

Canada 



**THE CITY OF WINNIPEG**

# **BID OPPORTUNITY**

**BID OPPORTUNITY NO. 539-2013**

**PLESSIS ROAD TWINNING AND GRADE SEPARATION AT CN REDDITT  
SUBDIVISION: SHOOFLY TRACK INSTALLATION AND PERMANENT TRACK  
CONSTRUCTION AT MILEAGE 246.64**

## TABLE OF CONTENTS

### PART A - BID SUBMISSION

Form A: Bid	1
Form B: Prices	4
Form G1: Bid Bond and Agreement to Bond	7
Form G2: Irrevocable Standby Letter of Credit and Undertaking	9

### PART B - BIDDING PROCEDURES

B1. Contract Title	1
B2. Submission Deadline	1
B3. Site Investigation	1
B4. Enquiries	1
B5. Confidentiality	1
B6. Addenda	2
B7. Substitutes	2
B8. Bid Components	3
B9. Bid	4
B10. Prices	4
B11. Qualification	5
B12. Bid Security	6
B13. Opening of Bids and Release of Information	7
B14. Irrevocable Bid	7
B15. Withdrawal of Bids	7
B16. Evaluation of Bids	8
B17. Potential For Future Contract For Completing Permanent Track Works and Shoofly Removal Works in 2014	8
B18. Award of Contract	8

### PART C - GENERAL CONDITIONS

C0. General Conditions	1
------------------------	---

### PART D - SUPPLEMENTAL CONDITIONS

#### General

D1. General Conditions	1
D2. Scope of Work	1
D3. Definitions	1
D4. Contract Administrator	2
D5. Contractor's Supervisor	2
D6. Ownership of Information, Confidentiality and Non Disclosure	2
D7. Notices	2
D8. Furnishing of Documents	3

#### Submissions

D9. Authority to Carry on Business	3
D10. Safe Work Plan	3
D11. Insurance	3
D12. Performance Security	4
D13. Subcontractor List	5
D14. Equipment List	5
D15. Detailed Work Schedule	5
D16. Environmental Protection Plan	6

#### Schedule of Work

D17. Commencement	11
D18. Restricted Work Hours	12
D19. Schedule Restrictions	12
D20. Work By Others	12

D21. Sequence of Work	12
D22. Building Canada Fund – Major Infrastructure Component	15
D23. Critical Stages	15
D24. Substantial Performance	16
D25. Total Performance	16
D26. Accelerated Completion	16
D27. Liquidated Damages	17
<b>Control of Work</b>	
D28. Job Meetings	17
D29. Prime Contractor – The Workplace Safety and Health Act (Manitoba)	17
D30. The Workplace Safety and Health Act (Manitoba) – Qualifications	18
<b>Measurement and Payment</b>	
D31. Payment	18
<b>Warranty</b>	
D32. Warranty	18
Form H1: Performance Bond	19
Form H2: Irrevocable Standby Letter of Credit	21
Form J: Subcontractor List	23
Form K: Equipment	24

## **PART E - SPECIFICATIONS**

### **General**

E1. Applicable Specifications and Drawings	1
E2. Geotechnical Report	1
E3. Office Facilities	1
E4. Geotechnical Instrumentation	2
E5. Protection Of Existing Trees	2
E6. Traffic Management	3
E7. Site Security	3
E8. Water Used on City of Winnipeg Construction Projects	3
E9. Coordination of Construction with CN	3
E10. Encroachment on Private Property	4
E11. Track Construction	4
E12. Railway Property Cleaning	25
E13. Railway Grading and Drainage	25
E14. Railway Granular Materials	27

## **APPENDIX A: GEOTECHNICAL REPORT**

## **APPENDIX B: CN SAFETY REQUIREMENTS AND WORK PERMIT FORM**

## **APPENDIX C: CONTINUOUS WELDING RAIL THERMAL EXPANSION**

## **APPENDIX D: CN CRUSHED ROCK BALLAST MATERIAL SPECIFICATION**

## **DRAWINGS**

## **PART B - BIDDING PROCEDURES**

### **B1. CONTRACT TITLE**

**B1.1 PLESSIS ROAD TWINNING AND GRADE SEPARATION AT CN REDDITT SUBDIVISION: SHOOFLY TRACK INSTALLATION AND PERMANENT TRACK CONSTRUCTION AT MILEAGE 246.64**

### **B2. SUBMISSION DEADLINE**

- B2.1** The Submission Deadline is 12:00 noon Winnipeg time, July 11, 2013.
- B2.2** Bids determined by the Manager of Materials to have been received later than the Submission Deadline will not be accepted and will be returned upon request.
- B2.3** The Contract Administrator or the Manager of Materials may extend the Submission Deadline by issuing an addendum at any time prior to the time and date specified in B2.1.

### **B3. SITE INVESTIGATION**

- B3.1** Further to C3.1, a site meeting will be held to provide Bidders access with the CN right-of-way on Thursday July 4, 2013 at 3:30 p.m. Meet at the northeast corner of Plessis Road and the CN Redditt Subdivision. No additional site visits on Railway property will be permitted without prior arrangements with the Contract Administrator.
- B3.2** The Bidder is required to complete CN's Contractor Orientation Training as outlined in Appendix "B", prior to entering CN property for the site investigation.
- B3.3** The Bidder shall not be entitled to rely on any information or interpretation received at the Site investigation unless that information or interpretation is the Bidder's direct observation, or is provided by the Contract Administrator in writing.

### **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. CONFIDENTIALITY**

- B5.1** Information provided to a Bidder by the City or acquired by a Bidder by way of further enquiries or through investigation is confidential. Such information shall not be used or disclosed in any way without the prior written authorization of the Contract Administrator. The use and disclosure of the confidential information shall not apply to information which:
- (a) was known to the Bidder before receipt hereof; or

- (b) becomes publicly known other than through the Bidder; or
- (c) is disclosed pursuant to the requirements of a governmental authority or judicial order.

B5.2 The Bidder shall not make any statement of fact or opinion regarding any aspect of the Bid Opportunity to the media or any member of the public without the prior written authorization of the Contract Administrator.

## **B6. ADDENDA**

B6.1 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.

B6.2 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.

B6.2.1 Addenda will be available on the Bid Opportunities page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/bidopp.asp>

B6.2.2 The Bidder is responsible for ensuring that he/she has received all addenda and is advised to check the Materials Management Division website for addenda regularly and shortly before the Submission Deadline, as may be amended by addendum.

B6.3 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.

## **B7. SUBSTITUTES**

B7.1 The Work is based on the Plant, Materials and methods specified in the Bid Opportunity.

B7.2 Substitutions shall not be allowed unless application has been made to and prior approval has been granted by the Contract Administrator in writing.

B7.3 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.

B7.4 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.

- B7.5 The Contract Administrator, after assessing the request for approval of a substitute, may in his/her 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.
- B7.6 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.
- B7.6.1 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/she wishes to inform.
- B7.7 If the Contract Administrator approves a substitute as an “approved equal”, any Bidder may use the approved equal in place of the specified item.
- B7.8 If the Contract Administrator approves a substitute as an “approved alternative”, any Bidder bidding that approved alternative may base his/her 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 B16.
- B7.9 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.
- B7.10 Notwithstanding B7.2 to B7.9, in accordance with B8.6, deviations inconsistent with the Bid Opportunity document shall be evaluated in accordance with B16.1(a).

## **B8. BID COMPONENTS**

- B8.1 The Bid shall consist of the following components:
- (a) Form A: Bid;
  - (b) Form B: Prices, hard copy;
  - (c) Bid Security
    - (i) Form G1: Bid Bond and Agreement to Bond, or
    - (ii) Form G2: Irrevocable Standby Letter of Credit and Undertaking, or
    - (iii) a certified cheque or draft.
- B8.2 Further to B8.1, the Bidder should include the written correspondence from the Contract Administrator approving a substitute in accordance with B7.
- B8.3 All components of the Bid shall be fully completed or provided, and submitted by the Bidder no later than the Submission Deadline, with all required entries made clearly and completely, to constitute a responsive Bid.
- B8.4 The Bid shall be submitted enclosed and sealed in an envelope clearly marked with the Bid Opportunity number and the Bidder's name and address.
- B8.4.1 Samples or other components of the Bid which cannot reasonably be enclosed in the envelope may be packaged separately, but shall be clearly marked with the Bid Opportunity number, the Bidder's name and address, and an indication that the contents are part of the Bidder's Bid.
- B8.4.2 A hard copy of Form B: Prices must be submitted with the Bid. If there is any discrepancy between the Adobe PDF version of Form B: Prices and the Microsoft Excel version of Form B: Prices, the PDF version shall take precedence.
- B8.5 Bidders are advised not to include any information/literature except as requested in accordance with B8.1.

B8.6 Bidders are advised that inclusion of terms and conditions inconsistent with the Bid Opportunity document, including the General Conditions, will be evaluated in accordance with B16.1(a).

B8.7 Bids submitted by facsimile transmission (fax) or internet electronic mail (e-mail) will not be accepted.

B8.8 Bids shall be submitted to:

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

## **B9. BID**

B9.1 The Bidder shall complete Form A: Bid, making all required entries.

B9.2 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/her own name, his/her 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/her own, the business name and the name of every partner or corporation who is the owner of such business name shall be inserted.

B9.2.1 If a Bid is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B9.2.

B9.3 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.

B9.4 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/her 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/her 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.

B9.4.1 The name and official capacity of all individuals signing Form A: Bid should be printed below such signatures.

B9.5 If a Bid is submitted jointly by two or more persons, the word "Bidder" shall mean each and all such persons, and the undertakings, covenants and obligations of such joint Bidders in the Bid and the Contract, when awarded, shall be both joint and several.

## **B10. PRICES**

B10.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B: Prices.

B10.1.1 For the convenience of Bidders, and pursuant to B8.4.2 and B16.4.2, an electronic spreadsheet Form B: Prices in Microsoft Excel (.xls) format is available along with the

Adobe PDF documents for this Bid Opportunity on the Bid Opportunities page at the Materials Management Division website at <http://www.winnipeg.ca/matmgt/>

- B10.2 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.
- B10.3 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.
- B10.4 Payments to Non-Resident Contractors are subject to Non-Resident Withholding Tax pursuant to the Income Tax Act (Canada).

## **B11. QUALIFICATION**

- B11.1 The Bidder shall:
- (a) undertake to be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba; and
  - (b) be financially capable of carrying out the terms of the Contract; and
  - (c) have all the necessary experience, capital, organization, and equipment to perform the Work in strict accordance with the terms and provisions of the Contract.
- B11.2 The Bidder and any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:
- (a) be responsible and not be suspended, debarred or in default of any obligations to the City. A list of suspended or debarred individuals and companies is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/debar.stm>
- B11.3 The Bidder and/or any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:
- (a) have successfully carried out work similar in nature, scope and value to the Work; and
  - (b) be fully capable of performing the Work required to be in strict accordance with the terms and provisions of the Contract; and
  - (c) have a written workplace safety and health program if required pursuant to The Workplace Safety and Health Act (Manitoba).
- B11.4 Further to B11.3(c), the Bidder shall, within five (5) Business Days of a request by the Contract Administrator, provide proof satisfactory to the Contract Administrator that the Bidder/Subcontractor has a workplace safety and health program meeting the requirements of The Workplace Safety and Health Act (Manitoba), by providing:
- (a) a valid COR certification number under the Certificate of Recognition (COR) Program administered by the Construction Safety Association of Manitoba or by the Manitoba Heavy Construction Association's WORKSAFELY™ COR™ Program; or
  - (b) a report or letter to that effect from an independent reviewer acceptable to the City. (A list of acceptable reviewers and the review template are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/>
- B11.5 The Bidder shall submit, within three (3) Business Days of a request by the Contract Administrator, proof satisfactory to the Contract Administrator of the qualifications of the Bidder and of any proposed Subcontractor.



B11.5.1 The Bidder may be required to submit, within three (3) Business Days of a request by the Contract Administrator, a letter satisfactory to the Contract Administrator of the acceptance of the Bidder and of any proposed Subcontractor by CN.

CN contact regarding Bidder eligibility is:  
Mr. Shane McCartney  
Manager of Engineering Services  
Telephone No. (204) 231-7763

Mr. Shane McCartney will only respond to questions regarding Bidder eligibility. All other questions are to be in accordance with B4.1.

B11.6 The Bidder shall provide, on the request of the Contract Administrator, full access to any of the Bidder's equipment and facilities to confirm, to the Contract Administrator's satisfaction, that the Bidder's equipment and facilities are adequate to perform the Work.

## **B12. BID SECURITY**

B12.1 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.

B12.1.1 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.

B12.1.2 All signatures on bid securities shall be original.

B12.1.3 The Bidder shall sign the Bid Bond.

B12.1.4 The Surety shall sign and affix its corporate seal on the Bid Bond and the Agreement to Bond.

B12.2 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.

B12.2.1 Where the bid security provided by the successful Bidder is in the form of a certified cheque or draft pursuant to B12.1(c), it will be deposited and retained by the City as the performance security and no further submission is required.

B12.2.2 The City will not pay any interest on certified cheques or drafts furnished as bid security or subsequently retained as performance security.

B12.3 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.

### **B13. OPENING OF BIDS AND RELEASE OF INFORMATION**

- B13.1 Bids will be opened publicly, after the Submission Deadline has elapsed, in the office of the Corporate Finance Department, Materials Management Division, or in such other office as may be designated by the Manager of Materials.
- B13.1.1 Bidders or their representatives may attend.
- B13.1.2 Bids determined by the Manager of Materials, or his/her designate, to not include the bid security specified in B12 will not be read out.
- B13.2 Following the submission deadline, the names of the Bidders and their Total Bid Prices (unevaluated, and pending review and verification of conformance with requirements) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/>
- B13.3 After award of Contract, the name(s) of the successful Bidder(s) and the Contract amount(s) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/>
- B13.4 The Bidder is advised that any information contained in any Bid may be released if required by City policy or procedures, by The Freedom of Information and Protection of Privacy Act (Manitoba), by other authorities having jurisdiction, or by law.

### **B14. IRREVOCABLE BID**

- B14.1 The Bid(s) submitted by the Bidder shall be irrevocable for the time period specified in Paragraph 11 of Form A: Bid.
- B14.2 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.

### **B15. WITHDRAWAL OF BIDS**

- B15.1 A Bidder may withdraw his/her Bid without penalty by giving written notice to the Manager of Materials at any time prior to the Submission Deadline.
- B15.1.1 Notwithstanding C23.3, the time and date of receipt of any notice withdrawing a Bid shall be the time and date of receipt as determined by the Manager of Materials.
- B15.1.2 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.
- B15.1.3 If a Bidder gives notice of withdrawal prior to the Submission Deadline, the Manager of Materials will:
- (a) retain the Bid until after the Submission Deadline has elapsed;
  - (b) open the Bid to identify the contact person named in Paragraph 3 of Form A: Bid and the Bidder's authorized representatives named in Paragraph 12 of Form A: Bid; and
  - (c) if the notice has been given by any one of the persons specified in B15.1.3(b), declare the Bid withdrawn.
- B15.2 A Bidder who withdraws his/her Bid after the Submission Deadline but before his/her Bid has been released or has lapsed as provided for in B14.2 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.

## **B16. EVALUATION OF BIDS**

B16.1 Award of the Contract shall be based on the following bid evaluation criteria:

- (a) compliance by the Bidder with the requirements of the Bid Opportunity, or acceptable deviation therefrom (pass/fail);
- (b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B11 (pass/fail);
- (c) Total Bid Price;
- (d) economic analysis of any approved alternative pursuant to B7.

B16.2 Further to B16.1(a), the Award Authority may reject a Bid as being non-responsive if the Bid is incomplete, obscure or conditional, or contains additions, deletions, alterations or other irregularities. The Award Authority may reject all or any part of any Bid, or waive technical requirements or minor informalities or irregularities, if the interests of the City so require.

B16.3 Further to B16.1(b), the Award Authority shall reject any Bid submitted by a Bidder who does not demonstrate, in his/her Bid or in other information required to be submitted, that he/she is responsible and qualified.

B16.4 Further to B16.1(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.

B16.4.1 Further to B16.1(a), in the event that a unit price is not provided on Form B: Prices, the City will determine the unit price by dividing the Amount (extended price) by the approximate quantity, for the purposes of evaluation and payment.

B16.4.2 The electronic Form B: Prices and the formulas imbedded in that spreadsheet are only provided for the convenience of Bidders. The City makes no representations or warranties as to the correctness of the imbedded formulas. It is the Bidder's responsibility to ensure the extensions of the unit prices and the sum of Total Bid Price performed as a function of the formulas within the electronic Form B: Prices are correct.

## **B17. AWARD OF CONTRACT**

B17.1 The City will give notice of the award of the Contract or will give notice that no award will be made.

B17.2 The City will have no obligation to award a Contract to a Bidder, even though one or all of the Bidders are determined to be responsible and qualified, and the Bids are determined to be responsive.

B17.2.1 Without limiting the generality of B17.2, the City will have no obligation to award a Contract where:

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

B17.3 Where an award of Contract is made by the City, the award shall be made to the responsible and qualified Bidder submitting the lowest evaluated responsive Bid, in accordance with B16.

**B17.3.1** Following the award of contract, a Bidder will be provided with information related to the evaluation of his/her Bid upon written request to the Contract Administrator.

## PART C - GENERAL CONDITIONS

### C0. GENERAL CONDITIONS

- C0.1 The *General Conditions for Construction* (Revision 2006 12 15) are applicable to the Work of the Contract.
- C0.1.1 The General Conditions for Construction are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at [http://www.winnipeg.ca/matmgt/gen\\_cond.stm](http://www.winnipeg.ca/matmgt/gen_cond.stm)
- C0.2 A reference in the Bid Opportunity to a section, clause or subclause with the prefix “**C**” designates a section, clause or subclause in the *General Conditions for Construction*.

## PART D - SUPPLEMENTAL CONDITIONS

### GENERAL

#### D1. GENERAL CONDITIONS

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

#### D2. SCOPE OF WORK

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

- (a) Shoofly Track Construction;
- (b) Permanent Track Construction.

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

- (a) Track Construction
  - (i) Supply and install all track material as identified in Section E11, including turnouts and ballast.
- (b) Earth and Base Works
  - (i) Complete track embankment including sub ballast placement and ditching.

#### D3. DEFINITIONS

D3.1 When used in this Bid Opportunity:

- (a) “**Contract #1**” means the Plessis Road Twinning and Grade Separation at CN Redditt Subdivision: Rail Shoofly Grade Preparation and Miscellaneous Wastewater Sewer, Watermain and Land Drainage Works;
- (b) “**Contract #2**” means the Plessis Road Twinning and Grade Separation at CN Redditt Subdivision: Shoofly Track Installation and Permanent Track Construction at Mileage 246.64;
- (c) “**Contract #3**” means the Plessis Road Twinning and Grade Separation at CN Redditt Subdivision: Plessis Road Reconstruction, Underpass Structures, Land Drainage Sewer and Miscellaneous Underground and Landscaping Works;
- (d) “**AREMA**” means American Railway Engineering and Maintenance of Way Association;
- (e) “**CN**” means Canadian National Railway Company or designated representative definition, and;
- (f) “**Project**” means the construction of an underpass and bi-directional rail bridge, and relocation and improvement of certain roadways and intersections, involving certain sections of Plessis Road, Pandora Avenue West and Dugald Road in east Winnipeg, including the Work of Contracts #1-3.
- (g) “**Engineer**” for the purposes of this Project shall have the same meaning as Contract Administrator.
- (h) “**Protecting Foreman (also referred to as CN Assigned Employee)**” means the CN employee or Contractor employee qualified in the Canadian Rail Operation Rules (CROR) and CN requirements. Protecting Foremen are responsible for protecting employees against Railway traffic. Protecting Foremen are charged solely with the safe movement of trains and are not responsible for the safety of the Contractor, the Contractor’s personnel or the Contractor’s equipment.
- (i) “**Day**” means Monday to Friday from 7 am to 7 pm.

#### **D4. CONTRACT ADMINISTRATOR**

D4.1 The Contract Administrator is AECOM, represented by:

Mr. Bob Paetsch  
Senior Project Manager  
99 Commerce Drive, Winnipeg, Manitoba R3P 0Y7  
Telephone No. 204-928-7428  
Facsimile No. 204-284-2040

D4.2 At the pre-construction meeting, Mr. Bob Paetsch will identify additional personnel representing the Contract Administrator and their respective roles and responsibilities for the Work.

D4.3 Bids Submissions must be submitted to the address in B8.8.

#### **D5. CONTRACTOR'S SUPERVISOR**

D5.1 At the pre-construction meeting, the Contractor shall identify his/her 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 twenty-four (24) hours a day to respond to an emergency.

#### **D6. OWNERSHIP OF INFORMATION, CONFIDENTIALITY AND NON DISCLOSURE**

D6.1 The Contract, all deliverables produced or developed, and information provided to or acquired by the Contractor are the property of the City and shall not be appropriated for the Contractors own use, or for the use of any third party.

D6.2 The Contractor shall not make any public announcements or press releases regarding the Contract, without the prior written authorization of the Contract Administrator.

D6.3 The following shall be confidential and shall not be disclosed by the Contractor to the media or any member of the public without the prior written authorization of the Contract Administrator;

- (a) information provided to the Contractor by the City or acquired by the Contractor during the course of the Work;
- (b) the Contract, all deliverables produced or developed; and
- (c) any statement of fact or opinion regarding any aspect of the Contract.

D6.4 A Contractor who violates any provision of D6 may be determined to be in breach of Contract.

#### **D7. NOTICES**

D7.1 Except as provided for in C23.2.2, all notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the Contractor shall be sent to the address or facsimile number identified by the Contractor in Paragraph 2 of Form A: Bid.

D7.2 All notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the City, except as expressly otherwise required in D7.4 or elsewhere in the Contract, shall be sent to the attention of the Contract Administrator at the facsimile number identified in D4.1.

D7.3 Notwithstanding C21, all notices of appeal to the Chief Administrative Officer shall be sent to the attention of the Chief Financial Officer at the following facsimile number:

The City of Winnipeg  
Chief Financial Officer

Facsimile No.: 204-949-1174

- D7.4 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 facsimile number:

The City of Winnipeg  
Legal Services Department  
Attn: Director of Legal Services

Facsimile No.: 204-947-9155

#### **D8. FURNISHING OF DOCUMENTS**

- D8.1 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/her at cost.

#### **SUBMISSIONS**

#### **D9. AUTHORITY TO CARRY ON BUSINESS**

- D9.1 The Contractor shall be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba, or if the Contractor does not carry on business in Manitoba, in the jurisdiction where the Contractor does carry on business, throughout the term of the Contract, and shall provide the Contract Administrator with evidence thereof upon request.

#### **D10. SAFE WORK PLAN**

- D10.1 The Contractor shall provide the Contract Administrator with a Safe Work Plan at least five (5) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.
- D10.2 The Safe Work Plan shall be prepared and submitted in the format shown in the City's template which is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/safety/default.stm>
- D10.3 Notwithstanding D10.1, D10.2 and Appendix "B" CN Safety Requirements, the Contractor shall conform and operate in accordance with the CN "Safety Guidelines for Contractors".

#### **D11. INSURANCE**

- D11.1 The City shall provide and maintain the following owner controlled project insurance coverage to remain in place at all times during the performance of the Work:
- (a) Wrap-up liability insurance in an amount of no less than twenty-five million dollars (\$25,000,000) inclusive per occurrence and twenty-five millions dollars (\$25,000,000) general aggregate, covering bodily injury, personal injury, property damage and products and completed operations consistent with industry standard insurance policy wordings. Wrap up liability insurance to also include evidence of contractual liability and cross liability clauses.
  - (b) Project specific Contractors Pollution Liability (CPL) insurance in the amount of at least five million dollars (\$5,000,000) per occurrence and five million dollars (\$5,000,000) aggregate insuring against claims for injuries to persons or damages to property which may arise from



or in connection with the performance of the work hereunder performed by the Contractor, its agents, representatives, employees or subcontractors.

- (i) The Contractor shall be responsible for deductibles up to \$50,000 maximum of any one loss.
- (ii) The City of Winnipeg will carry such insurance to cover the Owner, Province, Federal Government, contractors, sub-contractors and all consultants as insured's. Provision of this insurance by the City of Winnipeg is not intended in any way to relieve the Contractor from his obligations under the terms of the Contract. Specifically, losses relating to deductibles for insurance, as well as losses in excess of limits of coverage and any risk of loss that is not covered under the terms of the insurance provided by the City of Winnipeg remains with the contractor.
- (iii) Wrap-up liability insurance shall be maintained from the date of the commencement of the Work until the date of Total Performance of the work and shall include an additional 24 months completed operation coverage which will take affect after Total Performance.

D11.2 The Contractor and sub-contractors shall provide and maintain the following insurance coverage at all times during the performance of the work:

- (a) Commercial General Liability insurance, in the minimum amount of ten million dollars (\$10,000,000.00) inclusive. The said Commercial General Liability insurance shall include coverage for products and completed operations, blanket contractual liability, cross liability, non-owned automobile, and unlicensed motor vehicle liability. The Province of Manitoba, the Federal Government of Canada and their ministers, officers, employees and agents, the City of Winnipeg and CN shall be added as additional insured's.
- (b) Automobile Liability Insurance covering all motor vehicles, owned and operated and used or to be used by the Contractor directly or indirectly in the performance of the Work. The Limit of Liability shall not be less than two million dollars (\$2,000,000) inclusive for loss or damage including personal injuries and death resulting from any one accident or occurrence.
- (c) Property insurance for equipment and tools used on the project that may be owned, rented, leased or borrowed.

D11.3 Deductibles shall be borne by the Contractor.

D11.4 All policies must be taken out with insurers licensed to carry on business in the Province of Manitoba.

D11.5 The Contractor shall not cancel, or cause any such policy or policies to lapse without a minimum thirty (30) days prior written notice to the City.

D11.6 The Contractor shall provide the Contract Administrator with evidence of insurance at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than seven (7) Calendar Days from notification of the award of the Contract. The evidence shall be in a form of a certificate of insurance and must be satisfactory to the City Solicitor.

D11.7 All policies shall be in a form satisfactory to the City of Winnipeg and shall be kept in full force during the Work.

## **D12. PERFORMANCE SECURITY**

D12.1 The Contractor shall provide and maintain performance security until the later of the expiration of the warranty period or twenty-four (24) months after the Total Completion Date of the Project 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.

D12.1.1 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.

D12.2 If the bid security provided in his/her Bid was not a certified cheque or draft pursuant to B12.1(c), the Contractor shall provide the City Solicitor with the required performance security within seven (7) Calendar Days of notification of the award of the Contract by way of letter of intent and prior to the commencement of any Work on the Site and in no event later than the date specified in the C4.1 for the return of the executed Contract.

### **D13. SUBCONTRACTOR LIST**

D13.1 The Contractor shall provide the Contract Administrator with a complete list of the Subcontractors whom the Contractor proposes to engage (Form J: Subcontractor List) at or prior to a pre-construction meeting, or at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in the C4.1 for the return of the executed Contract.

### **D14. EQUIPMENT LIST**

D14.1 The Contractor shall provide the Contract Administrator with a complete list of the equipment which the Contractor proposes to utilize (Form K: Equipment List) at or prior to a pre-construction meeting, or at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in the C4.1 for the return of the executed Contract.

### **D15. DETAILED WORK SCHEDULE**

D15.1 The Contractor shall provide the Contract Administrator with a detailed work schedule at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in the General Conditions for the return of the executed Contract.

D15.2 The detailed work schedule shall consist of the following:

- (a) a critical path method (C.P.M.) schedule for the Work;
  - (b) a Gantt chart for the Work based on the C.P.M. schedule; and
- all acceptable to the Contract Administrator.

D15.3 Further to D15.2(a), the C.P.M. schedule shall clearly identify the start and completion dates of all of the following activities/tasks making up the Work as well as showing those activities/tasks on the critical path:

- (a) Construction of shoofly tracks;
- (b) Construction of permanent tracks;
- (c) Construction of track embankments.

D15.4 Further to D15.2(b), the Gantt Chart shall show the time on a weekly basis, required to carry out the Work of each trade, or specification division. The time shall be on the horizontal axis, and the type of trade shall be on the vertical axis.

D15.5 In addition to all other schedules the Contractor is required to submit a detailed breakdown in 15 min increments of all work to be performed during any main track blocks. This is to be

submitted a minimum of seven (7) days prior to the requested block date. Included with this submission will be a list of all equipment and personnel that will be on-site to support the planned work during the block. The equipment and personnel shall be of a sufficient number to provide redundancy such that any failures do not cause the time limits of the block to be exceeded.

## **D16. ENVIRONMENTAL PROTECTION PLAN**

- D16.1 Prior to commencing construction activities or delivery of materials to Site, submit an Environmental Protection Plan for review and approval by Contract Administrator. The Environmental Protection Plan shall present a comprehensive plan to address known or potential environmental issues which may be present during construction. Where applicable, the Environmental Protection Plan shall include sub-contractor activities. The submission of the Environmental Protection Plan to the Contract Administrator shall in no way relieve the Contractor of full responsibility for the success or failure of all environmental management practices and procedures.
- D16.2 The contractor is advised that at least the following Acts, Regulations, and By-laws apply to the Work:
- (a) Federal
    - (i) Canadian Environmental Assessment Act (CEAA) C.37;
    - (ii) Fisheries Act C.F-14;
    - (iii) Transportation of Dangerous Goods Act and Regulations C.34; and
    - (iv) Navigable Waters Protection Act.
  - (b) Provincial
    - (i) The Dangerous Goods Handling and Transportation Act D12;
    - (ii) The Endangered Species Act E111;
    - (iii) The Environment Act C.E125;
    - (iv) The Fire Prevention Act F80;
    - (v) The Manitoba Heritage Resources Act H39-1;
    - (vi) The Manitoba Noxious Weeds Act N110;
    - (vii) The Manitoba Nuisance Act N120;
    - (viii) The Public Health Act C.P210;
    - (ix) The Workplace Safety and Health Act W210;
    - (x) Current applicable Associated Regulations (Note: Provincial Regulations updated as of September 1999) and
    - (xi) The Manitoba Stream Crossing Guidelines for the Protection of Fish and Fish Habitat, Manitoba National Resources, 1996.
  - (c) Municipal
    - (i) The City of Winnipeg By-law No. 1/2008 and all amendments up to and including 110/2012,
    - (ii) The City of Winnipeg By-law No. 1573/77 and all amendments up to and including 154/2012; and
    - (iii) Any other applicable Acts, Regulations, and By-laws.
- D16.3 The Environmental Protection Plan shall address the following:
- (a) Name[s] of person[s] responsible for ensuring adherence to Environmental Protection Plan.
  - (b) Name[s] and qualifications of person[s] responsible for manifesting hazardous waste to be removed from Site.
  - (c) Name[s] and qualifications of person[s] responsible for training Site personnel.
  - (d) Erosion and sediment control plan which identifies type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure

that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.

- (e) Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Plan to include measures for marking limits of use areas including methods for protection of features including vegetation to be preserved within authorized Work areas.
- (f) Environmental Emergency Response: including procedures, instructions, and reporting in the event of unforeseen spill of regulated substance.
- (g) Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
- (h) Hazardous materials and waste management plan outlining storage, transportation and disposal.
- (i) Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, do not become air borne and travel off project Site.
- (j) Contaminant prevention plan that: identifies potentially hazardous substances to be used on job site; identifies intended actions to prevent introduction of such materials into air, water, or ground; and details provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.
- (k) Waste water management plan that identifies methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete wash or curing water, clean-up water, dewatering of ground water, hydrostatic test water, and water used in flushing of lines.
- (l) Monitor and report to ensure implementation of environmental protection measures.

#### D16.4 Fires

- (a) Fires and burning rubbish or waste materials on Site is not permitted.

#### D16.5 Disposal of Waste

- (a) Dispose all waste at licensed facilities or with licensed haulers.
- (b) All waste disposal grounds receiving debris and construction waste from this project must be operated under the authority of a valid permit issued pursuant to MR 150 (latest edition) Waste Disposal Grounds Regulation under the Environment Act.
- (c) Dispose of all sewage and seepage from the on-site sanitary facilities in accordance with the Onsite Wastewater Management Systems Regulation MR 83/2003.
- (d) Do not bury waste materials on Site.
- (e) Do not dispose of solid or liquid wastes in drains or waterways.

#### D16.6 Hazardous Waste

##### D16.6.1 Definitions

- (a) Dangerous Goods: product, substance, or organism that is specifically listed or meets hazard criteria established in the Dangerous Goods Handling and Transportation Act or regulations including hazardous materials and wastes.
- (b) Hazardous Material: product, substance, or organism that is used for its original purpose; and that is either dangerous goods or a material that may cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into the environment.
- (c) Hazardous Waste: any hazardous material that is no longer used for its original purpose and that is intended for recycling, treatment or disposal.
- (d) Workplace Hazardous Materials Information System (WHMIS): a Canada-wide system designed to give employers and workers information about hazardous materials used in workplace. Under WHMIS, information on hazardous materials is

provided on container labels, material safety data sheets (MSDS), and worker education programs. WHMIS is put into effect by combination of federal and provincial laws.

#### D16.6.2 Materials Management

- (a) Only bring on Site quantity of hazardous materials required to perform Work.
- (b) Maintain MSDSs in proximity to where materials are being used. Communicate this location to personnel who may have contact with hazardous materials.
- (c) Ensure personnel have been trained in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements.

#### D16.6.3 Storage and Handling

- (a) Store and handle hazardous materials and wastes in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.
  - (i) Sign storage areas.
  - (ii) Store and handle flammable and combustible materials in accordance with current Manitoba and National Fire Code of Canada requirements.
  - (iii) Do not transfer of flammable and combustible liquids in vicinity of open flames or heat-producing devices.
  - (iv) Do not use flammable liquids having flash point below 38 degrees C, such as naphtha or gasoline as solvents or cleaning agents.
  - (v) Store flammable and combustible waste liquids for disposal in approved containers located in safe, ventilated area. Keep quantities to minimum.
  - (vi) Observe smoking regulations, smoking is prohibited in areas where hazardous materials are stored, used, or handled.
- (b) Keep no more than 100 litres of flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use.
  - (i) Store flammable and combustible liquids in approved safety cans bearing the Underwriters' Laboratory of Canada or Factory Mutual seal of approval.
  - (ii) Storage of quantities of flammable and combustible liquids exceeding 100 litres for Work purposes requires the written approval of the Contract Administrator.
  - (iii) Fuel storage exceeding 100L shall be a minimum distance of 100 metres from any water body and in compliance with the requirements of the Storage and Handling of Petroleum Products and Allied Products Manitoba Regulation 188/2001 of the Dangerous Goods Handling and Transportation Act.
- (c) Storage requirements for quantities of hazardous materials and wastes in excess of 5 kg for solids, and 5 litres for liquids:
  - (i) Store hazardous materials and wastes in closed and sealed containers.
  - (ii) Label containers of hazardous materials and wastes in accordance with WHMIS.
  - (iii) Store hazardous materials and wastes in containers compatible with that material or waste.
  - (iv) Segregate incompatible materials and wastes. Ensure that different hazardous materials or hazardous wastes are not mixed.
  - (v) Store hazardous materials and wastes in secure storage area with controlled access.
  - (vi) Maintain clear egress from storage area.
  - (vii) Store hazardous materials and wastes in location that will prevent them from spilling into environment.
  - (viii) Store products on spill trays or berms with 110% capacity.
  - (ix) Do not store within 30 metres of a waterway or drain

- (x) Have appropriate emergency spill response equipment available near storage area, including personal protective equipment.
- (xi) Maintain inventory of hazardous materials and wastes, including product name, quantity, and date when storage began and disposal occurred. Maintain tipping and other disposal receipts.
- (d) Report spills or accidents immediately:
  - (i) to the Contract Administrator.
  - (ii) to Manitoba Conservation Accident Reporting Line at 204-944-4888 in accordance with Manitoba Regulation 439/87 of the Dangerous Goods and Transportation Act.
  - (iii) Submit a written spill report to the Contract Administrator outlining cause and proposed corrective action and Manitoba Conservation as required. Provide copies of reports submitted to Manitoba Conservation to the Contract Administrator.

#### D16.6.4 Transportation

- (a) Transport hazardous materials and wastes in accordance with the Manitoba Dangerous Goods Handling and Transportation Act.
  - (i) Ensure that trained personnel handle, offer for transport, or transport dangerous goods.
  - (ii) Use licensed carrier authorized by provincial authorities to accept subject material.
  - (iii) Label container[s] with legible, visible safety marks as prescribed by federal and provincial regulations.
  - (iv) Provide photocopy of shipping documents and waste manifests to the Contract Administrator.
  - (v) Track receipt of completed manifest from consignee after shipping dangerous goods. Provide a photocopy of completed manifest to the Contract Administrator.
  - (vi) Report discharge, emission, or escape of hazardous materials immediately to the Contract Administrator and appropriate provincial authority. Take measures to control release.

#### D16.6.5 Disposal

- (a) Dispose of hazardous waste materials in accordance with applicable federal and provincial acts, regulations, and guidelines.
  - (i) Recycle hazardous wastes for which there is approved, cost effective recycling process available.
  - (ii) Send hazardous wastes to authorized hazardous waste disposal or treatment facilities.
  - (iii) Burning, diluting, or mixing hazardous wastes for purpose of disposal is prohibited.
  - (iv) Disposal of hazardous materials in waterways, storm or sanitary sewers, or in municipal solid waste landfills is prohibited.

#### D16.6.6 Erosion and Sediment Control

- (a) Develop an erosion control plan to control negative impacts on water and air quality; plan should meet these objectives:
  - (i) Prevent loss of soil during construction by storm water run-off and wind erosion.
  - (ii) Protect against erosion from stockpiled topsoil aggregates.
  - (iii) Prevent sedimentation of the land drainage system and receiving streams with dust, particulate matter or eroded sediment.
- (b) Supply, install, maintain and remove (as applicable and when no longer required) effective sediment control barriers and erosion control before starting Work that may

result in the deposit of sediment into a ditch or water body to avoid potential impacts to fish and fish habitat.

- (i) Erosion and sediment control measures and installations include, as required, silt socks around storm drains, silt fence barriers, erosion control blanket, straw wattles, and geotextile fabric as appropriate.
- (ii) Routinely inspect all erosion and sediment control measures and installations and immediately repair any deficiencies.

D16.6.7 Work to Adjacent Waterways

- (a) Do not operate construction equipment in waterways and, where possible, avoid operating equipment within 30 metres of the waterway.
- (b) Do not use waterway beds for borrow material.
- (c) Do not dump excavated fill, waste material or debris in ditches or waterway.
- (d) Design and construct temporary crossings to minimize erosion to waterways.
- (e) Dispose of excavated materials above the high water mark and 30 metres way from a watercourse.

D16.6.8 Drainage

- (a) Provide temporary drainage and pumping as necessary to keep excavations and Site free from water.
- (b) Do not pump water containing suspended materials into waterways, sewer or drainage systems.
- (c) Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

D16.6.9 Reducing Site Disturbances

- (a) Do not disturb, in any way, the embankment slopes, roadway shoulders, and adjacent ground surfaces areas outside the limits of the construction areas including the approved lay down, staging and access unless written permission has been obtained from the Contract Administrator. Such written permission will be granted only if it can be shown that there is no alternative.
- (b) Minimize disturbance of any undeveloped areas on Site and maintain existing Site grading where indicated and where possible.
  - (i) Minimize stripping of topsoil and vegetation
  - (ii) Re-grade and plant vegetation on construction Site as soon as possible.
  - (iii) Avoid soil compaction where possible.

D16.6.10 Pollution Control

- (a) Maintain temporary erosion and pollution control features installed under this contract.
- (b) Maintain construction equipment in good working order. Control emissions from equipment.
- (c) Cover or wet down dry materials and stockpiled soils to prevent blowing dust and debris. Provide dust control for the construction Site, temporary and access roads.
- (d) Bring only clean fill, granular, rip rap and other similar construction materials to the project Site.

D16.6.11 CN Environmental Requirements

- (a) Carry out all measures which CN, in its sole discretion considers necessary to keep the work free and clear of all environmental contaminants or residue results from the Contractor's occupation or use of the CN's premises (Premises), such condition to be confirmed by a post-termination environmental inspection/audit of the Premises to be carried out by CN. The Contractor shall be solely responsible for the cost of all work carried out to correct any environmental contamination which occurs on the Premises,

or which occurs on other lands as a result of the Contractor's occupation or use of the Premises.

- (b) CN shall have the right to enter upon the Premises, at all reasonable times and from time to time, in order to inspect the Premises and conduct or require the Contractor to conduct, at the Contractor's expense, such tests as may be required to verify the condition of the Premises.
- (c) The Contract shall be responsible to notify CN of all environmental contamination that the Contractor suspects is occurring on or escaping onto the Premises from adjacent lands or resulting from third party occupation.
- (d) If the Contractor fails to correct any environmental contamination to the satisfaction of CN and any public authority having jurisdiction, CN may perform such work by its employees or agents. CN may charge the Contractor from time to time for all the costs incurred by CN in correcting such environmental contamination, plus fifteen per cent (15%) for overhead, and the Contract shall pay CN's invoice or invoices for such costs within ten (10) days of receipt of each invoice. In the event such remedial work is carried out by any public authority, the cost of such work shall be borne by the Contractor.
- (e) Upon completion of the contract, the Contractor shall leave the Premises in a clean and tidy condition, free of any environmental contamination resulting from or occurring during the Contractor's occupation or use of the Premises. If the Contractor has installed any facility on or under the Premises, the Contractor shall remove such facility. The Contractor shall have the burden of proving that any environmental contamination has not resulted from or occurred during its occupation or use of the Premises.
- (f) The responsibility of the Contractor to CN with respect to the environmental obligations contained herein shall continue to be enforceable by CN.

## **SCHEDULE OF WORK**

### **D17. COMMENCEMENT**

D17.1 The Contractor shall not commence any Work until he/she is in receipt of a letter of intent from the Award Authority authorizing the commencement of the Work.

D17.2 The Contractor shall not commence any Work on the Site until:

- (a) the Contract Administrator has confirmed receipt and approval of:
  - (i) evidence of authority to carry on business specified in D9;
  - (ii) evidence of the workers compensation coverage specified in C6.15;
  - (iii) the twenty-four (24) hour emergency response phone number specified in D5.2;
  - (iv) the Safe Work Plan specified in D10;
  - (v) evidence of the insurance specified in D11;
  - (vi) the performance security specified in D12;
  - (vii) the subcontractor list specified in D13;
  - (viii) the equipment list specified in D14;
  - (ix) the detailed work schedule specified in D15 and
  - (x) the Environmental Protection Plan specified in D16
- (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;
- (c) The Contractor has provided proof of CN Contractor Safety Training for each individual proposed to work on the Site to the Contract Administrator and;



- (d) The Contractor has executed the CN Work Permit Application (Appendix B) submitted with the permit fee to CN and has provided a copy of CN acceptance to the Contract Administrator.

D17.3 The Contractor shall not commence the Work on Site before August 28, 2013, the anticipated Critical Stage Date for Phases I and II of Bid Opportunity No. 342-2013.

D17.4 The City intends to award this Contract by July 25, 2013.

D17.4.1 If the actual date of award is later than the intended date, the dates specified for Critical Stages, Substantial Performance, and Total Performance will be adjusted by the difference between the aforementioned intended and actual dates.

#### **D18. RESTRICTED WORK HOURS**

D18.1 Further to clause 3.10 of CW 1130, the Contractor shall require written permission forty-eight (48) hours in advance from the Contract Administrator for any work to be performed between 2000 hours and 0700 hours, or on Saturdays, Sundays, Statutory Holidays and or Civic Holidays.

#### **D19. SCHEDULE RESTRICTIONS**

D19.1 CN Flagmen

- (a) The Contractor will be required to provide qualified flagmen for the project as outlined in specification E9 Co-ordination of Construction with CN. Should CN decide to provide their own flagmen for the project, work schedules may be restricted by CN Flagmen availability.

#### **D20. WORK BY OTHERS**

D20.1 Work by others on or near the Site will include but not necessarily be limited to:

- (a) Manitoba Telecom Services – Relocation/protection of existing lines;
- (b) Shaw – Relocation/protection of existing lines;
- (c) Shell Canada Products Limited – Relocation/protection of existing lines;
- (d) Imperial Oil Limited – Relocation/protection of existing lines;
- (e) Manitoba Hydro – Removal of existing hydro poles and street lighting;
- (f) Manitoba Hydro – Relocation of a 12kV line and a 24 kV Feeder;
- (g) Pattison Sign Structure – Relocation of billboard;
- (h) CN – CN Signal and Communication Works;
- (i) City of Winnipeg Traffic Services – Erection and maintenance of temporary traffic control signs. Supply and installation of permanent traffic signs and bases. Closure of Plessis Road between Dugald Road and Kernaghan Avenue is scheduled to occur on July 28, 2013,
- (j) Contract #1 – Rail Shoofly Grade Preparation and Miscellaneous Wastewater Sewer, Watermain and Land Drainage Works. Work has commenced with an anticipated Total Performance Date of October 15, 2013 and;
- (k) Contract #3 – Plessis Road Reconstruction, Underpass Structures, Land Drainage Sewer, Lift Station and Miscellaneous Underground and Landscaping Works. Work is anticipated to commence November 4, 2013.

#### **D21. SEQUENCE OF WORK**

D21.1 The sequence of work as follows has been deemed acceptable. Bidders are encouraged to review and determine if a more cost effective and or time saving option is possible.

D21.1.1 The Contractor shall be aware that any alternative sequence of work proposed will be required to provide uninterrupted service on the two mainlines and the two yard leads for the duration of the project.

D21.2 **Phase I – Shoofly Track Construction**

**Stage A**

- i. Build WU01 Lead PS – New #10 RH 136# on embankment.
  - a. Install switch; 6 hour CN block required.
  - b. Surface Switch
- ii. Dismantle track panels that were removed to facilitate turnout installation. Stock pile material to area designated by CN.
- iii. Construct WU01 to tie in limits; transition from 136# to 100# rail required.
  - a. Ballast and surface.
- iv. Cut over WU01; 6 hour CN block required.
- v. Remove and dismantle remaining WU01 track to facilitate shoofly track construction.
- vi. Excavate existing WU01 embankment at designated location to enable positive ditch drainage.

**Stage B**

- i. Construct Proposed North Shoofly to tie in limits; ballast and surface.
- ii. Construct in place 2 - #10 136# RH for east N.Shoofly to S.Shoofly X-Over.
- iii. Construct in place 1 - #10 136# LH on N.Shoofly for WM01 Lead.
- iv. Construct 9 x 39' track panels and and stockpile for use in cut-overs.

**Stage C**

- i. Construct Proposed South Shoofly to tie in limits.
- ii. Construct in place: 2 - #10 136# RH for east N.Shoofly to S.Shoofly X-Over.
- iii. Ballast and surface track constructed in Stages B and C.

**Stage D**

- i. Construct segment of proposed WM01 between existing North Maintrack and existing WM01 Lead
  - a. Leave as skeleton track.
- ii. Construct segment of proposed WM01 from new N.Shoofly WM01 turnout to just south of the existing South Maintrack.
  - a. Ballast and surface this segment.

**Stage E**

- i. Cut over east and west locations of proposed South Shoofly; 8 hour CN train block required.
- ii. Remove track to facilitate proposed WM01 construction:
  - a. Remove existing south #10 132# RH on N.Maintrack to S.Maintrack east cross-over.
    - i) Dismantle and stockpile to area designated by CN.
  - b. Remove from track above switch to existing non-operational WU01 #10 132# RH T.O.
    - i) Dismantle and stockpile to area designated by CN.
- iii. Build segment of proposed WM01 with track panels from stage B just south of existing N.Maintrack, from WM01 track constructed in Stage D.
  - a. Ballast and surface.

**Stage F**

- i. One 8 hour Maintrack CN block to run concurrently with 16 hour WM01 CN block required to facilitate following work:
  - a. N.Shoofly
    - i) Cut over east and west segments of N.Maintrack with 2 track panels on each side.
    - ii) Ballast and surface.
  - b. WM01 track
    - i) Remove extent of N.Maintrack required to facilitate proposed WM01 track construction.
    - ii) Using track panels construct track through existing maintrack embankment, connect to north and south segment of proposed WU01 track built in previous stages.
    - iii) Cut over existing WM01 lead.
    - iv) Ballast and surface.
  - c. Work to do upon completion of train block / cut overs.
    - i) Remove North and South maintrack, including west X-Over, over Plessis road.
    - ii) Install crossing planks on WM01 and reprofile access road.
    - iii) Remove tracks and existing embankment at designated location of existing WM01 to enable drainage.
    - iv) Construct fueling pad area.
    - v) Dismantle and stockpile removed track to area designated by CN.

D21.2.1 Phase I - Stages A to F must occur consecutively. The Contractor shall not begin a subsequent stage until the current stage has been completed or approved by the Contract Administrator.

D21.2.2 Immediately following the completion of the shoofly track works, 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.

D21.2.3 Switch over mainline train traffic to shoofly.

D21.3 **Phase II – Permanent Track Construction**

**Stage G**

- i. Construct in place on out of service S.Maintrack east side of Plessis road:
  - a. New #12 RH 136# for future WU01 lead
    - i) Removal of existing #10 RH WU01 required to facilitate this installation.
  - b. New #12 RH 136# for future N.Maintrack to S.Maintrack X-Over
  - c. Dismantle and stockpile removed track to area designated by CN.
- ii. Construct in place on future N.Maintrack alignment east side of Plessis road:
  - a. New #12 LH 136# for future WM01 Lead.
  - b. New #12 RH 136# for future N.Maintrack to S.Maintrack X-Over
- iii. Construct in place on out of service S.Maintrack west side of Plessis road:
  - a. New #12 LH 136# for future N.Maintrack to S.Maintrack X-Over
  - b. Dismantle and stockpile removed track to area designated by CN.

**Stage H**

- i. Remove entire N.Maintrack and remaining existing S.Maintrack switches within extents of project.
  - a. Ballast to be hauled off site.
  - b. Dismantle and stockpile removed track to area designated by CN.
- ii. Build N.Maintrack within available working area at new alignment offset.

- iii. Ballast and Surface work from Stage G and H.
- iv. Construct 10 track panels and stockpile in designated area for future use.
- v. Construct Crossing Pads
  - a. (6) - 5 panel 7" x 10" x 20'
  - b. (12) - 2 panel 7" x 10" x 20'
- vi. Weld track as required.
- vii. Clean up site.

## **D22. BUILDING CANADA FUND – MAJOR INFRASTRUCTURE COMPONENT**

D22.1 Funding for the Plessis Road Twinning and Grade Separation at CN Redditt Subdivision Project (also known as the Plessis Road Underpass Project) is being provided to the City of Winnipeg by the Government of Canada ("Canada") and The Province of Manitoba ("Manitoba"). As required by the City's funding agreements with Canada and Manitoba, the Contractor must:

- (a) Establish and maintain for a period of at least six (6) years following the date of substantial completion of the Plessis Road Twinning and Grade Separation at CN Redditt Subdivision Project proper and accurate financial accounts and records, including but not limited to its contracts, invoices, statements, receipts and vouchers, (including supporting documents), prepared in accordance with generally accepted accounting principles, as are necessary to properly account for the services or goods provided by the Contractor to the City;
- (b) Permit The City, Manitoba, Canada, the Auditor General of Canada, and/or their designated representatives, to the extent permitted by law, at all times, to inspect the terms of the Contract and any records and accounts respecting the Project, and to have free access to the Project sites and any documentation relevant for the purpose of audit;
- (c) Permit the City, Canada and/or Manitoba and its agents, and their respective authorized representatives, to monitor the Work and to inspect and audit the accounting and other records relating to the Work for a period of six (6) years following June 30, 2015;
- (d) Indemnify and save Manitoba and its Ministers, officers, employees and agents harmless from and against all claims and demands, losses, costs, damages, actions, suit or other proceedings brought or pursued in any manner in respect of any matter caused by the Contractor or arising from the contract or from the goods or services provided, or required to be provided, by the Contractor, except those resulting from the negligence of any of Manitoba's Ministers, officers, servants, employees or agents;
- (e) Respect and comply with all applicable legislation and standards, whether federal, provincial or municipal, including (without limitation) labour, environmental, and human rights legislation;
- (f) Consent to the City providing a copy of the Contract to Manitoba and its agent upon request from Manitoba; and
- (g) Consent to the City providing Manitoba and its agents with the results of the City's inspections and audits of the Work and of the Contractor's accounts and records.

## **D23. CRITICAL STAGES**

D23.1 The Contractor shall achieve the critical stage of the Work in accordance with the following requirements:

- (a) Phase I – Temporary Shoofly track construction as described in D21 shall be completed by November 20, 2013.

D23.2 When the Contractor considers the Work associated with the critical stage listed in D23.1 to be completed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Completion. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be re-inspected.

D23.3 The date on which the critical stage Work has been accepted by the Contract Administrator as being completed to the requirements of the Contract is the date on which completion of critical stage has been achieved.

#### **D24. SUBSTANTIAL PERFORMANCE**

D24.1 The Contractor shall achieve Substantial Performance by December 20, 2013.

D24.2 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.

D24.3 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.

#### **D25. TOTAL PERFORMANCE**

D25.1 The Contractor shall achieve Total Performance by January 10, 2014.

D25.2 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.

D25.3 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.

#### **D26. ACCELERATED COMPLETION**

D26.1 Description

D26.1.1 This specification shall cover the accelerated completion of Phase I – Temporary Shoofly track construction as described in D21 of this contract.

D26.2 Acceleration of Work

D26.2.1 At no risk to the City, the Contractor at his own initiative, means, and expense, may undertake to complete the Works of this Contract to facilitate the safe opening of the Temporary Shoofly track in advance of the Critical Stage date as specified in D23.

D26.2.2 The opening of the Temporary Shoofly track shall occur when the track is approved by CN for operations.

D26.2.3 In recognition of the fact that an early completion of the Works in Phase I is of benefit to the City, the City will compensate the Contractor for said early completion on a per diem unit price basis, as hereinafter set out, provided that the City will not be liable to pay for any period of acceleration in excess of twenty (20) Calendar Days.

D26.2.4 It is noted that certain delays on track construction Work are normal, due to train traffic delays, necessary layout and dimensional changes. The Contract Administrator will attempt to resolve each situation as soon as possible. The Contractor is advised that no extension to the Critical Stage Date listed in D23 will be given for events of this sort which cause construction delay and are resolved within 48 hours of the requirement of change becoming known to both the Contractor and the Contract Administrator.

### D26.3 Method of Measurement

D26.3.1 Subject to clause D26.2.3 hereof, accelerated completion will be measured on a unit basis per diem. The number of days to be paid for will be the total number of Calendar Days with which all of Phase I is completed and approved by CN for operations in advance of the number of Calendar Days specified herein for Critical Stage Date in D23, with all specified Works listed in D21.2 completed and acceptable to the Contract Administrator.

### D26.4 Basis of Payment

D26.4.1 Subject to clause D26.2.3 hereof, accelerated completion will be paid for at the Unit Price per diem specified hereinafter for "Accelerated Completion" which price shall be payment in full for performing all operations undertaken and all other items incidental to the Work included in this Specification. Unit Price per diem = Ten thousand dollars (\$10,000).

D26.4.2 Payment for this item is not identified on Form B: Prices, and shall not be included thereon. If accelerated completion does occur as specified herein, then payment will be made for this item as an addition to the contract.

## D27. LIQUIDATED DAMAGES

D27.1 If the Contractor fails to achieve the Critical Stage - Phase I Shoofly Track Construction on or before November 20, 2013, the Contractor shall pay the City ten thousand dollars (\$10,000) per Calendar Day for each and every Calendar Day following the day fixed herein for same during which such failure continues:

D27.2 If the Contractor fails to achieve Substantial Performance or Total Performance in accordance with the Contract by the days fixed herein for same, the Contractor shall pay the City the following amounts per Calendar Day for each and every Calendar Day following the days fixed herein for same during which such failure continues:

- (a) Substantial Performance – five thousand dollars (\$5,000);
- (b) Total Performance – one thousand dollars (\$1,000).

D27.3 The amounts specified for liquidated damages in D27.1 and D27.2 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.

D27.4 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

## CONTROL OF WORK

### D28. JOB MEETINGS

D28.1 Regular weekly job meetings will be held at the Site. These meetings shall be attended by a minimum of one representative of the Contract Administrator, one representative of the City and one representative of the Contractor. Each representative shall be a responsible person capable of expressing the position of the Contract Administrator, the City and the Contractor respectively on any matter discussed at the meeting including the Work schedule and the need to make any revisions to the Work schedule. The progress of the Work will be reviewed at each of these meetings.

D28.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he/she deems it necessary.

### D29. PRIME CONTRACTOR – THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA)

D29.1 For the purpose of determining Prime Contractor, Contract #1 shall be all underground utility works and the construction of the rail embankments up to the top of the sub-ballast, Contract #2

shall be the supply and installation of ballast and all track material for the shoofly track construction and the permanent track works and Contract #3 will be all other works relating to the underpass construction.

- D29.2 Further to C6.26, the Prime Contractor shall serve as and will have the duties of the Prime Contractor in accordance with The Workplace Safety and Health Act (Manitoba) as follows:
- (i) Contractor for Contract #1 for the Construction Project Site upon commencement of Contract #1 – Bid Opportunity #342-2013;
  - (ii) Contractor for Contract #2 for the Construction Project Site upon Total Performance of Contract #1 - Bid Opportunity #342-2013, as notified in writing by the Contract Administrator and prior to Contract #3 commencement; and
  - (iii) Contractor for Contract #3 for the Construction Project Site upon commencement of Contract #3, as notified in writing by the Contract Administrator.
- D29.3 Contract #1 Safe Work Plan identifies typical embankment and underground utility works. Contract #1 Safe Work Plan will be provided to the successful bidder of Contract #2.

### **D30. THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA) – QUALIFICATIONS**

- D30.1 Further to B11.4, the Contractor/Subcontractor must, throughout the term of the Contract, have a Workplace Safety and Health Program meeting the requirements of The Workplace Safety and Health Act (Manitoba). At any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require updated proof of compliance, as set out in B11.4.

## **MEASUREMENT AND PAYMENT**

### **D31. PAYMENT**

- D31.1 Further to C12, the City may at its option pay the Contractor by direct deposit to the Contractor's banking institution.

## **WARRANTY**

### **D32. WARRANTY**

- D32.1 Notwithstanding C13.2, the warranty period shall begin on the date of Total Performance and shall expire one (1) year thereafter, except where longer warranty periods are specified in the respective Specification sections, unless extended pursuant to C13.2.1 or C13.2.2, in which case it shall expire when provided for thereunder.
- D32.1.1 For the purpose of Performance Security, the warranty period shall be one (1) year.
- D32.2 Notwithstanding C13.2, the Contract Administrator may permit the warranty period for a portion or portions of the Work to begin prior to the date of Total Performance if a portion of the Work cannot be completed because of unseasonable weather or other conditions reasonably beyond the control of the Contractor but that portion does not prevent the balance of the Work from being put to its intended use.
- D32.2.1 In such case, the date specified by the Contract Administrator for the warranty period to begin shall be substituted for the date specified in C13.2 for the warranty period to begin.

**FORM H1: PERFORMANCE BOND**  
(See D12)

KNOW ALL MEN BY THESE PRESENTS THAT

\_\_\_\_\_ ,  
(hereinafter called the "Principal"), and

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

\_\_\_\_\_ dollars (\$\_\_\_\_\_)

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

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

BID OPPORTUNITY NO. 539-2013

**PLESSIS ROAD TWINNING AND GRADE SEPARATION AT CN REDDITT SUBDIVISION: SHOOLLY TRACK INSTALLATION AND PERMANENT TRACK CONSTRUCTION AT MILEAGE 246.64**

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

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

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

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

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

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

\_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_ .



SIGNED AND SEALED  
in the presence of:

\_\_\_\_\_  
(Witness as to Principal if no seal)

\_\_\_\_\_  
(Name of Principal)

Per: \_\_\_\_\_ (Seal)

Per: \_\_\_\_\_

\_\_\_\_\_  
(Name of Surety)

By: \_\_\_\_\_ (Seal)  
(Attorney-in-Fact)

**FORM H2: IRREVOCABLE STANDBY LETTER OF CREDIT  
(PERFORMANCE SECURITY)**  
(See D12)

\_\_\_\_\_  
(Date)

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

RE: PERFORMANCE SECURITY – BID OPPORTUNITY NO. 539-2013

**PLESSIS ROAD TWINNING AND GRADE SEPARATION AT CN REDDITT SUBDIVISION:  
SHOOFLY TRACK INSTALLATION AND PERMANENT TRACK CONSTRUCTION AT  
MILEAGE 246.64**

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 (2007 Revision), International Chamber of Commerce Publication Number 600.

\_\_\_\_\_  
(Name of bank or financial institution)

Per: \_\_\_\_\_  
(Authorized Signing Officer)

Per: \_\_\_\_\_  
(Authorized Signing Officer)



**FORM K: EQUIPMENT**  
(See D14)

**PLESSIS ROAD TWINNING AND GRADE SEPARATION AT CN REDDITT SUBDIVISION: SHOOFLY  
TRACK INSTALLATION AND PERMANENT TRACK CONSTRUCTION AT MILEAGE 246.64**

<p><b>1. Category/type:</b></p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p>
<p><b>2. Category/type:</b></p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p>
<p><b>3. Category/type:</b></p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p>

**FORM K: EQUIPMENT**  
(See D14)

**PLESSIS ROAD TWINNING AND GRADE SEPARATION AT CN REDDITT SUBDIVISION: SHOOFLY  
TRACK INSTALLATION AND PERMANENT TRACK CONSTRUCTION AT MILEAGE 246.64**

**4. Category/type:**

Make/Model/Year: \_\_\_\_\_ Serial No.: \_\_\_\_\_

Registered owner: \_\_\_\_\_

Make/Model/Year: \_\_\_\_\_ Serial No.: \_\_\_\_\_

Registered owner: \_\_\_\_\_

Make/Model/Year: \_\_\_\_\_ Serial No.: \_\_\_\_\_

Registered owner: \_\_\_\_\_

**5. Category/type:**

Make/Model/Year: \_\_\_\_\_ Serial No.: \_\_\_\_\_

Registered owner: \_\_\_\_\_

Make/Model/Year: \_\_\_\_\_ Serial No.: \_\_\_\_\_

Registered owner: \_\_\_\_\_

Make/Model/Year: \_\_\_\_\_ Serial No.: \_\_\_\_\_

Registered owner: \_\_\_\_\_

**6. Category/type:**

Make/Model/Year: \_\_\_\_\_ Serial No.: \_\_\_\_\_

Registered owner: \_\_\_\_\_

Make/Model/Year: \_\_\_\_\_ Serial No.: \_\_\_\_\_

Registered owner: \_\_\_\_\_

Make/Model/Year: \_\_\_\_\_ Serial No.: \_\_\_\_\_

Registered owner: \_\_\_\_\_

## PART E - SPECIFICATIONS

### GENERAL

#### E1. APPLICABLE SPECIFICATIONS AND DRAWINGS

- E1.1 These Specifications shall apply to the Work.
- E1.2 *The City of Winnipeg Standard Construction Specifications* in its entirety, whether or not specifically listed on Form B: Prices, shall apply to the Work.
- E1.2.1 *The City of Winnipeg Standard Construction Specifications* is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/Spec/Default.stm>
- E1.2.2 The version in effect three (3) Business Days before the Submission Deadline shall apply.
- E1.2.3 Further to C2.4(d), Specifications included in the Bid Opportunity shall govern over *The City of Winnipeg Standard Construction Specifications*.
- E1.3 Appendix "B" CN Safety Requirements take precedence on all matters within CN property.
- E1.4 The following are applicable to the Work:

<u>Drawing No.</u>	<u>Drawing Name/Title</u>	<u>Drawing (Original) Sheet Size</u>
	<u>CN Redditt Subdivision: Shoofly and Final Track Construction at Mileage 246.25 to 246.81</u>	
P-3346-1070	Cover Sheet and Location Plan	A1
P-3346-1071	Plan and Profile	A1
P-3346-1072	Phase 1 – Stage A	A1
P-3346-1073	Phase 1 – Stage B	A1
P-3346-1074	Phase 1 – Stage C	A1
P-3346-1075	Phase 1 – Stage D	A1
P-3346-1076	Phase 1 – Stage E	A1
P-3346-1077	Phase 1 – Stage F	A1
P-3346-1078	Phase 2 – Stage G	A1
P-3346-1079	Phase 2 – Stage H	A1

#### E2. GEOTECHNICAL REPORT

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

#### E3. OFFICE FACILITIES

- E3.1 The Contractor shall supply office facilities meeting the following requirements:
- The field office shall be for the exclusive use of the Contract Administrator.
  - The building shall be conveniently located near the site of the Work.
  - The building shall have a minimum floor area of 25 square metres, a height of 2.4 m with two windows for cross ventilation and a door entrance with a suitable lock.
  - The building shall be suitable for all weather use. It shall be equipped with an electric heater and air conditioner so that the room temperature can be maintained between either 16-18°C or 24-25°C.

- (e) The building shall be adequately lighted with fluorescent fixtures and have a minimum of three wall outlets.
- (f) The building shall be furnished with one desk, one drafting table, 3 m x 1.2 m table, one stool, one four-drawer legal size filing cabinet and a minimum of twelve chairs.
- (g) A portable toilet shall be located near the field office building. The toilet shall have a locking door and be for the exclusive use of the Contract Administrator and other personnel from the City.
- (h) The field office building and the portable toilet shall be cleaned on a weekly basis immediately prior to each site meeting. The Contract Administrator may request additional cleaning when he/she deems it necessary.

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

E3.3 The office facilities will be provided from the date of the commencement of the Work to the date of Total Performance.

E3.4 On a one time basis, where directed by the Contract Administrator, the Contractor shall relocate the office facilities to a location more convenient for the remaining Work.

#### **E4. GEOTECHNICAL INSTRUMENTATION**

##### **E4.1 General Requirements**

E4.1.1 Geotechnical instrumentation (by others) for the purpose of construction and post-construction performance monitoring is expected for the site. The instrumentation of the site may include, but not limited to, the installation of monitoring wells, vibrating wire piezometers, settlement gauges and slope inclinometers within the construction area.

##### **E4.2 Monitoring**

E4.2.1 The instrumentation shall be monitored by the Contract Administrator during construction. Contractors are advised that it may be necessary to limit equipment movement in the vicinity of the monitoring work. The Contract Administrator shall make every effort to coordinate the monitoring with the Contractor's operation so as to minimize disruption of the Work.

##### **E4.3 Protection of Instrumentation**

E4.3.1 The Contractor shall take all necessary precautions to prevent damage to geotechnical instrumentation. Should instrumentation become damaged as a result of the Contractor's operation, it shall be repaired or replaced, if necessary, at the Contractor's expense.

##### **E4.4 Additional Instrumentation**

E4.4.1 It may become necessary during the Work to install additional geotechnical instrumentation. The Contractor shall facilitate this work. The Contract Administrator shall make every effort to coordinate the installation of additional instrumentation with the Contractor's operation so as to minimize disruption of the Work.

#### **E5. PROTECTION OF EXISTING TREES**

E5.1 The Contractor shall take the following precautionary steps to prevent damage from construction activities to existing boulevard trees within the limits of the construction area:

- (a) The Contractor shall not stockpile materials and soil or park vehicles and equipment on boulevards within 2 metres of trees.
- (b) Trees identified to be at risk by the Contract Administrator are to be strapped with 25 x 100 x 2400 mm wood planks, or suitably protected as approved by the Contract Administrator.
- (c) Excavation shall be performed in a manner that minimizes damage to the existing root



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

- (d) Operation of equipment within the dripline of the trees shall be kept to the minimum required to perform the work required. Equipment shall not be parked, repaired, refuelled; construction materials shall not be stored, and earth materials shall not be stockpiled within the driplines of trees. The dripline of a tree shall be considered to be the ground surface directly beneath the tips of its outermost branches. The Contractor shall ensure that the operations do not cause flooding or sediment deposition on areas where trees are located.
- (e) Work on-site shall be carried out in such a manner so as to minimize damage to existing tree branches. Where damage to branches does occur, they shall be neatly pruned.

E5.2 All damage to existing trees caused by the Contractor's activities shall be repaired to the requirements and satisfaction of the Contract Administrator and the City Forester or his/her designate.

E5.3 No separate measurement or payment will be made for the protection of trees.

E5.4 Except as required in clause E5.1(c) and E5.1(e), Elm trees shall not be pruned at any time between April 1 and July 31.

## **E6. TRAFFIC MANAGEMENT**

E6.1 Further to D21. Sequence of Work:

E6.1.1 The Contractor shall schedule construction activities to meet the following:

(a) Site access for railway traffic shall be maintained at all times.

E6.1.2 Ambulance/emergency vehicle access must be maintained at all times.

E6.2 Further to clause 3.7 of CW 1130:

E6.2.1 Plessis Road 150 m south of Kernaghan Avenue and Dugald Road will be closed to thru traffic and pedestrians from July 28, 2013, until the completion of Contract 3, December 30, 2014. The City of Winnipeg Traffic Services Department shall barricade and sign the street "Road Closed" for the duration of the Project.

## **E7. SITE SECURITY**

E7.1 During the project the Contractor shall be responsible for maintaining only authorized site access 24 hours a day. Any existing security fencing etc. that may be altered during construction will need to have an equivalent replacement. No measurement for payment shall be made for this work.

## **E8. WATER USED ON CITY OF WINNIPEG CONSTRUCTION PROJECTS**

E8.1 Further to clause 3.7 of CW 1120, the Contractor shall pay for all costs, including sewer charges, associated with obtaining water from the City in accordance with the Waterworks and Sewer By-laws.

## **E9. COORDINATION OF CONSTRUCTION WITH CN**

### **DESCRIPTION**

E9.1 General Requirements

E9.1.1 The Contractor shall be responsible to meet all CN current constraints, requirements, engineering track standards, and safety measures.

E9.1.2 CN safety requirements are included in Appendix "B".

E9.2 Flag Protection of Work

E9.2.1 The Contractor will be required to supply flag protection for this project.

E9.2.2 Protection foreman must have qualifications that meet CN requirements and are required to provide proof of such with a copy of record provided to the Contract Administrator prior to the start of any works. Payment for flag protection will be as outlined in E11.17.15.

E9.3 Train Movements

E9.3.1 The Contractor is to expect in the range of 20 train movements in a twenty four (24) hour period. The contract price is to include any cost associated with these construction delays and no separate payment will be made for delays in construction due to train movements.

**E10. ENCROACHMENT ON PRIVATE PROPERTY**

E10.1 Further to Section 3.11 of CW 1130 of the General Requirements, the Contractor shall confine his work to the public right-of-ways and construction easements at all times, except if he has received written permission from the property owner. The Contractor shall provide the Contract Administrator with a copy of any written permission he has received to enter onto private property.

E10.2 The Contractor's construction activities shall be confined to the minimum area necessary for undertaking the work and he shall be responsible for all damage to private property resulting from his work. Particular care shall be taken to assure no damage is done to building, fencing, trees and plants, and provision shall be made to maintain full drainage for private properties during construction.

**E11. TRACK CONSTRUCTION**

DESCRIPTION

E11.1 Flag Protection of Work

E11.1.1 In addition to E9, when contractors employees are required to perform Protecting Foreman duties they must be CN qualified and have in their possession a valid rules card.

E11.2 Work Included

E11.2.1 Provide all labour and equipment to construct trackage as shown on the drawings and specified in this Specification. References to CN drawings within the specifications and drawings will be provided to any Contractor not in possession of the latest documents.

E11.2.2 Track construction, turnout construction, ballasting, surfacing and welding shall be performed by foremen and laborers experienced in railroad track construction. Track will be constructed to the design alignment, dimensions and top of rail profile as indicated on the drawings. Track construction consists of new trackage, turnout(s) and existing track reconfiguration in addition to removal and stockpiling of surplus material.

E11.2.3 Distribute and install track material.

E11.2.4 Install railway supplied turnouts and ties.

E11.2.5 Supply and construct railway 136 lb track complete structure on new pre-plated No. 1 treated hardwood ties.

E11.2.6 Stockpile of surplus CN supplied track material in a designated location as directed by the Track Supervisor.

E11.2.7 Supply and place ballast for turnouts and track to design alignment and elevation. Includes resurfacing existing grade at switch locations, as required.

- E11.2.8 Install six No. 10 136 lb. turnouts with RMB frog, 16'6" switch points on new switch ties and switch stand complete with transition rails.
- E11.2.9 Install five No. 12 136 lb. turnouts with RMB frog, on new switch ties and switch stand complete with transition rails.
- E11.2.10 Supply of a qualified Protection Foreman.
- E11.2.11 Lift, line and surface turnouts and track to design alignment and elevation.
- E11.2.12 Obtain permits or approvals required and pay all permits and approval fees.
- E11.2.13 All other work as called for on the drawings and/or described in the Specifications.

#### MATERIALS

- E11.3 Mainline rail shall be new 136 lb, CWR. All rail shall be control cooled, straight, and free of kinks and be in compliance with current AREMA Specifications, Chapter 4.
- E11.4 Taper rail shall be minimum second hail, one spot 136 lb. All rail shall be control cooled, straight, and free of kinks and be in compliance with current AREMA Specifications, Chapter 4. Rail joints are not to be located within crossing.
- E11.5 Turnout rail shall be new 136 lb. free of physical defects. All rail shall be control cooled, straight, and free of kinks and be in compliance with current AREMA Specifications, Chapter 4.
- E11.6 Wood ties for mainline usage shall be new 7" x 9" x 8.5' track ties. All ties shall be hardwood grade ties, treated with a creosote-coal tar solution to a net retention of 9.2 lbs. per cubic foot minimum for mixed hardwoods and 7 lbs. per cubic foot minimum for oak. Wood ties shall conform to current AREMA Specifications, Chapter 30, "Ties", for size, quality, treatment, and defects.
  - E11.6.1 No ties will be accepted with the following defects
    - (a) Broken tie – tie which is broken through.
    - (b) Split tie – tie split end to end for the entire depth of the tie.
    - (c) Split tie end – tie end split resulting in poor surface and gauge.
    - (d) Cut tie – tie which is rail or plate cut, or adzed to a depth of 1 inch or more.
    - (e) Crushed tie – tie which has the bearing surface under the rail crushed one inch or more.
    - (f) Spike killed tie – Condition is indicated by numerous splits at the tie end and/or loose or high spikes, wide gauge and poor alignment.
    - (g) Decayed tie – tie which is decayed and cannot hold spikes, gauge or surface.
    - (h) Damaged tie – tie which is damaged to a depth of 2 inches or more due to derailments, dragging equipment or fire.
    - (i) A break across the annular rings (commonly known as a "split") which is not over 8 inches long will be allowed. A split over 8" long or more than one split, or a split wider than 1/4" at the face across which it occurs, will not be allowed.
  - E11.6.2 Crossing ties shall be new 7" x 9"x 9' track ties. All ties shall be hardwood grade ties, treated with a creosote-coal tar solution to a net retention of 9.2 lbs. per cubic foot minimum for mixed hardwoods and 7 lbs. per cubic foot minimum for oak. Wood ties shall conform to current AREMA Specifications, Chapter 30, "Ties", for size, quality, treatment, and defects.
  - E11.6.3 Turnouts are to be new 136lb #10 TS-267 (TS-241 for crossovers) and new 136lb #12 TS-271, and must be in accordance with the current CN Standard Plans. Secondhand turnouts, if approved, must be of acceptable quality as determined by the Contract Administrator with no mismatch between rail, points or frog.
    - (a) All turnouts must have new hardwood switch ties.

- (b) All turnouts must be equipped with adjustable braces.
  - (c) Minimum 14" tie plates are to be used in turnout construction.
  - (d) Switch machines shall be new with connecting rods, targets, and reflective tips as required.
  - (e) Secondhand turnout material is not to be painted.
- E11.6.4 Rail anchors shall be new or manufacturer certified refurbished, drive-on-type and of standard manufacture, as approved by the Contract Administrator, of the proper size to fit 136lb rail sections.
- E11.6.5 Tie plates shall be new, and measure a minimum of 7-1/2"x14" in size on tangent and 7-1/2"x16" on curves up to 6°. Curves over 6° shall have 16" plates. All plates shall have 6 spike holes. All tie plates are to be double shoulder with 1:40 cant, free of injurious defects and foreign material, and shall conform to current AREMA Specifications for 136lb rail.
- E11.6.6 Joint bars shall be new, in good condition, toeless type, free of foreign material and without injurious defects. They shall conform to current AREMA Specifications, and must be to the proper design and dimensions for the rail on which it is to be applied. 136lb joint bars shall have 6 bolt holes and measure a minimum 36" in length.
- E11.6.7 Compromise bars shall be new, in good condition, toeless type, free of foreign material and without injurious defects. They shall conform to current AREMA Specifications, and must be to the proper design and dimensions for the rails on which it is to be applied. Installed bars will be painted blue.
- E11.6.8 Track spikes must be new 5/8" square with reinforced throat design. All track spikes shall conform to current AREMA Specifications for High-Carbon Steel Track Spikes, Chapter 5, Part 2. Length of track spike under its head shall be 6 inches.
- E11.6.9 Track bolts with nuts must be new. Bolts and nuts shall conform to current AREMA Specifications. Bolts and nuts shall be to the appropriate size for the bolt holes in the rail section with length sufficient for a full nut and spring washer and 1/4" thread exposed.
- E11.6.10 New spring washers of the appropriate size to fit the track bolt used shall conform to current AREMA Specifications. Each track bolt shall receive one spring washer.
- E11.6.11 Tie plugs for softwood ties shall be new, creosote treated, and shall conform to current AREMA Specifications, Chapter 30. A chemical plug is required for hardwood ties.
- E11.6.12 Thermite field welding material for 136lb rail is to be as manufactured by Boutet or Orgotherm.
- E11.6.13 Crossing planks shall be new softwood treated 7"x10"x20' prebored and meeting current CN standard.
- E11.6.14 Crossing lag bolts shall be new hex 3/4"x12" complete with 3/4" flat washer.
- E11.6.15 Track Panels shall be 136lb, in 39' lengths, fully anchored and shall meet track standards as outlined in this specification.
- E11.6.16 Rock ballast shall be as approved by CN. The gradation of the rock ballast is 2" minus in size with a minimal amount of fines as per CN Specification 12-20C Class 2 (Appendix D). Walking ballast shall conform to AREMA Size No. 5, and meet the quality requirements as shown in the AREMA Table No. 1 and No. 2. All ballast shall be crushed to assure abrasive edges. Frozen ballast, at time of placement, will not be accepted.
- (a) Contractor shall furnish written test results to the Contract Administrator that indicates the crushed rock ballast is accordance with the limiting values referenced above.
  - (b) Ballast to have a minimum count of particles with one or more fractured faces of 70% on each sieve size.
  - (c) The percent of wear due to abrasion shall be less than 30% for the ballast per ASTM C 131 "A" Grading.

## E11.7 Track Construction

E11.7.1 Contractor shall exercise care in the unloading and distribution of track material and in the construction of trackage to avoid disturbing the surface of the subballast and the seeding and mulching on the side slopes. Any damage to either the subballast surface or side slopes caused by Contractor's operations shall be repaired at Contractor's expense to the satisfaction of the Contract Administrator. The Contractor shall provide for the movement and handling of and the laying of rail in such a manner as to avoid damage to new roadbed, subballast, and rail. Care must be exercised to avoid twisting or damaging rail. During handling, Contractor shall be responsible for damage to rail to the extent that sections thereof damaged, in the opinion of the Contract Administrator, unsuitable for use in track, such rail section shall be replaced at the sole expense of the Contractor. It is entirely up to the Contract Administrator to determine if any rails or portions thereof have been damaged.

## E11.8 Handling of Material

E11.8.1 Contractor shall be responsible for all track material. Contractor's responsibility begins at his loading of materials, unloading of materials to ground at site locations, continues through its placement into the track structure and until final acceptance of the track by the Contract Administrator.

E11.8.2 No additional compensation will be allowed for segregating or replacing materials of questionable quality or condition. After inspection by the Contract Administrator, the Contractor will be advised if material in question is suitable for use. If material is rejected by Contract Administrator, the Contractor will replace the rejected material at his expense.

E11.8.3 The Contractor's responsibility for materials continues through its placement into the track structure and until final acceptance of the track by the Contract Administrator and CN. If materials are damaged, lost, or wasted through Contractor's negligence, poor workmanship or handling, Contractor shall replace said materials in kind at no additional cost.

## E11.9 Execution

E11.9.1 Timber ties shall be unloaded and handled in such a manner as not to damage them, using approved handling equipment. Pulling timber ties into position with picks or shovels will not be permitted. Tie tongs shall be used for this purpose.

(a) Cross ties shall be placed at a design spacing of 20 ½" center to center except where crossing planks are to be installed they shall be placed at 19 ½" center to center. The cross ties shall be placed on the approved finished subballast, perpendicular to center line of track, with the right hand (in the direction of increasing stationing) ends of cross ties being parallel with and each end of the cross tie being the same distance from center line of track, except on curves, where cross ties are to be aligned to the inside of the curve. All rail joints/welds are to be suspended between ties.

(b) When both new and PW ties are being used only new ties shall be placed within 200 feet of any switch ties.

(c) If spikes are pulled from any timber tie, hole shall immediately be filled by driving in a treated wood tie plug the full depth of the hole in softwood ties or by injecting an approved chemical plug material in hardwood ties.

(d) Lay timber ties with heartwood face down, and if not possible to determine position of the heartwood, lay the widest surface of the timber tie down.

(e) Top surface of timber ties shall be clean and smooth to provide full bearing for tie plates. The bottom of the rail, the tie plate and the wearing surface of the timber tie shall be broom cleaned before the rail is laid.

E11.9.2 Tie plates shall be used under running rails on all track where timber ties are placed.

(a) Tie plates should be free of dirt and foreign material when installed.

- (b) Care must be exercised to see that canted tie plates are applied so as to cant the rail inward.
  - (i) Tie plates must be placed square with the rail and centered on the tie. Particular care must be given to see that the tie plate shoulders and spike heads are never under the base of the rail and that the tie plates are well seated with full even bearing on the ties and the rail is properly seated on the tie plate. After rails are in place, outside shoulder of tie plate shall be in full contact with outside edge of rail base.
- (c) The same size tie plate must be used opposite one another on each cross tie. Plates from different manufacturers must not be intermixed.
- (d) Sweep off all granular material from ties prior to placement of tie plates.
- (e) Sweep off all granular material from tie plates prior to placement of rail.
- (f) Cutting or burning of tie plates is not permitted.

E11.9.3 Cross ties shall be spiked as per Table 1.

Table 1

SPIKING PATTERN		MGTS PER YEAR	DEGREE OF CURVE			
No.	Field Gauge		Tangent up to 2°	2° to 4°	4° to 6°	Greater than 6°
A		Other than Main Track	X	X	X	X
		0-20	X			
B		0-20		X	X	
		Greater than 20	X			
C		0-20				X
		Greater than 20		X	X	
D		Greater than 20				X
		Turnouts Spiking pattern D will be applied to turnouts as per Figure 2 below 89				

E11.9.4 Turnouts shall be spiked with Spike Pattern D from a point 39' in front of the points to a point 39' beyond the last switch tie on the tangent and to a point 39' beyond the E.C. of the return curve.

E11.9.5 Installation of joint bars complete with tightened bolts must occur before spiking rail.

- (a) Uniform track gauge must be maintained when spiking and must be checked by use of standard track gauge.
- (b) The right hand rail going in the direction of increasing stationing shall be spiked to cross ties, and the opposite rail shall be brought to standard gauge of 4'-8½" measured at right angles between the rails, 5/8" below the top of rail. Gauge to be checked at every third tie by using a tested and approved track gauge. Curves shall have gauge widened in accordance with the following table:

Degree of Curve	Gauge
10 degrees or less	4'-8½"
Greater than 10 degrees	Increased 1/16 inch per degree of curvature

- (c) Spikes will be driven only with a standard spike maul, sledge hammer, pneumatic or hydraulic spiking hammer or spiking machine.
- (d) All spikes shall be started and driven vertically with the face of the spike in contact with the base edge of the rail and so driven as to allow 1/8 inch to 3/16 inch space between the underside of the head of the spike and the top of the base of the rail. In no case shall the spikes be overdriven or straightened while being driven. When spikes are driven by machine, work shall be closely supervised to see that they are

driven with a hammer centered exactly over each spike head and drive spike vertically. Set stop on the machine to prevent overdriving.

- (e) No spike shall be within 2" of the end of a joint bar. Do not strike rail directly with a maul, either on top when driving, or on side to obtain track gauge.
- (f) Withdraw spikes which are incorrectly driven and fill hole by driving a treated tie plug to full depth of hole in softwood ties or by injecting an approved chemical plug material in hardwood ties. Locate replacement spike at another hole in tie plate.

E11.9.6 As required assemble temporary track rail joints before fastening rails to timber ties using joint bars with 4 track bolts and a spring washer for each bolt, first removing all dirt, loose mill scale, and rust from contact surfaces of joint bars and rails.

- (a) Holes for track bolts shall only be drilled by an approved type of rail drill. Under no circumstances shall new holes be drilled between two holes already drilled.
- (b) Rail joints shall be applied so that bars are not cocked between base and head of rail.
- (c) If necessary to force joint bar into position, strike lower edge of bar lightly with 4 lb maul. Do not drive bolts in place. Under no circumstances shall rail be struck in web with tool or any metal object.
- (d) Tighten bolts in sequence, beginning at joint center and working out to ends. Bolts to be tightened to torques required as per Olf a bolt tightening machine is not used, a standard track wrench with a 42" long handle may be used.

E11.9.7 Insulated joints should be suspended, that is, the end post should not be over a tie.

- (a) Plates must be used with all insulated joints on wood track ties. As shown on CN Plan TS-1206, insulated tie plates will be used on ties within 2" of the end post of an insulated joint.
- (b) Rail ends where insulated joints are to be installed must conform to the following:
  - (i) The end face shall be saw cut and bolt holes drilled to the proper size and location for the rail section.
  - (ii) All rough edges and burrs shall be removed from the end face and bolt holes.
- (c) All rust, scale, dirt or other foreign matter must be removed from the rail joint area and from the joint bars before the joint is installed.
- (d) If the end post projects above the top of rail, it must be trimmed so that the top is below the top of rail, but not exceeding 1/8" below.
- (e) Track near insulated joints shall be adequately anchored. Non-glued insulated joints will be considered as joints and will be anchored to the correct standard.
- (f) Rail anchors must not be applied on the sides of ties adjacent to bootlegs.
- (g) Rail end overflow must be removed at insulated joints by slotting in accordance with CN Plan TS-1113. The gap should be filled with silicone sealer to prevent the influx of dirt and grinding material.

E11.9.8 Compromise Joints and Rails

- (a) To determine the hand of the joint, face the joint from the center of the track. When the larger rail section is on the left side of the joint, it is a left hand joint. When the larger section is on the right, it is a right hand joint.
- (b) A compromise joint consists of one gauge side and one field side. The rail sections that the compromise bar will fit are indicated at each end of the bar.
- (c) Compromise joint bars must not be modified from their initial design to fit a different rail section. Rail shall only change by one rail weight per bar location.
- (d) Compromise joints (except 132/136) must not be installed in turnouts, or within 20' of an open deck bridge, turnout, highway crossing or railroad crossing.
- (e) Compromise rails will be fully supported and tamped with the correct size tie plates under the corresponding rail section.

- E11.9.9 Derails shall be installed as per CN Plan TS 2208
- (a) Derails are classified as either right or left hand. A right hand derail is installed on the right hand rail and derails toward the right.
    - (i) Care must be taken to ensure derails are located properly.
  - (b) Derails are to be installed such that in the derailing position the derail block covers the ball of the rail and lie flat on the top of the rail throughout the underside of the derailing block surface and will bear directly on sound ties.
  - (c) A steel shim, of the correct thickness and with holes punched or drilled for all fasteners, may be necessary under the derail to ensure the block lies flat on top of the rail.
    - (i) Where 2" shims or extender/elevator plates are used, tie screws of 1" longer must be used.
  - (d) Ties, to which derails are fastened, must be sound and well tamped and have the top surfaces in the same plane.
    - (i) Tie plates are not to be installed at the derail location.
  - (e) Derails must be installed at right angles to the rail and will be fastened with 1" x 6½" lag screws.
  - (f) Derails which have been manufactured to accommodate eight or more fasteners must be fastened with a minimum of eight fasteners.
    - (i) Where derails are manufactured to accommodate less than eight fasteners, all available holes must be used.
  - (g) Derails must be properly lubricated and adjusted for ease of movement.
  - (h) Derails must be painted yellow and have signs installed as per CN Plan TS 2208.
  - (i) Tracks equipped with a derail shall have the switch stand lever painted yellow.
- E11.9.10 The Contractor shall provide such equipment, tools, and materials necessary and required for turnout construction.
- (a) Install turnouts in accordance with the appropriate standard plans
  - (b) Rail gaps at turnout panels shall be welded.
  - (c) Minimum 14" Tie Plates are to be used in turnout construction.
  - (d) All switch ties must be as laid out on standard plans, properly spaced and square to through track. Switch ties are not to be cut.
  - (e) The turnout stock-rail must be bent horizontally, as shown on the standard plan. Only standard carbon and 3HB rail, in 115 lb section or smaller, may be field bent with an approved bender.

**For safety reasons, under no circumstances are head hardened rails or rails greater than 115 lb to be bent in the field.**
  - (f) Ensure the switch point fits snugly against the stock rails for the entire length of the planed portion. Points will not overhang gauge plates nor be more than one inch back from front edge. Running surface of points will be ¼" above stock rail, as measured at the location where the distance between gauge face of stock rail and gauge face of switch point when tight against the stock rail is 4½".
  - (g) Bolt switches, frogs and guard rails fully. Provide washers and cotter pins for bolts. Grade 8 bolts are identified by six radial lines on the head of the bolt and are to be tightened as per:



Grade 8 Bolts

Size of Bolt		Torque
Inches		Ft-Lb.
1		840
1-1/4		1675
1-3/8		2500

- (h) All turnouts must be fully spiked or fastened with tie screws and clips. Spikes are to be fully driven or timber tie screws drawn down.
- (i) Switch stands will be located as per instructions issued by the Engineer.
- (j) Switch stands must be plumb, securely spiked, bolted or lagged to the head block ties. They must also be secured with lock or keeper as supplied.
- (k) Standard throw of switch points as measured at the No. 1 switch rod and at the No.5 switch rod of turnouts equipped with auxiliary throw mechanism must be set in accordance with the appropriate standard plan.
- (l) Switch rods and transit clips must not contact the side of the tie or the slide plate.
- (m) All switch stands must be equipped with the appropriate reflectorized target assembly (in some locations a double bladed target tip is required). Target assemblies will be properly adjusted to display green when the switch is lined for the normal route and yellow when lined for the diverging route.
- (n) Install switch rod bolts and connecting rod bolts, except the bolt under the switch stand, with the nut on the upper side to permit ready inspection of the cotter pin.
- (o) Install the connecting rod bolt under the switch stand with the head on the upper side.
- (p) Install cotter pins on all connecting and switch rod bolts.
- (q) Position the handle on the switch stand so that when the switch is in the normal position it faces away from the frog and the track, and moves in the same direction as the points when the switch is lined for the diverging route. Switch handles of rigid switch stands will be adjusted such that they cannot be placed in locking position with normal pressure when 1/8" shim placed between point and stock rail at first rod.
- (r) Lubricate switch stands, switch plates, connecting rod bolts and spring frogs properly after assembly.
- (s) Stock rails must be properly seated in the switch plate, have no lateral movement in the plates and switch plates have no movement on the ties.
- (t) Care must be taken in adjusting braces to avoid over-driving and rotating the stock rails out of the seat of the plate.
- (u) Flangeways must be clear of obstructions and not less than 1½" deep, not less than 1¾" wide and not more than 2" wide.
- (v) Guard Check Gauge
  - (i) The minimum distance from the gauge line of a frog to the guard line of its guard rail or guarding face, as measured across the track at right angles to the gauge line is 4'-6¼".
- (w) Guard Face Gauge
  - (i) The maximum distance between guard lines as measured across the track at right angles to the gauge line is 4'-5 1/8".
- (x) Fully anchor the rail on both tracks through turnouts except where anchors will interfere with switch points. Fully anchor for 200 feet in both directions beyond the turnout.

- (y) Once installed, line new turnouts for through movement and spike the switch point. Switch points shall remain spiked until inspected by the Engineer.

**CONSTRUCTION METHODS**

- E11.10 The method and equipment used by the Contractor in handling and movement and the laying of rail will be subject to the approval of the Engineer.
  - E11.10.1 Rail shall be free of dirt and foreign material when installed
  - E11.10.2 Rail will only be cut square and clean by means of a rail saw with all burrs removed. Torch cut rail will not be allowed to remain in the track. When sawing rail for reuse saw cut must be made at least 4" (100 mm) from any torch mark on the rail.
  - E11.10.3 The Contractor will ensure that rails are laid such that gauge faces of rail are matched according to their previous position in track such that the gauge side remains the gauge side.
  - E11.10.4 Rail must not be struck with mauls, sledgehammers or other heavy objects.
  - E11.10.5 Rail of different chemistries or manufacturers shall not be mixed in any given stretch. Use compromise bars to join rails of different sections. Bars which join rails of more than one weight difference are not allowed.
  - E11.10.6 Jointed rail shall be laid with staggered joints. The stagger between joints of opposite rails must not be less than 12 feet. Rail joints must be kept clear of crossing planks and be a minimum of 20' from the end of planks.
  - E11.10.7 Rail temperature shall be measured periodically throughout the day with at least two accurate thermometers placed on the base of the rail near the web, away from wind and out of the direct rays of the sun and away from all sources of artificial heat or cold. The thermometer shall be left in place for at least 10 minutes prior to taking a reading. A pyrometer may also be used to measure rail temperature.
    - (a) When using pyrometers to determine rail temperature, the pyrometer should be pointed into the shaded portion of the web of the rail. Rail temperature must be taken at intervals of approximately 150'.
  - E11.10.8 Expansion space between rail ends must be provided. Expansion space of the proper dimension between rail ends can be obtained through the use of shims of the correct thickness as per tables below.

**Table 5-5-4. Rail End Openings for Allowance of Expansion**

33-Foot Rail 160 Joints per Mile		39-Foot Rail 135 Joints per Mile		78-Foot Rail 68 Joints per Mile	
Rail Temperature Degrees F	Expansion Inches	Rail Temperature Degrees F	Expansion Inches	Rail Temperature Degrees F	Expansion Inches
Below -10	5/16	Below 6	5/16	Below 35	5/16
-10 to 14	1/4	6 to 25	1/4	35 to 47	1/4
15 to 34	3/16	26 to 45	3/16	48 to 60	3/16
35 to 59	1/8	46 to 65	1/8	61 to 73	1/8
60 to 85	1/16	66 to 85	1/16	74 to 85	1/16
Over 85	None	Over 85	None	Over 85	None

- E11.10.9 Fibre, hardwood, or metal shims may be used to obtain the proper expansion space by bringing rail ends squarely together against the expansion shims. Expansion shims must not be removed until the rail is properly spiked, the bolts tightened and rail anchors applied.

- E11.10.10 When new rail adjoins rail previously in track the old rail will be built up by welding at the joint to protect the end of the new rail.
- E11.10.11 Rail is to be placed to avoid mismatch however where rail end mismatch exceeds  $\frac{1}{4}$ " on the top or the gauge side of a rail joint, it shall be reduced by grinding, welding or replacement of the rail.
- E11.10.12 Rail ends with excessive flow will be repaired by slotting. Crushed or battered rail ends will be cut off.
- E11.10.13 Nicked or gouged rail shall be rejected and replaced as determined by the Engineer at the sole cost of the Contractor for any rail damage due to the Contractor's handling. This includes the cost of the replacement rail, transportation, welds, and any associated costs in the change out of the defect.
- E11.10.14 Upon completion of the days work, all rail laid must be fully spiked, bolted and anchored.
- E11.11 All cross ties shall be anchored to a minimum box pattern of 8 ties per 39'. The same ties on opposite rails shall be boxed.
- E11.11.1 Only the proper tools or machines will be used when applying or removing anchors. The use of spike mauls is prohibited. When applying anchors by machine ensure the machine is properly adjusted.
- E11.11.2 Anchors must be installed from gauge to field side of rail to insure full bearing surface against the side of the tie, bearing against the adjacent tie and remain tight on the rail. Anchors must be on the same side of the same tie on both rails. Ties are to be at right angles to the rail before applying anchors. Anchors improperly installed will be removed and applied correctly without additional charge by the Contractor. Anchors will only be removed when the rails is still in the track and done such as to prevent damage to the anchor or rail.
- E11.11.3 Anchors must be fully driven; however, care must be taken to avoid over-driving as this may fracture or spread the metal, resulting in loss of holding power. Any rail anchor that is fractured or with metal spread will be rejected and replaced with another anchor at the Contractor's expense.
- E11.11.4 Anchors shall be installed only to the rail section for which they are designed and shall only be the same type of anchor to any one tie.
- E11.11.5 Care must be exercised in the spacing of anchors to ensure that no anchors are located on any tie under or adjacent to the ends of a rail joint bar, bond wires, insulated joints or other signal or track appliances.
- E11.11.6 Anchor rail immediately after laying.
- E11.11.7 Bumping posts shall have 10 ties in front of and all ties behind fully box anchored.
- E11.12 CWR
- E11.12.1 The Contractor shall provide such equipment, tools, and materials necessary and required for welded rail track construction.
- E11.12.2 Definitions
- (a) Continuous Welded Rail (CWR) is rail welded into lengths of 400 feet or more.
  - (b) Rail Laying Temperature (RLT) is the actual temperature at which the CWR is laid.
  - (c) Preferred Rail Laying Temperature (PRLT) is the target installation temperature of welded rail in a particular area. For this location the PRLT is 90 degrees F.
  - (d) Preferred Rail Laying Temperature Range (PRLTR) is the PRLT plus 25 degrees F.
- E11.12.3 It will be necessary for the Contractor to move the welded rail strings to the exact location they are to be installed. The Contractor shall furnish such additional equipment and supplies as may be required to adequately distribute welded rail strings. Care must be

taken to ensure that strings are laid such that gauge faces of rail are matched according to their previous position in track.

- E11.12.4 The Contractor shall provide for the movement and handling of and the laying of welded rail strings in such a manner as to avoid damage to new roadbed, subballast, and rail. Care must be exercised to avoid twisting or damaging welded rail strings. During handling, Contractor shall be responsible for damage to welded rail strings to the extent that complete strings or sections thereof damaged, in the opinion of the Engineer, unsuitable for use in track, such rail section shall be replaced at the sole expense of the Contractor. It is entirely up to the Engineer to determine if any rail strings or portions thereof have been damaged. The method and equipment used by the Contractor in handling and movement and the laying of welded rail strings will be subject to the approval of the Engineer.
- E11.12.5 Rail shall be free of dirt and foreign material when installed. Each string of rail placed into the track structure shall be numbered at a point within ten (10) feet of each end of the rail as it is laid by the Contractor with permanent type marker prior to adjustment for temperature. Numbering shall be in accordance with Engineer's instructions.
- E11.12.6 The Contractor will not create any additional joints in a solid length of CWR without the authority of the Engineer.
- (a) CWR will not end on open deck bridges or closer than 200' from the backwall of the bridge.
- E11.12.7 The welded rail strings may be delivered with torch cut ends or torch cut holes in the ends. Rail ends with torch cut holes or torched ends will have to be removed. Any removal of ends with torched areas shall be accomplished by use of a rail saw a minimum of 6" from the edge of the torch cut area. Distance is measured from the cut face to the closest edge of the torch cut or area.
- E11.12.8 Rail will only be cut square and clean by means of a rail saw with all burrs removed. Torch cut rail will not be allowed to remain in the track. CWR strings shall not be cut to facilitate laying or fitting without written approval of the Engineer.
- E11.12.9 Upon completion of the final ballast lift and after all final lining, surfacing, and brooming has taken place, the rail shall be adjusted to arrive at the PRLT for final placement.
- E11.12.10 Rail temperature shall be measured at each end of the CWR string by placing at least two rail thermometers on the base of the rail near the web, away from wind and out of the direct rays of the sun and away from all sources of artificial heat or cold.
- (a) When using pyrometers to determine rail temperature, the pyrometer should be pointed into the shaded portion of the web of the rail. Rail temperature must be taken at intervals of approximately 150'.
- E11.12.11 CWR will be anchored within the PRLTR without further adjustment.
- E11.12.12 CWR below the PRLT must be de-stressed as soon as possible. CWR must be de-stressed using proper procedures.
- (a) If rail temperature is below the minimum then approved rail heaters must be used to raise the rail temperature. Rail vibrators shall be used to prevent rail from hanging up in tie plates or tie pads. Rail heaters and rail vibrators are to be operated uniformly and continuously. CWR being adjusted by heating must be free to expand longitudinally towards its loose end. The rail anchoring on ties is to be done immediately behind the rail heaters when the rail is within the PRLTR. Where rail heaters are used, care must be exercised to prevent damage to the ties. A steel hammer must not be used for vibration as it will damage the rail.
- E11.12.13 A record shall be kept by the Contractor indicating the rail and air temperatures for each piece of CWR laid. This form must be completed by the Contractor and given to the Engineer on a daily basis whenever CWR is placed.
- E11.12.14 To determine the proper expansion or contraction for any length of CWR for any temperature differential Contractor shall refer to Appendix C entitled "Continuous Welded

Rail Thermal Expansion". The Appendix contains a table that indicates the necessary CWR expansion or contraction adjustments based on length of rail string versus the temperature differential.

- E11.12.15 The ends of welded rail strings and field cuts shall be field welded in accordance with E11.14 Thermite Field Welding of this specification.
- E11.12.16 The air and rail temperature at the time of laying shall be painted on the web on the field side of the rail 6' from the end of each rail string with 4" letters. As an example: A 78° R80° will indicate an air temperature of 78° and a rail temperature of 80°. Rail that is laid at a rail temperature below 90° and heated in accordance with these instructions shall have an additional marking of H 105°. As an example: A 68° R 60° H 105° will indicate an air temperature of 68°, rail temperature of 60°, and a 105° heated rail condition. Markings on the rail should be legible and made with a permanent paint type marker. Markings from previous installation must be obliterated.
- E11.12.17 Rails less than 19.5' long on curves and 12' long on tangents shall not be used except for temporary closures.
- E11.12.18 Ends of welded rail strings shall be staggered by at least 19½' unless otherwise authorized in writing by the Engineer. Plant welds will be staggered (to the extent possible) by at least 19½'.
- E11.12.19 Nicked or gouged rail shall be rejected and replaced as determined by the Engineer at the sole cost of the Contractor for any rail damage due to the Contractor's handling. This includes the cost of the replacement rail, transportation, welds, and any associated costs in the change out of the defect.
- E11.12.20 Upon completion of the days work, all rail laid must be fully spiked, bolted and anchored, unless approved protective measures are in place.
- E11.12.21 The use of eight hole splice bars may be approved if unable to complete thermite welds prior to cold weather.
- E11.13 All cross ties shall be anchored in a box pattern on every other tie except at permanent joints not welded, adjacent to jointed rail and at turnouts & non glued insulated joints they will be anchored at every tie for a distance of 200 feet. The same ties on opposite rails shall be boxed.
- E11.13.1 Only the proper tools or machines will be used when applying or removing anchors. The use of spike mauls is prohibited.
- E11.13.2 Anchors must be installed from gauge to field side of rail to insure full bearing surface against the side of the tie, bearing against the adjacent tie and remain tight on the rail. Anchors must be on the same side of the same tie on both rails. Ties are to be at right angles to the rail before applying anchors. Anchors improperly installed will be removed and applied correctly without additional charge by the Contractor. Anchors will only be removed when the rails is still in the track.
- E11.13.3 Anchors must be fully driven; however, care must be taken to avoid over-driving as this may fracture or spread the metal, resulting in loss of holding power. Any rail anchor that is fractured or with metal spread will be rejected and replaced with another anchor at the Contractor's expense.
- E11.13.4 Anchors shall be installed only after the track has been raised, lined, and ties re-spaced, following all ballast operations and de-stressing of the welded rail.
- E11.13.5 Care must be exercised in the spacing of anchors to ensure that no anchors are located on any tie under or adjacent to the ends of a rail joint bar or thermite weld.
- E11.14 Thermite Field Welding
- E11.14.1 General
- (a) All rail joints between CWR strings and transition rail shall be thermite field welded.

- (b) Field welds should be made at the time of rail laying regardless of temperature. When the field welding of a rail joint cannot be completed, each rail must be bolted with at least two bolts on each side of the joint before the track is placed in temporary service (four bolts per joint). The use of eight hole splice bars may be approved if unable to complete thermite welds prior to cold weather.
- (c) Holes for complete bolting of cut rails shall be drilled by an approved type of rail drill. Under no circumstances shall new holes be drilled between two holes already drilled. Cutting rails or drilling holes in cut rails by means of acetylene or electric torch will not be permitted.

#### E11.14.2 Execution

- (a) All thermite field welding shall be supervised and performed by an experienced rail welding supervisor and welder certified by the manufacturer of the welding equipment.
- (b) Contractor shall inform the Engineer daily of the location of completed welds in order for the Engineer to arrange for testing and inspection. A record shall be kept by the Contractor for each field weld made during new track construction and copied to the Engineer.
- (c) All equipment and material required in the production of thermite welds shall be furnished by the Contractor. Thermite welding materials and equipment shall be as manufactured by Boutet or Orgotherm.
- (d) The thermite welding method and procedure shall conform to current AREMA Specification Chapter 4 and with the instructions from the welding kit manufacturer (Boutet or Orgotherm) and as specified herein. Boutet or Orgotherm self-preheating weld kits shall be applied in strict accordance with manufacturer instructions, these Specifications, and to the satisfaction of the Engineer.
- (e) Winter thermite welding. Hot thermite weld material has the potential to become explosive whenever it comes in contact with moisture. Under winter conditions, the source of moisture may be in the form of snow and/or frost in the ballast. It is imperative that manufacturers' procedures for welding be followed at all times. In addition, the following precautions MUST be taken when thermite welding in the presence of snow and/or frost.

**In no case, shall thermite welding be performed when the temperature is below 0°F (-18°C).**

- (i) A minimum of a 10' radius must be cleared of snow around the weld area. When this is not practical due to embankment constraints, snow must be cleared to at least the edge of the ballast section.
  - (ii) A hydraulic rail puller MUST be used on all closure welds.
  - (iii) Rail pullers will not be removed until the weld has cooled below 700°F (389°C).
  - (iv) It is recommended to install an approved drip pan with dry sand under the weld area to prevent any excess molten metal from contacting any moisture that may be present. It may be necessary to heat the ballast with a torch in order to facilitate removal.
  - (v) After igniting the charge ensure everyone is clear of the weld area by at least 40 feet and remains in the clear until the reaction and pour are complete.
  - (vi) All preheat and tear down times must be strictly adhered to. Note, 5 minutes is the minimum time required before the removal of slag pans, crucible and normal demolding begins.
  - (vii) A dry location must be secured to place the waste material. (it is recommended to use a steel drum or rack on back of a truck for disposal of the weld waste).
  - (viii) To prevent rapid cool down an approved cooling blanket or cooling box MUST be used. The weld must be covered immediately after hot grinding and remain covered until the weld has cooled below 400°F (222°C).
- (f) Wearing of all protective clothing and safety equipment is required during welding operations.

- (g) Prior to welding, rail must be visually examined for physical defects and must meet the criteria within this specification for alignment and wear. Any rail not meeting the criteria must be reported to the engineer immediately.
- (h) Thermite welds shall be located as close as possible to the center of tie cribs. The weld shall not be closer than 4" to the edge of the tie and in no case shall a weld be situated over a tie plate. Contractor shall re-space ties as necessary to prevent a weld from sitting on a tie. Field welded joints are to be centered between ties.
  - (i) Contractor shall tamp and dress track, as necessary, to provide firm support at the weld.
  - (ii) Contractor shall plug with the appropriate plug type for the tie and re-drive all necessary spikes.
  - (iii) Contractor shall re-apply and adjust anchors as necessary to conform to specified anchor pattern.
- (i) No holes closer than 6" from the weld will be permitted in the rail. Distance is measured from the cut face to the closest edge of the hole.
- (j) Thermite welds will not be made within 6' of another field weld or within 3' of a plant weld without written approval by the Engineer.
- (k) Welding gaps for thermite welds shall be 1" except where approved wide gap welds are used.
- (l) All rail ends shall be saw cut. The cut must be square and perpendicular to the rail axis, with a variation not exceeding 0.03" and all scale, rust and burrs must be removed.
- (m) Overflow on rails shall be ground off for 2" beyond the mold area.
- (n) Vertical rail end alignment shall be made along the running surface of the rails, such that a flat running surface will result on cool down. Any difference in height of rails shall be in the vertical base offset.
- (o) Vertical misalignment of rail ends on the base underside must not exceed 1/8" on thermite welds.
- (p) Horizontal alignment must be straight for at least 36" through the weld area. To meet this requirement when welding in curved track, rail positioners (aligners) must be used.
- (q) Horizontal rail end alignment shall be made along both sides of the head, web and base edges of the rail. Adjustments shall be made such that:
  - (i) On new rails, or rails with comparable gauge face wear, any difference in the width of head, web or base shall be divided equally on either side.
  - (ii) On rails with uneven head width, the bases and webs of the rails shall be aligned so that the horizontal offset in the head, web or base does not exceed 0.06". The gauge and field sides of the railhead shall be blended in by grinding.
- (r) Head bond weld nuggets of exothermic rail bonds, which fall within the mold are, must be completely removed by grinding prior to thermite welding.
- (s) Immediately prior to mold installation the rail ends and surface area that will be exposed to the thermite material must be cleaned a minimum distance of 6" from the end with a wire brush or a grinding wheel in order for this area to be free of grease, rust, and other foreign material, along with any other recommendations of the welding kit manufacturer.
- (t) Molds must be centered over the weld gap.
- (u) During sealing of the molds, cardboard inserts must be placed over the molds to prevent any foreign material from falling into the mold cavity.
- (v) Check the plastic bag containing the charge, ensuring that the bag is sealed and has not been punctured in handling.

- (w) Before preheating, check the rail temperature with a rail thermometer, if the rail temperature is below 60 degrees Fahrenheit both rails must have supplemental heat applied to raise the rail temperature to at least 100 degrees Fahrenheit.
  - (i) The length of the rail to be supplementally heated shall be between 30 and 36 inches for rail temperatures between 60 degrees Fahrenheit down to 16 degrees Fahrenheit.
- (x) A rail expander will be placed on the rail to maintain the correct gap and crown unless temperature conditions are such that the possibility of rail movement is eliminated.
  - (i) If a change in rail temperature is anticipated while the weld is being poured or while it is cooling, the rail expander should be adjusted to compensate for any stresses which will occur at the weld due to a change in temperature.
  - (ii) Depending upon the type of change expected, one of the following procedures will assist in preventing temperature induced stresses from affecting the quality of the weld.
    - .1 Rail temperature is low and a raise in temperatures is anticipated, the rail expander should be set up to expand the gap and enough pressure built up to cause a slight increase in the gap. This should prevent any subsequent decrease in gap width.
    - .2 Rail temperature is high and a drop in temperature is anticipated, the rail expander should be set up to pull and enough pressure built up to cause a slight subsequent increase in width.
    - .3 Whenever either of the above procedures is required, the final gap width must be as stated in the manufacturers instructions for the rail weight being welded.
    - .4 The rail expander must remain on the rail until the weld is complete and has cooled to 700 degrees F. This is verified when the center of the weld around its entire periphery will not melt a 700 degree F tempilstick.
    - .5 When the rail expander is removed, it must be released in a gradual manner.
- (y) Rail ends will be preheated prior to welding to a sufficient temperature and for a sufficient time to ensure full fusion of the weld metal to the rail ends without cracking of the rail or weld, per manufacturer's instructions. Preheating must not be interrupted and the heat shall be uniformly distributed over the rail ends. The preheat time specified for the process must be adhered to.
- (z) Ignition must be preformed immediately after preheating.
- (aa) During the pour, the crucible must be centered over the mold. When the pour is completed the molten slag must be allowed to solidify for three minutes prior to removing the slag pot. **For the CJ One shot crucible, the slag pot must not be removed until 5 minutes after the pour. The weld must not be sheared until 6.5 minutes after the pour.**
- (bb) In the event of a leak, apply molded fusul paste with the end of a wood handle at least 36" in length. Never attempt to stop a leak in any other manner.
- (cc) Should the thermite reaction or the time delay of the self-tapping thimble be abnormal, the weld must be rejected.
- (dd) With multi-use crucibles if the reaction is abnormal and the automatic thimble doesn't tap, the crucible should be left standing over the mold for 5 minutes. If the thimble releases during that time, the metal will pour into the mold and although the weld will have to be cut out, there is no danger of personal injury. The loaded crucible should then be carefully set aside and no attempt made to empty it until the metal has cooled. After cool down, the metal is easily dumped.
- (ee) With power shears or a sledge hammer and hot cut chisel, remove the excess metal, while still hot, off the sides of the ball of the rail.



- (ff) Never dump hot slag or any molten material on wet soil, wet ballast, or into water. To extinguish a metal fire, use only dry sand. The use of vapour forming extinguishing materials is forbidden.
- (gg) The mold shall be left in place after tapping for a sufficient time to permit complete solidification of the molten metal and proper slow cooling to prevent cracking and provide a complete weld with the proper hardness and ductility.
- (hh) Thermite welds shall be ground hot. When hot grinding, the weld shall be left at least 0.032" above the parent rail steel on the running surface, to ensure it does not shrink below the rail head upon cool down. The contour radius, gauge face and field side of the head shall be hot ground flush or blended in where necessary. Do not grind the rail head free hand.
- (ii) After the weld has cooled to ambient temperature it shall be cold ground, flush with the rail surface and blended in where necessary. Do not grind the rail head free hand. Check the final contour of the rail head with a 36" straight edge.
- (jj) The weld must be protected against water or any liquid for two hours after finish grinding. Welds shall be allowed to cool normally, without induced cooling.
- (kk) Date and initials of welder and Contractor's name shall be placed on the web of the rail with metal marking paint and all welds shall have a number based upon a numbering system approved by the Engineer. These marks will be placed on the field side of the rail being welded.
- (ll) Contractor shall not add more rail than what was removed when installing insulated joints, replacement rail, and performing welds after final de-stressing of the CWR.
- (mm) Contractor shall provide sufficient time to allow welds to cool to 450 degrees Fahrenheit and have completed the finish grinding prior to any equipment movement across welds.
- (nn) With the "unfinished" base of the thermite welds the Contractor will need to exercise caution when adjusting the rail so as not to bind the rail at a tie plate, or allow the ties to be skewed.
- (oo) No additional welds shall be installed within 3' of an existing plant weld and 6' of an existing thermite weld.

#### E11.14.3 Field Quality Control

- (a) All welds giving fault indication by ultrasonic inspection or visible inspection, being unacceptable, shall be replaced at Contractors expense. This includes the addition of a rail plug and additional welds where required.
  - (i) Ultrasonic testing of all completed welds in the track shall be carried out as specified herein.
  - (ii) All initial testing and submittals shall be performed as directed by the Engineer at no cost to the Contractor.
  - (iii) Welds not meeting the following requirements will be rejected:
    - .1 Each weld shall have full penetration and complete fusion with no evidence of surface or internal fissures or cracks.
    - .2 Porosity or slag type defects shall not exceed 0.040 inches in any dimension and the total area of all defects shall not exceed 0.024 square inches.
    - .3 Conformance to alignment tolerances.
  - (iv) If a defective weld is found, it shall be cut out and a new section not less than 10' long on tangent track and not less than 20' long on curved track shall be inserted, welded with two thermite welds, and re-tested all at Contractor's expense.
  - (v) Ultrasonic testing will be performed by a competent material testing service as determined by the Engineer.

- (vi) All welds shall be visually inspected by the Contractor and Engineer for surface cracks and alignment. Welds with surface cracks visible to the eye or not within the alignment tolerances will not be acceptable.

## E11.15 Ballasting and Surfacing

### E11.15.1 General

- (a) Contractor shall supply, haul and unload all crushed rock ballast material, surface, tamp, line, finish surface, regulate, and power broom new track constructed. All track shall be surfaced and tamped as soon as possible after unloading ballast.
  - (i) Ballast shall be placed to a minimum depth of 12" below the bottom of the ties at grade point to the dimensions and widths (minimum 12" shoulders for CWR) as shown on the drawings. Ballast shall be compacted by approved tamping methods to hold track firmly in place. All tamping operations shall be performed with an approved power tamper machine.
  - (ii) Placement of ballast and surfacing of track shall be done in a manner such that all tolerances and requirements of these specifications shall be retained by the track structure for a period of 1 year from the time of acceptance.
- (b) The Contractor at their expense shall provide all the plant, equipment, and labor necessary to unload and transport the ballast to the track construction site and distribute the ballast to the track structure.

### E11.15.2 Execution

- (a) Contractor will direct the unloading and distribution of ballast and will be fully responsible for all aspects of the unloading and distribution, subject to approval by the Engineer. All costs associated with any equipment derailed during ballasting including repairs to damaged railway equipment will be the responsibility of the contractor.
- (b) When unloading ballast in the center of the track, a plow tie may be used in order to evenly spread ballast and prevent excessive rock from accumulating on the rail and possibly derailing cars.
- (c) After unloading ballast, all cars must be completely empty and doors closed and locked prior to releasing.
- (d) Power tamping machines are to be used throughout all track construction. Manual tamping will not be allowed. The use of a ballast compactor together with the power tamping machines may be used with the written permission of the Engineer.
  - (i) Tamping machines are to be automatic multi-tooled with a minimum of 8 tamping feet per rail and having automatic profile reference beams of not less than 75'.
  - (ii) Each tool shall have a tamping pressure sufficient to close the ballast beneath each tie. The foot of each tool shall be a minimum of 1½" x 3" at all times.
  - (iii) A junior tamping machine less the reference beam may be used in conjunction with a lead machine provided that all other characteristics of the lead machine are the same on the junior tamper. The tamping machine with the reference beam will tamp a minimum of every second tie.
  - (iv) Any proposed ballast compaction equipment shall be included in Form K: Equipment and is subject to acceptance of the Engineer.
- (e) No part of the track structure will be raised more than 3" in any one lift. New track construction will have to be worked more than once and the Contractor will have to apply additional ballast to conform to the ballast cross section shown within the Typical Track Section drawings.
- (f) Each lift is to be tamped from a line 16" inside each rail on both sides of and to the ends of the ties. Center area between these limits shall be filled lightly with ballast but not tamped. Tamping shall proceed, simultaneously; at both ends of the tie making sure ballast is forced directly under the ties and against the sides and ends of the ties.

- (i) Too many insertions with a power tamper may cause a center bound track condition. Generally two squeezes per tie up to 1½" of raise with one additional insertion and squeeze for each additional 1" of raise is required with insertion depth being a minimum of 1½" below the bottom of tie.
  - (ii) When the track has been raised to within 2" of final grade, the final lift shall be made by raising the track up to grade stake elevation making necessary allowance for settlement. The ballast shall be applied under the ties for their entire length.
- (g) During raising and tamping, if any crib area is void of ballast below the bottom of the tie then the area of the track is to be re-tamped following the application of additional ballast.
- (h) While raising and tamping track levels shall be constantly used to insure correct surface and cross level.
- (i) Contractor will finish each point on the track to within a maximum of ½" deviation from zero cross level on tangent. Average cross level on tangent and super elevation on curves will be as specified.
  - (ii) Contractor will finish the track so that the difference in cross level between any two points less than 62' apart on tangents and on curves between the spirals must be no more than 1". Deviation from zero cross level at any point on tangent may not be more than ½". Variations in cross level on spirals in any 31' may not be more than ¾". Track will be finished so that the deviation from uniform profile on either rail at the mid-ordinate of a 62' chord may not be more than 1¼".
  - (iii) Contractor will finish the track so that the horizontal alignment between any two points 62' apart on tangent track will deviate from a straight line by no more than ¾". Mid ordinate of a 62' chord between two points on the gauge side of the outer rail will be one inch per degree of curve with an allowable tolerance of plus or minus 5/8".
- (i) After track has been brought to true surface, elevation, and grade, it shall be given a final lining and placed in true alignment and grade conforming to the elevations and alignment according to the drawings and the ballast dressed to the design ballast cross section.
- (j) When raising track, the Contractor has a tolerance of plus or minus ½" to the design grade as long as requirements of this Section are met. If not raised to the established grade, then the Contractor will unload ballast in sufficient quantity and continue to surface the track to comply with the tolerances.
- (i) All ties are to be straightened and re-spaced as necessary immediately prior to unloading ballast for the final raise.
  - (ii) If the Contractor raises the track too high to comply with the allowable tolerance, Contractor, at his expense, will excavate the ballast sufficiently to lower the track and then surface the track again to bring it into full conformity.
- (k) When track is lifted or jacked, care must be exercised by the Contractor to avoid stressing or permanently bending the rail, joints, or turnout components.
- (l) When surfacing through a turnout with boltless adjustable rail braces, switch points and stock rails will be blocked to prevent displacement of stock rail from the switch plate.
- (m) Tamp turnout ties for 16" on each side of main and turnout rails. Headblock ties to be tamped as above with no voids under remainder of tie.
- (n) Turnout tie cribs are to be full except to prevent contact with rods and for drainage as required.
- (o) Contractor will correct any hanging or skewed tie that is a result of his tamping and raising the track. Tie plates will be positioned so that the shoulder is against the outside base of rail for the entire length of the shoulder.

- (i) Contractor will plug and re-drive all high or loose spikes and will plug and replace all spikes removed.
  - (ii) Contractor will replace and/or adjust all tie plates and rail anchors knocked off or that worked loose or were damaged during the surfacing and regulating. The anchors must remain matched across from each other on each rail. Tie plates must remain square to the tie.
- (p) Contractor will provide the ballast section as shown in the Typical Track Section drawings. No dirt or foreign materials will be allowed into the ballast section.
- (q) After track has been brought to true surface, elevation, and grade it shall be given a final lining and placed in true alignment conforming to design and the ballast shall be trimmed neatly to the dimensions and widths of the Typical Track Section drawings
- (i) Cribs shall be filled to top of tie.
  - (ii) No ballast will be left on top of ties, spikes, fasteners and plates.
- (r) Surplus ballast shall be spread evenly along the ballast slopes. Dressing of the ballast by placing earth higher than the toe and thus preventing proper drainage will not be permitted. After all ballast placement has been completed, the track shall be given a complete power broom finish with approved machinery. Contractor shall insure that the top of ballast rock matches the top of tie surface and that no excess ballast remains on either the top of rail, top of tie, base of rail, or top of tie plate, spike or anchor or roadway crossing surface.
- (s) Contractor shall exercise caution while regulating ballast shoulders so as to avoid track misalignments and to avoid obstructing adjacent drainage ditches, structures, or culverts with ballast, dirt, vegetation, or other material.
- (i) If Contractor obstructs an adjacent drainage ditch, structure, or culvert, he will have to initiate the cleaning of those as soon as possible.
  - (ii) Contractor is responsible to ensure that the partially ballasted track in his work area does not buckle out of alignment. If a misalignment of the track occurs as a result of the Contractor's operations, he must correct at his expense.

## E11.16 Crossings

### E11.16.1 General

- (a) This section includes the installation requirements of all softwood crossing surfaces as indicated on the drawings.
- (b) Conform to all applicable Local, Provincial and Federal laws, codes, specifications and ordinances for materials and installation of the crossings as they apply to this specification.
- (c) The Contractor will be allowed, at the Contractor's expense, to supply and install additional temporary crossings as required for convenience and shall make good, at the Contractor's expense, any track material damaged by same. This shall include all material and labour required to meet the specifications of this project. Upon completion of all work these temporary crossings are to be removed, at the contractors expense.
- (d) Contractor is responsible for any and all approved detouring, detour roadways, all signage, barricading and traffic control that may be necessary to facilitate crossing installation. It shall be the sole responsibility of the Contractor to erect and maintain such detour roadways, signage, barricades and traffic control as required by during the length of time that the road is closed to traffic or while crossing protection is required.
- (e) Track materials and construction execution associated with crossing installation to be in accordance with all parts of these specifications.

### E11.16.2 Execution

- (a) Softwood Crossing Surface

- (i) Install new 7" x 9" x 9' hardwood crossing ties at locations shown on drawings in accordance with E11.9.1 of these specifications except ties to be installed at 19½" centers.
- (b) Install new softwood crossing planks.
  - (i) Planks will be cut to length as required with the outer ends of all planks beveled so to minimize the effects of dragging equipment.
  - (ii) Planks will be placed such that a flangeway space not less than 3" nor more than 4¾" wide shall be provided between the gauge side of the running rails and the planking. A flangeway on the field side of the running rails will not be allowed.
  - (iii) Planks will be fastened to the crossing ties by means of the ¾" x 12" hex lag bolts and washers through the prebored holes in the planks. Should additional pilot holes be required they will consist of a 5/8" hole drilled a minimum of 5" into the crossing plank such that they are aligned with every 4th crossing tie.
  - (iv) All wood surfaces exposed by either cutting or drilling must be treated with P2 - Petroleum Creosol.
  - (v) All cross ties within crossing planks and for a distance of 20' in each direction shall be fully anchored.
  - (vi) Remove all debris from site and leave crossing in a clean condition.

#### MEASUREMENT AND PAYMENT

- E11.17 The Unit Price, submitted in the Bid, shall include the entire cost of supplying all labour and equipment to construct trackage as shown on the drawings and specified in this Specification. With the exception of the quantities identified with the track WM01 connection grading complete shall be considered incidental to the work.
- E11.17.1 "Supply and Install 136lb Jointed Track Structure on supplied New No.1 Treated Hardwood Ties Complete" will be paid for at the contract unit price per track foot bid for this work including rail, anchoring, tamping, trimming, lifting, lining and surfacing, to design elevations and dimensions, exclusive of placing ballast. Track complete shall include the rail, ties, tie plates, anchors, track spikes, OTM (including bond wires complete), de-stressing and all other incidental items. Track feet of 136lb track construction will be based on as-built measurements taken by the Engineer upon completion of all surfacing. Length of track constructed will be measured from the centerline of the first and last track ties (excluding switch ties). Payment will be based on the track feet completed. A track foot is described as the lineal measurement in feet along the centerline of a set of rails (two rails). Completed track will be measured for length along the centerline of track by the Engineer. Length of measurement will be rounded up to the nearest whole foot.
- E11.17.2 "Supply and Install 136lb Thermite Welds Complete" will be paid for at the contract unit price per weld bid for this work. Thermite Welding Complete shall include all material, equipment and manpower required to weld as outlined in section E11.14.
- E11.17.3 "Install supplied No.10 RH 136lb RBM All Welded Turnout, 16'6" Switch Points on New Supplied Crossover Switch Ties Complete" will be paid for at the contract unit price per turnout bid for this work including rail anchoring, aligning and surfacing, exclusive of ballasting. Turnout complete shall include the turnout rail, transition rail, frog, switch ties, switch stands, switch plates, frog plates, tie plates, anchors, clips, screws, track spikes, OTM and all other incidental items. Turnout construction will be based on as built measurements taken by the Engineer upon completion of all surfacing. Turnouts will be counted as each.
- E11.17.4 "Install supplied No.10 RH 136lb RBM All Welded Turnout, 16'6" Switch Points on New Supplied Switch Ties Complete" will be paid for at the contract unit price per turnout bid for this work including rail anchoring, aligning and surfacing, exclusive of ballasting. Turnout complete shall include the turnout rail, transition rail, frog, switch ties, switch stands, switch plates, frog plates, tie plates, anchors, clips, screws, track spikes, OTM and all other

incidental items. Turnout construction will be based on as built measurements taken by the Engineer upon completion of all surfacing. Turnouts will be counted as each.

- E11.17.5 “Install supplied No.10 LH 136lb RBM All Welded Turnout, 16’6” Switch Points on New Supplied Switch Ties Complete” will be paid for at the contract unit price per turnout bid for this work including rail anchoring, aligning and surfacing, exclusive of ballasting. Turnout complete shall include the turnout rail, transition rail, frog, switch ties, switch stands, switch plates, frog plates, tie plates, anchors, clips, screws, track spikes, OTM and all other incidental items. Turnout construction will be based on as built measurements taken by the Engineer upon completion of all surfacing. Turnouts will be counted as each.
- E11.17.6 “Install supplied No.12 RH 136lb RBM All Welded Turnout on New Supplied Switch Ties Complete” will be paid for at the contract unit price per turnout bid for this work including rail anchoring, aligning and surfacing, exclusive of ballasting. Turnout complete shall include the turnout rail, transition rail, frog, switch ties, switch stands, switch plates, frog plates, tie plates, anchors, clips, screws, track spikes, OTM and all other incidental items. Turnout construction will be based on as built measurements taken by the Engineer upon completion of all surfacing. Turnouts will be counted as each.
- E11.17.7 “Install supplied No.12 LH 136lb RBM All Welded Turnout on New Supplied Switch Ties Complete” will be paid for at the contract unit price per turnout bid for this work including rail anchoring, aligning and surfacing, exclusive of ballasting. Turnout complete shall include the turnout rail, transition rail, frog, switch ties, switch stands, switch plates, frog plates, tie plates, anchors, clips, screws, track spikes, OTM and all other incidental items. Turnout construction will be based on as built measurements taken by the Engineer upon completion of all surfacing. Turnouts will be counted as each.
- E11.17.8 “Supply and Install Softwood Plank Crossing Complete” will be paid for at the contract unit price per track foot bid for this work. Completed softwood railroad crossing shall include the rail, planks, plank fastenings, crossing ties, OTM, separator fabric, detours, traffic control and all other incidental items. Completed softwood railroad crossing will be measured by the Engineer along the centerline of track from outside edge of plank to outside edge of plank at each crossing.
- E11.17.9 “Reline Existing Track” will be paid for at the contract unit price per track foot bid for this work including relining track, preparation as required, tamping, trimming, lifting, lining and surfacing to design elevations and dimensions.
- E11.17.10 “Removal of Track , Sorting and Stockpiling of Track Material” will be paid for at the contract unit price per track foot bid for this work including dismantling of track, sorting of rail and OTM, transporting the material to a designated stockpile location on-site, exclusive of ballast removal.
- E11.17.11 “Removal and Stockpile of Turnouts” will be paid for at the contract unit price per turnout removed bid for this work including dismantling of turnout into sections, transporting the turnout sections to a designated stockpile location on-site, exclusive of ballast removal.
- E11.17.12 “Removal and Stockpile of Ballast” will be paid for at the contract unit price per cubic yard of ballast stockpiled at a designated stockpile location on-site. This work shall include collection, loading, transportation and stockpiling of ballast as directed by the Engineer.
- E11.17.13 “Supply and Install Ballast” will be measured and paid for at the contract unit price per cubic yard. This shall include placement of ballast on skeletonized track include unloading and placing sufficient ballast to enable 12” of ballast under the tie complete with 12” shoulders noted within this specification or on the drawings.
- E11.17.14 “Supply and Construct 136lb 39’ Track Panels Complete” will be paid for at the contract unit price per each bid for this work, including fully anchoring, storage and installation. Track complete shall include the rail, ties, tie plates, anchors, track spikes, OTM, all other incidental items. Panels will be counted as each and must be inspected by the Engineer prior to installation.

E11.17.15 "Supply of Protection Foreman" will be paid for at the contract unit price per day bid for this work. Supply of Protection Foreman shall include the cost of transportation, meals, lodging and all equipment necessary to provide Track Protection for the duration of the project.

## **E12. RAILWAY PROPERTY CLEANING**

### DESCRIPTION

#### E12.1 General

- E12.1.1 Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
- E12.1.2 Store volatile wastes in covered metal containers and remove from premises daily.
- E12.1.3 Prevent accumulation of wastes which create hazardous conditions.
- E12.1.4 Provide adequate ventilation during use of volatile or noxious substances.

### MATERIALS

- E12.2 Use only cleaning materials recommended by manufacturer of surface to be cleaned and as recommended by cleaning material manufacturer.

### CONSTRUCTION METHODS

#### E12.3 Cleaning During Construction

- E12.3.1 On a daily basis maintain premises free from debris and waste material.
- E12.3.2 Maintain project site and public properties free from accumulations of waste materials and rubbish.
- E12.3.3 Remove waste materials and rubbish from site.
- E12.3.4 Disposal of wastes on Railway property by burial or burning shall not be permitted.

### MEASUREMENT AND PAYMENT

#### E12.4 Cleaning

- E12.4.1 Cleaning and disposal operations are considered incidental to the Work and no separate measurement or payment will be made

## **E13. RAILWAY GRADING AND DRAINAGE**

### DESCRIPTION

#### E13.1 General

- E13.1.1 Further to City of Winnipeg Standard Specifications the following shall apply.

#### E13.2 Definitions

- E13.2.1 Sub-base elevation: elevation immediately below sub-ballast or road surface gravel.

#### E13.3 Requirements of Regulatory Agencies

- E13.3.1 Adhere to municipal, provincial and national government requirements relating to safety of excavations and protection of workers.

#### E13.4 Soil Conditions

- E13.4.1 A soil investigation has been carried out at the site to determine soil conditions, soil characteristics and water levels.

(a) The Geotechnical Report is included in Appendix A.

E13.4.2 The City will not accept unfamiliarity with encountered soil conditions and water levels as a basis for a claim for additional payment.

## CONSTRUCTION METHODS

E13.5 Excavating

E13.5.1 General

- (a) Advise Contract Administrator sufficiently in advance of excavation operations for initial cross-sections to be taken.
- (b) Remove and dispose of material off Railway property in excess of requirements for embankment construction as directed in accordance with CW 1130.
- (c) Take particular note of the following:
  - (i) Where necessary, the Contract Administrator may design cuts and fills especially for stability, which will affect dimensions indicated on the drawings.
  - (ii) Remove unsuitable materials encountered in cut sections to depth and extent directed.
    - 1. Replace with approved material and compact.
  - (iii) When slides occur in cuts after they are properly formed, remove the material, modify the slopes and adopt other precautions as directed.
    - 1. The materials shall be classified as "Common Excavation" and Contractor will be paid for its removal at the unit contract price for "Common Excavation".
  - (iv) Complete all excavation as far in advance of fill construction as practical.
  - (v) Maintain all work in a well-drained condition, free of debris and other obstructions.
- (d) The City will not pay for additional excavation (borrow or common) which the Contractor may require for his convenience or movement of equipment.

E13.5.2 Waste Material

- (a) Remove and dispose of unsuitable material as directed.
  - (i) Refill depressions and holes from this work. This work shall be paid for at the contract unit price for "Common Excavation".
- (b) Remove and dispose of material off Railway property in excess of requirements for embankment construction as directed.

E13.5.3 Ditch Excavation

- (a) Complete ditch excavation as far in advance of embankment construction as practical, to the grades set by the Contract Administrator, to permit ready flow of surface water.
- (b) Excavate ditches in cuts at the same time as the main cut in order that the excavated material can be used in adjacent embankments.
- (c) Use suitable equipment to ensure cut slopes and sub-base sections are not undercut.
- (d) Maintain and keep ditches open and free from debris and other obstructions until final acceptance.

E13.5.4 Placement of Geotextile

- (a) Place geotextile in accordance with CW 3130 and this specification.
- (b) The geotextile shall be installed full width for the required length of the areas shown on the drawings in accordance with the manufacturer's recommended procedure. Align machine direction parallel to the rail line, free of tension, stress, folds, wrinkles, or creases. Joints in the fabric shall be overlapped not less than 600 mm (2 feet).



- (c) The fabric shall be placed within a key in the existing embankment and secured as directed by the Contract Administrator.
- (d) The fabric shall be placed and wrapped back upon itself at the end away from the track as directed by the Contract Administrator.
- (e) Dumping of material or equipment movement directly on the geotextile will not be allowed.
- (f) The geotextile shall not be exposed more than 48 hours before covering.

E13.5.5 Execution

- (a) Compact all material and excavations to a density of not less than 95% maximum dry density in accordance with Standard Proctor Compaction Test (ASTM D698).

E13.6 Field Quality Control

E13.6.1 To be completed in accordance with CW 3110.

E13.7 Finishing

- E13.7.1 Remove soft or other unstable material that will not compact properly and fill resulting depressions with approved material.
- E13.7.2 Shape and compact entire rail bed to design elevations within 13 mm (0.5 inch) of design but not uniformly high or low.
- E13.7.3 Finish back and side slopes of common material to neat condition, true to line and grade.
- E13.7.4 Trim all waste and stockpile areas neatly and maintain in a well-drained condition.
- E13.7.5 Maintain finished surfaces in a condition conforming to this section until acceptance and surveyed by the Contract Administrator.

MEASUREMENT AND PAYMENT

E13.8 General

- E13.8.1 The Unit Prices, submitted in the Bid, shall include the entire cost of supplying all labour, material, equipment and tools for, excavation and grading of all classes of material; all as required to construct the work as shown on the drawings and specified in this Specification.
- E13.8.2 All measurement and payment will be in accordance with applicable City of Winnipeg Specifications.

**E14. RAILWAY GRANULAR MATERIALS**

DESCRIPTION

E14.1 Supply, placement and compaction of granular material for sub-ballast material.

MATERIALS

- E14.2 State on Form J: the source of granular materials to be incorporated into work.
  - E14.2.1 Contract Administrator will investigate quality of material after award of contract.
- E14.3 Materials require approval before being used in the work.
- E14.4 Provide access for sampling.
- E14.5 The Contractor shall provide, at no cost to the City, necessary equipment to obtain samples of granular materials.
- E14.6 If requested, the Contractor shall submit samples of the proposed granular material for testing and evaluation.

- E14.7 If, in opinion of Contract Administrator, materials from proposed source do not meet, or cannot reasonably be processed to meet specified requirements, locate an alternate source or demonstrate that material from source in question can be processed to meet specific requirements.
- E14.8 Should a change of material source be proposed during work, advise Contract Administrator 2 weeks in advance of proposed change to allow sampling and testing.
- E14.9 Acceptance of a material at source does not preclude future rejection if it is subsequently found to lack uniformity, or if it fails to conform to requirements specified, or if its field performance is found to be unsatisfactory.
- E14.10 When common excavation material is suitable for use as granular material, use such common excavation materials as granular material in preference to obtaining granular material from other sources.
- E14.11 Include in unit price for granular material entire cost of constructing and/or maintaining suitable access roads, opening work faces, clearing, grubbing and stripping of pit areas, and royalties.
- E14.12 Sub-ballast:
- E14.12.1 Material to be crushed or screened pit run gravel, containing no more than 3% organics by weight as determined by ASTM C 123.
- E14.12.2 Gradations to be within limits specified.

<u>Sieve Size</u>	<u>Percent Passing</u>
75 mm (3")	100
25 mm (1")	60 - 90
4.75 mm (#4)	35 - 60
425 micro m (#40)	10 - 40
75 micro m (#200)	3 - 10

#### CONSTRUCTION METHODS

- E14.13 Placing
- E14.13.1 Use granular material to construct sub-ballast course and other work as indicated or directed.
- E14.13.2 Do not place granular material until finished sub-base surface is inspected and approved by Contract Administrator.
- E14.13.3 Place material only on a clean unfrozen surface, properly shaped and compacted and free from snow and ice.
- E14.13.4 Place, using methods which do not lead to segregation or degradation of material.
- E14.13.5 Place material to full width of section in uniform layers not exceeding 150 mm (6 inch) loose thickness and compact to specified density. Contract Administrator may authorize thicker lifts if specified compaction can be achieved.
- E14.13.6 Replace fouled material with approved material and compact, at no cost to the City.
- E14.14 Compaction
- E14.14.1 Compact full width to density not less than 95% maximum dry density in accordance with Standard Proctor Compaction Test (ASTM D698).
- (a) Sub-ballast – 95% Standard Proctor Maximum Dry Density.

- E14.14.2 Apply water as necessary during compaction to obtain specified density. If material is excessively moist, aerate by scarifying with suitable equipment until moisture content is corrected.
- E14.14.3 Apply water to reduce dust nuisance.
- E14.14.4 In areas not accessible to rolling equipment, compact to specified density with approved mechanical tampers.

#### E14.15 Field Quality Control

- E14.15.1 Contract Administrator shall take representative samples at expense of Contractor and submit them to laboratory tests for approval of its quality and nature prior and/or during its use.
  - (a) Provide necessary personnel and equipment to permit adequate investigation and sampling.
  - (b) Advise Contract Administrator at least two weeks in advance of use of any material to allow sufficient time for sampling and testing.
  - (c) The City will pay for testing of material.
- E14.15.2 Contract Administrator may perform density and other tests on site, to control construction.
  - (a) Facilitate such work and pay for any testing apparatus damaged from the operations.
  - (b) Do not claim for delays to the operations resulting from field tests.
- E14.15.3 Final acceptance of materials made after materials dumped, spread and compacted in place.
  - (a) Contract Administrator may reject at source, on transportation vehicle or in place.
  - (b) Contract Administrator will not consider for payment the removal and disposal of any rejected material.

#### E14.16 Finishing

- E14.16.1 Finished sub-ballast surface shall be within 15 mm (0.5 inches) of design elevations but not uniformly high or low.
- E14.16.2 Maintain surface in a clean condition, free draining and conforming to the specification until final acceptance.

#### MEASUREMENT AND PAYMENT

- E14.17 The Unit Price, submitted in the Bid, shall include the entire cost of supplying all labour, material and equipment to supply, load, haul, place and compact granular materials for sub-ballast in the work as shown on the drawings and specified in this specification.
- E14.18 Granular material will be measured on a volume basis and paid for at the Contract Unit Price per cubic metre for "Supply and Placing Sub-Ballast Material. The volume to be paid for will be the total number of cubic metres of crushed Sub-Ballast material supplied and placed in accordance with this specification, accepted and measured by the Contract Administrator.
- E14.19 Granular material placed outside design sections as staked by the Contract Administrator will not be considered for payment.