



THE CITY OF WINNIPEG

BID OPPORTUNITY

BID OPPORTUNITY NO. 766-2010

GARAGE DOOR RETROFIT AT 360 MCPHILLIPS STREET

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PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

B1.1 GARAGE DOOR RETROFIT AT 360 MCPHILLIPS STREET

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 4:00 p.m. Winnipeg time, November 30, 2010.

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

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

B3. SITE INVESTIGATION

B3.1 Further to C3.1, the Contract Administrator or an authorized representative will be available at the Site from 10:00 a.m. to 11:00 a.m. on November 23, 2010 to provide Bidders access to the Site.

B3.2 The Bidder is advised that the Site investigation is for the Bidder to assess the scope of Work, existing conditions of the Work, and to learn of the security risks and safety precautions required that will aid the Bidder in submitting a bid price.

B3.3 The Bidder shall not be entitled to rely on any information or interpretation received at the Site investigation unless that information or interpretation is the Bidder's direct observation, or is provided by the Contract Administrator in writing.

B4. ENQUIRIES

B4.1 All enquiries shall be directed to the Contract Administrator identified in D3.1.

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

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

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

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

B5. ADDENDA

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

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

- B5.2.1 Addenda will be available on the Bid Opportunities page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt>
- B5.2.2 The Bidder is responsible for ensuring that he has received all addenda and is advised to check the Materials Management Division website for addenda regularly and shortly before the Submission Deadline, as may be amended by addendum.
- B5.2.3 The Bidder shall acknowledge receipt of each addendum in Paragraph 8 of Form A: Bid. Failure to acknowledge receipt of an addendum may render a Bid non-responsive.

B6. SUBSTITUTES

- B6.1 The Work is based on the Plant, Materials and methods specified in the Bid Opportunity.
- B6.2 Substitutions shall not be allowed unless application has been made to and prior approval has been granted by the Contract Administrator in writing.
- B6.3 Requests for approval of a substitute will not be considered unless received in writing by the Contract Administrator at least five (5) Business Days prior to the Submission Deadline.
- B6.4 The Bidder shall ensure that any and all requests for approval of a substitute:
- (a) provide sufficient information and details to enable the Contract Administrator to determine the acceptability of the Plant, Material or method as either an approved equal or alternative;
 - (b) identify any and all changes required in the applicable Work, and all changes to any other Work, which would become necessary to accommodate the substitute;
 - (c) identify any anticipated cost or time savings that may be associated with the substitute;
 - (d) certify that, in the case of a request for approval as an approved equal, the substitute will fully perform the functions called for by the general design, be of equal or superior substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed Work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance;
 - (e) certify that, in the case of a request for approval as an approved alternative, the substitute will adequately perform the functions called for by the general design, be similar in substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed Work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance.
- B6.5 The Contract Administrator, after assessing the request for approval of a substitute, may in his sole discretion grant approval for the use of a substitute as an "approved equal" or as an "approved alternative", or may refuse to grant approval of the substitute.
- B6.6 The Contract Administrator will provide a response in writing, at least two (2) Business Days prior to the Submission Deadline, only to the Bidder who requested approval of the substitute.
- B6.6.4 The Bidder requesting and obtaining the approval of a substitute shall be entirely responsible for disseminating information regarding the approval to any person or persons he wishes to inform.
- B6.7 If the Contract Administrator approves a substitute as an "approved equal", any Bidder may use the approved equal in place of the specified item.
- B6.8 If the Contract Administrator approves a substitute as an "approved alternative", any Bidder bidding that approved alternative may base his Total Bid Price upon the specified item but may also indicate an alternative price based upon the approved alternative. Such alternatives will be evaluated in accordance with B14.

- B6.9 No later claim by the Contractor for an addition to the Total Bid Price because of any other changes in the Work necessitated by the use of an approved equal or an approved alternative will be considered.
- B6.10 Notwithstanding B6.2 to B6.9, and in accordance with B7.7, deviations inconsistent with the Bid Opportunity document shall be evaluated in accordance with B14.1(a).

B7. BID COMPONENTS

- B7.1 The Bid shall consist of the following components:
- (a) Form A: Bid;
 - (b) Form B: Prices;
- B7.2 Further to B7.1, the Bidder should include the written correspondence from the Contract Administrator approving a substitute in accordance with B6.
- B7.3 All components of the Bid shall be fully completed or provided, and submitted by the Bidder no later than the Submission Deadline, with all required entries made clearly and completely, to constitute a responsive Bid.
- B7.4 The Bid Submission may be submitted by mail, courier or personal delivery, or by facsimile transmission.
- B7.5 If the Bid Submission is submitted by mail, courier or personal delivery, it shall be enclosed and sealed in an envelope clearly marked with the Bid Opportunity number and the Bidder's name and address, and shall be submitted to:
- The City of Winnipeg
Corporate Finance Department
Materials Management Division
185 King Street, Main Floor
Winnipeg, MB R3B 1J1
- B7.5.5 Samples or other components of the Bid Submission which cannot reasonably be enclosed in the envelope may be packaged separately, but shall be clearly marked with the Bid Opportunity number, the Bidder's name and address, and an indication that the contents are part of the Bidder's Bid Submission.
- B7.6 Bidders are advised not to include any information/literature except as requested in accordance with B7.1.
- B7.7 Bidders are advised that inclusion of terms and conditions inconsistent with the Bid Opportunity document, including the General Conditions, will be evaluated in accordance with B14.1(a).
- B7.8 If the Bid Submission is submitted by facsimile transmission, it shall be submitted to (204) 949-1178.
- B7.8.6 The Bidder is advised that the City cannot take responsibility for the availability of the facsimile machine at any time.
- B7.8.7 Bids submitted by internet electronic mail (e-mail) will not be accepted.

B8. BID

- B8.1 The Bidder shall complete Form A: Bid, making all required entries.
- B8.2 Paragraph 2 of Form A: Bid shall be completed in accordance with the following requirements:
- (a) if the Bidder is a sole proprietor carrying on business in his own name, his name shall be inserted;
 - (b) if the Bidder is a partnership, the full name of the partnership shall be inserted;

- (c) if the Bidder is a corporation, the full name of the corporation shall be inserted;
 - (d) if the Bidder is carrying on business under a name other than his own, the business name and the name of every partner or corporation who is the owner of such business name shall be inserted.
- B8.2.8 If a Bid is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B8.2.
- B8.3 In Paragraph 3 of Form A: Bid, the Bidder shall identify a contact person who is authorized to represent the Bidder for purposes of the Bid.
- B8.4 Paragraph 10 of Form A: Bid shall be signed in accordance with the following requirements:
- (a) if the Bidder is a sole proprietor carrying on business in his own name, it shall be signed by the Bidder;
 - (b) if the Bidder is a partnership, it shall be signed by the partner or partners who have authority to sign for the partnership;
 - (c) if the Bidder is a corporation, it shall be signed by its duly authorized officer or officers;
 - (d) if the Bidder is carrying on business under a name other than his own, it shall be signed by the registered owner of the business name, or by the registered owner's authorized officials if the owner is a partnership or a corporation.
- B8.4.9 The name and official capacity of all individuals signing Form A: Bid should be printed below such signatures.
- B8.4.10 All signatures shall be original.
- 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).
- B10. QUALIFICATION**
- B10.1 The Bidder shall:
- (a) undertake to be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba; and
 - (b) be financially capable of carrying out the terms of the Contract; and
 - (c) have all the necessary experience, capital, organization, and equipment to perform the Work in strict accordance with the terms and provisions of the Contract.
- B10.2 The Bidder and any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:

- (a) be responsible and not be suspended, debarred or in default of any obligations to the City. A list of suspended or debarred individuals and companies is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/debar.stm>

- B10.3 The Bidder and/or any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:
- (a) have successfully carried out Work similar in nature, scope and value to the Work; and
 - (b) be fully capable of performing the Work required to be in strict accordance with the terms and provisions of the Contract; and
 - (c) have a written Workplace safety and health program if required pursuant to The Workplace Safety and Health Act (Manitoba);
- B10.4 The Bidder shall submit, within three (3) Business Days of a request by the Contract Administrator, proof satisfactory to the Contract Administrator of the qualifications of the Bidder and of any proposed Subcontractor.
- B10.5 The Bidder shall provide, on the request of the Contract Administrator, full access to any of the Bidder's equipment and facilities to confirm, to the Contract Administrator's satisfaction, that the Bidder's equipment and facilities are adequate to perform the Work.

B11. OPENING OF BIDS AND RELEASE OF INFORMATION

- B11.1 Bids will not be opened publicly.
- B11.2 Following the submission deadline, the names of the Bidders and their Total Bid Prices (unevaluated, and pending review and verification of conformance with requirements) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/bidopp.asp>
- B11.3 After award of Contract, the name(s) of the successful Bidder(s) and the Contract Amount(s) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt>
- B11.4 The Bidder is advised that any information contained in any Bid may be released if required by City policy or procedures, by The Freedom of Information and Protection of Privacy Act (Manitoba), by other authorities having jurisdiction, or by law.

B12. IRREVOCABLE BID

- B12.1 The Bid(s) submitted by the Bidder shall be irrevocable for the time period specified in Paragraph 9 of Form A: Bid.
- B12.2 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 for the time period specified in Paragraph 9 of Form A: Bid.

B13. WITHDRAWAL OF BIDS

- B13.1 A Bidder may withdraw his Bid without penalty by giving written notice to the Manager of Materials at any time prior to the Submission Deadline.
- B13.1.11 Notwithstanding C23.3, the time and date of receipt of any notice withdrawing a Bid shall be the time and date of receipt as determined by the Manager of Materials.

B13.1.12 The City will assume that any one of the contact persons named in Paragraph 3 of Form A: Bid or the Bidder's authorized representatives named in Paragraph 10 of Form A: Bid, and only such person, has authority to give notice of withdrawal.

B13.1.13 If a Bidder gives notice of withdrawal prior to the Submission Deadline, the Manager of Materials will:

- (a) retain the Bid until after the Submission Deadline has elapsed;
- (b) open the Bid to identify the contact person named in Paragraph 3 of Form A: Bid and the Bidder's authorized representatives named in Paragraph 10 of Form A: Bid; and
- (c) if the notice has been given by any one of the persons specified in B13.1.13(b), declare the Bid withdrawn.

B13.2 A Bidder who withdraws his Bid after the Submission Deadline but before his Bid has been released or has lapsed as provided for in B12.2 shall be liable for such damages as are imposed upon the Bidder by law and subject to such sanctions as the Chief Administrative Officer considers appropriate in the circumstances. The City, in such event, shall be entitled to all rights and remedies available to it at law.

B14. EVALUATION OF BIDS

B14.1 Award of the Contract shall be based on the following bid evaluation criteria:

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

B14.2 Further to B14.1(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.

B14.3 Further to B14.1(b), the Award Authority shall reject any Bid submitted by a Bidder who does not demonstrate, in his Bid or in other information required to be submitted, that he is responsible and qualified.

B14.4 Further to B14.1(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.

B14.4.14 If there is any discrepancy between the Total Bid Price written in figures, the Total Bid Price written in words and the sum of the quantities multiplied by the unit prices for each item, the sum of the quantities multiplied by the unit prices for each item shall take precedence.

B14.4.15 Further to B14.1(a), in the event that a unit price is not provided on Form B: Prices, the City will determine the unit price by dividing the Amount (extended price) by the approximate quantity, for the purposes of evaluation and payment.

B15. AWARD OF CONTRACT

B15.1 The City will give notice of the award of the Contract or will give notice that no award will be made.

B15.2 The City will have no obligation to award a Contract to a Bidder, even though one or all of the Bidders are determined to be responsible and qualified, and the Bids are determined to be responsive.

B15.2.16 Without limiting the generality of B15.2, 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.
- B15.3 Where an award of Contract is made by the City, the award shall be made to the responsible and qualified Bidder submitting the lowest evaluated responsive Bid, in accordance with B14.
- B15.3.17 Following the award of contract, a Bidder will be provided with information related to the evaluation of his Bid upon written request to the Contract Administrator.
- B15.4 Notwithstanding C4, the City will issue a Purchase Order to the successful Bidder in lieu of the execution of a Contract.
- B15.5 The Contract, as defined in C1.1, in its entirety shall be deemed to be incorporated in and to form a part of the Purchase Order notwithstanding that it is not necessarily attached to or accompany said Purchase Order.

PART C - GENERAL CONDITIONS

C0. GENERAL CONDITIONS

C0.1 The *General Conditions for Construction* (Revision 2006 12 15) are applicable to the Work of the Contract.

C0.1.18 The *General Conditions for Construction* are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at http://www.winnipeg.ca/matmgt/gen_cond.stm

C0.2 A reference in the Bid Opportunity to a section, clause or subclause with the prefix “**C**” designates a section, clause or subclause in the *General Conditions for Construction*.

PART D - SUPPLEMENTAL CONDITIONS

GENERAL

D1. GENERAL CONDITIONS

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

D2. SCOPE OF WORK

D2.1 The Work to be done under the Contract shall consist of temporary shoring of the roof and wall during replacement, replacement of the existing garage door and accessories, removal of existing building components, and new construction to accommodate a larger garage door and opening.

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

- (a) erection of shoring to support the roof and wall during the replacement.
- (b) removal of existing door and accessories.
- (c) relocate gas, electrical, and sewer vent to accommodate new door and accessories.
- (d) cut, remove, and dispose of existing concrete, glass blocks, and ceiling components.
- (e) form and pour new reinforced concrete.
- (f) place existing glass blocks and mortar above lintel.
- (g) supply and install wood ceiling detail.
- (h) supply and install new wood frame, hardware, and new steel frame for garage door.
- (i) supply and install new garage door, operator, hardware, and accessories.
- (j) paint new concrete and lumber.
- (k) Site restoration and clean-up.

D3. CONTRACT ADMINISTRATOR

Jim Lukashenko, P.Eng.
Manager, Bridges & Structures
MMM Group Limited
Suite 111-93 Lombard Avenue
Winnipeg, MB R3B 3B1

Telephone No. (204) 943-3178
Facsimile No. (204) 943-4948

D3.1 At the pre-construction meeting, Jim Lukashenko will identify additional personnel representing the Contract Administrator and their respective roles and responsibilities for the Work.

D4. CONTRACTOR'S SUPERVISOR

D4.1 At the pre-construction meeting, the Contractor shall identify his designated supervisor and any additional personnel representing the Contractor and their respective roles and responsibilities for the Work.

D5. NOTICES

D5.1 Except as provided for in C23.2.2, all notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the Contractor

shall be sent to the address or facsimile number identified by the Contractor in Paragraph 2 of Form A: Bid.

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

D5.3 Notwithstanding C21., all notices of appeal to the Chief Administrative Officer shall be sent to the attention of the Chief Financial Officer at the following facsimile number:

The City of Winnipeg
Chief Financial Officer

Facsimile No.: (204) 949-1174

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

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

Facsimile No.: (204) 947-9155

SUBMISSIONS

D6. AUTHORITY TO CARRY ON BUSINESS

D6.1 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.

D7. SAFE WORK PLAN

D7.1 The Contractor shall provide the Contract Administrator with a Safe Work Plan at least five (5) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

D7.2 The Safe Work Plan should 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>

D8. INSURANCE

D8.1 The Contractor shall provide and maintain the following insurance coverage:

- (a) commercial general liability insurance, in the amount of at least two million dollars (\$2,000,000.00) inclusive, with The City of Winnipeg added as an additional insured, with a cross-liability clause, such liability policy to also contain contractual liability, unlicensed motor vehicle liability, non-owned automobile liability 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 for owned automobiles used for or in connection with the Work in the amount of at least two million dollars (\$2,000,000.00) at all times during the performance of the Work and until the date of Total Performance;
- (c) all risks course of construction insurance in the amount of one hundred percent (100%) of the total Contract Price, written in the name of the Contractor and The City of Winnipeg, at all times during the performance of the Work and until the date of Total Performance.

D8.2 Deductibles shall be borne by the Contractor.

D8.3 The Contractor shall provide the Contract Administrator 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 seven (7) Calendar Days from notification of the award of Contract by Purchase Order.

D8.4 The Contractor shall not cancel, materially alter, or cause each policy to lapse without providing at least thirty (30) Calendar Days prior written notice to the Contract Administrator.

D9. PERFORMANCE SECURITY

D9.1 If the Contract Price exceeds twenty-five thousand dollars (\$50,000.00), the Contractor shall provide and maintain performance security until the expiration of the warranty period in the form of:

- (a) a performance bond of a company registered to conduct the business of a surety in Manitoba, in the form attached to these Supplemental Conditions (Form H1: Performance Bond), in the amount of fifty percent (50%) of the Contract Price; or
- (b) an irrevocable standby letter of credit issued by a bank or other financial institution registered to conduct business in Manitoba and drawn on a branch located in Winnipeg, in the form attached to these Supplemental Conditions (Form H2: Irrevocable Standby Letter of Credit), in the amount of fifty percent (50%) of the Contract Price; or
- (c) a certified cheque or draft payable to "The City of Winnipeg", drawn on a bank or other financial institution registered to conduct business in Manitoba, in the amount of fifty percent (50%) of the Contract Price.

D9.1.19 Where the performance security is in the form of a certified cheque or draft, it will be deposited by the City. The City will not pay any interest on certified cheques or drafts furnished as performance security.

D9.2 The Contractor shall provide the City Solicitor with the required performance security within seven (7) Calendar Days of notification of the award of the Contract by way of Purchase Order and prior to the commencement of any Work on the Site.

SCHEDULE OF WORK

D10. COMMENCEMENT

D10.1 The Contractor shall not commence any Work until he is in receipt of a Purchase Order from the Award Authority authorizing the commencement of the Work.

D10.2 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 D6;
 - (ii) evidence of the Workers compensation coverage specified in C6.15;
 - (iii) the Safe Work Plan specified in D7;
 - (iv) evidence of the insurance specified in D8;
 - (v) the performance security specified in D9;

- (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.

D10.3 The Contractor shall commence the Work on the Site within seven (7) Working Days of receipt of the Purchase Order.

D10.4 The City intends to award this Contract by January 14, 2011.

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

D11. SUBSTANTIAL PERFORMANCE

D11.1 The Contractor shall achieve Substantial Performance by March 1, 2011.

D11.2 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 reinspected.

D11.3 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.

D12. TOTAL PERFORMANCE

D12.1 The Contractor shall achieve Total Performance by March 15, 2011.

D12.2 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 reinspected.

D12.3 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.

D13. LIQUIDATED DAMAGES

D13.1 If the Contractor fails to achieve Substantial Performance in accordance with the Contract by the day fixed herein for Substantial Performance, the Contractor shall pay the City eight hundred dollars (\$800.00) per Working Day for each and every Working Day following the day fixed herein for Substantial Performance during which such failure continues.

D13.2 The amount specified for liquidated damages in D13.1 is based on a genuine pre-estimate of the City's damages in the event that the Contractor does not achieve Substantial Performance by the day fixed herein for same.

D13.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

CONTROL OF WORK

D14. JOB MEETINGS

D14.1 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.

D14.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he deems it necessary.

D15. PRIME CONTRACTOR – THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA)

D15.1 Further to C6.24, the Contractor shall be the Prime Contractor and shall serve as, and have the duties of the Prime Contractor in accordance with The Workplace Safety and Health Act (Manitoba).

MEASUREMENT AND PAYMENT

D16. INVOICES

D16.1 Further to C12, the Contractor shall submit an invoice for each order delivered to:

The City of Winnipeg
Corporate Finance - Accounts Payable
4th Floor, Administration Building, 510 Main Street
Winnipeg MB R3B 1B9

Facsimile No.: (204) 949-0864
Email: CityWpgAP@winnipeg.ca

D16.2 Invoices must clearly indicate, as a minimum:

- (a) the City's purchase order number;
- (b) date of delivery;
- (c) delivery address;
- (d) type and quantity of goods delivered;
- (e) the amount payable with GST and MRST shown as separate amounts; and
- (f) the Contractor's GST registration number.

D16.3 The City will bear no responsibility for delays in approval of invoices which are improperly submitted.

D16.4 Bids Submissions must be submitted to the address in B7.5.

D17. PAYMENT

D17.1 Further to C12, the City may at its option pay the Contractor by direct deposit to the Contractor's banking institution.

WARRANTY

D18. WARRANTY

D18.1 Notwithstanding C13.2, the warranty period shall begin on the date of Total Performance and shall expire one (1) year thereafter, except where longer warranty periods are specified in the respective Specification sections, unless extended pursuant to C13.2.1 or C13.2.2, in which case it shall expire when provided for thereunder.

D18.1.20 For the purpose of Performance Security, the warranty period shall be one (1) year.

D18.2 Notwithstanding C13.2, the Contract Administrator may permit the warranty period for a portion or portions of the Work to begin prior to the date of Total Performance if a portion of the Work cannot be completed because of unseasonable weather or other conditions reasonably beyond the control of the Contractor but that portion does not prevent the balance of the Work from being put to its intended use.

D18.2.21 In such case, the date specified by the Contract Administrator for the warranty period to begin shall be substituted for the date specified in C13.2 for the warranty period to begin.

FORM H1: PERFORMANCE BOND
(See D9)

KNOW ALL MEN BY THESE PRESENTS THAT

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

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

_____ dollars (\$ _____ . _____)

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

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

BID OPPORTUNITY NO. 766-2010

GARAGE DOOR RETROFIT AT 360 MCPHILLIPS 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: IRREVOCABLE STANDBY LETTER OF CREDIT
(PERFORMANCE SECURITY)**
(See D9)

(Date)

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

RE: PERFORMANCE SECURITY - BID OPPORTUNITY NO. 766-2010
GARAGE DOOR RETROFIT AT 360 MCPHILLIPS STREET

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

(Name of Contractor)

(Address of Contractor)

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

_____ Canadian dollars.

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

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

Partial drawings are permitted.

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

(Address)

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

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

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

(Date)

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

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

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

(Name of bank or financial institution)

Per: _____
(Authorized Signing Officer)

Per: _____
(Authorized Signing Officer)

PART E - SPECIFICATIONS

GENERAL

E1. APPLICABLE SPECIFICATIONS 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.
- E1.2.22 *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>
- E1.2.23 The version in effect three (3) Business Days before the Submission Deadline shall apply.
- E1.2.24 Further to C2.4(d), Specifications included in the Bid Opportunity shall govern over *The City of Winnipeg Standard Construction Specifications*.
- E1.3 The following are applicable to the Work:

<u>Drawing No.</u>	<u>Drawing Name/Title</u>
	Cover Sheet
D-12272	Plan, Elevation & Sections
D-12273	Sections & Details

E2. TEMPORARY USE OF CITY EQUIPMENT

- E2.1 City systems and equipment shall not be used during construction without the Contract Administrator's written permission. The Contract Administrator reserves the right to withdraw said permission if, in his opinion, proper care and maintenance are not provided.

E3. MOBILIZATION AND DEMOBILIZATION

- E3.1 Mobilization and Demobilization will include but not be limited to start-up costs, equipment set-up and removal, field office and storage facilities set-up, and Site clean-up and removal.
- E3.2 Mobilization and Demobilization will be measured on a lump sum basis and paid for at the Contract Lump Sum Price for "Mobilization and "Demobilization" in accordance with this specification, accepted and measured by the Contract Administrator.
- E3.3 Mobilization and Demobilization can only be a maximum of 10% of the Total Bid Price.
- E3.4 50% of the Mobilization and Demobilization lump sum price will be paid on the first progress payment.
- E3.5 The remaining 50% of the Mobilization and Demobilization lump sum price will be paid subsequent to the completion of the Work and restoration and clean-up of the Site.

E4. DANGEROUS WORK CONDITIONS

- E4.1 Further to Clause C 6.26 of the General Conditions, the Contractor shall be aware that confined spaces may exist and shall follow the "Guidelines for Confined Entry Work" as published by the Manitoba Workplace Safety and Health Division
- E4.2 The Contractor shall be aware of the potential hazards that can be encountered in confined spaces such as explosive gases, toxic gases, and oxygen deficiency.

- E4.3 The air in a confined space must be tested before entry and continuously during the time that personnel are inside the space. Equipment for continuous monitoring of gases must be explosion-proof and equipped with a visible and audible alarm. The principal tests are for oxygen deficiency, explosion range and toxic gases. Testing equipment must be calibrated in accordance with manufacturer's specifications.
- E4.4 The Contractor shall ventilate all confined as required and approved by the Manitoba Workplace Safety and Health Act (the "Act"). If no ventilation is supplied, a Worker must wear a respirator or supplied air to enter the confined space.
- E4.5 Workers must wear a respirator or supplied air at all times when entering a confined space where live sewage is present.
- E4.6 The Contractor shall provide a photoionization detector (PID) on Site at all times to monitor potential hydrocarbon vapours in the confined spaces. The gas detector and safety equipment conforming to the Act shall be made available to the Contract Administrator for his use during inspections.
- E4.7 The Contract Administrator may issue a stop Work order to the Contractor if the above guidelines are not being followed. The Contractor shall not resume his operations until the Contract Administrator is satisfied the Contractor is following the appropriate procedures. The Contractor shall have no claim for extra time or costs due to the stop Work order for not following these safety guidelines.
- E4.8 The Contractor's attention is drawn to the Province of Manitoba Workplace Safety and Health Act ("the Act"), and the Regulations and Guidelines thereunder pertaining to confined entry Work, and in particular the requirements for conducting hazard/risk assessments and providing personal protective equipment (PPE).
- E4.9 The Contractor shall provide supplied air breathing apparatus conforming to the requirements of the Act, Regulation and Guidelines for the use of the Contract Administrator where confined entry is required to allow for inspection of the Work.
- E4.10 The Contract Administrator may issue a Stop Work Order to the Contractor if he determines the above guidelines are not being followed. The Contractor shall not resume his operations until the Contract Administrator is satisfied the Contractor is following the appropriate procedures. The Contractor shall have no claim for extra time or costs due to Stop Work Order for not following these safety guidelines.

E5. SITE SECURITY

- E5.1 The Contractor shall be responsible for security of the Site during the Work and shall erect effective temporary enclosures across the door openings at the end of the Work day.
- E5.2 Site security shall be incidental to the Work and no separate payment will be made.
- E5.3 The Contractor shall be responsible to ensure that during winter construction, construction openings are tightly and effectively secured to prevent heat escape outdoors.

E6. SALVAGE AND DEMOLITION

- E6.1 All salvaged material shall become the property of the Contractor unless specifically noted otherwise by the Contract Administrator, and shall be removed from the Site.
- E6.2 All demolished material, as determined by the Contract Administrator, shall be removed from the Site, hauled, and legally disposed of.
- E6.3 Measurement and Payment
- (a) Salvage and demolition shall be paid for under the Contract Lump Sum Price for "Removal and Disposal of Demolished and Salvaged Materials", 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.

E7. SHORING

- E7.1 The type, strength, and amount of shoring and bracing shall be such as the nature of the ground and attendance conditions may require, taking in to account property lines, existing slopes, utilities, and roadways.
- E7.2 Shoring and bracing shall be so spaced and dimensioned as to prevent caving, loss of ground, and surface settlement. It shall be free from defects that might impair its strength or suitability for the Work. Sheeting/shoring and bracing shall conform to the latest revisions of the "Construction Safety Act" of the Department of Labour of the Government of Manitoba.
- E7.3 Supporting design calculations are required to facilitate review of the submission for conformance with the Contract Documents.
- E7.4 Submit Shop Drawings and design calculations for the shoring system designed and sealed by a Professional Engineer registered or licensed to practice in the Province of Manitoba and experienced in the structural design of shoring systems. The designer of the shoring system shall inspect the system during construction and certify, in writing to the Contract Administrator, that construction is in conformance with the approved design.
- E7.5 Shoring and bracing shall be installed such that the structure size, wall thickness, and any Work relating to construction as shown on the drawings can be achieved subsequent to installation of the shoring system.
- E7.6 Shoring and bracing shall remain in place until concrete has attained 75% of the design strength.

E8. SHOP DRAWINGS

- E8.1 Description
- (a) This Specification shall revise, amend, and supplement the requirements of CW 1100.
- (i) The term 'shop drawings' means drawings, diagrams, illustrations, schedules, performance charts, brochures, and other data including Site erection drawings which are to be provided by the Contractor to illustrate details of a portion of the Work.
 - (ii) The Contractor shall submit specified shop drawings to the Contract Administrator for review. All submissions must be in metric units. Where data is in imperial units, the correct metric equivalent shall also be shown on all submissions for Engineering review.
- (b) Shop Drawings
- (i) Original drawings are to be prepared by the Contractor, Subcontractor, supplier, distributor, or manufacturer, which illustrate appropriate portion of Work; showing fabrication, layout, setting or erection details as specified in appropriate sections.
 - (ii) Shop drawings for the following structural components shall bear the seal of a Professional Engineer registered to practice in the Province of Manitoba.
 - (i) Shoring.
- (c) Contractor's Responsibilities
- (i) Review shop drawings, product data and samples prior to submission and stamp and sign drawings indicating conformance to the Contract requirements.
 - (ii) Verify:
 - (i) Field measurements.
 - (ii) Field construction criteria.
 - (iii) Catalogue numbers and similar data.

- (iii) Coordinate each submission with requirements of Work and Contract Documents. Individual shop drawings will not be reviewed until all related drawings are available.
 - (iv) Notify Contract Administrator, in writing at time of submission, of deviations from requirements of Contract Documents.
 - (v) Responsibility for deviations in submission from requirements of Contract Documents is not relieved by Contract Administrator's review of submission, unless Contract Administrator gives written acceptance of specified deviations.
 - (vi) Responsibility for errors and omissions in submissions is not relieved by the Contract Administrator's review of submittals.
 - (vii) The Contractor shall make all corrections required by the Contract Administrator and shall resubmit the required number of corrected copies of Shop Drawings for review. The Contractor shall direct specific attention in writing or on resubmitted Shop Drawings to revisions other than the corrections requested by the Contract Administrator on previous submissions.
 - (viii) After the Contract Administrator has reviewed and returned the copies, distribute the copies to sub-trades as appropriate.
 - (ix) Maintain one (1) complete set of reviewed shop drawings, filed by Specification Section Number, at the Site of Work for use and reference of the Contract Administrator and Sub-Contractors.
- (d) Submission Requirements
- (i) Schedule submissions at least 14 Calendar days before dates reviewed submissions will be needed, and allow for a 14 Calendar day period for review by the Contract Administrator of each individual submission and re-submission, unless noted otherwise in the Contract Documents.
 - (ii) Submit three (3) paper prints of shop drawings. The Contractor is advised that the Contract Administrator will retain one and return two (2) copies of all submittals to the Contractor.
 - (iii) Accompany submissions with a transmittal letter, containing:
 - (i) Date.
 - (ii) Project title and bid opportunity number.
 - (iii) Contractor's name and address.
 - (iv) Number of each shop drawing, product data, and sample submitted.
 - (v) Specification section, title, number, and clause.
 - (vi) Drawing number and detail/section number.
 - (vii) Other pertinent data.
 - (iv) Submissions shall include:
 - (i) Date and revision dates.
 - (ii) Project title and bid opportunity number.
 - (iii) Name of:
 - ◆ Contractor.
 - ◆ Subcontractor.
 - ◆ Supplier.
 - ◆ Manufacturer.
 - ◆ Separate detailer when pertinent.
 - (iv) Identification of product of material.
 - (v) Relation to adjacent structure or materials.
 - (vi) Field dimensions, clearly identified as such.
 - (vii) Specification section name, number and clause number, or drawing number and detail/section number.
 - (viii) Applicable standards, such as CSA or CGSB numbers.

- (ix) Contractor's stamp, initialed or signed, certifying review of submission, verification of field measurements, and compliance with contract documents.
- (e) Other Considerations
 - (i) Fabrication, erection, installation, or commissioning may require modifications to equipment or systems to conform to the design intent. Revise pertinent shop drawings and resubmit.
 - (ii) Material and equipment delivered to the Site of the Works will not be paid for at least until pertinent shop drawings have been submitted and reviewed.
 - (iii) Incomplete shop drawing information will be considered as stipulated deductions for the purposes of progress payment certificates.
 - (iv) No delay or cost claims will be allowed that arise because of delays in submissions, re-submissions, and review of shop drawings.
 - (v) If the Contract Administrator requests details or items on shop drawings, which the Contractor believes require extra payment or contract time, the Contractor shall make any claims forthwith and receive acceptance, as extra Work, or rejection, before fabrication proceeds.

E8.2 Measurement and Payment

- (a) Preparation, submission, and revisions of shop drawings shall be incidental to the Work and no separate payment will be made.

E9. SURFACE RESTORATION

- E9.1 Prior to construction, inspect the grassed, pavement, and gravel surfaces within and adjacent to the Site with the Contract Administrator to record the current condition. After construction and Site clean-up is complete, re-inspect the condition with the Contract Administrator.
- E9.2 Restoration of grassed areas damaged as result of construction activities will be restored in accordance with CW 3510. Restoration of grassed areas will not be measured for payment and shall be included as part of the Work being done.
- E9.3 Pavement damaged as a result of construction activities will be restored in accordance with CW 3230 and CW 3410. Restoration of the pavement will not be measured for payment and shall be included as part of the Work being done.
- E9.4 Gravel surfacing damaged as a result of construction activities will be restored in accordance with CW 3150. Restoration of the gravel surfacing will not be measured for payment and shall be included as part of the Work being done.
- E9.5 Surface Restoration and related Work specified herein shall be considered incidental to the Contract Lump Sum Price for "Mobilization and Demobilization", and no separate measurement or payment will be made.

E10. RELOCATION OF GAS LINE

- E10.1 Description
 - (a) The Contractor is responsible to relocate gas line if required for construction of this project.
- E10.2 Construction
 - (a) A gas line connected to the heat control system must stay in operation in order to ensure heating of the building during construction. If the gas line must be disconnected, the Contractor is responsible to ensure that a replacement heating system is in place.
- E10.3 Measurement and Payment
 - (a) Relocation of Gas Line shall be paid for under the Contract Lump Sum Price for "Replace Garage Door and Related Works", 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.

E11. CARPENTRY

E11.1 Description

- (a) This specification shall cover the supply, fabrication, transportation, handling, delivery, and placement of all carpentry Work.

E11.2 References

- (a) Canadian General Standards Board (CGSB)
 - (i) CAN/CGSB-11.3, Hardboard.
- (b) Canadian Standards Association (CSA)
 - (i) CSA B111 – Wire Nails, Spikes, and Staples.
 - (ii) CSA O80 – Wood Preservation.
 - (iii) CAN/CSA O141 – Softwood Lumber.
 - (iv) CSA O151 – Canadian Softwood Plywood.
- (c) National Lumber Grades Authority (NLGA)
 - (i) Standard Grading Rules for Canadian Lumber.

E11.3 Materials

- (a) Lumber: unless specified otherwise, softwood, S4S, moisture content 19% (S-dry) or less in accordance with CAN/CSA-O141, Spruce, Pine or Fir NLGA No. 2 or better grade. Glued end-jointed (finger-jointed) lumber is not acceptable.
- (b) Canadian softwood plywood (CSP): to CSA 0151, standard construction, square edge. Standard sheathing grade.
- (c) Hardboard paneling: to CAN/CGSB-11.3, smooth, tempered, 1219 mm x 2438 mm x 3 mm thick panels.
- (d) Nails, spikes, and staples: to CSA B111 and NBC requirements. Galvanized.
- (e) Bolts: steel, of sizes required, complete with nuts and washers. Galvanized.
- (f) Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead plugs, recommended for purpose by manufacturer.
- (g) Surface-applied wood preservative: copper naphthenate or pentachlorophenol base water repellent preservative. Use clear for materials exposed in final assembly, coloured elsewhere.

E11.4 Pressure Preservative Treated Wood

- (a) Provide lumber materials pressure preservative treated wood for:
 - (i) Rough bucks at openings.
 - (ii) Wood strapping.
 - (iii) Lumber used on exterior of building, above or below grade.
- (b) Treat material to CAN/CSA-O80 using ACQ-C (alkaline copper quat, Type C) preservative to obtain a minimum net retention level of 4.0 kg/m³ for wood.
- (c) Materials shall be dried after treatment to a moisture content of 19% or less.
- (d) Each piece of treated material shall be identified with a tag or ink mark bearing the Canadian Wood Preservers' Bureau quality mark.
- (e) Apply surface applied wood preservative to heartwood exposed from ripping, end cutting, or boring.

E11.5 Construction

- (a) Comply with requirements of the NBC, Part 4 and supplemented by the following paragraphs:
 - (i) Install members true to line, levels, and elevations and space uniformly.
 - (ii) Construct continuous members from pieces of longest practical length.
 - (iii) Install spanning members with "crown-edge" up.
 - (iv) Frame, anchor, fasten, tie, and brace members to provide necessary strength and rigidity.
 - (v) Countersink bolts where necessary to provide clearance for other Work.
 - (vi) Use fastenings of the following types, except where a specific type is indicated or specified:
 - (i) To hollow masonry, plaster, and panel surfaces use toggle bolts.
 - (ii) To solid masonry and concrete use expansion shield with lag screws, lead plugs with wood screws.
 - (iii) To structural steel use bolts through drilled hole, or welded stud-bolts or power driven self-drilling screws, or welded stud-bolts or explosive actuated stud-bolts.
 - (iv) All metal fasteners in contact with pressure treated wood shall be stainless steel or have an ACQ-C resistant coating.
 - (vii) Install furring and blocking as required to space-out and support surface wall and ceiling finishes, facings, fascia, soffit, siding, and other Work as indicated. Align and plumb faces of furring and blocking to tolerance of 1:600.
 - (viii) Install rough bucks, nailers, and linings to rough openings as required to provide backing for frames and other Work. Except where indicated otherwise, use material at least 38 mm thick.
 - (ix) Install fascia backing, nailers and other wood supports as required and secure using galvanized fasteners.
 - (x) Install hardboard paneling with finishing nails.

E11.6 Quality Assurance

- (a) Lumber identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
- (b) Plywood, particleboard, OSB, and wood based compoSite panels in accordance with CSA and ANSI standards.

E11.7 Measurement and Payment

- (a) Carpentry shall be paid for under the Contract Lump Sum Price for "Replace Garage Door and Related Works", 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.

E12. SUPPLYING AND PLACING REINFORCING STEEL

E12.1 Description

- (a) This Specification shall cover the supply, fabrication, and placement of plain reinforcing steel.
- (b) 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.

E12.2 Materials

- (a) General

- (i) The Contractor shall be responsible for the supply, safe storage, and handling of all materials as set forth in this Specification.
 - (ii) All materials shall be handled and stored in a careful and Workmanlike manner, to the satisfaction of the Contract Administrator. Storage of materials shall be in accordance with the latest edition of CSA Standard CAN3-A23.1, Storage of Materials, except as otherwise specified herein.
- (b) Reinforcing Steel
- (i) All reinforcing steel shall conform to the requirements of CSA Standard G30.18, Grade 400W, Billet-Steel Bars for concrete reinforcement. If, in the opinion of the Contract Administrator, any reinforcing steel provided for the concrete Works exhibits flaws in manufacture or fabrication, such material shall be immediately removed from the Site and replaced with acceptable reinforcing steel.
 - (ii) All reinforcing steel shall be straight and free from paint, oil, mill-scale, and injurious defects. Surface seams or surface irregularities will not be cause for rejection, provided that the minimum dimensions, cross sectional area, and tensile properties of a hand wire-brushed specimen are not less than the requirements of CSA Standard G30.18.
- (c) Bar Accessories
- (i) Bar accessories shall be of a type approved by the Contract Administrator. They shall be made from a non-rusting material, and shall not stain, blemish, or spall the concreted surface for the life of the concrete.
 - (ii) Bar accessories shall include bar chairs, spacers, clips, wire ties, wire (18 gauge minimum), or other similar devices that may be approved by the Contract Administrator.
- (d) Reinforcing Steel Shop Drawings
- (i) The Contractor will be responsible for producing the detailed drawings for the fabrication and placement of the reinforcing steel. The Contractor shall submit shop drawings for the supply and placement of reinforcing steel. Shop drawings shall consist of bar bending details, lists, placing drawings, and mass tabulations. On placing drawings, indicate sizes, spacing, location, and quantities of reinforcement. Prepare drawings in accordance with ACI 315R, Manual of Engineering and Placing Drawings for Reinforced Concrete Structures. Detail lap lengths and bar development lengths to CSA S6-06, unless otherwise indicated. Provide two (2) sets of full-size hard copies to the Contract Administrator. Provide drawing in AutoCAD or other suitable electronic format.

E12.3 Construction Methods

- (a) Fabrication of Reinforcing Steel
- (i) Reinforcing steel shall be fabricated in accordance with CSA Standard A23.1 to the lengths and shapes as shown on the Drawings.
- (b) Placing of Reinforcing Steel
- (i) Reinforcing steel shall be placed accurately in the positions shown on the Drawings and shall be retained in such positions by means of a sufficient number of bar accessories so that the bars shall not be moved out of alignment during or after the depositing of concrete. The Contractor's decision in this matter shall be final.
 - (ii) Reinforcing steel shall be free of all foreign material in order to ensure a positive bond between the concrete and steel. The Contractor shall also remove any dry concrete, which may have been deposited on the steel from previous concrete placement, before additional concrete may be placed. Intersecting bars shall be tied positively at each intersection.
 - (iii) Splices in reinforcing steel shall be made only where indicated on the Drawings. Prior approval of the Contract Administrator shall be obtained where other splices are to be made. Welded splices shall conform to CSA Standard W186, and are subject to prior written approval of the Contract Administrator.

- (iv) Reinforcing steel shall not be straightened or rebent in a manner that will injure the metal. Bars with bends not shown on the Drawings shall not be used. Heating of reinforcing steel will not be permitted without the prior approval of the Contract Administrator. A minimum of twenty-four (24) hours advance notice shall be given to the Contract Administrator prior to placing any concrete to allow for inspection of the reinforcement.

E12.4 Quality Control

- (a) Inspection
 - (i) All Workmanship and all materials furnished and supplied under this Specification are subject to close and systematic inspection and testing by the Contract Administrator including all operations, from the selection and production of materials, through to final acceptance of the specified Work. The Contractor shall be wholly responsible for the control of all operations incidental thereto notwithstanding any inspection or approval that may have been previously given. The Contract Administrator reserves the right to reject any materials or Works that are not in accordance with the requirements of this Specification.
- (b) Access
 - (i) The Contract Administrator shall be afforded full access for the inspection and quality control testing of reinforcing steel, both at the Site of Work and at any plant used for fabrication of the reinforcing steel, to determine whether the reinforcing steel is being supplied in accordance with this Specification.
- (c) Quality Testing
 - (i) Quality control testing will be used to determine the acceptability of the reinforcing steel supplied by the Contractor.
 - (ii) The Contractor shall provide, without charge, the samples of reinforcing steel required for quality control tests and provide such assistance and use of tools and construction equipment, as is required.

E12.5 Measurement and Payment

- (a) Supplying and Placing Steel Reinforcing shall be paid for under the Contract Lump Sum Price for "Replace Garage Door and Related Works", 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.

E13. SUPPLYING AND PLACING CAST-IN-PLACE STRUCTURAL CONCRETE

E13.1 Description

- (a) This Specification shall cover the preparation of Cast-in-Place Structural Concrete for, and all concreting operations related to, the construction of wall and lintel, except as amended or supplemented herein.
- (b) 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.

E13.2 Materials

- (a) General
 - (i) The Contractor shall be responsible for the supply, safe storage, and handling of all materials set forth in this Specification.
- (b) Handling and Storage of Materials
 - (i) All materials shall be handled and stored in a careful and Workmanlike manner, to the satisfaction of the Contract Administrator. Storage of materials shall be in accordance with CSA Standard CAN/CSA-A23.1.

- (c) Testing and Approval
 - (i) All materials supplied under this Specification shall be subject to inspection and testing by the Contract Administrator or by the Testing Laboratory designated by the Contract Administrator. There shall be no charge to the City for any materials taken by the Contract Administrator for testing purposes.
 - (ii) All materials shall be approved by the Contract Administrator at least seven (7) days before any construction is undertaken. If in the opinion of the Contract Administrator, such materials in whole or in part do not conform to the Specifications detailed herein or are found to be defective in manufacture, or have become damaged in transit, storage, or handling operations, then such materials shall be rejected by the Contract Administrator and replaced by the Contractor at his own expense.
- (d) Bonding Agents
 - (i) The Contractor shall identify the product(s) and submit product information to the Contract Administrator for review and approval.
- (e) Curing Compound
 - (i) If permitted for use, curing compound shall be liquid membrane-forming and conform to the requirements of ASTM Standard C309 and the proposed standard ASTM P198. Rate of application shall be 1.5 times the rate specified by the manufacturer.
 - (ii) Curing compounds shall be resin-based and white-pigmented.
- (f) Patching Mortar
 - (i) The patching mortar shall be made of the same cementitious material and of approximately the same proportions as used for the concrete, except that the coarse aggregate shall be omitted and the mortar shall consist of not more than one (1) part cement to two (2) parts sand by damp loose volume. White Portland Cement shall be substituted for a part of the grey Portland Cement on exposed concrete in order to produce a colour matching the colour of the surrounding concrete, as determined by a trial patch. The quantity of mixing water shall be no more than necessary for handling and placing.
- (g) Non-Shrink Cementitious Grout
 - (i) Where non-shrink cementitious grout is used, it shall be Sternson M-bed Standard, Specialty Construction Products CPD Non-Shrink Grout, Sika 212 Non-Shrink Grout, Meadows CG-86, or equal as accepted by the Contract Administrator. The minimum compressive strength of the grout at 28 days shall be 40 MPa.
- (h) FormWork
 - (i) FormWork materials shall conform to CSA Standard CSA-S269.3.
 - (ii) No "stay-in-place" formWork or falseWork is permitted.
 - (iii) All form sheeting plywood to be covered with form liner. Form sheeting plywood shall be exterior Douglas Fir, concrete form grade, conforming to CSA Standard O121-M, a minimum of 20 mm thick.
 - (iv) Boards used for formWork shall be fully seasoned and free from defects such as knots, warps, cracks, etc., which may mark the concrete surface.
 - (v) No formWork accessories will be allowed to be left in place within 50 mm of the surface following form removal. Items to be left in place, must be made from a non-rusting material or galvanized steel; and they shall not stain, blemish, or spall the concrete surface for the life of the concrete.
 - (vi) Studding shall be spruce or pine and shall have such dimensions and spacing that they shall withstand distortion from all the forces to which the forms will be subjected. Minimum dimensions shall be 50 mm x 150 mm.
 - (vii) Walers shall be spruce or pine, with minimum dimensions of 100 mm x 150 mm.
 - (viii) All forms are incidental to these Works and must be removed by the Contractor once adequate strength and curing of the concrete has been achieved.

- (i) Permeable Formliner
 - (i) Formliner shall be Hydroform, Texel Drainiform or equal as approved in accordance with B6.
- (j) Concrete
 - (i) General
 - (i) Concrete repair material shall be compatible with the concrete substrate.
 - (ii) The Contractor shall be responsible for the design and performance of all concrete mixes supplied under this specification. Either ready mix concrete or proprietary repair mortars, where applicable, may be used having the following minimum properties in accordance with CSA A23.1-04:
 - (i) Class of Exposure: C-1
 - (ii) Compressive Strength @ 28 days = 35 MPa
 - (iii) Air Content: Category 1 per Table 4 of CSA A23.1-04
 - (iii) Mix design for ready mix concrete shall be submitted to Contract Administrator at least two (2) weeks prior to concrete placing operations.
 - (iv) The Workability of each concrete mix shall be consistent with the Contractor's placement operations.
 - (v) Any proposed proprietary repair mortar shall be subject to the approval of the Contract Administrator and must meet or exceed the properties of the ready mix concrete.
 - (vi) The temperature of all types of concrete shall be between 15°C and 25°C at discharge. Temperature requirements for concrete containing silica fume shall be between 10°C and 18°C at discharge unless otherwise approved by the Contract Administrator.
 - (vii) Concrete materials susceptible to frost damage shall be protected from freezing.
 - (ii) Coarse Aggregate
 - (i) The maximum nominal size of coarse aggregate shall be sized to suit the Contractor's mix design. Gradation shall be in accordance with CSA A23.1, Table 11, Group 1. The coarse aggregate shall satisfy the Standard Requirements specified in CSA A23.1, Table 12, "Concrete Exposed to Freezing and Thawing".
 - (ii) Coarse aggregate shall consist of crushed stone or gravel or a combination thereof, having hard, strong, durable particles free from elongation, dust, shale, earth, vegetable matter, or other injurious substances. Coarse aggregate shall be clean and free from alkali, organic, or other deleterious matter and shall have an absorption not exceeding 2.25%.
 - (iii) The aggregate retained on the 5 mm sieve shall consist of clean, hard, tough, durable, angular particles with a rough surface texture and shall be free from organic material, adherent coatings of clay, clay balls, and excess of thin particles or any other extraneous material.
 - (iv) Coarse aggregate when tested for abrasion in accordance with ASTM C131 shall not have a loss greater than 30%.
 - (v) Tests of the coarse aggregate shall not exceed the limits for standard for requirements prescribed in CSA A23.1, Table 12, for concrete exposed to freezing and thawing.
 - (iii) Fine Aggregate
 - (i) Fine aggregate shall meet the grading requirements of CSA A23.1, Table 10, Gradation FA1.
- (k) Aggregates
 - (i) The Contractor shall be responsible for testing the fine and coarse aggregates to establish conformance to these specifications, and the results of these tests shall be provided to the Contract Administrator if requested. All aggregates shall comply with CSA A23.1.

- (ii) Fine aggregate shall consist of sand, stone, screenings, other inert materials with similar characteristics or a combination thereof, having clean, hard, strong, durable, uncoated grains free from injurious amounts of dust, lumps, shale, alkali, organic matter, loam, or other deleterious substances.
 - (iii) Tests of the fine aggregate shall not exceed the limits for standard requirements prescribed in CSA A23.1, Table 12.
- (l) Cementing Materials
 - (i) Cementing materials shall conform to the requirements of CSA A3001.
 - (ii) Silica Fume
 - (i) Should the Contractor choose to include silica fume in the concrete mix design, it shall not exceed 8% by mass of cement.
 - (iii) Fly Ash
 - (i) Fly ash shall be Type CI or Type F and shall not exceed 25% by mass of cement.
 - (iv) Cementitious materials shall be stored in a suitable weather-tight building that shall protect these materials from dampness and other destructive agents. Cementitious materials that have been stored for a length of time resulting in the hardening or formation of lumps shall not be used in the Work.
- (m) Admixtures
 - (i) Air entraining admixtures shall conform to the requirements of ASTM C260.
 - (ii) Chemical admixtures shall conform to the requirements of ASTM C494 or C1017 for flowing concrete.
 - (iii) All admixtures shall be compatible with all other constituents. The addition of calcium chloride, accelerators, and air-reducing agents will not be permitted, unless otherwise approved by the Contract Administrator.
 - (iv) Appropriate low range water reducing and/or superplasticizing admixtures shall be used in concrete containing silica fume. Approved retarders or set controlling admixtures may be used for concrete containing silica fume.
- (n) Water
 - (i) Water to be used for mixing and curing concrete or grout and saturating substrate shall conform to the requirements of CSA A23.1 and shall be free of oil, alkali, acidic, organic materials or deleterious substances.
- (o) Concrete Supply
 - (i) Concrete shall be proportioned, mixed, and delivered in accordance with the requirements of CSA A23.1, except that the transporting of ready mixed concrete in non-agitating equipment will not be permitted unless prior written approval is received from the Contract Administrator.
 - (ii) Unless otherwise directed by the Contract Administrator, the discharge of ready mixed concrete shall be completed within 120 minutes after the introduction of the mixing water to the cementing materials and aggregates.
 - (iii) The Contractor shall maintain all equipment used for handling and transporting the concrete in a clean condition and proper Working order.
- (p) Flexible Joint Sealant
 - (i) Flexible joint sealant for all horizontal, vertical, and sloping joints shall be guaranteed non-staining grey polyurethane, approved by the Contract Administrator and applied in strict accordance with the manufacturer's instructions, including appropriate primers. Approved products are Vulkem 116 by Mameco; Sonolastic NP1 by Sonneborne; RC-1 by Permapol; and Sikaflex by Sika; or equal in accordance with B6.
- (q) Fibre Joint Filler

- (i) Fibre joint filler shall be rot-proof and of the preformed, non-extruding, resilient-type, made with a bituminous fibre such as "Flexcell," and shall conform to the requirements of ASTM Standard D1751, or equal in accordance with B6.
- (r) Expanding Joint Filler
 - (i) Expanding joint filler shall be compressed to 20% of its expanded width and be a polyurethane foam, impregnated throughout with a latex modified asphalt. An approved product is "Emseal," by Emseal Corporation. Expanding joint filler to be installed as per Manufacturer's instructions.
- (s) Miscellaneous Materials
 - (i) The Contractor shall supply all materials, as approved by the Contract Administrator, to ensure the satisfactory completion of the concrete repair Works.

E13.3 Equipment

- (a) General
 - (i) All equipment shall be of a type accepted by the Contract Administrator. The equipment shall be in good Working order, kept free from hardened concrete or foreign materials, and shall be cleaned at frequent intervals.
 - (ii) The Contractor shall have sufficient standby equipment available on short notice at all times.
- (b) Vibrators
 - (i) The Contractor shall have sufficient numbers of internal concrete vibrators and experienced operators on-Site to properly consolidate all concrete in accordance with ACI 309. The type and size of vibrators shall be appropriate for the particular application, the size of the pour, and the amount of reinforcing and shall conform to standard construction procedures.
 - (ii) The Contractor shall have standby vibrators available at all times during the pour.
- (c) Miscellaneous Equipment
 - (i) The Contractor shall provide all miscellaneous equipment as required to properly and thoroughly execute and complete all operations related to the supply and placement of structural concrete.

E13.4 Construction Methods

- (a) General
 - (i) The Works involving Cast-in-Place Concrete include the construction of:
 - (i) Lintel Beam.
- (b) Form Work and Shoring
 - (i) FormWork shall be designed, erected, braced, and maintained to safely support all vertical and lateral loads until such loads can be supported by the concrete.
 - (ii) As a maximum, the following spacings shall apply, for studding and whaling:
 - (i) 20 mm plywood: studding – 450 mm centre to centre.
 - (ii) Whalers – 760 mm centre to centre.
 - (iii) Forms shall be clean before use. Plywood and other wood surfaces shall be sealed against adsorption of moisture from the concrete by a field-applied form coating or a factory-applied liner.
 - (iv) Form accessories to be partially or wholly embedded in the concrete, such as ties and hangers, shall be a commercially manufactured type. The portion remaining within the concrete shall leave no metal within 50 mm of the surface when the concrete is exposed to view. Spreader cones on ties shall not exceed 25mm in diameter.
 - (v) All exposed edges shall be chamfered 25 mm unless otherwise noted on the Drawings.

- (vi) Slots, recesses, chases, sleeves, inserts, bolts, hangers, and other items shall be formed or set in coordination and cooperation with the trade concerned. No openings shall be made in structural members that are not shown on the structural drawings without the prior approval of the Contract Administrator.
 - (vii) Shores shall be provided with positive means of adjustment (jacks or wedges). All settlement shall be taken up before or during concreting as required.
 - (viii) Mud sills of suitable size shall be provided beneath shores, bedded in sand or stone, where they would otherwise bear on soil. The soil below shores must be adequately prepared to avoid settlements during or after concreting. Shores must not be placed on frozen ground.
 - (ix) Brace shores horizontally in two (2) directions and diagonally in the same two (2) vertical planes so that they can safely withstand all dead and moving loads to which they will be subjected.
 - (x) The loads and lateral pressures outlined in Part 3, Section 102 of "Recommended Practice for Concrete FormWork," (ACI 347) and wind loads as specified by the National Building Code shall be used for design. Additional design considerations concerning factors of safety for formWork elements and allowable settlements outlined in Section 103 of the above reference shall apply.
 - (xi) FormWork shall have sufficient strengths and rigidity so that the resultant finished concrete conforms to the shapes, lines, and dimensions of the members shown on the Drawings.
 - (xii) FormWork shall be constructed to permit easy dismantling and stripping and such that removal will not damage the concrete. Provision shall be made in the formWork for shores to remain undisturbed during stripping where required.
 - (xiii) Forms shall be constructed and maintained so that the completed Work is within minus 3 mm or plus 6 mm of the dimensions shown on the Drawings.
 - (xiv) FormWork shall be cambered, where necessary to maintain the specified tolerances, to compensate for anticipated deflections in the formWork due to the weight and pressure of the fresh concrete and due to construction loads.
 - (xv) Forms shall be sufficiently tight to prevent leakage of grout or cement paste.
 - (xvi) Form panels shall be constructed so that the contact edges are kept flush and aligned.
 - (xvii) All form lumber, studding, etc. becomes the property of the Contractor when the Work is finished and it shall be removed from the concrete and the Site by the Contractor after the concrete is set, free of extra charge, and the entire Site left in a neat and clean condition.
 - (xviii) It shall be permissible to use the forms over again where possible, provided they are thoroughly cleaned and in good condition after being removed from the former portions of the Work. The Contract Administrator shall be the sole judge of their condition and his decision shall be final regarding the use of them again.
- (c) Formliner
- (i) Formliners shall be used on all exposed formed surfaces.
- (d) General Curing
- (i) The use of curing compound will not be allowed on concrete areas that are to receive additional concrete or waterproofing.
 - (ii) Unformed concrete surfaces shall be covered and kept moist by means of wet polyester blankets for seven (7) consecutive days immediately following finishing operations or otherwise approved by the Contract Administrator and shall be maintained at above 10°C for at least seven (7) consecutive days thereafter. Construction joints shall only be covered and kept saturated by means of wet polyester curing blankets for the curing period.
 - (iii) If permitted for use, curing compounds shall be applied at the rate of not less than 1.5 times the rate specified by the manufacturer. The compound must be applied uniformly and by roller. Spraying of the compound will not be permitted.

- (iv) Concrete shall be protected from the harmful effects of sunshine, drying winds, surface dripping, or running water, vibration, and mechanical shock. Concrete shall be protected from freezing until at least twenty-four (24) hours after the end of the curing period.
 - (v) Changes in temperature of the concrete shall be uniform and gradual and shall not exceed 3°C in any one (1) hour period or 20°C in any twenty-four (24) hour period.
 - (vi) Formed surfaces shall receive, immediately after stripping and patching, the same application of curing compound as finished surfaces.
 - (vii) After completing the finishing of unformed surfaces where curing compound is not permitted, the surfaces shall be promptly covered with a minimum of a single layer of clean, damp polyester curing blanket and 6mil polyethylene.
 - (viii) Care shall be exercised to ensure that the polyester curing blanket is well drained and that it is placed as soon as the surface will support it without deformation. The Contractor shall ensure that water from the polyester curing blankets does not run into areas where concrete placement and finishing operations are underway. If this occurs, concrete placement shall stop until the problem is corrected satisfactory to the Contract Administrator.
- (e) Placing Concrete
- (i) The Contract Administrator must be notified at least twenty-four (24) hours prior to concrete placement so that an adequate inspection may be made of formwork, shoring, reinforcement, expansion joints, and related works. Placement without required prior notification will not be allowed.
 - (ii) Equipment for mixing or conveying concrete shall be thoroughly flushed with clean water before and after each pour. Water used for this purpose shall be discharged outside the forms.
 - (iii) Concrete shall be conveyed from the mixer to the place of final deposit by methods that will prevent segregation and a marked change in consistency. The deck slab shall be placed by pumping methods.
 - (iv) Before depositing any concrete, all debris shall be removed from the space to be occupied by the concrete and any mortar splashed upon the reinforcement or forms shall be removed.
 - (v) Placing of concrete, when started, shall be continuous. No concrete shall be placed against concrete that has sufficiently hardened to cause the formation of seams or "cold joints" within the section. If placing must be interrupted, construction joints shall be located where shown on the Drawings or as approved.
 - (vi) Concrete shall be placed as nearly as possible to its finish position. Rakes or mechanical vibrators shall not be used to transport concrete.
 - (vii) The maximum drop of free concrete into the forms shall not be greater than 1.5m; otherwise, rubber tubes or pouring ports spaced not more than 1.2m vertically and 2.5m horizontally shall be used.
 - (viii) All concrete, during and immediately after deposition, shall be consolidated by mechanical vibrators so that the concrete is thoroughly worked around the reinforcement, around embedded items, and into the corners of the forms; eliminating all air or stone pockets that may cause honeycombing, pitting or planes of weakness. Mechanical vibrators, when immersed, shall have a minimum frequency of 7,000 revolutions per minute.
 - (ix) Vibrators shall be inserted systematically into the concrete at intervals such that the zones of influence of the vibrator overlap (generally 300 mm to 900 mm). Apply the vibrator at any point until the concrete is sufficiently compacted (5 to 15 seconds) but not long enough for segregation to occur. Spare vibrators in working condition shall be kept on the job site during all placing operations.
 - (x) Concrete shall not be placed in rain or snow unless adequate protection is provided for formwork and concrete surfaces.
- (f) Finishing of Unformed Surfaces

- (i) Screeding of all unformed concrete surfaces shall be performed by the sawing movement of a straight edge along wood or metal strips or form edges that have been accurately set at required elevations.
 - (ii) Screeding shall be done on all concrete surfaces as a first step in other finishing operations. Screeding shall be done immediately after the concrete has been vibrated.
 - (iii) After screeding, the concrete shall not be Worked further until ready for floating. Floating shall begin when the water sheen has disappeared. The surface shall then be consolidated with hand floats. Concrete surfaces after floating shall have a uniform, smooth, granular texture.
- (g) Form Removal
- (i) All forms shall remain in place for a minimum of seven (7) days. The Contract Administrator must be notified at least twenty-four (24) hours prior to any form removal. The Contractor must receive approval from the Contract Administrator prior to beginning Work.
 - (ii) The minimum strength of concrete in place for safe removal of soffit forms for horizontal or inclined members, as well as vertical forms shall be 20MPa, with the added provisions that the member shall be of sufficient strength to safely carry its own weight, together with superimposed construction loads, and that the forms shall stay in place a minimum of three (3) days unless otherwise approved by the Contract Administrator.
 - (iii) Field-cured test specimens, representative of the in-place concrete being stripped, may be tested to verify the concrete strength.
- (h) Patching of Formed Surfaces
- (i) Immediately after forms have been removed, but before any repairing or surface finishing is started, the concrete surface shall be inspected by the Contract Administrator. Any repair or surface finishing started before this inspection may be rejected and required to be removed.
 - (ii) All formed concrete surfaces shall have bolts, ties, struts, and all other timber or metal parts not specifically required for construction purposes cut back 50mm from the surface before patching.
 - (iii) Minor surface defects caused by honeycomb, air pockets greater than 5mm in diameter, and voids left by strutting, and tie holes shall be repaired by removing the defective concrete to sound concrete, dampening the area to be patched and then applying patching mortar. A slurry grout consisting of water and cement, shall be thoroughly brushed onto the area to be patched. When the slurry grout begins to lose the water sheen, the patching mortar shall be applied. It shall be struck-off slightly higher than the adjacent surface and left for one (1) hour before final finishing to permit initial shrinkage of the patching mortar and it shall be touched up until it is satisfactory to the Contract Administrator. The patch shall be cured as specified in this Specification, and the final colour shall match the surrounding concrete.
 - (iv) All objectionable fins, projections, offsets, streaks, or other surface imperfections shall be removed by approved means to the Contract Administrator's satisfaction. Cement washes of any kind shall not be used.
 - (v) Concrete shall be cast against forms that will produce plane surfaces with no bulges, indentations, or protuberances other than those shown on the Drawings. The arrangement of panel joints shall be kept to a minimum. Panels containing worn edges, patches, or other defects that will impair the texture of concrete surfaces shall not be used. All fins on the concrete surfaces shall be removed.
- (i) Cold Weather Concreting
- (i) The requirements of this section shall be applied to all concreting operations during cold weather; i.e., if the mean daily temperature falls below 5°C during placing or curing.

- (ii) The Contract Administrator will advise the Contractor, in writing, as to the degree of heating of water and aggregates.
 - (iii) Supplementary equipment, as required below, shall be at the job Site if concrete is likely to be placed in cold weather.
 - (iv) Formwork and reinforcing steel shall be heated to at least 5°C before concrete is placed.
 - (v) The temperature of the concrete shall be maintained at not less than 10°C for seven (7) days, or 15°C for five (5) days, or 20°C for three (3) days after placing. The concrete shall be kept above freezing temperature for at least a period of seven (7) days. In no case shall the heating be removed until the concrete has reached a minimum compressive strength, which will be specified by the Contract Administrator for Work under construction, and as determined from compressive strength tests for specimens secured under the same conditions as the concrete Works in question.
 - (vi) Aggregates shall be heated to a temperature of not less than 20°C and not more than 55°C. Water shall be heated to a temperature between 20°C and 55°C. The temperature of the concrete at the time of placement shall be within the range specified in CSA Standard CAN/CSA-A23.1 for the thickness of the section being placed.
 - (vii) When the mean daily temperature falls below 5°C, a complete hoarding of the Work, together with supplementary heat, shall be provided.
 - (viii) When the ambient temperature is below -15°C, the hoarding shall be constructed so as to allow the concrete to be placed without the hoarding having to be opened. If the mixing is done outside of the hoarding, the concrete shall be placed by means of hoppers installed through the hoarding. The hoppers are to be plugged when not in use.
 - (ix) When the ambient temperature is equal to or above -15°C, the Contractor will be permitted to open small portions of the hoarding for a limited time to facilitate the placing of the concrete.
 - (x) Before depositing any of the concrete, the Contractor shall show that enough heating equipment is available to keep the air temperature surrounding the forms within the specified range. This shall be accomplished by bringing the temperature inside of the hoarding to the specified 20°C, at least 12 hours prior to the start of the concrete placing.
 - (xi) The Contractor shall supply all required heating apparatus and the necessary fuel. When dry heat is used, a means of maintaining atmospheric moisture shall be provided. The relative humidity within the heated enclosure shall be maintained at a minimum of 40% during concrete placing and finishing operations. Following finishing operations, exposed concrete surfaces shall be protected from excessive drying by applying curing compound, covering the surfaces with polyethylene, or providing water curing.
 - (xii) Sufficient standby heating equipment must be available to allow for any sudden drop in outside temperatures and any breakdowns that may occur in the equipment.
 - (xiii) Combustion-type heaters may be used if their exhaust gases are vented outside the enclosures and not allowed to come into contact with concrete surfaces. Fire extinguishers must be readily at hand wherever combustion-type heaters are used. Heating and hoarding shall be considered incidental to this specification and no separate measurement and payment will be made.
 - (xiv) The Contractor shall keep a curing record of each concrete pour. The curing record shall include: date and location of the pour, mean daily temperature, hoarding relative humidity, temperatures above and below the concrete surface at several points, and notes regarding the type of heating, enclosure, unusual weather conditions, etc. This record shall be available for inspection by the Contract Administrator at the end of the concrete operations.
- (j) Clean Up

- (i) The Contractor shall maintain the Sites of Work in a tidy condition and free from the accumulation of waste and debris.

E13.5 Quality Control

(a) Inspection

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

(b) Access

- (i) The Contract Administrator shall be afforded full access for the inspection and control of testing of concrete and constituent materials, both at the Site of Work and at any plant used for the production of concrete, to determine whether the concrete is being supplied in accordance with this Specification.

(c) Materials

- (i) All materials supplied under this Specification shall be subject to testing and approval by the Contract Administrator.

(d) Concrete Quality

- (i) Quality control tests will be used to determine the acceptability of the concrete supplied by the Contractor.
- (ii) The Contractor shall provide, without charge, the samples of concrete and the constituent materials required for quality control tests and provide such assistance and use of tools and construction equipment as is required.
- (iii) The frequency and number of concrete quality control tests shall be in accordance with the requirements of CSA Standard CAN/CSA-A23.1.
- (iv) Compressive strength tests on specimens cured under the same conditions as the concrete Works will be made to check the strength of the in-place concrete and the adequacy of curing. Subsequent operations will not be allowed until the in-place concrete has achieved a compressive strength of 25 MPa.

(e) Corrective Action

- (i) If the results of the tests indicate that the concrete is not of the specified quality, the Contract Administrator shall have the right to implement additional testing, as required, to further evaluate the concrete at the Contractor's expense.
- (ii) The Contractor shall, at his own expense, correct such Work or replace such materials found to be defective under this Specification in an approved manner to the satisfaction of the Contract Administrator.

E13.6 Measurement and Payment

- (a) Supplying and Placing Cast-In-Place Structural Concrete shall be paid for under the Contract Lump Sum Price for "Replace Garage Door and Related Works", 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.

E14. JOINT SEALERS

E14.1 Description

- (a) This Specification shall cover the supply and placement of all joint sealer Work.

E14.2 Materials

- (a) Sealant Materials Designations

- (i) Type 1 – Silicones One Part: to CAN/CGSB-19.13. Acceptable material: Dow Corning 795, GE Silpruf, Tremco Spectrum 2.
 - (ii) Type 2 – Silicones One Part: to CAN/CGSB-19.22-M89 (Mildew resistant). Acceptable material: Dow Corning 786.
 - (iii) Type 3 – Acrylic Latex One Part: to CGSB 19-GP-5M. Acceptable material: Tremco 100 Latex Caulk, GE Acrylasil Latex Caulk.
 - (iv) Type 4 – Butyl: to CGSB 19-GP-14M. Acceptable material: Tremco Butyl Sealant.
- (b) Accessories
- (i) Preformed compressible and non-compressible back-up materials.
 - (i) High-density foam, extruded closed cell polyvinyl chloride (PVC), extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 kPa to 200 kPa, extruded polyolefin foam, 32 kg/m density, or neoprene foam backer, size as recommended by manufacturer.
 - (ii) Bond breaker tape. Polyethylene bond breaker tape that will not bond to sealant.
 - (ii) Joint cleaner: non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.
 - (iii) Primer: as recommended by manufacturer.
- (c) Construction Methods
- (i) Sealant Selection
 - (i) Perimeters of exterior openings where frames meet exterior façade of building: Sealant Type 1.
 - (ii) Miscellaneous flashing joints and metal cladding: Sealant Type 1.
 - (iii) Perimeter of washroom fixtures (e.g., sinks, urinals, water closets, vanities, etc.): Sealant Type 2.
 - (iv) Interior paintable joints: Sealant Type 3.
 - (v) Bedding aluminum doorsills: Sealant Type 4.
 - (ii) Deliver and store materials in original wrappings and containers with manufacturer's seals and labels intact. Protect from freezing, moisture, water, and contact with ground or floor.
 - (iii) Environmental and Safety Requirements
 - (i) Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of material safety data sheets acceptable to Labour Canada.
 - (ii) Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions
 - (iv) Protection
 - (i) Protect installed Work of other trades from staining or contamination.
 - (v) Preparation of Joint Surfaces
 - (i) Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.
 - (ii) Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter that may impair Work.
 - (iii) Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.
 - (iv) Ensure joint surfaces are dry and frost free.
 - (v) Prepare surfaces in accordance with manufacturer's directions.
 - (vi) Priming

- (i) Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.
- (ii) Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.
- (vii) Backup Material
 - (i) Apply bond breaker tape where required to manufacturer's instructions.
 - (ii) Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.
- (viii) Mixing
 - (i) Mix materials in strict accordance with sealant manufacturer's instructions.
- (ix) Application
 - (i) Sealant
 - ◆ Apply sealant in accordance with manufacturer's written instructions.
 - ◆ Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.
 - ◆ Apply sealant in continuous beads.
 - ◆ Apply sealant using gun with proper size nozzle.
 - ◆ Use sufficient pressure to fill voids and joints solid.
 - ◆ Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, and embedded impurities.
 - ◆ Tool exposed surfaces before skinning begins to give slightly concave shape.
 - ◆ Remove excess compound promptly as Work progresses and upon completion.
 - (ii) Curing
 - ◆ Cure sealants in accordance with sealant manufacturer's instructions.
 - ◆ Do not cover up sealants until proper curing has taken place.
 - (iii) Clean-Up
 - ◆ Clean adjacent surfaces immediately and leave Work neat and clean.
 - ◆ Remove excess and droppings using recommended cleaners as Work progresses.
 - ◆ Remove masking tape after initial set of sealant.

E14.3 Measurement and Payment

- (a) The supplying and placing of joint sealers shall be paid for under the Contract Lump Sum Price for "Replace Garage Door and Related Works", 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.

E15. INSULATED STEEL GARAGE DOOR AND FRAME

E15.1 Description

- (a) This Specification shall cover the supply, fabrication, and placement of the electric hoist operator, insulated garage metal door, track, and accessories.

E15.2 Materials

- (a) Fabrication Standards
 - (i) Fabricate door and frame to Canadian Manufacturing Specification for steel doors and frames, except where specified otherwise.
- (b) Steel

- (i) Commercial grade steel to ASTM A568-81, Class 1, hot-dip galvanized to ASTM A527-80, coating designation to ASTM A525-81, ZF75 (A25).
- (c) Component Part Thickness and Door Construction
 - (i) End Stiles: 16 gauge steel and incorporate a thermal break to help prevent heat/cold conductivity between the inside and outside steel skin.
 - (ii) Doors: Section profile will be ribbed, textured surface. Sections will be roll-formed, hot-dipped, galvanized steel exterior no less than 0.41 mm. Sections will be manufactured by a continuous foamed-in place polyurethane lamination process resulting in a metal/foam/metal sandwich of homogeneous polyurethane insulation. Sections (Panels) will have a thickness of 41 mm and will incorporate a dual PVC thermal break and joint seal to prevent heat or cold conductivity.
- (d) Door Insulation
 - (i) Insulation will be a rigid, foamed-in-place, polyurethane core free of CFCs and will be fully encapsulated in nonpermeable materials to prevent loss of thermal efficiency over time. The insulation will have an R-value of 14.86 (2.63 W/Msq), U-value of 0.067 (0.380 Msq/W) calculated values based on certified test data.
- (e) Door Accessories
 - (i) Track shall be 51 mm and angle-mounted.
 - (ii) Springs will be rated for a minimum life expectancy of 10,000 cycles.
 - (iii) Weatherstrip between sections will be a dual PVC thermal break and joint seal. Bottom weatherstrip will be EPDM rubber bulb-type strip.
 - (iv) Lock shall be interior mounted slide lock (keyed lock).
 - (v) Operation shall be chain hoist and electric operator.
 - (vi) A fail safe system shall be built in to the door system for safety purposes.
 - (vii) Safety sensors shall be located at the bottom of the garage door.
 - (viii) Hardware: Hinges and fixtures will be galvanized steel. Full-floating, ball-bearing rollers will have hardened steel races and rubber coating. Roller sizes will be adequate for design requirements and limitations.
- (f) Shop Drawings
 - (i) Submit shop drawings in accordance with E8 - Shop Drawings.
 - (ii) Submit shop drawings clearly indicating the type of door and track, material, steel core thickness, minimum head room, openings, arrangement of hardware, operator, and finishes.

E15.3 Construction Methods

- (a) General
 - (i) Install doors and frames to CSDFMA Installation Guide.
- (b) Door Installation
 - (i) Install doors and hardware in accordance with templates and manufacturer's instructions.
 - (ii) Adjust operable parts for correct function.
- (c) Track Installation
 - (i) Set tracks plumb, square, level, and at the correct elevation. Secure anchorages and connection to adjacent construction.
 - (ii) Brace tracks rigidly in position while building-in. Install temporary horizontal wood spreader at third points of door opening to maintain track width. Remove temporary spreaders after tracks are built-in. Make allowances for deflection of structure to ensure structural loads are not transmitted to tracks.
- (d) Painting
 - (i) Paint doors and tracks in accordance with E16 – Painting, in colour approved by Contract Administrator.

E15.4 Measurement and Payment

- (a) The supplying and placing of the steel hollow metal door and frame shall be paid for under the Contract Lump Sum Price for "Replace Garage Door and Related Works", 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. PAINTING

E16.1 Description

- (a) This Specification shall cover the supply and placement of all painting Work.

E16.2 Materials

(a) Paint

- (i) Only paint materials listed in the MPI Approved Products List (APL) are acceptable for use on the project, except where other products are specified.
- (ii) Paint materials for each coating formula to be products of a single manufacturer.
- (iii) Colour schedule will be provided by Contract Administrator. Selection of colours will be from manufacturer's full range of colours.

(b) Paint Finishes

- (i) Except for Formula 1 (epoxy) use Master Painters Institute (MPI) finishing formulae as specified below.
- (ii) Formula 1: for wood to receive paint finish:
 - (i) MPI EXT 6.4B - Alkyd GR (semi-gloss) finish premium grade.
- (iii) Formula 2: for shop primed and unprimed ferrous metal surfaces:
 - (i) MPI EXT 5.1D - Alkyd G5 (semi-gloss) finish premium grade.
- (iv) Formula 3: for galvanized and zinc-coated metal apply:
 - (i) MPI EXT 5.3B - Alkyd G5 (semi-gloss) finish premium grade.

E16.3 Construction Methods

(a) Standard of Acceptance

- (i) Walls: No defects visible from a distance of 1000 mm at 90 degrees to surface when viewed using final lighting source.
- (ii) Ceilings: No defects visible from floor at 45 degrees to surface when viewed using final lighting source.
- (iii) Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.
- (iv) Delivery, Storage and Handling

(b) Delivery, Storage, and Handling

- (i) Deliver and store materials in original containers, sealed with labels intact.
- (ii) Indicate on containers or wrappings:
 - (i) Manufacturer's name and address.
 - (ii) Type of paint.
 - (iii) Compliance with applicable standard.
 - (iv) Colour number in accordance with colour schedule provided by Contract Administrator.
- (iii) Observe manufacturer's recommendations for storage and handling.

(c) Environmental Requirements

- (i) Safety: comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.

- (ii) Ventilation: ventilate area of Work by use of approved portable supply and exhaust fans.
 - (iii) Provide temporary heating where permanent facilities are not available to maintain minimum recommended temperatures.
 - (iv) Apply paint finish only in areas where dust is no longer being generated by related construction operations such that airborne particles will not affect the quality of the finished surface.
 - (v) Apply paint only when surface to be painted is dry, properly cured, and adequately prepared.
- (d) Extra Materials
- (i) Submit one 4-litre can of each type and colour of primer and finish coating. Identify colour and paint type in relation to established colour schedule and finish formula.
 - (ii) Deliver to The City and store where directed.
- (e) Protection
- (i) Cover or mask floors, walls, and equipment adjacent to areas being painted to prevent damage and to protect from paint drops and splatters. Use non-staining coverings.
 - (ii) Protect items that are permanently attached such as Fire Labels on doors, frames, and name plates on equipment.
 - (iii) Protect factory finished products and equipment.
- (f) Cleaning and Surface Preparation
- (i) Clean and prepare surfaces in accordance with MPI Painting Specification Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:
 - (i) Remove dust, dirt, and other surface debris by vacuuming, wiping with dry, clean cloths or compressed air.
 - (ii) Wash surfaces with a biodegradable detergent and bleach where applicable and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
 - (iii) Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
 - (iv) Allow surfaces to drain completely and allow to dry thoroughly.
 - (ii) Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pre-treatment as soon as possible after cleaning and before deterioration occurs.
 - (iii) Where possible, prime surfaces of new wood surfaces before installation. Use same primers as specified for exposed surfaces.
 - (i) Apply vinyl sealer to MPI #36 over knots, pitch, sap and resinous areas.
 - (ii) Apply wood filler to nail holes and cracks.
 - (iv) Clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements. Remove traces of blast products from surfaces, pockets and corners to be painted.
 - (v) Touch up of shop primers with primer as specified in applicable section. Major touch-up including cleaning and painting of field connections, welds, rivets, nuts, washers, bolts, and damaged or defective paint and rusted areas, shall be by supplier of fabricated material.
- (g) Application
- (i) Apply paint in accordance with manufacturer's application instructions unless specified otherwise.
 - (ii) Apply each coat of paint as a continuous film of uniform thickness. Re-paint thin spots or bare areas before next coat of paint is applied.

- (iii) Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.
 - (iv) Sand and dust between each coat to remove visible defects.
 - (v) Finish top, bottom, edges, and cut-outs of doors after fitting as specified for door surfaces.
- (h) Mechanical/Electrical Equipment
- (i) Do not paint exposed conduit, ductwork, and hangers, unless otherwise indicated.
 - (ii) Paint exposed piping. Colour and texture to match adjacent surfaces, except as noted otherwise.
 - (iii) Touch-up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.
 - (iv) Do not paint over nameplates, brass, or bronze surfaces or machined surfaces.
 - (v) Paint both sides and edges of backboards for telephone and electrical equipment before installation. Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.
- (i) Restoration
- (i) Clean and reinstall all hardware items that were removed before undertaken painting operations.
 - (ii) Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.

E16.4 Measurement and Payment

- (a) Painting shall be paid for under the Contract Lump Sum Price for "Replace Garage Door and Related Works", 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. ASBESTOS AND LEAD PAINT REMEDIATION

E17.1 General

- (a) This specification specifically references asbestos remediation, however, it is also applicable to lead paint remediation.

E17.2 Description

- (a) This Specification consists of preparing the Site by reducing asbestos and lead paint so that the risk to construction Workers is acceptable for normal Work procedures.
- (b) Past City investigations have shown there to be no asbestos or lead paint in the building, however, if asbestos or lead paint is encountered, the Contractor will be responsible for asbestos or lead paint remediation within the project limits.
- (c) The following remediation specifications are written as performance criteria and are to be applied by qualified Contractors familiar with safe asbestos remediation and lead paint remediation.

E17.3 Abatement Contractor Responsibilities

- (a) It should be noted that the following remediation specifications are performance standards and do not provide detailed specifications as to how the Site must be remediated. The successful Contractor must be familiar with asbestos remediation procedures.
- (b) The Contractor shall submit to the Contract Administrator his abatement methodology for review at least ten (10) Working days prior to commencing abatement Work.
- (c) Asbestos hoarding shall be designed by an Engineer registered to practice in the Province of Manitoba, and installed according to the Workplace Safety and Health Guidelines.

- (d) All existing debris and dirt inside the building and on equipment inside the building, prior to starting the remediation process, will be assumed to contain asbestos and will be removed prior to the start of Site remediation.
 - (i) Workers will wear disposable clothing and appropriate respiratory protection to do the cleanup.
 - (ii) Cleaning will be done by damp mopping or HEPA vacuum.
- (e) All cleaned equipment inside the building will be wrapped in 6-mil polyethylene or other suitable material to protect it during the remediation process.
- (f) When all asbestos containing materials have been removed, all surfaces including the hoarding will be damp mopped to remove all residual contaminants.
- (g) When declared cleaned to an acceptable level, the wrapped equipment will be unwrapped and given a final cleaning before allowing anyone to be in contact with them.

E17.4 Asbestos Abatement and Disposal

- (a) This Work will be carried out as a Type 3 project. In addition to the Site specific responsibilities, the following general responsibilities must be met where a Type 3 removal process is used. See E1.4 - Procedures for Type 3 Operations.
- (b) A reduced pressure will be maintained within the Asbestos Work Area (>0.02 in. w.g.) established by extracting air directly from the Asbestos Work Area and discharging it to exterior of the building. The air must be passed through a HEPA filter prior to extraction. The volume of air extracted must be sufficient to provide one (1) air change every 20 minutes during wet removal and once every 15 minutes during dry removal while ensuring that at all times, air flows into the Asbestos Work Area.
- (c) The Contractor will submit a copy of his Work plan to the Contract Administrator prior to commencing Work. The Work plan will include, but is not limited to:
 - (i) General preventive methods.
 - (ii) Proposed abatement and disposal procedures for each area.
 - (iii) Proposed Work schedule.
 - (iv) Names and addresses of the persons who will do the Work.
 - (v) Copies of the Worker's license or permit to Work with asbestos.
 - (vi) Personal protection including copies of respirator fit test results for Workers at the Site.
 - (vii) Methods for cleaning of premises.
 - (viii) Disposal of waste materials.
 - (ix) Information, labelling, education and training.
 - (x) Handling of materials during abatement activities.
- (d) The abatement Contractor will maintain a daily sign-in/sign-out roster for all persons entering the Site, and a list of supervisors for each day.
- (e) Requirements as set out in "Manitoba Guidelines for Working with Asbestos" will apply. Areas will be cleaned to 0.01f/cc before being declared acceptable for occupancy.
- (f) The Abatement Contractor will review the project with the Workplace Safety and Health Branch and develop appropriate abatement procedures. The Contractor will then submit an abatement plan to the Contract Administrator, which is in full compliance with the requirements of the appropriate authorities. The appropriate authorities are deemed to include, but not necessarily be limited to, the following:
 - (i) Workplace Safety and Health Branch of the Manitoba Department of Labour with respect to on-Site exposure to hazardous materials.
 - (ii) Manitoba Conservation with respect to potential impact on the surrounding community of off-Site migration and dispersion of hazardous materials as well as disposal of hazardous and potentially hazardous materials.
 - (iii) City of Winnipeg relative to disposal of asbestos contaminated material at the City of Winnipeg Brady Street Landfill.

E17.5 Procedures for Type 3 Operations

- (a) Before any Type 3 operation is performed, the Contractor must notify the Contract Administrator and Workplace Safety and Health Branch in writing at least 5 Working days before the start of Work, and must include:
 - (i) the name, address, and telephone number of the person giving notice.
 - (ii) the name, address, and telephone number of the owner of the building, or agent of the owner, where the Work will be performed.
 - (iii) the address or municipal location of the building where the Work will be performed.
 - (iv) the name, address, and telephone number of the company performing the Work.
 - (v) a description of the Work to be performed.
 - (vi) the start date and expected completion date of the Work.
 - (vii) the name, address, and telephone number of the supervisor in charge of the Work.
- (b) Eating, drinking, chewing, or smoking is prohibited in the Work area.
- (c) Before starting Work, suitable barriers and clearly visible signs warning of the asbestos Work and hazards must be set up at a distance from the Work Site.
- (d) Before any Work is performed, all asbestos dust and contaminated debris must be removed by means of a vacuum cleaner equipped with a HEPA filter; or by wet mopping, wet sweeping or wet wiping.
- (e) Compressed air must not be used to clean up or remove dust and debris from contaminated surfaces.
- (f) Movable equipment within the Work area must be cleaned with a vacuum cleaner equipped with a HEPA filter, or wet wiping, and then removed from the Work Site.
- (g) Fixed equipment within the Work area must be cleaned with a vacuum cleaner equipped with a HEPA filter; or wet wiping, and then covered with impermeable sheeting and sealed with tape.
- (h) Where a Type 3 operation is conducted indoors where walls do not already enclose the operation, the spread of asbestos from the Work area must be prevented by the construction of a negative pressure enclosure.
 - (i) The negative pressure enclosure must be constructed of two layers of a minimum of 6-mil polyethylene or other suitable material, with reinforced polyethylene on the floors.
 - (j) The negative pressure enclosure must have at least four air changes per hour and a minimum pressure differential of -0.02 inches of water gauge relative to the air outside of the enclosure must be maintained.
 - (k) The negative pressure enclosure must be kept under negative pressure for the duration of the operation.
 - (l) All air exhausted from the negative pressure enclosure must pass through a HEPA filter and then be vented to the outside of the building.
- (m) All mechanical ventilation in the contaminated area, except that required to provide the negative air pressure, must be disabled and a barrier of at least two layers of 6-mil polyethylene placed over all openings in the contaminated area.
- (n) All openings from the contaminated area, including windows and doors, must be adequately sealed with adhesive tape or isolated by two layers of 6-mil polyethylene sheeting.
- (o) Care must be taken to ensure that asbestos dust cannot escape at points where pipes and conduits pass out of the Working area.
- (p) All entry points to the Work Site must carry prominently displayed warning notices that identify an asbestos activity, and forbid entry to anyone not wearing appropriate respiratory protection and protective clothing.
- (q) A Worker decontamination unit must be connected to the Work Site, or as close as is reasonably practicable to the Work Site.

- (r) The Worker decontamination unit must consist of a series of interconnecting rooms including:
 - (i) a clean room suitable for changing into or from street clothes and for storing clean clothing and equipment.
 - (ii) a shower room.
 - (iii) an equipment room suitable for changing into protective clothing and for storage of contaminated protective clothing and equipment.
- (s) The Worker decontamination unit must be constructed such that overlapping curtains of polyethylene sheeting or other suitable material are fitted to each side of the entrance or exit to each room.
- (t) The Worker decontamination unit must be arranged in sequence and constructed so that every person entering or leaving the Work area must pass through each room of the decontamination unit.
- (u) The shower room in the Worker decontamination unit:
 - (i) must be provided with an adequate supply of hot and cold water or water of a constant temperature that is not less than 40° Celsius or more than 50° Celsius.
 - (ii) must have individual controls inside the room to regulate water flow or temperature if there is hot and cold water.
 - (iii) must be provided with clean towels.
- (v) The negative pressure enclosure must be tested on a daily basis to ensure that no asbestos will escape by the use of:
 - (i) a smoke generator operating inside the enclosure and no visible smoke outside the enclosure.
 - (ii) a recording manometer to ensure that a minimum pressure differential of - 0.02 inches of water gauge relative to the air outside of the enclosure is being maintained at all times, or
 - (iii) daily perimeter air monitoring to ensure that background concentrations of airborne asbestos fibres are not exceeded.
- (w) A competent person must inspect the Work area for defects in the enclosure, barriers, and Worker decontamination unit:
 - (i) at the beginning of each shift.
 - (ii) at the end of a shift where there is no shift beginning immediately following the shift that is ending.
 - (iii) at least once each day on days when there are no shifts.
- (x) Any defect found on inspection must be remedied immediately, and no Work, other than necessary repair Work, shall be performed in the contaminated area until the repair Work is completed.
- (y) Only persons wearing appropriate protective clothing and respiratory protection are allowed to enter the contaminated Work area.
- (z) Unless personal monitoring is performed inside the contaminated Work area to determine the actual exposure to airborne asbestos fibres and an appropriate respirator is then selected, all persons inside the contaminated area must wear at a minimum:
 - (i) a full face powered air purifying respirator with HEPA cartridges while Working on wetted asbestos-containing materials; or
 - (ii) a full face supplied air respirator or self-contained breathing apparatus, complete with a reserve escape bottle, operating in the continuous flow mode while Working on dry asbestos-containing materials.
- (aa) When entering the Work area Workers must:
 - (i) enter the clean room of the Worker decontamination unit, remove all street clothing, store it in the lockers provided and put on clean, appropriate respiratory protection and protective clothing.

- (ii) pass through the shower room to the equipment room.
 - (iii) leave the equipment room to enter the Work area.
- (bb) At the end of Work Workers must:
 - (i) remove gross visible contamination from their protective clothing and respiratory protection in the Work area.
 - (ii) enter the equipment room of the Worker decontamination unit and remove all loose asbestos fibre from their respiratory protection equipment with the use of a vacuum cleaner equipped with a HEP A filter and
 - (i) where the protective clothing will be reused, remove all loose asbestos fibre from their Work clothing with the use of a vacuum cleaner equipped with a HEP A filter, then remove all clothing, and store it in a suitable manner; or
 - (ii) where the protective clothing is not intended to be reused, double- bag it in 6-mil polyethylene bags and dispose of it as asbestos waste.
 - (iii) pass into the shower room and without removing the respiratory protection, shower thoroughly.
 - (iv) remove and thoroughly clean the respiratory protection equipment, store it appropriately.
 - (v) pass into the clean area, dry, dress and leave through the clean area door.
- (cc) Where it is not practical to locate the Worker decontamination unit adjacent to the Work area and passage through a non-contaminated zone is necessary, a two-room Worker decontamination unit must be located at both the Work Site and at the remote Worker decontamination unit, and the following procedure used to enter and exit the area:
 - (i) when starting Work Workers must:
 - (i) enter the clean room of the remote Worker decontamination unit, remove all street clothing, store it in the lockers provided and put on appropriate clean protective clothing.
 - (ii) pass through the shower room, and proceed to the decontamination unit attached to the Work Site.
 - (iii) enter the clean room of the Worker decontamination unit attached to the Work Site, and put on appropriate respiratory protection, and (iv) pass through the equipment room, and enter the Work area.
 - (ii) at the end of Work Workers must:
 - (i) remove visible gross contamination in the Work area.
 - (ii) enter the equipment room of the Worker decontamination unit attached to the Work area, remove all loose asbestos fibre from respiratory protection with the use of a vacuum cleaner equipped with a HEPA filter.
 - (iii) where the protective clothing will be reused, remove all loose asbestos fibre with the use of a vacuum cleaner equipped with a HEP A filter, and then remove the protective clothing, and store it in a suitable manner, or
 - (iv) where the protective clothing is not intended to be reused, double-bag it in 6-mil polyethylene bags and dispose of it as asbestos waste.
 - (v) proceed into the clean room and put on appropriate clean protective clothing and remove the respiratory protection and store it appropriately.
 - (vi) proceed immediately to the remote Worker decontamination unit
 - (vii) enter the shower area of to the remote Worker decontamination unit and remove their protective clothing and shower thoroughly.
 - (viii) pass into the clean area, dry, dress in street clothes and leave through the clean area.
- (dd) Electrical circuits inside the contaminated area must be deactivated unless equipped with ground- fault circuit interrupters.
- (ee) Wet handling techniques must be used to control dust on the surfaces of any asbestos-containing materials, unless wetting creates a hazard or causes damage.

- (ff) Dry stripping is associated with very high levels of airborne asbestos fibres and therefore should be used only:
 - (i) where wet methods may be injurious to Workers.
 - (ii) where live electrical apparatus might be made dangerous by contact with water; or
 - (iii) where hot metal is to be stripped and the use of water may be damaging.
- (gg) Where the surfaces mentioned above can not be wetted, a vacuum cleaner equipped with a HEPA filter, or by other means that does not create airborne asbestos fibres, must be used to control the spread of dust.
- (hh) All waste containing asbestos must be cleaned up frequently and immediately upon completion of the Work by wet sweeping or wet mopping and double-bagged in 6- mil polyethylene bags, and disposed of as asbestos waste.
- (ii) Waste containing asbestos must be kept wet.
- (jj) Where the surfaces mentioned above can not be wetted, a vacuum cleaner equipped with a HEPA filter, or other means that does not create airborne asbestos fibres, must be used to control the spread of dust.
- (kk) All bags of waste asbestos and contaminated protective clothing must be removed from the Work area through a waste decontamination unit connected to the negative pressure enclosure.
- (ll) The waste decontamination unit must consist of a series of interconnecting rooms including:
 - (i) a container clean room.
 - (ii) a holding room.
 - (iii) a transfer room.
- (mm) The waste decontamination unit must be constructed such that overlapping curtains of polyethylene sheeting, or other suitable material, are fitted to each side of the entrance or exit to each room.
- (nn) Bags of asbestos waste and contaminated protective clothing must be removed from the Work area by the following procedure:
 - (i) remove visible contamination from the bags in the Work area.
 - (ii) transfer the bag into the container cleaning room.
 - (iii) clean the bags with a damp cloth or sponge, place the bag into a second 6- mil polyethylene bag, seal the outer bag, and transfer the double-bagged waste to the holding room;
 - (iv) Workers performing the activities described in (ii) and (iii) must wear the same protective clothing and respiratory protection as those Workers in the contaminated Work area.
 - (v) Workers performing the activities described in (ii) and (iii) must exit by the Worker decontamination unit.
 - (vi) the double-bagged waste is then moved from the holding room to the container clean room, without entering the holding room, and then outside the waste decontamination unit by a Worker who enters from the waste container clean room.
 - (vii) Workers performing the activity described in (vi) do not require respiratory protection or protective clothing.
- (oo) Contaminated equipment, tools, and other items used in the Work area must be cleaned with a damp cloth and by vacuuming with a vacuum equipped with a HEPA filter and removed from the Work area through the waste decontamination unit by the same method as described for asbestos waste.
- (pp) Before the negative pressure enclosure, Worker decontamination unit, and waste decontamination unit may be remove or altered:
 - (i) the contaminated areas must be decontaminated by a combination of wet cleaning and vacuuming with vacuum cleaner equipped with a HEPA.

- (ii) there must be no visible trace of asbestos dust.
- (iii) a final air monitoring clearance test of the area inside the negative pressure enclosure must be performed, and the concentration of airborne asbestos fibres inside the enclosure must not exceed 0.01 fibres per cubic centimetre.
- (qq) All polyethylene sheets used to form the negative pressure enclosure, the Worker decontamination unit(s), the waste decontamination unit and covering all openings inside the contaminated area must be folded to contain any remaining debris and double-bagged in 6-mil polyethylene bags, securely tied and disposed of as asbestos waste.
- (rr) When an activity described is being carried out out-of-doors, the procedures described in this section, with the exception of the building and operating of a negative pressure enclosure, Worker decontamination unit, and waste decontamination unit, must be followed.

E17.6 Measurement and Payment

- (a) Asbestos sampling and testing shall be paid for under the Contract Unit Price for "Asbestos Sampling and Testing", which price shall be payment in full for sampling and testing all materials within the project limits and for performing all operations herein described and all other items incidental to the Work.
- (b) Lead Paint sampling and testing shall be paid for under the Contract Unit Price for "Lead Paint Sampling and Testing", which price shall be payment in full for sampling and testing all materials within the project limits and for performing all operations herein described and all other items incidental to the Work.
- (c) Measurement and Payment for Removal of Asbestos and Lead Paint within the project limits will be considered extra if required, and will be paid for on a time and materials basis.