELSRO PETROTACT 240" or an approved equivalent. The installation shall be in accordance with the manufacturer's recommendations.
 - (e) Supplying and installing approved protection boards to cover the hot poured rubberized asphalt water proofing on the bridge deck and approach slabs. The protection board shall be "SEALTIGHT VIBRAFLEX 70" or an approved equivalent. The installation shall be in accordance with the manufacturer's recommendations. This shall replace the dusting requirement, i.e. Section 7.2(g) of the referenced specification.

E18. ASPHALT PAVING ON BRIDGES

- E18.1 Asphalt paving on bridge deck and approach shall be done in conformance with specifications 1052 M, "Specifications for Asphalt Paving on Bridges". The asphalt mix shall be pre-approved based on trial samples supplied by the Contractor and tested by the City's designated laboratory prior to placement on site.
- E18.2 Application of tack coat onto the protection board is required. The asphalt paving machine shall proceed in the same direction as the protection board. The Contractor shall saw-cut the asphalt, supply and place an approved joint sealant as shown on the Drawings.

- E18.3 No measurement or separate payment shall be made for the works, stated in the above two subsections, as they will be considered incidental to and paid for under the unit contract price.

SPECIFICATIONS FOR THE CONSTRUCTION OF PR 207

E19. CLEARING AND GRUBBING

- E19.1 All trees designated for removal, as outlined on the drawings, shall be removed. This will also include the removal of stumps and roots. All material removed shall be disposed of off site.
- E19.2 Contrary to specification 300.11 Clearing and Grubbing will not be paid directly, but will be considered incidental to the Work.

E20. PLACING CULVERTS

- E20.1 Contrary to specification 400.11, culvert gravel and the removal of unsuitable material will not be paid for directly, but will be considered incidental to the installation of the culverts.
- E20.2 Contrary to specification 3.1 the culverts will not be supplied by the City. The Contractor shall be responsible for the ordering, delivery, and payment for the culverts.
- E20.3 All culverts shall conform to CSA G401, Corrugated Steel Pipe Products and ASTM A90, Standard Test Method for Weight (Mass) of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings.
- E20.4 All culverts shall be 2.0 mm gauge and 65 mm x 13 mm corrugation profile.
- E20.5 Notwithstanding Specification CSA G401, the corrugated steel culverts and couplers shall be Aluminized Type 2 coated.
- E20.6 Coupler flanges shall consist of rolled or formed angles, or lugs, that are to be riveted or welded to the coupler. The coupler ends shall have a minimum overlap of 50 mm after the connection is tightened.
- E20.7 Notwithstanding CSA G401, Section 3.5.1.2.6, the surface condition called "white rust" will be evaluated according to severity of staining. Where the staining covers more than 10% of the surface area of the culvert or has developed into grey spotting, test coupons shall be cut from the culvert. These coupons shall be chemical strip tested in accordance with ASTM A90. Culverts shall be rejected if testing shows insufficient coating thickness. When the staining has developed to dark grey or black spotting, the culvert shall be rejected.
- E20.8 Culverts unacceptable due to failure to meet specifications or due to damage in shipping or handling shall be rejected and shall be immediately replaced or repaired by the Contractor.

E21. GWWD RAILWAY EMBANKMENT CULVERT REMOVAL AND INSTALLATION

- E21.1 Description
- E21.1.1 Culvert Installation shall be in accordance with 400, "Specification for Removing Culverts and Placing Culverts" except where noted, revised, or supplemented in this specification.
- E21.2 Materials
- E21.2.1 The Contractor shall supply railway ballast in accordance with the requirements hereinafter specified.
- E21.2.2 Railway ballast shall be composed of hard, strong and durable particles, clean and free from injurious amounts of deleterious substances and conforming to the following requirements of this specification.

(a) The limits for deleterious substances are as follows:

- (i) Soft and friable pieces 5.0%
- (ii) Material finer than No. 200 Sieve 2.0%
- (iii) Clay lumps 0.5%

E21.2.3 The percentage of wear shall be less than 32%, as determined by the LA Abrasion Test, ASTM Designation C131.

E21.2.4 The soundness loss shall be less than 13.0%, as determined by the magnesium sulphate soundness test for coarse aggregate, ASTM Designation C88.

E21.2.5 The railway ballast shall contain less than 25% by mass of flat pieces. In case of dispute, the test method "Determination of Flakiness Index", British Standard B12, shall be used.

E21.2.6 The minimum bulk specific gravity shall be 2.60, ASTM Designation C127.

E21.2.7 At least 60% of the railway ballast shall have 2 or more fractured faces.

E21.2.8 Railway ballast shall conform to the following gradation in accordance with ASTM Designation C136 and C117:

Sieve Opening Size	Permissible Range (% by Weight Passing)
2 inch	100
1½ inch	90 – 100
1 inch	20 – 55
¾ inch	0 – 15
¾ inch	0 – 5
No. 200	0 - 2

E21.3 Construction Methods

E21.3.1 The City of Winnipeg will be responsible for removing and reinstalling the ties and rail. At least five (5) Business Days notice shall be given to the Contract Administrator.

E21.3.2 The Contractor shall complete the excavating, culvert installation, and backfilling within a 24 hour period following removal of the ties of and rail.

E21.3.3 The Contractor shall excavate to the lines and grades as specified by the Contract Administrator and install the culvert according to specification 400.

E21.3.4 After proper placement and backfill of the culvert the Contractor shall rebuild the track structure to match the existing.

E21.3.5 The sub-ballast layer shall be a minimum of 300 mm in thickness. The Contractor shall utilize a 50 mm down crushed limestone material meeting CW3110-R7. It shall be placed and compacted according to CW3110.

E21.3.6 The ballast material layer shall be a minimum of 300 mm in thickness. The Contractor shall utilize a material as specified in specification E20.2 above. It shall be placed and compacted according to CW3110.

E21.4 Measurement and Payment

E21.4.1 The length of pipe culvert removed will be determined by linear measurement along its invert.

E21.4.2 The length of culvert placed will be determined by linear measurement along its invert.

E21.4.3 Removal and placement of the corrugated steel pipe culvert through the GWWD Railway will be paid for at the Contract Unit Price per metre for Removing Metal Pipe Culverts and Placing Culverts - Group A, respectively.

E21.4.4 No payment will be made for the culvert bedding, rail embankment, sub-ballast and ballast. This will be considered incidental to the culvert removal and installation for the GWWD Railway.

E22. WORK BY THE GWWD RAILWAY

E22.1 The GWWD Railway will be on site lengthening the existing crossing at PR 207 and also constructing the new crossing for the Cell 2 Access Road.

E22.2 Costs related to delays due to the construction of these crossings shall be borne by the Contractor.

E22.3 The Contractor shall supply approximately 25 tonnes of ballast as specified in E20.2.8 above to the GWWD for the track raise. This material shall not be paid for directly, but be considered incidental to the Work.

E23. REMOVE AND INSTALL CHAIN LINK FENCE

E23.1 Description

E23.1.1 Remove and Install Chain Link Fence shall be in accordance with specification CW 3550-R2, "Chain Link Fencing" except where noted, revised, or supplemented in this specification.

E23.2 Materials

E23.2.1 The Contractor shall supply all material as outlined in CW3550-R2 except the fabric. The fabric shall be salvaged from the existing fence and reinstalled on the re-aligned fence. Any other parts that are salvageable from the existing fence will be presented by the Contractor and considered for acceptability by the Contract Administrator. The Contractor shall transfer the fabric to the new alignment during the same work shift.

E23.2.2 The fence height is 3660 mm.

E23.2.3 Concrete piles of 400 mm diameter and 1800 mm in length shall be installed at each post.

E23.3 Construction Methods

E23.3.1 The Contractor shall remove the fence to the limits as indicated on the drawings.

E23.3.2 The new fence (with salvaged material) shall be installed along the alignment as indicated on the drawings.

E23.3.3 The existing piles shall be removed from the ground and disposed of off site.

E23.4 Measurement and Payment

E23.4.1 Chain link fencing will be measured as specified in lineal metres.

E23.4.2 Chain link fencing will be paid as specified in CW 3550-R2.

E24. EXCAVATION

E24.1 Further to 500.1.7 the Contractor shall supply the culverts for the Work.

E24.2 Contrary to 500.1.9 the earth islands remaining after power poles are moved will not be paid as Extra Work. Rather, the Contractor shall bear the cost of levelling the islands.

E24.3 Contrary to 500.1.2 Mobilization of Equipment will not be paid directly, but will be considered incidental to the Work.

- E24.4 Contrary to 500.2.7.5.2 b) the City will not supply lime as a drying agent. Lime shall be supplied by the Contractor.
- E24.5 Contrary to 500.2.11.1 Water will not be paid for directly, but will be considered incidental to the Work.
- E24.6 Topsoil Excavation
- E24.6.1 Notwithstanding specification No. 500.2.11.4 the sod removed from the grade slopes prior to the bench cuts will be included in the topsoil quantities and will be paid for at the unit price for "Topsoil Excavation" and will be payment in full for stripping the slopes including all work necessary or incidental thereto.
- E24.7 Common Excavation
- E24.7.1 Further to specification 500.4 all levelling of existing roads will be paid as Common Excavation.
- E24.8 Borrow Excavation
- E24.8.1 Borrow will be required to widen the intersection of PR 207 and the main access road to the WTP. The Contractor shall bench the sideslopes as outlined in specification 500.2.7.4.
- E24.8.2 Further to specification 500.5 all borrow material shall be obtained from a stockpile within the WTP yard site. The Contractor shall utilize the stockpile at the southerly portion of Muster Area 2, as illustrated on Drawing CM-G001, beginning at the west tip and working in an easterly direction.
- E24.8.3 This stockpile will be measured at the beginning of construction as well as at the end of construction.
- E24.8.4 The unit price for Borrow Excavation will be inclusive of haul.
- E24.8.5 If the Contractor elects to place the fill material on the roadway, construction of the subgrade embankment shall be done on one-half the road at a time.
- E24.8.6 At the end of each days' operation all benched subgrade shall be back-filled with embankment material placed to the specified lines and grades.
- E24.9 The Contractor shall be responsible for quality control testing. Results of all quality control tests shall be submitted to the Contract Administrator as they become available. The Contractor shall bear the cost of all consulting services retained by them.
- E24.9.1 Each layer of embankment or subgrade material shall be tested and accepted by the Contractor's Quality Control lab for compaction before succeeding layers are placed. The density shall be determined by means of a nuclear density machine.
- E24.10 The Contract Administrator will conduct random Quality Assurance testing. The Contractor shall allow the Contract Administrator unhindered access to the materials and shall assist the Contract Administrator in carrying out any sampling, testing or inspection, including but not limited to the provision for necessary traffic control, suitable access and storage.
- E24.11 Portions of the work may be accepted when completed to the satisfaction of the Contract Administrator. Final acceptance of portions to be used by construction equipment will not be given.
- E25. ADJUSTMENT OF MANHOLE**
- E25.1 A manhole as indicated on the drawings shall be lowered by the Contractor.
- E25.2 Further to CW3210-R6 the manhole shall be adjusted as follows:
- (a) Salvage the existing manhole frame and cover.

- (b) Sawcut the concrete barrel to just below ground level.
- (c) Reinstall the manhole frame and cover by sealing with Ramnek.

E25.3 Once adjusted the manhole shall sit flush with the surrounding grade.

E25.4 Adjustment of the manhole will be measured on a unit basis and paid for at the Contract Unit Price per unit for "Adjustment of Catch Basins/Manhole Frames".

E26. DEMOLITION AND ABANDONMENT OF AQUEDUCT SIPHON (FILLING EXISTING CULVERTS)

E26.1 The Aqueduct Siphon that lies just east of PR 207 requires partial demolition and abandonment prior to constructing the Aqueduct Bridge and the embankment for the PR 207 intersection widening.

E26.2 After pumping the siphon clear of water, the headwalls of the siphon shall be removed by sawcutting to just past the 45 degree angle on each end. Any exposed reinforcement steel shall be cut off.

E26.3 According to CW 2160 2.16 Table CW 2160.1 D) a flowable cement-stabilized fill shall be injected into the siphon filling it to the surface. The mixture should be capable of filling all voids in irregular excavations, is self levelling and hardens without the need for compaction.

E26.4 The 150 mm gate valve box shall be removed during demolition.

E26.5 "Filling Existing Culverts" will be measured for payment by volume based on the number of cubic metres used to completely fill the culverts.

E26.6 The price per cubic metre for "Filling Existing Culverts" will be payment in full for demolishing the siphon headwalls, removing the gate valve box, for supplying and placing cementitious fill and for all work necessary to fill the siphon.

E27. FAILURE REPAIR

E27.1 Areas to be repaired shall be designated by the Contract Administrator.

E27.2 Areas excavated for repairs shall be back-filled with materials designated by the Engineer.

E27.3 All failure repairs shall be paid in accordance with GC 7.4 except where applicable contract unit prices apply.

E28. SAWCUTTING PAVEMENT

E28.1 Sawcutting pavement shall be performed at the south project limit adjacent to the Petro-Canada gasoline station. The purpose of the sawcutting is to provide a butt joint to the existing asphaltic concrete. The sawcut shall be in a straight line to provide an even joint to the remaining pavement.

E28.2 The depth of cut shall be to the bottom of the existing pavement.

E28.3 Sawcutting Pavement will not be paid directly, but will be incidental to Reclaiming Bituminous Pavement.

E29. RECLAIMING BITUMINOUS PAVEMENT

E29.1 There are two areas that that have asphaltic concrete. The first is located between stations 0+120 and 0+240, while the second is located at the box culvert between stations 2+430 and 2+450. These areas shall have the asphaltic concrete milled.

- E29.2 The asphaltic concrete shall be milled to full depth at the stations between 0+120 and 0+240, but only milled 30 mm from stations 2+430 to 2+450.
- E29.3 Contrary to 815.7.2, the milled bituminous pavement material is not required to be recycled. However, the milled material shall be disposed of in accordance with the applicable Provincial and Municipal Regulations and Acts.
- E29.4 Contrary to 815.9 the unit price for Reclamation of Existing Bituminous Pavement will not be paid for directly, but will be considered incidental to the Work.

E30. PREPARATION OF EXISTING SURFACE

- E30.1 The Contractor shall scarify the existing road mix bituminous pavement and underlying granular base course to a depth of 150 mm and pulverize it so that no particle has a dimension greater than 100 mm in any plane. The re-laid mixture shall be re-configured to a 2% cross slope and compacted to a minimum of 95% AASHTO Standard Dry Density. The centreline roadway profile, after re-compacting, shall not be lower than 75 mm from existing.
- E30.2 Should the Contractor conduct these operations with equipment and/or methods which result in disturbing material below 150 mm, all material disturbed must be pulverized and re-laid. There will be no additional payment for this work unless the City has requested work below 150 mm be done; in which case the additional scarifying, pulverizing and relaying will be paid for on the basis of Extra Work.
- E30.3 The surface shall be prepared at least one kilometre but not more than two kilometres in advance of placing granular base course material and shall be maintained to the required profile, cross section and density, free from ruts and waves.
- E30.4 Preparation of Existing Surface will be measured in stations of 100 m in length along the centreline of the roadway for the length of surface prepared.
- E30.5 The unit price per station for "Preparation of Existing Surface" will be payment in full for performing all operations described herein and that incidental to the work. The unit of measurement for each station will include all surface preparation within that station whether full or partial roadway width or one or both shoulders or any combination of these.

E31. CRUSHED ROCK 50 MM MINUS (LIMESTONE)

- E31.1 The Contractor shall supply and place Crushed Rock, 50 mm Minus (Limestone) on the accepted subgrade of the gravel portion of the re-aligned Water Treatment Plant Access Road.
- E31.2 Crushed rock shall be bladed and compacted to ensure a maximum of fine material on or near the surface of the lift. To ensure adequate compaction, Crushed Rock, 50 mm minus shall be placed in one (1) lift not exceeding 300 mm in depth. It has been the experience of the City on similar projects that satisfactory compaction is best attained with the use of a heavy grid roller compactor. The City will accept other compaction units, providing the equipment and procedure will ensure a close knit dense surface. Water for compaction, if required, will not be paid for directly, as it will be considered incidental to the unit price for "Crushed Rock, 50 mm minus".
- E31.3 Crushed Rock, 50 mm Minus (Limestone) shall be supplied in accordance with the following requirements:
- (a) Maximum Los Angeles abrasion loss of 35% (ASTM C131)

(b) The gradation of the Crushed Rock, 50 mm Minus Limestone shall be as follows:

Canadian Metric Sieve Size (millimetres)	Percent of Total Dry Weight Passing Each Sieve
50	100%
25	40 – 70%
10	20 – 40%
2.5	5 – 15%
0.08	0 – 5%

E31.4 The unit price per tonne for "Crushed Rock, 50 mm Minus", will be payment in full for supplying, drilling, blasting, processing, loading, hauling, placing and compacting the material in accordance with the guidelines outlined above including such work as may be incidental thereto.

E32. GRANULAR BASE COURSE

E32.1 Contrary to 700.1.2 Mobilization of Equipment will not be paid directly, but will be considered incidental to the Work.

E32.2 Contrary to 900.3.1 the City will not provide quality control (test representative aggregate samples), but will provide quality assurance testing instead.

E32.2.1 The Contractor shall be responsible for quality control testing. Results of all quality control tests shall be submitted to the Contract Administrator as they become available. The Contractor shall bear the cost of all consulting services retained by them.

E32.2.2 The Contract Administrator will conduct random Quality Assurance testing. The Contractor shall allow the Contract Administrator unhindered access to the materials and shall assist the Contract Administrator in carrying out any sampling or testing, including the provision for necessary traffic control, suitable access and storage.

E32.3 Contrary to 900.3.4 the City will not provide a mix design as this will be the responsibility of the Contractor.

E32.4 Contrary to 900.8 the Contract Administrator will only provide quality assurance testing. The Contractor shall be responsible for quality control.

E32.5 Contrary to 900.11.1 Binder will not be paid for directly, but will be considered incidental to the Work.

E32.6 Contrary to 900.11.1 Binder Haul will not be paid for directly, but will be considered incidental to the Work.

E32.7 Contrary to specification 700.3.3, 700.7.4, and 700.7.6 the City will not supply the emulsified asphalt. This shall be the responsibility of the Contractor.

E32.8 Class "A" granular base course shall be produced.

E32.9 Contrary to specification 700.3.4 the Mix Design shall be produced by the Contractor to ensure that the base course aggregate will meet plasticity and/or grain size requirements.

E32.10 The mix design shall be reviewed and approved by the Contract Administrator.

E33. SEEDING

E33.1 All disturbed areas shall be seeded. Seeding shall commence immediately after the work is completed or as directed by the Contract Administrator

- E33.2 Contrary to specification 540 (I).3 the City will not supply the seed. The supplying of the seed shall be the responsibility of the Contractor.
- E33.3 The Certificate of Analysis for each seed supplied shall be provided to the Contract Administrator.
- E33.4 The seed mixture will be composed as follows:
- (a) Application No. 1:
- Timothy 20%
 - Creeping Red Fescue 20%
 - Alsike Clover 10%
 - Meadow Fescue 25%
 - Crested Wheatgrass 25%
- (b) Application No. 2
- Fall Rye 100%
- E33.5 The seed mixture shall be applied separately from the fall rye.
- E33.6 The rate of application shall be 50 kg per hectare for the seed mixture and 50 kg per hectare for the fall rye. The Contractor shall seed the ditches and slopes of the finished grade using a seed drill.
- E33.7 The seed shall be placed at a consistent depth of 6 mm to 19 mm.
- E33.8 Seeding operations shall not be carried out under adverse conditions of high winds, frozen ground, or ground covered with snow, ice, or standing water. Unless otherwise permitted by the Contract Administrator, seeding shall be performed during the following time periods:
- (a) Spring start-up to June 15
- (b) August 1st to September 30
- E33.9 Seeding that is not completed by September 30 shall be completed in the spring of the following year as soon as atmospheric and site conditions allow for seeding operations to commence, as determined by the Contract Administrator.
- E33.10 Notwithstanding specification 540 (I), fertilizer will be required. Fertilizer type fertilizer (34-17-0 or 27-14-0) at approximately 50 kg/hectare shall be incorporated into the soil with the seed or broadcasted following the seeding and in conjunction with the harrowing.
- E33.11 The unit price for "Supplying and Placing Seed" will be payment in full for supplying the seed, transporting the seed to the project site, harrowing, seeding, handling and storage of seed, fertilizing and all operations necessary or incidental thereto.
- E34. TEMPORARY ASPHALT PLANT EMISSION CONTROL GUIDELINES**
- E34.1 Mixing sites shall be sited in accordance with the "Temporary Asphalt Plant Siting Guidelines" dated July 1996, a copy of which may be obtained at the Manitoba Transportation and Government Services "Tenders" Counter in Winnipeg.
- E34.2 The Contractor must adhere to the Manitoba Temporary Asphalt Plant Siting Procedures/Guidelines.
- E34.3 The Contractor may use a fuel source such as propane, natural gas, or de-ashed oil to minimize emissions from the Hot Mix Asphalt (HMA) plant. (acceptable supplier of de-ashed oil:

Enviro-West Inc, or equivalent). If the Contractor selects this option, a material safety data and batch analysis sheets must be submitted for review, prior to HMA plant operation.

- E34.4 Air emissions should not exhibit a visible plume with opacity greater than 5% at any point beyond the plant site, and should not result in the deposition of visible particulate residue at any time beyond the plant site.
- E34.5 A bag house or wet scrubber shall be utilized on asphalt plants to reduce particulate matter emissions. The Contractor shall operate and maintain the emission control device in good working order for the duration of the work.
- E34.6 If a scrubber system is used, the Contractor shall construct suitable settling ponds within the environmental requirements, to handle the settlement of the particulate. The disposal of the sediment in the ponds or the dust collected by the bag filters must be disposed of in a manner that would leave this waste material stable.
- E34.7 The Contractor shall operate the HMA plant in a manner that avoids the creation of off property nuisance, odour and noise. Furthermore, the HMA plant shall be maintained in good working order.
- E34.8 The Contractor shall also treat gravel-surfaced areas regularly with water, or other environmentally friendly suppressant. Vehicle speeds in the plant area must be controlled to minimize dust generation.
- E34.9 No additional payment will be made for the supply, operation and maintenance of the Emission Controls on the Bituminous Plant as described above, as this work will be considered incidental to the unit price for "Bituminous Pavement, Class "B" (Oils Supplied by Contractor)".

E35. APPLYING PRIME COAT, BLOTTER SAND, AND TACK COAT

- E35.1 The base course layer shall be primed with SS-1 emulsified asphalt.
- E35.2 The bituminous pavement shall be tacked with SS-1 emulsified asphalt.
- E35.3 Contrary to specification 805.3.3 the City will not supply any asphalt products.
- E35.4 After fine trimming the granular base in advance of asphaltic concrete, the surface of the base shall be flushed with SS1 as a final operation at an approximate rate of 1.1 l/m² of undiluted SS1.
- E35.5 Contrary to specification 805.3.3 the City will not purchase excess asphalt products.
- E35.6 The unit price for "Bituminous Pavement, Class "B" (oils supplied by Contractor)" will be considered full payment for "Supply and Apply Prime Coat" and for the performance of all operations necessary or incidental thereto.
- E35.7 All asphaltic materials must come from pre-approved suppliers and meet current Manitoba specifications for Emulsified Asphalts dated August 1997 and Asphalt Cements dated August 1992.
 Emulsified asphalts shall conform to the requirements specified in the following table:

Test	ASTM	SS-1
Flash Point, °C	D1310	-
Consistency Test @ 50°C s.f.s.	D88	20-60
Residue by Distillation, %	D244	55 min
Oil Distillate by Volume, %	D244	-

Test	ASTM	SS-1
Storage Stability, %: 24 hour 5 day	D244	- 3 max
Sieve Test, %	D244	0.1 max
Coating Test	D244	uniform
Tests on Residue by Distillation to 260°C		
Pen. at 25°C, mm	D5	100-250
Solubility, %	D2042	97.5 min
Ductility at 25°C, mm	D113	400 min
Float Test at 60°C, sec	D139	-

E36. IMPROVEMENT OF APPROACHES

E36.1 All approaches designated by the Contract Administrator shall be improved. The Contract Administrator shall designate material used to improve the approaches.

E36.2 Payment will be made at the unit price of each material utilized.

E37. CRASH CUSHIONS AT GWWD CROSSING

E37.1 Scope of Work

E37.1.1 This section shall cover the supply and installation of crash cushions as show on the drawings.

E37.2 Materials

E37.2.1 Crash Cushions

- (a) All materials supplied under this specification shall be of a type approved by the Engineer, and shall be subject to inspection and testing by the Contract Administrator.
- (b) Crash cushions will be "Energite III" or "Fitch Module Systems" or approved equal.

E37.2.2 Sand

- (a) All materials supplied under this specification shall be of a type approved by the Contract Administrator.
- (b) Sand shall conform to the following gradation. All barrels to be filled with the following 'winter sand' mix (65 kg sodium chloride / cubic metre of sand).

Sieve Opening Size	Permissible Range (% by Weight Passing)
9.5 mm	95-100
4.75 mm	20 - 100
2 mm	10 - 70
425 micrometre	0 - 10

E37.3 Construction Methods

E37.3.1 General

- (a) Do not perform work during inclement weather conditions or under adverse field conditions such as frozen ground or ground covered with snow, ice, or standing water.

E37.3.2 Installation

- (a) The Contractor shall supply, assemble, place and fill the crash cushions with sand and rock salt in accordance with the manufacturer's instructions and as indicated on the drawing.
- (b) The crash cushions shall not be installed until the new cantilevered light units are erected.

E37.4 Method of Measurement

E37.4.1 Supply and placement of the crash cushions will be measured as one unit. The amount to be paid for shall be the entire configuration as outlined on the Drawings and in accordance with this Specification and accepted by the Contract Administrator.

E37.5 Basis of Payment

E37.5.1 Supply and placement of the crash cushions will be paid for at the Contract Unit Price, measured as specified herein, which price shall be payment in full for supplying all materials and for completing all operations herein described and all other items incidental to the work included in this Specification.

E38. CANTILEVERED LIGHT UNITS FOR GWWD RAILWAY CROSSING ON PR 207

E38.1 After the installation of the new railway crossing for PR 207, LED light units shall be installed. The Contractor shall complete all embankment work prior to the installation of these light units. All specifications shall meet American Railway Engineering and Maintenance-of-Way Association (AREMA) and Transport Canada RTD-10 regulations.

E39. BITUMINOUS PAVEMENT

DESCRIPTION

E39.1 The Work shall consist of:

E39.1.1 Production of hot-mixed, hot-laid bituminous pavement mix for all placing operations relating to the construction of pavements, overlays and other related pavement works.

E39.2 References and Related Specifications

E39.2.1 All reference standards shall be the current issue or the latest revision at the first date of tender advertisement.

E39.2.2 References

- (a) AASHTO MP1-93, Edition 1A, Provisional Specification for Performance Graded Asphalt Binder
- (b) ASTM D5, Standard Test Method for Penetration of Bituminous Materials
- (c) ASTM D92, Standard Test Method for Flash and Fire Points by Cleveland Open Cut Tester
- (d) ASTM D113, Standard Test Method for Ductility of Bituminous Materials
- (e) ASTM D1754, Standard Test Method for Effect of Heat and Air on Asphaltic Materials (Thin-Film Oven Test)
- (f) ASTM D2042, Standard Test Method for Solubility of Asphalt Materials in Trichloroethylene
- (g) ASTM D2170, Standard Test Method for Kinematic Viscosity of Asphalt (Bitumens)

- (h) ASTM D2171, Standard Test Method for Viscosity of Asphalts by Vacuum Capillary Viscometer

SUBMITTALS

E39.3 The Contractor shall submit the following to the Contract Administrator:

- E39.3.1 The proposed mix design and test results to the Contract Administrator for verification and approval, which will include the following:
 - (a) Aggregate source location(s)
 - (b) The gradation of each aggregate to be used in the mixture, meeting the requirements in Table 1 below.
 - (c) The percentage by mass of each aggregate to be used in each mixture
 - (d) The design gradation of the combined aggregate for each mixture
 - (e) All bituminous mix design data used to arrive at the final mix design, the bulk specific gravity of the combined aggregates, theoretical maximum specific gravities, and the asphalt absorption of the combined aggregates
 - (f) Identification of each asphalt cement supplier by name, location and types and grades of asphalt cement to be supplied along with the asphalt cement mixing temperature.
 - (g) Voids table to include Air Voids, Voids in Mineral Aggregate (VMA) and Voids Filled with Asphalt for various asphalt contents (0.5% increments) and bulk densities (increments of 5 kg/m³)
 - (h) The design asphalt content expressed as a percentage of the dry weight of the aggregate.
 - (i) The results of three separate 75 blow Marshall tests to show that the requirements have been met.

- E39.3.2 Any change in the asphalt cement or aggregates by the Contractor will require a new bituminous mix design. All costs incurred in mix design formulation are the responsibility of the Contractor.

- E39.3.3 The approval of the bituminous mix design will become the mix design for the start of the project.

Table 1: Gradation Limits

Passing Standard Sieve	Percent of Total Dry Weight Passing Each Sieve
	Class "B"
25 mm	
19 mm	100%
16 mm	90-100%
12.5 mm	75-95%
9.5 mm	70-90%
4.75 mm	55-70%
2.0 mm	35-55%
425 um	17-32%
180 um	4-12%
75 um	3-7%
Min. Crush Count ¹	50%
Max. Los Angeles Abr. Loss ²	35%

Table 1: Gradation Limits

Passing Standard Sieve	Percent of Total Dry Weight Passing Each Sieve
	Class "B"
Max. Shale Content ³	
Final Lift	3%
Other Lifts	7%
Max. Ironstone Content ⁴	
Final Lift	11%

Notes:

1. The crush count is the percentage by weight of the blended aggregate particles retained on a 4.75 mm sieve (which are not shale or ironstone) and have at least one freshly fractured face.
2. The shale content is the percent by weight of the particles retained on a 4.75 mm sieve that are shale particles.
3. The ironstone content is the percent by weight of the particles retained on a 4.75 mm sieve that are ironstone particles.

Physical Properties

	Class "B"
Asphalt Cement	5.0–6.0%
VMA ¹ , %	14.0-16%
Air Voids	
Top Lift	3.5-4.0%
Bottom Lift	4.0-6.0%

MATERIALS

E39.4 General

E39.4.1 The Contractor is responsible for the supply, storage and handling of all materials set forth in this Specification.

E39.5 Aggregates

E39.5.1 Changes in the source of aggregate supply during the course of the Contract will not be permitted without notification in writing and the approval of the Contract Administrator.

E39.5.2 The Contractor shall use professional engineering services and a CSA certified testing laboratory to assess the aggregate materials proposed for use and to carry out the design of the bituminous mixture.

E39.6 Fine Aggregates

E39.6.1 Fine aggregate shall consist of sand having clean, hard, strong, durable, uncoated grains free from injurious amounts of dust, soft or flaking particles, shale, alkali, organic matter, loam or other deleterious substances.

E39.7 Coarse Aggregate

E39.7.1 Coarse aggregate shall consist of natural gravel, crushed stone or other approved materials of similar characteristics having clean, hard, strong, durable, uncoated particles

free from injurious amounts of soft, friable, thin, elongated or laminated pieces, alkali, organic or other deleterious matter.

E39.7.2 Crushed stone shall consist of angular, cubical fragments of aggregate of uniform quality throughout. It shall be produced from rock formations or from boulders and stones and shall be from sources of approved nature and origin. Coarse aggregate will not be accepted from rock formations or from boulders and stones containing intrusions or stratifications of an undesirable nature or from source showing signs of disintegration from the elements or other causes.

E39.8 Asphalt Cement

E39.8.1 Asphalt cement shall be 150/200'A' penetration grade asphalt or PG 58-34 Superpave Performance Grade as per Draft Standard "Manitoba PG Selection Criteria", dated January 10, 2006.

E39.8.2 The asphalt cement grade shall conform to the requirements specified in Table 2 and the Superpave Performance Grade shall conform to the requirements in "AASHTO MP1-93, Edition 1A, Provisional Specification for Performance Graded Asphalt Binder".

E39.8.3 The asphalt cement must be approved as identified in the attached Approved Products List and shall be to the satisfaction of the Contract Administrator. Any asphalt cement that is not in the Approved Products List will be subject to approval by the Contract Administrator.

E39.8.4 The supply of asphalt cement includes, but is not limited to, ordering, scheduling deliver of, receiving, handling, storing, sampling, and testing of the materials and other related work. The Contractor shall calibrate storage tanks and make calibration tables or charts available to the Contract Administrator prior to the start of operations and make convenient provision for asphalt cement samples to be taken from storage tanks by the Contract Administrator.

E39.9 Supplementary Materials and VMA.

E39.9.1 Supplementary materials and VMA material shall consist of sound, durable particles of crushed rock, gravel, stone, sand and fines, free from organic material.

Table 2: Penetration Grade Asphalt Cement Requirements

Test Characteristics	ASTM	Premium Grades of Asphalt Cements		
		120-150	150-200	200-300
Absolute Viscosity, 60°C, Pa.s (140°F, Poise) Penetration, 25°C, 100g 5s in dmm (77°F)	D2171 D5	The viscosity and penetration values must fall within the area bounded by M to N to B to A to M, plotted as straight lines on a full logarithmic plot (log-log), with the co-ordinates of the points as follows: <u>Point</u> <u>Abs.Visc.</u> <u>Pen.</u> M 230 (2300) 120 N 109 (1090) 120 B 78 (780) 150 A 155 (1550) 150	The viscosity and penetration values must fall within the area bounded by A to B to C to D to A, plotted as straight lines on a full logarithmic plot (log-log), with the co-ordinates of the points as follows: <u>Point</u> <u>Abs.Visc.</u> <u>Pen.</u> A 155 (1500) 150 B 78 (780) 150 C 50 (500) 200 D 92 (920) 200	The viscosity and penetration values must fall within the area bounded by C to D to E to F to C, plotted as straight lines on a full logarithmic plot (log-log), with the co-ordinates of the points as follows: <u>Point</u> <u>Abs.Visc.</u> <u>Pen.</u> C 50 (500) 200 D 92 (920) 200 E 45 (450) 300 F 26.5 (265) 300
Kinematic Viscosity, 135°C, mm ² /s (275°F, Centistokes) Penetration, 25°C, 100g 5s in dmm (77°F)	D2170 D5	The viscosity and penetration values must fall within the area bounded by M to N to B to A to M, plotted as straight lines on a full logarithmic plot (log-log), with the co-ordinates of the points as follows: <u>Point</u> <u>Abs.Visc.</u> <u>Pen.</u> M 435 (435) 120 N 305 (305) 120 B 255 (255) 150 A 360 (360) 150	The viscosity and penetration values must fall within the area bounded by A to B to C to D to A, plotted as straight lines on a full logarithmic plot (log-log), with the co-ordinates of the points as follows: <u>Point</u> <u>Abs.Visc.</u> <u>Pen.</u> A 360 (360) 150 B 255 (255) 150 C 205 (205) 200 D 285 (285) 200	The viscosity and penetration values must fall within the area bounded by C to D to E to F to C, plotted as straight lines on a full logarithmic plot (log-log), with the co-ordinates of the points as follows: <u>Point</u> <u>Abs.Visc.</u> <u>Pen.</u> C 205 (205) 200 D 285 (285) 200 E 205 (205) 300 F 150 (150) 300
Flash Point, Cleveland Open Cup, min°C (min°F)	D92	205 (401)	205(401)	175 (347)
Solubility in Trichloroethylene, min % Tests on Residue from Thin-Film Oven Test	D2042 D1754		99.5	99.5
Ratio of Absolute Viscosity of Residue from Thin Film Oven Test to Original Absolute Viscosity, Max		4.0	4.0	4.0
Ductility: - 25°C (77°F), 5 cm/min, min, cm - 15.56°C (60°F), 5 cm/min, min, cm	D113	100 -	100 -	- 100
General Requirements: - The asphalt shall be prepared by the refining of petroleum, it shall be uniform in character and shall not foam when heated to 175°C (347°F) - The temperature at delivery to the site shall e between 135°C (275°F) and 175°C (347°F).				

CONSTRUCTION METHODS

E39.10 Mixing Plant

- E39.10.1 Mixing plants shall be calibrated prior to commencing production of the specified mix. The Contractor shall provide the Contract Administrator with a certificate of calibration which certifies that the plant has been calibrated to produce a uniform mixture in accordance with this Specification.

E39.11 Mix Production

- E39.11.1 Aggregate and asphalt shall be combined to produce a uniform mixture of specified gradation at an asphalt content in accordance with the approved bituminous mix design.

E39.12 Base Preparation

- E39.12.1 The placing of the bituminous paving mixture shall not commence until the construction of the granular base course has been completed in accordance with the requirements of the Specification 700: Granular Base Course.
- E39.12.2 The Contract Administrator shall approve the surface upon which new bituminous paving mix is to be placed.

E39.13 Hauling Bituminous Material

- E39.13.1 Trucks used to transport the bituminous material from the mixing plant to the construction site shall be clean, free from foreign materials and lubricated. Truck boxes shall be raised to drain excess lubricant before being loaded with bituminous materials.
- E39.13.2 Waterproof tarpaulins shall be installed on shall cover the truck box completely when the Contract Administrator considered the moisture, temperature, wind, length of haul or other considerations will require protection over the bituminous material.
- E39.13.3 Bituminous material loaded in excess of the allowable load limits shall be unloaded and, if possible, salvaged by the Contractor. Where material is wasted, the cost of the asphalt cement in the wasted material shall be paid for by the Contractor.

E39.14 Placing of Bituminous Material

- E39.14.1 The Contractor shall maintain the primed base course free from surface breaks and potholes until the pavement has been constructed. Bituminous material shall not be deposited on the highway until the surface is properly prepared and in satisfactory condition.
- E39.14.2 The Contractor shall provide sufficient trucks to ensure a continuous supply of bituminous material to the paver.

E39.15 Over Base Course

- E39.15.1 When placing bituminous pavement, the base course shall have been previously prepared with one uniform application of prime coat prior to the delivery of the bituminous concrete paving mixture.

E39.16 Removal of Existing Pavement

- E39.16.1 When required, the temporary or existing pavement surface course shall be removed in accordance with Specification 815: Reclaiming of Bituminous Pavement.

E39.17 Levelling Course

- E39.17.1 A levelling course of bituminous pavement shall be placed over area of uneven pavement. The levelling course shall be constructed at locations and to the depth as

directed by the Contract Administrator. A paver shall be used unless otherwise permitted.

E39.17.2 A levelling course shall be laid in lifts not exceeding 60 mm in depth, and each lift shall be compacted to a minimum 97% of Marshall Density. The levelling course shall be properly compacted and shall have cooled to 50°C or lower before placing any further materials thereon.

E39.18 Patching

E39.18.1 Areas to be considered as bituminous patches shall be less than 1.5 m in width. The locations requiring asphalt patching shall be shown on the Drawings or as directed by the Contract Administrator.

E39.19 Maintenance

E39.19.1 Where surface maintenance involves bituminous patching the Contractor shall, at his own expense, supply all equipment, labour and materials to restore the surface.

E39.20 Full Depth

E39.20.1 The Contractor shall saw cut the bituminous pavement full-depth along the limits designated and removed of in accordance to Specification 442: Removing Pavement. Upon removal of the bituminous and/or concrete pavement, the existing base materials shall be leveled and compacted. The Contractor shall place and compact base course material as required to a maximum thickness of 50 mm. The materials shall be placed to the satisfaction of the Contract Administrator.

E39.20.2 In general, the bituminous pavement for the main roadway shall be constructed in three lifts, to a minimum thickness of 140 mm. However, bituminous pavement thickness of 100 mm is required over the Aqueduct Bridge, which shall be constructed in two lifts.

E39.21 Spreading Bituminous Material

E39.21.1 The Contractor shall taper the outer edge of the bituminous pavement on the shoulders on the top lift of bituminous pavement to a 4:1 grade slope using an edge plate provided on the paver.

E39.21.2 Intersecting roadways may require hand labour or special methods of construction. No extra payment will be paid for this work, as it will be considered an incidental operation to the applicable unit prices for the Work being performed.

E39.21.3 When paving adjacent to a newly laid lane on final lift or adjacent to a curb, control of profile may be accomplished by reference to a shoe on the adjacent final lift.

E39.21.4 The speed of the paver shall be maintained at a uniform rate that is in balance with the actual plant production, but in no case shall the paver exceed a speed of 25 m per minute.

E39.21.5 The paver shall produce a uniformly textured surface free from tearing, tracking or other unacceptable surface irregularities. If the surface condition is not acceptable, spreading operations shall cease until equipment adjustments, repairs or replacement are made. Spreading operations shall not recommence without the approval of the Contract Administrator. Delays and expense entailed in adjustments, repairs or replacement of equipment shall be the responsibility of the Contractor.

E39.21.6 The sequence of spreading operations in respect to lanes and lifts shall be as directed by the Contract Administrator.

E39.21.7 The length of pavement constructed on a lane, shall be controlled so that:

- (a) on other than top lift, the length of pavement in the adjacent lane is not exceeded by more than one day's normal production.

- (b) on top lift, the temporary pavement marking is applied continuously on the same side of centerline and the length of centerline drop-off is kept to a minimum.

E39.21.8 The bituminous material shall be spread to the width as staked on the ground or as specified by the Contract Administrator. A lift shall consist of not more than 60 mm thick.

E39.22 Compacting Bituminous Material

E39.22.1 The Contractor shall supply rollers in sufficient quantities, to produce a uniform, tight knit pavement surface having a minimum of 97% Marshall Density, with no individual test being less than 95%.

E39.22.2 If the material tends to adhere to the compaction equipment, they shall be kept moistened, but excess water or oil will not be permitted.

E39.23 Joints

E39.23.1 Where transverse butt joints are required, the Contractor shall cut back the previously constructed lift to a vertical face.

E39.23.2 Where adjacent lanes of bituminous pavement are constructed the Contractor shall paint longitudinal seams with emulsified asphalt cement. If the lane has been traveled on, it shall be cut back to a vertical face prior to applying the emulsified asphalt cement.

E39.23.3 Where bituminous pavement is to be constructed against a vertical concrete surface, the joint shall be painted with asphalt cement or undiluted emulsified asphalt cement.

E39.23.4 Longitudinal seams and transverse joints shall be constructed so as to provide a smooth surface.

E39.24 Weather Limitations

E39.24.1 The top lift of bituminous pavement shall be placed only when the surface is dry. The atmospheric temperature shall be a minimum 6°C and rising for projects with a deadhaul of 40 km or less and not less than 10°C and rising for projects with deadhauls exceeding 40 km. If the wind velocity exceeds 10 km/hour the atmospheric temperature shall be at least 10°C and rising.

E39.24.2 Lifts other than the top lift may be placed when the surface is dry and the atmospheric temperature 150 mm above the surface to be paved is not less than 0°C and rising. Notwithstanding the above, when weather conditions are unfavourable, or are likely to become unfavourable, paving operations may be suspended.

E39.24.3 Spreading and compacting operations shall be restricted to the hours between official sunrise and official sunset.

E39.25 Asphalt Cement Working Temperatures

E39.25.1 The asphalt cement shall be heated in a storage tank to a working temperature within the range specified by the asphalt cement Supplier. Provision shall be made for determining the temperature of the asphalt cement at or near the discharge end of the feed line.

E39.25.2 The actual mixing temperature within the specified range shall be as directed by the Contract Administrator, based upon temperature-viscosity curves.

E39.26 Controlling and Delineating Drop-off

E39.26.1 When two or more lifts of bituminous pavement are to be constructed and the roadway is to remain open to traffic, base course shoulders shall be constructed in a minimum of two lifts. A granular fillet can be considered to be a lift.

E39.26.2 When the depth of pavement drop-off exceeds 50 mm, the outside edge of the pavement shall be temporarily delineated until the shoulder has been constructed. Delineation will not be permitted as an alternate to shoulder construction.

E39.27 Delineators

E39.27.1 The Contractor shall supply and maintain approved delineators and install them at 100 m intervals on tangents and 50 m on curves.

QUALITY CONTROL / QUALITY ASSURANCE

E39.28 All materials supplied under this Specification shall be subject to inspection and testing by the Contract Administrator or by the certified testing laboratory designated by the Contract Administrator. There will be no charge for materials taken by the Contract Administrator for testing purposes.

E39.29 The Contract Administrator shall approve all materials before any construction is undertaken. If, in the opinion of the Contract Administrator such materials, in whole or part, do not conform to the Specification detailed herein or are found to be defective in manufacture or have become damaged in transit, storage or handling operations, then such materials shall be rejected by the Contract Administrator and replaced by the Contractor at his own expense.

E39.30 Quality Control Testing

E39.31 The Contractor shall be responsible for quality control testing. Results of all quality control tests shall be submitted to the Contract Administrator as they become available. The Contractor shall bear the cost of all consulting services retained by them.

E39.32 Quality Assurance Testing

E39.33 The Contract Administrator will conduct random Quality Assurance testing. The Contractor shall allow the Contract Administrator unhindered access to the materials and shall assist the Contract Administrator in carrying out any sampling, testing or inspection, including but not limited to the provision for necessary traffic control, suitable access and storage.

E39.34 The Contractor shall reinstate pavement layers or other structures to prior condition at the position that samples have been taken.

E39.35 Approval of Finished Surface

E39.36 The finished surface of each lift of bituminous pavement shall be smooth, free from segregation and roller marks, uniform and true to line and cross-section as shown on the Plans or as specified by the Contract Administrator.

E39.37 After final rolling, the surface profile will be measured by the City using a profile measuring device indicating deviations in excess of 6 mm. On lifts other than the top lift, the Contractor will be informed of the readings and shall decide how to proceed.

E39.38 Finished top lift pavement, on which the number of profile deviations exceeds the specified limits, or on which the surface is defective in texture, uniformity or riding quality, shall be correct at the expense of the Contractor if so directed by the Contract Administrator. Correction shall be as outlined in Table 3 below.

Table 3: Bituminous Pavement

Defect Criteria	Rejection level	Type of Repair
Bituminous Mix Properties	Outside the following Ranges VMA 14 – 16% In place air voids 3.5 – 5%	Remove and replace
Segregation Minor to severe	As per definition >10% 100m of one lane pavement	Chip seal or Microsurfacing the entire 100m one lane width Final lift only

Table 3: Bituminous Pavement

Defect Criteria	Rejection level	Type of Repair
Surface Defects		
	Areas containing excess or insufficient asphalt	Remove and replace
	Improper matching of longitudinal and transverse joints on final lift of asphalt concrete	Remove and replace joint
	Roller marks on final lift of asphalt concrete	Seal coat
	Cracking or tearing	Remove and replace
	Contamination by diesel, hydraulic fluids, detergent or other harmful product	Remove and replace
	Foreign objects or materials that are detrimental to the asphalt concrete; and Clay balls or oversized materials	Remove and replace
Density	< 95% of Marshall density	Mill (Remove) and Overlay
Smoothness	> 20 Prl	Mill (Remove) and Overlay

METHOD OF MEASUREMENT

E39.39 Bituminous Pavement

E39.39.1 Bituminous pavement will be measured, on a certified weigh scale, by weight in tonnes of pavement actually spread on the road.

E39.40 Maintenance Patching

E39.40.1 Maintenance patching will not be measured.

E39.41 Full Depth Patching

E39.41.1 Full depth patching will not be measured.

BASIS OF PAYMENT

E39.42 Bituminous pavement will be paid for at the Contract Unit Price for "Bituminous Pavement, Class "B", measured as specified herein, which will be payment in full for performing all operations herein described and all other items incidental to the Work.

E39.43 Maintenance Patching

E39.43.1 Maintenance patching will not be paid directly, but will be considered incidental to the Work.

E39.44 Full Depth Patching

E39.44.1 Full depth patching will not be paid directly, but will be considered incidental to the Work.