THE CITY OF WINNIPEG

TENDER

TENDER NO. 620-2021

DOWNTOWN PAVEMENT RENEWAL PROJECT – 2022 PAVEMENT RENEWALS: SMITH STREET

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PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

B1.1 Downtown Pavement Renewal Project – 2022 Pavement Renewals: Smith Street

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, January 19, 2022.

B2.2 The Contract Administrator or the Manager of Materials may extend the Submission Deadline by issuing an addendum at any time prior to the time and date specified in B2.1.

B3. ENQUIRIES

B3.1 All enquiries shall be directed to the Contract Administrator identified in D4.1.

B3.2 If the Bidder finds errors, discrepancies or omissions in the Tender, or is unsure of the meaning or intent of any provision therein, the Bidder shall notify the Contract Administrator of the error, discrepancy or omission, or request a clarification as to the meaning or intent of the provision at least five (5) Business Days prior to the Submission Deadline.

B3.3 Responses to enquiries which, in the sole judgment of the Contract Administrator, require a correction to or a clarification of the Tender will be provided by the Contract Administrator to all Bidders by issuing an addendum.

B3.4 Responses to enquiries which, in the sole judgment of the Contract Administrator, do not require a correction to or a clarification of the Tender will be provided by the Contract Administrator only to the Bidder who made the enquiry.

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

B3.6 Any enquiries concerning submitting through MERX should be addressed to:
MERX Customer Support
Phone: 1-800-964-6379
Email: merx@merx.com

B4. CONFIDENTIALITY

B4.1 Information provided to a Bidder by the City or acquired by a Bidder by way of further enquiries or through investigation is confidential. Such information shall not be used or disclosed in any way without the prior written authorization of the Contract Administrator. The use and disclosure of the confidential information shall not apply to information which:

(a) was known to the Bidder before receipt hereof; or

(b) becomes publicly known other than through the Bidder; or

(c) is disclosed pursuant to the requirements of a governmental authority or judicial order.

B4.2 The Bidder shall not make any statement of fact or opinion regarding any aspect of the Tender to the media or any member of the public without the prior written authorization of the Contract Administrator.

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 Tender, 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.

B5.3 Addenda will be available on the MERX website at www.merx.com.

B5.4 The Bidder is responsible for ensuring that he/she has received all addenda and is advised to check the MERX website for addenda regularly and shortly before the Submission Deadline, as may be amended by addendum.

B5.5 The Bidder shall acknowledge receipt of each addendum in Paragraph 10 of Form A: Bid/Proposal. Failure to acknowledge receipt of an addendum may render a Bid non-responsive.

B5.6 Notwithstanding B3, enquiries related to an Addendum may be directed to the Contract Administrator indicated in D4.

B6. SUBSTITUTES

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

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, to the Bidder who requested approval of the substitute.

B6.6.1 The Contract Administrator will issue an Addendum, disclosing the approved materials, equipment, methods and products to all potential Bidders. The Bidder requesting and obtaining the approval of a substitute shall be 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 B17.

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

B7. BID COMPONENTS

B7.1 The Bid shall consist of the following components:

(a) Form A: Bid;

(b) Form B: Prices;

(c) Form G1: Bid Bond and Agreement to Bond.

B7.2 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.

B7.3 The Bid shall be submitted electronically through MERX at www.merx.com.

B7.3.1 Bids will **only** be accepted electronically through MERX.

B7.4 Bidders are advised that inclusion of terms and conditions inconsistent with the Tender document, including the General Conditions, will be evaluated in accordance with B17.1(a).

B8. BID

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

B8.2 Paragraph 2 of Form A: Bid/Proposal 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/Proposal, the Bidder shall identify a contact person who is authorized to represent the Bidder for purposes of the Bid.

B8.4 Paragraph 13 of Form A: Bid/Proposal 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;

(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/Proposal should be entered 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.

B9.2 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).

B9.5 The Bidder shall enter the Total Bid Price from Form B: Prices into the Total Bid Price field in MERX.

B9.5.1 Bidders are advised that the calculation indicated in B17.4 will prevail over the Total Bid Price entered in MERX.

B9.6 Form B: Prices is organized into Parts: Part 1 of the Work, Part 2 of the Work, and Part 3 of the Work. Bidders shall provide a total price for each part and, on the summary sheet, a Total Bid Price consisting of the sum of prices for Part 1, Part 2 and Part 3.

B10. DISCLOSURE

B10.1 Various Persons provided information or services with respect to this Work. In the City's opinion, this relationship or association does not create a conflict of interest because of this full disclosure. Where applicable, additional material available as a result of contact with these Persons is listed below.

B10.2 The Persons are:

(a) N/A

B11. CONFLICT OF INTEREST AND GOOD FAITH

B11.1 Further to C3.2, Bidders, by responding to this Tender, declare that no Conflict of Interest currently exists, or is reasonably expected to exist in the future.

B11.2 Conflict of Interest means any situation or circumstance where a Bidder or employee of the Bidder proposed for the Work has:

(a) other commitments;

(b) relationships;

(c) financial interests; or

(d) involvement in ongoing litigation;

that could or would be seen to:

(i) exercise an improper influence over the objective, unbiased and impartial exercise of the independent judgment of the City with respect to the evaluation of Bids or award of the Contract; or

(ii) compromise, impair or be incompatible with the effective performance of a Bidder's obligations under the Contract;

(e) has contractual or other obligations to the City that could or would be seen to have been compromised or impaired as a result of its participation in the Tender process or the Work; or

(f) has knowledge of confidential information (other than confidential information disclosed by the City in the normal course of the Tender process) of strategic and/or material relevance to the Tender process or to the Work that is not available to other bidders and that could or would be seen to give that Bidder an unfair competitive advantage.

B11.3 In connection with its Bid, each entity identified in B11.2 shall:

(a) avoid any perceived, potential or actual Conflict of Interest in relation to the procurement process and the Work;

(b) upon discovering any perceived, potential or actual Conflict of Interest at any time during the Tender process, promptly disclose a detailed description of the Conflict of Interest to the City in a written statement to the Contract Administrator; and

(c) provide the City with the proposed means to avoid or mitigate, to the greatest extent practicable, any perceived, potential or actual Conflict of Interest and shall submit any additional information to the City that the City considers necessary to properly assess the perceived, potential or actual Conflict of Interest.

B11.4 Without limiting B11.3, the City may, in its sole discretion, waive any and all perceived, potential or actual Conflicts of Interest. The City's waiver may be based upon such terms and conditions as the City, in its sole discretion, requires to satisfy itself that the Conflict of Interest has been appropriately avoided or mitigated, including requiring the Bidder to put into place such policies, procedures, measures and other safeguards as may be required by and be acceptable to the City, in its sole discretion, to avoid or mitigate the impact of such Conflict of Interest.

B11.5 Without limiting B11.3, and in addition to all contractual or other rights or rights at law or in equity or legislation that may be available to the City, the City may, in its sole discretion:

(a) disqualify a Bidder that fails to disclose a perceived, potential or actual Conflict of Interest of the Bidder or any of its employees proposed for the Work;

(b) require the removal or replacement of any employees proposed for the Work that has a perceived, actual or potential Conflict of Interest that the City, in its sole discretion, determines cannot be avoided or mitigated;

(c) disqualify a Bidder or employees proposed for the Work that fails to comply with any requirements prescribed by the City pursuant to B11.4 to avoid or mitigate a Conflict of Interest; and

(d) disqualify a Bidder if the Bidder, or one of its employees proposed for the Work, has a perceived, potential or actual Conflict of Interest that, in the City's sole discretion, cannot be avoided or mitigated, or otherwise resolved.

B11.6 The final determination of whether a perceived, potential or actual Conflict of Interest exists shall be made by the City, in its sole discretion.

B12. QUALIFICATION

B12.1 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.

B12.2 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 https://www.winnipeg.ca/matmgt/Templates/files/debar.pdf

B12.3 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);

B12.4 Further to B12.3(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) Written confirmation of a safety and health certification meeting SAFE Work Manitoba's SAFE Work Certified Standard (e.g., COR™ and SECOR™) in the form of:

(i) a copy of their valid Manitoba COR certificate and Letter of Good Standing (or Manitoba equivalency) as issued under the Certificate of Recognition (COR) Program administered by the Construction Safety Association of Manitoba or by the Manitoba Heavy Construction Association's WORKSAFELY™ COR™ Program; or

(ii) a copy of their valid Manitoba SECOR™ certificate and Letter of Good Standing (or Manitoba equivalency) as issued under the Small Employer Certificate of Recognition Program (SECOR™) administered by the Construction Safety Association of Manitoba or by the Manitoba Heavy Construction Association's WORKSAFELY™ COR™ Program; or

(b) a report or letter to that effect from an independent reviewer acceptable to the City. (A list of acceptable reviewers and the review template are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at http://www.winnipeg.ca/matmgt/.

B12.5 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.

B12.6 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.

B13. BID SECURITY

B13.1 The Bidder shall include in its Bid Submission bid security in the form of a digital 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 Form G1: Bid Bond and Agreement to Bond, available on The City of Winnipeg, Corporate Finance, Materials Management Division website at https://www.winnipeg.ca/MatMgt/templates/files/eBidsecurity.pdf.

B13.2 Bid security shall be submitted in a digital format meeting the following criteria:

(a) The version submitted by the Bidder must have valid digital signatures and seals;

(b) The version submitted by the Bidder must be verifiable by the City with respect to the totality and wholeness of the bond form, including: the content; all digital signatures and digital seals; with the surety company, or an approved verification service provider of the surety company.

(c) The version submitted must be viewable, printable and storable in standard electronic file formats compatible with the City, and in a single file. Allowable formats include pdf.

(d) The verification may be conducted by the City immediately or at any time during the life of the bond and at the discretion of the City with no requirement for passwords or fees.

(e) The results of the verification must provide a clear, immediate and printable indication of pass or fail regarding B13.2(a).

B13.3 Bonds failing the verification process will not be considered to be valid and the bid shall be determined to be non-responsive in accordance with B17.1(a).

B13.4 Bonds passing the verification process will be treated as original and authentic.

B13.4.1 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.

B13.5 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 formed with the successful Bidder and the contract securities are furnished as provided herein. The bid securities of all other Bidders will be released when a Contract is awarded.

B13.6 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 Tender.

B14. OPENING OF BIDS AND RELEASE OF INFORMATION

B14.1 Bids will not be opened publicly.

B14.2 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 MERX website at www.merx.com.

B14.3 After award of Contract, the name(s) of the successful Bidder(s) and their Contract amount(s) will be available on the MERX website at www.merx.com.

B14.4 The Bidder is advised that any information contained in any Bid may be released if required by The Freedom of Information and Protection of Privacy Act (Manitoba), by other authorities having jurisdiction, or by law or by City policy or procedures (which may include access by members of City Council).

B14.4.1 To the extent permitted, the City shall treat as confidential information, those aspects of a Bid Submission identified by the Bidder as such in accordance with and by reference to Part 2, Section 17 or Section 18 or Section 26 of The Freedom of Information and Protection of Privacy Act (Manitoba), as amended.

B15. IRREVOCABLE BID

B15.1 The Bid(s) submitted by the Bidder shall be irrevocable for the time period specified in Paragraph 11 of Form A: Bid/Proposal.

B15.2 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 formed and the contract securities have been

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/Proposal.

B16. WITHDRAWAL OF BIDS

B16.1 A Bidder may withdraw his/her Bid without penalty prior to the Submission Deadline.

B17. EVALUATION OF BIDS

B17.1 Award of the Contract shall be based on the following bid evaluation criteria:

(a) compliance by the Bidder with the requirements of the Tender, or acceptable deviation therefrom (pass/fail);

(b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B12 (pass/fail);

(c) Total Bid Price;

(d) economic analysis of any approved alternative pursuant to B6.

B17.2 Further to B17.1(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.

B17.2.1 Any bid with an apparent imbalance between the unit prices in Part 1, Part 2 and Part 3 may be determined to be non-responsive and rejected by the Award Authority in its sole discretion, acting reasonably.

B17.3 Further to B17.1(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 qualified.

B17.4 Further to B17.1(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.

B17.4.1 Further to B17.1(a), in the event that a unit price is not provided on Form B: Prices, the City may determine the unit price by dividing the Amount (extended price) by the approximate quantity, for the purposes of evaluation and payment.

B17.4.2 Bidders are advised that the calculation indicated in B17.4 will prevail over the Total Bid Price entered in MERX.

B18. AWARD OF CONTRACT

B18.1 The City will give notice of the award of the Contract or will give notice that no award will be made.

B18.2 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 qualified, and the Bids are determined to be responsive.

B18.2.1 Without limiting the generality of B18.2, 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.

B18.3 The Work of this Contract is contingent upon Council approval of sufficient funding in the 2022 Capital Budget. If the Capital Budget approved by Council does not include sufficient funding for the Work, the City will have no obligation to award a Contract.

B18.4 Where an award of Contract is made by the City, the award shall be made to the qualified Bidder submitting the lowest evaluated responsive Bid, in accordance with B17.

B18.4.1 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.

B18.5 As noted in D3 and identified in Form B: Prices, the Work of Part 2 will be contingent upon Manitoba Hydro approving funding for the Work. If sufficient funding for Part 2 Work is not approved by Manitoba Hydro the City shall have the right to eliminate all or any portion of Part 2 Work in accordance with D2 with no compensation to the Bidder.

PART C - GENERAL CONDITIONS

C0. GENERAL CONDITIONS

C0.1 The *General Conditions for Construction* (Revision 2020-01-31) 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 Tender 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. FORM OF CONTRACT DOCUMENTS

D2.1 Notwithstanding C4.1(c) and C4.4, the Contract Documents will be provided to the Contractor electronically and there will be no requirement for execution and return to the City by the Contractor. Accordingly, the provisions under C4.4(a) and C4.4(b) are no longer applicable.

D3. SCOPE OF WORK

D3.1 The Work to be done under the Contract shall consist of three parts:

(a) Part 1 – City Funded Work

(b) Part 2 – Manitoba Hydro Funded Work

(c) Part 3 – City Funded Work.

Part 1 – City Funded Work

D3.2 Part 1 – City Funded Work shall consist of:

(a) Pavement Rehabilitation
  (i) Smith Street – Midtown Bridge to Graham Avenue

(b) Concrete Pavement Reconstruction
  (i) Smith Street – Graham Avenue to Notre Dame Avenue

(c) Manhole and Sewer Work
  (i) Smith Street (MH20014368) – Remove/Replace Manhole Risers
  (ii) Smith Street (MH20014296) – Remove/Replace Manhole Risers and Grout Pipe Connections
  (iii) Smith Street (MH20014194) – Remove/Replace Manhole Risers
  (iv) Smith Street (MH20014272) – Remove/Replace Manhole Risers and Grout Benching
  (v) Smith Street (MH20012848) – Remove/Replace Manhole Risers
  (vi) Smith Street (MH20012838) – Remove/Replace Manhole Risers
  (vii) Smith Street (MH20012904) – Remove/Replace Manhole Risers
  (viii) Smith Street (MH20014447) – Replace Benching
  (ix) Smith Street (MH20014446) – Grout Benching
  (x) Smith Street (MH20014448) – Replace Benching

(d) Traffic Signals Installations
  (i) Traffic Signals Installation – Smith Street and Navy Way
  (ii) Traffic Signals Installation – Smith Street and Broadway
  (iii) Traffic Signals Installation – Smith Street and York Avenue
  (iv) Traffic Signals Installation – Smith Street and St. Mary Avenue
  (v) Traffic Signals Installation – Smith Street and Graham Avenue
  (vi) Traffic Signals Installation – Smith Street and Portage Avenue
  (vii) Traffic Signals Installation – Smith Street and Ellice Avenue

(viii) Traffic Signals Installation – King Street and Notre Dame Avenue

Part 2 – Manitoba Hydro Funded Work

D3.3 Part 2 – Manitoba Hydro Funded Work shall consist of:

(a) Street Lighting and Associated Works
  (i) Smith Street – Smith Street at Navy Way
  (ii) Smith Street – Graham Avenue to Notre Dame Avenue

Part 3 – Winnipeg Police Service Building Bollards

D3.4 Part 3 – Winnipeg Police Service Building Bollards Work shall consist of:

(a) Removal of Existing Traffic Barriers and Delivery to City Yard

(b) Removal of Sidewalk

(c) Supply and Installation of Bollards

(d) Sidewalk Restoration

D3.5 The City currently has no approved funding in the Capital Budget for Part 2 of the Work, but is anticipating receiving notification about funding from Manitoba Hydro during the Award Period. Part 2 of the Work is contingent upon Manitoba Hydro approving sufficient funding.

D3.5.1 Further to C7.1, if notice of sufficient funding is not received, the City shall have the right to eliminate all or any portion of Part 2, and the Contract Price will be reduced accordingly.

D3.5.2 Further to C7.5, C7.5.1, and C7.6, a reduction in the Contract Price pursuant to D3.5.1 shall not be considered in calculating the aggregate reduction in the Contract Price for purposes of C7.5.

D3.5.3 If all or any portion of Part 2 is eliminated pursuant to D3.5.1, the time periods stipulated in D22 for Substantial Performance of the Work and in D23 for Total Performance of the Work will be reduced proportionally by the Contract Administrator acting reasonably.

D3.6 The major components of the Work are as follows:

(a) Pavement Rehabilitation
  (i) Installation of Traffic Signals Infrastructure
  (ii) Complete Manhole and Sewer Work (Sewer Inspections as required)
  (iii) Planing existing asphalt pavement
  (iv) Installation of Winnipeg Police Service Building Bollards including removal of existing traffic barriers, delivery of existing traffic barriers to City yard and the supply/installation of the bollards
  (v) Removal and salvage of Aluminum Balance Barrier Rail
  (vi) Full depth concrete repairs of existing joints and slabs
  (vii) Geometric Improvements at Navy Way
  (viii) Renewal of existing curbs in gutter lanes
  (ix) Replacement of existing catch basins and catch basin leads
  (x) Adjustment of catch basins, sewer manholes, appurtenances, and utility manholes
  (xi) Renewal of existing sidewalk
  (xii) Placement of asphalt overlay (Type 1A, average thickness 85 mm)
  (xiii) Construct new 100 mm concrete sidewalk c/w paving stone band
  (xiv) Installation of plant materials
  (xv) Installation of detectable warning tiles
  (xvi) Supply and placement of paving stones
  (xvii) Supply and installation of amenities (bike racks, tree grates, etc.)

(xviii) Boulevard restoration

(b) Concrete Pavement Reconstruction

(i) Installation of Traffic Signals Infrastructure
(ii) Complete Manhole and Sewer Work (Sewer Inspections as required)
(iii) Installation of curb and gutter inlets, catch basins, catch pits, and connection pipe
(iv) Installation of catch basins and catch pits (as required)
(v) Connection to existing sewer
(vi) Connection to existing manholes and existing services
(vii) Removal and salvage of Aluminum Balance Barrier Rail
(viii) Remove existing pavement
(ix) Excavation (c/w removal of existing concrete street car bedding and wood ties)
(x) Insulation of water services (as required)
(xi) Compaction of existing sub-grade
(xii) Placement of separation/filtration fabric and geogrid
(xiii) Placement of sub-base and base course materials
(xiv) Installation of subdrains
(xv) Adjustment of existing sewer manholes and utility manholes
(xvi) Construction of 250 mm plain dowelled concrete pavement utilizing hand-placed or slip form methods c/w 180 mm separate barrier curb (where applicable)
(xvii) Complete curb renewal at intersections beyond reconstruction limits (as required)
(xviii) Construction of 250 mm plain dowelled concrete pavement at all side street connections
(xix) Construction of 200 mm reinforced concrete pavement (back lanes/private driveways/approaches/geometric improvements)
(xx) Remove existing concrete/paving stone sidewalk
(xxi) Installation of street light bases, conduit, new light standards and street light cable
(xxii) Construction of Silva Cell soil retention system
(xxiii) Placement of trees
(xxiv) Construction of new 100 mm concrete sidewalk c/w paving stone band and detectable surface warning tiles
(xxv) Supply and placement of interlocking paving stones
(xxvi) Supply and installation of amenities (bike racks, tree grates, etc.)
(xxvii) Boulevard restoration

D4. CONTRACT ADMINISTRATOR

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

Thomas Findlay
Project Manager

Telephone No. 204 390-1464

Email Address Thomas.findlay@aecom.com

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

D5. CONTRACTOR'S SUPERVISOR

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

D5.2 At least two (2) Business Days prior to the commencement of any Work on the site, the Contractor shall provide the Contract Administrator with a phone number where the supervisor identified in D5.1 or an alternate can be contacted twenty-four (24) hours a day to respond to an emergency.

D6. NOTICES

D6.1 Except as provided for in C22.4, 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/Proposal.

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 identified in D4.

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 ‘issued for construction’ Contract Documents electronically, including Drawings in PDF formal only.

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 Documents, if applicable.

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

D9.3 Notwithstanding B12.4 at any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require an updated COR Certificate or Annual Letter of good Standing. A Contractor, who fails to provide a satisfactory COR Certificate or Annual Letter of good Standing, will not be permitted to continue to perform any Work.

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 five million dollars ($5,000,000.00) inclusive, with The City and Manitoba and its Ministers, officers, employees and agents added as an additional insured, including 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) 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 $5,000,000 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.

(d) Property insurance for all equipment, tools, field office and portable toilets used by the Contractor directly or indirectly in the performance of the Work on the project that may be owned, rented, leased or borrowed.

D10.2 Deductibles shall be borne by the Contractor.

D10.3 All Subcontractors performing Work on the project shall provide the Contractor with evidence of insurance as outlined in D10.1(a) and D10.1(b) above and be registered with Workers' Compensation Board of Manitoba and maintain insurance and workers compensation coverage throughout the performance of the Work. The Contractor shall provide the Contract Administrator with evidence of same prior to the commencement of any Work.

D10.4 All policies shall be taken out with insurers duly licensed to carry on business in the Province of Manitoba.

D10.5 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 Documents, as applicable.

D10.6 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. CONTRACT SECURITY

D11.1 The Contractor shall provide and maintain the performance bond and the labour and material payment bond 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; and

(b) a labour and material payment bond of a company registered to conduct the business of a surety in Manitoba, in the form attached to these Supplemental Conditions (Form H2: Labour and Material Payment Bond), in an amount equal to fifty percent (50%) of the Contract Price.

D11.1.1 Where the contract security is a performance bond, it may be submitted in hard copy or digital format. If submitted in digital format the contract security must meet the following criteria:

(a) the version submitted by the Contractor must have valid digital signatures and seals;

(b) the version submitted by the Contractor must be verifiable by the City with respect to the totality and wholeness of the bond form, including: the content; all digital signatures and digital seals; with the surety company, or an approved verification service provider of the surety company.

(c) the version submitted must be viewable, printable and storable in standard electronic file formats compatible with the City, and in a single file. Allowable formats include pdf.

(d) the verification may be conducted by the City immediately or at any time during the life of the bond and at the discretion of the City with no requirement for passwords or fees.

(e) the results of the verification must provide a clear, immediate and printable indication of pass or fail regarding D11.1(b).

D11.1.2 Digital bonds failing the verification process will not be considered to be valid and may be determined to be an event of default in accordance with C18.1. If a digital bond fails the verification process, the Contractor may provide a replacement bond (in hard copy or digital format) within seven (7) Calendar Days of the City's request or within such greater period of time as the City in its discretion, exercised reasonably, allows.

D11.1.3 Digital bonds passing the verification process will be treated as original and authentic.

D11.2 The Contractor shall provide the City Solicitor with the required performance and labour and material payment bonds within seven (7) Calendar Days of notification of the award of the Contract by way of an award letter and 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 Documents, if applicable.

D11.3 The Contractor shall, as soon as practicable after entering into a contract with a Subcontractor:

(a) give the Subcontractor written notice of the existence of the labour and material payment bond in D11.1(b); and

(b) post a notice of the bond and/or a copy of that bond in a conspicuous location at the Site of the Work.

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 Documents, if applicable.

D13. DETAILED WORK SCHEDULE

D13.1 The Contractor shall provide the Contract Administrator with a detailed work schedule at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in the General Conditions for the return of the executed Contract Documents, as applicable.

D13.2 If, prior to submitting the Detailed Work Schedule, the Contractor does not receive notification pursuant to D14.4 that all or some portion of Part 2 of the Work may be commenced, he/she shall complete the Detailed Work Schedule for only the remaining portion of the Work assuming that, if all of Part 2 is eliminated, the time periods stipulated in D22 for Substantial Performance

of the Work and in D23 for Total Performance of the Work will be reduced by Five (5) Working Days.

D13.3 If, after submitting the Detailed Work Schedule, the Contractor receives notification that all or any portion of Part 2 of the Work may be commenced, he/she shall submit a revised Detailed Work Schedule no later than two (2) Business Days from receipt of the notification.

D13.4 The detailed work schedule shall consist of the following:

(a) a critical path method (C.P.M.) schedule for the Work; and

(b) a Gantt chart for the Work based on the C.P.M. schedule;

all acceptable to the Contract Administrator.

D13.5 Further to D13.4(a), the C.P.M. schedule shall clearly identify the start and completion dates of all of the following activities/tasks making up the Work as well as showing those activities/tasks on the critical path:

(a) Commencement Date;

(b) Substantial Performance Date;

(c) Total Performance Date;

(d) Milestone Dates for Critical Stages of the Work;

(e) Interim Milestone Dates for Commencement and Completion of the Various Construction Phases and Locations;

(f) Work by Others;

(g) Part 2 of the Work; and

(h) Part 3 of the Work.

D13.6 Further to D13.4(b), the Gantt chart shall show the time on a weekly basis, required to carry out the Work of each trade, or specification division. The time shall be on the horizontal axis, and the type of trade shall be on the vertical axis.

SCHEDULE OF WORK

D14. COMMENCEMENT

D14.1 The Contractor shall not commence any Work until he/she is in receipt of an award letter from the Award Authority authorizing the commencement of the Work.

D14.2 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 D5.2.

(iv) the Safe Work Plan specified in D9;

(v) the Pedestrian and Cyclist Accessibility Plan specified in E2;

(vi) evidence of the insurance specified in D10 including all **subcontractors** with the City and Manitoba and its Ministers, officers, employees and agents added as additional insureds, including a cross liability clause;

(vii) the contract security specified in D11;

(viii) the subcontractor list specified in D12;

(ix) the detailed work schedule specified in D13; and

(x) the direct deposit application form specified in D30.

(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.

D14.3 The Contractor shall commence the Work on the Site April 18, 2022 or within seven (7) Working Days of the Contract Administrator determining that seasonal conditions are satisfactory for construction to commence.

D14.4 The Contractor shall not commence Part 2 of the Work as described in D3 and identified in Form B: Prices, unless prior to the receipt of the Award Letter, he/she has received notification from the Contract Administrator that the City has received notice of sufficient funding from Manitoba Hydro.

D14.5 The City intends to award this Contract by March 11, 2022.

D14.5.1 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.

D15. WORKING DAYS

D15.1 Further to C1.1(tt);

D15.1.1 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.

D15.1.2 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.

D15.1.3 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.

D16. RESTRICTED WORK HOURS

D16.1 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.

D17. WORK BY OTHERS

D17.1 Work by others on or near the Site will include but not necessarily be limited to:

(a) Winnipeg Transit – removal and reinstallation of bus shelters; operation of bus routes;

(b) City of Winnipeg Traffic Signals – Traffic Signals Branch will be responsible for all cabling and erection of above ground plant. The Contractor is responsible for co-ordinating removal of above ground plant and cabling to facilitate the installation of the underground plant. The Contractor must coordinate with Traffic Signals such that the signal operations at the intersection are maintained except where permitted by Contract Administrator and Traffic Signals Branch. This may result in the Work being completed in multiple stages.

(c) Manitoba Hydro Gas Division – lowering and/or rock wrapping of underground main and services as required; adjustment of impacted gas valves.

(d) Manitoba Hydro Underground Power – repairs or upgrades required for existing vaults or ductlines within the project limits; adjustment of manhole(s) frames and covers as required.

(e) Manitoba Hydro – electrical supply and inspection of new street lighting hardware (to be installed by Contractor) and energizing of the new street lighting.

(f) BellMTS – adjustment of manhole(s) frames as required.

(g) Telus – adjustment of manhole(s) frames as required.

(h) Zayo – adjustment of manhole(s) frames as required.

(i) Shaw – adjustment of manhole(s) frames as required.

(j) City of Winnipeg Traffic Services – instructions for installation of traffic signage locations (in accordance with E7) and required line painting.

(k) City of Winnipeg Water and Waste – Investigation of condition of curb stops and watermain valves. Potential emergency repairs to Water and Waste Infrastructure. Sewer Renewals, planned within the Project Area include Sewer Lining in Smith/Navy Way intersection Sewer Contractor will require access to Manholes and Sewer Stabilization in Broadway/Smith intersection (should not have major impact on the work),.

(l) City of Winnipeg Geomatics Branch – various works on survey monuments.

(m) Winnipeg Parking Authority – removal and reinstallation of parking pay stations.

(n) Benchmark Advertising – removal and replacement of garbage and recycling containers.

(o) Canada Post – removal and replacement of mailboxes.

(p) Transit Plus – pick up and drop off customers.

(q) St. Regis Hotel Building Development.

(r) Restoration or redial work required on Areaways throughout the project area by building owners.

(s) 187 Smith Street – Building renovation and sidewalk work – Edison Property Management (204)223-6457.

D17.2 Further to D17.1 the Contractor shall cooperate and coordinate all activities with all parties performing required Work by Others. The Contractor must include the Work by Others identified in D17.1 in their construction schedule as per D13 and accommodate the necessary area on site required for the Work by Others.

D18. CO-OPERATION WITH OTHERS

D18.1 The Contractor's attention is directed to the fact that other Contractors, the personnel of Utilities and the staff of the City may be working within the project limits, approach roadways, adjacent roadways or rights-of-way. The activities of these agencies may coincide with the Contractor's execution of the Work, and it will be the Contractor's responsibility to co-operate to the fullest extent with the other personnel working in the area, and such co-operation is an obligation of the Contractor under the terms of the Contract.

D19. DOWNTOWN EVENTS

D19.1 The Contractor's attention is directed to the fact that several events will be taking place within and adjacent to the project limits, approach roadways, adjacent roadways or rights-of way. The schedule of these events may coincide with the Contractor's execution of the Work, and it will be the Contractor's responsibility to cooperate to the fullest extent and ensure the safety of pedestrians and vehicles within the project area. Such co-operation and attention to safety is an obligation of the Contractor under the terms of the Contract. Due to the uncertainty surrounding Covid-19, these events may not take place. Dates for these events are not yet public. The list of events includes, but is not limited to:

(a) Whiteout Events – Donald Street between St. Mary Avenue and Portage Avenue; Graham Avenue between Hargrave Street and Smith Street;

(b) Pride Vigil – Broadway between Osborne Street and Kennedy Street;

(c) Pride Parade – Broadway between Osborne Street and Kennedy Street;

(d) Burton Cummings Theatre/Odeon Park Events – Smith Street between Ellice Avenue and Notre Dame Avenue;

(e) Downtown Winnipeg Farmers' Market – Edmonton Street between Graham Avenue and Portage Avenue;

(f) Folklorama Kickoff – Memorial Park (Memorial Boulevard between Broadway and St. Mary Avenue;

(g) Manyfest – Broadway between Osborne Street and Edmonton Street;

(h) We Day – Smith Street between Ellice Avenue and Notre Dame Avenue; and

(i) Santa Claus Parade – Portage Avenue between Sherbrooke Street and Main Street.

D20. SEQUENCE OF WORK

D20.1 Further to C6.1, the sequence of work shall be in accordance with the staging drawings specified in E1 and as follows:

D20.1.1 The Work shall be divided into four separate project phases/locations . Each project phase/ location shall be subdivided into stages.

D20.1.2 Working Days for the Contract will commence on April 18, 2022 with the commencement of the Traffic Signals related work and the associated underground work as per D14.3, D21.1(b), D22 and D23.

D20.1.3 Traffic Signals related installations – Smith Street from Midtown Bridge to Graham Avenue including the work at intersections noted in D3.

(a) Prior to commencing the Pavement Rehabilitation and Pavement Reconstruction Work identified in D3.6, all Traffic Signals related installations shall be completed, including the installation of required items by the Contractor, the Contractor co-ordinating the removal of above ground plant and cabling to facilitate the installation of the underground plant, and Traffic Signals Branch completing all cabling and erection of above ground plant to the satisfaction of the Contract Administrator. The Contractor must coordinate with Traffic Signals such that the signal operations at the intersection are maintained except where permitted by the Contract Administrator and Traffic Signals Branch. This may result in the work being completed in multiple stages.

D20.1.4 Concrete Pavement Rehabilitation – Smith Street from Midtown Bridge to Graham Avenue.

(a) Work on Smith Street from Midtown Bridge to Graham Avenue shall commence on May 9, 2022 or once the Contract Administrator has determined that all required Traffic Signals work within the Phase has been completed.

(i) Prior to commencing Stage 1, all manhole repairs, manhole replacements, sewer repairs, sewer connections, catchbasin lead repairs, catchbasin or catchpit installations and all other associated underground work must be completed to the satisfaction of the Contract Administrator. All associated Underground work may commence on April 18, 2022 along with the Traffic Signals related installations, pending approval of the Contractor's proposed lane closures by the Contract Administrator and Traffic Management.

(ii) Asphalt milling of the intersections of Smith/Broadway, Smith/York, and Smith/St. Mary to occur no more than 72 hours prior to final paving of rest of Smith. Milling and placing of asphalt work to take place during off-peak weekday hours or evenings/overnights/weekends. Further time and schedule restrictions may be specified by City of Winnipeg Traffic Management.

(iii) The remaining work described in D3 has been divided into two (2) Stages, see CT-02, CT-03, CT-04, CT-07, CT-08, CT-09 and E7 for details, each Stage must be completed before commencing the next.

D20.1.5 Concrete Pavement Reconstruction – Smith Street from Graham Avenue to Portage Avenue.

(a) Work on Smith Street from Graham Avenue to Portage Avenue shall commence on May 9, 2022 or once the Contract Administrator has determined that all required Traffic Signals work within the Phase has been completed.

(i) Prior to commencing Stage 1, all manhole repairs, manhole replacements, sewer repairs, sewer connections, catchbasin lead repairs, catchbasin or catchpit installations and all other associated underground work must be completed to the satisfaction of the Contract Administrator. All associated Underground work may commence on April 18, 2022 along with the Traffic Signals related installations, pending approval of the Contractor's proposed lane closures by the Contract Administrator and Traffic Management.

(ii) The remaining work described in D3 has been divided into two (2) Stages, see CT-05, CT-10 and E7 for details, each Stage must be completed before commencing the next.

D20.1.6 Concrete Pavement Reconstruction – Smith Street from Portage Avenue to Notre Dame Avenue.

(a) Work on Smith Street from Portage Avenue to Notre Dame Avenue shall commence on June 1, 2022 or once the Contract Administrator has determined that all required Traffic Signals work within the Phase has been completed.

(i) Prior to commencing Stage 1, all manhole repairs, manhole replacements, sewer repairs, sewer connections, catchbasin lead repairs, catchbasin or catchpit installations and all other associated underground work must be completed to the satisfaction of the Contract Administrator.

(ii) The remaining work described in D3 has been divided into two (2) Stages, see CT-05, CT-06, CT-10, CT-11 and E7 for details, each Stage must be completed before commencing the next.

D20.1.7 Immediately following the completion of the asphaltic concrete works, the Contractor shall clean up the Site and remove all plant, surplus material, waste and debris other than that left by the City or other Contractors.

D20.1.8 Placing the topsoil and finished grading of all boulevard and median areas shall be completed prior to commencing construction of asphaltic concrete overlays, including scratch courses.

D21. CRITICAL STAGES

D21.1 The Contractor shall achieve critical stages of the Work in accordance with the following requirements:

(a) Traffic Signals installations as described in D3 and D17 shall be totally performed within twenty-five (25) consecutive Working Days of the commencement of the Work as specified in D14 and B18. Work on this critical stage shall commence on April 18, 2022 or within seven (7) Working Days of the Contract Administrator determining that seasonal conditions are satisfactory for construction to commence, as per D14.

(b) Concrete Pavement Rehabilitation – Smith Street from Midtown Bridge to Graham Avenue as described in D3 and D20 shall be totally performed within seventy-five (75) consecutive Working Days of the commencement of the Concrete Pavement Rehabilitation – Smith Street from the Midtown Bridge to Graham Avenue Critical Stage as specified in D14 and B18. Work on this critical stage shall commence on May 16, 2022 or once the Contract Administrator has determined that all required Traffic Signals work within the project has been completed.

D21.2 When the Contractor considers the Work associated with Traffic Signals Installations and/or Concrete Pavement Rehabilitation – Smith Street from Midtown Bridge to Graham Avenue 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.

D21.3 The date on which the Traffic Signals Installations and/or Concrete Pavement Rehabilitation – Smith Street from Midtown Bridge to Graham Avenue Work has been accepted by the Contract Administrator as being completed to the requirements of the Contract is the date on which completion of Traffic Signals Installations and/or Concrete Pavement Rehabilitation – Smith Street from Midtown Bridge to Graham Avenue has been achieved.

D22. SUBSTANTIAL PERFORMANCE

D22.1 The Contractor shall achieve Substantial Performance within One Hundred and Twenty (120) consecutive Working Days of the commencement of the Work as specified in D14.

D22.2 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.

D22.3 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.

D23. TOTAL PERFORMANCE

D23.1 The Contractor shall achieve Total Performance within One Hundred and Twenty Five (125) consecutive Working Days of the commencement of the Work as specified in D14.

D23.2 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.

D23.3 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.

D24. LIQUIDATED DAMAGES

D24.1 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) Traffic Signals Installations – Two Thousand Five Hundred dollars ($2,500);

(b) Concrete Pavement Rehabilitation – Smith Street from Midtown Bridge to Graham Avenue – Four Thousand dollars ($4,000);

(c) Substantial Performance – Four Thousand dollars ($4,000);

(d) Total Performance – One Thousand Five Hundred dollars ($1,500).

D24.2 The amounts specified for liquidated damages in D24.1 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.

D24.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

D25. COVID-19 SCHEDULE DELAYS

D25.1 The City acknowledges that the schedule for this Contract may be impacted by the COVID-19 pandemic. Commencement and progress of the Work shall be performed by the Contractor with due consideration to the health and safety of workers and the public, directives from health authorities and various levels of government and in close consultation with the Contract Administrator.

D25.2 If the Contractor is delayed in the performance of the Work by reason of the COVID-19 pandemic, the Work schedule may be adjusted by a period of time equal to the time lost due to such delay and costs related to such delay will be determined as identified herein.

D25.3 A minimum of seven (7) Calendar Days prior to the commencement of Work, the Contractor shall declare whether COVID-19 will affect the start date. The Contractor shall provide sufficient evidence that the delay is directly related to COVID-19, including but not limited to evidence related to availability of staff, availability of Material or work by others.

D25.4 For any delay related to COVID-19 and identified after Work has commenced, the Contractor shall within seven (7) Calendar Days of becoming aware of the anticipated delay declare the additional delay and shall provide sufficient evidence as indicated in D25.3. Failure to provide this notice will result in no additional time delays being considered by the City.

D25.5 The Work schedule, including the durations identified in D16 to D23 where applicable, will be adjusted to reflect delays accepted by the Contract Administrator. No additional payment will be made for adjustment of schedules except where seasonal work, not previously identified in the Contract, is carried over to the following construction season.

D25.6 Where Work not previously identified is being carried over solely as a result of delays related to COVID-19, as confirmed by the Contract Administrator, the cost of temporary works to maintain the Work in a safe manner until Work recommences, will be considered by the Contract Administrator. Where the Work is carried over only partially due to COVID-19, a partial consideration of the cost of temporary works will be considered by the Contract Administrator.

D25.7 Any time or cost implications as a result of COVID-19 and in accordance with the above, as confirmed by the Contract Administrator, shall be documented in accordance with C7.

D26. SCHEDULED MAINTENANCE

D26.1 The Contractor shall perform the following scheduled maintenance in the manner and within the time periods required by the Specifications:

(a) Reflective Crack Maintenance as specified in CW3250;

(b) General Maintenance of Plant Material as specified in E39;

(c) Sod and Seed Maintenance as specified in CW3510.

D26.2 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

D27. JOB MEETINGS

D27.1 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.

D27.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he/she deems it necessary.

D28. PRIME CONTRACTOR – THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA)

D28.1 Further to C6.26, the Contractor shall be the Prime Contractor and shall serve as, and have the duties of the Prime Contractor in accordance with The Workplace Safety and Health Act (Manitoba).

D29. THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA) – QUALIFICATIONS

D29.1 Further to B12.4, the Contractor/Subcontractor must, throughout the term of the Contract, have a Workplace Safety and Health Program meeting the requirements of The Workplace Safety and Health Act (Manitoba). At any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require updated proof of compliance, as set out in B12.4.

MEASUREMENT AND PAYMENT

D30. PAYMENT

D30.1 Further to C12, the City shall make payments to the Contractor by direct deposit to the Contractor's banking institution, and by no other means. Payments will not be made until the Contractor has made satisfactory direct deposit arrangements with the City. Direct deposit application forms are at https://winnipeg.ca/finance/files/Direct_Deposit_Form.pdf.

WARRANTY

D31. WARRANTY

D31.1 Notwithstanding C13.2, the warranty period shall begin on the date of Substantial Performance and shall expire one (1) years thereafter for Pavement Rehabilitation – Smith Street from Midtown Bridge to Graham Avenue , and two (2) years thereafter for pavement reconstruction works, unless extended pursuant to C13.2.1 or C13.2.2, in which case it shall expire when provided for thereunder.

D31.2 Notwithstanding C13.2, the warranty period for the Green Bike Lane Treatment shall begin on the date that the Green Bike Lane Treatment is accepted as completed by the Contract Administrator and shall expire two (2) years thereafter for the Green Bike Lane Treatment, unless extended pursuant to C13.2.1 or C13.2.2, in which case it shall expire when provided for thereunder.

THIRD PARTY AGREEMENTS

D32. FUNDING AND/OR CONTRIBUTION AGREEMENT OBLIGATIONS

D32.1 Funding for the Work of the Contract is being provided to the City of Winnipeg by the Government of Manitoba and/or the Government of Canada and accordingly, as required by the applicable funding agreements, the following terms and conditions shall apply.

D32.2 For the purposes of D32:

(a) **"Government of Canada"** includes the authorized officials, auditors, and representatives of the Government of Canada; and

(b) **"Government of Manitoba"** includes the authorized officials, auditors, and representatives of the Government of Manitoba.

D32.3 Indemnification By Contractor

D32.3.1 In addition to the indemnity obligations outlined in C17 of the General Conditions for Construction, the Contractor agrees to indemnify and save harmless the Government of Canada and the Government of Manitoba and each of their respective Ministers, officers, servants, employees, and agents from and against all claims and demands, losses, costs, damages, actions, suit or other proceedings brought or pursued in any manner in respect of any matter caused by the Contractor or arising from this Contract or the Work, or from the goods or services provided or required to be provided by the Contractor, except those resulting from the negligence of any of the Government of Canada's or the Government of Manitoba's Ministers, officers, servants, employees, or agents, as the case may be.

D32.4 Records Retention and Audits

D32.4.1 The Contractor shall maintain and preserve accurate and complete records in respect of this Contract and the Work, including all accounting records, financial documents, copies of contracts with other parties and other records relating to this Contract and the Work during the term of the Contract and for at least six (6) years after Total Performance. Those records bearing original signatures or professional seals or stamps must be preserved in paper form; other records may be retained in electronic form.

D32.4.2 In addition to the record keeping and inspection obligations outlined in C6 of the General Conditions for Construction, the Contractor shall keep available for inspection and audit at all reasonable times while this Contract is in effect and until at least six (6) years after Total Performance, all records, documents, and contracts referred to in D32.4.1 for inspection, copying and audit by the City of Winnipeg, the Government of Manitoba and/or the Government of Canada and their respective representatives and auditors, and to produce them on demand; to provide reasonable facilities for such inspections, copying and audits, to provide copies of and extracts from such records, documents, or contracts upon request by the City of Winnipeg, the Government of Manitoba, and/or the Government of Canada and their respective representatives and auditors, and to promptly provide such other information and explanations as may be reasonably requested by the City of Winnipeg, the Government of Manitoba, and/or the Government of Canada from time-to-time.

D32.5 Other Obligations

D32.5.1 The Contractor consents to the City providing a copy of the Contract Documents to the Government of Manitoba and/or the Government of Canada upon request from either entity.

D32.5.2 If the Lobbyists Registration Act (Manitoba) applies to the Contractor, the Contractor represents and warrants that it has filed a return and is registered and in full compliance with the obligations of that Act, and covenants that it will continue to comply for the duration of this Contract.

D32.5.3 The Contractor shall comply with all applicable legislation and standards, whether federal, provincial, or municipal, including (without limitation) labour, environmental, and human rights laws, in the course of providing the Work.

D32.5.4 The Contractor shall properly account for the Work provided under this Contract and payment received in this respect, prepared in accordance with generally accepted accounting principles in effect in Canada, including those principles and standards approved or recommended from time-to-time by the Chartered Professional Accountants of Canada or the Public Sector Accounting Board, as applicable, applied on a consistent basis.

D32.5.5 The Contractor represents and warrants that no current or former public servant or public office holder, to whom the Value and Ethics Code for the Public Sector, the Policy on Conflict of Interest and Post Employment, or the Conflict of Interest Act applies, shall derive direct benefit from this Contract, including any employment, payments, or gifts,

unless the provision or receipt of such benefits is in compliance with such codes and the legislation.

D32.5.6 The Contractor represents and warrants that no member of the House of Commons or of the Senate of Canada or of the Legislative Assembly of Manitoba is a shareholder, director or officer of the Contractor or of a Subcontractor, and that no such member is entitled to any benefits arising from this Contract or from a contract with the Contractor or a Subcontractor concerning the Work.

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

TENDER NO. 620-2021

Downtown Pavement Renewal Project – 2022 Pavement Renewals: Smith Street
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: LABOUR AND MATERIAL PAYMENT BOND
(See D11)

KNOW ALL MEN BY THESE PRESENTS THAT

_____
his/its heirs, executors, administrators, successors or assigns (hereinafter called the "Principal"), and

_____ ,
his/its heirs, executors, administrators, successors or assigns (hereinafter called the "Surety"), are held and firmly bound unto **THE CITY OF WINNIPEG** (hereinafter called the "Obligee"), for the use and benefit of claimants as herein below defined, in the amount of

_____

_____ dollars ($_____.____)

of lawful money of Canada, for the payment whereof we, the Principal and the Surety jointly and severally bind ourselves firmly by these presents.

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

TENDER NO. 620-2021

Downtown Pavement Renewal Project – 2022 Pavement Renewals: Smith Street

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 promptly make payment to all claimants as hereinafter defined, for all labour, service and material used or reasonably required for use in the performance of the Contract, then this obligation shall be void, otherwise it shall remain in full force and effect subject, however, to the following conditions:

(a) A claimant is defined as one having a direct contract with the Principal for labour, service and material, or any of them, used or reasonably required for use in the performance of the contract, labour, service and material being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental of equipment (but excluding rent of equipment where the rent pursuant to an agreement is to be applied towards the purchase price thereof) directly applicable to the Contract;

(b) The above-named Principal and Surety hereby jointly and severally agree with the Obligee that every claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant’s work, labour or service was done or performed, or materials were furnished by such claimant, may sue on this bond, prosecute the suit to final judgment for such sum or sums as may be justly due claimant, and have execution thereon;

(c) No suit or action shall be commenced hereunder by any claimant

    (i) unless claimant shall have given written notice to the Principal and the Surety above-named, within one hundred and twenty (120) days after such claimant did or performed the last of the work, labour or service, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the work, labour or service was done or performed. Such notice shall be served by mailing the same by registered mail to the Principal, and Surety, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the Province of Manitoba;

(ii) after the expiration of one (1) year following the date on which Principal ceased work on said Contract; including work performed under the guarantees provided in the Contract;

(iii) other than in a court of competent jurisdiction in the Province of Manitoba.

(d) The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of mechanics liens which may be filed of record against said improvement, whether or not claim for the amount of such lien be presented under and against this bond.

(e) The Surety shall not be liable for a greater sum than the specified penalty of this bond.

The Principal and Surety hereby agree that The Guarantors' Liability Act (Manitoba) shall apply to this Bond.

IN TESTIMONY WHEREOF, the Principal has hereunto set its hand affixed its seal, and the Surety has caused these presents to be sealed and with its corporate seal duly attested by the authorized signature of its signing authority this

_____ 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 J: SUBCONTRACTOR LIST
(See D12)

Downtown Pavement Renewal Project – 2022 Pavement Renewals: Smith Street

Portion of the Work	Name	Address
SURFACE WORKS:		
Supply of Materials:		
Concrete		
Asphalt		
Base Course & Sub-Base		
Sod		
Bollards		
Installation/Placement:		
Geotextile Fabrics		
Concrete		
Asphalt		
Base Course & Sub-Base		
Street Lighting		
Sod/Seed/Plant Material		
Bollards		
Tree Grates		
Silva Cells		
Joint Sealant		
Green Bike Lane Treatment		
UNDERGROUND WORKS:		
Supply of Materials:		
Sewer Service Pipe/Land Drainage Pipe		
Subdrains		
Catchbasins/Catchpits/Manholes		
Installation/Placement:		
Catchbasins/Catchpits/Manholes and Associated Works		

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 Tender shall govern over *The City of Winnipeg Standard Construction Specifications*.

E1.3 Bidders are reminded that requests for approval of substitutes as an approved equal or an approved alternative shall be made in accordance with B6. In every instance where a brand name or design specification is used, the City will also consider approved equals and/or approved alternatives in accordance with B6.

E1.4 The following are applicable to the Work:

Drawing No.	Drawing Name/Title	Drawing (Original) Sheet Size
CT-00	Cover Page and Location Plan	A1
CT-01	General Arrangement and Drawing Index	A1
CT-02	Smith Street – Rehabilitation Midtown Bridge/Navy Way to Station 0+170 Stage 1	A1
CT-03	Smith Street – Rehabilitation Station 0+170 to Station 0+490 Stage 1	A1
CT-04	Smith Street – Rehabilitation Station 0+490 to Station 0+810 Stage 1	A1
CT-05	Smith Street – Reconstruction Station 0+810 to Station 1+130 Stage 1	A1
CT-06	Smith Street – Reconstruction Station 1+130 to Notre Dame Avenue Stage 1	A1
CT-07	Smith Street – Rehabilitation Midtown Bridge/Navy Way to Station 0+170 Stage 2	A1
CT-08	Smith Street – Rehabilitation Station 0+170 to Station 0+490 Stage 2	A1
CT-09	Smith Street – Rehabilitation Station 0+490 to Station 0+810 Stage 2	A1
CT-10	Smith Street – Reconstruction Station 0+810 to Station 1+130 Stage 2	A1
CT-11	Smith Street – Reconstruction Station 1+130 to Notre Dame Avenue Stage 2	A1
CT-12	Smith Street – Navy Way and Smith Street	A1
CT-13	Smith Street – Station 0+780 to Station 1+000	A1
CT-14	Smith Street – Station 1+000 to Notre Dame Avenue	A1
CT-15	Smith Street – Midtown Bridge to Station 0+170	A1
CT-16	Smith Street – Station 0+170 to Station 0+300	A1
CT-17	Smith Street – Station 0+300 to Station 0+420	A1
CT-18	Smith Street – Station 0+420 to Station 0+550	A1
CT-19	Smith Street – Station 0+550 to Station 0+670	A1

Drawing No.	Drawing Name/Title	Drawing (Original) Sheet Size
CT-20	Smith Street – Station 0+670 to Station 0+770	A1
CT-21	Smith Street – Station 0+770 to Station 0+900	A1
CT-22	Smith Street – Station 0+900 to Station 1+030	A1
CT-23	Smith Street – Station 1+030 to Station 1+160	A1
CT-24	Smith Street – Station 1+160 to Notre Dame Avenue	A1
CT-25	Smith Street – Bollard Location Plan	A1
CT-26	Miscellaneous Details and Sections	A1
CT-27	Miscellaneous Details and Sections	A1
S-2117	Traffic Signals – Smith and Navy	A1
S-1275	Traffic Signals – Smith and Broadway	A1
S-1580	Traffic Signals – Smith and York	A1
S-1560	Traffic Signals – Smith and St. Mary	A1
S-1392	Traffic Signals – Smith and Graham	A1
S-1714	Traffic Signals – Smith and Portage	A1
S-1125	Traffic Signals – Smith and Ellice	A1
S-1010	Traffic Signals – King and Notre Dame	A1
1-04707-DE-50000-0574-1	Manitoba Hydro – Smith Streetlighting – Sheet 1	A1
1-04707-DE-50000-0574-2	Manitoba Hydro – Smith Streetlighting – Sheet 2	A1
1-04707-DE-50000-0574-3	Manitoba Hydro – Smith Streetlighting – Sheet 3	A1

E2. SITE REQUIREMENTS FOR ACCESSIBILITY

E2.1 The Contractor shall provide the Contract Administrator with an Accessibility 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 Documents, if applicable.

E2.2 The Accessibility Plan shall demonstrate how the Contractor will accommodate the safe passage of pedestrians and cyclists in accordance with the Manual of Temporary Traffic Control, the Contract Drawings, Staging Plans, and Streets By-Law No. 1481/77 at all times for the duration of the Construction. Unless noted in the Contract, the Accessibility Plan must include a written plan for the following:

(a) How the Contractor will maintain at least one crossing in each direction for each intersection (one north/south crosswalk and one east/west crosswalk).

(b) How the Contractor will maintain access to bus stops within the Site.

(c) How the Contractor will maintain access to pedestrian corridors and half signals.

(d) How the Contractor will maintain cycling facilities.

(e) How the Contractor will maintain access to residents and businesses unless otherwise noted in the Contract.

(f) Any required detour signage at adjacent crossings to facilitate sidewalk or active transportation pathway closures.

E2.3 The Accessibility Plan may also include figures, sketches, or drawings to demonstrate the proposed plan.

E2.4 The Accessibility Plan shall include written details on how the Contractor intends to review, maintain and document all items related to the Accessibility Plan on-site during construction, including but not limited to:

(a) Signage

(b) Temporary Ramping

(c) Transit Stops

(d) Detour Signage.

E2.5 At minimum, the Contractor shall review the site conditions on a daily basis to ensure all the features related to the Accessibility Plan are in place. The site review is intended to correct deficiencies as a result of unforeseen events such as wind, traffic, or the general public. Deficiencies that are a direct result of the Contractor's actions must be corrected immediately.

E2.6 Any changes to the Accessibility Plan must be approved by the Contract Administrator.

E2.7 Upon request from the Contract Administrator, the Contractor shall provide records demonstrating that the Site has been maintained.

E2.8 Failure to produce records that demonstrate that the Site was maintained in compliance with the Accessibility Plan or deficiencies as a direct result of actions by the Contractor that are not immediately corrected may result in a pay adjustment. The rate of pay adjustment will be as per the following schedule:

(a) First Offence – a warning will be issued and documented in the weekly site meeting.

(b) Second Offence – a field instruction to immediately correct the Site will be issued by the Contract Administrator.

(c) Third and Subsequent Offences – a pay reduction will be issued in the amount of $250.00.

E3. MOBILIZATION AND DEMOBILIZATION PAYMENT

DESCRIPTION

E3.1 This Specification shall cover all operations relating to the mobilization and demobilization of the Contractor to the project location(s).

E3.2 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.

E3.3 The inclusion of a payment item for the Work under this Specification shall not release or reduce the responsibilities of the Contractor under any other specification in this Contract.

SCOPE OF WORK

E3.4 Further to C12 of the General Conditions, where Mobilization and Demobilization is included as a bid item, it shall consist of the following, as applicable:

(a) Mobilization shall include, but not be limited to:

(i) All activities and associated costs for transportation of the Contractor's personnel, equipment, and operating supplies to the site, and/or sites, and/or between sites;

(ii) Establishment of offices, buildings, other necessary general facilities and equipment parking/staging areas for the Contractor's operations at the site or sites;

(iii) Premiums paid for performance and payment bonds including coinsurance and reinsurance agreements as applicable;

(iv) General cleanup and housekeeping needed maintain a neat and orderly project site and/or sites;

(v) Development and implementation of the Accessibility Site Plan as per E2;

(vi) Other job related items.

(b) Demobilization shall include, but not be limited to:

(i) All activities and costs for transportation of personnel, equipment, and supplies not used in the project from the site, and/or sites, and/or between sites;

(ii) Disassembly, removal, and site cleanup and restoration of offices, buildings, and other facilities assembled on the site and/or sites;

(iii) Repair of access roads, temporary haul roads, and equipment parking areas leaving the project site in the same or better condition than at the start of the project;

(iv) General cleanup and housekeeping needed to restore a neat and orderly project site.

(v) Monitoring, maintenance and reporting of the Accessibility Site Plan as per E2.

E3.5 Access to the site, equipment parking, and staging areas are limited to that shown on the drawings or as approved by the Contract Administrator.

MEASUREMENT AND PAYMENT

E3.6 The lump-sum price for the Mobilization and Demobilization bid item shall not exceed five percent (5.00%) of the total bid price for the Contract.

E3.6.1 Further to B9, B17, C12 and E3.6, should the lump sum price exceed 5% of the Total Bid Price the lump sum price will be reduced to 5% of the Total Bid Price, the Total Bid Price will be determined using the reduced lump sum price and payment will be based on the reduced lump sum price.

E3.7 Payment for Mobilization:

(a) 60% of the lump-sum price will be paid to the contractor for Mobilization on the first Progress Estimate for the Contract.

E3.8 Payment for Demobilization:

(a) The remaining 40% of the lump-sum price will be paid upon:

(i) Restoration of the site and/or sites to the satisfaction of the Contract Administrator;

(ii) Distribution of the Declaration of Total Performance.

E3.9 Pay Reduction for Accessibility Site Plan

(a) The Demobilization payment will be reduced by the number of pay adjustments incurred in accordance with E2 and as determined by the Contract Administrator.

E3.10 Mobilization and Demobilization will be paid only once (to a maximum of 100%), regardless of the number of times the Contractor mobilizes to the site and/or sites.

E4. GEOTECHNICAL REPORT

E4.1 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 'G'.

E5. OFFICE FACILITIES

E5.1 The Contractor shall supply office facilities meeting the following requirements:

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

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

(c) The building shall have a minimum floor area of 25 square metres, a height of 2.4m with two windows for cross ventilation and a door entrance with a suitable lock.

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

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

(f) The building shall be furnished with one desk, table 3m x 1.2m, one stool, and a minimum of 12 chairs.

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

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

E5.2 The Contractor shall be responsible for all installation and removal costs, all operating costs, and the general maintenance of the office facilities.

E5.3 The office facilities will be provided from the date of the commencement of the Work to the date of Substantial Performance.

E5.4 On a one time basis, where directed by the Contract Administrator, the Contractor shall relocate the office facilities to a location more convenient for the remaining Work.

E6. PROTECTION OF EXISTING TREES

E6.1 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.

E6.2 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.

E6.3 No separate measurement or payment will be made for the protection of trees.

E6.4 Except as required in clause E6.1(c) and E6.1(e), Elm trees shall not be pruned at any time between April 1 and July 31.

E7. TRAFFIC CONTROL

E7.1 Further to clauses 3.6, 3.7 and 3.8 of CW 1130:

(a) Where directed by the Contract Administrator, 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 on City Streets (MTTC), the Contractor ("Construction Agency" in the manual) shall be responsible for supplying, placing, maintaining and removing the appropriate temporary traffic control devices as specified by the MTTC, the Contract Drawings, Staging Plans and Traffic Management Plans or by the Traffic Management Branch of the City of Winnipeg Public Works Department. The Contractor shall bear all costs associated with the supply, placement and maintenance of temporary traffic control devices by their own forces or subcontractor.

(c) In addition, the Contractor shall be responsible for removing, placing, and maintaining all regulatory signing but not limited to:

(i) Parking restrictions;

(ii) Stopping restrictions;

(iii) Turn restrictions;

(iv) Diamond lane removal;

(v) Full or directional closures on a Regional Street;

(vi) Traffic routed across a median; and

(vii) Full or directional closure of a non-regional street where there is a requirement for regulatory signs (turn restrictions, bus stop relocations, etc.) to implement the closure.

(d) The Contractor shall remove and stockpile any regulatory signage not required during construction such as but not limited to parking restrictions, turn restrictions and loading restrictions.

E7.2 Further to E7.1(c) the Contractor shall make arrangement with the Traffic Services Branch of the City of Winnipeg to supply regulatory signs as required.

E7.3 Upon request from the Contract Administrator, the Contractor shall provide records demonstrating that the site has been maintained.

E7.4 Further to E7.1(c) and E7.1(d) the Contractor shall make arrangements with the Traffic Services Branch of the City of Winnipeg to reinstall the permanent regulatory signs after the contract work is complete. At this time the Contractor shall make arrangements to drop off the stockpiled materials to Traffic Services at 495 Archibald Street.

E7.5 Any changes to the approved Traffic Management Plan must be submitted to the Contract Administrator a minimum of five (5) Working Days prior to the required change for approval.

E7.6 If the Contract Administrator determines that the Contractor is not performing Traffic Control in accordance with this specification, Traffic Services may be engaged to perform the Traffic Control and the Contractor shall bear the costs associated by Traffic Services Branch of the City of Winnipeg in connection with the works undertaken by the Contractor.

E8. TRAFFIC MANAGEMENT

E8.1 Further to clause 3.7 of CW 1130:

(a) Single lane closures on intersecting and/or adjoining streets shall only be permitted for construction activities when approved by the Traffic Management Branch. Traffic Management Branch may limit the closures to off peak hours only. Storage/parking of materials, equipment or vehicles is not permitted on Regional Streets at any time unless approved by the Contract Administrator, in consultation with the Traffic Management Branch.

E8.1.1 Pavement Rehabilitation – Smith Street from the Mid Town Bridge to Graham Avenue

(a) Prior to commencing any other Work all Traffic Signals related installations must be completed including the installation of required items by the Contractor, the Contractor

coordinating the removal of above ground plant and cabling to facilitate the installation of the underground plant, and Traffic Signals Branch completing all cabling and erection of above ground plant. The Contractor must coordinate with Traffic Signals such that the signal operations at the intersection are maintained except where permitted by Contract Administrator and Traffic Signals Branch. This may result in the work being completed in multiple stages. During this work maintain a minimum of one lane of northbound traffic, Traffic Management may specify that two lanes will need to be maintained during peak hours. When no work is being performed on site, non-essential lane closures will not be permitted. During this Work, Parking and Loading Zones will only be restricted if necessary.

(b) Prior to commencing Stage 1 the Underground works are to be completed. During this work maintain a minimum of one lane of northbound traffic, Traffic Management may specify that two lanes will need to be maintained during peak hours. When no work is being performed on site, non-essential lane closures will not be permitted. During this Work, Parking and Loading Zones will only be restricted if necessary.

(c) The required work during Stage 1 includes but is not limited to planning of existing asphalt material, concrete joint/slab repairs, replacement of existing catch basins and catch basin leads, adjustments of manholes/appurtenances, renewal of existing curbs, construction of sidewalk c/w paving stone band, installation of detectable warning tiles and placement of asphalt overlay. During Stage 1 the Work will take place in the east gutter and adjacent lane. The Contractor shall maintain the lanes of northbound traffic as per the staging drawings. Parking and Loading Zones will be restricted to complete this work. See drawing CT-02, CT-03 and CT-04 for additional staging details.

  (i) During Stage 1 the Contractor shall maintain bus stops in the existing locations, as per MTTC the stops must be fully accessible throughout construction through the use of loading ramps.

(a) The required work during Stage 2 includes but is not limited to planning of existing asphalt material, concrete joint/slab repairs, replacement of existing catch basins and catch basin leads, adjustments of manholes/appurtenances, renewal of existing curbs, construction of sidewalk c/w paving stone band, installation of detectable warning tiles and placement of asphalt overlay. During Stage 2 the Work will take place in the west gutter and adjacent lane. The Contractor shall maintain the lanes of northbound traffic as per the staging drawings. Parking and Loading Zones will be restricted to complete this work. See drawing CT-07, CT-08 and CT-09 for additional staging details.

  (i) During Stage 2 the Contractor shall maintain bus stops in the existing locations along the east curb.

(e) Stage construction on Smith Street to maintain 2 lanes of though traffic and all turning movements in the intersections of Smith/Broadway, Smith/York and Smith/St. Mary.

(f) The Contractor shall install and maintain proper advance warning and lane closure signage for each Stage upstream of the Mid Town Bridge limit for northbound traffic.

(g) During all stages, Winnipeg Transit bus movements need to be maintained. Any disruptions will require the approval of Winnipeg Transit and the Contract Administrator. The Contractor shall accommodate the area necessary for Winnipeg Transit operate their regular routes, any required work that interferes with Transit bus movements shall be completed over a weekend.

(h) Contractor shall maintain turns on to the maximum extent possible as directed by the Contract Administrator.

(i) The Contractor shall maintain access to all side streets, lanes and private approaches at all times, any disruptions require approval from the contract administrator and the Contractor must advise the property owner.

(j) The Contractor shall maintain pedestrian crossings at the current locations or with temporary asphalt ramps at all side streets beyond the construction limits.

(k) The Contractor shall maintain longitudinal pedestrian access along both sides of Smith Street at all times.

(l) The Contractor shall have flag persons upstream at all side street intersections during asphalt paving and when moving any construction vehicle in or out of traffic.

(m) The Contractor shall install and maintain signage in accordance with the Manual of Temporary Traffic Control and as per the Staging drawings.

E8.1.2 Concrete Pavement Reconstruction – Smith Street from Graham Avenue to Notre Dame Avenue

(a) Prior to commencing any other Work all Traffic Signals related installations must be completed including the installation of required items by the Contractor, the Contractor coordinating the removal of above ground plant and cabling to facilitate the installation of the underground plant and Traffic Signals Branch completing all cabling and erection of above ground plant. The Contractor must coordinate with Traffic Signals such that the signal operations at the intersection are maintained except where permitted by Contract Administrator and Traffic Signals Branch. This may result in the work being completed in multiple stages. During this work maintain a minimum of one lane of northbound traffic, Traffic Management may specify that two lanes will need to be maintained during peak hours. When no work is being performed on site, non-essential lane closures will not be permitted. During this Work, Parking and Loading Zones will only be restricted if necessary.

(b) Prior to commencing Stage 1 the Underground works are to be completed. During this work maintain a minimum of one lane of northbound traffic, Traffic Management may specify that two lanes will need to be maintained during peak hours. When no work is being performed on site, non-essential lane closures will not be permitted. During this Work, Parking and Loading Zones will only be restricted if necessary.

(c) During Stage 1 maintain one lane of northbound traffic with poly posts protecting a 1.3 m Work Zone Buffer. See drawing CT-05 and CT-06 for additional staging details.

(d) During Stage 2 maintain two lanes of northbound traffic with poly posts protecting the construction area. See drawing CT-10 and CT-11 for additional staging details. The Contractor will be allowed off peak closure of an additional lane during concrete placement.

(e) Stage construction on Smith Street to maintain 2 lanes of though traffic and all turning movements at the Smith intersections of Broadway, York and St Mary's.

(f) During all stages, Winnipeg Transit bus movements need to be maintained. Any disruptions will require the approval of Winnipeg Transit and the Contract Administrator. The Contractor shall accommodate the area necessary for Winnipeg Transit operate their regular routes, any required work that interferes with Transit bus movements shall be completed over a weekend.

(g) At the Smith intersection of Graham Avenue and Ellice Avenue The Contractor shall maintain pedestrian corridor utilizing pedestrian channelization in order to maintain a minimum of one east/west pedestrian crossing at all times in each intersection. Construct temporary asphalt ramps to accommodate pedestrian traffic as necessary.

(h) The Contractor shall install and maintain proper advance warning and lane closure signage for each Stage upstream of the Mid Town Bridge limit for northbound traffic.

(i) The Contractor shall maintain access to all side streets, lanes and private approaches at all times, any disruptions require approval from the contract administrator and the Contractor must advise the property owner.

(j) The Contractor shall maintain pedestrian crossings at the current locations or with temporary asphalt ramps at all side streets beyond the construction limits.

(k) The Contractor shall maintain longitudinal pedestrian access along both sides of Smith Street at all times either on existing sidewalk or utilizing pedestrian channelization on newly constructed roadway.

(l) The Contractor shall install and maintain signage in accordance with the Manual of Temporary Traffic Control and as per the Staging drawings.

(m) The Contractor shall install and maintain proper advance warning and lane closure signage for each Stage upstream of the Broadway limit for northbound traffic.

(n) The Contractor shall maintain access to all side streets, lanes and private approaches at all times, any disruptions require approval from the contract administrator and the Contractor must advise the property owner.

E8.1.3 Private approach construction shall be staged to maintain access to private lots and businesses at all times. 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.

E8.1.4 The Contractor shall have flag persons necessary to maintain the flow of traffic during certain work operations.

E8.1.5 Ambulance/emergency vehicle access must be maintained at all times.

E9. REFUSE AND RECYCLING COLLECTION

E9.1 Contractor shall maintain back lane and private lot access and coordinate with private refuse and/or recycling collection vehicles. If 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, 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.

E10. PEDESTRIAN SAFETY

E10.1 During the project, Concrete Reconstruction on Smith Street from Graham Avenue to Notre Dame Avenue, a temporary snow fence shall be installed adjacent to pedestrian traffic along the edge of excavation. 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.

E11. WATER OBTAINED FROM THE CITY

E11.1 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.

E12. SURFACE RESTORATIONS

E12.1 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 complete all surface restorations required to restore the facility to its design and restore full capacity of the facility 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 Work is completed. The Contractor shall bear all costs associated with temporary repairs and their maintenance. The costs may include but shall not be limited to temporary paving work, temporary roads, sidewalks, active transportation/cycling facilities, Winnipeg Parking Authority charges related to loss of parking revenue and all traffic signing costs including those of Traffic Services.

E13. INFRASTRUCTURE SIGNS

E13.1 The Contractor shall obtain infrastructure signs from the Central Stores at 1277 Pacific Avenue. 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

E14. SUPPLY AND INSTALLATION OF PAVEMENT REPAIR FABRIC

DESCRIPTION

E14.1 General

E14.1.1 This specification covers the supply and installation of pavement repair fabric.

E14.1.2 Referenced Standard Construction

(a) CW 3130 – Supply and Installation of Geotextile Fabrics.

MATERIALS

E14.2 Storage and Handling

E14.2.1 Store and handle material in accordance with Section 2 of CW 3130.

E14.3 Pavement Repair Fabric

E14.3.1 Pavement repair fabric will be Glas Grid Road Reinforcement Mesh - Style 8501.

CONSTRUCTION METHODS

E14.4 General

E14.4.1 Install pavement repair fabric at random locations as directed by the Contract Administrator.

E14.4.2 The extent of the placement limits and quantities required will be determined by the Contract Administrator and provided 48 hours prior to the placement of asphalt.

E14.4.3 Proceed with installation upon completion and acceptance of the asphalt levelling course.

E14.4.4 Install fabric in accordance with the manufacturer's specifications and recommendations.

E14.4.5 Only construction equipment required to place the final asphalt surface course will be allowed to travel on the exposed fabric.

E14.4.6 Replace damaged or improperly placed fabric.

E14.4.7 Ensure temperature of the asphalt material does not exceed the melting point of the fabric.

MEASUREMENT AND PAYMENT

E14.5 Pavement Repair Fabric

E14.5.1 The supply and installation of the pavement repair fabric will be measured on an area basis and paid for at the Contract Unit Price per square metre for "Pavement Repair Fabric". The area to be paid for will be the total number of square metres of pavement repair fabric supplied and installed in accordance with this specification, accepted and measured by the Contract Administrator.

E15. SALT TOLERANT GRASS SEEDING

DESCRIPTION

E15.1 Further to CW 3520 and CW3540, this specification shall cover sub-grade preparation and the supply and placement of Salt Tolerant Grass Seed.

MATERIALS

E15.2 Salt Tolerant Grass Seed

E15.2.1 Salt Tolerant Grass Seed for regional and collector boulevards, medians and interchange areas shall be a mixture composed of:

(a) Seventy percent (70%) Fults or Nuttals Alkaligrass (Puccinellia spp.), twenty percent (20%) Audubon or Aberdeen Creeping Red Fescue and ten percent (10%) Perennial Ryegrass.

EQUIPMENT

E15.3 Scarification equipment shall be suitable for the area being scarified, shall be capable of scarifying the sub-grade to the specified depth and shall be accepted by the Contract Administrator. For confined areas a toothed bucket may be acceptable. For larger areas tilling equipment may be required.

CONSTRUCTION METHODS

E15.4 Preparation of Existing Grade

E15.4.1 Prior to placing topsoil, in areas to be seeded greater in width than 600mm, prepare the existing sub-grade by scarifying to a minimum depth of 75mm and to a maximum depth of 100mm to the satisfaction of the Contract Administrator.

E15.4.2 Scarification shall consist of breaking up and loosening the sub-grade. No scarification shall occur within the edge of a tree canopy (or drip line).

E15.5 Salt Tolerant Grass Seeding

E15.5.1 Salt Tolerant Grass Seed shall be sown at a rate of 2.2 kilograms per 100 square meters.

MEASUREMENT AND PAYMENT

E15.6 Supply, placement and maintenance of Salt Tolerant Grass Seed will be paid for at the Contract Unit Price per square metre for "Salt Tolerant Grass Seeding", measured as specified herein, which price shall be payment in full for supplying all materials and for completing all operations herein described and all other items incidental to the work included in this Specification. Payment for Salt Tolerant Grass Seeding shall be in accordance with the following:

(a) Sixty five (65%) percent of quantity following supply and placement.

(b) Remaining thirty five (35%) percent of quantity following termination of the Maintenance Period.

E16. PORTLAND CEMENT CONCRETE SIDEWALK WITH BLOCK OUTS FOR INDICATOR SURFACES

DESCRIPTION

E16.1 This specification shall supplement CW 3325-R5 “Portland Cement Concrete Sidewalks”.

CONSTRUCTION METHODS

E16.2 Add the following to section 9:

E16.2.1 As shown on the drawings and as directed by the Contract Administrator, construct sidewalk with block outs and/or monolithic curb and sidewalk with block outs, to allow for the installation of indicator surfaces.

E16.2.2 Verify dimensions of paving stones (indicator surface) prior to construction of the block-outs. Gaps between paving stones and concrete pavement shall not exceed five (5) millimetres.

E16.2.3 Concrete curbs for monolithic curb and sidewalk with block outs shall be constructed in accordance with CW 3240.

MEASUREMENT AND PAYMENT

E16.3 Add the following to section 12:

E16.3.1 Construction of concrete sidewalks with block outs for indicator surfaces will be measured on surface area basis. The surface area to be paid for shall be the number of square metres constructed in accordance with this specification and accepted by the Contract Administrator, as computed by measurements made by the Contract Administrator.

BASIS OF PAYMENT

E16.4 Add the following to section 13:

E16.4.1 Construction of concrete sidewalks with block outs for indicator surfaces will be paid for at the Contract Unit Price per square meter for the “Items of Work” listed here below, measured as specified herein, which price shall be payment in full for supplying all materials and for performing all operations herein described and all other items incidental to the work included in this specification.

E16.4.2 Items of Work:

(a) 100 mm Sidewalk with Block Outs

E16.4.3 Concrete thickness greater than the specified sidewalk thickness as a result of shaping the base material to accommodate the block outs is incidental to the listed Items of Work.

E17. PAVING STONES FOR INDICATOR SURFACES

DESCRIPTION

E17.1 This specification shall supplement CW 3330-R5 “Installation of Interlocking Paving Stones”

MATERIALS

E17.2 Add the following to section 5:

E17.2.1 Paving Stones for indicator surfaces shall be as shown on the drawings.

E17.2.2 Paving Stones for indicator surfaces shall be :

Barkman Concrete paving stones -
Charcoal Holland Paver (60mm X 210 mm X 210 mm)
https://www.barkmanconcrete.com/

Endicott Clay Paver(92mm X 57mm X 194mm)- Dark Ironspot
https://endicott.com/

Yankee Hill Brick (92mm X 57mm X 194mm)- Dark Ironspot
http://yankeehillbrick.com/

CONSTRUCTION METHODS

E17.3 Add the following to section 9.2 “Preparation of Sub-grade, Sub-base and Sand-base”:

E17.3.1 Preparation of Sand-Base for Paving Stones in Sidewalk Block Outs.

E17.3.2 Place a 15mm layer of bedding sand in the blocked out sidewalk areas.

E17.3.3 The bedding sand shall be spread and levelled so that the paving stones when installed are 5 mm higher than the finished grade.

E17.3.4 No more sand shall be spread than can be covered in with paving stone on the same day.

E17.3.5 The bedding sand shall not be compacted or disturbed prior to laying the paving stones.

E17.4 Add the following to section 9.3 “Installation of Paving Stones”:

E17.4.1 For indicator surface paving stones, commence installation of paving stones against the long edge of the block out to obtain the straightest possible course of installation.

MEASUREMENT AND PAYMENT

E17.5 Add the following to section 12:

E17.6 Supply and Installation of Paving Stones for Indicator Surfaces

E17.6.1 Paving stones for indicator surfaces will be measured on surface area basis. The surface area to be paid for shall be the number of square metres constructed in accordance with this specification and accepted by the Contract Administrator, as computed by measurements made by the contract Administrator.

BASIS OF PAYMENT

E17.7 Add the following to section 13:

E17.7.1 The supply and installation of paving stones for indicator surfaces will be paid for at the Contract Unit Price per square meter for “Paving Stone Indicator Surface”, measured as specified herein, which price shall be payment in full for supplying all materials and for performing all operations herein described and all other items incidental to the work included in this specification.

E17.7.2 Concrete thickness greater than the specified sidewalk thickness as a result of shaping the base material to accommodate the block outs is incidental to the item “100 mm Sidewalk with Blockouts”.

E18. SUPPLY AND INSTALL WATERMAIN AND WATER SERVICE INSULATION

DESCRIPTION

E18.1 Notwithstanding 3.12 of CW 2110, this specification covers the supply and installation of insulation in roadway excavations over watermains and water services.

E18.2 Referenced Standard Construction Specifications

(a) CW 2030 – Excavation Bedding and Backfill

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

E18.3 Referenced Standard Details

(a) SD-018 - Watermain and Water Service Insulation

MATERIALS

E18.4 Acceptable insulation is:

(a) Extruded Polystyrene rigid foam insulation – Type 4, 4” in thickness.

DOW - Roofmate or Highload 40

Owen’s Corning - Foamular 350 or Foamular 400.

2" X 48" X 96", 2" X 24" X 96", 4" X 24" X 96"

E18.5 Sand Bedding:

(a) In accordance with CW 2030

CONSTRUCTION METHODS

E18.6 Prior to the installation of any sub-base material or geotextile material, locate all existing water services. Further to SD-018, where directed by the Contract Administrator, excavate the sub-grade to allow the top of the insulation to be installed flush with the surrounding sub-grade. Install the insulation on a level surface centered over the located watermain or water service for the full width of the roadway excavation. Install sand bedding if required to level the surface. Stockpile and dispose of excavated material in accordance with CW 3110.

E18.7 Thickness of insulation is 100 mm (4"). If using 50 mm (2") panels 2 layers are required. Total width of insulation to be as directed by the Contract Administrator. Place sufficient full width panels to meet or exceed the specified width.

E18.8 Place insulation panels adjacent to each other over the specified area with no gaps between panels and less than 15mm of elevation difference along the adjoined edges. Where 2" thick panels are being used, offset the top layer to prevent the panel joints from aligning with the joints in the lower layer.

E18.9 Use full panels of insulation where possible. Where necessary cut insulation panels to obtain coverage to specified lengths. Insulation pieces shall be a minimum of dimension of 300 mm in width or length.

E18.10 Take appropriate measures to ensure panels are not displaced when installing geotextiles and during backfilling operations.

MEASUREMENT AND PAYMENT

E18.11 Watermain and Water Service Insulation shall be measured on an area basis and paid for at the Contract Unit Price per square metre of "Watermain and Water Service Insulation". The area to be paid for shall be the total square meters of watermain and water service insulation supplied and installed in accordance with this specification, accepted and measured by the Contract Administrator.

(a) Excavation of the roadway subgrade in accordance with E18.6 will not be measured for payment and will be included in the payment for "Watermain and Water Service Insulation".

E19. INSULATION OF EXISTING WATERMAINS AT CATCH PITS AND CATCHBASINS

DESCRIPTION

E19.1 General

E19.1.1 This Specification covers all operations relating to the insulation of watermains where a catch pit and/or catchbasins will be installed in the vicinity of existing watermain.

E19.1.2 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.

CONSTRUCTION METHODS

E19.2 Further to CW 2110-R11 and SD-018, the Contractor shall modify the insulation to accommodate the installation of the catch pits and/or catchbasins in the vicinity of existing watermains as per the details shown on the Drawings.

MEASUREMENT AND PAYMENT

E19.3 Catch Pit Insulation

E19.3.1 Catch Pit/Catchbasin Insulation will be measured on a unit basis and paid for at the Contract Unit Price per each for “Catch Pit and Catchbasin Insulation”, which price shall be payment in full for the supplying all materials and for completing all operations herein described and all other items incidental to the work included in this Specification, accepted and measured by the Contract Administrator.

E20. EXISTING STREET CAR TRACK BEDDING

DESCRIPTION

E20.1 General

E20.1.1 This Specification covers the removal of existing street car track bedding including rails on Smith Street within the project limits, records indicate track bedding may be present, if discovered it shall be removed in accordance with this specification.

E20.2 Definitions

E20.2.1 Street Car Track Bedding – The concrete bedding, including wooden ties and rails, for the street car tracks previously located down Smith Street. The concrete bedding is estimated to be approximately 2.7 metres wide by 0.6 metres thick.

E20.3 Referenced Standard Construction Specifications

E20.3.1 CW 1130 – Work Site Requirements.

CONSTRUCTION METHODS

E20.4 Removal of Existing Street Car Track Bedding

E20.4.1 Remove the existing concrete bedding by demolishing, loading, hauling and disposing of the existing concrete bedding, including rails and ties and any other materials encountered from the site.

E20.4.2 Dispose of the removed bedding in accordance with Section 3.4 of CW 1130.

MEASUREMENT AND PAYMENT

E20.5 Removal of Existing Street Car Track Bedding

E20.5.1 Removal of Existing Street Car Track Bedding shall be measured on a cubic metre basis. basis and paid for at the Contract Unit Price for “Removal of Existing Street Car Track bedding”, which price shall be payment in full for completing all operations herein described and all other items incidental to the work included in this Specification, accepted and measured by the Contract Administrator.

E21. HYDRO EXCAVATION

DESCRIPTION

E21.1 General

E21.1.1 This specification shall cover the removal of earthen material immediately adjacent to underground utilities infrastructure such as gas lines, gas services and areaways 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.

E21.1.2 This specification shall also cover Hydro excavation around existing trees in tree pit applications.

E21.2 Equipment

E21.2.1 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.

E21.2.2 Spray head shall be equipped with a rotating type nozzle, in order to provide a wider path of cut.

CONSTRUCTION METHODS

E21.3 Hydro-Removal of Earthen Material

E21.3.1 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.

E21.3.2 Earthen material adjacent to tree roots for tree well construction shall be sprayed with controlled pressure water so as to not cause damage to the tree. The contractor must make arrangements to have personnel for City Forestry present during Hydro Excavation for tree well construction.

E21.4 Recovery of Excavated Material

E21.4.1 The recovery of excavated material shall be done using vacuum type method, or other type method as approved by the Contract Administrator.

E21.4.2 The recovery of material shall follow immediately behind the excavation, to avoid excavated areas from filling with excavated material.

E21.4.3 The use of mechanical sweepers will not be allowed.

E21.4.4 Dispose of material in accordance with Section 3.4 of CW 1130.

E21.5 Backfill of Hydro Excavated Hole

E21.5.1 The Contractor shall be responsible for the backfill of the hydro excavated hole upon the completion of the Work described herein, to the approval of the Contract Administrator.

MEASUREMENT AND PAYMENT

E21.6 Hydro Excavation

E21.6.1 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”. Hydro Excavation as a pay item is to be paid only when directed by the Contract Administrator for site investigation purposes only. It is not to be paid for the contractor’s execution of normal contract requirements. For example, required to complete excavations and for safety watch requirements and all other work identified in the tender documents and drawings. 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. Travel to and from the Site will not be accounted for in the payment of this item.

E22. SAWCUTTING

DESCRIPTION

E22.1 Further to CW 3240, the Contractor will be required to sawcut the existing concrete sidewalk full depth as follows:

E22.1.1 At the back of sidewalk along the face of the existing buildings so as not to damage the face of the buildings during removal.

E22.1.2 The Contractor shall exercise extreme caution when sawcutting sidewalks to avoid damage to any underlying areaways as per E25.

E22.1.3 In the event of damage to any buildings by the Contractor, the Contractor shall immediately notify the Contract Administrator and make all repairs or replacements necessary, at his own expense, to the satisfaction of the Contract Administrator and the Owner of the building.

MEASUREMENT AND PAYMENT

E22.2 All costs in connection with the above sawcutting are incidental and shall be included in the Contract Unit Price for "Miscellaneous Concrete Slab Removal, i) 100 mm Sidewalk (includes paving stone)".

E23. ADJUSTMENT OF UTILITY MANHOLE FRAMES

DESCRIPTION

E23.1 General

E23.1.1 This specification covers the adjustment of utility manhole frames which works include but are not limited to picking up the materials, removing the existing frame, making any required changes to the structure to accommodate new frame installation, reinstalling the existing frame or installing a new frame/cover, installing supplied lifter rings and constructing any required temporary asphalt ramps.

E23.1.2 Utility manhole frames to be adjusted include but are not limited to Manitoba Hydro and BellMTS.

E23.1.3 Pavement removal and replacement will be in accordance with Specifications CW 3100 and CW 3230. Pavement isolations surrounding utility manhole frames must be reinforced with 15m bars for isolation in the roadway and 10m bars for isolations in sidewalk.

E23.1.4 The Contractor is to provide a minimum 48 hour notice to the utility and the Contract Administrator prior to undertaking any of the proposed works on the utility manholes.

E23.1.5 The Contractor to make arrangements through the utility for watch personnel to be present during construction of the required works to the utility manholes.

E23.1.6 Referenced Standard Construction Specifications

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

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

MATERIALS

E23.2 Manhole Frames, Covers and Riser Rings

E23.2.1 Utility manhole frames and covers shall be provided by the utility. The Contractor shall arrange to pick up materials from the particular utility's storage yard.

CONSTRUCTION METHODS

E23.3 Removal of Existing Pavement

E23.3.1 Remove complete concrete slab surrounding utility manhole in accordance with Specification CW 3110.

E23.3.2 Removal procedures to be done in a manor not to damage utility manhole structure.

E23.4 Removal of Manhole Frame and Cover

E23.4.1 Remove the required concrete embedding the frame and remove the frame and cover. Utility Watch personnel to approve construction method prior to proceeding. The Contractor is to provide opportunity for the utility to collect the old frame and cover if applicable, otherwise the old frame and covers are to be disposed of off-site as directed by the Contract Administrator.

E23.5 Removal and Installation of New Frame and Cover

E23.5.1 Install new or existing frame and cover as specified herein and or on the drawings, if applicable. Existing frames identified as being in good condition are to be reused.

E23.5.2 The Contractor shall set the frame and cover to the proposed grade utilizing shims and a form inside the manhole frame to prevent concrete from spilling into the interior of the manhole and produce a neat finished surface inside the frame. The Contractor shall then pour concrete around the outside of the frame to secure it to the manhole.

E23.6 Installation of Lifter Rings

E23.6.1 Install new lifter rings as specified herein and or on the drawings, if applicable.

E23.6.2 The Contractor shall check prior to installation to ensure that the riser ring will fit into the existing frame, if existing frame does not accommodate the proposed riser ring, then a new frame and cover will be installed.

E23.6.3 The Contractor shall remove the existing cover, clean the existing frame, install required riser ring and reinstall the cover.

E23.7 Construct temporary asphalt ramp

E23.7.1 Where required for re-opening lane to traffic, construct temporary asphalt ramp to the grades as noted on the drawings and as directed by the Contract Administrator.

MEASUREMENT AND PAYMENT

E23.8 Removal and Installation of Utility Frame and Cover

E23.8.1 Removal and Installation of Utility Frame and Covers will be measured on a unit basis and paid for at the Contract Unit Price per unit for “Removal and Installation of Utility Frame and Covers”. The number of units to be paid for will be the total number of manhole frames and covers installed in accordance with this specification, accepted and measured by the Contract Administrator.

E23.9 Installation of Utility Manhole Riser Rings

E23.9.1 Installation of Utility Manhole Riser Rings will be measured on a unit basis and paid for at the Contract Unit Price per unit for “Installation of Utility Manhole Riser Rings”. The number of units to be paid for will be the total number of riser rings installed in accordance with this specification, accepted and measured by the Contract Administrator.

E23.10 Concrete Pavement removal and replacement will be measured and paid for in accordance with Specification CW 3230.

E24. MMAX PAVEMENT COLORING

DESCRIPTION

E24.1 General

E24.1.1 This Specification covers all operations relating to the supply and installation of Mmax pavement coloring for indicated pedestrian walking areas, as noted on the drawings.

E24.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labor, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of all Works as hereinafter specified.

MATERIALS

E24.2 MMax Pedestrian Indicator Strips

E24.2.1 The material shall be Mmax Colored Lane Treatment by Ennis-Flint color to be Terracotta or equivalent, in accordance with B6 as approved by the Contract Administrator. A link to the manufacturer's product data sheet is provided: https://www.ennisflintamericas.com/downloads/dl/file/id/636/product/1048/brochure_mmax.pdf

SUBMITTALS

E24.3 Prior to construction submit the following to the Contract Administrator

E24.3.1 Material data sheets for the product proposed to be supplied and installed.

CONSTRUCTION METHODS

E24.4 Surface Preparation

E24.4.1 Surface Preparation to be in accordance with Manufacturer's instructions.

E24.5 Masking

E24.5.1 Masking of the edges of all Mmax Colored Lane Treatment areas to be in accordance with Manufacturer's instructions.

E24.6 Paint Mixing

E24.6.1 Mix paint in accordance with manufacturer's instructions.

E24.7 Installation of Mmax Pedestrian Indicator Strips

E24.7.1 Install Mmax Pedestrian Indicator Strips in accordance with Manufacturer's instructions.

E24.7.2 Any damage done to the Mmax Pedestrian Indicator Strips prior to completion of each marking area shall be rectified at the Contractor's expense.

MEASUREMENT AND PAYMENT

E24.7.3 Supply and Installation of Mmax Pedestrian Indicator Strips shall be measured on an area basis and will be paid for at the contract Unit Price per square metre for "Supply and Installation of Mmax Pedestrian Indicator Strips" supplied and installed in accordance with this specification and accepted and measured by the Contract Administrator.

E25. SIDEWALK REMOVAL AT AREAWAYS

E25.1 Further to CW 3235 the Contractor is advised that at various locations throughout the project there are sections of building basements called "Areaways" that extend into the City right of way, or may be present behind back of sidewalk. AECOM has located "areaways" using historical as-built drawings, and hydro excavation to confirm location as much as possible. There are no known areaways within the project limits, however there may be additional areaways below the sidewalks for which no record information exists. As a result, the Contractor shall exercise extreme caution when removing all sidewalks and will use methods for removal to prevent damage to any underlying areaways. All costs associated with additional effort required to remove sidewalk shall be included in "Miscellaneous Concrete Slab Removal, i) 100mm Concrete Sidewalk (includes paving stone)" and no additional payment shall be made.

E25.2 Should the Contractor damage an areaway roof during sidewalk removal, the repair and restoration of the areaway roof shall be completed at the Contractor's expense.

E26. CONSTRUCTION IN CLOSE PROXIMITY TO LARGE DIAMETER WATERMAIN

E26.1 Contractors carrying out pavement construction or working in close proximity to the Large Diameter Watermain shall meet the following conditions and technical requirements:

E26.1.1 Pre-Work, Planning and General Execution

(a) No work shall commence at the site until the construction method statement has been approved, a pre-construction meeting has been held, and the Large Diameter Watermain location has been clearly delineated in the field including centreline alignment, outside limits of the pipe and top elevation of the pipe.

(b) The Contractor shall ensure that all work crew members understand and observe the requirements of this specification. Prior to commencement of onsite work, the Contractor shall jointly conduct an orientation meeting with the Contract Administrator and with all superintendents, foremen and heavy equipment operators to make all workers on site fully cognizant of the limitations of altered loading on the Large Diameter Watermain and ramifications of inadvertent damage to the Large Diameter Watermain and the constraints associated with work in close proximity to the Large Diameter Watermain.

(c) For transverse crossings of the Large Diameter Watermain in support of the pavement construction activities, designate crossing locations just beyond the construction site and confine equipment crossing the Large Diameter Watermain at those locations. Reduce equipment speeds to levels that minimize impact loadings.

(d) For construction work activities either longitudinally or transverse to the alignment of the Large Diameter Watermain, work only with the equipment and in the manner stipulated in the approved construction method statement and the requirements noted herein.

(e) Subgrade, subbase and base course construction shall be kept in a rut free condition at all times. Construction equipment is prohibited from crossing the Large Diameter Watermain if the grade is insufficient to support the equipment without rutting.

(f) Granular material, construction material, soil or other material shall not be stockpiled on the Large Diameter Watermain or within 5 metres of the Large Diameter Watermain centreline.

(g) Stage construction such that the Large Diameter Watermain is not subjected to significant asymmetrical loading at any time.

(h) Where work is in proximity to the Large Diameter Watermain, utilize construction practices and procedures that do not impart excessive vibration loads on the Large Diameter Watermain or that would cause settlement of the subgrade below the Large Diameter Watermain.

E26.1.2 Demolition and Excavation

(a) Concrete demolition and removal within 3 metres horizontally of the Large Diameter Watermain shall be completed by saw cutting and removal, or use of hand held jackhammers. Use of machine mounted concrete breakers above the Large Diameter Watermain shall not be permitted.

(b) Where there is less than 2.5 metres of cover over the Large Diameter Watermain, offset the excavator or excavation equipment from the Large Diameter Watermain, a minimum of 2.5 metres from the Large Diameter Watermain centerline, to carry out excavation.

(c) Where there is less than 1.6 metres of earth cover over the Large Diameter Watermain and further excavation is required either adjacent to or over the Large Diameter Watermain, utilize only smooth edged excavation buckets, soft excavation or hand excavation techniques.

(d) Excavated materials intended for reuse shall not be dumped directly on the Large Diameter Watermain but shall be carefully bladed into place.

E26.1.3 Subgrade Construction

(a) Subgrade compaction shall be limited to static compaction methods.

(b) Stage work activities to minimize the timer period that unprotected subgrade is exposed to the environment and protect the subgrade against the impacts of adverse

weather if subbase/base course construction activities are not sequential with excavation.

E26.1.4 Subbase and Base Course Construction

(a) Subbase or base course materials shall not be dumped directly on top of the Large Diameter Watermain but shall be carefully bladed into place.

(b) Subbase compaction shall be either carried out by static methods without vibration or with smaller equipment such as hand held plate packers or smaller roller equipment.

E27. BUSINESS INFORMATION SIGNS

E27.1 Further to Specification E13, the Contractor is advised that they will be required to supply and install business information signs on Smith Street, prior to starting any work at the upstream end of each block under construction, that identify the names of each of the business within that block. The Contractor must erect the business signs prior to starting construction. Signs shall be supplied and installed for each side of the street under construction with the names of business on that side of the street.

E27.2 The signs shall be a minimum if 1.22m x 2.44 m (4 feet x 4 feet) mounted with the longest dimension vertical with sufficient support and ballast so as not be blown over. The signs shall have a white background, with each business name stenciled in black lettering of sufficient size to be read at a distance of 10m.

E27.3 The supply, erection, removal and disposal of the signs shall be incidental to the supply and installation of temporary construction signage and no further measurement or payment shall be made.

E28. TREE REMOVAL

E28.1 Further to CW 3010 - Clearing and Grubbing, tree removal including the roots shall be measured on a unit basis for the number of trees (larger than 75 mm in diameter) removed in accordance with CW 3010. Payment shall be at the Contract Unit Price bid for “Tree Removal” measured as specified herein for the total number of trees removed in accordance with this Specification, accepted and measured by the Contract Administrator.

E28.2 The Contractor shall identify trees that may be affected by Work and inform the Contract Administrator of trees that need to be removed. No trees shall be removed from the project without written approval from the Contract Administrator.

E29. MISCELLANEOUS CONCRETE SLAB REMOVAL (CONCRETE SIDEWALK INCLUDING PAVING STONE)

DESCRIPTION

E29.1 This specification shall supplement CW 3235 “Renewal of Existing Miscellaneous Concrete Slabs”.

CONSTRUCTION METHODS

E29.2 Add the following to section 3.1:

E29.2.1 As shown on the drawings and as directed by the Contract Administrator, remove miscellaneous concrete slabs complete with any paving stones within the removal limits.

E29.2.2 Any paving stones that are to be reused shall be done so in accordance with E30 – “Removal and Stockpiling of Existing Paving Stones”.

E29.2.3 As directed by the Contract Administrator, any Paving Stones deemed unusable shall be disposed of.

MEASUREMENT AND PAYMENT

E29.2.4 Removal and stockpiling of existing interlocking paving stones will be measured on an area basis and paid for at the Contract Unit Price per square metre for "Removal and Stockpiling of Existing Paving Stones". The area to be paid will be the total number of square metres removed and stockpiled in accordance with this specification, accepted and measured by the Contract Administrator.

E29.3 Add the following to section 4.1:

(a) Removal of miscellaneous concrete slabs will be measured on an area basis and paid for at the Contract Unit Price per square metre for the "Items of Work" listed here below. The area to be paid for will be the total number of square metres of existing miscellaneous concrete slabs removed in accordance with this specification, accepted and measured by the Contract Administrator.

Items of Work:

Miscellaneous Concrete Slab Removal

i) 100mm Sidewalk (includes Paving Stones)

E30. REMOVAL AND STOCKPILING OF EXISTING INTERLOCKING PAVING STONES

DESCRIPTION

E30.1 General

E30.1.1 This specification shall supplement the City of Winnipeg Standard Construction Specification CW 3330 and shall cover all operations related to the removal and stockpiling of existing interlocking paving stones for reinstallation.

CONSTRUCTION METHODS

E30.2 Removal of existing interlocking paving stones (concrete pavers and clay pavers) for stockpiling shall include: removal of paving stones and base course material as required; disposal of base course material and unusable paving stones; and stockpiling of paving stones in an area approved by the Contract Administrator.

MEASUREMENT AND PAYMENT

E30.2.1 Removal and stockpiling of existing interlocking paving stones will be measured on an area basis and paid for at the Contract Unit Price per square metre for "Removal and Stockpiling of Existing Paving Stones". The area to be paid will be the total number of square metres removed and stockpiled in accordance with this specification, accepted and measured by the Contract Administrator.

E31. REMOVE AND REINSTALL BIKE HOOPS

DESCRIPTION

E31.1 General

E31.1.1 This specification covers the removal, salvaging and re-installation of existing bicycle hoops along Garry Street and Notre Dame Avenue.

CONSTRUCTION METHODS

E31.2 Removal and Salvage of Bicycle Hoops

E31.2.1 Existing bicycle hoops designated for removal to facilitate construction shall be carefully removed and salvaged. All components and all hardware shall be salvaged for reuse and stockpiled at locations designated by the Contractor Administrator.

E31.2.2 In the event of damage to any materials by the Contractor, the Contractor shall immediately notify the Contract Administrator and make all repairs or replacements necessary, at his own expense, to the satisfaction of the Contract Administrator. In no case shall the Contractor reinstall a damaged component.

E31.3 Re-Installation of Salvaged Bicycle Hoops

E31.3.1 Re-Install salvaged bicycle hoops to the satisfaction of the Contract Administrator.

MEASUREMENT AND PAYMENT

E31.4 Remove and Reinstall Salvaged Bicycle Hoops

E31.4.1 The removal and reinstall of bicycle hoops shall be measured on a unit basis and paid for at the Contract Unit Price for "Salvage and Reinstall Bicycle Hoop", which payment shall be considered compensation in full for performing of all operations necessary to complete the Work as specified including any items incidental to the Work of this specification.

E32. WORK NEAR HIGH PRESSURE GAS MAIN AND OTHER MANITOBA HYDRO INFRASTRUCTURE

E32.1 The Contractor shall complete all works in accordance with typical utility requirements.

E32.2 No further measurement or payment shall be made for meeting Manitoba Hydro requirements.

E33. INSTALLATION OF TRAFFIC SERVICES SIGN CLAMPS

DESCRIPTION

E33.1 General

E33.1.1 This Specification covers all operations relating to the Installation of Traffic Services Sign Clamps.

E33.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labor, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of all Works as hereinafter specified.

MATERIALS

E33.2 Traffic Services Sign Clamps

E33.2.1 The Contract Administrator will arrange for Traffic Service to have the sign clamps delivered to site. The Contractor is to store the Sign Clamps in a secure location until the material is ready for installation.

CONSTRUCTION METHODS

E33.3 Installation

E33.3.1 Installation of Traffic Services Sign Clamps is to be done in conjunction with the Installation of the 100mm Concrete Sidewalk and placed into the fresh concrete at locations determine by Traffic Services. The Base Course material is to be prepared at each location to accommodate the Installation of Traffic Services Sign Clamps.

MEASUREMENT AND PAYMENT

E33.3.2 Installation of Traffic Services Sign Clamps will be incidental to the “Installation of 100mm Sidewalk with Block Outs.” No measurement and payment will be made for these Items of Work.

E34. CRUSHED BLACK GRANITE

DESCRIPTION

E34.1 This Specification covers the installation of black crushed granite mulch around existing trees indicated on the drawings.

SUBMITTALS

E34.2 Prior to construction, submit the following to the Contract Administrator;

E34.2.1 Mulch samples to the Contract Administrator for approval prior to installation.

(a) A Black Crushed Granite sample. Minimum sample size to be 2.5 kg.

MATERIALS

E34.3 Non-woven geotextile to CW 3120.

E34.4 Black Granite Mulch: shall be 20 to 40 mm granite mulch, black in colour. The material shall be free of organic and inorganic debris.

CONSTRUCTION METHODS

E34.5 Hydro-excavate around existing tree to accommodate the required 75mm thickness. The Contractor is to make arrangements for City of Winnipeg Forestry personnel to be on site during hydro-excavation to ensure exposure of tree roots is acceptable.

E34.6 Clear excavation of all construction debris, trash, rubble and any foreign material. Excavate and remove oil spills and other soil contamination sufficiently to remove the harmful material.

E34.7 All excavated material shall be disposed of offsite in accordance with CW 1130.

E34.8 Crushed Black Granite: supply and install 75 mm deep crushed black granite in tree well locations and levels as shown on the Construction Drawings.

MEASUREMENT AND PAYMENT

E34.9 Crush Black Granite

E34.9.1 Supply and installation of “Crushed Black Granite” shall be made on an unit basis and paid for at the Contract Unit Price per square metre placed at the specified depth. In which payment shall be considered compensation in full for the supply of all materials and the performing of all operations necessary to complete the Work as specified including any items incidental to the Work of this specification.

E35. SOIL CELLS

DESCRIPTION

E35.1 Provide all labour, materials, methods, equipment and accessories for the supply and installation of Soil Cells and related excavation, geotextile, aggregate sub-base, aggregate base, and silva cell system.

MATERIALS

E35.2 Geotextile to CW3130.

E35.3 Geogrid to CW3135.

E35.4 Aggregate sub-base to CW3110.

E35.5 Aggregate base to CW3110.

E35.6 Silva Cell System

(a) 2x Silva Cell System Components: one base, six 2x posts and one deck. Assembled dimensions (each cell) 1.2m long by 0.6m wide by 0.784m high or approved equivalent.

(b) Root Barrier: Deeproot UB18-2 root barrier, per silva cell specifications or approved equivalent.

(c) Pin, per silva cell specifications.

(d) Cable ties, per silva cell specifications.

(e) Silva cell system available from DeepRoot Canada Corp. ph.: 604-687-0899. Contact: Mike James.

CONSTRUCTION METHOD

E35.7 Installations shall be as per Manufacturer's specifications available at https://www.deeproot.com/products/silva-cell/resources/ .

E35.8 Silva cell modules must be transported and stored on manufacturers pallets with pallet wrap intact until ready for installation. Pallets should be positioned on firm level base, so as not to impede traffic or work flow.

E35.9 The Contractor must ensure that all buried utilities and services are located and if necessary, protected and exposed prior to any excavation in accordance with specification CW1120.

E35.10 Excavate and confirm to the dimensions and depth shown on the Drawings, including provision for drainage and base course layer, allowing 200mm (8") additional clearance in length and width. Side walls of excavated pit to be clean, straight, and within 15° of vertical. Soft dig / day lighting process to be used in area of existing underground utilities. Ensure subgrade slopes to subdrain trench toward perforated drainage pipe system (min 2.0% slope).

E35.11 Clear excavation of all construction debris, trash, rubble and any foreign material. Excavate and remove oil spills and other soil contamination sufficiently to remove the harmful material. Fill over excavations with approved fill and compact to the required subgrade compaction.

E35.12 All excavated material shall be disposed of off-site in accordance with specification CW1130.

E35.13 Compact sub-grade in accordance with specification CW3110.

E35.14 Install reinforcement geotextile fabric in accordance with CW3130.

E35.15 Install perforated drainage pipe in accordance with specification CW3120, and as shown on the Drawings.

E35.16 Install aggregate sub-base below silva cell system to the depths indicated in the Drawings and compact to a minimum of 95% of maximum dry density at optimum moisture content, in accordance with ASTM D 698 Standard Proctor Method.

E35.17 Assemble and install silva cell system in accordance with manufacturers specifications.

E35.18 Install geogrid. Geogrid to line perimeter of silva cell system with 150mm toe (outward from base) and 300mm excess (over top of deck).

E35.19 Load planting medium into the silva cell system. Install planting medium in accordance with manufacturers specifications.

E35.20 Install backfill in 200mm lifts to top of silva cell system.

E35.21 Place geotextile over top of silva cell system, 450mm overlap past excavation.

E35.22 Install root barrier directly adjacent to concrete edge restraint.

MEASUREMENT AND PAYMENT

E35.23 The construction of soil cells shall be measured on a volume basis, and paid for at the Contract Unit Price per cubic metre as “Soil Cells”. The volume to be paid for shall be the total cubic metre area installed in accordance with this specification, accepted and measured by the Contract Administrator. Inclusive of excavation, granular drainage material, geotextile, geogrid, aggregate sub-base, silva cell system and backfill. Over-excavation will not be paid.

E36. PLANTING MEDIUM & FINISHED GRADING

DESCRIPTION

E36.1 This Specification covers the supply and installation of planting medium in tree vaults.

REFERENCES

E36.2 Agriculture and Agri-Food Canada

E36.2.1 The Canadian System of Soil Classification, Third Edition, 1998.

E36.3 Canadian Council of Ministers of the Environment (CCME) Guidelines.

E36.4 The City of Winnipeg Standard Construction Specifications CW 1130 and CW 3540.

SUBMITTALS

E36.5 Submit 0.5kg sample of topsoil to National Testing Laboratory, or approved alternate, and indicate present use and intended use. Prepare and ship sample in accordance with Provincial regulations and testing laboratory requirements.

E36.6 Submit two (2) copies of soil analysis and recommendations for corrections to Contract Administrator.

QUALITY ASSURANCE

E36.7 Testing of planting medium to be carried out and paid for by Contractor. Prepare and ship planting medium samples to approved laboratory in accordance with Provincial regulations and laboratory requirements, indicating intended use on each sample.

E36.8 Test planting medium for nutrients N, P, K, micronutrients, soluble salt content, pH value and OM (organic matter).

E36.9 Acceptance of planting medium is subject to an inspection of material and confirmation of test results. Do not commence soft landscaping work until Contract Administrator has accepted planting medium.

DELIVERY, STORAGE AND HANDLING

E36.10 Store materials in a dry area, protected from freezing, sedimentation and contamination.

E36.11 Deliver and store fertilizer in waterproof bags labeled with weight, analysis and name of manufacturer.

MATERIALS

E36.12 Planting Medium Soil Mix

E36.12.1 Planting Medium: In accordance with CW 3540 for topsoil except organic matter to be in the range of 5-10%.

E36.12.2 Peatmoss: deliver from partially decomposed fibrous or cellular stems and leaves of species of sphagnum mosses. Elastic and homogeneous, brown in colour. Free of wood and deleterious material that could prohibit growth. Shredded particle minimum size: 5 mm.

E36.12.3 Sand: hard fine silica sand, well washed and free of impurities, chemical or organic matter, coarse texture, and to the following gradation.

Particle Size (mm)	% Passing through Screen
2.0	100%
1.0	95 to 100%
0.5	80 to 100%
0.25	0 to 30%
0.15	0 to 8%
0.75	0 to 1%

E36.12.4 Fertilizer: Synthetic start-up slow release fertilizer with a N-P-K analysis of 12-36-15 ratio at a rate of 4 kg per 100 sq.m. (8 pounds per 100 sq. ft).

CONSTRUCTION METHODS

E36.13 Excavation

E36.13.1 Excavate tree vaults by hand unless otherwise directed by Contract Administrator. Dispose of all rock, clay soils and other deleterious materials off Site.

(a) Protect bottom of excavations against freezing.

(b) Remove water that has entered the excavated tree pit prior to planting. Notify Contract Administrator if water source is groundwater.

(c) Verify and obtain approval by Contract Administrator of tree vaults with geotextile prior to compacted soil mound and planting medium placement

E36.13.2 Planting Medium Placement

(a) Place planting medium in uniform layers over approved, unfrozen sub-grade, to the depth indicated on the Drawings.

(b) Eliminate rough spots and low areas, Prepare a loose, friable bed, boot firm and level

E36.13.3 Soil Amendments

(a) Apply lime, sulpher, or other soil amendment at a rate determined and recommended from planting medium sample test.

(b) Mix soil amendment well into full depth topsoil prior to application of fertilizer

E36.13.4 Finished Grading

(a) Per CW3540.

(b) Fine grade entire soil area to elevations as indicated on the Drawings. Eliminate rough spots and low areas Leave surfaces smooth, uniform and firm against foot printing with a fine loose texture

SURPLUS MATERIAL

E36.14 Dispose of unused planting medium off Site in accordance with CW1130.

CLEANING

E36.15 Perform cleaning to remove accumulated environmental dirt from all paved surfaces of building faces. Remove surplus materials, rubbish, tools and equipment barriers

MEASUREMENT AND PAYMENT

E36.16 Supply and installation of planting medium will be measured on a volume basis and paid for at the Contract Unit Price per cubic metre for “Supply and Install Planting Medium”. The volume to be paid will be the total number of cubic metres installed in accordance with this specification, accepted and measured by the Contract Administrator

E37. TREES

DESCRIPTION

E37.1 General

E37.1.1 This specification covers all operations relating to the supply and installation of nursery-grown trees in areas indicated on the Drawings, including preparation, digging, transport and planting, and maintenance.

E37.1.2 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.

E37.2 Nomenclature

E37.2.1 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.

E37.3 Source Quality Control

E37.3.1 All nursery stock supplied shall be nursery grown and of species and sizes as indicated on the Drawings. Nursery stock shall be No. 1 Grade material in accordance with the current edition of Landscape Canada's (CNTA) "Guide Specifications for Nursery Stock".

E37.3.2 Any nursery stock dug from native stands, wood lots, orchards, or neglected nurseries, which have not received proper cultural maintenance, shall be designated as "collected plants". The use of "collected plants" will not be permitted unless approved by the Contract Administrator.

E37.3.3 The Contractor shall notify Contract Administrator of source of plant material at least seven (7) days in advance of shipment.

E37.3.4 Acceptance of plant material at source does not prevent rejection of same plant material on site prior to or after planting operations.

E37.3.5 Imported plant material must be accompanied with necessary permits and import licenses. Conform to federal and provincial regulations.

E37.4 Shipment and Pre-Planting Care

E37.4.1 Coordinate shipping of plants and excavation of holes to ensure minimum time lapse between digging and planting.

E37.4.2 Tie branches of trees securely and protect plant material against abrasion, exposure and extreme temperature change during transit. Avoid binding of planting stock with rope or wire, which would damage bark, break branches or destroy natural shape of plant. Give full support to root balls, especially of large trees, during lifting.

E37.4.3 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.

E37.4.4 Remove broken and damaged roots with sharp pruning shears. Make clean cut and cover cuts over 50 mm diameter with wound dressing.

E37.4.5 Keep roots moist and protect from sun and wind. Heel-in trees that cannot be planted immediately in shaded areas; water well.

E37.5 Replacement

E37.5.1 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.

MATERIALS

E37.6 General

E37.6.1 The Contractor shall be responsible for the supply, safe storage and handling of all materials set forth in this Specification. All materials supplied under this Specification shall be subject to inspection and acceptance by the Contract Administrator.

E37.7 Water

E37.7.1 Water shall be potable and free of minerals that may be detrimental to plant growth.

E37.8 Fertilizer

E37.8.1 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.

E37.9 Trunk Protection and Tree Support

E37.9.1 Tree protection shall be a 100 x 600 mm long section of plastic weeping tile material.

E37.10 Root Ball Burlap

E37.10.1 Root ball burlap shall be 150 g Hessian burlap.

E37.11 Anti-desiccant

E37.11.1 Anti-desiccant shall be wax-like emulsion to provide film over plant surfaces reducing evaporation but permeable enough to permit transpiration.

E37.12 Plant Material

E37.12.1 All plant material specified for this project shall be containerized and/or ball and burlap nursery stock. All plants shall be from the Winnipeg area and the Oak-Aspen Forest Eco-region.

E37.12.2 Comply with latest edition of the “Guide Specification for Nursery Stock”, produced by Landscape Canada (CNTA), referring to quality, size and development of nursery-grown plant material and root balls.

E37.12.3 Nursery stock shall be No. 1 grade trees, shrubs and vines.

E37.12.4 All plant material shall be measured when branches are in their natural position. Height and spread dimensions specified in the Plant List on the Drawings refer to the main body of the plant, and not from branch tip to root base or from branch tip to branch tip. Where trees are measured by calliper (cal.), reference is made to the diameter of the trunk measured at 300 mm above ground as the tree stands properly planted in the nursery.

E37.12.5 All containerized whips and herbaceous plant material shall have a minimum of one full year's growth. Roots shall be healthy, reaching the sides of the containers, and developed such that the root ball can be kept intact during transplanting. Roots shall not encircle each other to the extent of inhibiting plant growth.

E37.12.6 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.

E37.12.7 Use trees, shrubs and groundcovers with structurally sound, strong fibrous root systems, and free of disease, insects, defects or injuries, including rodent damage, sun scald, frost cracks, abrasions or scars to the bark. Plants must have been root pruned regularly, but not later than one growing season prior to arrival on site.

E37.12.8 All parts of the plants shall be moist and show live, green cambium tissue when cut.

E37.12.9 At least one (1) plant of each variety supplied shall bear a tag showing both the botanical and common name of the plant.

E37.13 Additional Plant Material Qualifications:

E37.13.1 Imported Plant Material

(a) 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.

E37.13.2 Cold Storage

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

E37.13.3 Container-Grown Stock

(a) 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.

E37.13.4 Balled and Burlapped Plant Material

(a) 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.

E37.13.5 Tree Spade Dug Material

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

E37.13.6 Substitutions

(a) 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

E37.14 General

E37.14.1 Workmanship

(a) The Contractor shall stake out location of trees as per the Drawings. Obtain Contract Administrator's approval prior to excavating.

(b) 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.

(c) The Contractor shall apply anti-desiccant in accordance with material manufacturer's instructions.

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

E37.14.2 Planting Time

(a) Trees growing in containers/ball and burlap may be planted throughout growing season.

(b) Plant only under conditions that are conducive to health and physical conditions of plants.

(c) 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.

E37.14.3 Excavations

(a) 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.

(b) The sides of all tree pits shall be scarified to the depth of one shovel blade.

(c) Provide drainage for planting holes in heavy soil if natural drainage does not exist. Have method approved.

(d) Protect the bottoms of excavations against freezing.

(e) Remove water that enters excavations prior to planting. Ensure source of water is not ground water.

E37.14.4 Planting

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

(b) Plant trees vertically, with roots placed straight out in hole. Orient plant material to give best appearance in relation to structures, roads and walkways.

(c) Place plant material to depth equal to depth they were originally growing in nursery or in locations collected.

(d) 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.

(e) 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.

(f) 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.

(g) Construct 75 mm deep saucers around the outer edge of planting pits to assist with maintenance watering.

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

E37.14.5 Pruning

(a) Prune trees 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.

E37.14.6 Standards

(a) All roots shall be cleanly cut; split roots are not acceptable.

(b) Branches and trunks shall be tied and protected; broken or abraded branches or trunks are not acceptable.

(c) Planting shall be protected from drying conditions; desiccated material not acceptable.

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

E37.15 Maintenance

E37.15.1 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.

E37.15.2 Weeding

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

E37.15.3 Insects and Diseases

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

E37.15.4 Adjustments

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

E37.15.5 Maintenance Period

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

MEASUREMENT AND PAYMENT

E37.16 Trees

E37.16.1 Supply and installation of trees will be measured on a unit price basis for each tree listed in the “Plant Material List”, which price shall be payment in full for supplying all materials and for completing all operations herein described and all other items incidental to the work included in this Specification, accepted and measured by the Contract Administrator.

E37.17 Fertilizer

E37.17.1 Supply and installation of fertilizer for plant material will be considered incidental to the Works of this Specification. No measurement and payment will be made for this Item of Work.

E38. LONG TERM SCHEDULED MAINTENANCE OF PLANT MATERIAL

DESCRIPTION

E38.1 This specification covers all operations relating to the maintenance of plant material following acceptance of the Work by the Contract Administrator.

E38.1.1 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.

E38.2 MATERIALS

E38.3 General

E38.3.1 The Contractor shall be responsible for the supply, safe storage and handling of all materials set forth in this Specification. All materials supplied under this Specification shall be subject to inspection and acceptance by the Contract Administrator.

E38.4 The Contractor shall provide all necessary materials and equipment including: additional topsoil, soil ameliorates, mulches, fertilizers and pesticides, and pruning tools, water trucks, hoses, water metres and any other items necessary for the maintenance of the areas indicated in this specification.

CONSTRUCTION METHODS

E38.5 Provision of Maintenance Personnel

E38.5.1 The Contractor shall provide all necessary personnel for the ongoing maintenance operations.

E38.6 Capability of Personnel

E38.6.1 Maintenance personnel should have at least one year of experience in arboriculture/maintenance and should be under the direction of a foreman, in all cases, with not less than five years of experience with similar maintenance operations.

E38.6.2 The maintenance foreman shall be familiar with plant identification.

E38.7 Maintenance Period

E38.7.1 Maintain plantings for a period of two (2) years from the completion of the Maintenance for Establishment period, as determined by the Contract Administrator. Note: Completion shall not occur after October 30, or before May 15 of any year.

E38.8 Maintenance Schedule

E38.8.1 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.

E38.9 Recording Maintenance Operations

E38.9.1 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

E38.10 Traffic

E38.10.1 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).

E38.11 Maintenance of Trees

E38.11.1 Maintain trees as indicated in Trees Specification - maintenance clause.

E38.11.2 Watering Trees

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

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

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

E38.11.3 Fertilizing, Pruning and Spraying Deciduous Trees

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

E38.11.4 Pruning Deciduous Trees

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

E38.11.5 Cultivation

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

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

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

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

(e) Restore wood chip mulch when cultivation completed.

E38.11.6 Spraying

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

E38.11.7 Straightening

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

E38.11.8 Mulching Wood Chip

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

E38.11.9 Weeding

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

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

E38.11.10 Dispose of waste material at a recognized solid waste disposal site.

MEASUREMENT AND PAYMENT

E38.12 General Maintenance of Trees

E38.12.1 Trees will be measured on a unit and paid for at the Contract Unit Price per annual for the "Items of Work" listed here below which price shall be payment in full for supplying all materials and for completing all operations herein described and all other items incidental to the work included in this Specification, accepted and measured by the Contract Administrator.

(a) Items of Work

(i) General Maintenance of Plant Material

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

E39. PLANT MATERIAL WARRANTY

DESCRIPTION

E39.1 General

E39.1.1 This Specification covers the provision of warranty for all plant material itemized on the Plant List:

(a) Plant Material shall be under warranty for two full years.

E39.1.2 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.

E39.2 Timing

E39.2.1 Warranty shall commence upon acceptance of installed plant material.

E39.3 Warranty

E39.3.1 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.

E39.4 End-of-Warranty Inspection

E39.4.1 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.

E39.5 Replacement

E39.5.1 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.

E39.5.2 Replace plant material in the following spring or fall as directed.

E39.5.3 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.

E39.5.4 Continue such replacement and warranty until plant material is acceptable.

E39.5.5 Trees determined by the Contract Administrator to have been damaged by vandalism shall be replaced and such replacement trees will be paid for at the Contract Unit Prices for the species indicated on the Drawings.

MEASUREMENT AND PAYMENT

E39.6 Warranties on Plant Material

E39.6.1 Warranties on plant material will be incidental to the "Plant Material." No measurement and payment will be made for these Items of Work.

E40. BIKE RACKS

DESCRIPTION

E40.1 This Specification covers all operations relating to the supply and installation of bicycle racks.

E40.2 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.

SUBMITTALS

E40.3 Contractor shall submit shop drawing for review by the Contract Administrator prior to purchase and installation.

MATERIALS

E40.4 General

E40.4.1 The Contractor shall be responsible for the supply, safe storage, handling and installation of all materials set forth in this Specification. All materials supplied under this Specification shall be subject to inspection and acceptance by the Contract Administrator.

E40.5 Site Amenities and Accessories

E40.5.1 Bicycle Rack

(a) Bicycle rack to be Hoop Bike Rack AL-HOOP-CLR – 800 mm (34") height, finish to be Brushed Aluminum, clear coated, as manufactured by Rackworks, or equal as approved by the Contract Administrator.

Rackworks (Woodcock Cycle Works)
433 St. Mary's Road, Winnipeg, MB R2M 3K7
Ph: 204-955-5221

E40.5.2 Accessories

(a) All mounting accessories to be stainless steel and tamper proof.

CONSTRUCTION METHODS

E40.6 Bicycle Rack

E40.6.1 Surface mount bicycle rack on concrete pad as indicated on the Construction Drawings. Follow manufacturer's instructions for surface mounting of bicycle racks.

MEASUREMENT AND PAYMENT

E40.7 Bicycle Rack

E40.7.1 Bicycle racks will be measured on a unit basis and paid for at the Contract Unit Prices per each for “Supply and Install Bicycle Rack”, which price shall be payment in full for supplying and installing all materials and for completing all operations herein described and all other items incidental to the work included in this specification, accepted and measured by the Contract Administrator.

E41. TREE GRATES

DESCRIPTION

E41.1 Provide all labour, material, methods, equipment and accessories for the supply and install of tree grates and tree guards.

MATERIALS

E41.2 Tree Grate

E41.2.1 1219 x 1219 mm Metropolitan tree grate Model #R-8706-1A, excluding frame, grey iron finish. Available from Crozier Enterprises ph. 416-214-7727, or approved equal.

CONSTRUCTION METHODS

E41.3 All work is to be located and installed in accordance with the Drawings and manufacturer’s specifications.

E41.4 Tree grates to be installed and true to correct elevations and location, as directed by the Contract Administrator.

E41.5 Tree grates to be carefully handled so that no parts will be bent, broken, or otherwise damaged. Contractor is responsible for replacing any damaged grates, prior to installation, at no cost to the City.

E41.6 Install tree grate in galvanized tree grate frame. Tree grate to sit flush with top of frame lip.

MEASUREMENT AND PAYMENT

E41.7 Tree Grates

E41.7.1 The supply and installation of tree grates shall be paid for on a unit basis each and paid for at the Contract Unit Price per unit for Tree Grates. Price shall be payment in full for supplying materials and for performing the work in accordance with this specification, accepted and measured by the Contract Administrator. Prices to include all mounting hardware.

E42. EXTERIOR METAL FABRICATION

DESCRIPTION

E42.1 General

E42.1.1 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 for fabrication and installation of galvanized tree grate frames.

E42.2 References

E42.2.1 American Society for Testing and Materials International (ASTM)

(a) ASTM A53/A53M-02, Specification for Pipe, Steel, Black and Hot-Dipped Zinc-Coated Welded and Seamless.

(b) ASTM A269-02, Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.

(c) ASTM A307-02, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

E42.2.2 Canadian Standards Association (CSA International)

(a) CAN/CSA-G40.20/G40.21-98, General Requirements for Rolled or Welded Structural Quality Steel.

(b) CAN/CSA-G164-M93 (R1988), Hot Dip Galvanized or Irregularly Shaped Articles latest.

(c) CAN/CSA-S16.1-01 Filler Metals and Allied Materials for Metal Arc Welding (developed in co-operation with the Canadian Welding Bureau).

(d) CSA W59-1989, R2001, Welded Steel Construction, Metal Arc Welding, Imperial Version.

MATERIALS

E42.3 Tree Grate Frame

E42.3.1 Frame: 112 mm x 76 mm x 6 mm thk. Steel tube.

E42.3.2 Lip: 9 mm thk. Steel flat bar.

E42.3.3 Free Standing Support:

(a) 112 mm x 112 mm x 6 mm thk. Steel tube, and

(b) 6 mm flat bar plate.

E42.3.4 All components to be hot-dip galvanized following assembly.

E42.4 Accessories

E42.4.1 Welding materials:

(a) CSA W59.

E42.4.2 Welding electrodes:

(a) CSA W48 Series.

SUBMITTALS

E42.5 Submit shop drawing for tree grate frame.

E42.5.1 Shop drawing to clearly indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number and size of anchors, supports, reinforcement, details and accessories.

E42.5.2 Indicate and list hardware and miscellaneous items.

E42.5.3 Provide templates, patterns, fixing diagrams as required.

E42.5.4 Indicate related, adjacent materials, and connections.

E42.6 Submit mock-up of one tree grate with galvanized frame fully assembled for review and approval by the Contract Administrator.

DELIVERY, STORAGE AND HANDLING

E42.7 Deliver materials to site, suitably packaged. Do not deliver materials long before they are required on site or cause any delays to scheduling.

E42.8 Store materials in a dry location off the ground, and prevent damage.

E42.9 Materials that have been damaged or deemed unfit for use during delivery or storage shall be immediately replaced at no cost.

SITE CONDITIONS

E42.10 Make a careful examination of the site and structures and investigate all matters relating to the nature of the work to be undertaken, the means of access and egress, the rights and interests which may be interfered with during the construction of the Work.

E42.11 Report any discrepancies or omissions to the Contract Administrator, who will issue written clarification. Oral interpretations or instructions are not acceptable.

CONSTRUCTION METHODS

E42.12 Review and understand the tree grate dimensions and details.

E42.13 Obtain approval of shop drawings and mock-up prior to fabrication.

E42.14 Have a tree grate on hand prior to fabrication. Tree grate shall sit flush with top of frame lip. Know thickness of hot-dipped galvanization material to ensure that tree grate is flush with top of lip following galvanization.

E42.15 Lip shall sit flush with adjacent surfaces. Adjust height of frame steel tube as required to make flush.

E42.16 Fabricate work square, true, straight and accurate to required sizes, with joints closely fitted and properly secured.

E42.17 Do welding work in accordance with CSA W59.

E42.18 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.

E42.19 De-grease and de-blur all sharp edges in the shop left behind after fabrication is complete, prior to galvanization.

E42.20 Hot-dip galvanize after fabrication. No touch-up, welding, drilling or grinding will be accepted after galvanization.

INSTALLATION

E42.21 Erect metal work square, plumb, straight and true, accurately fitted, with tight joints and intersections.

E42.22 Install tree grate frame on tree vault thickened edge. Remove debris from lip and/or grind down concrete as required to ensure tree grate frames do not wobble and are flush with adjacent surfaces.

ACCEPTANCE

E42.23 Work will be accepted only if it is erected true to the Drawings and conforms to the approved shop drawings and mock-up.

MEASUREMENT AND PAYMENT

E42.24 Tree Grate Frames

E42.24.1 Supply and installation of Tree Grate Frames shall be measured on a unit basis and paid for at the Contract Unit Price for “Supply and Install of Tree Grate Frame (1.2 x 1.2)” which payment shall be considered compensation in full for the supply of all materials and the performing of all operations necessary to complete the Work as specified including any items incidental to the Work of this specification.

E43. REMOVAL OF PRECAST CONCRETE TRAFFIC BARRIERS

DESCRIPTION

E43.1 General

E43.1.1 This specification covers all operations relating to the removal of existing precast concrete traffic barriers on Smith Street at the Winnipeg Police Building.

E43.1.2 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

E43.2 Precast Traffic Barriers

E43.2.1 The Precast Traffic Barriers are precast concrete jersey barriers which are approximately 3.0 m long by 0.45 m wide by 0.9 m high. Each barrier has two lifting holes cast into them. The number of traffic barriers to be removed is 22.

CONSTRUCTION METHODS

E43.3 Barrier Removal

E43.3.1 The Contractor shall carefully load the barriers and transport them to the City Bridge yard at 960 Thomas Avenue. The Contractor shall then offload the barriers at the City yard. The Contractor shall be responsible for providing all equipment and incidental materials required for loading, transporting and offloading the barriers at the City yard. Should the Contractor damage any of the barriers they shall be replaced at their expense.

E43.3.2 The Contractor shall contact Mr. Mike Terleski at 204-794-8510 a minimum of 24 hours prior to delivery of the barriers to the City yard.

MEASUREMENT AND PAYMENT

E43.3.3 Removal of Precast Traffic Barriers shall be measured on a Lump Sum basis and will be paid for at the Contract Unit Price for “Removal of Precast Concrete Traffic Barriers” for the loading, hauling and offloading of barriers in accordance with this specification and accepted and measured by the Contract Administrator.

E44. SUPPLY AND INSTALLATION OF BOLLARDS

DESCRIPTION

E44.1 General

E44.1.1 This Specification covers all operations relating to the supply and installation of permanent security bollards in the sidewalk at the Winnipeg Police building on Smith Street.

E44.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labor, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of all Works as hereinafter specified.

E44.1.3 The selection of bollard type is based on best available information of the existing underground infrastructure. The quantities of bollard type(shallow or deep) may have to be modified if the existing infrastructure or surface conditions require and shallow or deep mount bollards will be paid for at the contract unit amounts.

MATERIALS

E44.2 Bollards

E44.2.1 Bollards supplied and installed shall meet the requirements of the US State Department and US Defense Department K12 rating (or ASTM F2656/F2656M M50/P1) rating (or better). Permanent stainless steel covers shall also be supplied for installation over the bollards and shall conform to AISI Type 316 stainless steel with a minimum thickness of 3.5mm. Apply Coating System to entire bollard and any non-galvanized steel. Coating system shall be Amercoat 385 as tie coat/epoxy primer and intermediate coat, and Amercoat 450H as polyurethane topcoat.

E44.3 Reinforcing Steel

E44.3.1 All reinforcing steel shall be hot dipped Galvanized. Reinforcing shall not be in contact with bollard or bollard reinforcing plate.

SUBMITTALS

E44.4 Prior to construction, submit the following to the Contract Administrator

E44.4.1 Shop drawings for the each type of Bollard proposed to be supplied and installed as well as shop drawings for all foundations, signed and sealed by a professional engineer licensed to practice in the Province of Manitoba.

CONSTRUCTION METHODS

E44.5 Installation

E44.5.1 The bollards shall be installed at the locations shown on the drawings for the type of bollard indicated. The bollards and foundations shall be installed/constructed in accordance with the manufacturer's instructions.

E44.5.2 Type A Shallow Mount bollards shall have foundations not more than 600 mm deep and the top of the foundation shall be below the bottom of the sidewalk.

E44.5.3 Type B Deep Mount bollards shall have foundation not more than 850 mm wide and the top of the foundation shall be flush with the surrounding sidewalk.

E44.5.4 For Type B bollards the foundation shall be anchored to the surrounding sidewalk with 10M deformed bars, 300 mm long spaced 600 mm on centre.

MEASUREMENT AND PAYMENT

E44.5.5 Supply and Installation of Bollards shall be measured on a unit basis and will be paid for at the contract Unit Price for "Items of Work" listed here below. The number of bollards to be paid for shall be the number supplied and installed, including foundations and stainless steel covers, in accordance with this specification and accepted and measured by the Contract Administrator.

Items of Work:

Supply and Installation of Bollards

(i) Type A Shallow Mount
(ii) Type B Deep Mount

E45. SPLICING OF TRAFFIC SIGNALS CONDUIT

E45.1 Materials

E45.1.1 In addition to CW 3620 3.11.12, Joining of conduit will not be allowed except:

(a) Where joining of conduit is required for Convenience of Road Construction Sequencing with a maximum of one (1) joint per conduit.

E45.1.2 In place of CW 3620 3.11.13, Joining of conduit shall use an approved oversize coupler to connect nominal size 1.5" or 2" LDPE pipe, IPEX Series 75, installation to follow manufacture's recommendations.

(a) Approved Products:

(i) Plasson Universal Slip Repair Coupler 60-64, Product Code: 176100060064 for use with nominal 2" LDPE.

(ii) Plasson Universal Slip Repair Coupler 48-51, Product Code: 176100048051 for use with nominal 1.5" LDPE.

(b) Substitutes will not be allowed except:

(i) Where application has been made to and approval has been provided by Traffic Signals. The Contractor shall provide sufficient information and details to enable the Traffic Signals to determine acceptability.

E45.1.3 As per CW 3620 4.11.5, No measurement or payment shall be made for Joining of Conduit.

E45.1.4 Removal of CW 3620 2.10.1 (b) Conduit coupling pipe and gear clamps.

E46. TRAFFIC SIGNALS – SERVICE BOX PRE-CAST

DESCRIPTION

E46.1 This specification covers the use and installation of a service box pre-cast 17" x 30"x 18" and 13" x 24" x 18".

MATERIALS

E46.2 Materials shall be as per Section 2 of CW 3620.

CONSTRUCTION METHODS

E46.3 Install Pre-Cast Service Box in grass boulevards/medians, and hard surfaced medians or as shown on the Drawings or as directed by the Contract Administrator.

E46.4 Fill bottom of excavation with compacted limestone base course material to set precast surface box to grade.

E46.5 Install Pre-Cast Service Box on top of the compacted granular fill material to pavement, sidewalk or boulevard finished grade.

E46.6 All conduits must be bundled into a group in the centre of the Pre-Cast Service Box. Install plastic plugs prior to backfill.

E46.7 Backfill around Pre-Cast Service Box exterior. Backfill shall conform to requirements of SD-342.

E46.8 Pre-Cast Service Box shall meet the grade of the sidewalk or boulevard provided by the Contract Administrator.

E47. TRAFFIC SIGNALS – INSTALLATION OF EARLY OPEN CONCRETE BASES

DESCRIPTION

E47.1 This specification shall cover the installation of Early Open Concrete Bases.

MATERIALS

E47.2 Supply concrete for bases in accordance with CW 2160, Table CW 2160.1 Design Requirements for Concrete Used for Underground Structures, for Type A Structures (monolithic sewers and reinforced structures).

E47.3 Further to E47.2, the supplied concrete shall achieve a minimum compressive strength of 22 MPa at 48 hours.

CONSTRUCTION METHODS

E47.4 Construction methods for the installation of Early Open Concrete Bases shall be as per Section 3.7 of CW 3620.

E48. TRAFFIC SIGNALS – INSTALLATION OF PRE-CAST TYPE PM BASES

E48.1 Pre-Cast Type PM concrete bases shall be supplied by the Contractor including anchor bolts.

E48.2 Fabrication and installation shall be in accordance with SD-315.A.

E49. TRAFFIC SIGNALS – ANCHOR BOLT PROJECTIONS FOR CONCRETE BASES

E49.1 Further to Section 3.7 of CW 3620 Concrete Bases Type A, Type G, Type OD and Type J bases shall have an anchor bolt projection as specified below.

E49.1.1 The following projections shall override what has been specified on SD-310, SD-313 and SD-314.

Concrete Base Type	Anchor Bolt Projection (mm)	Tolerance
Type A	76.0	(71.0 – 76.0)
Type G	89.0	(84.0 – 89.0)
Type OD	50.8	(45.8 – 50.8)
Type J	150.0	(145.0 – 150.0)

E50. INSTALLATION OF STREET LIGHTING AND ASSOCIATED WORKS

E50.1 DEFINITIONS

LIMITS OF APPROACH means the shortest distance that is permissible between live high voltage (>750 volts) conductors or apparatus and any part of a worker's body, material or tools being handled, or equipment operated.

MANITOBA HYDRO CENTRAL STORES means Manitoba Hydro's Waverley Service and Reclaim Centre - 1840 Chevrier Blvd - Winnipeg, Manitoba

OVERHEAD FEED means an electrical supply via an overhead conductor connected between streetlight standards. Typically strung between standards on a temporary basis.

OVERHEAD SOURCE means an electrical supply from Manitoba Hydro's system. (Typically an overhead conductor from a wooden distribution pole or a DIP/RISER located on a wooden distribution pole.)

RECLAIM material means existing material that has been removed from Manitoba Hydro's system and to be returned to Manitoba Hydro.

SCRAP material means existing material that has been removed from Manitoba Hydro's system and to be recycled/disposed of by the Contractor.

SURPLUS material means new material that has been requisitioned by the Contractor and not incorporated into the work at the end of the Contract.

WORK CLEARANCE means an ELECTRICAL AND/OR NATURAL GAS FACILITIES LOCATE form (see SAMPLE ONLY included as Appendix D) issued by each of Manitoba Hydro's Customer Service Centre (CSC) affected to permit work to commence (Permit to work).

E50.2 DESCRIPTION

E50.2.1 The work shall consist of the supply of all supervision, labour, materials (except as indicated under MATERIAL SUPPLIED BY MANITOBA HYDRO below) insurance, tools,

backfill and equipment (and their maintenance), transportation, fuel, oil, meals and lodging, mobilization and de-mobilization, and warranty of workmanship as required to install and remove temporary Overhead Feeds, remove existing street light poles as required, install new street light poles and associated underground cables/conduits, all in accordance with the requirements specified in the tender documents.

E50.3 WORK LOCATIONS

E50.3.1 The proposed street light installation and removals are shown on construction drawings and are as follows:

(a) Location 1

(b) Location 2

(c) Location 3

(d) Location 4

E50.4 COORDINATION OF WORK

E50.4.1 The Contractor shall provide a minimum of ten (10) working days notice to Manitoba Hydro prior to the start of construction. The work shall be conducted and coordinated with Manitoba Hydro in a manner to ensure street lighting is maintained at all times for the duration of the work. The construction drawings provide the Proposed Sequence of Construction.

E50.4.2 The Contractor shall obtain Work Clearance from Manitoba Hydro's Customer Service Centre(s) (CSC) affected prior to the work commencing. No additional compensation shall be paid to the Contractor for delays obtaining Work Clearance for any reason.

E50.4.3 Manitoba Hydro's CSC will provide the Limits of Approach applicable to the Contractor on the Work Clearance form.

E50.5 ORIENTATION

E50.5.1 Prior to the commencement of the proposed work, the Contractor's crew foremen, electricians, and other key personnel shall attend one (1) day of orientation provided by Manitoba Hydro for various operations such as cable handling, cable splicing/termination, installation of street light poles, concrete bases, luminaires and various other construction standards and procedures. The Contractor will be responsible for all costs associated with personnel salaries, travel, sustenance and overheads, etc., during training.

E50.6 PRE-CONSTRUCTION MEETING

E50.6.1 Prior to the commencement of the work, the Contractor shall attend a pre-construction meeting with Manitoba Hydro. The agenda for this meeting shall include but not be limited to the following:

(a) Reference the Contractor's Safe work Procedures;

(b) Prime Contractor;

(c) materials;

(d) sequence of construction;

(e) communication plan;

(f) any training requirements & qualifications;

(g) Drawing and Project review;

(h) a review of the Contractor's proposed work schedule; and

(i) any and all other topics of clarification that the Contractor and the Contract Administrator may wish to discuss.

E50.6.2 The Contractor's cost to attend this pre-construction meeting shall be incorporated into the unit prices for the work.

E50.7 QUALIFICATIONS AND CERTIFICATION

E50.7.1 The Contractor's Crew Foreman, installers and other key Contractor's Personnel shall possess the necessary certification, licensing, training, experience and familiarity with safety rules, procedures and hazards relating to the work. Journeyman Power Line Technician (PLT), Journeyman Lineman, Journeyman Cableman or Journeyman Electricians shall be required to perform portions of this work.

E50.7.2 Journeyman Power Line Technician (PLT), Journeyman Cableman and Journeyman Lineman are also required to possess a "Limited Specialized Trade Licence – 'M-P' Licence – Power Line" issued by the Province of Manitoba.

E50.7.3 Manitoba "Safe work" Bulletin M&E010 dated January 5, 2011 regarding Electrician Licenses discusses the requirements for a "Limited Specialized Trade Licence – 'M-P' Licence – Power Line".

For more information contact:
Manitoba
Mechanical and Engineering Branch
500-401 York Avenue
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E50.7.4 Licensed Journeyman Electricians or Journeyman PLT or Journeyman Cableman or Journeyman Lineman ARE REQUIRED for all cable handling operations included but not limited to: disconnecting cables in the handhole, installation and removal of temporary overhead feeds, installation and connection of ground rods, streetlight cable splices, termination of streetlight cables in handholds and at luminaires. The Contractor shall employ sufficient qualified personnel on its crews to conform to the Electrician's Licensing Act. The Contractor shall be prepared to provide proof of licences to Manitoba Hydro upon request.

E50.7.5 The Contractor shall assess the hazards associated with the work and have documented Safe work Procedures to perform the work. It is the Contractor's responsibility to train employees on these procedures. The Contractor shall be prepared to provide proof of training to Manitoba Hydro upon request.

E50.8 REFERENCED STANDARD CONSTRUCTION SPECIFICATIONS

E50.8.1 In addition to these Specifications, the work to be performed by the Contractor relative to the installation and/or replacement of street lighting poles, concrete bases and associated cabling shall be in accordance with the following:

(a) Manitoba Hydro 66kV and Below Standards;

(b) CSA C22.3 No. 7 (latest edition);

(c) Canadian Electrical Code (CEC) Part 1 (latest edition); and

(d) Any other applicable codes

(e) (collectively, the "Standards")

E50.8.2 Revisions and updates to the Manitoba Hydro 66kV and Below Standards are issued periodically and the latest issued version of the Standard will apply. For the convenience of the Contractor for bidding purposes, excerpts of the Manitoba Hydro 66kV and Below Standards have been included as Appendix A.

E50.8.3 In some cases, Municipal, Provincial or Federal laws or this Technical Specification may be more stringent than the CSA Standards. Whenever conflict exists, the Contractor shall comply with the most stringent requirements applicable at the place of the work.

E50.9 TOOLS, EQUIPMENT AND MATERIALS

E50.9.1 The Contractor shall be required to provide all tools and equipment required for performing the specified tasks. Equipment shall be in good operating condition, shall be properly maintained using original equipment manufacturer replacement parts and shall be provided with letters of testing/inspection from the manufacturer when requested. Where the equipment is provided as a kit with multiple parts and tools, the kit shall be complete with all parts required to perform the designed task. Contractor fabricated tools or equipment will not be accepted for use.

E50.9.2 The Contractor shall obtain the following specific Electrical Equipment including but not limited to:

(a) Compression tool or tools and associated dies to perform compressions to a maximum size of 1/0 Al (MD-6 compression tools shall not be used).

(b) Approved compression tools are:

Manufacture	Type	Model No.	Range
Burndy	In-line, battery	PATMD68-14V	350 Kcmil AL
Cembre	In-line, battery	B54Y (06V081E)	4/0 AWG AL
Burndy	Pistol, battery	BUR PAT60018V	350 Kcmil AL

E50.9.3 Dies shall be of the type shown in Standard CD210-21 and CD 210-24 only, must have identical markings, and compression tool die must match die number stamped on connector.

(a) Modiewark Model #4444 or Fluke 1AC-II Volt Alert potential Indicator

(b) Voltage meter – Fluke model #T3C

(c) Insulated wire cutters – used for cutting cable ends square.

E50.9.4 Alternative equipment manufacturers may be considered upon request by the Contractor and shall be approved for use by Manitoba Hydro prior to use.

E50.9.5 Manitoba Hydro may reject any tools or equipment that do not appear to be in good condition or fail to successfully provide the required function.

E50.10 MATERIAL SUPPLIED BY MANITOBA HYDRO

E50.10.1 Manitoba Hydro shall supply all street light poles, concrete bases, breakaway bases, luminaires, street light arms, ground rods, compression sleeves, grommets, nuts, electrical cables, conduits, relays, cable guards, Gel-caps and all other materials noted in the Standards. The Contractor shall sign receipts indicating the location on which the materials are to be used. The material shall be picked up by the contractor from the following locations:

E50.10.2 Manitoba Hydro Central Stores (contact personnel will be provided to the successful contractor).

E50.10.3 Materials requested will be supplied to the Contractor by Manitoba Hydro upon presentation of Manitoba Hydro's Stores Material Order Form. The Contractor shall assume all responsibilities for the loading, unloading, transportation, proper handling, secure storage and working of the materials and shall make replacements at its own expense in case any material is damaged, stolen or lost due to improper handling, storage or poor workmanship.

E50.10.4 The Contractor shall, at the time of materials release, check and confirm the quantity of materials. Shortages, discrepancies, or damages to materials shall be immediately reported in writing to Manitoba Hydro.

E50.10.5 After commencing performance of the work, the Contractor shall continually monitor all material required for the timely completion of the work and shall report additional material requirements to Manitoba Hydro a minimum of 72 hours prior to materials being required to perform the work. No additional compensation shall be paid as a result of delays due to

material shortages where additional material requirements were not reported a minimum of 72 hours prior to being required for the work on an active project.

E50.11 MATERIAL SUPPLIED BY CONTRACTOR

E50.11.1 The Contractor shall be responsible to furnish gravel, sand, ¾" down limestone, ¼" down limestone, protective hose (i.e. typically 2" fire hose), duct seal and pit-run material for backfilling around street light poles and around cables as per the Standards. The cost of furnishing the above listed materials shall be incorporated into the unit prices for the work.

E50.12 SURPLUS, RECLAIM AND SCRAP MATERIAL

E50.12.1 Upon completion of the work, the Contractor shall, at its own expense, deliver to Manitoba Hydro Central Stores, all Surplus materials furnished by Manitoba Hydro and not used in the work, regardless of the location of said material at that time.

E50.12.2 In addition, the Contractor shall, at its own expense, deliver to Manitoba Hydro Central Stores all Reclaim materials from the work specifically HPS luminaires. Manitoba Hydro shall be responsible for the proper disposal of Reclaim HPS luminaires. The HPS bulb shall remain installed and unbroken in the Reclaim luminaire. The Contractor shall handle the Reclaim luminaires with care and shall avoid breaking the bulb or refractor.

E50.12.3 Manitoba Hydro's preference is to recycle as much Scrap Material as practicable. The Contractor is responsible to remove the Scrap Material, transport to the recycler or Manitoba Hydro approved disposal site, pay for any disposal fees and may retain any recycling value.

E50.13 DE-ENERGIZATION AND LOCKOUT

E50.13.1 **Manitoba Hydro -** Where a standard is supplied from an Overhead Source, Manitoba Hydro's staff shall be responsible to disconnect and isolate the street light standard or standards between the standard and Overhead Source. Some street light standards may be temporarily fed from an Overhead Source. This Overhead Source shall be disconnected and removed by Manitoba Hydro staff prior to commencing with the work. The streetlight circuits will not be Locked Out by Manitoba Hydro.

E50.13.2 **The Contractor** - The Contractor shall assess the hazards associated with the work and employ its own Safe Work Procedure for the work to be performed. The Contractor's Safe Work Procedure shall include provisions that the street light circuits will not be Locked Out by Manitoba Hydro. The Contractor's Safe Work Procedure shall achieve Lock Out or techniques equivalent to Lock Out.

E50.13.3 The Contractor shall complete a job planning form (an example is included as Appendix E) on a daily basis before any work commences and provide Manitoba Hydro with copies of the job plans if requested.

E50.14 TEMPORARY OVERHEAD FEEDS

E50.14.1 Manitoba Hydro in consultation with the Contractor will determine if temporary lighting will be provided by the existing street lights or from the new street lights.

E50.14.2 When using the existing poles for temporary lighting, Manitoba Hydro shall remove an Overhead Source in accordance with DE-ENERGIZATION AND LOCKOUT section above, prior to the Contractor installing a #4 duplex overhead conductor between the existing poles. The #4 duplex overhead conductor will normally be attached to the tenon of the davit arm near the luminaire with a pre-form grip. Older poles may require a spool insulator be attached to the pole using a pre-form grip to support the #4 duplex overhead conductor. A short length of 2C/#12 copper conductor is connected to the terminals of the luminaire brought out and connected to the #4 duplex overhead conductor. The final span to the Overhead Source shall be installed by Manitoba Hydro.

E50.14.3 When using the new poles for temporary lighting, the Contractor shall install the new bases, poles and #4 duplex overhead conductor. The #4 duplex overhead conductor will be attached to the tenon of the davit arm near the luminaire with a pre-form grip. A short

length of 2C/#12 copper conductor is connected to the terminals of the luminaire brought out and connected to the #4 duplex overhead conductor. The final span to the Overhead Source shall be installed by Manitoba Hydro.

E50.14.4 All material used to provide the temporary overhead feed shall be returned to Manitoba Hydro. Care shall be taken to coil and tag Reclaim conductor for reuse. If used, insulators shall be handled carefully to prevent breakage.

E50.15 SAFE EXCAVATION

E50.15.1 The work shall be performed in accordance with the requirements of Manitoba Hydro's Safe Excavation and Safety Watch Guidelines (latest revision) included as Appendix B and Manitoba Workplace Safety and Health Regulation 217 latest revision.

E50.16 SAFE HANDLING

E50.16.1 The Contractor shall apply handling techniques in accordance with Manitoba Workplace Health and Safety Regulation 217 (latest revision).

E50.17 ELECTRIC CABLES AND CONDUITS

(a) The Contractor shall use diligent care and proper equipment in handling of all cables, so as not to injure the jacket and avoid gouging, kinking, scratching or abrading the cables. If any material is damaged to any extent, the Contractor shall repair the damages at its own expense, in a manner approved by Manitoba Hydro or will be charged the full cost of the damaged items.

(b) Cable reels shall not be dropped and must be handled and placed/stored in an upright position at all times and shall not be laid flat for any purpose or reason. Cable reels shall be adequately supported on hard surface to prevent the reel from sinking into the ground that can cause undue stress on the cables. Cable reels should be inspected for damages prior to use. If a cable reel is found to be defective, such defect shall be reported immediately to Manitoba Hydro.

(c) The Contractor shall place all material and string the cables in such a manner as to cause the least interference with normal use of the land, street or roadway. All material shall be unloaded in a manner to preserve its condition, prevent loss and/or theft and permit easy access for Manitoba Hydro's inspection.

(d) The Contractor shall provide Manitoba Hydro's inspector sufficient opportunity, in the sole discretion of Manitoba Hydro, to inspect the work.

E50.18 PRECAST CONCRETE BASES

E50.18.1 The Contractor shall handle, store, transport and unload the precast concrete bases in a manner to prevent damage to the threaded bolts and conduit casing.

E50.18.2 Precast Concrete Bases are extremely heavy. Approximate weight of pre-cast concrete bases are found in the Standards. The Contractor shall only use equipment rated for such weight.

E50.19 STREET LIGHT POLES AND ARMS

E50.19.1 The Contractor shall handle, store, transport, and provide proper load securement for the poles and arms in a manner to prevent damage.

E50.20 LUMINAIRES

E50.20.1 The Contractor shall handle, store, transport and unload the luminaires in their original packaging and in a manner to prevent damage.

E50.21 SMALL MATERIAL

E50.21.1 Photo electric cells, shorting caps, shims, nut covers and associated supplies shall be kept in a suitable warehouse provided by the Contractor at its own expense. Photo electric cells shall be transported and stored in such a manner as to prevent breakage.

E50.22 CARE OF MATERIALS

E50.22.1 The Contractor shall assume all responsibilities of all the materials and shall replace, at its own expense, any materials damaged, stolen or lost due to improper handling or poor workmanship.

E50.23 WIRE AND CABLE REEL STORAGE

E50.23.1 Cable reels shall be stored with the flanges upright and resting on a hard surface. At temporary storage sites where the soil may be soft, preservative-treated plywood sheets may be used to keep the flanges from sinking into the ground.

E50.23.2 If cable reels must be pancaked or stored on their side in vertical racks, do not lift the reel by the top flange. Spacers (two 2 X 4s placed wide side up) should be placed under the bottom flange and between the reels in order to create a space to insert the forks and lift the reels without damaging the cable.

E50.24 REEL HANDLING

E50.24.1 When off-loading reels from a truck, reels shall be lowered using a hydraulic gate, hoist or forklift truck. When a reel is rolled from one point to another, care must be taken to see that the reel does not straddle objects such as rocks, pipes, curbs or wooden blocks which could damage the cable or protective covering. A reel should always be rolled on hard surfaces to avoid sinkage and in the opposite direction to the cable wraps to ensure that the reel is rolled in such a direction as to tighten the cable on the reel.

E50.24.2 When using a hoist, install a mandrel through the reel arbour hole and attach a sling. Use a spreader bar approximately 6 inches longer than the overall reel width placed between the sling ends just above the reel flanges. This will prevent bending of the reel flanges and damage to the cable.

E50.24.3 If a forklift is used to move a reel, the reel is to be approached from the flange side. Position the forks such that the reel is lifted by both reel flanges. The lift forks shall not contact the cable.

E50.24.4 Returnable reels shall be returned promptly to Manitoba Hydro Central Stores and in no case later than three (3) days after the completion of the work unless otherwise mutually agreed between the Contractor and Manitoba Hydro.

E50.25 PRESSURIZED WATER/VACUUM EXCAVATION

E50.25.1 Pressurized water/vacuum excavation (PW/VE) shall be used to daylight all buried utilities and structures where excavation by other mechanical means would be expected to provide a physical risk to that utility or structure.

E50.25.2 The work shall be performed in accordance with the requirements of Manitoba Hydro’s Safe Excavation and Safety Watch Guidelines (latest revision) included as Appendix B.

E50.26 REMOVAL STREET LIGHT POLE FROM EXISTING BASE

E50.26.1 This shall include all work required to remove a street light pole from an existing base as set forth in this Technical Specification. The pole may be on an existing precast concrete base, steel power installed screw base or poured in place concrete base.

E50.26.2 The Contractor shall furnish all labour, supplies and materials (except as indicated in the Section "MATERIAL SUPPLIED BY MANITOBA HYDRO") necessary for the removal of the street light pole from the existing base. Care shall be taken to preserve the luminaire. The luminaire shall be reinstalled on the new street light pole or returned to Manitoba Hydro's stores as instructed by the Manitoba Hydro.

E50.26.3 The Contractor shall be responsible to transport all Surplus and Reclaim materials to Manitoba Hydro Central Stores and transport and dispose of all Scrap material as set forth in this Specification.

E50.27 REMOVAL OF BASE AND DIRECT BURIED STREET LIGHT POLE

E50.27.1 This shall include all excavation, whether by auger, pressurized water/vacuum excavation, by hand, or by other methods which may be necessary to remove a base or direct buried street light pole. The base may be poured in place concrete, steel power installed or precast concrete.

E50.27.2 The Contractor shall be responsible to transport all Surplus and Reclaim materials to Manitoba Hydro Central Stores and transport and dispose of all Scrap material as set forth in this Specification.

E50.27.3 The Contractor is responsible to supply all backfill material as specified in the Standards and carry out all backfill, compacting and leveling of all excavations and voids for removed bases and direct buried street light poles so as to be ready for top soil and seed or sod or as directed by Manitoba Hydro.

E50.28 INSTALLATION OF FOUNDATION - CONCRETE BASE

E50.28.1 This shall include all excavation, whether by auger, pressurized water/vacuum excavation, by hand, or by other methods which may be necessary to replace or install a concrete base as set forth in this Specification.

E50.28.2 The Contractor shall furnish all labour, supplies and material (except as indicated in the Section "MATERIAL SUPPLIED BY MANITOBA HYDRO") necessary to install a new or replace a concrete base. Excavation for the precast concrete base shall be to a diameter and depth specified in Standard CD 300-6. All excess material is to be removed by the Contractor.

E50.28.3 The concrete base shall be set on a bed of ¾" down limestone. The concrete base backfill material shall be compacted in lifts no more than 150 mm. Backfill material shall be ¾" down limestone. Compacting of backfill material shall be done using a hydraulic tamper. Alternative tamping methods shall be approved by Manitoba Hydro. Underground cables entering the concrete base shall be protected by a length of protective hose supplied by the Contractor and a layer of sand surrounding the cables to protect it from the limestone. The concrete base shall be installed level in all 4 directions. Final grade must be established prior to installing the concrete bases.

E50.28.4 The completed backfill shall be at least equal in compaction to undisturbed soil, as required by the Municipal authorities or elsewhere in this Specification. The Contractor shall level all excavations.

E50.28.5 Should settlement occur in the excavation and cause a depression in the surface, the Contractor shall repair the surface. Placing of additional backfill material due to settlement shall be at the Contractor's expense.

E50.28.6 The concrete base shall be oriented in the proper direction to allow the easy entrance of the underground cables into the plastic pipe preinstalled in the concrete base. Care shall be taken to prevent damage to the insulation or jacket of the conductors. The cable shall be left long enough to extend one (1) metre beyond the top of the hand hole.

E50.29 BASE MOUNTED STREET LIGHT POLES

E50.29.1 This shall include all work required to install the street light pole on the concrete base as set forth in this Specification.

E50.29.2 The Contractor shall furnish all labour, supplies and material (except as indicated in the Section "MATERIAL SUPPLIED BY MANITOBA HYDRO") necessary for the installation of the pole (straight shaft or davit) on the concrete base.

E50.29.3 Unless otherwise specified on the construction drawings, the Contractor shall orient the poles so that the hand hole is on the left side of the pole when viewed from the road. A worker should be able to see oncoming traffic when working in the hand hole.

E50.29.4 The Contractor shall level the street light pole in all 4 directions. Leveling shims may be used.

E50.29.5 Tightening of bolts shall be performed in a manner that brings the surfaces up evenly. All nuts shall be tightened and torqued in accordance with Standard CD 300-9. The Contractor shall install the nut covers included with the pole.

E50.29.6 Unless otherwise specified, excess underground cable and 2C-12 wire shall be left inside the hand hole with the hand hole cover loosely installed.

E50.29.7 Existing street light poles may have street signs attached. The Contractor shall remove the signs from the existing pole and temporarily reattach the signs to the new pole. The Contractor shall notify Manitoba Hydro of the location where the signs have been removed.

E50.30 LUMINAIRES AND ASSOCIATED WIRING

E50.30.1 The Contractor shall furnish labour, supplies and material (except as indicated in the Section "MATERIAL SUPPLIED BY MANITOBA HYDRO") necessary to install the luminaire and associated wiring. Unless otherwise specified, the luminaire shall be installed with a tilt of zero (0) degrees. The Contractor shall install a length of 2 conductor No. 12 gauge (2C-12) wire from the terminals of the luminaire, through the arm (if applicable), down the pole to the hand hole. One (1) metre of 2C-12 wire shall be left at the hand hole. Impact equipment (air or electric) shall not be used to tighten luminaire mounting bolts. The Contractor shall be liable for damage due to over tightening.

E50.30.2 The Contractor shall verify the luminare voltage matches the source voltage as shown on the construction drawings. If luminaire voltage does not match the source voltage, the Contractor shall re-wire the luminaire in accordance with the wiring diagram provided. NOTE: Not applicable for LED luminaires.

E50.30.3 As specified on the construction drawings, the luminaire will require either a photo electric cell (PEC) or shorting cap installed. When installing the PEC the eye shall be oriented north. The Contractor shall also install the appropriate wattage bulb in the luminaire. NOTE: Bulb installation not applicable for LED luminaires.

E50.31 BREAK AWAY BASES

E50.31.1 Break away bases shall be installed in accordance with Standard CD 300-10. The height of the concrete base above grade shall not exceed 50mm. The surface of the concrete base shall be flat and level. A reaction plate shall be installed between the concrete base and the break-away base.

E50.31.2 The Contractor shall torque the couplers in accordance with Standard CD 300-10. Impact tools shall not be used to tighten or torque couplers or nuts associated with a break away base.

E50.32 SPLICING/CONNECTING CABLES

E50.32.1 The electric cable shall be spliced/terminated as per Standards CD 215-12, CD 215-13, CD 310-1, CD 310-4, CD 310-9 and CD 310-10 with the exception that the Contractor will use a GELCAP-SL-2/0 splice kit (See Appendix C). Termination in the hand hole may include the installation of an inline fuse holder.

E50.32.2 The Contractor shall furnish all labour, supplies and material (except as indicated in the Section "MATERIAL SUPPLIED BY MANITOBA HYDRO") necessary to splice/terminate the street light conductor(s).

E50.33 EXCAVATION

E50.33.1 The Contractor shall furnish all labour, supplies and material (except as indicated in the Section "MATERIAL SUPPLIED BY MANITOBA HYDRO") necessary for the completion and maintenance of grade and line of the street light cables and conduit including water control if found to be necessary. The trench shall be graded to conform to the street light cables and conduit so that the street light cables and conduit rest firmly on a smooth surface throughout its length. All stones or other objects which, in the opinion of Manitoba Hydro might damage the street light cable jacket and conduit shall be removed. Where the presence of rock or other condition prevent a satisfactory bed for the cables, 150 mm of well-tamped, clean soil or ¼" down crushed limestone shall be placed in the bottom of the trench. In this case, the spoil bank from trenching operations shall not be allowed to fall into the trench or mix with the soil to be used in backfilling the trench. Loose debris or foreign matter and the spoil bank shall be placed so as not to hinder drainage, damage property, or obstruct traffic.

E50.33.2 Trenches shall be dug to such a depth that will provide a minimum cover of 600 mm from final grade in sodded areas and 1000 mm in roadways in accordance with Standard CD 305-1.

E50.34 LAYING CABLES

E50.34.1 Cables are to be lowered in the trench in an orderly fashion so as to maintain a consistent path and straight alignment. All cables shall be lowered in a continuous run (NO SPLICING) and in accordance with the construction drawings; and shall maintain the necessary separation, where required. All cables shall be of continuous runs and capped and sealed if they are not being installed in the pole at that time. Cables shall not be dragged over paved surfaces.

E50.34.2 Once a cable is cut its ends must be sealed immediately with an approved and appropriately sized, heat shrink or cold shrink sealing cap to prevent moisture ingress unless the cable is being installed in the pole at that time.

E50.34.3 During the removal of the cable, the reels shall be placed on jacks, stands or trailers with a bar through the arbour holes which will allow the reel to be turned easily, and the cable to be paid out. Cables can be paid out from the bottom or the top of the reel. Cable in coils shall be handled in a similar manner. This can be achieved by supporting the coil in a vertical plane and rotating it by hand as the cable is carefully uncoiled. The cable shall never be pulled over the flange of a reel, or pulled off the side of a coil, since this will introduce a twist in the cable.

E50.34.4 During installation, under no circumstance is the cable to be subjected to a bending radius tighter than that detailed in the Standards.

E50.34.5 Where specified in the Standards or on the construction drawings, the Contractor shall install the street light cable in a conduit.

E50.35 INSTALLING CONDUIT AND CABLE BY BORING (HORIZONTAL DIRECTIONAL DRILLING)

E50.35.1 The Contractor shall dig the approaches and openings necessary to install boring equipment, and the boring equipment used shall be of such a nature as to minimize the opening size required. The boring equipment shall produce a straight hole without unnecessary dips or bends. The bore hole shall be only slightly larger than the outside diameter of the conduits or cables to minimize possible settlement. Cables and conduits shall be pulled in with pulling eyes or using a kellum grip in a manner so as to guard against damage.

E50.35.2 During construction as the drill bit crosses each existing facility a lookout shall be assigned by the Contractor to visually confirm the drill bit is maintaining a minimum 300 mm clearance from the existing facility all in accordance with Manitoba Hydro Safe Excavation and Safety Watch Guidelines (latest revision) included as Appendix B. Maximum pulling tensions on any streetlight cable shall be limited to 2.9 kN/0.65 kips.

E50.35.3 Drilling fluids and associated waste materials shall be disposed of in a manner that minimizes environmental effects.

E50.35.4 The Contractor shall properly compact the backfill material and will be responsible for placing additional material should settlement occur for the duration of the warranty period.

E50.36 BURIED UTILITY CROSSINGS

E50.36.1 All buried obstructions are not necessarily shown on the reference drawings and the locations of those indicated are approximate only.

E50.36.2 The Contractor shall determine the location of all buried obstructions and shall notify the appropriate authorities and obtain all necessary permits prior to excavation, trenching and directional drilling near or across such obstructions. All buried obstructions where the new buried cable route crosses other utilities including but not limited to gas, water, sewer, telephone and electric lines shall be exposed as per each utilities guidelines by the Contractor, including the use of Pressurized Water/Vacuum Equipment (PW/VE) where necessary. Should any damage occur to such lines during the course of the work, the Contractor shall be responsible for the damage and the costs of repairs to buried obstructions caused by its operations and shall fully indemnify the City of Winnipeg and Manitoba Hydro from and against all claims arising out of such damage. Manitoba Hydro Safe Excavation and Safety Watch Guidelines (latest revision) included as Appendix B shall be followed when crossing natural gas pipelines and electrical cables by the directional boring method.

E50.36.3 The PW/VE technique, used to expose underground plant in certain conditions, must be performed in accordance with each utility's requirements, including but not limited to Manitoba Hydro, Manitoba Telecom Services, Shaw Cable, etc. PW/VE costs that the Contractor will incur during the work must be factored into the Contractor's bid prices. The Contractor shall not be entitled to extra compensation for the use of PW/VE on the work.

E50.36.4 The Contractor shall be responsible to supply all backfill material and carry out all backfill, compacting and leveling of all excavations so as to be ready for topsoil and seed or sod or as directed by Manitoba Hydro.

E50.37 BENDING CABLES/CONDUITS AND INSTALLATION INTO STANDARDS

E50.37.1 It is desired to reduce to a minimum the required number of bends and to lay the cables/conduits to conform to the contour of the ground and maintain a normal covering. This shall be accomplished by cutting the trench slightly deeper in approaches to road crossings and drainage ditches. It is intended that the Contractor shall eliminate unnecessary bending by operating the trenching machine at various depths rather than by finishing grading the trench by hand whenever practical.

E50.37.2 Sharp bends of the cables/conduits shall be avoided at all times. All bends shall meet the requirements set out in this Specification. If excessive bending was exerted on any cable, the cable shall be replaced at the Contractor's cost. During installation, under no circumstance is the cable to be subjected to a bending radius tighter than that detailed in the Standards. At street light poles the Contractor shall install the ends of the cables into the plastic pipe preinstalled in the concrete base. Care shall be taken to prevent damage to the insulation or jacket of the conductors. Underground cables entering the concrete base shall be protected by a length of protective hose supplied by the Contractor and by a layer of sand surrounding the cables to protect it from the limestone. The cable shall be left long enough to extend one (1) metre beyond the hand hole. The street light cable in the trench shall be installed in conduit for mechanical protection and the ends sealed with duct seal supplied by the Contractor. Care shall be taken to prevent damaging the cable where it exits the conduit. The conduit shall only be installed into the concrete base if conduit sizes make it practicable.

E50.37.3 Unless otherwise directed, excess underground cable and 2C-12 wire shall be left inside the hand hole with the hand hole cover loosely installed.

E50.38 BACKFILL

E50.38.1 All backfilling material within 300 mm of the cables/conduits shall be clean, free of sod, vegetation, organic material, stones or other debris, and of a consistency as to not create significant voids or air spaces around the cables/conduits. Other backfilling material shall be free of stones greater than 150 mm on their maximum dimension. Where cinders or very acid soil are encountered or where gravel or incompressible fill is required by Municipal authorities, ¼" down crushed limestone shall be placed all around the cables for a depth of at least 300 mm. The completed backfill shall be at least equal in compaction to undisturbed soil or as directed by Manitoba Hydro. Backfill material is to be placed and compacted in lifts not exceeding 300 mm. All excess material is to be removed by the Contractor.

E50.38.2 Tamping or flushing methods must be used where necessary to give the required compaction. Where tamping is used, hand tampers shall be used to at least 300 mm above the cable before machine tamping may be used. The Contractor shall level all excavations so as to be ready for topsoil and seed or sod or as directed by the Manitoba Hydro. Should settlement occur in the excavation and cause a depression in the surface, the Contractor shall repair the surface to the satisfaction of the Manitoba Hydro at the Contractor's cost.

E50.38.3 Excavations remaining where poles have been removed shall be backfilled with spoil, pit run gravel or ¾" down limestone and compacted in lifts of 150mm as directed by Manitoba Hydro. The top 300 mm of the excavation shall be backfilled with topsoil.

E50.38.4 Excavations remaining where utility crossings have been exposed shall be backfilled with sand or clean spoil and compacted in lifts of 150mm. The top 300 mm of the excavation shall be backfilled with topsoil.

E50.38.5 Backfill of all excavations shall be in accordance with City of Winnipeg Standard Construction Specification CW 2030 (latest revision), to the satisfaction of the authority having jurisdiction and Manitoba Hydro.

E50.39 DEFECTIVE WORK & WARRANTY

E50.39.1 If any portion of the work fails to comply with the requirements of this Specification, fails within the Warranty period, or if the final tests prove or indicate the existence of any fault or defect in the work, or any part thereof, Manitoba Hydro may forthwith re-execute or make good the faulty or defective work or alter the same to make it comply with requirements of the Specification at the Contractor's expense. Manitoba Hydro shall give the Contractor notice together with particulars of such failure, fault or defect, Manitoba Hydro's cost to re-execute or make good the faulty or defective work and the Cost shall be deducted from the Contract.

E50.39.2 At the completion of the work for each location, Manitoba Hydro shall prepare and issue a Network Commissioning Report, a sample of which is included as Appendix F, to the Contractor. The Network Commissioning Report shall be dated indicating the commencement of the Warranty period for the work performed at the location.

E50.40 AS-BUILT DRAWING

E50.40.1 The Contractor shall provide an as-built drawing or mark-up drawing to Manitoba Hydro which accurately displays the "as-built" location of the buried street light cables, conduits and street light poles.

E50.41 MEASUREMENT AND PAYMENT

E50.41.1 Removal of 25' to 35' street light pole and precast, poured in place concrete, steel power installed base or direct buried including davit arm, luminaire and appurtenances

(a) This pay item will be measured on a unit basis and paid for at the Contract Unit Price per unit for "Removal of 25' to 35' street light pole and precast, poured in place concrete, steel power installed base or direct buried including davit arm, luminaire and appurtenances". The number of units to be paid for at the Contract Unit Price shall be verified and accepted by Manitoba Hydro. The Price shall be payment in full for

performing all operations herein described including removal of the pole, base, luminaire, appurtenances, use of pressurized water/vacuum excavation, transportation of Reclaim, Surplus and Scrap material, payment of associated disposal fees and all other items incidental to the work included in the Specification.

E50.41.2 Removal of 45' street light pole and precast, poured in place concrete, steel power installed base or direct buried including davit arm, luminaire and appurtenances

(a) This pay item will be measured on a unit basis and paid for at the Contract Unit Price per unit for “Removal of 45' street light pole and precast, poured in place concrete, steel power installed base or direct buried including davit arm, luminaire and appurtenances”. The number of units to be paid for at the Contract Unit Price shall be verified and accepted by Manitoba Hydro. The Price shall be payment in full for performing all operations herein described including removal of the pole, base, luminaire, appurtenances, use of pressurized water/vacuum excavation, transportation of Reclaim, Surplus and Scrap material, payment of associated disposal fees and all other items incidental to the work included in the Specification.

E50.41.3 Installation of Conduit and #4 AL C/N or 1/0 AL Triplex Streetlight Cable in Conduit by Open Trench Method

(a) This pay item will be measured on a linear metre basis and paid for at the Contract Unit Price per linear metre for “Installation of Conduit and #4 AL C/N or 1/0 AL Triplex streetlight cable in Conduit by open trench method.” The number of meters to be paid for at the Contract Unit Price shall be measured and accepted by Manitoba Hydro. The Price shall be payment in full for performing all operations herein described including installation of the conduit, pulling cable into the conduit, backfilling the trench, buried utility crossings, use of pressurized water/vacuum excavation and all other items incidental to the work included in the Specification.

E50.41.4 Installation of 50 mm Conduit by Boring Method complete with Cable Insertion (#4 AL C/N or 1/0 AL Triplex)

(a) This pay item will be measured on a linear metre basis and paid for at the Contract Unit Price per linear metre for “Installation of 50 mm conduit or conduits by boring method complete with cable insertion (#4 AL C/N or 1/0 AL Triplex).” The number of meters to be paid for at the Contract Unit Price shall be measured and accepted by Manitoba Hydro. The Price shall be payment in full for performing all operations herein described including installation of 50mm conduit or conduits by boring method, inserting the #4 AL C/N or 1/0 AL Triplex streetlight cable into the conduit(s), buried utility crossings, use of pressurized water/vacuum excavation and all other items incidental to the work included in the Specification.

E50.41.5 Installation of cable (#4 AL C/N or 1/0 AL Triplex) by boring method.

(a) This pay item will be measured on a linear metre basis and paid for at the Contract Unit Price per linear metre for “Installation of cable(s) (#4 AL C/N or 1/0 AL Triplex) by boring method.” The number of meters to be paid for at the Contract Unit Price shall be measured and accepted by Manitoba Hydro. The Price shall be payment in full for performing all operations herein described including installation of the cable or cables by boring method, buried utility crossings, use of pressurized water/vacuum excavation and all other items incidental to the work included in the Specification.

E50.41.6 Installation of 25'/35' Pole, Davit Arm and Precast Concrete Base Including Luminaire and Appurtenances

(a) This pay item will be measured on a unit basis and paid for at the Contract Unit Price per unit for “Installation of 25'/35' pole, davit arm and precast concrete base including luminaire and appurtenances.” The number of units to be paid for at the Contract Unit Price shall be verified and accepted by Manitoba Hydro. The Price shall be payment in full for performing all operations herein described including installation of the pole, davit arm, base, luminaire, appurtenances, placing the cable(s) into the base, use of pressurized water/vacuum excavation and all other items incidental to the work included in the Specification.

E50.41.7 Installation of 45' Pole, Davit Arm and Precast Concrete Base Including Luminaire and Appurtenances

(a) This pay item will be measured on a unit basis and paid for at the Contract Unit Price per unit for “Installation of 45' pole, davit arm and precast concrete base including luminaire and appurtenances.” The number of units to be paid for at the Contract Unit Price shall be verified and accepted by Manitoba Hydro. The Price shall be payment in full for performing all operations herein described including installation of the pole, davit arm, base, luminaire, appurtenances, placing the cable(s) into the base, use of pressurized water/vacuum excavation and all other items incidental to the work included in the Specification.

E50.41.8 Installation of One (1) 10' Ground Rod at Every Third Street Light, at the End of a Street Light Circuit or Anywhere Else as Shown on the Design Drawings. Trench #4 Ground Wire up to 1 m From Rod Location to New Street Light and Connect (Hammerlock) to Top of Ground Rod

(a) This pay item will be measured on a unit basis and paid for at the Contract Unit Price per unit for “Installation of one (1) 10' ground rod at every third street light, at the end of a street light circuit or anywhere else as shown on the design drawings. Trench #4 ground wire up to 1 m from rod location to new street light and connect (hammerlock) to top of the ground rod.” The number of units to be paid for at the Contract Unit Price shall be verified and accepted by Manitoba Hydro. The Price shall be payment in full for performing all operations herein described including install one (1) 10’ ground rod, trench the #4 ground wire to the new streetlight pole, connect (hammerlock) ground wire to rod and all other items incidental to the work included in the Specification.

E50.41.9 Installation of Lower 3 m of Cable Guard, Ground Lug, Cable Up Pole, and First 3 M Section of Ground Rod Per Standard CD 315-5

(a) This pay item will be measured on a unit basis and paid for at the Contract Unit Price per unit for “Install/lower 3 m of Cable Guard, ground lug, cable up pole, and first 3 m section of ground rod per Standard CD 315-5”. The number of units to be paid for at the Contract Unit Price shall be verified and accepted by Manitoba Hydro. The Price shall be payment in full for performing all operations herein described including installing the lower section of cable guard, ground lug, ground rod, coiling cable(s) up the pole and all other items incidental to the work included in the Specification.

E50.41.10 Installation and Connection of Externally-Mounted Relay and PEC Per Standards CD 315-12 and CD 315-13

(a) This pay item will be measured on a unit basis and paid for at the Contract Unit Price per unit for “Installation and connection of externally-mounted relay and PEC per Standards CD 315-12 and CD 315-13”.The number of units to be paid for at the Contract Unit Price shall be verified and accepted by Manitoba Hydro. The Price shall be payment in full for performing all operations herein described including mounting the relay, PEC, wiring as per the schematic and all other items incidental to the work included in the Specification.

E50.41.11 Termination of 2/C #12 Copper Conductor to Street Light Cables Per Standard CD310-4, CD310-9 or CD310-10

(a) This pay item will be measured on a unit basis and paid for at the Contract Unit Price per unit for “Terminate 2/C #12 copper conductor to street light cables per Standard CD310-4, CD310-9 or CD310-10”.The number of units to be paid for at the Contract Unit Price shall be verified and accepted by Manitoba Hydro. The Price shall be payment in full for performing all operations herein described including connection of the 2/C # 12 copper conductor to the #4 C/N or 1/0 Al Triplex cable(s) using a GELCAP-SL-2/0 splice kit and all other items incidental to the work included in the Specification.

E50.41.12 Splicing #4 AL C/N or 2 Single Conductor Street Light Cables

(a) This pay item will be measured on a unit basis and paid for at the Contract Unit Price per unit for “Splicing #4 Al C/N or 2 single conductor street light cables”. The number

of units to be paid for at the Contract Unit Price shall be verified and accepted by Manitoba Hydro. The Price shall be payment in full for performing all operations herein described including splicing the #4 AL C/N or 2 single conductor cables in accordance with Standard CD 215-12 and CD 215-13 and all other items incidental to the work included in the Specification.

E50.41.13 Splicing 1/0 AL Triplex Cable or 3 Single Conductor Street Light Cables

(a) This pay item will be measured on a unit basis and paid for at the Contract Unit Price per unit for “Splicing 1/0 AL triplex cable or 3 single conductor street light cables”. The number of units to be paid for at the Contract Unit Price shall be verified and accepted by Manitoba Hydro. The Price shall be payment in full for performing all operations herein described including splicing the 1/0 Al triplex cable or set of 3 single conductor cables in accordance with Standard CD 215-12 and CD 215-13 and all other items incidental to the work included in the Specification.

E50.41.14 Installation of Break-Away Base and Reaction Plate on Base-Mounted Poles up to 35’

(a) This pay item will be measured on a unit basis and paid for at the Contract Unit Price per unit for “Installation of break-away base and reaction plate on base mounted poles up to 35’”. The number of units to be paid for at the Contract Unit Price shall be verified and accepted by Manitoba Hydro. The Price shall be payment in full for performing all operations herein described including installation of the reaction plate, break-away base and all other items incidental to the work included in the Specification.

E50.41.15 Installation of Overhead Span of #4 Duplex Between New or Existing Streetlight Poles and Connect Luminaire to Provide Temporary Overhead Feed

(a) This pay item will be measured on per span basis and paid for at the Contract Unit Price per span for “Installation of Overhead Span of #4 duplex Between New or Existing Streetlight Poles and Connect Luminaire to Provide Temporary Overhead Feed”. The number of units to be paid for at the Contract Unit Price shall be verified and accepted by Manitoba Hydro. The Price shall be payment in full for performing all operations herein described including attachment of the #4 duplex overhead conductor using a perform grip (c/w spool insulator(s) to davit arm if necessary), sagging conductor, connection of luminaire using 2C#12 copper conductor and all other items incidental to the work included in the Specification.

E50.41.16 Removal of Overhead Span of #4 Duplex Between New or Existing Streetlight Poles to Remove Temporary Overhead Feed

(a) This pay item will be measured on a per span basis and paid for at the Contract Unit Price per span for “Removal of Overhead Span of #4 duplex Between New or Existing Streetlight Poles to Remove Temporary Overhead Feed”. The number of units to be paid for at the Contract Unit Price shall be verified and accepted by the Manitoba Hydro. The Price shall be payment in full for performing all operations herein described including removal of the #4 duplex overhead conductor, spool insulator(s) and all other items incidental to the work included in the Specification.

E50.41.17 Expose Underground Cable Entrance of Existing Streetlight Pole and Install New Streetlight Cable(s).

(a) This pay item will be measured on a unit basis and paid for at the Contract Unit Price per unit for “Expose Underground Cable Entrance of Existing Streetlight Pole and Install New Streetlight Cable(s)”. The number of units to be paid for at the Contract Unit Price shall be verified and accepted by Manitoba Hydro. The Price shall be payment in full for performing all operations herein described including excavation and exposure of the underground cable entrance by any means necessary including use of pressurized water/vacuum excavation, installation of the new streetlight cables(s), backfill, compaction and all other items incidental to the work included in the Specification.

E51. CONCRETE CONSTITUENT MATERIALS, MIX DESIGN REQUIREMENTS, AND HOT AND COLD WEATHER CONCRETING

DESCRIPTION

E51.1 General

E51.1.1 PORTLAND CEMENT CONCRETE PAVEMENT WORKS shall be in accordance with CW3310-R17, PORTLAND CEMENT CONCRETE PAVEMENT WORKS, except as otherwise specified herein.

E51.1.2 This specification covers Portland cement concrete constituent materials and design requirements for the preparation of Portland Cement Concrete for all concreting operations relating to the construction of pavements, curbs, gutters, private approaches, bull-noses, median slabs, median, safety median and boulevard splash strips, sidewalk and other related concrete works.

E51.1.3 This specification also covers hot and cold weather concreting.

E51.1.4 Replace 2.0 Definitions of CW 3310-R17, PORTLAND CEMENT CONCRETE PAVEMENT WORKS with 1.2 of this specification.

E51.1.5 Replace 5.3 Portland Cement Concrete Constituent Materials of CW 3310-R17, PORTLAND CEMENT CONCRETE PAVEMENT WORKS with 2.0 MATERIALS of this specification.

E51.1.6 Replace 6.0 Design Requirements of CW 3310-R17, PORTLAND CEMENT CONCRETE PAVEMENT WORKS with 3.0 DESIGN REQUIREMENTS of this specification.

E51.1.7 Replace 9.8. Weather Conditions of CW 3310-R17, PORTLAND CEMENT CONCRETE PAVEMENT WORKS with 4.0 HOT AND COLD WEATHER CONCRETING of this specification.

E51.1.8 Replace 13.0 Basis of Payment of CW 3310-R17, PORTLAND CEMENT CONCRETE PAVEMENT WORKS with 5.1 BASIS OF PAYMENT FOR CW 3310-R17 of this specification.

E51.1.9 Replace 13.0 Basis of Payment of CW 3230-R8, FULL-DEPTH PATCHING OF EXISTING PAVEMENT SLABS AND JOINTS with 5.2 BASIS OF PAYMENT FOR CW 3230-R8 of this specification

E51.1.10 Replace 13.0 Measurement and Payment for CW 3235-R9, RENEWAL OF EXISTING MISCELLANEOUS CONCRETE SLABS with 5.3 MEASUREMENT AND PAYMENT FOR CW 3235-R9 of this specification

E51.1.11 Replace 4.0 Measurement and Payment for CW 3240-R10, RENEWAL OF EXISTING CURBS with 5.4 MEASUREMENT AND PAYMENT FOR CW 3240-R10 of this specification

E51.1.12 Replace 13.0 Basis of Payment for CW 3325-R5, PORTLAND CEMENT CONCRETE SIDEWALK with 5.5 BASIS OF PAYMENT FOR CW 3325-R5 of this specification.

E51.1.13 This specification also replaces 2.0 Definitions, 5.3 Portland Cement Concrete Constituent Materials, 6.0 Design Requirements, 9.8. Weather Conditions, and 13.0 Basis of Payment of CW3310-R17, PORTLAND CEMENT CONCRETE PAVEMENT WORKS where other specifications (e.g. CW3230-R8, CW3235-R9, CW3240-R10, CW3325-R5) reference CW3310-R17, PORTLAND CEMENT CONCRETE PAVEMENT WORKS.

E51.1.14 All requirements and tests shall be in accordance with the latest edition of CSA A23.1-19/CSA A23.2-19, except as otherwise specified herein.

E51.2 Definitions

E51.2.1 Reinforced Concrete Pavement - A Portland Cement Concrete pavement with distributed steel reinforcement in the pavement slab and with deformed tie bars across longitudinal

joints and smooth dowels across transverse contraction joints. Distributed steel reinforcement consists of smooth or deformed bars.

E51.2.2 Plain-Dowelled Pavement - A Portland Cement Concrete pavement with no reinforcing steel in the pavement slab and with deformed tie bars across longitudinal joints and smooth dowels across transverse contraction joints.

E51.2.3 Type 1 Concrete shall be used for expressways, major arterials, minor arterials, industrial/commercial collectors, residential major collectors, residential minor collectors, and industrial/commercial local pavements.

E51.2.4 Type 2 Concrete shall be used for residential roads and alleys, curb and gutter sections, curbs, commercial approaches, residential approaches, miscellaneous concrete slab and splash strips. Type 1 Concrete can be used instead of Type 2 Concrete.

E51.2.5 Type 3 is early opening concrete and shall be used for 24 hours early opening after placement.

E51.2.6 Type 4 is early opening concrete and shall be used for 72 hours early opening after placement.

E51.2.7 Type 5 Concrete shall be used for Sidewalks. Type 1 or Type 2 Concrete can be used instead of Type 5 Concrete.

E51.2.8 Type 6 Concrete is cold weather concreting and shall replace all other concrete types for all applications when cold weather exists, except Type 8.

E51.2.9 Type 7 is concrete for restoration of utility pavement cuts.

E51.2.10 Type 8 is concrete for temporary restoration.

E51.2.11 Coarseness Factor - A measure of the coarseness of the combined aggregate materials being incorporated into the concrete mix, defined as the percentage of all plus 2 500 sieve particles, which are also retained on the 10 000 sieve. Coarseness Factor = 100 (cumulative % retained on 10 000 Sieve divided by the cumulative % retained on 2 500 Sieve).

E51.2.12 Hot weather is defined as one or a combination of the ambient air temperature being at or above 27 °C, or when there is a probability of the temperature rising above 27 °C during the concrete placing period (as forecast by the nearest official meteorological office), or the evaporation rate that exceeds 0.75 kg/m^2 /h due to high concrete temperature (maximum temperature of 32 °C for fresh concrete), low relative humidity and high wind speed that tends to impair the quality of freshly mixed or hardened concrete by accelerating the rate of moisture loss and rate of cement hydration, or otherwise causing detrimental results.

E51.2.13 Cold weather is defined as a period when there is a probability of the ambient air temperature falling below 5 °C within 24 hours of placing or the average daily temperature for three consecutive days has fallen to, or is expected to fall, below 5°C as forecast by the nearest official meteorological office. The daily temperature is the mean temperature which is the average of the maximum and minimum temperature during the period from midnight to midnight.

E51.2.14 The protection period is the time required to prevent concrete from being affected by exposure to cold weather and to develop a minimum compressive strength of 24 MPa. Concrete compressive strength shall be determined by maturity meters and field cured cylinders. In no case shall the protection period be less than seven (7) days.

MATERIALS

E51.3 Concrete Constituent Materials

E51.4 Aggregates

E51.4.1 Aggregate shall consist of crushed stone or gravel or a combination of these materials conforming to the requirements of this Specification.

E51.4.2 Each of the fine- and coarse-fractions of the combined aggregate shall meet all the requirements of CSA A23.1, Table 10 (FA1) and Table 11, respectively and shall be handled and weighed separately to maintain uniformity. The supplier shall provide the City of Winnipeg, Research and Standards Engineer with test data in accordance with CSA A23.2-30A to demonstrate that the material will produce concrete of acceptable quality that meets all the relevant requirements of this Specification.

E51.4.3 The combined aggregate gradation and allowable deviations shall comply with the requirements in Table CW 3310.1.

TABLE CW 3310.1 – Combined Aggregate Gradation Limits and Allowable Deviations

Sieve Size	Percent of Total Dry Weight Passing Each Sieve	Allowable Deviation From The Job Mix Formula, % By Mass Passing Sieve
28 000	100%	--
20 000	90% - 100%	± 2%
14 000	75% - 95%	± 2%
10 000	60% - 75%	± 3%
5 000	35% - 50%	± 3%
2 500	27% - 35%	± 2%
1 250	20% - 30%	± 2%
630	10% - 20%	± 2%
315	5% - 10%	± 2%
160	1% - 4%	± 1%
80	0% - 2%	± 1%

E51.4.4 The fineness modulus of fine aggregate shall be not less than 2.3 nor more than 3.1.

E51.4.5 Aggregates shall conform to CSA-A23.1, Clauses 4.2.3.1 to 4.2.3.6. Each of the fine- and coarse-fractions shall comply with the physical requirements in Table CW 3310.2 and the test results shall be provided with the mix design submittal.

TABLE CW 3310.2 – Limits for Deleterious Substances and Physical Properties of Aggregates

Material	**Parameter**	**Test Method**	**Maximum Limits**	**Frequency of Test**
coarse aggregate	Clay lumps	CSA A23.2-3A	0.25%	2 years
	Low density granular material	CSA A23.2-4A	0.5%	2 years
	Material finer than 80 µm	CSA A23.2-5A	1.0%	1 year
	Relative density and absorption	CSA A23.2-12A	Note*	1 year
	Flat and elongated particles - Flat particles - Elongated particles	CSA A23.2-13B	25% 40%	1 year

	Petrographic examination** – PN	CSA A23.2-15A	125	1 year
	Unconfined freeze-thaw	CSA A23.2 24A	6%	Twice per season
	Alkali-silica reactivity	CSA A23.2-25A	0.15%	2 years
	Alkali-carbonate reactivity	CSA A23.2-26A	Note*	1 year
	Micro-Deval	CSA A23.2-29A	17%	Twice per season
fine aggregate	Clay lumps	CSA A23.2-3A	1%	2 years
	Low density granular material	CSA A23.2-4A	0.5%	2 years
	Material finer than 80 µm	CSA A23.2-5A	3.0%	1 year
	Organic impurities	CSA A23.2-7A	free from injurious amounts	2 years
	Petrographic examination**	CSA A23.2-15A	Note**	1 year
	Micro-Deval	CSA A23.2-23A	20%	1 year
	Alkali-silica reactivity	CSA A23.2-25A	0.15%	2 years

- *No acceptance/rejection values; however, the results shall be submitted.
- **Petrographic examinations shall be used to calculate the petrographic number (PN), to provide an appraisal of the physical-mechanical quality of coarse aggregate. Determination of PNs applies solely to coarse aggregates and should not be used for fine aggregates. The petrographic report for the fine aggregate shall include a comment on the suitability of the material for use in the production of concrete mix.
- The Coarseness Factor of the combined aggregate shall be between 45 and 65.
- Quarried limestone and dolomite shall not be acceptable as concrete aggregate materials.

E51.5 Hydraulic Cement

E51.5.1 Hydraulic Cement shall be either General Use (GU) or General Use Limestone (GUL) conforming to the requirements of the latest edition of CSA A3001. High-early-strength Portland cement (HE) may also be used for cold weather concreting only. Cement shall be kept in weather tight storage that will protect it from moisture and contamination, and in such a manner as to permit inspection, sampling and identification, where required, of each lot.

E51.6 Supplementary Cementing Materials

E51.6.1 Fly ash shall conform to the requirements of CSA A3001 Class F. Fly ash shall be added to concrete mixtures as a separate constituent material. The use of blended hydraulic cement is not permitted.

E51.7 Water

E51.7.1 Potable water, which is water suitable for human consumption, is permitted to be used as mixing water in concrete without testing. Non-potable water and combined water shall conform to ASTM C1602M, Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete. The concrete supplier shall maintain documentation on the characteristics of the mixing water in compliance with the

requirements of Tables 1 and 2 in ASTM C1602M. Testing to verify compliance with the requirements in Table 1 shall be conducted on the Type 1 hand placement paving mix with fly ash. The testing frequency for mixing water shall be in accordance with Appendix X1 of ASTM C1602M. Information on the testing frequency of the concrete mixing water shall be included in the concrete suppliers' quality control program. The source(s) of concrete mixing water and test data indicating compliance with ASTM C1602M shall be provided with the Mix Design Statement submitted to the City of Winnipeg, Research and Standards Engineer.

E51.8 Admixtures

E51.8.1 Air-Entraining Admixture

(a) The air-entraining admixture shall conform to the requirements of ASTM C260, Standard Specification for Air-Entraining Admixtures for Concrete.

E51.8.2 Chemical Admixtures

(a) Chemical admixtures shall conform to the requirements of ASTM C494, Standard Specification for Chemical Admixtures for Concrete. Chloride-based chemical admixtures will not be permitted under any circumstances.

E51.8.3 Cold-Weather Admixture Systems

(a) Cold-weather admixture systems shall conform to the requirements of ASTM C1622, Standard Specification for Cold-Weather Admixture Systems.

DESIGN REQUIREMENTS

E51.9 Concrete Suppliers

E51.9.1 The City of Winnipeg, Research and Standards Engineer will maintain a list of approved concrete suppliers. To obtain approval, concrete suppliers must annually submit the following information to the Research and Standards Engineer prior to April 1st.

(a) Concrete suppliers Approval Guidelines and Application is available at the City of Winnipeg, Corporate Finance, Material Management Division website at: https://www.winnipeg.ca/matmgt/Spec/Default.stm.

(b) Names of suppliers and sources for all materials and admixtures.

(c) Concrete mix designs with unique mix design codes signed and dated by person selecting the mix proportions.

(d) Copy of valid Concrete Manitoba certificate for concrete batch plant.

(e) Copies of valid scale calibration reports for the concrete batch plant.

(f) Test data for aggregates (in accordance with clause 51.4).

(g) The mill certificate for the cement and fly ash including chemical and physical composition and analysis, fly ash source and name of supplier.

(h) Sieve analysis test reports for the individual aggregates and the combined aggregate gradations to be used in the concrete. The sieve analysis test reports shall be representative of the material to be used during concrete production.

(i) Performance data from trial batches prior to construction to demonstrate the concrete mix will achieve the performance criteria in Table CW 3310.3.

TABLE CW 3310.3: Performance Criteria and Testing

	Time (day)	Type 1	Type 2	Type 3, and Type 6	Type 4	Type 5	Type 7**	Type 8
A minimum of one (1) set* of concrete	@ 1	--	--	20 MPa	--	--	--	--
	@ 3	15 MPa	15 MPa	--	20 MPa	--	--	--

compressive strength tests for the slipform paving mix with and without fly ash according to CSA A23.2-9C	@ 7	20 MPa	20 MPa	--	--	--	--	--
	@ 28	35 MPa	32 MPa	35 MPa	35 MPa	--	--	--
A minimum of two (2) sets* of concrete compressive strength tests for the hand placement paving mix with and without fly ash according to CSA A23.2-9C	@ 1	--	--	20 MPa	--	--	--	--
	@ 3	15 MPa	15 MPa	24 MPa	20 MPa	12 MPa	20 MPa	12 MPa
	@ 7	20 MPa	20 MPa	--	--	--	--	--
	@ 28	35 MPa	32 MPa	35 MPa	35 MPa	30 MPa	35 MPa	30 MPa
Air-void test according to ASTM C457	@ 28	See Note ***						
Rapid chloride penetrability test (RCPT) according to CSA A23.2-23C	@ 56	See Note ****						

*Each set contains at least three (3) cylinders at each specified date. The average of each set shall be equal to or greater than the specified strength, with no single result less than 85% of the specified strength.

** Type 7 is concrete for restoration of utility pavement cuts and shall be adjusted to meet the specified strength for other types based on the application and shall include set retarders or hydration stabilizers to extend the discharge time to 150 min.

***A minimum of one sample for air-void test at 28 days shall be performed for each cement for Type 1, Type 2, and Type 3 with fly ash, and Type 6. The air-void test shall meet the following requirements:

- Spacing factor shall not exceed 230 µm, with no single value greater than 260 µm; and,
- Air content shall be greater than or equal to 5.0% and less than 8.0%.

****A minimum of two samples for rapid chloride penetrability test shall be performed for Type 1, Type 2 and Type 3 for mixes with and without fly ash. For Type 1 and Type 3, the average penetrability shall be equal to or less than 1250 coulombs at 56 days based on the charge passed, with no single result greater than 1500 coulombs for mixes with and without fly ash. For Type 2, the average of chloride ion penetrability shall be equal to or less than 1500 coulombs at 56 days based on the charge passed, with no single result greater than 1750 coulombs.

(j) Quality control program for all materials, including a proposed sampling and testing plan with minimum sampling and testing frequencies;

(k) The laboratory(s) to be used and its credentials;

(l) The quality control personnel and their qualifications; and,

(m) Frequency of production equipment inspection, verification of calibration, and any certification of the production facility.

E51.10 The City of Winnipeg, Research and Standards Engineer will conduct inspections at least once a year during production. Samples of materials may be taken and tested.

E51.11 Testing for qualification or acceptance purposes shall be done in accordance with this Specification and the applicable test procedures and standard practices of CSA A23.2. There shall be no charge for any materials taken for testing purposes.

E51.12 Changes in the source of any concrete constituent materials will not be permitted without approval of the City of Winnipeg, Research and Standards Engineer. For new sources, all materials shall be tested.

E51.13 Once approved, all concrete shall be supplied in accordance with the approved Mix Design Statement. No changes in the concrete mix designs will be permitted without written permission from the City of Winnipeg, Research and Standards EngineerConcrete Properties.

E51.14 Concrete Suppliers

E51.14.1 The Mix Design Statements for all concrete types shall be submitted to the City of Winnipeg, Research and Standards Engineer for approval. The concrete mix shall be

proportioned such as to yield concrete having the required workability, strength and durability in Table CW 3310.4.

TABLE CW 3310.4 – Concrete Properties

	Type 1	Type 2	Type 3	Type 4	Type 5	Type 6	Type 7	Type 8
Minimum Cementitious Content (kg/m^3)	360	340	360	360	320	400	340	300
Maximum Supplementary Cementing Materials – Fly Ash** (%) (see Note 2)	20%	20%	15%	20%	15%	0%	20%	20%
Maximum Water/Cementitious Ratio								
- Slip form paving	0.4	0.4	0.4	0.4	-	0.35	-	-
- Hand placement	0.42	0.42	0.42	0.42	0.42	0.36	0.42	0.45
Slump (mm)								
- Slip form paving	50 ± 20	50 ± 20	50 ± 20	50 ± 20	-	50 ± 20	-	-
- Hand placement	70 ± 20	70 ± 20	70 ± 20	70 ± 20	80 ± 20	70 ± 20	100±20	100±20
Nominal Maximum Aggregate Size (mm)	20	20	20	20	20	20	20	20
Air Content (%)	5-8	5-8	5-8	5-8	5-8	5-8	5-8	5-8
Minimum Compressive Strength (MPa)								
- @ 1 days	-	-	20	-	-	20		-
- @ 3 days	15	15	-	20	-	24	Note 1*	-
- @ 7 days	-	-	-	-	-	-		-
- @ 28 days	35	32	Note 1*	Note 1*	30	Note 1*		30
Maximum Rapid Chloride Penetrability Test*** (coulombs) @ 56 days. (see Note 3)	1500	1750	Note 1*	Note 1*	-	Note 1*	-	-

*The concrete shall meet Type 1 or Type 2 based on the application.
**The use of fly ash in concrete mix will be permitted. The Contractor will have the option to replace cement up to but not exceeding the above limits, by weight of total cementitious materials, depending on the concrete type. The use of fly ash will be permitted when the average daily temperature is 10˚C and rising for the next five (5) consecutive days of placement as forecast by the nearest official meteorological office. The use of fly ash will not be permitted when the average daily temperature is below 10˚C and the average daily temperature for more than five (5) consecutive days has fallen to, or is expected to fall, below 10˚C within fourteen (14) days of placement as forecast by the nearest official meteorological office unless authorized in writing by the City of Winnipeg, Research and Standards Engineer.
***The concrete supplier shall develop and submit maturity relationships for Type 1 and Type 6 mixes.

***Rapid chloride penetrability test will be required where there is evidence of concrete damage as a result of inadequate curing and adverse weather conditions, including hot weather, wind, rain, sleet, snow and cold weather. The Contract Administrator shall be allowed access to all sampling locations and reserves the right to take samples for testing at any time.

E51.15 Plant Quality Control

E51.15.1 The concrete supplier shall provide quality control for the plant to ensure all materials meet the approved mix designs. This information shall be submitted bi-weekly and will be monitored by the City of Winnipeg, Research and Standards Engineer. Failure to submit the quality control results shall be cause for immediate suspension of the concrete supplier.

E51.15.2 A new mill certificate for cement and fly ash shall be provided monthly during production.

E51.15.3 Check tests of any concrete constituent materials may be undertaken by a Testing Laboratory designated by the City of Winnipeg, Research and Standards Engineer. The concrete supplier shall be equipped with a suitable means or device for obtaining a representative sample of the cement and fly ash. The device shall enable the sample to be readily taken in proximity to the cement or fly ash weigh hopper and from a container or

conveyor holding only cement or fly ash to prevent contamination. Any materials which fails to comply with the requirements of CSA A3001 will be rejected, notwithstanding any certificate of acceptance that may have been previously given. Materials that have been rejected must be removed immediately by the concrete supplier.

HOT AND COLD WEATHER CONCRETING

E51.16 The Contractor shall be responsible for taking all necessary measures to protect freshly laid concrete from adverse weather conditions, including hot weather, wind, rain, sleet, snow and cold weather, except as otherwise specified herein.

E51.16.1 Hot weather concreting

(a) When the ambient air temperature is at or above 27 °C, or when there is a probability of the temperature rising above 27 °C during the placing period (as forecast by the nearest official meteorological office), the Contractor shall provide protection for the concrete from the effects of hot and/or drying weather conditions.

(b) When drying conditions are greater than or equal to 0.75 kg/m^2/hr as estimated by use of Figure D1, Appendix D, Guidelines for Curing and Protection of CSA A23.1, the plastic concrete surface shall be protected from drying by application of an evaporation retardant. The evaporation retardant shall be applied according to the manufacturer's recommendations.

E51.16.2 Cold weather concreting

(a) When there is a probability of the air temperature falling below 5 °C within 24 h of placing or the average daily temperature for more than three successive days is fallen to, or is expected to fall, below 5°C as forecast by the nearest official meteorological office, cold weather concreting requirements shall apply.

(b) Concrete shall be placed on unfrozen base material, free of water, snow, and ice. Frozen base material will be identified by measuring the surface temperature using infrared thermometers or similar devices. If the surface temperature is less than or equal to 0°C, the base will be considered frozen. The Contractor shall use suitable heating methods to maintain the base temperature above 0°C. Salt shall not be used to thaw ice, snow, or frost.

(c) Type 6 Concrete shall be used for cold weather concreting.

(d) Where less than 30 cubic meters of concrete will be placed, the Contractor shall protect the concrete using a minimum of one layer of insulated tarp with R-value more than 5 for a minimum of seven (7) days after completion of placing operations unless otherwise specified by the Contract Administrator.

(e) Where 30 cubic meters of concrete or more will be placed, a minimum of three maturity meters shall be used. One maturity meter shall be placed in the final 4 m of paving, and the two other maturity meters shall be placed at locations designated by the Contract Administrator. Each maturity meter shall be capable of recording the time and temperature at three depths, ½ inch below the surface, mid slab and ½ inch above the bottom of the pavement. Locations where the maturity meters are placed shall be protected in the same manner as the rest of the concrete.

(f) The Contract Administrator shall provide all necessary wires and connectors for maturity meters. The Contractor shall be responsible for the placement, protection, and maintenance of all wires and connectors. No additional measurement or payment will be made for the placement, protection, and maintenance of all wires and connectors.

(g) The Contractor shall maintain the internal concrete temperature above 10 °C during the protection period, a minimum of seven (7) days after completion of placing operations, and until the concrete has developed a minimum compressive strength of 24 MPa. Temperature and concrete compressive strength shall be determined by maturity meters and field cured cylinders. A minimum of four (4) readings for temperature shall be collected in the first three (3) days and then two times daily thereafter.

(h) The Contractor shall provide suitable protection methods to the Contract Administrator for approval such as insulation (blankets and boards), heating systems such as electric blankets and hydronic heating systems, unheated or heated enclosures, or a combination of the methods to maintain the internal concrete temperature above 10 °C. In no case shall the protection method be less than one layer of insulated tarp with R-value more than 5.

(i) If the internal concrete temperature at any location in the concrete falls below 10 °C but not less than 5°C during the curing period, supplemental heat shall be introduced immediately.

(j) If the internal concrete temperature at any location in the concrete falls below 5 °C during the curing period, cores shall be collected and tested at 28 days. The cores will be tested in accordance with ASTM C856, Standard Practice for Petrographic Examination of Hardened Concrete and CSA A23.2-14C, Obtaining and testing drilled cores for compressive strength testing. Concrete damaged by frost, as determined by the compressive strength test or Petrographic analysis, shall be removed and replaced at the Contractor's expense. All costs associated with coring, transmittal of cores, and petrographic examination and compressive testing shall be borne by the Contractor regardless of the outcome of the examination.

(k) If the internal concrete temperature at any location in the concrete falls below 0 °C during the curing period, concrete shall be removed and replaced by the Contractor at his own expense.

(l) The protection method shall not be completely removed until the concrete has cooled to the temperature differential given in CSA A23.2, Table 20. The Contractor shall provide suitable methods for gradual cooling to the Contract Administrator for approval such as loosening the forms while maintaining cover with plastic sheeting or insulation, gradual decrease in heating inside an enclosure, or turning off the heat and allowing the enclosure to slowly equilibrate to ambient temperature. If the concrete cracks due to a sudden temperature change, concrete shall be removed and replaced by the Contractor at his own expense.

(m) Concrete damaged as a result of inadequate protection against weather conditions shall be removed and replaced by the Contractor at his own expense.

(n) No additional measurement or payment will be made for cold weather concreting.

BASIS OF PAYMENT FOR CW 3310-R17

E51.17 Concrete Pavements, Median Slabs, Bullnoses and Safety Median

E51.17.1 Construction of concrete pavements, median slabs, bull-noses and safety median will be paid for at the Contract Unit Price per square metre for the "Items of Work" listed here below, measured as specified herein, which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the work included in this Specification. The unit price shall be reduced for deficiencies in pavement thickness as per Clause E51.19 of this Specification.

Items of Work:

i. "Construction of 250 mm Type (*) Concrete Pavement (**)(***)"
ii. "Construction of 230 mm Type (*) Concrete Pavement (**)(***)"
iii. "Construction of 200 mm Type (*) Concrete Pavement (**)(***)"
iv. "Construction of 150 mm Type (*) Concrete Pavement (**)(***)"
v. "Construction of Type (*) Concrete Median Slabs (****)"
vi. "Construction of Monolithic Type (*) Concrete Median Slabs (****)"
vii. "Construction of Type (*) Concrete Safety Medians (****)"
viii. "Construction of Monolithic Type (*) Concrete Curb and Sidewalk (****)"
ix. "Construction of Monolithic Type (*) Concrete Bull-noses"

*Specify the Concrete Type

**Specify either Reinforced or Plain-Dowelled

***Specify Slip Form Paving if required

****Specify referenced Standard Detail.

E51.18 Concrete Pavements for Early Opening

E51.18.1 Construction of concrete pavements for early opening will be paid for at the Contract Unit Price per square metre for the "Items of Work" listed here below, measured as specified herein, which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the work included in this Specification. The unit price shall be reduced for deficiencies in pavement thickness as per Clause E51.19 of this Specification.

Items of Work:

(i) "Construction of 250 mm (Type *) Concrete Pavement For Early Opening (**)(***)"

(ii) "Construction of 230 mm (Type *) Concrete Pavement For Early Opening (*)(**)(***)"

(iii) "Construction of 200 mm (Type *) Concrete Pavement For Early Opening (*)(**)(***)"

(iv) "Construction of 150 mm (Type *) Concrete Pavement For Early Opening (*)(**)(***)"

*Specify either Type 3 or Type 4

**Specify either Reinforced or Plain-Dowelled

***Specify Slip Form Paving if required

E51.19 Pavement Thickness Tolerances

E51.19.1 At the option of the Contract Administrator, pavement thickness may be determined by coring pavement sections representing each day's pour and determining the pavement thickness by averaging the depth of the cores.

E51.19.2 Pavement found deficient in thickness by more than five (5%) percent shall be paid for at the reduced price. The reduced price = P_R x contract price;

P_R is in % and T_D is in %

Where: $P_R = 100 - [(T_D - 5) / 5]$ x 25

Where: T_D = thickness deficiency greater than or equal to 5%, up to 10%

E51.19.3 When the pavement thickness is deficient by more than ten (10%) percent and the judgement of the Contract Administrator is that the area of such deficiency should not be removed and replaced, payment will be fifty (50%) percent of Contract Unit Price.

E51.19.4 The cost of initial cores will not be paid for by the Contractor. Additional cores requested by the Contractor to determine the extent of areas deficient in thickness, shall be paid for by the Contractor.

E51.20 Concrete Curbs, Curb and Gutter, and Splash Strips

E51.20.1 Construction of concrete curbs, curb and gutter, and splash strips will be paid for at the Contract Unit Price per metre for the "Items of Work" listed here below, measured as specified herein, which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the work included in this Specification.

Items of Work:

(i) "Construction of Type (*) Concrete Barrier Curb (**)"

(ii) "Construction of Type (*) Concrete Modified Barrier Curb (**)"

(iii) "Construction of Type (*) Concrete Curb and Gutter (**)"

(iv) "Construction of Type (*) Concrete Mountable Curb (**)"

(v) "Construction of Type (*) Concrete Lip Curb (**)"

(vi) "Construction of Type (*) Concrete Curb Ramp (**)"

(vii) "Construction of Type (*) Concrete Safety Curb (**)"

(viii) "Construction of Type (*) Concrete Splash Strips (***)"

* Specify the Concrete Type
** Specify height, type and Referenced Standard Detail
***Specify height, monolithic or separate, type, width, and referenced Standard Detail

E51.20.2 No measurement or payment shall be made for supply or placement of bonding grout for concrete curbs.

E51.20.3 Drilled curb ramp tie bars are to be paid in accordance with CW 3230.

E51.21 Dowel Assemblies

E51.21.1 Supply and installation of dowel assemblies will be paid for at the Contract unit Price per metre for "Supply and Installation of Dowel Assemblies", measured as specified herein, which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the work included in this Specification.

E51.22 Drilled Tie Bars and Dowels

E51.22.1 Supply and installation shall be in accordance with Clause 9.2.3 of CW 3310-R17.

BASIS OF PAYMENT FOR CW 3230-R8

E51.23 Full Slab Replacement

E51.23.1 Replacement of complete slabs will be paid for at the Contract Unit Price per square metre for the "Items of Work" listed here below, measured as specified herein, which price shall be payment in full for supplying all materials and for performing all operations herein described and all other items incidental to the work included in this Specification.

Items of Work: Slab Replacement

(i) 250mm Type (*) Concrete Pavement (**)

(ii) 230mm Type (*) Concrete Pavement (**)

(iii) 200mm Type (*) Concrete Pavement (**)

(iv) 150mm Type (*) Concrete Pavement (**)

* Specify the Concrete Type
** Specify either Reinforced or Plain-Dowelled

E51.24 Full Depth Partial Slab Patches

E51.24.1 Full-depth partial slab patches will be paid for at the Contract Unit Price per square metre for "Items of Work", listed here below, measured as specified herein, which price shall be payment in full for supplying all materials and for performing all operations herein described and all other items incidental to the work included in this Specification.

Items of Work: Partial Slab Patches

(i) 250mm Type (*) Concrete Pavement (**)

(ii) 230mm Type (*) Concrete Pavement (**)

(iii) 200mm Type (*) Concrete Pavement (**)

(iv) 150mm Type (*) Concrete Pavement (**)

* Specify the Concrete Type
** Specify class of patch

E51.25 Dowels in Drilled Holes

E51.25.1 Installation of dowels into hardened concrete will be paid for at the Contract Unit Price for "Drilled Dowels"*, measured as specified herein, which price shall be payment in full for supplying all materials and for performing all operations herein described and all other items incidental to the work included in this Specification.

*Specify diameter(s) of dowels

E51.26 Tie Bars in Drilled Holes

E51.26.1 Installation of tie bars into hardened concrete will be paid for at the Contract Unit Price for "Drilled Tie Bars"* measured as specified herein, which price shall be payment in full for supplying all materials and for performing all operations herein described and all other items incidental to the work included in this Specification.

*Specify size(s) of tie bars.

MEASUREMENT AND PAYMENT FOR CW 3235-R9

E51.27 Removal of Miscellaneous Concrete Slabs

E51.27.1 Removal of miscellaneous concrete slabs will be measured on an area basis and paid for at the Contract Unit Price per square metre for the “Items of Work” listed here below. The area to be paid for will be the total number of square metres of existing miscellaneous concrete slabs removed in accordance with this specification, accepted and measured by the Contract Administrator.

Items of Work: Miscellaneous Concrete Slab Removal

(i) Median Slab
(ii) Monolithic Median Slab
(iii) Safety Median
(iv) 100mm Sidewalk
(v) 150mm Reinforced Sidewalk
(vi) Bullnose
(vii) Monolithic Curb and Sidewalk

E51.28 Installation of Miscellaneous Concrete Slabs

E51.28.1 Installation of miscellaneous concrete slabs will be measured on an area basis and paid for at the Contract Unit Price per square metre for the “Items of Work” listed here below. The area to be paid for will be the total number of square metres of miscellaneous concrete slabs installed in accordance with this specification, accepted and measured by the Contract Administrator.

Items of Work: Miscellaneous Concrete Slab Installation

(i) Type (*) Concrete Median Slab**
(ii) Type (*) Concrete Monolithic Median Slab**
(iii) Type (*) Concrete Safety Median**
(iv) Type (*) Concrete 100mm Sidewalk**
(v) Type (*) Concrete 150mm Reinforced Sidewalk***
(vi) Type (*) Concrete Bullnose**
(vii) Type (*) Concrete Monolithic Curb and Sidewalk**

* Specify the Concrete Type
** referenced Standard Detail to be specified
*** renewal area to be specified

E51.28.2 All costs for installing sign support clamps and constructing isolations for boulevard and median appurtenances will be included in the payment for the "Items of Work" listed for miscellaneous concrete slab installation.

E51.28.3 All costs for excavation, sub-grade compaction, placement of sub-base, placement of leveling course and backfill materials, slabs installation and boulevard grading to the limits as identified in Section 3.2 of this specification will be included in the payment for the "Items of Work" listed for Installation of Miscellaneous Concrete Slabs.

E51.28.4 Additional base course over and above leveling course material will be paid in accordance with CW 3110.

E51.29 Miscellaneous Concrete Slab Renewal

E51.29.1 Miscellaneous concrete slab renewal will be measured on an area basis and paid for at the Contract Unit Price per square metre for the "Items of Work" listed here below. The area to be paid for will be the total number of square metres of existing miscellaneous concrete slabs removed and installed in accordance with this specification, accepted and measured by the Contract Administrator.

Items of Work: Miscellaneous Concrete Slab Renewal

(i) Type (*) Concrete Median Slab**
(ii) Type (*) Concrete Monolithic Median Slab**
(iii) Type (*) Concrete Safety Median**
(iv) Type (*) Concrete 100mm Sidewalk* (***)
(v) Type (*) Concrete 150mm Reinforced Sidewalk (***)
(vi) Type (*) Concrete Bullnose**
(vii) Type (*) Concrete Monolithic Curb and Sidewalk**

* Specify the Concrete Type
** referenced Standard Details to be specified.
*** renewal area to be specified.

a.) Less than 5 sq. m
b.) 5 sq. m to 20 sq. m
c.) Greater than 20 sq. m

E51.29.2 All costs for the slab removal, excavation, sub-grade compaction, placement of leveling course and backfill materials, slabs installation and boulevard grading to the limits as identified in Section 3.3 of this specification will be included in the payment for the "Items of Work" listed for Miscellaneous Concrete Slab Renewal.

E51.29.3 Additional base course over and above leveling course material will be paid in accordance with CW 3110.

E51.29.4 All costs for installing sign support clamps and constructing isolations for boulevard and median appurtenances will be included in the payment for the "Items of Work" listed for Miscellaneous Concrete Slab Renewal.

E51.30 Adjustment of Precast Concrete Sidewalk Blocks

E51.30.1 Adjustment of precast concrete sidewalk blocks will be measured on an area basis and paid at the Contract Unit Price per square metre for "Adjustment of Precast Sidewalk Blocks". The area to be paid for will be the total number of square metres of precast concrete sidewalk blocks adjusted to grade in accordance with this specification, accepted and measured by the Contract Administrator.

E51.30.2 No measurement or payment will be made for any precast sidewalk blocks damaged or lost during replacement.

E51.31 Supply of Precast Concrete Sidewalk Blocks

E51.31.1 Supply of precast concrete sidewalk blocks will be measured on an area basis and paid at the Contract Unit Price per square metre for "Supply of Precast Sidewalk Blocks". The area to be paid for will be the total number of square metres of precast concrete sidewalk blocks supplied in accordance with this specification, accepted and measured by the Contract Administrator.

E51.32 Removal of Precast Concrete Sidewalk Blocks

E51.32.1 Removal of precast concrete sidewalk blocks will be measured on an area basis and paid at the Contract Unit Price per square metre for "Removal of Precast Sidewalk Blocks". The area to be paid for will be the total number of square metres of precast concrete sidewalk blocks removed in accordance with this specification, accepted and measured by the Contract Administrator.

MEASUREMENT AND PAYMENT FOR CW 3240-R10

E51.33 Concrete Curb Removal

E51.33.1 Concrete curb removal will be measured on a length basis and paid for at the Contract Unit Price per metre for the "Items of Work" listed here below. The length to be paid for will be the total number of metres of concrete curb removed in accordance with this specification, accepted and measured by the Contract Administrator.

Items of Work: Concrete Curb Removal

(i) Barrier*
(ii) Modified Barrier*
(iii) Curb and Gutter
(iv) Mountable Curb
(v) Lip Curb
(vi) Modified Lip Curb
(vii) Curb Ramp
(viii) Safety Curb
(ix) Splash Strips**

* Integral or Separate to be specified.
** Monolithic or Separate.

E51.33.2 Removal of existing asphalt material immediately in front of the curb that is required for installation will be included in the payment for the "Items of Work" listed for Concrete Curb Removal when the asphalt overlay is not identified to be removed.

E51.34 Concrete Curb Installation

E51.34.1 Concrete curb installation will be measured on a length basis and paid for at the Contract Unit Price per metre for the "Items of Work" listed here below. The length to be paid for will be the total number of metres of concrete curb or splash strip installed in accordance with this specification, accepted and measured by the Contract Administrator.

Items of Work: Concrete Curb Installation

(i) Type (*) Concrete Barrier**
(ii) Type (*) Concrete Modified Barrier**
(iii) Type (*) Concrete Curb and Gutter**
(iv) Type (*) Concrete Mountable Curb**
(v) Type (*) Concrete Lip Curb**
(vi) Type (*) Concrete Modified Lip Curb**

(vii) Type (*) Concrete Curb Ramp**
(viii) Type (*) Concrete Safety Curb**
(ix) Type (*) Concrete Splash Strips***

* Specify the Concrete Type
** reveal height, type and reference to Standard Detail to be specified.
*** reveal height, monolithic or separate, type, width and reference to Standard Detail to be specified.

E51.34.2 The placement and compaction of asphalt material immediately in front of the curb will be included in the payment for the "Items of Work" listed for Concrete Curb Installation when the asphalt overlay is not identified to be removed.

E51.34.3 No payment will be made for leveling course.

E51.34.4 Base course will be paid in accordance with CW 3110.

E51.34.5 Supply and placement of bonding grout for concrete curbs will not be measured for payment.

E51.35 Concrete Curb Renewal

E51.35.1 Concrete curb renewal will be measured on a length basis and paid for at the Contract Unit Price per metre for the "Items of Work" listed here below. The length to be paid for will be the total number of metres of concrete curb or splash strip removed and installed in accordance with this specification, accepted and measured by the Contract Administrator.

Items of Work: Concrete Curb Renewal

(i) Type (*) Concrete Barrier** (***)
(ii) Type (*) Concrete Modified Barrier**
(iii) Type (*) Concrete Curb and Gutter** (***)
(iv) Type (*) Concrete Mountable Curb**
(v) Type (*) Concrete Lip Curb**
(vi) Type (*) Concrete Modified Lip Curb**
(vii) Type (*) Concrete Curb Ramp**
(viii) Type (*) Concrete Safety Curb**
(ix) Type (*) Concrete Splash Strips (***) (****)

* Specify the Concrete Type
* reveal height, type and referenced Standard Detail to be specified.
** renewed length to be specified.

a.) Less than 3 m
b.) 3 m to 30 m
c.) Greater than 30 m

*** reveal height, monolithic or separate, type, width and reference to Standard Detail to be specified.

E51.35.2 All costs for removal, excavation, sub-grade compaction, leveling course and backfill materials, curb installation and boulevard grading to the limits as identified in Section 3.4 of this specification will be included in the payment for the "Items of Work" listed for Concrete Curb Renewal.

E51.35.3 Base course will be paid in accordance with CW 3110.

E51.35.4 For installation lengths greater than 30 metres, the length will include breaks for approaches, isolations or fixed obstacles such as light standards or poles.

E51.35.5 Curb ramp tie bars are to be paid in accordance with CW 3230.

E51.35.6 Supply and placement of bonding grout for concrete curbs will not be measured for payment.

BASIS OF PAYMENT FOR CW 3325-R5

E51.36 Concrete Sidewalks

E51.36.1 Construction of concrete sidewalks will be paid for at the Contract Unit Price per square metre for "100 mm Type (*) Concrete Sidewalk", measured as specified herein, which price shall be payment in full for supplying all materials and for performing all operations herein described and all other items incidental to the work included in this Specification.

E51.37 Leveling Course

E51.37.1 No payment shall be made for leveling course.

E51.38 Excavation, Sub-grade Compaction, and Base Course

E51.38.1 Excavation, sub-grade compaction, and additional base course shall be paid for in accordance with Specification CW 3110.