



THE CITY OF WINNIPEG

BID OPPORTUNITY

BID OPPORTUNITY NO. 348-2006

ASBESTOS REMEDIATION – 700 ASSINIBOINE PARK DRIVE

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PART B - BIDDING PROCEDURES

B1. PROJECT TITLE

B1.1 ASBESTOS REMEDIATION – 700 ASSINIBOINE PARK DRIVE

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, June 13, 2006.

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

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

B3. SITE INVESTIGATION

B3.1 Further to GC:3.1, the Contract Administrator or an authorized representative will be available at the Site from 10:00 a.m. to 11:00 a.m. on June 6, 2006 to provide Bidders access to the Site.

B3.2 The Bidder shall not be entitled to rely on any information or interpretation received at the Site investigation unless that information or interpretation is the Bidder's direct observation, or is provided by the Contract Administrator in writing.

B4. ENQUIRIES

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

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

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

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

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

B5. ADDENDA

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

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

- B5.2.1 Addenda will be available on the Bid Opportunities page at The City of Winnipeg, Corporate Finance, Materials Management Branch 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 Branch internet site for addenda shortly before submitting his Bid.
- B5.3 The Bidder shall acknowledge receipt of each addendum in Paragraph 8 of Form A: Bid. Failure to acknowledge receipt of an addendum may render a Bid non-responsive.

B6. SUBSTITUTES

- B6.1 The Work is based on the Plant, Materials and methods specified in the Bid Opportunity.
- B6.2 Substitutions shall not be allowed unless application has been made to and prior approval has been granted by the Contract Administrator in writing.
- B6.3 Requests for approval of a substitute will not be considered unless received in writing by the Contract Administrator at least five (5) Business Days prior to the Submission Deadline.
- B6.4 The Bidder shall ensure that any and all requests for approval of a substitute:
- (a) provide sufficient information and details to enable the Contract Administrator to determine the acceptability of the Plant, Material or method as either an approved equal or alternative;
 - (b) identify any and all changes required in the applicable Work, and all changes to any other Work, which would become necessary to accommodate the substitute;
 - (c) identify any anticipated cost or time savings that may be associated with the substitute;
 - (d) certify that, in the case of a request for approval as an approved equal, the substitute will fully perform the functions called for by the general design, be of equal or superior substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance;
 - (e) certify that, in the case of a request for approval as an approved alternative, the substitute will adequately perform the functions called for by the general design, be similar in substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance.
- B6.5 The Contract Administrator, after assessing the request for approval of a substitute, may in his sole discretion grant approval for the use of a substitute as an “approved equal” or as an “approved alternative”, or may refuse to grant approval of the substitute.
- B6.6 The Contract Administrator will provide a response in writing, at least two (2) Business Days prior to the Submission Deadline, only to the Bidder who requested approval of the substitute.
- B6.6.1 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 shall base his Total Bid Price upon the specified item but may also indicate an alternative price based upon the approved alternative. Such alternatives will be evaluated in accordance with B14.

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

B7. BID SUBMISSION

B7.1 The Bid Submission consists of the following components:

- (a) Form A: Bid;
- (b) Form B: Prices.

B7.2 The Bid Submission shall be submitted enclosed and sealed in an envelope clearly marked with the Bid Opportunity number and the Bidder's name and address.

B7.2.1 Samples or other components of the Bid Submission which cannot reasonably be enclosed in the envelope may be packaged separately, but shall be clearly marked with the Bid Opportunity number, the Bidder's name and address, and an indication that the contents are part of the Bidder's Bid Submission.

B7.3 Bid Submissions submitted by facsimile transmission (fax) or internet electronic mail (e-mail) will not be accepted.

B7.4 Bid Submissions shall be submitted to:

The City of Winnipeg
Corporate Finance Department
Materials Management Branch
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 10 of Form A: Bid shall be signed in accordance with the following requirements:

- (a) if the Bidder is a sole proprietor carrying on business in his own name, it shall be signed by the Bidder;
- (b) if the Bidder is a partnership, it shall be signed by the partner or partners who have authority to sign for the partnership;
- (c) if the Bidder is a corporation, it shall be signed by its duly authorized officer or officers;
- (d) if the Bidder is carrying on business under a name other than his own, it shall be signed by the registered owner of the business name, or by the registered owner's authorized officials if the owner is a partnership or a corporation.

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

B8.4.2 All signatures shall be original.

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

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;
- (b) be responsible and not be suspended, debarred or in default of any obligation to the City;
- (c) be financially capable of carrying out the terms of the Contract;
- (d) have all the necessary experience, capital, organization, and equipment to perform the Work in strict accordance with the terms and provisions of the Contract;
- (e) have successfully carried out work, similar in nature, scope and value to the Work;
- (f) employ only Subcontractors who:
 - (i) are responsible and not suspended, debarred or in default of any obligation 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 Branch internet site at <http://www.winnipeg.ca/matmgt>); and
 - (ii) have successfully carried out work similar in nature, scope and value to the portion of the Work proposed to be subcontracted to them, and are fully capable of performing the Work required to be done in accordance with the terms of the Contract;
- (g) have a written workplace safety and health program in accordance with The Workplace Safety and Health Act (Manitoba).

B10.2 The Bidder shall be prepared to 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.

B10.3 The Bidder shall provide, on the request of the Contract Administrator, full access to any of the Bidder's equipment and facilities to confirm, to the Contract Administrator's satisfaction, that the Bidder's equipment and facilities are adequate to perform the Work.

B11. OPENING OF BIDS AND RELEASE OF INFORMATION

- B11.1 Bid Submissions will be opened publicly, after the Submission Deadline has elapsed, in the office of the Corporate Finance Department, Materials Management Branch, or in such other office as may be designated by the Manager of Materials.
- B11.1.1 Bidders or their representatives may attend.
- B11.2 After the public opening, the names of the Bidders and their Total Bid Prices as read out (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 Branch internet site at <http://www.winnipeg.ca/matmgt>.
- B11.3 After award of Contract, the name(s) of the successful Bidder(s) and the Contract Amount(s) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Branch internet site at <http://www.winnipeg.ca/matmgt>.
- B11.4 The Bidder is advised that any information contained in any Bid Submission may be released if required by City policy or procedures, by The Freedom of Information and Protection of Privacy Act (Manitoba), by other authorities having jurisdiction, or by law.

B12. IRREVOCABLE BID

- B12.1 The Bid(s) submitted by the Bidder shall be irrevocable for the time period specified in Paragraph 9 of Form A: Bid.
- B12.2 The acceptance by the City of any Bid shall not release the Bids of the next two lowest evaluated responsive Bidders and these Bidders shall be bound by their Bids on such Work for the time period specified in Paragraph 9 of Form A: Bid.

B13. WITHDRAWAL OF BIDS

- B13.1 A Bidder may withdraw his Bid without penalty by giving written notice to the Manager of Materials at any time prior to the Submission Deadline.
- B13.1.1 Notwithstanding GC:23.3, the time and date of receipt of any notice withdrawing a Bid shall be the time and date of receipt as determined by the Manager of Materials.
- B13.1.2 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 10 of Form A: Bid, and only such person, has authority to give notice of withdrawal.
- B13.1.3 If a Bidder gives notice of withdrawal prior to the Submission Deadline, the Manager of Materials shall:
- (a) retain the Bid Submission until after the Submission Deadline has elapsed;
 - (b) open the Bid Submission to identify the contact person named in Paragraph 3 of Form A: Bid and the Bidder's authorized representatives named in Paragraph 10 of Form A: Bid; and
 - (c) if the notice has been given by any one of the persons specified in B13.1.3(b), declare the Bid withdrawn.
- B13.2 A Bidder who withdraws his Bid after the Submission Deadline but before his Bid has been released or has lapsed as provided for in B12.2 shall be liable for such damages as are imposed upon the Bidder by law and subject to such sanctions as the Chief Administrative

Officer considers appropriate in the circumstances. The City, in such event, shall be entitled to all rights and remedies available to it at law.

B14. EVALUATION OF BIDS

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

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

B14.2 Further to B14.1(a), the Award Authority may reject a Bid as being non-responsive if the Bid Submission 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 if the interests of the City so require.

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

B14.4 Further to B14.1(c), the Total Bid Price shall be the lump sum price shown on Form B: Prices.

B14.4.1 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.

B15. AWARD OF CONTRACT

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

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

B15.2.1 Without limiting the generality of B15.2, the City will have no obligation to award a Contract where:

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

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

B15.4 Notwithstanding GC:4, the City will issue a Purchase Order to the successful Bidder in lieu of the execution of a Contract.

B15.5 The Contract, as defined in GC:1.1, in its entirety shall be deemed to be incorporated in and to form a part of the Purchase Order notwithstanding that it is not necessarily attached to or accompany said Purchase Order.

PART C - GENERAL CONDITIONS

C1. GENERAL CONDITIONS

C1.1 The *General Conditions for Construction Contracts* (Revision 2000 11 09) are applicable to the Work of the Contract.

C1.1.1 The *General Conditions for Construction Contracts* are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Branch internet site at <http://www.winnipeg.ca/matmgt>.

PART D - SUPPLEMENTAL CONDITIONS

GENERAL

D1. GENERAL CONDITIONS

- D1.1 In addition to the *General Conditions for Construction Contracts*, these Supplemental Conditions are applicable to the Work of the Contract.
- D1.2 The General Conditions are amended by striking out "The City of Winnipeg Act" wherever it appears in the General Conditions and substituting "The City of Winnipeg Charter".
- D1.3 The General Conditions are amended by striking out "Tender Package" wherever it appears in the General Conditions and substituting "Bid Opportunity".
- D1.4 The General Conditions are amended by striking out "Tender Submission" wherever it appears in the General Conditions and substituting "Bid Submission".
- D1.5 The General Conditions are amended by deleting GC:6.16 and GC:6.17. The City of Winnipeg is now within the jurisdiction of the Manitoba Ombudsman pursuant to The Ombudsman Act.

D2. SCOPE OF WORK

- D2.1 The Work to be done under the Contract shall consist of asbestos remediation.

D3. CONTRACT ADMINISTRATOR

- D3.1 The Contract Administrator is:
Stan Russell
Project Officer
Main Floor, 100 Main Street
Winnipeg, MB R3C 1A4
Telephone No. (204) 986-4368
Facsimile No. (204) 986-7311
- D3.2 At the pre-construction meeting, the Contract Administrator 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 GC:23.2.2, 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 Administrative Officer Secretariat
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
Corporate Services Department
Legal Services Division
185 King Street, 3rd Floor
Winnipeg MB R3B 1J1
Facsimile No.: (204) 947-9155

SUBMISSIONS

D6. INSURANCE

D6.1 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) all inclusive, with The City of Winnipeg being added as an additional insured, with a cross-liability clause, such liability policy to also contain a contractual liability, an unlicensed motor vehicle liability and a products and completed operations endorsement to remain in place at all times during the performance of the Work and throughout the warranty period;
- (b) Coverage for asbestos abatement on an occurrence basis.

D6.2 Deductibles shall be borne by the Contractor.

D6.3 The Contractor shall provide the City Solicitor with a certificate of insurance of each policy, in a form satisfactory to the City Solicitor, at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than seven (7) Calendar Days from notification of the award of Contract.

D6.4 The Contractor shall not cancel, materially alter, or cause each policy to lapse without providing at least fifteen (15) Calendar Days prior written notice to the Contract Administrator.

D7. PERFORMANCE SECURITY

D7.1 If the Contract Price exceeds twenty-five thousand dollars (\$25,000.00), the Contractor shall provide and maintain performance security until the expiration of the warranty period in the form of:

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

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

D7.1.1 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.

D7.2 The Contractor shall provide the City Solicitor with the required performance security within seven (7) Calendar Days of notification of the award of the Contract by way of Purchase Order and prior to the commencement of any Work on the Site.

D8. SUBCONTRACTOR LIST

D8.1 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 seven (7) Calendar Days from notification of the award of Contract.

D9. SECURITY CLEARANCE

D9.1 Each individual proposed to perform Work under the Contract shall be required to obtain a Criminal Record Search Certificate from the police service having jurisdiction at his place of residence.

D9.2 Prior to the commencement of any Work, and during the term of the Contract if additional or replacement individuals are proposed to perform Work, the Contractor shall supply the Contract Administrator with a Criminal Record Search Certificate obtained not earlier than one (1) year prior to the Submission Deadline, or a certified true copy thereof, for each individual proposed to perform Work within City facilities or on private property.

D9.3 Any individual for whom a Criminal Record Search Certificate is not provided, or for whom a Criminal Record Search Certificate indicates any convictions or pending charges related to property offences or crimes against another person, will not be permitted to perform any Work within City facilities or on private property.

D9.4 Any Criminal Record Search Certificate obtained thereby will be deemed valid for the duration of the Contract subject to a repeated records search as hereinafter specified.

D9.5 Notwithstanding the foregoing, at any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require an updated criminal records search. Any individual who fails to provide a satisfactory Criminal Record Search Certificate as a result of a repeated criminal records search will not be permitted to continue to perform Work under the Contract within City facilities or on private property.

D9.6 Any Security Clearance obtained thereby will be deemed valid for the duration of the Contract subject to a repeated Security Clearance Check as hereinafter specified.

D9.7 Notwithstanding the foregoing, at any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require a further Security Clearance Check. Any individual who fails to obtain a satisfactory Security Clearance Check as a result of a repeated

Security Clearance Check will not be permitted to continue to perform Work under the Contract at Winnipeg Police Facilities.

SCHEDULE OF WORK

D10. COMMENCEMENT

- D10.1 The Contractor shall not commence any Work until he is in receipt of a Purchase Order from the Award Authority authorizing the commencement of the Work.
- D10.2 The Contractor shall not commence any Work on the Site until:
- (a) the Contract Administrator has confirmed receipt and approval of:
 - (i) evidence that the Contractor is 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;
 - (ii) evidence of the workers compensation coverage specified in GC:6.14;
 - (iii) evidence of the insurance specified in D6;
 - (iv) the performance security specified in D7;
 - (v) the Subcontractor list specified in D8; and
 - (vi) the security clearances specified in D9.
 - (b) the Contractor has attended a pre-construction meeting with the Contract Administrator, or the Contract Administrator has waived the requirement for a pre-construction meeting.
- D10.3 The Contractor shall commence the Work on the Site within seven (7) Working Days of receipt of the Purchase Order.

D11. TOTAL PERFORMANCE

- D11.1 The Contractor shall achieve Total Performance within ten (10) consecutive Working Days of the commencement of the Work as specified in D10.
- D11.2 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.
- D11.3 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.

D12. LIQUIDATED DAMAGES

- D12.1 If the Contractor fails to achieve Total Performance in accordance with the Contract by the day fixed herein for Total Performance, the Contractor shall pay the City one hundred dollars (\$100) per Working Day for each and every Working Day following the day fixed herein for Total Performance during which such failure continues.
- D12.2 The amount specified for liquidated damages in D12.1 is based on a genuine pre-estimate of the City's losses in the event that the Contractor does not achieve Total Performance by the day fixed herein for same.

D12.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

D13. SCHEDULED MAINTENANCE

CONTROL OF WORK

D14. JOB MEETINGS

D14.1 Regular weekly job meetings will be held at the Site. These meetings shall be attended by a minimum of one representative of the Contract Administrator, one representative of the City and one representative of the Contractor. Each representative shall be a responsible person capable of expressing the position of the Contract Administrator, the City and the Contractor respectively on any matter discussed at the meeting including the Work schedule and the need to make any revisions to the Work schedule. The progress of the Work will be reviewed at each of these meetings.

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

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

D15.1 Further to GC:6.26, the Contractor shall be the Prime Contractor and shall serve as, and have the duties of the Prime Contractor in accordance with The Workplace Safety and Health Act (Manitoba).

WARRANTY

D16. WARRANTY

D16.1 Notwithstanding GC:13.2, the warranty period shall begin on the date of Total Performance and shall expire two (2) years thereafter unless extended pursuant to GC:13.2.1 or GC:13.2.2, in which case it shall expire when provided for thereunder.

D16.2 Notwithstanding GC:13.2 or D16.1, the Contract Administrator may permit the warranty period for a portion or portions of the Work to begin prior to the date of Total Performance if:

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

D16.2.1 In such case, the date specified by the Contract Administrator for the warranty period to begin shall be substituted for the date specified in GC:13.2 for the warranty period to begin.



WINNIPEG POLICE SERVICE SECURITY CLEARANCE CHECK SERVICES – DIVISION 30

NAME OF EMPLOYER:

NATURE OF WORK BEING DONE FOR WINNIPEG POLICE SERVICE:
ASBESTOS REMEDIATION – 700 ASSINIBOINE PARK DRIVE

WARNING: ANY FALSE OR INCOMPLETE INFORMATION MAY RESULT IN REJECTION OF THIS APPLICATION

EMPLOYEE INFORMATION

LAST NAME: _____ GIVEN NAMES: _____

BIRTH NAME OR OTHER NAME(S) USED: _____
(if different from above)

MALE FEMALE DATE OF BIRTH: _____ BIRTH PLACE: _____
Y M D

ADDRESS: _____ CITY: _____ PROVINCE: _____

POSTAL CODE: _____ RESIDENTIAL PHONE: _____

AUTHORIZATION

I, _____ hereby authorize any employer or other person, to whom a duplicate or photocopy of this document is provided, to furnish any information, opinions, reports, records or copies which may be requested by the Winnipeg Police Service, in connection with the undersigned's application for a security check as a person contracted or associated with the Winnipeg Police Service.

I consent to the collection, use, disclosure, transmittal and examination of all information compiled by the Winnipeg Police Service. I agree to waive any right of action against any person or institution providing information or opinions in compliance with this authorization.

Signature of Witness

Signature of Applicant

Date

IDENTIFICATION

The following **MANDATORY IDENTIFICATION** must be presented and visually verified by the Division Clerk or their designate:

Driver's Licence with photo / Birth Certificate / Social Insurance Card

Signature of Division Clerk or Designate of visual verification

Date

PART E - SPECIFICATIONS

GENERAL

E1. APPLICABLE SPECIFICATIONS, STANDARD DETAILS AND DRAWINGS

- E1.1 *The City of Winnipeg Standard Construction Specifications* in its entirety, whether or not specifically listed on Form B: Prices, shall apply to the Work.
- E1.1.1 *The City of Winnipeg Standard Construction Specifications* is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Branch internet site at <http://www.winnipeg.ca/matmgt>.
- E1.1.2 The version in effect three (3) Business Days before the Submission Deadline shall apply.
- E1.1.3 Further to GC:2.4(d), Specifications included in the Bid Opportunity shall govern over *The City of Winnipeg Standard Construction Specifications*.

GENERAL – SECTION 13080

E2. GENERAL REQUIREMENTS

- E2.1 Conform to requirements of this specification. This section is to apply in conjunction with all other sections and drawings listed in this document.

E3. GENERAL AND RELATED WORK SPECIFIED ELSEWHERE:

- E3.1.1 Related Work specified elsewhere:
- | | | |
|-------------|---------------|---------------------------------------|
| Division 13 | Section 13082 | Asbestos Abatement – Type II |
| Division 13 | Section 13083 | Asbestos Abatement – Type III |
| Division 13 | Section 13084 | Asbestos Abatement – Type II Glovebag |

E4. SITE CONDITIONS

- E4.1 The Site conditions identify the location and condition of all known asbestos-containing materials (ACM) to be disturbed by the Work of this contract. This information is provided for reference purposes only and the Contractor must confirm existing conditions within the Work area as a part of this contract.
- E4.2 The Work area will consist of two crawlspace areas and the boiler room, the Maintenance Engineer's office area adjacent to the boiler room, and a 3-storey elevator shaft located in the basement of the building at 700 Assiniboine Park Drive in Winnipeg, Manitoba (the Site).
- E4.3 The City of Winnipeg (the City) has identified the presence of asbestos-containing pipe and pipefitting insulation and mechanical gasket material; and the potential presence of asbestos-containing wall and ceiling plaster and/or filler compound associated with gypsum board walls and ceilings in the Work area.
- E4.4 The City has identified the presence of suspect visible mould growth (SVG) on pipe insulation materials in the two crawlspaces of the Site building.
- E4.5 Every effort has been made by the City to identify known ACMs within the proposed Work area. As a precautionary measure, where material is encountered by the Contractor that is suspected of containing asbestos fibres, the Contractor is to immediately stop Work in the area and notify the Contract Administrator. Do not resume Work in the area until the asbestos content of the material has been determined and the Contract Administrator has granted authorization.

E5. OUTLINE OF WORK

- E5.1 Refer to Sections 13082, 13083, and 13084 of this specification for a specific outline of Work and specified personal protective measures for the safe handling, removal, and clean-up of ACMs. The following Work will be completed using Type II, Type II Glovebag, and Type III asbestos abatement procedures:
- E5.2 Boiler Room:
- (a) Prior to asbestos abatement activities, supply and install a temporary water heater in a location approved by the Contract Administrator. It is anticipated that the water heater will be located in the hallway outside of the boiler room and is to be isolated by appropriate construction hording. The water heater must be of sufficient size to supply domestic hot water to building occupants and to the asbestos decontamination facilities.
 - (b) Remove the carpet present on the boiler room floor.
 - (c) Remove all asbestos-containing pipe and pipefitting insulation using Type III asbestos abatement procedures.
 - (d) Disassemble the boiler tank and associated exhaust pipe. Remove and dispose of all asbestos-containing gasket material and any other suspect ACMs using Type III asbestos abatement procedures. Clean the removed components sufficiently for re-use or for disposal as non-asbestos-contaminated waste as approved by the City. It is anticipated that all cleaned mechanical components shall remain in the boiler room.
 - (e) Remove fiberglass insulation and/or other non-asbestos insulation from pipes, fittings, and air ducts marked by Contract Administrator.
 - (f) Repair/encapsulate damaged or cracked potential asbestos containing ceiling plaster using modified Type II asbestos abatement procedures (similar to precautions specified for Type II Glovebag).
- E5.3 Mechanical Office:
- (a) Remove all asbestos-containing pipe and pipefitting insulation from the mechanical office and adjoining washroom using Type II and/or Type II Glovebag asbestos abatement procedures.
 - (b) Repair/encapsulate damaged or cracked potential asbestos containing ceiling plaster using modified Type II asbestos abatement procedures (similar to precautions specified for Type II Glovebag).
- E5.4 Elevator Shaft:
- (a) Remove asbestos-containing pipefitting insulation identified by the Contract Administrator using Type II Glovebag asbestos abatement procedures.
 - (b) Repair/encapsulate damaged or cracked potential asbestos containing ceiling plaster using modified Type II asbestos abatement procedures (similar to precautions specified for Type II Glovebag).
- E5.5 Crawlspace:
- (a) Remove all asbestos-containing pipe and pipefitting insulation from the two crawlspaces using Type II Glovebag asbestos abatement procedures.
 - (b) Remove all pipe and pipefitting insulation on which SVG has been observed using procedures specified for Type II Glovebag asbestos abatement.
 - (c) Remove all debris, asbestos-containing or otherwise, from the crawlspace.
- E5.6 Do not remove any materials not specifically identified by the Contract Administrator. Where un-specified materials have been removed by the Contractor, the Contractor will be responsible

for the re-installation of the removed materials to the satisfaction of the City, and at no cost to the City.

- E5.7 All Work shall be completed within the time period specified by the City unless otherwise approved by the City.
- E5.8 The Contractor is not responsible for the re-installation of materials removed or disassembled as part of this scope of Work unless otherwise specified by the Contract Administrator.
- E5.9 Determination of quantities, location, and nature of asbestos and other regulated Work activities including, but not limited to, considerations for transportation, disposal, handling and storage of materials, availability of labour, worker and visitor protection, water, electric power, roads, uncertainties of weather or physical conditions at the Site, is the responsibility of the Contractor.
- E5.10 The location of all venting for negative air units will be discussed at the time of the mandatory Contractor walk-through. All venting must be approved by the Contract Administrator.
- E5.11 The use of unused (new) flexible ducting for all negative air unit exhaust is required. No previously used exhaust ducting is to be used on-site.
- E5.12 All work must comply with all Federal, Provincial and local requirements. In the event of conflict between these requirements and the specification document, the more stringent requirement shall apply.
- E5.13 The Contractor is also responsible for the following general requirements:
- (a) Protect all surfaces and items present within the asbestos Work areas that may not be effectively cleaned.
 - (b) Isolate the asbestos Work areas from adjoining occupied and non-occupied areas.
 - (c) At the completion of Work, clean and replace all mechanical and electrical equipment, ducting, building components, materials or other items removed to accommodate asbestos removal unless otherwise specified by the Contract Administrator.
 - (d) Remove and dispose of as asbestos-containing waste, all building components, materials, and items contaminated by asbestos that cannot be effectively cleaned.
 - (e) Conduct final cleaning of the Work area to remove visible signs of asbestos, debris, or settled dust.
 - (f) Apply approved sealer (lock-down agent) to all surfaces within the Work area including those surfaces from which any ACMs had been removed.
 - (g) Unless otherwise specified, the handling, removal, and cleanup of asbestos-containing or contaminated materials is to be performed following wet techniques.

E6. SCHEDULE

- E6.1 The Contractor is to submit a proposed schedule showing the phasing and proposed Work force related to each Work area for approval by the City. Asbestos removal must not delay the performance of other trades.
- E6.2 Prior to any on-site activities, the Contractor shall submit a proposed schedule showing phasing and proposed Workforce related to each Work area enclosure or repair operation.

GENERAL – SECTION 13082 TYPE II

E7. GENERAL REQUIREMENTS

E7.1 Conform to requirements of this specification.

E8. RELATED WORK SPECIFIED ELSEWHERE:

E8.1 Refer to accompanying Section 13080, Asbestos Abatement – E3.

E9. DESCRIPTION OF WORK

E9.1 Supply all labour, material, and equipment necessary to safely execute and complete all Work of this section while in conjunction with Work specified, required, or implied under Section 13080, Asbestos Abatement – General.

E9.2 Prepare and isolate the asbestos Work area from adjoining occupied and unoccupied areas as specified in E16 of this section.

E9.3 Construct worker and waste decontamination facilities at the perimeter of the Work area as specified in E18 and E19 of this section.

E9.4 Allow for access to security and other alarm panels at all times.

E9.5 Pre-clean and protect all surfaces and equipment that are to remain within the asbestos Work area.

E9.6 Contractor to ensure Work area is secure.

E9.7 All asbestos removal will be completed using Type II procedures as specified in E21 of this section.

E9.8 Asbestos handling, removal, and cleanup will be performed using wet techniques.

E9.9 Shut off electrical power and provide battery powered emergency lighting and ground fault interrupter circuits for power source for electrical tools in accordance with applicable CSA standard prior to applying water to asbestos-containing materials.

E9.10 All friable asbestos abatement Work will be performed using Full Face Powered Air Purifying Respirators, protective clothing, and worker protection procedures outlined in E15 of this section.

E9.11 The Contractor shall assume that all Work is to be performed during quiet times such as non-regular business hours or when the area is unoccupied as determined by the Contract Administrator.

E9.12 After preparation of the Work areas and decontamination facilities, the Contractor shall remove, clean and turn over to the City, all re-usable mechanical equipment, electrical equipment and building components that may interfere with the asbestos removal and associated clean-up. The removal of such materials is at the discretion of the Contract Administrator.

E9.13 All re-usable mechanical equipment, electrical equipment and building components that can not be removed, shall be pre-cleaned and protected from damage and contamination.

E9.14 After preparation of the Work areas and decontamination facilities, remove dust and debris from any equipment that is to remain within the asbestos Work area during the abatement Work including but not limited to sump pits and associated components, floor drains, electrical

- equipment, etc. Pre-clean settled dust using a wet cloth and/or HEPA equipped vacuum cleaner.
- E9.15 Seal off any equipment that is to remain within the asbestos Work area during the abatement Work, including but not limited to sump pits and associated components, floor drains, electrical equipment, etc., using two (2) layers of rip-proof polyethylene sheeting sealed with tape and/or with polyurethane foam as appropriate.
- E9.16 Remove any non-asbestos-containing debris and rubble present throughout the Work area that cannot be practically segregated from asbestos-containing or asbestos-contaminated materials.
- E9.17 After preparation of the Work areas and decontamination facilities, remove and dispose of all materials specified under Section 13080, Asbestos Abatement – General and/or as identified by the Contract Administrator. Asbestos-containing materials shall be removed using Type II procedures as specified in E21 of this section.
- E9.18 Do not remove any materials not specifically identified by the Contract Administrator. Where un-specified materials have been removed by the Contractor, the Contractor will be responsible for the re-installation of the removed materials to the satisfaction of the City, and at no cost to the City.
- E9.19 Clean all surfaces from which asbestos has been removed to remove all visible material.
- E9.20 Remove and dispose of all asbestos-containing and suspect asbestos-containing debris and rubble present throughout the Work area.
- E9.21 Clean settled dust from all accessible surfaces using a wet cloth and/or HEPA equipped vacuum cleaner.
- E9.22 Conduct final cleaning of the specified asbestos Work area.
- E9.23 Apply a heavy coat of encapsulant to the exposed ends of asbestos-containing material that is to remain.
- E9.24 On approval of the Contract Administrator, seal all surfaces from which asbestos has been removed and surfaces potentially contaminated with asbestos with an approved sealer (lock-down agent).
- E9.25 Any contamination of surrounding areas, indicated by visual inspection or air monitoring, shall necessitate the enclosure of these areas and complete cleanup of affected areas in same manner as that applicable to asbestos Work areas, at no cost to City.
- E9.26 Contractor will be responsible for the general upkeep of the Site. Workers and trades will use designated washrooms only. Designated washrooms must be kept clean at all times. All other facilities will be off limits.
- E9.27 All containment structures, such as hoardings, platforms, etc., that are used to segregate the Work area are to remain in place until directed by the Contract Administrator.
- E9.28 When directed by the Contract Administrator, decommission all containment and decontamination structures and re-establish all objects and systems as specified in E24, E25 and E26 of this section.
- E9.29 All asbestos-containing or contaminated materials removed shall be transported and disposed of as specified in E26 of this section.

E10. DEFINITIONS

- E10.1 **Airlock:** 2 curtained doorways spaced minimum of 2 m (6') apart.
- E10.2 **Asbestos-Containing Material:** Materials identified under Section 13080, E4 Site Conditions and/or the Contractor Scope of Work document, including fallen materials and settled dust.
- E10.3 **Asbestos-Contaminated Waste:** Materials identified under Section 13080, E4 Site Conditions and/or the Contractor Scope of Work document that have been removed as specified under Section 13083, including fallen materials, debris, rubble, and settled dust, and materials and/or equipment deemed to be contaminated under this specification and/or by the Contract Administrator.
- E10.4 **Asbestos Work Area(s):** Area(s) where Work takes place which will or may disturb asbestos-containing material, including fallen material or settled dust that may contain asbestos.
- E10.5 **Authorized Visitor(s):** Contract Administrator or person(s) representing regulatory agencies, and person(s) authorized by them.
- E10.6 **Curtained Doorway:** Device to allow ingress or egress from enclosure while permitting minimal air movement, typically constructed by placing 2 overlapping flaps of polyethylene sheeting (2 sheets of polyethylene per flap) attached to head and 1 jamb of existing or temporarily constructed door frame. Secure vertical edge of 1 flap along 1 vertical side of door frame, and vertical edge of other flap along opposite vertical side of door frame. Reinforce free edges of polyethylene with duct tape.
- E10.7 **DOP Test:** A testing method used to determine the integrity of the negative pressure unit using dioctyl phthalate (DOP) HEPA filter leak test.
- E10.8 **Fitting:** Individual segments of a mechanical service line which may include hangers, tees, elbows, joints, valves, unions, etc.
- E10.9 **Friable Material:** Material that when dry can be crumbled, pulverized or powdered by hand pressure and includes such material that is crumbled, pulverized or powdered.
- E10.10 **HEPA Filter:** High Efficiency Particulate Aerosol filter at least 99.97 percent efficient in collecting 0.3 micrometer aerosol.
- E10.11 **Negative Pressure:** Reduced pressure within asbestos Work area(s) established by extracting air directly from Work area, and discharging directly to exterior of building. Discharged air first passes through HEPA filter. Extract sufficient air to ensure constant reduced pressure at perimeter of Work area with respect to surrounding areas. Air volume extracted should be sufficient to provide four (4) air changes per hour and maintain a reduced pressure of 5 Pascals (0.02 inches water column) within the Work area in relation to the surrounding areas.
- E10.12 **Occupied Area:** Any area of the Site building or Work Site that is outside the Work area.

E11. REGULATIONS AND GUIDELINES

- E11.1 Comply with applicable Building Codes, Electrical, Fire and Construction Safety Codes as well as Federal, Provincial, and local requirements pertaining to asbestos provided that in any case of conflict among these requirements or with these specifications the more stringent requirement shall apply. Work shall be performed under regulations in effect at the time Work is performed.
- E11.2 Manitoba Workplace Safety and Health Act, Chapter W210, Workplace Health Hazard Regulation (MR 53/88).

- E11.3 Manitoba Workplace Safety and Health Act, Chapter W210, Fibrosis and Silicosis Regulation (MR 100/88R).
- E11.4 Manitoba Environment Act, Chapter E125, Waste Disposal Grounds Regulation (MR 100/88R) as it pertains to asbestos.
- E11.5 Provincial Guidelines associated with MR53/88 and MR 100/88R which relate to asbestos.
- E11.6 The Contractor shall ensure that:
- (a) Measures and procedures prescribed under the Occupational Health & Safety Act and regulations are carried out.
 - (b) Every employee and every worker under their control complies with applicable Acts and Regulations.
 - (c) Health and Safety of workers and public are protected.
 - (d) Policies and procedures of the City are complied with including Site specific procedures.
 - (e) All material handling and associated equipment conform to and are operated in accordance with "Workplace Hazardous Materials Information System" (WHMIS).
 - (f) Notify sanitary landfill Site as per local and Provincial requirements.
- E11.7 The Contractor may be requested to provide information on their health & safety record.
- E11.8 Laws of Province of Manitoba shall govern this Work. The Contractor shall observe all such laws and shall obtain and/or pay all permits, notices, fees, taxes, duties as may be required. Likewise, it is the responsibility of the Contractor to comply with Worker's Compensation and Workplace Safety and Health Acts.

E12. QUALITY ASSURANCE

- E12.1 Ensure Work proceeds to schedule and meets all requirements of this section. Perform Work so airborne asbestos or asbestos wastewater run-off does not contaminate areas outside asbestos Work enclosure.
- E12.2 Any contamination of surrounding areas, indicated by visual inspection or air monitoring, shall necessitate the enclosure of these areas and complete cleanup of affected areas in same manner as that applicable to asbestos Work areas, at no cost to City. The Contract Administrator shall be notified as soon as possible following such an occurrence and informed of the measures being implemented to correct the situation.
- E12.3 Pay cost to City of inspection and air monitoring performed as result of failure to perform Work satisfactorily.
- E12.4 Use only skilled and qualified workers for all trades required for this Work.

E13. SUBMITTALS

- E13.1 The Contractor shall ensure that the following has been submitted to the Contract Administrator at least five (5) days prior to commencing Work:
- (a) Obtain and submit all necessary permits for transporting and disposal of asbestos waste.
 - (b) Names of supervisory personnel who will be responsible for asbestos Work area(s).
 - (c) Proof that supervisory personnel have attended a training course on asbestos control (2 day minimum duration) and have performed supervisory function on at least 2 other asbestos control projects of similar nature.

- (d) Satisfactory proof that every worker has had instruction and training in the hazards of asbestos exposure, in personal hygiene and Work practices, and in the use, cleaning, and disposal of respirators and protective clothing.
- (e) A proposed schedule showing phasing and proposed workforce related to each Work area enclosure or repair operation.
- (f) A plan showing the proposed locations of all hoarding walls, decontamination enclosure systems, tunnels, and negative air unit venting locations for approval by the Contract Administrator.
- (g) Negative air unit performance data and results of DOP test as required.
- (h) List of existing damage for acceptance.
- (i) Documentation for materials used in the course of the project including MSDS sheets or other data documenting compliance with specifications for such materials as, but not limited to sealants, encapsulants, wetting agents, and polyethylene sheeting.
- (j) Before commencing any Work, Contractor shall submit, in writing, confirmation of good standing with Worker's Compensation Board of Manitoba.
- (k) Waste manifest forms on a weekly basis and at the completion of the project.
- (l) Prepare and provide a copy of the Contractor's Site specific Health and Safety Plan to the Contract Administrator.
- (m) Provide a written emergency access/egress plan for the Work area for approval by the Contract Administrator.

E14. SUPERVISION

- E14.1 A minimum of one (1) supervisor is required for every ten (10) workers unless otherwise approved by the Contract Administrator.
- E14.2 An approved supervisor must remain within the asbestos Work area at all times during the disturbance, removal, or other handling of asbestos-containing materials.
- E14.3 Site supervision must only be replaced by approved replacement on approval by the Contract Administrator. The City reserves the right to request the replacement of the supervisor without explanation.

E15. WORKER AND VISITOR PROTECTION

- E15.1 **Instructions:** Before entering asbestos Work area(s), instruct workers and visitors in use of respirators (including fit testing), entry and exit from enclosures and all aspects of Work procedures and protective measures including appropriate asbestos awareness and/or abatement training. A competent person, as defined by Workplace Safety and Health Act, shall provide instruction.
- E15.2 **Respirators:** Provide appropriate respiratory equipment for all persons entering asbestos Work area enclosure including authorized visitors. During wet removal and clean-up in enclosed asbestos Work area workers, supervisors, and authorized visitors shall wear, as a minimum, powered air-purifying full-face respirator (PAPR) with P-100 filter cartridges in accordance with NIOSH Part 84 requirements (formerly high efficiency particulate aerosol (HEPA) cartridge filters). When air sampling has shown that airborne fibre levels are consistently less than 1 fibres/mL, and on written approval by the Contract Administrator, non-powered half-face respirators with minimum P100 filter cartridges may be used. Filters shall be replaced daily or tested according to manufacturer's specifications and replaced as necessary. All waste filters shall be disposed of as asbestos waste. Respirators shall be acceptable to the Workplace Safety and Health Branch of Manitoba Labour and Immigration. Provide instruction to workers

and visitors in use of respirators including qualitative fit testing. No supervisor, worker or authorized visitor shall wear facial hair which may affect the seal between the respirator and face. Maintain respiratory protection equipment in proper functioning and clean condition.

- E15.3 **Protective Clothing:** Provide workers and visitors in full-enclosure asbestos Work area with new full body coveralls with integral hoods. Once coveralls are worn in the asbestos Work area, treat and dispose of as asbestos contaminated waste. Workers and visitors shall also wear other protective apparel required by Manitoba Labour and Immigration construction regulations. Footwear shall be of a suitable type that will prevent fibre penetration and able to be wet wiped.
- E15.4 At no time shall the Contractor use existing furnishings or mechanical equipment (including piping) to support personal.
- E15.5 Before entering full-enclosure asbestos Work area(s), don appropriate respirator with new or tested filters, clean coveralls and head covers.
- E15.6 To leave the asbestos Work area(s), all persons shall:
- (a) HEPA vacuum or wet wipe clothing and respirator prior to leaving the asbestos Work area.
 - (b) Enter the Staging Area, remove contaminated coveralls, and place in receptacles for disposal with other asbestos-contaminated materials.
 - (c) Still wearing appropriate respirator, proceed to the Clean Room or designated wash area.
 - (d) Using soap and warm water wash and remove respirator then thoroughly wash hands and face.
- E15.7 Do not eat, drink, smoke or chew gum or tobacco in enclosures.
- E15.8 Workers and visitors shall be protected at all times when a possibility of asbestos disturbance exists.
- E15.9 A copy of the procedures described under E15: Worker and Visitor Protection shall be posted at access points to the asbestos Work area.
- E15.10 Maintain one emergency access kit equipped with a respirator, protective clothing, etc. and post emergency access procedures at the decontamination facility access point to the asbestos Work area for use by City or authorized visitors.

PRODUCTS

E16. MATERIALS

- E16.1 **Amended Water:** Water with wetting agent added.
- E16.2 **Asbestos Waste Receptors:** Two separate containers of which at least one shall consist of 0.15 mm (6 mil) minimum thickness sealable polyethylene bag. Other container may be 0.15 (6 mil) minimum thickness polyethylene bag. Other container shall be adequate to prevent perforating rips, or tears during filling, transport or disposal. Containers must be acceptable to disposal Site selected and Ministry of Environment, and shall have a pre-printed cautionary asbestos warning in both official languages, clearly visible when ready for removal to the disposal Site. As per the following:
- CAUTION CONTAINS ASBESTOS FIBRES (25 mm high)
Do Not Mishandle (19 mm high).
- E16.3 **Encapsulant:** Standard of acceptance - Ocean No. 666, Ocean Fire Retardants Inc., , coloured blue unless another colour is specified by City.

- E16.4 **Flexible ducting:** Unused (new) metal reinforced flexible ductwork, 12" diameter minimum.
- E16.5 **Ground Fault Panel:** Portable electrical panel equipped with ground fault circuit interrupters (5 mA protection) of sufficient capacity to power all electrical equipment and lights in asbestos Work enclosure. Panel complete with ground fault interrupter lights, test switch to ensure unit is working, and reset switch. To be installed by a licensed technician.
- E16.6 **HEPA Vacuum:** Vacuum with all necessary fittings, tools and attachments. Air must pass HEPA filter before discharge.
- E16.7 **Negative Air Unit:** Portable air handling system, which extracts air directly from asbestos Work area and discharges air outside building. Unit shall be fitted with pre-filter and HEPA final filter. Air shall pass HEPA filter before discharge. Unit shall have pressure differential gauge to monitor filter loading. Unit shall have auto shut-off and warning system for HEPA filter failure. HEPA filter shall have separate hold down clamps to retain filter in place.
- E16.8 **Polyethylene Sheeting:** 0.15 mm (6 mil) minimum thickness unless otherwise specified; with tape seals along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide continuous polyethylene membrane protection. Sheet size shall be such to minimize joints.
- E16.9 **Power Sprayer:** Standard of acceptance - Graco Maxi-wetter.
- E16.10 **Protective Coveralls:** Disposable full body coveralls complete with elasticized hoods and cuffs made of spun polyolefin material Tyvek by Dupont or non-woven material Kleenguard by Kimberley Clark . All coveralls must be rated for asbestos abatement applications by the manufacturer.
- E16.11 **Rip-Proof Polyethylene:** 0.20 mm (8 mil) fabric made up from 0.13 mm (5 mil) weave and 2 layers 0.04 mm (1.5 mil) poly laminate, in sheet size to minimize joints.
- E16.12 **Sealer (Lock down agent):** Sealer for purpose of trapping residual fibre debris. Product must have flame spread and smoke development ratings both less than 25. Product shall leave no stain when dry: TC-55 (clear), A/D Fire Protection Systems Inc., Scarborough, Ontario. For mechanical equipment, pipes, boilers, etc. use high temperature sealer only: Chil-Abate CP210, Childers Products Company, Mississauga, Ontario.
- E16.13 **Sprayer:** Garden-type portable manual sprayer, low velocity, capable of producing mist or fine spray.
- E16.14 **Tape:** Tape suitable for sealing polyethylene to surface encountered under both wet conditions using amended water, and dry conditions. Standard of acceptance – Nashua 300 polyethylene coated cloth tape, Tyco Adhesives.
- E16.15 **Wetting Agent:** Non-foaming surface active agent; mixed with water in concentration to provide thorough wetting of asbestos fibre: Standard of Acceptance, Asbesto-Wet, distributed by Asbetec Distributors.

PREPARATION

E17. CLEAN SITE PREPARATION FOR FULL-ENCLOSURE ASBESTOS WORK AREAS

- E17.1 Clean and remove equipment, tools, furnishings, and stored materials that can be moved without disturbing asbestos-containing materials.

- E17.2 Erect appropriate worker and waste decontamination facilities at locations approved by the Contract Administrator.
- E17.3 Erect hoarding walls where required and complete other isolation measures between asbestos Work area and occupied areas. Where required, the hoarding walls shall be constructed as follows:
Build walls of 39 mm x 89 mm (2" x 4") wood framing, 400 mm (16") o.c. with continuous top and sill plates. Cover both side walls with polyethylene sheeting. Walls exposed to non-construction occupied areas shall be covered with good one side 9 mm (1/2 ") plywood unless stipulated by City or Contract Administrator. The exposed surface of the plywood shall be painted (minimum 2 coats) with colour of paint to be determined by City.
- E17.4 All wall and horizontal surfaces shall be pre-cleaned using damp cloth or sponge techniques prior to placement of polyethylene sheeting to any wall or floor surfaces. HEPA equipped vacuum cleaners may also be used to perform this task.
- E17.5 If necessary, caulk and seal ducts and duct shafts within Work area which are to remain in service, as required, to make airtight. Cut and cap supply ducts with rigid sheet metal caps and seal. Seal joints and holes in HVAC ductwork to remain operational through an asbestos Work area, using tape and rip-proof polyethylene to make airtight. Perform Work at appropriate time under contaminated conditions if necessary.
- E17.6 Seal off all openings including but not limited to doorways, hatch openings, windows, vents, service holes in walls and grilles to non-operating ducts with two (2) layers of rip-proof polyethylene sheeting sealed with tape or with polyurethane foam as appropriate.
- E17.7 Pre-clean and cover with polyethylene sheeting all items that are to remain within the enclosure during the abatement Work including but not limited to motors, heating units, fire apparatus, door closers, fans, tanks, benches, shelving, storage racks, valves, taps, controllers, lights, and other fixtures and furnishings within enclosure. Clean previously contaminated surfaces with HEPA vacuum before covering with sheeting.
- E17.8 Install plywood enclosures, covered with rip-proof polyethylene, to protect equipment or fixtures in asbestos Work area(s) that may be damaged.
- E17.9 If required, cover existing wall and floor surfaces with polyethylene sheeting sealed with tape. Provide two separately sealed layers of polyethylene sheeting. Separately seal floor drains or openings. Use sufficient layers (2) and necessary sheathing for walking surface to protect floors which may be damaged. Cover floors first so that polyethylene extends at least 300 mm (12") up walls then cover walls to overlap floor sheeting. Provide additional protection for floors likely to be damaged by amended water by covering floor with rip-proof polyethylene sheeting sealed with tape.
- E17.10 Establish negative pressure in asbestos Work area as described in E16.7 and E10.11. Negative pressure units shall have total rated capacity with filters in place sufficient to provide a minimum of four air changes every hour. Volume of air shall be sufficient to ensure airflow is maintained from clean areas into asbestos Work area.
- E17.11 Vent units to outside of building. Locate vents to discharge air away from building access points or sidewalks. Discharge vents a minimum of 5 m away from building entrances, open windows or air intakes. Do not discharge air into building interior. The location of venting must be approved by the Contract Administrator and will be discussed at the time of the mandatory pre-bid Contractor walk-through.

- E17.12 If requested, leak test negative air units prior to commencement of abatement at operating position, using DOP method. Provide reports for unit efficiency test results within 48 hours of testing, including calibration certificates for testing equipment.
- E17.13 Operate negative pressure units continuously from this time until completion of final air monitoring. Replace pre-filters as necessary to maintain airflow. Maintain negative air pressure of 5 Pascals (0.02 inches water column) pressure reduction within asbestos enclosure with respect to surrounding areas.
- E17.14 Maintain emergency and fire exits from asbestos Work area, or establish alternative exits satisfactory to authorities having jurisdiction.
- E17.15 Ensure existing power supply to asbestos Work area is isolated and disconnected where necessary. Do not disrupt power supply to remaining areas of building. Provide ground fault electrical system. A minimum of one (1) ground fault electrical panel shall be provided for every 300m² of asbestos Work area. Supply all electrical apparatus from this ground fault system. Ensure safe installation of electrical lines and equipment.
- E17.16 Provide temporary lighting in asbestos Work area to levels that will permit Work to be done safely.
- E17.17 Provide fire extinguisher at each emergency exit, and in decontamination facilities. Protect extinguishers with polyethylene sheeting in manner that will not hamper emergency use. Existing on-site extinguishers may not be used without prior approval of the City.

E18. DECONTAMINATION ENCLOSURE SYSTEM

- E18.1 Where required, construct worker and waste decontamination facilities at entrance to each asbestos Work area as approved by the Contract Administrator. Decontamination Facility shall be comprised of a minimum one room which serves as an air lock as described below. Where requested by the Contract Administrator, a two room decontamination facility may be constructed.
- E18.2 Provide a set of curtain doorways between each room, and at both dirty and clean entrances to enclosure systems.
- E18.3 **Access Room / Container Cleaning Room:** When requested, build or establish an Access Room / Container Cleaning Room between asbestos Work enclosure and Clean Room. Room shall be of sufficient size to accommodate largest item of equipment used and/or two (2) waste containers. Access Room / Container Cleaning Room is to be used for gross removal of dust and debris from waste containers and equipment, labelling and sealing of waste containers, and temporary storage pending removal, as well as changing out of protective clothing and storage of contaminated protective clothing and equipment. Minimum size of room is to be 1.5 square metres with a minimum height of 1.9 m.
- E18.4 **Staging Area:** When a separate Access Room / Container Cleaning Room has not been constructed, the area within the Type II containment closest to the entranceway shall be considered the Staging Area. The Staging Area shall be used for gross removal of dust and debris from waste containers and equipment, labelling and sealing of waste containers, and temporary storage pending removal.
- E18.5 **Clean Room:** Build Clean Room to be used as change room (to and from street clothes) with washing facilities for hands and face. Install waste receptor, and storage facilities for worker's shoes and any protective clothing to be re-worn in asbestos Work areas. Clean Room shall be large enough to accommodate at least one worker and allow sufficient space to undress comfortably. Room shall also be of sufficient size to accommodate largest item of equipment

used and/or two (2) waste containers. Minimum size of room is to be 1.5 square metres with a minimum height of 1.9 m.

- E18.6 Where a separate clean room is not required, a designated wash-up area must be provided within the Work area. The wash-up area must be supplied with a waste receptor, wash basin and storage facilities for worker's shoes and any protective clothing to be re-worn in asbestos Work areas.

E19. CONSTRUCTION OF DECONTAMINATION ENCLOSURES (WHERE REQUIRED)

- E19.1 **Floor:** Prior to erecting wall framing, lay one (1) sheet of rip-proof polyethylene sheeting over floor area to be covered by enclosures. The floor sheeting should extend at least 600 mm (24") beyond the outside perimeter of the planned enclosure on all sides. After the construction of the enclosure walls, wrap the excess floor sheeting up the outside of the enclosure, overlapping the polyethylene sheeting covering perimeter walls. Provide second layer of rip-proof polyethylene to all floors, extending 600 mm up inside of enclosure walls.
- E19.2 **Walls:** Build load-bearing walls of 39 mm x 89 mm (2" x 4") wood framing, 400 mm (16") o.c. with continuous top and sill plates. Cover both sides of walls with polyethylene sheeting. Walls exposed to asbestos Work area shall be covered with min. 9 mm (3/8") plywood sheeting or hardboard. Caulk seal and tape plywood joints and cover with one (1) layer of polyethylene sheeting. Walls exposed to occupied area shall be covered with good one side 9 mm plywood.
- E19.3 **Roof:** Size of joists shall be determined by span, loads, use and Code. Use as a minimum 39 mm x 138 mm (2" x 6") joists. Cover joists with 19 mm (3/4") plywood sheeting and seal and tape joints. Cover with two (2) layers of rip-proof polyethylene, overlapping the perimeter walls by at least 600 mm (24"). Wrap the excess sheeting over the polyethylene sheeting covering perimeter walls. At underside of joists install one (1) layer of polyethylene sheeting.
- E19.4 **Doorways:** Build curtain doorways designed so that when workers or drums and equipment move through doorway, one (1) of two (2) barriers comprising doorway always remains closed.

E20. MAINTENANCE OF ENCLOSURES

- E20.1 Maintain enclosures in tidy condition. Thoroughly clean decontamination facilities at the end of each Work shift and, if required, replace dust control mats as specified.
- E20.2 Ensure barriers and polyethylene linings are effectively sealed and taped. Repair damaged barriers and remedy defects immediately upon discovery.
- E20.3 Visually inspect enclosures at beginning and end of each working period.
- E20.4 Use smoke methods to test the effectiveness of the isolation barriers when directed by the Contract Administrator.

E21. EXECUTION

- E21.1 Do Not Commence Asbestos Removal Work Until:
- (a) Arrangements have been made for disposal of waste.
 - (b) Asbestos Work areas and decontamination enclosures are effectively segregated.
 - (c) Negative pressure equipment is operating continuously.
 - (d) Tools, equipment and waste materials receptors are on hand.
 - (e) Arrangements have been made with the Contract Administrator for Work area security.

- (f) Signs are displayed in areas where access to sealed asbestos Work area is possible.
Signs shall read:

CAUTION (25 mm high)

Asbestos Hazard Area (19 mm high)

Unauthorized Entry Prohibited (19 mm high)

Wear Assigned Protective Equipment (19 mm high)

Breathing Asbestos Dust May Cause Serious Bodily Harm (19 mm high).

- E21.2 The Contract Administrator has been notified of intention to proceed, has reviewed enclosures, equipment, procedures, and other submitted materials, and has granted authorization to proceed.

E22. CONTAMINATED SITE PREPARATION FOR FULL-ENCLOSURE ASBESTOS WORK AREA

- E22.1 Before performing any contaminated Work, prepare Site as previously described.
- E22.2 Request that building personnel shut off air handling and ventilation systems supplying or exhausting from the asbestos Work area enclosure(s). Ensure air-handling systems remain shut off for duration of Work.
- E22.3 Seal holes or penetrations to provide airtight enclosure around asbestos Work area(s).
- E22.4 Protect electrical, communication, life safety and control systems to remain in place in asbestos Work area with polyethylene and tape.

E23. ASBESTOS-CONTAINING MATERIAL REMOVAL

- E23.1 Before removing asbestos, prepare Site as described previously.
- E23.2 All individuals involved with any portions of the removal process shall be equipped with appropriate respirators and protective equipment while working within the enclosure.
- E23.3 Repeatedly mist the air throughout the performance of this Work and maintain all surfaces within the asbestos Work area in a damp state.
- E23.4 Spray asbestos-containing materials with amended water using airless spray equipment. Saturate asbestos to prevent release of airborne fibres during removal.
- E23.5 Remove the saturated asbestos-containing material in small sections and place directly into waste containers. Do not allow saturated asbestos to dry out or fall to the floor. As it is being removed, pack the material in sealable plastic bags 6-mil minimum thickness and place in labelled containers for transport.
- E23.6 If asbestos debris falls to the floor, spray asbestos debris on floor with amended water to prevent it from drying out and immediately remove from the floor and put in waste containers.
- E23.7 Seal filled containers, clean external surfaces thoroughly, and remove from working area to staging area.
- E23.8 After completion of removal of asbestos-containing materials, clean surfaces from which asbestos has been removed with stiff bristle brushes, vacuum, or wet-sponge (as appropriate) to remove all visible material.
- E23.9 Remove asbestos waste containers and decontaminated equipment and materials from the asbestos Work area through the decontamination enclosure as follows:

- (a) In the Staging Area, remove gross contamination from the surface of the item to be removed. The item shall then be cleaned, wet wiped, and double bagged and/or sealed in polyethylene prior to transferring to a second worker present in the Clean Room. Wash water shall be treated as asbestos-contaminated waste.
- (b) The worker present in the Clean Room shall transfer the clean items outside the waste decontamination enclosure. Workers present in the Work enclosure must not leave the asbestos Work area until decontaminating as specified in E15.6 of this section.
- (c) Treat all removed materials exposed to asbestos, as asbestos-contaminated waste unless such materials can be properly decontaminated and are specified to be re-used.

E23.10 After removing all visible asbestos, wet clean entire Work area including but not limited to pipes, pipefittings, ducts, and similar items not covered with polyethylene sheeting and request visual inspection and acceptance.

E23.11 Following inspection and acceptance, apply heavy coat of slow drying sealer to all surfaces from which asbestos has been removed. Apply thinned coat (sufficient to coat all surfaces) to interior of polyethylene enclosure. Allow a minimum of 12 hours with no disturbance of asbestos Work area. Operate negative air units during this period.

DECOMMISSIONING

E24. DISMANTLING OF PROTECTION

- E24.1 If air sampling by The Contract Administrator shows that levels in asbestos Work area do not exceed the action level of 0.05 fibres/mL, as determined by NIOSH 7400 Analytical Method, A Counting Rules, and when approved in writing by the Contract Administrator, proceed with final dismantling of decontamination and Work enclosures as follows:
- E24.2 Remove polyethylene sheeting exposed during contaminated Work including upper surfaces plus any underlying sheeting contaminated by water leaks, rips, tears, or exposed by failure of upper layer. Wear appropriate respirator and disposable coveralls during removal of sheeting. Carefully roll sheeting away from walls to centre of asbestos Work area. As sheeting is rolled away from walls and corners, HEPA vacuum visible debris.
- E24.3 While removing top layer of sheeting from surfaces protected by two (2) layers of sheeting, cut lower sheeting so as to expose horizontal surfaces that may be contaminated with asbestos debris. HEPA vacuum any visible debris.
- E24.4 Place polyethylene sheeting, seals, tape, cleaning material, clothing, and other contaminated waste in asbestos waste receptors for transport. Remove with HEPA vacuum any debris which may have fallen behind sheeting.
- E24.5 Seal all openings of asbestos abatement equipment which may be contaminated with asbestos fibres which cannot be effectively cleaned and remove equipment from Site. Such equipment shall include negative air units, flexible ducting and HEPA vacuums.
- E24.6 Remove hoardings, temporary lighting, equipment and facilities provided for Work.
- E24.7 Complete final general cleaning of worksite and ensure no dust and debris remain.
- E24.8 The Contract Administrator will conduct Site inspections and air monitoring for all Type II asbestos Work as specified in E27 and E28 of this section.

E25. RE-ESTABLISHMENT OF OBJECTS AND SYSTEMS

- E25.1 Reconstruct items demolished (if required) that are to remain and reinstall objects and items in their proper positions, which were removed to facilitate asbestos removal operation. Reconstruction and reinstallation shall be by tradesmen qualified in Work being reinstalled or reconstructed.
- E25.2 Re-establish mechanical and electrical systems in proper working order. Arrange for, and pay costs of, electrical or mechanical repairs needed due to this Work.
- E25.3 Make good all damage at completion of Work not identified in pre-removal survey.

E26. WASTE TRANSPORT AND DISPOSAL

- E26.1 Asbestos-containing or contaminated materials removed shall be treated, packaged, transported and disposed of as asbestos-contaminated waste.
- E26.2 Conform to all Provincial and local requirements for transporting and disposal of hazardous waste.
- E26.3 Check with local landfill operator to determine type of waste containers acceptable.
- E26.4 Ensure shipment of containers to landfill is by a waste hauler licensed by the Province of Manitoba to transport asbestos waste.
- E26.5 Transportation of all waste and materials through occupied areas shall be covered or placed within unmarked carts and must never be left unattended. Clean-up waste route and loading area after each load. Use asbestos abatement precautions if appropriate or requested by the Contract Administrator.
- E26.6 All asbestos waste must be removed from the Work area at the end of each Work shift unless approved by the Contract Administrator.
- E26.7 Each load requires completion of bill of lading showing type and weight of hazardous waste being transported. Provide proof (copies of all waste manifests) of proper disposal of asbestos material to the Contract Administrator on a weekly basis (at a minimum) and on completion of the project.
- E26.8 Co-operate with Manitoba Conservation inspectors and immediately carry out instructions for remedial Work at landfill to maintain environment, at no additional cost to the City.
- E26.9 Ensure landfill operator is fully aware of hazardous material being dumped.
- E26.10 Ensure that containers used for dumping are locked and covered at all times.

INSPECTION AND AIR MONITORING

E27. INSPECTION

- E27.1 Site inspections and air monitoring may be conducted for all Type II asbestos Work.
- E27.2 From commencement of Work until completion of clean-up operations, the Contract Administrator is empowered by the City to inspect for compliance with the requirements of the governing authorities, adherence to specifications and to inspect for cleanliness and completion both inside and outside asbestos Work area(s).

- E27.3 The Contract Administrator may periodically inspect both inside and outside the Work area during active abatement.
- E27.4 The Contract Administrator is empowered to shut-down all Work activities when leakage of asbestos from the Work area has occurred or is likely to occur.
- E27.5 The Contractor is to allow inspection by the Contract Administrator and provide full access to the Work area. The Contractor shall make good on any Work disturbed by the inspection at no cost to the City.
- E27.6 If asbestos Work area(s) or adjacent areas are found unacceptable in accordance with standards specified or required by authorities having jurisdiction, correct such deficiencies at no cost to the City.
- E27.7 Pay cost to provide re-inspection of Work found not to be in accordance with these specifications and requirements of authorities having jurisdiction.
- E27.8 Provide a minimum of 24 hours written notice to the Contract Administrator of any request for scheduling milestone inspections or transportation of asbestos water through an occupied area.
- E27.9 The following milestone inspections will be performed by the Contract Administrator throughout the course of this project:
- (a) Preparation/Pre-Abatement Inspection: The Contract Administrator will inspect all project and Site preparations completed as specified in E17 to E22 of this section prior to the commencement of any contaminated Work. Upon successful completion of the specified preparation activities as determined by the Contract Administrator, and on approval of the Contract Administrator, the Contractor will be cleared to begin contaminated Work. Contaminated Work shall not commence until such approval has been obtained.
 - (i) The Contract Administrator will complete a Preparation/Pre-Abatement Inspection Report noting any deficiencies or additional Work required prior to beginning contaminated Work. Copies of the report will be forwarded to the City and the Contractor.
 - (b) Pre-final Visual Clearance Inspection: The Contract Administrator will perform an inspection of the Work area after completion of all asbestos abatement Work but prior to the application of the lock-down agent to assess the successful completion of all activities required by the project specifications. Upon successful completion of the abatement Work as determined by the Contract Administrator, the Contractor will be cleared to apply the lock-down agent on approval of the Contract Administrator.
 - (i) The Contract Administrator will complete a Pre-final Visual Clearance Inspection Report noting any deficiencies or additional Work required prior to applying the lock-down agent. Copies of the report will be forwarded to the City and the Contractor.
 - (c) Final Clearance Inspection and Air Monitoring: The Contract Administrator will perform a Final Clearance Inspection a minimum 12 hours following the application of the lock-down agent as specified in E23.11 of this section, to assess adherence to these specifications and to inspect for cleanliness and completion both inside and outside asbestos Work area(s). The inspection will include the collection of clearance air samples. If clearance air sample results are acceptable as specified in E28 of this section, and on approval of the Contract Administrator, the Contractor will be cleared to begin decommissioning activities specified in E24, E25, and E26 of this section.
 - (i) The Contract Administrator will complete a Final Clearance Inspection Report noting the clearance air sample results and any deficiencies or additional Work required prior to decommissioning activities. The report will also include a list of any Site specific tear down requirement and a list of any observed damages caused by the abatement activities. Copies of the report will be forwarded to the City and the Contractor.

- (d) Final Dismantling Inspection: If deemed necessary by the Contract Administrator, an inspection may be performed after the removal of hoarding, perimeter seals and decontamination facility from the asbestos Work area.

E27.10 Do not proceed with next phase of Work until written approval of each inspection is received from the Contract Administrator.

E28. AIR MONITORING

- E28.1 Air sampling may be periodically performed within and immediately adjacent to each active asbestos Work area. Results obtained from all test monitoring shall be posted at the Work Site and provided to the City and the Contractor.
- E28.2 All air samples will be collected in accordance with NIOSH Analytical Method 7400.
- E28.3 If air monitoring or visual inspection indicates that areas outside current asbestos Work area enclosures are contaminated above the designated action level of 0.05 fibres/mL, the Contractor is to clean these areas in same manner as that applicable to asbestos Work areas, at no cost to City.
- E28.4 If air monitoring in Work areas shows that removal procedures are not sufficient to maintain airborne fibre levels below 2.5 fibres/ml, all Work is to stop within the Work area and removal procedures re-assessed.
- E28.5 If air sampling by Contract Administrator show that levels in asbestos Work area do not exceed the action level of 0.05 fibres/mL, as determined by NIOSH 7400 Analytical Method (A Counting Rules), proceed with dismantling of asbestos Work area on approval by the Contract Administrator.
- E28.6 The air clearance concentration shall not exceed the designated action level of 0.05 fibres/mL.

GENERAL – SECTION 13083 (PIPE INSULATION) TYPE III

E29. GENERAL REQUIREMENTS

E29.1 Conform to requirements of this specification.

E30. RELATED WORK SPECIFIED ELSEWHERE:

E30.1 Refer to accompanying Section 13080, Asbestos Abatement – General: E3.

E31. DESCRIPTION OF WORK

- E31.1 Supply all labour, material, and equipment necessary to safely execute and complete all Work of this section while in conjunction with Work specified, required, or implied under Section 13080, Asbestos Abatement – General.
- E31.2 Supply and install a temporary water heater in a location approved by the Contract Administrator. It is anticipated that the water heater will be located in the hallway outside of the boiler room and is to be isolated by appropriate construction hording. The water heater must be of sufficient size to supply domestic hot water to building occupants and to the asbestos decontamination facilities.
- E31.3 Prepare and isolate the asbestos Work area from adjoining occupied and unoccupied areas as specified in E39 of this section.

- E31.4 Construct worker decontamination facilities at the perimeter of the Work area as specified in E40 and E42 of this section.
- E31.5 Construct waste decontamination facilities at the perimeter of the Work area as specified in E41 and E42 of this section.
- E31.6 Allow for access to security and other alarm panels at all times.
- E31.7 Pre-clean and protect all surfaces and equipment that are to remain within the asbestos Work area.
- E31.8 Contractor to ensure Work area is secure.
- E31.9 All asbestos removal will be completed using Type III procedures as specified in E44 of this section.
- E31.10 Asbestos handling, removal, and cleanup will be performed using wet techniques.
- E31.11 Shut off electrical power and provide battery powered emergency lighting and ground fault interrupter circuits as the power source for electrical tools in accordance with applicable CSA standard prior to applying water to asbestos-containing materials.
- E31.12 All friable asbestos abatement Work will be performed using Full Face Air Purifying Respirators, protective clothing, and worker protection procedures outlined in E37 of this section.
- E31.13 The Contractor shall assume that all Work is to be performed during quiet times such as non-regular business hours or when the area is unoccupied as determined by the Contract Administrator.
- E31.14 After preparation of the Work areas and decontamination enclosures, the Contractor shall remove, clean and turn over to the City, all re-usable mechanical equipment, electrical equipment and building components that may interfere with the asbestos removal and associated clean-up. The removal of such materials is at the discretion of the Contract Administrator.
- E31.15 All re-usable mechanical equipment, electrical equipment and building components that can not be removed, shall be pre-cleaned and protected from damage and contamination.
- E31.16 After preparation of the Work areas and decontamination facilities, remove dust and debris from any equipment that is to remain within the asbestos Work area during the abatement Work including but not limited to sump pits and associated components, floor drains, electrical equipment, etc. Pre-clean settled dust using a wet cloth and/or HEPA equipped vacuum cleaner.
- E31.17 Seal off any equipment that is to remain within the asbestos Work area during the abatement Work, including but not limited to sump pits and associated components, floor drains, electrical equipment, etc., using two (2) layers of rip-proof polyethylene sheeting sealed with tape and/or with polyurethane foam as appropriate.
- E31.18 Remove any non-asbestos-containing debris and rubble present throughout the Work area that cannot be practically segregated from asbestos-containing or asbestos-contaminated materials as asbestos waste.
- E31.19 After preparation of the Work areas and decontamination facilities, remove and dispose of all materials specified under Section 13080, Asbestos Abatement – General and/or as identified by the Contract Administrator. All asbestos-containing materials shall be removed using Type III procedures as specified in E44 of this section.

- E31.20 Do not remove any materials not specifically identified by the Contract Administrator. Where un-specified materials have been removed by the Contractor, the Contractor will be responsible for the re-installation of the removed materials to the satisfaction of the City, and at no cost to the City.
- E31.21 Clean all surfaces from which asbestos has been removed to remove all visible material.
- E31.22 Remove and dispose of all asbestos-containing and suspect asbestos-containing debris and rubble present throughout the Work area.
- E31.23 Clean settled dust from all accessible surfaces using a wet cloth and/or HEPA equipped vacuum cleaner.
- E31.24 Conduct final cleaning of the specified asbestos Work area.
- E31.25 Apply a heavy coat of encapsulant to the exposed ends of asbestos-containing insulation that is to remain.
- E31.26 On approval of the Contract Administrator, seal all surfaces from which asbestos has been removed and surfaces potentially contaminated with asbestos with an approved sealer (lock-down agent).
- E31.27 All Work will be subject to inspection and air monitoring inside and outside asbestos Work area by the Contract Administrator. Any contamination of surrounding areas, indicated by visual inspection or air monitoring, shall necessitate the enclosure of these areas and complete cleanup of affected areas in same manner as that applicable to asbestos Work areas, at no cost to City.
- E31.28 Contractor will be responsible for the general upkeep of the Site. Workers and trades will use designated washrooms only. Designated washrooms must be kept clean at all times. All other facilities will be off limits.
- E31.29 All containment structures, such as hoardings, platforms, etc., that are used to segregate the Work area are to remain in place until directed by the Contract Administrator.
- E31.30 When directed by the Contract Administrator, decommission all containment and decontamination structures and re-establish all objects and systems as specified in E47, E48 and E49 of this section.
- E31.31 All asbestos-containing or contaminated materials removed shall be transported and disposed of as specified in E49 of this section.

E32. DEFINITIONS

- E32.1 **Airlock:** 2 curtained doorways spaced minimum of 2 m (6') apart.
- E32.2 **Asbestos-Containing Material:** Materials identified under Section 13080, E4 Site Conditions, including fallen materials and settled dust.
- E32.3 **Asbestos-Contaminated Waste:** Materials identified under Section 13080, E4 Site Conditions that have been removed as specified under Section 13083, including fallen materials, debris, rubble, and settled dust, and materials and/or equipment deemed to be contaminated under this specification and/or by the Contract Administrator.
- E32.4 **Asbestos Work Area(s):** Area(s) where Work takes place which will or may disturb asbestos-containing material, including fallen material or settled dust that may contain asbestos.

- E32.5 **Authorized Visitor(s):** Contract Administrator or person(s) representing regulatory agencies, and person(s) authorized by them.
- E32.6 **Curtained Doorway:** Device to allow ingress or egress from enclosure while permitting minimal air movement, typically constructed by placing 2 overlapping flaps of polyethylene sheeting (2 sheets of polyethylene per flap) attached to head and 1 jamb of existing or temporarily constructed door frame. Secure vertical edge of 1 flap along 1 vertical side of door frame, and vertical edge of other flap along opposite vertical side of door frame. Reinforce free edges of polyethylene with duct tape.
- E32.7 **DOP Test:** A testing method used to determine the integrity of the negative pressure unit using dioctyl phthalate (DOP) HEPA filter leak test.
- E32.8 **Fitting:** Individual segments of a mechanical service line which may include hangers, tees, elbows, joints, valves, unions, etc.
- E32.9 **Friable Material:** Material that when dry can be crumbled, pulverized or powdered by hand pressure and includes such material that is crumbled, pulverized or powdered.
- E32.10 **HEPA Filter:** High Efficiency Particulate Aerosol filter at least 99.97 percent efficient in collecting 0.3 micrometer aerosol.
- E32.11 **Negative Pressure:** Reduced pressure within asbestos Work area(s) established by extracting air directly from Work area, and discharging directly to exterior of building. Discharged air first passes through HEPA filter. Extract sufficient air to ensure constant reduced pressure at perimeter of Work area with respect to surrounding areas. Air volume extracted should be sufficient to provide four (4) air changes per hour and maintain a reduced pressure of 5 Pascals (0.02 inches water column) within the Work area in relation to the surrounding areas.
- E32.12 **Occupied Area:** Any area of the Site building or Work Site that is outside the Work area.

E33. REGULATIONS AND GUIDELINES

- E33.1 Comply with applicable Building Codes, Electrical, Fire and Construction Safety Codes as well as Federal, Provincial, and local requirements pertaining to asbestos provided that in any case of conflict among these requirements or with these specifications the more stringent requirement shall apply. Work shall be performed under regulations in effect at the time Work is performed.
- E33.2 Manitoba Workplace Safety and Health Act, Chapter W210, Workplace Health Hazard Regulation (MR 53/88).
- E33.3 Manitoba Workplace Safety and Health Act, Chapter W210, Fibrosis and Silicosis Regulation (MR 100/88R).
- E33.4 Manitoba Environment Act, Chapter E125, Waste Disposal Grounds Regulation (MR 100/88R) as it pertains to asbestos.
- E33.5 Provincial Guidelines associated with MR53/88 and MR 100/88R which relate to asbestos.
- E33.6 The Contractor shall ensure that:
- (a) Measures and procedures prescribed under the Occupational Health & Safety Act and regulations are carried out.
 - (b) Every employee and every worker under their control complies with applicable Acts and Regulations.
 - (c) Health and Safety of workers and public are protected.

- (d) Policies and procedures of the City are complied with including Site specific procedures.
- (e) All material handling and associated equipment conform to and are operated in accordance with "Workplace Hazardous Materials Information System" (WHMIS).
- (f) Not later than ten days before commencing asbestos Work on this project, notify in writing, the local office of Manitoba Labour and Immigration, Workplace Safety and Health Division, that hazardous asbestos Work will be completed at the Site. Notify orally before commencing Work.
- (g) Notify sanitary landfill Site as per local and Provincial requirements.

E33.7 The Contractor may be requested to provide information on their health & safety record.

E33.8 Laws of Province of Manitoba shall govern this Work. The Contractor shall observe all such laws and shall obtain and/or pay all permits, notices, fees, taxes, duties as may be required. Likewise, it is the responsibility of the Contractor to comply with Worker's Compensation and Workplace Safety and Health Acts.

E34. QUALITY ASSURANCE

E34.1 Ensure Work proceeds to schedule and meets all requirements of this section. Perform Work so airborne asbestos or asbestos wastewater run-off does not contaminate areas outside asbestos Work enclosure.

E34.2 Any contamination of surrounding areas, indicated by visual inspection or air monitoring, shall necessitate the enclosure of these areas and complete cleanup of affected areas in same manner as that applicable to asbestos Work areas, at no cost to City. The Contract Administrator shall be notified as soon as possible following such an occurrence and informed of the measures being implemented to correct the situation.

E34.3 Pay cost to City of inspection and air monitoring performed as result of failure to perform Work satisfactorily.

E34.4 Use only skilled and qualified workers for all trades required for this Work.

E35. SUBMITTALS

E35.1 The Contractor shall ensure that the following has been submitted to the Contract Administrator at least five (5) days prior to commencing Work:

- (a) Obtain and submit all necessary permits for transporting and disposal of asbestos waste.
- (b) Names of supervisory personnel who will be responsible for asbestos Work area(s).
- (c) Proof that supervisory personnel have attended a training course on asbestos control (2 day minimum duration) and have performed supervisory function on at least 2 other asbestos control projects of similar nature.
- (d) Satisfactory proof that every Worker has had instruction and training in the hazards of asbestos exposure, in personal hygiene and Work practices, and in the use, cleaning, and disposal of respirators and protective clothing.
- (e) A proposed schedule showing phasing and proposed Workforce related to each Work area enclosure or repair operation.
- (f) A plan showing the proposed locations of all hoarding walls, decontamination enclosure systems, tunnels, and negative air unit venting locations for approval by the Contract Administrator.
- (g) Negative air unit performance data and results of DOP test as required.

- (h) List of existing damage for acceptance.
- (i) Documentation for materials used in the course of the project including MSDS sheets or other data documenting compliance with specifications for such materials as, but not limited to sealants, encapsulants, wetting agents, and polyethylene sheeting.
- (j) Before commencing any Work, Contractor shall submit, in writing, confirmation of good standing with Worker's Compensation Board of Manitoba.
- (k) Waste manifest forms on a weekly basis and at the completion of the project.
- (l) Prepare and provide a copy of the Contractor's Site specific Health and Safety Plan to the Contract Administrator.
- (m) Provide a written emergency access/egress plan for the Work area for approval by the Contract Administrator.

E36. SUPERVISION

- E36.1 A minimum of one (1) supervisor is required for every ten (10) workers unless otherwise approved by the Contract Administrator.
- E36.2 An approved supervisor must remain within the asbestos Work area at all times during the disturbance, removal or other handling of asbestos-containing materials.
- E36.3 Site supervision must only be replaced by approved replacement on approval by the Contract Administrator. The City reserves the right to request the replacement of the supervisor without explanation.

E37. WORKER AND VISITOR PROTECTION

- E37.1 **Instructions:** Before entering asbestos Work area(s), instruct workers and visitors in use of respirators (including fit testing), entry and exit from enclosures and all aspects of Work procedures and protective measures including appropriate asbestos awareness and/or abatement training. A competent person, as defined by Workplace Safety and Health Act, shall provide instruction.
- E37.2 **Respirators:** Provide appropriate respiratory equipment for all persons entering asbestos Work area enclosure including authorized visitors. During wet removal and clean-up in enclosed asbestos Work area workers, supervisors, and authorized visitors shall wear, as a minimum, powered air-purifying full-face respirator (PAPR) with P-100 filter cartridges in accordance with NIOSH Part 84 requirements (formerly high efficiency particulate aerosol (HEPA) cartridge filters). Use of other types of respiratory protection can only be used on written approval by the Contract Administrator. Filters shall be replaced daily or tested according to manufacturer's specifications and replaced as necessary. All waste filters shall be disposed of as asbestos waste. Respirators shall be acceptable to the Workplace Safety and Health Branch of Manitoba Labour and Immigration. Provide instruction to workers and visitors in use of respirators including qualitative fit testing. No supervisor, worker or authorized visitor shall wear facial hair which may affect the seal between the respirator and face. Maintain respiratory protection equipment in proper functioning and clean condition.
- E37.3 **Protective Clothing:** Provide workers and visitors in full-enclosure asbestos Work area with new full body coveralls with integral hoods. Once coveralls are worn in the asbestos Work area, treat and dispose of as asbestos contaminated waste. Workers and visitors shall also wear other protective apparel required by Manitoba Labour and Immigration construction regulations. Footwear shall be of a suitable type that will prevent fibre penetration and able to be wet wiped.
- E37.4 At no time shall the Contractor use existing furnishings or mechanical equipment (including piping) to support personal.

- E37.5 Before entering full-enclosure asbestos Work area(s), remove street clothes in clean change room and don appropriate respirator with new or tested filters, new disposable coveralls and head covers before entering equipment and access areas or asbestos Work area. Store street clothes, uncontaminated footwear, towels etc. in clean change room.
- E37.6 Persons leaving full-enclosure asbestos Work area(s) shall remove gross contamination from clothing before leaving asbestos Work area. Proceed to equipment and access room and remove all clothing except respirator. Place contaminated Work suit in receptacles for disposal with other asbestos contaminated materials. Footwear, clothing, hardhats, protective eyewear, etc., shall be left in equipment and access room to dry for later use. Still wearing appropriate respirator, proceed naked to showers. Clean respirator to ensure that visible contamination is removed. After having thoroughly washed hair and body with shampoo and soap, remove respirator. Remove filters and dispose of as asbestos waste in container provided for this purpose or test filters according to manufacturer's recommendation. Dispose of filters as necessary. Wet clean inside of respirator. Upon completion of asbestos abatement, dispose of footwear as contaminated waste or clean before removing from equipment and access room, or carry in sealed plastic bag to next Site.
- E37.7 Following showering, proceed to clean room, dry off and dress in street clothes. Store respirators in such a fashion to allow them to be put on prior to entering asbestos Work area at start of next shift without contaminating clean area. If re-entry to asbestos Work area is to take place, follow procedures in E37.5.
- E37.8 Removal of waste and equipment from holding room of waste decontamination enclosure system shall be performed as per E46.9 of this section. No worker shall use this system as means to leave or enter asbestos Work area.
- E37.9 Do not eat, drink, smoke or chew gum or tobacco in enclosures.
- E37.10 Workers and visitors shall be protected at all times when a possibility of asbestos disturbance exists.
- E37.11 A copy of the procedures described under E37: Worker and Visitor Protection shall be posted at access points to the asbestos Work area.
- E37.12 Maintain one emergency access kit equipped with a respirator, protective clothing, etc. and post emergency access procedures at the decontamination chamber access point to the asbestos Work area for use by City or authorized visitors. The emergency access respirator shall be a PAPR Full Face Respirator during hours of active asbestos abatement Work and, at a minimum, a half face respirator with minimum P100 filter cartridges after shift-end when active abatement is not being conducted.

PRODUCTS

E38. MATERIALS

- E38.1 **Amended Water:** Water with wetting agent added.
- E38.2 **Asbestos Waste Receptors:** Two separate containers of which at least one shall consist of 0.15 mm (6 mil) minimum thickness sealable polyethylene bag. Other container may be 0.15 (6 mil) minimum thickness polyethylene bag. Other container shall be adequate to prevent perforating rips, or tears during filling, transport or disposal. Containers must be acceptable to disposal Site selected and Ministry of Environment, and shall have a pre-printed cautionary asbestos warning in both official languages, clearly visible when ready for removal to the disposal Site. As per the following:

CAUTION CONTAINS ASBESTOS FIBRES (25 mm high)

Do Not Mishandle (19 mm high).

- E38.3 **Encapsulant:** Standard of acceptance - Ocean No. 666, Ocean Fire Retardants Inc., coloured blue unless another colour is specified by City.
- E38.4 **Flexible ducting:** Unused (new) metal reinforced flexible ductwork, 12" diameter minimum.
- E38.5 **Ground Fault Panel:** Portable electrical panel equipped with ground fault circuit interrupters (5 mA protection) of sufficient capacity to power all electrical equipment and lights in asbestos Work enclosure. Panel complete with ground fault interrupter lights, test switch to ensure unit is working, and reset switch. Installed by licensed technician.
- E38.6 **HEPA Vacuum:** Vacuum with all necessary fittings, tools and attachments. Air must pass HEPA filter before discharge.
- E38.7 **Negative Air Unit:** Portable air handling system, which extracts air directly from asbestos Work area and discharges air outside building. Unit shall be fitted with pre-filter and HEPA final filter. Air shall pass HEPA filter before discharge. Unit shall have pressure differential gauge to monitor filter loading. Unit shall have auto shut-off and warning system for HEPA filter failure. HEPA filter shall have separate hold down clamps to retain filter in place.
- E38.8 **Polyethylene Sheeting:** 0.15 mm (6 mil) minimum thickness unless otherwise specified; with tape seals along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide continuous polyethylene membrane protection. Sheet size shall be such to minimize joints.
- E38.9 **Power Sprayer:** Standard of acceptance - Graco Maxi-wetter.
- E38.10 **Protective Coveralls:** Disposable full body coveralls complete with elasticized hoods and cuffs made of spun polyolefin material Tyvek by Dupont or non-woven material Kleenguard by Kimberley Clark . All coveralls must be rated for asbestos abatement applications by the manufacturer.
- E38.11 **Rip-Proof Polyethylene:** 0.20 mm (8 mil) fabric made up from 0.13 mm (5 mil) weave and 2 layers 0.04 mm (1.5 mil) poly laminate, in sheet size to minimize joints.
- E38.12 **Sealer (Lock down agent):** Sealer for purpose of trapping residual fibre debris. Product must have flame spread and smoke development ratings both less than 25. Product shall leave no stain when dry: TC-55 (clear), A/D Fire Protection Systems Inc., Scarborough, Ontario. For mechanical equipment, pipes, boilers, etc. use high temperature sealer only: Chil-Abate CP210 , Childers Products Company, Mississauga, Ontario.
- E38.13 **Sprayer:** Garden-type portable manual sprayer, low velocity, capable of producing mist or fine spray.
- E38.14 **Tape:** Tape suitable for sealing polyethylene to surface encountered under both wet conditions using amended water, and dry conditions. Standard of acceptance – Nashua 300 polyethylene coated cloth tape, Tyco Adhesives.
- E38.15 **Wetting Agent:** Non-foaming surface active agent; mixed with water in concentration to provide thorough wetting of asbestos fibre: Standard of Acceptance, Asbesto-Wet, distributed by Asbetec Distributors.

PREPARATION

E39. CLEAN SITE PREPARATION FOR FULL-ENCLOSURE ASBESTOS WORK AREAS

- E39.1 Clean and remove equipment, tools, furnishings, and stored materials that can be moved without disturbing asbestos-containing materials.
- E39.2 Complete isolation measures between the asbestos Work area and occupied areas. If required, erect hoarding walls and complete other isolation measures between asbestos Work area and occupied areas. The hoarding walls shall be constructed as follows:
- (a) Build walls of 39 mm x 89 mm (2" x 4") wood framing, 400 mm (16") o.c. with continuous top and sill plates. Cover both side walls with polyethylene sheeting. Walls exposed to non-construction occupied areas shall be covered with good one side 9 mm (1/2 ") plywood unless stipulated by City or Contract Administrator. The exposed surface of the plywood shall be painted (minimum 2 coats) with colour of paint to be determined by City.
- E39.3 Erect worker and waste decontamination enclosures at locations approved by the Contract Administrator.
- E39.4 All wall and horizontal surfaces shall be pre-cleaned using damp cloth or sponge techniques prior to placement of polyethylene sheeting to any wall or floor surfaces. HEPA equipped vacuum cleaners may also be used to perform this task.
- E39.5 If necessary, caulk and seal ducts and duct shafts within Work area which are to remain in service, as required, to make airtight. Cut and cap supply ducts with rigid sheet metal caps and seal. Seal joints and holes in HVAC ductwork to remain operational through an asbestos Work area, using tape and rip-proof polyethylene to make airtight. Perform Work at appropriate time under contaminated conditions if necessary.
- E39.6 Seal off all openings including but not limited to doorways, hatch openings, windows, vents, service holes in walls and grilles to non-operating ducts with two (2) layers of rip-proof polyethylene sheeting sealed with tape or with polyurethane foam as appropriate.
- E39.7 Pre-clean and cover with polyethylene sheeting all items that are to remain within the enclosure during the abatement Work including but not limited to motors, heating units, fire apparatus, door closers, fans, tanks, benches, shelving, storage racks, valves, taps, controllers, lights, and other fixtures and furnishings within enclosure. Clean previously contaminated surfaces with HEPA vacuum before covering with sheeting.
- E39.8 Install plywood enclosures, covered with rip-proof polyethylene, to protect equipment or fixtures in asbestos Work area(s) that may be damaged.
- E39.9 Pre-clean wall and floor surfaces of all asbestos and asbestos contaminated debris, rubble, and dust present within the Work area using a HEPA filtered vacuum or by wet wiping.
- E39.10 If required, pre-clean and cover existing wall and floor surfaces with polyethylene sheeting sealed with tape. Provide two separately sealed layers of polyethylene sheeting. Separately seal floor drains or openings. Use sufficient layers (2) and necessary sheathing for walking surface to protect floors which may be damaged. Cover floors first so that polyethylene extends at least 300 mm (12") up walls then cover walls to overlap floor sheeting. Provide additional protection for floors likely to be damaged by amended water by covering floor with rip-proof polyethylene sheeting sealed with tape.
- E39.11 Establish negative pressure in asbestos Work area as described in E38.7 and E32.11. Negative pressure units shall have total rated capacity with filters in place sufficient to provide a minimum of four air changes every hour. Volume of air shall be sufficient to ensure airflow is maintained from clean areas into asbestos Work area.

- E39.12 Vent units to outside of building. Locate vents to discharge air away from building access points or sidewalks. Discharge vents a minimum of 5 m away from building entrances, open windows or air intakes. Do not discharge air into building interior. The location of venting must be approved by the Contract Administrator and will be discussed at the mandatory pre-bid Contractor walk-through.
- E39.13 If requested, leak test negative air units prior to commencement of abatement at operating position, using DOP method. Provide reports for unit efficiency test results within 48 hours of testing, including calibration certificates for testing equipment.
- E39.14 Operate negative pressure units continuously from this time until completion of final air monitoring. Replace pre-filters as necessary to maintain airflow. Maintain negative air pressure of 5 Pascals (0.02 inches water column) pressure reduction within asbestos enclosure with respect to surrounding areas.
- E39.15 Maintain emergency and fire exits from asbestos Work area, or establish alternative exits satisfactory to authorities having jurisdiction.
- E39.16 Ensure existing power supply to asbestos Work area is isolated and disconnected where necessary. Do not disrupt power supply to remaining areas of building. Provide ground fault electrical system where application of amended water is required for wetting asbestos-containing materials. A minimum of one (1) ground fault electrical panel shall be provided for every 300 m² of asbestos Work area. Supply all electrical apparatus from this ground fault system. Ensure safe installation of electrical lines and equipment.
- E39.17 Provide temporary lighting in asbestos Work area to levels that will permit Work to be done safely.
- E39.18 Provide fire extinguisher at each emergency exit, and in decontamination facilities. Protect extinguishers with polyethylene sheeting in manner that will not hamper emergency use. Existing on-site extinguishers may not be used without prior approval of the City.

E40. WORKERS' DECONTAMINATION ENCLOSURE SYSTEM

- E40.1 Construct workers' decontamination enclosure at entrance to each asbestos Work area as approved by the Contract Administrator. Worker decontamination enclosure system shall be comprised of three interconnecting rooms (chambers) as described below.
- E40.2 Provide a set of curtain doorways between each room, and at both dirty and clean entrances to enclosure systems.
- E40.3 **Equipment and Access Room:** Build room between shower room and asbestos Work area. Install waste receptor, and storage facilities for worker's shoes and any protective clothing to be re-worn in asbestos Work areas. Equipment and access room shall be large enough to accommodate specified facilities and other equipment needed, and at least one worker allowing sufficient space to undress comfortably. Minimum size 3 square metres with a minimum height of 1.9 m.
- E40.4 **Shower Room:** Build room between clean room and equipment and access room of suitable size (minimum height 1.9 m) and install one (1) shower for every five (5) workers. Provide constant separate supplies of hot and cold water capable of maintaining a water temperature of between 40 and 50 °C. Provide valves controllable at shower(s) to regulate water temperature. Provide rigid piping with watertight connections and connect to water sources and drains. Provide soap, clean towels and appropriate containers for disposal of used respirator filters. Direct wastewater to sanitary sewer drains. When requested or where required by Provincial or Municipal law, direct wastewater to sewer via water filtering system consisting of a minimum 2-stage filtering system (25-micron and 5-micron filters) or other approved means of filtering.

E40.5 **Clean Room:** Build room between shower room and clean areas outside of enclosures with a minimum height of 1.9 m. At doorway to clean room, provide vented wood door, with locking passage set. Provide hangers for workers' street clothes and personal belongings. Provide storage for clean protective clothing and respiratory equipment. Install water heater, if required. If requested by City or Contract Administrator, dust control ('sticky') floor mats shall be placed outside the clean room and replaced a minimum of once every two (2) shifts (or more often if required).

E41. WASTE AND EQUIPMENT DECONTAMINATION ENCLOSURE SYSTEM

E41.1 Construct system comprised of three linked rooms: Purpose of this system is to provide means to decontaminate drums, scaffolding, material containers, vacuum and spray equipment; and other tools and equipment for which worker decontamination system is not suitable.

E41.2 Provide curtain doorways between rooms and at both dirty and clean entrances to the Enclosure System.

E41.3 **Staging Area:** Establish a staging area within the asbestos Work area for gross removal of dust and debris from waste containers and equipment and temporary storage pending removal to container cleaning room. Minimum size of 3 square metres.

E41.4 **Container Cleaning Room:** Build container cleaning room between the Staging Area and Holding Room. Room shall be of sufficient size to allow proper washing or otherwise decontaminating equipment, drums and other waste containers and double bagging and labelling of asbestos waste. Treat wash water as asbestos contaminated waste. Minimum size of 1.5 square metres with a minimum height of 1.9 m.

E41.5 **Holding Room:** Build Holding Room between Container Cleaning Room and Transfer Room. Room shall be of sufficient size to accommodate largest item of equipment used and two (2) rigid waste containers or five (5) waste bags. Minimum size of 1.5 square metres with a minimum height of 1.9 m.

E41.6 **Transfer Room:** Build Transfer Room between Holding Room and uncontaminated area. At doorway to holding room, provide vented wood door, with locking passage set or other means of security. Keys must be provided to City and Contract Administrator. Minimum size of 1.5 square metres with a minimum height of 1.9 m. If requested, dust control ('sticky') floor mats shall be placed outside the holding room and replaced a minimum of once every two (2) shifts (or more often if required).

E42. CONSTRUCTION OF DECONTAMINATION ENCLOSURES

E42.1 **Floor:** Prior to erecting wall framing, lay one (1) sheet of rip-proof polyethylene sheeting over floor area to be covered by enclosures. The floor sheeting should extend at least 600 mm (24") beyond the outside perimeter of the planned enclosure on all sides. After the construction of the enclosure walls, wrap the excess floor sheeting up the outside of the enclosure, overlapping the polyethylene sheeting covering perimeter walls. Provide second layer of rip-proof polyethylene to all floors, extending 600 mm up inside of enclosure walls.

E42.2 **Walls:** Build load-bearing walls of 39 mm x 89 mm (2" x 4") wood framing, 400 mm (16") o.c. with continuous top and sill plates. Cover both sides of walls with polyethylene sheeting with caulk sealed and taped joints or seams. If requested, the exterior of walls exposed to occupied area shall be covered with min. 9 mm (3/8") plywood sheeting or hardboard and painted or otherwise finished to meet the City's requirements.

E42.3 **Roof:** Size of joists shall be determined by span, loads, use and Code. Use as a minimum 39 mm x 138 mm (2" x 6") joists. Cover joists with 19 mm (3/4") plywood sheeting and seal and

tape joints. Cover with two (2) layers of rip-proof polyethylene, overlapping the perimeter walls by at least 600 mm (24"). Wrap the excess sheeting over the polyethylene sheeting covering perimeter walls. At underside of joists install one (1) layer of polyethylene sheeting.

E42.4 **Doorways:** Build curtain doorways designed so that when workers or drums and equipment move through doorway, one (1) of two (2) barriers comprising doorway always remains closed.

E43. MAINTENANCE OF ENCLOSURES

E43.1 Maintain enclosures in tidy condition. Thoroughly clean decontamination facilities at the end of each Work shift and, if required, replace dust control mats as specified.

E43.2 Ensure barriers and polyethylene linings are effectively sealed and taped. Repair damaged barriers and remedy defects immediately upon discovery.

E43.3 Visually inspect enclosures at beginning and end of each working period.

E43.4 Use smoke methods to test the effectiveness of the isolation barriers when directed by the Contract Administrator.

E44. EXECUTION

E44.1 Do Not Commence Asbestos Removal Work Until:

- (a) Arrangements have been made for disposal of waste.
- (b) Asbestos Work areas and decontamination enclosures are effectively segregated.
- (c) Negative pressure equipment is operating continuously.
- (d) Tools, equipment and waste materials receptors are on hand.
- (e) Arrangements have been made with the Contract Administrator for Work area security.
- (f) Signs are displayed in areas where access to sealed asbestos Work area is possible.
Signs shall read:

CAUTION (25 mm high)

Asbestos Hazard Area (19 mm high)

Unauthorized Entry Prohibited (19 mm high)

Wear Assigned Protective Equipment (19 mm high)

Breathing Asbestos Dust May Cause Serious Bodily Harm (19 mm high).

- (g) Provide proof that notification of asbestos Work has been submitted to Manitoba Labour and Immigration.
- (h) The Contract Administrator has been notified of intention to proceed, has reviewed enclosures, equipment, procedures, and other submitted materials, and has granted authorization to proceed.

E45. CONTAMINATED SITE PREPARATION FOR FULL-ENCLOSURE ASBESTOS WORK AREA

E45.1 Before performing any contaminated Work, prepare Site as previously described.

E45.2 Request that building personnel shut off air handling and ventilation systems supplying or exhausting from the asbestos Work area enclosure(s). Ensure air-handling systems remain shut off for duration of Work.

E45.3 Seal holes or penetrations to provide airtight enclosure around asbestos Work area(s).

E45.4 Protect electrical, communication, life safety and control systems to remain in place in asbestos Work area with polyethylene and tape.

E46. ASBESTOS-CONTAINING MATERIAL REMOVAL

E46.1 Before removing asbestos, prepare Site as described previously.

E46.2 All individuals involved with any portions of the removal process shall be equipped with appropriate respirators and protective equipment while working within the enclosure.

E46.3 Repeatedly mist the air throughout the performance of this Work and maintain all surfaces within the asbestos Work area in a damp state.

E46.4 Spray asbestos-containing materials with amended water using airless spray equipment. Saturate asbestos to prevent release of airborne fibres during removal. Fully saturated asbestos may be placed directly into waste containers or may be allowed to fall to the floor.

E46.5 Remove the saturated asbestos-containing material in small sections. Do not allow saturated asbestos to dry out. As it is being removed, pack the material in sealable plastic bags 6-mil minimum thickness and place in labelled containers for transport.

E46.6 Spray asbestos debris on floor with amended water to prevent it from drying out. Remove asbestos debris from the floor and put in waste containers at regular intervals as the Work progresses and at the end of every shift.

E46.7 Seal filled containers, clean external surfaces thoroughly, and remove from working area to staging area.

E46.8 After completion of removal of asbestos-containing materials, clean surfaces from which asbestos has been removed with stiff bristle brushes, vacuum, or wet-sponge (as appropriate) to remove all visible material.

E46.9 Removal of asbestos waste containers and decontaminated equipment and materials from the asbestos Work area shall be removed through the waste decontamination enclosure as follows:

- (a) Remove gross contamination from the surface of the item to be removed within the staging area.
- (b) Pass the item to a second worker present in the container cleaning room. The item shall be cleaned, wet wiped and double bagged and/or sealed in polyethylene prior to transferring to a third worker present in the holding room. Wash water shall be treated as asbestos-contaminated waste.
- (c) The worker present in the holding room shall transfer the clean items to a fourth worker located outside the waste decontamination enclosure. The fourth worker must not enter the waste decontamination enclosure. Those workers present in the enclosure must leave the asbestos Work area through the worker decontamination chamber only.
- (d) Treat all removed materials exposed to asbestos, as asbestos-contaminated waste unless such materials can be properly decontaminated and are specified to be re-used.

E46.10 After removing all visible asbestos, wet clean entire Work area including but not limited to pipes, pipefittings, ducts, and similar items not covered with polyethylene sheeting. Request visual inspection and acceptance.

E46.11 Following inspection and acceptance, apply heavy coat of slow drying sealer to all surfaces from which asbestos has been removed. Apply thinned coat (sufficient to coat all surfaces) to interior of polyethylene enclosure. Allow a minimum of 12 hours with no disturbance of asbestos Work area. Operate negative air units during this period.

DECOMMISSIONING

E47. DISMANTLING OF PROTECTION

- E47.1 All containment structures, such as hoardings, platforms, etc., which are used to segregate the Work area, are to remain in place until directed by the Contract Administrator.
- E47.2 If air sampling by The Contract Administrator shows that levels in asbestos Work area do not exceed 0.01 fibres/mL as determined by NIOSH 7400 Analytical Method, A Counting Rules, and when approved in writing by the Contract Administrator, proceed with final dismantling of decontamination and Work enclosures as follows:
- E47.3 Remove polyethylene sheeting exposed during contaminated Work including upper surfaces plus any underlying sheeting contaminated by water leaks, rips, tears, or exposed by failure of upper layer. Wear appropriate respirator and disposable coveralls during removal of sheeting. Carefully roll sheeting away from walls to centre of asbestos Work area. As sheeting is rolled away from walls and corners, HEPA vacuum visible debris.
- E47.4 While removing top layer of sheeting from surfaces protected by two (2) layers of sheeting, cut lower sheeting so as to expose horizontal surfaces that may be contaminated with asbestos debris. HEPA vacuum any visible debris.
- E47.5 Place polyethylene sheeting, seals, tape, cleaning material, clothing, and other contaminated waste in asbestos waste receptors for transport. Remove with HEPA vacuum any debris which may have fallen behind sheeting.
- E47.6 Seal all openings of asbestos abatement equipment which may be contaminated with asbestos fibres which cannot be effectively cleaned and remove equipment from Site. Such equipment shall include negative air units, flexible ducting and HEPA vacuums.
- E47.7 Remove hoardings, temporary lighting, equipment and facilities provided for Work.
- E47.8 Visible debris discovered on the course of the Site dismantlement is to be promptly cleaned using a damp cloth and/or HEPA vacuum.
- E47.9 The Contract Administrator will conduct Site inspections and air monitoring for all Type III asbestos Work as specified in E50 and E51 of this section.

E48. RE-ESTABLISHMENT OF OBJECTS AND SYSTEMS

- E48.1 Reconstruct items demolished (if required) that are to remain and reinstall objects and items in their proper positions, which were removed to facilitate asbestos removal operation. Reconstruction and reinstallation shall be by tradesmen qualified in Work being reinstalled or reconstructed.
- E48.2 Re-establish mechanical and electrical systems in proper working order. Arrange for, and pay costs of, electrical or mechanical repairs needed due to this Work.
- E48.3 Make good all damage at completion of Work not identified in pre-removal survey.

E49. WASTE TRANSPORT AND DISPOSAL

- E49.1 Asbestos-containing or contaminated materials removed shall be treated, packaged, transported and disposed of as asbestos-contaminated waste.
- E49.2 Conform to all Provincial and local requirements for transporting and disposal of hazardous waste.

- E49.3 Check with local landfill operator to determine type of waste containers acceptable.
- E49.4 Ensure shipment of containers to landfill is by a waste hauler licensed by the Province of Manitoba to transport asbestos waste.
- E49.5 Transportation of all waste and materials through occupied areas shall be covered or placed within unmarked carts and must never be left unattended. Clean-up waste route and loading area after each load. Use asbestos abatement precautions if appropriate or requested by the Contract Administrator.
- E49.6 All asbestos waste must be removed from the Work area at the end of each Work shift unless approved by the Contract Administrator.
- E49.7 Each load requires completion of bill of lading showing type and weight of hazardous waste being transported. Provide proof (copies of all waste manifests) of proper disposal of asbestos material to the Contract Administrator on a weekly basis (at a minimum) and on completion of the project.
- E49.8 Co-operate with Manitoba Conservation inspectors and immediately carry out instructions for remedial Work at landfill to maintain environment, at no additional cost to the City.
- E49.9 Ensure landfill operator is fully aware of hazardous material being dumped.
- E49.10 Ensure that containers used for dumping are locked and covered at all times.

INSPECTION AND AIR MONITORING

E50. INSPECTION

- E50.1 Site inspections and air monitoring shall be conducted for all Type III asbestos Work.
- E50.2 From commencement of Work until completion of clean-up operations, the Contract Administrator is empowered by the City to inspect for compliance with the requirements of the governing authorities, adherence to specifications and to inspect for cleanliness and completion both inside and outside asbestos Work area(s).
- E50.3 The Contract Administrator will periodically inspect both inside and outside the Work area during active abatement, including air sampling as specified in E51 of this section.
- E50.4 The Contract Administrator is empowered to shut-down all Work activities when leakage of asbestos from the Work area has occurred or is likely to occur.
- E50.5 The Contractor is to allow inspection by the Contract Administrator and provide full access to the Work area. The Contractor shall make good on any Work disturbed by the inspection at no cost to the City.
- E50.6 If asbestos Work area(s) or adjacent areas are found unacceptable in accordance with standards specified or required by authorities having jurisdiction, correct such deficiencies at no cost to the City.
- E50.7 Pay cost to provide re-inspection of Work found not to be in accordance with these specifications and requirements of authorities having jurisdiction.
- E50.8 The Contract Administrator will complete an inspection report summarizing the results of the inspection and air sampling, including any deficiencies noted and correction actions required. A copy of the report will be forwarded to the City and the Contractor.

- E50.9 Provide a minimum of 24 hours written notice to the Contract Administrator of any request for scheduling milestone inspections or transportation of asbestos water through an occupied area.
- E50.10 The following milestone inspections will be performed by the Contract Administrator throughout the course of this project:
- (a) Preparation/Pre-Abatement Inspection: The Contract Administrator will inspect all project and Site preparations completed as specified in E39 to E45 of this section prior to the commencement of any contaminated Work. Upon successful completion of the specified preparation activities as determined by the Contract Administrator, and on approval of the Contract Administrator, the Contractor will be cleared to begin contaminated Work. Contaminated Work shall not commence until such approval has been obtained.
 - (b) The Contract Administrator will complete a Preparation/Pre-Abatement Inspection Report noting any deficiencies or additional Work required prior to beginning contaminated Work. Copies of the report will be forwarded to the City and the Contractor.
 - (c) Pre-final Visual Clearance Inspection: The Contract Administrator will perform an inspection of the Work area after completion of all asbestos abatement Work but prior to the application of the lock-down agent to assess the successful completion of all activities required by the project specifications. Upon successful completion of the abatement Work as determined by the Contract Administrator, the Contractor will be cleared to apply the lock-down agent on approval of the Contract Administrator.
 - (d) The Contract Administrator will complete a Pre-final Visual Clearance Inspection Report noting any deficiencies or additional Work required prior to applying the lock-down agent. Copies of the report will be forwarded to the City and the Contractor.
 - (e) Final Clearance Inspection and Air Monitoring: The Contract Administrator will perform a Final Clearance Inspection a minimum of 12 hours following the application of the lock-down agent as specified in E46.11 of this section, to assess adherence to these specifications and to inspect for cleanliness and completion both inside and outside asbestos Work area(s). The inspection will include the collection of clearance air samples. If clearance air sample results are acceptable as specified in E51 of this section, and on approval of the Contract Administrator, the Contractor will be cleared to begin decommissioning activities specified in E47, E48, and E49 of this section.
 - (f) The Contract Administrator will complete a Final Clearance Inspection Report noting the clearance air sample results and any deficiencies or additional Work required prior to decommissioning activities. The report will also include a list of any Site specific tear down requirement and a list of any observed damages caused by the abatement activities. Copies of the report will be forwarded to the City and the Contractor.
 - (g) Final Dismantling Inspection: If deemed necessary by the Contract Administrator, an inspection may be performed after the removal of hoarding, perimeter seals and decontamination facility from the asbestos Work area.
- E50.11 Do not proceed with next phase of Work until written approval of each inspection is received from the Contract Administrator.

E51. AIR MONITORING

- E51.1 Air sampling will be periodically performed within and immediately adjacent to each active asbestos Work area. Results obtained from all test monitoring shall be posted at the Work Site and provided to the City and the Contractor.
- E51.2 All air samples will be collected in accordance with NIOSH Analytical Method 7400.
- E51.3 If air monitoring or visual inspection indicates that areas outside current asbestos Work area enclosures are contaminated above the designated action level 0.05 fibre/mL, the Contractor is

to clean these areas in same manner as that applicable to asbestos Work areas, at no cost to City.

- E51.4 If air monitoring in Work areas shows airborne fibre levels above 10 fibre/mL, all Work is to stop within the Work area, workers are to exit the Work area following worker decontamination procedures and the Contractor's workers will not be allowed to re-enter for a period of eight hours or until authorized by the Contract Administrator. On re-entry into the Work area, the air and any fallen debris or exposed surfaces shall be misted with amended water.
- E51.5 If air sampling by Contract Administrator show that levels in asbestos Work area do not exceed 0.01 fibres/mL as determined by NIOSH 7400 Analytical Method (A Counting Rules), and on approval of the Contract Administrator, proceed with dismantling of enclosures.
- E51.6 Clearance level is ≤ 0.01 fibres/mL.

GENERAL SECTION 13084 – GLOVEBAG

E52. GENERAL REQUIREMENTS

- E52.1 Conform to requirements of this specification.

E53. RELATED WORK SPECIFIED ELSEWHERE:

- E53.1 Refer to accompanying Section 13080, Asbestos Abatement – General: E3.

E54. DESCRIPTION OF WORK

- E54.1 Supply all labour, material, and equipment necessary to safely execute and complete all Work of this section while in conjunction with Work specified, required, or implied under Section 13080, Asbestos Abatement – General.
- E54.2 Prepare and isolate the asbestos Work area from adjoining occupied and unoccupied areas as specified in E62 of this section.
- E54.3 Shut down and/or isolate any air moving equipment that could contribute to the dispersal of fibres from the Work area.
- E54.4 Setup worker decontamination facilities at the perimeter of the Work area as specified in E63 of this section.
- E54.5 Allow for access to security and other alarm panels at all times.
- E54.6 HEPA vacuum or wet clean all surfaces and equipment throughout the asbestos Work area from which settled dust will be disturbed during the course of this Work.
- E54.7 All asbestos removal will be completed using Type II Glovebag procedures as specified in E64 of this section.
- E54.8 All Type II Glovebag abatement Work will be performed using a minimum of half-face HEPA filtered respirator, protective clothing, and worker protection procedures outlined in E60.6 of this section.
- E54.9 The Contractor shall assume that all Work is to be performed during quiet times such as non-regular business hours or when the area is unoccupied as determined by the Contract Administrator.

- E54.10 After preparation of the Work areas and decontamination facilities, remove and dispose of all materials specified in Section 13080, Asbestos Abatement – General from the Work area using Type II Glovebag procedures as specified in E64 of this section.
- E54.11 Clean all surfaces from which asbestos has been removed using a wet cloth and/or HEPA equipped vacuum cleaner.
- E54.12 Prior to completion of each Work shift seal all surfaces from which asbestos has been removed with an approved sealer (lock-down agent).
- E54.13 Apply a heavy coat of encapsulant to the exposed ends of remaining asbestos-containing insulation.
- E54.14 All Work will be subject to inspection and/or air monitoring inside and outside asbestos Work area by the Contract Administrator.
- E54.15 Any contamination of surrounding areas, indicated by visual inspection or air monitoring, shall necessitate the enclosure of these areas and complete cleanup of affected areas in same manner as that applicable to asbestos Work areas, at no cost to City.
- E54.16 Contractor will be responsible for the general upkeep of the Site. Workers and trades will use designated washrooms only. Designated washrooms must be kept clean at all times. All other facilities will be off limits.
- E54.17 When directed by the Contract Administrator, decommission the Work area and decontamination facilities, and re-establish all objects and systems as specified in E66, E67, and E68 of this section.
- E54.18 All asbestos-containing or contaminated materials removed shall be transported and disposed of as specified in E68 of this section.

E55. DEFINITIONS

- E55.1 **Asbestos-Containing Material:** Materials identified under Section 13080, E4 Site Conditions and/or the Contractor Scope of Work document, including fallen materials and settled dust.
- E55.2 **Asbestos-Contaminated Waste:** Materials identified under Section 13080, E4 Site Conditions and/or the Contractor Scope of Work document that have been removed as specified under Section 13083, including fallen materials, debris, rubble, and settled dust, and materials and/or equipment deemed to be contaminated under this specification and/or by the Contract Administrator.
- E55.3 **Asbestos Work Area(s):** Area(s) where Work takes place which will or may disturb asbestos-containing material, including fallen material or settled dust that may contain asbestos.
- E55.4 **Authorized Visitor(s):** Contract Administrator or person(s) representing regulatory agencies, and person(s) authorized by them.
- E55.5 **Friable Material:** Material that when dry can be crumbled, pulverized or powdered by hand pressure and includes such material that is crumbled, pulverized or powdered.
- E55.6 **Glovebag:** Portable, single use pipe insulation removal enclosure with integral gloves.
- E55.7 **HEPA Filter:** High Efficiency Particulate Aerosol filter at least 99.97 percent efficient in collecting 0.3 micrometer aerosol.
- E55.8 **Occupied Area:** Any area of the Site building or Work Site that is outside the Work area.

E56. REGULATIONS AND GUIDELINES

- E56.1 Comply with applicable Building Codes, Electrical, Fire and Construction Safety Codes as well as Federal, Provincial, and local requirements pertaining to asbestos provided that in any case of conflict among these requirements or with these specifications the more stringent requirement shall apply. Work shall be performed under regulations in effect at the time Work is performed.
- E56.2 Manitoba Workplace Safety and Health Act, Chapter W210, Workplace Health Hazard Regulation (MR 53/88).
- E56.3 Manitoba Workplace Safety and Health Act, Chapter W210, Fibrosis and Silicosis Regulation (MR 100/88R).
- E56.4 Manitoba Environment Act, Chapter E125, Waste Disposal Grounds Regulation (MR 100/88R) as it pertains to asbestos.
- E56.5 Provincial Guidelines associated with MR53/88 and MR 100/88R which relate to asbestos.
- E56.6 The Contractor shall ensure that:
- (a) Measures and procedures prescribed under the Occupational Health & Safety Act and regulations are carried out.
 - (b) Every employee and every worker under their control complies with applicable Acts and Regulations.
 - (c) Health and Safety of workers and public are protected.
 - (d) Policies and procedures of the City are complied.
 - (e) All material handling and associated equipment conform to and are operated in accordance with "Workplace Hazardous Materials Information System" (WHMIS).
 - (f) Notify sanitary landfill Site as per local and Provincial requirements.
- E56.7 The Contractor may be requested to provide information on their health & safety record.
- E56.8 Laws of Province of Manitoba shall govern this Work. The Contractor shall observe all such laws and shall obtain and/or pay all permits, notices, fees, taxes, duties as may be required. Likewise, it is the responsibility of the Contractor to comply with Worker's Compensation and Workplace Safety and Health Acts.

E57. QUALITY ASSURANCE

- E57.1 Ensure Work proceeds to schedule and meets all requirements of this section. Perform Work so airborne asbestos or asbestos wastewater run-off does not contaminate areas outside asbestos Work enclosure.
- E57.2 Any contamination of surrounding areas, indicated by visual inspection or air monitoring, shall necessitate the enclosure of these areas and complete cleanup of affected areas in same manner as that applicable to asbestos Work areas, at no cost to City. The Contract Administrator shall be notified as soon as possible following such an occurrence and informed of the measures being implemented to correct the situation.
- E57.3 Pay cost to City of inspection and air monitoring performed as result of failure to perform Work satisfactorily.
- E57.4 Use only skilled and qualified workers for all trades required for this Work.

E58. SUBMITTALS

- E58.1 The Contractor shall ensure that the following has been submitted to the Contract Administrator at least five (5) days prior to commencing Work:
- (a) Obtain and submit all necessary permits for transporting and disposal of asbestos waste.
 - (b) Names of supervisory personnel who will be responsible for asbestos Work area(s).
 - (c) Proof that supervisory personnel have attended a training course on asbestos control (2 day minimum duration) and have performed supervisory function on at least 2 other asbestos control projects of similar nature.
 - (d) Satisfactory proof that every worker has had instruction and training in the hazards of asbestos exposure, in personal hygiene and Work practices, and in the use, cleaning, and disposal of respirators and protective clothing.
 - (e) A proposed schedule showing phasing and proposed workforce related to each Work area enclosure or repair operation.
 - (f) List of existing damage for acceptance.
 - (g) Documentation for materials used in the course of the project including MSDS sheets or other data documenting compliance with specifications for such materials as, but not limited to sealants, encapsulants, wetting agents, and polyethylene sheeting.
 - (h) Before commencing any Work, Contractor shall submit, in writing, confirmation of good standing with Worker's Compensation Board of Manitoba.
 - (i) Waste manifest forms on a weekly basis and at the completion of the project.
 - (j) Prepare and provide a copy of the Contractor's Site specific Health and Safety Plan to the Contract Administrator.

E59. SUPERVISION

- E59.1 A minimum of one (1) supervisor is required for every ten (10) workers unless otherwise approved by the Contract Administrator.
- E59.2 An approved supervisor must remain within the asbestos Work area at all times during the disturbance, removal or other handling of asbestos-containing materials.
- E59.3 Site supervision must only be replaced by approved replacement on approval by the Contract Administrator. The City reserves the right to request the replacement of the supervisor without explanation.

E60. WORKER AND VISITOR PROTECTION

- E60.1 **Instructions:** Before entering asbestos Work area(s), instruct workers and visitors in use of respirators and all aspects of Work procedures and protective measures. Competent person as defined by Workplace Safety and Health Act shall provide instruction.
- E60.2 **Respirators:** Provide appropriate respiratory equipment for all persons entering asbestos Work area including authorized visitors. During glovebag removal all workers, supervisors, and authorized visitors shall wear, at minimum, non-powered half-face respirators with minimum P100 filter cartridges in accordance with NIOSH Part 84 requirements (Formerly high efficiency particulate aerosol (HEPA) cartridge filters). Filters shall be replaced daily or tested according to manufacturer's specifications and replaced as necessary. All waste filters shall be disposed of as asbestos waste. Respirators shall be acceptable to the Workplace Safety and Health Branch of Manitoba Labour and Immigration. Provide instruction to workers and visitors in use of respirators including qualitative fit testing. No supervisor, worker or authorized visitor shall

wear facial hair which may affect the seal between the respirator and face. Maintain respiratory protection equipment in proper functioning and clean condition.

- E60.3 **Protective Clothing:** Provide workers and visitors with new full body coveralls with integral hoods. Once coveralls are worn in the asbestos Work area, treat and dispose of as asbestos contaminated waste. Workers and visitors shall also wear other protective apparel required by Manitoba Labour and Immigration construction regulations. Footwear shall be of a suitable type that will prevent fibre penetration and able to be wet wiped.
- E60.4 At no time shall the Contractor use existing furnishings or mechanical equipment (including piping) to support personal.
- E60.5 Before entering asbestos Work area(s), don appropriate respirator with new or tested filters, new disposable coveralls with integrated hoods, and all other appropriate personal protective equipment.
- E60.6 To leave the asbestos Work area(s), all persons shall:
- (a) HEPA vacuum or wet wipe clothing and respirator prior to leaving the asbestos Work area.
 - (b) Remove contaminated coveralls and place in receptacles for disposal with other asbestos-contaminated materials prior to leaving the asbestos Work area.
 - (c) Still wearing appropriate respirator, proceed out of the established asbestos Work area to the decontamination facility.
 - (d) Using soap and warm water wash and remove respirator then thoroughly wash hands and face.
- E60.7 Do not eat, drink, smoke or chew gum or tobacco in asbestos Work area.
- E60.8 Workers and visitors shall be protected at all times when a possibility of asbestos disturbance exists.
- E60.9 A copy of the procedures described under E60: Worker and Visitor Protection shall be posted at access points to the asbestos Work area.

PRODUCTS

E61. MATERIALS

- E61.1 **Amended Water:** Water with wetting agent added.
- E61.2 **Asbestos Waste Receptors:** Two separate containers of which at least one shall consist of 0.15 mm (6 mil) minimum thickness sealable polyethylene bag. Other container may be 0.15 (6 mil) minimum thickness polyethylene bag. Other container shall be adequate to prevent perforating rips, or tears during filling, transport or disposal. Containers must be acceptable to disposal Site selected and Ministry of Environment, and shall have a pre-printed cautionary asbestos warning in both official languages, clearly visible when ready for removal to the disposal Site. As per the following:
- CAUTION CONTAINS ASBESTOS FIBRES (25 mm high)
Do Not Mishandle (19 mm high).
- E61.3 **Encapsulant:** Standard of acceptance - Ocean No. 666, Ocean Fire Retardants Inc., coloured blue unless another colour is specified by City.
- E61.4 **Glove Bag:** Prefabricated, 0.25 mm (10 mil) minimum thickness polyvinyl-chloride bag with integral 0.25 mm (10 mil) thick polyvinyl-chloride gloves and elasticized ports. Bag equipped

with reversible double-pull double throw zipper on top to facilitate installation on pipe and progressive movement along pipe and with straps for sealing ends to bag around pipe:
Standard of Acceptance: Safe-T-Strip distributed by Hazmasters Equipment Inc., Pickering Ontario, in configurations suitable for Work.

- E61.5 **HEPA Vacuum:** Vacuum with all necessary fittings, tools and attachments. Air must pass HEPA filter before discharge.
- E61.6 **Knife:** Knife with fully retractable blade for use inside glove bag.
- E61.7 **Polyethylene Sheeting:** 0.15 mm (6 mil) minimum thickness unless otherwise specified; with tape seals along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide continuous polyethylene membrane protection. Sheet size shall be such to minimize joints.
- E61.8 **Protective Coveralls:** Disposable full body coveralls complete with elasticized hoods made of spun polyolefin material Tyvek by Dupont or non-woven material Kleenguard by Kimberley Clark . All coveralls must be rated for asbestos abatement applications by the manufacturer.
- E61.9 **Sealer (Lock down agent):** Sealer for purpose of trapping residual fibre debris. Product must have flame spread and smoke development ratings both less than 25. Product shall leave no stain when dry: TC-55 (clear), A/D Fire Protection Systems Inc., Scarborough, Ontario . For mechanical equipment, pipes, boilers, etc. use high temperature sealer only: Chil-Abate CP210 , Childers Products Company, Mississauga, Ontario.
- E61.10 **Securing Straps:** For glove bag, reusable nylon straps at least 1" wide with metal tightening buckle for sealing ends of bags around pipe and/or insulation.
- E61.11 **Sprayer:** Garden-type portable manual sprayer, low velocity, capable of producing mist or fine spray.
- E61.12 **Tape:** Tape suitable for sealing polyethylene to surface encountered under both wet conditions using amended water, and dry conditions. Standard of acceptance – Nashaua 300 polyethylene coated cloth tape, Tyco Adhesives.
- E61.13 **Wetting Agent:** Non-foaming surface active agent; mixed with water in concentration to provide thorough wetting of asbestos fibre: Standard of Acceptance, Asbesto-Wet, distributed by Asbetec Distributors.

PREPARATION

E62. SITE PREPARATION

- E62.1 Complete isolation measures between the asbestos Work area and occupied areas using tape barriers, saw-horses, or other barriers, or by closing any door, windows, etc. at the perimeter of the Asbestos Work area.
- E62.2 Install worker decontamination facilities at locations approved by the Contract Administrator.
- E62.3 Set-up clear warning signs at each entry point to the Work area and at a distance from the Work area if required. Signs shall read:
- CAUTION** (25 mm high)
 - Asbestos Hazard Area (19 mm high)
 - Unauthorized Entry Prohibited (19 mm high)
 - Wear Assigned Protective Equipment (19 mm high)
 - Breathing Asbestos Dust May Cause Serious Bodily Harm (19 mm high)

- E62.4 Request that building personnel shut off air handling and ventilation systems supplying or exhausting from the asbestos Work area. Ensure air-handling systems remain shut off for duration of Work.
- E62.5 Clean and remove equipment, tools, furnishings, and stored materials that can be moved without disturbing asbestos-containing materials.
- E62.6 Cover with polyethylene sheeting any furnishings or equipment that will remain in the asbestos Work area. Clean previously contaminated surfaces with HEPA vacuum before covering with sheeting.
- E62.7 Maintain emergency and fire exits from asbestos Work area, or establish alternative exits satisfactory to authorities having jurisdiction.
- E62.8 Lay polyethylene sheeting directly underneath piping from which insulation is to be removed.
- E62.9 Locate required tools, equipment, and waste receptors within the asbestos Work area.
- E62.10 Provide fire extinguisher at the asbestos Work area. Protect extinguishers with polyethylene sheeting in manner that will not hamper emergency use. Existing on-site extinguishers may not be used without prior approval of the City.

E63. WORKERS' DECONTAMINATION FACILITIES

- E63.1 Set-up an isolated worker decontamination area adjacent to the asbestos Work area consisting of a HEPA filtered vacuum, bucket of warm water, soap, rags, and disposal container for asbestos contaminated disposable coveralls.

E64. EXECUTION

- E64.1 Do Not Commence Asbestos Removal Work Until:
 - (a) Arrangements have been made for disposal of waste.
 - (b) Asbestos Work areas and decontamination facilities are effectively segregated.
 - (c) Tools, equipment and waste materials receptors are on hand.
 - (d) Signs are displayed in areas where access to asbestos Work area is possible.
 - (e) The Contract Administrator has been notified of intention to proceed, has reviewed enclosures, equipment, procedures, and other submitted materials, and has granted authorization to proceed.

E65. ASBESTOS-CONTAINING MATERIAL REMOVAL

- E65.1 Before removing asbestos, prepare Site as described previously.
- E65.2 All individuals involved with any portions of the removal process shall be equipped with appropriate respirators and protective equipment while working within the asbestos Work area.
- E65.3 Pre-clean surface of pipe or fitting to remove fallen or damaged insulation by HEPA vacuuming or damp wiping.
- E65.4 Before beginning Work, wet all insulation to be removed with amended water.
- E65.5 Wet areas of damaged jacketing with amended water and tape over damage, or wrap with polyethylene sheeting, to provide temporary repair.

- E65.6 If insulation is not jacketed, wet surface with amended water and wrap entire length of fitting and/or piping with 0.15 mm (6 mil) polyethylene sheeting taped in place.
- E65.7 Place tools necessary to remove insulation in tool pouch. Zip glovebag onto pipe and/or fitting and seal all openings to fitting with cloth securing straps. For valve bags seal valve cover with wire tie .
- E65.8 Insert nozzle of spray pump into bag through valve and thoroughly wet insulation and interior of glovebag.
- E65.9 Place hands into gloves and use necessary tools to remove insulation. Roll jacketing carefully to minimize possibility of ripping or puncturing bags. Preformed insulation block should be cut at joints to minimize fibre release.
- E65.10 Arrange insulation to obtain full capacity of glovebag.
- E65.11 Wet freshly exposed insulation frequently during Work.
- E65.12 After insulation has been removed, wash down fitting and/or exposed pipe and interior of glovebag thoroughly. Use one hand to aid washing process. Wet surface of insulation in lower section of glovebag and exposed end of asbestos insulation remaining on fitting by spraying with water prior to moving glovebag.
- E65.13 If glovebag is to be moved along fitting, evacuate air from bag using a HEPA vacuum through the valve opening, move glovebag along pipe and re-seal. Use double-pull zipper to pass hangers. Repeat insulation removal procedures specified above.
- E65.14 If glovebag is to be removed from cleaned pipe and/or fitting for use on new pipe and/or fitting, seal interior zip lock and evacuate air from glovebag using a HEPA vacuum through the valve opening. Re-install in new location before opening zip lock. Repeat insulation removal procedures specified above.
- E65.15 If glovebag is ripped, cut or opened in any way, cease Work and repair with tape before continuing Work. Immediately clean spilled material with HEPA vacuum or wet washing.
- E65.16 To remove glovebag once filled, wash top section and tools thoroughly. Place tools in one hand (glove), pull hand out inverted and twist to create a separate pouch. Tape in two locations to seal separate pouch from glovebag and cut between two tape locations to remove separated pouch. Place pouch with tools in next glove bag, or into a water bucket. Open the pouch underwater to remove and clean tools.
- E65.17 Pull waste disposal bag over glovebag before removing from pipe and/or fitting. Remove securing straps. Unfasten zipper.
- E65.18 After removal of glovebag, ensure newly exposed pipe and/or fitting is clean of residue by HEPA vacuuming or wet wiping surfaces. Ensure that surfaces are kept free of wet sludge.
- E65.19 Before completion of shift, apply sealer to all surfaces of freshly-exposed pipes and/or fittings.
- E65.20 Apply heavy coat of encapsulant to exposed ends of asbestos insulation to remain.
- E65.21 Dispose of removed glovebags as contaminated waste.
- E65.22 Remove drop sheet and dispose of as contaminated waste.
- E65.23 On completion of removal activities, clean asbestos Work area with HEPA vacuum or by wet wiping or mopping and request inspection by Contract Administrator.

DECOMMISSIONING

E66. DISMANTLING OF PROTECTION

- E66.1 If air sampling by The Contract Administrator shows that levels in asbestos Work area do not exceed the action level of 0.05 fibres/mL, as determined by NIOSH 7400 Analytical Method, A Counting Rules, and when approved in writing by the Contract Administrator, proceed with final dismantling of the asbestos Work area.
- E66.2 Site inspections and air monitoring may be conducted for all Type II asbestos Work including a final review of the Work area by the Contract Administrator to ensure that no dust or debris remains.

E67. RE-ESTABLISHMENT OF OBJECTS AND SYSTEMS

- E67.1 Reconstruct items demolished (if required) that are to remain and reinstall objects and items in their proper positions, which were removed to facilitate asbestos removal operation. Reconstruction and reinstallation shall be by tradesmen qualified in Work being reinstalled or reconstructed.
- E67.2 Re-establish mechanical and electrical systems in proper working order. Arrange for, and pay costs of, electrical or mechanical repairs needed due to this Work.
- E67.3 Make good all damage at completion of Work not identified in pre-removal survey.

E68. WASTE TRANSPORT AND DISPOSAL

- E68.1 Asbestos-containing or contaminated materials removed shall be treated, packaged, transported and disposed of as asbestos-contaminated waste.
- E68.2 Conform to all Provincial and local requirements for transporting and disposal of hazardous waste.
- E68.3 Check with local landfill operator to determine type of waste containers acceptable.
- E68.4 Ensure shipment of containers to landfill is by a waste hauler licensed by the Province of Manitoba to transport asbestos waste.
- E68.5 Transportation of all waste and materials through occupied areas shall be covered or placed within unmarked carts and must never be left unattended. Clean-up waste route and loading area after each load. Use asbestos abatement precautions if appropriate or requested by the Contract Administrator.
- E68.6 All asbestos waste must be removed from the Work area at the end of each Work shift unless approved by the Contract Administrator.
- E68.7 Each load requires completion of bill of lading showing type and weight of hazardous waste being transported. Provide proof (copies of all waste manifests) of proper disposal of asbestos material to the Contract Administrator on a weekly basis (at a minimum) and on completion of the project.
- E68.8 Co-operate with Manitoba Conservation inspectors and immediately carry out instructions for remedial Work at landfill to maintain environment, at no additional cost to the City.
- E68.9 Ensure landfill operator is fully aware of hazardous material being dumped.
- E68.10 Ensure that containers used for dumping are locked and covered at all times.

INSPECTION AND MONITORING

E69. INSPECTION

- E69.1 From commencement of Work until completion of clean-up operations, the Contract Administrator is empowered by the City to inspect for compliance with the requirements of the governing authorities, adherence to specifications and to inspect for cleanliness and completion both inside and outside asbestos Work area(s).
- E69.2 The Contract Administrator may periodically inspect both inside and outside the Work area during active abatement.
- E69.3 The Contract Administrator is empowered to shut-down all Work activities when leakage of asbestos from the Work area has occurred or is likely to occur.
- E69.4 The Contractor is to allow inspection by the Contract Administrator and provide full access to the Work area. The Contractor shall make good on any Work disturbed by the inspection at no cost to the City.
- E69.5 If asbestos Work area(s) or adjacent areas are found unacceptable in accordance with standards specified or required by authorities having jurisdiction, correct such deficiencies at no cost to the City.
- E69.6 Pay cost to provide re-inspection of Work found not to be in accordance with these specifications and requirements of authorities having jurisdiction.

E70. AIR MONITORING

- E70.1 Air sampling may be performed periodically within and immediately adjacent to each active asbestos Work area. Results obtained from all test monitoring shall be posted at the Work Site and provided to the City and the Contractor.
- E70.2 All air samples will be collected in accordance with NIOSH Analytical Method 7400.
- E70.3 If air monitoring or visual inspection indicates that areas inside or outside the asbestos Work area are contaminated above the action level of 0.05 fibres/mL, the Contractor is to clean these areas in same manner as that applicable to asbestos Work areas, at no cost to City.
- E70.4 If air sampling by Contract Administrator show that levels in asbestos Work area do not exceed the action level of 0.05 fibres/mL, as determined by NIOSH 7400 Analytical Method (A Counting Rules), proceed with dismantling of asbestos Work area.
- E70.5 The air clearance concentration shall not exceed the designated action level of 0.05 fibres/mL.