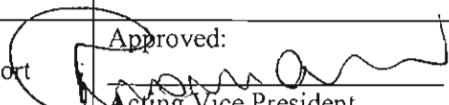
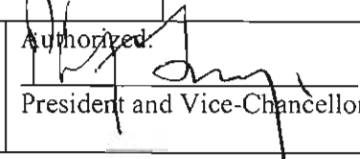
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Submitted: Risk Management Support Group	Approved:  Acting Vice President, Administration	Authorized:  President and Vice-Chancellor

1 PURPOSE

- 1.1 To provide for the health and safety of faculty, staff, students and visitors by implementing and maintaining a comprehensive Asbestos Management Control Program for all the locations containing asbestos material, and for all work involving contact with asbestos containing materials.
- 1.2 To ensure compliance with the Occupational Health and Safety Act, the Ontario Designated Substance Regulations respecting Asbestos and the Environmental Protection Act.

2 SCOPE

- 2.1 All faculty, staff, students, visitors and contractors.

3 RELATED DOCUMENTS


- 3.1 Construction Health and Safety Manual (Construction Safety Association)
- 3.2 Environmental Protection Act R.S.O. , Amended to 461/05
- 3.3 Occupational Health and Safety Act R.S.O. 1990
- 3.4 O.Reg. 837, R.R.O. 1990, Amended to O. Reg. 279/05, Designated Substance – Asbestos (Appendix A)
- 3.5 O.Reg. 838, R.R.O. 1990, Amended to O. Reg. 278/05, November, 2005, Designated Substance – Asbestos On Construction Projects And In Buildings And Repair Operations (Appendix A)
- 3.6 RMM #404 McMaster University Medical Centre Asbestos Management Control Program
- 3.7 RMM #500 Designated Substance Control Program
- 3.8 RMM #301 Standard Operating Procedures (SOP) Policy
- 3.9 RMM #300 Safety Training and Orientation Program
- 3.10 RMM #311 Respiratory Protection Program
- 3.11 RMM #111 Contracting Work Safety Program/Due Diligence Program

4 DEFINITIONS

- 4.1 **Asbestos** – Fibrous silicates are: Actinolite, Amosite, Anthophyllite, Chrysotile, Crocidolite and Tremolite.
- 4.2 **Asbestos Co-ordinator** – a person appointed by the University to implement and co-ordinate the Asbestos Management Control Plan. This may be a Project Manager/Supervisor.
- 4.3 **Architectural Technical Specialist** – a person appointed by the University to implement and co-ordinate the asbestos inventory.
- 4.4 **Asbestosis** – a degenerative disease of the lungs caused by breathing asbestos fibres.
- 4.5 **Designated Substance** – a biological, chemical or physical agent or combination thereof prescribed as a designated substance to which the exposure of a worker is prohibited, regulated, restricted, limited or controlled, i.e. asbestos which is one of eleven Designated Substances regulated by the Ministry of Labour.

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- 4.6 **Employer** – a person who employs one or more workers or contracts for the services of one or more workers and includes a contractor or subcontractor who performs work or supplies services, and a contractor or subcontractor who undertakes with the owner, constructor, contractor or subcontractor, to perform work or supply services.
- 4.7 **Friable Material** – means material that,
 (a) when dry, can be crumbled, pulverized or powdered by hand pressure, or
 (b) is crumbled, pulverized or powdered;
- 4.8 **Mesothelioma** – an asbestos related cancer of the chest and/or abdomen with diagnostic signs and symptoms similar to pleurisy.
- 4.9 **Owner** – includes a trustee, receiver, mortgagee in possession, tenant, lessee or occupier of any lands or premises used or to be used as a workplace, and a person who acts for or on behalf of an owner or as an agent or delegate.
- 4.10 **Supervisor** – person who has charge of a workplace or authority over a worker.
- 4.11 **Worker** – a worker is a person who performs work or supplies services for monetary compensation.
- 4.12 **Program** – a Program is a set of written instructions to support the Health and Safety Policy of the University.
- 4.13 **Project Manager** – a person designated by the University to manage specific maintenance and/or construction projects.
- 4.14 **TLV** – Threshold Limit Values is a guideline that refers to airborne concentrations of chemical substances and represents conditions under which it is believed that nearly all workers may be repeatedly exposed, day after day, over a working lifetime without adverse health effects.
- 4.15 **Methods**
 PCM – phase contrast microscopy. A light microscope with an eyepiece graticule designed for fibre counting. NIOSH 7400, method designated for fibre counting under Reg 278/05. Fibre definition in NIOSH 7400 – length greater than 5 microns, length-to-width 3 to 1 ratio or greater.
- TEM – transmission electron microscope. A microscope that uses electrons rather than light to view a specimen. Using this microscope it is possible to do an asbestos fibre count. All fibre sizes are visible and the microscope can identify the asbestos fibres. It is a technique that is used when there is concern that the fibres may be asbestos and the airborne fibre counts exceed 0.01 fibres/cc.
- Micrometre, a unit of length in the metric system one micron = 0.00004 inch
 Diameter of human hair 0.001 inches or 0.00254 centimeters
 Asbestos, rust, sediment, dirt can be as small as 0.02 microns or 1/500th diameter of a human hair
- 4.16 **Assuring the quality of test results** - part of a quality assurance program, the laboratory shall adhere to all stated QA/QC (quality assurance/quality control) requirements in the methods used. Procedures shall be in place to estimate the uncertainty of measurement of all calibrations and test methods. At a minimum, the following QC checks shall be performed per batch of samples;
Precision is evaluated by the reproducibility of analyses. Precision is commonly expressed as standard deviation or relative percent difference and can be evaluated by the analysis of duplicate samples or duplicate sampling media spikes.
Duplicate analyses are one or more additional analyses on separate aliquots of samples that can be used to assist in the evaluation of method variance.

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4.17 **Blank sampling** media and analytical reagents shall be analyzed, when applicable, with each batch of samples, using the same procedure that is used for field samples. Customers of the laboratory should supply specimens of blank sampling media from the same source lot as was used for collecting the field samples. Laboratory results need to identify whether or not the blank value has been subtracted.

4.18 **Acceptance Limits** for each method shall be established based on statistical evaluation of the data generated by the analysis of quality control check samples, unless specific acceptance limits are established by the method. The calculation procedures for statistically derived acceptance limits shall be documented. Some methods have listed acceptance criteria for applicable analytes based on determinations by a single laboratory, or the compilation of data from many laboratories, or limits that are assumed or expected. Laboratories should realize these method performance limits might be too broad to define accurate acceptance criteria for their particular laboratory conditions. These limits are best used as guidelines during the initial phases of method use and are superseded when the laboratory has collected sufficient self-generated data for proper statistical evaluation.

4.19 **Acronyms**

- AMCP - Asbestos Management Control Program
- JHSC – Joint Health and Safety Committee
- CJHSC – Central Joint Health and Safety Committee
- MOE – Ministry of the Environment
- MOL – Ministry of Labour
- OHSA – Occupational Health and Safety Act
- EOHSS – Environmental and Occupational Health Support Services
- SOP – Standard Operating Procedure
- FHSc – Faculty of Health Sciences Safety Office
- TLV – Threshold Limit Value

5 RESPONSIBILITIES

5.1 Role of Senior Managers (Directors/Deans/Chairs/Department Managers):

Senior Managers shall:

- provide the resources and direction necessary to support and maintain an effective Asbestos Management Control Program;
- ensure Asbestos Management Control Program is enforced;
- ensure occupants of the building are notified of the Asbestos Management Control Program; and
- shall have access to the asbestos inventory.

5.2 Role of the Facility Services Department:

The Facility Services Department is responsible for the implementation and management of the Asbestos Management Control Program (AMCP) that shall include but not be limited to the following elements:


- assignment of an Architectural Technical Specialist to manage:
 - a survey which identifies all locations of concern and asbestos type(s);
 - an up-to-date inventory identifying where asbestos or material containing asbestos exists;
 - floor plans indicating the location of sprayed on friable material (fireproofing and textured ceilings), and asbestos-containing ceiling tiles to be provided for all buildings where such material is present;

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N.B. This inventory shall be updated on all occasions when asbestos-containing material is repaired and/or removed.

- results of sampling(s) shall be forwarded to the Architectural Technical Specialist to update the inventory;
 - control of emergency and scheduled work, and emergency procedures; (Appendix L); and
 - SOP for the implementation of Type 1, Type 2, Glove Bag, or Type 3 procedures as appropriate for maintenance, restoration and renovation work by employees and/or contractors; (Appendix C)
- training and orientation programs for Facility Services employees, and contractors performing work for the Facility Services Department;
 - workers involved in Type 3 shall successfully complete the Asbestos Abatement Worker Training Program approved by the Ministry of Training, Colleges and Universities;
 - supervisor of a worker in a Type 3 operation shall successfully complete the Asbestos Abatement Supervisor Training Program; and shall complete prior to performing or supervising the work; (Appendix H)
 - a system to record the names of all persons trained and the training dates, including respirator fit testing as described in RMM Policy #311 Respiratory Protection Program;
 - a process for Facility Services workers and contractors who may disturb asbestos containing materials and the procedures required to conduct such work safely; (Appendix C)
 - periodic inspections of friable materials to assess conditions and the need for remedial action and environmental sampling;
 - should there be an equivalent measure or procedure which may vary from the O.Reg. 278/05, the Asbestos Co-ordinator shall develop a written procedure and prior to submission to the MOL, forward a copy to EOHSS and to the JHSC worker representative, (Section 23 (2)); (Appendix J)
 - material sampling and testing procedures; (Appendix D & F)
 - building air monitoring requirements on projects administered by Facility Services (**see Appendix B**);
 - workplace safety procedures, hygiene procedures and personal protective equipment (i e. respirators, disposable coveralls); (Appendix G)
 - medical surveillance program for Facility Services workers performing Type 2 or Type 3 work; (Appendix I)
 - asbestos waste containment and disposal procedures;
 - notice of asbestos construction projects to EOHSS prior to start date;
 - shall ensure MOL is advised of all projects in writing involving certain Type 2 and Type 3 operations and forwarding to EOHSS prior to reporting to the MOL, and a copy to Facility Services Architectural Technical Specialist; (Appendix E) and
 - providing records of exposure (Section 21) to EOHSS to notify the MOL Provincial Physician each calendar year and at the termination of workers, who performed Type 2 or Type 3 work. (Appendix I)

5.3 Role of Asbestos Co-ordinator

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The Asbestos Co-ordinator shall manage and co-ordinate the following components of the AMCP:

- results of sampling(s) shall be forwarded to the Architectural Technical Specialist, and be updated into the inventory;
N.B. This inventory shall be updated on all occasions when asbestos-containing material is repaired and/or removed.
- the Architectural Technical Specialist is contacted for all projects that involved direct and/or potential contact with asbestos containing material;
- contractors and their employees are aware of the AMCP and the location and type of asbestos containing material;
- contractors' employees have been trained and certified in AMCP procedures appropriate for the project, i.e. Type 1, Type 2, Glove Bag or Type 3, asbestos procedures;
(Workers involved in Type 3 shall successfully complete the Asbestos Abatement Worker Training Program approved by the Ministry of Training, Colleges and Universities; Supervisor of a worker in a Type 3 operation shall successfully complete the Asbestos Abatement Supervisor Training Program; and shall complete prior to performing or supervising the work.)
- control of emergency and scheduled work, and emergency procedures; (Appendix L)
 - respond to reports of asbestos debris, or deteriorated or damaged materials on an emergency basis;
 - arrange for pre-renovation/demolition surveys to check for asbestos-containing materials in concealed locations such as wall cavities and pipe chases prior to start of work;
 - arrange for Type 2/Type 3 maintenance/emergency work. Outside Asbestos Abatement Contractor will provide minor abatement services on an as needed basis in order to ensure response to maintenance/emergency work;
 - on notification from a Project Manager/Supervisor for certain Type 2 and or Type 3 removal, arrange for removal or abatement project; and tenderers must be provided with written notice of locations of friable materials and other information prescribed by O. Reg. 278/05; and
- should there be an equivalent measure or procedure which may vary from the O.Reg. 278/05, the Asbestos Co-ordinator shall develop a written procedure and prior to submission to the MOL, forward a copy to EOHSS and a JHSC worker representative (Section 23 (2)); and (Appendix J)
- SOPs' for the implementation of Type 1, Type 2, Glove Bag or Type 3 procedures as appropriate for maintenance, restoration and renovation work by employees and/or contractors; (Appendix C)
- through a project manager the JHSC is notified of the project (Type 2 or Type 3) and expected timelines, including notification of testing/sampling to permit attendance by a JHSC worker representative. Project Manager shall notify JHSC worker representative of any testing and request attendance. Results of the testing/sampling to be communicated to the occupants of the building and JHSC;
- shall ensure MOL is advised of all projects in writing involving certain Type 2 and Type 3 operations and forwarding to EOHSS prior to reporting to the MOL, and a copy to Facility Services Architectural Technical Specialist; and (Appendix E)
- shall ensure that air sampling for asbestos fibres follows the procedure outlined in Reg 278/05 for Type 3 Clearance Air Testing (Section 18 (6) 1. through to 5.), Appendix F. If required, all other air sampling for airborne asbestos shall follow NIOSH 7400, see Appendix B.

5.4 Role of Project Managers:

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Project Managers shall ensure that:

- the Architectural Technical Specialist is contacted for all projects that involve direct and/or potential contact with asbestos containing material;
- contractors and their employees are aware of the AMCP and the location and type of asbestos-containing material;
- contractors' employees have been trained and certified in AMCP procedures appropriate for the project, i.e. Type 1, Type 2, Glove Bag, Type 3, asbestos procedures;
(Workers involved in Type 3 shall successfully complete the Asbestos Abatement Worker Training Program approved by the Ministry of Training, Colleges and Universities; Supervisor of a worker in a Type 3 operation shall successfully complete the Asbestos Abatement Supervisor Training Program; and shall complete prior to performing or supervising the work.) (Appendix H)
- plans and specifications for all Type 2 or Type 3 are drafted and implemented as required by Regulation 278/05;
- building air monitoring procedures are considered and implemented when required, and JHSC consulted and notified;
- JHSC is notified of the project (Type 2 or Type 3) and expected timelines, including notification of testing/sampling to permit attendance by a JHSC worker representative. Project Manager shall notify JHSC worker representative of any testing and request attendance. Results of the testing/sampling to be communicated to the occupants of the building, JHSC and union;
- the senior manager (Directors/Deans/Chairs/Department Managers) shall be informed in advance of all work involving asbestos containing materials;
- all persons in the area are informed prior to asbestos work procedures to be implemented (Type 2 or Type 3);
- notice of project signs are posted in locations that cover all access to the area and that would include emergency remediation communicated to the occupants and JHSC worker representative through the Directors/Deans/Chairs/Department Managers;
- all persons in the area and JHSC are informed that any disturbance of the possible asbestos containing material should be reported immediately to the project manager;
- all persons in the area and JHSC are informed when the work has been completed;
- should there be an equivalent measure or procedure which may vary from the O.Reg. 278/05, the Project Manager shall develop a written procedure and prior to submission to the MOL, forward a copy to EOHSS and to the JHSC worker representative (Section 23 (2)); and (Appendix J); and
- shall ensure MOL is advised of all projects in writing involving certain Type 2 and Type 3 operations and forwarding to EOHSS prior to reporting to the MOL, and copy to Facility Services Architectural Technical Specialist. (Appendix E)

5.5 Role of Supervisors/Managers (Administrative and Faculty)

Supervisors shall ensure that:

- all people who may be affected by the work are notified;

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- the requirements of the AMCP are strictly enforced;
- the Facility Services Architectural Technical Specialist and EOHSS are notified of any activity that may result in persons coming into contact with building structures, equipment or materials that are known or suspected of containing asbestos; and
- shall ensure MOL is advised of all projects in writing involving certain Type 2 and Type 3 operations and forwarding to EOHSS for reporting to MOL, with a copy to Facility Services Architectural Technical Specialist. (Appendix E)

5.6 Role of Contractor:

Contractors shall:

- acknowledge requirements as described in RMM Policy #111, Contracting Work Safety/Due Diligence Program;
- work in compliance with the procedures issued under the AMCP;
- ensure McMaster University approved project specific asbestos procedures are implemented for all work in campus facilities;
- ensure that only workers trained and authorized in Type 1, Type 2, Glove Bag or Type 3 asbestos work procedures are assigned to work involving contact with material containing asbestos;
- ensure that all asbestos contained waste material is disposed of in a manner approved by MOE and local authorities;
- shall ensure MOL is advised of all projects in writing involving certain Type 2 and Type 3 operations and forwarding a copy to EOHSS prior to filing with MOL, and a copy to the Project Manager/Supervisor; (Appendix E) and
- ensure that should there be an equivalent measure or procedure, which may vary from the O. Reg. 278/05, develop a written procedure and prior to submission to the MOL, forward a copy to EOHSS, JHSC worker representative (Section 23 (2)). (Appendix J)

5.7 Role of Authorized Person:

Persons authorized by their supervisor to work on or with asbestos-containing material shall:

- have received training and work in compliance with the procedures issued under the AMCP;
- use protective equipment as required by the procedures issued under the AMCP;
- participate in require medical surveillance programs as required by the AMCP; and
- dispose of friable asbestos material in the prescribed manner by MOE and local authorities.

5.8 Role of EOHSS/Faculty of Health Sciences Safety Office (FHSc):

EOHSS/Faculty of Health Sciences Safety Office shall:

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- develop, implement and update this program, and monitor the Hamilton Health Sciences Corporation's Asbestos Management Plan for the McMaster University site;
- provide advice and assistance in developing AMCP training programs;
- assess and provide comment on major asbestos abatement projects;
- consult on asbestos related issues and investigate all reported asbestos related incidents; Type 2 and Type 3, in consultation with the JHSC worker representative;
- inform JHSC's in advance of all major/construction asbestos abatement projects prior to start date;
- audit and provide comment on the AMCP on an annual basis, and submit to CJHSC for review;
- provide for an annual asbestos awareness notice to be communicated to building occupants;
- develop and conduct asbestos training sessions for occupants of the buildings and JHSC members;
- provide general asbestos related information and training awareness for building occupants on an ongoing basis and prior to all major asbestos abatement projects;
- assist developing training for Facility Services staff and FSJHSC members;
- monitor contractors performing ACMP work;
- assist with the respirator fit testing as required per Regulation 278/05 and RMM Policy #311 Respiratory Protection Program;
- forward records from Facility Services of exposure, per section (21) to Provincial Physician MOL, each calendar year and at the termination of workers, performing certain Type 2 and Type 3 work; (Appendix I)
- review and monitor should there be an equivalent measure or procedure which may vary from the O.Reg. 278/05; (Appendix J) and
- review comments in JHSC minutes related to specific AMCP's in University owned buildings.

5.9 Role of Central Joint Health & Safety Committee (CJHSC)

The CJHSC shall:

- conduct reviews of the Asbestos Management Control Program Policy (#401) on a scheduled basis

5.10 Role of JHSC'S

The JHSC shall:

- where applicable conduct an assessment of asbestos related work procedures as part of the annual work Procedural Guidelines;
- assign a JHSC worker representative who has the right to be present at the start of testing;
- have the right to attend Industrial Hygiene testing as per OHSAA for all projects when notified by the project manager where asbestos is likely to be disturbed;

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- review the results of testing, and follow up with the Project Manager to address concerns; and
- share the submission should there be an equivalent measure or procedure which may vary from the O.Reg. 278/05, which the Project Manager shall develop a written procedure and prior to submission to the MOL for approval, forward a copy to EOHSS and to the JHSC; (Appendix J) and
- be consulted on the strategy of air testing prior to the project.


6. **PROCEDURAL GUIDELINES**

6.1 **Training**

- All persons required to work with or who may come into contact with friable asbestos material or products containing asbestos shall be trained in AMCP procedures;
- The training shall include but not be limited to the following:
For Individuals Assigned to Work Involving Contact or Potential Contact with Asbestos Containing Material and/or Equipment While Performing the Work
 - Designated Substance - Asbestos On Construction Projects And In Buildings And Repair Operations, O.Reg. 278/05; (Appendix A)
 - Air testing (Appendix B)(NOTE: except Type 3 Clearance Air Testing Appendix F);
 - Asbestos Management Control Program;
 - Asbestos Inventory/Floor Plans;
 - Type 1, Type 2, Glove Bag or Type 3 - Asbestos Work Procedures; (Appendix C)
 - Health monitoring requirements;
 - Air monitoring requirements;
 - In Type 3 work, successfully complete and be certified as per the Ministry of Colleges and Universities certification program for workers and project managers/supervisors; (Appendix H)
 - Use and care of protective equipment (i.e. respirators, protective clothing); and
 - Use appropriate Disposal Procedures for friable and/or asbestos containing material and equipment.
- **For Building Occupants in facilities containing sprayed friable asbestos material:**
 Occupants of building containing sprayed friable asbestos material shall receive training and information on:
 Asbestos Awareness training developed and presented by EOHSS and Faculty of Health Science Safety Office, and includes the following: (Appendix H)
 - Asbestos Regulations;
 - Asbestos related health risks;
 - Air monitoring requirements;
 - Asbestos Management Control Program; and
 - Asbestos inventory/floor plans.

6.2 **Asbestos Management Control Program shall require:**

- the asbestos inventory and floor plans shall be updated on an ongoing basis;
- the Architectural Technical Specialist shall be informed of all projects or services involving work on or near friable asbestos material or material containing friable asbestos;

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- For Type 3 work, workers successfully complete and be certified as per the Ministry of Colleges and Universities certification program. (Appendix H)
- only trained and authorized project managers/supervisors shall be assigned to manage work involving friable asbestos material or material containing asbestos;
- shall require contractors assigned to projects involving work with friable asbestos material or products containing asbestos are qualified and certified to conduct such work;
- written procedures for work involving friable asbestos material or products containing asbestos shall be provided by the Project Manager/Supervisor/Asbestos Co-ordinator; (Appendix C)
- shall ensure MOL is advised of all projects involving Type 3 operations;
- shall provide for updating of the asbestos inventory and building floor plans;
- shall advise all building occupants and the JHSC prior to all Type 3 projects and Type 2 operations that require enclosures in public areas; and
- shall provide for the safe and authorized disposal of friable asbestos material and products containing asbestos.

6.3 Program Audit Procedures

- EOHSS/Faculty of Health Sciences Safety Office will conduct periodic audits of the AMCP's on the main campus and in host institutions; and
- JHSC's shall assess the effectiveness of the AMCP as part of the annual inspection of the workplace and shall forward their findings to the Senior Manager responsible for the facility and the CJHSC.

7. RECORDS


- Training records for asbestos workers shall include the names of the persons trained, their department and the date training was provided as per McMaster University Safety Training and Orientation Program, Policy #300;
- All records of safety orientation and training shall be documented by supervisors and retained by the individual's department;
- Records will be updated and retained for the duration that the individual is acting in the same capacity;
- The asbestos inventory shall be updated on an ongoing basis and EOHSS be notified when this update occurs; and
- Project specific asbestos work procedures for certain Type 2 and Type 3 work shall be retained for a period of three years.



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Policy #401 - ASBESTOS MANAGEMENT CONTROL PROGRAM

APPENDICES:

APPENDIX A - Designated Substance – Asbestos On Construction Projects and In Building and Repair Operations (O. Reg. 278/05)

Designated Substance – Asbestos (O.Reg. 279/05)

APPENDIX B - Air Test

APPENDIX C - Operations & Procedures for Type 1, Type 2 and Glove Bag, and Type 3

APPENDIX D - Bulk Material Samples (Subsection 3 (3))

APPENDIX E - Advance Notice reference to Type 3 Operation and certain Type 2 Operations (Section 11.)

APPENDIX F - Clearance Air Testing (Section 18 (5) – Type 3)

APPENDIX G - Respirators (section 13)

APPENDIX H - Instruction and Training (Section 19)

APPENDIX I - Asbestos Work Report (Section 21) and Asbestos Workers Register (Section 22)

APPENDIX J - Use Of Equivalent Measure or Procedures (Section 23)

APPENDIX K - Notice To Inspector (Section 24)

APPENDIX L - Work Practices – Emergency Work, and
 Emergency Reaction In The Event Of Suspected Asbestos Spill

Appendix M – Result reporting

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APPENDIX A

O.Reg. 838, R.R.O. 1990, Amended to O. Reg. 278/05, November, 2005, Designated Substance – Asbestos On Construction Projects And In Buildings And Repair Operations

2. (1) This Regulation applies to,
 - (a) every project, its owner, and every constructor, employer and worker engaged in or on the project;
 - (b) the repair, alteration or maintenance of a building, the owner of the building, and every employer and worker engaged in the repair, alteration or maintenance;
 - (c) every building in which material that may be asbestos-containing material has been used, and the owner of the building;
 - (d) the demolition of machinery, equipment, aircraft, ships, locomotives, railway cars and vehicles, and every employer and worker engaged in the demolition; and
 - (e) subject to subsection (3),
 - (i) work described in subsection (2) I which asbestos-containing material is likely to be handled, dealt with, disturbed or removed, and
 - (ii) every employer and worker engaged in the work.
- (2) Clause (1) (e) applies to,
 - (a) the repair, alteration or maintenance of machinery, equipment, aircraft, ships, locomotives, railway cars and vehicles; and
 - (b) work on a building that is necessarily incidental to the repair, alteration or maintenance of machinery or equipment.
- (3) This Regulation does not apply to an employer to whom Regulation 837 of the Revised Regulations of Ontario, 1990 (designated substance – Asbestos) applies in respect of those workers before December 16, 1985 put into effect and maintained measures and procedures to control the exposure of Regulation 837 of the Revised Regulations of Ontario, 1990.
- (4) This Regulation does not apply to an owner of a private residence occupied by the owner or the owner's family or to an owner of a residential building that contains not more than four dwelling units, one of which is occupied by the registered owner or family of the registered owner.

O.Reg. 837, R.R.O. 1990, Amended to O. Reg. 279/05, Designated Substance – Asbestos (See Appendix A)


3. (1) This Regulation applies,
 - (c) to every employer,
 - (i) engaged in the repair, alteration or maintenance of machinery, equipment, aircraft, ships, locomotives, railway cars and vehicles and to those workers of such an employer who are likely to inhale or ingest asbestos or
 - (ii) engaged in work on a building that is necessarily incidental to the repair, alteration or maintenance of machinery or equipment and to those workers of such an employer who are likely to inhale or ingest asbestos,

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APPENDIX B

Air Testing for Airborne Asbestos Fibres Other than Type 3 Clearance Sampling

1. Testing shall use the phase contrast microscopy method in accordance with U.S. National Institute of Occupational Safety and Health (NIOSH) Manual of Analytical Methods, method 7400, Issue 2: Asbestos and other fibres by PCM (August 15, 1994), using the asbestos fibre counting rules.
2. All analytical reports shall at a minimum state the method used, detection limit and analytical precision for the method, the blank analysis value and whether or not it has been subtracted from the reported results in addition to the reported results.
3. The TLV current asbestos value is the level considered acceptable for air sampling.

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APPENDIX C


Designated Substance – Asbestos On Construction Projects and In Buildings and Repair Operations, O.Reg. 278/05

OPERATIONS - Section 12 (2) – Type 1

The following are **Type 1 Operations**:

1. 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.
2. 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.
3. Breaking, cutting, drilling, abrading, grinding, sanding or vibrated non-friable asbestos-containing material if,
 - i the material is wetting to control the spread of dust or fibres, and
 - ii the work is done only by means of non-powered hand-held tools.
4. Removing less than one square metre of drywall in which joint-filling compounds that are asbestos-containing material have been used. O.Reg. 278/05, s. 12 (2).


The more common non-friable materials that would be encountered in buildings include vinyl asbestos floor tile, drywall with asbestos-containing joint compounds, asbestos cement, transite-pipe and board, some ceiling tiles, and packing, caulking and gaskets for mechanical equipment. It should be assumed that these materials contain asbestos unless the manufacturer states it is asbestos-free, or unless laboratory analysis shows no asbestos present.

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PROCEDURES – Section 14 – Type 1


The **measures** and **procedures** to be taken in **Type 1** tasks can be summarized from Section 14 as follows:

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, if the dust on that surface is likely to be disturbed.
2. The spread of dust from the work area shall be controlled by measures appropriate to the work to be done including the use of drop sheets of polyethylene or other suitable material that is impervious to asbestos.
3. In the case of an operation mentioned in paragraph 4 of subsection 12 (2), the material shall be wetted before and kept wet during work to control the spread of dust or fibres, unless wetting would create a hazard or cause damage.
4. A wetting agent shall be added to water that is to be used to control the spread of dust and fibres.
5. Frequently and at regular intervals during the doing of the work and immediately on completion of the work,
 - i. 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 container as described in paragraph 5 of section 15, and
 - ii. drop sheets shall be wetted and placed in a container as described in paragraph 5 of section 15, as soon as practicable after subparagraph i has been complied with.
6. Drop sheets shall not be reused.
7. After the work is completed, polyethylene sheeting and similar materials used for barriers and enclosures shall not be reused, but shall be wetted and placed in a container as described in paragraph 5 of section 15 as soon as practicable after paragraph 5 of this section has been complied with.
8. After the work is completed, barriers and portable enclosures that will be reused shall be cleaned, by using a vacuum equipped with a HEPA filter or by damp wiping, as soon as practicable after paragraphs 5 and 7 have been complied with.
9. Barriers and portable enclosures shall not be reused unless they are rigid and can be cleaned thoroughly.
10. Compressed air shall not be used to clean up and remove dust from any surfaces.
11. Eating, drinking, chewing or smoking shall not be permitted in the work area.
12. If a worker requests that the employer provide a respirator to be used by the worker, the employer shall provide the worker with a NIOSH approved respirator in accordance with Table 2, and the worker shall wear and use the respirator.
13. If a worker requests that the employer provide protective clothing to be used by the worker, the employer shall provide the worker with protective clothing as described in paragraph 12 of section 15, and the worker shall wear the protective clothing.
14. A worker who is provided with protective clothing shall, before leaving the work area,
 - i. decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing,

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- ii. if the protective clothing will not be reused, place it in a container as described in paragraph 5 of section 15.

15. Facilities for the washing of hands and face shall be made available to workers and shall be used by every worker when leaving the work area. O. Reg. 278/05, s. 14.


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OPERATIONS – Section 12 (3) - **Type 2** (moderate risk)

Type 2 operations have a greater risk of airborne asbestos as they are performed on friable material. The extent of disturbance is minor so the precautions are somewhat localized, as described in section 12:


(3) The following are **Type 2 operations**:

1. Removing all or part of a false ceiling to obtain access to a work area, if asbestos-containing material is likely to be lying on the surface of the false ceiling.
2. The removal or disturbance of one square meter or less of friable asbestos-containing material during the repair, alteration, maintenance or demolition of all or part of machinery or equipment or a building, aircraft, locomotive, railway car, vehicle or ship.
3. Enclosing friable asbestos-containing material.
4. Applying tape or a sealant or other covering to pipe or boiler insulation that is asbestos-containing material.
5. Installing or removing ceiling tiles that are asbestos-containing material, if the tiles cover an area of 7.5 square metres or more and are installed or removed without being broken, cut, drilled, abraded, ground, sanded or vibrated.
6. Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable asbestos-containing material if,
 - i. the material is not wetted to control the spread of dust or fibres, and
 - ii. the work is done only by means of non-powered hand-held tools.
7. Removing one square metre or more of drywall in which joint filling compounds that are asbestos-containing material have been used.
8. Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable asbestos-containing material if the work is done by means of power tools that are attached to dust-collecting devices equipped with HEPA filters.
9. Removing insulation that is asbestos-containing material from a pipe, duct or similar structure using a glove bag.
10. Cleaning or removing filters used in air handling equipment in a building that has sprayed fireproofing that is asbestos-containing material.
11. An operation that,
 - i. is not mentioned in any of paragraphs 1 to 10,
 - ii. may expose a worker to asbestos, and
 - iii. is not classified as a Type 1 or Type 3 operation. O. Reg. 278/05, s. 12 (3).


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PROCEDURES – Section 15 - **Type 2** and **Type 3**:

15. The following measures and procedures apply to Type 2 operations and to Type 3 operations:
1. The work area shall be identified by clearly visible signs warning of an asbestos dust hazard.
 2. Signs required by paragraph 1. shall be posted in sufficient numbers to warn of the hazard and shall state in large clearly visible letters that,
 - i. there is an asbestos dust hazard, and
 - ii. access to the work area is restricted to persons wearing protective clothing and equipment.
 3. A wetting agent shall be added to water that is to be used to control the spread of dust and fibres.
 4. Eating, drinking, chewing or smoking shall not be permitted in the work area.
 5. Containers for dust and waste shall be,
 - i. dust tight,
 - ii. suitable for the type of waste,
 - iii. impervious to asbestos,
 - iv. identified as asbestos waste,
 - v. cleaned with a damp cloth or a HEPA vacuum immediately before being removed from the work area, and
 - vi. removed from the workplace frequently and at regular intervals.
 6. Frequently and at regular intervals during the doing of the work and immediately on completion of the work,
 - i. 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 container as described in paragraph 5, and
 - ii. drop sheets shall be wetted and placed in a container as described in paragraph 5, as soon as practicable after subparagraph i has been complied with.
 7. Drop Sheets shall not be reused.
 8. After the work is completed, polyethylene sheeting and similar materials used for barriers and enclosures shall not be reused, but shall be wetted and placed in a container as described in paragraph 5 as soon as practicable after paragraph 6 has been complied with.
 9. After the work is completed, barriers and portable enclosures that will be reused shall be cleaned, by using a vacuum equipped with a HEPA filter or by damp wiping, as soon as practicable after paragraphs 6 and 8 have been complied with.


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10. Barriers and portable enclosures shall be reused unless they are rigid and can be cleaned thoroughly.
11. The employer shall provide every worker who will enter the work area with a NIOSH approved respirator in accordance with Table 2 and the worker shall wear and use the respirator.
12. Protective clothing shall be provided by the employer and worn by every worker who enters the work area, and the protective clothing,
 - i. shall be made of a material that does not readily retain nor permit penetration of asbestos fibres,
 - ii. shall consist of head covering and full body covering that fits snugly at the ankles, wrists and neck, in order to prevent asbestos fibres from reaching the garments and skin under the protective clothing,
 - iii. shall include suitable footwear, and
 - iv. shall be repaired or replaced if torn.
13. Compressed air shall not be used to clean up and remove dust from any surface.
14. Only persons wearing protective clothing and equipment shall enter a work area where there is an asbestos dust hazard. O. Reg. 278/05, s. 15.

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Additional PROCEDURES – Section 16 – Type 2:

16. In addition to the measures and procedures prescribed by section 15, the following measures and procedures apply to Type 2 Operations:
 1. If the operation is one mentioned in paragraph 1 of subsection 12 (3), the friable material that is likely to be disturbed shall be cleaned up and removed by using a vacuum equipped with a HEPA filter when access to the work area is obtained.
 2. Before commencing work that is likely to disturb friable asbestos-containing material that is crumbled, pulverized or powdered and that is lying on any surface, the friable material shall be cleaned up and removed by damp wiping or by using a vacuum equipped with a HEPA filter.
 3. Friable asbestos-containing material that is not crumbled, pulverized or powdered and that may be disturbed or removed during the work shall be thoroughly wetted before the work and kept wet during the work, unless wetting would create a hazard or cause damage.
 4. Subject to paragraph 5, the spread of dust from a work area shall be controlled by measures appropriate to the work to be done, including the use of drop sheets of polyethylene or other suitable material that is impervious to asbestos.
 5. If the operation is one mentioned in paragraph 1 or 2 of subsection 12 (3) and is carried on indoors, the spread of dust from the work area shall be prevented, if practicable, by,
 - i. using an enclosure of polyethylene or other suitable material that is impervious to asbestos (including, if the enclosure is opaque, one or more transparent window areas to allow observation of the entire work area from outside the enclosure), if the work area is not enclosed by walls,
 - ii. disabling the mechanical ventilation system serving the work area, and
 - iii. sealing the ventilation ducts to and from the work area.
 6. Before leaving the work area, a worker shall,
 - i. decontaminate his/her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing, and
 - ii. if the protective clothing will not be reused, place it in a container as described in paragraph 5 of section 15.
 7. Facilities for the washing of hands and face shall be made available to workers and shall be used by every worker when leaving the work area. O. Reg. 278/05, s. 16.

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Additional **PROCEDURES** – Section 17 – **Type 2 GLOVE BAG OPERATIONS**

17. In addition to the measures and procedures prescribed by section 15 and 16, the following measures and procedures apply to Type 2 operations referred to in paragraph 9 of subsection 12 (3):

1. The work area shall be separated from the rest of the workplace by walls, barricades, fencing or other suitable means.
2. The spread of asbestos-containing material from the work area shall be prevented by disabling the mechanical ventilation system serving the work area and sealing all openings or voids, including ventilation ducts to and from the working area.
3. Surfaces below the work area shall be covered with drop sheets of polyethylene or other suitable material that is impervious to asbestos.
4. 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.
5. The glove bag shall be equipped with,
 - i. 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,
 - ii. 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,
 - iii. a tool pouch with a drain,
 - iv. a seamless bottom and a means of sealing off the lower portion of the bag, and
 - v. a high strength double throw zipper and removable straps, if the bag is to be moved during the removal operation.
6. A glove bag shall not be used to remove insulation from a pipe, duct or similar structure if,
 - i. it may not be possible to maintain a proper seal for any reason including, without limitation,
 - A. the condition of the insulation, or
 - B. the temperature of the pipe, duct or similar structure, or
 - ii. the bag could become damaged for any reason including, without limitation,
 - A. the type of jacketing, or
 - B. the temperature of the pipe, duct or similar structure



7. Immediately before the glove bag is attached, the insulation jacketing or coating shall be inspected for damage or defects, and if any damage or defect is present, it shall be repaired.
8. The glove bag shall be inspected for damage or defects,
 - i. immediately before it is attached to the pipe, duct or other similar structure, and
 - ii. at regular intervals during its use.
9. If damage or defects are observed when the glove bag is inspected under subparagraph 8 i , the glove bag shall not be used and shall be disposed of.
10. If damage or defects are observed when the glove bag is inspected under subparagraph 8 ii or at any other time,
 - i. the use of the glove bag shall be discontinued,
 - ii. the inner surface of the glove bag and the contents, if any, shall be thoroughly wetted,
 - iii. the glove bag and the contents, if any, shall be removed and placed in a container as described in paragraph 5 of section 15, and
 - iv. the work area shall be cleaned by vacuuming with a vacuum equipped with a HEPA filter before removal work is resumed.
11. When the removal work is completed,
 - i. the inner surface of the glove bag and the waste inside shall be thoroughly wetted and the air inside the bag shall be removed through an elasticized valve, by means of a vacuum equipped with a HEPA filter,
 - ii. the pipe, duct or similar structure shall be wiped down and sealed with a suitable encapsulant,
 - iii. the glove bag, with the waste inside, shall be placed in a container as described in paragraph 5 of section 15, and
 - iv. the work area shall be cleaned by damp wiping or by cleaning with a vacuum equipped with a HEPA filter. O. Reg. 278/05, s. 17

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OPERATIONS – Section 12 (4) – Type 3

(4) The following are Type 3 Operations:


1. The removal or disturbance of more than one square metre of friable asbestos-containing material during the repair, alteration, maintenance or demolition of all or part of a building, aircraft, ship, locomotive, railway car or vehicle or any machinery or equipment.
2. The spray application of a sealant to friable asbestos-containing material.
3. Cleaning or removing air handling equipment, including rigid ducting but not including filters, in a building that has sprayed fireproofing that is asbestos-containing material.
4. Repairing, altering or demolishing all or part of a kiln, metallurgical furnace or similar structure that is made in part of refractory materials that are asbestos-containing materials.
5. Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable asbestos-containing material, if the work is done by means of power tools that are not attached to dust collecting devices equipped with HEPA filters.
6. Repairing, altering or demolishing all or part of any building in which asbestos is or was used in the manufacture of products, unless the asbestos was cleaned up and removed before March 16, 1986. O. Reg. 278/05, s. 12 (4).

(5) Work on ceiling tiles, drywall or friable asbestos-containing material is classified according to total area on which work is done consecutively in a room or enclosed area, even if the work is divided into smaller jobs. O. Reg. 278/05, s. 12 (5).

(6) The following provisions apply if a dispute arises as to the classification of an operation under this section:


1. A party to the dispute may notify an inspector at the office of the Ministry of Labour nearest the workplace of the dispute.
2. The party who notifies the inspector shall promptly inform the other parties that the inspector has been notified.
3. Work on the operation shall cease until the inspector has given a decision under paragraph 4.
4. The inspector shall, as soon as possible, investigate the matter and give the parties a decision in writing. O. Reg. 278/05, s. 12 (6).

(7) Nothing in subsection (6) affects an inspector's power to issue an order for a contravention of this Regulation. O. Reg. 278/05, s. 12 (7).

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PROCEDURES – Section 15 - Type 2 and Type 3:


1. The work area shall be identified by clearly visible signs warning of an asbestos dust hazard.
2. Signs shall be posted in sufficient numbers to warn of the hazard and shall state in large clearly visible letters that,
 - i. there is an asbestos dust hazard, and
 - ii. access to the work area is restricted to persons wearing protective clothing and equipment.
3. A wetting agent shall be added to water that is to be used to control the spread of dust and fibres.
4. Eating, drinking, chewing or smoking shall not be permitted in the work area.
5. Containers for dust and waste (referred to as asbestos waste containers) shall be,
 - i. dust tight,
 - ii. suitable for the type of waste,
 - iii. impervious to asbestos,
 - iv. identified as asbestos waste,
 - v. cleaned with a damp cloth or a HEPA vacuum immediately before being removed from the work area, and
 - vi. removed from the workplace frequently and at regular intervals.
6. Frequently and at regular intervals during the doing of the work and immediately on completion of the work,
 - i. 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 container as described in paragraph 5, and
 - ii. drop sheets shall be wetted and placed in a container as described in paragraph 5, as soon as practicable after subparagraph i has been complied with.
7. Drop Sheets shall not be reused.
8. After the work is completed, polyethylene sheeting and similar materials used for barriers and enclosures shall not be reused, but shall be wetted and placed in a container as described in paragraph 5 as soon as practicable after paragraph 6 has been complied with.

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9. After the work is completed, barriers and portable enclosures that will be reused shall be cleaned, by using a vacuum equipped with a HEPA filter or by damp wiping, as soon as practicable after paragraphs 6 and 8 have been complied with.
10. Barriers and portable enclosures shall be be reused unless they are rigid and can be cleaned thoroughly.
11. The employer shall provide every worker who will enter the work area with a NIOSH approved respirator in accordance with Table 2 and the worker shall wear and use the respirator.
12. Protective clothing shall be provided by the employer and worn by every worker who enters the work area, and the protective clothing,
 - i. shall be made of a material that does not readily retrain nor permit penetration of asbestos fibres,
 - ii. shall consist of head covering and full body covering that fits snugly at the ankles, wrists and neck, in order to prevent asbestos fibres from reaching the garments and skin under the protective clothing,
 - iii. shall include suitable footwear, and
 - iv. shall be repaired or replaced if torn.
13. Compressed air shall not be used to clean up and remove dust from any surface.
14. Only persons wearing protective clothing and equipment shall enter a work area where there is an asbestos dust hazard. O. Reg. 278/05, s. 15.

Additional measures and **PROCEDURES** – Section 18 - **Type 3**

18. (1) In addition to the measures and procedures prescribed by section 15, the following measures and procedures apply to Type 3 operations:
 1. The work area shall be separated from the rest of the workplace by walls, the placing of barricades or fencing or other suitable means.
 2. Subsection (2) applies to an operation mentioned in paragraph 5 of subsection 12 (4).
 3. Subsection (3) applies to an operation mentioned in paragraph 1, 2, 3 or 4 of subsection 12 (4) that is carried on outdoors.
 4. Subsection (4) applies to an operation mentioned in paragraph 1, 2, 3 or 4 or 6 of subsection 12 (4) that is carried on indoors. O. Reg. 278, s. 18 (1).
- (2) In the case of an operation mentioned in paragraph 5 of subsection 12(4) the following measures and procedures also apply:
 1. The spread of dust from the work area shall be prevented by,
 - i. using enclosures of polyethylene or other suitable material that is impervious to asbestos (including, if the enclosure material is opaque, one or more transparent window areas to allow observation of the entire work area from outside the enclosure), if the work area is not enclosed by walls, and
 - ii. using curtains of polyethylene sheeting or other suitable material that is impervious to asbestos, fitted on each side of each entrance or exit from the work area.


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2. Unless the operation is carried on outdoors, or inside a building that is to be demolished and will not be entered by any person except the workers involved in the operation and the workers involved in the demolition, the spread of dust from the work areas shall also be prevented by,
 - i. creating and maintaining within the enclosed area, by installing a ventilation system equipped with a HEPA filtered exhaust unit, a negative air pressure of 0.02 inches of water, relative to the area outside the enclosed area,
 - ii. ensuring that replacement air is taken from outside the enclosed area and is free from contamination with any hazardous dust, vapour, smoke, fume, mist or gas, and
 - iii. using a device, at regular intervals, to measure the difference in air pressure between the enclosed area and the area outside it.
 3. The ventilation system referred to in subparagraph 2 i shall be inspected and maintained by a competent worker before each use to ensure that there is no air leakage, and if the filter is found to be damaged or defective, it shall be replaced before the ventilation system is used.
 4. Before leaving the work area, a worker shall,
 - i. decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing, and
 - ii. if the protective clothing will not be reused, place it in a container as described in paragraph 5 of section 15.
 5. Facilities for the washing of hands and face shall be made available to workers and shall be used by every worker when leaving the work area. O. Reg. 278/05, s. 18 (2).
- (3) In the case of an operation mentioned in paragraph 1, 2, 3 or 4 of subsection 12 (4) that is carried outdoors, the following measures and procedures also apply:
1. If practicable, any asbestos-containing material to be removed shall be thoroughly wetted before and during removal, unless wetting would create a hazard or cause damage.
 2. Dust and waste shall not be permitted to fall freely from one work level to another.
 3. If practicable, the work area shall be washed down with water after completion of the clean up and removal described in paragraph 6 of section 15.
 4. Temporary electrical power distribution systems for tools and equipment involved in wet removal operations shall be equipped with ground fault circuit interrupters.
 5. A decontamination facility shall be located as close as practicable to the work area and shall consist of,
 - i. a room suitable for changing into protective clothing and for storing contaminated protective clothing and equipment,
 - ii. a shower room as described in paragraph 7 of subsection (4), and
 - iii. a room suitable for changing into street clothes and for storing clean clothing and equipment.
 6. The rooms described in subparagraphs 5 i, ii and iii shall be arranged in sequence and constructed so that any person entering or leaving the work area must pass through each room.

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7. When leaving the work area, a worker shall enter the decontamination facility and shall, in the following order,
 - i. decontaminated his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing,
 - ii. if the protective clothing will not be reused, place it in a container as described in paragraph 5 of section 15,
 - iii. shower, and
 - iv. remove and clean the respirator. O. Reg. 278/05, s. 18 (3).

- (4) In the case of an operation mentioned in paragraph 1, 2, 3, 4 or 6 of subsection 12 (4) that is carried on indoors, the following measures and procedures also apply:
 1. Friable asbestos-containing material that is crumbled, pulverized or powdered and that is lying on any surface in the work area shall be cleaned up and removed using a vacuum equipped with a HEPA filter or by damp wiping and everything shall be removed from the work area or covered with polyethylene sheeting or other suitable material that is impervious to asbestos.
 2. The spread of dust from the work area shall be prevented by an enclosure of polyethylene or other suitable material that is impervious to asbestos, if the work area is not enclosed by walls, and by a decontamination facility consisting of a series of interconnecting rooms including,
 - i. a room suitable for changing into protective clothing and for storing contaminated protective clothing and equipment,
 - ii. a shower room as described in paragraph 7,
 - iii. a room suitable for changing into street clothes and for storing clean clothing and equipment, and
 - iv. curtains of polyethylene sheeting or other suitable material that is impervious to asbestos, fitted to each side of the entrance or exit to each room.
 3. The rooms described in subparagraphs 2 i, ii and iii shall be arranged in sequence and constructed so that any person entering or leaving the work area must pass through each room.
 4. The mechanical ventilation system serving the work area shall be disabled and all openings or voids, including ventilation ducts to or from the work area, shall be sealed by tape or other appropriate means.
 5. Unless the operation is carried on inside a building that is to be demolished and will not be entered by any person except the workers involved in the operation and the workers involved in the demolition, the spread of dust from the work area shall also be prevented by,
 - i. creating and maintaining within the enclosed area, by installing a ventilation system equipped with a HEPA filtered exhaust unit, a negative air pressure of 0.02 inches of water, relative to the area outside the enclosed area,
 - ii. ensuring that replacement air is taken from outside the enclosed area and is free from contamination with any hazardous dust, vapour, smoke, fume, mist or gas, and
 - iii. using a device, at regular intervals, to measure the difference in air pressure between the enclosed area and the area outside it.

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6. The ventilation system referred to in subparagraph 5 i shall be inspected and maintained by a competent worker before each use to ensure that there is no air leakage, and if the filter is found to be damaged or defective, it shall be replaced before the ventilation system is used.
7. The shower room in the decontamination facility shall,
 - i. be provided with hot and cold water or water of a constant temperature that is not less than 40 degrees Celsius or more than 50 degrees Celsius,
 - ii. have individual controls inside the room to regulate water flow and, if there is hot and cold water, individual controls inside the room to regulate temperature,
 - iii. be capable of providing adequate supplies of hot water to maintain a water temperature of at least 40 degrees Celsius, and
 - iv. be provided with clean towels.
8. When leaving the work area, a worker shall enter the decontamination facility and shall, in the following order,
 - i. decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing,
 - ii. if the protective clothing will not be reused, place it in a container as described in paragraph 5 of section 15,
 - iii. shower, and
 - iv. remove and clean the respirator.
9. If practicable, existing electrical power distribution systems that are not water-tight shall be de-energized and locked out where wet removal operations are to be carried out.
10. Temporary electrical power distribution systems for tools and equipment involved in wet removal operations shall be equipped with ground fault circuit interrupters.
11. Friable asbestos-containing material shall be thoroughly wetted before and during removal, unless wetting would create a hazard or cause damage.
12. The work area shall be inspected by a competent worker for defects in the enclosure, barriers and decontamination facility,
 - i. at the beginning of each shift,
 - ii. at the end of a shift if there is no shift that begins immediately after the first-named shift, and
 - iii. at least once each day on days when there are no shifts.
13. Defects observed during an inspection under paragraph 12 shall be repaired immediately and no other work shall be carried out in the work area until the repair work is completed.
14. If practicable, dust and waste shall be kept wet.
15. On completion of the work,
 - i. negative air pressure shall be maintained if required by subparagraph 5 i,
 - ii. the inner surface of the enclosure and the work area inside the enclosure shall be cleaned by a thorough washing or by vacuuming with a vacuum equipped with a HEPA filter,
 - iii. equipment, tools and other items used in the work shall be cleaned with a damp cloth or by vacuuming with a vacuum equipped with a HEPA filter or they shall be placed in a container as described in paragraph 5 of section 15 before being removed from the enclosure, and

- iv. a visual inspection shall be conducted by a competent worker to ensure that the enclosure and the work area inside the enclosure are free from visible dust, debris or residue that may contain asbestos.
16. Once the work area inside the enclosure is dry after the steps set out in subparagraphs 15 ii, iii and iv have been completed, clearance air testing shall be conducted by a competent worker in accordance with subsection (5), unless the operation is carried on inside a building that is to be demolished and will not be entered by any person except the workers involved in the operation and the workers involved in the demolition.
17. The barriers, enclosure and decontamination facility shall not be removed or dismantled until,
- i. cleaning has been done as described in paragraph 15, and
 - ii. if clearance air testing is required, it has been completed and the work area inside the enclosure has passed the clearance air test. O. Reg. 278/05, s. 18 (4).

Appendix D

TABLE 1
BULK MATERIAL SAMPLES

Subsection 3 (3)

Item	Type of material	Size of area of homogeneous material	Minimum number of bulk material samples to be collected
1.	Surfacing material, including without limitation material that is applied to surfaces by spraying, by troweling or otherwise, such as acoustical plaster on ceilings and fireproofing materials on structural members	Less than 90 square metres	3
90 or more square metres, but less than 450 square metres		5	
450 or more square metres		7	
2.	Thermal insulation, except as described in item 3	Any size	3
3.	Thermal insulation patch	Less than 2 linear metres or 0.5 square metres	1
4.	Other material	Any size	3


O. Reg. 278/05, Table 1.



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APPENDIX E

ADVANCE NOTICE RE TYPE 3 OPERATION AND CERTAIN TYPE 2 OPERATIONS (Section 11.)

11. (1) Before commencing a type 3 operation, the constructor, in the case of a project, and the employer, in any other case, shall notify, orally and in writing, an inspector at the office of the Ministry of Labour nearest the workplace of the operation. O. Reg. 278/05, s. 11 (1).
- (2) Subsection (1) also applies with respect to a Type 2 operation described in paragraph 9 of subsection 12 (3) in which one square metre or more of insulation is to be removed. O. Reg. 278/05, s. 11 (2).
- (3) The written notice required by subsection (1) shall set out,
 - (a) the name and address of the person giving the notice;
 - (b) the name and address of the owner of the place where the work will be carried out;
 - (c) 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;
 - (d) a description of the work that will be carried out;
 - (e) the starting date and expected duration of the work; and
 - (f) the name and address of the supervisor in charge of the work. O. Reg. 278/05, s. 11 (3).



**ADVANCE NOTICE
TYPE 3 OPERATION AND CERTAIN TYPE 2 OPERATION**

**TO: Ministry of Labour
Ellen Fairclough Building
119 King St. West
Hamilton, Ontario
L8P 4Y7
TEL: 905 577-6221
FAX: 905 577-1200**

**FROM: McMaster University
1280 Main Street West
Hamilton, Ontario
L8S 4K1
TEL: 905 525-9140, EXT: _____
FAX: 905 _____**


Location the place of work is to be carried out:

Description of the work to be carried out:

Name of Contact: _____

Date: _____


cc: EOHSS (ext. 24352)
JHSC Worker Representative (name & ext) _____

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APPENDIX F

CLEARANCE AIR TESTING - Section 18 (5) - **Type 3**

- (5) The following rules apply to clearance air testing:
1. Sample collection and analysis shall be done,
 - i. using the phase contrast microscopy method, in accordance with subsection (6) or
 - ii. using the transmission electron microscopy method, in accordance with subsection (7).
 2. If the work area inside the enclosure fails the clearance air test, the steps set out in subparagraphs 15 ii, iii and iv of subsection (4) shall be repeated and the work area shall be allowed to dry before a further test is carried out, unless paragraph 6 of subsection (6) applies. O. Reg. 278/05, s. 18 (5).
- (6) Clearance air testing using the phase contrast microscopy method shall be carried out 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, and shall comply with the following requirements:
1. Testing shall be based on samples taken inside the enclosure.
 2. Forced air shall be used, both before and during the sampling process, to ensure that fibres are dislodged from all surfaces inside the enclosure before sampling begins and are kept airborne throughout the sampling process.
 3. At least 2,400 litres of air shall be drawn through each sample filter, even though the standard mentioned above provides for a different amount.
 4. The number of air samples to be collected shall be in accordance with Table 3.
 5. The work area inside the enclosure passes the clearance air test only if every air sample collected has a concentration of fibres that does not exceed 0.01 fibres per cubic centimeters of air.
 6. If the work area inside the enclosure fails a first test that is done using the phase contrast microscopy method, the samples may be subjected to a second analysis using transmission electron microscopy in accordance with the standard mentioned in subsection (7).
 7. When a second analysis is done as described in paragraph 6, the work area inside the enclosure passes the clearance air test only if every air sample collected as a concentration of asbestos fibres that does not exceed 0.01 fibres per cubic centimeter of air. O. Reg. 278/05, s. 18 (6).
- (7) Clearance air testing using the transmission electron microscopy method shall be carried out 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), and shall comply with the following requirements:
1. Testing shall be based on samples taken inside the enclosure and samples taken outside the enclosure but inside the building.
 2. Forced air shall be used inside the enclosure, both before and during the sampling process, to ensure that fibres are dislodged from all surfaces before sampling begins and are kept airborne throughout the sampling process.

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3. At least 2,400 litres of air shall be drawn through each sample filter, even though the standard mentioned above provides for a different amount.
 4. 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.
 5. Sampling inside and outside the enclosure shall be conducted concurrently.
 6. 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. O. Reg. 278/05, s. 18 (7).
- (8) Within 24 hours after the clearance air testing results are received,
- (a) The owner and the employer shall post a copy of the results in a conspicuous place or places,
 - (i) at the workplace, and
 - (ii) if the building contains other workplaces, in a common area of the building; and
 - (b) 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. O. Reg. 278/05, s. 18 (8).
- (9) The owner of the building shall keep a copy of the clearance air testing results for at least one year after receiving them. O. Reg. 278/05, s. 18 (9).




APPENDIX F (cont'd)

**TABLE 3
AIR SAMPLES
Paragraph 4 of subsection 18 (6)**

Minimum number of 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


O. Reg. 278/05 Table 3.

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APPENDIX G

RESPIRATORS – Section 13

- (1) A respirator provided by an employer and used by a worker in a Type 1, Type 2 or Type 3 operations,
 - (a) shall be fitted so that there is an effective seal between the respirator and the worker's face, unless the respirator is equipped with a hood or helmet;
 - (b) shall be assigned to a worker for his or her exclusive use, if practicable;
 - (c) shall be used and maintained in accordance with written procedures that are established by the employer and are consistent with the manufacturer's specifications;
 - (d) 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, or after each use when used by more than one worker;
 - (e) shall have damaged or deteriorated parts replaced prior to being used by a worker; and
 - (f) when not in use, shall be stored in a convenient, clean and sanitary location. O. Reg. 278, s. 13 (1).
- (2) The following additional requirements apply to a respirator of the supplied air type:
 1. The compressed air used for breathing shall meet the standards set out in Table 1 of CSA Standard Z180.1-00, Compressed Breathing Air and systems (March, 2000).
 2. If an oil-lubricated compressor is used to supply breathing air, a continuous carbon monoxide monitor equipped with an alarm shall be provided.
 3. If an ambient breathing air system is used, the air intake shall be located in accordance with Appendix B of the standard referred to in paragraph 1. O. Reg. 278/05, s. 13 (2).
- (3) If respirators are used in the workplace,
 - (a) the employer shall establish written procedures regarding the selection, use and care of respirators; and
 - (b) a copy of the procedures shall be provided to and reviewed with each worker who is required to wear a respirator. O. Reg. 278/05, s. 13 (3).
- (4) A worker shall not be assigned to an operation requiring the use of a respirator unless he or she is physically able to perform the operation while using the respirator. O. Reg. 278/05, s. 13 (4).

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APPENDIX H

INSTRUCTION AND TRAINING – Section 19

19. (1) The employer shall ensure that instruction and training in the following subjects are provided by a competent person to every worker working in a Type 1, Type 2 or Type 3 operation:
1. The hazards of asbestos exposure.
 2. Personal hygiene and work practices.
 3. The use, cleaning and disposal of respirators and protective clothing. O. Reg. 278/05, s. 19 (1).
- (2) The joint health and safety committee or the health and safety representative, if any, for the workplace shall be advised of the time and place where the instruction and training prescribed by subsection (1) are to be carried out. O. Reg. 278/05, s. 29 (2)
- (3) Without restricting the generality of paragraph 3 of subsection (1), the instruction and training related to respirators shall include instruction and training related to,
- (a) the limitations of the equipment;
 - (b) inspection and maintenance of the equipment;
 - (c) proper fitting of a respirator; and
 - (d) respirator cleaning and disinfection. O. Reg. 278/05, s. 19 (3).

ASBESTOS ABATEMENT TRAINING PROGRAMS – Section 20

20. (1) The employer shall ensure that,
- (a) every worker involved in a Type 3 operation has successfully completed the Asbestos Abatement Worker Training Program approved by the Ministry of Training, colleges and Universities; and
 - (b) every supervisor of a worker involved in a Type 3 operation has successfully completed the Asbestos Abatement Supervisor Training Program approved by the Ministry of Training, Colleges and Universities. O. Reg. 278/05, s. 20 (1).
- (2) The employer shall ensure that every worker and supervisor successfully completes the appropriate program required under subsection (1) before performing or supervising the work to which the program relates. O. Reg. 278/05, s. 20 (2).
- (3) A document issued by the Ministry of Training, Colleges and Universities, showing that a worker has successfully completed a program mentioned in subsection (1), is conclusive proof, for the purposes of this section, of his or her successful completion of the program. O. Reg. 278/05, s. 20 (3).
- (4) In accordance with the *Agreement on Internal Trade, 1995* and the *Protocols of Amendment*, a worker shall be deemed to hold a document showing successful completion referred to in subsection (3) if he

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or she has successfully completed equivalent training in another province or territory of Canada, as determined by the Director. O. Reg. 278/05, s. 20 (4).


APPENDIX I

ASBESTOS WORK REPORT – Section 21

21. (1) The employer of a worker working in a Type 2 operation or a Type 3 operation shall complete an asbestos work report in a form obtained from the Ministry for each worker,
 - (a) at least once in each 12-month period; and
 - (b) immediately on the termination of the employment of the worker. O. Reg. 278/05, s. 21 (1).
- (2) As soon as the asbestos work report is completed, the employer shall,
 - (a) forward it to the Provincial Physician, Ministry of labour, and
 - (b) give a copy to the worker. O. Reg. 278/05, s. 21 (2).
- (3) For the purposes of clause (2) (a), the employer may deliver the report to the Provincial Physician in person or send it by ordinary mail, by courier or by fax. O. Reg. 278/05, s. 21 (3).

ASBESTOS WORKERS REGISTER – Section 22

22. (1) The Provincial Physician, Ministry of Labour, shall establish and maintain an Asbestos Workers Register listing the name of each worker for whom an employer submits an asbestos work report under Section 21. O. Reg. 278/05, s. 22, (1).
- (2) On the recommendation of the Provincial Physician, a worker who is listed in the Register may volunteer to undergo the prescribed medical examination described in paragraph 1 of subsection (4). O. Reg. 278/05, s 22, (2).
- (3) A worker who has undergone the prescribed medical examination described in paragraph 1 of subsection (4) may volunteer to undergo subsequent examinations of the same type if they are recommended by his or her physician. O. Reg. 278/05, s. 22 (3).
- (4) The following medical examinations are prescribed for the purposes of subsection 26 (3) of the Act:
 1. An examination consisting o a medical questionnaire, chest x-rays and pulmonary function tests.
 2. A subsequent examination that consists of the components described in paragraph 1, is recommended by the worker’s physician and takes place at least two years after the most recent examination. O. Reg. 278/05, s. 22 (4).
- (5) A worker who is removed from exposure to asbestos because an examination discloses that he or she may have or his a condition resulting from exposure to asbestos and suffers a loss of earnings as a result of the removal from exposure to asbestos is entitled to compensation for the loss in the manner


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and to the extent provided by the *Workplace Safety and Insurance Act, 1997*.
O. Reg. 278/05, s. 22 (5).

APPENDIX J

USE OF EQUIVALENT MEASURE OR PROCEDURE – Section 23


23. A constructor, in the case of a project, or the employer, in any other case, may vary a measure or procedure required by this regulation if the following conditions are satisfied:
1. The measure or procedure, as varied, affords protection for the health and safety of workers that is at least equal to the protection that would be provided by complying with this Regulation.
 2. The constructor or employer gives written notice of the varied measure or procedure, in advance, to the joint health and safety committee or the health and safety representative, if any, for the workplace.
O. Reg. 278/05, s. 23.

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APPENDIX K

Notice to Inspector – Section 24

24. (1) When this Regulation requires written notice to an inspector at an office of the Ministry of Labour, the notice shall be given,
- (a) by delivering it to the office in person;
 - (b) by sending it by ordinary mail, by courier or by fax, or
 - (c) by sending the notice to the inspector by electronic means that are acceptable to the Ministry.
O. Reg. 278/05, s. 24 (1).
- (2) When this Regulation requires oral notice to an inspector at an office of the Ministry of Labour, the notice shall be given,
- (a) in person;
 - (b) by telephoning the inspector, or
 - (c) by sending the notice to the inspector by electronic means that are acceptable to the Ministry.
O. Reg. 278/05, s. 24 (2).

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APPENDIX L

WORK PRACTICES-EMERGENCY WORK


Emergency asbestos procedures shall be implemented when required in order to protect those undertaking the work, as well as to protect all others from, or limit exposure to, airborne asbestos. Procedures indicated shall be followed as closely as possible, in the event of an emergency situation.

Procedures for asbestos work, required as an immediate response to floods, pipe breaks, ceiling collapses, or other emergencies that affect asbestos materials, are as follows:

1. Clear area of all occupants.
2. Construct enclosure around area if time permits.
3. Shut down ventilation system serving area.
4. Worker performing repair shall wear protective respirator and disposable suit. If normal work clothes are worn they must be disposed of if visibly contaminated.
5. Use drop sheet under work, if possible, to minimize clean-up.
6. Perform emergency repair with minimum disturbance of asbestos.
7. Obtain asbestos equipment and perform clean-up of visible material. Use HEPA filtered vacuum, or wet cleaning. Dispose of all cleaning supplies as contaminated waste.
8. The worker should wipe off or vacuum disposable clothing and footwear. Proceed to washroom to wash face and hands.
9. Notify the Asbestos Coordinator/Technical Specialist regarding the asbestos disturbance, before allowing unprotected persons to enter the area. The Asbestos Coordinator/Technical Specialist will contact an asbestos consultant if deemed necessary to obtain inspection and air monitoring.
10. The McMaster University Asbestos Coordinator/Technical Specialist shall investigate the extent of asbestos disturbance, to determine additional actions to be undertaken. Shall notify EOHSS and JHSC worker representative on the status of the situation.


EMERGENCY REACTION IN THE EVENT OF SUSPECTED ASBESTOS SPILL

1. Do not clean up, cover, move or contact asbestos-suspect material. Cease work in the area and do not resume work at risk of disturbing material. Leave the area and notify the appropriate contact:

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Mon-Fri (day shift – Asbestos Coordinator/Technical Specialist, ext. 23061)
Off hours – Security (dial 88)

2. Isolate the area by locking doors if this can be done without blocking emergency or fire routes.
3. If it is not possible to safely isolate the area, the Asbestos Coordinator/Technical Specialist will notify: appropriate persons not to enter the area, EOHSS and a JHSC worker representative. If possible, post a sentry to prevent unnecessary access.
4. The Asbestos Coordinator/Technical Specialist will determine if asbestos is likely contained in the debris. If material cannot be confirmed asbestos-free by records or appearance, follow procedures below.
5. The Asbestos Coordinator/Technical Specialist will arrange to shut down ventilation systems to the affected area.
6. Contact Asbestos Abatement Contractor to clean-up contaminated area.
7. The Asbestos Coordinator/Technical Specialist will contact the asbestos consultant to provide testing of suspect material or inspection and air monitoring when required.
8. In cases of emergency maintenance work “Work Practices – Emergency Work” must be followed.

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APPENDIX M

REPORTING THE RESULTS

Final test reports shall also include:

- (a) Reporting limit
- (b) Modification to the test method, if applicable
- (c) Date of sample receipt
- (d) Page numbers on each page, and either x of y page numbering or a clear indication of the end of the report

Measurements below the method reporting limit shall be reported a < (less than) or not detected (ND) and reference the reportable limit. The reporting of zero (0.00) concentration is **not** permitted.

The final report shall state the measured quantitative result of the analysis of any blank samples submitted to the laboratory. Also, a statement must be made that discloses whether or not the sample results have been corrected for contamination based on the field blank or other analytical blank.

ACRONYMS

Acceptance Limited – established mathematical data quality limits for analytical method performance

Accuracy – the degree of agreement between an observed value and an accepted reference value. Accuracy includes a combination of precision and bias.


Analytical Sensitivity – the lowest concentration that can be detected by the method, based upon the amount or portion of sample analyzed (e.g., for methods involving a count = 1 raw count per amount or portion of sample analyzed, calculated and expressed in the final reporting units).

Bias – a systematic error manifested as a consistent positive or negative deviation from the known true value.

Calibration – a set of operations used: (1) to determine the value of a reference standard or reference material to a stated uncertainty; or, (2) to determine the accuracy of the reading of a test device to a stated uncertainty.

Deviation – a departure from written procedures, test methods, contracts or any other standard operating procedure that is part of the laboratory Quality Assurance System.

Duplicate Samples – two samples taken from and representative of the same population and carried through all steps of the sampling and analytical procedures in an identical manner. Duplicate samples are used to assess variance of the total method including sampling and analysis.

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Field Blank – an analyte-free matrix carried to the sampling site, exposed to the sampling conditions (e.g. bottle caps removed), returned to the laboratory, treated as a sample, and carried through all steps of the analysis. For example, a clean culture media plate, sorbent tube, or a clean filter could be used as a field blank. The field blank, which should be treated just like the sample, evaluates possible effects attributable to sipping and field handling procedures.

Laboratory Quality Assurance Program(s) (LQAP) – general term referring to any AIHA program or programs established to maintain standards of performance for analysts and/or laboratories analyzing samples and evaluating exposures to hazardous agents.

Method - an orderly arrangement of steps to accomplish sample analysis.

Method Blank – an unexposed sampling media or reagent(s), not taken to the field or shipped, but carried through the complete sample preparation and analytical procedure. The blank is used to assess possible background contamination from the analytical process. This blank may also be referred to as a laboratory blank.

Method Detection Limit (MDL) – the minimum concentration of any analyte that, in a given matrix and with a specific method, has a 99 percent probability of being identified, qualitatively or quantitatively measured, and reported to be greater than zero.

Non-Standard Method – method not meeting the definition of ‘Standard Method’ contained in this module.
Precision – the degree to which a set of observations or measurements of the same property, usually obtained under similar conditions, conform to themselves.
 Precision is often expressed as standard deviation, variance or range, in either absolute or relative terms.

Quality Assurance (QA) – an integrated system of activities involving planning, quality control, quality assessment, reporting and quality improvement to ensure a product or service meets defined standards of quality within a stated level of confidence.


Quality Control (QC) – technical activities whose purpose is to measure and control the quality of a product or service so that it meets the needs of users. The aim is to provide quality that is satisfactory, adequate, dependable and economical.

Reporting Limit – the lowest concentration of analyte in a sample that can be reported with a defined, reproducible level of certainty. This value is based on the low standard used for instrument calibration. For environmental lead analyses, the reporting limit must be at least twice the MDL.

Reproducibility – the extent to which a method, test or experiment yields the same or similar results when performed on subsamples of the same sample by different analysts or laboratories.

Standard – a substance or material with properties believed to be known with sufficient accuracy to permit its use to evaluate the same property of another. In chemical measurements, it often describes a solution or substance commonly prepared by the analyst to establish a calibration curve or the analytical response function of an instrument.

Standard Method – procedures recommended by national or international agencies, such as the Environmental Protection Agency (EPA), the National Institute for Occupational Safety and Health (NIOSH), the American Society for Testing and Materials (ASTM), the Association of Official Analytical Chemists (AOAC), the American Public Health Association (APHA), the Occupational Safety and Health Administration (OSHA).

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Standard Operating Procedure (SOP) – A written document that details the procedures of an operation; an analysis or action whose techniques and procedures are thoroughly prescribed, and which are accepted as the procedure for performing certain routine or repetitive tasks.

Test Method – specified technical procedure for performing a test. See Standard Operating Procedure.

Uncertainty of Measurement – result of the evaluation aimed at characterizing the range within which the true value of a test result is estimated to lie, generally within a given likelihood.

Verification – confirmation by examination and provision of evidence that specified requirements have been met.