DUFFERIN-PEEL CATHOLIC DISTRICT SCHOOL BOARD

2021 ASBESTOS MANAGEMENT PROGRAM

Supplement to Project Specification for the Abatement of Asbestos-containing Materials in the

CATHOLIC EDUCATION CENTRE
40 MATHESON BOULVARD WEST
MISSISSAUGA, ONTARIO
L5R 1C5

March 26, 2021

Project Number: 21007-D

NORROX Technical Services Inc.

PROJECT - 2021 ASBESTOS MANAGEMENT PROGRAM - ASBESTOS ABATEMENT

GROUP 4 AHU PROJECT
CATHOLIC EDUCATIONR CENTRE
40 MATHESON BOULVARD WEST, MISSISSAUGA, ONTARIO; L5R 1C5

Date:_____

Submitted By: (Abatement Sub-contractor only)

Address: _____

_____

_____

Telephone _____ Facsimile: _____ E-Mail _____

Having examined, the Bid Documents and Addenda No. _____ to No. _____ Inclusive as issued for the project, and having examined the project site; hereby offer to enter into a Contract with the General Contractor to supply all the necessary labor, equipment and material to complete the Work required by the Bid Documents for the stipulated price of:

_____ Dollars (_____)
(in writing)

in Canadian funds, which price includes and specified applicable taxes in force at this date except as may be otherwise provided in the Bid Documents.

We hereby declare that:

1 We agree to substantially perform the Work within the schedule set forth within this Bid Document.

2 No person, firm or corporation other than the undersigned has any interest in this Bid or in the proposed Contract for which this Bid is made.

Bidder's Name:

_____
(Print)

Authorized Signature(s):

_____

3 This Bid is open to acceptance for a period of sixty (60) days from the date of bid closing.

4 If the General Contractor (To be announced) fails to make payments to the Abatement Contractor as they become due under the terms of the Contract or in an award by arbitration or court, interest of _____ percent (_____ %) per annum on such unpaid amounts shall also become due and payable until payment.

5 Owner may cancel any segment of work prior to the start of such work and the submitted costs for such work shall be deleted from the Contract as per this tender submission without any charge or penalty as result of the cancellation of such work.

Bidder's Name:

_____
(Print)

Authorized Signature(s):

_____

Date: _____ Corporate Seal:

(1) Witness _____
(Print)

_____
(Signature)

(2) Witness _____
(Print)

_____
(Signature)

CONTRACT WORK
SCHEDULE OF PRICES FOR INDIVIDUAL SEGMENTS OF WORK
STIPULATED SUMS

This work is conditional, subject to sample collection and analysis of gasket and or packing for Asbestos. Asbestos Abatement Contractor shall not be entitled to any funds if material (gasket and or packing) does not contain asbestos

Item No.	Description	Total Price in Canadian Funds
1	Catholic Education Centre, Mississauga Work Segment A (Work Area A-1) – Gasket and Packing removal from identified hot water heating pipe valves (3-way), vessels and flange joints (strainer access plates) required to be removed for the installation of new or cleaning of existing fittings as part of the Group 4 AHU Project in the Boiler Room under the mezzanine floor on the third floor of the 1986 Original Building. • The Type 1 indoor removal & disposal of all specified asbestos-containing gasket and packing as identified on Floor Plan AR-2. • Cost shall be inclusive of preparation, removal, cleaning and disposal.	Stipulated Sum

STIPULATED SUM QUOTATION TOTALS

Item 1 =

Sub-total $_____

HST $_____

TOTAL $_____

Bidder's Name:

_____
(Print)

Authorized Signature(s):

_____

PART 1 - GENERAL

Notes:
1. Asbestos abatement will proceed only after it is confirmed that asbestos is present in gasket and packing associated with the hot water pipe valves vessels and flange joints.
2. Plumbing/Heating/Mechanical sub-trade shall drain hot water piping and open the specified locations of piping identified in pictures at the end of this specification section exposing the full gasket and or packing for the various valves and strainers for the Board's inspection firm to collect and analyze for asbestos.
3. Where asbestos is confirmed in packing and or gasket, then preparation of the asbestos abatement work area can proceed when the Contract is signed or a letter of intent is issued by the owner or representative, all submittals are accepted by the Abatement Inspector appointed by the owner and approval is granted by the Inspector in writing to begin.

1.1 Outline of Work

1.1.1 The scope of work required under this section of the specification includes for the complete removal of the specified Asbestos-containing building materials found in a specific area of the Catholic Education Centre, 40 Matheson Boulevard West in Mississauga, Ontario

1.1.2 This is a renovation project and protection of the building, its components and finish is required unless specified for demolition or disposal.

1.1.3 Segments of Work:

1.1.3.1 **Work Segment A** - This work consists of the removal of asbestos-containing gasket and packing from two select three-way valves and seven select strainer access plates of the hot water heating pipe vessels (strainer) flange joints identified for work found in the boiler room. (Work Area A-1) on the second floor of the 1986 original building of the Catholic Education Centre,

1.1.3.1.1 **<u>On the start of the construction project</u>** Plumbing/Heating/Mechanical sub-trade shall perform the following:

1.1.3.1.1.1 Shut off and drain water from piping associated with the boilers and heating pipe.

1.1.3.1.1.2 Open all marked locations of piping valves, vessels or flange joints exposing the gasket and packing in the hot water heating pipe system without removing any gasket and packing.

1.1.3.1.1.3 Arrange for the Board's appointed inspection firm ***(NORROX Technical Services Inc.)*** to collect samples of materials suspected to contain asbestos.

1.1.3.1.1.4 Asbestos analysis by the inspection firm shall comply with Section "3.11 Bulk Sample Analysis".

1.1.3.1.1.5 Analytical results shall be provided by the inspection firm to the Board's Project Representative, Architect and General Contractor within 24 hours of sample collection.

1.1.3.1.2 If gasket and packing is confirmed to contain asbestos then

1.1.3.1.3 Refer to Floor Plans AR-1 & AR-2 for Work Area A-1 found at the end of this specification section for the location of the abatement work areas.

1.1.3.1.4 All of this work shall be performed by a **specialist** Asbestos Abatement Contractor in accordance with the requirements of these specifications and Ontario Regulation 278/05 and shall be sequenced as the first phase of work of the overall project.
Note 1: Asbestos preparation, removal or cleaning work cannot be performed on any days when building is occupied.
Note 2: General Contractor or demolition forces shall not demolish any part of the building, remove any materials until all of this asbestos abatement has been completed first.

1.1.3.1.5 The work shall be subjected to inspection by the Board's appointed inspection firm ***(NORROX Technical Services Inc.)***. Each segment of work may proceed only after written authorization to proceed is issued by the inspector. Authorization shall include preparation of the work area and worker decontamination centre, removal of the asbestos-containing materials; application of sealant; dismantling non-critical barriers; secondary cleaning; and dismantling of work area enclosure.

1.1.3.1.6 All interior work shall be performed following the work procedures specified for Type 1 removal work as contained in this specification section "Asbestos Abatement, Division 2, Section 02082, Part 3, Sub Part 3.8 Non-Friable Or Manufactured Asbestos-Containing Materials Removal Work Method and 3.9 Waste Disposal In this specification section.

1.1.3.1.7 A "Notice of Project" **will not** be required with this segment of the school project.

1.1.3.1.8 The work shall be performed in the following sequence in accordance with all requirements of the specified section of the specification:

1.1.3.1.8.1 Proceed with preparatory work after the Inspector provides written authorization to proceed with preparations:

1.1.3.1.8.1.1 Arrange for and have HEPA vacuum cleaners DOP tested.

1.1.3.1.8.1.2 For the interior work:

1.1.3.1.8.1.2.1 Ensure all moveable materials have been taken from the room.

1.1.3.1.8.1.2.2 Fully cover all equipment needing protection after deactivation and lock-out serving the rooms with 6-mil polyethylene sheeting sealed with tape.

1.1.3.1.8.1.2.3 Construction an enclosure around the areas of work with polyethylene sheeting sealed with tape.

1.1.3.1.8.1.2.4 Cover entrance to the work area with overlapping sheets of 6-mil polyethylene sheeting sealed with tape.

1.1.3.1.8.1.2.4.1 Sheets of polyethylene shall overlap by at least 1/3 of the door opening.

1.1.3.1.8.1.2.4.2 Weigh down the corners of the open ends of polyethylene sheeting

1.1.3.1.8.1.2.4.3 In addition place Asbestos warning sign at all entrances to the work area.

1.1.3.1.8.2 After the work area has been fully prepared, inspected by the Inspector and after the Inspector provides written authorization to proceed with removal:

1.1.3.1.8.2.1 Workers shall wear protective equipment including approved respirators, body coverings, hard hats, safety footwear, and any other required safety equipment.

1.1.3.1.8.2.2 Workers shall enter through the overlapping flaps of polyethylene sheeting at entrance to the work area.

1.1.3.1.8.2.3 All personnel leaving the work area shall fully HEPA vacuum their protective clothing and shall wash face and hands with supplied water containers.

1.1.3.1.8.2.4 On exit the protective suits shall be deposited in 6-mil waste bags.

1.1.3.1.8.2.5 Spray asbestos-containing materials with amended water sufficient to surface saturate the asbestos-containing material and keep wet.

1.1.3.1.8.2.6 Open pipe fittings to expose the asbestos-containing gasket and packing and remove material only with hand tools and immediately place in waste bags.

1.1.3.1.8.2.7 Alternatively place exposed asbestos material found intact on pipe fitting directly in a waste bag.

1.1.3.1.8.2.8 After removal and after all waste has been placed in sealed waste bags clean entire work area by wet wiping, wire brushing and / or HEPA vacuuming. Then allow work area to dry out.

1.1.3.1.8.3 For the Type 1 enclosure removal work area, after an overnight settling period, after the work area enclosure is dry, after the Inspector confirms that the work area is visually clean, permit the Inspector, to conduct air sampling following aggressive sampling techniques. No access is permitted during the air sampling process. Air sampling shall be performed at the Inspector's discretion.

1.1.3.1.8.4 After Inspector completes air-sampling analysis, and where the air sampling results are equal to or less than 0.01 fibres/cubic centimeter, and after the Inspector provides written authorization to proceed, restore work area as prescribed in the specification. Where the results of analysis are greater than 0.01 fibres/cubic centimetre, the work area shall be re-cleaned and permit air sampling to be repeated until air sampling results are less then 0.01 fibres/cubic centimetre.

1.1.4 Furnish all labor, supervision, materials, equipment and services specified, indicated or required to provide asbestos removal as further described in this section. The words "asbestos removal", in the above clause shall mean not only the major items of service covered by this section of the specification, but all the incidental sundry components necessary for the complete execution of the work, with their labor charges, whether or not these sundry components and services are mentioned in detail in the tender documents issued in connection with the contract.

1.1.5 A summary of Asbestos-containing materials is provided in the Asbestos Locations Report and Analytical Certificates for the one select area of the Catholic Education Centre is appended to the project specification under separate cover.

1.1.6 All HEPA filtered negative air filter fan units and HEPA filtered vacuum cleaners shall be DOP tested and repaired to manufacturer's specifications at commencement of the project and whenever the filters are disturbed.

1.1.7 Security alarm systems, fire alarm and sprinkling system shall remain functional after completion of the work. All damage caused by work of this Contract shall be repaired at the Contractor's expense.

1.1.8 All removal work shall use wet removal techniques to minimize releases of airborne asbestos fibre and to enhance dust control after removal.

1.1.9 All surfaces are to be cleaned of asbestos debris by hand scraping, brushing and HEPA vacuuming.

1.1.10 All asbestos waste and contaminated debris is to be removed from the site in sealed containers and transported by a commercial hauler under a bill of lading to an approved landfill site.

1.1.11 Quality control inspections will be performed by the Inspector appointed by the owner throughout the project. Any contamination of surrounding areas indicated by visual inspection or air monitoring will require the complete enclosure and clean up of the affected areas at the Contractor's expense.

1.1.12 For Type 3 Removal work written clearance instructions issued by the Inspector will allow the Contractor to proceed to subsequent phases of work as follows:

1.1.12.1 Preparation

1.1.12.2 Removal / cleaning / repair followed by primary cleaning

1.1.12.3 Application of sealant

1.1.12.4 Tear down of non-critical barriers and all floor polyethylene sheeting followed by secondary cleaning

1.1.12.5 Tear down & site restoration

1.1.13 For Type 1 & 2 Removal work written clearance instructions issued by the Inspector will allow the Contractor to proceed to subsequent phases of work as follows:

1.1.13.1 Preparation

1.1.13.2 Removal / Cleaning / Repair

1.1.13.3 Final Clean

1.1.13.4 Tear Down & Site Restoration

1.1.14 Air monitoring will be conducted throughout the course of the project.

1.1.14.1 Air monitoring, will be performed by the Inspector on behalf of the owner.

1.1.14.2 Owner will not be performing air monitoring to meet Contractor's requirements for personnel sampling or any other purpose.

1.1.14.3 Contractor shall provide electrical outlets inside and outside the work area in sufficient quantity as required by inspector.

1.1.14.4 Air monitoring will be performed to detect faults in the work area isolation and for the purpose of clearing the work area at completion of cleaning, repair or removal activities.

1.1.14.5 Air sampling analytical certificates will be submitted solely to the owner and may not be supplied to the Contractor.

1.1.14.6 Within 24 hours after the clearance air testing results are received,

1.1.14.6.1 The owner and the employer shall post a copy of the results in a conspicuous place or places, at the workplace, and if the building contains other workplaces, in a common area of the building; and

1.1.14.6.2 A copy shall be provided to the joint health and safety committee or the health and safety representative, if any, for the workplace and for the building.

1.1.14.7 The owner of the building shall keep a copy of the clearance air testing results for at least one year after receiving them.

1.2 Definitions Relative to Asbestos Abatement:

1.2.1 Aerosol: A system consisting of particles, solid or liquid, suspended in air.

1.2.2 Airlock: A system for permitting ingress or egress without permitting air movement between a contaminated area and an uncontaminated area, typically consisting of two sets of two curtained doorways at least 1.5 metres apart.

1.2.3 Air Monitoring: The process of measuring the fibre content of a specific volume of air.

1.2.4 Amended Water: Water with a non-ionic surfactant (wetting agent) added to reduce water surface tension to 35 or less dynes, to allow through wetting of asbestos fibres.

1.2.5 Asbestos: The fibrous forms (asbestiform) of varieties of Chrysotile, Riebeckite (Crocidolite), Cummingtonite-Grunerite (Amosite), Anthophyllite, Actinolite and Tremolite.

1.2.6 Asbestos-containing material: Any material containing asbestos of any type and in any concentration.

1.2.7 Asbestos Waste: Any waste containing asbestos of any type and in any concentration.

1.2.8 Authorized Visitor: The Inspector or his representative and persons representing regulatory agencies.

1.2.9 Barrier: Any surface that seals off the work area to inhibit the movement of fibres or air.

1.2.10 Curtained doorway: An arrangement of closures to allow ingress and egress from one room to another while permitting minimal air movement between rooms, typically constructed by placing two overlapping sheets of polyethylene over an existing or temporarily framed doorway, securing each along the top of the doorway, securing the vertical edge of one sheet along one vertical side of the doorway, and securing the vertical edge of the other sheet along the opposite vertical side of the doorway. All free edges of polyethylene shall be reinforced with duct tape and the bottom edge shall be weighted to ensure proper closing.

Weights shall be secured and suspended off the floor and attached at the bottom opposing side of the polyethylene sheet that is not fastened to the framed doorway. Each polyethylene sheet shall overlap openings not less than 1/3 of the doorway opening.

1.2.11 Demolition: The wrecking or taking out of any building component, system, finish or assembly of a facility together with any related handling operations.

1.2.12 D.O.P. Testing: Dioctylphthalate aerosol challenge of a HEPA filter system and is used to establish the integrity and effectiveness of the system to filter out asbestos fibres.

1.2.13 Encapsulant: A material that surrounds or embeds asbestos fibres in an adhesive matrix, to prevent release of fibres.

1.2.14 Encapsulation: Treatment of asbestos-containing material with an encapsulant.

1.2.15 Enclosure: The construction of an air-tight, impermeable, permanent barrier around asbestos-containing material to control the release of asbestos fibres into the air.

1.2.16 Filter: A media component used in respirators, water filters, vacuum cleaners or negative pressure filter fan units to remove solid or liquid particles from the inspired air.

1.2.17 Friable Asbestos-containing Material: Material that contains more then 0.5% asbestos of any type by weight and that can be crumbled, pulverized, or reduced to powder or small particles by hand pressure when dry.

1.2.18 Glovebag: A sack (typically constructed of 6-mil transparent polyethylene sheeting or polyvinyl chloride plastic) with inward projecting long sleeve gloves, which are designed to enclose an object from which an asbestos-containing material is to be removed.

1.2.19 EPA Filter: A high efficiency particulate air (HEPA) filter capable of trapping and retaining 99.97% of asbestos fibres greater then 0.3 microns in diameter.

1.2.20 HEPA Vacuum: High Efficiency Particulate Air filtered vacuum equipment with a filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.

1.2.21 Negative Pressure Ventilation System: A system which extracts air directly from work area, filters such extracted air through a HEPA filtering system, and discharges this air directly outside work area to exterior of building. This system shall maintain a minimum pressure differential of 0.02, 0.003 or 0.004 inches of the water gauge relative to adjacent areas outside of work areas as specified, be equipped with an alarm to warn of system breakdown, and be equipped with an instrument to continuously monitor and automatically record pressure differences.

1.2.22 Polyethylene sheeting sealed with tape: Polyethylene sheeting of type and thickness specified sealed with tape along all edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide a continuous polyethylene membrane to protect

underlying surfaces from water damage or damage by sealant, and to prevent escape of asbestos fibres through the sheeting into a clean area.

1.2.23 Repair: Returning damaged asbestos-containing materials to an undamaged condition or to an intact state so as to prevent fibre release.

1.2.24 Respirator: A device designed to protect the wearer from the inhalation of harmful atmospheres.

1.2.25 Surfactant: A chemical wetting agent (soap) added to water to improve penetration into the asbestos-containing material.

1.2.26 Waste container: A properly labeled leak-tight container used for transporting asbestos waste from work area to disposal site.

1.2.27 Wet Cleaning: The process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops, or other cleaning utensils which have been dampened with amended water or by using water propulsion directed at asbestos-contaminated surfaces.

1.2.28 Work: Includes all services, labour and material required to complete the work as specified in the contract.

1.2.29 Work Area: The actual area where removal, repair and/or cleaning of asbestos-containing materials takes place.

1.3 Regulatory Agencies

1.3.1 Comply with Federal, Provincial, and local requirements pertaining to asbestos, provided that in any case of conflict among those requirements or with these specifications the more stringent requirement shall apply.

1.3.2 The regulations shall include but not be limited to the following:

1.3.2.1 Ontario Regulation 278/05, the Regulation Respecting Asbestos on Construction Projects and in Buildings and Repair Operations

1.3.2.2 R.R.O. 1990, Reg. 347 Waste Management Regulation under the Environmental Protection Act

1.3.2.3 The Regulations respecting the Handling, Offering for Transport and Transporting of Dangerous Goods Act

1.3.2.4 R.R.O. 1990, Reg. 213 Regulations for Construction Projects

1.3.2.5 Ontario Electrical Safety Code, latest edition

1.3.2.6 Ontario Occupational Health and Safety Act RSO 1990 c0.1 as amended

1.3.2.7 WHIMS Regulations R.R.O. 1990, Reg. 860

1.3.2.8 Fire Departments Act and Fire Marshals Act

1.4 Submittals

1.4.1 Before commencing work submit to the Inspector:

1.4.1.1 Copy of the environmental compliance or certificate of approval or provisional certificate of approval or letter with the appropriate approval number from the waste disposal site that will be used indicating that they are authorized to accept and dispose of asbestos waste.

1.4.1.2 Copy of the environmental compliance or certificate of approval or provisional certificate of approval or letter with the appropriate approval number from the waste transporter indicating that they are authorized to transport asbestos waste.

1.4.1.3 Certify in a letter duly signed from the Asbestos Abatement Contractor addressed to the "Dufferin-Peel Catholic District School Board" and Board Project Manager certifying that all employees have had instruction and training in:

1.4.1.3.1 The hazards of asbestos exposure

1.4.1.3.2 Respirator use

1.4.1.3.3 Dress

1.4.1.3.4 Use of showers

1.4.1.3.5 Entry and exit from work areas

1.4.1.3.6 All aspects of work procedures and protective measures.

1.4.1.4 For Type 3 operations the Asbestos Abatement Contractor shall furnish documentation that substantiates that:

1.4.1.4.1 Every supervisor has successfully completed the Asbestos Supervisor Training Program approved by the Ministry of Training, Colleges and Universities.

1.4.1.4.2 Every worker must has successfully completed the Asbestos Worker Training Program approved by the Ministry of Training, Colleges and Universities

1.4.1.5 Submit proof that the Contractor's Superintendent and Forepersons had attended an asbestos abatement course of not less than two days duration, approved by the Inspector.

1.4.1.6 Certify in a letter duly signed and addressed to the "Dufferin-Peel Catholic District School Board" and Board Project Manager, that the Forepersons have a minimum of

2000 hours performance at a supervisory function on at least two other asbestos projects of comparable size and complexity.

1.4.1.7 Phone numbers where supervisory personnel can be reached in case of emergency. **One of these supervisors must remain on site at all times, asbestos preparation; removal or cleanup is underway.**

1.4.1.8 Submit layout of proposed work area enclosures and decontamination facilities to Inspector for review and approval.

1.4.1.9 Submit documentation including test results for sealer proposed for use.

1.4.1.10 All notifications listed in 1.7 of Part 1.

1.4.2 Before commencing asbestos removal, repair or cleaning work, submit to the inspector:

1.4.2.1 Results of D.O.P tests. For Type 3 work or other work using negative pressure filter fan units.

1.4.2.2 Results of D.O.P tests. For Type 1, 2 and/or 3 work or other work HEPA filtered vacuum units.

1.4.3 After completion of work:

1.4.3.1 The Contractor shall submit to the inspector, a copy of transport documentation including: Bill of Lading, Transportation Manifest, weigh bill, other dump receipts and trip tickets issued by the waste disposal site or waste hauler.

1.5 Existing Conditions

1.5.1 A summary of Asbestos-containing materials and analytical certificate for materials expected to be present on this project is provided for the specified areas of the building under separate cover. This is for general information only and is not necessarily representative of all asbestos-containing materials contained within the scope of this project.

1.5.2 Notify the Inspector of suspect asbestos-containing material discovered during the work not apparent from the drawings or specifications pertaining to the work. Inspector will arrange for analysis where material was not identified in specifications or during site visit.

1.5.3 All work shall stop around this material until the inspector obtains a sample and performs the analysis. The inspector will issue additional instruction where it is found that the material contains asbestos. The Contractor shall indicate in writing to the Owner within 24 hours whether an increase in Contract price will occur and what the dollar value (in Canadian funds) will be. Where written notice is not provided in 24 hours and the Contractor removes the material it shall be understood that no extra is being requested for the work.

1.6 Visitor Protection

1.6.1 Provide protective clothing and approved respirators with filters to authorized visitors to work areas.

1.6.2 Instruct where necessary authorized visitors in the use of protective clothing and respirators.

1.6.3 Instruct authorized visitors in proper procedures to be followed in entering into and exiting from work areas.

1.7 Notification

1.7.1 Not later than Ten (10) calendar days prior to starting work on this project notify the following orally and in writing:

1.7.1.1 An Inspector at the office of the Ontario Ministry of Labour nearest the workplace of the operation before commencing:

1.7.1.1.1 Any Type 3 operation; or

1.7.1.1.2 A Type 2 operation described in paragraph 9 of subsection 12 (3) of Ontario Regulation 278/05. Removing insulation that is an asbestos-containing material from a pipe, duct or similar structure using a glove bag in which one square metre or more of insulation is to be removed.

1.7.1.2 The written notice required by subsection 11 (1) of Ontario Regulation 278/05 shall set out,

1.7.1.2.1 The name and address of the person giving the notice;

1.7.1.2.2 The name and address of the owner of the place where the work will be carried out;

1.7.1.2.3 The municipal address or other description of the place where the work will be carried out sufficient to permit the inspector to locate the place, including the location with respect to the nearest public highway;

1.7.1.2.4 A description of the work that will be carried out;

1.7.1.2.5 The starting date and expected duration of the work; and

1.7.1.2.6 The name and address of the supervisor in charge of the work.

1.7.1.3 When this Regulation requires written notice to an inspector at an office of the Ministry of Labour, the notice shall be given,

1.7.1.3.1 By delivering it to the office in person;

1.7.1.3.2 By sending it by ordinary mail, by courier or by fax, or

1.7.1.3.3 By sending the notice to the inspector by electronic means that are acceptable to the Ministry.

1.7.1.4 When this Regulation requires oral notice to an inspector at an office of the Ministry of Labour, the notice shall be given,

1.7.1.4.1 In person;

1.7.1.4.2 By telephoning the inspector; or

1.7.1.4.3 By sending the notice to the inspector by electronic means that are acceptable to the Ministry.

1.8 Payment

1.8.1 Asbestos-containing Materials

1.8.1.1 Payment shall include all materials, equipment and labor necessary to remove, handle, inventory, package and dispose of the specified asbestos-containing material.

1.8.1.2 Payment for all of Work Segment A shall be made under the stipulated price portion of the “Supplemental Cost Form” submitted for this project.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 General Material Requirements: Provide materials that comply with the Contract Documents, that are undamaged and unless otherwise indicated, unused at the time of installation.

2.1.2 Polyethylene Sheeting: Minimum 0.15 mm thick unless otherwise specified in sheet size to minimize joints.

2.1.3 Fabric Reinforced Polyethylene Sheeting: Minimum 0.25 mm thick, woven fibre reinforced fabric bonded both sides with polyethylene in sheet size to minimize joints.

2.1.4 Flame Resistant Polyethylene Sheeting: A single layer film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-Resistant Textiles and Films; in sheet size to minimize joints.

2.1.5 Tape: Cloth or fibreglass reinforced duct tape suitable for sealing polyethylene under both wet conditions using amended water, and dry conditions.

2.1.6 Spray Cement: Spray adhesive in aerosol cans, which is specifically formulated to stick tenaciously to sheet polyethylene.

2.1.7 Caulking: One component non-staining acrylic sealant to conform to GSB Specification 19GP-5M.

2.1.8 Foam: Low-density polyurethane expanding foam Froth-Pack or equivalent or better.

2.1.9 Wetting agent: 50% polyoxyethylene ester and 50% polyoxyethylene ether, or other material approved by Inspector, mixed with water in a concentration to provide adequate penetration and wetting of asbestos-containing material.

2.1.10 Slow drying sealer: Non-staining, clear, water dispersible type that remains tacky on surface for at least 8 hours and designed for the purpose of trapping residual asbestos fibres. Sealer shall have flame spread and smoke developed rating less than 50.

2.1.11 Asbestos waste containers: Shall be in two separate containers which shall be dust tight and impervious to asbestos and any chemical used during the removal process. Containers shall be acceptable to waste disposal site. Containers shall be as follows:

2.1.11.1 Polyethylene Waste Bag: 0.15-mm (6-mil) thickness sized or the waste.

2.1.11.2 Metal or Fibre Drums: 55 US gallon capacity with tight sealing metal top and bottoms and a locking ring. Note Polyethylene liners shall be used for all drums.

2.1.11.3 Labels: Waste containers shall have a pre-printed cautionary asbestos warning label, acceptable to waste disposal site.

2.1.12 Govebag: Prefabricated poly-vinyl-chloride (PVC) glovebag for reuse or polyethylene glovebag for single use, and both types shall be equipped with:

2.1.12.1 Sleeves and gloves that are permanently sealed to the body of the bag to allow the worker to access and deal with the insulation and maintain a sealed enclosure throughout the work period;

2.1.12.2 Valves or openings to allow insertion of a vacuum hose and the nozzle of a water sprayer while maintaining the seal to the pipe, duct or similar structure,

2.1.12.3 A tool pouch with a drain; and

2.1.12.4 A seamless bottom and a means of sealing off the lower portion of the bag.

2.1.12.5 All glove bags, disposal bags, tape and any other disposable material shall be new, uncontaminated and in same condition as purchased from manufacturer. All equipment must be clean, uncontaminated and in good working order.

2.1.12.6 The glove bag shall be made of material that is impervious to asbestos and sufficiently strong to support the weight of material the bag will hold.

2.1.13 PVC Glovebag: prefabricated, 0.25-mm (10 mil) minimum thickness, poly-vinyl-chloride bag with integral 0.25mm (10-mil) thick poly-vinyl-chloride gloves and elasticized valve/port. Bag equipped with a high strength reversible double-pull, double-throw zipper on top with a protective flap of 0.25mm (10-mil) minimum thickness poly-vinyl-chloride to facilitate installation on pipe and progressive movement along pipe. A mid level sealing strip, either zipper or locking strips or ridged pvc for the purpos of sealling off the lower portion of the bag.

2.1.14 Polyethylene Glovebag: prefabricated, 0.15-mm (6-mil) minimum thickness, polyethyelene bag with integral polythylene, latex, vinyl or neoprene gloves and cut out valve or vacuum port. Bag designed to be taped to pipe, duct or other suitable material. Contents of bag shall be sealed by twisting the centre of the bag and sealing the twisted section with tape. Individual bags may be separate or contained on a roll and attached together.

2.1.15 Securing Device: reusable nylon straps at least 1" wide with metal tightening buckle for sealing ends of bags around pipe and/or insulation.

2.2 EQUIPMENT

2.2.1 General: Provide equipment that is undamaged, clean and in serviceable condition. Provide only equipment that is recognized as being suitable for the intended use.

2.2.2 Airless Sprayer: Spray equipment for amended water.

2.2.3 Fine Atomizing Spray Nozzle: Nozzle for airless sprayer capable of delivering a fine particle spray of amended water.

2.2.4 Expansion Poles: Purposely made pole devices designed to hold a single piece of polyethylene sheeting to the floor and the ceiling. Expanding mechanism is by either spring separation (acceptable product "Zip Pole") or by screw expansion (acceptable product "Task Pole")

2.2.5 Power Washer: Airless spray equipment capable of delivering a steam of water at a pressure of not less than 1200 psi or exceeding 2500 psi.

2.2.6 HEPA Filter Fan Units: Shall be used to create negative pressure differential in the work area. Each HEPA filter fan units shall consist of, but not be limited to:

2.2.6.1 Protective cabinet

2.2.6.2 Inlet protective grill

2.2.6.3 Pre-filter

2.2.6.4 HEPA filter

2.2.6.5 Fan

2.2.6.6 Pressure differential gauge and high/low switch

2.2.6.7 On off switch

2.2.7 Negative Pressure Differential Control Units: Device capable of measuring pressure differential between work area and the outside areas. Each negative pressure differential control unit shall consist of but not be limited to:

2.2.7.1 Pressure differential gauge, range 0 to 0.10 inches of the water gauge

2.2.7.2 High limit audible alarms

2.2.7.3 Low limit audible alarms

2.2.7.4 Sensor tubing and wall clamps

2.2.7.5 Wall mounting brackets

2.2.7.6 Auto reset

2.2.7.7 Continuous recording tape or wheel chart

2.2.8 HEPA vacuum: high efficiency particulate air filtered vacuum cleaner. All HEPA vacuums brought to the site shall be visibly clean, shall be in a good state of repair and shall be maintained in such state through completion of the project, shall be D.O.P. tested on site prior to use or after each HEPA filter disturbance.

2.2.9 Electrical Service: provide a weather proof, grounded temporary electric power service and distribution system of sufficient size, capacity, and power characteristics to accommodate the work.

2.2.9.1 Ground Fault Panel: Electrical panel equipped with breaker type ground fault circuit interrupters (GFCI) of sufficient capacity to power all electrical equipment and lights in the work area. All circuit breakers shall have 5 mA ground fault protection and shall be equipped with test button and reset switch. The panel shall be complete with all necessary accessories including ground fault interrupter breakers installed by a licensed electrician.

2.2.9.2 Electrical Components and Equipment: All electrical materials supplied by the Contractor shall be fully approved by the Canadian Standards Association (CSA) or Underwriters Laboratories Canada (ULC).

2.2.9.3 Temporary Lighting: Provide general lighting for adequate illumination. Protect lamps with guard cages grounded together to distribution panel or tempered glass enclosures.

2.2.9.4 Electrical Power Cords: Use only grounded extension cords of sufficient length to access all locations of the work area. Use "hard-service" cords where exposed to abrasion and traffic. Use waterproof connectors to connect separate lengths of electric cords is single lengths will not reach areas of work.

2.2.10 Water Service: provide all connection to the owner's water system including back flow protection. Valves shall be temperature and pressure rated for the conditions encountered.

2.2.10.1 Supply Water Pipe: High-pressure hose including high-pressure fittings and components or Type L copper minimum with 50/50 solder joints to ASTM B032 alloy.

2.2.10.2 Drain Water Pipe: ABS pipe to CS B.181.1-1973 with solvent weld or by high-pressure hose at discharge from filters.

2.2.10.3 Hot Water Heater: ULC rated electric hot water heater appropriately sized for the project. Provide with relief valve compatible with water heater operation and drain spout directed to a drain. Activate from ground fault panel located within the temporary electrical panel

2.2.10.4 Sump Pump: Provide totally submersible waterproof unit with integral floats switch and shall have a manual switch. Provide unit sized to pump 2 times the flow capacity of all showers or hoses supplying water to the sump through filters.

2.2.10.5 Shower: Shall be the walk through type to permit use by one person at a time. Shower enclosure shall be a minimum of 24 gauge steel walls with baked enamel, galvanized steel, aluminum or stainless steel finish. Shower pan shall be one piece leak proof and deep enough to accommodate sump pump.

2.2.10.6 Filters: Shall be multi staged cascade type on drain lines from shower(s) or any other water source carrying asbestos-containing water from the work area. Provide units with disposable filter elements as indicated. Connect so that discharged water passes primary filter and output of primary filter passes through secondary filter.

2.2.10.6.1 Primary Filter: Passes particles 20 microns and smaller

2.2.10.6.2 Tertiary Filter: Passes particles 5 microns and smaller

2.2.11 Scaffolding: Scaffolding may be of the suspension type or standing type such as metal tube and coupler, tubular welded frame, pole or outrigger type or cantilever type. The type, erection and use of all scaffolding shall comply with all applicable safety provisions and engineered for the loads to be received.

2.2.12 Self-contained Toilets: Single-occupant portable toilet units of the chemical type, properly vented.

PART 3 – EXECUTION

3.8 NON-FRIABLE OR MANUFACTURED ASBESTOS-CONTAINING MATERIALS REMOVAL WORK METHOD

TYPE 1 Work The installing or removing ceiling tiles that are asbestos-containing material, if the tiles cover an area less than 7.5 square metres and are installed or removed without being broken, cut, drilled, abraded, ground, sanded or vibrated.

TYPE 1 Work Installing or removing non-friable asbestos-containing material, other than ceiling tiles, if the material is installed or removed without being broken, cut, drilled, abraded, ground, sanded or vibrated

TYPE 1 Work Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable asbestos-containing material if,
i. the material is wetted to control the spread of dust or fibres, and
ii. the work is done only by means of non-powered hand-held tools.

TYPE 1 Work Removing less than one square metre of drywall in which joint-filling compounds that are asbestos-containing material have been used.

3.8.1 Preparation - Worker Decontamination Enclosure System: *Include for extensive removal work.*

3.8.1.1 Worker decontamination area shall be provided near to the work area.

3.8.1.2 Worker decontamination area shall comprise a shower and a clean room for changing.

3.8.1.3 Use an existing shower where permitted

3.8.1.4 Where a shower is not available install a portable shower.

3.8.1.5 Provide a constant supply of separate hot and cold water.

3.8.1.6 Provide piping and connect to water sources and drains.

3.8.1.7 Pump wastewater through a 5-micrometre-filter system acceptable to Inspector before directing into drains.

3.8.18 Provide soap, clean towels and appropriate containers for disposal of used respirator filters.

3.8.1.9 Showers shall be made available and used by work force from beginning of preparatory work to completion of the Contract.

3.8.2 Preparation - Construction of Decontamination Centres:

3.8.2.1 Ensure that the shower room is separated from a clean room.

3.8.2.2 Build suitable framing for enclosures or use existing rooms where convenient and line with polyethylene sheeting sealed with tape. Framing shall be constructed of 2" x 4" studs (stud grade) at 24" O.C. (max.) With 2" x 4" wood sill and top plates (also stud grade) fasten with a minimum of two 3 ½" common nails per stud end.

3.8.2.3 Alternatively use expansion poles either spring loaded or of the screw type to hold polyethylene sheeting from floor to ceiling. Expansion poles shall be placed 24" O.C. (max.) and polyethylene sheeting should be a single piece extended floor to ceiling with rubberized pads on either end of the pole so that the floor or ceiling finishes are not marred.

3.8.2.4 Use one layer of FR polyethylene sheeting sealed with tape on floors, walls and ceiling then cover enclosure with one layer of clear polyethylene sheeting sealed with tape. All polyethylene sheeting sheeting should be placed on the exterior side to expansion poles with the FR polyethylene sheeting applied on the exterior and clear polyethylene sheeting on the interior work area face. Floor polyethylene shall extend at least 12" up the sides of the wall and then shall be overlapped by wall polyethylene sheeting.

3.8.2.5 Build curtained doorways between enclosures so that when people move through a doorway, one of the two closures comprising the doorway always remains closed.

3.8.3 Preparation - Separation of Work Areas from Clean Areas:

3.8.3.1 Facilities for the washing of hands and face shall be provided at the outside of the work area or enclosure and shall be made available to workers and shall be used by every worker when leaving the work area.

3.8.3.2 Deactivate and lock out air handling and ventilation systems.

3.8.3.3 Isolate heating grills, air handling and ventilation systems to prevent contamination and fibre dispersal to other areas of the building during the work phase. Isolation shall be accomplished by sealing grills, ventilation ducts and openings with 6-mill (0.15 mm) polyethylene sheeting sealed with tape.

3.8.3.4 Seal all other openings from room with polyethylene sheeting sealed with tape.

3.8.3.5 Place drop sheets of 6-mill (0.15 mm) polyethylene sheeting under extent of work, if applicable (omit for removal of floor coverings).

3.8.3.6 Cover drapery, other fabrics, carpet, furnishings, shelving or other items with drop sheets of 6-mill (0.15 mm) polyethylene sheeting and fasten with tape.

3.8.3.7 Build overlapping curtained doorways between work area enclosure so that the work area remains isolated Weight door flaps.

3.8.3.8 Separate parts of the building required to remain in use from parts of the building used for asbestos abatement by placing rope barriers at the boundary of the designated work area where walls so not exist and the asbestos-containing materials are to be removed wetted with amended water and are to be kept wet even if material can be removed intact.

3.8.3.9 Temporary boundaries shall be a minimum of 2 metres from the location of the material being removed. Where walls do not exist

3.8.3.10 At the outside of the work area install warning signs in upper case "Helvetica Medium" letters reading or similar to as follows:

CAUTION ASBESTOS HAZARD AREA (25 mm)
NO UNAUTHORIZED ENTRY (19 mm)
WEAR ASSIGNED PROTECTIVE EQUIPMENT (19 mm)
BREATHING ASBESTOS DUST MAY CAUSE SERIOUS BODILY HARM (7 mm)

3.8.4 Preparation - Construction of Scaffold or Elevated Work Platforms:

3.8.4.1 All platforms shall be constructed using pre-engineered scaffolding systems.

3.8.4.2 Scaffolding shall be covered with prefabricated platforms.

3.8.4.3 All surfaces shall be covered with 1 layer of FR polyethylene sheeting sealed.

3.8.4.4 All scaffolding or platforms shall rest on wood blocks or have rubber wheels with locking chocks.

3.86.5 Preparation - Electrical Service:

3.8.5.1 Provide all necessary ground fault protection and temporary lighting required for the work.

3.8.5.2 Lock out all existing power to or through the work area. No lighting or power existing in the work area shall be used. All power and lighting to the work area are to be provided with ground fault protection.

3.8.5.3 The ground fault supply box shall be located outside of the work area and elevated off the floor.

3.8.6 Preparation - Water Service:

3.8.6.1 The Owner will supply water from existing building sources at no charge.

3.8.6.2 Contractor shall use hose or pipe to supply water to work area.

Or

All water shall be transported in jerry type cans on wheeled dollies.

3.8.6.3 Water shall be supplied for the following uses:

3.8.6.3.1 Temporary shower and wash facilities

3.8.6.3.2 Abatement work area

3.8.6.4 Shower installation where an existing shower is not available:

3.8.6.4.1 A master shut-off valve shall be installed adjacent to and on the clean side of the shower. All water shall be shut off at completion of the day's work.

3.8.6.4.2 Water supply shall be by means of copper pipe and fittings or high-pressure hose and fittings. Any hose used shall be installed downstream of master shut-off valve and is not to be left under pressure when unattended.

3.8.6.4.3 A water heater shall be provided for the shower where hot water is not available. Overflow pressure regulator on hot water tank shall be connected to a drain to prevent spillage if activated.

3.8.6.5 All piping shall be tested watertight and shall remain so for the duration of the work.

3.8.6.6 Provide drainage from shower and washroom as required and direct to existing drains.

3.8.6.7 After completion of use, the water pipe system shall be returned to the as found condition.

3.8.7 Maintenance of Enclosures:

3.8.7.1 Maintain enclosures in tidy condition.

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

3.8.7.3 Visually inspect enclosures at the beginning of each working period.

3.8.7.4 Use smoke methods to test effectiveness of barriers when directed by Inspector.

3.8.8 Asbestos Abatement work shall not commence until:

3.8.8.1 Arrangements have been made for disposal of waste.

3.8.8.2 Warning signs, barricades and tape barriers are available and established.

3.8.8.3 Tools, equipment and materials waste containers are on hand.

3.8.8.4 Facilities for the washing of face and hands are provided at the edge or outside the work area.

3.8.8.5 All notifications have been completed and other preparatory steps have been taken.

3.8.8.6 Approval in writing is granted by the Inspector to start.

3.8.9 Asbestos Removal - Worker Protection

3.8.9.1 Instructions: Before commencing work instruct workers in use of respirators, dress, entry and exit from work areas, and all aspects of work procedures and protective measures.

3.8.9.2 Respirators: Provide workers for his or her exclusive use, personally issued and marked as to efficiency and purpose respiratory equipment acceptable to Labour Canada or provincial labour department as suitable for the asbestos exposure in the work area. If disposable type filters are used, provide sufficient filters so those workers can install new filters following disposal of used filters and before re-entering contaminated areas.

3.8.9.3 A respirator provided by an employer and used by a worker shall be a non-powered reusable air purifying half mask dust respirator or better, equipped with N-100, R-100 or P-100 High Efficiency Particulate Aerosol (HEPA) filters suitable for asbestos-containing dust.

3.8.9.4 Shall be fitted so that there is an effective seal between the respirator and the worker's face.

3.8.9.5 Shall be used and maintained in accordance with written procedures that are established by the employer and are consistent with the manufacturer’s specifications.

3.8.9.6 Shall be cleaned, disinfected and inspected after use on each shift, or more often if necessary, when issued for the exclusive use of one worker.

3.8.9.7 Shall have damaged or deteriorated parts replaced prior to being used by a worker.

3.8.9.8 When not in use, shall be stored in a convenient, clean and sanitary location.

3.8.9.9 Protective Clothing: provide workers with full body disposable type coveralls.

3.8.9.10 Provide other body protection required under applicable safety regulations.

3.8.9.11 Each worker shall:

3.8.9.11.1 Before proceeding to the work area.

3.8.9.11.1.1 Remove street clothes in clean area.

3.8.9.11.1.2 Put on respirator with new filters or reusable filters that have been tested as satisfactory.

3.8.9.11.1.3 Put on clean coveralls and head covers.

3.8.9.11.1.4 All street clothes, uncontaminated footwear, towels, and similar uncontaminated articles shall be stored in clean change room.

3.8.9.11.2 At completion of work.

3.8.9.11.2.1 Remove gross contamination from clothing by first HEPA vacuuming and then by damp wiping using soap and water.

3.8.9.11.2.2 Wash face and hands with clean water from buckets of clean water before leaving work area.

3.8.9.11.2.3 The worker shall proceed to the shower.

3.8.9.11.2.4 Place contaminated work suits in labeled waste receptacles for disposal with other asbestos contaminated materials.

3.8.9.11.2.5 After showering proceed to clean area and change into street clothes.

3.8.9.12 Workers shall not eat, drink, smoke or chew in the work area except in established clean room or area.

3.8.9.13 Workers shall be fully protected with respirators and protective clothing during preparation, removal and final cleaning.

3.8.10 Asbestos Removal - Work Procedures

3.8.10.1 Before beginning work, visible dust shall be removed with a damp cloth or a vacuum equipped with a HEPA filter from any surface in the work area, including the thing to be worked on.

3.8.10.2 Spray asbestos material with water containing the specified wetting agent, using airless spray equipment capable of providing a "mist" application to prevent release of fibres. Saturate the asbestos material sufficiently to wet it to the substrate without causing excess dripping. Spray the asbestos material repeatedly during work process to maintain saturation and to minimize asbestos fibre dispersion.

3.8.10.3 No material shall be removed by being broken, cut, drilled, abraded, ground, sanded or vibrated or the use of power tools unless it is thoroughly saturated and amended water is being continually applied.

3.8.10.4 Mist the air periodically with water to reduce airborne fibre level.

3.8.10.5 Remove material in sections as intact as possible. Do not allow saturated asbestos to dry out.

3.8.10.6 Frequently and at regular intervals during the doing of the work as it is being removed pack the material in sealable plastic bags 0.15-mm minimum thick and place in labeled containers for transport. Seal filled containers. Clean external surfaces thoroughly by wet sponging. Remove from immediate working area.

3.8.10.7 Vinyl floor tile may be removed in the following manner:

3.8.10.7.1 Place dry ice chips in a 6-mil polyethylene bag over the tile to be removed.

3.8.10.7.2 Allow area to freeze, then reset bag over new area

3.8.10.7.3 Immediately remove tile intact with hand scrappers.

3.8.11 Asbestos Removal - Cleaning

3.8.11.1 After completion of work, all surfaces from which asbestos has been removed shall be wire brushed and wet-sponged to remove all visible material. During this work the surfaces shall be kept wet.

3.8.11.2 After wire brushing and wet sponging to remove visible asbestos, wet clean the entire work area and equipment used in the process.

3.8.11.3 Dust and waste shall be cleaned up and removed using a vacuum equipped with a HEPA filter, or by damp mopping or wet sweeping, and placed in a labeled waste container.

3.8.11.4 Dispose of asbestos waste in waste containers as the waste is generated and seal when filled.

3.8.11.5 Clean exterior of waste containers before removing from work area by wet wiping or HEPA vacuuming.

3.8.11.6 After completion of cleaning spray sealant unless damage will occur on all surfaces in the work area and allow to dry.

3.8.11.7 The work area shall be examined by inspector and accepted as clean when there is no visible residue, dirt, dust, film, stain or discoloration resulting either from, asbestos removal procedures or from cleaning procedures on surfaces in the work area.

3.8.11.8 After satisfactory completion of the cleaning operation and when the area has dried, the Inspector shall take clearance air samples in the work area. During this time the Contractor permits no entry.

3.8.11.9 Should the air sample fail to be less than 0.1 f/cc then the Contractor shall reclean the work area and pay for the costs of additional inspection and air monitoring using the Inspector appointed by the owner. Repeat cleaning using HEPA vacuum equipment, or

wet cleaning methods where feasible, in conjunction with sampling until levels meet these criteria.

3.8.12 Asbestos Removal - Restoration of Site

3.8.12.1 After the area is declared clean and written authorization to proceed has been issued by the Inspector restore site.

3.8.12.2 Dismantle all polyethylene barriers and drop sheets, wet with amended water and dispose of all polyethylene sheeting as asbestos waste. Polyethylene sheeting shall be placed directly into a labeled waste bag.

3.8.12.3 Dispose of asbestos waste in accordance with subsection 3.7 Waste Disposal

3.8.12.4 Re-establishment of Objects and Systems when work area is complete:

3.8.12.4.1 Re-establish objects moved to temporary locations in the course of the work, in their proper positions.

3.8.12.4.2 Re-secure mounted objects removed in the course of the work in their former positions.

3.8.12.4.3 Re-establish mechanical and electrical systems in proper working order. Install new filters.

3.8.12.4.4 Repair or replace objects damaged in the course of the work, as directed by Inspector.

3.9 WASTE DISPOSAL

3.9.1 At completion of the work remove sealed and labeled containers containing asbestos waste and dispose of to authorized land fill site in accordance with the requirements of disposal authority. Ensure that Contractor's representative who shall ensure that dumping is done in accordance with governing regulations accompanies each shipment of containers transported to dump.

3.9.2 Bulk lift or roll off containers shall be constructed of steel only, fully enclosed on all sides, top and bottom and complete with a locking mechanism in proper working order. This container shall remain locked at all times when not in use.

3.9.3 Asbestos-containing wastes shall be disposed of in accordance with procedures established by the Ontario Ministry of Environment and Energy, R.R.O. 1990, Reg. 347 as amended under the Environmental Protection Act and the Government of Canada, Transportation of Dangerous Goods Act.

3.9.4 Where asbestos waste will be disposed of in bulk, comply with the requirements of the Ministry of Energy & Environment, Guideline C-6 the Handling, Transportation and Disposal of Asbestos Waste in Bulk.

3.9.5 Both sides of every vehicle used for the transportation of asbestos and every waste container must display thereon in large easily legible letters that contrast in colour with the background the words

"Caution"
In letters not less than ten centimetres in height and the words:
Contains Asbestos Fibres
Avoid Creating Dust and Spillage
Asbestos May Be Harmful To Your Health
Wear Approved Protective Equipment.

3.9.6 Every vehicle used for the transportation of asbestos waste shall display a Class 9 Label on all four sides.

3.9.7 Each side of every waste container or the signs on the four sides of the transport vehicle must display the words:

3.9.7.1 "White Asbestos", Product Identification Number "2590" for Chrysotile Asbestos.

3.9.7.2 "Blue Asbestos", Product Identification Number "2212" for an Asbestos other than for Chrysotile or unknown material.

3.9.8 The waste must be transported in a fully enclosed truck or alternatively, in a fully enclosed waste disposal skip.

3.9.9 To deal with spills or receptor breakage, the driver must be familiar with clean up and handling procedures.

3.9.10 The truck must be equipped with a shovel and broom, wetting agent, protective clothing, respiratory protective equipment, polyethylene bags of at least 6-mil thickness and bag enclosures.

3.9.11 It is the Contractor's responsibility to notify the Disposal Company and its driver of the nature of the waste provided for disposal.

3.9.12 It is the Contractor's responsibility to co-ordinate all disposal of asbestos materials with the land fill site.

3.9.13 Prior to the shipment of asbestos waste the building owner of representative shall sign and receive a copy of the bill of lading or transportation manifest. The contractor shall submit to the inspector a copy of the weigh bill, dump receipts and trip tickets issued by the waste disposal site or waste hauler.

3.10 AIR MONITORING

3.10.1 From commencement of preparatory work, until completion of cleaning operations air samples may be taken both inside and outside of work area enclosures for Type 3 Work Areas in accordance with the requirements of Provincial Health and Safety Regulations, Acts, Guidelines or the Peel District School Board. In addition air samples may be taken both inside and outside of the work area as required by the Inspector for other Type 2 and Type 1 Work Areas

3.10.2 Initial air tests will be taken following the Phase Contrast Microscopy (PCM) Method in accordance with U.S. National Institute of Occupational Safety and Health Manual of Analytical Methods, Method 7400, Issue 2: Asbestos and other Fibres by PCM (August 15, 1994), using the asbestos fibre counting rules

3.10.2.1 Fibres referred to in this section include fibres regardless of composition as counted by the PCM method used.

3.10.3 Secondary air tests for the clearance of Type 3 work areas may be taken following the Transmission Electron Microscopy (TEM) method in accordance with U.S. National Institute of Occupational Safety and Health Manual of Analytical Methods, Method 7402, Issue 2: Asbestos by TEM (August 15, 1994).

3.10.4 Air samples will be collected in areas subject to normal air circulation away from room corners, obstructed locations, and sites near windows, doors of vents.

3.10.5 The Inspector shall take all air samples.

3.10.6 The services of a testing laboratory will be employed by the Inspector to perform the laboratory analysis of the air samples.

3.10.7 Analytical turnaround shall be within 24 hours.

3.10.8 Exposure levels for Type 3 work shall not exceed the following criteria:

3.10.8.1 Outside the work area during preparation removal and cleaning - 0.05 Fibres per Cubic Centimetre (f/cc)

3.10.8.1.1 Sampling will be performed at a specific station.

3.10.8.1.2 If air monitoring shows that areas outside work area enclosures are contaminated all work inside the work area shall stop. The contaminated area shall be enclosed, maintained and cleaned, in the same manner as that applicable to work areas. The area of high fibre count shall be thoroughly cleaned with wet wiping and HEPA vacuuming by the Contractor to the satisfaction of the Inspector. Further air monitoring will be carried out to confirm that the area has been adequately cleaned. Abatement work may proceed only after the contaminated area has been enclosed.

3.10.8.2 Inside the work area during preparation prior to removal - 0.1 f/cc

3.10.8.2.1 Sampling may be performed at a specific station or mounted on a labourer.

3.10.8.2.2 All work shall stop and proceed only after the cause of the high fibre counts has been remedied. The high fibre count area shall be thoroughly cleaned with wet wiping and HEPA vacuuming the Contractor to the satisfaction of the Inspector. Further air monitoring will be carried out to confirm that the area has been adequately cleaned. Preparatory work may proceed only after the air sample results indicate that the fibre concentration is at or below the specified criteria.

3.10.8.3 Inside the work area during removal and subsequent cleaning operations - 2.0 f/cc

3.10.8.3.1 Sampling may be performed at a specific station or mounted on a labourer.

3.10.8.3.2 Should levels exceed this value, work shall stop and proceed only after the cause of the high fibre concentration has been remedied. Where it is not possible to reduce fibre concentration then respirators offering higher protection will be required and work can proceed.

3.10.8.4 Final clearance Tests - 0.01 f/cc

3.10.8.4.1 Testing shall be based on samples taken inside the enclosure.

3.10.8.4.2 The work area shall be fully dry before air sampling can occur.

3.10.8.4.3 The number of PCM air samples shall be taken based on the following schedule:

Minimum number of PCM air samples to be taken from each enclosure	Area of enclosure
2	10 Square metres or less
3	More than 10 but less than 500 square metres
5	500 Square metres or more

3.10.8.4.4 In addition one air sample may be taken concurrently outside the work area entrance to worker or waste decontamination enclosure.

3.10.8.4.5 Aggressive sampling procedures as described below will be followed

3.10.8.4.5.1 Before sampling pumps are started the exhaust from forced-air equipment (electric leaf blower) will be swept against all walls, ceiling, floors, ledges and other surfaces in the room. This procedure will be continued for 5 minutes per 10, 0000 cubic feet of room volume.

3.10.8.4.5.2 At least one 20-inch diameter fan per 10,000 cubic feet of room volume will be mounted in a central location at approximately 1 metre above

floor directed toward the ceiling and operated at low speed for the entire period of sample collection.

3.10.8.4.7.3 After air-sampling pumps have been shut off, fans will be shut off.

3.10.8.4.6 A minimum of 2,400 litres of air shall be drawn through each sample filter and sampling rate shall not exceed 16 litres per minute of air. The minimum sampling time at maximum flow rate is 2 hours and 30 minutes.

3.10.8.4.7 Clearance air monitoring results for asbestos work area will be accepted where the concentrations all samples taken inside the work area meets the project and regulated criteria of 0.01 f/cc.

3.10.8.4.8 Where air samples fail by the PCM testing method and where authorized by the owner a second test may be performed following the TEM testing method.

3.10.8.4.9 Testing shall be based on samples taken inside the enclosure and samples taken outside the enclosure but inside the building.

3.10.8.4.10 At least five air samples shall be taken inside each enclosure and at least five air samples shall be taken outside the enclosure but inside the building.

3.10.8.4.11 Sampling inside and outside the enclosure shall be conducted concurrently.

3.10.8.4.12 Aggressive sampling procedures as described below will be followed inside the work area

3.10.8.4.12.1 Before sampling pumps are started the exhaust from forced-air equipment (electric leaf blower) will be swept against all walls, ceiling, floors, ledges and other surfaces in the room. This procedure will be continued for 5 minutes per 10, 0000 cubic feet of room volume.

3.10.8.4.12.2 At least one 20-inch diameter fan per 10,000 cubic feet of room volume will be mounted in a central location at approximately 1 metre above floor directed toward the ceiling and operated at low speed for the entire period of sample collection.

3.10.8.4.12.3 After air-sampling pumps have been shut off, fans will be shut off.

3.10.8.4.13 A minimum of 2,400 litres of air shall be drawn through each sample filter and sampling rate shall not exceed 16 litres per minute of air. The minimum sampling time at maximum flow rate is 2 hours and 30 minutes.

3.10.8.4.14 The work area inside the enclosure passes the clearance air test if the average concentration of asbestos fibres in the samples collected inside the enclosure is statistically less than the average concentration of asbestos fibres in the samples collected outside the enclosure, or if there is no statistical difference between the two average concentrations.

3.10.9 Exposure levels for Type 2 work shall not exceed the following criteria:

3.10.9.1 Inside the work area during preparation prior to removal - 0.1 f/cc

3.10.9.1.1 Sampling may be performed at a specific station.

3.10.9.1.2 All work shall stop and proceed only after the cause of the high fibre counts has been remedied. The high fibre count area shall be thoroughly cleaned with wet wiping and HEPA vacuuming the Contractor to the satisfaction of the Inspector. Further air monitoring will be carried out to confirm that the area has been adequately cleaned. Preparatory work may proceed only after the air sample results indicate that the fibre concentration is at or below the specified criteria.

3.10.9.3 Inside the work area within an enclosure during removal - 1.0 f/cc

3.10.9.3.1 Sampling may be performed at a specific station or mounted on a labourer.

3.10.9.3.2 Should levels exceed this value, work shall stop and proceed only after the cause of the high fibre concentration has been remedied. Where it is not possible to reduce fibre concentration then respirators offering higher protection will be required and work can proceed.

3.10.9.3 At a work area during repair activity and for clearance air test where the underlying asbestos-containing materials are not disturbed - 0.1 f/cc

3.10.9.4 Final clearance Tests - 0.01 f/cc (inside enclosure work)

3.10.9.4.1 Testing shall be based on samples taken inside the enclosure.

3.10.9.4.2 The work area shall be fully dry before air sampling can occur.

3.10.9.4.3 One PCM air samples shall be taken inside the work area.

3.10.9.4.4 In addition one air sample may be taken concurrently outside the work area entrance to worker or waste decontamination enclosure.

3.10.9.4.5 Aggressive sampling procedures as described below will be followed

3.10.9.4.5.1 Before sampling pumps are started the exhaust from forced-air equipment (electric leaf blower) will be swept against all walls, ceiling, floors, ledges and other surfaces in the enclosure.

3.10.9.4.5.2 At least one 12-inch diameter fan will be mounted in a central location at approximately 1 metre above floor directed toward the ceiling and operated at low speed for the entire period of sample collection.

3.10.9.4.5.3 After air-sampling pumps have been shut off, fans will be shut off.

3.10.9.4.6 A minimum of 2,400 litres of air shall be drawn through each sample filter and sampling rate shall not exceed 16 litres per minute of air. The minimum sampling time at maximum flow rate is 2 hours and 30 minutes.

3.10.9.4.7 Clearance air monitoring results for asbestos work area will be accepted where the concentrations all samples taken inside the work area meets the project and regulated criteria of 0.01 f/cc.

2.10.10 Exposure levels for Type 3 work shall not exceed the following criteria:

3.10.10.1 During preparation, removal, cleaning and clearance - 0.1 f/cc

3.10.10.1.1 Sampling may be performed at a specific station or mounted on a labourer.

3.10.10.1.2 Should levels exceed this value, work shall stop and proceed only after the cause of the high fibre concentration has been remedied. Where it is not possible to reduce fibre concentration then respirators offering higher protection will be required and work can proceed.

3.10.10.1.3 Final clearance Tests shall be performed as follows

3.10.10.1.3.1 Testing shall be based on samples taken inside the enclosure or work area.

3.10.10.1.3.2 The work area shall be fully dry before air sampling can occur.

3.10.10.1.3.3 One PCM air samples shall be taken inside the work area.

3.10.10.1.3.4 In addition one air sample may be taken concurrently outside the work area entrance to worker or waste decontamination enclosure.

3.10.10.1.3.5 Aggressive sampling procedures as described below will be followed

3.10.10.1.3.5.1 Before sampling pumps are started the exhaust from forced-air equipment (electric leaf blower) will be swept against all walls, ceiling, floors, ledges and other surfaces in the enclosure.

3.10.10.1.3.5.2 At least one 20-inch diameter fan per 10,000 cubic feet of work area will be mounted in a central location at approximately 1 metre above floor directed toward the ceiling and operated at least on low speed for the entire period of sample collection.

3.10.10.1.3.5.3 After air-sampling pumps have been shut off, fans will be shut off.

3.10.10.1.3.6 A minimum of 2,400 litres of air shall be drawn through each sample filter and sampling rate shall not exceed 16 litres per minute of air. The

minimum sampling time at maximum flow rate is 2 hours and 30 minutes.

3.10.10.3.3.7 Clearance air monitoring results for asbestos work area will be accepted where the concentrations all samples taken inside the work area meets the project and regulated criteria of 0.1 f/cc.

3.10.11 If air monitoring shows elevated fibre concentrations exceeding the prescribed levels then any of the following may be required by the Contractor after the work is stopped:

3.10.11.1 Increase in the wetting rate of asbestos-containing materials inside work area.

3.10.11.2 Evaluation of work practice and correct poor practice.

3.10.11.3 Reduction in area activity.

3.10.11.4 Examine for failure in negative air filter / fan units or rupture of exhaust tubing. Repair as required.

3.10.11.5 Examine for failure of work area enclosure seals. Repair as required.

3.10.11.6 Evaluation of a possible outside source of contamination.

3.10.12 Contractor shall take all additional precautions necessary to reduce fibre exposure.

3.11 Bulk Sample Analysis

3.11.1 The analysis for Asbestos in bulk materials will be performed using Polarized Light Microscopy with Dispersion Staining Techniques.

3.11.1.1 U.S. Environmental Protection Agency. Test Method EPA/600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials. June 1993 is an acceptable method for analysis.

3.11.1.2 Any material that contains 0.5 per cent or more asbestos by dry weight is deemed to be asbestos-containing

3.11.2 Any material that may or is likely to contain asbestos not disclosed in the Specifications or site visit and uncovered during the work shall be analyzed by the fore mentioned method.

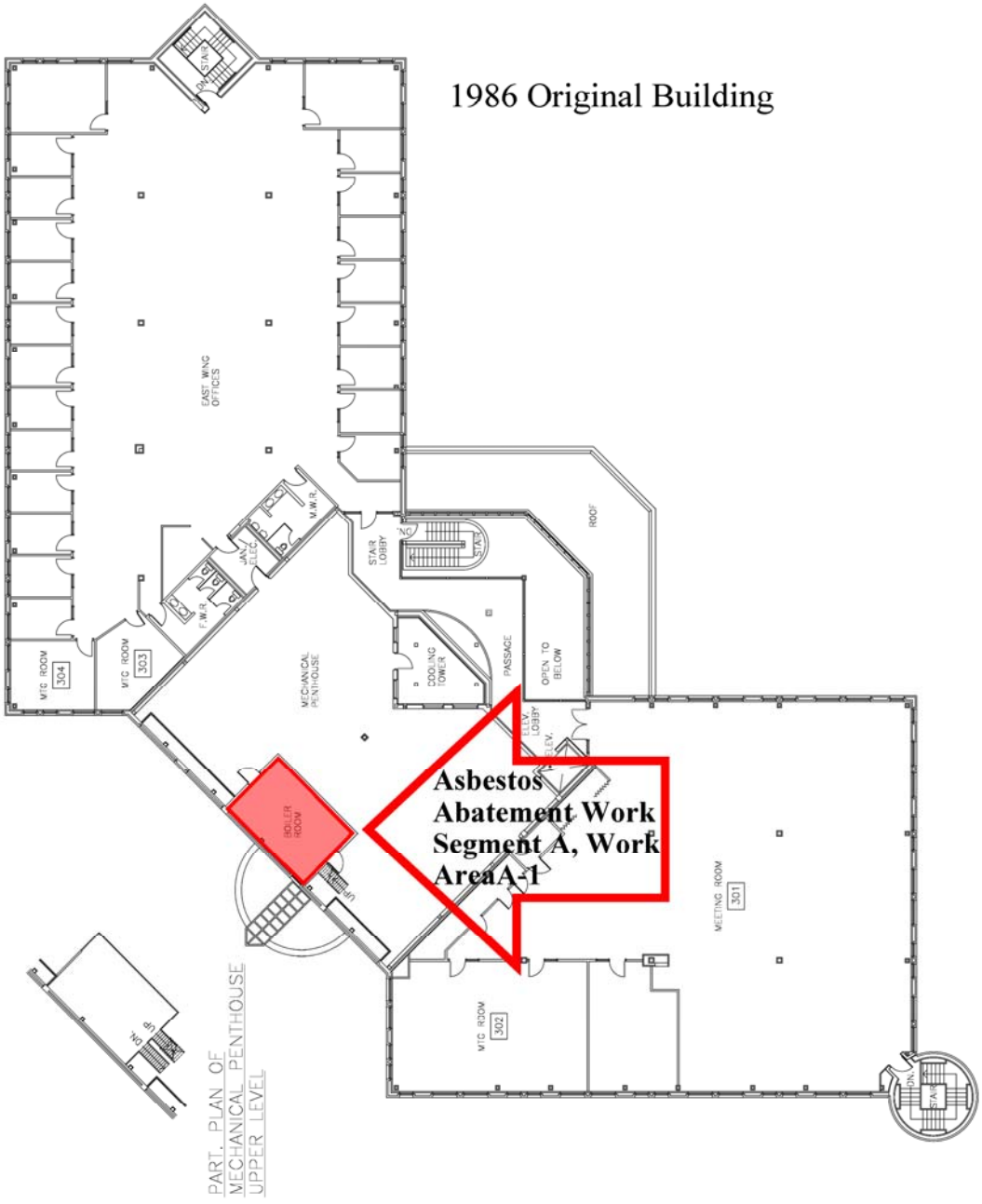
3.11.3 Contractor shall advise Inspector immediately orally and in writing of the undisclosed material.

3.11.4 Contractor shall permit Inspector access to obtain sample(s) for analysis.

3.11.5 The services of a testing laboratory will be employed by the Inspector to perform the laboratory analysis of the bulk samples.

3.11.6 Analytical turnaround shall be by next day and results shall be relayed to Contractor and Owner.

3.11.7 The Consultant shall be responsible for all other aspects of bulk sample analysis and shall pay the costs of analysis



Drawing AR-1 Catholic Education Centre, General Location of the Asbestos Abatement Work Segment A, Work Area A-1, existing Boiler Room, Third Floor, 1986 Original Building

Notes:

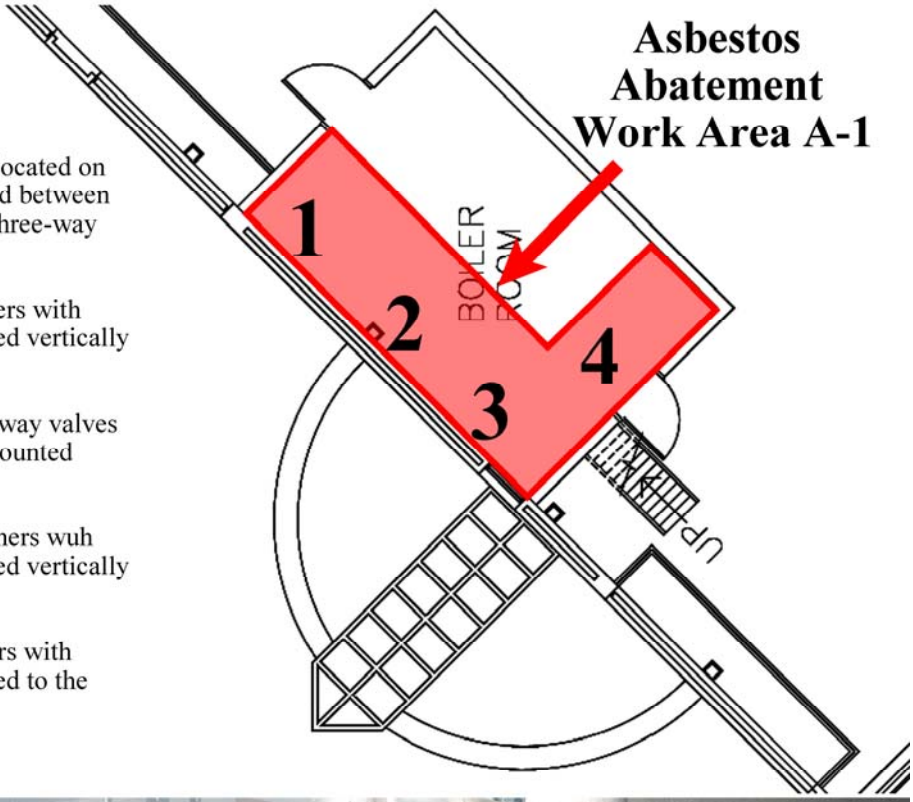
Gaskets or packing are located on strainer access plates and between the flange joints of the three-way valves.

Location 1 - Two strainers with access plates are mounted vertically on the wall.

Location 2 - Two three-way valves with flange plates are mounted vertically on the wall.

Location 3 - Three strainers wuh access plates are mounted vertically on the wall.

Location 4 - Two stainers with access plates are mounted to the floor.



Drawing AR-2 Catholic Education Centre, Detailed Location of the Asbestos Abatement Work Segment A, Work Area A-1, existing Boiler Room, Third Floor, 1986 Original Building