THE CITY OF WINNIPEG

BID OPPORTUNITY

BID OPPORTUNITY NO. 598-2008

FOUNDATION WATERPROOFING – CARNEGIE BUILDING, 380 WILLIAM AVE.

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PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

B1.1 FOUNDATION WATERPROOFING – CARNEGIE BUILDING, 380 WILLIAM AVE.

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, August 20, 2008.

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. BIDDERS' CONFERENCE

B3.1 Further to C3.1, the Bidder shall attend a Bidders' conference at 380 William Avenue from 10:00 a.m. to 11:00 a.m. on Tuesday, August 12, 2008. Attendance is mandatory, and the Bid of any Bidder not having attended will be rejected on the basis that it is non-responsive.

B3.2 The Bidder is advised that, at the Bidders' Conference, site-specific issues related to all aspects of the work will be discussed.

B3.3 The Bidder shall not be entitled to rely on any information or interpretation received at the Bidders' Conference unless that information or interpretation 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 internet site at http://www.winnipeg.ca/matmgt.

B5.2.2 The Bidder is responsible for ensuring that he has received all addenda and is advised to check the Materials Management Division internet site for addenda regularly and shortly before the Submission Deadline, as may be amended by addendum.

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

B6. SUBSTITUTES

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

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

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

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

(a) provide sufficient information and details to enable the Contract Administrator to determine the acceptability of the Plant, Material or method as either an approved equal or alternative;

(b) identify any and all changes required in the applicable Work, and all changes to any other Work, which would become necessary to accommodate the substitute;

(c) identify any anticipated cost or time savings that may be associated with the substitute;

(d) certify that, in the case of a request for approval as an approved equal, the substitute will fully perform the functions called for by the general design, be of equal or superior substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the date specified in the Supplemental Conditions for Substantial 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 date specified in the Supplemental Conditions for Substantial Performance.

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

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

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

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

B6.8 If the Contract Administrator approves a substitute as an “approved alternative”, any Bidder bidding that approved alternative 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 B15.

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

B7. BID COMPONENTS

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

(a) Form A: Bid;

(b) Form B: Prices;

(c) Bid Security

(i) Form G1: Bid Bond and Agreement to Bond, or
Form G2: Irrevocable Standby Letter of Credit and Undertaking, or
a certified cheque or draft;

B7.2 Further to B7.1, the Bidder should include the written correspondence from the Contract Administrator approving a substitute in accordance with B6.

B7.3 All components of the Bid shall be fully completed or provided, and submitted by the Bidder no later than the Submission Deadline, with all required entries made clearly and completely, to constitute a responsive Bid.

B7.4 The Bid shall be submitted enclosed and sealed in an envelope clearly marked with the Bid Opportunity number and the Bidder's name and address.

B7.4.1 Samples or other components of the Bid which cannot reasonably be enclosed in the envelope may be packaged separately, but shall be clearly marked with the Bid Opportunity number, the Bidder's name and address, and an indication that the contents are part of the Bidder’s Bid.

B7.5 Bidders are advised not to include any information/literature except as requested in accordance with B7.1.

B7.6 Bidders are advised that inclusion of terms and conditions inconsistent with the Bid Opportunity document, including the General Conditions, may result in the Bid being determined to be non-responsive.

B7.7 Bids submitted by facsimile transmission (fax) or internet electronic mail (e-mail) will not be accepted.

B7.8 Bids shall be submitted to:

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

B8. BID

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

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

(a) if the Bidder is a sole proprietor carrying on business in his own name, his name shall be inserted;

(b) if the Bidder is a partnership, the full name of the partnership shall be inserted;

(c) if the Bidder is a corporation, the full name of the corporation shall be inserted;

(d) if the Bidder is carrying on business under a name other than his own, the business name and the name of every partner or corporation who is the owner of such business name shall be inserted.

B8.2.1 If a Bid is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B8.2.

B8.3 In Paragraph 3 of Form A: Bid, the Bidder shall identify a contact person who is authorized to represent the Bidder for purposes of the Bid.

B8.4 Paragraph 12 of Form A: Bid shall be signed in accordance with the following requirements:

(a) if the Bidder is a sole proprietor carrying on business in his own name, it shall be signed by the Bidder;

(b) if the Bidder is a partnership, it shall be signed by the partner or partners who have authority to sign for the partnership;

(c) if the Bidder is a corporation, it shall be signed by its duly authorized officer or officers and the corporate seal, if the corporation has one, should be affixed;

(d) if the Bidder is carrying on business under a name other than his own, it shall be signed by the registered owner of the business name, or by the registered owner's authorized officials if the owner is a partnership or a corporation.

B8.4.1 The name and official capacity of all individuals signing Form A: Bid should be printed below such signatures.

B8.5 If a Bid is submitted jointly by two or more persons, the word "Bidder" shall mean each and all such persons, and the undertakings, covenants and obligations of such joint Bidders in the Bid and the Contract, when awarded, shall be both joint and several.

B9. PRICES

B9.1 The Bidder shall state the lump sum price in Canadian funds for the Work on Form B: Prices.

B9.1.1 Notwithstanding C12.2.3(c), the price on Form B: Prices shall not include the Manitoba Retail Sales Tax (MRST, also known as PST), which shall be extra where applicable.

B9.2 Prices from Non-Resident Bidders are subject to a 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 internet site 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 provide 3 (three) references from owners of premises where such work has been successfully completed; and

(b) be fully capable of performing the Work required to be in strict accordance with the terms and provisions of the Contract; and

(c) have a written workplace safety and health program if required pursuant to The Workplace Safety and Health Act (Manitoba);

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

(a) a valid COR certification number under the Certificate of Recognition (COR) Program administered by the Manitoba Construction Safety Association or by the Manitoba Heavy Construction Association's Safety, Health and Environment Program; or

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

B10.5 The Bidder shall submit, within three (3) Business Days of a request by the Contract Administrator, proof satisfactory to the Contract Administrator of the qualifications of the Bidder and of any proposed Subcontractor.

B10.6 The Bidder shall provide, on the request of the Contract Administrator, full access to any of the Bidder's equipment and facilities to confirm, to the Contract Administrator's satisfaction, that the Bidder's equipment and facilities are adequate to perform the Work.

B11. BID SECURITY

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

(a) a bid bond, in the amount of at least ten percent (10%) of the Total Bid Price, and agreement to bond of a company registered to conduct the business of a surety in Manitoba, in the form included in the Bid Submission (Form G1: Bid Bond and Agreement to Bond); or

(b) an irrevocable standby letter of credit, in the amount of at least ten percent (10%) of the Total Bid Price, and undertaking issued by a bank or other financial institution registered to conduct business in Manitoba and drawn on a branch located in Winnipeg, in the form included in the Bid Submission (Form G2: Irrevocable Standby Letter of Credit and Undertaking); or

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

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

B11.1.2 All signatures on bid securities shall be original.

B11.1.3 The Bidder shall sign the Bid Bond.

B11.1.4 The Surety shall sign and affix its corporate seal on the Bid Bond and the Agreement to Bond.

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

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

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

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

B12. OPENING OF BIDS AND RELEASE OF INFORMATION

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

B12.1.1 Bidders or their representatives may attend.

B12.2 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 internet site at http://www.winnipeg.ca/matmgt.

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

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

B13. IRREVOCABLE BID

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

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

B14. WITHDRAWAL OF BIDS

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

B14.1.1 Notwithstanding C23.3, the time and date of receipt of any notice withdrawing a Bid shall be the time and date of receipt as determined by the Manager of Materials.

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

B14.1.3 If a Bidder gives notice of withdrawal prior to the Submission Deadline, the Manager of Materials will:

(a) retain the Bid until after the Submission Deadline has elapsed;

(b) open the Bid to identify the contact person named in Paragraph 3 of Form A: Bid and the Bidder's authorized representatives named in Paragraph 12 of Form A: Bid; and

(c) if the notice has been given by any one of the persons specified in B14.1.3(b), declare the Bid withdrawn.

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

B15. EVALUATION OF BIDS

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

(a) compliance by the Bidder with the requirements of the Bid Opportunity (pass/fail);

(b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B10 (pass/fail);

(c) Total Bid Price;

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

B15.2 Further to B15.1(a), the Award Authority may reject a Bid as being non-responsive if the Bid is incomplete, obscure or conditional, or contains additions, deletions, alterations or other irregularities. The Award Authority may reject all or any part of any Bid, or waive technical requirements or minor informalities or irregularities, if the interests of the City so require.

B15.3 Further to B15.1(b), the Award Authority shall reject any Bid submitted by a Bidder who does not demonstrate, in his Bid or in other information required to be submitted, that he is responsible and qualified.

B15.4 Further to B15.1(c), the Total Bid Price shall be the lump sum price shown on Form B: Prices.

B15.4.1 If there is any discrepancy between the lump sum price written in figures and the lump sum price written in words, the price written in words shall take precedence.

B16. AWARD OF CONTRACT

B16.1 The City will give notice of the award of the Contract or will give notice that no award will be made.

B16.2 The City will have no obligation to award a Contract to a Bidder, even though one or all of the Bidders are determined to be responsible and qualified, and the Bids are determined to be responsive.

B16.2.1 Without limiting the generality of B16.2, the City will have no obligation to award a Contract where:

(a) the prices exceed the available City funds for the Work;

(b) the prices are materially in excess of the prices received for similar work in the past;

(c) the prices are materially in excess of the City's cost to perform the Work, or a significant portion thereof, with its own forces;

(d) only one Bid is received; or

(e) in the judgment of the Award Authority, the interests of the City would best be served by not awarding a Contract.

B16.3 Where an award of Contract is made by the City, the award shall be made to the responsible and qualified Bidder submitting the lowest evaluated responsive Bid, in accordance with B15.

B16.3.1 Following the award of contract, a Bidder will be provided with information related to the evaluation of his Bid upon written request to the Contract Administrator.

PART C - GENERAL CONDITIONS

C0. GENERAL CONDITIONS

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

C0.1.1 The *General Conditions for Construction* are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division internet site 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 excavating around the perimeter of the building and installing a new weeping tile and drainage system along with a new waterproofing membrane on a new concrete exterior foundation wall face.

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

(a) Shore transformer pad for adjacent building and temporarily support lean-to on west side;

(b) Provide temporary shoring as necessary for adjacent building ramp and stairs to the south;

(c) Temporarily relocate cooling tower to elsewhere on site (temporary reconnection not required);

(d) Break out front stairs, concrete curbs, entry pad and sidewalk where they meet the building;

(e) Provide temporary access for public at all times to main entrance;

(f) Excavate around building perimeter including at asphalt parking lot to west and concrete lane to south;

(g) Clean foundation wall face to expose exterior stone face;

(h) Break off stone to smooth foundation wall to +/- 1” profile;

(i) Prepare surface of foundation wall and install new 3” reinforced concrete skin, waterproofing membrane, insulation, and stucco parging;

(j) Install new 6” perimeter weeping tile and three drains (cored through 48” wide stone footing) to new interior sump pits c/w submersible pumps to discharge to building exterior;

(k) Backfill with free draining granular and clay cap followed by new concrete/asphalt/grass to replace existing;

(l) Reconstruct front and side entry pads and stairs to match existing;

(m) Repave asphalt parking lot;

(n) Reinstall existing cooling tower on new concrete pad and reinstall fencing.

D3. CONTRACT ADMINISTRATOR

D3.1 The Contract Administrator is Crosier Kilgour & Partners Ltd., represented by:

Haney Louka, P.Eng.
Structural Engineer
300-275 Carlton Street
Winnpeg, MB R3C 5R6

Telephone No. (204) 943-7501
Facsimile No. (204) 943-7507

D3.2 At the pre-construction meeting, Crosier Kilgour and Partners Ltd. 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 All notices of appeal to the Chief Administrative Officer shall be sent to the attention of the Chief Financial Officer at the following address or facsimile number:

The City of Winnipeg
Chief Financial Officer
Administration Building, 3rd Floor
510 Main Street
Winnipeg MB R3B 1B9

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

Facsimile No.: (204) 947-9155

D6. FURNISHING OF DOCUMENTS

D6.1 Upon award of the Contract, the Contractor will be provided with five (5) complete sets of the Bid Opportunity. If the Contractor requires additional sets of the Bid Opportunity, they will be supplied to him at cost.

SUBMISSIONS

D7. AUTHORITY TO CARRY ON BUSINESS

D7.1 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.

D8. SAFE WORK PLAN

D8.1 The Contractor shall provide the Contract Administrator with a Safe Work Plan at least five (5) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

D8.2 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 internet site at http://www.winnipeg.ca/matmgt/safety/default.stm .

D9. INSURANCE

D9.1 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 Substantial 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 Substantial Performance.

D9.2 Deductibles shall be borne by the Contractor.

D9.3 The Contractor shall provide the City Solicitor with a certificate(s) of insurance, in a form satisfactory to the City Solicitor, at least two (2) Business Days prior to the commencement of any Work but in no event later than the date specified in C4.1 for the return of the executed Contract.

D9.4 The Contractor shall not cancel, materially alter, or cause each policy to lapse without providing at least thirty (30) Calendar Days prior written notice to the Contract Administrator.

D10. PERFORMANCE SECURITY

D10.1 The Contractor shall provide and maintain performance security until the expiration of the warranty period in the form of:

(a) a performance bond of a company registered to conduct the business of a surety in Manitoba, in the form attached to these Supplemental Conditions (Form H1: Performance Bond), in the amount of fifty percent (50%) of the Contract Price; or

(b) an irrevocable standby letter of credit issued by a bank or other financial institution registered to conduct business in Manitoba and drawn on a branch located in Winnipeg, in the form attached to these Supplemental Conditions (Form H2: Irrevocable Standby Letter of Credit), in the amount of fifty percent (50%) of the Contract Price; or

(c) a certified cheque or draft payable to "The City of Winnipeg", drawn on a bank or other financial institution registered to conduct business in Manitoba, in the amount of fifty percent (50%) of the Contract Price.

D10.1.1 Where the performance security is in the form of a certified cheque or draft, it will be deposited by the City. The City will not pay any interest on certified cheques or drafts furnished as performance security.

D10.2 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 letter of intent and prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

D11. DETAILED PRICES

D11.1 The Contractor shall provide the Contract Administrator with a detailed price breakdown (Form I: Detailed Prices) at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

D11.2 The Contractor shall state a price for each item or sub-item of the Work identified on Form I: Detailed Prices. The detailed prices must be consistent with the price(s) provided in the Contractor's Bid.

D12. SUBCONTRACTOR LIST

D12.1 The Contractor shall provide the Contract Administrator with a complete list of the Subcontractors whom the Contractor proposes to engage (Form J: Subcontractor List) at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

D13. DETAILED WORK SCHEDULE

D13.1 The Contractor shall provide the Contract Administrator with a detailed work schedule at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

D13.2 The detailed work schedule shall consist of the following:

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

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

all acceptable to the Contract Administrator.

D13.3 Further to D13.2(a), the C.P.M. schedule shall clearly identify the start and completion dates of all of the following activities/tasks making up the Work as well as showing those activities/tasks on the critical path:

(a) Permits, mobilization, utility locates, and other start-up activities;

(b) Cooling tower relocation

(c) Temporary shoring, excavation, and demolition;

(d) Surface preparation and installation of new concrete foundation wall face;

(e) Installation of waterproofing membrane;

(f) Installation of weeping tile, drains, pits, and pumps;

(g) Backfilling;

(h) Landscaping;

(i) Reconstruction of entries and parking lot;

(j) Cleanup/demobilization.

D13.4 Further to D13.2(b), the Gantt chart shall show the time on a weekly basis, required to carry out the Work of each trade, or specification division. The time shall be on the horizontal axis, and the type of trade shall be on the vertical axis.

SCHEDULE OF WORK

D14. COMMENCEMENT

D14.1 The Contractor shall not commence any Work until he is in receipt of a letter of intent from the Award Authority authorizing the commencement of the Work.

D14.2 The Contractor shall not commence any Work on the Site until:

(a) the Contract Administrator has confirmed receipt and approval of:

(i) evidence of authority to carry on business specified in D7;

(ii) evidence of the workers compensation coverage specified in C6.15;

(iii) the Safe Work Plan specified in D8;

(iv) evidence of the insurance specified in D9;

(v) the performance security specified in D10;

(vi) the detailed prices specified in D11;

(vii) the Subcontractor list specified in D12;

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

(b) the Contractor has attended a pre-construction meeting with the Contract Administrator, or the Contract Administrator has waived the requirement for a pre-construction meeting.

D14.3 The Contractor shall commence the Work on the Site within seven (7) Working Days of receipt of the letter of intent.

D15. SUBSTANTIAL PERFORMANCE

D15.1 The Contractor shall achieve Substantial Performance by October 31, 2008.

D15.2 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.

D15.3 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.

D16. TOTAL PERFORMANCE

D16.1 The Contractor shall achieve Total Performance by November 30, 2008.

D16.2 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.

D16.3 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.

D17. SCHEDULED MAINTENANCE

D17.1 The Contractor shall perform the following scheduled maintenance in the manner and within the time periods required by the Specifications:

(a) Tree and shrub maintenance as specified in Specification section 02 90 10 Tree and Shrub Preservation;

(b) Sod maintenance as specified in Specification section 02 93 80 Sodding.

D17.2 Determination of Substantial Performance shall be exclusive of scheduled maintenance identified herein. All scheduled maintenance shall be completed prior to the expiration of the warranty period. Where the scheduled maintenance cannot be completed during the warranty period, the warranty period shall be extended for such period of time as it takes the Contractor to complete the scheduled maintenance.

CONTROL OF WORK

D18. JOB MEETINGS

D18.1 Regular job meetings will be held at the Site every two (2) weeks. 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.

D18.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he deems it necessary.

D19. PRIME CONTRACTOR – THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA)

D19.1 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

D20. PAYMENT

D20.1 Further to C12, the City may at its option pay the Contractor by direct deposit to the Contractor's banking institution.

WARRANTY

D21. WARRANTY

D21.1 Notwithstanding C13.2, the warranty period shall begin on the date of Substantial 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.

D21.1.1 For the purpose of Performance Security, the warranty period shall be one (1) year.

D21.2 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 Substantial 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.

D21.2.1 In such case, the date specified by the Contract Administrator for the warranty period to begin shall be substituted for the date specified in C13.2 for the warranty period to begin.

FORM H1: PERFORMANCE BOND
(See D10)

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. 598-2008

FOUNDATION WATERPROOFING – CARNEGIE BUILDING, 380 WILLIAM AVE.

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 D10)

_____
(Date)

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

RE: PERFORMANCE SECURITY - BID OPPORTUNITY NO. 598-2008

FOUNDATION WATERPROOFING – CARNEGIE BUILDING, 380 WILLIAM AVE.

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

_____ ,
(Name of Contractor)

_____
(Address of Contractor)

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

_____

_____ Canadian dollars.

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

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

Partial drawings are permitted.

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

_____
(Address)

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

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

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

_____ .
(Date)

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

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

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

_____
(Name of bank or financial institution)

Per: _____
(Authorized Signing Officer)

Per: _____
(Authorized Signing Officer)

FORM I: DETAILED PRICES
(See D11)

FOUNDATION WATERPROOFING – CARNEGIE BUILDING, 380 WILLIAM AVE.

ITEM NO.	DESCRIPTION	SPEC. REF.	UNIT	APPROX. QUANTITY	UNIT PRICE	AMOUNT
1.	Mobilization/demobilization, permits, fees, hoardings, temporary access, and other general conditions	--	Lump sum	1		
2.	Temporary Shoring	02250	Lump sum	1		
3.	Demolition	02071	Lump sum	1		
4.	Excavation and backfilling	02230	Lump sum	1		
5.	Drainage	02622	Lump sum	1		
6.	Asphalt paving	02743	Lump sum	1		
7.	Topsoil and finish grading	02921	Lump sum	1		
8.	Sodding	02938	Lump sum	1		
9.	Cast-in-place concrete	03100 03200 03300	Lump sum	1		
10.	Rigid insulation	07210	Lump sum	1		
11.	Waterproofing	07545	Lump sum	1		
12.	Metal flashing and trim	07620	Lump sum	1		
13.	Mechanical work	Per drawings	Lump sum	1		
14.	Electrical work	Per drawings	Lump sum	1		
15.	Landscaping/trees/shrubs cash allowance	--	Lump sum	1	25,000	25,000
16.	Mechanical/Electrical cash allowance	--	Lump sum	1	10,000	10,000
17.	Material testing cash allowance	03300	Lump sum	1	4,000	4,000

FORM J: SUBCONTRACTOR LIST
(See D12)

FOUNDATION WATERPROOFING – CARNEGIE BUILDING, 380 WILLIAM AVE.

Name	Address

FORM L: DETAILED WORK SCHEDULE

(See D13)

FOUNDATION WATERPROOFING – CARNEGIE BUILDING, 380 WILLIAM AVE.

For each item of Work, indicate the cumulative percentage proposed to be completed by the end of each time period until 100% completion is achieved.

Items of Work	Time Period in Working Days					
	0	10	20	30	40	50
Mobilization						
Temporary shoring, excavation, demolition						
Surface preparation and concrete installation						
Waterproofing system installation						
Installation of drainage system including weeping tile, collectors, pits, including concrete infill around same						
Installation of pumps and related electrical work						
Backfilling						
Exterior concrete work at entries						
New parking lot paving						
Landscaping						
Cleanup/Demobilization						

PART E - SPECIFICATIONS

GENERAL

E1. APPLICABLE SPECIFICATIONS AND DRAWINGS

E1.1 These Specifications shall apply to the Work.

E1.2 *The City of Winnipeg Standard Construction Specifications* in its entirety, whether or not specifically listed on Form B: Prices, shall apply to the Work.

E1.2.1 *The City of Winnipeg Standard Construction Specifications* is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division internet site at http://www.winnipeg.ca/matmgt.

E1.2.2 The version in effect three (3) Business Days before the Submission Deadline shall apply.

E1.2.3 Further to C2.4(d), Specifications included in the Bid Opportunity shall govern over *The City of Winnipeg Standard Construction Specifications*.

E1.3 The following are applicable to the Work:

Specification No.	Specification Title
--	Table of Contents
01 00 00	General Requirements
01 33 00	Submittal Procedures
01 45 00	Quality Control
01 78 10	Closeout Submittals
02 07 10	Demolition
02 23 00	Excavation Trenching and Backfilling
02 25 00	Temporary Shoring
02 62 20	Foundation and Underslab Drainage
02 74 30	Asphalt Paving
02 90 10	Tree and Shrub Preservation
02 90 20	Tree Protection
02 92 10	Topsoil and Finish Grading
02 93 80	Sodding
03 10 00	Concrete Formwork and Accessories
03 20 00	Reinforcing Steel
03 30 00	Cast-in-Place Concrete
07 21 00	Rigid Insulation
07 54 50	Cold Liquid Applied Waterproofing
07 62 00	Metal Flashing and Trim
07 91 00	Sealants

Drawing No.	Drawing Name/Title
S-1	Foundation Plan
S-2	Sections and Details
S-3	Sections
ME-1	Basement Plan Plumbing and Electrical
ME-2	Mechanical & Electrical Specification

END OF TABLE OF CONTENTS

1. GENERAL

1.1 Architect, Consultant or Engineer

.1 Wherever the word Architect, Consultant or Engineer is used in the construction specifications, it shall be replaced with Contract Administrator as defined in C1.1(o) and C5 of General Conditions for Construction Contracts and D1 of Supplemental Conditions.

1.2 Codes and Standards

.1 Execute Work in accordance with the latest editions and supplements of the applicable regulations and standards listed below and as stated in the specifications.
- .1 Manitoba Building Code
- .2 Manitoba Fire Code
- .3 Federal, provincial and Municipal government laws, rules, ordinances and codes, where applicable
- .4 Refer to General Conditions for Construction Contracts

.2 Where specified standards are not dated, conform to the latest issue of specified standard, amended and revised as of the date for receipt of bids

.3 Work shall meet or exceed requirements of specified standards, codes and referenced documents. Even if permitted by preceding regulations and standards, grade of Work shall in no case be lower than specified in project specifications.

.4 Electrical components and equipment, which are not CSA approved, shall be approved by the Manitoba Department of Labour and Manpower prior to connection to the electrical service. Pay for all costs associated with obtaining the necessary approval.

.5 Unless specified otherwise, the Contractor shall, at his own expense, obtain all required permits and certificates of inspection and approval from proper authorities.

1.3 Building Envelope

.1 Comply with the National Building Code (NBC), 2005, Section 5 “Wind, Water and Vapour Protection”. Building Envelope shall resist air leakage, vapour diffusion, rain penetration, moisture and groundwater infiltration, and flame spread.

.2 Avoid penetrating through building envelope air barrier. Where penetrations are necessary, maintain integrity of air barrier by patching and making good to the approval of the Contract Administrator with approved material and methods.

.3 Patch and make good building envelope at all locations where envelope has been penetrated as a result of removal and/or relocation of existing equipment, piping, ductwork, conduit, cable, wiring, etc. Use only approved materials and methods.

1.4 Construction Safety

.1 Observe and enforce all construction safety measures required by the Manitoba Building Code, Worker’s Compensation Board, Municipal Statue or By-Laws.

.2 In the event of conflict between any provisions of above authorities, the most restrictive provision shall apply.

.3 During winter construction, when combustion type space heaters are employed, provide adequate ventilation for safety of workers.

.4 The Contractor shall be registered with the Workers Compensation Board of Manitoba and shall provide and maintain workers compensation coverage throughout the term of the Contract, and shall provide the Contract Administrator with evidence thereof upon request.

1.5 Layout of the Work

.1 Provide all devices required and assume full responsibility for and execute complete layout of the Work to main lines and levels in relation to designated reference points and benchmarks. Protect all markings, benchmarks, and monuments from movement or destruction.

.2 Supply such devices as straight edges and templates required to facilitate Contract Administrator's review of Work.

1.6 Definition of Trades

.1 For convenience of reference only, the specifications are separated into the internationally recognized titled/trade sections. (See table of contents). Sections are identified by title and six-digit number system.

.2 The Contractor shall decide who supplies and installs required materials or equipment and extras will not be considered on the grounds of differences in interpretation of the Project Documents as to who performs what Works.

.3 The Contractor is totally responsible as to who provides required materials or articles and Work.

.4 The Contractors are to allow for continued access throughout the construction period and ensuring the facility entering and exiting is maintained to the approval of the Local Authorities having Jurisdiction, local by-laws, and Work Place Safety and health Policies. This will also be applicable for parking lot accesses and other such requirements to assist the City in maintaining normal operations.

.5 Generally, construction activities shall be restricted to the Work areas as defined. Where Work must proceed outside of designated Work areas, all scheduling shall be arranged with the Contract Administrator prior to commencement of such Work. The Contractor is to submit a Safety Access Plan as well as a Detailed Site Co-ordination Plan.

.6 The Contractor shall, in his construction schedule, allow a period of time from completion of one sequence to commencement of Work on the next sequence to allow for testing and commissioning of equipment, thus allowing time for the City employees to vacate the next Work area.

.7 The Contractor shall provide a Construction Schedule for each individual sequence of Work indicating commencement and completion dates for each sequence. The Contractor shall be aware that Substantial performance under the Lien Act applies to the Total Contract and not to the completion and occupancy of the individual Sequence of the Work.

.8 The Contractor shall submit as-built drawings and maintenance manuals for each sequence of Work at completion of each sequence.

1.7 Use of Site and Premises

.1 The Contractor's use of premises, site access and construction activities are limited to those areas as defined on the drawings.

.2 Construction personnel must use only designated entrances for access to Work areas, delivery of materials and/or equipment and removal of construction debris.

.3 For security reasons, all interior work will be limited to the facility's hours of operation (8:30 a.m. to 4:30 p.m. Monday to Friday excluding holidays). No after-hours interior work will be permitted.

.4 Restrict equipment, Work and workers to designated areas and established routes to and from Work areas.

.5 Storage of construction materials, tools, equipment, etc. in areas outside designated Work areas is not permitted.

.6 The Contractor will be responsible to provide temporary sanitary facilities for personnel throughout the project duration. Building washrooms will not be available for use by the Contractor.

.7 If required, obtain and pay for use of off-site storage or Work areas needed for operations or for delivered equipment or materials not required immediately on the premises.

.8 Keep all fire lanes, egress, and access routes clear at all times.

.9 Parking restrictions may be applied and on Site parking will be allowed at the City's discretion.

1.8 Occupancy of Work Areas by the City

.1 The City reserves the right to enter and occupy work areas in whole or in part before completion of the Contract, provided that, in the opinion of the Contract Administrator, such entry and occupancy do not prevent or interfere with the Contractor in completion of the Contract.

.2 Such entry and occupation by the City are not to be considered as acceptance of the Work and will not relieve the Contractor from responsibility to complete the Contract.

1.9 Glass Breakage

.1 Contractors shall be responsible for all glass that is broken, scratched or cracked during the execution of the Work and shall replace such glass at their own expense.

1.10 Cleanup and Final Cleaning of the Work

.1 The contractor shall maintain the Site and the Work in a tidy condition and free from the accumulation of waste products and debris. Upon attaining Substantial Performance of the Work, the Contractor shall remove any products, tools, construction machinery and equipment not required for the performance of the remaining Work. He shall also remove waste products and debris, and clean for suitable occupancy, unless otherwise specified.

.2 Total Performance of the Work shall not be attained until the Contractor has cleaned up the Site and has removed all plant and surplus products, tools, construction materials and equipment. The contractor shall also have removed waste products and debris.

1.11 Mock-ups

.1 The Contractor shall erect mock-ups for inspection of materials and workmanship to allow the Contract Administrator to make adjustments to fixture or equipment location and/or arterial installation process, as may be necessary. There will be a requirement for a mock-up of window installation to ascertain tie in details of vapour and air barriers as well as rough opening treatment, flashing installations, etc.

.2 The mock-up shall not be limited to the window installations alone and all mock-ups shall be a part of the finished work as designated by the Contract Administrator and where

specified throughout the contract documents. They shall be as complete as possible with all materials, finishes, fixtures and equipment indicated for installation.

END OF SECTION

1. GENERAL

1.1 Section Includes

.1 Shop drawings and product data

.2 Samples

1.2 Related Sections

.1	Quality Control	Section 01 45 00
.2	Closeout Submittals	Section 01 78 10

1.3 Administrative

.1 Submit to Contract Administrator submittals listed for review. Submit with reasonable promptness and in orderly sequence so as not to cause delay in Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 Work affected by submittal shall not proceed until review is complete.

.3 Present shop drawings, product data, samples and mock-ups in SI Metric units.

.4 Where items or information is not produced in SI Metric units, converted values are acceptable.

.5 Review submittals prior to submission to Contract Administrator. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and shall be considered rejected.

.6 Notify Contract Administrator, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.7 Verify field measurements and affected adjacent Work are coordinated.

.8 Contractor's responsibility for errors and omissions in submission is not relieved by Contract Administrator's review of submittals.

.9 Contractor's responsibility for deviations in submission from requirements of Contract Document is not relieved by Contract Administrator review.

.10 Keep one reviewed copy of each submission on site.

1.4 Shop Drawings and Product Data

.1 Refer to CCDC-2-1994.

.2 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by the Contractor to illustrate details of a portion of Work.

.3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.4 Allow 7 days for Contract Administrator's review of each submission.

.5 Adjustments made on shop drawings by Contract Administrator are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Contract Administrator prior to proceeding with Work.

.6 Make changes in shop drawings as Contract Administrator may require, consistent with Contract Documents. When resubmitting, notify contract Administrator in writing of any revisions other than those requested.

.7 Accompany submissions with transmittal letter, containing:

.1 Date

.2 Project title and number

.3 Contractor's name and address

.4 Identification and quantity of each shop drawing, product data and sample.

.5 Other pertinent data.

.8 Submissions shall include:

.1 Date and revision dates

.2 Project title and number

.3 Name and address of:

.1 Subtrade
.2 Supplier
.3 Manufacturer

.4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.

.5 Details of appropriate portions of Work as applicable:
.1 Fabrication
.2 Layout, showing dimensions, including identified field dimensions, and clearances.
.3 Setting or erection details
.4 Capacities
.5 Performance characteristics
.6 Standards
.7 Operating weight
.8 Wiring diagrams
.9 Single line and schematic diagrams
.10 Relationship to adjacent Work

.9 After Contract Administrator's review, distribute copies.

.10 Submit 6 prints of shop drawings for each requirement requested in specification Sections and as Contract Administrator may reasonably request.

.11 Submit 6 hardcopy or electronic copies of product data sheets or brochures for requirements requested in specification Sections and as requested by Contract Administrator where shop drawings will not be prepared due to standardized manufacture of product.

.12 Delete information not applicable to project.

.13 Supplement standard information to provide details applicable to project.

.14 If upon review by Contract Administrator, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

1.5 Samples

.1 Submit for review samples in duplicate as requested in respective specification Sections. Label samples with origin and intended use.

.2 Deliver samples prepaid to Contract Administrator's business address.

.3 Notify Contract Administrator in writing, at time of submission of deviations in samples from requirements of Contract Documents.

.4 Where colour, pattern or texture is criterion, submit full range of samples.

.5 Adjustments made on samples by Contract Administrator are not intended to change Contract price. If adjustments affect value of Work, state such in writing to Contract Administrator, prior to proceeding with Work.

.6 Make changes in samples which Contract Administrator may require, consistent with Contract Documents.

.7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

2 PRODUCTS

2.1 Not used

.1 Not Used

3 EXECUTION

3.1 Not used

.1 Not used

END OF SECTION

1. GENERAL

1.1 Section Includes

.1 Inspection and testing, administrative and enforcement requirements

.2 Tests and mix designs

.3 Mock ups

.4 Mill tests

.5 Equipment and system adjust and balance

1.2 Related Sections

.1	Submittal Procedures	Section 01 33 00
.2	Closeout Submittals	Section 01 78 00

1.3 Inspection

.1 Allow Contract Administrator access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.

.2 Give timely notice requesting inspection if Work is designated for special tests, inspections, or approvals by Contract Administrator instructions, or law of Place of Work.

.3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such test is made, uncover such Work, have inspections or tests satisfactorily completed and make good such work.

.4 Contract Administrator may order any part of Work to be examined if Work is suspected to not be in accordance with Contract Documents. Correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Contract Administrator shall pay cost of examination and replacement.

1.4 Independent Inspection Agencies

.1 Independent Inspection/Testing Agencies will be engaged by Contract Administrator for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by the City.

.2 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

.3 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Contract Administrator at no cost to the City. Contractor to pay costs for retesting and re-inspection.

1.5 Access to Work

.1 Allow inspection/testing agencies access to Work, off-site manufacturing and fabrication plants.

.2 Cooperate to provide reasonable facilities for such access.

1.6 Procedures

.1 Notify appropriate agency and Contract Administrator in advance of requirement for tests, in order that attendance arrangements can be made.

.2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in Work.

.3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.7 Rejected Work

.1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Contract Administrator as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

.2 Make good other contractor's Work damaged by such removals or replacements promptly.

.3 If in the opinion of Contract Administrator it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, the City may deduct from the Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which shall be determined by Contract Administrator.

1.8 Reports

.1 Submit 2 copies of inspection and test reports to Contract Administrator.

.2 Provide copies to Sub-trade of Work being inspected or tested or manufacturer or fabricator of material being inspected or tested.

1.9 Tests and Mix Designs

.1 Furnish test results and mix designs as may be requested.

.2 The cost of test and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work shall be appraised by Contract Administrator and may be authorized as recoverable.

1.10 Mock-ups

.1 Prepare mock-ups for Work specifically requested in specifications. Include for Work of all Sections required to provide mock-ups.

.2 Prepare mock-ups for Contract Administrator's review with reasonable promptness and in an orderly sequence, so as not to cause any delay in Work.

.3 Failure to prepare mock-ups in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.

.4 If requested, Contract Administrator will assist in preparing a schedule fixing dates for preparation.

.5 Remove mock-up at conclusion of Work or when acceptable to Contract Administrator.

.6 Mock-ups may remain as part of Work as approved by Contract Administrator.

1.11 Mill Tests

.1 Submit mill test certificates as required of specification Sections.

1.12 Equipment and Systems

.1 Submit adjustment and balancing reports for mechanical, electrical and building equipment systems.

2. PRODUCTS

2.1 Not used

.1 Not used

3. EXECUTION

3.1 Not used

.1 Not used

END OF SECTION

1. GENERAL

1.1 Section Includes

.1 As-built drawings, samples, and specifications

.2 Equipment and systems

.3 Product data, materials and finishes, and related information

.4 Operation and maintenance data

.5 Spare parts, special tools and maintenance materials

.6 Warranties and bonds

.7 Final site survey certificate

1.2 Related Sections

.1	Submittal Procedures	Section 01 33 00
.2	Quality Control	Section 01 45 00

1.3 Submission

.1 Prepare instructions and date by personnel experienced in maintenance and operation of described products.

.2 Copy will be returned after final inspection, with Contract Administrator's comments.

.3 Revise content of documents as required prior to final submittal.

.4 Two weeks prior to Substantial Performance of the Work, submit to the Contract Administrator, four (4) final copies of operating and maintenance manuals in English.

.5 At Total Performance, the Contractor shall provide the Contract Administrator with one (1) set of record drawings as "As-Built" Drawings and specifications bearing notations of all changes and variations from the originals. The Contractor shall affix his company name and sign and date each drawing. The accuracy of these drawings shall be the responsibility of the Contractor, who shall bear all expenses of corrections thereto. Final payment shall not be made until this requirement has been fulfilled.

.6 Ensure spare parts, maintenance materials and special tools provided are new, nor damaged or defective, and of same quality and manufacture as products provided in Work.

.7 If requested, furnish evidence as to type, source and quality of products provided.

.8 Defective products will be rejected, regardless of previous inspections, Replace products at own expense.

.9 Pay costs of transportation.

1.4 Forrmat

.1 Organize data in the form of an instructional manual.

.2 Binders: Vinyl, hard covered, 3 'D' ring, loose leaf with spine.

.3 When multiple binders are used, correlate data into related consistent groupings. Identify contents of each binder on spine.

.4 Cover: Identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.

.5 Arrange content by systems under Section numbers and sequence of Table of Contents.

.6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.

.7 Text: Manufacturer's printed data, or typewritten data.

.8 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

1.5 Contents – Each volume

.1 Table of Contents: provide title of project;
.1 Date of submission; names
.2 Addresses, and telephone numbers of Contract Administrator and with name of responsible parties;
.3 Schedule of products and systems, indexed to content of volume

.2 For each product or system:
.1 List full names, addresses and telephone numbers of applicable sub-trades and suppliers, including local source of supplies and replacement parts.

.3 Product Data: mark each sheet to clearly identify specific products and component parts, and date applicable to installation; delete inapplicable information.

.4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.

.5 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 – Quality Control.

1.6 As-Builts and Samples

.1 In addition to requirements in General conditions, maintain at the site for Contract Administrator one record copy of:
.1 Contract Drawings (As built)
.2 Specifications
.3 Addenda
.4 Change Orders and other modifications to the Contract
.5 Reviewed shop drawings, product data, ands samples
.6 Field test records
.7 Inspection certificates
.8 Manufacturer's certificates

.2 Store record documents and samples in field office apart from documents used for construction. Provide files, racks and secure storage.

.3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.

.4 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.

.5 Keep record documents and samples available for inspection for Contract Administrator.

1.7 Recording Actual Site Conditions

.1 Record information on set of black line opaque drawings, and in copy of Project Manual, provided by Contractor Administrator.

.2 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.

.3 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.

.4 Contract Drawings and shop drawings: legibly mark each item to record actual construction, including:

.1 Measured depths of elements of foundation in relation to finish first floor datum.
.2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
.3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
.4 Field changes of dimension and detail.
.5 Changes made by change orders.
.6 Details not on original Contract Drawings.
.7 References to related shop drawings and modifications.

.5 Specifications; legibly mark each item to record actual construction, including:

.1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
.2 Changes made by Addenda and change orders.

.6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

1.8 Final Survey

.1 Contractor is to provide Building Location Certificate at project completion.

1.9 Equipment and Systems

.1 Each item of Equipment and Each System: include description of unit or system, and component parts, Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.

.2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.

.3 Include installed colour coded wiring diagrams.

.4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control stopping, shut-down,

and emergency instructions. Include summer, winter, and any special operating instructions.

.5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

.6 Provide servicing and lubrication schedule, and list of lubricants required.

.7 Include manufacturer's printed operation and maintenance instructions.

.8 Include sequence of operation by controls manufacturer.

.9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

.10 Provide installed control diagrams by controls manufacturer.

.11 Provide Contractor's coordination drawings, with installed colour coded piping diagrams.

.12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

.13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

.14 Include test and balancing reports as specified in Section 01 45 00 – Quality Control.

.15 Additional requirements: As specified in individual specification sections.

1.10 Materials and Finishes

.1 Building Products, Applied Materials, and Finishes; include product data, with catalogue number, size, composition, and colour and texture designations. Provide information for re-ordering custom manufactured products.

.2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.3 Moisture-protection and Weather-exposed products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.4 Additional Requirements: as specified in individual specifications sections.

1.11 Spare Parts

.1 Provide spare parts, in quantities specified in individual specification sections.

.2 Provide items of same manufacture and quality as items in Work.

.3 Deliver to site; place and store.

.4 Receive and catalogue all items. Submit inventory listing to Contractor Administrator. Include approved listings in maintenance Manual.

.5 Obtain receipt for delivered products and submit prior to final payment.

1.12 Maintenance Materials

.1 Provide maintenance and extra materials, in quantities specified in individual specification sections.

.2 Provide items of same manufacture and quality as items in Work.

.3 Deliver to site; place and store in locations as directed by Contractor Administrator.

.4 Receive and catalogue all items. Submit inventory listing to Contractor Administrator. Include approved listings in Maintenance Manual.

.5 Obtain receipt for delivered products and submit prior to final payment.

1.13 Special Tools

.1 Provide special tools, in quantities specified in individual specification section.

.2 Provide items with tags identifying their associated function and equipment.

.3 Deliver to site; place and store.

.4 Receive and catalogue all items. Submit inventory listing to Contract Administrator. Include approved listings in Maintenance Manual.

1.14 Storage, Handling and Protection

.1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.

.2 Store in original and undamaged condition with manufacturer's seal and labels intact.

.3 Store components subject to damage from weather in weatherproof enclosures.

.4 Store paints and freezable materials in a heated and ventilated room.

.5 Remove and replace damaged products at own expense and to satisfaction of Contract Administrator.

1.15 Warranties and Bonds

.1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.

.2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

.3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of Work.

.4 Except for items put into use with City's permission, leave date of beginning of time of warranty until the Date of Total Performance is determined.

.5 Verify that documents are in proper form, contain full information, and are notarized.

.6 Co-execute submittals when required.

.7 Retain warranties and bonds until time specified for submittal.

2. PRODUCTS

2.1 Not used

.1 Not used

3. EXECUTION

3.1 Not used

.1 Not used

END OF SECTION

1. GENERAL

.1 Comply with National Building Code, Part 8, Construction Safety Measures at Construction and Demolition sites, and Provincial requirements.

2. ASBESTOS

.1 Demolition of spray or trowel applied asbestos can be hazardous to health. Should material resembling spray or trowel-applied asbestos be encountered, stop work and notify Contract Administrator immediately. Do not proceed until written instructions have been received from Contract Administrator.

3. PROTECTION

.1 Prevent movement, settlement, or other damage to adjacent structures, utilities, and parts of building(s) to remain in place. Provide bracing and shoring as required and as shown on drawings. Refer to 02250 for shoring requirements.

.2 Keep noise, dust, and inconvenience to occupants and public to a minimum.

.3 Protect building systems, services and equipment.

.4 Provide temporary dust screens, covers, railings, supports and other protection as required.

.5 Shore all excavations as required by the Manitoba Workplace Safety and Health Division.

4. NOTICE

.1 Notify Contract Administrator before disrupting building access or services.

5. DEMOLITION, SALVAGE AND DISPOSAL

.1 Excavate/remove material as required to accommodate waterproofing and foundation drainage work without affecting adjacent property and with due consideration for public access requirements of the City of Winnipeg.

.2 Remove items to be reused, store as directed by Contract Administrator.

.3 Dispose of removed materials, except where specified otherwise, in accordance with authority having jurisdiction.

6. FIXED PRICE

The contractor shall include the above work in the fixed prices in the appropriate sections, inclusive of all labour, material requirements, supervision and incidentals.

END OF SECTION

1. GENERAL

.1 This Specification shall cover excavation and re-grading of the materials directly adjacent to the foundation walls.

2. MATERIALS

.1 Fill Materials

.1 Granular Fill

Granular fill shall consist of sound, hard, pit-run or crushed rock or crushed gravel and shall be free from organic or soft material which would disintegrate through decay or weathering. The granular material to be supplied by the Contractor shall conform to the following grading requirements:

Canadian Metric Sieve Size	Percent of Total Dry Weight Passing
75 000	100%
25 000	80% - 100%
5 000	40% - 70%
2 000	25% - 50%
315	10% - 35%
80	5% - 30%

The material passing the 315 micrometre sieve shall have a liquid limit not greater than twenty-five (25) and a plasticity index not greater than six (6).

.2 Pea Gravel

Pea Gravel directly adjacent to the perforated weeping tile shall be clean and free running. Pea Gravel shall conform to the following grading requirements:

Canadian Metric Sieve Size	Percent of Total Dry Weight Passing
25 000	100%
5 000	40% - 70%
2 000	0% - 3%

.3 Fill at Planting Areas

Clean, rounded stone fill is to be used at all planting areas. Fill at Planting Areas shall conform to the following grading requirements:

Canadian Metric Sieve Size	Percent of Total Dry Weight Passing
75 000	100%
25 000	25% - 40%
5 000	10% - 35%
2 000	0% - 3%

.4 Common Fill

Common fill material shall be excavated material; clean, sound, free of topsoil, friable material and organic material, approved for re-use by the Contract Administrator.

.2 Compaction

.1 Compact fill materials to the following Standard Proctor Dry Densities:

.1 Exterior side of concrete foundation walls. Granular fill compacted to not less than 95% and common fill as indicated.

.2 Fill adjacent to weeping tile: pea gravel.

3. EXECUTION

.1 Preparation

.1 Locate all underground services and above ground utilities and protect throughout construction.

.2 Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations. Note areas which require shoring and temporary support and provide adequate design for same under seal of engineer licensed to practice in Manitoba.

.3 Protect sub-grades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary. Maintain fill materials free of frost at all times.

.4 Provide erosion control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

.2 Excavation

.1 Excavate subsoil required for waterproofing and weeping tile installation and related work.

.2 Hand trim excavation and leave free of loose matter.

.3 Remove lumped subsoil, boulders and rock.

.4 Correct unauthorized excavation at no extra cost to City of Winnipeg.

.5 Fill over-excavated areas under structure bearing surfaces in as directed by the Contract Administrator.

.6 Stockpile excavated material to be re-used in area designated on site and remove excess subsoil not being re-used, from site. Removal and disposal costs to be included in fixed price.

.7 Protect excavations by shoring, bracing, sheet piling, underpinning or other methods required to prevent cave-in or loose soil from falling into excavation.

.8 Notify Contract Administrator of unexpected subsurface conditions and discontinue affected work in area until notified to resume work.

.9 Protect bottom of excavations and soil adjacent to and beneath foundation from frost.

.10 Grade excavation top perimeter to prevent surface water run-off into excavation.

.3 Backfilling

.1 Ensure areas to be backfilled are free from debris, snow, ice and water and that the ground surfaces and fill materials are not in a frozen condition.

.2 Perform all necessary compaction of existing sub-grade surfaces if densities are not equal to that required for backfill materials.

.3 Cut out “soft” areas of existing sub-grade, backfill with sand and compact to required density.

.4 Backfill areas to rough grades, contours, levels and elevations to match condition prior to start of work or to improve surface drainage away from the structure.

.5 Perform backfilling operations systematically and as early as possible to allow maximum time for natural settlement and compaction.

.6 Place and compact fill materials in continuous layers not exceeding 8" loose depth. Use a method so as not to disturb or damage mechanical and electrical service, foundation wall insulation, waterproofing and weeping tile system.

.7 Maintain optimum moisture content of backfill materials so as to attain required compaction density.

.8 Backfill material to be granular fill as noted elsewhere in this section. Areas to receive topsoil are to be first capped with minimum 12” clean clay from excavated material, sloped away from the structure. Clay to be free of organics, rubble, etc. as approved by Contract Administrator.

4. FIXED PRICE

The Contractor shall provide Fixed Prices in the appropriate sections, inclusive of all labour, material requirements and supervision and incidentals.

END OF SECTION

1. GENERAL

1.1 Section Includes

.1 Methods and procedures for bracing and shoring of building components designated to remain.

1.2 Related Sections

.1 Section 02 07 10 –Selective Demolition.

1.3 References

.1 Canadian Construction Documents Committee (CCDC)
- .1 CCDC 2-94, Stipulated Price Contract.

.2 Canadian Standards Association (CSA)
- .1 CSA B111 1974(R2003), Wire Nails, Spikes and Staples.
- .2 CSA G40.20/G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .3 CSA O86.1-01, Engineering Design in Wood (Limited States Design).
- .4 CAN/CSA S16.1-01, Limit States Design of Steel Structures.
- .5 CAN/CSA S136-01, Cold Formed Steel Structural Members including supplement CSA S136.1 01.
- .6 CSA W59-03, Welded Steel Construction (Metal Arc Welding).

.3 American Society for Testing and Materials (ASTM)
- .1 ASTM A325M-04b, Specification for Structural Bolts, Steel, Heat Treated 120/105 ksi Minimum Tensile Strength.

1.4 Measurement Procedure

.1 No measurement will be made for work completed under this section.

1.5 Definitions

.1 Bracing: temporary support installed in excavation or structure to stabilize against deformations or failure.

.2 Shoring: temporary support installed in an excavation or structure to relieve loads.

1.6 Performance Requirements

.1 Ensure that materials, equipment and procedures safely supporting existing structure and construction live loads; that allow work to be accomplished and that minimize risk of damage of adjacent structures.

1.7 Shop Drawings

.1 Submit shop drawings for all shoring work required and as noted on the drawings.

.2 Shop drawings to indicate shop and erection details in accordance with performance requirements in 1.6.

.3 Submit to Contract Administrator for review of shoring, bracing and temporary framing drawings signed by professional engineer registered or licensed in Province of Manitoba, Canada.

2. PRODUCTS

2.1 Materials

.1 Structural members: timber SPF grade No. 2 or better.

.2 Structural steel members: to CAN/CSA G40.21, grade 300 or better, type W.

.3 Wood connections: Canadian soft wood plywood to CSA O151; Douglas Fir plywood to CSA O121; Poplar plywood to CSA O153, O2 sheathing grade.

.4 Steel connections: to CAN/CSA G40.21, grade 300 or better, type W.

.5 Nails: to CSA B111.

.6 Bolts: lag screws, nuts and washers to CSA O86.1.

.7 High tensile bolts: to ASTM A325M.

.8 Welding materials: CSA W59.

2.2 Source Quality Control

.1 Timber identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.

.2 Plywood identification: by grade mark in accordance with applicable CSA standards.

3. EXECUTION

3.1 Examination

.1 Before starting work, verify existing conditions and variations from original contract documents and notify Contract Administrator.

3.2 Preparation

.1 Remove machinery installations, services, stored materials from building. Store materials designated for salvage or reuse in area designated by City of Winnipeg.

.2 Before shoring is commenced.

.1 Components to be protected:

.1 Existing structural components designated to remain.

.2 Electrical transformer at the southeast corner of the building.

.3 Entry lean-to at southwest corner of the building.

.4 Stair, ramp, and landing along north wall of 365 Bannatyne (adjacent to south wall of 380 William)

.5 All other items designated to remain or for reuse.

3.3 Installation

.1 Design, erection, operation, maintenance, and removal of temporary shoring and bracing is the sole responsibility of the Contractor.

.2 Commence work as per Contract Administrator instructions.

.3 Obtain approval from Contract Administrator, before execution, if alteration to bracing and shoring systems are necessary.

.4 Support individual elements that become loose during shoring and bracing installation.

.5 Erect structural timber to CSA O86.1.

.6 Erect structural steel work to CAN/CSA S16.1 and CSA S136.

.7 Weld to CSA W59.

3.4 Adjustment

.1 Monitor bracing and shoring system performance and maintain its effectiveness by making adjustments, replacing or repairing damaged and weakened elements of system until final completion of project.

END OF SECTION

1. GENERAL

.1 This section specifies and includes supplying all materials, labour, supervision, equipment, and ancillary requirements to complete installation of foundation and underslab drainage. This specification shall be read in conjunction with the contract drawings.

2. MATERIALS

.1 Flexible plastic tubing and fittings: to CGSB 41-GP-29Ma, Type 1 and 2, corrugated, nominal inside diameter 6 inch.

.2 Filter Sock: Manufacturer's standard filter sock compatible with weeping tile.

.3 Filter Fabric: Manufacturer's standard non-woven pervious geotextile fabric of polypropylene, nylon or polyester fibres or a combination.

1. Provide filter fabrics that meet or exceed the listed minimum physical properties determined according to ASTM D 4759 and the referenced standard test method in parentheses:

    1. Grab Tensile Strength (ASTM D 4632): 100 lb.

    2. Apparent Opening Size (ASTM D 4751): #100 U.S. Standard sieve.

    3. Permeability (ASTM D 4491): 150 gallons per minute per square foot.

.4 Polyethylene:

1. Polyethylene vapour barrier confirming to requirements of CGSB 70-GP-1a, 10 mil thickness.

3. EXECUTION

3.1 Inspection

.1 Ensure graded subgrade conforms with required drainage pattern before placing bedding material.

.2 Ensure improper slopes, unstable areas, areas requiring additional compaction or other unsatisfactory conditions are corrected to approval of Contract Administrator.

.3 Advise Contract Administrator of timing for inspection of foundation wall waterproofing and drain tile installation before backfilling.

3.2 Granular Bedding Preparation

.1 Cut trenches in subgrade and place granular bedding materials in uniform layers not exceeding 6" compacted thickness to depth as indicated.

.2 Shape bed true to grade and to provide continuous, uniform bearing surface for tubing.

.3 Shape transverse depressions, as required, to suit joints.
.4 Compact each layer full width of bed to at least 95% of Standard Proctor density.

.5 Fill excavation below design elevation of bottom of specified bedding with compacted bedding material.

3.3 Pipe or Tubing Installation

.1 Ensure tubing interior and coupling surfaces are clean before laying.

.2 Review condition of filter sock. Do not install weeping tile with ripped or damaged filter sock. Replace all damaged lengths of filter sock.

.3 Grade bedding to establish tubing slope. Do not use shims to establish slope.

.4 Lay perforated tubing to slope of 1/16" per foot as indicated. Face perforations and coupling slots downward.

.5 Lay non-perforated tubing to slope of 1/8" per foot as indicated, from perforated tubing to disposal area. Use compatible couplings from weeping tile manufacturer. Make joints in non-perforated tubing watertight.

.6 Install end plugs at ends of collector drains to protect tubing ends from damage and ingress of foreign material.

.7 Connect non-perforated tubing to sump pit by appropriate adapters manufactured for this purpose.

3.4 Pipe or Tubing Surround Material

.1 Upon completion of tubing laying complete with pea gravel material as indicated and geotextile filter, surround and cover tubing as indicated.

.2 Place surround material manually in uniform layers not exceeding 6" compacted thickness, as indicated.

.3 Place layers uniformly and simultaneously on each side of the tubing.

.4 Place filter bed by hand in maximum of 6" lifts. Consolidate by hand tamping to prevent displacement of pipe.

3.5 Backfill Material

.1 Place backfill material above tubing surround in uniform layers not exceeding 6" compacted thickness up to grades as indicated.

.2 Under paving and walks, compact backfill to at least 95% Standard Proctor Density. In other areas, compact to at least 90% Standard Proctor Density.

4. Fixed Price

The Contractor shall include the above work in the fixed prices in the appropriate sections, inclusive of all labour, material requirements and supervision, and incidentals.

1. GENERAL

1.1 Section Includes

.1 Materials and installation for asphalt concrete paving.

1.2 Related Sections

.1 Section 02 23 00 – Excavation, Trenching and Backfilling.

1.3 References

.1 American Society for Testing and Materials International, (ASTM)
  .1 ASTM D698-07e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).

.2 City of Winnipeg Standard Construction Specifications
  .1 CW 3410 – Asphalt Concrete Paving Works.

1.4 Measurement Procedures

.1 No measurement will be made under this Section. Include in base bid costs for all supervision, labour and materials, and equipment related to removal and replacement of asphalt paving areas as noted on the drawings and as required for completion of the foundation waterproofing operations.

2. PRODUCTS

2.1 Materials

.1 Granular materials: to CW3110-Sub-Grade, Sub-Base and Base Course Construction.

.2 Prime coat: to CW 3410.

.3 Tack coat: to CW 3410.

.4 Asphalt cement: to CW 3410.

.5 Asphalt concrete: to CW 3410.

.6 Traffic paint: to Section 02761.

3. EXECUTION

3.1 Foundations

.1 Foundations for parking lots to comprise:
  .1 Granular base A to Section 02230. Thickness to match existing.

.2 Construction of granular foundations: to Section 02230.

.3 Compaction: to Section 02230.

3.2 Placing

.1 Surface preparation: to CW 3410.

.2 Application of prime coat and tack coat: to CW 3410.

.3 Construction of asphalt concrete: to CW 3410.

.4 Place asphalt concrete to thicknesses, grades and lines to match existing. Provide positive slope away from structure.

.5 Placing conditions:
- .1 Place asphalt mixtures only when air temperature is above 5°C.
- .2 When temperature of surface on which material is to be placed falls below 10°C, provide extra rollers as necessary to obtain required compaction before cooling.
- .3 Do not place hot-mix asphalt when pools of standing water exist on surface to be paved, during rain, or when surface is damp.

.6 Place asphalt concrete in compacted lifts of thickness of minimum 2 inches.

.7 Do not throw surplus material on freshly screeded surfaces.

.8 When hand spreading is used:
- .1 Use approved wood or steel forms, rigidly supported to assure correct grade and cross section. Use measuring blocks and intermediate strips to aid in obtaining required cross-section.
- .2 Distribute material uniformly. Do not broadcast material.
- .3 During spreading operation, thoroughly loosen and uniformly distribute material by lutes or covered rakes. Reject material that has formed into lumps and does not break down readily.
- .4 After placing and before rolling, check surface with templates and straightedges and correct irregularities.
- .5 Provide heating equipment to keep hand tools free from asphalt. Control temperature to avoid burning material. Do not use tools at higher temperature than temperature of mix being placed.

.9 Compaction: to CW 3410.

.10 Start rolling operations as soon as placed mix can bear weight of roller without excess displacement of material or cracking of surface.

.11 Operate roller slowly initially to avoid displacement of material.

.12 Use static compaction for levelling coarse less than 1 inch thick.

.13 For lifts 2 inches thick and greater, adjust speed and vibration frequency of vibratory rollers to produce minimum of 25 impacts per metre of travel. For lifts less than 2 inches thick, impact spacing not to exceed compacted lift thickness.

.14 Overlap successive passes of roller by minimum of 8 inches and vary pass lengths.

.15 Keep wheels of roller slightly moistened with water to prevent pick-up of material but do not over-water.

.16 Do not stop vibratory rollers on pavement that is being compacted with vibratory mechanism operating.

.17 Do not permit heavy equipment or rollers to stand on finished surface before it has been compacted and has thoroughly cooled.

3.3 Finish Tolerances

.1 Finished asphalt surface to be within 1/4 inch of design elevation but not uniformly high or low.

.2 Finished asphalt surface not to have irregularities exceeding 1/4 inch when checked with 15 feet straight edge placed in any direction.

3.4 Defective Work

.1 Correct irregularities which develop before completion of rolling by loosening surface mix and removing or adding material as required. If irregularities or defects remain after final compaction, remove surface course promptly and lay new material to form true and even surface and compact immediately to specified density.

.2 Repair areas showing checking, rippling, or segregation.

.3 Adjust roller operation and screed settings on paver to prevent further defects such as rippling and checking of pavement

END OF SECTION

1. DESCRIPTION

.1 This Section specifies fertilizing and preserving root systems of trees and shrubs affected by adjacent excavation.

2. RELATED SECTIONS

.1 Topsoil and Finish Grading Section 02 92 10

3. REFERENCES

.1 Canadian Standards Association (CSA):
- .1 CSA G30.5-M1983(R1991), Welded Steel Wire Fabric for Concrete Reinforcement.

4. SCHEDULING

.1 Obtain approval from Contract Administrator of schedule indicating commencement of work.

5. MATERIALS

.1 Topsoil:
- .1 Refer to Section 02921 - Topsoil and Finish Grading.

.2 Peatmoss:
- .1 Derived from partially decomposed species of Sphagnum Mosses.
- .2 Elastic and homogeneous.
- .3 Free of wood and deleterious material which could prohibit growth.
- .4 Shredded minimum particle size: 3/16”.

.3 Fertilizer:
- .1 To Canada "Fertilizer Act" and "Fertilizers Regulations".
- .2 Complete, commercial, slow release with 35% of nitrogen content in water-insoluble form.

.4 Anti-desiccant: commercial, wax-like emulsion.

.5 Filter Cloth:
- .1 Type 1: 100% non-woven needle punched polyester, 0.10” thick, 2.5 oz/ft mass; or;
- .2 Type 2: biodegradable burlap.

.6 Wood posts: 2” x 4” x 8’-0” length, untreated wood.

.7 Welded wire fabric (WWF): 4” x 4”, to CSA G30.5.

6. IDENTIFICATION AND PROTECTION

.1 Identify plants and limits of root systems to be preserved to satisfaction of the Contract Administrator.

.2 Protect plant and root systems from damage, compaction and contamination resulting from construction to satisfaction of the Contract Administrator.

.3 Tree limbs and branches overhanging the construction area shall not be damaged. The responsibility to ensure that the above-ground portions of trees are not damaged is that of the Contractor involved in the actual work.

8. MAINTENANCE DURING CONSTRUCTION PERIOD

.1 From time of acceptance by the Contract Administrator to end of warranty period, perform following maintenance operations:

.1 Water to maintain soil moisture conditions for optimum growth and health of plant material without causing erosion.

.2 Remove dead, broken or hazardous branches from plant material.

END OF SECTION

1. DESCRIPTION

.1 This Specification shall cover the protection of existing trees within the limits of the construction site.

2. GENERAL

.1 The Contractor shall furnish all labour, materials, equipment and services necessary to complete the Work as specified herein and shown on the Drawings.

3. RELATED WORK

.1	Tree and Shrub Preservation	Section 02 90 10
.2	Sodding	Section 02 93 80

4. MATERIALS

.1 Dimension Lumber: 1" x 6" x 8'-0"

5. TREE PRESERVATION

.1 The Contractor shall protect existing trees in areas where excavation work is being done and as directed by the Contract Administrator.

.2 The Contractor shall not stockpile materials and soil or park vehicles and equipment within 6'-0" of trees.

.3 Mature tree trunks shall be strapped with 1" x 6" x 8'-0" wood planks. Smaller trees shall be similarly protected using appropriately sized wood planks.

.4 Work on site shall be carried out in such a manner so as to minimize damage to existing tree branches. Where damage to tree branches does occur, the Contractor shall neatly prune the damaged branch and coat the cut with an appropriate wound dressing to prevent infection.

END OF SECTION

1. GENERAL

.1 Related Work

.1 Section 02 23 00 Excavation, Trenching and Backfilling

.2 Section 02 93 80 Sodding

.2 Source Quality Control

.1 Advise Contract Administrator of sources of topsoil to be utilized 7 days in advance of starting work.

.2 Contractor is responsible for soil analysis and related costs, and requirements for amendments to supply topsoil as specified.

.3 Test topsoil for clay, sand, and silt, NPK, Mg, soluble salt content, growth inhibitors and soil sterilants.

.1 Submit 0.5 kg sample of topsoil to testing laboratory and indicate present use, intended use, type of subsoil and quality of drainage. Prepare and ship sample in accordance with provincial regulations and testing laboratory requirements.

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

.3 Protection of Existing Facilities

.1 Protect elements surrounding the work of this section from damage or disfiguration.

.2 Protect landscaping and other features remaining as final work.

.3 Protect existing structures, fences, roads, sidewalks, paving and curbs.

.4 Delivery and Storage

.1 Coordinate locations for storage of all materials with City of Winnipeg.

.2 Deliver and store fertilizer in waterproof bags accompanied in writing by weight, analysis and name of manufacturer.

2. PRODUCTS

.1 Topsoil

.1 Shall consist of a screened clay-textured or loam-textured dark topsoil, a fertile, friable material neither of heavy clay nor of very light sandy nature containing by volume, a minimum of 4% to a maximum 25% organic matter (peat, rotted manure or composted material) and capable of sustaining vigorous plant growth.

.2 Ph value: 6.0 to 7.5

.3 Contain no toxic elements or growth inhibiting materials.

.4 Free from:

.1 Debris, roots, stones, and clay lumps over 40 mm diameter.

.2 Course vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.

.3 Subsoil contamination.

.4 Quackgrass rhizomes, Canada Thistle roots or other noxious weeds.

.5 Consistence: friable when moist.

.6 Salinity rating less than 1.5mmhos/cm.

.5 Planting mix: mix 4 parts topsoil with 1 part peatmoss.

.2 Soil Amendments

.1 Peatmoss:
- .1 Derived from partially decomposed species of Sphagnum Mosses.
- .2 Elastic and homogeneous, brown in colour.
- .3 Free of wood and deleterious material which could prohibit growth.
- .4 Shredded particle minimum size: 5 mm.

.2 Sand: washed course silica sand, medium to course textured.

.3 Limestone if required as a result of soil analysis.
- .1 Ground agricultural limestone containing minimum calcium carbonate equivalent of 85%.
- .2 Gradation requirements: percentage passing by weight, 90% passing 1.0 mm sieve, 50% passing 0.125 mm sieve.

.4 Fertilizer:
- .1 Synthetic slow release fertilizer with an NPK analysis of 1-2-1 ratio at a rate to provide 48 kg actual Nitrogen, 96 kg actual Phosphate and 48 kg actual Potassium per hectare.

3. EXECUTION

.1 Preparation of Existing Grade

.1 Verify that grades are correct. If discrepancies occur, notify Contract Administrator and do not commence work until instructed by Contract Administrator.

.2 Fine grade subgrade, eliminating uneven areas and low spots, ensuring positive drainage.

.3 Remove debris, roots, branches, stones in excess of 50 mm diameter and other deleterious materials. Remove soil contaminated with calcium chloride, toxic materials and petroleum products. Remove debris which protrudes more than 75 mm above surface. Dispose of removed material off site.

.4 Cultivate entire area which is to receive topsoil to depth of 100 mm. Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.

.2 Placing and Spreading of Topsoil/Planting Soil

.1 Place topsoil after Contract Administrator has accepted subgrade.

.2 Spread topsoil in uniform layers not exceeding 150 mm, over unfrozen subgrade free of standing water.

.3 For sodded areas keep topsoil 25 mm below finished grade.

.4 Spread topsoil to following minimum depths after settlement and 80% compaction:
- .1 100 mm for sodded areas.
- .2 300 mm for shrub beds.
- .3 150 mm around all tree root balls.

.3 Soil Amendments

.1 Fertilizer: apply and thoroughly mix fertilizer into full specified depth of topsoil at following rates: to provide 48 kg actual Nitrogen, 96 kg actual Phosphate and 48 kg actual Potassium per hectare.

.4 Finish Grading

.1 Fine grade to elevations and contours shown. Eliminate rough spots and low areas and ensure positive drainage. Prepare loose friable bed by means of cultivation and subsequent raking. Roll lightly and rake wherever topsoil is too loose.

.2 Roll topsoil with 100 pound roller, minimum 3' wide, to compact and retain surface. Leave surfaces smooth, uniform and firm against deep footprinting.

4. ACCEPTANCE

.1 Testing of topsoil may be carried out by testing laboratory designated by Contract Administrator, paid for by the Contractor.

5. SURPLUS MATERIAL

.1 Dispose of surplus topsoil not required for fine grading and landscaping off site.

6. FIXED PRICE

The Contractor shall include in the appropriate fixed prices for all supply and installation of the topsoil and finish grading as indicated on the drawings and specified herein.

END OF SECTION

1. GENERAL

.1 Related Work

.1	Section 02 23 00	Excavation, Trenching and Backfilling
.2	Section 02 92 10	Topsoil and Finish Grading

.2 Source Quality Control

.1 Obtain approval from Contract Administrator of sod at source.

.2 When proposed source of sod is approved, use no other source without written authorization.

.3 Samples

.1 Submit one square metre of sod if requested.

.4 Scheduling

.1 Schedule sod laying to coincide with topsoil operations.

.2 Schedule deliveries in order to keep storage at jobsite to minimum without causing delays.

.5 Delivery and Storage

.1 Deliver, unload, and store sod on pallets.

.2 Deliver sod to site within 24 hours of being lifted and lay sod within 36 hours of being lifted.

.3 Do not deliver small, irregular, broken or discoloured pieces of sod.

.4 During wet weather, allow sod to dry sufficiently to prevent tearing during lifting and handling.

.5 During dry weather, protect sod from drying and water sod as necessary to ensure its vitality and prevent dropping of soil in handling. Dry sod will be rejected.

.6 MAINTENANCE

.1 Water, fertilize, cut, and maintain sod for 1 year warranty period, one full growing season, whichever occurs later. Water as required to supplement rainfall and maintain optimum growing conditions. During establishment period, water as required to maintain moisture penetration of 150 mm.

.7 WARRANTY

.1 Warranty period shall commence at date of Substantial Performance, and shall extend for one full growing season.

2. PRODUCTS

.1 Materials

.1 Nursery sod: Quality and source to comply with standards outlined in Guide Specifications for Nursery Stock, Section 17, latest edition published by the Canadian Trades Association, Number one Kentucky Bluegrass sod grown from mixture of 3 Kentucky Bluegrass cultivars.

.2 Broken, dry, discoloured pieces will be rejected by Contract Administrator.

.3 Water: potable.

.4 Herbicide: type, rate, and method of application subject to approval by Contract Administrator.

3. EXECUTION

.1 Laying of Sod

.1 Prior to sodding, obtain approval from Contract Administrator that finished grade and depth of topsoil are satisfactory.

.2 Lay sod within 36 hours of being lifted.

.3 Sodding during excessively wet conditions, at freezing temperatures or over frozen soil is not acceptable.

.4 Lay sod in rows, perpendicular to slope, and with joints staggered. Butt sections closely without overlapping or leaving gaps between sections. Cut out irregular or thin sections with sharp implements.

.5 Lay a full row of sod not less than 300 mm in width along the perimeter of sodded areas and parallel to walkways, paving, etc.

.6 Provide close contact between sod and soil by light rolling. Use of heavy roller to correct irregularities in grade is not permitted.

.7 Water sod immediately after laying to obtain moisture penetration into top 100 mm of topsoil.

.2 Maintenance

.1 Maintain sodded area from start of installation until final acceptance.

.2 Cut grass to 40 mm before it reaches height of 75 mm. Remove clippings which will smother grassed areas.

.3 Maintain sodded areas weed free.

.3 Acceptance

.1 Sodded areas will be accepted at final inspection provided that:
- .1 Sodded areas are properly established.
- .2 Sod is free of bare and dead spots and without weeds.
- .3 No surface soil is visible when grass has been cut to height of 40 mm.
- .4 Sodded areas have been cut minimum 2 times.

.2 Lawns sodded in fall will be accepted in following spring one month after start of growing season provided acceptance conditions are fulfilled.

4. FIXED PRICE

The Contractor shall include in the appropriate fixed prices for the all inclusive supply, preparation, installation and ancillary procedures involved in the total application of sod is areas identified herein or as required to correct damage during construction activities. All labour, materials, preparation, supervision, and equipment as required to supply and install the sod as specified.

END OF SECTION

1. GENERAL

1.1 Section Includes

.1 This section covers supply, fabrication, and placement of concrete formwork and falsework for the structural concrete slab and all other miscellaneous formwork and falsework required to complete the work described herein and shown on the repair drawings. Work in this section consists of furnishing all labour, materials, equipment, supervision, and incidentals necessary to install the concrete formwork and falsework.

1.2 Related Sections

.1 Section 03 20 00 – Concrete Reinforcement.

.2 Section 03 30 00 – Cast-in-Place Concrete.

1.3 References

.1 Canadian Standards Association (CSA)
- .1 CSA A23.1-04, Concrete Materials and Methods of Concrete Construction.
- .2 CAN/CSA-O86-01, Engineering Design in Wood.
- .3 CAN/CSA-S269.1-1975 (R2003), Falsework for Construction Purposes.
- .4 CAN/CSA-S269.3-M92 (R2003), Concrete Formwork.

1.4 Measurement Procedures

.1 No measurement will be made under this Section. Include costs in items of work for which concrete formwork and falsework is required.

1.5 Coordination

.1 Coordinate this section with other sections of work which require attachment of components to formwork.

.2 If formwork is placed after reinforcement resulting in insufficient concrete cover over reinforcement before proceeding, request instructions from Contract Administrator.

2. PRODUCTS

2.1 Materials

.1 Formwork materials: to CSA S269.1.

.2 Form ties:
- .1 For concrete not designated 'Architectural', use removable or snap off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm dia. in concrete surface.
- .2 For Architectural concrete, use snap ties complete with plastic cones and light grey concrete plugs.

.3 Form release agent: non toxic, biodegradable, low VOC. Form release agents shall be a colourless, non staining, and shall not absorb moisture. The amount of material used shall be kept to a minimum. Form release agent which has come into contact with reinforcing steel shall be removed prior to casting.

.4 The concrete surface is to receive a permanent waterproofing coating. Any release agent shall be compatible with the coating.

.5 Form stripping agent: colourless mineral oil, non toxic, biodegradable, low VOC, free of kerosene.

3. EXECUTION

3.1 Fabrication and Erection

.1 Verify lines, levels and centres before proceeding with formwork/falsework and ensure dimensions agree with drawings.

.2 Fabricate and erect formwork in accordance with CAN/CSA S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CAN/CSA A23.1.

.3 Align form joints and make watertight. Keep form joints to minimum.

.4 Use ¾" (20 mm) chamfer strips on external corners, and ¾" (20 mm) fillets at interior corners , joints, unless specified otherwise.

.5 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections. Assure that all anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.

.6 Clean formwork in accordance with CAN/CSA A23.1, before placing concrete.

3.2 Removal and Reshoring

.1 Leave formwork in place for a minimum of three (3) days after placing concrete.

.2 Remove formwork when concrete has reached 75 % of its design strength or minimum period noted above.

.3 Re use formwork and falsework subject to requirements of CAN/CSA A23.1.

END OF SECTION

1. GENERAL

1.1 Section Includes

.1 This section covers supply, fabrication, and placement of embedded reinforcing steel in all concrete sections, particularly curbs, gutters, pavement, pads, repair areas, etc.

1.2 Related Sections

.1 Section 03 10 00 – Concrete Formwork and Accessories.

.2 Section 03 30 00 – Cast-in-Place Concrete.

1.3 References

.1 Canadian Standards Association (CSA)
- .1 CSA-A23.1-04, Concrete Materials and Methods of Concrete Construction.
- .2 CAN/CSA-G30.18-M92(R2002), Billet-Steel Bars for Concrete Reinforcement.
- .3 CSA G40.20-04/G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel/ Structural Quality Steel.
- .4 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
- .5 CSA W186-M1990(R2007), Welding of Reinforcing Bars in Reinforced Concrete Construction.

.2 American Society for Testing and Materials (ASTM)
- .1 ASTM A82/A82M-07, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
- .2 ASTM A184/A184M-06, Standard Specifications for Fabricated Deformed Steel Bar Mats for Concrete Reinforcement.
- .3 ASTM A185-07, Standard Specifications for Steel Welded Wire Reinforcement, Plain, for Concrete.
- .4 ASTM A496/A496M-07, Standard Specification for Steel Wire, Deformed, for Concrete Reinforcement.
- .5 ASTM A497/a497M-07, Standard Specification for Steel Welded Wire, Deformed, for Concrete Reinforcement.
- .6 ASTM A704/A704M-06, Standard Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement.
- .7 ASTM A775/A775M-07b, Specification for Epoxy-Coated Reinforcing Steel Bars.

1.4 Measurement Procedures

.1 No measurement will be made under this section. Include costs in items of concrete work for which reinforcement is required.

2. PRODUCTS

2.1 Materials

.1 Substitute different size bars only if permitted in writing by Contract Administrator.

.2 Reinforcing steel: billet steel, grade 400, [epoxy coated] deformed bars to CAN/CSA G30.18, unless indicated otherwise.

.3 Cold drawn annealed steel wire ties: to ASTM A82 [All tie wires and accessories to be non-corroding or epoxy coated.]

.4 Welded steel wire fabric: to ASTM A185. Provide in flat sheets only.

.5 Epoxy coating of non prestressed reinforcement: to ASTM A775/A775M.

.6 Galvanizing of non prestressed reinforcement: to CSA G164, minimum zinc coating [610] g/m^3.

.1 Protect galvanized reinforcing steel with chromate treatment to prevent reaction with Portland cement paste.

.2 If chromate treatment is carried out immediately after galvanizing, soak steel in aqueous solution containing minimum 0.2% by weight sodium dichromate or 0.2% chromic acid.

.1 Temperature of solution equal to or greater than 32 degrees and galvanized steels immersed for minimum 20 seconds.

.3 If galvanized steels are at ambient temperature, add sulphuric acid as bonding agent at concentration of 0.5% to 1%.

.1 In this case, no restriction applies to temperature of solution.

.4 Chromate solution sold for this purpose may replace solution described above, provided it is of equivalent effectiveness.

.7 Chairs, bolsters, bar supports, spacers: to CSA A23.1.

.8 Mechanical splices: subject to approval of Contract Administrator.

.9 Plain round bars: to CSA G40.21.

2.2 Fabrication

.1 Fabricate reinforcing steel in accordance with CSA A23.1.

.2 Obtain Contract Administrator's approval for locations of reinforcement splices other than those shown on placing drawings.

.3 Upon approval of Contract Administrator, weld reinforcement in accordance with CSA W186.

.4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists. For epoxy coated bars, method of bundling and transportation should be in accordance with ASTM A775/A775M.

2.3 Source Quality Control

.1 Upon request, provide Contract Administrator with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, [minimum [4] weeks prior to commencing reinforcing work].

.2 Upon request inform Contract Administrator of proposed source of material to be supplied.

3. EXECUTION

3.1 Field Bending

.1 Do not field bend or field weld reinforcement except where indicated or authorized by Contract Administrator.

.2 When field bending is authorized, bend without heat, applying a slow and steady pressure.

.3 Replace bars which develop cracks or splits.

3.2 Placing Reinforcement

.1 Place reinforcing steel as indicated on reviewed placing drawings and in accordance with CAN/CSA A23.1.

.2 Prior to placing concrete, obtain Contract Administrator's approval of reinforcing material and placement.

.3 Ensure cover to reinforcement is maintained during concrete pour.

.4 Protect epoxy coated portions of bars with covering during transportation and handling.

3.3 Field Touch up

.1 Touch up damaged and cut ends of epoxy coated or galvanized reinforcing steel with compatible finish to provide continuous coating.

END OF SECTION

1. GENERAL

1.1 Work Covered by this Section

.1 This section covers the manufacture, transport, placement, finishing, curing, and all related aspects of the supply and installation of cast-in-place concrete work for this project.

1.2 Related Sections

.1 Section 03 10 00 - Concrete Forms and Accessories.

.2 Section 03 20 00 - Concrete Reinforcement.

1.3 References

.1 Canadian Standards Association (CSA)
- .1 CSA-A23.1-04, Concrete Materials and Methods of Concrete Construction.
- .2 CSA-A23.2-04, Methods of Test for Concrete.
- .3 CSA A283-06, Qualification Code for Concrete Testing Laboratories.
- .4 CAN/CSA-A3000-03, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
  - .1 CSA-A3001-03, Cementitious Materials for Use in Concrete.

.2 American Society for Testing and Materials (ASTM)
- .1 ASTM C260-061, Specification for Air-Entraining Admixtures for Concrete.
- .2 ASTM C309-07, Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
- .3 ASTM C494/C494M-05a, Standard Specification for Chemical Admixtures for Concrete.
- .4 ASTM A820/A820M-06 Standard Specification for Steel Fibers for Fiber-Reinforced Concrete.
- .5 ASTM C1017/C1017M-7, Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.

.3 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet for Use in Building Construction.

1.4 Certificates

.1 Provide certification that mix proportions selected will produce concrete of quality, yield and strength as specified in concrete mixes, and will comply with CSA-A23.1. Certification letter to be sealed by an engineer registered in the Province of Manitoba.

.2 Provide certification that plant, equipment, and materials to be used in concrete comply with requirements of CSA-A23.1. Certification letter to be sealed by an engineer registered in the Province of Manitoba.
- .1 When plant does not hold valid certification, provide test data and certification by qualified independent inspection and testing laboratory that materials used in concrete mixture will meet specified requirements.

.3 Minimum 2 weeks prior to starting concrete work, submit proposed quality control procedures for review by Contract Administrator on following items:
- .1 Cold weather concrete.
- .2 Curing.
- .3 Finishes.

.4 Formwork removal.

.4 Minimum 2 weeks prior to starting concrete work submit to Contract Administrator manufacturer's test data and certification by qualified independent inspection and testing laboratory that following materials will meet specified requirements:
.1 Portland cement.
.2 Supplementary cementing materials.
.3 Admixtures.
.4 Aggregates.
.5 Water.

1.5 Delivery, Storage and Handling

.1 Concrete hauling time: maximum allowable time for concrete to be delivered to site of Work and discharged not to exceed 90 minutes after batching.
.1 Modifications to maximum time limit must be agreed to Contract Administrator and concrete producer as described in CSA A23.1/A23.2.
.2 Deviations to be submitted for review by Contract Administrator.

.2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.

.3 Waste Management and Disposal:
.1 Provide an appropriate area on the job site where concrete trucks can be safely washed. Divert unused admixtures and additive materials (pigments, fibres) from landfill to official hazardous material collections site as approved by Contract Administrator.
.2 Unused admixtures and additive materials must not be disposed of into sewer systems, into lakes, streams, onto ground or in other location where it will pose health or environmental hazard.
.3 Prevent admixtures and additive materials from entering drinking water supplies or streams. Using appropriate safety precautions, collect liquid or solidify liquid with inert, noncombustible material and remove for disposal. Dispose of waste in accordance with applicable local, Provincial/Territorial and National regulations.

1.6 Abbreviations

.1 Cement: hydraulic cement or blended hydraulic cement (XXb - where b denotes blended).
.1 Type GU or GUb - General use cement.
.2 Type MS or MSb - Moderate sulphate-resistant cement.
.3 Type CI - with CaO content ranging from 8 to 20%.

.2 HRWRA - High-range water reducing agent.

.3 HVSCM – High volume supplementary cementing materials.

.4 MRWRA - Mid-range water reducing agent.

.5 SCM – Supplemental cementing materials.

.6 SSD - Saturated surface dry.

.7 WRA – Water reducing agent.

2. PRODUCTS

2.1 Materials

.1 The concrete constituents shall comply with the following standards:
.1 Hydraulic cement: to CAN/CSA-A3001.

.2 Blended Hydraulic cement: to CAN/CSA-A3001.
.3 Supplementary cementing materials: to CAN/CSA-A3001.
.4 Water: To CSA-A23.1.
.5 Aggregates: to CSA-A23.1. Coarse aggregates to be normal density.
.6 Air entraining admixture: ASTM C260. The use of chloride containing admixtures is strictly forbidden.
.7 Admixtures:
  .1 Air entraining admixture: to ASTM C260.
  .2 Chemical admixture: to ASTM C494 or ASTM C1017 for self-consolidating concrete. Contract Administrator to approve accelerating or set retarding admixtures during cold and hot weather placing.

2.2 Mixes

.1 Proportion normal density concrete in accordance with CSA-A23.1, Table 5, Alternative 1 to give following properties:

  .1 Exterior concrete slabs, stairs, curbs
    .1 Minimum compressive strength at 28 days: 32 MPa.
    .2 Class of exposure: C-2
    .3 Air category: 1
    .4 Supplemental cementing materials: Class CI Fly ash.
    .5 Volume of SCM: Normal
    .6 Nominal size of coarse aggregate: 20 mm.
    .7 Slump (after addition of WRA): consistent with placement and consolidation methods, equipment, and site conditions and as approved by Contract Administrator.
  .2 Concrete foundation wall skin
    .1 Minimum compressive strength at 28 days: 32 MPa.
    .2 Class of exposure: S-2
    .3 Air category: 2
    .4 Supplemental cementing materials: Class Cl fly ash.
    .5 Volume of SCM: Normal
    .6 Nominal size of coarse aggregate: 20 mm
    .7 Slump (after addition of WRA): consistent with placement and consolidation methods, equipment, and site conditions and as approved by Contract Administrator.

3. EXECUTION

3.1 Preparation

.1 Obtain Contract Administrator's approval before placing concrete. Provide 24 hours notice prior to placing of concrete.

.2 Ensure reinforcement and inserts are not disturbed during concrete placement.

.3 Prior to placing of concrete obtain Contract Administrator's approval of proposed method for protection of concrete during placing and curing in adverse weather.

.4 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.

.5 In locations where new concrete is dowelled to existing work, drill holes in existing concrete. Place steel dowels of deformed steel reinforcing bars and epoxy grout to anchor and hold dowels in positions as indicated. Refer to Section 03200.

.6 Do not place load upon new concrete until authorized by Contract Administrator.

.7 Provide formwork and falsework to Section 03100 - Concrete Forms and Accessories.

.8 Place reinforcing steel and install dowels to Section 03200 - Concrete Reinforcement. Provide dowels at locations shown on the drawings.

.9 Obtain Contract Administrator's approval before placing concrete. Provide 24 hours notice prior to placing of concrete.

.10 Ensure reinforcement and inserts are not disturbed during concrete placement.

.11 Prior to placing of concrete obtain Contract Administrator's approval of proposed method for protection of concrete during placing and curing in adverse weather. Protection and curing must comply with the hot weather and cold weather requirements of CSA-A23.1.

.12 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.

.13 In locations where new concrete is dowelled to existing work, drill holes in existing concrete. Place steel dowels of deformed steel reinforcing bars and epoxy grout to anchor and hold dowels in positions as indicated.

.14 Provide temporary bridging as required to permit access to all areas during placement, finishing and curing.

3.2 Mix Production

.1 Concrete to be mixed, delivered and placed in accordance with CSA A23.1 guidelines.

.2 Concrete to be batched and mixed at a ready mix plant and delivered to site in ready to place form. However, use of a HRWRA may be required to obtain the specified slump. HRWRA addition shall occur at the batch plant or on-site in carefully controlled dosages by trained personnel of the concrete supplier and in accordance with pre-approved dosages.

.3 Slump and air must be measured both before and after addition of HRWRA.

.4 The addition of water to the concrete to increase slump and aid in pumping is strictly forbidden unless written permission from Contract Administrator is obtained.

.5 Concrete to be mixed, delivered and placed in accordance with CSA-A23.1.

.6 Concrete to be batched and mixed at a ready mix plant and delivered to site in ready to place form.

.7 Control of slump on the job site to be in accordance with CSA-A23.1 except as otherwise specified below:

- .1 The addition of water to increase slump is strictly prohibited.
- .2 The use of a HRWRA may be required to aid in placement of the concrete and obtain adequate consolidation in heavily reinforced sections.
- .3 HRWRA addition shall occur at the batch plant or on site. For site addition, concrete supplier to provide written notice minimum 2 weeks prior to commencement of concrete work, indicating recommended dosages based on slump at point of discharge.
- .4 Site addition HRWRA will be the responsibility of the concrete supplier.

.8 Control of air content on the job-site to be in accordance with CSA-A23.1.

3.3 Placement

.1 Place concrete work in accordance with CSA-A23.1.

.2 Concrete shall be transported to placement location by pump or trolley.

.3 When concrete is placed by pump, the initial slurry used to prime the pump shall not be incorporated into the topping. The slurry shall be trapped and disposed off-site.

.4 Ensure reinforcement, anchors, inserts, etc. are not disturbed during concrete placement.

.5 Ensure high points and slopes to drains as shown on drawings are maintained.

.6 When placing concrete against concrete that has achieved initial set, wait until final set occurs; then prepare the surface and treat like any other cured concrete surface being prepared for concrete.

.7 Place concrete in its final position as soon as possible after mixing. A maximum time limit of 90 minutes from the time of initial mixing to complete discharge shall be observed. Do not use any concrete more than 90 minutes from initial mixing or having a partial set before placing. Exemptions to the maximum time limit, if required, shall be submitted to the Contract Administrator in writing a minimum of 2 weeks prior to placement of concrete. Proposed methods and materials used to extend the maximum time limit shall be agreed upon by the Contract Administrator and the concrete supplier prior to placement of the concrete.

.8 Pour concrete continuously between predetermined construction and control joints. Do not "break" or interrupt successive pours such that "cold" joints occur. Install a construction dam or bulkhead in case of a delay longer than 60 minutes. During delays between 5 and 60 minutes, protect the end of the placement with damp burlap.

.9 Protect freshly placed concrete from exposure to dust, debris and precipitation.

.10 Special provisions for cold weather concrete placement shall be in accordance with Clause 21 of CSA A23.1 unless specifically noted otherwise.

.1 When the air temperature is at or below 5°C, or when there is a probability of it falling below 5°C within the entire curing period following placement, all materials and equipment needed for adequate protection and curing shall be on hand and ready for use before the concrete placement is started.

.11 Maintain accurate field records of poured concrete items to indicate date, location of pour, quality, air, temperature and test samples taken.

3.4 Construction

.1 Do cast-in-place concrete work in accordance with CSA-A23.1.

.2 Sleeves and inserts.

.1 No sleeves, ducts, pipes or other openings shall pass through concrete members except where indicated or approved by Contract Administrator.

.2 Electrical conduits, junction and fixture boxes shall not be embedded within concrete members.

.3 Where approved by Contract Administrator, set sleeves, ties, pipe hangers and other inserts and openings as indicated or specified elsewhere. Sleeves and openings greater than 100 x 100 mm not indicated, must be approved by Contract Administrator.

.4 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain approval of modifications from Contract Administrator before placing of concrete.

.5 Check locations and sizes of sleeves and openings shown on drawings.

.3 Do not place load upon new concrete until authorized by Contract Administrator.

3.5 Consolidation of Concrete

.1 Consolidate concrete to ACI 309R.

3.6 Finishing

.1 Following the light hand trowel and once a uniform surface has been achieved, the surface shall be given a slight texture with a soft-bristled broom.

.2 Ensure a uniform, level surface is obtained, as shown on the drawings.

.3 Immediately after final finishing, apply additional coat of evaporation reducer to prevent drying shrinkage. Apply at manufacturers recommended coverage. Evaporation reducer is not be applied during any finishing operation nor should it be worked into the surface.

.4 Rub exposed sharp edges of concrete with carborundum to produce 3 mm radius edges unless otherwise indicated.

3.7 Joints

.1 Timing of the saw cutting will vary with weather conditions however are typically completed within 1 to 4 hours after final finishing. Timing of the saw cutting will be the responsibility of the Contractor.

.2 Where paving abuts curbs, walls and other vertical surfaces use ½" Flexcell.

.3 Round edges, including edges of joints with a 3/8" (10 mm) radius edging tool.

.4 Unless otherwise indicated, all control and construction joints to be filled with a flexible joint sealant in accordance with Sections 07900 and 07910.

3.8 Curing

.1 Cure and protect concrete in accordance with requirements of Section 21 of CSA A23.1-00.

.2 Concrete surfaces to be cured at a minimum temperature of 10°C for the entire curing period.

.3 Formwork to be left in place for a minimum of 3 days after placement of concrete.

.4 Upon removal of the forms immediately apply a cure and seal compound. Cure and sealing compound at manufacturer's recommended application rate. Apply curing compound in two applications at right angles to each other.

3.9 Field Quality Control

.1 Inspection and testing of concrete and concrete materials will be carried out by a Testing Laboratory designated by Contract Administrator in accordance with CSA-A23.1 and as described herein.

.2 Slump and air measurements will be completed on each of the initial 4 loads of concrete per day of casting to ensure satisfactory control of the air content is established. If adequate control of air content is not established within the first 4 loads of concrete or if a test falls outside the specified limits, the testing frequency shall revert to one test per load until satisfactory control is re-established. Costs for the additional testing will be borne by the Concrete Supplier.

.3 Not less than one test in which slump, air, and three cylinders are taken, shall be made for each 50 cubic meters of concrete placed on any one day. One cylinder shall be tested at 7 days, the other two at 28 days unless directed otherwise by the Contract Administrator.

.4 Contract Administrator may take additional test cylinders during cold weather concreting or when concrete quality is suspect. Cure cylinders on job site under same conditions as concrete which they represent.

.5 Non-destructive Methods for Testing Concrete shall be in accordance with CSA-A23.2.

.6 Inspection or testing by Contract Administrator will not augment or replace Contractor quality control nor relieve him of his contractual responsibility.

.7 Except as noted, the Contractor will pay for costs of tests via the testing cash allowance.

3.10 Defective Concrete

.1 Defective concrete: cracking, spalling, scaling and concrete not conforming to required lines, details, dimensions, tolerances, or specified requirements.

.2 Repair or replacement of defective concrete will be determined by the Contract Administrator, based on the specifications and the above guidelines.

.3 Do not patch, fill, touch-up, repair or replace exposed concrete except upon express direction of Contract Administrator for each individual use.

.4 Modify or replace concrete not conforming to lines, detail and elevations indicated on drawings.

.5 Repair or replace concrete not properly placed, resulting in excessive honeycombing and other defects in critical areas of stress. Surface of concrete foundation wall skin to be free of all voids, joint ridges, and other surface irregularities that would be detrimental to the application of the waterproofing membrane. All such irregularities are to be repaired at the Contractor's expense.

.6 Notify Contract Administrator of proposed methods of repairing or replacing defective concrete. Methods of repairing or replacing defective concrete shall be acceptable to the Contract Administrator.

END OF SECTION

1. GENERAL

This section covers supply and installation of 2½" rigid extruded closed-cell polystyrene insulation over the treated foundation walls.

2. DELIVERY, HANDLING, AND STORAGE

.1 Do not leave insulation exposed to sunlight. Keep covered with opaque polyethylene film or light-coloured tarpaulins at all times. Coordinate deliveries to comply with construction schedule.

.2 Store flammable materials outside the building. Abide by fire protection regulations of the City of Winnipeg as well as Workplace, Health and Safety.

.3 Protect stored material from broken edges, corners, punctures, or indentations.

3. PRODUCTS

.1 Rigid extruded expanded polystyrene insulation to be Styrofoam SM as manufactured by Dow Chemical Canada Inc. Insulation to meet CAN/CGSB-51.20-M87, Type 4, shiplap edges.

.2 Insulation to comply with the following test procedures and standards:
- .1 Permeability: 0.9 perms (ASTM E96-80)
- .2 Compressive strength: 30 p.s.i. (ASTM D1621-79)
- .3 Thermal resistance: R-5.0 (ASTM C518-85) per inch
- .4 Water absorption: less than 0.7% (ASTM D2842-69)

4. EXECUTION

.1 Install materials in accordance with material manufacturer's instructions. Ensure continuous uniform thermal effect.

.2 Cut and trim insulation neatly to fit spaces. Lap joints tightly.

5. ACCESSORIES

.1 Insulation fasteners to concrete: X-IE Insulation Fastener, corrosion resistant finish, length to suit insulation; 2 $^{3}/_{8}$" diameter head by Hilti. Provide minimum 8 fasteners on each insulation board. Dip fasteners into waterproofing membrane material just prior to insertion.

6. CLEANUP

.1 Remove all leftover materials and debris from site and dispose of same in proper manner. Cleanup of materials to be performed on a daily basis.

7. FIXED PRICE

.1 The Contractor shall include in the appropriate Fixed Prices for the supply, installation and ancillary procedures required for the application of the rigid insulation board. All labour, materials, preparation, supervision, and equipment as required to supply and install the insulation as specified herein.

END OF SECTION

1. GENERAL

.1 Work Included in this Section

.1 This section specifies and includes supplying all materials, labour, supervision, equipment, and ancillary requirements to complete the installation of a flexible, cold, liquid-applied membrane system. This specification shall be read in conjunction with the contract drawings.

.2 References

.1 American Society for Testing and Materials (ASTM):

- .1 ASTM C836 - Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course.
- .2 ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension.
- .3 ASTM D2240 - Standard Test Method for Rubber Property - Durometer Hardness.
- .4 ASTM D4263-83(1999) Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method
- .5 ASTM D5034 - Standard Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test).
- .6 ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.

.2 International Concrete Repair Institute (ICRI):

- .1 Guideline No. 03732, Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays.

.3 Quality Assurance

.1 The waterproofing shall be installed by a manufacturer-approved applicator only. Contact manufacturer for listing of approved applicators. Applicators must have experience in applying specified membrane materials to concrete surfaces. Provide a minimum of three (3) references establishing successful application of waterproofing system.

.2 Waterproofing work shall be performed only by skilled applicators, employed by a company operating all adequate and necessary equipment to execute such work.

.3 The Contractor shall note the extent and locations of membrane waterproofing on the drawings and also include the relevant flashing hardware, tie-bars, and joint sealant.

.4 Notify manufacturer's authorized representative at least two weeks before start of work. Schedule minimum of three (3) job site inspections by manufacturer's authorized representative, the first scheduled before application of product. Application of elastomeric waterproofing without prior notice will not constitute acceptance by manufacturer of five-year waterproofing inspection and guarantee procedure.

.5 The Contract Administrator will inspect the membrane installation very carefully for pinholes, insufficient waterproofing thickness or any other conditions which may affect the integrity of the waterproofing system. Any deficiencies in the membrane installation noted by the Contract Administrator are to be corrected at the Contractor's expense.

.6 Manufacturer Qualifications: Company regularly engaged in manufacturing and marketing of products specified in this section.

.7 Installer Qualifications: Qualified to perform work specified by reason of experience or training provided by product manufacturer.

.4 Manufacturer's Representative

.1 The waterproofing materials manufacturer must delegate a representative to visit the work site at commencement of work.

.2 At all times, the Contractor shall permit and facilitate access to the work site to said manufacturer's representative.

.5 Delivery and Storage

.1 Deliver products in original factory packaging bearing identification of product, manufacturer, and batch number. Provide Material Safety Data Sheets for each product.

.2 Store products in location protected from freezing, damage, construction activity, precipitation, and direct sunlight in strict accordance with manufacturer's recommendations.

.3 Condition products to approximately 15°C to 20°C for use in accordance with manufacturer's recommendations.

.4 Handle all products with appropriate precautions and care as stated on Material Safety Data Sheet.

.6 Project Conditions

.1 Do not use products under conditions of precipitation or freezing weather. Use appropriate measures for protection and supplementary heating to ensure proper drying and curing conditions in accordance with manufacturer's recommendations if application during inclement weather occurs.

.2 Ensure substrate is dry.

.7 Warranties/Guarantees

.1 The system manufacturer shall furnish a written single-source performance warranty that the membrane system will be free of defects related to workmanship or material deficiency for a five (5) year period from the date of Substantial Performance. The following problems shall be specifically covered under the warranty:

.1 cohesive or adhesive failure of the waterproofing system;
.2 deficiencies resulting in crack-bridging failure of the system;
.3 leakage as a result of any installation or material deficiency.
.4 The warranty must include the removal and subsequent replacement of concrete, asphalt, other materials, equipment in order to complete any required warranty repairs.

.2 The waterproofing sub-contractor shall supply the City of Winnipeg with a written and signed document, guaranteeing that all work (supply and installation of membrane) completed shall remain as installed, free from any application defect and to be bonded, for a period of three (3) years from date of acceptance of the Work of this trade and so stated by the Contract Administrator. The warranty must include the removal and subsequent replacement of concrete, asphalt, other materials, equipment in order to complete any required warranty repairs.

2. PRODUCTS

.1 Materials

.1 Cold Applied Liquid Waterproofing Membrane: single-component, bitumen modified, cold liquid applied moisture curing urethane complying with ASTM C836; trowel, roller, spray, or squeegee grade as required for application, cured properties as follows:
- .1 Shore A hardness: 40 ± 5, per ASTM D2240.
- .2 Elongation: 600%, per ASTM D412.
- .3 Tensile strength: 1,035 kPa ± 35 kPa, per ASTM D412.
- .4 100 percent modulus: 550 kPa ± 35 kPa, per ASTM D412.
- .5 Crack bridging: Pass 1.6 mm with no loss of bond or cracking exhibited, cycled 10 times per 24 hours at 9°C per ASTM C836.
- .6 Swelling in water (3 days at room temperature): Nil.
- .7 Weatherometer (Atlas Xenon Arc 1,000 hours): No cracking, no hardening.
- .8 Moisture vapor permeability: 0.22 ng/Pa-m (0.15 perm inches) per ASTM E96.
- .9 Service temperature range: -40°C to 50°C.
- .10 Minimum recovery: 90 percent.

.2 Acceptable Waterproofing System: HLM 5000 by Sonneborn / Chemrex Inc.
- .1 Apply grade of fluid-applied waterproofing to meet job requirements as follows:
  - .1 HLM 5000(R) T for trowel application.
  - .2 HLM 5000(R) R for roller application.
  - .3 HLM 5000(R) S for spray application.
  - .4 HLM 5000(R) SL for squeegee application.
- .2 Sealant: Sonolastic NP2 to Section 07910 unless otherwise noted.
- .3 Reinforcing Fabric: Sonoshield Reinforcing Fabric by Sonneborn / Chemrex Inc.
  - .1 Elongation to ASTM D5034: Machine direction 54 percent, cross direction 147 percent.
  - .2 Grab breaking to ASTM D5034: Machine direction 24.5 kg, cross direction 14.5 kg.
  - .3 Thickness: 0.61 mm, minus 0 plus 0.05 mm.
  - .4 Nominal weight: 72.2 g/square m.
  - .5 Yarn denier: 70.
  - .6 Mullen burst: 556 kPa.
- .4 Protection Board: Protection Course II by Sonneborn / Chemrex Inc. As shown on drawings.
- .5 Drainage Board: Sonoshield DBS 6200 by Sonneborn / Chemrex Inc.
- .6 Parging for concrete block: Sonoblock by Sonneborn / Chemrex Inc.
  - .1 Use Emaco R300 by MBT / Chemrex at locations indicated by Contract Administrator.

.2 Accessories

.1 Rust Inhibiting Primer: Aquapon Zinc-Rich Epoxy Primer by Pittsburgh Paints.

.2 Rigid Insulation: to Section 07212.

.3 Polyethylene film 10 mil: to CGSB 51-GP-51M-81.

.4 Fastening bars: As shown on Drawings.

3. EXECUTION

.1 Examination

.1 Inspect areas involved in work to establish extent of work, access, and need for protection of surrounding construction.

.2 Protect surroundings from primers, patching repair compounds, and waterproofing products, including, but not limited to, windows, walkways, drives, automobiles, and landscaping.

.3 Conduct all pre-application inspections of site verification with an authorized manufacturer's representative.

.2 Protection

.1 Adjoining surfaces shall be protected against any damage that could result from the waterproofing installation.

.2 Maintain all equipment and tools in good working order.

.3 Complete all preparatory work before application begins. Select grade of liquid waterproofing that best meets job requirements.

.3 Preparation

.1 Before commencing work, any defects must be made good with a material that adheres to the base, is stable, and is compatible with membrane materials.

.2 The substrate must be clean, dry, and free of contamination by concrete treatment products, which could affect the adhesion of the waterproofing or the physical integrity of the membrane itself.

.3 Check if the work of other trades has been properly completed.

.4 Inspect through-wall penetrations, including electrical, lighting, signage, plumbing, HVAC, and fire sprinkler piping for watertight seal. Repair deficiencies with manufacturer approved sealant in accordance with Section 07910 or as shown on the drawings.

.6 Install a 24 inch x 24 inch (600 mm x 600 mm) polyethylene patch over representative areas of the wall in accordance with ASTM D4263 monitor for 24 hours in order to determine that no residual moisture exists which may effect the integrity of the membrane.

.7 Surface Preparation of Concrete Surfaces:

.1 All new concrete to be cured for a minimum of 28 days prior to application.

.2 Blast surface with a medium-heavy blast is mandatory and to be of sufficient duration to remove all loose, deleterious material and clean the concrete surface in preparation of the membrane installation.

.3 The specified surface profile is ICRI-CSP-4. Samples which detail the specified profile may be viewed at the office of the Contract Administrator. These samples shall be the standard to which the concrete profile must match. Areas found deficient shall be immediately re-blasted at the Contractor's expense.

.4 Blast all perimeters and projections to clean and texture surface to accommodate membrane installation.

.5 Additional surface preparation may be required where contamination remains after the initial surface preparation and cleaning. Costs for additional blasting are to be included in the Contractors' price.

.6 After the concrete surface has been prepared to the required soundness and surface profile, surfaces may still need to be cleaned by vacuum cleaning, air blast cleaning, or water blast cleaning to remove the residue created by the surface preparation method or to remove spent media.

.7 Cleaned surfaces are to be covered with 6 mil (0.15 mm) poly and protected against exposure to vehicles, dust, and debris. Membrane must be installed over cleaned areas within 24 hours of blasting.

.8 Surface Preparation of Metals:

.1 Sandblast or wire brush all incidental metal to bright metal. Prime with a top quality rust-inhibiting metal primer. Allow to dry. Reprime surfaces.

.2 Vent, drain pipe, and other penetrations: Clean metal surfaces to bright metal and prime with a top quality rust-inhibiting metal primer. Allow to dry. Reprime surfaces.

.3 Install appropriate cant with slope grade sealant in accordance with Section 07910. Allow sealant to cure.

.4 Detail Preparation

.1 Concrete Surface Defects and Static Cracks:

.1 Clean and prepare surface in accordance with preceding section.

.2 Open up air void pockmarks and honeycombs to allow liquid waterproofing to fill cavities completely.

.3 Parge coat substrates with excessive pinholes, bug holes, or porosity which might cause blisters or pinholes in membrane. Use approved cementitious waterproofing only.

.4 Apply 60 wet mils (1.5 mm) prestripe of liquid membrane to nonmoving joints and cracks less than 1/8 inch (3 mm) wide. Fill and overlap joint or crack 4 inches (100 mm) on each side. Feather edges.

.5 Rout and clean cracks and joints over 1/8 inch (3 mm) wide to minimum of 1/4 inch x 1/4 inch (6 mm x 6 mm). Install bond breaker tape to prevent adhesion to bottom of joint. Prime joint faces and seal with manufacturer approved sealant in accordance with Section 07910. Allow sealant to cure.

.6 Apply coat of liquid household carnauba wax, teflon bond breaker tape, or approved equivalent over cured sealant to prevent waterproofing membrane from adhering to joint sealant. Allow wax to dry.

.7 Prestripe all cracks and caulked joints with 60 wet mils (1.5 mm) of liquid waterproofing.

.3 Inside Corners and Penetrations:

.1 Clean and prepare surface in accordance with preceding section.

.2 Sealant cants to be installed at all inside corner details.

.3 Prime surface and form sealant cant into corner at junction of all horizontal and vertical surfaces (e.g. wall sections, curbs, or columns). Unless otherwise noted on the drawings, install bond breaker tape in corner and apply 1 inch x 1 inch (25 mm x 25 mm) cant of sealant. Tool to 45 degree cant. Allow sealant to cure.

.4 For deck to wall joints, apply masking tape to vertical sections at appropriate height above sealant cant to provide clean termination as shown on the drawings.

.4 Outside Corners:

.1 Round all outside corners to create a 3/8 inch (10 mm) fillet.
.2 Install high-build fluid-applied waterproofing complete with reinforcing fabric in all outside corners. Extend reinforcing fabric min 12 inches (300 mm) beyond inside corner each side.

.5 Installation

.1 Complete all preparatory work before installation begins.

.2 Waterproofing work shall be performed on a continuous basis as surface and weather conditions allow.

.3 Install waterproofing elements on clean and dry surfaces.

.4 Do not install materials in conditions of rain, snow or fog.

.5 Mark off areas of 125 ft² (11.6 m²) on horizontal applications.

.6 Apply cold applied liquid waterproofing in two layers at 60 wet mils (1.5 mm) per layer. Total thickness of cured system not less than 120 dry mils (3 mm) including reinforcing fabric.

.7 Spread immediately to ensure workability. Repeat procedure until entire surface is covered.

.8 Verify applied thickness of 60 wet mils (1.5 mm) with wet thickness gauge as work progresses.

.9 Set reinforcing fabric into wet material. Overlap all seams minimum of 3 inches (75 mm). Repeat procedure until entire surface is covered.

.10 Allow first coat to cure overnight.

.11 Repeat items 5 through 8.

.12 Allow to cure 48 hours at 21°C and 50 percent relative humidity. Extend curing time at lower temperatures and relative humidity.

.13 Protect waterproofing membrane from damage before placement of drainage board and insulation.

.14 Install tightly butted protection board as shown on the Drawings.

.15 Provide fastening bars at locations shown on the Drawings.

.6 Cleaning

.1 Remove wet liquid membrane, primer, and sealant products from tools and equipment with solvent such as xylene, toluene, or MEK. Remove dried materials mechanically.

.2 Clean up and properly dispose of all debris remaining on job site related to application.

.7 Field Quality Control

.1 Manufacturer's Field Service (Final Inspection, Warranty Request) by Manufacturer's Representative.

.2 Inspect finished surface preparation, application, and finished waterproofing and complete additional preparation or application to achieve appropriate result.

.3 In no case will manufacturer's representative approve surface or finish if the following conditions are found: pinholes, insufficient waterproofing thickness, or

any other conditions which, in manufacturer's representative's opinion, may cause failure of installation.

4. FIXED PRICE

The Contractor shall provide a fixed price for the all inclusive supply, preparation, installation, and ancillary procedures involved in the total application of the cold liquid-applied membrane system, tie-bars and flashing. All labour, materials, preparation, supervision, and equipment as required to supply and install the membrane as specified herein.

END OF SECTION

1. GENERAL

.1 Scope of Work

.1 Work by this section is as per the accepted Trade Definitions.

.2 Work includes but is not limited to:
- .1 Fabricated metal flashings and sheet metal work to CRCA specifications.
- .2 Supply pre-finished steel flashings as noted on drawings.

.2 Reference Standards

.1 Fabricated metal flashings and sheet metal work to CRCA specifications.

.2 Galvanized steel sheet with factory applied coating to ASTM 525 (latest edition) with G90 designation Zinc coating.

.3 Solder to ASTM B32.

.4 Plastic cement to CGSB 37-GP-5M.

.5 Sealants in accordance with Section 07900. Colour to be chosen from the Colorite “HMP”, “Industry Standard Colour Chart” or from the “Extended Inventory Colour Chart”.

.6 Fasteners to CSA B111.

2. PRODUCTS

.1 Materials

.1 Flashing not exposed to be 0.80mm unless otherwise noted on drawings, galvanized steel sheet commercial quality.

.2 Exposed flashing and coping caps to be 0.75mm unless noted otherwise on drawings, pre-finished steel.

.3 Isolation coating to be alkali resistant bituminous paint.

.4 Fasteners to be of same material as sheet metal and be either screw or nail type with large heads in sufficient length to penetrate substrate 20mm and remain secure.

.5 Solder to be 50% tin/50% lead.

.6 Flux to be rosin cut muriatic acid or commercial preparation suitable for materials to be soldered.

.7 Caulking sealant to be compatible with surface of material being adhered to.

3. EXECUTION

.1 Fabrication

.1 Shop fabricate metal flashing and trim components to the maximum length possible, forming metal work with clear, sharp, straight and uniform bends and rises. Hem exposed edges of flashings 12mm to the underside. Use S lock seams at all joints.

.2 Form flashing components from single full width sheet. Provide shop fabricated mitred corners, joined using closed end pop rivets and joint sealant.

.3 Fabricate related sheet metal work in accordance with approved shop drawings and applicable standards.

.4 Solder manufactured sheet metal joints with heavy, well heated coppers. Pre-tin joints not less than 40mm wide. Provide 25mm minimum soldered joints. After soldering, wash joints and neutralize remaining acid with alkaline solution.

.5 Provide linear sheet metal items in minimum 3000mm sections except as otherwise noted. Form flashing and fascia/soffits using single pieces for the full width. Provide shop fabricated, mitred and joined corners.

.2 Installation

.1 Install all pre-finished metal flashing and trim such that liner face is not exposed to view. Where liner face is exposed, pre-paint to match pre-finished exposed face, or fabricate 2-ply installation.

.2 Oil-canning or crimping at fasteners securing metal flashing, trim, or rain ware, will not be acceptable. Contract Administrator to review upon completion.

.3 Be careful to install butt joints, butt joints with backer sheet, and lapped joints at locations shown on the drawings.

4. FIXED PRICE

The Contractor shall include in the appropriate fixed prices for the supply and installation of all metal flashing and trim as indicated on the drawings and specified herein.

END OF SECTION

1. GENERAL

1.1 Work Covered by This Section

.1 This section covers the supply and installation of a flexible joint sealant for reglets and concrete joints. This section also covers the supply and installation of sealant for flashing terminations and miscellaneous work.

.2 The work covered under this section consists of all labour, material, equipment, supervision and incidentals required to prepare and seal the joints and cracks as shown and detailed on the drawings, and as specified herein.

1.2 Reference Documents

.1 American Society for Testing and Materials (ASTM):
- .1 ASTM C920-05 Standard Specification for Elastomeric Joint Sealants.
- .2 ASTM C1193-05a Standard Guide for Use of Joint Sealants.
- .3 ASTM C1330-02 Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.

1.3 Measurement Procedures

.1 No measurement will be made under this section for joint sealants which are specifically shown on drawings. Include costs in items for which joint sealant is required.

1.4 Quality Assurance

.1 The Contract Administrator, Contractor and an authorized representative of the sealant manufacturer shall meet on site prior to commencing installation to review and approve related conditions which affect the performance of the sealant.

.2 The Contractor shall note that these specifications refer equally to all joint and reglet sizes regardless of width or configuration.

1.5 Field Mock-Up

.1 Perform at least two (2) test areas to confirm proper method of application and installation. Each test area should consist of a minimum 10 lineal feet (3 metres).

.2 Field adhesion testing will be performed by the Contract Administrator in the presence of and with the assistance of the Contractor and be completed throughout the course of the work. The purpose of the field adhesion testing is to help detect application problems such as improper cleaning, use of improper primer, poor primer application, or improper joint configuration.

.3 The field adhesion test shall be performed as follows:
- .1 Make a knife cut horizontally along the full width of the joint.
- .2 Make two (2) vertical cuts (from the horizontal cut) approximately 3 inches (75 mm) long, along both sides of the joint.
- .3 Place a 1 inch (25 mm) mark on the sealant tab.
- .4 Grasp the 3 inch (75 mm) sealant tab firmly 1 inch (25 mm) from its bonded edge and pull at a 90° angle.
- .5 If dissimilar substrates are being sealed, check the adhesion of sealant to each substrate separately. This is accomplished by extending the vertical cut along one side of the joint, checking adhesion to the opposite side, and then repeating for the other surface.

.6 Field adhesion test criteria: The sealant should tear cohesively within itself without bond loss.

.7 At this time the joint will be inspected for complete fill. The joint should not have voids, and joint dimensions should match those shown on the drawings.

.8 This testing will be completed by the Contract Administrator in the presence of and with the assistance of the Contractor and results recorded by the Contract Administrator, retained and made available for review upon request.

.4 Repair of Sealant at Field Adhesion Test Locations

.1 Repair the sealant pulled from the test area by applying new sealant to the test area. Assuming good adhesion was obtained, use the same application procedure to repair the area as was used originally for the joint. Care should be taken to ensure that the original sealant surface area is clean and that the new sealant is in contact with the original sealant.

.2 Contractor shall carry costs associated with sealant testing and repair in their bid including but not limited to access, labour, materials, etc.

1.6 Warranty

.1 The Contractor and/or system manufacturer shall furnish a written performance warranty covering labour and materials at the time of tender submission or approval, stating that the installed sealant will be free of defects related to workmanship or material deficiency for a minimum of five (5) years from the date of Substantial Performance. The Contractor shall co-sign the warranty and the approved warranty shall be made part of the contractual agreement. The following problems shall be specifically covered under the warranty in writing:

.1 Cohesive or adhesive failure of the seal.

.2 Abrasion or tear failure of the seal resulting from normal weathering.

.3 Moisture leakage through a sealed joint or crack.

.4 Chalking, cracking, sliding, debonding, shrinkage in the sealant.

.2 The system manufacturer and/or Contractor shall submit a detailed warranty statement consistent with the terms of this specification at the time of tender submission for approval. The approved warranty shall be made part of the contractual agreement.

1.7 Delivery Storage and Handling

.1 The sealant shall be delivered to the jobsite in the manufacturer's original unopened containers.

.2 Containers shall include manufacturer's labels indicating: the supplier, name of materials, formula or specification number, colour, date of manufacture, and shelf life. Product data sheets in accordance with WHIMIS shall be on-site and available at all times.

2. PRODUCTS

2.1 Materials

.1 Two-component polyurethane joint sealants for concrete reglets and joints to: ASTM C920, Type M, Grade NS, Class 25, Use NT, T, M. Acceptable product(s):

.1 NP2 by Sonneborn/Chemrex Inc.

.2 Single component, neutral cure, silicone sealant for flashing terminations, glazing, and miscellaneous work to: ASTM C920, Type S, Grade NS, Class 25, Use NT, M, A and O (granite). Acceptable product:

.1 795 by Dow Corning.

2.2 Accessories

.1 Primers, bond breakers and miscellaneous materials required to install the sealant shall be in accordance with manufacturer's recommendations, and as approved by the Contract Administrator. Use of aggregate bond breakers is prohibited.
- .1 Primer: Use only manufacturer's approved primer.
- .2 Closed-cell foam backing rod shall conform to ASTM C1330.
- .3 Bond breaker tape: self-adhesive, pressure sensitive tape mad from TFE-flourocarbon (Teflon) or polyethylene which sealant will not adhere to.

3. EXECUTION

3.1 Surface Preparation of Concrete

.1 All new concrete to cure for minimum 28 days.

.2 Clean joints and saw cuts by grinding, sandblasting, or wire brushing to expose a sound surface free of contamination and in order to provide a clean, sound substrate for optimum seal adhesion.

.3 Thoroughly clean all joint and crack reglets. Ensure that surfaces to be sealed are sound, dry, free from dirt, water, frost, loose scale, corrosion, oil, grease, waterproofing or water-repellant treatments, or other contaminants which may adversely affect the performance of the sealing materials.

.4 Remove loose particles present or resulting from grinding, abrading, or blast cleaning by blowing out joints with oil-free compressed air (or vacuuming) prior to primer application. Conform to ASTM C1193. These practices will be considered the governing standards and will be used in part by the Contract Administrator to ascertain acceptability of work.

.5 If the substrate is suspected of being substandard, an on-site trial application is to be conducted to verify that the substrate is satisfactory. Work will not proceed until unsatisfactory conditions have been corrected in a manner acceptable to the manufacturer. All costs associated with verification to be carried by Contractor.

.6 Prior to installation of the sealant an inspection of both the joint and substrate is required to confirm the joint design and to ensure that the substrate is sound and acceptable for sealant application. A substrate that is unsound, cracked, or weak must be repaired prior to sealant.

.7 Do not proceed with Work until any unsatisfactory conditions have been corrected in a manner acceptable to the Contract Administrator.

3.2 Preparation

.1 Back-Up Material: Install appropriate size backer rod, larger than joint where necessary according to manufacturer's recommendations.

.2 Bond Breaker: Install bond-breaker strip in joint to be sealed on top of back-up material to prevent adhesion of sealant to back-up material; install per manufacturer's recommendations. The tape shall be installed continuously with no skips or voids in the tape application.

.3 Installation of a primer and bond breaker will be required in all joints. These as well as other miscellaneous materials required to install the sealant shall be in strict accordance with project specifications and as approved by the Contract Administrator. The use of aggregate bond breakers will be strictly prohibited.

.4 Pack joints continuously with closed cell baker rod joint backing material allowing a recess to receive sealant. Installation of backer rod with a sharp tool such as putty knife

is not permitted. Ensure surface skin of the backer rod is not punctured or cut during installation. A puncture in the backer rod may result in out-gasing into the uncured sealant resulting in voids or other defects in the cured sealant. Sealant backing rod to meet requirements of ASTM C1330.

.5 Backer rod to be installed under adequate compression to hold it in-place in the joint opening and to resist the pressure applied when tooling a non-sag sealant into place. Backer rod diameter to be 25% greater than the joint width. Install backer rod without stretching. Under no circumstances should backer rod that is too small for the joint be doubled up or braided together to fit the opening.

.6 Where joint configuration and/or size does not permit the use of a backer rod, install bond breaker tape continuously with no skips or voids in the tape application.

.7 Priming of all substrates is mandatory. Prime substrates as recommended by the sealant manufacturer. Primer to be installed prior to installation of the sealant backing. Allow primer to dry until all the solvent evaporates. This typically takes 5 to 30 minutes, depending on temperature and humidity.

.8 Prime only those surfaces that will be sealed with sealant the same day. If a previously primed surface that was performed the day before is encountered it must be reprimed.

3.3 Sealant Installation

.1 Prepare sealants that require mixing; follow manufacturer's recommended procedures, mixing thoroughly.

.2 Mix only as much material as can be applied within manufacturer's recommended application time period.

.3 Apply materials only within manufacturer's specified application life period. Discard sealant after application life is expired or if prescribed application period has elapsed.

.4 Application of sealants shall be by skilled applicators installed in accordance with manufacturer's printed directions and supervision. The sealants shall be carefully applied to meet the design requirements.

.5 Sealant shall not be installed on wet or damp substrates. Wet or damp substrates should be allowed to dry before application of primer and/or sealant.

.6 Do not install sealants under conditions of precipitation or temperatures below 4°C. Use appropriate measures for protection and supplementary heating to ensure proper curing conditions in accordance with manufacturer's recommendations if application during inclement weather occurs.

.7 All sealants have a temperature range for optimum handling which can vary considerably, and should be stored at a temperature within this range for at least 16 hours before use.

.8 Do not use sealant that has started to set in its container, exceeded shelf life or installation times as stated by the manufacturer.

.9 The sealant shall be carefully handled and stored to prevent inclusion of foreign materials, or exposure to excessive temperatures as specified by the manufacturer.

.10 Sealant to be installed in a manner that will completely fill the cavity formed in the joint opening by the substrates and sealant backing or bond breaker.

.11 Apply sealant by any of the common types of hand operated guns. Nozzles shall be sized and shaped to fit the intended joint opening width, which will confine the sealant to the joint and aid in building pressure to force the sealant into the joint cavity. Ensure that mixing and placing procedures do not entrain air within the sealant.

.12 Immediately after applying the sealant, tool the bead. Tooling forces material into cavities and into more intimate contact with the substrate. Wet tooling will not be permitted.

.13 The joint is to be tooled as to provide a concave-shaped surface. Specifically, the sealant and concrete are to be flush at the edges but recessed at the joint centre, forming a parabolic arc. Do not re-use any material forced outside of the joint by the tooling procedure.

.14 Sealant installation shall be a full bead free from air pockets and embedded impurities and free from ridges, wrinkles and sags.

.15 Use anti-tack solutions only with the approval and directions of the sealant manufacturer.

3.4 Cleaning

.1 Do not clean inadvertent spills or splatters of sealant on concrete or masonry with solvent because of possible permanent staining of the substrate. Scrape, wipe or scrub such spills with dry tools or rags.

.2 Clean bulk caulking guns, barrel and nozzle completely after every day's use.

.3 The special precautions recommended by the manufacturer shall be rigidly followed where hazardous materials are involved.

END OF SECTION