



THE CITY OF WINNIPEG

BID OPPORTUNITY

BID OPPORTUNITY NO. 413-2012

**ROUNDBOUT CONSTRUCTION: GRASSIE BOULEVARD AND MOLSON STREET
INTERSECTION**

TABLE OF CONTENTS

PART A - BID SUBMISSION

Form A: Bid	1
Form B: Prices	4
Form G1: Bid Bond and Agreement to Bond	12
Form G2: Irrevocable Standby Letter of Credit and Undertaking	14

PART B - BIDDING PROCEDURES

B1. Contract Title	1
B2. Submission Deadline	1
B3. Site Investigation	1
B4. Enquiries	1
B5. Addenda	1
B6. Substitutes	2
B7. Bid Components	3
B8. Bid	4
B9. Prices	4
B10. Qualification	5
B11. Bid Security	5
B12. Opening of Bids and Release of Information	6
B13. Irrevocable Bid	6
B14. Withdrawal of Bids	7
B15. Evaluation of Bids	7
B16. Award of Contract	8

PART C - GENERAL CONDITIONS

C0. General Conditions	1
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PART D - SUPPLEMENTAL CONDITIONS

General

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

Submissions

D8. Authority to Carry on Business	3
D9. Safe Work Plan	3
D10. Insurance	3
D11. Performance Security	4
D12. Subcontractor List	4
D13. Equipment List	4
D14. Detailed Work Schedule	4

Schedule of Work

D15. Commencement	4
D16. Working Days	5
D17. Restricted Work Hours	5
D18. Work By Others	5
D19. Sequence of Work	6
D20. Critical Stages	6
D21. Substantial Performance	6
D22. Total Performance	6
D23. Liquidated Damages	7
D24. Scheduled Maintenance	7

Control of Work

D25. Job Meetings	7
D26. Prime Contractor – The Workplace Safety and Health Act (Manitoba)	8

Measurement and Payment

D27. Payment	8
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Warranty

D28. Warranty	8
Form H1: Performance Bond	9
Form H2: Irrevocable Standby Letter of Credit	11
Form J: Subcontractor List	13
Form K: Equipment	14
Form L: Detailed Work Schedule	16
Form L: Detailed Work Schedule	17

PART E - SPECIFICATIONS

General

E1. Applicable Specifications and Drawings	1
E2. Geotechnical Report	1
E3. Office Facilities	2
E4. Protection Of Existing Trees	2
E5. Traffic Control	3
E6. Traffic Management	3
E7. Refuse and Recycling Collection	3
E8. Pedestrian Safety	4
E9. Water Obtained From the City	4
E10. Surface Restorations	4
E11. Infrastructure Signs	4
E12. Supply and Install Detectable Warning Surface Tiles	4
E13. Removal of Trees	17
E14. Earthwork	17
E15. Hydro-Excavation	19
E16. Modified Barrier Curb	20
E17. Adjustment of Manholes/Catch Basins	21
E18. Ditch Inlet Grate	21
E19. Corrugated Steel Pipe Removal	22
E20. Supply and Install Culvert End Markers	22
E21. Hydro Mulching	23
E22. Planting Soil	23
E23. Trees, Shrubs and Perennials	25
E24. Round Rock Mulch & Granite Boulders	30
E25. Long Term Scheduled Maintenance of Plant Material	32
E26. Plant Material Warranty	34
E27. Wood Fence	35
E28. 1395 Molson Street Sprinkler System	38
E29. Parking Lot Light Standard Concrete Pile Foundation	39
E30. Line Painting	46
E31. Pre-cast Parking Curbs	47
E32. Relocation of Existing Signs	48
E33. Parking Lot Electrical	49
E34. Sign Support Clamps	51
E35. Operating Constraints for Work in Close Proximity to Feeder mains	51
E36. Manhole Chamber Improvements	54

Appendix 'A' - Geotechnical Report

Appendix 'B' - Impact of Typical Construction Equipment Surface Loads on the North Kildonan Feedermain

Appendix 'C' - 1395 Molson Sprinkler System

PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

B1.1 Roundabout Construction: Grassie Boulevard and Molson Street Intersection

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, June 22, 2012.

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, the Bidder may view the Site without making an appointment.

B3.2 The Bidder is advised that they may not enter private property on their own, including 1395 or 1425 Molson Street where work is expected as part of the contract.

B3.3 Further to C3.1, the Contract Administrator or an authorized representative will be available at the Site from 8:30 to 9:30 on June 15, 2012 to provide Bidders access to 1395 or 1425 Molson Street.

B3.4 The Bidder is advised that the existing sprinkler system, parking lot, and signs on private property can be reviewed at the site investigation.

B3.5 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 D3.1.

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

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

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

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

B5. ADDENDA

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

- B5.2 The Contract Administrator will issue each addendum at least two (2) Business Days prior to the Submission Deadline, or provide at least two (2) Business Days by extending the Submission Deadline.
- B5.2.1 Addenda will be available on the Bid Opportunities page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/bidopp.asp>
- B5.2.2 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.
- B5.3 The Bidder shall acknowledge receipt of each addendum in Paragraph 10 of Form A: Bid. Failure to acknowledge receipt of an addendum may render a Bid non-responsive.

B6. SUBSTITUTES

- B6.1 The Work is based on the Plant, Materials and methods specified in the Bid Opportunity.
- B6.2 Substitutions shall not be allowed unless application has been made to and prior approval has been granted by the Contract Administrator in writing.
- B6.3 Requests for approval of a substitute will not be considered unless received in writing by the Contract Administrator at least five (5) Business Days prior to the Submission Deadline.
- B6.4 The Bidder shall ensure that any and all requests for approval of a substitute:
- (a) provide sufficient information and details to enable the Contract Administrator to determine the acceptability of the Plant, Material or method as either an approved equal or alternative;
 - (b) identify any and all changes required in the applicable Work, and all changes to any other Work, which would become necessary to accommodate the substitute;
 - (c) identify any anticipated cost or time savings that may be associated with the substitute;
 - (d) certify that, in the case of a request for approval as an approved equal, the substitute will fully perform the functions called for by the general design, be of equal or superior substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance;
 - (e) certify that, in the case of a request for approval as an approved alternative, the substitute will adequately perform the functions called for by the general design, be similar in substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance.
- B6.5 The Contract Administrator, after assessing the request for approval of a substitute, may in his/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.
- B6.6 The Contract Administrator will provide a response in writing, at least two (2) Business Days prior to the Submission Deadline, only to the Bidder who requested approval of the substitute.
- B6.6.1 The Bidder requesting and obtaining the approval of a substitute shall be entirely responsible for disseminating information regarding the approval to any person or persons he/she wishes to inform.
- B6.7 If the Contract Administrator approves a substitute as an “approved equal”, any Bidder may use the approved equal in place of the specified item.

- B6.8 If the Contract Administrator approves a substitute as an “approved alternative”, any Bidder bidding that approved alternative 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 B15.
- B6.9 No later claim by the Contractor for an addition to the Total Bid Price because of any other changes in the Work necessitated by the use of an approved equal or an approved alternative will be considered.
- B6.10 Notwithstanding B6.2 to B6.9, in accordance with B7.6, deviations inconsistent with the Bid Opportunity document shall be evaluated in accordance with B15.1(a).

B7. BID COMPONENTS

- B7.1 The Bid shall consist of the following components:
- (a) Form A: Bid;
 - (b) Form B: Prices, hard copy;
 - (c) Bid Security;
 - (i) Form G1: Bid Bond and Agreement to Bond, or
Form G2: Irrevocable Standby Letter of Credit and Undertaking, or
a certified cheque or draft;
- B7.2 Further to B7.1, the Bidder should include the written correspondence from the Contract Administrator approving a substitute in accordance with B6.
- B7.3 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.
- B7.4 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.
- B7.4.1 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.
- B7.4.2 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.
- B7.5 Bidders are advised not to include any information/literature except as requested in accordance with B7.1.
- B7.6 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 B15.1(a).
- B7.7 Bids submitted by facsimile transmission (fax) or internet electronic mail (e-mail) will not be accepted.
- B7.8 Bids shall be submitted to:
- The City of Winnipeg
Corporate Finance Department
Materials Management Division
185 King Street, Main Floor
Winnipeg MB R3B 1J1

B8. BID

- B8.1 The Bidder shall complete Form A: Bid, making all required entries.
- B8.2 Paragraph 2 of Form A: Bid shall be completed in accordance with the following requirements:
- (a) if the Bidder is a sole proprietor carrying on business in his/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.
- B8.2.1 If a Bid is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B8.2.
- B8.3 In Paragraph 3 of Form A: Bid, the Bidder shall identify a contact person who is authorized to represent the Bidder for purposes of the Bid.
- B8.4 Paragraph 12 of Form A: Bid shall be signed in accordance with the following requirements:
- (a) if the Bidder is a sole proprietor carrying on business in his/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.
- B8.4.1 The name and official capacity of all individuals signing Form A: Bid should be printed below such signatures.
- B8.5 If a Bid is submitted jointly by two or more persons, the word "Bidder" shall mean each and all such persons, and the undertakings, covenants and obligations of such joint Bidders in the Bid and the Contract, when awarded, shall be both joint and several.

B9. PRICES

- B9.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B: Prices.
- B9.1.1 For the convenience of Bidders, and pursuant to B7.4.2 and B15.4.3, an electronic spreadsheet Form B: Prices in Microsoft Excel (.xls) format is available along with the Adobe PDF documents for this Bid Opportunity on the Bid Opportunities page at the Materials Management Division website at <http://www.winnipeg.ca/matmgt/>
- B9.2 The quantities listed on Form B: Prices are to be considered approximate only. The City will use said quantities for the purpose of comparing Bids.
- B9.3 The quantities for which payment will be made to the Contractor are to be determined by the Work actually performed and completed by the Contractor, to be measured as specified in the applicable Specifications.
- B9.4 Payments to Non-Resident Contractors are subject to Non-Resident Withholding Tax pursuant to the Income Tax Act (Canada).

B10. QUALIFICATION

B10.1 The Bidder shall:

- (a) undertake to be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba; 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.

B10.2 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>

B10.3 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);

B10.4 Further to B10.3(c), the Bidder shall, within five (5) Business Days of a request by the Contract Administrator, provide proof satisfactory to the Contract Administrator that the Bidder/Subcontractor has a workplace safety and health program meeting the requirements of The Workplace Safety and Health Act (Manitoba), by providing:

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

B10.5 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.

B10.6 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.

B11. BID SECURITY

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

- (a) a bid bond, in the amount of at least ten percent (10%) of the Total Bid Price, and agreement to bond of a company registered to conduct the business of a surety in Manitoba, in the form included in the Bid Submission (Form G1: Bid Bond and Agreement to Bond); or
- (b) an irrevocable standby letter of credit, in the amount of at least ten percent (10%) of the Total Bid Price, and undertaking issued by a bank or other financial institution registered to conduct business in Manitoba and drawn on a branch located in Winnipeg, in the form

included in the Bid Submission (Form G2: Irrevocable Standby Letter of Credit and Undertaking); or

- (c) a certified cheque or draft payable to “The City of Winnipeg”, in the amount of at least fifty percent (50%) of the Total Bid Price, drawn on a bank or other financial institution registered to conduct business in Manitoba.

- B11.1.1 If the Bidder submits alternative bids, the bid security shall be in the amount of the specified percentage of the highest Total Bid Price submitted.
- B11.1.2 All signatures on bid securities shall be original.
- B11.1.3 The Bidder shall sign the Bid Bond.
- B11.1.4 The Surety shall sign and affix its corporate seal on the Bid Bond and the Agreement to Bond.
- B11.2 The bid security of the successful Bidder and the next two lowest evaluated responsive and responsible Bidders will be released by the City when a Contract for the Work has been duly executed by the successful Bidder and the performance security furnished as provided herein. The bid securities of all other Bidders will be released when a Contract is awarded.
- B11.2.1 Where the bid security provided by the successful Bidder is in the form of a certified cheque or draft pursuant to B11.1(c), it will be deposited and retained by the City as the performance security and no further submission is required.
- B11.2.2 The City will not pay any interest on certified cheques or drafts furnished as bid security or subsequently retained as performance security.
- B11.3 The bid securities of all Bidders will be released by the City as soon as practicable following notification by the Contract Administrator to the Bidders that no award of Contract will be made pursuant to the Bid Opportunity.

B12. OPENING OF BIDS AND RELEASE OF INFORMATION

- B12.1 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.
 - B12.1.1 Bidders or their representatives may attend.
 - B12.1.2 Bids determined by the Manager of Materials, or his/her designate, to not include the bid security specified in B11 will not be read out.
- B12.2 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/>
- B12.3 After award of Contract, the name(s) of the successful Bidder(s) and the Contract amount(s) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/>
- B12.4 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.

B13. IRREVOCABLE BID

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

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

B14. WITHDRAWAL OF BIDS

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

B14.1.1 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.

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

B14.1.3 If a Bidder gives notice of withdrawal prior to the Submission Deadline, the Manager of Materials 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 B14.1.3(b), declare the Bid withdrawn.

B14.2 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 B13.2 shall be liable for such damages as are imposed upon the Bidder by law and subject to such sanctions as the Chief Administrative Officer considers appropriate in the circumstances. The City, in such event, shall be entitled to all rights and remedies available to it at law, including the right to retain the Bidder's bid security.

B15. EVALUATION OF BIDS

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

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

B15.2 Further to B15.1(a), the Award Authority may reject a Bid as being non-responsive if the Bid 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.

B15.3 Further to B15.1(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.

B15.4 Further to B15.1(c), the Total Bid Price shall be the sum of the quantities multiplied by the unit prices for each item shown on Form B: Prices.

B15.4.1 If there is any discrepancy between the Total Bid Price written in figures, the Total Bid Price written in words and the sum of the quantities multiplied by the unit prices for each item, the sum of the quantities multiplied by the unit prices for each item shall take precedence.

- B15.4.2 Further to B15.1(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.
- B15.4.3 The electronic Form B: Prices and the formulas imbedded in that spreadsheet are only provided for the convenience of Bidders. The City makes no representations or warranties as to the correctness of the imbedded formulas. It is the Bidder's responsibility to ensure the extensions of the unit prices and the sum of Total Bid Price performed as a function of the formulas within the electronic Form B: Prices are correct.

B16. AWARD OF CONTRACT

- B16.1 The City will give notice of the award of the Contract or will give notice that no award will be made.
- B16.2 The City will have no obligation to award a Contract to a Bidder, even though one or all of the Bidders are determined to be responsible and qualified, and the Bids are determined to be responsive.
- B16.2.1 Without limiting the generality of B16.2, the City will have no obligation to award a Contract where:
- (a) the prices exceed the available City funds for the Work;
 - (b) the prices are materially in excess of the prices received for similar work in the past;
 - (c) the prices are materially in excess of the City's cost to perform the Work, or a significant portion thereof, with its own forces;
 - (d) only one Bid is received; or
 - (e) in the judgment of the Award Authority, the interests of the City would best be served by not awarding a Contract.
- B16.3 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 B15.
- B16.3.1 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
- 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) Pavement Reconstruction
 - (i) Roundabout Construction: Grassie Boulevard and Molson Street Intersection
 - (ii) All approaches to intersection (lengths vary from 50 m to 200 m)
- (b) Land Drainage Sewer Construction

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

- (a) Pavement Reconstruction
 - (i) Removal of trees
 - (ii) Construction of temporary pavements and sidewalks
 - (iii) Excavation and benching of subgrade, including ditches
 - (iv) Removal of existing culverts
 - (v) Excavation and compaction of sub-grade
 - (vi) Installation of catchbasins
 - (vii) Construction of pavement structure
 - (viii) Construction of concrete pavement
 - (ix) Construction of sidewalk and curb
 - (x) Paving stone installation
 - (xi) Construction of asphalt tie ins
 - (xii) Removal of temporary pavements
 - (xiii) Boulevard and ditch restoration
 - (xiv) Fence installation
 - (xv) Sodding, Hydro Mulching, and Landscaping
- (b) Land Drainage Sewer Construction
 - (i) Manhole chamber improvements
 - (ii) Installation of sewer
 - (iii) Installation of manholes
 - (iv) Installation of catchbasin leads

D3. CONTRACT ADMINISTRATOR

D3.1 The Contract Administrator is Dillon Consulting Limited, represented by:

David Wiebe, P.Eng.
Project Manager
1558 Willson Place, Winnipeg, Manitoba, R3T 0Y4
Telephone No. 204 453-2301
Facsimile No. 204 452-4412

D3.2 At the pre-construction meeting, David Wiebe, P.Eng. will identify additional personnel representing the Contract Administrator and their respective roles and responsibilities for the Work.

D3.3 Bids Submissions must be submitted to the address in B7.8

D4. CONTRACTOR'S SUPERVISOR

D4.1 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.

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

D5. OWNERSHIP OF INFORMATION, CONFIDENTIALITY AND NON DISCLOSURE

D5.1 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.

D5.2 The Contractor shall not make any public announcements or press releases regarding the Contract, without the prior written authorization of the Contract Administrator.

D5.3 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.

D5.4 A Contractor who violates any provision of D5 may be determined to be in breach of Contract.

D6. NOTICES

D6.1 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.

D6.2 All notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the City, except as expressly otherwise required in D6.3 or elsewhere in the Contract, shall be sent to the attention of the Contract Administrator at the facsimile number identified in D3.1.

D6.3 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

D7. FURNISHING OF DOCUMENTS

- D7.1 Upon award of the Contract, the Contractor will be provided with five (5) complete sets of the Bid Opportunity. If the Contractor requires additional sets of the Bid Opportunity, they will be supplied to him/her at cost.

SUBMISSIONS

D8. AUTHORITY TO CARRY ON BUSINESS

- D8.1 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.

D9. SAFE WORK PLAN

- D9.1 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.
- D9.2 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. INSURANCE

- D10.1 The Contractor shall provide and maintain the following insurance coverage:
- (a) commercial general liability insurance, in the amount of at least two million dollars (\$2,000,000.00) inclusive, with The City of Winnipeg added as an additional insured, with a cross-liability clause, such liability policy to also contain contractual liability, unlicensed motor vehicle liability, non-owned automobile liability, broad form property damage cover and products and completed operations, to remain in place at all times during the performance of the Work and throughout the warranty period;
 - (b) if applicable, 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 \$2,000,000 inclusive for loss or damage including personal injuries and death resulting from any one accident or occurrence;
 - (c) an all risks Installation Floater carrying adequate limits to cover all machinery, equipment, supplies and/or materials intended to enter into and form part of any installation.
- D10.2 Deductibles shall be borne by the Contractor.
- D10.3 The Contractor shall provide the City Solicitor with a certificate(s) of insurance, in a form satisfactory to the City Solicitor, at least two (2) Business Days prior to the commencement of any Work but in no event later than the date specified in the C4.1 for the return of the executed Contract.
- D10.4 The Contractor shall not cancel, materially alter, or cause each policy to lapse without providing at least thirty (30) Calendar Days prior written notice to the Contract Administrator.

D11. PERFORMANCE SECURITY

- D11.1 The Contractor shall provide and maintain performance security until the expiration of the warranty period in the form of:
- (a) a performance bond of a company registered to conduct the business of a surety in Manitoba, in the form attached to these Supplemental Conditions (Form H1: Performance Bond), in the amount of fifty percent (50%) of the Contract Price; or
 - (b) an irrevocable standby letter of credit issued by a bank or other financial institution registered to conduct business in Manitoba and drawn on a branch located in Winnipeg, in the form attached to these Supplemental Conditions (Form H2: Irrevocable Standby Letter of Credit), in the amount of fifty percent (50%) of the Contract Price; or
 - (c) a certified cheque or draft payable to "The City of Winnipeg", drawn on a bank or other financial institution registered to conduct business in Manitoba, in the amount of fifty percent (50%) of the Contract Price.
- D11.1.1 Where the performance security is in the form of a certified cheque or draft, it will be deposited by the City. The City will not pay any interest on certified cheques or drafts furnished as performance security.
- D11.2 If the bid security provided in his/her Bid was not a certified cheque or draft pursuant to B11.1(c), the Contractor shall provide the City Solicitor with the required performance security within seven (7) Calendar Days of notification of the award of the Contract by way of letter of intent and prior to the commencement of any Work on the Site and in no event later than the date specified in the C4.1 for the return of the executed Contract.

D12. SUBCONTRACTOR LIST

- D12.1 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.

D13. EQUIPMENT LIST

- D13.1 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.
- D13.2 For equipment to be used in proximity of the North Kildonan Feedermain, the equipment list shall include the requirements of E35.

D14. DETAILED WORK SCHEDULE

- D14.1 The Contractor shall provide the Contract Administrator with a detailed work schedule (Form L: 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.

SCHEDULE OF WORK

D15. COMMENCEMENT

- D15.1 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.

- D15.2 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 D8;
 - (ii) evidence of the workers compensation coverage specified in C6.15;
 - (iii) the twenty-four (24) hour emergency response phone number specified in D4.2.
 - (iv) the Safe Work Plan specified in D9;
 - (v) evidence of the insurance specified in D10;
 - (vi) the performance security specified in D11;
 - (vii) the subcontractor list specified in D12;
 - (viii) the equipment list specified in D13;
 - (ix) the detailed work schedule specified in D14; and
 - (x) the submittals for work around the feedermain specified in E35.3.
 - (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.
- D15.3 The Contractor shall commence the Work on the Site within seven (7) Working Days of receipt of the letter of intent.
- D15.4 The City intends to award this Contract by July 6, 2012
- D15.4.1 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.

D16. WORKING DAYS

- D16.1 Further to C1.1(gg);
- D16.1.1 The Contract Administrator will determine daily if a Working Day has elapsed and will record his/her assessment. On a weekly basis the Contract Administrator will provide the Contractor with a record of the Working Days assessed for the preceding week. The Contractor shall sign each report signifying that he/she agrees with the Contract Administrator's determination of the Working Days assessed for the report period.
- D16.1.2 Work done to restore the Site to a condition suitable for Work, shall not be considered "work" as defined in the definition of a Working Day.
- D16.1.3 When the Work includes two or more major types of Work that can be performed under different atmospheric conditions, the Contract Administrator shall consider all major types of Work in determining whether the Contractor was able to work in assessing Working Days.

D17. RESTRICTED WORK HOURS

- D17.1 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.

D18. WORK BY OTHERS

- D18.1 Work by others on or near the Site will include but not necessarily be limited to:
- (a) Manitoba Hydro (Street Lighting) – Street lighting poles and overhead cables must be relocated within this project site. It is anticipated, but not ensured, that most of this work will be completed prior to the commencement of this project.

- (b) Manitoba Hydro (Gas) – Rock wrapping of existing natural gas lines may be required. Contractor to contact Manitoba Hydro during excavation. Manitoba Hydro will then determine if rock wrapping is necessary;
- (c) MTS – Relocation of existing overhead lines will be required within this project site. It is anticipated, but not ensured, that this work will be completed prior to the commencement of this project.
- (d) Shaw – Relocation of existing overhead and underground lines will be required within this project site. It is anticipated, but not ensured, that this work will be completed prior to the commencement of this project.
- (e) Norscan Instruments Ltd – Line location of the Dark Fibre Network for the River East School Division will be required. Contractor to contact Jeff Sadler at 233-9138 to arrange.

D19. SEQUENCE OF WORK

D19.1 Further to C6.1, the sequence of work shall be as per the drawings. See sheet 03 to sheet 06 for the Sequence of Work, Construction Activities, and Traffic Control for each stage.

D20. CRITICAL STAGES

D20.1 The Contractor shall achieve critical stages of the Work in accordance with the following requirements:

- (a) Feedermain shutdown for road structure construction over thrust blocks as detailed in E35.4.2(b)(v) must be complete within a span of 5 Working Days

D20.2 When the Contractor considers the Work associated with the critical stage 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.

D20.3 The date on which the critical stage Work has been accepted by the Contract Administrator as being completed to the requirements of the Contract is the date on which completion of the critical stage has been achieved.

D21. SUBSTANTIAL PERFORMANCE

D21.1 The Contractor shall achieve Substantial Performance within seventy (70) consecutive Working Days of the commencement of the Work as specified in D15.

D21.2 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.

D21.3 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.

D22. TOTAL PERFORMANCE

D22.1 The Contractor shall achieve Total Performance within eighty (80) consecutive Working Days of the commencement of the Work as specified in D15.

D22.2 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.

- D22.3 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.

D23. LIQUIDATED DAMAGES

- D23.1 If the Contractor fails to achieve Critical Stages, Substantial Performance or Total Performance in accordance with the Contract by the days fixed herein for same, the Contractor shall pay the City the following amounts per Working Day for each and every Working Day following the days fixed herein for same during which such failure continues:

- (a) Critical Stage – Two Thousand, Five Hundred dollars (\$2,500);
- (b) Substantial Performance – Two Thousand, Five Hundred dollars (\$2,500);
- (c) Total Performance - One Thousand, Two Hundred dollars (\$1,200).

- D23.2 The amounts specified for liquidated damages in D23.1 are based on a genuine pre-estimate of the City's losses in the event that the Contractor does not achieve critical stages, Substantial Performance or Total Performance by the days fixed herein for same.

- D23.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

D24. SCHEDULED MAINTENANCE

- D24.1 The Contractor shall perform the following scheduled maintenance in the manner and within the time periods required by the Specifications:

- (a) Reflective Crack Maintenance (during two year warranty period) as specified in CW 3250;
- (b) Sodding (maintenance period) as specified in CW 3510;
- (c) Seeding (maintenance period) as specified in CW 3520.
- (d) Long-Term Scheduled Maintenance of Plant Material as specified in E25.

- D24.2 Determination of Substantial Performance and Total Performance shall be exclusive of scheduled maintenance identified herein. All scheduled maintenance shall be completed prior to the expiration of the warranty period. Where the scheduled maintenance cannot be completed during the warranty period, the warranty period shall be extended for such period of time as it takes the Contractor to complete the scheduled maintenance.

CONTROL OF WORK

D25. JOB MEETINGS

- D25.1 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.

- D25.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he/she deems it necessary.

D26. PRIME CONTRACTOR – THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA)

D26.1 Further to C6.24, the Contractor shall be the Prime Contractor and shall serve as, and have the duties of the Prime Contractor in accordance with The Workplace Safety and Health Act (Manitoba).

MEASUREMENT AND PAYMENT

D27. PAYMENT

D27.1 Further to C12, the City may at its option pay the Contractor by direct deposit to the Contractor's banking institution.

WARRANTY

D28. WARRANTY

D28.1 Notwithstanding C13.2, the warranty period shall begin on the date of Total Performance and shall expire two (2) years thereafter unless extended pursuant to C13.2.1 or C13.2.2, in which case it shall expire when provided for thereunder.

D28.2 Notwithstanding C13.2 or D28.1, the Contract Administrator may permit the warranty period for a portion or portions of the Work to begin prior to the date of Total Performance if:

- (a) a portion of the Work cannot be completed because of unseasonable weather or other conditions reasonably beyond the control of the Contractor but that portion does not prevent the balance of the Work from being put to its intended use.

D28.2.1 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 D11)

KNOW ALL MEN BY THESE PRESENTS THAT

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

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

_____ dollars (\$_____)

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

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

BID OPPORTUNITY NO. 413-2012

Roundabout Construction: Grassie Boulevard and Molson Street Intersection
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 D11)

(Date)

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

RE: PERFORMANCE SECURITY – BID OPPORTUNITY NO. 413-2012

Roundabout Construction: Grassie Boulevard and Molson Street Intersection

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

(Name of Contractor)

(Address of Contractor)

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

_____ Canadian dollars.

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

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

Partial drawings are permitted.

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

(Address)

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

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

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

(Date)

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

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

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

(Name of bank or financial institution)

Per: _____
(Authorized Signing Officer)

Per: _____
(Authorized Signing Officer)

FORM K: EQUIPMENT
(See D13)

Roundabout Construction: Grassie Boulevard and Molson Street Intersection

<p>1. Category/type: Concrete Paving</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>2. Category/type: Asphalt Paving</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>3. Category/type: Excavation and Earthwork</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 D13)

Roundabout Construction: Grassie Boulevard and Molson Street Intersection

<p>4. Category/type: Sewer Construction</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>5. Category/type: Base Placement</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>6. Category/type: Other</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>

PART E - SPECIFICATIONS

GENERAL

E1. APPLICABLE SPECIFICATIONS AND DRAWINGS

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

<u>Drawing No.</u>	<u>Drawing Name/Title</u>	<u>Drawing (Original) Sheet Size</u>
01	Cover Sheet	A1
P-3329-02	Control Line Geometry	A1
P-3329-03	Construction – Stage 1	A1
P-3329-04	Construction – Stage 2	A1
P-3329-05	Construction – Stage 3	A1
P-3329-06	Construction – Stage 4	A1
P-3329-07	Paving and Grading – North Leg	A1
P-3329-08	Paving and Grading – East Leg	A1
P-3329-09	Paving and Grading – South Leg	A1
P-3329-10	Paving and Grading – West Leg (1 of 2)	A1
P-3329-11	Paving and Grading – West Leg (2 of 2)	A1
P-3329-12	Paving and Grading – Roundabout	A1
P-3329-13	Paving and Grading – 1395 Molson Parking Lot	A1
P-3329-14	Plan-Profile – LDS	A1
P-3329-15	Concrete Joint Layout	A1
P-3329-16	Details	A1
P-3329-17	Cross Sections – North, East & South Legs	A1
P-3329-18	Cross Sections – West Leg & Roundabout	A1
P-3329-19	Cross Sections – Stage 1 & 2	A1
P-3329-20	Cross Sections – Stage 3 & 4	A1
P-3329-21	Electrical – 1395 Molson Parking Lot	A1
P-3329-22	Landscaping – Planting Plan	A1
P-3329-23	Landscaping – Tree Removals & Tree Planting	A1
P-3329-24	Manhole Chamber Improvements	A1

E2. GEOTECHNICAL REPORT

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

E3. OFFICE FACILITIES

- E3.1 The Contractor shall supply office facilities meeting the following requirements:
- (a) The field office shall be for the exclusive use of the Contract Administrator.
 - (b) The building shall be conveniently located near the site of the Work.
 - (c) The building shall have a minimum floor area of 15 square metres, 2.4 m with two windows for cross ventilation and a door entrance with a suitable lock.
 - (d) The building shall be suitable for all weather use. It shall be equipped with an electric heater and air conditioner so that the room temperature can be maintained between either 16-18°C or 24-25°C.
 - (e) The building shall be adequately lighted with fluorescent fixtures and have a minimum of two wall outlets.
 - (f) The building shall be furnished with one desk, one meeting table, one stool, one legal sized filing cabinet, and minimum 8 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.

E4. PROTECTION OF EXISTING TREES

- E4.1 The Contractor shall take the following precautionary steps to prevent damage from construction activities to existing boulevard trees within the limits of the construction area:
- (a) The Contractor shall not stockpile materials and soil or park vehicles and equipment on boulevards within 2 metres of trees.
 - (b) Trees identified to be at risk by the Contract Administrator are to be strapped with 25 x 100 x 2400mm wood planks, or suitably protected as approved by the Contract Administrator.
 - (c) Excavation shall be performed in a manner that minimizes damage to the existing root systems. Where possible, excavation shall be carried out such that the edge of the excavation shall be a minimum of 1.5 times the diameter (measured in inches), with the outcome read in feet, from the closest edge of the trunk. Where roots must be cut to facilitate excavation, they shall be pruned neatly at the face of excavation.
 - (d) Operation of equipment within the dripline of the trees shall be kept to the minimum required to perform the work required. Equipment shall not be parked, repaired, refuelled; construction materials shall not be stored, and earth materials shall not be stockpiled within the driplines of trees. The dripline of a tree shall be considered to be the ground surface directly beneath the tips of its outermost branches. The Contractor shall ensure that the operations do not cause flooding or sediment deposition on areas where trees are located.
 - (e) Work on-site shall be carried out in such a manner so as to minimize damage to existing tree branches. Where damage to branches does occur, they shall be neatly pruned.
- E4.2 All damage to existing trees caused by the Contractor's activities shall be repaired to the requirements and satisfaction of the Contract Administrator and the City Forester or his/her designate.
- E4.3 No separate measurement or payment will be made for the protection of trees.

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

E5. TRAFFIC CONTROL

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

- (a) Where directed, the Contractor shall construct and maintain temporary asphalt ramps to alleviate vertical pavement obstructions such as manholes and planing drop-offs to the satisfaction of the Contract Administrator. Payment shall be in accordance with CW3410.
- (b) In accordance with the Manual of Temporary Traffic Control in Work Areas on City Streets, the Contractor ("Agency" in the manual) shall make arrangements with the Traffic Services Branch of the City of Winnipeg to place all temporary regulatory signs. The Contractor shall bear all costs associated with the placement of temporary traffic control devices by the Traffic Services Branch of the City of Winnipeg in connection with the works undertaken by the Contractor.

E6. TRAFFIC MANAGEMENT

E6.1 Further to clause 3.7 of CW 1130, see drawing sheets 03 to 06 for the traffic management details for each stage:

E6.1.1 Should the Contractor be unable to maintain pedestrian or vehicular access to a residence or business, he/she shall review the planned disruption with the business or residence and the Contract Administrator, and take reasonable measures to minimize the impact. The Contractor shall provide a minimum of 24 hours notification to the affected residence or business and the Contract Administrator, prior to disruption of access.

E6.1.2 Pedestrian and ambulance/emergency vehicle access must be maintained at all times.

E7. REFUSE AND RECYCLING COLLECTION

E7.1 While access to refuse and/or recycling collection vehicles is restricted, on collection day(s) the Contractor shall move all of the affected property owners refuse and/or recycling materials to a nearby common area, prior to an established time, in accordance with E7.2 to permit the normal collection vehicles to collect the materials. Immediately following recycling collection the Contractor shall return recycling receptacles to the addresses marked on the receptacles.

E7.2 Collection Schedule:

Grassie Blvd from McLeod Avenue to 100 m east of Molson Street

Collection Day(s): South of Grassie: Garbage and Recycling day 3

North of Grassie: Garbage and Recycling day 1

Collection Time: 7:00 a.m. to 6:00 p.m.

Common Collection Area: South of Grassie: Pick up is back lane for both garbage and recycling.

North of Grassie: Pick up is front street for both garbage and recycling.

North and south side of McLeod is front street pick up.

Molson Street from McLeod Avenue to 100 m south of Grassie Boulevard

Collection Day(s): Garbage and Recycling day 1

Collection Time: 7:00 a.m. to 6:00 p.m.

Common Collection Area: Front street pick up for garbage and recycling.

E7.3 No measurement or payment will be made for the work associated with this specification.

E8. PEDESTRIAN SAFETY

E8.1 During the project, a temporary snow fence shall be installed adjacent to existing and temporary sidewalks as necessary to prevent access to the construction area. The Contractor shall be responsible for maintaining the snow fence in a proper working condition. No measurement for payment shall be made for this work.

E9. WATER OBTAINED FROM THE CITY

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

E10. SURFACE RESTORATIONS

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

E11. INFRASTRUCTURE SIGNS

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

E12. SUPPLY AND INSTALL DETECTABLE WARNING SURFACE TILES

DESCRIPTION

E12.1 This specification covers the supply and installation of detectable warning surface tiles in sidewalk ramps and multi-use path ramps.

SPECIFICATIONS AND DRAWINGS

E12.2 Referenced Standard Construction Specifications and Standard Details

- (a) CW 3235 - Renewal of Existing Miscellaneous Concrete Slabs
- (b) CW 3240 - Renewal of Existing Curbs
- (c) CW 3310 - Portland Cement Concrete Pavement Works
- (d) CW 3325 - Portland Cement Concrete Sidewalk
- (e) SD-229C - Curb Ramp for Concrete Pavement

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

E12.3 SDE Drawings

- (a) SDE-229A - Curb Ramp Layout for Intersections
- (b) SDE-229AA - Detectable Warning Surface Tile in Curb Ramps for Intersections, Layout Option 1
- (c) SDE-229AC – 300x300 Detectable Warning Surface Tile, Layout Option 3
- (d) SDE-229AD – 300x300 Detectable Warning Surface Tile, Layout Option 3 DETAIL
- (e) SDE-229AE – Curb Ramp for Pedestrian Corridor with a Traffic Control Device
- (f) SDE-229AF – Detectable Warning Surface Tile Orientation for Offset Intersections
- (g) SDE-229BB – Detectable Warning Surface Tile in Curb Ramps for Medians
- (h) SDE-229E - Curb Ramp Depressed Curb

MATERIALS

E12.4 Acceptable Detectable Warning Surface Tile product is:

- (a) 610 x 1220mm (2'x 4') Cast in Place (Federal Yellow).
- (b) 300 x 300mm (1'x1') Cast in Place (Federal Yellow).

Manufacturer - ADA Solutions Inc.,
Supplier -
Brock White Canada
879 Keewatin Street
Winnipeg, Manitoba

Attention: Bernie Giesbrecht
Ph: 204-479-8089

or

Manufacturer - Armor Tile Tactile Systems
Supplier –
Alsip's Building Products
1 Cole Avenue
Winnipeg, Manitoba

Attention: Jason Alsip
Ph. 204-667-3330

- E12.4.1 Detectable warning surface tiles shall be Federal Yellow (USA); or Safety Yellow (Canada).
- E12.4.2 Detectable warning surface tiles shall be cast in place type with ribs. (Anchored type is not allowed)
- E12.4.3 Truncated domes on detectable warning surface tiles shall be in accordance with ADA Accessibility Guidelines (ADAAG).

CONSTRUCTION METHODS

E12.5 Selection of Layout Options

- E12.5.1 Select the appropriate design layout for detectable warning surface tiles according to the following prioritized order:
- E12.5.2 Layout Option One – Install detectable warning surface tiles in accordance with SDE-229A and SDE-229AA.

- E12.5.3 If two 610mm x 1220mm tiles would physically overlap each other, or would be within 150mm of each other, or if one tile would lie within the circulation path towards the other tile, then install the detectable warning surface tiles according to the following order, Layout Option Two(2) or Three(3).
- E12.5.4 Layout Option Two – Separate the tiles by moving either one or both tiles along the curb line in opposite directions, in accordance with this Specification, and keeping the ramp and pedestrian road crossing as perpendicular to the road as is possible, as directed by the Contact Administrator.
- E12.5.5 Layout Option Three – Install detectable warning surface tiles in accordance with SDE-229AC and SDE-229AD.
- E12.6 General
- E12.6.1 Construct curb ramps, sidewalk ramps and multi-use paths in accordance with the referenced Standard Construction Specifications, Standard Details, and SDE drawings.
- E12.6.2 Detectable warning surface tile shall not be placed at private approaches or alleys.
- E12.6.3 All curb ramps opposite each other shall have the same width.
- E12.6.4 Construct the lip of the depressed curb in accordance with SDE – 229E.
- E12.6.5 Construct ramp slopes in accordance with SD-229C and SD-229D. Use a ramp slope with preference for a slope as close to 5% maximum as possible.
- E12.6.6 Construct flare and curb taper slopes according to the following:
- If the curb taper is within a grassed area, construct the curb taper 900mm in length.
 - When the flare and curb taper are in a full width sidewalk and the sidewalk area at the top of the ramp is <1500mm in width, construct the flare and curb taper at 5% slope to allow safe passage for wheelchairs in this area.
 - When the flare and curb taper are in a full width sidewalk and the sidewalk area at the top of the ramp is ≥ 1500 mm in width, construct the flare and curb taper at 10% slope.
- E12.6.7 Install the detectable warning surface tile in accordance with E12.10.
- E12.6.8 Trim the corner of the tile at curb radii in accordance with SDE-229AA and SDE-229AD.
- E12.6.9 Install the detectable warning surface tiles as shown on the referenced drawings or as directed by the Contract Administrator.
- E12.6.10 Orient the detectable warning surface tiles perpendicular to the crossing direction.
- E12.6.11 Locate gratings, access covers and other appurtenances outside of the sidewalk ramps, depressed curbs, rest areas, and gutters in front of the depressed curbs, as directed by the Contact Administrator.
- E12.7 Medians and Refuge Islands
- E12.7.1 Where the distance from back of curb to back of curb is 1.32m or greater, install one detectable warning surface tile 50mm from the back of each curb.
- E12.7.2 Where the distance from back of curb to back of curb is less than 1.32m, place the tiles 50mm from the back of curb and cut the tile(s) to fill the remaining area between the curbs.
- E12.8 2.0m Wide Depressed Curb for Multi-use Paths
- E12.8.1 Construct a curb ramp with a 2.0m depressed curb at high volume collector and regional street intersections in accordance with SDE-229E, in accordance with Public Works Department guidelines and as directed by the Contract Administrator.
- E12.8.2 Construct the concrete ramp 2.0m wide and a minimum of 1.50m deep from back of curb.
- E12.8.3 Construct the curb ramp in accordance with SD-229C and SD229D.

- E12.8.4 Install one 610mm x 1220mm tile centered to the 2.0m wide depressed curb. The part of the tile nearest the curb must be 50mm from the back of curb similar to tile placement in SDE-229AA.
- E12.9 3.5m Wide Depressed Curb for Multi-use Paths
- E12.9.1 Construct a curb ramp with a 3.5m depressed curb at low volume collector and residential street intersections in accordance with SDE-229E, in accordance with Public Works Department guidelines and as directed by the Contract Administrator.
- E12.9.2 Construct the concrete ramp 3.5m wide and a minimum of 1.50m deep from back of curb.
- E12.9.3 Construct the curb ramp in accordance with SD-229C and SD229D.
- E12.9.4 Install two (2) tiles in each concrete ramp, one (1) on each side for each direction. Place the short edge of each tile 150mm from the edge of the concrete ramp, with both tiles in line with each other transversely across the concrete ramp. The tile(s) nearest the curb must be 50mm from back of curb similar to tile placement in SDE-229AA.
- E12.9.5 Saw cut the middle of the concrete slab, perpendicular to the curb and to a depth of D/4. Cut additional sawcuts as directed by the Contract Administrator.

INSTALLATION INSTRUCTIONS

- E12.10 Installation Instructions for Cast In Place Inline Dome Detectable/Tactile Warning Surface Tile
- (a) During Cast In Place Detectable/Tactile Warning Surface Tile installation procedures, ensure adequate safety guidelines are in place and that they are in accordance with the applicable industry and government standards.
 - (b) The specifications of the structural embedment flange system and related materials shall be in strict accordance with the contract documents and the guidelines set by their respective manufacturers. Do not set Cast In Place tiles in asphaltic concrete.
 - (c) The physical characteristics of the concrete shall be consistent with the contract specifications. An overly wet mix will cause the tile to float. Under these conditions, suitable weights such as 2 concrete blocks or sandbags (12 kg) shall be placed on each tile.
 - (d) Prior to placement of the Cast In Place Detectable/Tactile Warning Surface Tile system, the contract drawings shall be reviewed.
 - (e) Pour and finish the concrete using typical mason's tools, however, 12 kg weights, and a large non-marring rubber mallet are specific to the installation of the Cast In Place Detectable/Tactile Warning Surface Tile system. A vibrating mechanism can be employed, if desired. The vibrating unit should be fixed to a soft base such as wood, at least 300mm square.
 - (f) The factory-installed plastic sheeting must remain in place during the entire installation process to prevent the splashing of concrete onto the finished surface of the tile. Remove the plastic sheeting after the concrete has set.
 - (g) When preparing to set the tile, it is important that NO concrete be removed in the area to accept the tile. It is imperative that the installation technique eliminates any air voids under the tile. Holes in the tile perimeter allow air to escape during the installation process. Concrete will flow through the large holes in each embedment flange on the underside of the tile. This will lock the tile solidly into the cured concrete.
 - (h) Drill additional 6mm vent holes in the ribs under the tile as required to help seat the tile in the concrete.
 - (i) The concrete shall be poured and finished true and smooth to the required dimensions and slope prior to the tile placement. The tile shall be placed in accordance with the contract drawings.
 - (j) The Cast In Place Detectable/Tactile Warning Surface Tiles shall be tamped (or vibrated) into the fresh concrete to ensure that the surface of the truncated domes are flush to the adjacent concrete surface. Embedment of the tile so the top of the truncated domes are flush with the adjacent concrete will reduce the possibility of damage due to snow clearing

operations. The embedment process should not be accomplished by stepping on the tile as this may cause uneven setting which can result in air voids under the tile surface.

- (k) While concrete is workable, a 3/8" radius edging tool shall be used to create a finished edge of concrete, a steel trowel shall then be used to finish the concrete around the tile's perimeter.
- (l) During and after the tile installation and the concrete curing stage, it is imperative that there is no walking, leaning or external force placed on the tile that may rock the tile causing a void between the underside of tile and concrete.
- (m) Following tile placement, review installation tolerances to contract drawings and adjust tile before the concrete sets. Two suitable weights of 12kg each shall be placed on each tile as necessary to ensure solid contact of the underside of tile to concrete.
- (n) If required, individual tiles can be bolted together using ¼ inch or equivalent hardware. This can help to ensure that adjacent tiles are flush to each other during the installation process. Tape or caulking can be placed on the underside of the bolted butt joint to ensure that concrete does not rise up between the tiles during installation. Any protective plastic wrap which was peeled back to facilitate bolting or cutting, should be replaced and taped to ensure that the tile surface remains free of concrete during the installation process.
- (o) Following the concrete curing stage, protective plastic wrap is to be removed from the tile surface by cutting the plastic with a sharp knife, tight to the concrete/tile interface. If concrete bled under the plastic, a soft brass wire brush will clean the residue without damage to the tile surface.
- (p) Tiles can be cut using a continuous rim diamond blade in a circular saw or mini-grinder. Use of a straightedge to guide the cut is advisable where appropriate.
- (q) Bolt 300mm x 300mm tiles together prior to placing in plastic concrete. This ensures that the surface of the tiles are flush with each other.

MEASUREMENT AND PAYMENT

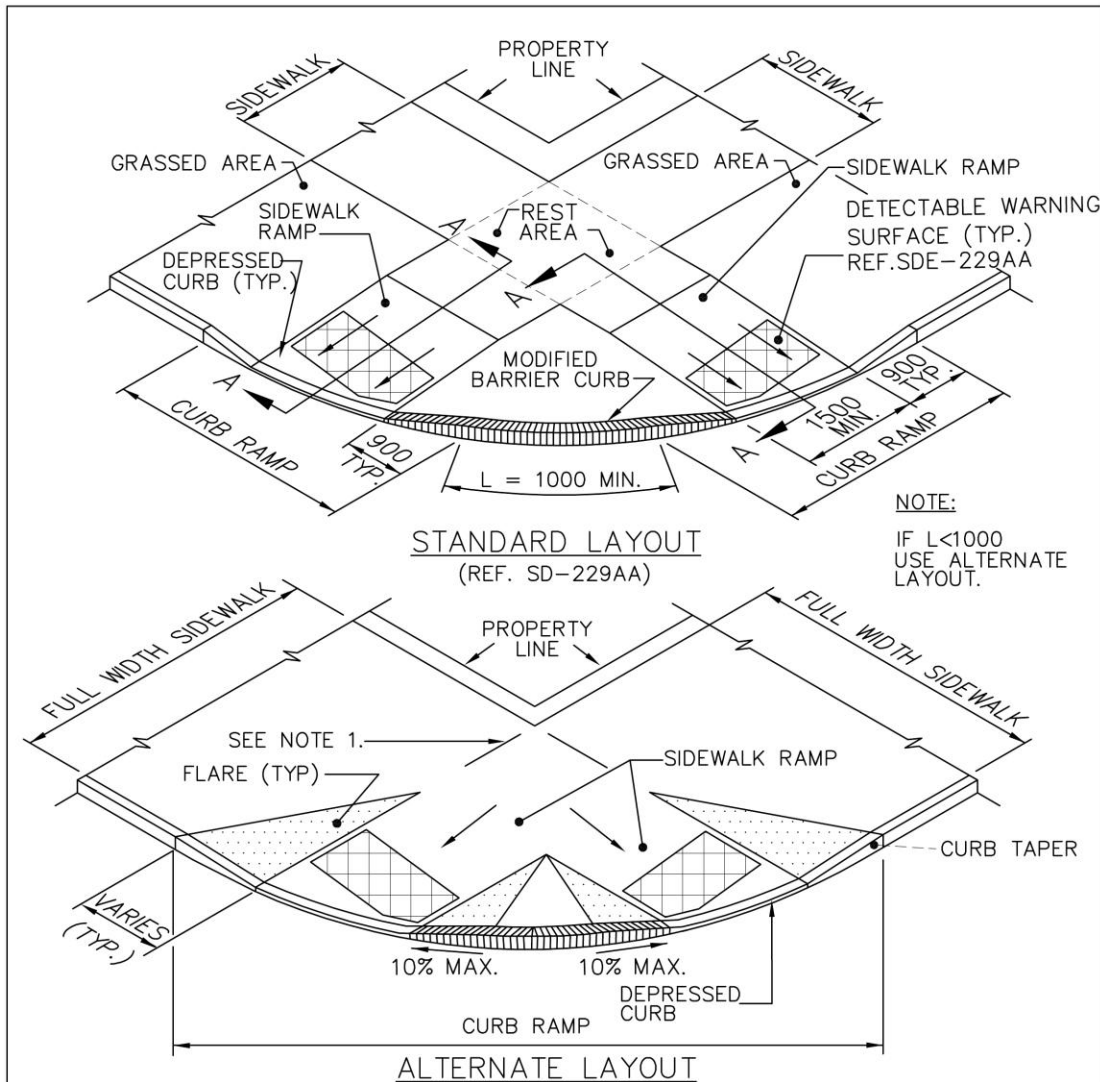
- E12.11 Detectable Warning Surface Tiles shall be measured on a unit basis and paid for at the Contract Unit Price per unit for the "Items of Work" listed here below. The number of units to be paid for shall be the total number of detectable warning surface tiles supplied and installed in accordance with this specification, accepted and measured by the Contract Administrator.

Detectable Warning Surface Tiles:

- i) 300mm x 300mm tiles
- ii) 610mm x 1220mm tiles

- E12.12 The area under the detectable warning surface tile is part of the concrete sidewalk ramp and will be paid in accordance with CW 3235 or CW 3325.
- E12.13 The concrete sidewalk ramp and the concrete ramp for multi-use paths will be paid as 100mm sidewalk in accordance with CW 3235 or CW 3325.
- E12.14 Curb ramp will be paid in accordance with CW 3240 or CW 3310.


DRAWINGS



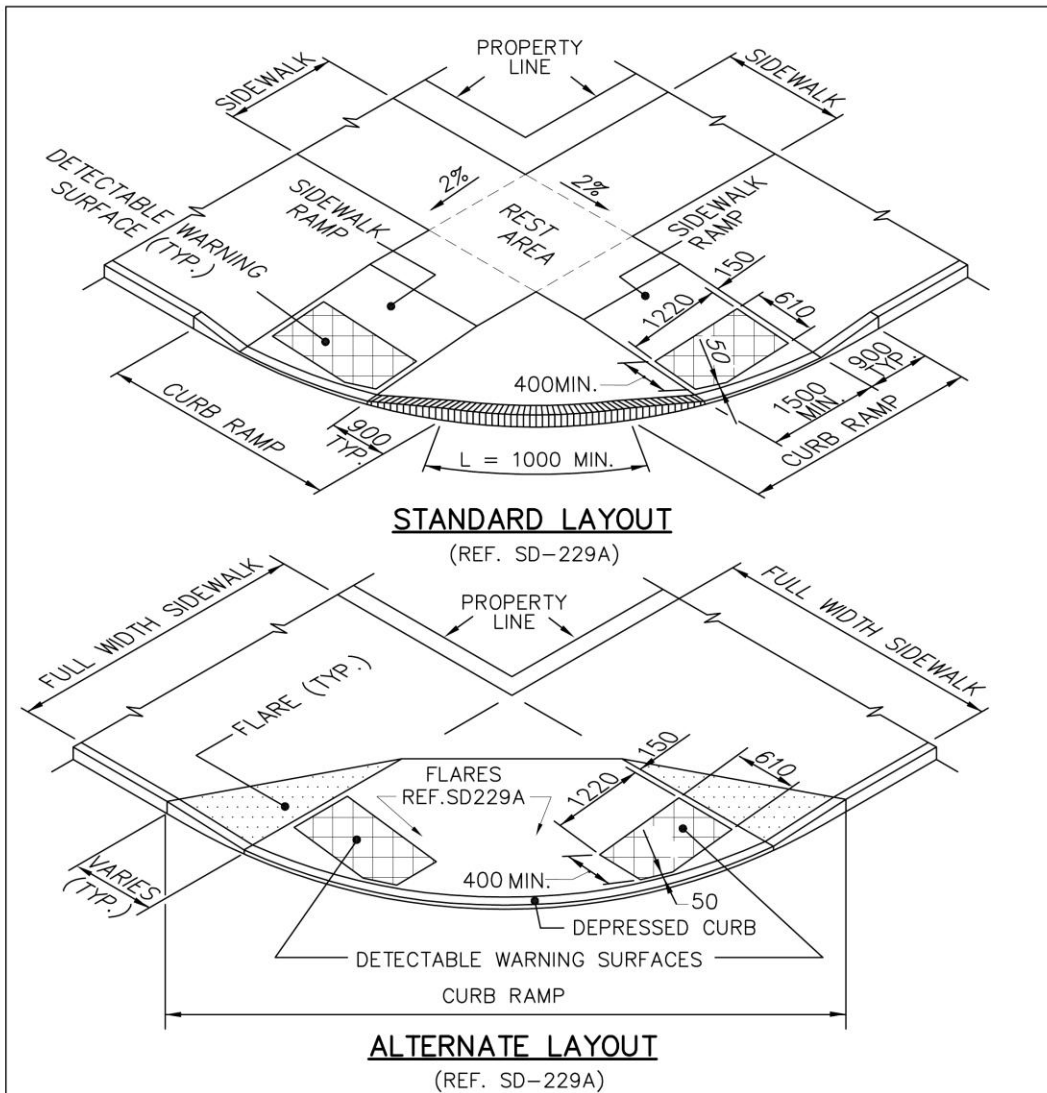
NOTE:
 IF L < 1000
 USE ALTERNATE
 LAYOUT.


DIMENSIONS ARE IN MILLIMETRES

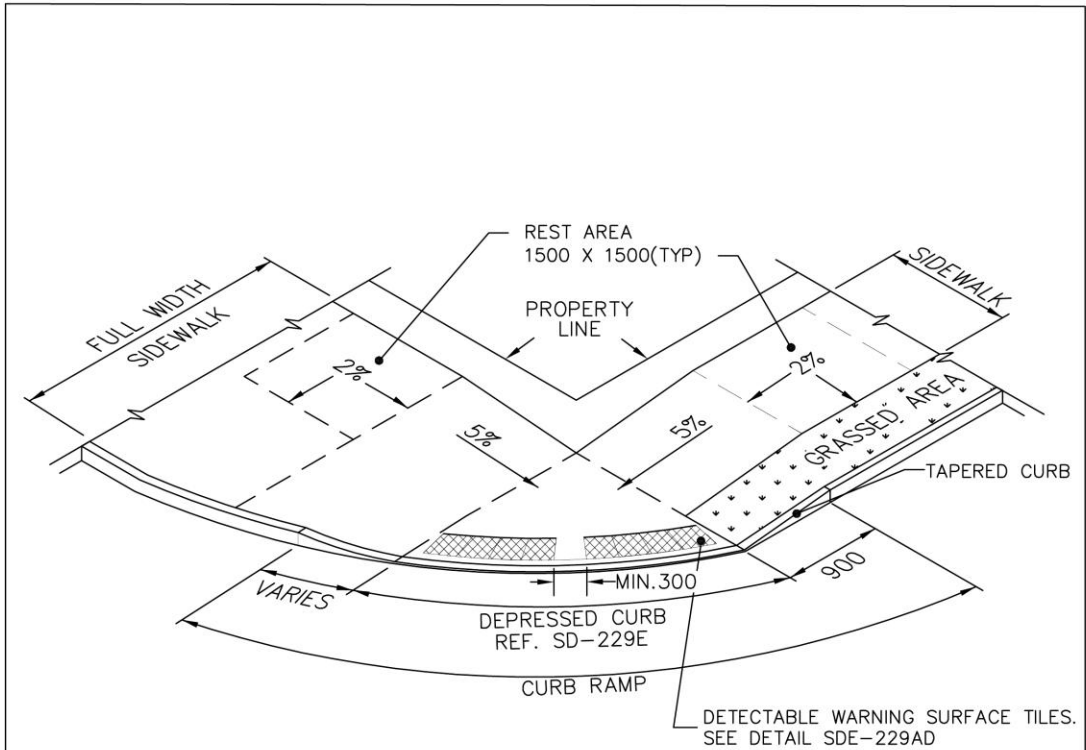
- NOTE:**
1. LINEUP DEPRESSED CURB WITH BACK OF SIDEWALK.
 2. FOR SECTION A-A SEE SD-229C & SD-229D
 3. CONSTRUCT FLARE AND CURB TAPER SLOPE IN ACCORDANCE WITH SECTION 1.6 OF THIS SPECIFICATION
 4. REST AREA MINIMUM 1500 X 1500

 THE CITY OF WINNIPEG PUBLIC WORKS DEPARTMENT	
	Reference Spec. No. E-SUPPLY & INSTALL DETECTABLE WARNING SURFACE
CURB RAMP LAYOUT FOR INTERSECTIONS	


Designed By: B.P.	Drawn By: T.G.A..	Scale : N.T.S.
Checked By: F.W.C.	Date: 11-02-10	Drawing No.
Approved:		SDE-229A

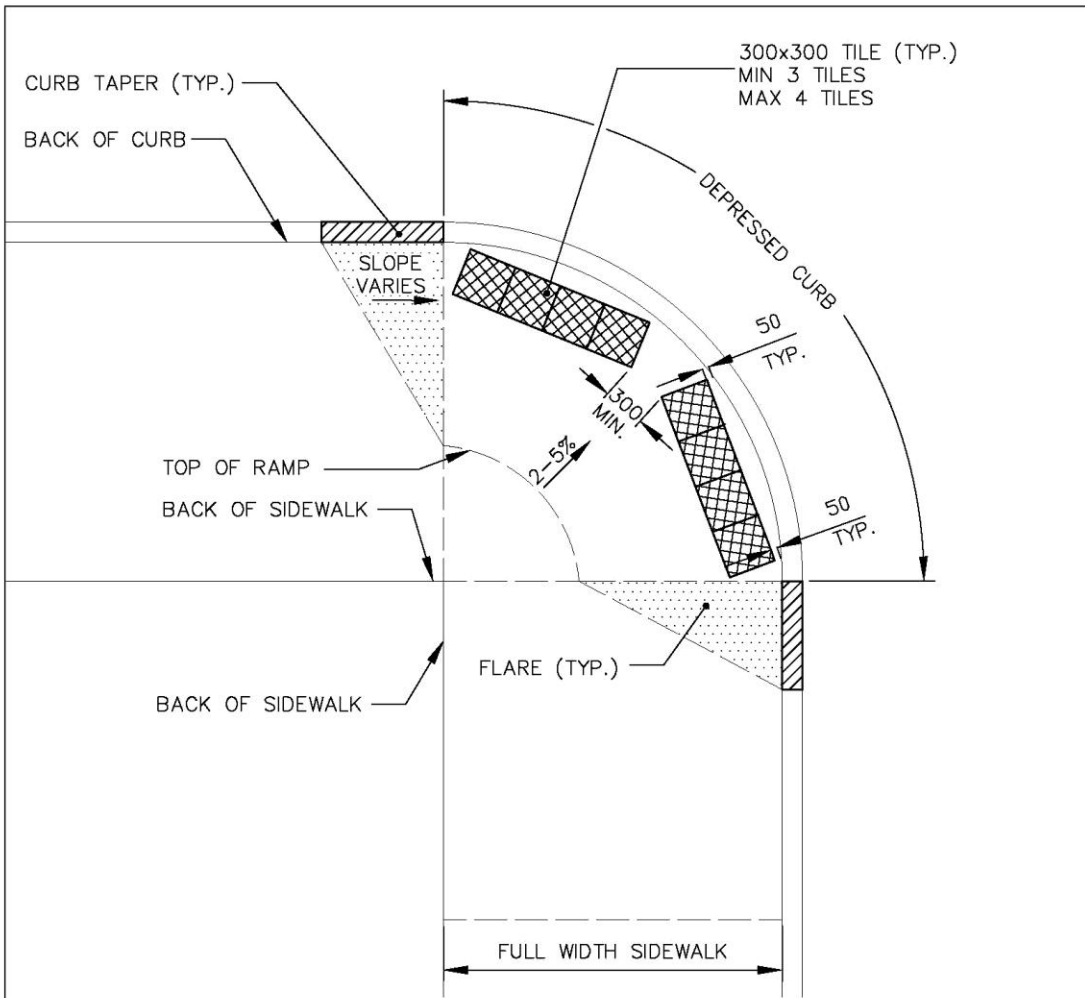


 THE CITY OF WINNIPEG PUBLIC WORKS DEPARTMENT		DIMENSIONS ARE IN MILLIMETRES		
Reference Spec. No. CW 3235, CW 3310, CW 3325 E-SUPPLY & INSTALL DETECTABLE WARNING SURFACE		Designed By: B.P.	Drawn By: T.G.A.	Scale : N.T.S.
DETECTABLE WARNING SURFACE TILE SURFACE IN CURB RAMPS FOR INTERSECTIONS. LAYOUT OPTION 1		Checked By: F.W.C.	Date: 11-02-10	Drawing No.
		Approved:		SDE-229AA



NOTES:
 1. PLACE 300x300 DETECTABLE WARNING SURFACE TILES IN ACCORDANCE WITH "SELECTION OF LAYOUT OPTIONS" IN THIS SPECIFICATION.

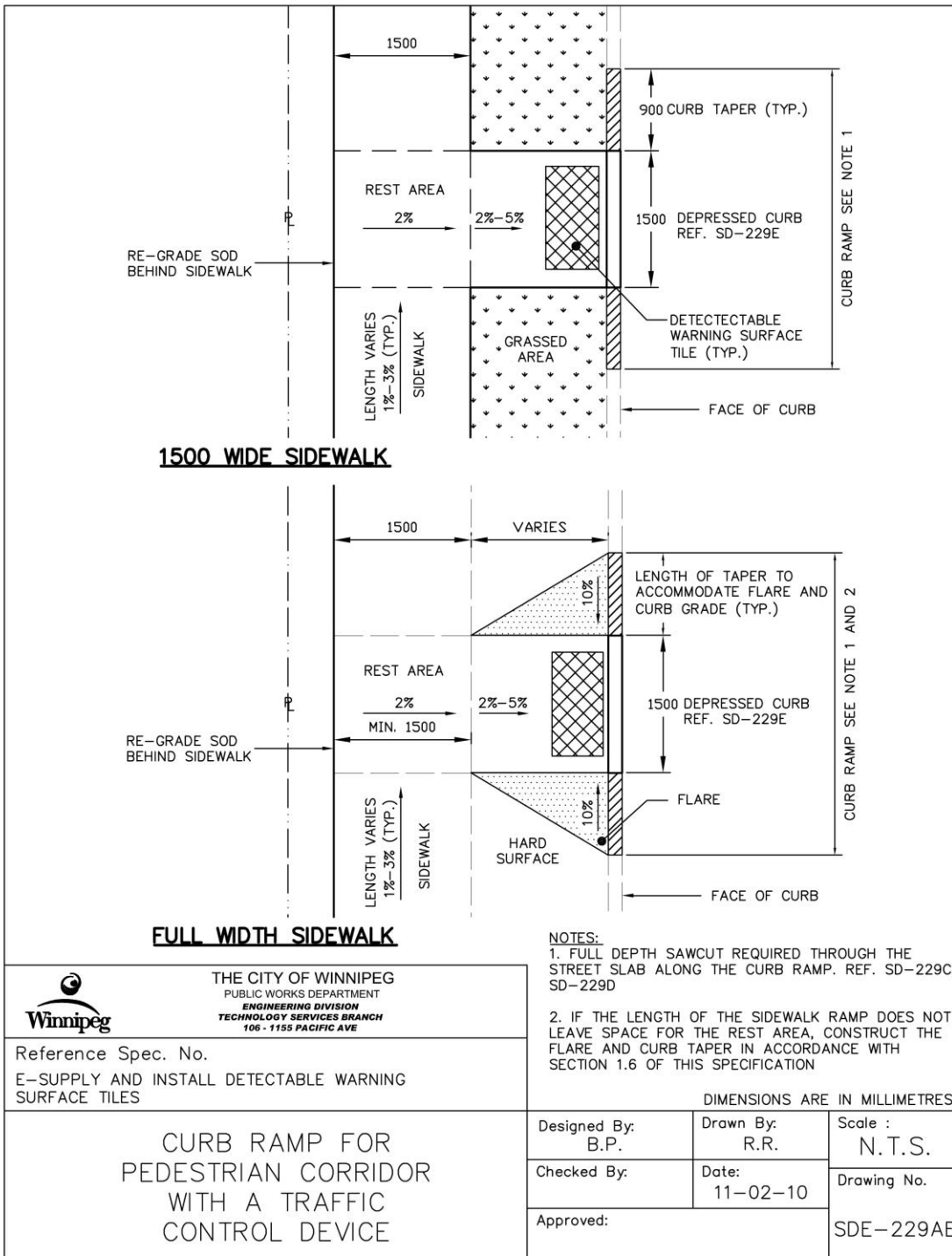
 THE CITY OF WINNIPEG PUBLIC WORKS DEPARTMENT	DIMENSIONS ARE IN MILLIMETRES		
	Reference Spec. No. E-SUPPLY AND INSTALL DETECTABLE WARNING SURFACE TILES	Designed By: B.P.	Drawn By: R.R.
300 X 300 mm DETECTABLE WARNING SURFACE TILE LAYOUT OPTION 3	Checked By:	Date: 11-02-10	Drawing No.
	Approved:	SDE-229AC	




NOTES:
 1. WHEN THE SIDEWALK AREA AT THE TOP OF THE RAMP IS $\geq 1500\text{mm}$ OR $< 1500\text{mm}$ IN WIDTH, CONSTRUCT THE SLOPE OF THE CURB RAMP AND THE CURB TAPER IN ACCORDANCE WITH SECTION 1.6 OF THIS SPECIFICATION.

 <p>THE CITY OF WINNIPEG PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION TECHNOLOGY SERVICES BRANCH 106 - 1185 PACIFIC AVE</p>	Reference Spec. No. E-SUPPLY AND INSTALL DETECTABLE WARNING SURFACE TILES		
	<p>300x300mm DETECTABLE WARNING SURFACE TILE LAYOUT OPTION 3 DETAIL</p>		

DIMENSIONS ARE IN MILLIMETRES		
Designed By: B.P.	Drawn By: R.R.	Scale : N.T.S.
Checked By:	Date: 11-02-10	Drawing No.
Approved:		SDE-229AD

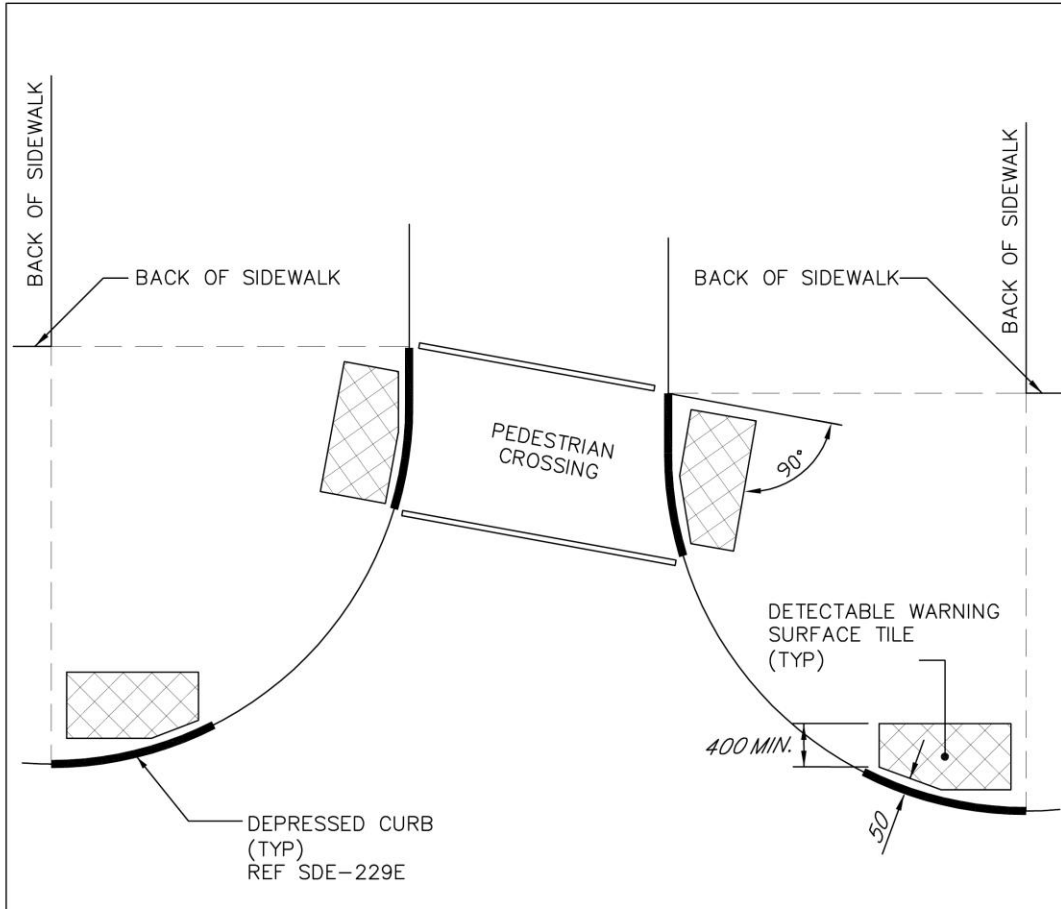


 THE CITY OF WINNIPEG
 PUBLIC WORKS DEPARTMENT
 ENGINEERING DIVISION
 TECHNOLOGY SERVICES BRANCH
 106 - 1155 PACIFIC AVE


Reference Spec. No.
 E-SUPPLY AND INSTALL DETECTABLE WARNING SURFACE TILES

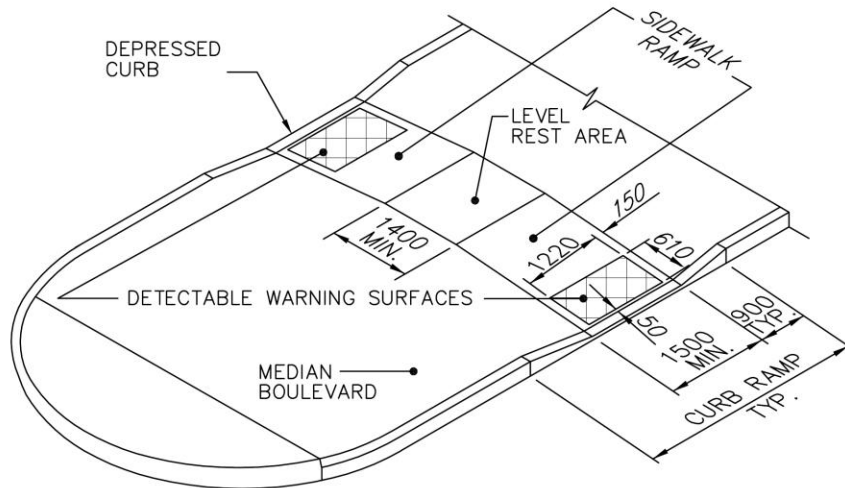
CURB RAMP FOR PEDESTRIAN CORRIDOR WITH A TRAFFIC CONTROL DEVICE

Designed By: B.P.	Drawn By: R.R.	Scale: N.T.S.
Checked By:	Date: 11-02-10	Drawing No.
Approved:	SDE-229AE	



- NOTES:**
 1. LOCATE END OF DEPRESSED CURB IN LINE WITH PROJECTED BACK OF SIDEWALK.
 2. CONSTRUCT FLARES IN ACCORDANCE WITH SDE-229A


 THE CITY OF WINNIPEG PUBLIC WORKS DEPARTMENT		
Reference Spec. No. CW 3235, CW 3310, CW 3325 E-SUPPLY & INSTALL DETECTABLE WARNING SURFACE TILES		
DIMENSIONS ARE IN MILLIMETRES		
DETECTABLE WARNING SURFACE TILE ORIENTATION FOR OFFSET INTERSECTIONS	Designed By: B.P.	Drawn By: T.G.A.
	Checked By: F.W.C.	Date: 11-02-10
	Approved:	
		Scale : N.T.S. Drawing No. SDE-229AF

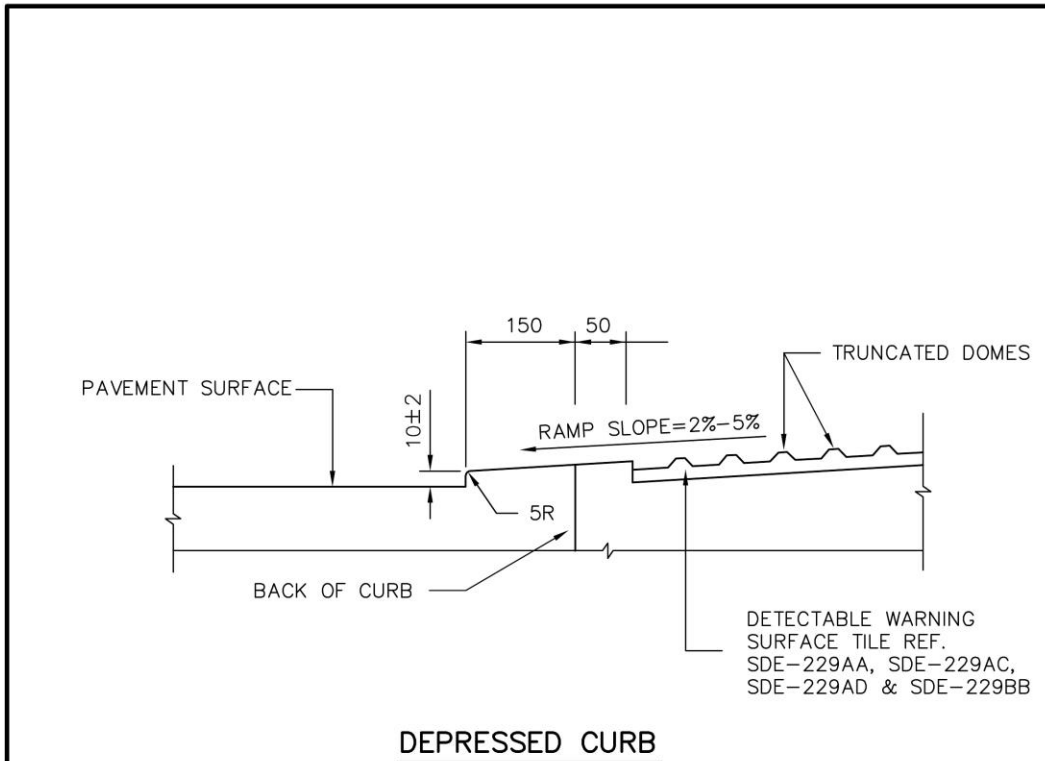


MEDIAN SIDEWALK CROSSING
 (REF. SD-229B)

NOTE:


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

 THE CITY OF WINNIPEG PUBLIC WORKS DEPARTMENT	DIMENSIONS ARE IN MILLIMETRES		
	Reference Spec. No. CW 3235, CW 3310, CW 3325 E-SUPPLY & INSTALL DETECTABLE WARNING SURFACE	Designed By: B.P.	Drawn By: T.G.A.
DETECTABLE WARNING SURFACE TILE IN CURB RAMPS FOR MEDIANS	Checked By: F.W.C.	Date: 11-02-10	Drawing No. SDE-229BB
	Approved:		



NOTES:

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

 THE CITY OF WINNIPEG PUBLIC WORKS DEPARTMENT	DIMENSIONS ARE IN MILLIMETRES		
	Reference Spec. No. CW 3235, CW 3310, CW 3325 E-SUPPLY & INSTALL DETECTABLE WARNING SURFACE	Designed By: B.P.	Drawn By: T.G.A.
CURB RAMP DEPRESSED CURB	Checked By: F.W.C.	Date: 11-02-10	Drawing No. SDE-229E
	Approved:		

E13. REMOVAL OF TREES

DESCRIPTION

E13.1 General

- E13.1.1 This specification covers the removal of existing trees necessary for the completion of the Works.

MATERIALS AND EQUIPMENT

- E13.2 Not Applicable.

CONSTRUCTION METHODS

E13.3 General

- E13.3.1 Contractor shall remove designated trees as shown on the drawings and as directed by the Contract Administrator on an "as required" basis in accordance with the requirements hereinafter specified.
- E13.3.2 The Contractor shall not complete a tree removal unless they receive authorization from the Contract Administrator.
- E13.3.3 The Contractor shall remove trees in a manner satisfactory to the Contract Administrator or designate and agrees that the Work may be inspected by City personnel.
- E13.3.4 The Contractor shall cut down designated trees and grub out the stumps and rootballs.
- E13.3.5 The Contractor shall remove and/or dispose of all material resulting from the Work immediately by removing to a landfill site, or by chipping and removing material to an appropriate location.
- E13.3.6 The Contractor shall repair any damage resulting from the Work to adjacent trees and shall report all damage immediately to the Contract Administrator.

MEASUREMENT AND PAYMENT

- E13.4 Removal of Trees will be measured on a unit basis and paid for at the Contract Unit Price per tree and associated stump/roots for "Removal of Trees". The number to be paid for will be the total number of trees and associated stump/roots removed and disposed of in accordance with this specification and accepted by the Contract Administrator.

E14. EARTHWORK

DESCRIPTION

E14.1 General

- E14.1.1 This specification covers the work related to:
- (a) Stripping of grass and topsoil,
 - (b) Excavation and Fill Placement
 - (c) Benching of the roadway, ditches, and boulevards for temporary and permanent roadworks,
 - (d) Roadway Excavation, and
 - (e) Removal of temporary roadways.
- E14.1.2 Referenced Standard Construction Specifications
- (a) CW 1130 – Site Requirements

- (b) CW 3110 – Sub-Grade, Sub-Base and Base Course Construction
- (c) CW 3170 – Earthwork and Grading

MATERIALS AND EQUIPMENT

E14.2 Materials

E14.2.1 Material supplied shall be as per CW 3170 Clause 5 and CW 3110 Clause 2 and 3.9.

E14.3 Equipment

E14.3.1 Equipment as per CW 3170 Clause 8.

CONSTRUCTION METHODS

E14.4 Further to CW 1130 Clause 3.15, the Contract Administrator will mark out earthwork cut and fill alignment and elevations.

E14.5 Stripping Grass and Topsoil

E14.5.1 Contractor to strip existing grass cover, topsoil, and organic soils in all areas where construction of roadway or temporary roadway is to be built, and within the limits identified by the Contract Administrator.

E14.5.2 Stripped material to be removed offsite and becomes the property of the Contractor.

E14.6 Excavation, Fill Placement, and Benching

E14.6.1 Refer to the Contract Drawings for typical cut/fill elevations along the roadway, temporary roads, ditches, and boulevards, and final grade elevations.

E14.6.2 The Contractor is to note the following is the estimated cut and fill volumes for the Work. This information is provided to assist bidders in estimation of level of effort for the work only. Note these volumes include the following: Existing topsoil, temporary and permanent roadway excavation, boulevard excavation, benching, final ditch grading including excavation and fills:

<u>Cut (m3)</u>	<u>Fill (m3)</u>
6700	1700

E14.6.3 Actual earth work volumes will not be measured by the Contract Administrator in the field during or after construction has taken place.

E14.6.4 Excavate in-situ material below the temporary and permanent roadways by benching. Excavation in the bottom of the ditches will be excavated to a depth of 300 mm below the existing ditch bottom elevation. Construct benches such that they are of sufficient width to support mechanical vibratory compactors.

E14.6.5 Compact the benches prior to placement of suitable site fill or crushed sub-base material.

E14.6.6 Compact benched area under temporary and permanent roadways to a minimum of 95% Standard Proctor Density

E14.6.7 Excavated material, deemed to be suitable site material may be used as fill within the project site. No additional measurement or payment will be made for the relocation of material being held for final grading and fill placement. No additional measurement or payment will be made if the Contractor elects to haul excavated material away and later haul material to the project site for filling purposes.

E14.6.8 All roadway excavation shall be completed as per this specification.

E14.7 Removal of Temporary Roads

- E14.7.1 At the conclusion of each stage the Contractor may be required to remove previously constructed temporary roads. The removal of these temporary roads will be to the design and grades as shown on the drawings to the approval of the Contract Administrator.

MEASUREMENT AND PAYMENT

E14.8 Earthwork

- E14.8.1 Stripping of grasses and topsoil, excavation and fill placement, benching, roadway excavation, and temporary roadway removal will not be measured and will be paid on a lump sum basis for "Earthwork". The amount to be paid for will be for the stripping of grasses and topsoil, excavation and fill placement, benching, temporary and permanent roadway excavation, and temporary roadway removal completed in accordance with this specification, accepted and measured by the Contract Administrator.

E15. HYDRO-EXCAVATION

DESCRIPTION

E15.1 General

- E15.1.1 This specification shall cover the removal of earthen material immediately adjacent to underground utilities infrastructure by means of high pressure water spray, and the recovery of evacuated material by vacuum type means or equivalent method as approved by the Contract Administrator.

EQUIPMENT

- E15.2 Hydro-Excavation unit shall be capable of maintaining a minimum working pressure of 10,000 psi, at a rate of flow of 10 to 12 gallons per minute. Unit should be adjustable, so as to provide adequate pressure to remove earthen material identified by the Contract Administrator.
- E15.3 Spray head shall be equipped with a rotating type nozzle, in order to provide a wider path of cut.

CONSTRUCTION METHODS

E15.4 Hydro-removal of earthen material

- E15.4.1 Earthen material adjacent to utility entity shall be sprayed with high pressure water so as to remove all such material identified by the Contract Administrator.

E15.5 Recovery of excavated material

- E15.5.1 The recovery of excavated material shall be done using vacuum type method, or other type method as approved by the Contract Administrator.
- E15.5.2 The recovery of material shall follow immediately behind the excavation, to avoid excavated areas from filling with excavated material.
- E15.5.3 The use of mechanical sweepers will not be allowed.
- E15.5.4 Dispose of material in accordance with Section 3.4 of CW 1130-R1.

MEASUREMENT AND PAYMENT

E15.6 Hydro-Excavation

- E15.6.1 Hydro-Excavation of earthen material will be measured on an hourly basis and paid for at the Contract Unit Price per hour for "Hydro-Excavation". The hours to be paid for will be the total number of hours of Hydro-Excavation in accordance with this specification, accepted and measured by the Contract Administrator.

E16. MODIFIED BARRIER CURB

DESCRIPTION

E16.1 General

E16.1.1 This specification covers the work related to the installation of Modified Barrier Curb in various formats:

- (a) Integral with pavement slab
- (b) Separate with stirrups
- (c) Integral Curb and Gutter

E16.1.2 Referenced Standard Construction Specifications

- (a) CW 3310 – Portland Cement Concrete Pavement Works

MATERIALS AND EQUIPMENT

E16.2 Materials

E16.2.1 Material supplied shall be as per CW 3310 Clause 5.

E16.3 Equipment

E16.3.1 Equipment as per CW 3310 Clause 8.

CONSTRUCTION METHODS

E16.4 In general, construct modified barrier curb of various formats as per CW 3310 Clause 9 and shaped as per SD-203B.

E16.5 Where underlying pavements are constructed using slip form pavers, the modified barrier curb shall be formed integral with the pavement slab.

E16.6 Where underlying pavements are hand formed, and integral modified barrier curb is specified, the Contractor shall use wood forms and templates to ensure the curb is shaped properly. Concrete for the curb shall be placed on the slab within 20 minutes of final floating of the slab to ensure adhesion of the integral curb.

E16.7 Separate modified barrier curb shall be constructed where specified using the SD-203B shape and reinforcement specified in SD-203A.

E16.8 Modified barrier curb and gutter (integral) shall be constructed where specified using the SD-203B shape for the curb, and the gutter width and reinforcement specified in SD-200. Unless directed by the Contract Administrator, the curb and gutter shall be slip formed.

MEASUREMENT AND PAYMENT

E16.9 Modified Barrier Curb

E16.9.1 Construction of modified barrier curb of various formats will be measured on a length basis and will be paid for at the Contract Unit Price per metre for the "Concrete Curbs, Curb and Gutter, and Splash Strips" items below, measured as specified herein, which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in the specification.

- (a) Concrete Curbs, Curb and Gutter, and Splash Strips:
 - (i) Construction of Modified Barrier (180 mm ht, Integral)
 - (ii) Construction of Modified Barrier (180 mm ht, Separate)
 - (iii) Construction of Curb and Gutter (180 mm ht, Modified Barrier, Integral, 600 mm width, 150 mm Plain Concrete Pavement, Slip Form Paving)

E17. ADJUSTMENT OF MANHOLES/CATCH BASINS

DESCRIPTION

E17.1 General

- E17.1.1 This specification shall supplement the specification for Adjustment of Catch Basins/Manholes Frames and Adjustment of Valve Boxes found in CW 3210. Due to construction staging, some items may have to be adjusted for grade more than once.

MATERIALS

- E17.2 As per CW 3210 Clause 2, and CW 2130 Clause 2.

CONSTRUCTION METHODS

- E17.3 As per CW 3210 Clause 3.2 and 3.5, and CW 2130 Clause 3.8.
- E17.4 Utilize concrete riser sections, bricks, or mortar to adjust manholes and catch basins such that the units are accessible and do not affect traffic in temporary or permanent pavements or sidewalks.

MEASUREMENT AND PAYMENT

- E17.5 Further to the standard items in CW 3210 and CW 2130, adjustments for valve boxes, manholes and catchbasins, including concrete risers, bricks, and adjustments of frames and covers will be measured and paid for based on the change between the existing conditions at before commencement to the final grade at the completion of the project.
- E17.6 No measurement or payment will be made for items used to adjust the height during interim stages of the project.

E18. DITCH INLET GRATE

DESCRIPTION

E18.1 General

- E18.1.1 This specification covers the supply and installation of ditch inlet grates, typically used in open swales or ditches as an alternative to City of Winnipeg Approved Product grated manhole cover AP-006.

MATERIALS AND EQUIPMENT

- E18.2 As per Contract Drawings.
- E18.3 All steel shall be supplied in accordance with details on the Contract Drawings. All steel shall be hot dip galvanized after fabrication and all hardware shall be stainless steel.
- E18.4 Cover to be Shopost Iron Works MK-A1 or approved equal in accordance with B5.

CONSTRUCTION METHODS

E18.5 General

- E18.5.1 Contractor to securely affix ditch inlet grates to manhole reducer or riser utilizing stainless steel hardware.
- E18.5.2 Any galvanized surfaces that are damaged shall be coated with a galvanizing compound approved by the Contract Administrator

MEASUREMENT AND PAYMENT

E18.6 Ditch Inlet Grates will be measured on a unit basis and paid for at the Contract Unit Price per cover as "Ditch Inlet Grate". The number to be paid for will be the total number of Ditch Inlet Grates installed in accordance with this specification and accepted by the Contract Administrator.

E19. CORRUGATED STEEL PIPE REMOVAL

E19.1 The removal of corrugated steel pipes of varying sizes and lengths shall be measured and paid for on a length basis and paid for at the Contract Unit Price per lineal metre for "Corrugated Steel Pipe - Removal". The length to be paid for will be the total number of metres of Corrugated Steel Pipe removed and disposed of off-site in accordance with this specification, accepted and measured by the Contract Administrator.

E20. SUPPLY AND INSTALL CULVERT END MARKERS

DESCRIPTION

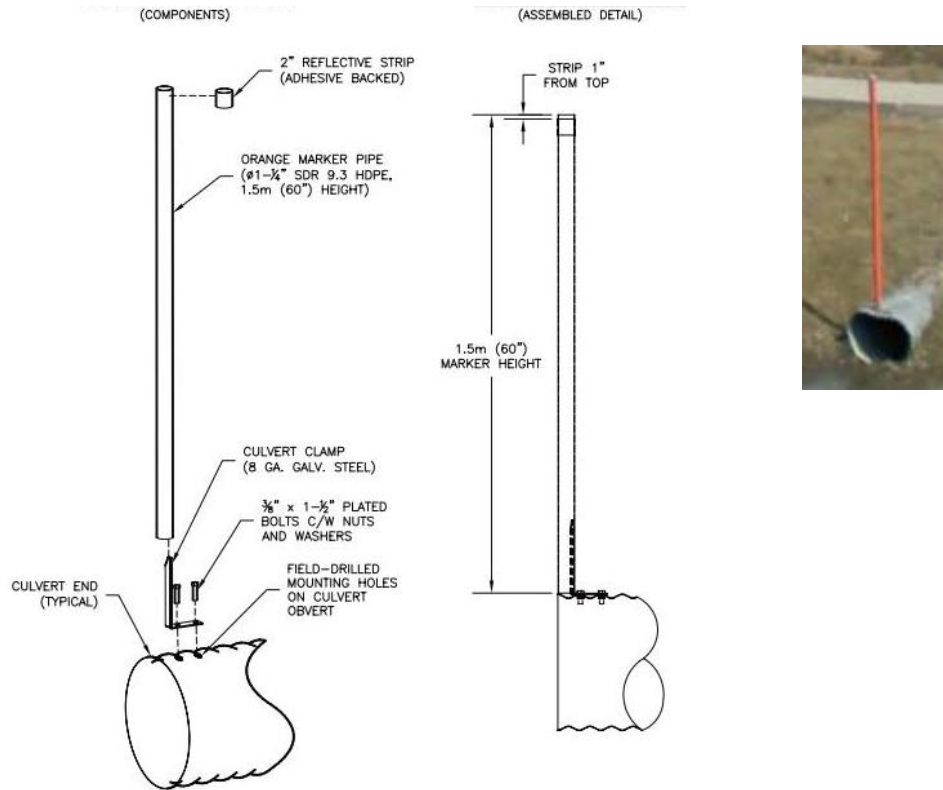
E20.1 General

E20.1.1 This specification covers the supply and installation of culvert end markers on each of the newly installed CSP culverts.

MATERIALS

E20.2 Culvert End Markers

E20.2.1 Supply and install units similar to that shown in the images below.



CONSTRUCTION METHODS

- E20.3 Culvert end markers are to be installed at each end of every new culvert within this project. Affix using industry standard hardware.

MEASUREMENT AND PAYMENT

- E20.4 Culvert End Markers shall be measured and paid for on a unit basis for the Contract Unit Price per "Culvert End Markers". The amount to be paid for will be the total number of Culvert End Markers supplied and installed in accordance with this Specification, accepted and measured by the Contract Administrator.

E21. HYDRO MULCHING

DESCRIPTION

- E21.1 General
- E21.1.1 The Contractor is to note that any locations specified for seeding are to include hydro mulch application as specified in CW 3520.

MATERIALS

- E21.2 As per CW 3520 Clause 5.6.

CONSTRUCTION METHODS

- E21.3 As per CW 3520 Clause 9.5 and 9.6.
- E21.4 Apply hydro mulch in all seeded areas.

MEASUREMENT AND PAYMENT

- E21.5 The supply, placement and maintenance of hydro mulch is incidental to "Seeding".

E22. PLANTING SOIL

DESCRIPTION

- E22.1 General
- E22.1.1 This specification shall amend and supplement City of Winnipeg Standard Construction Specification CW 3540-R5 "Topsoil and Finish Grading for Establishment of Turf Areas", and shall cover supply, preparation and placement of planting soil.
- E22.1.2 Referenced Standard Construction Specifications
- (a) CW 3540-R5 Topsoil and Finish Grading for Establishment of Turf Areas

MATERIALS

- E22.2 Peatmoss
- E22.2.1 Peat moss shall be decomposed plant material, fairly elastic and homogenous, free of colloidal residue, wood, sulphur and iron; containing a minimum of 60% organic material by weight, with moisture content not exceeding 15%. Shredded particles shall not exceed 6 mm in size. Minimum pH value of peat shall be 4.5; maximum 6.0.
- E22.3 Sand
- E22.3.1 Sand shall be hard, granular, sharp sand to CSA A82.56-M1976, well-washed and free of impurities, chemicals and organic matter.

E22.4 Bonemeal

E22.4.1 Bonemeal shall be raw, finely ground with a minimum chemical analysis of 3% nitrogen and 20% phosphoric acid.

E22.5 Wood Mulch

E22.5.1 Wood mulch shall be chipped ash, maple, poplar, birch and other deciduous trees. Mulch shall be chipped to sizes ranging from 50mm to 100mm. Mulch may NOT contain stringy twigs and seed. Mulch shall be free of non-organic material, wood preservatives or diseased wood. The mulch shall contain no more than 5% of the following materials in total: soil, sawdust, peatmoss, coniferous wood and needles.

E22.5.2 The Contractor shall supply a wood mulch sample to the Contract Administrator for approval prior to installation.

E22.6 Fertilizer

E22.6.1 Chemical fertilizers shall have N-P-K compositions as recommended by an agricultural soil-testing laboratory approved by the Contract Administrator provided for each of the following:

- (a) Horticultural shrubs and perennial grasses with planting soil mix;

E22.7 Chemical Application

E22.7.1 Roundup or similar chemical herbicides approved by Agriculture Canada shall be used only with the approval of the Contract Administrator.

CONSTRUCTION METHODS

E22.8 Planting Soil Mixture for Trees, Shrubs Perennials

E22.8.1 Planting soil mixture shall be a mix of 75% topsoil and 20% peatmoss, loose by volume. Incorporate 5% sand, or as required, to improve soil texture. Incorporate bonemeal at 3 kg/cubic metre of planting soil mixture.

E22.9 Construction of Planting Beds

E22.9.1 Excavate centre of roundabout and other planting beds to a depth of 450 mm, and sufficient width to allow 450 mm topsoil to the side of all rootballs.

E22.9.2 Install planting soil mixture, loosely compacted in planting beds with a smooth top surface to match surrounding contours. Level planting soil mixture by hand around existing and newly planted shrubs and perennials.

E22.9.3 Install 75 mm depth wood mulch in all beds following planting operations.

METHOD OF MEASUREMENT

E22.10 Excavation of Plant Beds

E22.10.1 The excavation of plant beds will be measured by volume in cubic metres, in accordance with the specifications and drawings and accepted by the Contract Administrator.

E22.11 Planting Soil Mixture

E22.11.1 Construction of planting beds, and supply and installation of planting soil mixture shall be measured on a volume basis in cubic metres, complete with planting soil mixture, all in accordance with the Drawings and this specification, and accepted by the Contract Administrator, as computed by the Contract Administrator.

E22.12 Wood Mulch

E22.12.1 Supply and installation of wood mulch shall be measured on a volume basis in cubic metres, as installed in planting beds in accordance with the Drawings and this

specification, and accepted by the Contract Administrator, as computed by the Contract Administrator.

BASIS OF PAYMENT

E22.13 Excavation of Plant Beds

E22.13.1 Excavation of planting beds and median and boulevards will be paid for under the unit price for "Plant Bed Excavation" for shrub beds and perennial beds. The price shall be considered full payment for all materials, equipment and labour necessary to do the work described herein, including disposal of all subsoil and debris from the excavated areas.

E22.14 Planting Soil Mixture

E22.14.1 Construction of planting beds and supply and installation of planting soil mixture will be paid for at the Contract Unit Price for "Planting Soil Mixture", which price shall be payment in full for supplying all materials and performing all operations herein specified, and all other items included in the work of this specification.

E22.15 Wood Mulch

E22.15.1 Supply and installation of wood mulch will be paid for at the Contract Unit Price for "Wood Mulch", which price shall be payment in full for supplying all materials and performing all operations herein specified, and all other items included in the work of this specification.

E23. TREES, SHRUBS AND PERENNIALS

DESCRIPTION

E23.1 General

E23.1.1 This specification covers the supply and installation of nursery-grown trees and shrubs plantings in areas indicated on the Drawings, including preparation, digging, transport and planting, and maintenance.

E23.2 Nomenclature

E23.2.1 Nomenclature of specified nursery stock shall conform to the International Code of Nomenclature for Cultivated Plants and shall be in accordance with the approved scientific names given in the latest edition of Standardized Plant Names. The names of varieties not named therein are generally in conformity with the names accepted in the nursery trade.

E23.3 Source Quality Control

E23.3.1 All nursery stock supplied shall be nursery grown and of species and sizes as indicated on the Drawings. Nursery stock shall be No. 1 Grade material in accordance with the "Canadian Standards for Nursery Stock" as set out by the Canadian Nursery Landscape Association (CNLA).

E23.3.2 The Contractor shall notify Contract Administrator of source of plant material at least seven (7) days in advance of shipment.

E23.3.3 Acceptance of plant material at source does not prevent rejection of same plant material on site prior to or after planting operations.

E23.3.4 Imported plant material must be accompanied with necessary permits and import licenses. Conform to federal and provincial regulations.

E23.4 Shipment and Pre-Planting Care

E23.4.1 Coordinate shipping of plants and excavation of holes to ensure minimum time lapse between digging and planting.

- E23.4.2 Tie branches of trees and shrubs securely and protect plant material against abrasion, exposure and extreme temperature change during transit. Avoid binding of planting stock with rope or wire, which would damage bark, break branches or destroy natural shape of plant. Give full support to root balls, during lifting.
- E23.4.3 Cover plant foliage with tarpaulin, and protect bare roots by means of dampened straw, peat, saw dust or other acceptable material to prevent loss of moisture during transit and storage.
- E23.4.4 Keep roots moist and protect from sun and wind. Heel-in trees and shrubs that cannot be planted immediately in shaded areas; water well.

E23.5 Replacement

- E23.5.1 During the first two (2) years following completion of planting operations, remove from site any plants that have died or failed to grow satisfactorily, as determined by the Contract Administrator. As an example, plant material installed in 2012 that has failed to grow satisfactorily and has not been replaced by October 31, 2013 would be required to be replaced in the Spring of 2014.

MATERIALS

E23.6 Water

- E23.6.1 Water shall be potable and free of minerals that may be detrimental to plant growth.

E23.7 Fertilizer

- E23.7.1 Fertilizer shall be slow release organic. Fertilizer shall contain N-P-K in ratio as recommended by soil test results from an approved agricultural soil testing laboratory.

E23.8 Root Ball Burlap

- E23.8.1 Root ball burlap shall be 150 g Hessian burlap.

E23.9 Anti-desiccant

- E23.9.1 Anti-desiccant shall be wax-like emulsion to provide film over plant surfaces reducing evaporation but permeable enough to permit transpiration.

E23.10 Wound Dressing

- E23.10.1 Wound dressing shall be horticultural accepted non-toxic, non-hardening emulsion.

E23.11 Plant Material

- E23.11.1 All plant material specified for this project shall be containerized nursery stock. All plants shall be from the Winnipeg area and the Oak-Aspen Forest Eco-region.
- E23.11.2 Comply with latest edition of the "Canadian Standards for Nursery Stock" Stock", produced by Canadian Nursery Landscape Association (CNLA), referring to quality, size and development of nursery-grown plant material and root balls.
- E23.11.3 Nursery stock shall be No. 1 grade shrubs, trees and perennials.
- E23.11.4 All plant material shall be measured when branches are in their natural position. Height and spread dimensions and container size shall conform to CNLA standards.
- E23.11.5 All plant material shall be measured when branches are in their natural position. Height and spread dimensions specified in the Plant List on the Drawings refer to the main body of the plant, and not from branch tip to root base or from branch tip to branch tip. Where trees are measured by calliper (cal.), reference is made to the diameter of the trunk measured at 300 mm above ground as the tree stands properly planted in the nursery.
- E23.11.6 Any plants designated as nursery stock but dug from native stands, wood lots, orchards, or neglected nurseries that have not received proper cultural maintenance, shall be

designated as "collected stock". Material sources are to be approved by Contract Administrator prior to ordering or collecting. The Contractor shall provide all of the necessary nursery certificates to ensure that the plant species comply with this specification.

- E23.11.7 All containerized whips and herbaceous plant material shall have a minimum of one full year's growth. Roots shall be healthy, reaching the sides of the containers, and developed such that the root ball can be kept intact during transplanting. Roots shall not encircle each other to the extent of inhibiting plant growth.
- E23.11.8 All trees shall have one, only, sturdy, reasonably straight and vertical trunk, and a well-balanced crown with fully developed leader, unless designated "multi-stem". All evergreens shall be symmetrically grown and branched from ground level, up
- E23.11.9 Use trees, shrubs and perennials with structurally sound, strong fibrous root systems, and free of disease, insects, defects or injuries, including rodent damage, sun scald, frost cracks, abrasions or scars to the bark. Plants must have been root pruned regularly, but not later than one growing season prior to arrival on site.
- E23.11.10 All parts of the plants shall be moist and show live, green cambium tissue when cut.
- E23.11.11 At least one (1) plant of each variety supplied shall bear a tag showing both the botanical and common name of the plant.
- E23.11.12 Additional Plant Material Qualifications:
- (a) Imported Plant Material
 - (i) Plant material obtained from areas with milder climatic conditions from those of site acceptable only when moved to site prior to the breaking of buds in their original location and heeled-in in a protected area or placed in cold storage until conditions suitable for planting. Obtain Contract Administrator's approval to use imported plant material.
 - (b) Cold Storage
 - (i) Approval required for plant material that has been held in cold storage.
 - (c) Container-Grown Stock
 - (i) Acceptable if containers large enough for root development. Trees and shrubs must have grown in container for minimum of one growing season but not longer than two. Root system must be able to hold soil when removed from container. Plants that have become root bound are not acceptable. Container stock must have been fertilized with slow releasing fertilizer.
 - (d) Balled and Burlapped Plant Material
 - (i) Deciduous trees in excess of 3 m height must have been dug with large firm ball. Root balls must include 75% of fibrous and feeder root system. This excludes use of native trees grown in light sandy or rocky soil. Secure root balls with burlap, heavy twine and rope. For large trees: wrap ball in double layer of burlap and drum lace with minimum 10 mm diameter rope. Protect root balls against sudden changes in temperature and exposure to heavy rainfall.
 - (e) Tree Spade Dug Material
 - (i) Obtain approval of the Contract Administrator for digging plant material with mechanized digging equipment, hydraulic spade or clam-shell type. Dig root balls to satisfy Landscape Canada (CNTA) standards. Lift root ball from hole, place in wire basket designed for purpose, line with burlap. Tie basket to ball with heavy rope. Take care not to injure trunk of tree with wire basket ties or rope.
 - (f) Substitutions
 - (i) Substitutions to plant material as indicated on the Plant List will not be permitted unless written approval has been obtained as to type, variety and

size prior to award of Contract. Plant substitutions must be of similar species and of equal size to those originally specified.

CONSTRUCTION METHODS

E23.12 Workmanship

- E23.12.1 The Contractor shall layout location of shrubs and planting beds as per the Drawings. Obtain Contract Administrator's approval prior to excavating.
- E23.12.2 The Contractor shall obtain clearances from all utilities, with respect to underground lines located in the areas to be excavated, prior to commencing planting operations.
- E23.12.3 The Contractor shall apply anti-desiccant in accordance with material manufacturer's instructions.
- E23.12.4 The Contractor shall coordinate planting operations; keep the site clean and planting holes drained, and immediately remove soil or debris spilled onto pavement.

E23.13 Planting Time

- E23.13.1 The Contractor shall plant deciduous plant material during dormant period before buds have broken. Plant material noted for spring planting only must be planted in dormant stage.
- E23.13.2 Plant material imported from region with warmer climatic conditions may only be planted in early spring.
- E23.13.3 When permission has been obtained to plant deciduous plant material after buds have broken, spray plants with anti-desiccant to slow down transpiration prior to transplanting.
- E23.13.4 When permission has been obtained, trees, shrubs and perennials growing in containers may be planted throughout growing season.
- E23.13.5 Plant only under conditions that are conducive to health and physical conditions of plants.
- E23.13.6 The Contractor shall provide the Contract Administrator with a planting schedule at least two weeks prior to planting operations. Extending planting operations over long period using limited crew will not be accepted.

E23.14 Excavations

- E23.14.1 Shrub beds: excavate to minimum depth of 450 mm, as indicated on the Drawings. Individual shrubs shall be planted in 600 mm deep holes backfilled with planting soil mixture.
- E23.14.2 Trees: excavate to depth such that the top of the root ball is even with existing grade, with a surface width of two times the diameter of the root ball. Backfill around trees with planting soil mixture.
- E23.14.3 The sides of all shrub beds shall be scarified to the depth of 150 mm.
- E23.14.4 Provide drainage for planting holes in heavy soil if natural drainage does not exist. Have method approved.
- E23.14.5 Protect the bottoms of excavations against freezing.
- E23.14.6 Remove water that enters excavations prior to planting. Ensure source of water is not ground water.

E23.15 Planting

- E23.15.1 Trees shall be placed on undisturbed soil and to a depth equal to that at which they were originally growing at the nursery.
- E23.15.2 For shrubs, loosen bottom of planting hole to depth of 150 to 200 mm. Cover bottom of each excavation with minimum of 150 mm of planting soil mixture.

- E23.15.3 Plant trees and shrubs vertically, with roots placed straight out in hole. Orient plant material to give best appearance in relation to structures, roads and walkways.
- E23.15.4 Place plant material to depth equal to depth they were originally growing in nursery or in locations collected.
- E23.15.5 Ball and burlap root balls: loosen burlap and cut away minimum top 1/3 without disturbing root ball. Do not pull burlap or rope from under root ball. With container stock, remove entire container without disturbing root ball. Non-biodegradable wrappings must be removed.
- E23.15.6 Tree spade excavated materials:
- (a) Tree spade planting shall be permitted only by approval of the Contract Administrator.
 - (b) Dig tree pit with same mechanical equipment as used to dig plant material. Ensure hole dug is upright as possible. Place in hole a mixture of 40 L of planting soil and fertilizer mixed with water to soupy consistency. This will be forced up sides of ball as root ball is placed in hole.
 - (c) Loosen bottom of planting hole to depth of 150 to 200 mm. Cover bottom of each excavation with minimum 150 mm topsoil mixture.
- E23.15.7 Tamp planting soil mixture around root system in layers of 150 mm eliminating air voids. Frozen or saturated planting soil is unacceptable. When 2/3 of planting soil has been placed, fill hole with water. After water has been completely penetrated into soil, complete backfilling.
- E23.15.8 Excavate 200 mm depth an additional 600 mm beyond planting pits around the perimeter of all tree planting pits, and fill with planting soil mixture.
- E23.15.9 Construct 100 mm deep saucers around the outer edge of planting pits to assist with maintenance watering.
- E23.15.10 When planting is completed apply slow release organic fertilizer at minimum rate of 12 kg/100 m for shrub beds or as recommended by the soil analysis. Mix fertilizer thoroughly with top layer of planting soil and water in well.
- E23.16 Pruning
- E23.16.1 Prune trees, shrubs and groundcover after planting, as indicated. Postpone pruning of those trees where heavy bleeding may occur, until in full leaf. Employ clean sharp tools and make cuts flush with main branch, smooth and sloping as to prevent accumulation of water. Remove projecting stumps on trunks or main branches. Remove dead and injured branches and branches that rub causing damage to bark. Trim trees and shrubs without changing their natural shape. Do not damage lead branches or remove smaller twigs along main branches.
- E23.17 Standards
- E23.17.1 All roots shall be cleanly cut; split roots are not acceptable.
- E23.17.2 Branches and trunks shall be tied and protected; broken or abraded branches or trunks are not acceptable.
- E23.17.3 Planting shall be protected from drying conditions; desiccated material not acceptable.
- E23.17.4 All plants shall be free of insects and disease: galls, blight and other manifestations of insect infestation or disease not acceptable.
- E23.18 Wood Mulch
- E23.18.1 All planting beds shall be covered with a 75 mm depth of wood chip mulch to the limits shown on the planting details.
- E23.18.2 Wood mulch shall extend to the limits of the beds shown on drawings, but shall not be installed within 50 mm of the plant stem.

E23.18.3 The saucers of all trees not planted in beds shall be covered with a 100 mm depth of wood chip mulch.

E23.19 Maintenance

E23.19.1 Watering

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

E23.19.2 Weeding

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

E23.19.3 Insects and Diseases

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

E23.19.4 Adjustments

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

E23.19.5 Maintenance Period

- (a) See E25.

MEASUREMENT AND PAYMENT

E23.20 Trees, Shrubs and Perennials

E23.20.1 Supply and installation of trees, shrubs and perennials will be measured on a unit price basis and will be paid for at the Contract Unit Price per unit for "Items of Work", measured as specified herein, which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in the specification.

- (a) Items of Work:
 - (i) Brandon Elm
 - (ii) Colorado Spruce
 - (iii) Pygmy Caragana
 - (iv) Arnold Red Honeysuckle
 - (v) Gold Coast Juniper
 - (vi) Blue Chip Juniper
 - (vii) Prince of Wales Juniper
 - (viii) Snowbird Potentilla
 - (ix) Russian Sage

E23.20.2 Supply and installation of fertilizer for plant material will be included in payment for the plant material. The supply of mulch for saucers around deciduous trees not is included in the unit price for those trees and no separate payment will be made.

E24. ROUND ROCK MULCH & GRANITE BOULDERS

GENERAL

E24.1 Scope of Work

E24.1.1 This Section outlines the requirements for the supply and installation of round rock mulch and boulders located in the center section of the roundabout.

MATERIALS

- E24.2 Round rock mulch shall be round rock that is clean and free from organic matter, in a mixture of sizes (diameters are nominal):
- (a) 50% - 25 mm - 35 mm diameter round stone
 - (b) 50% - 35 mm - 50 mm diameter round stone
- E24.3 Non-woven separation fabric shall be light, non-absorptive, non-woven material such as SuperPro20 or approved equal supply by Martek Corporation, intended for use as a weed barrier, allowing complete flow through of water.
- E24.4 Granite Boulders will an average diameter of 400 mm to 750 mm. The boulders shall be no smaller than 250 mm in any dimension and no larger than 1000 mm in any dimension. The boulders shall be comprised of granite, and free of major cracks.
- E24.5 Material samples shall be approved by the Contract Administrator prior to installation.

CONSTRUCTION METHODS

- E24.6 General
- E24.6.1 Do not perform work during inclement weather conditions or under adverse field conditions such as frozen ground or ground covered with snow, ice, or standing water.
- E24.6.2 Prevent damage to buildings, landscaping, curbs, sidewalks, trees, fences, roads and adjacent property.
- E24.7 Installation of Round Rock Mulch
- E24.7.1 Smooth out subgrade to extent practical for affected areas without existing geotextile or landscape fabric.
- E24.7.2 Place separation fabric loosely (to allow for placement of rock) over finished subgrade, after any debris is removed, to cover entire area as indicated, with 200 mm overlaps at sheet edges or onto existing fabric. Ensure settled fabric will extend to edges of area to receive stones, leaving a minimum of 200 mm beyond edges. Fold over and bury this 200 mm margin vertically in the soil at the edge. Ensure the subgrade below the stone will sheet drain out.
- E24.7.3 Place granite boulders first, then cover the fabric with rocks, placing larger, rocks and cobbles first, then following with stones and finer material to ensure coverage of the fabric with at least 75 mm of stones, making sure that no fabric is visible.
- E24.7.4 The stone should be laid in layers min 75 mm deep so that there are no voids and to provide complete coverage (no dirt showing).
- E24.7.5 Following completion of installation, the Contractor shall remove all surplus material and leave adjacent areas clean and free of debris.
- E24.7.6 Do not place boulders or rock mulch within 600 mm of the back of the curb against the truck apron. Install wood mulch in these areas.

MEASUREMENT AND PAYMENT

- E24.8 Supply and placement of Round Rock Mulch will be measured on a volume basis and paid for at the Contract Unit Price per cubic metre for "Round Rock Mulch". The volume shall be determined by the area installed multiplied by the specified depth installed, in accordance with this specification and approved by the Contract Administrator. No payment shall be made for installation beyond the specified limits.
- E24.9 Supply and placement of Limestone Granite Boulders will be measured on a unit basis and paid for at the Contract Unit Price per boulder for "Granite Boulders". The number to be paid for will

be the total number of boulders placed in accordance and approved by the Contract Administrator.

- E24.10 Supply and placement of the Non-Woven Separation Fabric will be measured on an area basis paid for at the Contract Unit Price per square metre for "Non-Woven Separation Fabric". The area shall be measured by the area of the round rock mulch installed over top of the fabric. No extra payment will be made for waste material or any necessary overlapping of material.

E25. LONG TERM SCHEDULED MAINTENANCE OF PLANT MATERIAL

DESCRIPTION

E25.1 General

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

MATERIALS

- E25.2 The Contractor shall provide all necessary materials and equipment including: additional topsoil, soil ameliorates, mulches, sod, seed, fertilizers and pesticides, and tractors, mowers, hand mowers, trimmers, fertilizer spreaders, pruning tools, water trucks, hoses, water metres and any other items necessary for the maintenance of the areas indicated in this specification.

CONSTRUCTION METHODS

E25.3 Commencement of Long Term Scheduled Maintenance

- E25.3.1 When the Contractor determines that all landscaping items including planting beds, planting of trees, shrubs, and perennials, placement of rock and wood mulch, and all other landscaping features described in E22, E23, and E24 are complete, the Contractor shall request a final inspection from the Contract Administrator.
- E25.3.2 When the Contract Administrator deems all landscaping items listed above are complete, the long term scheduled maintenance period shall commence.

E25.4 Provision of Maintenance Personnel

- E25.4.1 The Contractor shall provide all necessary personnel for the ongoing maintenance operations.

E25.5 Capability of Personnel

- E25.5.1 Maintenance personnel should have at least one year of experience in landscape maintenance and should be under the direction of a foreman, in all cases, with not less than five years of experience with similar maintenance operations.
- E25.5.2 The maintenance foreman shall be familiar with native plantings and plant identification techniques.

E25.6 Maintenance Period

- E25.6.1 Maintain trees, shrubs and planting beds for a period of two (2) years from the date of completion of the plant material in E25.3. Note: Completion shall not occur after October 30, or before May 15 of any year.

E25.7 Maintenance Schedule

- E25.7.1 Provide the Contract Administrator a Schedule of Proposed Maintenance Activities for the two-year scheduled maintenance period, based on the requirements outlined herein. The scheduled maintenance period shall not commence until the schedule has been reviewed by the Contract Administrator.

E25.8 Recording Maintenance Operations

E25.8.1 The Contractor shall provide a detailed maintenance log, including but not limited to the following: hours of labour undertaken, number of personnel employed and equipment used. The log will itemize watering, spraying and any other maintenance work. Contractor shall submit logs monthly at regularly scheduled meetings with the Contract Administrator. Maintenance log will be included in payment for the maintenance work

E25.9 Traffic

E25.9.1 Do not conduct maintenance operations during peak traffic periods (Monday to Friday from 07:00 to 09:00 and from 15:30 to 17:30).

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

E25.10.1 Maintain shrubs, grasses and planting beds as indicated in E23.19.

E25.10.2 Watering Trees, Shrubs and Perennials

- (a) Newly planted trees, perennials, and shrubs require water to become established; however, watering too often can kill a plant. During the summer, if temperatures are fairly high and there has been no rainfall, water approximately once a week.
- (b) Contractor shall determine the need for watering by taking soil tests weekly with a one-inch auger. Take a test sample from the planting soil by drilling to a minimum depth of 600 mm. The soil shall contain enough moisture to hold together when compressed in the hand, but shall not be muddy.
- (c) Testing shall be undertaken at a minimum of 10 sites per week at a minimum of 10m between sites. The installed plant material and bioengineering shall not be allowed to dry out to the detriment of the viability of the plant material. Contractor shall monitor and submit lots to the Contract Administrator monthly. Contractor shall water-in plant material works in late fall during the scheduled maintenance period.
- (d) Thoroughly soak coniferous trees prior to winter freeze-up.

E25.10.3 Pruning Trees and Deciduous Shrubs

- (a) Prune in accordance with E23.16 by thinning out unnecessary limbs or portions of limbs and by cutting back the terminal growth. Cut with pruning shears. When cutting the terminal growth, make the cuts one-quarter inch above the bud or lead twig. Where an entire limb is removed, make the cuts flush with the main stem or trunk.

E25.10.4 Cultivation

- (a) Cultivate only as required to reconstruct planting beds, or tree saucers to remove significant weed growth.
- (b) Do not cultivate around plants with a shovel or spade. The tendency is to penetrate too deeply and cause root injury. Cultivate with a hoe or similar tool. When using a hoe never penetrate soil more than 50 mm. Maintain natural elevation of the surrounding area when cultivating. Create a gentle saucer to contain water around the tree root zone.
- (c) Avoid pyramiding soil around the base of any plant as this causes water to drain away and will encourage undesirable top root growth.
- (d) The boundary between the adjacent sod and soil saucer should be crisp and well formed.
- (e) Restore wood mulch when cultivation completed.

E25.10.5 Spraying

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

E25.10.6 Straightening

- (a) Straighten trees as required or as directed by the Contract Administrator
- E25.10.7 Mulching Chip
 - (a) Add wood mulch to planting areas as required to maintain an even fresh surface.
- E25.10.8 Weeding
 - (a) Hand weed and lightly rake a minimum of once per month, or as determined by the Contract Administrator, to remove competition for installed plant material/undesirable plant material. Dispose of undesirable material off-site.
 - (b) The Contractor shall be responsible for any fines or weed control notices issued for the planting areas. All such notices shall be dealt with by the Contractor in a timely fashion. Copies of any fines and notices shall be provided to the Contract Administrator within five (5) working days of receipt by the Contractor.
- E25.10.9 General Cleanup
 - (a) Remove garbage and debris from planting beds as required or as directed by the Contract Administrator

METHOD OF MEASUREMENT

- E25.11 General Maintenance of Trees, Shrubs, Perennials and Planting Beds
 - E25.11.1 Two year general maintenance of trees and shrubs, and planting beds including fertilizing, pruning, spraying for insects, disease control, cultivation, care of guy wires and turnbuckles, straightening, mulching, watering, weeding and cleanup will be measured once annually for the two (2) year period.
 - E25.11.2 All measured work will be in accordance with the Drawings and this specification and accepted by the Contract Administrator, as computed by the Contract Administrator.

BASIS OF PAYMENT

- E25.12 General Maintenance of Trees, Shrubs, Perennials and Planting Beds
 - E25.12.1 General maintenance will be paid for at the Contract Unit Price per year for "Long Term Scheduled Maintenance of Plant Material", which price shall be payment in full for supplying all labour, equipment and materials and performing all operations herein described, and all other items included in the Work of this specification.

E26. PLANT MATERIAL WARRANTY

DESCRIPTION

- E26.1 General
 - E26.1.1 This specification covers the provision of warranty for all plant material itemized on the Plant List, for the two-year maintenance period and for the individual areas identified within the overall Contract Area.
- E26.2 Timing
 - E26.2.1 Warranty shall be for two (2) years, commencing upon acceptance of installed plant material as described in E25.3.
- E26.3 Warranty
 - E26.3.1 The Contractor hereby warrants that the plant material as itemized on the Plant Lists and on the Drawings will remain free of defects for the maintenance period indicated for each area of the Contract.

E26.4 End-of-Warranty Inspection

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

E26.5 Replacement

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

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

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

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

E26.5.5 Trees determined by the Contract Administrator to have been damaged by vandalism or streets maintenance operations (snow plows) shall be replaced and such replacement trees will be paid for at the Contract Unit Prices for the species indicated on the Drawings.

MEASUREMENT AND PAYMENT

E26.6 Warranty

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

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

E27. WOOD FENCE

DESCRIPTION

E27.1 This specification shall cover:

- (a) The supply and installation of timber post and rail parking fence at 1395 Molson Street as shown on the drawings and as specified herein including compacted granular foundation around the posts.
- (b) The removal of the existing timber post and rail parking fence at 1395 Molson Street.
- (c) The removal, salvage, and reinstallation of the wood fence on the east side of the rear property of 1174 McLeod Avenue. The fence is currently on public right of way and must be relocated to private property.
- (d) The supply and installation of a 1.22 m (4') and 1.83 m (6') wood fence at 1395 Molson Street as shown on the drawings and as specified herein including compacted granular foundation around the posts.

MATERIALS

E27.2 Lumber identification by a grade stamp of an agent certified by the Canadian Lumber Accreditation Board.

E27.3 Pressure treated wood is to be guaranteed for 10 years against rot, decay, insect attack, splitting, warping, or breaking. Fences are to be guaranteed against defects in materials and workmanship for a period of 12 months from the date of Substantial Performance of the Contract. The Contractor is not responsible for acceptable wear through usage or acts of vandalism.

- E27.4 All wood for fences shall be no. 2 or better wolmanized pressure treated pine, spruce or fir; no wane, bark, checking, or splitting permitted.
- E27.4.1 Timper post and rail parking fence to be green pressure treated. 1.22 m wood fence for 1395 Molson Street to be brown pressure treated.
- E27.5 Hardware: all hardware is as follows:
- (a) Nails, spikes, and screws: hot dipped galvanized, size indicated on drawings, or specified.
 - (b) Bolts: galvanized; 12 mm in diameter unless otherwise specified, complete with nuts and washers.
 - (c) Galvanizing: to CSA G164-M1981;
 - (d) Joist hangers: min. 1.0 mm thick sheet steel galvanized coating.
 - (e) Fasteners indicated on drawing or specified by the Owner (no substitutes).
- E27.6 Wood preservative: Surface applied wood preservative; coloured, or copper naphthenate or 5% pentachlorophenol solution, water repellent preservative.
- E27.7 Granular material: crushed limestone, 10 mm diameter containing down size material with degree of fines.

CONSTRUCTION METHODS

- E27.8 Timber Post and Rail Parking Fence Installation and 1395 Molson Street 1.22 m (4') and 1.83 m (6') Fence Installation
- E27.8.1 All workmanship and all materials furnished and supplied under this specification are subject to close and systematic inspection and testing by the Contract Administrator including all operations from the selection and production of materials through to final acceptance of the specified Work. The Contractor shall be wholly responsible for the control of all operations incidental thereto notwithstanding any inspection or approval that may have been previously given. The Contract Administrator reserves the right to reject any materials or Works which are not in accordance with the requirements of this Specification.
- E27.8.2 The Contractor shall, at his own expense, correct such Work or replace such materials found to be defective under this Specification in an approved manner to the satisfaction of the Contract Administrator.
- E27.8.3 The Contract Administrator shall be afforded full access for the inspection and control testing of materials, both at the Site and at any plant or borrow pit used for the supply of the materials to determine whether the material is being supplied in accordance with this Specification.
- E27.8.4 All lumber shall be neatly cut for a proper fit. All cuts shall be treated with preservation before being secured.
- E27.8.5 Fences to be constructed to the lines, grades, and specifications as shown in the drawings or as specified herein. Establish final grades and elevations for fences after regrading of Site. In the event that asphalt paving is to be carried on in the location of the fencing, the paving shall precede the fence construction.
- E27.8.6 The Contractor shall stake out the post locations as located on the Drawings. Prior to drilling holes, all underground services shall be protected. Fence support posts shall be set true in line and elevation.
- E27.8.7 Factory treated end of post shall always be placed down in excavated hole prior to backfilling, under no circumstance shall a cut end of a post be placed down into an excavated hole. Treat all cuts or cut tops with preservative prior to any other lumber being secured to the post. Install posts plumb and level to the lines and grades required by the Work. Nail outside rails to posts. Secure all pickets to the rails. After all pickets are installed, install inside rails between posts and finish by installing cap over fence top.

- E27.8.8 Backfill hole excavations with crushed limestone, compacting the material by tamping with a blunt pole or rod. Material shall be compacted in layers not exceeding 150 mm. Top of fill to be overfilled so that the fill has convex appearance, sloping away from the post.
- E27.8.9 All wood shall be even and neat and shall provide a solid finished product suitable for the purposes intended.
- E27.8.10 Install spanning members with crown edge up.
- E27.8.11 Treat all cut, trimmed, or drilled with liberal application of preservative before installation. Apply preservative by dipping or by brushing to completely saturate and maintain wet film on surface for minimum 3 minute soak.
- E27.9 Wood Fence Removal
- E27.9.1 Remove all objects designated by the Contract Administrator for removal, including any concrete bases visible or not. Fill and re-grade any holes created from the removal of the concrete bases using an acceptable fill as approved by the Contract Administrator.
- E27.9.2 All debris is to be removed from the Site and disposed of or salvaged by the Contractor.
- E27.10 Removal, Salvage and Reinstallation of 1174 McLeod Ave Fence
- E27.10.1 Remove all objects designated by the Contract Administrator for removal, including any concrete bases visible or not. Fill and re-grade any holes created from the removal of the concrete bases using an acceptable fill as approved by the Contract Administrator.
- E27.10.2 The installation of the rear backyard fence shall be as per E27.8, the drawings, and as directed by the Contract Administrator. All material shall be salvaged if possible. Any material not able to be salvaged, shall be replaced by the same type of new material.
- E27.10.3 Modify to fit, and reinstall existing wood gate, including latch and hinges.
- E27.10.4 All remaining debris is to be removed from the Site and disposed of or salvaged by the Contractor.

MEASUREMENT AND PAYMENT

- E27.11 The supply and installation of timber post and rail parking fence will be measured on a length basis and paid for at the Contract Unit Price per lineal meter for "Timber Parking Fence (1395 Molson Street)". The length to be paid for will be the total lineal meters of timber parking fence supplied and installed in accordance with this specification, accepted and measured by the Contract Administrator.
- E27.12 The removal of the existing wood parking fence at 1395 Molson Street will be measured on a length basis and paid for at the Contract Unit Price per lineal meter for "Removal of Timber Parking Fence (1395 Molson Street)". The length to be paid for will be the total lineal meters of wood parking fence removed in accordance with this specification, accepted and measured by the Contract Administrator.
- E27.13 The removal, salvaging, and reinstallation of the backyard wood fence at 1174 McLeod Avenue will be measured on a unit price basis and paid for at the Contract Unit Price per "Wood Fence Relocation (1174 McLeod Avenue)". The amount to be paid for shall be for the removed, salvaged, and reinstalled backyard fence in accordance with this specification, accepted and measured by the Contract Administrator. Any requirement for additional material, to replace material that could not be salvaged, will be incidental to the payment for this work.
- E27.14 The supply and installation of the 1395 Molson Street 4' wood fence will be measured on a length basis and paid for at the Contract Unit Price per lineal meter for "1.22 m (4') Wood Fence (1395 Molson Street)". The length to be paid for will be the total lineal meters of 1.22 m high (4') wood fence supplied and installed in accordance with this specification, accepted and measured by the Contract Administrator.

E27.15 The supply and installation of the 1395 Molson Street 6' wood fence will be measured on a length basis and paid for at the Contract Unit Price per lineal meter for "1.83 m (6') Wood Fence (1395 Molson Street)". The length to be paid for will be the total lineal meters of 1.83 m high (6') wood fence supplied and installed in accordance with this specification, accepted and measured by the Contract Administrator.

E28. 1395 MOLSON STREET SPRINKLER SYSTEM

DESCRIPTION

E28.1 General

E28.1.1 This specification shall cover the salvaging and reinstallation of existing sprinkler system components, along with new underground irrigation lines to accommodate the changes to the landscaped portions of 1395 Molson Street (Baron Estates) affected by the relocation of the parking lot.

- (a) Referenced Standard Construction Specifications
 - (i) CW 3530-R3 – Manual Irrigation System

MATERIALS AND EQUIPMENT

E28.2 Observed onsite materials to be salvaged are as follows:

- (a) Sprinkler Heads: Rain Bird 5000
- (b) Irrigation Control Valves: Rain Bird 100 DU in Carson Industries Enclosure

E28.3 The approximate location of sprinkler system components is shown in Appendix C. It is expected that two control zones of the system will be affected by construction and must be modified.

E28.4 New materials required as per CW 3530 Section 5.

CONSTRUCTION METHODS

E28.5 Salvaging of existing components

- E28.5.1 Arrange through the Contract Administrator to meet with the building maintenance manager to review the system connection at the NW corner of the building.
 - E28.5.2 Notify the Contract Administrator at least two (2) days in advance of commencing any work.
 - E28.5.3 Salvage and store affected sprinkler heads and control valves.
 - E28.5.4 Cap live ends of existing pipe such that the remainder of the sprinkler system zones can be utilized during construction.
- E28.6 Restoration of sprinkler system
- E28.6.1 Modify, extend, or remove existing irrigation pipe to adequately cover the revised landscaped portions of the property with sprinkler heads.
 - E28.6.2 In general, utilize surplus sprinkler heads from the zone south of the new parking lot to provide additional cover in the zone north of the parking lot where the landscaped area has grown.
 - E28.6.3 Position sprinkler heads adequately to cover the revised landscaped portions of the property.
 - E28.6.4 Other construction methods such as pipe and component installation and backfill as per CW 3530 Section 9.

- E28.6.5 Notify the Contract Administrator at least two (2) days in advance of testing the system after installation is complete. Test the two affected zones to ensure adequate coverage and adjustment of the sprinklers, as well as to check for excessive leakage. The Contractor is not responsible to test or make ready other sprinkler zones on the property.

MEASUREMENT AND PAYMENT

E28.7 1395 Molson Street Sprinkler System

- E28.7.1 The sprinkler system work will not be measured and will be paid for at the Contract Lump Sum Price for "1395 Molson Street Sprinkler System". The amount to be paid for will be for the work done in accordance with this specification, and accepted by the Contract Administrator.

E29. PARKING LOT LIGHT STANDARD CONCRETE PILE FOUNDATION

DESCRIPTION

- E29.1 The Work covered under this Item shall include all concreting operations related to construction of a cast-in-place concrete pile foundation for 1395 Molson Street parking lot in accordance with this Specification and as shown on the Drawings.
- E29.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of all Works as hereinafter specified.

MATERIALS

E29.3 General

- E29.3.1 The Contractor shall be responsible for the supply, safe storage, and handling of all materials set forth in this Specification.

E29.4 Handling and Storage of Materials

- E29.4.1 All materials shall be handled and stored in a careful and workmanlike manner, to the satisfaction of the Contract Administrator. Storage of materials shall be in accordance with CSA Standard A23.1-04.

E29.5 Testing and Approval

- E29.5.1 All materials supplied under this Specification shall be subject to inspection and testing by the Contract Administrator or by the Testing Laboratory designated by the Contract Administrator. There shall be no charge to the City for any materials taken by the Contract Administrator for testing purposes.
- E29.5.2 All materials shall be approved by the Contract Administrator at least seven (7) days before any construction is undertaken. If, in the opinion of the Contract Administrator, such materials in whole or in part, do not conform to the Specifications detailed herein or are found to be defective in manufacture or have become damaged in transit, storage, or handling operations, then such materials shall be rejected by the Contract Administrator and replaced by the Contractor at his own expense.

E29.6 Cement

- E29.6.1 See drawings.

E29.7 Concrete

E29.7.1 General

- (a) Concrete repair material shall be compatible with the concrete substrate.

- E29.7.2 The Contractor shall be responsible for the design and performance of all concrete mixes supplied under this specification. Either ready mix concrete or proprietary repair mortars, where applicable, may be used having the properties listed on the drawings in accordance with CSA A23.1-04:
- E29.7.3 Mix design for ready mix concrete shall be submitted to Contract Administrator at least two weeks prior to concrete placing operations.
- E29.7.4 The workability of each concrete mix shall be consistent with the Contractor's placement operations. Self compacting concrete may be used for pile foundations.
- E29.7.5 Any proposed proprietary repair mortar shall be subject to the approval of the Contract Administrator and must meet or exceed the properties of the ready mix concrete.
- E29.7.6 The temperature of all types of concrete shall be between 15°C and 25°C at discharge. Temperature requirements for concrete containing silica fume shall be between 10°C and 18°C at discharge unless otherwise approved by the Contract Administrator.
- E29.7.7 Concrete materials susceptible to frost damage shall be protected from freezing.
- E29.8 Aggregate
- E29.8.1 The Contractor shall be responsible for testing the fine and coarse aggregates to establish conformance to these specifications, and the results of these tests shall be provided to the Contract Administrator if requested. All aggregates shall comply with CSA A23.1.
- E29.8.2 Coarse Aggregate
- (a) The maximum nominal size of coarse aggregate shall be sized to suit the Contractor's mix design. Gradation shall be in accordance with CSA A23.1, Table 11, Group 1. The coarse aggregate shall satisfy the Standard Requirements specified in CSA A23.1, Table 12, "Concrete Exposed to Freezing and Thawing".
 - (b) Coarse aggregate shall consist of crushed stone or gravel or a combination thereof, having hard, strong, durable particles free from elongation, dust, shale, earth, vegetable matter or other injurious substances. Coarse aggregate shall be clean and free from alkali, organic or other deleterious matter; and shall have an absorption not exceeding 2.25%.
 - (c) The aggregate retained on the 5 mm sieve shall consist of clean, hard, tough, durable, angular particles with a rough surface texture, and shall be free from organic material, adherent coatings of clay, clay balls, and excess of thin particles or any other extraneous material.
 - (d) Coarse aggregate when tested for abrasion in accordance with ASTM C131 shall not have a loss greater than 30%.
 - (e) Tests of the coarse aggregate shall not exceed the limits for standard for requirements prescribed in CSA A23.1, Table 12, for concrete exposed to freezing and thawing.
- E29.8.3 Fine Aggregate
- (a) Fine aggregate shall meet the grading requirements of CSA A23.1, Table 10, Gradation FA1.
 - (b) Fine aggregate shall consist of sand, stone, screenings, other inert materials with similar characteristics or a combination thereof, having clean, hard, strong, durable, uncoated grains free from injurious amounts of dust, lumps, shale, alkali, organic matter, loam, or other deleterious substances.
 - (c) Tests of the fine aggregate shall not exceed the limits for standard requirements prescribed in CSA A23.1, Table 12.
- E29.9 Cementing Materials
- E29.9.1 Cementing materials shall conform to the requirements of CSA A3001.

- E29.9.2 Silica Fume
- (a) Should the Contractor choose to include silica fume in the concrete mix design, it shall not exceed 8% by mass of cement.
- E29.9.3 Fly Ash
- (a) Fly ash shall be Type C1 or Type F and shall not exceed 25% by mass of cement.
- E29.9.4 Cementitious materials shall be stored in a suitable weather-tight building that shall protect these materials from dampness and other destructive agents. Cementitious materials that have been stored for a length of time resulting in the hardening or formation of lumps shall not be used in the Work.
- E29.10 Admixtures
- E29.10.1 Air entraining admixtures shall conform to the requirements of ASTM C260.
- E29.10.2 Chemical admixtures shall conform to the requirements of ASTM C494 or C1017 for flowing concrete.
- E29.10.3 All admixtures shall be compatible with all other constituents. The addition of calcium chloride, accelerators, and air-reducing agents will not be permitted, unless otherwise approved by the Contract Administrator.
- E29.10.4 Appropriate low range water reducing and/or superplasticizing admixtures shall be used in concrete containing silica fume. Approved retarders or set controlling admixtures may be used for concrete containing silica fume.
- E29.10.5 An aminocarboxylate based migrating corrosion inhibitor admixture shall be used in concrete that will be used as a repair material that will either be in contact with or adjacent to reinforcing steel in existing concrete. Proposed admixtures shall be subject to the approval of the Contract Administrator.
- E29.11 Water
- E29.11.1 Water used for mixing concrete shall be clean and free from injurious amounts of oil, acid, alkali, organic matter, or other deleterious substances. It shall be equal to potable water in physical and chemical properties.
- E29.12 Concrete Supply
- E29.12.1 Concrete shall be proportioned, mixed, and delivered in accordance with the requirements of CSA A23.1, except that the transporting of ready mixed concrete in non-agitating equipment will not be permitted unless prior written approval is received from the Contract Administrator.
- E29.12.2 Unless otherwise directed by the Contract Administrator, the discharge of ready mixed concrete shall be completed within 120 minutes after the introduction of the mixing water to the cementing materials and aggregates.
- E29.12.3 The Contractor shall maintain all equipment used for handling and transporting the concrete in a clean condition and proper working order.
- E29.13 Reinforcing Steel
- E29.13.1 Reinforcing steel shall be deemed to include all reinforcing bars, tie-bars, and dowels.
- E29.13.2 All reinforcing steel shall conform to the requirements of CSA Standard G30.18, Grade 400 W, Billet-Steel Bars for Concrete Reinforcement. All reinforcing steel shall be new deformed billet steel bars. All bars, including ties, shall be hot-dip galvanized in accordance with CSA Standard G164 for a minimum net retention of 600 g/m². Reinforcing steel supply and installation will be incidental to construction of concrete pile foundation and no separate payment will be made.
- E29.14 Anchor Bolts, Nuts, and Washers

E29.14.1 Anchor bolts, nuts, and washers shall be in accordance with CSA Standard G40.21 Grade 300W, and shall be hot-dip galvanized full length in accordance with CSA G164 for a minimum net retention of 600 g/m², for the entire length of the anchor bolts. The threaded portion of the anchor bolts shall be 300 mm long. Anchor bolt supply and installation will be incidental to construction of concrete pile foundation and no separate payment will be made.

E29.15 Anchor Bolt Templates

E29.15.1 Anchor bolt templates shall be CSA G40.21 Grade 300W, minimum 10 mm thick, and will be incidental to construction of new concrete pile foundation and no separate payment will be made.

E29.15.2 The Contractor is to verify the dimensions of the existing base plate before constructing the anchor bolt template.

E29.16 Miscellaneous Materials

E29.16.1 Miscellaneous materials shall be of the type specified on the Drawings or approved by the Contract Administrator.

CONSTRUCTION METHODS

E29.17 Removal and Reinstallation of Existing Light Standard and Pile

E29.17.1 Disconnect existing electrical supply as per E33.

E29.17.2 Remove and store existing light standard. The light standard shall be lifted and secured with nylon ropes or other approved methods. Use of steel chains and steel hooks against the surface will not be permitted. The structure components (shaft and arm etc.) shall be placed on timber blocking and secured with nylon ropes during storage.

E29.17.3 Discard existing bolts, washers, or other hardware.

E29.17.4 Remove existing concrete pile, or demolish to at least 600 mm below proposed parking lot grade. Backfill with suitable granular material.

E29.17.5 When ready for reinstallation, the light standard shall be lifted and secured with methods specified in E29.17.2.

E29.17.6 The Contractor shall ensure that the anchoring nuts of the anchor bolts are tightened according to the "turn-of-nut" method of the AASHTO Code

E29.17.7 Reconnect electrical supply as per E33.

E29.18 Location and Alignment of Piles

E29.18.1 Pile construction shall not commence until the Contractor has obtained clearance from the appropriate Utility Authorities.

E29.18.2 Pile shall be placed in the position shown on the Drawings and as directed by the Contract Administrator in the field.

E29.18.3 The deviation of the axis of any finished pile shall not differ by more than 1 percent from the vertical.

E29.19 Buried Utilities

E29.19.1 The Contractor shall exercise extreme caution when constructing the pile foundations in the vicinity of existing buried utilities and buildings. The Drawings show the approximate locations of existing buried utilities. The Contractor shall be responsible for obtaining the exact location of the buried utilities from the appropriate Utility Authorities prior to installing the piles.

E29.19.2 The proposed locations of the pile foundations may be changed by the Contract Administrator if they interfere with the buried utilities.

E29.19.3 The Contractor shall be responsible for all costs that may be incurred for repair/rectification of any damage caused to the existing buried utilities as a result of the Contractor's operations in constructing cast-in-place concrete piles, as determined by the Contract Administrator.

E29.20 Excavation

E29.20.1 The Contractor is responsible for determining the excavation method at the pile location. Either drilled/cored or hydro excavation is acceptable.

E29.20.2 Excavations for piles shall be made with equipment designed to remove a core of the diameter shown on the Drawings, or hydro-jet excavation to a depth to bypass and/or expose adjacent utilities.

E29.20.3 It may be necessary to hydro-jet excavate utilities adjacent to a pile location to adequately ascertain the location or provide enough "slack" in conduits to move them slightly to avoid interference with the pile location. The Contract Administrator may elect to alter the location of a pile if hydro-jet excavation shows that utilities cannot be avoided. If the pile location must be altered, no measurement or payment will be made for the abandonment of the pile due to utility interference.

E29.20.4 Upon reaching the required elevation, the bottom of the excavation shall be cleaned as directed by the Contract Administrator in the field.

E29.20.5 All excavated material from the piles shall be promptly hauled away from the Site to an approved disposal area as located by the Contractor.

E29.20.6 Upon completion of the cleaning out of the bottom to the satisfaction of the Contract Administrator, the reinforcement and anchor bolts shall be set in place and the concrete poured immediately. Under no circumstances shall the hole be left to stand open after boring has been completed.

E29.20.7 If the hole is condemned because of caving, it shall be filled with lean-mix concrete and a new hole bored as near as possible to the location shown on the Drawings. In locations where underground utilities have been exposed, the underground utilities shall be covered with clean sand to 300 mm above the utility. Payment will not be made for condemned piles.

E29.21 Sleeving

E29.21.1 Timber or steel sleeving shall be used to temporarily line the bore to prevent bulging or caving of the walls and to protect men at work in the bore.

E29.21.2 The sleeving shall be designed by the Contractor and constructed to resist all forces that may tend to distort it.

E29.21.3 The sleeving shall be withdrawn as the concrete is placed in the bore. The sleeving shall extend at least 1 m below the top of the freshly deposited concrete at all times.

E29.21.4 The clearance between the face of the bore hole and the sleeving shall not exceed 75 mm.

E29.22 Inspection of Bores

E29.22.1 Concrete shall not be placed in the bore until it has been inspected and approved by the Contract Administrator.

E29.22.2 The Contractor shall have available suitable light for the inspection of the bore throughout its entire length.

E29.22.3 All improperly set sleeving, bore, or bottom shall be corrected to the satisfaction of the Contract Administrator.

E29.23 Placing Reinforcing Steel

E29.23.1 Reinforcement shall be:

- (a) placed in accordance with the details shown on the Drawings
- (b) rigidly fastened together, and
- (c) lowered into the bore intact before concrete is placed.

E29.23.2 Spacers shall be utilized to properly locate the reinforcing steel cage in the bore.

E29.24 Placing Anchor Bolts

E29.24.1 The anchor bolts shall be aligned with a steel template matching the bolt holes in the existing light standard base plate. The setting template shall be held in place by the top and bottom nuts of the anchor bolts. Extreme care shall be used in this operation. Placement of anchor bolts without the steel template will not be permitted.

E29.24.2 The threaded portion of the anchor bolts projecting above the top surface of pile shall be coated with oil, before the concrete is poured, to minimize the fouling of threads splattered by concrete residue.

E29.25 Forms

E29.25.1 The top of the pile shall be formed with tubular forms (Sonotube) to a minimum depth of 1000 mm below final grade.

E29.25.2 The forms shall be sufficiently rigid to prevent lateral or vertical distortions from the loading environment to which they shall be subjected. Forms shall be set to the design grades, lines, and dimensions, as shown on the Drawings.

E29.26 Placing Concrete

E29.26.1 Care shall be taken to ensure that anchor bolts are vertically aligned and that anchor bolts and conduits are properly positioned prior to placement of concrete.

E29.26.2 Concrete shall not have a free fall of more than 2.0 m and shall be placed so that the aggregates will not separate or segregate. The slump of the concrete shall not exceed 110 mm. The concrete shall be vibrated throughout the entire length of the pile.

E29.26.3 Concrete shall be placed to the elevations as shown on the Drawings. The top surface of the pile shall be finished smooth and even with a hand float.

E29.26.4 The shaft shall be free of water prior to placing of concrete. Concrete shall not be placed in or through water unless authorized by the Contract Administrator. In the event that tremie concrete is allowed by the Contract Administrator, the concrete shall be placed as specified herein.

E29.27 Tremie Concrete

E29.27.1 The shaft of the pile shall be pumped clear of water so that the bottom can be cleaned. Pumping shall then be stopped and water shall be allowed to come into the bore until a state of equilibrium is reached. Concrete shall then be placed by means of a tremie pipe. The tremie pipe shall have a suitable gate in the bottom to prevent water from entering the pipe. The bottom of the pipe shall be maintained below the surface of the freshly placed concrete. The pipe shall be capable of being raised or lowered quickly in order to control the flow of concrete.

E29.27.2 Tremie concrete shall be poured up to a depth of 600 mm or as the Contract Administrator directs. Pumps shall then be lowered into the bore and the excess water pumped out. The laitance that forms on top of the tremie shall then be removed and the remainder of the concrete shall be placed in the dry bore.

E29.28 Protection of Newly Placed Concrete

E29.28.1 Newly laid concrete threatened with damage by rain, snow, fog, or mist shall be protected with a tarpaulin or other approved means.

E29.29 Curing Concrete

- E29.29.1 The top of the freshly finished concrete piles shall be covered and kept moist by means of wet polyester blankets immediately following finishing operations and shall be maintained at above 10°C for at least seven (7) consecutive days thereafter.
- E29.29.2 After the finishing is completed, the surface shall be promptly covered with a minimum of a single layer of clean, damp polyester blanket.
- E29.29.3 Concrete shall be protected from the harmful effects of sunshine, drying winds, surface dripping or running water, vibration, and mechanical shock. Concrete shall be protected from freezing until at least twenty-four hours after the end of the curing period.
- E29.29.4 Changes in temperature of the concrete shall be uniform and gradual and shall not exceed 3° in one hour or 20° in twenty-four hours.

E29.30 Form Removal

- E29.30.1 Forms shall not be removed for a period of at least 24 hours after the concrete has been placed. Removal of forms shall be done in a manner to avoid damage to, or spalling of, the concrete.
- E29.30.2 The minimum strength of concrete in place for safe removal of forms shall be 20 MPa.
- E29.30.3 Field-cured test specimens, representative of the in-place concrete being stripped, will be tested to verify the concrete strength.

E29.31 Patching of Formed Surfaces

- E29.31.1 Immediately after forms around top of pile have been removed, but before any repairing or surface finishing is started, the concrete surface shall be inspected by the Contract Administrator. Any repair of surface finishing started before this inspection may be rejected and required to be removed.
- E29.31.2 All formed concrete surfaces shall have bolts, ties, struts, and all other timber or metal parts not specifically required for construction purposes cut back fifty (50) mm from the surface before patching.
- E29.31.3 Minor surface defects caused by honeycomb, air pockets greater than 5 mm in diameter, and voids left by strutting, and tie holes shall be repaired by removing the defective concrete to sound concrete, dampening the area to be patched and then applying patching mortar. A slurry grout consisting of water and cement, shall be well-brushed onto the area to be patched. When the slurry grout begins to lose the water sheen, the patching mortar shall be applied. It shall be struck-off slightly higher than the surface and left for one hour before final finishing to permit initial shrinkage of the patching mortar and it shall be touched up until it is satisfactory to the Contract Administrator. The patch shall be cured as specified in this Specification, and the final colour shall match the surrounding concrete.

E29.32 Cold Weather Concreting

- E29.32.1 Protection of concrete shall be considered incidental to its placement. The temperature of the concrete shall be maintained at or above 10°C for a minimum of three (3) days or till the concrete has reached a minimum compressive strength of 20 MPa, by whatever means are necessary. Concrete damaged as a result of inadequate protection against weather conditions shall be removed and replaced by the Contractor at his own expense. Also, concrete allowed to freeze prior to the three (3) days will not be accepted for payment.

QUALITY CONTROL

- E29.33 All workmanship and all materials furnished and supplied under this Specification are subject to close and systematic inspection and testing by the Contract Administrator, including all operations from the selection and production of materials, through to final acceptance of the Work. The Contractor shall be wholly responsible for the control of all operations incidental thereto notwithstanding any inspection or approval that may have been previously given. The Contract Administrator reserves the right to reject any materials or Works that are not in accordance with the requirements of this Specification.

- E29.34 The Contractor shall be responsible for making a thorough inspection of materials to be supplied under this Contract. All material shall be free of surface imperfections and other defects.

MEASUREMENT AND PAYMENT

- E29.35 Parking Lot Light Standard Concrete Pile Foundation

- E29.35.1 Construction of new cast-in-place concrete pile foundations including removal of existing pile, storage and reinstallation of existing light standard, supply and installation of anchor bolts and steel template, and placement of concrete pile will not be measured and will be paid for at the Contract Lump Sum Price for "Parking Lot Light Standard Concrete Pile Foundation" constructed in accordance with this Specification and accepted by the Contract Administrator.

E30. LINE PAINTING

DESCRIPTION

- E30.1 The work of this section comprises the furnishing of all labour, equipment and materials required to complete the painted pavement markings for parking stalls as shown on the drawings at 1395 Molson Street and as hereinafter specified.

MATERIALS

- E30.2 Paint shall conform to City of Winnipeg specification for reflectorized traffic paint or suitable equivalent for application to asphalt and/or concrete surface.
- E30.2.1 CGSB 1-GP-74M + Amdt-May-81, alkyd traffic paint
- E30.2.2 High Gloss Traffic Paint (IBIS Products Limited)
- E30.3 Paint colours shall be:
- (a) Yellow - all centre lines, parking stall lines, painted medians, and handicap symbols illustrated on plan
 - (b) White - stop bars, passing lane lines, bicycle symbols, and arrows.
 - (c) CGSB 1-GP-12C + Amdt-Dec-84, yellow 505-308, white 513-301 (MTO Spec. 1710);(White 40-2478, Yellow 40-3057-IBIS Products Limited)
 - (d) Federal Traffic Paint, Yellow 40-3597 Qual No 80087, White 40-3596 Qual No 80086 (IBIS Products Limited)
 - (e) High Gloss Traffic Paint, Yellow 40-1821 (IBIS Products Limited)
- E30.4 Thinner to CGSB 1-GP-5M
- E30.5 Glass Beads: Overlay Type: To CGSB 1-GP-74 ÷ Amdt-May-81

CONSTRUCTION METHODS

- E30.6 Line painting to be done upon completion of asphalt paving work and curing time. All lines are to be to as per the drawings or as required by TAC standards.
- E30.7 No markings shall be performed when the temperature is below 10⁰ Celsius nor during rainfall or fog, or until the surface is perfectly dry. No markings shall be done if, in the opinion of the Site supervisor, the conditions are not conducive to provide a top quality result.
- E30.8 Immediately before application of the paint, the existing surface shall be dry and entirely free from dirt, grease, oil acids, laitance, or other foreign matter which would reduce the bond between the coat of paint and the asphalt/concrete. The surface shall be thoroughly cleaned by sweeping and blowing as required to remove all dirt, laitance and loose materials.

- E30.9 Suitable chalkline layouts of proposed lines and arcs shall be spotted in advance of the paint application. Control points shall be spaced at such intervals as will ensure accurate location of all markings.
- E30.10 When discrepancies between the drawings and the field layout occur, these discrepancies are to be reported to the Contract Administrator for further action before proceeding with the application of paint.
- E30.11 The Contractor shall provide an experienced technician to supervise the location, alignment, layout, dimension, and application of the paint.
- E30.12 Paint shall be applied at a rate of 200 lineal feet per gallon (60m per 4.5L) and maintain a uniform lines unless otherwise indicated on specifications drawings.
- E30.13 The paint shall be mixed in accordance with the manufacturer's instructions before application. The paint shall be thoroughly mixed and applied to the surface of the concrete with the marking machine. The surface shall receive two (2) coats, the first coat shall be thoroughly dry before the second coat is applied.
- E30.14 Glass beads are to be added to paint as per manufacturer's specifications.
- E30.15 The paint applicator to be an approved pressure type mobile distributor capable of applying paint in single or double and dashed lines, and that will ensure uniform application and having a positive shut-off.
- E30.16 In the application of straight strips, any deviation in the edges exceeding 1/2 inch in 50 feet shall be obliterated and the marking corrected. The width of the markings shall be as designated within a tolerance of 5 percent. All paintings shall be performed to the satisfaction of the Contract Administrator by competent and experienced equipment operators, labourers, and artisans in a neat and workmanlike manner.
- E30.17 Thoroughly clean distribution tank before refilling with paint of different colour.
- E30.18 After application of the paint, all markings shall be protected while the paint is drying. The fresh paint shall be protected from injury or damage of any kind. The Contractor shall be directly responsible and shall erect or place suitable warning signs, flags, or barricades, protective screens, or coverings as required. All surfaces shall be protected from disfiguration by spatter, splashes, spillage drippings, of paint or other materials.
- E30.19 Parking stall lines will be painted as per drawing and/or as directed by the Contract Administrator. Each stall line will be 75 mm wide and 4.5 m long.

MEASUREMENT AND PAYMENT

- E30.20 Line painting will be measured and paid for at the Contract lump sum price for "Line Painting" measured as specified herein, which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification.

E31. PRE-CAST PARKING CURBS

DESCRIPTION

- E31.1 This specification shall cover the removal, salvage and reinstallation of the existing parking curbs at 1395 Molson Street.

CONSTRUCTION METHODS

- E31.2 Remove, salvage and store parking curbs from the existing parking lot so they are not damaged. Parking curbs damaged during removal are to be replaced by the Contractor at their cost.

E31.3 Upon completion of the asphalt and the parking fence, reinstall the parking curbs, keeping them in place with pins minimum 15M. X 600 mm long rebar spikes.

MEASUREMENT AND PAYMENT

E31.4 Remove, salvage, and reinstall existing parking curbs will not be measured or paid for as this work will be incidental to the construction of the 1395 Molson Street Parking lot.

E31.5 Removal, salvaging, storing, and reinstallation of the existing parking curbs will be measured and paid for at the Contract lump sum price for "Pre-Cast Parking Curbs" measured as specified herein, which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification.

E32. RELOCATION OF EXISTING SIGNS

DESCRIPTION

E32.1 General

E32.1.1 This specification shall cover the relocation of the following signs:

(a) Baron Estates entrance feature sign located at 1395 Molson Street as seen below.



(b) Baron Estates advertising sign located in the SE corner of Molson and Grassie



(c) Park Valley advertising sign located in the SW corner of Molson and Grassie



CONSTRUCTION METHODS

- E32.2 Relocate signs to location as directed by the Contract Administrator. Generally, signs will be relocated less than 5 metres from existing locations.
- E32.2.1 Baron Estates entrance feature sign is mounted on a concrete footing. It is unknown if the footing is installed on piles. Contractor to relocate sign with or without existing concrete footing. If the existing footing is not retained, Contractor to construct a new footing and reattach the Baron Estates sign. Any damage to the sign during relocation is to be repaired at the Contractor's expense.
- E32.2.2 Baron Estates advertising sign to be removed and salvaged. Move disassembled sign and posts to location specified by Contract Administrator on the 1395 Molson property.
- E32.2.3 Park Valley advertising sign to be removed, salvaged, and reinstalled. If existing posts are rotten, supply and construct new posts as per E27.8 and paint/stain to match existing posts.

MEASUREMENT AND PAYMENT

- E32.3 The relocation of these signs shall be measured on a Lump Sum Basis for all three signs and paid for at the Contract Unit Price for "Relocation of Existing Signs". The amount to be paid for shall be for the relocation of all three signs in accordance with this specification, and accepted by the Contract Administrator.

E33. PARKING LOT ELECTRICAL

DESCRIPTION

- E33.1 This specification shall cover the removal of existing, and new installation of the electrical parking outlets, parking lot lighting, conduits, and wiring at 1395 Molson Street (Baron Estates).
- E33.2 Quality Assurance
- E33.2.1 This project will be installed in accordance with the following codes, regulations and standards:
- Do complete installation in accordance with CSA C22.2 latest edition.
 - Comply with CSA electrical bulletins in force at the time of installation. Comply with the requirements of all provincial and local laws, rules, ordinances, and codes.
 - Grounding shall be in accordance with CEC latest edition.
 - The electrical installation shall be in accordance with the requirements of the electrical supply authority and local inspection authority.
 - Visit the site and include all costs necessary to complete the installation as described herein and as shown on the drawings. No extra payment will be made for additional work not reviewed by a site visit.

E33.3 Permits

- E33.3.1 Obtain all necessary permits required for the electrical installation.
- E33.3.2 Pay all associated fees relating to permits.

E33.4 Submittals

- E33.4.1 Submit shop drawings and product data for new equipment.

E33.5 Operations and Maintenance Data

- E33.5.1 Provide operations and maintenance data for incorporation into the maintenance manuals.
- E33.5.2 Include details of design elements, construction features, component functions, and maintenance requirements and schedules to perform effective start-up, operations, maintenance and repair, modifications, extension, and expansion of any portion or feature of the installation.

MATERIALS AND EQUIPMENT

- E33.6 Electrical equipment shall be new unless otherwise noted.
- E33.7 Equipment and material shall be CSA certified, and manufactured to standards described. Where there is no alternative to supplying equipment, which is not CSA certified, obtain special approval from the appropriate inspection departments.
- E33.8 Minimum wire is #12 AWG copper. Conductors shall be approved for application such as direct burial, in conduit, etc.
- E33.9 Conduits shall be PVC for underground installations.

CONSTRUCTION METHODS

E33.10 Trenching, Cutting and Patching

- E33.10.1 Include the cost of all trenching, cutting and patching required for the installation of the electrical work.
- E33.10.2 Restore grounds to original condition prior to start of work. Backfill with suitable material.
- E33.10.3 Obtain the approval of the Contract Administrator and the owner before arranging for any cutting. Patching shall restore the affected area to original condition. Material and methods shall match existing.

E33.11 Workmanship

- E33.11.1 Install equipment, conduit, and cable in a workmanlike manner to present a neat appearance to the satisfaction of the Contract Administrator.
- E33.11.2 Install equipment and apparatus requiring maintenance, adjustment, or eventual replacement with adequate clearance and accessibility for the same.
- E33.11.3 Replace work unsatisfactory to the Contract Administrator without extra cost.

E33.12 Testing and Commissioning

- E33.12.1 The Contractor shall engage the services of a recognized independent testing agency for the purposes of equipment testing and inspections.
- E33.12.2 Include visual and mechanical testing of equipment to insure equipment is in good working order, make adjustments as necessary, the measuring and high potential testing of medium and high voltage cables, any adjustments to the equipment in the field and application of final relay settings and testing of all relays during commissioning.
- E33.12.3 Conduct the following tests including:

- (a) Lighting and associated control systems
- (b) Parking lot receptacles

E33.12.4 Submit three (3) copies of final test reports to the Contract Administrator.

MEASUREMENT AND PAYMENT

E33.13 The work described herein shall not be measured, and will be paid on a Lump Sum Basis for "Parking Lot Electrical". The amount to be paid for shall be for the removal of existing, and new installation of the electrical parking outlets, parking lot lighting, conduits, and wiring done in accordance with this specification and the drawings, and accepted by the Contract Administrator.

E34. SIGN SUPPORT CLAMPS

E34.1 The Contractor shall install all new sign support clamps at the locations shown on the drawings or as directed by the Contract Administrator. The City shall supply all sign support clamps.

E34.2 All costs in connection with the installation of sign support clamps are incidental.

E35. OPERATING CONSTRAINTS FOR WORK IN CLOSE PROXIMITY TO FEEDERMAINS

DESCRIPTION

E35.1 This Section details operating constraints for all work to be carried out in close proximity to the North Kildonan Feedermain. Close proximity shall be deemed to be any construction activity within a 5 m offset from the centreline of the feedermain.

GENERAL

E35.2 General Considerations for Work in Close Proximity to Feeder mains

E35.2.1 Feeder mains are a critical component of the City of Winnipeg Regional Water Supply System and work in close proximity to the pipeline shall be undertaken with an abundance of caution. The pipe cannot be taken out of service for extended periods to facilitate construction and inadvertent damage caused to the pipe would likely have catastrophic consequences.

E35.2.2 Work around feeder mains shall be planned and implemented to minimize the time period that work is carried out in close proximity to the pipe and to ensure that the pipeline is not subjected to excessive construction related loads, including excessive vibrations and/or concentrated or asymmetrical lateral loads during backfill placement.

E35.2.3 The Contract Administrator will mark out the approximate alignment of the feedermain prior to commencement of construction with stakes or paint. The Contractor is responsible for maintaining markers onsite (eg. stakes or posts) that can be used by all construction personnel to delineate the feedermain during construction.

E35.2.4 The North Kildonan Feedermain is constructed of Prestressed Concrete Cylinder Pipe (Lined Core) conforming to AWWA Standard C301. The North Kildonan Feedermain was manufactured and installed in 1969.

E35.2.5 Large diameter pressure pipe generally has limited ability to withstand increased earth and live loading. Therefore, every precaution must be undertaken to ensure that applied loading during all phases of construction is within accepted loading parameters. Prestressed pipe typically fails in a non-ductile mode and has the potential to cause extensive consequential damage to infrastructure if failure should occur.

E35.2.6 Loading limitations and calculated loads associated with typical construction equipment is attached in Appendix B for illustrative purposes. The loading calculations shall be interpreted with caution, however, as many factors can cause applied loads to increase

considerably, such as unbalanced loading, variations in wheel base or track width, payload, impact factors due to excessive speed or vibration, etc.

E35.3 Submittals

E35.3.1 Submit proposed construction equipment specifications to the Contract Administrator for review seven (7) days prior to construction. The submissions need to include sufficient data on operational weights, dimensions, and payloads to facilitate assessment that the proposed construction equipment is not in excess of the typical construction loading that this assessment was based on. Submittal shall include:

- (a) Equipment operating weight and dimensions including wheel or track base, track length or axle spacing, track widths or wheel configurations
- (b) Payload weights
- (c) Load distributions in the intended operating configuration

E35.3.2 Submit a Construction Method Statement with proposed construction plan including haul routes, excavation equipment locations, loading positioning and base construction sequencing, to the Contract Administrator for review seven (7) days prior to construction. Do not commence construction until the Construction Method Statement has been reviewed and accepted by the Contract Administrator.

E35.3.3 The Contract Administrator will review the equipment and construction method statement in light of the feedermain loading limitations.

CONSTRUCTION METHODS

E35.4 Protection of Feedermain During Construction

E35.4.1 The sections of the feedermain affected by construction:

- (a) North Kildonan Feedermain - Runs along the west boulevard of Molson Street (from the south) and turns west down the north boulevard of Grassie Boulevard.

E35.4.2 Contractors carrying out repair work or working in close proximity to feedermain shall meet the following conditions and technical requirements:

- (a) Pre-Work, Planning and General Execution
 - (i) No work shall commence at the site until the Equipment Specifications and Construction Method Statement have been submitted and accepted, and feedermain locations have been clearly delineated in the field. Work over feedermain shall only be carried out with equipment that has been reviewed and quantified in terms of its loading implications on the pipe. All proposed construction equipment must be submitted to Contract Administrator for review prior to construction. Work in areas in close proximity to feedermain shall only be carried out with equipment that has been reviewed and quantified in terms of its loading implications by the Contract Administrator.
 - (ii) Contact the City of Winnipeg, Water and Waste Department (W&WD), Construction Services Coordinator (Andy Vincent 986-3823) prior to construction.
 - (iii) Notify W&WD well in advance of construction to coordinate required service and feedermain interruptions
 - (iv) Where work is in close proximity to a feedermain, utilize construction practices and procedures that do not impart excessive vibration loads on the feedermain or that would cause settlement of the subgrade below the feedermain.
 - (v) Crossing feedermain is prohibited in the time period from removal of existing roadway structure until the completion of granular base construction. At all times prior to completion of final paving; reduce equipment speeds to levels that minimize the effects of impact loading to the pipe
 - (vi) For construction work activities either longitudinally or transverse to the alignment of a feedermain, work only with equipment and in the manner

- stipulated in the accepted Construction Method Statement and the supplemental requirements noted herein.
- (vii) Where work is in proximity to a feedermain, utilize construction practices and procedures that do not impart excessive vibration loads on the feedermain or that would cause settlement of the subgrade below the feedermain.
 - (viii) The pipeline elevation datum relative to the proposed roadway shall be adequately verified. Deviations from the elevations noted herein shall be reported to Contract Administrator for review prior to construction of the subgrade.
 - (ix) Construction operations should be staged in such a manner as to limit multiple construction loads at one time, (e.g. offset crossings sufficiently from each other, rollers should remain a sufficient distance behind spreaders to limit loads. A reasonable offset distance is 3m between loads).
 - (x) No vehicular traffic shall be allowed to cross or operate over the valve chamber at Grassie and Molson. The valve chamber shall be staked and flagged off before commencement of construction activities. Notwithstanding all restrictions on working near feedermain noted herein equipment will not be allowed to operate within 3 m of the valve chamber walls, unless reviewed by the Contract Administrator as per above requirements.
 - (xi) The Contractor and all site supervisory personnel and equipment operators have to be formally briefed to ensure that they are fully cognizant of the associated restrictions, constraints, and risks associated with working adjacent to and over this pipeline. New personnel introduced after commencement of the project need to be formally orientated as to the significance and constraints associated with working over the feedermain.
- (b) Demolition and Excavation
- (i) Use of pneumatic concrete breakers within 3 metres of a feedermain is prohibited. Pavement shall be full depth sawcut and carefully removed. Use of hand held jackhammers for pavement removal will be allowed.
 - (ii) Where there is less than 1.6 metres of earth cover over a feedermain and further excavation is required either adjacent to or over the feedermain, utilize only smooth edged excavation buckets, soft excavation or hand excavation techniques. Where there is less than 1 metre of cover over the feedermain, carefully expose the feedermain by hand excavation to delineate the location and depth of the main, and provide full time supervision of the excavation.
 - (iii) Where there is less than 2.5 m of earth cover over a feedermain, offset backhoe or excavation equipment from the feedermain, a minimum of 3 m from centerline, to carry out excavation.
 - (iv) Equipment should not be allowed to operate while positioned directly over a feedermain.
 - (v) Where excavation is required over existing thrust blocks, arrange for a shutdown of the feedermain through the Contract Administrator prior to proceeding with excavation. Expose top of thrust blocks by hand excavation or soft excavation methods to determine limits and elevation of thrust blocks prior to mass excavation. Extreme caution is to be exercised when excavating to avoid displacement of the thrust blocks
- (c) Subgrade Construction
- (i) Subgrade compaction shall be prohibited within 2 metres of a feedermain. Subgrade compaction within 3 metres of a feedermain shall be limited to non vibratory methods only.
 - (ii) Subgrade, sub-base and base course construction shall be kept in a rut free condition at all times. Construction equipment is prohibited from crossing pipelines if the grade is insufficient to support the equipment without rutting.
 - (iii) Subgrade conditions should be inspected by personnel with competent geotechnical experience (e.g. ability to adequately visually classify soils and

- competency of subgrade, subbase, and base course materials). In the event of encountering unsuitable subgrade materials above the feedermain, proposed design revisions shall be submitted to this office for review to obtain approval from the Water and Waste Department relative to any change in conditions.
- (iv) Construction operations shall be staged to minimize the time period between excavation to subgrade and placement of granular subbase materials. Should bare subgrade be left overnight, measures shall be implemented to protect the subgrade against inadvertent travel over it and to minimize the impact of wet weather.
- (d) Subbase and Base Course Construction
- (i) Granular material, construction material, soil or other material shall not be stockpiled on the pipelines or within 5 metres of the pipe centerline.
 - (ii) Subbase or base course materials shall not be dumped directly on pipelines but shall be stockpiled outside limits noted in these recommendation and shall be carefully bladed in-place.
 - (iii) Subbase compaction within 3 metres of the centreline of a feedermain shall be either carried out by static methods (without vibration) or with smaller approved equipment such as hand held plate packers or smaller roller equipment.
 - (iv) Place subbase and base materials over thrust blocks prior to returning feedermain to service.

MEASUREMENT AND PAYMENT

E35.5 No measurement or payment will be made for the works listed in this specification.

E36. MANHOLE CHAMBER IMPROVEMENTS

DESCRIPTION

E36.1 General

E36.1.1 This specification covers the supply of all materials and construction of the two manhole chamber improvements in the NE corner of the intersection as indicated in the drawings.

SPECIFICATIONS AND DRAWINGS

E36.2 Referenced Standard Construction Specifications and Standard Details

- (a) CW 2030 – Excavation, Bedding and Backfill
- (b) CW 2160 – Concrete Underground Structures and Works
- (c) ASTM A775 / A775M - 07b

MATERIALS

E36.3 General

E36.3.1 Class 3 Backfill as per CW 2030.

E36.3.2 Concrete shall conform to Type A) Monolithic Sewers and Reinforced Structures as per CW 2160 2.16 Concrete Mix Design.

E36.3.3 SikaSwell S-2 or an approved equivalent as determined by the Contract Administrator shall be used as a hydrophilic waterstop material.

E36.3.4 Reinforcing steel as per CW 2160 2.6 Reinforcing Steel, except all reinforcing steel shall be minimum 275W, deformed and epoxy coated in accordance with ASTM A775 / A775M - 07b. All reinforcing steel shall be sized and deformed as shown in the contract drawings.

E36.3.5 Other miscellaneous materials as per CW 2160 Section 2 and Contract Drawings.

CONSTRUCTION METHODS

- E36.4 Shop drawings will not be required, however if the supplied reinforcing steel is not the correct dimensions, or if the placement of reinforcing steel, or if the formwork is not constructed as shown in the contract drawings, it shall be remedied at own expense.
- E36.5 Excavate around manhole chambers to depths required to expose existing risers required to be modified or demolished. Excavate as per CW 2030 Section 3.
- E36.6 Remove or demolish existing risers to elevation as indicated on Contract Drawings or as directed by Contract Administrator
- E36.7 Construct concrete formwork as per CW 2160 Section 3.2 and as shown in the contract drawings or as directed by Contract Administrator.
- E36.8 Fabricate and install steel reinforcement as per CW 2160 Section 3.4 and as shown in the contract drawings or as directed by Contract Administrator.
- E36.9 Cut existing valve box sleeve and stem to elevations on the drawing.
- E36.10 Perform concrete works, including formwork, steel reinforcement placement, curing and finishing as per CW 2160 Section 3.
- E36.11 Place manhole frame and cover on new concrete reinforcement and protect manhole chamber from damage during Stage 1 and 2 traffic detour. Undertake any repairs necessary after Stage 1 at own cost.
- E36.12 Cover manhole frame and cover with plywood or other suitable material to prevent temporary roadway material from entering manhole chamber. Construct temporary roadway over manhole chamber.
- E36.13 Expose manhole chambers from temporary pavement in Stage 3. Adjust manhole frame and cover to final grade and isolate from adjacent new concrete pavement as per Contract Drawings.

MEASUREMENT AND PAYMENT

- E36.14 Northeast Corner Watermain Manhole Chamber Improvements
- (a) The Northeast Corner Watermain Manhole Chamber Improvements shall be measured and paid for on a lump sum basis for "Northeast Corner Watermain Manhole Chamber Improvements". This price shall include material, equipment, labour, supervision, overhead and all other costs associated with the work.
 - (b) All work described herein, including excavation, backfill, and final adjustment of frame shall be incidental to the pay item E36.14(a).
- E36.15 Northeast Corner Sewer Manhole Chamber Improvements
- (a) The Northeast Corner Sewer Manhole Chamber Improvements shall be measured and paid for on a lump sum basis for "Northeast Corner Sewer Manhole Chamber Improvements". This price shall include all material, equipment, labour, supervision, overhead and all other costs associated with the work.
 - (b) All work described herein, including excavation, backfill, and final adjustment of frame shall be incidental to the pay item E36.15(a).